User Manual

Allen-Bradley

ControlFLASH Firmware Upgrade Kit User Manual

Allen-Bradley • Rockwell Software

Rockwell Automation

Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

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

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

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

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

Table of Contents

Preface

Purpose of This Manual

This manual describes how to use the ControlFLASH® software to upgrade device firmware.

New features and benefits

ControlFLASH version 14.01.00 includes the following new features or enhancements:

- Supports RSLinx Enterprise. You can use either RSLinx Classic or RSLinx Enterprise as your communications software. RSLinx Enterprise can be used with devices supporting USB and EtherNet/IP communications only. RSLinx Classic, if installed, is the default choice. You can choose to use another edition of RSLinx on the Welcome page if both are installed.
- Supports **-E** parameter to specify the RSLinx edition to communicate the target device.

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 support firmware updates via ControlFLASH.

You should also have the following knowledge:

- A basic understanding of networking concepts.
- A basic familiarity of RSLinx software.

ControlFLASH Firmware Kit

This chapter helps you get started with using the ControlFLASH Firmware Kit with your application.

System Requirements

ControlFLASH 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 at http://compatibility.rockwellautomation.com/Pages/home.aspx.

Hardware requirements:

- 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 16GB of available hard drive space

Operating systems:

ControlFLASH is tested on operating systems installed from original Microsoft® media only. ControlFLASH runs on either the 32-bit or 64-bit versions of the following Windows® operating systems:

- Windows 10 Enterprise
- Windows 10 Professional
- Windows 8.1 Enterprise
- Windows 8.1 Professional
- Windows 8 Enterprise
- Windows 8 Professional
- Windows 7 Ultimate with Service Pack 1
- Windows 7 Enterprise with Service Pack 1
- Windows 7 Professional with Service Pack 1
- Windows Server 2012 Standard
- Windows Server 2012 Datacenter
- Windows Server 2012 R2 Standard
- Windows Server 2012 R2 Datacenter
- Windows Server 2008 R2 Standard with Service Pack 1
- Windows Server 2008 R2 Enterprise with Service Pack 1

Additional software:

One of the following communications software packages must be installed before running ControlFLASH:

- RSLinx® Classic Lite
- RSLinx Classic
- RSLinx Enterprise version 5.90 or higher

Before You Begin

Before you start using ControlFLASH Firmware Kit, you need to:

- Verify that you have a version of RSLinx software installed.
- Configure your configuration drivers in the RSLinx software.
- Verify your communication drivers operate correctly.

Install ControlFLASH

Introduction

ControlFLASH is installed when you install Studio 5000 Logix Designer version 28.00 or later.

- You can download the standalone installation package from Rockwell Automation Product Compatibility and Download Center (PCDC). See Install ControlFLASH Through Installation Package on page 9.
- When you download an older version of firmware kits from Rockwell Automation PCDC, ControlFLASH version 12.00 or earlier is also included. See Install ControlFLASH Through Firmware on page 11.

IMPORTANT	The illustrations shown in this manual are samples. Because your system configurations or the firmware kits are different, the dialog boxes you see when running the tool may be different from the ones you see here.

About Firmware Kits

In ControlFLASH version 12.00 and earlier, each firmware kit is delivered as an MSI install. It always includes the ControlFLASH application, the firmware NVS and BIN files. You always need to run the MSI file to install ControlFLASH and the included firmware kits on your computer.

Starting from ControlFLASH version 13.00, each new firmware kit is delivered as an individual Device Management Kit (DMK) file. The ControlFLASH tool is separate and needs to be installed only once.

A DMK is a single, digitally signed file that contains the firmware binaries. ControlFLASH authenticates DMK's origin and validates its contents, providing enhanced protection against malicious threats. You can just download and use it, no need to install or unzip it. The file is named for easy identification and management, for example, *1756-L73_28.011.dmk*. For more information, see ControlFLASH Help.

Install ControlFLASH Through Installation Package

Locate and download the installation package

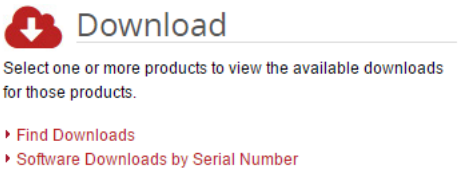
Follow these instructions below:

1. From Internet Explorer, go to the PCDC website:

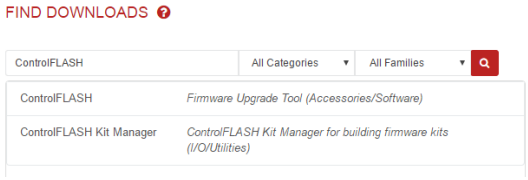
   http://compatibility.rockwellautomation.com/Pages/home.aspx

To use this site, you must register and log in.

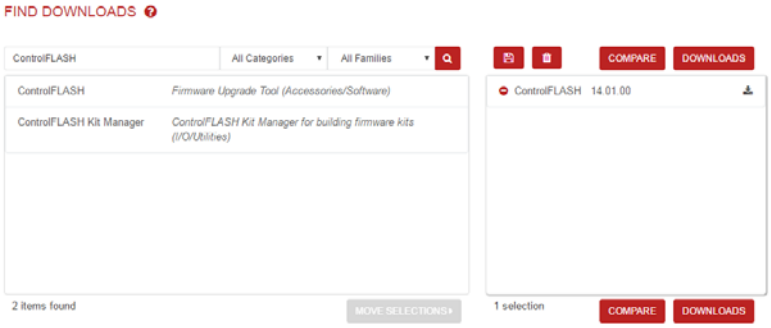
2. In **Downloads** area, click **Find Product Downloads**.



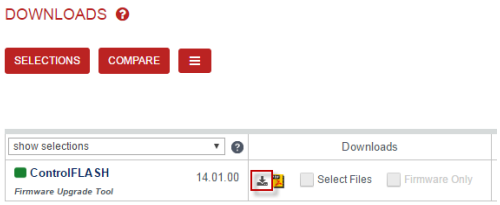
3. In the **Find Downloads** page, enter **ControlFLASH** and click **Search**.



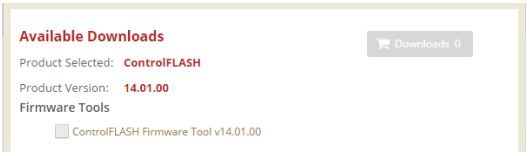
4. Select the row of **ControlFLASH** and click **Downloads** to continue.



5. In this page, click the **Show downloads** icon to show the available downloads.



6. In the **Available Downloads** page, select ControlFLASH and click **Downloads**.



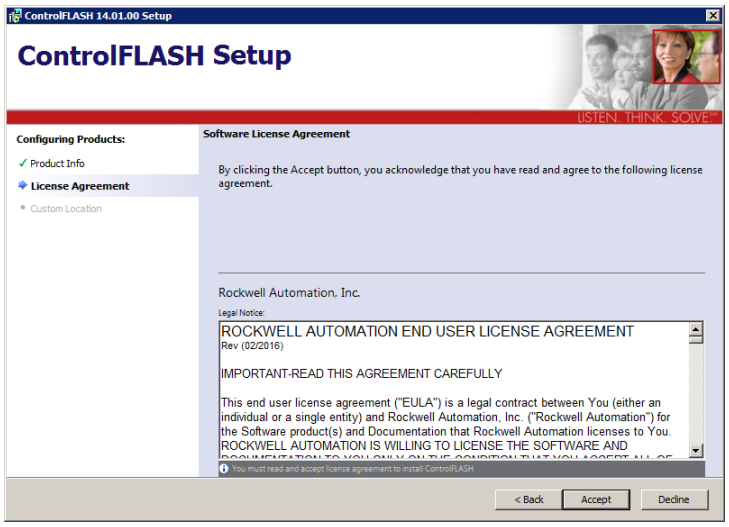
7. Follow instructions on the web to download the installation package.

