



# ControlFLASH Plus Quick Start Guide

Version 6.00.00



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# 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.

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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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These 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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The following icon may appear in the text of this document.



**Tip:** Identifies information that is useful and can help to make a process easier to do or easier to understand.

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Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

# Preface

## About this publication

Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

## Purpose of this manual

This quick start guide describes how to use the ControlFLASH Plus® software to upgrade device firmware.


## Who should use this manual

You should use this manual if you need to maintain firmware revisions. Refer to your product release notes to determine whether it supports firmware updates via ControlFLASH Plus.

You should also have the following knowledge:

- A basic understanding of networking concepts
- A basic familiarity of FactoryTalk® Linx™ software

## Access help

There is additional information in the help for this application. Access help by clicking  [Help](#) that appears at the top-right corner of the ControlFLASH Plus software window.

## Legal Notices

Rockwell Automation publishes legal notices, such as privacy policies, license agreements, trademark disclosures, and other terms and conditions on the [Legal Notices](#) page of the Rockwell Automation website.

## Software and Cloud Services Agreement

Review and accept the Rockwell Automation Software and Cloud Services Agreement [here](#).

## Open Source Software Licenses

The software included in this product contains copyrighted software that is licensed under one or more open source licenses.

You can view a full list of all open source software used in this product and their corresponding licenses by opening the oss\_license.txt file located in your product's OPENSOURCE folder on your hard drive. This file is divided into these sections:

- Components  
Includes the name of the open source component, its version number, and the type of license.
- Copyright Text  
Includes the name of the open source component, its version number, and the copyright declaration.
- Licenses  
Includes the name of the license, the list of open source components citing the license, and the terms of the license.

The default location of this file is:

C:\Program Files (x86)\Common Files\Rockwell\Help\ControlFLASH Plus\Release Notes\OPENSOURCE\oss\_licenses.txt.

You may obtain Corresponding Source code for open source packages included in this product from their respective project web site(s). Alternatively, you may obtain complete Corresponding Source code by contacting Rockwell Automation via the **Contact** form on the Rockwell Automation website: <https://www.rockwellautomation.com/global/about-us/contact/contact.page>. Please include "Open Source" as part of the request text.

# Start with ControlFLASH Plus

This chapter helps you get started with using the ControlFLASH Plus software.

## ControlFLASH Plus overview

ControlFLASH Plus® is a software tool used for electronically changing firmware revisions in hardware devices. It provides an intuitive, easy-to-use interface that can:

- Flash one or multiple devices within a single operation.
- Manage firmware revisions and firmware locations.
- Download firmware revisions from the Product Compatibility and Download Center.
- Manage and use devices' revisions favorites.
- Create an inventory of your devices and send the inventory to your Rockwell Automation® account for registration.

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**IMPORTANT:** ControlFLASH Plus only supports the firmware update for devices supporting the Common Industrial Protocol (CIP). To perform updates of non-CIP devices, use the ControlFLASH™ tool.

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## System requirements

ControlFLASH Plus works within the system requirements of all Rockwell Automation software products. For the latest information regarding software platform support, refer to Rockwell Automation [Product Compatibility and Download Center](#).

### Hardware requirements

ControlFLASH Plus requires the following hardware:

- An Intel® Core 2 Duo processor running at 2.8 GHz or faster or another processor with equivalent specifications
- 4 GB or more memory RAM
- At least 16 GB of available hard drive space
- An Ethernet adapter

### Software requirements

ControlFLASH Plus has been tested on the following systems:

- Windows Server® 2022
- Windows Server 2019
- Windows® 11
- Windows 10

### Rockwell Automation Test Environment



Rockwell Automation tests software products under a standard configuration of operating systems and antivirus software. For additional information, see the Knowledgebase Document ID: [PN24 - Rockwell Software Products and Antivirus Software](#).

## Additional software

- The following communications software must be installed before running ControlFLASH Plus:
  - FactoryTalk® Linx™ version 6.40.00 or later
 

There is an optional installation package that includes FactoryTalk Linx in ControlFLASH Plus version 2.00.00 or later.
- The Ethernet adapter driver is required for installation due to Telemetry Collector.

The installation package also includes FactoryTalk Updater. FactoryTalk Updater Agent is selected by default when installing ControlFLASH Plus. Install FactoryTalk Updater Client and Server as needed. Refer to FactoryTalk Updater Release Notes > Application Notes for more information.

## Supported browsers

The following web browsers have been tested and are supported for use with this release:

- Google® Chrome™ browser
- Microsoft® Edge™
- Mozilla® Firefox®

## Security requirements

To help meet secure system design requirements, review these publications:

- [Configure System Security Features User Manual](#) (publication SECURE-UM001)
- [System Security Design Guidelines](#) (publication SECURE-RM001)
- [Converged Plantwide Ethernet \(CPwE\) Design and Implementation Guide](#) (publication ENET-TD001)

To learn about implementing CIP Security, see [CIP Security with Rockwell Automation Products Application Technique](#) (publication SECURE-AT001).

## Before you begin

Before using ControlFLASH Plus, you need to:

- Install FactoryTalk® Linx™ version 6.40.00 and FactoryTalk® Services Platform version 6.40.00.



**Tip:** There is an optional installation package that includes FactoryTalk Linx and FactoryTalk Services Platform in ControlFLASH Plus version 2.00.00 and later.

- Configure communication drivers in the FactoryTalk Linx software.
- Verify that your communications drivers work correctly.



**Tip:** For more information about FactoryTalk Linx, refer to the [FactoryTalk Linx Getting Results Guide](#) (publication LNXENT-GR001).

## Install ControlFLASH Plus

You can download the installation packages from [Rockwell Automation Product Compatibility and Download Center \(PCDC\)](#). We provide two installation packages:

- If you have installed FactoryTalk Linx 6.40.00 or later, you can download the ControlFLASH Plus installer without FactoryTalk Services Platform.



**Tip:** To flash Micro810® or Micro820® over USB, you need to download and install FactoryTalk Linx 6.40.00 or later.

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- If you have not installed FactoryTalk Linx 6.40.00 or later, you must download the ControlFLASH Plus installer with FactoryTalk Services Platform.

To install ControlFLASH Plus through the installation package, complete the following operations:

- Download and install FactoryTalk Services Platform version 6.40.00 or later.
- [Locate and download the installation package on page 10.](#)
- [Install ControlFLASH Plus on page 10.](#)

## Download the installation package

### To download the installation package

1. From the browser, go to the [PCDC](#) website:  
To use this site, you must register and sign in.
2. Click  to open the search box, enter **ControlFLASH Plus**, and then press **Enter**.
3. Find the ControlFLASH Plus product, and then click **Downloads**.
4. Click the **show downloads** icon .
5. In the **Available Downloads** page, select the appropriate ControlFLASH Plus installation package and click **Downloads**.
6. Follow the instructions on the web to download the installation package.

## Install ControlFLASH Plus

To install ControlFLASH Plus, follow the steps below:

- [Step 1: Launch the Setup wizard and start the installation on page 10.](#)
- [Step 2: Read and accept license agreements on page 11.](#)
- [Step 3: Start the installation on page 11.](#)
- [Step 4: Finish the installation on page 12.](#)
- [Step 5: View the release notes on page 12.](#)

When the installation completes, FactoryTalk® Security is enabled by default. When started, ControlFLASH Plus signs in to the FactoryTalk network directory.

## Launch the Setup wizard

1. Close all open programs.
2. In the ControlFLASH Plus installation package, double-click **Setup.exe**.

3. If Microsoft .NET Framework 4.8 is not installed on your computer, it will be automatically installed during the process of installation.
4. (optional) On the **ControlFLASH Plus Setup** page, select a language to be shown during the installation process. By default, your system language is selected.  
Click **Release notes** to view the ControlFLASH Plus Release Notes in your browser.
5. To install the software using the recommended installation location, click **Install now** and skip to [Step 2: Read and accept license agreements on page 11](#).
6. To select which components to install and change installation location, click **Customize**.  
If you download the installation package that only includes ControlFLASH Plus and FactoryTalk Updater, the other components won't show.

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**NOTE:** We provide the installation package that includes FactoryTalk Updater, FactoryTalk Updater Agent is selected by default. Install the Client and Server as needed. For more information about FactoryTalk Updater, refer to the Application notes section in FactoryTalk Updater Release Notes.

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7. On the **Customize** page, select the components. There may be three options shown:
  - **Mandatory** (grayed-out and selected checkbox) indicates software that will be automatically installed as part of the selected application.
  - **Recommended** (selected checkbox) indicates software that Rockwell Automation recommends for the application. You may decide to clear the checkbox so the software does not install.
  - **Optional** (clear checkbox) indicates software that you may wish to include depending on your system. Select the box to include the software during installation. To change the installation location, click **Customize**.
8. Click **Install**.

## Read and accept license agreements

End-user license agreements (EULA) spell out your rights and responsibilities. Depending on the components being installed, there may be more than one license agreement on this page. The individual license agreements are listed above the text box.

Some software products may be delivered or made available only after you agree to the terms and conditions of each of the license agreements.

1. On the **End User License Agreements** page, select each agreement and read the agreement carefully.
2. When all license agreements have been read, click **Accept all**.



**Tip:** If you click **Decline**, you will return to the **ControlFLASH Plus Setup** page.

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## Start the installation

After accepting the license agreements, the Setup wizard automatically installs the software and does not require any input.

## Finish the installation

The installation completes.

- To view the installation details, click **Installation Summary**.
- To receive the latest product updates and patch notification, click **Register for updates**.
- To install the latest version of Adobe® Acrobat® Reader®, click **Download it free** and follow the on-screen instructions.

Restart the computer to complete the installation.




**Tip:** After installing the software, you can repair, modify, or uninstall the software from the Setup wizard or Windows Control Panel.

---

If you also install FactoryTalk Updater Client on your computer, use it to check the latest version of ControlFLASH Plus from the Product Compatibility and Download Center.

## View the release notes

After ControlFLASH Plus is installed, view the release notes to learn about the system requirements, system features, anomalies, and application notes for this release.

1. Click **Start > All Programs > FLASH Programming Tools > ControlFLASH Plus**.
2. After ControlFLASH Plus is opened, click  **Settings**.
3. In the **Settings** dialog box, click **About > ControlFLASH Plus Release Notes**.
4. The release notes will be opened with the browser.

## Install with command-lines

ControlFLASH Plus supports silent or unattended installation using command-line parameters. Silent installation runs in a quiet mode without any user interface, while unattended installation runs in a quiet simple mode and shows progress through the UI. Unattended installation does not accept any input, but still shows error or restart messages.

## Perform the installation

Use command-line parameters to perform a silent or unattended installation of ControlFLASH Plus.

The command-line installation requires the administrator permission. The steps may vary slightly depending on your operating system.

### To perform silent or unattended installation:

1. Close all Windows programs.
2. Open the **Command Prompt** window.
3. In the **Command Prompt** window, navigate to *D:*, where *D:* is the drive containing the ControlFLASH Plus installation package.

In this example, type *D:* and press **Enter**.



**Tip:** If the **User Account Control** dialog box shows, click **Yes**.

---

4. Type a command with the following syntax and press **Enter**.

```
Setup.exe {/Q | /QS} /IAcceptAllLicenseTerms [/AutoRestart] [/SetupLanguage=language]
[/Record] [/Playback] [/InstallDrive=drive]
```

For more information about parameters, type **Setup.exe /?** or see [Command-line parameters for silent or unattended installation on page 13](#).

Command-line parameters

Unattended or silent install

Use command-line parameters to perform an unattended or silent installation of the software.

Command-line parameters

The following table identifies the installation command-line parameters. Command-line parameters are case-insensitive. However, if a specified value includes a space, be sure to enclose the value in quotation marks (for example, "value with spaces").

| Parameter               | Description   |
|-------------------------|---|
| /?                      | Displays the usage options for installation parameters.   |
| /Q                      | <p>Silent Install, install runs in a quiet mode without any user interface.</p> <p>This parameter is recommended if you are deploying the software installation using an IT tool or script, and don't expect to see any error or restart messages. When using this parameter, your IT tool or script should check the error codes, and respond as needed. For example, if the installation returns error code 1641, then the IT tool or script should restart the computer and relaunch the installation after restart.</p> <p>This parameter is required if /QS or /Record is not specified.</p>   |
| /QS                     | <p>Unattended Install, install runs in a quiet simple mode and shows progress through the UI, it does not accept any input but still shows error or restart messages.</p> <p>When using this parameter, you will not have to check the error codes, and the installation will stop and display a prompt if there are error or restart messages. For example, if an immediate restart is required to complete the install, a restart message will be displayed for you to confirm the restart. Installation resumes automatically from the point of interruption after restart.</p> <p>This parameter is required if /Q or /Record is not specified.</p> |
| /IAcceptAllLicenseTerms | <p>Acknowledges acceptance of the license terms.</p> <p>This parameter is required for /Q or /QS parameters.</p>  |

| Parameter                | Description  |
|--------------------------|--|
| /AutoRestart             | <p>Automatically restarts the computer after the installation is complete. Used when a restart is required to complete the installation.</p> <p>This parameter is optional. If this parameter is not used silent install (/Q) will return either error code 1641 or 3010 if a restart is required, and unattended install (/QS) will result in a confirmation prompt that must be agreed to before the installation is completed.</p>                                |
| /SetupLanguage="value"   | <p>Specifies which language will be displayed during install process.</p> <p>The value must be the one of the following:</p> <ul style="list-style-type: none"> <li>• ENU</li> <li>• CHS</li> <li>• DEU</li> <li>• ESP</li> <li>• FRA</li> <li>• ITA</li> <li>• JPN</li> <li>• KOR</li> <li>• PTB</li> </ul> <p>This parameter is optional. If this parameter is not used, the default language is the current user or operating system user interface language.</p> |
| /Record                  | <p>Records the installation options chosen to a recording file.</p> <p>This parameter is optional.</p>   |
| /Playback                | <p>Plays back a recording file to specify the installation options.</p> <p>This parameter is optional.</p>   |
| /IgnoreWarning           | <p>Specifies that the setup ignores warnings and continues.</p> <p>This parameter is optional. If it is not specified, the setup exits when a warning occurs.</p>  |
| /Uninstall               | <p>Uninstalls the product.</p>   |
| /Repair                  | <p>Runs a repair operation on the installed products.</p> <p>This parameter is optional.</p>   |
| /InstallLocation="value" | <p>Specifies the install location.</p> <p>This parameter is optional. If this parameter is not used, the default install location is "C:\Program Files (x86)\Rockwell Software".</p> <p>Some software restricts the installer to only change the drive the software is installed on. Use /? to determine which parameter is supported.</p>   |
| /InstallDrive="value"    | <p>Specifies the install drive.</p>  |

| Parameter | Description   |
|-----------|---|
|           | This parameter is optional. If this parameter is not used, the default install drive is C:. |

## Error codes

The following table identifies the error codes that can be returned by an installation.




| Error Code                      | Value | Description  |
|---------------------------------|-------|--|
| ERROR_SUCCESS                   | 0     | The installation completed successfully.   |
| ERROR_INVALID_PARAMETER         | 87    | One of the parameters was invalid.   |
| ERROR_INSTALL_USEREXIT          | 1602  | The installation was cancelled by the user.  |
| ERROR_INSTALL_FAILURE           | 1603  | A fatal error occurred during installation.  |
| ERROR_BAD_CONFIGURATION         | 1610  | The configuration data for this product is corrupt. Contact your support personnel.  |
| ERROR_SUCCESS_REBOOT_INITIATED  | 1641  | The installer has initiated a restart. After the restart, the installation will continue.  |
| ERROR_SUCCESS_REBOOT_REQUIRED   | 3010  | A restart is required to complete the installation. After the restart, the product is successfully installed.                              |
| ERROR_SUCCESS_RELAUNCH_REQUIRED | 3012  | Restart pending. Restart computer for installation to continue.  |
| ERROR_SUCCESS_NOT_APPLICABLE    | 3013  | The installation cannot proceed because the products are already installed.  |
| ERROR_SUCCESS_WARNING_REBOOT    | 3014  | The installation succeeded with warnings. Check the installation log file for details. To complete the installation, restart the computer. |

## Explore the user interface





This chapter introduces the user interface of ControlFLASH Plus, including:

- Components on the ControlFLASH Plus window
- **Settings** dialog box
- **Flash Devices** tab
- **Manage Firmware** tab
- **Manage Favorites** tab
- **Product Inventory & Registration** tab

The following table explains the items in the ControlFLASH Plus window and their meanings.

