



ControlLogix Configurable Flowmeter Module Firmware Revision 2.4

Catalog Number 1756-CFM

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About This Publication

This release note contains descriptions of enhancements, anomalies corrected, and procedures to configure the Configurable Flowmeter Module (1756 - CFM) to use the new enhancement.

Some CFM applications may require additional configuration when using firmware revision 2.4. The following table explains what action you must take in order to use firmware revision 2.4 based upon on your system. It also explains where you can find that action described in this release note.

If you have	And need to	Then	On page
A new 1756-CFM module with firmware revision 2.4.	Use the module <i>without</i> using the enhancement described on page 2.	No further action required.	
A new 1756-CFM module with firmware revision 2.4.	Use the module <i>with</i> the ability to use the enhancement described on page 2.	Configure the CFM to Use the Configurable On/Off Behavior	4
A 1756-CFM module at firmware revision 1.4 or lower.	<ul style="list-style-type: none">• Correct an anomaly described in this release note.• Use the module <i>without</i> using the enhancement described on page 2	Install the 2.4 Firmware	3
A 1756-CFM module at firmware revision 1.4 or lower.	Use the module <i>with</i> the ability to use the enhancement described on page 2.	<ul style="list-style-type: none">• Install the 2.4 Firmware• Configure the CFM to Use the Configurable On/Off Behavior	3 4

Enhancements

The following enhancement is enabled by firmware revision 2.4.

Configurable Output Behaviors

Firmware revision 2.4 enables you to configure the 1756-CFM module outputs to turn on or off at specified frequency counts.

Three types of behaviors, listed in the Frequency Values and Resulting Behaviors table, can be configured with use of firmware revision 2.4. You may use this table as a reference when determining on/off frequency values later in the configuration procedure.

Frequency Value	Behavior
FreqOn = 0.0 FreqOff = 0.0	Typical behavior when firmware revision 1.x is used. If the C.OutputSetup[X].TriggerOn value is 1, a frequency count corresponding to the TriggerOn frequency activates the Ch[X]Overspeed Alarm, which latches and requires additional programming to unlatch.
FreqOff greater than FreqOn	The specified channel turns off when the frequency count is at or above the specified FreqOff value. The specified channel turns on when the frequency count is at or above the FreqOn value. For example: <div style="text-align: center;"> <p> FreqOff = 60 FreqOn = 20 = On </p> </div>
FreqOn greater than FreqOff	The specified channel turns on when the frequency count is at or above the specified FreqOn value. The specified channel turns off when the frequency count is at or below the specified FreqOff value. For example: <div style="text-align: center;"> <p> FreqOn = 60 FreqOff = 20 = On </p> </div>

IMPORTANT

Installing firmware revision 2.4 will result in the correction of anomalies listed in this document. You may install firmware revision 2.4 without configuring the 1756-CFM if you do not want to specify on/off frequency output behaviors.

If you want to specify on/off frequency output behaviors, complete the configuration procedure.

Corrected Anomalies

The following are anomalies that have been corrected in previous firmware revisions.

Firmware Revision	Anomaly	Correction
2.4	When used in Prover or Totalizer mode, the NetVolume value may incorrectly display 1.#QNAN indicating Not-A-Number (NAN) floating-point value.	Firmware revision 2.4 detects the incorrect NAN floating-point value and instead registers a zero value.
1.4	The 1756-CFM Coordinated System Time differed from the Master Coordinated System Time.	With firmware revision 1.4, the 1756-CFM uses the correct CST value.
1.3	Frequency counts dropped below user configured output off frequency at CFM module reset.	Firmware revision 1.3 changes the Process Consumer Data routine so frequency counts remain above the configured output off frequency at reset.
1.2	When used in certain conditions, the 1756-CFM module outputs energize intermittently when the controller mode is altered.	Firmware revision 1.2 stabilizes the 1756-CFM outputs.

Install Firmware Revision 2.4

As of March 2007, the 1756-CFM module ships at firmware revision 2.4 and no further installation is required.

