



## 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@5550	1756-L1, -L1Mx	12.29
ControlLogix@5555	1756-L55, -L55Mxx	12.26
ControlLogix@5561	1756-L61	12.33
ControlLogix@5562	1756-L62	12.33
ControlLogix@5563	1756-L63	12.33

These release notes include the changes and corrected anomalies of earlier revisions of 12.x firmware.

### Compatible Revisions

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

Update this:	To this revision or later:
RSLink® software	2.41
RSLogix™ 5000 software	12.02
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

## 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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new features for ControlLogix controllers	Enhancements	4
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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"> <li>• Is the firmware revision of the controller 9.x or earlier?</li> <li>• Does the nonvolatile memory of the controller contain a project?</li> <li>• Is the <i>Load Image</i> property of the nonvolatile memory set to <i>On Power Up</i> or <i>On Corrupt Memory</i>?</li> </ul> <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"> <li>1. In the <i>Load Image</i> drop-down list, select <i>User Initiated</i>.</li> <li>2. Store the project to the nonvolatile memory of the controller.</li> </ol> <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>

<b>If:</b>	<b>Then:</b>						
<p>Your controller meets <i>both</i> of these conditions:</p> <ul style="list-style-type: none"> <li>• It has nonvolatile memory.</li> <li>• It is currently at revision 11.x or earlier.</li> </ul>	<p>Take these precautions:</p> <table border="1" data-bbox="586 352 1474 499"> <thead> <tr> <th data-bbox="586 352 824 392"><b>If the controller:</b></th> <th data-bbox="829 352 1474 392"><b>Then:</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="586 399 824 499"><i>does not</i> use a CompactFlash card</td> <td data-bbox="829 399 1474 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="586 506 824 562">uses a CompactFlash card</td> <td data-bbox="829 506 1474 871"> <p>Either:</p> <ul style="list-style-type: none"> <li>• Remove the CompactFlash card from the controller.</li> <li>• 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>.</li> </ul> <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>	<b>If the controller:</b>	<b>Then:</b>	<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"> <li>• Remove the CompactFlash card from the controller.</li> <li>• 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>.</li> </ul> <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>
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<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"> <li>• Remove the CompactFlash card from the controller.</li> <li>• 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>.</li> </ul> <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"> <li>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"> <li>• Knowledgebase document G19984. To access Rockwell Automation's Knowledgebase, go to <a href="http://www.ab.com">www.ab.com</a>. Select <i>Support</i>.</li> <li>• <i>Logix5000 Controllers Common Procedures</i>, publication 1756-PM001E or later</li> </ul> </li> <li>2. If your controller is close to its limits of memory, see "Additional Memory Requirements" on page 16 to determine how much additional memory you require.</li> <li>3. For additional information on how the controller organizes its memory, see Knowledgebase document G19984.</li> </ol> <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"> <li>• interrupts any lower priority tasks</li> <li>• executes one time</li> <li>• returns control to where the previous task left off</li> </ul> <p>The trigger can be:</p> <ul style="list-style-type: none"> <li>• change of a digital input</li> <li>• new sample of analog data</li> <li>• certain motion operations</li> <li>• consumed tag</li> <li>• EVENT instruction</li> </ul>
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"> <li>• COORDINATE_SYSTEM data type. Use this data type to create tags that define the properties of the coordinated motion.</li> <li>• 6 new motion instructions to perform coordinated motion: <ul style="list-style-type: none"> <li>• Motion Coordinated Stop (MCS)</li> <li>• Motion Coordinated Linear Move (MCLM)</li> <li>• Motion Coordinated Circular Move (MCCM)</li> <li>• Motion Coordinated Change Dynamics (MCCD)</li> <li>• Motion Coordinated Shutdown (MCSD)</li> <li>• Motion Coordinated Shutdown Reset (MCSR)</li> </ul> </li> </ul>
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 <math>\geq 12.0</math>, a 1784-CF64 Industrial CompactFlash card lets you:</p> <ul style="list-style-type: none"> <li>• store both the firmware and project for a controller</li> <li>• store multiple projects on a CompactFlash card</li> <li>• use a CompactFlash reader to manage the projects on a CompactFlash card</li> </ul>
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"> <li>• All ControlLogix556x controllers let you use a 1784-CF64 Industrial CompactFlash card for nonvolatile memory storage.</li> <li>• The 1756-L61 controller has 2M bytes of data and logic memory.</li> <li>• The 1756-L62 controller has 4M bytes of data and logic memory.</li> </ul>
1756-HYD02 Module	<p>Use a ControlLogix controller and a 1756-HYD02 module to control 2 hydraulic axes.</p>