| Item  | Description  |
|---|--|
| <a href="#">Flash Devices tab on page 25</a>  | Allows you to browse devices, select firmware revisions, and start a flash operation. When ControlFLASH Plus can access the Product Compatibility and Download Center, you can select a device's firmware revisions from the Product Compatibility and Download Center. You can also access up-to-date hardware and firmware lifecycle states, release notes, important notices, and copyright information. To download the firmware revisions, sign in to the Product Compatibility and Download Center.                                    |
| <a href="#">Manage Firmware tab on page 29</a>  | Shows devices' firmware revisions in the monitored folders. When ControlFLASH Plus can access the Product Compatibility and Download Center, you can select the firmware revisions from the Product Compatibility and Download Center. You can also access up-to-date hardware and firmware lifecycle states, release notes, important notices, and copyright information. To download firmware revisions, sign in to the Product Compatibility and Download Center. It also allows you to delete one or multiple unused firmware revisions. |
| <a href="#">Manage Favorites tab on page 32</a>   | Allows you to create, view, manage, and change the favorite lists.   |
| <a href="#">Product Inventory &amp; Registration tab on page 32</a>   | Allows you to create an inventory of your devices and send the inventory to your Rockwell Automation account for registration.   |
|  <b>Help</b>             | Opens the ControlFLASH Plus online help.<br><b>Tip:</b> To access the ControlFLASH Plus Quick Start Guide, click <b>Start &gt; All Programs &gt; FLASH Programming Tools &gt; ControlFLASH Plus Quick Start Guide</b> .  |
|  <b>Settings</b>         | Opens the <b>Settings</b> dialog box.  |
|  <b>Refresh Firmware</b> | Refreshes the firmware as found in the monitored folders.<br><b>Tip:</b> To save time, refresh the firmware after installing all non-DMK firmware kits.  |



| Item  | Description   |
|---|---|
|  Disconnected from the Download Center. No internet connection.<br> User doesn't have permission to connect to Download Center.<br> Connected to Download Center<br> Download Center available. <a href="#">Sign in</a> | <p>Shows the connection status indicator to the Product Compatibility and Download Center with different colors.</p> <ul style="list-style-type: none"> <li>Red <ul style="list-style-type: none"> <li><b>Disconnected from Download Center</b><br/>ControlFLASH Plus cannot access the Product Compatibility and Download Center. In most cases, when you don't have Internet connectivity, this will occur.</li> <li><b>User doesn't have permission to connect to Download Center</b><br/>The current user has no access to device revision on the Product Compatibility and Download Center.</li> </ul> </li> <li>Green<br/>ControlFLASH Plus can access the Product Compatibility and Download Center, you have signed in, and it allows you to download firmware revisions.</li> <li>Yellow<br/>ControlFLASH Plus can access the Product Compatibility and Download Center and <b>Sign in</b> shows. To download firmware revisions, sign in to the Product Compatibility and Download Center.</li> </ul> |

## Settings

Use the **Settings** dialog box to configure the settings for ControlFLASH Plus, including:

- [General on page 18](#)
- [Reports on page 19](#)
- [Security on page 21](#)
- [Firmware Locations on page 22](#)
- [Options on page 24](#)
- [About on page 24](#)


## Sign in to the PCDC

When connected to the Internet, sign in to the Product Compatibility and Download Center to download firmware revisions and view the firmware revisions' Important Notice.

### Prerequisites

- Make sure that the current user has permission to connect to the Product Compatibility and Download Center. For how to configure the connection permission, refer to [FactoryTalk Security System Configuration Guide](#) (publication FTSEC-QS001).


To sign in to the Product Compatibility and Download Center

- 1. In the lower left of the ControlFLASH Plus window, select **Sign in**.
-  **Tip:** In the **Settings** dialog box, select **General**, and then select **Sign in**.
- 2. In the **Sign in** webpage, enter a registered account and its password.
- 3. (optional) To view firmware revisions' Important Notice easily, select **Keep me signed in** to enable single signed on.
- 4. Select **Sign in**.

Sign out of the PCDC

After signing out of the Product Compatibility and Download Center, downloading firmware revisions and viewing firmware revisions' Important Notice from the Product Compatibility and Download Center is not allowed.

To sign out of the Product Compatibility and Download Center

- 1. In the ControlFLASH Plus window, select  **Settings**.
- 2. In the **Settings** dialog box, select **General**.
- 3. Select **Sign out**.

General

The following table lists the options in the **General** tab and their meanings.

| Options   | Description   |
|---|---|
| Flash   | Uses <b>Flash</b> to configure whether one selected revision will always be applied to all devices of the same type and the default behavior of the <b>Select Revision for All</b> dialog box.  |
| Let me choose each time (show messages)                   | When selecting a firmware revision in the <b>Flash To</b> column of the <b>Flash Devices</b> tab, with this option selected, a confirmation dialog box always opens giving you options to decide if you want to apply the revision to all devices of the same type.   |
| Yes, always select for all devices (do not show messages) | When selecting a firmware revision in the <b>Flash To</b> column of the <b>Flash Devices</b> tab, with this option selected, the selected revision will always be applied to all devices of the same type without showing a confirmation dialog box.  |
| No, never select for all devices (do not show messages)   | When selecting a firmware revision in the <b>Flash To</b> column of the <b>Flash Devices</b> tab, with this option selected, the selected revision will not be applied to other devices of the same type without showing a confirmation dialog box.<br><br>The confirmation dialog box has a checkbox used to turn off this function. |
| Enable enhanced concurrent flashing algorithm             | With this checkbox selected, the enhanced concurrent flashing is turned on to flash up to 20 devices regardless of the topology.  |

| Options   | Description   |
|---|---|
|   | With this mode turned on, devices in parent/children relationships and the ones connected on Ethernet linear/DLR topologies are also flashed concurrently.<br>This checkbox is selected by default.   |
| <b>Enable application log for troubleshooting</b> | With this checkbox selected, the default path for application logs appears and ControlFLASH Plus generates logs anytime it is started and stopped.<br><b>Tip:</b> When application errors occurred during operations, you can view the application logs to find the causes of the errors. |
| <b>Sign in</b>                                    | Selects this button to open the Product Compatibility and Download Center sign-in webpage. When you are signed in, the account shows.   |
| <b>Sign out</b>                                   | Selects this button to sign out of the Product Compatibility and Download Center.   |


## Enable application log

When an application error occurred during operations, view the application log to check the causes of the error.

### Prerequisites

- In **Settings > General**, select **Enable application log for troubleshooting** and restart ControlFLASH Plus.

### To enable application log

- In the ControlFLASH Plus window, select  **Settings**.
- In the **Settings** dialog box, select the **General** tab.
- On the **General** tab, select the **Enable application log for troubleshooting** checkbox.  
The default path for application logs shows and you are prompted with a dialog box indicating that when launching ControlFLASH Plus next time, application logging will begin.
- Select **Close**.



**Tip:** The application logs will be created on application start and stopped at application stop.  
Select the path link to open the default folder for application logs.

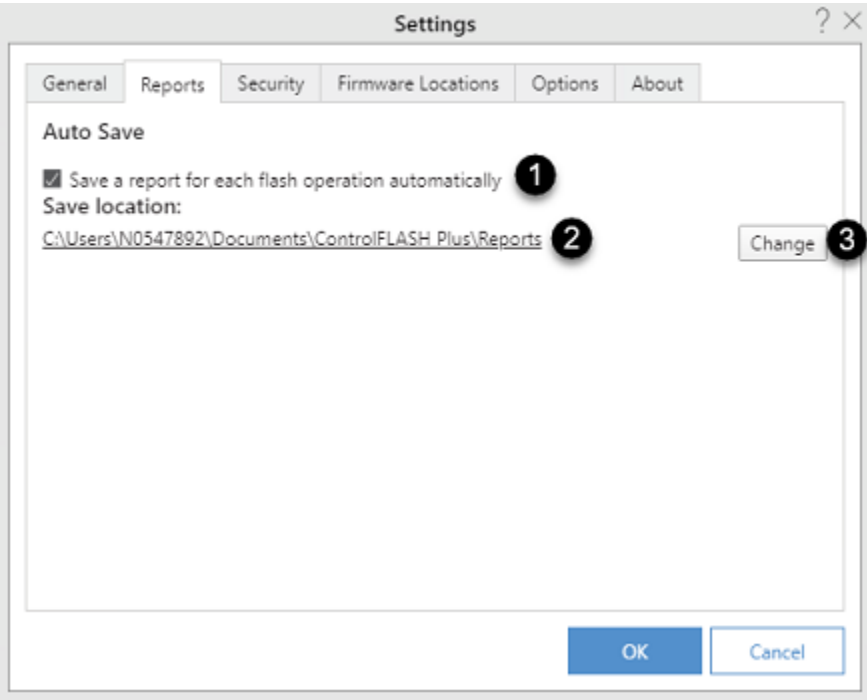
## Reports

Use the **Reports** tab to configure the automatic saving settings for reports of each flash operation, including:

- The option to turn on or off the automatic saving.
- The location of the saved report.

With the **Save a report for each flash operation automatically** checkbox selected, a report summarizing the flash result is automatically saved when a flash operation completes.

To change the report location, click **Change**. The default location is C:\Users\<Username>\Documents\ControlFLASH Plus\Reports.



The following table explains each item on the **Reports** tab.

| Item | Description  |
|------|--|
| 1    | Turns on or off the automatic save of reports.       |
| 2    | Shows the location of automatically saved reports.   |
| 3    | Changes the location of automatically saved reports. |

## View a flash report

Once a flash operation completes, you can view the CSV report file summarizing the result of the operation.

### To view a flash report

1. After a flash operation completes, click **Close** when you are prompted with the **Flash Results** dialog box.
2. If auto-save is off, click **Create Report**.  
If auto-save is on, go to step 5.
3. In the **Save as** dialog box, navigate to the location used to save the report.



**Tip:** The default name of the report follows the format as *ControlFLASH Plus Report* <year\_month\_day\_hour\_minute\_second>.

4. Click **Save**.
5. Click **Show Reports**.
6. Double-click the report to open it.

## Security

Use the **Security** tab to sign in to or off from FactoryTalk Security and view the current user. ControlFLASH Plus uses the FactoryTalk Security single sign-on feature. Single sign-on signs in as the Windows-linked user currently signed in to the computer. If single sign-on is disabled, a notification message shows at the top of the **Flash Devices** tab. Clicking the message opens the **Security** tab prompting the user to sign in.

You can sign in as another user by signing out and then sign back in.

- To sign out, click **Log off**. Once signed out, no flash operations can be performed.
- To sign in, enter the user name and password, then click **Log on**.

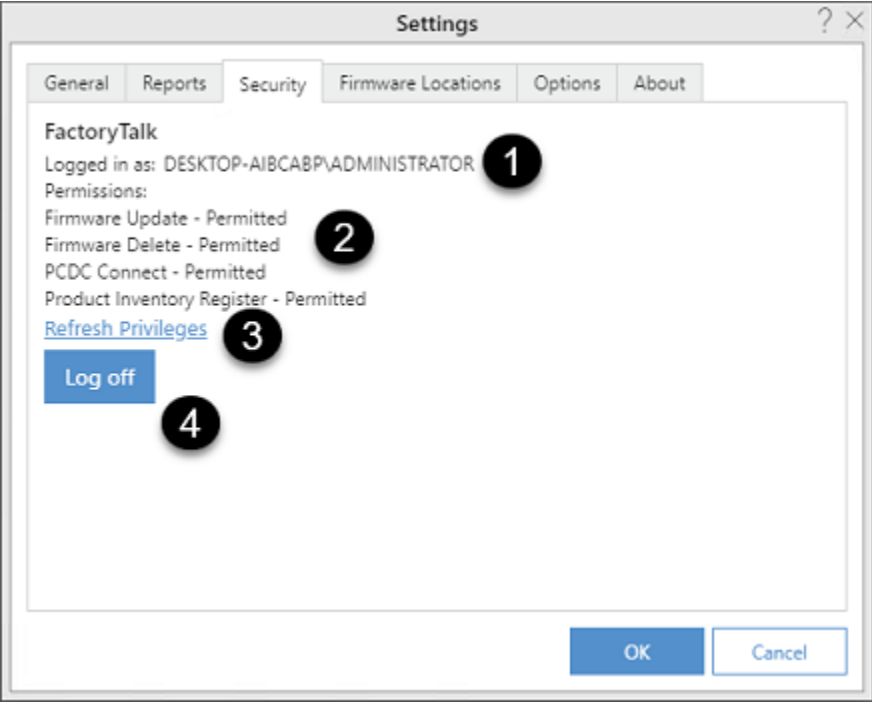
The **Security** tab displays the following permissions of the current user.

- Update firmware  
Users with this permission denied cannot perform flash operations.
- Delete firmware revision  
Users with this permission denied cannot delete firmware revisions.
- Product Compatibility and Download Center connection.  
Users with this permission denied have no access to device revision on the Product Compatibility and Download Center.
- Register products  
Users with this permission denied cannot register Rockwell Automation products.

For more information on single sign-on, see the *FactoryTalk Services Platform Help*.

The deleting firmware revision and Product Compatibility and Download Center connection policies are only configurable and applicable when using FactoryTalk Services Platform version 6.20 and higher and that we default to allow for both when using FactoryTalk Services Platform version 6.11 or earlier.

The Product Inventory & Registration policy is only configurable and applicable when using FactoryTalk Services Platform version 6.31 and higher.



The following table explains each item on the **Security** tab.

| Item | Description   |
|------|---|
| 1    | Shows the signed-in user.                                       |
| 2    | Shows the authenticated status.                                 |
| 3    | Refreshes the information of the signed-in user authentication. |
| 4    | Signs out of the system.  |



Firmware Locations

Use the **Firmware Locations** tab to view and manage the file locations that ControlFLASH Plus monitors for revision files.


- To add a monitored location, click **Add Location**, select the target folder, and then click **OK**. Click **OK** in the **Settings** dialog box to save the change.

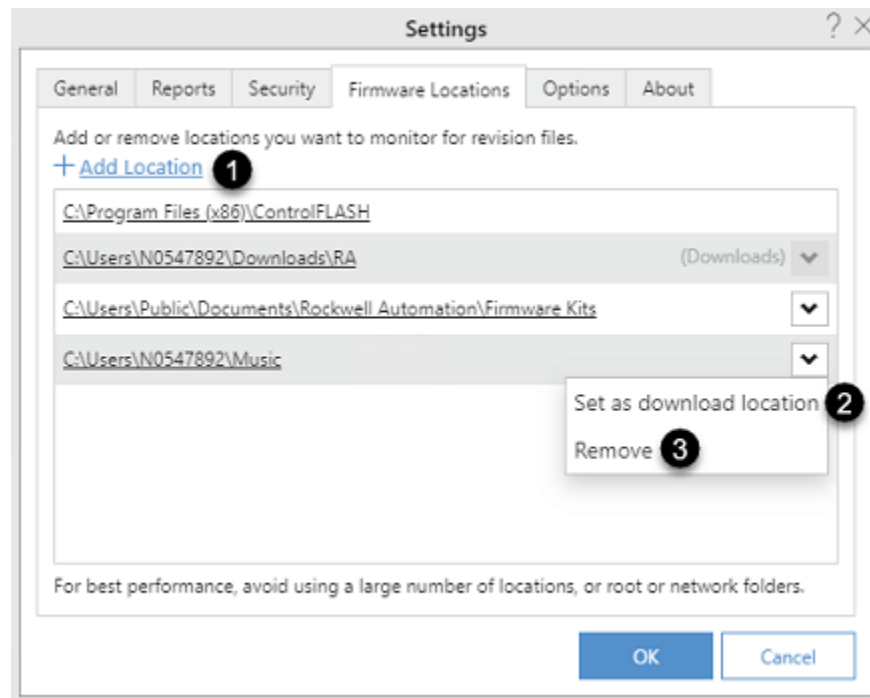


**Tip:** If you use the download manager to download firmware revisions from the [Product Compatibility and Download Center](#), the default or customized path of the firmware revisions will be added to the location list automatically.

- To set a default monitored location, click  at the end of the location. Select **Set as download location**, and then click **OK** in the **Settings** dialog box to save the change.
- To remove a monitored location, in the location list, click  at the end of the location. Select **Remove**, and then click **OK** in the **Settings** dialog box to save the change.
- To open a monitored download location, click the location in the location list.

**Tip:**

- Once a monitored download location is set as default, its  is disabled.
- The following locations are listed by default and cannot be removed:
  - C:\Program Files (x86)\ControlFLASH
  - C:\Users\<Username>\Downloads\RA
  - C:\Users\Public\Documents\Rockwell Automation\Firmware Kits




The following table explains each item on the **Firmware Locations** tab.

| Item | Description   |
|------|---|
| 1    | Adds a monitored location.                              |
| 2    | Sets a monitored location as default download location. |
| 3    | Removes a monitored location.                           |

## Add a monitored folder

Add a monitored folder to customize the path for saving the firmware revisions.

