

ControlLogix High-speed Counter Module, Firmware Revision 2.1

Catalog Number 1756-HSC

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About This Publication

These release notes describe enhancements and corrected anomalies specific to the High-speed Counter Module (catalog number 1756-HSC), firmware revisions 1.5...2.1.

Enhancements

This section describes enhancements provided with firmware revision 2.1.

Increased Output-parameter Availability

IMPORTANT

This enhancement is recommended for use only when a new application or system is being programmed and brought online.

This enhancement is not recommended for use with applications that have been in use for some time. This is because the process of integrating and using this feature with an existing application requires significant changes to the program that may be time consuming and affect production.

With firmware revision 2.1, support for a number of output parameters have been added to let you alter parameters of the high-speed counter module's configuration in a more timely manner.

The implementation time has been decreased because the parameters can be altered as output data rather than through the use of a reconfiguration message.

New Output-parameter Tags Available with Firmware Revision 2.1

After completing the configuration procedure described in these release notes, these configuration parameter tags are available as output parameters.

Newly-added Output Parameters

[-] Local:5:C.RollOver	DINT[2]	Decimal
[+] Local:5:C.RollOver[0]	DINT	Decimal
[+] Local:5:C.RollOver[1]	DINT	Decimal
[-] Local:5:C.Preset	DINT[2]	Decimal
[+] Local:5:C.Preset[0]	DINT	Decimal
[+] Local:5:C.Preset[1]	DINT	Decimal
[-] Local:5:C.Output[0]	AB:1756_HS...	
[-] Local:5:C.Output[0].ONValue	DINT[2]	Decimal
[+] Local:5:C.Output[0].ONValue[0]	DINT	Decimal
[+] Local:5:C.Output[0].ONValue[1]	DINT	Decimal
[-] Local:5:C.Output[0].OFFValue	DINT[2]	Decimal
[+] Local:5:C.Output[0].OFFValue[0]	DINT	Decimal
[+] Local:5:C.Output[0].OFFValue[1]	DINT	Decimal
[+] Local:5:C.Output[0].ToThisCounter	SINT	Decimal
[+] Local:5:C.Output[0].FaultMode	SINT	Decimal
[+] Local:5:C.Output[0].ProgMode	SINT	Decimal

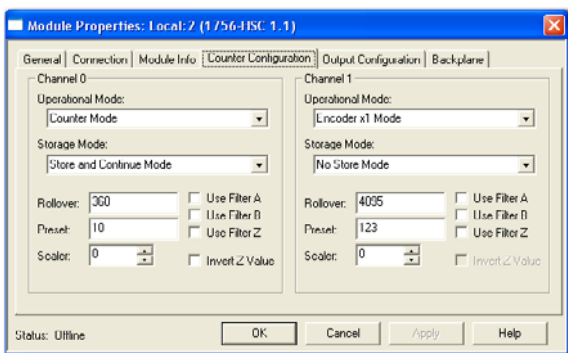
For more information about how these tags function in your application, see the [Application Notes](#) on [page 12](#).

For more information about configuring your 1756-HSC module to use this enhancement, see [Configure the Module to Use New Output Parameters](#) on [page 6](#).

About the 1756-HSC Parameters in RSLogix 5000 Software

In RSLogix 5000 programming software, version 15 or later, the parameters shown above are available as configuration parameters implemented through the use of the 1756-HSC module profile. These configuration parameters are easily configured in the Counter Configuration tab of the Module Properties dialog box (shown below).

Dialog Box Used to Specify Counter Configuration Parameters



In RSLogix 5000 software, version 13 or earlier, these parameters had to be edited as tags since the module profile used in RSLogix 5000 software did not provide the Counter Configuration tab used to specify the module's configuration.

Corrected Anomalies

These anomalies have been corrected with the firmware revisions identified.