Enhancement:	Description:
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 12.29*

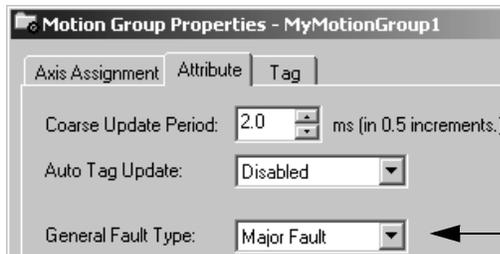
*ControlLogix5555 Rev 12.25*

*ControlLogix5561, 5562, 5563 Rev 12.32*

Change:	Description:									
During Prescan, 1756-L61, 1756-L62, and 1756-L63 Controllers Use a Watchdog Time of 5 seconds	<p>During prescan, a 1756-L61, 1756-L62, or 1756-L63 controller overrides the specified watchdog time for each task and uses 5 seconds for the watchdog time. This occurs <i>only</i> during prescan.</p> <p>In previous revisions of the 12.x firmware, those controllers used the watchdog time for a task during prescan. That might have triggered a major fault, especially if you imported the project from an earlier revision (e.g., 11.x).</p> <p style="text-align: right;">Lgx00040009</p>									
Out-of-Range Subscript No Longer Produces a Fault During Prescan	<p>During prescan, the controller automatically clears any faults due to an array subscript that is beyond the range of the array (out of range).</p> <p>In <i>previous</i> revisions, this produced a major fault.</p> <p style="text-align: right;">Lgx00041679</p>									
Wind Up High and Low of an Enhanced PID (PIDE) Function Block Act Differently	<p>In the enhanced PID (PIDE) function block instruction, the wind up inputs now produce the following response from the instruction:</p> <table border="1"> <thead> <tr> <th>If this input is on (1):</th> <th>Old response:</th> <th>New response:</th> </tr> </thead> <tbody> <tr> <td>WindupHIn</td> <td>output could not increase</td> <td>output can not integrate in a positive direction</td> </tr> <tr> <td>WindupLIn</td> <td>output could not decrease</td> <td>output can not integrate in a negative direction</td> </tr> </tbody> </table>	If this input is on (1):	Old response:	New response:	WindupHIn	output could not increase	output can not integrate in a positive direction	WindupLIn	output could not decrease	output can not integrate in a negative direction
If this input is on (1):	Old response:	New response:								
WindupHIn	output could not increase	output can not integrate in a positive direction								
WindupLIn	output could not decrease	output can not integrate in a negative direction								

# Allen-Bradley Motors

Change:	Description:
While in Program Mode, a Motion Group Fault No Longer Produces a Major Fault	As an option, you can configure a motion group to produce a <i>major fault</i> any time the group detects a motion fault.

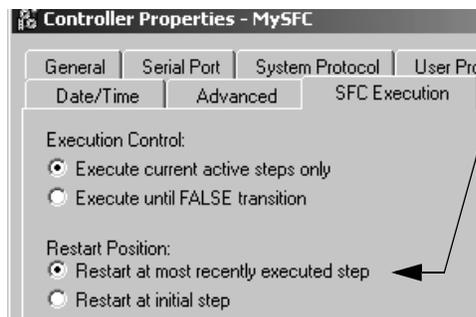


With this revision, a motion group that is configured to produce a major fault produces a major fault *only* if the controller is in run/remote run mode.