If you need to upgrade from firmware revision 1.4 or lower, download the firmware and related files from <http://support.rockwellautomation.com>

Configure the CFM to Use the Configurable On/Off Behavior

These configuration procedures provide step-by-step instructions for you to complete the following tasks:

- Add the 1756-Generic module profile to your I/O configuration.
- Copy and paste the required user-defined tags, controller tags, and ladder logic.
- Specify the configurable on/off behaviors.

IMPORTANT

Use these configuration procedures **only** if you are configuring your 1756-CFM module using RSLogix5000 version 16 or lower.

To complete the configuration, you must download and open the CFM_GenericProfileExample.ACD file from one of the following locations.

- As packaged with the 1756-CFM firmware revision 2.4 firmware kit provided at <http://support.rockwellautomation.com>.
- In the RSLogix 5000 version 16 quick start page.
 - To open the file, select the Controller Projects tab. Then select Open Sample Project > V16 > Rockwell Automation > CFM_GenericProfileExample.ACD.

Once you have downloaded and opened the CFM_GenericProfileExmple.ACD file, complete the configuration procedure that matches your application.

If	Then
You are configuring the module for use in a new application	Complete the procedure explained in Configure the CFM for Use in a New Application on page 4.
You are configuring the module for use in an existing application	Complete the procedure explained in Configure a CFM for Use in an Existing Application on page 9.

Configure the CFM for Use in a New Application

Complete this procedure if you are creating a new application to use the 1756-CFM and the configurable on/off feature.

Add the 1756-Generic Profile to the Program

1. In RSLogix5000 software, create a new project named CFM_DEMO.

2. Specify the controller type, revision number, chassis type, and slot number according to your ControlLogix controller chassis.
3. In the I/O Configuration folder, add a new module.

Use the Generic 1756 Module profile listed in Other module types.

4. In the New Module dialog, enter the Connection Parameter information exactly as displayed below.

IMPORTANT

Specify the new module's slot to match the location of the 1756-CFM module in the ControlLogix chassis. Assigning and placing the module in slot 4 is not required for this configuration.

5. Click OK.

The Module Properties dialog displays.

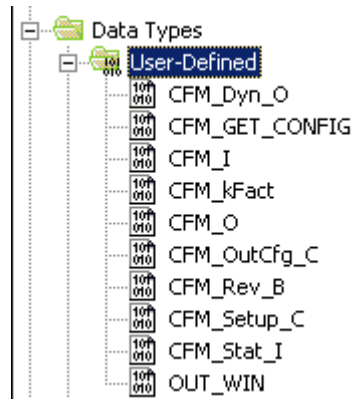
6. Set the module RPI to 100.
7. Click OK.

The 1756-Generic module is now in the I/O configuration.

Copy and Paste the Tags and Logic from the Example to Your Program

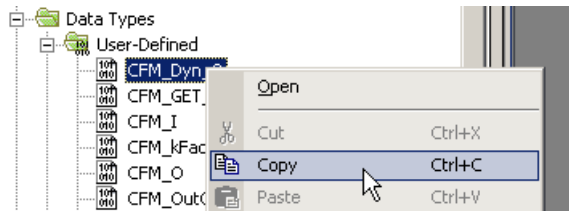
1. Minimize the CFM_DEMO project and open a new instance of RSLogix 5000.
2. Open CFM_GenericProfileExample.ACD.

- In the controller organizer of the CFM_GenericProfileExample project, expand the User-Defined data types.

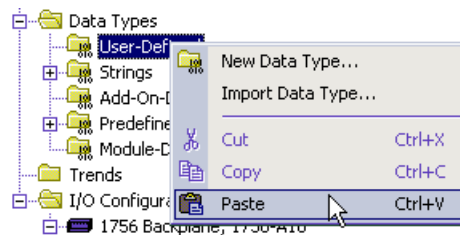


- Copy one of the User-Defined data types.

You must select and copy each of User-Defined data types individually.



- In the CFM_DEMO project, paste the copied User-Defined data type into the User-Defined data type folder.

