

ControlLogix Combination Controller and SERCOS Interface Card, Firmware Revision 17

Catalog Number 1756-L60M03SE

Topic	Page
When to Use These Release Notes	1
About This Publication	2
Compatible Revisions	2
Enhancements	4
Corrected Anomalies	6
Known Anomalies	16
Install the Controller Revision	19
Additional Memory Requirements	20

■ When to Use These Release Notes

Use these release notes for firmware revision 17.03

IMPORTANT

Before updating your ControlLogix Combination Controller and SERCOS Interface card, we strongly recommend that you review information pertinent to previous major firmware revisions. For example, when updating from revision 16.x to 17.x, view information for revision 16 in the ControlLogix Combination Controller and SERCOS Interface Card, revision 16 Release Notes, publication [1756-RN642](#), in addition to the content of these release notes.

Firmware release notes contain material for all minor revisions subsequent to each major revision. If your controller, for example, is at revision 16.3, and not the last minor revision, 16.5, you should view all of the information for revision 16.3...16.5 before updating to revision 17.x.

ControlLogix SERCOS Interface Module, Revision 16 Release Notes, publication [1756-RN642](#), are available at <http://literature.rockwellautomation.com>.

About This Publication

This publication describes enhancements and anomalies (corrected and known) for the ControlLogix Combination Controller and SERCOS Interface Card, revision 17.x.

Compatible Revisions

To use firmware revision 17.03, update your system as follows.

Software	Required Version
RSLink Classic software	2.54 (CPR 9, SR 1)
RSLink Enterprise software	5.17 (CPR 9, SR 1)
RSLogix 5000 programming software	17.00 (CPR 9, SR 1)
RSNetWorx for ControlNet software	9.00 (CPR 9, SR 1)
RSNetWorx for DeviceNet software	
RSNetWorx for EtherNet/IP software	

Before You Begin

Before you upgrade your firmware, please consider the following.

IMPORTANT

Loss of communication or power during a controller firmware flash upgrade may result in the controller's rejection of the new firmware. If the controller firmware upgrade fails due to the conditions described, the following corrective actions may be required:

- Cycle controller power and successfully complete the flash upgrade.
 - If a nonrecoverable fault occurs, then return the controller for factory repair.
-

The following preliminary actions are required before upgrading your controller firmware.

If	Then
Your controller is at revision 11 firmware or earlier	You must first upgrade to revision 12 or 13 before attempting to update to revision 17.x. Once you have your controller upgraded to revision 12 or 13 then you can upgrade the controller to revision 17.x.
Your controller meets both of these conditions: <ul style="list-style-type: none"> • It has nonvolatile memory • It is currently at revision 11.x or earlier 	Remove the CompactFlash card from the controller or check the Load Image option of the CompactFlash card. If it is set to On Power Up or On Corrupt Memory, first store the project with the Load Image option set to User Initiated. Otherwise, you may get a major fault when you update the firmware of the controller. This occurs because the On Power Up or On Corrupt Memory options cause the controller to load the project from nonvolatile memory. The firmware mismatch after the load then causes a major fault.
Your controller is close to its limits of memory	This revision may require more memory than previous revisions. <ul style="list-style-type: none"> • To see what components of your current project require more memory, see page 20. • RSLogix 5000 software, version 13.0 or later, lets you estimate the memory requirements of the controller offline. To update to this revision, you may have to add an expansion memory card to the controller or use a controller with a larger amount of memory.
Your controller is connected to a DH-485 network	Disconnect it from the DH-485 network before 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.