In previous revision, the motion group could produce a major fault while the controller was in program/remote program mode. For example, a store to nonvolatile memory interrupts the execution of the motion planner, which produces a fault.

Lgx00042176

Improvements in How an SFC Restarts After Its Execution Is Aborted	<p>This revision provides better handling of situations where the execution of a sequential function chart (SFC) was aborted due:</p> <ul style="list-style-type: none"> <li>• loss of power</li> <li>• controller entered the faulted mode (flashing red OK LED)</li> </ul> <p>The changes include the following:</p>
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Regardless of this setting, the SFC *always restarts at the initial step* after a change from faulted mode (flashing red OK LED) to run/remote run mode.

Lgx00042264

*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><b>Important:</b> 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.

*ControlLogix5555 Rev 12.26*

*ControlLogix5561, 5562, 5563 Rev 12.33*

<b>Corrected anomaly:</b>	<b>Description:</b>
MCLM and MCCM Instructions Still Provided Command Output for Axes when Speed = 0.0	Multi-Axis MCLM and MCCM instructions calculated a small command output value when Speed = 0.0. The X and Y positions would increase slightly.  Lgx00043909
Coordinate System ActualPosition Value Returned Wrong Data Type	The Coordinate System ActualPosition value returned an array of DINT values rather than an array of REAL values.  Lgx00043991
Certain Conditions Could Generate an Unknown Major Fault When a Motion Axis Fault Occurred	Under these conditions, RSLogix 5000 software displayed an unknown major fault after an axis fault occurred: <ul style="list-style-type: none"> <li>• UID/UIE instruction in an event, periodic, or continuous task</li> <li>• the motion group is configured to trigger major faults in response to axis faults</li> <li>• fault handler routine responds to axis faults and clears the axis fault code</li> <li>• an axis fault occurs while the user task is in the UID section of code</li> </ul> Lgx00046070
Loss of UID/UIE Behavior if a Fault Routine Executed	The controller uses an internal count to keep track of nesting UID/UIE instructions. When a UID is scanned, the count increments by one; when a UIE is scanned, the count decrements by one. The count is set to zero when a program completes execution.  If a fault routine executed when the UID/UIE count was not zero, at the end of the fault routine, the controller set the UID/UIE count back to zero. Control was returned to the program with interrupts enabled when they should still be disabled.  Lgx00046070
Non-recoverable Fault Occurred when Motion Speed Set to Zero	A non-recoverable fault occurred on some motion moves when the speed was set to zero. This occurred because planning calculations divided by 0.  Lgx00046949

*ControlLogix5550 Rev 12.29*  
*ControlLogix5555 Rev 12.25*  
*ControlLogix5561, 5562, 5563 Rev 12.32*