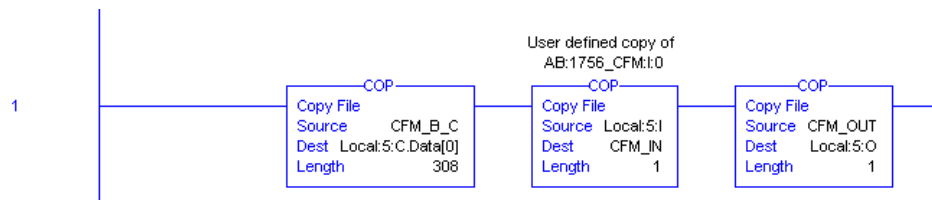


- Repeat steps four and five until all of the User-Defined data types contained in the CFM_GenericProfileExample project have been pasted in the CFM_DEMO project.

7. In the CFM_GenericProfileExample project, copy the following data tags located in the Controller Tag folder.

Name	Value	Force Mas	Style	Data Type
+ CFM_B_C	{...}	{...}		CFM_Rev_B
+ CFM_Config	0		Decimal	DINT
+ CFM_IN	{...}	{...}		CFM_I
+ CFM_OUT	{...}	{...}		CFM_O

8. In the CFM_DEMO project, paste the copied data tags into the Controller Tags folder using the edit tags tab.
9. In the CFM_GenericProfileExample project, copy ladder logic rung 1 located in the Main Routine folder.



10. In the CFM_DEMO project, paste the copied rung into the Main Routine folder.
11. Change the Local:5 tag references to correspond to the location of your 1756-CFM module in your chassis.
12. Accept the pasted rung.
13. Delete the empty rung.

Specify the Configurable On/Off Behavior

1. In the CFM_DEMO program, select the Controller Tag folder and view the Monitor Tags tab.

- Expand the CFM_B_C tag until you reach the CFM_B_C.OutputWindow data tags.

Name	Value	Force Mas	Style	Data Type
[-] CFM_B_C	{...}	{...}		CFM_Rev_B
[-] CFM_B_C.ProgToFaultEn	0		Decimal	BOOL
[+] CFM_B_C.ChannelCfgBits	2#0000_0000		Binary	SINT
[-] CFM_B_C.Ch0ProverDirection	0		Decimal	BOOL
[-] CFM_B_C.Ch1ProverDirection	0		Decimal	BOOL
[-] CFM_B_C.Ch0LowFreqClear	0		Decimal	BOOL
[-] CFM_B_C.Ch1LowFreqClear	0		Decimal	BOOL
[-] CFM_B_C.Ch0PreTrigger	0		Decimal	BOOL
[-] CFM_B_C.Ch1PreTrigger	0		Decimal	BOOL
[+] CFM_B_C.Operations	{...}	{...}		CFM_Setup_C[2]
[-] CFM_B_C.OutputSetup	{...}	{...}		CFM_OutCfg_C[2]
[+] CFM_B_C.OutputSetup[0]	{...}	{...}		CFM_OutCfg_C
[+] CFM_B_C.OutputSetup[1]	{...}	{...}		CFM_OutCfg_C
[-] CFM_B_C.OutputWindow	{...}	{...}		OUT_WIN[2]
[-] CFM_B_C.OutputWindow[0]	{...}	{...}		OUT_WIN
[-] CFM_B_C.OutputWindow[0].FreqOn	6000.0		Float	REAL
[-] CFM_B_C.OutputWindow[0].FreqOff	4000.0		Float	REAL
[-] CFM_B_C.OutputWindow[1]	{...}	{...}		OUT_WIN
[-] CFM_B_C.OutputWindow[1].FreqOn	6000.0		Float	REAL
[-] CFM_B_C.OutputWindow[1].FreqOff	4000.0		Float	REAL

- In the Value column of CFM_B_C.OutputWindow FreqOn and FreqOff data tags, enter the desired On and Off frequency limits.

Use the table on page 2 for more information about determining your On/Off frequency limits.

You have completed basic configuration steps specific to the CFM 2.4 revision.

Complete additional project programming specific to your CFM module use and implement accordingly.