Enhancements

This firmware revision contains these enhancements

Enhancement	Description
Runtime Detection of Controller Modifications	<p>Online changes to programs and data in a 1756-L6x ControlLogix controller can be tracked via an internal log with change counters.</p> <p>The log includes the type of change and the personal computer identity (Windows login) of the user who made the change. The change log can be stored on the controller's CompactFlash card for offline review.</p> <p>Changes may also be monitored programmatically by reading the change log counter using a Get System Variable (GSV) instruction.</p>
Advanced Process Control Instructions	<p>Three new instructions targeted for process applications have been added.</p> <p>The new instructions are:</p> <ul style="list-style-type: none"> • Internal Model Control (IMC) – Compares actual process error against error calculated by an internal first order lag plus deadtime model. • Coordinated Control (CC) – Controls a single process variable by manipulating as many as three different control variables. • Modular Multivariable Control (MMC) – Controls two process variables to their setpoints using up to three control variables. <p>Instructions need to be purchased separately and licensed per use. The catalog numbers and associated use types are:</p> <ul style="list-style-type: none"> - 9324-RLDAPCENE – provides a license to use the instructions in RSLogix 5000 and provides a license to use them in a single Logix controller. - 9324-RLDAPCCLNE - provides a license to use the instructions in an additional controller, pay-to-deploy.
Runtime Partial Import	<p>You can now import programs, equipment phases, routines, rungs, and new Add-On Instructions into a running system.</p> <p>You can add these new components, as well as replace existing programs, equipment phases, and routines, while the system is running. New tags and User-Defined Types will be created as needed with values initialized from the import file. Data values of existing tags will be maintained.</p>
Kinetix6000 Advanced Safety Drive (S1) Support	<p>Version 17 provides support for the Kinetix6000 SERCOS S1 Advanced Safety based family of drives. The safety status can be directly accessed by the user's application via two new SERCOS Axis attributes (GuardStatus and GuardFaults) in the Axis_Servo_Drive data type. The configuration of the S1 Drive's safety parameters is done via an Ethernet WEB based interface and downloaded to the Kinetix6000 drive via this Ethernet connection.</p>
Kinetix6000 Enhanced Safe Torque-off Drive (S0) Support	<p>Version 17 provides support for the Kinetix6000 SERCOS S0 Enhanced Safety based family of drives. The safety status can be directly accessed by the user's application via a bit attribute (SafeOff) in the Axis_Servo_Drive data type.</p>

Enhancement	Description
Pause Management for Step Timer ACC	The Logix5000 timers store a portion of the wall clock with each scan and compare this to the value from the last scan. The timer's ACC value is updated by the difference. Previous to version 17, when a Sequential Function Chart (SFC) routine was paused and then released, all of the step timers jumped forward by the length of the pause time. Version 17 now provides an option to control how the step timers will treat the pause – ignore it or count the pause time.
Reading SFC Chart Paused State via GSV Instruction	The paused state of a Sequential Function Chart can be determined programmatically using the Get System Variable (GSV) instruction.
Produced/Consumed Tag Structures Status	<p>Status information can be included with produced and consumed tags. In order to take advantage of this enhancement, the Produced/Consumed tag will need to be a User Defined Type (UDT) with the first member being of data type CONNECTION_STATUS.</p> <p>Note that RSNetWorx software, version 9.00.00 or later is required when scheduling a ControlNet network that has Produced/Consumed tags with status.</p>
Added Extended Error Codes for MAOC Cam & Compensation array errors.	For Error Codes 36 and 37, new Extended Error Codes are available for Output Cam array and Output Compensation array errors. The Extended Error Codes describe errors that may occur because the element is incorrectly configured or the value of one of its members is out of range.
Support of Programmable Jerk for Multi-Axis Coordinated Move Instructions	<p>Support for programmable jerk has been extended to the multi-axis move instructions, that is, MCCM, MCLM, MCCD and MCS.</p> <p>You are now able to specify acceleration and deceleration jerk rates for the multi-axis coordinated moves directly via operands in the instruction faceplate for S-Curve profile motion for these instructions.</p> <p>The configurable maximum jerk rates are also accessible programmatically via the Get System Variable (GSV) and the Set System Variable (SSV) instructions.</p> <p>For project conversions, the new Jerk Operands are pre-populated in the MCLM, MCCM, MCCD and MCS instructions with default values for Jerk rate as 100% of time.</p>
Support for Programmable Jerk for Single-Axis Change Dynamics Instruction (MCD)	<p>The MCD instruction is used to Change the Speed, Acceleration and Deceleration of a running Single Axis Motion.</p> <p>Now with the Programmable Jerk, you can specify the Accel and Decel Jerk for S-Curve Profiles.</p>
Added ability to apply change dynamics to Active and Pending Motion	<p>A new enumeration, that is Active and Pending Motion, has been added to the Scope variable of the MCCD instruction.</p> <p>Choosing Active and Pending Motion specifies that the changes affect the motion dynamics of the active coordinated motion instruction and any pending coordinated motion instruction in the queue.</p>

