



ControlLogix® Controller Revision 12

Cat. No. 1756-L1, -L1M1, -L1M2, -L1M3, -L55, -L55M12, -L55M13, -L55M14, -L55M16, -L55M22, -L55M23, -L55M24, -L61, -L62, -L63

IMPORTANT

- Do not use this revision of firmware in a redundant controller system (ControlLogix Redundancy system).
- If you have a 1756-L55 controller, you must install a memory board. For more information, see the *ControlLogix Controller and Memory Board Installation Instructions*, publication 1756-IN101.

When to Use These Release Notes

These release notes correspond to the following revisions of the ControlLogix family of controllers:

Controller:	Catalog number:	Revision:
ControlLogix®5500	1756-L1, -L1Mx	12.28
ControlLogix®5555	1756-L55, -L55Mxx	12.24
ControlLogix®5561	1756-L61	12.31
ControlLogix®5562	1756-L62	12.31
ControlLogix®5563	1756-L63	12.31

Compatible Revisions

To use this controller revision, update your system as follows:

Update this:	To this revision or later:
RSLinx® software	2.41
RSLogix™ 5000 software	12.01
RSNetWorx™ for ControlNet™ software	4.11
RSNetWorx for DeviceNet™ software	4.12
1756-M02AE module	12.8
1756-M08SE module	12.6
1756-M16SE module	12.6
1756-HYD02 module	12.11

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What Is In These Release Notes

These release notes provide the following information:

For information about:	See this section:	On this page:
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Before You Update Your System

Before you update your controller or RSLogix 5000 software to this revision, do the following preliminary actions:

If:	Then:
Your controller is connected to a DH-485 network.	Disconnect it from the DH-485 network <i>before</i> you update the firmware of the controller. If you update the firmware of a controller while it is connected to a DH-485 network, communication on the network may stop.
You have a 1756-L55M23 or -L55M24 controller.	<p>See if all three of these conditions apply to the controller:</p> <ul style="list-style-type: none"> • Is the firmware revision of the controller 9.x or earlier? • Does the nonvolatile memory of the controller contain a project? • Is the <i>Load Image</i> property of the nonvolatile memory set to <i>On Power Up</i> or <i>On Corrupt Memory</i>? <p>If you answered yes to <i>all</i> of the questions, do the following <i>before</i> you update the firmware of the controller:</p> <ol style="list-style-type: none"> 1. In the <i>Load Image</i> drop-down list, select <i>User Initiated</i>. 2. Store the project to the nonvolatile memory of the controller. <p>Other Load Image selections cause the update of the controller to fail. (You are able to successfully update the controller the second time.)</p>