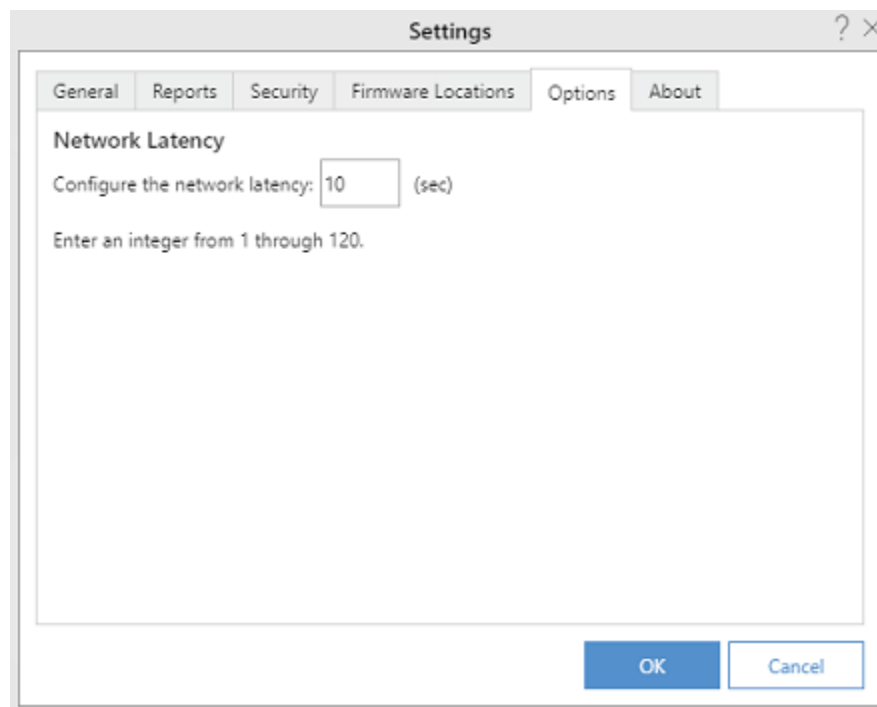
### To add a monitored folder

1. Select  **Settings**.
2. In the **Setting** dialog box, click the **Firmware Locations** tab.
3. Click **Add Location**.
4. In the **Browse For Folder** dialog box, select a folder.
5. Select **OK**.

## Options

Use the **Options** tab to configure the network latency.

Network latency indicates how much time it takes for a packet of data to transfer from one designated point to another. The latency is measured by sending a packet to FactoryTalk Linx that is returned to the sender. The default value is 10 seconds. It is not recommended to change the value unless the network is slow and FactoryTalk Linx needs more time to send a response message.

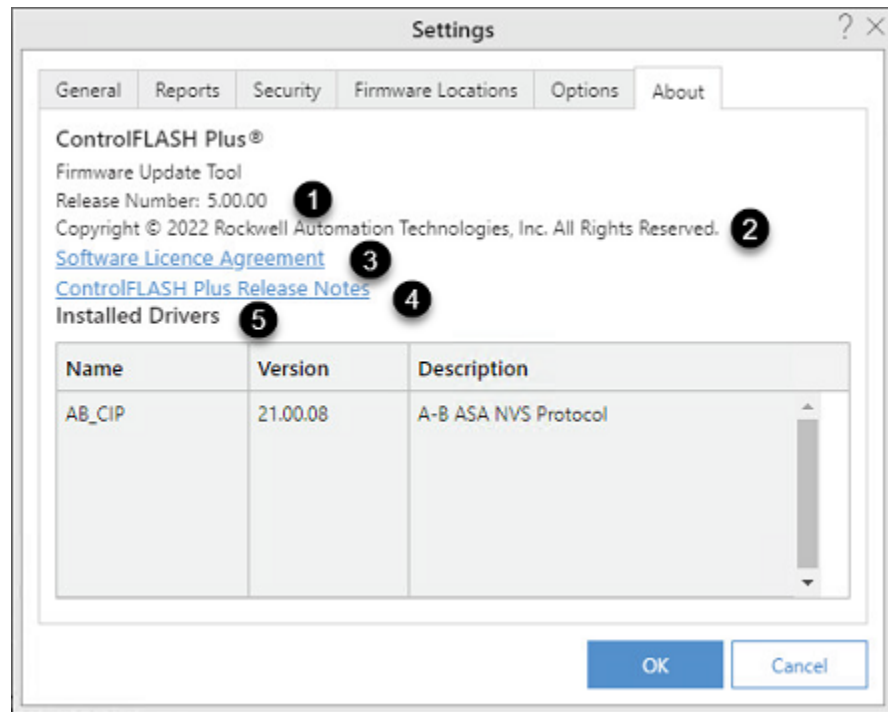


## About

Use the **About** tab to view the software version, copyright information, Rockwell Automation end-user license agreement, ControlFLASH Plus Release Notes, and the installed drivers.

- To view the Rockwell Automation end-user license agreement, click **Software License Agreement**.
- To view the release notes, click **ControlFLASH Plus Release Notes**.





The following table explains each item on the **Security** tab.


| Item | Description   |
|------|---|
| 1    | Shows the software version.   |
| 2    | Shows the copyright.  |
| 3    | Opens the Rockwell Automation end-user license agreement.                     |
| 4    | Opens the ControlFLASH Plus Release Notes.                                    |
| 5    | Lists the installed drivers, including driver name, version, and description. |


## Flash Devices





The **Flash Devices** tab shows by default when ControlFLASH Plus is opened. Use the **Flash Devices** tab to:



- Open the Network Browser to configure a starting browse path and select the number of levels to browse.
- Download firmware revisions from the Product and Compatibility and Download Center.
- Upgrade or downgrade device firmware.








The following table explains each item on the **Flash Devices** tab when ControlFLASH Plus can access the Product Compatibility and Download Center.

| Item  | Description   |
|---|---|
|  | Shows the starting browse path as configured in the Network Browser. By default, it shows the highest node of the network topology. For subsequent uses, it shows the last selected path in the previous session. |

| Item  | Description  |
|---|--|
| <b>Filter by device</b>   | <p>Filters one or more device types in a flashing session. The device list is filtered immediately as text included in the device name is entered.</p> <p>The number of selected devices, filtered devices, and all devices shows on the left of the <b>Filter by device</b> box.</p> <p>An orange highlight indicates that a filter is active.</p>  |
|  | <p>Accelerates the device selection in the list with the following options:</p> <ul style="list-style-type: none"> <li> <b>All</b><br/> Selects all devices whose selected <b>Flash To</b> revisions are equal to, greater than, or less than the current revision. </li> <li> <b>Upgrades Only</b><br/> Selects devices whose selected <b>Flash To</b> revisions are greater than the current revision. </li> <li> <b>Upgrades and Downgrades</b><br/> Selects devices whose selected <b>Flash To</b> revisions are greater or less than the current revision. This option doesn't select devices whose selected <b>Flash To</b> revisions are equal to their current ones, which avoids unnecessary firmware updates. </li> </ul> <p>Make sure that the <b>Flash To</b> revisions are set before using the selection accelerator.</p>  |
| <b>Device</b>   | <p>The <b>Device</b> column shows the network topology as returned by the browsing path. Network and chassis node names are shown in lighter gray to maintain the hierarchy.</p> <p>An orange highlight on the left border of this column indicates that a filter is active.</p>   |
| <b>Lifecycle Status</b>   | <p>Shows the device's lifecycle status found in the Product Compatibility and Download Center.</p> <ul style="list-style-type: none"> <li> <b>Active</b><br/> This is the most current offering with a product category. </li> <li> <b>Active Mature</b><br/> The product is fully supported, but a newer product or family exists. Gain value by migrating. </li> <li> <b>End Of Life</b><br/> The product's discontinued date was announced. Actively execute migrations and last time buys. Products are generally orderable until the discontinued date. </li> <li> <b>Discontinued</b><br/> New products are no longer manufactured or procured. Repair or exchange services may be available. </li> <li> <b>Product lifecycle status</b><br/> There are several lifecycle statuses found for a device. Click to find more details of these lifecycle statuses. </li> </ul> |

| Item             | Description  |
|------------------|--|
|                  | <ul style="list-style-type: none"> <li>• <b>Please check with vendor</b><br/>This device's lifecycle status is unknown because it isn't a Rockwell Automation or Allen-Bradley® device. Find more lifecycle status information from the device's vendor.</li> </ul> <p><b>Tip:</b> When there is no internet connectivity to the Product Compatibility and Download Center, the lifecycle statuses are not shown.</p> <p>You can visit <a href="https://www.rockwellautomation.com/global/support/product-compatibility-migration/lifecycle-status/overview.page">https://www.rockwellautomation.com/global/support/product-compatibility-migration/lifecycle-status/overview.page</a> for more information.</p>   |
| <b>Address</b>   | The <b>Address</b> column shows the address of the device, for example, the slot number for devices in backplanes. The complete address will be shown as a tooltip when hovering over a device's address or slot number.   |
| <b>In Device</b> | <p>The <b>In Device</b> column shows each device's current firmware revision.</p> <p>When ControlFLASH Plus can access the Product Compatibility and Download Center, the firmware revision lifecycle states are shown.</p> <ul style="list-style-type: none"> <li>•  Indicates that the current firmware revision is a <b>Preferred</b> revision. <b>Preferred</b> firmware revisions are less than three years or belong to non-discontinued catalog numbered products.</li> <li>•  Indicates that the current firmware revision is a <b>Limited</b> revision. <b>Limited</b> firmware revisions have some limitations in anomaly fix or operating system support.</li> <li>•  Indicates that the current firmware revision is a <b>Managed</b> revision. <b>Managed</b> firmware revisions are used for compatibility reasons or during the transition time to the <b>Limited</b> version lifecycle state.</li> <li>•  Indicates that the current firmware revision is a <b>Retired</b> revision. <b>Retired</b> firmware revisions cannot be downloaded from the Product Compatibility and Download Center. This icon is only shown for firmware revisions in the current computer.</li> <li>• Blank<br/>Indicates that the current firmware revision is an <b>Engineering</b> revision. Engineering firmware revisions</li> </ul> |

| Item  | Description  |
|---|--|
|   | <p>do not have lifecycle states available in the Product Compatibility and Download Center. This icon is only shown for firmware revisions in the current computer. Visit the Product Compatibility and Download Center for more information.</p>  |
| <b>Flash To</b>   | <p>The <b>Flash To</b> column shows the revisions available on the computer and from the Product Compatibility and Download Center.</p> <p>When ControlFLASH Plus is disconnected to the Product Compatibility and Download Center, the firmware revisions that you select from the Product Compatibility and Download Center will be remained but unavailable. Once connected to the Internet, the firmware revision becomes available.</p> <p>When ControlFLASH Plus can access the Product Compatibility and Download Center, the firmware revision lifecycle states are visible.</p>   |
| <b>Latest on Computer</b>   | <p>Accelerates the revision selection in the <b>Flash To</b> column with the following options:</p> <ul style="list-style-type: none"> <li> <b>Latest from Download Center</b><br/> Selects all the latest firmware revisions from the Product Compatibility and Download Center.<br/> When you have not signed in to the Product Compatibility and Download Center or you don't have internet connectivity to the Product Compatibility and Download Center, the connection status indicator with the Product Compatibility and Download Center will be shown next to <b>Latest from Download Center</b>. </li> <li> <b>Latest on Computer</b><br/> Selects all the latest firmware revisions found in the monitored folders that can include remote computers. </li> <li> <b>Favorite lists</b><br/> Selects a combination of devices and revisions as specified in one of the favorite lists. </li> </ul> |
|  | Allows you to select the row of device.  |
|  | <p>Lists the available firmware revisions on the computer and from the Product Compatibility and Download Center. When firmware revisions are found in the Product Compatibility and Download Center, the download arrow shows.</p> <ul style="list-style-type: none"> <li>When the download arrow is blue, it indicates that you are signed in to the Product Compatibility and Download Center and you can download the firmware revisions.</li> <li>When the download arrow is gray, it indicates that ControlFLASH Plus can access the Product Compatibility</li> </ul>  |

| Item  | Description  |
|---|--|
|   | and Download Center and you are signed out. To download firmware revisions, sign in to the Product Compatibility and Download Center.  |
|  | Views the firmware revisions' Release Notes found in the Product Compatibility and Download Center.  |
|  | Views the firmware revisions' Important Notice found in the Product Compatibility and Download Center.<br><b>Tip:</b> To view the firmware revisions' Important Notice, sign in to the Product Compatibility and Download Center.  |
|  | Views the copyright information of the firmware revision.  |
|  | ControlFLASH Plus check <b>In Device</b> firmware revisions and <b>Flash To</b> firmware revisions compatibility and provide compatibility information based on data from the Product Compatibility Download Center. When compatibility issues appear, the following icons are shown. <ul style="list-style-type: none"> <li> Indicates that the current firmware revision is not compatible with other firmware revisions.</li> <li> Indicates that the current firmware revision may be compatible with other firmware revisions.</li> <li> Indicates that there is no compatibility information of the current firmware revision.</li> </ul> |
| <b>Compatibility issues</b>   | Shows the total number of compatibility issues that occurred during the compatibility check process.   |
| <b>Create Favorite List</b>   | Creates a favorite list based on the current device and revision selections. This is turned on only when at least one device is selected.  |
| <b>Next</b>   | Starts the flash workflow. This is turned on only when at least one device is selected.  |





## Manage Firmware


Use the **Manage Firmware** tab to manage firmware revisions in the monitored folders. When you are signed in to the Product Compatibility and Download Center, it also allows you to download firmware revisions and view the firmware revisions' Important Notice from the Product Compatibility and Download Center.

The following table explains each item on the **Manage Firmware** tab when ControlFLASH Plus can access the Product Compatibility and Download Center.

| Item                          | Description  |
|-------------------------------|--|
| <b>Add Firmware Revisions</b> | Opens the <b>Add Firmware Revisions</b> dialog box to download firmware revisions from the Product Compatibility and |

| Item                    | Description  |
|-------------------------|--|
|                         | Download Center. When ControlFLASH Plus loses connection to the Product Compatibility and Download Center, <b>Add Firmware Revisions</b> doesn't show.   |
| <b>Delete Revisions</b> | Turns on the delete firmware revisions mode. Deleting unused firmware revisions improves the application's inventory building performance.   |
| <b>Export Revisions</b> | Opens the <b>Save As</b> dialog box to export the firmware inventory.  |
| <b>Device</b>           | <p>Shows the individual catalog number of the device. When ControlFLASH Plus can access the Product Compatibility and Download Center and a device's firmware revisions was found in the Product Compatibility and Download Center, <b>+</b> shows:</p> <ul style="list-style-type: none"> <li>• If signed in to the Product Compatibility and Download Center, you can use the <b>Add Firmware Revisions</b> dialog box to search, select, and download firmware revisions.</li> <li>• If signed out of the Product Compatibility and Download Center, you are allowed to use the <b>Add Firmware Revisions</b> dialog box to search and select firmware revisions only.</li> </ul> <p><b>Tip:</b> When a device's firmware revisions are all downloaded from the Product Compatibility and Download Center, <b>+</b> disappears after refreshing firmware.</p> <p>An orange highlight on the left border of this column indicates that a filter is active.</p> |
| <b>Vendor</b>           | Shows the name of the device vendor.   |
| <b>Lifecycle Status</b> | <p>Shows the device's lifecycle status found in the Product Compatibility and Download Center.</p> <ul style="list-style-type: none"> <li>• <b>Active</b><br/>This is the most current offering with a product category.</li> <li>• <b>Active Mature</b><br/>The product is fully supported, but a newer product or family exists. Gain value by migrating.</li> <li>• <b>End Of Life</b><br/>The product's discontinued date was announced. Actively execute migrations and last time buys. Products are generally orderable until the discontinued date.</li> <li>• <b>Discontinued</b><br/>New products are no longer manufactured or procured. Repair or exchange services may be available.</li> <li>• <b>Product lifecycle status</b><br/>There are several lifecycle statuses found for a device. Click to find more details of these lifecycle statuses.</li> </ul>  |

| Item  | Description   |
|---|---|
|   | <ul style="list-style-type: none"> <li>• <b>Please check with vendor</b><br/>This device's lifecycle status is unknown because it isn't a Rockwell Automation or Allen Bradley device. Find more lifecycle status information from the device's vendor.</li> </ul> <p><b>Tip:</b> When there is no internet connectivity to the Product Compatibility and Download Center, the lifecycle statuses are not shown.</p> <p>You can visit <a href="https://www.rockwellautomation.com/global/support/product-compatibility-migration/lifecycle-status/overview.page">https://www.rockwellautomation.com/global/support/product-compatibility-migration/lifecycle-status/overview.page</a> for more information.</p>     |
| <b>Revisions</b>  | <p>Shows the following information:</p> <ul style="list-style-type: none"> <li>• The device's available firmware revisions as found in the monitored folders</li> <li>• The current available firmware revisions lifecycle states in the Product Compatibility and Download Center.</li> <li>• The firmware revisions' Release Notes and Important Notice found in the Product Compatibility and Download Center.</li> </ul> <p>When ControlFLASH Plus loses connection to the Product Compatibility and Download Center, the firmware revisions and firmware revisions lifecycle states from the Product Compatibility and Download Center and the icons of the Release Notes and Important Notice don't show.</p> |
| <b>File Path</b>  | <p>Shows the file location of each firmware revision. Click a path link in the <b>File Path</b> column to show the file in a folder. When download starts, a progress bar appears. Select <b>Cancel</b> to cancel the download. Select <b>Retry</b> to restart a canceled download.</p>   |
| <b>Filter by device</b>   | <p>Filters one or more device types in a flashing session. The device list is filtered immediately as the text included in the device name is entered.</p> <p>The number of filtered devices and all devices shows on the left of the <b>Filter by device</b> box.</p> <p>An orange highlight indicates that a filter is active.</p>  |
|  | <p>Click  to view the copyright information of the firmware revision.</p>  |
|  | <p>Opens the firmware revision's Important Notice found in the Product Compatibility and Download Center.</p> <p><b>Tip:</b> To view the firmware revisions' Important Notice, sign in to the Product Compatibility and Download Center.</p>  |
|  | <p>Opens the firmware revision's Release Notes found in the Product Compatibility and Download Center.</p>  |

| Item  | Description   |
|---|---|
|  | Opens the <b>Add Firmware Revisions</b> dialog box for a specific device. |

## Manage Favorites

Use the **Manage Favorites** tab to manage favorite lists. A favorite list includes devices and corresponding revisions that can be used to quickly select target revisions during flash operations. Use the import and export functions to share favorite lists with others.