<b>Corrected anomaly:</b>	<b>Description:</b>
Frequent Access of Memory Statistics Produced Non-Recoverable Fault	<p>The following <i>combination</i> of circumstances produced a non-recoverable fault (solid red OK LED):</p> <ul style="list-style-type: none"> <li>• Any of the following attributes were frequently read from the controller:               <ul style="list-style-type: none"> <li>• largest contiguous block of additional free logic memory</li> <li>• largest contiguous block of free I/O memory</li> <li>• largest contiguous block of free data and logic memory</li> </ul> </li> <li>• Other Message (MSG) instructions were executing.</li> </ul> <p>When the controller experiences a non-recoverable fault, it clears the project from memory. Lgx00039939</p>
During Postscan a RET Instruction Might Have Returned Unexpected Values	<p>During postscan, a Return (RET) instruction continued to pass return parameters. Under the following <i>combination</i> of circumstances, this might have produced unexpected values.</p> <ol style="list-style-type: none"> <li>1. In a sequential function chart (SFC), multiple elements called the same subroutine at the same time and went inactive at the same time (e.g., an action called a subroutine several times, several paths of a simultaneous branch called the same subroutine).</li> <li>2. The subroutine manipulated tag values and returned the values to the SFC via a RET instruction.</li> <li>3. The <i>SFC Execution—Last Scan of Active Steps</i> option = <i>Automatic Reset</i>.</li> </ol> <p>With the Automatic Reset option, the controller postscans the logic and subroutines of an SFC action when the action goes from active to inactive.</p> <ul style="list-style-type: none"> <li>• If the SFC calls the subroutine multiple times, the controller postscans the subroutine multiple times.</li> <li>• During postscan, the logic might not manipulate tag values. As a general rule, the postscan executes instructions as if all conditions are false.</li> <li>• Without the manipulation of the values, the RET instruction returned the same value during each postscan. The values were left over from the last normal scan of the subroutine.</li> </ul> <p>With this revision, a RET instruction no longer passes return parameters during postscan. Lgx00040384</p> <p>ControlLogix5563, Rev 11.27 also corrects this anomaly (Lgx00040382)</p>
Technical Note—When a Cam Element was Configured to Unlatch at the End of a Cam Range, It Got Stuck in the On State	<p>If the output cam was moving in a positive direction (left to right) and the unlatch point was defined as the cam end position, unlatch might have remained active (on). This might also have occurred if the output cam was moving in a negative direction (right to left) and the cam start position defined the unlatch point.</p> <p>To obtain the technical note, go to Rockwell Automation’s Knowledgebase:</p> <ol style="list-style-type: none"> <li>1. Go to <a href="http://www.ab.com">www.ab.com</a>.</li> <li>2. Select <i>Support</i>.</li> <li>3. Look for Knowledgebase document G58339215</li> </ol> <p style="text-align: right;">Lgx00040398</p>

<b>Corrected anomaly:</b>	<b>Description:</b>						
Controller Ran Out of Memory for New Tags	<p>When memory that was previously used for logic, trends, or RSLinx DDE/OPC communication was freed up, the memory was no longer available for the creation of new tags. For example, stopping a trend frees up memory. But that memory was only available for new logic or trends. If the controller executed a significant number of trends, it no longer had any memory for new tags.</p> <p style="text-align: right;">Lgx00041261</p>						
Controller Fault Handler or Power-Up Handler Produced Unexpected Operations	<p>Under the following sequence of events, the controller might have produced unexpected operation:</p> <ol style="list-style-type: none"> <li>1. A project contained a program in either its Controller Fault Handler or Power-Up Handler.</li> <li>2. The project was downloaded to the controller and executed (controller placed in run mode).</li> <li>3. The project was taken offline and modified.</li> <li>4. The offline project was re-downloaded to the controller, but the controller was left in program mode.</li> <li>5. Either of the following occurred</li> </ol> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><b>Situation:</b></th> <th style="text-align: left;"><b>Actions:</b></th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">Situation A</td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <li>A. The project was stored to nonvolatile memory.</li> <li>B. The controller was placed in run mode.</li> <li>C. The project was loaded into the controller from nonvolatile memory.</li> </ul> </td> </tr> <tr> <td style="vertical-align: top;">Situation B</td> <td style="vertical-align: top;">Power to the controller turned off and then turned back on.</td> </tr> </tbody> </table> <p>In most instances, this produced a non-recoverable fault. When the controller experiences a non-recoverable fault, it clears the project from memory.</p> <p style="text-align: right;">Lgx00041503</p>	<b>Situation:</b>	<b>Actions:</b>	Situation A	<ul style="list-style-type: none"> <li>A. The project was stored to nonvolatile memory.</li> <li>B. The controller was placed in run mode.</li> <li>C. The project was loaded into the controller from nonvolatile memory.</li> </ul>	Situation B	Power to the controller turned off and then turned back on.
<b>Situation:</b>	<b>Actions:</b>						
Situation A	<ul style="list-style-type: none"> <li>A. The project was stored to nonvolatile memory.</li> <li>B. The controller was placed in run mode.</li> <li>C. The project was loaded into the controller from nonvolatile memory.</li> </ul>						
Situation B	Power to the controller turned off and then turned back on.						
1756-M22 Memory Board Would Not Store a Project	<p>If you tried to store a project to the nonvolatile memory of a 1756-L55M22 controller, the store operation failed.</p> <p style="text-align: right;">Lgx00041567</p>						
Enhanced PID (PIDE) Function Block Did Not Integrate When the Output Saturated	<p>The enhanced PID (PIDE) function block instruction did not integrate whenever the output saturated at 0%, 100%, or a user-specified limit. This anomaly was only present in earlier revisions of the 12.x of firmware.</p> <p>The PIDE instruction is now integrates as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><b>If the output is at:</b></th> <th style="text-align: left;"><b>It integrates in a:</b></th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">low output limit</td> <td style="vertical-align: top;">positive direction</td> </tr> <tr> <td style="vertical-align: top;">high output limit</td> <td style="vertical-align: top;">negative direction</td> </tr> </tbody> </table> <p style="text-align: right;">Lgx00041603</p>	<b>If the output is at:</b>	<b>It integrates in a:</b>	low output limit	positive direction	high output limit	negative direction
<b>If the output is at:</b>	<b>It integrates in a:</b>						
low output limit	positive direction						
high output limit	negative direction						