If:	Then:						
<p>Your controller meets <i>both</i> of these conditions:</p> <ul style="list-style-type: none"> • It has nonvolatile memory. • It is currently at revision 11.x or earlier. 	<p>Take these precautions:</p> <table border="1"> <thead> <tr> <th data-bbox="589 352 824 392">If the controller:</th> <th data-bbox="824 352 1479 392">Then:</th> </tr> </thead> <tbody> <tr> <td data-bbox="589 392 824 499"><i>does not</i> use a CompactFlash card</td> <td data-bbox="824 392 1479 499">Save the project to an offline file. When you update the firmware of the controller, you erase the contents of the nonvolatile memory (revision 10.x or later).</td> </tr> <tr> <td data-bbox="589 499 824 873">uses a CompactFlash card</td> <td data-bbox="824 499 1479 873"> <p>Either:</p> <ul style="list-style-type: none"> • Remove the CompactFlash card from the controller. • Check the <i>Load Image</i> option of the CompactFlash card. If it is set to <i>On Power Up</i> or <i>On Corrupt Memory</i>, first store the project with the <i>Load Image</i> option set to <i>User Initiated</i>. <p>Otherwise, you may get a major fault when you update the firmware of the controller. This occurs because the <i>On Power Up</i> or <i>On Corrupt Memory</i> options cause the controller to load the project from nonvolatile memory. The firmware mismatch after the load then causes a major fault.</p> </td> </tr> </tbody> </table>	If the controller:	Then:	<i>does not</i> use a CompactFlash card	Save the project to an offline file. When you update the firmware of the controller, you erase the contents of the nonvolatile memory (revision 10.x or later).	uses a CompactFlash card	<p>Either:</p> <ul style="list-style-type: none"> • Remove the CompactFlash card from the controller. • Check the <i>Load Image</i> option of the CompactFlash card. If it is set to <i>On Power Up</i> or <i>On Corrupt Memory</i>, first store the project with the <i>Load Image</i> option set to <i>User Initiated</i>. <p>Otherwise, you may get a major fault when you update the firmware of the controller. This occurs because the <i>On Power Up</i> or <i>On Corrupt Memory</i> options cause the controller to load the project from nonvolatile memory. The firmware mismatch after the load then causes a major fault.</p>
If the controller:	Then:						
<i>does not</i> use a CompactFlash card	Save the project to an offline file. When you update the firmware of the controller, you erase the contents of the nonvolatile memory (revision 10.x or later).						
uses a CompactFlash card	<p>Either:</p> <ul style="list-style-type: none"> • Remove the CompactFlash card from the controller. • Check the <i>Load Image</i> option of the CompactFlash card. If it is set to <i>On Power Up</i> or <i>On Corrupt Memory</i>, first store the project with the <i>Load Image</i> option set to <i>User Initiated</i>. <p>Otherwise, you may get a major fault when you update the firmware of the controller. This occurs because the <i>On Power Up</i> or <i>On Corrupt Memory</i> options cause the controller to load the project from nonvolatile memory. The firmware mismatch after the load then causes a major fault.</p>						
<p>Your controller is close to its limits of memory.</p>	<p>This revision <i>may</i> require more memory than previous revisions. Before you upgrade to this revision, do the following:</p> <ol style="list-style-type: none"> 1. Check the amount of unused memory that you have in the controller. To determine your unused memory, see either of the following documents: <ul style="list-style-type: none"> • Knowledgebase document G19984. To access Rockwell Automation's Knowledgebase, go to www.ab.com. Select <i>Support</i>. • <i>Logix5000 Controllers Common Procedures</i>, publication 1756-PM001E or later 2. If your controller is close to its limits of memory, see "Additional Memory Requirements" on page 11 to determine how much additional memory you require. 3. For additional information on how the controller organizes its memory, see Knowledgebase document G19984. <p>To upgrade to this revision, you may have to add an expansion memory card to the controller or use a larger memory card.</p>						

Enhancements

This revision of ControlLogix controllers contains the following new features:

Enhancement:	Description:
Event Tasks	<p>An event task performs a function only when a specific event (trigger) occurs. Whenever the trigger for the event task occurs, the event task:</p> <ul style="list-style-type: none"> • interrupts any lower priority tasks • executes one time • returns control to where the previous task left off <p>The trigger can be:</p> <ul style="list-style-type: none"> • change of a digital input • new sample of analog data • certain motion operations • consumed tag • EVENT instruction
Coordinated Multi-Axis Motion	<p>This revision lets you coordinate the motion of up to 3 axes. To perform coordinated motion, you use the following new components:</p> <ul style="list-style-type: none"> • COORDINATE_SYSTEM data type. Use this data type to create tags that define the properties of the coordinated motion. • 6 new motion instructions to perform coordinated motion: <ul style="list-style-type: none"> • Motion Coordinated Stop (MCS) • Motion Coordinated Linear Move (MCLM) • Motion Coordinated Circular Move (MCCM) • Motion Coordinated Change Dynamics (MCCD) • Motion Coordinated Shutdown (MCSD) • Motion Coordinated Shutdown Reset (MCSR)
Extended Error Code for Motion Instructions	<p>The MOTION_INSTRUCTION data type now includes a EXERR member. The EXERR member provides additional error codes to help you diagnose more complex errors.</p>
Cache Up to 32 Connections	<p>This revision lets you cache up to 32 connections, regardless of the type of Message (MSG) instruction (block transfer, etc.).</p> <p><i>Previous</i> revisions let you cache up to 16 connections for block-transfer MSGs and 16 connections for other types of MSGs.</p>
Additional Features for CompactFlash Cards	<p>If the revision of your project is \geq 12.0, a 1784-CF64 Industrial CompactFlash card lets you:</p> <ul style="list-style-type: none"> • store both the firmware and project for a controller • store multiple projects on a CompactFlash card • use a CompactFlash reader to manage the projects on a CompactFlash card