IMPORTANT

Test the CFM module 2.4 configuration before implementing the changes into your production process.

Configure a CFM for Use in an Existing Application

Complete this configuration process if you are updating an existing 1756-CFM application to use the configurable on/off feature.

Add the 1756-Generic Profile to the Program

1. In RSLogix 5000 software, open a project that contains programming for an existing CFM module.
2. In the I/O configuration, delete the existing 1756-CFM module.
3. In the I/O configuration, add a new module.

Use the generic 1756 module profile listed in Other module types.

4. Name the new module according to your preference.
5. In the New Module dialog, enter the Connection Parameters and Comm Format exactly as displayed below.

The screenshot shows the 'New Module' dialog box with the following configuration:

- Type: 1756-MODULE Generic 1756 Module
- Parent: Local
- Name: CFM_New
- Description: (empty)
- Comm Format: Data - REAL
- Slot: 1
- Connection Parameters:

	Assembly Instance:	Size:	
Input:	160	28	(32-bit)
Output:	130	30	(32-bit)
Configuration:	3	308	(8-bit)
Status Input:			
Status Output:			

At the bottom, there is a checkbox for 'Open Module Properties' (unchecked) and buttons for 'OK', 'Cancel', and 'Help'.

IMPORTANT

The specified slot should correspond to the existing position of the CFM module in your ControlLogix chassis.

6. Click OK.

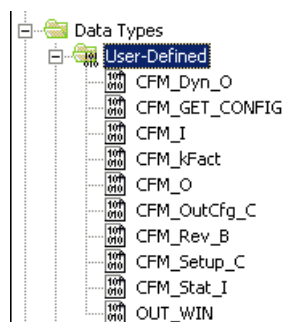
The Module Properties dialog displays.

7. Set the module RPI to 100.
8. Click OK.

The 1756-Generic module is now in the I/O configuration.

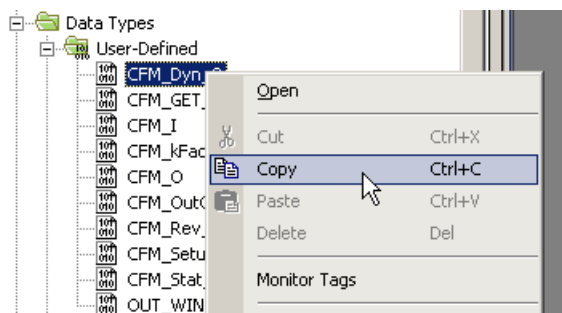
Copy and Paste the Tags and Logic from the Example to Your Program

1. Minimize the previously existing project and open a new instance of RSLogix 5000 software.
2. Open the CFM_GenericProfileExample.ACD.
3. In the controller organizer of the CFM_GenericProfileExample project, expand the User-Defined data types.

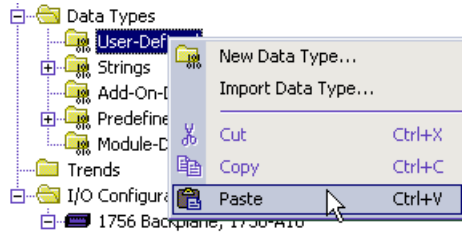


4. Copy one of the User-Defined data types.

You must select and copy each of User-Defined data types individually.



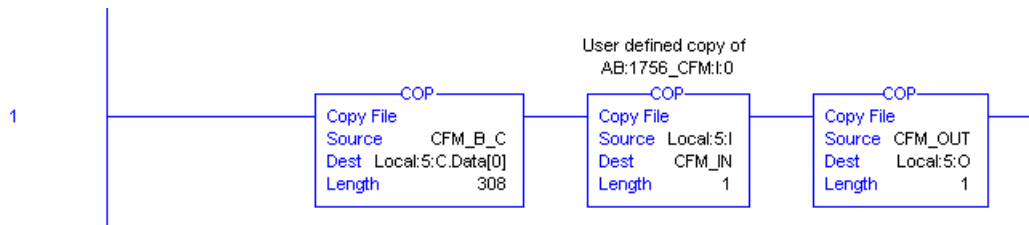
- In the previously existing project, paste the copied User-Defined data type into the User-Defined data type folder.