Install ControlFLASH

Starting from ControlFLASH version 13.00, when the installation completes, FactoryTalk Security is enabled by default. When launched, ControlFLASH logs on to the FactoryTalk Network Directory.

To install ControlFLASH, follow the steps below:

1. Extract the installation package and double-click **setup.exe**. The **ControlFLASH Setup** wizard is displayed.



2. Follow the instructions to finish the installation.

Install ControlFLASH Through Firmware

When you download an older version of firmware kits from Rockwell Automation PCDC, ControlFLASH version 12.00 or earlier is included. The firmware kit installation file also contains these files:

- ControlFLASH installation file
- ControlFLASH drivers
- ControlFLASH online help

Locate and download firmware kits

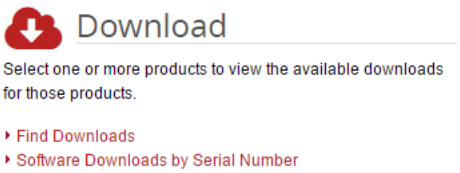
Follow these instructions below:

1. From Internet Explorer, go to the PCDC website:

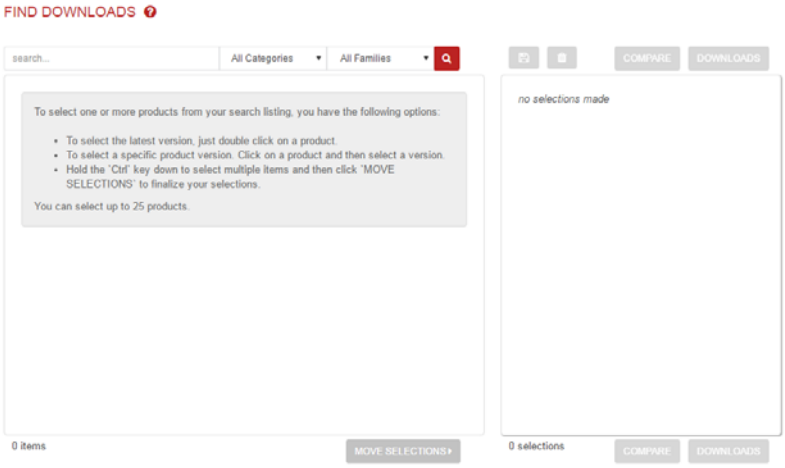
   http://compatibility.rockwellautomation.com/Pages/home.aspx

   To use this site, you must register and log in.

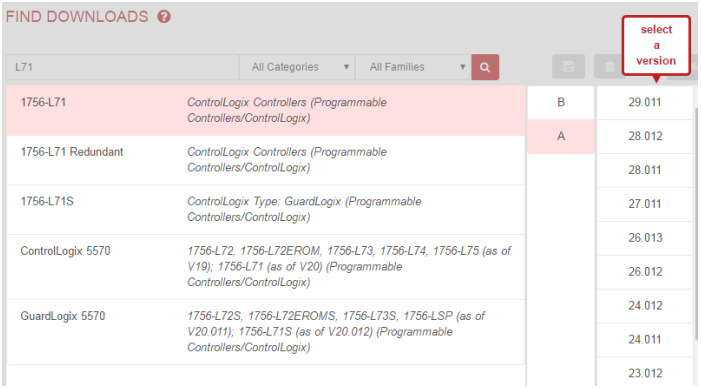
2. In **Downloads** area, click **Find Product Downloads**.



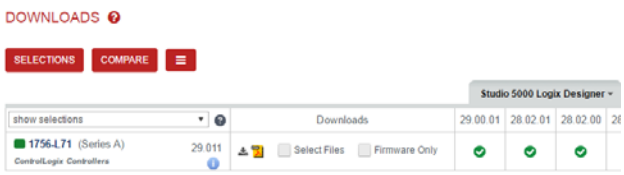
3. In the **Find Downloads** page, enter the catalog number or description that you want to download. You can also use the filter to limit the search.



4. Find the firmware and version you need and click **Downloads** to continue.



5. In this page, click the **Show downloads** icon to show the available downloads.



6. In the **Available Downloads** page, select ControlFLASH and click **Downloads**.

7. Follow instructions on the web to download the firmware.

Install ControlFLASH

If you have already downloaded and installed a firmware, a version of ControlFLASH may already be on your machine. If the next firmware you download has a newer version of ControlFLASH attached, then the newer version is installed. In all cases, any previously installed firmware remains accessible.

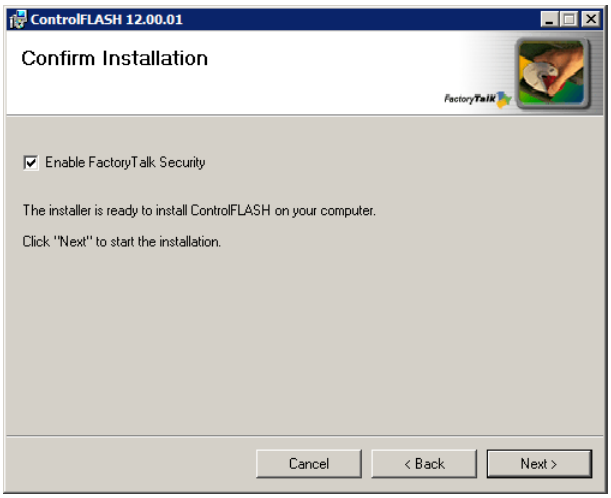
IMPORTANT	If the next firmware you download has an older version of ControlFLASH attached, the newer version of ControlFLASH may be overwritten. For details, refer to Rockwell Knowledgebase Answer ID 41194.

Follow the steps below to install ControlFLASH with a firmware.

1. Extract the file and double-click **ControlFLASH.msi**. In the **Welcome** dialog box, review the firmware information and click **Next**.

2. In the **License Agreement** dialog box, after reading the license, select **I Accept** and click **Next**.

3. In the **Select Installation Folder** dialog box, if needed, browse and select another folder. Click **Next**.
4. In the **Confirm Installation** dialog box, click **Next**.



5. Follow the instructions to finish the installation.

TIP When the installation completes, FactoryTalk Security is enabled by default. When launched, ControlFLASH logs on to the FactoryTalk Network Directory.

Configure ControlFLASH Policy in FactoryTalk Policies

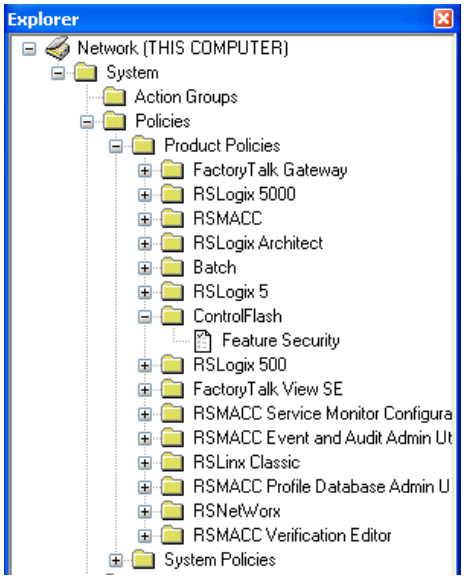
Introduction

This chapter tells you how to configure ControlFLASH security policy in FactoryTalk Administration Console.