Enhancement:	Description:
1756-L61, and -L62 Controllers	<p>The 1756-L61, and -L62 controllers expand the line of ControlLogix556x controllers.</p> <ul style="list-style-type: none"> • All ControlLogix556x controllers let you use a 1784-CF64 Industrial CompactFlash card for nonvolatile memory storage. • The 1756-L61 controller has 2M bytes of data and logic memory. • The 1756-L62 controller has 4M bytes of data and logic memory.
1756-HYD02 Module	Use a ControlLogix controller and a 1756-HYD02 module to control 2 hydraulic axes.
1756-OB16IS Module	The 1756-OB16IS is a 16 point, 10-30V, sink/source DC output module. It is identical to the 1756-OB16I module except when used with the Motion Arm Output Cam (MAOC) instruction. When used with an MAOC instruction, it provides very accurate and consistent latch and unlatch output events for the first 8 outputs.

Changes

ControlLogix5550 Rev 12.28

ControlLogix5555 Rev 12.24

ControlLogix5561, 5562, 5563 Rev 12.31

Change:	Description:
Zero Max. Decel, Produces Error	<p>If you execute a motion instruction on an axis whose maximum deceleration = 0, the instruction errors and returns an error code = 54.</p> <p>Important: By default, the maximum deceleration of a virtual axis = 0.</p>

Corrected Anomalies

The corrected anomalies are organized by the firmware revision that corrected them. We've also included the anomalies that were corrected by both R11.x and R12.x revisions of firmware.

ControlLogix5550 Rev 12.28

ControlLogix5555 Rev 12,24

ControlLogix5561, 5562, 5563 Rev 12,31

Corrected anomaly:	Description:
LDL2 Instruction Produced Inaccurate Coefficients or Non-Recoverable Fault	<p>A Second-Order Lead Lag (LDL2) instruction might have produced the following when certain input parameters were = 0:</p> <ul style="list-style-type: none"> • inaccurate internal coefficients • non-recoverable fault (solid red OK LED) <p style="text-align: right;">Logix00036816</p>
Wrong Error Message for Too Many Connections	<p>Firmware revisions 10.x erroneously lets you exceed 250 connections for the controller. If you update the project to a later revision, you will be unable to download the project.</p> <ul style="list-style-type: none"> • In firmware revision 11.x, the error message for this situation was not useful in diagnosing the situation. • This revision provides a more meaningful error message. <p style="text-align: right;">Logix00033501</p>
Array Subscript That Was Out of Range Produced Non-Recoverable Fault	<p>Under the following <i>combination</i> of circumstances, an array subscript produced a non-recoverable fault (solid red OK LED):</p> <ul style="list-style-type: none"> • A CMP, CPT, FAL, or FSC instruction operated on an array. • A tag identified the subscript of the array (indirect address). • The indirect address used an expression to calculate the value for the array subscript. • The indirect address produced a subscript that was too large for the array. (This produced a major fault.) • The controller contained a fault routine that tried to clear the major fault. <p>When the controller experiences a non-recoverable fault, it clears the project from memory.</p> <p style="text-align: right;">Logix00038663</p>
S-Curve (SCRV) Function Block Failed to Act as a Ramp	<p>If the $(\text{JerkRate} * \text{DeltaT}) \geq \text{AccelRate}$ or DecelRate, the instruction failed to function as a ramp.</p> <p style="text-align: right;">Logix00029955</p>
Enhanced PID (PIDE) Function Block Failed to Clamp Control Variable	<p>When $\text{ZCOff} = 0$ and the error value crossed zero and remained within the ZCDeadband range, ZCDeadbandOn failed to remain =1. This prevented the instruction from clamping the control variable.</p> <p style="text-align: right;">Logix00030777</p>
Enhanced PID (PIDE) Function Block Failed to Keep Control Variable at Saturation	<p>When a PIDE instruction drove the control variable to one of its limits (saturation), the instruction failed to keep the control variable at saturation long enough.</p> <ul style="list-style-type: none"> • As soon as the process variable began to change, the PIDE instruction let the control variable leave its limit. • With this revision, the PIDE instruction more accurately keeps the control variable at its full output. <p style="text-align: right;">Logix00036344</p>