- Repeat steps four and five until all of the User-Defined data types contained in the CFM_GenericProfileExample project have been pasted into the previously existing project.
- In the CFM_GenericProfile project, copy the following Controller Tag data tags.

Name	Value	Force Mas	Style	Data Type
+ CFM_B_C	{...}	{...}		CFM_Rev_B
+ CFM_Config	0		Decimal	DINT
+ CFM_IN	{...}	{...}		CFM_I
+ CFM_OUT	{...}	{...}		CFM_O

- In the other RSLogix 5000 project, paste the copied data tags into the Controller Tags folder.
- In the CFM_GenericProfileExample project, copy ladder logic rung 1 located in the Main Routine folder.



- In the other open RSLogix project, paste the copied rung into Main Routine folder.
- Accept the pasted rung.
- Delete the empty rung.

Specify the Configurable On/Off Behavior

1. In the previously existing program, select the Controller Tag folder and view the Monitor Tags tab.
2. Expand the CFM_B_C tag until you reach the CFM_B_C.OutputWindow data tags.

Name	Value	Force Mas	Style	Data Type
[-] CFM_B_C	{...}	{...}		CFM_Rev_B
[-] CFM_B_C.ProgToFaultEn	0		Decimal	BOOL
[+] CFM_B_C.ChannelCfgBits	2#0000_0000		Binary	SINT
[-] CFM_B_C.Ch0ProverDirection	0		Decimal	BOOL
[-] CFM_B_C.Ch1ProverDirection	0		Decimal	BOOL
[-] CFM_B_C.Ch0LowFreqClear	0		Decimal	BOOL
[-] CFM_B_C.Ch1LowFreqClear	0		Decimal	BOOL
[-] CFM_B_C.Ch0PreTrigger	0		Decimal	BOOL
[-] CFM_B_C.Ch1PreTrigger	0		Decimal	BOOL
[+] CFM_B_C.Operations	{...}	{...}		CFM_Setup_C[2]
[-] CFM_B_C.OutputSetup	{...}	{...}		CFM_OutCfg_C[2]
[+] CFM_B_C.OutputSetup[0]	{...}	{...}		CFM_OutCfg_C
[+] CFM_B_C.OutputSetup[1]	{...}	{...}		CFM_OutCfg_C
[-] CFM_B_C.OutputWindow	{...}	{...}		OUT_WIN[2]
[-] CFM_B_C.OutputWindow[0]	{...}	{...}		OUT_WIN
[-] CFM_B_C.OutputWindow[0].FreqOn	6000.0		Float	REAL
[-] CFM_B_C.OutputWindow[0].FreqOff	4000.0		Float	REAL
[-] CFM_B_C.OutputWindow[1]	{...}	{...}		OUT_WIN
[-] CFM_B_C.OutputWindow[1].FreqOn	6000.0		Float	REAL
[-] CFM_B_C.OutputWindow[1].FreqOff	4000.0		Float	REAL

3. In the Value column of the CFM_B_C.OutputWindow data tags, enter desired the On and Off frequency limits.

Use the table on page 2 for more information about determining your On/Off frequency limits.

4. Edit existing tag references throughout the project so they link to the appropriate, newly-added, user-defined tags.

For example, if tag reference is Local:5:I.Status.FreqAverage, change it to the corresponding user-defined tag, CFM_IN.Status.FreqAverage.

Complete additional project programming specific to your CFM module use and implement accordingly.

IMPORTANT

Test the CFM module 2.4 configuration before implementing the changes into your production process.

Additional Resources

Additional resources related to the CFM module and CFM module configuration are available.

Topic	Publication Title and No.
Configurable Flowmeter Module use	ControlLogix Configurable Flowmeter Module User Manual, publication 1756-UM010
Programming with RSLogix 5000	Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM0016

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

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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://support.rockwellautomation.com>.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running.

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

Rockwell 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, it may need to be returned.

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

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