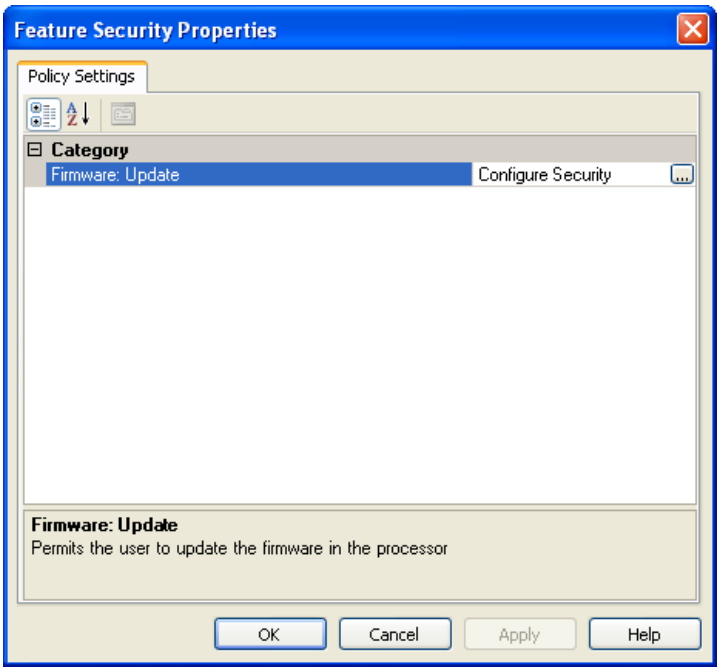
Configure ControlFLASH Policy

Follow the steps to configure security policy on ControlFLASH.

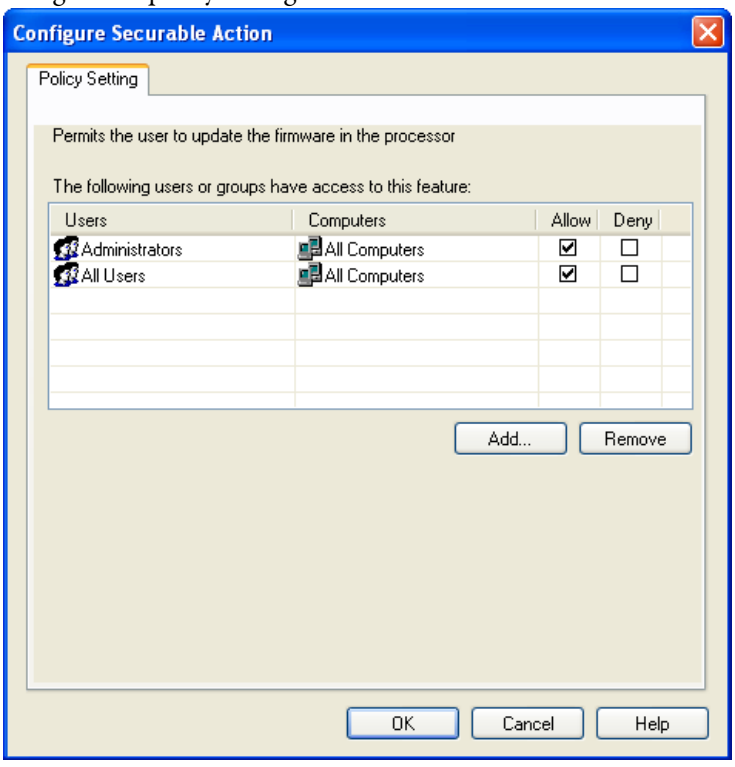
1. Open the FactoryTalk Administration Console.
2. In the Explorer area, expand **System > Policies > Product Policies > ControlFLASH**.



3. Double-click **Feature Security**. The Feature Security Properties window is displayed. Feature Security is included in FactoryTalk Services Platform 2.30 or later.



4. In the Firmware: Update category, click **Browse**. The Configure Securable Action window is displayed.
5. Configure the policy settings.



6. Click **OK** to complete the configuration.

Upgrade Firmware with ControlFLASH

Introduction

This chapter tells you how to upgrade firmware by using ControlFLASH.

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

IMPORTANT	The illustrations shown in this manual are samples. Because your system configurations or the firmware kits are different, the dialog boxes you see when running the tool may be different from the ones you see here.

Prepare for Firmware Upgrades

Follow the steps to prepare for the firmware upgrades.

ATTENTION: Devices controlled by a processor cannot be firmware updated. You cannot perform the upgrade while running a process. Before performing the upgrade, choose an appropriate time to remove your device from service.

1. Choose an appropriate time when all processes can be stopped to remove the device from service.
2. Verify that you can communicate to the device(s) that need firmware updating.

Prepare the Device for Upgrades

Follow this procedure to prepare the device for updating.

ATTENTION: Be sure to back up any data or programs that you have downloaded to a device. When you upgrade the firmware, all data and programs are erased.

1. Back up any current programs or data on the devices that you are updating.
2. Turn the key switch on your processor (if used) to Program mode.
3. Turn on power to the processor.

Use ControlFLASH to Upgrade Firmware

Follow these steps to use ControlFLASH to upgrade the firmware on your devices.

1. From Windows **Start** menu, select **All Programs** > **FLASH Programming Tools** > **ControlFLASH**. The Welcome to ControlFLASH dialog box is displayed.

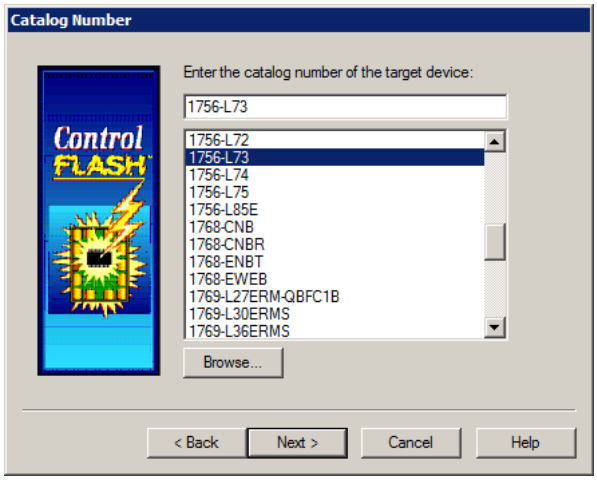
- To view the log information, click **View Log**.
- To show firmware releases that are available in the monitored folders, click **View Inventory**.
- To select another RSLinx edition as your default communication software, click **Change RSLinx Edition**.

  The button is enabled only if RSLinx Classic and RSLinx Enterprise version 5.90 or higher are installed. The default choice is **RSLinx Classic**. The other choice is RSLinx Enterprise that can be used with devices supporting USB and EtherNet/IP communications only.

  The following table shows the RSLinx edition that ControlFLASH uses.

ControlFLASH uses...	If...
RSLinx Classic	RSLinx Classic is installed and RSLinx Enterprise is not installed.
RSLinx Enterprise	RSLinx Enterprise is installed and RSLinx Classic is not installed.
Your preferred RSLinx edition	RSLinx Classic and RSLinx Enterprise are installed.

2. After you have the information, click **Next**. The **Catalog Number** dialog box is displayed. ControlFLASH searches and lists the available kits in the monitored folders. Click **Browse** to view or configure the monitored folders.

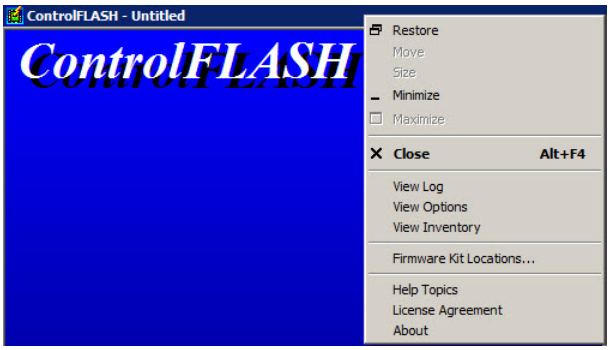


TIP You can also right-click the ControlFLASH icon and select **Firmware Kit Locations**.

When you download DMK firmware kits from Rockwell Automation PCDC, ControlFLASH automatically saves the folder location where the DMK files were downloaded to. By default, ControlFLASH monitors two folders:

- C:\Program Files\ControlFLASH for 32-bit or C:\Program Files (x86)\ControlFlash for 64-bit
- C:\Users\Public\Downloads\RA0

For best performance, we recommend you not using shared folders on a network, disk root folders, or a large number of folders.