Corrected Anomalies

This firmware revision contains these corrected anomalies

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.03	Outputs remotely located via a network may not go to their predefined PROGRAM mode state on a change out of RUN mode	<p>When a controller changes from RUN mode to a non-RUN mode state, that is to PROGRAM mode or a <u>recoverable</u> faulted state, the controller's outputs may not transition to their predefined PROGRAM mode state.</p> <p>Any of the following transitions from RUN mode to a non-RUN mode may cause this anomaly to occur:</p> <ul style="list-style-type: none"> • The key switch on the controller is turned from RUN mode to PROGRAM mode. • A remote command is sent to the controller to change from RUN mode to PROGRAM mode • The controller detects a major recoverable fault that causes an operating mode change from RUN mode to a faulted mode. <p>If your experience a major <u>non-recoverable fault</u> on your controller, the controller's outputs will transition to their predefined fault mode state.</p> <p>Lgx00099405</p>
17.03	The CONNECTION_STATUS.RunMode indication in a Produced tag may not indicate correctly.	<p>When using Produced/Consumed tags with CONNECTION_STATUS, the CONNECTION_STATUS.RunMode indication in the producing controller may not indicate correctly if it is not in RUN mode. The CONNECTION_STATUS.RunMode indication in the Consuming controller will indicate correctly.</p> <p>Lgx00099405</p>
17.02	Firmware upgrades using the ControlFlash utility are unsuccessful if the CompactFlash card is removed.	<p>If you have stored your program on a CompactFlash card, then remove the CompactFlash card while power is off without replacing it, attempts to upgrade the controller firmware are unsuccessful.</p> <p>Re-inserting the CompactFlash card restores the ability to upgrade firmware.</p> <p>Lgx00073863</p>
	Serial-port control structure bit RN inaccurately cleared.	<p>This anomaly occurs when using firmware revision 16.20 or later.</p> <p>If the ACL instruction is used to clear instructions from the ASCII queue, the serial-port control structures' RN bit is cleared (that is, the RN bit is set to zero) although it should not be.</p> <p>Lgx00081063</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	Use of revision 16 firmware and the controller serial port results in extended program scan times.	<p>If you use firmware at revision 16, including revisions 16.02...16.21, and the controller's serial port, the program scan time may increase. The program scan-time increase in revision 16 may be 2...10 times the scan time of the same program with revision 15.</p> <p>With revision 17, program scan times have been reduced from 2...10 times to 1.5...6 times the scan time of the same program executed in revision 15.</p> <p>Lgx00077845</p>
	Indirectly addressing an instance tag in an Add-On Instruction results in a Major Non-Recoverable Fault.	<p>When an indirectly-addressed instance tag is used instead of a directly-addressed instance tag within an Add-On Instruction, a Major Non-Recoverable Fault occurs. Typically the major fault occurs during the prescan of the controller.</p> <p>Lgx00077261, Lgx00076136</p>
	Serial messages broadcast from a master controller to station address 255 results in other messages failing.	<p>When two controllers are used in a master/slave configuration and the message to the broadcast station address (255) is executed, that message errors. Some messages occurring after the message addressed to address 255 also error with the same error code.</p> <p>Lgx00079116</p>
	The Slot Status bit for an I/O connection is slow to update if the connection is lost.	<p>When using I/O on an Ethernet network, if the connection to the network is lost at the adapter, the SlotStatusBit for that connection will not register the disconnect for 9 seconds or more.</p> <p>If you require loss-of-connection data more quickly than the 9 seconds, use the GSV instruction to monitor the entry status of the connection as it updates more quickly than the SlotStatusBit.</p> <p>Lgx00072696</p>
	When the SFC instruction's Last Scan of Active Steps option is set to Automatic Reset, a Major Non-Recoverable Fault occurs.	<p>A Major Non-Recoverable Fault may occur when these elements are present in the program:</p> <ul style="list-style-type: none"> • Within an SFC, a JSR instruction is used to jump to another SFC, also know as a nested SFC. • One or more of the nested SFC instructions contains Simultaneous Branches. • The Last Scan of Active Steps option (specified in the SFC Execution tab of the controller Properties dialog) is set to Automatic Reset. <p>To avoid a Major Non-Recoverable Fault when these elements are present, set the Last Scan of Active Steps to Don't Scan or to Programmatic Reset.