Corrected anomaly:	Description:
ControlLogix5563 Controller Produced Divide By Zero When a Floating Point Value Was Out of Range	<p>The following anomaly was corrected in a ControlLogix5563 controller:</p> <p>If a function block instruction received a very small value (greater than $-1.1754944e^{-38}$ but less than $1.1754944e^{-38}$) and used it to calculate a denominator, a value of 0 might have been produced for the denominator. This caused a divide-by-0 situation. The instruction now substitutes the minimum value of $-1.1754944e^{-38}$ or $1.1754944e^{-38}$, for the 0 denominator.</p>
	Logix00034100
IP Bit Incorrectly Indicated the Status of a Pending Cam	<p>If you waited too long to pend the next cam:</p> <ul style="list-style-type: none"> • The IP bits of both the current cam and the pending cam were left on. • Neither cam was active. <p>With this revision:</p> <ul style="list-style-type: none"> • The IP bit of the current cam turns off and the PC bit turns on. • The pending cam is left pending.
	Logix00037666
Homing an Axis Failed to Correctly Finish	<p>If you homed an axis that was configured as Rotary and used a home offset, the process incorrectly completed, as follows:</p> <ul style="list-style-type: none"> • The IP bit turned off. • The PC bit remained off.
	Logix00034046
AxisHomedStatus Member Was Not Available Via OPC/DDE	<p>OPC/DDE applications could not access the AxisHomedStatus member of the tag of an axis.</p>
	Logix00033317
MRP Instruction Did Not Accurately Set Position	<p>When a Motion Redefine Position (MRP) instruction was configured with the Position Select operand = Actual, it produced a position that was off by a very small fraction.</p>
	Logix00031253

ControlLogix5550 Rev 11.34 and 12.28

ControlLogix5555 Rev 11.32 and 12.24

ControlLogix5563 Rev 11.25 and 12.31

Corrected anomaly:	Description:
Resetting an SFC Corrupted a Simultaneous Branch	<p>If you reset a sequential function chart (using an SFR instruction) while it was executing the next to last step of a path of a simultaneous branch, that path might have become corrupted. When the simultaneous branch was executed again, the controller might have experienced a non-recoverable fault (solid red OK LED) and cleared the project from its memory.</p> <p style="text-align: right;">Logix00038637</p>
Controller Could Not Connect to a Toledo Weigh Scale Over a ControlNet Network	<p>The controller was unable to establish a connection with a Toledo weigh scale over a ControlNet network.</p> <ul style="list-style-type: none"> • To communicate with the weigh scale, the I/O configuration of the project used the Generic ControlNet Module type. • If the input or output assembly instance = 255, the controller incorrectly encoded the value (16-bit instead of 8-bit). This prevented the controller from connecting to the weigh scale. • RSLogix 5000 software returned a module fault code of 16#0315. <p style="text-align: right;">Logix00038188</p>
Use of a Third-Party OPC Server Produced a Non-Recoverable Fault	<p>If you monitored data using a third-party OPC server that by-passed RSLinx software, the controller might have experienced a non-recoverable fault (solid red OK LED) and cleared the project from its memory.</p> <p style="text-align: right;">Logix00037557</p>
S-Curve Move Produced a Non-Recoverable Fault	<p>Under the following <i>combination</i> of circumstances, an S-Curve move profile produced a non-recoverable fault (solid red OK LED):</p> <ul style="list-style-type: none"> • Motion Axis Move (MAM) instruction or Motion Change Dynamics (MCD) instruction with an S-Curve profile • certain parameters (e.g., Speed operand = 0) <p>When the controller experiences a non-recoverable fault, it clears the project from memory.</p> <p style="text-align: right;">Logix00037536</p>
IP bit of an MAS Instruction Remained Set	<p>Execution of the following <i>sequence</i> of motion instructions might have prevented the IP bit of a Motion Axis Stop (MAS) instruction from turning off:</p> <ol style="list-style-type: none"> 1. Motion Axis Move (MAM) instruction with an S-Curve profile 2. Motion Change Dynamics (MCD) instruction with the Speed operand = 0 3. Motion Axis Stop (MAS) instruction with the Stop Type operand = Move <p style="text-align: right;">Logix00035218</p>
Unconnected Messages Over an EtherNet/IP Network Produced a Non-Recoverable Fault	<p>Under the following combination of circumstances, a Message (MSG) instruction might have produced a non-recoverable fault (solid red OK LED):</p> <ul style="list-style-type: none"> • The MSG was configured as a PLC2, PLC3, PLC5, or SLC type message. • Communication was over an EtherNet/IP network. • The destination device was <i>not</i> present. <p>When the controller experiences a non-recoverable fault, it clears the project from memory.</p> <p style="text-align: right;">Logix00039180</p>