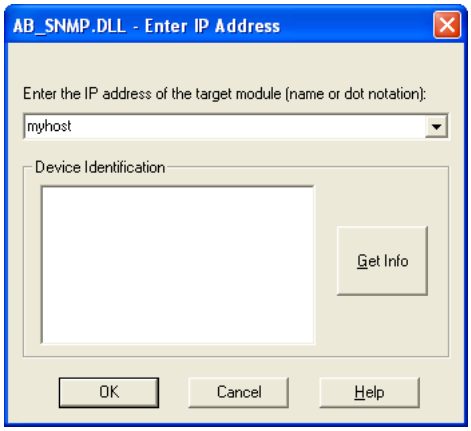


3. Select the catalog number of the target device and click **Next**. The device path dialog box allows you to specify the network path of the target module you are updating. The dialog box varies depending on the target module you are updating.
   - If you are updating a device with MicroXA or AB_ASA protocol driver, the RSWho dialog box is displayed.

     To specify the network path, navigate to the network where the device is located and select the target module. Click **OK** to go to the Firmware Revision dialog box.

For more information about configuring and using RSWho, refer to RSLinx help.

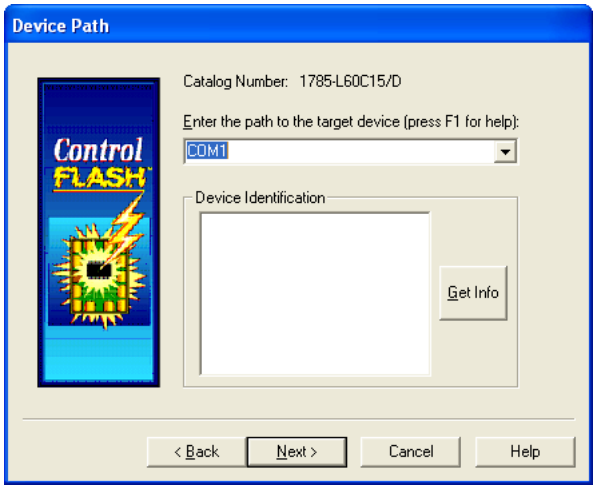
– If you are updating a device with AB_SNMP protocol driver, the AB_SNMP.DLL - Enter IP Address dialog box is displayed.



To specify the network path, in the device path box, enter the IP address or host name of the target module. Click **OK** to go to the Firmware Revision dialog box.

For more information about the device you are updating, click **Get Info**. The information is displayed in the Device Identification area. For more information about AB_SNMP protocol driver, click Help.

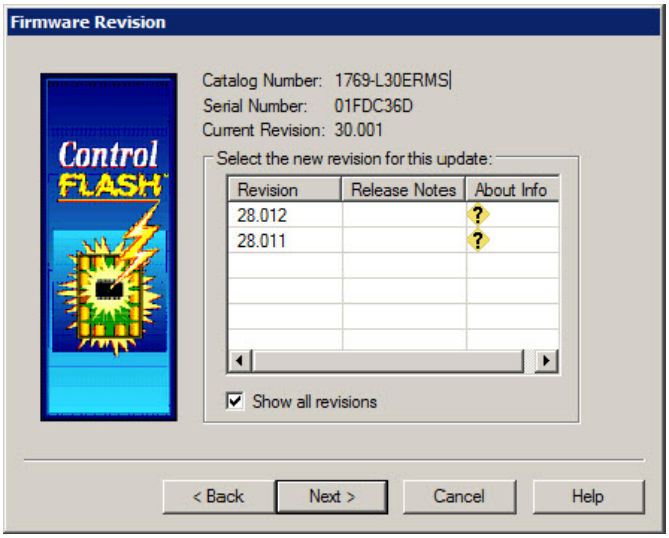
– If you are updating a device with AB_PLC5 protocol driver, the **Device Path dialog** box is displayed.



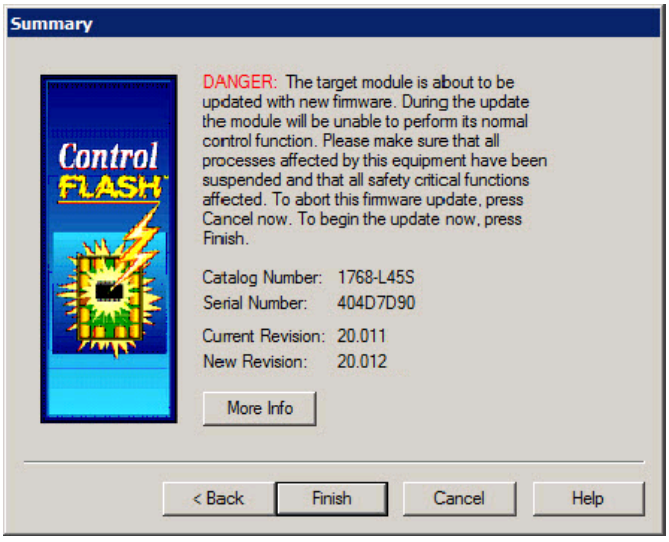
To specify the network path, in the device path box, enter the path in the box of the target module. Click **Next** to go to the **Firmware Revision** dialog box.

For more information about the device you are updating, click **Get Info**. The information is displayed in the **Device Identification** area.

4. In the **Firmware Revision** dialog box, do any of the following:
   - To specify a firmware revision, select the revision from the list.
   - To sort the firmware revision list, click the **Revision** column.
   - To see all available revisions that you can upgrade to, select the **Show all revisions** check box.
   - To view the license information, click the **About Info** icon.

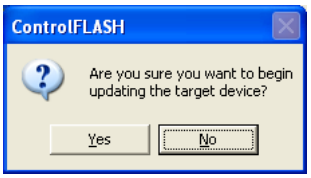


5. Click **Next** to go to the **Summary** dialog box. Click **More Info** to review more about the revision you selected



6. Click **Finish** when you are ready to upgrade the device.

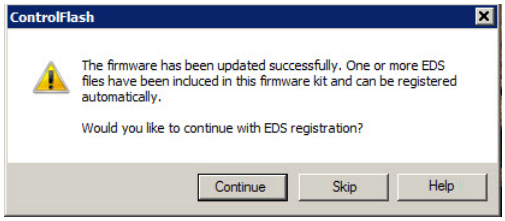
7. Click **Yes** to continue with the update. The upgrade is in progress.



ATTENTION: If you are attempting to flash a CompactLogix L2***x*** or L3***x*** controller, it is extremely important to allow the upgrade to complete without interruption.

ATTENTION: Interrupting the upgrade at this point may result in an inoperable product. Make sure the upgrade is going without interruption.

8. If the firmware kit contains EDS files, you can select whether to register these EDS files when the firmware upgrade completes.



   - To register EDS files, click **Continue**. To perform the registration, you need to log on to the computer as an administrator a user with administrative privileges.
   - To skip the EDS registration, click **Skip**.

9. After the upgrade, the **Update Status** dialog box appears. If the upgrade does not complete successfully, refer to Appendix A of this manual for more information about errors.

IMPORTANT Test the operation of the device you upgraded before using it in its intended application.

   - To view the Release Notes for this revision, click **View Release Notes**.
   - To view the history of programming events, click **View Log**.
   - Click **OK** to complete the upgrade.

Access Help

There is additional information in the help for this application. Access help from the button that appears on each ControlFLASH software dialog box.

For additional information about error messages, press **F1** while the ControlFLASH software displays the error message.

Use the Command Line

Introduction

This chapter explains how to use the command line to update module firmware and simplify firmware management. You can flash mutiple modules automatically and save time because you do not need to navigate through the software and select each module to flash.