The following table explains each item on the **Manage Favorites** tab.

| Item                           | Description   |
|--------------------------------|---|
| <b>Favorite Lists</b>          | Shows the favorite lists.   |
| <b>Export all</b>              | Creates a CFF (ControlFLASH Favorites) file including all the favorite lists.   |
| <b>Import</b>                  | Imports a CFF file that is exported with one or more favorite lists.<br><br>If an imported list has the same name as an existing one, the imported list name is appended with a number to ensure uniqueness.  |
| <b>New Favorite List</b>       | Allows you to create a favorite list.   |
| <b>Filter by favorite list</b> | Filters the favorite lists immediately as the text included in the favorite list name is entered.<br><br>The number of filtered and all favorite lists shows on the left of the <b>Filter by favorite list</b> box.<br><br>An orange highlight indicates that a filter is active. |
| <b>Add devices</b>             | Adds devices to the selected favorite list.   |
| <b>Copy</b>                    | Creates a copy of the selected favorite list.   |
| <b>Export</b>                  | Creates a file including the selected favorite list.  |
| <b>Delete</b>                  | Deletes the selected favorite list.   |
| <b>Device</b>                  | Shows the catalog number of the device.   |
| <b>Firmware Revision</b>       | Shows the device's available firmware revisions as found in the monitored folders.<br><br>Click the revision to select another one for the device in the favorite list.   |

## Product Inventory & Registration

Use the **Product Inventory & Registration** tab to:

- Create an inventory report of online devices to assess the lifecycle of your products.
- Send the inventory report to your Rockwell Automation account to start the product registration. Sending the inventory report is an alternative to other methods such as reading the serial number or scanning the QR code from the product label.



The following table explains each item on the **Product Inventory & Registration** tab.

| Item                   | Description  |
|------------------------|--|
| <b>New Inventory</b>   | Allows you to create your product inventory and optionally send it to Rockwell Automation for registration. Completion of registration must be done on the Rockwell Automation website. Click <b>Name Inventory</b> to start the process.  |
| <b>Pending to Send</b> | Shows inventories that are available to be sent to Rockwell Automation for registration. This page will only show inventories that were attempted to be sent but a network connection was not available.   |
| <b>Sent</b>            | Shows the inventories that have been sent to your Rockwell Automation account for registration. All created inventories, regardless of whether the inventory was sent to your Rockwell Automation account, are available under C:\Users\Administrator\Documents\ControlFLASH Plus\Inventories by default. The inventory files are in CSV and JSON formats. |

## Browse devices

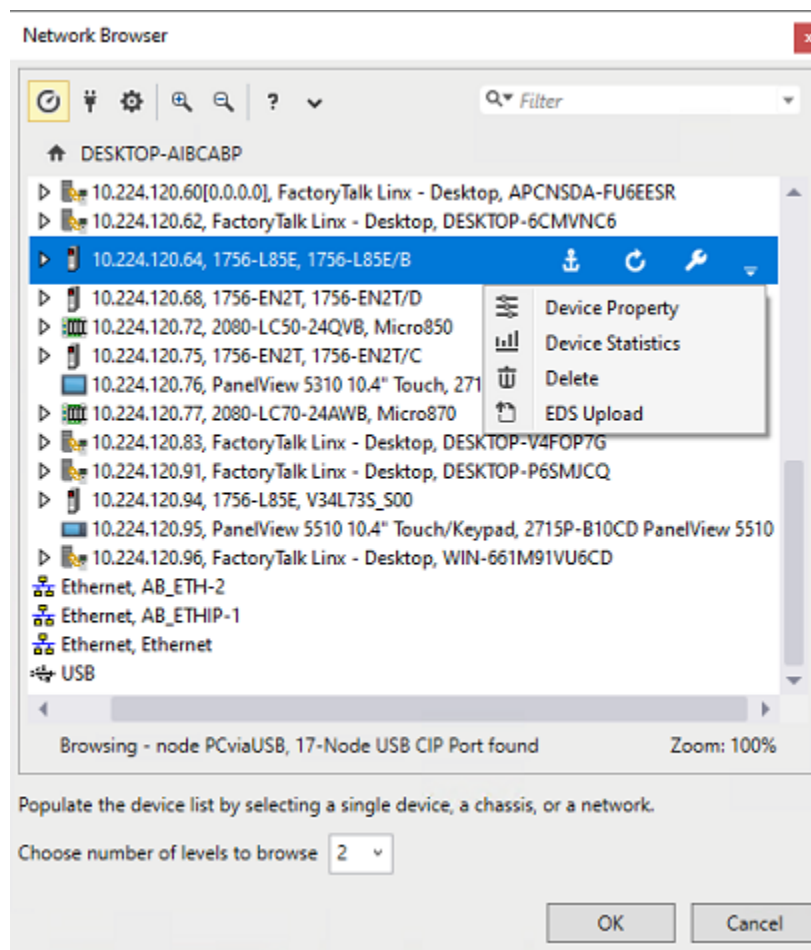
When ControlFLASH Plus is started for the first time, the **Browsing from path** is not configured. You need to configure the browsing path in the **Network Browser**. After you set the path for the first time, ControlFLASH Plus will use the last selected path setting.

Once a starting browse path is configured, ControlFLASH Plus uses the configured browsing path and number of levels to populate the devices list. The devices are shown with the current versions of firmware and available compatible firmware versions are shown in the **Flash To** column. The topology is refreshed when opening ControlFLASH Plus or changing the browsing path in the **Network Browser**.







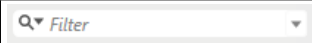



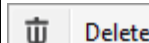
When updating topology and devices, you may cancel progress by clicking the **Cancel** button. Clicking the **Cancel** button opens the **Network Browser** for you to select another **Browsing from path**.









## Network Browser

Use the general settings of the **Network Browser** to specify network configuration items and browser display information. Resize the **Network Browser** to see more or less of a network topology. For more information about **Network Browser**, visit [FactoryTalk Linx Getting Results Guide](#) (publication LNXENT-GR001).




The following table explains each item in the **Network Browser** and their meanings.

| Settings          | Icon   | Description  |
|-------------------|--|--|
| Auto discover     |     | Enables the <b>Network Browser</b> to discover the selected device or network branch continuously.   |
| Add Driver        |     | Adds a driver on the computer to provide communications to a network.  |
| Advanced Settings |     | Opens <b>Advanced Settings</b> to configure network discovery settings.  |
| Zoom              |     | Increases (zoom in) or decreases (zoom out) the view of the network topology tree.   |
| Help              |     | Opens the help topics.   |
| Auto upload       |     | Enables the <b>Network Browser</b> to automatically upload and register EDS files for unknown devices in the selected device and its child devices.  |
| Filter            |    | Provides a filtered list of devices upon the searching criteria.   |
| Anchor            |     | Reroots a view in the network topology tree to give focus on a specific node and the corresponding children of that node.  |
| Refresh           |   | Instructs the browser to perform a discover cycle of the selected device or network branch immediately and update the network topology tree with the results. Refresh is only active when <b>Auto discover</b> is not activated.   |
| Property          |   | Used to perform the following: <ul style="list-style-type: none"> <li>• Show properties for a selected device.</li> <li>• Launch driver configuration for a selected driver.</li> <li>• Launch the bridged network configuration for the selected bridged network configuration.</li> <li>• Adjust device settings in the topology, such as editing the name of the driver, adjusting the discovery method, and copying and pasting <b>Device List/Range</b> items.</li> </ul> |
| Delete            |  | Used to remove a device from the network topology view in a computer.  |

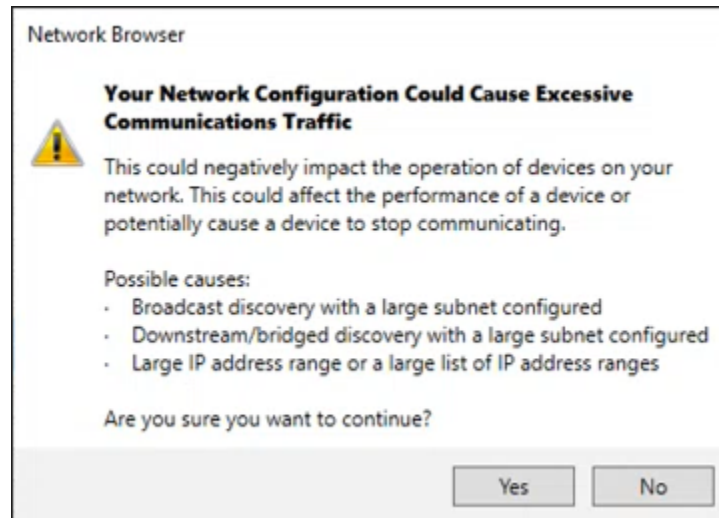
| Settings                          | Icon   | Description  |
|-----------------------------------|--|--|
|                                   |  | <p>Observe these guidelines to gain a better understanding of the delete command:</p> <ul style="list-style-type: none"> <li>Deleting a device from the network topology tree does not remove the device from the network. After closing the <b>Network Browser</b>, all devices on the network return to the view when the <b>Network Browser</b> launches and discovers the devices.</li> <li>Deleting a driver from the network topology tree permanently removes the driver and all its child nodes.</li> <li>Deleting a module with a network branch also removes the child nodes.</li> </ul> |
| Manual upload                     |  EDS Upload | Uploads and registers the EDS file from a selected device.   |
| CIP Security Indicator            |             | <p>When the icon is in the toolbar, it works as a switch to show or hide the CIP Security configuration status of a device.</p> <p>When the icon is in front of a device, it shows that the device supports CIP Security and no configuration has been taken yet.</p>  |
| CIP Security Indicator            |           | Means that the device is in the CIP security configuration process.  |
| CIP Security Indicator            |           | Means that the device is successfully configured with CIP security.  |
| Choose number of levels to browse |           | Expands the number list to choose the level number for browsing multiple devices. A network node or a device node will not be identified as a level. The default number is <b>2</b> .  |
| Device Property                   |           | Used to open the device properties dialog box based on the node selected.  |
| Device Statistics                 |           | <p>Used to open a dialog box that displays information to help diagnose a device.</p> <p><b>Note:</b> the button / option is not displayed for a device that does not provide access to its statistics.</p>  |
| Device Configuration              |           | Used to open the configuration dialog box based on the node selected. They can be  |

| Settings | Icon | Description   |
|----------|------|---|
|          |      | driver configuration, device configuration, and bridge configuration.<br><b>Note:</b> the button or option is not displayed for a device that does not provide access to its configuration. |

## Starting browse path and levels

Clicking  on the **Flash Devices** tab opens the **Network Browser**. Use this dialog box to select a node in the **Network Browser** tree as a starting point for browsing devices. Clicking **OK** refreshes the device list on the **Flash Devices** tab.

The dialog box allows you to choose the number of levels that should be browsed. The maximum number of levels to browse is 3. The default value of levels to browse is 2. Selecting a device as the starting point will ignore browse levels and only browse that device. The performance of detecting devices may be impacted if FactoryTalk Linx provides this warning. The way to avoid this warning is to reduce the number of IP addresses that are being browsed.




**IMPORTANT:** In the **Network Browser**, you must expand each level of the node that includes the devices you need and wait until all the devices are detected.

When selecting the root node in the **Network Browser** tree, **OK** is disabled by default.

## Add a driver for broadcast

### To add a driver for Local or Remote Broadcast


1. In the **Network Browser**, select .
2. In the **Configure Driver** dialog box, select a driver, and then select **Add New**.
3. To configure the physical port of the computer and the tuning settings, select the **Advanced** tab.
4. Select **Apply**.  
The new driver appears in the network topology tree.
5. Select the **General** tab, and in the **Name** box, enter a name for the driver.

6. In the **Discovery Method** list, select **Broadcast**.
7. To add a driver for Local Broadcast, select **Local Broadcast**. Skip to step 9.  
To add a driver for Remote Broadcast, select **Remote Broadcast**.
8. (optional) With **Remote Broadcast** selected, in the **IP Address** and the **Subnet Mask** fields, enter the addressing information for the driver distribution.
9. Select **OK**.

## Add a driver with a Device List/Range

When adding a driver, use a list or range of IP addresses to make sure that broadcast messages reach the desired devices.

### To add a driver with a Device List/Range

1. In the **Network Browser**, select .
2. In the **Configure Driver** dialog box, select a driver, and then select **Add New**.
3. To configure the physical port of the computer and the tuning settings, select the **Advanced** tab.
4. Select **Apply**.  
The new driver appears in the network topology tree.
5. Select the **General** tab, and in the **Name** box, enter a name for the driver.
6. In the **Discovery Method** list, select **Device List/Range**.
7. Select **Add New**, and then in the box under **Device List/Range**, enter the desired subnet range.
8. Select ☒.
9. Select **OK**.

## Open the Configure Driver dialog

Open the **Configure Driver** dialog box to edit the properties for a driver.


### To open the Configure Driver dialog box

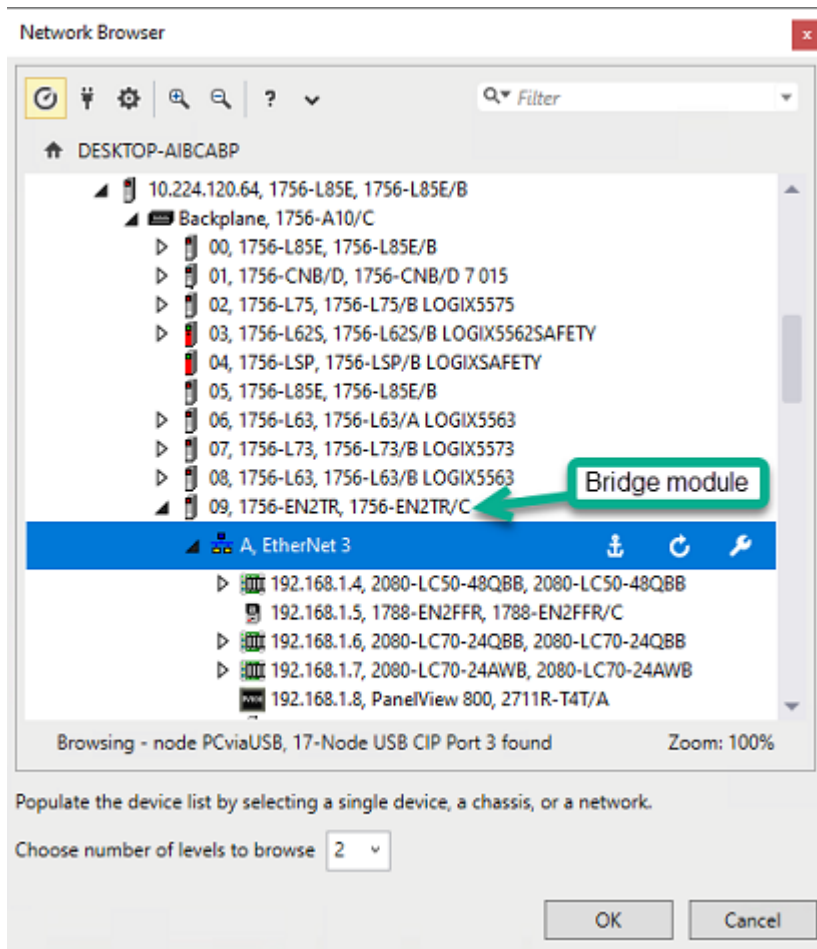
1. In the **Network Browser**, select a driver.
2. Select .