ControlLogix5550 Rev 11.33 and 12.28
ControlLogix5555 Rev 11.30 and 12.24
ControlLogix5563 Rev 11.24 and 12.31

Corrected anomaly:	Description:						
Product Service Advisory— Power Disruptions Cleared Memory	<p>Important: This revision corrects the following anomaly only if your controller is currently at 11.x firmware. Exception: It also corrects the anomaly in the 1756-L63 controller, firmware revisions 10.x and later.</p> <p>If power to the controller turned on and then turned off again in less than a second, the controller might have cleared the project from its memory.</p> <ul style="list-style-type: none"> • If the controller did not have enough time to complete a critical portion of the power-up sequence (less than 1 second), the controller typically cleared its memory. • This might have occurred during brownouts or other situations where power to the controller fluctuated for a short duration. <p style="text-align: right;">Logix00036366, Logix00036367</p>						
Load from Nonvolatile Memory Produced Faults	<p>If a project <i>automatically</i> loaded from the nonvolatile memory of a controller, a fault might have occurred.</p> <table border="1" data-bbox="597 884 1469 1339"> <thead> <tr> <th data-bbox="605 890 751 921">If the project:</th> <th data-bbox="808 890 873 921">Then:</th> </tr> </thead> <tbody> <tr> <td data-bbox="605 936 776 993">contained motion axes</td> <td data-bbox="808 936 1461 1178"> <p>A fault was more likely to occur. The following faults might have occurred:</p> <ul style="list-style-type: none"> • non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory. • motion group fault. The controller failed to become the CST master. This caused the motion group to fault because there was no CST master in the chassis. </td> </tr> <tr> <td data-bbox="605 1192 751 1249"><i>did not</i> contain motion axes</td> <td data-bbox="808 1192 1429 1333"> <p>A fault was still possible, though less likely. The following fault might have occurred:</p> <ul style="list-style-type: none"> • non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory. </td> </tr> </tbody> </table> <p>A project automatically loads from nonvolatile memory only if you configure it to do so. You can configure a project to automatically load under one of the following circumstances:</p> <ul style="list-style-type: none"> • during power-up • when the memory of the controller is empty <p style="text-align: right;">Logix00036642, Logix00036720</p>	If the project:	Then:	contained motion axes	<p>A fault was more likely to occur. The following faults might have occurred:</p> <ul style="list-style-type: none"> • non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory. • motion group fault. The controller failed to become the CST master. This caused the motion group to fault because there was no CST master in the chassis. 	<i>did not</i> contain motion axes	<p>A fault was still possible, though less likely. The following fault might have occurred:</p> <ul style="list-style-type: none"> • non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory.
If the project:	Then:						
contained motion axes	<p>A fault was more likely to occur. The following faults might have occurred:</p> <ul style="list-style-type: none"> • non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory. • motion group fault. The controller failed to become the CST master. This caused the motion group to fault because there was no CST master in the chassis. 						
<i>did not</i> contain motion axes	<p>A fault was still possible, though less likely. The following fault might have occurred:</p> <ul style="list-style-type: none"> • non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory. 						

Restrictions

This revision of ControlLogix controllers has the following restrictions:

Restriction:	Description:
Unconditional MDR Instruction Does Not Re-Execute	<p>A Motion Disarm Registration (MDR) instruction fails to repeatedly execute under the following circumstances:</p> <ul style="list-style-type: none"> • You place the MDR instruction in a structured text routine. • You do <i>not</i> provide any conditions to control the execution of the instruction. (I.e., you program it to execute continuously.) <p>In those circumstances, the EN bit might be left on after the first execution and the instruction <i>no</i> longer executes again.</p> <p>Important: In structured text, we recommend that you condition the instruction so that it only executes on a transition.</p>
1756-L55M16 controllers—3.5M Byte Limit of Tags	<p>You <i>cannot</i> download a project that has more than 3.5M bytes of tags to a 1756-L55M16 controller. During the download, RSLogix 5000 software indicates that the controller is out of memory.</p> <p>To stay within the 3.5M byte limit, take this precaution:</p> <ul style="list-style-type: none"> • As you create tags, periodically download the project. If the project successfully downloads, then you know you are within the 3.5M byte limit.
1756-L55M16 controllers—Guidelines for the Size of Routines	<p>You <i>cannot</i> download a project that has very large routines to a 1756-L55M16 controller. During the download, RSLogix 5000 software indicates that the controller is out of memory. (While online, you may be able to create a very large routine, but once offline you will be unable to download the project.)</p> <p>To avoid creating routines that are too large, take these precautions:</p> <ul style="list-style-type: none"> • Limit the number of rungs in a routine to less than 2500. (Use a series of smaller routines.) • If you are entering a large number of rungs in a routine, do this offline. • As you enter rungs, periodically download the project. If the project successfully downloads, then your routines are within limits.