Using the command line to flash modules provides the following benefits:

- Create applications that flash upgrade groups of devices automatically without having to repeatedly use the ControlFLASH menus. These can be scripts or VB applications that list the modules to flash, the firmware revisions, and the path requirements.
- Reduce training requirements of technicians and improve time for commissioning machines or performing field upgrades.
- Leverage multi-threaded syntax to flash up to five modules simultaneously for improved performance.

Command Line Mode

You can use the command line interface of ControlFLASH for flashing devices without user intervention. You can write a script file or some other Windows applications that pass the required parameters to ControlFLASH software. This can significantly improve the time required to flash large systems because each individual flash action does not have to be driven through the ControlFLASH GUI interface.

Consider the following requirements for using the command line.

- Any device that you can flash with ControlFLASH software can be flashed by using the command line or scripting. You must have the proper firmware kit installed in ControlFLASH software before you use the command line or scripting.

- You must use valid catalog numbers when developing your script files. Otherwise, ControlFLASH does not recognize your modules. The only way to be sure you have the correct catalog number to include in a script is to run the GUI version of the ControlFLASH software and write down the catalog number as it is shown.

- For both the command line and script methods of flashing devices, it is required that a firmware kit containing the requested firmware revision is installed on the computer making the call to the ControlFLASH software. The firmware kits must be installed in the default installation folder for ControlFLASH: C:\Program Files\ControlFLASH.
- You must have a valid installation of ControlFLASH on the computer before you can flash by using the command line or scripting versions. You must also have the kits installed on that machine for the specific modules and firmware revisions you intend to flash.

Command Line Syntax

The following are the command line usages.

Syntax	Use
`ControlFlash.exe -C <Catalog> -R <Revision> -P <Path> -E <Edition> -I <Instance> [-K] [-S]`	Shows the full command line syntax of updating target devices using catalog and revision.
`ControlFlash.exe -N <NVSFileName> -P <Path> -E <Edition> -I <Instance> [-K] [-S]`	Shows the full command line syntax of updating target devices using an NVS file.
`ControlFlash.exe -D <DMKFileName> -P <Path> -E <Edition> -I <Instance> [-K] [-S]`	Shows the full command line syntax of updating target devices using a DMK file.
`ControlFlash.exe -F <Filename>`	Points to command lines in a specific script file> where target devices and options are specified.
`ControlFlash.exe -?`	Shows the help information.

The following table shows details for each parameter:

Parameter	Description
-C	Catalog number of device as registered with the current installed ControlFLASH software. To identify installed kits, refer to the GUI version of ControlFLASH software. Example: **-C 1756-L63/A**
-R	Firmware revision you need to flash the device to. This revision must be registered for this device with the current install of the ControlFLASH software. To identify installed kits, refer to the GUI revision of ControlFLASH software. Example: **-R 16.23**
-P	FactoryTalk RSLinx path to the target device. -P AB_PCIC-1, 2 2 1 7 |_____| | | | | | | | | |__Node address | | | |__Backplane | | |__PCICS Communication card address | |__ControlNet cable address |_____PCICS driver name -P AB_ETH-2, 192.168.1.4, 1, 7 |_____||_____| | | | | | |__Node Address | | |__Backplane | |__IP address |_____Ethernet driver name -P AB_DF1-1,0,1 |_____| |_____CIP path to target device over DF1 driver Example: Path = -P AB_DF1-1,0,1 -P AB_VBP-1,1,16 |_____| |_____CIP path to target device over USB driver Example: Path = -P AB_VBP-1,1,16
-E	Specifies the RSLinx edition to communicate the target device. The value can be **RSLC** that stands for RSLinx Classic or **RSLE** that stands for RSLinx Enterprise. If omitted, the default value is **RSLC**. Example: **-E RSLE**
-F	Full path name to script file where target devices and options are specified. For details, refer to Script Files on page 26. Example: **-F MyScript.txt**
-N	Full path name to the NVS file that is used to update target devices. If the **-N** parameter is specified, the **-C** and **-R** parameters will be omitted. Example: **-N C:\Users\Public\ControlFlash\Firmware\1756-L6xS\R20_12_72 (V20.01)\556xS.nvs**
-D	Full path name to the DMK file that is used to update target devices. Example: **-D C:\Users\Public\ControlFlash\kits\1756-L73_21.011.44.dmk**
[-K]	Not including this parameter causes the device requested to flash even if it is already at the same revision your moving the device to. Including this parameter skips the flash request if the target device's firmware is already at the requested firmware revision.
[-S]	Not including this parameter causes a second command window to open and displays progress on the current flashing activity. Including this parameter starts Silent mode, no progress status (percentage completion) or command window is displayed.
-I	The instance or port number of the device supporting multiple assemblies. The value should be between **0** and **15**. Example: **-I 5**
-?	Displays help information.

ControlFLASH.exe is under the following locations:

- **C:\Program Files\ControlFLASH\Controlflash** for 32-bit operating systems
- **C:\Program Files (x86)\ControlFLASH\ControlFlash** for 64-bit operating systems

ControlFLASH opens a status window indicating the progress. You can set the **-S** parameter to disable this function and run in the silent mode.

ATTENTION: If you disable the status window, there will be no visual indication that a flash operation has failed or is in progress. In this case, Rockwell Automation recommends that you provide some other forms of user interaction through your own application, which indicates the status information.

Script Files

With ControlFLASH, you can create script files or execute your own C#, Java, or other language to have ControlFLASH push firmware to your devices. Your application can interact directly with ControlFLASH through a command line with status and diagnostics available in the ControlFLASH log or echoed back to your application directly.

Each device that you need to flash must have a unique **Device#**. ControlFLASH begins flashing devices with [Device1], [Device2], and so forth. ControlFLASH flashes the number of devices as indicated by the **NumberDevices** field. When you number your devices, do not skip a number and do not use [Device0]. The order of the file does not matter, as long as each number exists once in the file. In the example below, the NumberDevices is 4, so [Device5] will not be flashed.

Flash Multiple Devices

In the script file, you can flash up to five devices simultaneously by setting the **MultiFlash** option.

- When flashing a network communication device, for example, Ethernet, ControlNet, DeviceNet, or SERCOS, always disable **MultiFlash** by setting it to **0**.
- When flashing I/O modules, enable **MultiFlash** by setting it to **1**.

When creating a script file, there is a switch in the header that lets you flash up to five devices simultaneously.

ATTENTION: You should not use this option if flashing network or bridging type devices. ControlFLASH may start flashing a network card that is currently being used as part of the path to flash other devices under that communication card. This could render the child device unusable and require a return to the factory. Use the Multi-flash mode only for devices that are not required to gain access to other parts of the architecture.

The table below show options in the script file:

Entry	Description
Version	Version of the script file.
AbortOnFail	When flashing a device failed: 0 = continue flashing the remaining devices. 1 = stop flashing the remaining devices.
SkipOnFirmwareMatch	If a device to flash already has the matching firmware as stated in the script: 0 = do not skip flashing the device. 1 = skip flashing the device.
NumberDevices	Flash the first # of devices in this script file, begin with [Device1].
SilentMode	0 = ControlFLASH console window appears on screen and shows the flash progress. 1 = ControlFLASH console window does not appear on screen. You will not receive any flash status feedback.
MultiFlash	0 = flash only one device at a time. 1 = flash up to five devices concurrently.
Catalog	Catalog number of device as registered with the current installed ControlFLASH software. To identify installed kits, refer to the GUI version of ControlFLASH software. Example: 1756-L63/A
Revision	Firmware revision you need to flash the device to. This revision must be registered for this device with the current install of the ControlFLASH software. To identify installed kits, refer to the GUI revision of ControlFLASH software. Example: 16.23
Path	FactoryTalk RSLinx path to the target device. -P AB_PCIC-1, 2 2 1 7 |_____| | | | | | | | | |__Node address | | | |__Backplane | | |__PCICS Communication card address | |__ControlNet cable address |_____PCICS driver name -P AB_ETH-2, 192.168.1.4, 1, 7 |_____||_____| | | | | | |__Node Address | | |__Backplane | |__IP address |_____Ethernet driver name

Entry	Description
NVSFileName	Specifies the full path name of the NVS file. The file will be used to flash the target device.
DMKFileName	Specifies the full path name of the DMK file. The file will be used to flash the target device.
RSLinxEdition	Specifies the RSLinx edition to communicate the target device. The value can be **RSLC** that stands for RSLinx Classic or **RSLE** that stands for RSLinx Enterprise. If omitted, the default value is **RSLC**.