Firmware Revision	Anomaly	Description
2.1	StoredValue tag zeroed when ZInvert value is modified.	<p>When a change is made to the counter's ZInvert value, the StoreCount value for the opposite channel is set to zero.</p> <p>With this firmware revision, reconfiguring the ZInvert tags will not result in the StoreCount values being reset.</p>
1.6	Coordinated System Time (CST) Timestamp prone to rollover error.	<p>The 1756-HSC CST timestamp is prone to a rollover error from the lower 16 bits of the timestamp value. Instead of advancing by the typical 10,000 μs per sample, consecutive CST timestamps appear to revert back in time by approximately 55,536 μs (16 bit rollover minus the 10,000 μs sample time). You can monitor this by comparing the input CST Timestamp tag to its last value and determining if the value is ever negative.</p> <p>Firmware revision 1.6 corrects the CST timestamp. If you do not use the CST timestamp, you do not need to update your firmware.</p>
1.5	The module's Coordinated System Time (CST) differs from the Master Coordinated System Time.	<p>The Coordinated System Time (CST) specifies a synchronized time value for all modules in a ControlLogix chassis. Previously, when the CST was initialized in the 1756-HSC module, it was done incorrectly, causing the module's CST value to differ from the CST time master. With firmware revision 1.5, the 1756-HSC module uses the correct CST value.</p>

Firmware Revision	Anomaly	Description
1.5	Dynamic reconfiguration unavailable while online with RSLogix 5000 project.	<p>During normal operation, you could not reconfigure the 1756-HSC module while the module's RSLogix 5000 project was online. You could reconfigure the module only after the RSLogix 5000 project was changed and one of these events occurred:</p> <ul style="list-style-type: none">• The module was reset.• The module was removed and reinserted under power.• The control system was powered down and powered up again. <p>IMPORTANT: In order to complete dynamic reconfigurations, both high-speed counter module, firmware revision 1.5 or later, and RSLogix 5000 software, version 14 or later, must be used.</p>

Download Firmware

The 1756-HSC module ships with firmware revision 2.1 installed. To download other firmware revisions for your module, go to <http://support.rockwellautomation.com> and select Downloads.

Configure the Module to Use New Output Parameters

IMPORTANT

If you do not intend to use the newly-added output parameter tags provided with firmware revision 2.1, you do not need to complete the configuration procedures described below. If you are using firmware revision 2.1 only for the use of the corrected anomalies, configure your 1756-HSC module as described in the High-speed Counter Module User Manual, publication [1756-UM007](#).

If you intend to use the additional output tags available with firmware revision 2.1, you will need to configure the module as described below.

Access and Download the .ACD File

You must access the example ACD file, titled Generic_Connection_For_HSC_2_1, available at the Rockwell Automation Sample Code website (<http://samplecode.rockwellautomation.com>).

You should download this file before beginning the configuration.

Configure a 1756-Generic Module

After you have downloaded and opened the sample code ACD file, open a new instance of RSLogix 5000 software and complete the following steps.

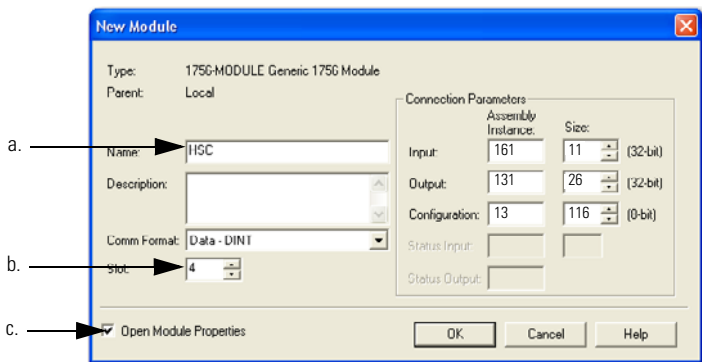
1. Create or open a project for your controller.

IMPORTANT

If you intend to use the new output tags, do not use the 1756-HSC module profiles available in RSLogix 5000 software. You must use the 1756-Generic profile as indicated.

2. Add a 1756-Generic module to the IO Configuration tree in the slot specific to your chassis configuration.

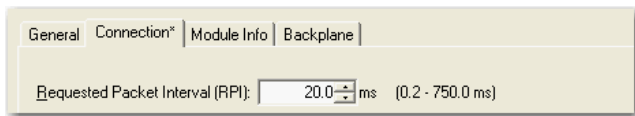
3. Specify the Comm Format and Connection Parameters exactly as shown.
 - a. Name the module.
 - b. Specify the slot specific to your chassis configuration.
 - c. Check Open Module Properties



4. Click OK.

The Module Properties dialog opens.

5. Enter the RPI value specific to your application.



6. Click OK.

IMPORTANT

Completing [step 7](#)...[step 12](#) is optional for the configuration of your 1756-HSC module.