## Add a bridge

Create a bridge to enable **Network Browser** to detect devices on another network and perform diagnostic and configuration functions on those devices.

## To add a bridge

1. In the **Network Browser** dialog box, below a bridged module, select the Ethernet network, and then select .




2. In the **General** tab, enter a name for the bridge, and then select **Add New**.
3. In the address box, enter the addressing information.
4. Select .
5. Select the **Advanced** tab to configure the browsing discovery options for the bridge.
  - Device discovery poll rate
  - Offline device discovery poll rate
  - Poll interval between browse cycles
  - Poll timeout
  - Maximum concurrent packets to this network
  - Auto remove offline devices
  - Reset the tuning
6. Select **OK**.

## Populate the devices list

Use the **Network Browser** to browse a single device or multiple devices.

## To populate the device list

1. On the **Flash Devices** tab, select  to open the **Network Browser**.
2. Expand each level of the node that contains the node you want in order for the devices on that level to be shown on the **Flash Devices** tab.
3. To browse a single device, select a device node. Skip to step 5.



**Tip:** The SERCOS interface node is identified as a single device, but it has subdevices when shown on the **Flash Devices** tab.

To browse multiple devices, select a network or a backplane node.

4. (optional) When browsing multiple devices, in the **Choose number of levels to browse** list, select the number of levels.



**Tip:** When the browsed devices are shown on in the **Flash Devices** tab, a backplane or a network node will not be identified as a level, but the devices under them.

5. Select **OK**.

## Generating the device topology

The devices list is generated differently depending on what is chosen as the starting node.

When a device (for example 1756-L85E) is selected, only the device itself is shown in the devices list.



**Tip:** A bridge node is also treated as a device node, for example, 1756-ENBT/A.

When a bus is selected, such as a backplane ("1756-A10/A"), a network ("Ethernet"), or a FactoryTalk Linx driver ("AB\_ETH-2"), all items under the bus, up to the number of levels configured, are shown in the devices list.

## Prepare the networks for flashing

1. Choose an appropriate time after all processes can be stopped to remove the device or devices from service.
2. Verify that the device or devices on the network are properly connected and that communications bandwidth is available.



**Tip:** It's not recommended to perform the flash operation while running a process. Before flashing, choose an appropriate time to remove your device or devices from service.



## Flash scheduling

ControlFLASH Plus determines the flash scheduling depending on the devices' flashing configuration, their topology, and parent-children relationships.

ControlFLASH Plus version 2.00.00 or earlier can flash of up to 20 devices concurrently based on their topology except for the following cases:

- Parent/children devices are updated sequentially. First, the parent devices are flashed concurrently, and then the children devices are flashed. Children devices may be flashed concurrently depending on their topology.
- Peer devices on linear buses are updated sequentially. Examples of linear buses include Ethernet Linear/DLR (not Star) and SERCOS.
- Devices with multiple active ports in a chassis are updated sequentially. An example of a device with multiple active ports would be a 1756-EN2TR with two network connections.

From version 3.00.00, ControlFLASH Plus supports enhanced concurrent flashing. This capability is turned on by default. The enhanced concurrent flashing extends the sorts of devices that can be flashed concurrently compared to earlier versions of the tool. For the devices whose reset mechanism can be controlled by ControlFLASH Plus, they can be flashed concurrently by holding the reset:

- Parent/children devices are now flashed concurrently by holding the reset.
- Peer devices on linear buses are now flashed concurrently by holding the reset.

---

**NOTE:** Future versions of the PowerFlex® firmware will allow for concurrent flashing.

---

For the devices whose reset mechanism can't be controlled by ControlFLASH Plus, they are still flashed sequentially:

- Parent/children devices (For example, 1756-DNB)
- Peer devices on linear buses (For example, PowerFlex Drives)

## Flash your devices

This chapter tells you how to update firmware by using ControlFLASH Plus.

Before you begin, make sure that you have prepared your system for flashing. If you need help, refer to the back cover of this publication for support information.

### Use ControlFLASH Plus to update firmware


Use ControlFLASH Plus to flash firmware revisions on one or multiple devices.

---

#### IMPORTANT:

- ControlFLASH Plus only supports the firmware update for devices supporting the Common Industrial Protocol (CIP). To perform updates of non-CIP devices, use the legacy ControlFLASH tool.
  - Make sure to specify the correct revision that you want to upgrade for your device. Otherwise, an unpredictable result may occur. Check on the Rockwell Automation [Product Compatibility and Download Center](#) or with your technical support representative if you are unsure about making the update.
  - To avoid the flash operation from being interrupted, make sure that the computer is powered to run throughout the operation and is not configured to enter or manually put into sleep mode.
  - Before flashing a Stratix® switch, ensure that:
    - You have the Stratix switch account with administrator privileges.
    - The Stratix switch has Secure Shell (SSH) sessions enabled.
    - The Stratix switch and the computer on which ControlFLASH Plus is installed are on the same subnet and can ping each other successfully. For example, you can't flash a Stratix switch that is behind a network address translation (NAT).
    - Provide a writable SD card for Stratix 5400 and Stratix 5700 before flashing. We recommend that the SD card is empty.
- 

### To flash devices

1. (optional) On the **Flash Devices** tab, click  to set up the browsing path on the network. The last selected path will be selected by default for subsequent uses.
2. On the **Flash Devices** tab, select one or multiple devices by selecting the checkbox on the left column.



**Tip:** To select devices, enter the device name in the **Filter by device** text box. Devices are filtered as you enter the text.

---

3. In the **Flash To** column, select the revisions to update the selected device.

**Tip:**

- When a Safety controller is selected, the checkbox of its partners will be selected and disabled automatically, and the revision of its partner will be changed as the Safety controller's.
- When there are wrong mode warnings, change the device mode in Studio 5000 Logix Designer® or Connected Components Workbench™ and click the refresh button.

4. (optional) In the **Compatibility** dialog box, select compatible firmware revisions.
5. Click **Next**.

**Tip:**

- If any of the selected revisions need to be downloaded from the Product Compatibility and Download Center, the **Download Center License Agreement** dialog box opens. Select **Accept**.

After the download completes, check the non-DMK firmware revisions and the incompatible ones. Select **Non-DMK firmware must be installed manually** to locate the file in the monitored folder and install all the non-DMK firmware kits manually, and then select **Refresh Firmware**. Select **Next**.

6. Read and understand all warning messages shown before proceeding.
7. Click **Flash**.




**Tip:** When a dialog box prompts you to confirm whether to trust the publisher of a DMK during the update, you can choose to trust it to continue.

When the operation completes:

- Click **Done** to return to the beginning of the flash workflow.
- Click **Retry** to flash devices whose flash operations have failed or were canceled.

## Compatibility dialog box

How do I open the Compatibility dialog box?



- On the **Flash Devices** tab, click , , or **Compatibility Issues**.

ControlFLASH Plus provides compatibility information after selecting firmware revisions to flash. Incompatible firmware revisions may cause some issues to the devices. Use the **Compatibility** dialog box to:

- Check compatibility information.
- Select compatible firmware revisions to flash.
- Ignore incompatible devices as needed.

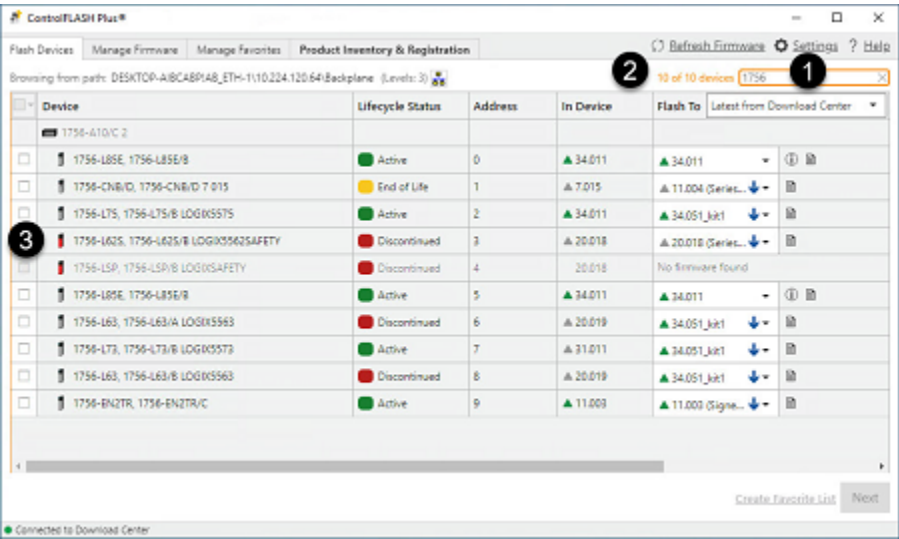
## Components

The following table explains the items in the **Compatibility** dialog box and their meanings.

| Item                                   | Description  |
|--|--|
| Lock Revision                          | <p>This column shows the current device's locked or unlocked status. Hover over the blank cell and click  to lock the current device revision. The unlocked devices' compatible choices will be updated to ensure compatibility with the locked device revision.</p> <p>Lock one or multiple devices as needed.</p> <p>Unlock the locked devices if there are no compatible firmware revisions.</p>   |
| Current Choices                        | <p>This column shows the following subcolumns:</p> <ul style="list-style-type: none"> <li>• <b>Device</b> shows devices with compatibility issues.</li> <li>• <b>In Device</b> shows each device's current firmware revision.</li> <li>• <b>Flash To</b> shows each device's firmware revision selected on the <b>Flash Devices</b> tab.</li> </ul>  |
| Compatible Choices                     | <p>This column shows suggested compatible firmware revisions.</p> <ul style="list-style-type: none"> <li>• <b>Closest Compatible</b> shows all compatible firmware revisions that are closest to the current firmware revisions.</li> </ul> <p><b>Note:</b> The closest compatible firmware revision won't be lower than the selected revision.</p> <ul style="list-style-type: none"> <li>• <b>Latest Compatible</b> shows all compatible firmware revisions that are latest from the Product Compatibility and Download Center.</li> </ul> <p>Indications appear if there are locked devices and no compatible firmware revisions.</p> |
| Ignore incompatible firmware revisions | <p>This column shows the delete icons. Click  to ignore the current incompatible device. Ignored devices will be removed from this dialog box and still listed on the <b>Flash Devices</b> tab.</p>   |

Filter devices

The device list is filtered immediately as text included in the device name is entered in the **Filter by device** box.



The following table explains each item when filtering the devices on the **Flash Devices** tab.

| Item | Description  |
|------|--|
| 1    | Shows the text that you are entering.  |
| 2    | Shows the number of filtered and total devices.  |
| 3    | Highlights the filtered devices in orange. Devices whose name includes the entered text will be shown. |

Cancel download operations



After the download starts, clicking [Cancel](#) on the bottom right of the **Flash Devices** tab will cancel all firmware revisions' download and clicking [Cancel](#) at the end of the progress bar will cancel a firmware revision's download.

When you cancel a download operation, all the downloaded files will be removed.

Cancel flash operations

After the flash operation starts, clicking the **Cancel** button will cancel all pending device updates. All device updates already started will not be canceled, but will proceed to completion as normal.

Retry flash operations

If the **Status** column shows failed or canceled, click **Retry** will restart canceled or failed flash operations.

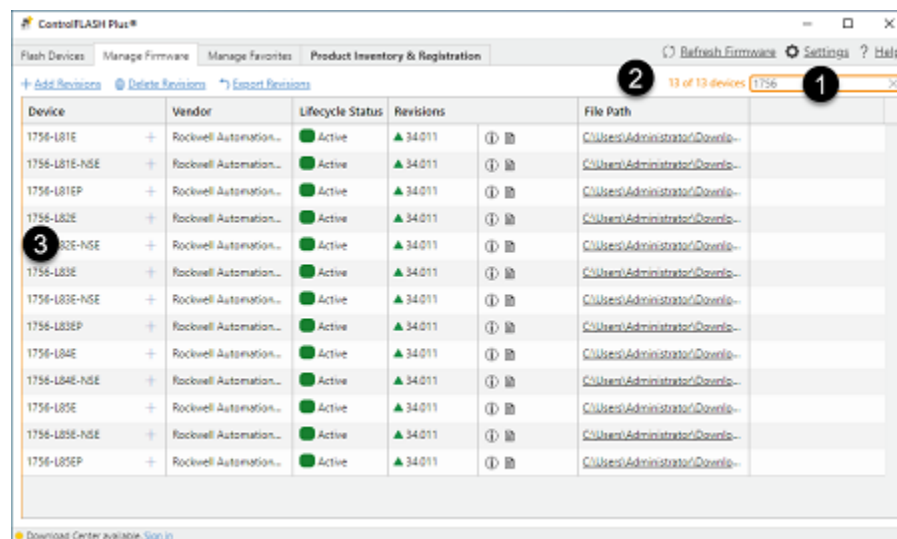
## Manage firmware revisions

Use the **Manage Firmware** tab to manage firmware revisions in the monitored folders. When you are signed in to the Product Compatibility and Download Center, it also allows you to download firmware revisions and view the firmware revisions' Important Notice from the Product Compatibility and Download Center.

For more information about this tab, refer to [Manage Firmware tab on page 29](#).

## Filter the device list

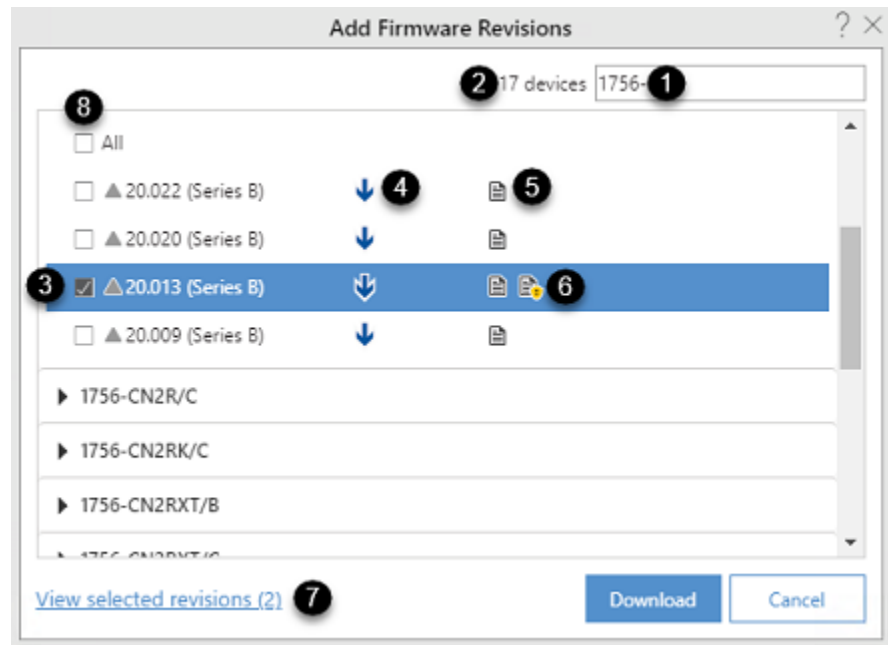
The device list is filtered immediately as text included in the device name is entered in the **Filter by device** box.



The following table explains each item when filtering the devices on the **Manage Firmware** tab.

| Item | Description  |
|------|--|
| 1    | Shows the text that you are entering.  |
| 2    | Shows the number of filtered and total devices.  |
| 3    | Highlights the filtered devices in orange. Devices whose name includes the entered text will be shown. |

## Add Firmware Revisions dialog box






The following table explains each item in the **Add Firmware Revisions** dialog box.

| Item            | Description   |
|-----------------|---|
| 1               | Shows the text that you are entering.   |
| 2               | Shows the number of the filtered devices.   |
| 3               | Allows you to select the firmware revision.   |
| 4               | Indicates that the firmware revision is found in the Product Compatibility and Download Center. To download the firmware revision, sign in to the Product Compatibility and Download Center.                                      |
| 5               | Opens the firmware revision's Release Notes found in the Product Compatibility and Download Center.   |
| 6               | Opens the firmware revision's Important Notice found in the Product Compatibility and Download Center.<br><b>Tip:</b> To view the firmware revisions' Important Notice, sign in to the Product Compatibility and Download Center. |
| 7               | Views the firmware revisions you selected.  |
| 8               | Selects a device's all firmware revisions from the Product Compatibility and Download Center.   |
| 9               | Shows the firmware revisions lifecycle states.  |
| <b>Download</b> | Selects this button to download the selected firmware revisions from the Product Compatibility and Download Center.   |
| <b>Cancel</b>   | Selects this button to returns to the <b>Manage Firmware</b> tab.   |

## Add firmware revisions

After signing in to the Product Compatibility and Download Center, use the **Add Firmware Revisions** dialog box to download firmware revisions and view the firmware revisions' Important Notice.