Example: script file

```
[FlashScript]
Version = 0.1
AbortOnFail = 1
SkipOnFirmwareMatch = 0
NumberDevices = 4
SilentMode = 0
MultiFlash = 0
[Device1]
Catalog = 1756-ENBT
Revision = 3.3.7
Path = AB_ETH-1,192.168.166.7,0 1,1
[Device2]
Catalog = 1756-CNBR/D
Revision = 5.45.10
Path = AB_ETH-1,192.168.166.7,0 1,2
[Device3]
Catalog = 1756-ENBT
Revision = 3.3.7
Path = AB_ETH-1,192.168.166.7,0 1,3
[Device4]
Catalog = 1756-DNB
Revision = 6.2.1
Path = AB_ETH-1,192.168.166.7,0 1,4
[Device5]
Catalog = 1756-CNBR/D
Revision = 5.45.10
Path = AB_ETH-1,192.168.166.7,0 1,5
```

Example: script file for NVS file updating

```
[FlashScript]
Version = 0.1
AbortOnFail = 0
SkipOnFirmwareMatch = 0
NumberDevices = 2
SilentMode = 0
```

```
MultiFlash = 1
[Device1]
Path = AB_ETH-1,10.108.187.85,1,4
NVSFileName = D:\Firmware\556xS.nvs
[Device2]
Path = AB_ETH-2,10.108.186.79,1,0
NVSFileName = D:\Firmware\556x_20_01_34.nvs
```

Example: script file for DMK file updating

```
[FlashScript]
Version = 0.1
AbortOnFail = 0
SkipOnFirmwareMatch = 0
NumberDevices = 2
SilentMode = 0
MultiFlash = 1
[Device1]
Path = AB_ETH-1,10.108.187.85,1,4
DMKFileName=D:\Firmware\L6xS_20.012.dmk
RSLinxEdition = RSLC
[Device2]
Path = AB_ETH-2,10.108.186.79,1,0
DMKFileName=D:\Firmware\L6x_20.001.dmk
RSLinxEdition = RSLC
```

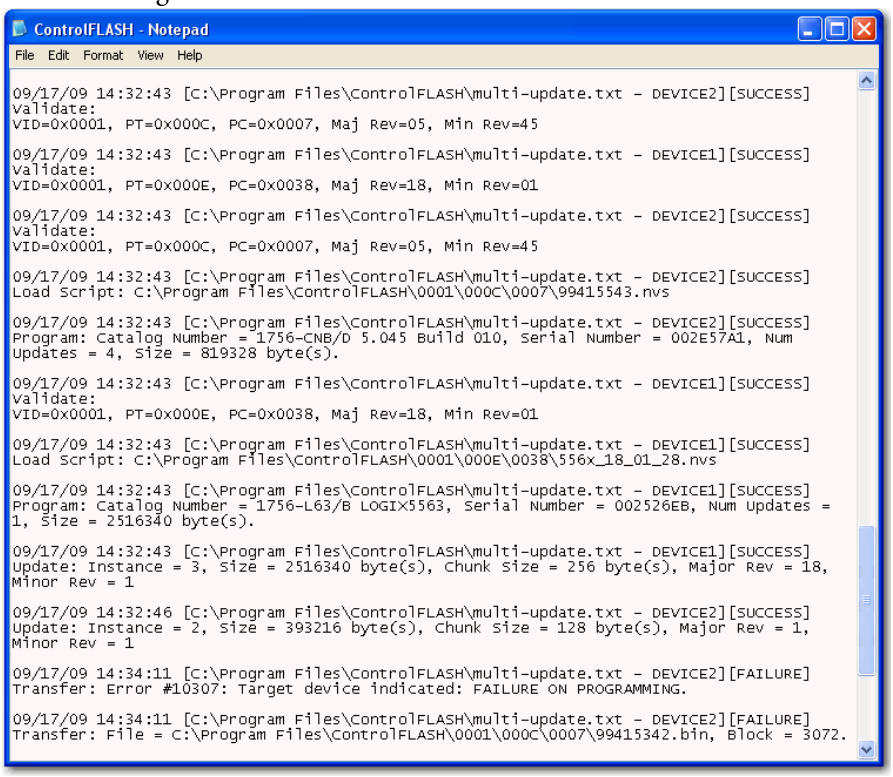
Troubleshooting

The first step to finding errors in your application is to use the ControlFLASH software log file. This file provides details about why your flashing script or command line request did not complete. This log file resides in the ControlFLASH directory. Before you spend a lot of time analyzing the log file however, make sure that you check the following:

- Target devices you are flashing have the correct firmware kit installed.
- ControlFLASH software has the correct RSLinx communication paths set up.
- The catalog number in your application matches the number in the ControlFLASH GUI.

Error Log

You can open the Error Log by clicking View Log on the ControlFLASH software dialog boxes.



Aborted Script File

If you have to abort a script file before completion or if the ControlFLASH software aborted the script because it received an error from a device, you can re-start that script. ControlFLASH starts flashing from the beginning of the script. You can, however, use the **SkipOnFirmwareMatch** switch to tell ControlFLASH software to not flash any devices that are already at the requested revision.

Stop a Command Line or Script Application

If you need to stop a flash operation that has already started, press **CTRL+ALT+F**. ControlFLASH stops executing the current script.

ControlFLASH completes flashing any devices currently in the process of being flashed to prevent risk of damaging the target device. Other modules not started in the script are not flashed.

If you are using your own interface to send commands to ControlFLASH, such as a script or C# application, pressing **CTRL+ALT+F** may not abort the operation

and you must manage abort operations by using your application. Refer to the developer of that application for information on how to perform an abort.

ControlFLASH and Factory Talk AssetCentre Interaction

Introduction

ControlFLASH 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 following information is also available in the ControlFLASH log file, as it was in previous versions.

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 displays 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 displays 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 in to 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 on to 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 activities are logged:

- Launch of ControlFLASH
- 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)
- Exit of ControlFLASH

The ControlFLASH activities are logged only if the client is properly configured with FactoryTalk AssetCentre server. ControlFLASH logs the current windows user login. ControlFLASH 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 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 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 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
Location	Computer name on which ControlFLASH is being executed.
Resource	Name of the resource that is ControlFLASH.
Username	FTAssetSecurity Login, if present, else Windows login
Message Text	If update succeed: 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. If update failed: 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.

Logging the Exit of ControlFLASH

When you exit ControlFLASH, a message is created and logged into the FactoryTalk AssetCentre Event Log with the following details.

Field	Description
Date and Time	Date and Time at which ControlFLASH application is closed.
Source	Application name, for example, ControlFLASH
Location	Computer name on which ControlFLASH is closed.
Resource	Name of the resource, for example, ControlFLASH.
Username	FTAssetSecurity Login, if present, otherwise Windows login.
Message Text	ControlFLASH application closed.