</p> <p>Lgx00072702</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	An SFC R action continues to post-scan on the specified action.	<p>This anomaly occurs only if the SFC Last Scan of Active Steps option is set to Programmatic Reset or Automatic Reset. When the default, Don't Scan, is set, the anomaly does not occur.</p> <p>The intention of a reset action, type R, is to terminate the execution of another action that was previously stored. When configured as described above, the reset action causes logic to execute a final scan.</p> <p>The reset action does not check to verify that an action is stored before it completes the final scan. As a result, each time the reset action is scanned, the target logic will be scanned one last time.</p> <p>These observable behaviors may result:</p> <ul style="list-style-type: none"> • The timer of the stored action will continue to time even though the action is no longer active. • The logic in the stored action will be executed in the configured mode. • At Automatic Reset, non-retentive outputs are cleared. • At Programmatic Reset, the logic will execute. In this situation, the action logic checks for the final scan condition (action.A = 1 and action.Q = 0) and performs some shutdown operations. This is the code that will be executed. <p>Lgx00069295</p>
	Attempts to download a program to a controller following a failed firmware upgrade are successful. (Failure is indicated by the OK status indicator flashing red after the upgrade is complete.)	<p>After a firmware upgrade attempt fails during the upgrade (for example, the cable is disconnected or communication is interrupted), the controller's OK status indicator flashes red and any user attempts to clear the fault by toggling the controller's keyswitch are unsuccessful.</p> <p>You can download a program to the controller, place the controller in Run mode, and run the program (the RUN status indicator displays run status). The outputs behave as specified by the program. However, when controller power is cycled, the program is lost and the controller properties indicate a firmware revision different from that most recently downloaded to the controller.</p> <p>Lgx00071250</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	Passing a User-defined Data Type (UDT) into an Add-On Instruction results in a Major Recoverable Fault or data memory corruption.	<p>An anomaly occurs when you pass a tag based on a User-defined Data Type (UDT) into an Add-On Instruction, and certain conditions are met that result in a Major Recoverable Fault or memory corruption.</p> <p>These conditions are required for Major Recoverable Fault or data memory corruption:</p> <ul style="list-style-type: none"> • A one-dimensional array tag that is based on a UDT that is passed into the Add-On Instruction. • The UDT tag contains a member that is a one-dimensional array. • Inside the Add-On Instruction, an operand address that specifies an immediate member of the UDT tag array and a variable element of the member array (for example, array[0].memberArray[x] is used). <p>Examples:</p> <pre>UDT array[0].memberArray[x]</pre> <p>When the size of the UDT array is smaller than that of the memberArray and the [x] value of the memberArray is larger than the size of the UDT array, a Major Recoverable Fault Code 4 Type 20 occurs.</p> <pre>UDT array[0].memberArray[x]</pre> <p>When the size of the UDT array is bigger than the memberArray and the [x] value is smaller than the size of the UDT Array but larger than the size of the memberArray, the expected fault does not occur and the data is written to a location outside the bounds of the memberArray.</p> <p>Lgx00077270 and Lgx00076136</p>
	An upload of an Add-On Instruction with a literal boolean input parameter modifies offline image.	<p>When an Add-On Instruction containing a literal value for one of its Boolean input parameters is referenced from a Ladder Diagram routine, an upload of the project will modify the display of the literal value by appending a ".0". Each time the project is downloaded and re-uploaded, another ".0" is appended, so that after the second download/upload sequence, the project file will not verify and can no longer be downloaded without first editing the modified literal value. The edit may be successfully performed either online or offline.</p> <p>Note, however, that when editing online, because the rung is in an unverified state, the "Finalize All Edits in Program" will not operate. In this case, use of the Accept/Test/Assemble sequence of operations will allow the edit to be completed. This condition does not affect the executing image, which will continue execution using the unmodified literal value. To avoid exposure to this problem, replace the literal value with a reference to a tag having the desired value.</p> <p>Lgx00077802</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	Acknowledging an analog or digital alarm does not clear the alarm's unacknowledged (InAlarmUnack) tag.	<p>If an alarm has an active status (InAlarm tag is true) and is unacknowledged (InAlarmUnack is true), acknowledging the alarm does not reset the alarm's unacknowledged tag (that is, even after being acknowledged, the InAlarmUnack continues to be true).</p> <p>This anomalous behavior occurs with both digital (ALMD) and analog (ALMA) alarms.</p> <p>Lgx00081999</p>