Corrected anomaly:	Description:
Resetting an SFC Produced a Non-Recoverable Fault	<p>The following <i>combination</i> of circumstances produced a non-recoverable fault (solid red OK LED):</p> <ul style="list-style-type: none"> <li>• An SFC called another SFC (SFC subroutine).</li> <li>• The SFC subroutine contained a simultaneous branch.</li> <li>• While the last step of the simultaneous branch in the SFC subroutine was executing, an SFC Reset (SFR) instruction reset the calling SFC.</li> <li>• SFC execution for the project was configured as follows:</li> </ul> <div data-bbox="672 573 1110 856" style="border: 1px solid gray; background-color: #f0f0f0; padding: 5px; margin: 10px 0;"> <p>Restart Position:</p> <p><input checked="" type="radio"/> Restart at most recently executed step</p> <p><input type="radio"/> Restart at initial step</p> <p>Last Scan of Active Steps:</p> <p><input checked="" type="radio"/> Automatic reset</p> <p><input type="radio"/> Programmatic reset</p> <p><input type="radio"/> Don't scan</p> </div>
PIDE Function Block Failed to Execute Properly After Import	<p>When the controller experiences a non-recoverable fault, it clears the project from memory. Lgx00042117</p> <hr/> <p>If you imported a project from a previous revision, the enhanced PID (PIDE) function block instruction might have failed to correctly set the rate-of-change alarms for the process variable (PVROCPoSAlarm, PVROCNegAlarm).</p> <p>Under the following <i>combination</i> of circumstance, the enhanced PID (PIDE) function block instruction might have failed to update the control variable:</p> <ul style="list-style-type: none"> <li>• Timing mode = oversample mode</li> <li>• Logic toggled the EnableIn bit.</li> <li>• You imported the project from a previous revision.</li> </ul> <p style="text-align: right;">Lgx00042169</p>
ASCII Read and Write Instructions Produced Non-Recoverable Fault	<p>In some instances, ASCII Read (ARD, ARL) or ASCII Write (AWA, AWT) instructions produced a non-recoverable fault (solid red OK LED). This occurred because the controller failed to schedule internal, firmware tasks.</p> <p>When the controller experiences a non-recoverable fault, it clears the project from memory. Lgx00042246</p>

*ControlLogix5550 Rev 12.28*  
*ControlLogix5555 Rev 12.24*  
*ControlLogix5561, 5562, 5563 Rev 12.31*