ControlFLASH Error Codes

Introduction

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

Error Message	Description
Authenticate Error	The download restrictions placed on the selected revision could not be validated. Files containing validation information are corrupted or have been deleted. Check with a technical support representative for help in restoring your restriction files.
Catalog Registry Error	The catalog registry database could not be read. Check with your technical support representative to verify that the correct database is loaded.
Catalog Directory Error	The catalog directory database could not be read. Check with a technical support representative to verify that the correct catalog database has been loaded.
Communication Error	An error occurred while the ControlFLASH software tried to communicate with the target device. Verify that: • All cable connections are secure. • The target device has power. • RSLinx Classic software is properly configured.
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.	The error might be caused because that: • 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. • The slot used for the controller is not a trusted slot. Make sure to use a trusted slot for the controller.
Invalid Catalog Number	The catalog number of the target device you selected does not match the catalog number selected in the Catalog Number dialog box. You selected an incorrect target device or catalog number. Select a device that matches the catalog number or a different catalog number.
Invalid Revision	The upgrade revision selected is not compatible with the selected target device. The selected firmware revision is either: • older than the firmware currently on the target device. • incompatible with the revision level of the target device. **ATTENTION:** Do not continue with the upgrade until you have verified that the upgrade is compatible with the selected device. Unpredictable system operation could result.
Instance Validation Error	The target device did not report enough information to be properly identified. Check with a technical support representative for help in resolving this problem.
Load Driver Error	The ControlFLASH 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 is loaded.
Log Viewer Error The event log viewer (Notepad.exe) could not be found	Verify that the Notepad application is installed on your system.
Mode Error	The target device is in a mode in which it cannot be programmed. Place the device into the appropriate mode.

Error Message	Description
Out of Memory Error	Your system is low on or out of RAM memory. The ControlFLASH software could not allocate enough memory for data. Free up RAM space by: • Shutting down other applications currently running. • Increasing the size of your virtual memory. • Purchasing additional RAM, if necessary.
Out of Memory Error Log File Error	The log file could not be accessed because of a file error. Either the log file could not be: • Opened. • Written to because of an error. • Written to because the disk is full. **ATTENTION:** Check with your application engineer or supervisor before deleting any files. Verify that you are not deleting any files necessary for system operation. If the disk is full, you can free up disk space by: • Deleting files from your c:\windows\temp directory. • Uninstalling any unnecessary applications. • Shutting down and restarting your computer.
Restriction System Error	The download restriction system could not read the master key disk. Check with a technical support representative for help in resolving this problem.
RSLinx not installed	Make sure RSLinx Classic or RSLinx Enterprise version 5.90 or higher is installed.
RSLinx Load Error	An error occurred while the ControlFLASH software tried to install the network protocol driver (DTL32.DLL). Verify that RSLinx Classic 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.

Create a Custom Interface to Process Firmware Downloads

Introduction

This chapter gives you an overview on how you can create a custom interface to batch process firmware downloads.

As discussed in previous chapters, you can automate firmware flashing by using a text file that lists devices and single command line. Create a text file that lists all the devices to be flashed and then use a single command line to flash everything on the list.

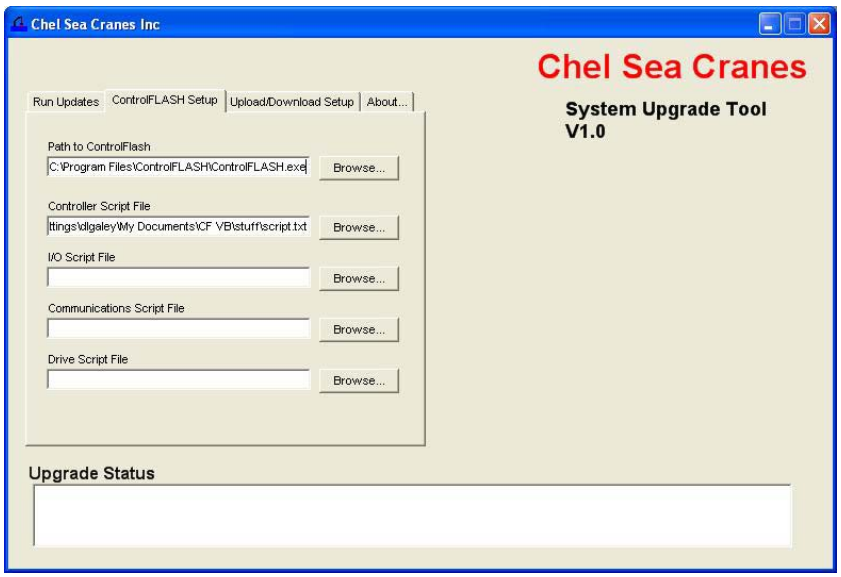
This functionality provides the following benefits:

- Flash groups of devices automatically, without having to repeatedly use the ControlFLASH menus.
- Create your own applications that automates firmware upgrades.

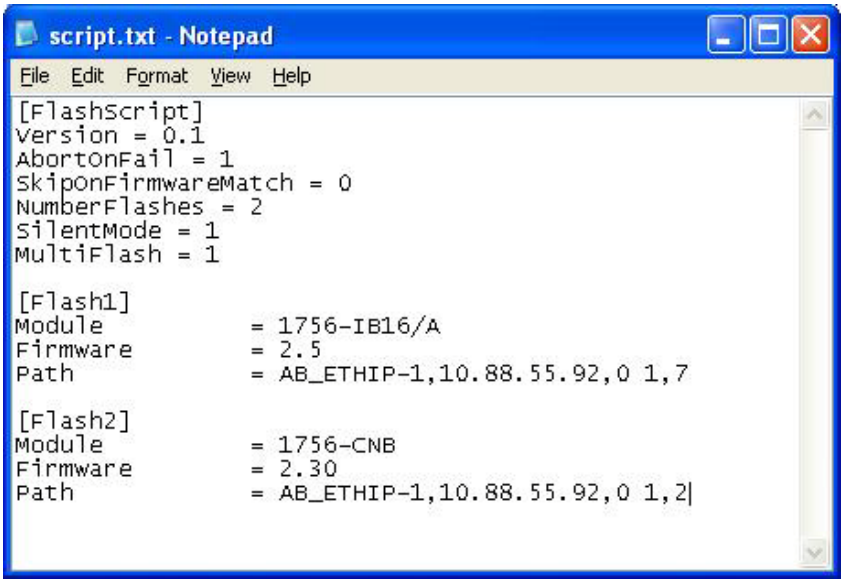
Example Automated Flash Tool

The following example application represents a tool that you might want to create to configure ControlFLASH to read the text file at a command line that automates your system upgrades. This tool was created with Visual Basic .NET.

In this type of custom tool, select the ControlFLASH Setup tab.

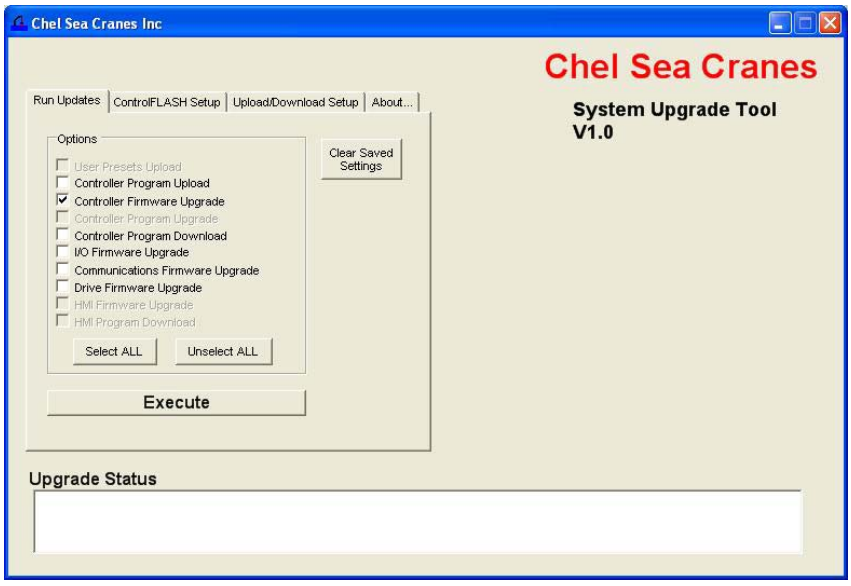


Using the fields created, specify the path to the ControlFLASH executable, as well as the text script files you want to use.