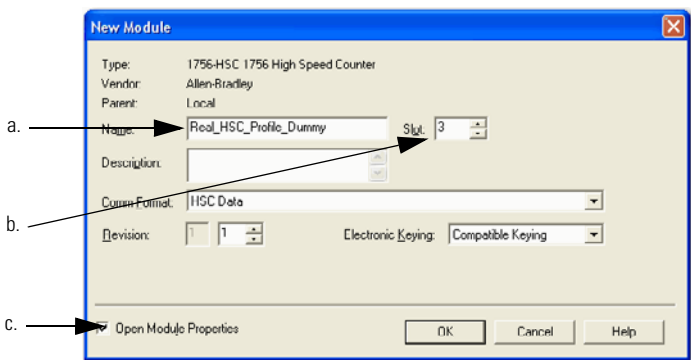
Using these steps makes it easier to configure your 1756-HSC module by using the profile and configuration dialogs available in RSLogix 5000 software, version 15 or later.

If you are using RSLogix 5000 software, version 13 or earlier, or you do not want to use the 1756-HSC module profile available in RSLogix 5000 software, version 15 or later, skip to [step 12](#).

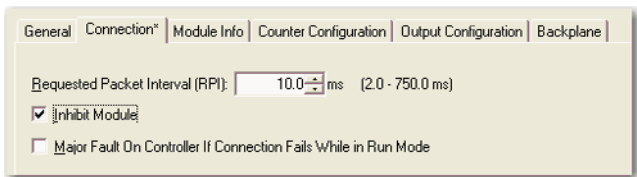
7. Add a 1756-HSC module and assign it to an unused chassis slot in your IO Configuration tree.

This module is not used, but the configuration of this profile aids later in the configuration of the generic module.

- a. Name the module.
- b. Set the slot number.
- c. Check Open Module Properties.



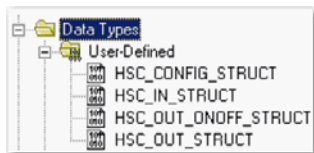
- Click OK.
- In the Module Properties Connections tab, leave the default RPI value and check Inhibit Module.



- Configure the remaining module properties to enable the module behavior you need.

The ladder logic pasted into your RSLogix 5000 project will copy the module configuration from this profile to the generic profile.

- Click OK.
- Save the project and open the Generic_Connection_For_HSC_2_1 file in a new instance of RSLogix 5000 software.
- In the controller organizer of the sample project, extend the User-Defined Data Types to view the HSC data types.



- Copy and paste each of the User-Defined Data Types (UDTs), one at a time, into your RSLogix 5000 project.

15. Create tags and specify the appropriate high-speed counter module UDTs for each (HSC_CONFIG, HSC_IN_STRUCT, and HSC_OUT_STRUCT).

Your tag name. →

Name	Δ	Data Type	Style	Description
HSC_CONFIG		HSC_CONFIG_STRUCT		
HSC_CONFIG.ProgTofaultEn		BOOL	Decimal	0=Outputs Remai...
HSC_CONFIG.RollOver		DINT[2]	Decimal	Counter=0-16777...
HSC_CONFIG.Preset		DINT[2]	Decimal	Counter=0 Rollov...
HSC_CONFIG.Scaler		INT[2]	Decimal	Counter=Must be ...
HSC_CONFIG.OperationalMode		SINT[2]	Decimal	0=Counter, 1=EN...
HSC_CONFIG.StorageMode		SINT[2]	Decimal	0=No Store, 1=St...
HSC_CONFIG.Invert		SINT	Decimal	Bit 0=LHU, Bit1=...
HSC_CONFIG.FilterA		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_CONFIG.FilterB		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_CONFIG.FilterZ		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_CONFIG.Output		HSC_OUT_ONOFF_STR...		