<b>Corrected anomaly:</b>	<b>Description:</b>
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"> <li>• inaccurate internal coefficients</li> <li>• non-recoverable fault (solid red OK LED)</li> </ul> <p style="text-align: right;">Lgx00036816</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"> <li>• In firmware revision 11.x, the error message for this situation was not useful in diagnosing the situation.</li> <li>• This revision provides a more meaningful error message.</li> </ul> <p style="text-align: right;">Lgx00033501</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"> <li>• A CMP, CPT, FAL, or FSC instruction operated on an array.</li> <li>• A tag identified the subscript of the array (indirect address).</li> <li>• The indirect address used an expression to calculate the value for the array subscript.</li> <li>• The indirect address produced a subscript that was too large for the array. (This produced a major fault.)</li> <li>• The controller contained a fault routine that tried to clear the major fault.</li> </ul> <p>When the controller experiences a non-recoverable fault, it clears the project from memory.</p> <p style="text-align: right;">Lgx00038663</p>
S-Curve (SCRV) Function Block Failed to Act as a Ramp	<p>If the <math>(\text{JerkRate} * \text{DeltaT}) \geq \text{AccelRate}</math> or <math>\text{DecelRate}</math>, the instruction failed to function as a ramp.</p> <p style="text-align: right;">Lgx00029955</p>
Enhanced PID (PIDE) Function Block Failed to Clamp Control Variable	<p>When <math>\text{ZCOff} = 0</math> and the error value crossed zero and remained within the <math>\text{ZCDeadband}</math> range, <math>\text{ZCDeadbandOn}</math> failed to remain =1. This prevented the instruction from clamping the control variable.</p> <p style="text-align: right;">Lgx00030777</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 disregarded the proportional term in the direction of the limit which meant that the instruction failed to keep the control variable at saturation long enough.</p> <ul style="list-style-type: none"> <li>• As soon as the process variable began to respond to the saturated control variable, the PIDE instruction let the control variable leave its limit.</li> <li>• With this revision, the PIDE instruction more accurately keeps the control variable at its full output based on the proportional contribution.</li> </ul> <p style="text-align: right;">Lgx00036344</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 <math>-1.1754944e^{-38}</math> but less than <math>1.1754944e^{-38}</math>) 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 <math>-1.1754944e^{-38}</math> or <math>1.1754944e^{-38}</math>, for the 0 denominator.</p>
Lgx00034100	
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"> <li>• The IP bits of both the current cam and the pending cam were left on.</li> <li>• Neither cam was active.</li> </ul> <p>With this revision:</p> <ul style="list-style-type: none"> <li>• The IP bit of the current cam turns off and the PC bit turns on.</li> <li>• The pending cam is left pending.</li> </ul>
Lgx00037666	
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"> <li>• The IP bit turned off.</li> <li>• The PC bit remained off.</li> </ul>
Lgx00034046	
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>
Lgx00033317	
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>
Lgx00031253	
In an SFC, a Major Fault Due to an Instruction Produced a Non-Recoverable Fault	<p>Under the following <i>combination</i> of circumstances, a major fault produced a non-recoverable fault (solid red OK LED):</p> <ol style="list-style-type: none"> <li>1. A sequential function chart (SFC) executed an instruction that produced a major fault. The instruction could have been either: <ul style="list-style-type: none"> <li>• embedded as structured text within the SFC</li> <li>• in a subroutine that the SFC called</li> </ul> </li> <li>2. A fault routine cleared the fault.</li> </ol>
<p>When the controller experiences a non-recoverable fault, it clears the project from memory.</p>	Lgx00038945
ControlLogix5563, Rev 11.27 also corrects this anomaly (Lgx00039772)	