### To add firmware revisions

1. On the **Manage Firmware** tab, select **Add Firmware Revisions** or  in the **Device** column.
2. In the **Add Firmware Revisions** dialog box, search devices, and then select firmware revisions as needed.
3. (optional) Select  to view the firmware revisions' Release Notes or select  to view the firmware revisions' Important Notice.
4. (optional) Select **View selected revisions** to view the firmware revisions you select.
5. Select **Download**.



**Tip:** When the operation completes:

- If it is a DMK file, the revision will appear in the **Revisions** column automatically.
- If it is a non-DMK file, select **Non-DMK firmware must be installed manually** to locate the firmware in the monitored folder, and then install the firmware manually. The revision will appear in the **Revisions** column after refreshing firmware.

## Delete firmware revisions

Delete one or multiple unused firmware revisions in a single operation to improve inventory building performance.

### Prerequisites

- Make sure the signed-in user has permission to delete firmware revisions.

### To delete firmware revisions

1. On the **Manage Firmware** tab, select  **Delete Revisions** to turn on the delete mode.
2. Select the checkboxes of firmware revisions that you want to delete.



**Tip:** Select a device's checkbox to select all its firmware revisions. Checkbox will appear dimmed, if you don't select all the firmware revisions of a device.


3. Select **Delete**.  
The **Delete** is turned off when flashing devices or downloading firmware revisions.
4. When prompts, confirm the firmware revisions list.
5. Select **Delete**.  
If the deletion fails, check the permissions of the firmware.

## Export firmware inventory

Export firmware inventory to create a backup for the firmware revisions' information.



### To export firmware inventory

1. On the **Manage Firmware** tab, select  [Export Revisions](#).
2. In the **Save As** dialog box, select a path and enter a name for the exported file.
3. Select **Save**.

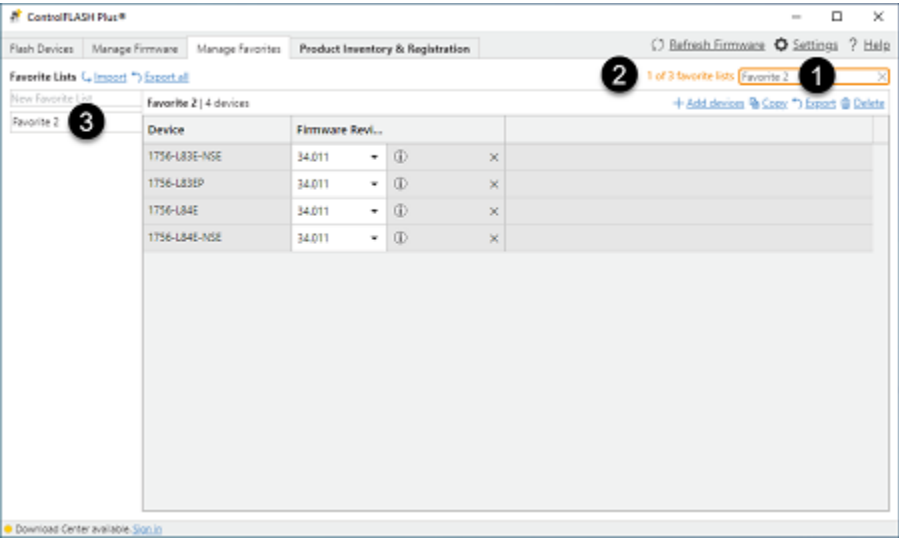
## Manage favorite lists

Use the **Manage Favorites** tab to manage favorite lists. A favorite list includes devices and corresponding revisions that can be used to quickly select target revisions during flash operations. Use the import and export functions to share favorite lists with others.

For more information about the **Manage Favorites** tab, refer to [Manage Favorites tab on page 32](#).

## Filter favorite lists

The favorite list is filtered immediately as the text included in the favorite list name is entered in the **Filter by device** box.



The following table explains each item when filtering the favorite list on the **Manage Favorites** tab.

| Item | Description   |
|------|---|
| 1    | Shows the text that you are entering.   |
| 2    | Shows the number of filtered and total favorite lists.  |
| 3    | Shows the filtered favorite list or lists. Favorite lists whose name includes the entered text will be shown. |

## Make a product inventory

Use the **Product Inventory & Registration** tab to:

- Create an inventory report of online devices to assess the lifecycle of your products.
- Send the inventory report to your Rockwell Automation account to start the product registration. Sending the inventory report is an alternative to other methods such as reading the serial number or scanning the QR code from the product label.

## Create a product inventory report

### To create a product inventory report

1. On the **Product Inventory & Registration** tab, on the **New Inventory** page, click **Name Inventory**.
2. In the **Inventory Name** dialog, enter the inventory name, and then click **Go to Select Path**.
3. In the **Network Browser** dialog box, select a node, select the level from the **Choose number of levels to browse** list, and then click **OK**. The devices list is generated differently depending on what is chosen as the starting node. See [Generating the devices list on page 40](#) for the detailed information.
4. After the browsing is completed, click **View full inventory** to see the CSV file, click **Back** to start another inventory, or click **Send Inventory** to send the inventory report to your Rockwell Automation account.



**Tip:** If the inventory only contains one device, the starting point for the browse may have been a device instead of a driver, network, or backplane.

## Register your products

Before registering your products, you need to [create a product inventory on page 51](#). Sending the inventory report for registration requires Internet connectivity.

### To register your products

If ControlFLASH Plus can connect to the PCDC:

1. On the **Product Inventory & Registration** tab, click **Send Inventory**.
2. If you are not signed in to Rockwell Automation, a dialog will appear. Select **Go to sign in**. On the webpage, sign in using your Rockwell Automation account details to allow sending the inventory. The webpage will close automatically.
3. Select **Sign in to your Account** to complete the registration process.

If ControlFLASH Plus can't connect to the PCDC, click **Go to Pending Inventories** after browsing the devices. When the PCDC connectivity is available, do the following steps:

1. On the **Product Inventory & Registration** tab, click **Pending to Send** or **Send Inventories** on the notification bar.
2. On the **Pending to Send** page, select your inventories, and then click **Send Inventories**.
3. Select **Sign in to your Account** to complete the registration process.

**NOTE:** Only eligible products can be registered.

The Product Inventory & Registration tab will send the entire inventory report, but only products included in the registration program can be registered in your Rockwell Automation account.

---

## Viewing sent inventories

A record of the inventories that have been sent to your Rockwell Automation account can be viewed from the **Sent** page. The inventory file can be viewed in CSV format by clicking **View Details**.

## Viewing all created inventories

All created inventories, regardless of whether the inventory was sent to your Rockwell Automation account, are available under C:\Users\Administrator\Documents\ControlFLASH Plus\Inventories by default. The inventory files are in CSV and JSON formats.

## FactoryTalk security in ControlFLASH Plus

FactoryTalk security is designed to provide a layer of application security. Its purpose is to protect against internal threats that are either malicious or accidental by limiting access to only those individuals who legitimately need access to specific automation assets.

FactoryTalk security allows centralized administration of user accounts and access permissions. Security information, including user authentication and authorization, can be shared across all software products and hardware devices on a particular computer, throughout a plant, or across an entire enterprise.

FactoryTalk security services are fully integrated into the FactoryTalk Directory. When the ControlFLASH Plus installation completes, FactoryTalk Security is enabled by default. When launched, ControlFLASH Plus signs in to the FactoryTalk Network Directory.

### Configure ControlFLASH Plus policy

In case you need to configure security policies for ControlFLASH Plus, use the following steps to do so.


#### To configure ControlFLASH Plus policy

1. Select **Start > All Programs > Rockwell Software > FactoryTalk Administration Console**.
2. In the **Select FactoryTalk Directory** dialog box, select **Network**, and click **OK**.
3. In FactoryTalk Administration Console, expand **System > Policies > Product Policies > ControlFlash** and double-click **Feature Security**.



**Tip:** ControlFLASH Plus and ControlFLASH use the same product policy settings.

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4. In the **Feature Security Properties** dialog box, click the browse button  next to the **Firmware: Update** item.
5. In the **Configure Securable Action** dialog box, view or configure the permissions for a user or group.

### The co-existence of ControlFLASH and ControlFLASH Plus

- ControlFLASH and ControlFLASH Plus can be installed and run on the same computer.
- ControlFLASH and ControlFLASH Plus share the same product policy setting in FactoryTalk Administration Console that is ControlFlash.
- Uninstalling ControlFLASH will cause legacy MSI firmware kits to become inaccessible to ControlFLASH Plus. To recover legacy firmware kits that have become inaccessible to ControlFLASH Plus, simply install the latest version of ControlFLASH.

## Device Management Kit

A Device Management Kit (DMK) is a file that contains firmware update files for one or more devices.

A DMK file contains:

- All files necessary to perform firmware update of a single or multiple catalogs.
- Digital signature files for validation.
- Release Notes if it was included in the file.

Place DMK files in folders monitored by ControlFLASH Plus and the software will search all the monitored folders whenever it looks for available revisions. The monitored folders can be added on the **Firmware Locations** tab of the **Settings** dialog box.



**Tip:** We don't recommend that you store DMK files in the legacy ControlFLASH installation folder, because in rare cases, DMK files in that folder can be deleted.

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### Verification of DMK's publisher

The certificate of Rockwell Automation has changed since November 2019.

The new DMK is either:

- Signed by Rockwell Automation with a new certificate.
- Signed by a third-party company.

If the DMK is new, and the publisher's certificate is not in the ControlFLASH Plus Trusted Publisher Certificate list, you can choose to trust the publisher.

## ControlFLASH Plus and FactoryTalk AssetCentre

ControlFLASH Plus uses FactoryTalk® AssetCentre to log user actions such as flashing a device or starting the application. The following information is included in the log:

- Windows credentials
- Device being flashed
- Path to the device being flashed
- Status of the operation

The information is also available in the ControlFLASH Plus log file.

### Information monitoring

In FactoryTalk-enabled software products, information such as system events and user actions are recorded in the Event Log and Audit Log.

### Event Log

The Event Log shows database information regarding events that occur in the system. Events are generally system-initiated. For example, an upload occurred as scheduled, or an alarm condition occurred. Only events that occur in FactoryTalk-enabled products are recorded in the Event Log.

### Audit Log

The Audit Log shows database information regarding actions that users perform in the system, such as editing a Logix Designer project or checking-out a file from the FactoryTalk AssetCentre database. Audit records are generated by FactoryTalk-enabled products.

### FactoryTalk AssetCentre

FactoryTalk AssetCentre offers a centralized repository for tracking and auditing the changes made to a plant-wide system. Any information related to an application is logged into the FactoryTalk AssetCentre server.

The details of the log usually contain the following fields:

- Date/Time
- User Name
- User Description (full user name, based on user information held in a security token or domain name; required for audit messages)
- Severity of message (error, warning, information, audit)
- Audience for message (operator, engineer, developer, FactoryTalk AssetCentre)
- Message text (text or resource ID that resolves to text when retrieved or passed between machine boundaries)
- Argument list (optional placeholders in message text)

Any additional details, apart from the basic fields listed here, can also be logged into the FactoryTalk AssetCentre server. For example, the *resource* field of the Audit log is not a part of the basic message format and is considered an additional field.

The following ControlFLASH Plus activities are logged:

- Flash burn started. Includes the following details:
  - Date/Time the flash began
  - Firmware Revision, both From and To
  - Username
  - Path to the device being flashed
  - Device Target Module Name and Identifier
- Flash Burn Status (Success/Failure)

The ControlFLASH Plus activities are logged only if the client is properly configured with FactoryTalk AssetCentre server. ControlFLASH Plus logs the current windows user sign-in. ControlFLASH Plus software activities are logged into the log\_AuditEventLog table of the FactoryTalk AssetCentre server.

If the connection between the client and server is lost while ControlFLASH Plus is used, all of the events are cached into a local log and are then updated into FactoryTalk AssetCentre server when the connection resumes.

The connectivity of the client to FactoryTalk AssetCentre server, if present, is identified with the help of the following registry entry.

HKEY\_LOCAL\_MACHINE\SOFTWARE\Rockwell Software\FactoryTalk AssetCentreClient\EventLog

Key- Server

Value- (Server Name)

This registry search is done during the launch of the ControlFLASH Plus application.

## Logging the device update status

The update status (Success or Failure) is logged into the FactoryTalk AssetCentre server. You can view the reasons for the Success or Failure in the ControlFLASH Plus log. The status of the update process is logged into FactoryTalk AssetCentre with the following details:

| Field         | Description  |
|---------------|--|
| Date and Time | Date and Time at which the update process has finished for the device.   |
| Source        | Application name, for example, ControlFLASH Plus.  |
| Location      | Computer name on which ControlFLASH Plus is being executed.  |
| Resource      | Name of the resource that is ControlFLASH Plus.  |
| Username      | FTAssetSecurity sign-in, if present, else Windows sign-in.   |
| Message Text  | <p>If updates succeed:</p> <p>The device "device name" is SUCCESSFULLY updated from version "x.x" to "y.y" and the path to the device being flashed is "device path".</p> <p>If update failed:</p> <p>The update process of the device "device name" from version x.x to y.y FAILED and the path to the device being flashed is "device path".</p> |



## ControlFLASH Plus SDK

Starting from version 6.00.00, ControlFLASH Plus® provides a Software Development Kit. The SDK is based on .NET Framework 4.8 and the C# language and uses the x86 platform. This SDK allows you to flash update devices without using the standard User Interface, in order to automate the flash updating process. This document introduces the functions in the API and provides you with examples of using the functions. With the API, you can:

- Get a device path list.
- Find the firmware.
- Validate the firmware.
- Flash the hardware.
- View the flashing status.

### Prerequisites

Before using the API, you must:

- Install ControlFLASH Plus version 6.00.00 or later.
- Have the ControlFLASH Plus SDK activation CFPSDK.EXE that is included in the RSLogix 5000 Pro activation.
- Use a client based on .NET Framework 4.8, the C# language, and the x86 platform.
- Reference RA.CFPlus.SDK.dll in C:\ProgramFiles (x86)\ControlFLASH Plus in the client.

### Known issues

The following are the known issues of the API:

- Exceptions can cause serious problems in the program.  
To resolve this problem, use `try-catch` to catch exceptions.
- You cannot use multiple software to call the SDK DLL file at the same time, otherwise you will see this error message, "ControlFLASH Plus is already running."
- You cannot run ControlFLASH Plus standalone and ControlFLASH Plus SDK at the same time.
- The SDK cannot browse the devices automatically. Use FactoryTalk® Linx™ Who Browser to browse the devices.
- You can flash a device only when you are signed in to the FactoryTalk® system through ControlFLASH Plus.
- You can flash multiple devices concurrently, but the SDK doesn't support the flashing order.
- You cannot call the `Destroy` function when you are flashing devices.

### The result of the API function

In this chapter, you will learn the following about the API:

- Result class
- Error codes

### Result class

To achieve uniformity, the result of the API function is in the `SdkResult<T>` class. The generic type `T` replaces the returned data. The type of the returned data depends on the function.

The following is the `SdkResult<T>` class:

```
class SdkResult<T> {
    bool Status,
    T ReturnValue,
    int Code,
    string Message
}
```

See the definitions of the return value in the following example:

```
public class SdkResult<T>
{
    /// <summary>
    /// Called function if or not correct return.
    /// if correct return true,or not return false.
    /// </summary>
    [JsonProperty("status")]
    public bool Status { get; set; }

    /// <summary>
    /// Return data
    /// </summary>
    [JsonProperty("returnValue")]
    public T ReturnValue { get; set; }

    /// <summary>
    /// if Status is true,code is 0;
    /// if Status is false, code is specific Code.
    /// </summary>
    [JsonProperty("code")]
    public int Code { get; set; }

    /// <summary>
    /// attach message ,according to code.
    /// message is empty ,if code is 0;
    /// message is specific message from CFP,if code is not 0;
    /// </summary>
    [JsonProperty("message")]
    public string Message { get; set; }
}
```

## SdkResult Properties

The properties of `SdkResult` are `Status`, `ReturnValue`, `Code`, and `Message`. See the following table for detailed information.

| Property    | Type   | Description  |
|-------------|--------|--|
| Status      | bool   | Displays the status of calling an API function. When the calling is successful, it is <code>true</code> . Otherwise, it is <code>false</code> .  |
| ReturnValue | T      | Displays the result of calling an API function. When the calling is successful, you can see the returned data. Otherwise, the result is <code>null</code> or empty. The data type of <code>T</code> depends on the type of the return value from a function. |
| Code        | int    | Displays the error code of calling an API function. When the calling is successful, it is 0. Otherwise, the value is greater than 0.   |
| Message     | string | Displays an error message when the error code is greater than 0.   |

## Error codes

The following table describes the error codes you might see when using the API.

| Error code | Description  |
|------------|--|
| 0          | Calling the function is successful.                                      |
| 1          | Calling the <code>Init</code> function is not successful.                |
| 2          | Calling the <code>Destroy</code> function is not successful.             |
| 3          | Calling the <code>PathList</code> function is not successful.            |
| 4          | Calling the <code>FindAllFirmwares</code> function is not successful.    |
| 5          | Calling the <code>Validate</code> function is not successful.            |
| 6          | Calling the <code>FlashDevice</code> function is not successful.         |
| 7          | Calling the <code>GetFlashStatus</code> function is not successful.      |
| 8          | Calling the <code>MultiFlashDevice</code> function is not successful.    |
| 9          | Calling the <code>GetMultiFlashStatus</code> function is not successful. |

## Introduction to the API functions

This chapter introduces the following functions in the API:

- `Init`
- `Destroy`
- `PathList`
- `FindAllFirmwares`

- `Validate`
- `FlashDevice`
- `GetFlashStatus`
- `MultiFlashDevice`
- `GetMultiFlashStatus`

Init

Use the `Init` function to:

- Initialize and load the resources required by the subsequent callings of functions.
- Verify whether the SDK is activated.