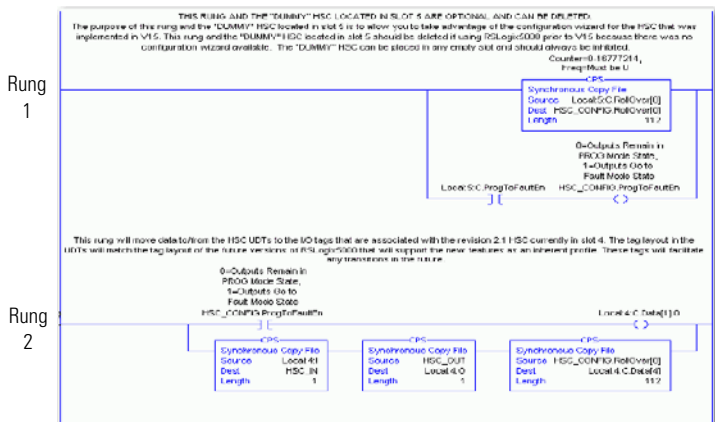
Your tag name. →

Name	Δ	Data Type	Style	Description
HSC_IN		HSC_IN_STRUCT		
HSC_IN.CommStatus		DINT	Decimal	0=Connected, -1...
HSC_IN.PresentValue		DINT[2]	Decimal	Counter=Present
HSC_IN.StoredValue		DINT[2]	Decimal	Counter=Stored c...
HSC_IN.Totalizer		DINT[2]	Decimal	Unused Revs 2 1
HSC_IN.WasReset		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_IN.WasPreset		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_IN.NewDataFlag		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_IN.ZState		SINT	Decimal	Bit 0=Z0 state, Bit...
HSC_IN.OutputState		SINT	Decimal	Bit 0=O0 state, Bi...
HSC_IN.IsOverridden		SINT	Decimal	Bit 0=O0, Bit1=O...
HSC_IN.CSTTmeestamp		DINT[2]	Decimal	Backplane CST ...

Your tag name. →

Name	Δ	Data Type	Style	Description
HSC_OUT		HSC_OUT_STRUCT		
HSC_OUT.ResetCounter		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_OUT.LoadPreset		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_OUT.ResetNewDataFlag		SINT	Decimal	Bit 0=CH0, Bit1=...
HSC_OUT.OutputControl		SINT[4]	Decimal	0=HSC Determ...
HSC_OUT.RollOver		DINT[2]	Decimal	Counter=0-16777...
HSC_OUT.Preset		DINT[2]	Decimal	Counter=0-Rollov...
HSC_OUT.Output		HSC_OUT_ONOFF_STR...		

16. In the example project, copy the ladder logic provided.



17. Paste the rungs into a routine of your HSC project.
18. If you are using RSLogix 5000 software, version 13 or earlier, or you did not add the unused 1756-HSC module at [step 7](#), delete rung 1 of the copied and pasted ladder logic.
19. Edit the Synchronous instructions (CPS) to match your configuration.
20. Complete your program as normal.

IMPORTANT

If you do not leave the unused 1756-HSC module in your project, or you have no other 1756-HSC module in your project, you cannot export and then re-import the project as the module-defined tags will not import properly.

Application Notes

This section describes how the 1756-HSC module tags are handled in an application that makes use of the newly-available output parameters.

Priority of Tag Values

When the newly-added output parameters are used in an application with the 1756-HSC module configuration tags, the data is handled according to this protocol:

- When an output parameter that has not been edited and is at zero, the corresponding configuration parameter takes priority and is used by the program.
- An output parameter with any nonzero value takes priority over the corresponding configuration tag. The value in the output-parameter tag is used by the program.
- If an output parameter has been edited to a value other than zero, then re-edited back to zero, the output-parameter tag value still takes priority over the configuration tag. This means that the zero-valued output parameter is used instead of the nonzero configuration tag value.

In general, the newly-added output parameter values have priority over the configuration tag values as handled by the program, unless the output parameters have never been changed and are at zero.

Additional Resources

These documents contain additional information concerning related Rockwell Automation products.

Resource	Description
ControlLogix High-speed Counter Installation Instruction, publication 1756-IN018	Provides installation procedures and specifications.
ControlLogix High-speed Counter user Manual, publication 1756-UM007	Provides a variety of information specific to the use of your 1756-HSC module.
ControlFLASH Firmware Upgrade Kit Quick Start, publication 1756-QS105	Describes how to use ControlFLASH software to upgrade your module firmware.

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.

Notes:

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At <http://support.rockwellautomation.com>, 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://support.rockwellautomation.com>.

Installation Assistance

If you experience a problem 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 product up and running.

United States	1.440.646.3434 Monday . . . Friday
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

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 in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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