*ControlLogix5550 Rev 11.34 and 12.28*

*ControlLogix5555 Rev 11.32 and 12.24*

*ControlLogix5563 Rev 11.25 and 12.31*

<b>Corrected anomaly:</b>	<b>Description:</b>
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;">Lgx00038637</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"> <li>• To communicate with the weigh scale, the I/O configuration of the project used the Generic ControlNet Module type.</li> <li>• 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.</li> <li>• RSLogix 5000 software returned a module fault code of 16#0315.</li> </ul> <p style="text-align: right;">Lgx00038188</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;">Lgx00037557</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"> <li>• Motion Axis Move (MAM) instruction or Motion Change Dynamics (MCD) instruction with an S-Curve profile</li> <li>• certain parameters (e.g., Speed operand = 0)</li> </ul> <p>When the controller experiences a non-recoverable fault, it clears the project from memory.</p> <p style="text-align: right;">Lgx00037536</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"> <li>1. Motion Axis Move (MAM) instruction with an S-Curve profile</li> <li>2. Motion Change Dynamics (MCD) instruction with the Speed operand = 0</li> <li>3. Motion Axis Stop (MAS) instruction with the Stop Type operand = Move</li> </ol> <p style="text-align: right;">Lgx00035218</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"> <li>• The MSG was configured as a PLC2, PLC3, PLC5, or SLC type message.</li> <li>• Communication was over an EtherNet/IP network.</li> <li>• The destination device was <i>not</i> present.</li> </ul> <p>When the controller experiences a non-recoverable fault, it clears the project from memory.</p> <p style="text-align: right;">Lgx00039180</p>

# Allen-Bradley Motors

*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 ACIG 2003-04-001	<p>Power Disruptions Cleared Memory</p> <p><b>Important:</b> 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"> <li>• 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.</li> <li>• This might have occurred during brownouts or other situations where power to the controller fluctuated for a short duration.</li> </ul> <p style="text-align: right;">Lgx00036366, Lgx00036367</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="597 926 1466 1381"> <thead> <tr> <th data-bbox="605 932 748 957">If the project:</th> <th data-bbox="813 932 870 957">Then:</th> </tr> </thead> <tbody> <tr> <td data-bbox="605 978 773 1035">contained motion axes</td> <td data-bbox="813 978 1466 1220"> <p>A fault was more likely to occur. The following faults might have occurred:</p> <ul style="list-style-type: none"> <li>• non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory.</li> <li>• 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.</li> </ul> </td> </tr> <tr> <td data-bbox="605 1241 748 1297"><i>did not</i> contain motion axes</td> <td data-bbox="813 1241 1466 1375"> <p>A fault was still possible, though less likely. The following fault might have occurred:</p> <ul style="list-style-type: none"> <li>• non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory.</li> </ul> </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"> <li>• during power-up</li> <li>• when the memory of the controller is empty</li> </ul> <p style="text-align: right;">Lgx00036642, Lgx00036720</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"> <li>• non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory.</li> <li>• 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.</li> </ul>	<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"> <li>• non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory.</li> </ul>
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"> <li>• non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory.</li> <li>• 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.</li> </ul>						
<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"> <li>• non-recoverable fault (solid red OK LED). This caused the controller to clear the project from its memory.</li> </ul>						

## 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"> <li>• You place the MDR instruction in a structured text routine.</li> <li>• You do <i>not</i> provide any conditions to control the execution of the instruction. (I.e., you program it to execute continuously.)</li> </ul> <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><b>Important:</b> 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"> <li>• As you create tags, periodically download the project. If the project successfully downloads, then you know you are within the 3.5M byte limit.</li> </ul>
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"> <li>• Limit the number of rungs in a routine to less than 2500. (Use a series of smaller routines.)</li> <li>• If you are entering a large number of rungs in a routine, do this offline.</li> <li>• As you enter rungs, periodically download the project. If the project successfully downloads, then your routines are within limits.</li> </ul>

Lgx00037634

## 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			
	<b>If the data type is:</b>	<b>And the tag is:</b>		
	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"> <li>number of user-defined data types in the controller organizer ⇒ Data Types folder ⇒ User-Defined folder</li> <li><i>not</i> the use of that data type in tags</li> </ul>	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"> <li>uses a structure as its data type</li> <li>does <i>not</i> use one of these data types: CONTROL, COUNTER, PID, or TIMER</li> <li>has only one dimension (e.g., UDT_1[5])</li> </ul>	(-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)		✓

**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"> <li>transfer more than 500 bytes of data</li> <li>target a controller in the same chassis</li> </ul> <i>and</i> <ul style="list-style-type: none"> <li>target a controller in the same chassis</li> </ul> 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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# Allen-Bradley Motors

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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
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