The following is the `Init` function:

```
SdkResult<string> Init ()
```

The following is the input and output information of the `Init` function:

- Input  
The `Init` function doesn't need input.
- Output
  - When the calling of `Init` is successful, the returned data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>true</code> . No error occurred while loading the ControlFLASH Plus resources. |
| ReturnValue | The returned string is <code>Success</code> .   |
| Code        | The error code is <code>0</code> .  |
| Message     | The error message is empty.   |

- When the calling of `Init` is not successful, the returned data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>false</code> . An error occurred while loading the ControlFLASH Plus resources.  |
| ReturnValue | The returned data are empty.  |
| Code        | The error code is <code>1</code> .  |
| Message     | The error messages might be: <ul style="list-style-type: none"><li>▪ Cannot initialize and load the resources because RA.CFPlus.SDK is not activated. Activate RA.CFPlus.SDK and try again.</li><li>▪ Cannot initialize and load the resources because the API cannot find the ControlFLASH_Plus.exe file path. Make sure that the path is correct and the file is available.</li></ul> |

| Name | Description   |
|------|---|
|      | <ul style="list-style-type: none"> <li>Cannot initialize and load the resources because the API cannot find the ControlFLASH.Plus.exe file. Make sure that the ControlFLASH.Plus.exe file is available.</li> <li>Cannot initialize and load the resources because ControlFLASH Plus is already running. Close ControlFLASH Plus and try again.</li> </ul> |

Calling the `Init` function is the prerequisite for using this API function. When you don't call this function and call other functions directly, the `Status` in the result object is `false`. The value of `ErrorCode` is greater than 0, and `ErrorMessage` is "RA.CFPlus.SDK is not initialized."

The following error message appears when you open ControlFLASH Plus after calling `Init`.

"ControlFLASH Plus is already running."

To resolve this problem, call `Destroy` to release the ControlFLASH Plus resources. This rule is to avoid flashing devices with the Software Development Kit (SDK) and ControlFLASH Plus at the same time.

## Destroy

Use the `Destroy` function to release the ControlFLASH Plus resources.

The following is the `Destroy` function:

```
SdkResult<string> Destroy()
```

The following is the input and output information of the `Destroy` function:

- Input  
The `Destroy` function doesn't need input.
- Output:
  - When the calling of `Destroy` is successful, the returned data are as follows:

| Name                     | Description   |
|--------------------------|---|
| <code>Status</code>      | The value is <code>true</code> . No error occurs while releasing the ControlFLASH Plus resources. |
| <code>ReturnValue</code> | The returned string is <code>Success</code> .   |
| <code>Code</code>        | The error code is 0.  |
| <code>Message</code>     | The error message is empty.   |

- When the calling of `Destroy` is not successful, the returned data are as follows:

| Name                | Description  |
|---------------------|--|
| <code>Status</code> | The value is <code>false</code> . An error occurred while releasing the ControlFLASH Plus resources. |

| Name        | Description  |
|-------------|--|
| ReturnValue | The returned data are empty.   |
| Code        | The error code is 2.   |
| Message     | The error message might be: <ul style="list-style-type: none"><li>Cannot release the ControlFLASH Plus resources because calling the Destroy function is not successful on the ControlFLASH Plus side. Call the Destroy function again to release the resources.</li></ul> |

After calling Destroy, you can use ControlFLASH Plus with the software using the SDK. A Success result appears if the user does not initialize or calls this function after initialization fails.

**NOTE:** When you are flashing a device, you cannot use Destroy.

PathList

Use the PathList function to get the subdevice path within the browseLevel under DevicePath.

The prerequisite for using PathList is that FactoryTalk Linx Who Browser is used, and you can get the node of the target device.

The following is the PathList function:

```
SdkResult<List<string>> PathList (
    string DevicePath,
    int browseLevel
)
```

The following is the input and output information of the PathList function:

- Input:
  - DevicePath is the path of a device that needs flashing, for example, AVCNSDACFPLUSC2!AB\_ETH1\10.224.82.153\Backplane\1\A\2\Backplane\3\A\192.168.1.16.
  - browseLevel is the level for browsing the devices. The maximum level is 3.
- Output:
  - When the calling of PathList is successful, the returned data are as follows:

| Name        | Description                             |
|-------------|---|
| Status      | The value is true.                      |
| ReturnValue | The returned data type is List<string>. |
| Code        | The error code is 0.                    |
| Message     | The error message is empty.             |

- When the calling of PathList is not successful, the returned data are as follows:

| Name        | Description  |
|-------------|--|
| Status      | The value is <code>false</code> .  |
| ReturnValue | The returned data are <code>null</code> .  |
| Code        | The error code is <code>3</code> .   |
| Message     | The error messages might be: <ul style="list-style-type: none"> <li>▪ RA.CFPlus.SDK is not activated. Wait for the activation to complete and try again.</li> <li>▪ RA.CFPlus.SDK is not initialized. Initialize RA.CFPlus.SDK and try again.</li> <li>▪ The parameter is not valid. Check the device path and try again.</li> <li>▪ The device path is not valid. Check the device path and try again.</li> <li>▪ Cannot find the device. Check the device path and try again.</li> </ul> |

## FindAllFirmwares

Use the `FindAllFirmwares` function to get the firmware information in the default monitored folders:

- C:\Program Files (x86)\ControlFLASH
- C:\Users\<Username>\Downloads\RA
- C:\Users\Public\Documents\Rockwell Automation\Firmware Kits

The following is the `FindAllFirmwares` function:

```
SdkResult<List<Revision>> FindAllFirmwares(
)
```

The following is the input and output information of the `FindAllFirmwares` function:

- Input:  
The `FindAllFirmwares` function doesn't need input.
- Output:
  - When the calling of `FindAllFirmwares` is successful, the returned data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>true</code> .                              |
| ReturnValue | The returned data type is <code>List&lt;Revision&gt;</code> . |
| Code        | The error code is <code>0</code> .                            |
| Message     | The error message is empty.                                   |

- When the calling of `FindAllFirmwares` is not successful, the returned data are as follows:

| Name        | Description                               |
|-------------|---|
| Status      | The value is <code>false</code> .         |
| ReturnValue | The returned data are <code>null</code> . |

| Name    | Description  |
|---------|--|
| Code    | The error code is 4.   |
| Message | The error messages might be: <ul style="list-style-type: none"><li>▪ RACFPlus.SDK is not activated. Wait for the activation to complete and try again.</li><li>▪ RACFPlus.SDK is not initialized. Initialize RACFPlus.SDK and try again.</li></ul> |

Revision type

The following is an example of the `Revision` type:

```
public class Revision
{
    /// <summary>
    /// Version
    /// </summary>
    public string Version { get; set; }

    /// <summary>
    /// VersionEx
    /// </summary>
    public string VersionEx { get; set; }

    /// <summary>
    /// VersionId
    /// </summary>
    public int VersionId { get; set; }

    /// <summary>
    /// Major
    /// </summary>
    public int Major { get; set; }

    /// <summary>
    /// Minor
    /// </summary>
    public int Minor { get; set; }

    /// <summary>
    /// SubMinor
    /// </summary>
    public uint SubMinor { get; set; }

    /// <summary>
    /// Fqn
    /// </summary>
    public string Fqn { get; set; }

    /// <summary>
    /// OnDisk
    /// </summary>
    public bool OnDisk { get; set; }
```



```

    /// <summary>
    /// Filepath
    /// </summary>
    public string Filepath { get; set; }

    /// <summary>
    /// Series
    /// </summary>
    public string Series { get; set; }

    /// <summary>
    /// LifeCycle
    /// </summary>
    public string LifeCycle { get; set; }

    /// <summary>
    /// ReleaseNotes
    /// </summary>
    public List<string> ReleaseNotes { get; set; }

    /// <summary>
    /// Psa
    /// </summary>
    public List<string> Psa { get; set; }

    // ReSharper disable once InconsistentNaming
    /// <summary>
    /// SRIDs
    /// </summary>
    public List<string> SRIDs { get; set; }

    /// <summary>
    /// HasSingleReset
    /// </summary>
    public bool HasSingleReset { get; set; }

    /// <summary>
    /// MaxPowerUpSeconds
    /// </summary>
    public uint MaxPowerUpSeconds { get; set; }

    //public string AboutInfo;
    /// <summary>
    /// HasRelativeDevice
    /// </summary>
    public bool HasRelativeDevice { get; set; }

    /// <summary>
    /// MinConcurrentFlashRevision
    /// </summary>
    public string MinConcurrentFlashRevision { get; set; }
}

```

# Validate

Use the `validate` function to get the firmware information of the device with the specified path on the local machine.

**NOTE:** When you are using `Validate`, you cannot call `Pathlist` and `FindAllFirmWares`.

The prerequisites for using `validate` are:

- The `PathList` and `FindAllFirmwares` functions are used because the `validate` function needs the device information obtained from the `PathList` and `FindAllFirmwares` functions.
- The device path in the `validate` parameter must be in the device path searched by `PathList`.
- The revision must be the same as the revision from the `FindAllFirmwares` function, for example 15.003, so that it is possible to pass the verification, otherwise, it will return an error message.
- The firmware revision requires the local firmware, otherwise, an error message indicating the firmware is not installed appears.
- The format of revision is two groups of numbers separated by dots, for example, 17.005.

The following is the `validate` function:

```
SdkResult<bool> Validate (
    string DevicePath,
    string revision
)
```

The following is the input and output information of the `validate` function:

- Input:
  - `DevicePath` is the path of the device in FactoryTalk Linx, for example, `AVCNSDACFPLUSC2!AB_ETH-1\10.224.82.153\Backplane\1\A\2\Backplane\3\A\192.168.1.16`.
  - `revision` is a firmware revision that needs validating, for example, `1.003`.
- Output:
  - When the call is successful, the returned data are as follows:

| Name        | Description  |
|-------------|--|
| Status      | The value is <code>true</code> .   |
| ReturnValue | The return value is <code>true</code> . The device is compatible with the firmware revision. |
| Code        | The error code is <code>0</code> .   |
| Message     | The error message is empty.  |

- When the call fails, the return data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>false</code> .   |
| ReturnValue | The return value is <code>false</code> . The device is not compatible with the firmware revision. |

| Name    | Description  |
|---------|--|
| Code    | The error code is 5.   |
| Message | <p>The error messages might be:</p> <ul style="list-style-type: none"> <li>▪ RACFPlus.SDK is not activated. Wait for the activation to complete and try again.</li> <li>▪ RACFPlus.SDK is not initialized. Initialize RACFPlus.SDK and try again.</li> <li>▪ The parameter is not valid. Check the device path and try again.</li> <li>▪ The device path is not valid. Check the device path and try again.</li> <li>▪ Cannot find the device path. Check the device path and try again.</li> <li>▪ The firmware is not installed. Check the firmware revision and try again.</li> </ul> |

## FlashDevice

Use the `FlashDevice` function to flash the device firmware in a path according to the firmware specified. The return value of `FlashDevice` is a string. `GetFlashStatus` uses the string to get the flashing status.

**NOTE:** When you are using `FlashDevice`, you cannot call `Pathlist` and `FindAllFirmWares`.

The following are the prerequisites for using `FlashDevice`:

- Wait until calling `Pathlist` and `FindAllFirmWares` is complete.
- Use `Validate` before using `FlashDevice`. `DevicePath` and the `revision` compatibility must pass the verification. When you don't use `Validate`, make sure that `DevicePath` and `revision` are the same as the parameters required by `Validate`. The format of `revision` is two groups of numbers separated by dots, for example, 17.005.
- Sign in to the FactoryTalk system through ControlFLASH Plus.

The following is the `FlashDevice` function:

```
SdkResult<string> FlashDevice (
    string DevicePath,
    string revision
)
```

The following is the input and output information of the `FlashDevice` function:

- Input:
  - `DevicePath` is the path of the device that needs flashing, for example, `AVCNSDACFPPLUSC21AB_ETH-1\10.224.82.153\Backplane\1\A\2\Backplane\3\A\192.168.1.16`.
  - `revision` is a version of firmware that needs flashing, for example, `11.003`.

- Output:
  - When the call is successful, the return data are as follows:

| Name        | Description                        |
|-------------|------------------------------------|
| Status      | The value is <code>true</code> .   |
| ReturnValue | The return value is a string.      |
| Code        | The error code is <code>0</code> . |
| Message     | The error message is empty.        |

- When the call fails, the return data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>false</code> .   |
| ReturnValue | The return value is empty.  |
| Code        | The error code is <code>6</code> .  |
| Message     | <p>The error messages might be:</p> <ul style="list-style-type: none"> <li>▪ RACFPlus.SDK is not activated. Wait for the activation to complete and try again.</li> <li>▪ RACFPlus.SDK is not initialized. Initialize RACFPlus.SDK and try again.</li> <li>▪ The parameter is not valid. Check the device path and try again.</li> <li>▪ The device path is not valid. Check the device path and try again.</li> <li>▪ Cannot find the device. Check the device path and try again.</li> <li>▪ The firmware is not installed. Check the firmware revision and try again.</li> <li>▪ Not signed in to FactoryTalk</li> <li>▪ You don't have permission to flash the firmware. Configure the feature security in FactoryTalk® Administration Console to allow flashing the firmware.</li> </ul> |

## GetFlashStatus

Use the `GetFlashStatus` function to get the flashing information by the `flashId`.

The prerequisite for using `GetFlashStatus` is that the `FlashDevice` interface function is used because `GetFlashStatus` needs the return value from the `FlashDevice` function. To get status information continuously, use this method regularly.

The following is the `GetFlashStatus` function:

```
SdkResult<TaskStatus> GetFlashStatus (
    string flashId
)
```

The following is the input and output information of the `GetFlashStatus` function:

- Input:
  - `FlashId` is the ID returned from the flashing function, for example,  
`System.Services.TaskManager.1: Flash device: [1756-EN2TR/C] [2023-06-05 07:34:58 5267135]`.
- Output:
  - When the call is successful, the returned data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>true</code> .                    |
| ReturnValue | The returned data type is <code>TaskStatus</code> . |
| Code        | The error code is <code>0</code> .                  |
| Message     | The error message is empty.                         |

- When the call fails, the return data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>false</code> .   |
| ReturnValue | The return value is <code>null</code> .   |
| Code        | The error code is <code>7</code> .  |
| Message     | The error messages might be: <ul style="list-style-type: none"><li>▪ RACFPlus.SDK is not activated. Wait for the activation to complete and try again.</li><li>▪ RACFPlus.SDK is not initialized. Initialize RACFPlus.SDK and try again.</li><li>▪ The parameter is not valid. Check the parameter and try again.</li></ul> |

## TaskStatus type

The following is an example of the `TaskStatus` type:

```
public class TaskStatus
{
    /// <summary>
    /// task status eg:Pending,
    Waiting,Running,Canceling,Paused,Succeed,Failed,Canceled,Suspended
    /// </summary>
    [JsonProperty("status")]
    public string Status { get; set; }
    /// <summary>
```

```

    /// task fqn
    /// </summary>

    [JsonProperty("fqn")]

    public string Fqn { get; set; }

    /// <summary>

    /// task progress (0--100)
    /// </summary>

    [JsonProperty("progress")]

    public int Progress { get; set; }

    /// <summary>

    /// task progress message
    /// </summary>

    [JsonProperty("progressInfo")]

    public string ProgressInfo { get; set; }

    /// <summary>

    /// Exception message
    /// </summary>

    [JsonProperty("message")]

    public string Message { get; set; }

    /// <summary>

    /// no normal info
    /// </summary>

    [JsonProperty("messagePrompt")]

    public string MessagePrompt { get; set; }

    /// <summary>

    /// message icon
    /// </summary>

    [JsonProperty("messageIcon")]

    public string MessageIcon { get; set; }

    /// <summary>

    /// message button
    /// </summary>

    [JsonProperty("messageButtons")]

    public string MessageButtons { get; set; }

    /// <summary>

    /// extended info
    /// </summary>

    [JsonProperty("extendedInfo")]

    public string ExtendedInfo { get; set; }

}

```

## MultiFlashDevice

Use the `MultiFlashDevice` function to flash multiple devices.