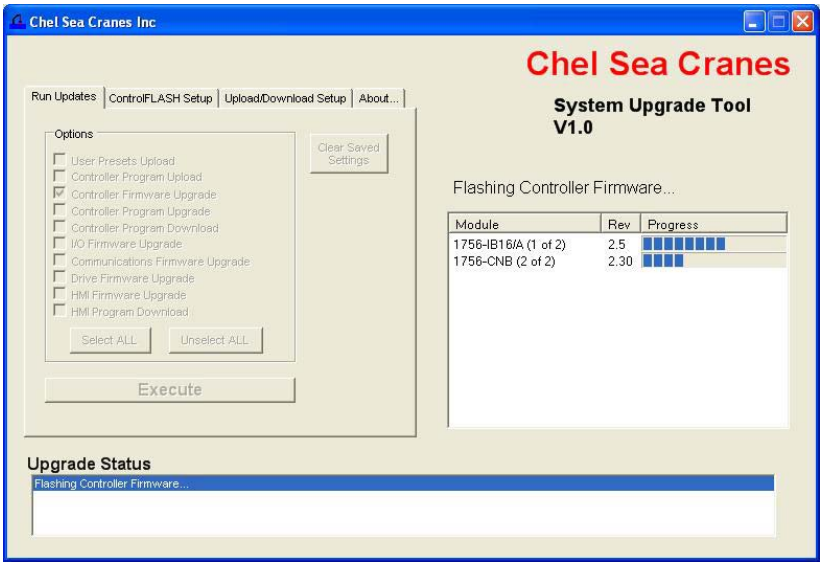


This example uses separate script files to flash controllers, I/O modules, communication modules, and drives, but it is not required that they be separated.

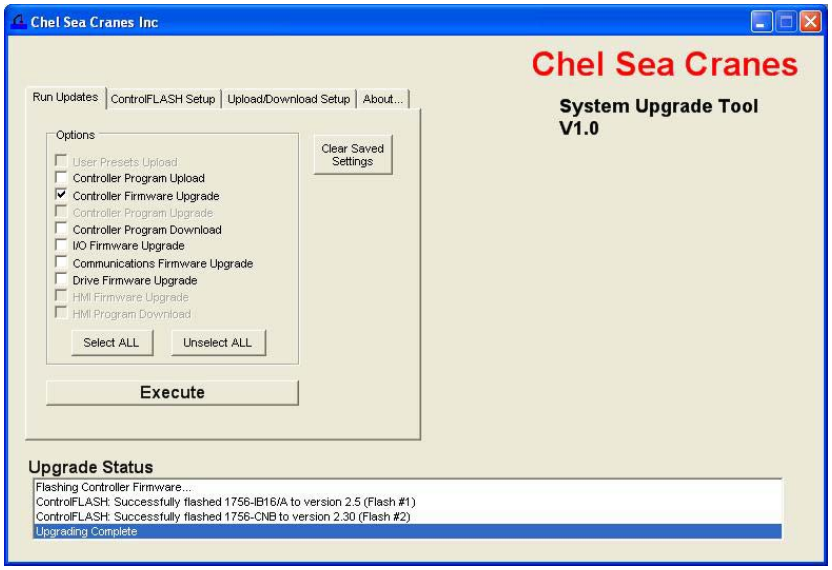
Assuming that the location of the executable and the script files do not change, these configurations need to be set only once. After configuration completes, click the **Run Updates** tab and select the actions that you want to perform, which include four boxes for the four different script files. Click **Execute** to run the selected actions.



While modules are flashing, the tool displays the progress on the right hand side of the window and success or failure messages in the status box at the bottom.



Once all selected upgrades are run, the status box shows the overall completion status.



How a Custom Upgrade Tool Works

The tool in this example was created using Visual Basic .net, but any major programming language can be used. The script files are created manually in a text editor. The tool itself first reads the script file to get the number of devices being flashed, including the names and revision numbers. The tool uses this information to form the display.

The tool then uses the System.Diagnostics.Process.Start function of the .NET framework to launch ControlFLASH software, giving as the arguments the path to the script file with a -T flag in front of it.

Example:

```
fileName = "C:\Program Files\ControlFLASH\ControlFLASH.exe"
arguments = "-T C:\samplescript.txt"
```

The tool then monitors the ControlFLASH process to detect when it has finished running so the tool can move on to the next step.

The easiest way to view the status of the flash upgrade by using this method is to edit the ControlFLASH script file and set SilentMode = 0 to use ControlFLASH software's built in status display.

If developers want to show the progress themselves, as the example tool does, they can use the registered window messages to show progress with external applications. Some knowledge of Microsoft Windows messages is needed.

ControlFLASH registers two Windows messages: WM_CFPROGRESS and WM_CFCOMPLETE. The WM_CFPROGRESS message is sent whenever ControlFLASH needs to report a change in progress of flashing a device. The WM_CFCOMPLETE message is sent whenever ControlFLASH finishes flashing a device. These messages can be received by any application that also registers messages of the same name.

Refer to MSDN: http://msdn.microsoft.com/en-us/library/ms644947(VS.85).aspx where lpString is WM_CFPROGRESS or WM_CFCOMPLETE

Example Visual Basic .NET Code

```
Private Declare Function RegisterWindowMessage Lib "user32" Alias
"RegisterWindowMessageA" _

(ByVal lpString As String) As Integer

Dim WM_CF_PROGRESS As Integer =
RegisterWindowMessage("WM_CFPROGRESS")

Dim WM_CF_COMPLETE As Integer =
RegisterWindowMessage("WM_CFCOMPLETE")
```

WM_CF_PROGRESS and WM_CF_COMPLETE are simply variable names used to store the integer values associated with the messages.

After registering the two messages, an application must override the form's WndProc method to actually listen for these messages

For more information, see MSDN: http://msdn.microsoft.com/en-us/library/system.windows.forms.form.wndproc(VS.71).aspx

Example:

```
Protected Overrides Sub WndProc(ByRef recWinMessage As
Windows.Forms.Message)
```

In WndProc, you first need to determine if the message received is one of the two registered ones. This is done by checking (in this example):

recWinMessage.Msg = WM_CF_PROGRESS (as defined in the above example) or recWinMessage.Msg = WM_CF_COMPLETE

Assuming the message is one of the two, the details of what the message means are as follows:

- If the message is WM_CFPROGRESS:

  `recWinMessage.WParam.ToInt32` is the number of the device currently being flashed. These numbers should correspond to the numbers listed in the script file

  `recWinMessage.LParam.ToInt32` is the actual progress of the current device (as a percentage).

Because of the way the system is designed, if recWinMessage.LParam.ToInt32 is 100, that does not mean the flashing of that device is complete. Flashing is only complete when the WM_CFCOMPLETE message is sent.

- If the message is WM_CFCOMPLETE:

  `recWinMessage.WParam.ToInt32` is still the number of the device

  `recWinMessage.LParam.ToInt32` indicates success or failure. If the value is 1, the flash succeeded; if 0, it failed.

For more information, see MSDN http://msdn.microsoft.com/en-us/library/system.windows.forms.message_members(VS.71).aspx

In this tool, the progress messages are used to set the values of the progress bars, and the complete messages are used to trigger the success and failure status messages in the lower status box.

IMPORTANT At the end of your override of the WndProc method, you must call the base class' WndProc method to handle any other messages sent, or your application will not work.

Example:

```
MyBase.WndProc(recWinMessage)
End Sub
```

Rockwell Automation Support

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

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

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at **http://www.rockwellautomation.com/support/americas/phone_en.html**, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

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

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

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at **http://www.rockwellautomation.com/literature/**.

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