Logix00037634

Additional Memory Requirements

Revision 12.x *may* require more memory than previous revisions (e.g., 10.x, 11.x). To estimate the additional memory that your project *may* require, use the following table:

Table 1 Additional memory requirements when you convert a project to revision 12 (Sheet 1 of 2)

If you have this firmware revision (add <i>all</i> that apply):	Then add the following memory requirements to your project:		Which comes from this type of memory:		
	Component	Increase per instance	I/O (base)	Data and Logic (expansion)	
11.x or earlier	tag that uses the MOTION_INSTRUCTION data type	4 bytes		✓	
	tag for an axis				
	If the data type is:	And the tag is:			
	AXIS_CONSUMED	⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒	264 bytes	✓	
	AXIS_SERVO	produced for another controller	264 bytes	✓	
		<i>not</i> produced for another controller	264 bytes		✓
	AXIS_SERVO_DRIVE	produced for another controller	288 bytes	✓	
		<i>not</i> produced for another controller	288 bytes		✓
	AXIS_VIRTUAL	produced for another controller	264 bytes	✓	
		<i>not</i> produced for another controller	264 bytes		✓
output cam execution targets	648 bytes		✓		
user-defined data type: <ul style="list-style-type: none"> number of user-defined data types in the controller organizer ⇒ Data Types folder ⇒ User-Defined folder <i>not</i> the use of that data type in tags 	128 bytes		✓		
indirect address (using a tag as the subscript for an array in an instruction, e.g., Array_A[Tag_B]). This memory change applies <i>only</i> if the array: <ul style="list-style-type: none"> uses a structure as its data type does <i>not</i> use one of these data types: CONTROL, COUNTER, PID, or TIMER has only one dimension (e.g., UDT_1[5]) 	(-60 bytes)		✓		
10.x or earlier	project for a ControlLogix5555 controller	1200 bytes		✓	
	project for a ControlLogix5563 controller	1200 bytes	✓		
	programs	12 bytes		✓	
	routines	16 bytes		✓	
9.x or earlier	project for a ControlLogix5550 controller	1200 bytes	✓		
	tag that uses the MESSAGE data type	376 bytes		✓	
8.x or 9.x	produced or consumed axis	(-21.6K bytes)	✓		
	axis that <i>is not</i> produced or consumed	(-21.6K bytes)		✓	

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Table 1 Additional memory requirements when you convert a project to revision 12 (Sheet 2 of 2)

If you have this firmware revision (add <i>all</i> that apply):	Then add the following memory requirements to your project:			Which comes from this type of memory:		
	Component	Increase per instance	I/O (base)	Data and Logic (expansion)		
8.x or earlier	output cam execution targets	5,404 bytes		✓		
	motion group	32 bytes		✓		
7.x or earlier	project	1050 bytes	✓			
	tags	0.55 bytes		✓		
	messages that: <ul style="list-style-type: none"> • transfer more than 500 bytes of data <li style="text-align: center;"><i>and</i> • target a controller in the same chassis This memory is allocated only when the MSG instruction is enabled. To estimate, count the number of these messages that are enabled and/or cached at one time.	2000 bytes	✓			
6.x or earlier	base tags	24 bytes			✓	
	alias tags	16 bytes			✓	
	produced and consumed tags	Data type	Bytes per tag			
		DINT	4	12 bytes	✓	
		REAL	4	12 bytes	✓	
				3 x bytes per tag	✓	
		3 x bytes per tag	✓			
6.x	routines	68 bytes			✓	
5.x or earlier	routines	116 bytes			✓	

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Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using our 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 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 our 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:

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.

www.rockwellautomation.com

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