The prerequisites for using `MultiFlashDevice` are:

- The `PathList` interface function is used because the `MultiFlashDevice` function needs the device information obtained from the `PathList` function.
- The `DevicePath` and `Revision` in the `multiFlashSetting` parameter are consistent with the requirements of the `FlashDevice` function.

`FlashId` is optional in this function. Normally, the number of the returned results from the `MultiFlashResult<string>` collection is the same as the number of the parameters from the `multiFlashSetting` collections. Specifically, for each device, the success of the flashing depends on the returned results from the device itself.

The following is the `MultiFlashDevice` function:

```
SdkResult<List<MultiFlashResult<string>>> MultiFlashDevice (
    List<MultiFlashSetting> multiFlashSettings
)
```

The following is the input and output information of the `MultiFlashDevice` function:

- Input:
  - `multiFlashSettings` is a collection of `MultiFlashSetting` objects. This document takes the `DevicePath` and `Revision` properties of the `multiFlashSetting` object as examples.
- Output:
  - When the call is successful, the returned data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>true</code> .  |
| ReturnValue | The returned data type is <code>List&lt;MultiFlashResult&lt;string&gt;&gt;</code> . |
| Code        | The error code is <code>0</code> .  |
| Message     | The error message is empty.   |

- When the call is not successful, the returned data are as follows:

| Name        | Description  |
|-------------|--|
| Status      | The value is <code>false</code> .  |
| ReturnValue | The return value is <code>null</code> .  |
| Code        | The error code is <code>8</code> .   |
| Message     | The error messages might be: <ul style="list-style-type: none"> <li>▪ RA.CFPlus.SDK is not activated. Wait for the activation to complete and try again.</li> <li>▪ RA.CFPlus.SDK is not initialized. Initialize RA.CFPlus.SDK and try again.</li> <li>▪ The parameter is not valid. Check the parameter and try again.</li> <li>▪ The device path is not valid. Check the parameter and try again.</li> </ul> |

| Name | Description   |
|------|---|
|      | <ul style="list-style-type: none"><li>▪ Cannot find the device. Check the parameter and try again.</li><li>▪ The firmware is not installed. Check the firmware revision and try again.</li><li>▪ Not signed in to FactoryTalk.</li><li>▪ You don't have permission to flash the firmware.</li></ul> <p>Configure the feature security in FactoryTalk Administration Console to allow flashing the firmware.</p> |

Because multiple devices are flashed at the same time, the order of flashing cannot be set according to the relationship between devices.

MultiFlashSetting type

The following is an example of the MultiFlashSetting type:

```
public class MultiFlashSetting
{
    /// <summary>
    /// Device Path
    /// </summary>
    public string DevicePath { get; set; }

    /// <summary>
    /// Firmware version
    /// </summary>
    public string Revision { get; set; }

    /// <summary>
    /// Flash Task Id
    /// </summary>
    public string FlashId { get; set; }

}
```

MultiFlashResult type

The following is an example of the MultiFlashResult type:

```
public class MultiFlashResult<T>
{
    /// <summary>
    /// Device Path
    /// </summary>
    public string DevicePath { get; set; }

    /// <summary>
```



```
    /// Firmware version
    /// </summary>

    public string Revision { get; set; }

    /// <summary>
    /// Flash Task Id
    /// </summary>

    public string FlashId { get; set; }

    /// <summary>
    /// Return Result
    /// </summary>

    public SdkResult<T> Result { get; set; }

}
```

GetMultiFlashStatus

Use the `GetMultiFlashStatus` function to get the status of flashing multiple devices.

The prerequisite for using `GetMultiFlashStatus` is that the `MultiFlashDevice` interface function is used because `GetMultiFlashStatus` needs the return value from the `MultiFlashDevice` function. To get the status information continuously, use this method regularly. The `FlashId` in the `multiFlashSetting` parameter is the same as the requirement of the `GetFlashStatus` function. `DevicePath` and `Revision` are optional. Normally, the number of the returned results from the `MultiFlashResult<TaskStatus>` collection is the same as the number of the parameters from the `multiFlashSetting` collections.

The following is the `GetMultiFlashStatus` function:

```
SdkResult<List<MultiFlashResult<TaskStatus>>> GetMultiFlashStatus (
    List<MultiFlashSetting> multiFlashSettings
)
```

The following is the input and output information of the `GetMultiFlashStatus` function:

- Input:
  - `multiFlashSettings` is a collection of `MultiFlashSetting` objects. You can only assign a value to the `FlashId` property of the `MultiFlashSetting` object.
- Output:
  - When the call is successful, the return data are as follows:

| Name        | Description   |
|-------------|---|
| Status      | The value is true.  |
| ReturnValue | The returned data type is List<MultiFlashResult<TaskStatus>>. |
| Code        | The error code is 0.  |
| Message     | The error message is empty.                                   |

- When the call is not successful, the returned data are as follows :

| Name        | Description   |
|-------------|---|
| Status      | The value is <code>false</code> .   |
| ReturnValue | The returned data are <code>null</code> .   |
| Code        | The error code is <code>9</code> .  |
| Message     | <p>The error messages might be:</p> <ul style="list-style-type: none"> <li>▪ RA.CFPlus.SDK is not activated. Wait for the activation to complete and try again.</li> <li>▪ RA.CFPlus.SDK is not initialized. Initialize RA.CFPlus.SDK and try again.</li> <li>▪ The parameter is not valid. Check the parameter and try again.</li> </ul> |

## Use the API functions

This chapter introduces the process of flashing devices using the API.

### To flash the device

1. Install ControlFLASH Plus.
2. Activate CFPSDK.EXE on FactoryTalk Activation Manager.
3. Reference RA.CFPlus.SDK.dll and related libraries in the project. The default location of the SDK is C:\ProgramFiles (x86)\ControlFLASH Plus.
4. Create an instance of the `CfpSdk` class.

```
var cfplusSdk = CfPlusSdk.Instance;
```

5. Call the `Init` function.

```
try
{
    var cfplusSdk = CfPlusSdk.Instance;

    SdkResult<string> sdkResult = cfplusSdk.Init();

    if (sdkResult.Status)

    {
        //Init success
        //Start other api
    }

    else

    {

        var code = sdkResult.Code;
```

```

        var message = sdkResult.Message;

    }

}

catch (global::System.Exception)

{

    // Handle the exception

}

```

6. Call the `PathList` function.

```

var path = @"AVCNSDACFPLUSC2!AB_ETH-1\10.224.82.153\Backplane\5\A";

var level = 1;

SdkResult<List<string>> sdkResult = cfplusSdk.PathList(path, level);

if (sdkResult.Status)

{

    //PathList success

    var returnValue = sdkResult.ReturnValue;

}

else

{

    var code = sdkResult.Code;

    var message = sdkResult.Message;

}

```

7. Call the `FindAllFirmwares` function.

```

SdkResult<List<Revision>> sdkResult = cfplusSdk.FindAllFirmwares();

if (sdkResult.Status)

{

    //FindAllFirmwares success

    var returnValue = sdkResult.ReturnValue;

}

```

```

else

{

    var code = sdkResult.Code;

    var message = sdkResult.Message;

}

```

8. Call the `validate` function.

```

var path =

    @"AVCNSDACFPLUSC2!AB_ETH-1\10.224.82.153\Backplane\1\A\2\Backplane\3\A\192.168.1.14";

var revision = "13.01";

SdkResult<bool> sdkResult = cfplusSdk.Validate(path, revision);

if (sdkResult.Status)

{ // Validate Success

    var returnValue = sdkResult.ReturnValue;

}

else

{

    var code = sdkResult.Code;

    var message = sdkResult.Message;

}

```

9. Flash the device.

- When you flash a single device, call the `FlashDevice` function.

```

var path =

    @"AVCNSDACFPLUSC2!AB_ETH-1\10.224.82.153\Backplane\1\A\2\Backplane\3\A\192.168.1.14";

var revision = "13.01";

SdkResult<bool> sdkResult = cfplusSdk.FlashDevice(path, revision);

if (sdkResult.Status)

```

```

{
    //FlashDevice success
    var returnValue = sdkResult.ReturnValue;

}

else

{

    var code = sdkResult.Code;

    var message = sdkResult.Message;

}

```

- When you flash multiple devices, call the `MultiFlashDevice` function.

```

var path =

@"AVCNSDACFPLUSC2!AB_ETH-1\10.224.82.153\Backplane\1\A\2\Backplane\3\A\192.168.1.14";

var path1 =

@"AVCNSDACFPLUSC2!AB_ETH-1\10.224.82.153\Backplane\1\A\2\Backplane\3\A\192.168.1.15";

var revision = "13.01";

var revision = "11.003";

var multiFlashSettings = new List<MultiFlashSetting> ()

{

    new MultiFlashSetting { DevicePath = path, Revision = revision },

    new MultiFlashSetting { DevicePath = path1, Revision = revision1 }

};

SdkResult<List<MultiFlashResult<string>>>> multiResult =

cfplusSdk.MultiFlashDevice(multiFlashSettings);

if (multiResult.Status)

{ //MultiFlashDevice success

    List<MultiFlashResult<string>>> returnValue = multiResult.ReturnValue;

```

```

// returnValue

foreach(var item in returnValue)

{

    //handle each devicepath and revision

    if(item.Status)

    {

        var flashId = item.Result.ReturnValue;

    }

}

}

else

{

    var code = sdkResult.Code;

    var message = sdkResult.Message;

}

```

10. View the flashing status.

- When you flash a single device, call the `GetFlashStatus` function.

```

var flashId = "System.Services.TaskManager.1: Flash device:[1756-EN2TR/C] [2023-09-14
06:13:58 9677268]";

var sdkResult = cfplusSdk.GetFlashStatus(flashId)

if (sdkResult.Status)

{

    var returnValue = sdkResult.ReturnValue;

}

else

{

    var code = sdkResult.Code;

    var message = sdkResult.Message;

}

```

- When you flash multiple devices, call the `GetMultiFlashStatus` function.

```
var multiFlashSettings = new List<MultiFlashSetting>

{

    new MultiFlashSetting { FlashId = multiResult.ReturnValue[0].FlashId },

    new MultiFlashSetting { FlashId = multiResult.ReturnValue[1].FlashId }

};

SdkResult<List<MultiFlashResult<TaskStatus>>> multiStatus =
    cfplusSdk.GetMultiFlashStatus(multiFlashSettings);

if (multiStatus.Status)

{ //GetMultiFlashStatus success

    List<MultiFlashResult<TaskStatus>> returnValue = multiStatus.ReturnValue;
    foreach(var item in returnValue)
    {
        //handle each flash id
        if(item.Status)
        {
            var fashId = item.FlashId;
            var taskStatus = item.Result.ReturnValue;
        }
    }
}

else

{

    var code = sdkResult.Code;

    var message = sdkResult.Message;

}
```

11. Call the `Destroy` function.

```
SdkResult<string> sdkResult = cfplusSdk.Destroy();

if (sdkResult.Status)
```

```
{  
  
    //Destroy success  
  
    var returnValue = sdkResult.ReturnValue;  
  
}  
  
else  
  
{  
  
    var code = sdkResult.Code;  
  
    var message = sdkResult.Message;  
  
}
```



## ControlFLASH Plus error codes

This appendix describes common error messages that you may see when running the ControlFLASH Plus software.

| Error Message   | Description  |
|---|--|
| Application Internal Error  | Occurs when a critical error appears. For example, the installation is corrupted.  |
| Application is already running.   | An error occurred while more than one ControlFLASH Plus application is running.  |
| URL Port Error  | An error occurred when no free URL ports exist.  |
| Application Close Error   | An error occurred when closing the application during the flashing process.  |
| Communication Error   | <p>An error occurred while the ControlFLASH Plus software tried to communicate with the target device.</p> <p>Verify that:</p> <ul style="list-style-type: none"> <li>• All cable connections are secure.</li> <li>• The target device has power.</li> <li>• FactoryTalk Linx software is properly configured.</li> </ul>  |
| Data File Error   | The data file used in programming could not be read. Check with a technical support representative to obtain a new data file.  |
| Failed to communicate to the target device. You do not have the permission to perform this operation. | <p>The error might be caused because that:</p> <ul style="list-style-type: none"> <li>• The security authority identifier of the target device does not match the identifier in FactoryTalk Services Platform. Make sure you have the permission to perform the operation.</li> <li>• The slot used for the controller is not a trusted slot. Make sure to use a trusted slot for the controller.</li> </ul> |
| DMK digital signature verification  | <p>The digital signature of the DMK file is not valid.</p> <p>Verify that:</p> <ul style="list-style-type: none"> <li>• The DMK file contains a valid digital signature.</li> <li>• The root certificate of the DMK file is trusted.</li> <li>• The DMK file is signed by a trusted publisher and issuer.</li> </ul>   |
| Instance Validation Error   | The target device did not report enough information to be properly identified. Check with a technical support representative for help.   |
| Load Driver Error   | The ControlFLASH Plus software could not find an essential support file for the selected catalog number. Check with your technical support representative to verify that the correct drivers are loaded.   |
| Load Device Error   | The ControlFLASH Plus software could not load properties from devices.   |

| Error Message   | Description   |
|---|---|
| Mode Error  | The target device is in a mode in which it cannot be programmed. Place the device into the appropriate mode.  |
| FactoryTalk Security Error  | The error occurred when failed to verify the user in the FactoryTalk Security service.  |
| FactoryTalk Linux not installed   | Make sure FactoryTalk Linux version 6.40.00 or later is installed.  |
| FactoryTalk Linux Load Error  | An error occurred while the ControlFLASH Plus software tried to install the network protocol driver (DTL32.DLL). Verify that the FactoryTalk Linux software is properly installed and configured. |
| Script File Error   | The script file associated with the selected upgrade is corrupt. Check with a technical support representative to obtain a new script file.   |
| Could not fetch dynamic install driver information.   | An error occurred when data about the installed driver cannot be obtained.  |
| Could not fetch configuration.  | Configuration of the application is not valid. Try to reinstall the application.  |
| Could not fetch the current user of FactoryTalk Security.                                     | Cannot obtain information about the signed-in user in FactoryTalk Security. Check the FactoryTalk Security installation.  |
| Could not fetch determination if the user has permissions.                                    | Cannot obtain user permissions from FactoryTalk Security.   |
| Could not fetch determination if single sign-on is enabled.                                   | Cannot obtain information if single sign-on (SSO) is enabled on the machine.  |
| Could not parse response of single sign-on logging.   | The information obtained from FactoryTalk Security about the single sign-on user is not valid.  |
| Could not log on the single sign-on user.   | The single sign-on user cannot sign in to FactoryTalk Security.   |
| Could not parse response of the user's logging.   | The information obtained from FactoryTalk Security about the user is not valid.   |
| Could not log on the user.  | The user cannot sign in to FactoryTalk Security.  |
| Could not log off the current user.   | The user cannot be signed out of FactoryTalk Security.  |
| User <Username> cannot be authenticated. Contact your administrator for more information.     | Wrong credentials are passed to the FactoryTalk Security sign-in.   |
| Could not open a file.  | The referred help file does not exist or is not accessible.   |
| Could not get the help folder.  | The folder with help files does not exist or is not accessible.   |
| Could not open the folder.  | The folder for reports is not accessible.   |
| The favorite lists cannot be imported.  | Cannot import favorite lists (the favorite lists are probably corrupted).   |
| The favorite lists cannot be exported.  | Cannot export favorite lists (the target folder is probably not accessible).  |
| A favorite list's name cannot contain any of the following characters: <, >, ", /, \,  , ?, * | Invalid characters are used in the favorite list name.  |

| Error Message   | Description   |
|---|---|
| Cannot apply the favorite list to all devices. Please check the list before proceeding with the flash operation.                          | Warns users that not all revisions used in the favorite list are available on the computer or compatible with particular devices.                               |
| Multiple Flash To revisions are selected for a single device type.<br>Select one revision for each device type to create a favorite list. | This error occurs when creating a favorite list with the selected devices and for one device type there are multiple selected devices with different revisions. |
| The name of the favorite list is already used.  | This error occurs when the given name of the favorite list already exists.  |
| The firmware you want to delete cannot be deleted.  | The firmware files to be deleted are not accessible.  |

# Rockwell Automation Support

Use these resources to access support information.

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

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## Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at [rok.auto/pec](https://rok.auto/pec).

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