	Writing 483 SINT values to another controller using a MSG instruction causes an error.	<p>If you attempt to write 483 SINT values to another controller by using a MSG instruction, an error occurs. This anomalous behavior does not occur with any other amount of SINT values (for example, attempting to write 482 or 484 SINT values to the other local controller does not cause this anomaly).</p> <p>Lgx00057515</p>
	Message errors may occur when using a CIP data table read or write message.	<p>If you perform a CIP data table read or write message to another controller with User-defined Data Types (UDTs), the message instructions may error with code 16#001F (extended error code 16#203).</p> <p>Lgx00083193</p>
	Attempts to rename Alias tags for bits within in a DINT referenced by an HMI are unsuccessful.	<p>If your HMI references any bit of a DINT and you try to rename Alias tags for bits 0...7 within that DINT, the new alias name fails to be set. Attempting to rename Alias tags for bits 8 and higher is successful.</p> <p>Lgx00079805</p>
	Use of certain Function Block instructions causes various minor faults.	<p>The use of these Function Block instructions may result in various minor faults when your program executes;</p> <p>BAND, BOR, BNOT, BXOR, CTUD, D2SD, D3SD, DFF, JKFF, OSFI, OSRI, RESD, SETD, TONR, TOFR, RTOR, and OSC.</p> <p>The minor faults result because the Overflow status flag (S:V) is set each time an instruction listed above is carried out.</p> <p>Lgx00045364, Lgx00028500</p>
	Nested SFCs, when configured to Automatic Reset, are prescanned rather than postscanned.	<p>Normally, if in an SFC where the configuration of the last scan is set to Automatic Rest, the code of associated actions are executed a final time and the scan mode is set to postscan. Postscan execution is a system-defined mode similar, but not the same as, prescan.</p> <p>With this anomaly, if an action in the SFC contains a JSR to another SFC, the subroutine is prescanned rather than postscanned (that is, the incorrect scan mode is set).</p> <p>Many instructions, especially motion instructions, remain inactive during a postscan, but re-initialize during a prescan.</p> <p>Lgx00086725</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	The SPCascadeInv value of a PIDE instruction is set any time SPCascade exceeds the SP limits.	<p>When the AllowCasRat and UseRatio tags are set, the SPCascadeInv should be set only if SPCascade multiplied by the ratio value exceeds the SP limits. However, the SPCascadeInv is set any time SPCascade exceeds the SP limits. SPCascade is set even when the setpoint (SPCascade multiplied by the ratio value) is below SP limits.</p> <p>Lgx00065664</p>
	Setting the WALLCLOCKTIME object may result in a Major Nonrecoverable Fault (MNRF) or an incorrect WALLCLOCKTIME value.	<p>Using an SSV instruction to set the local controller's WALLCLOCKTIME using the LocalDateTime attribute may result in an incorrect WALLCLOCKTIME value upon execution of the program. This incorrect time is usually evident in the seconds field.</p> <p>The discrepancy in the WALLCLOCKTIME may also result in a MNRF during controller power down or just after controller power has been cycled.</p> <p>To avoid this behavior, use the DateTime attribute and arithmetic to handle the GMT offset instead of using the LocalDateTime attribute to set the local controllers WALLCLOCKTIME object.</p> <p>Lgx00078925</p>
	Totalizer (TOT) instruction may continually remain in Program Mode.	<p>Setting the ProgValueReset input puts the Totalizer into Program Mode. The ProgOper output continues to indicate the mode requested (that is, Operator mode), however, only ProgStartReq, ProgStopReq and ProgResetReq are recognized.</p> <p>Lgx00077908</p>
	Motion Redefine Position (MRP) Error 13 for Positions within the range	<p>You may get the error "Parameter out of Range" if the MRP instruction is executed when:</p> <p>Current Position + MRP Position > 2^{31}/Axis Conversion Constant.</p> <p>Or</p> <p>Current Position + MRP Position < - 2^{31}/Axis Conversion Constant.</p> <p>For example, assume that the:</p> <ul style="list-style-type: none"> axis conversion constant = 120,000.0 feedback counts/1.0 unit. current command position = 17,893.0 units. <p>If the sum of your MRP instruction with a position of five units + the current commanded position, which exceeds 2^{31}/Axis Conversion Constant, the MRP will error.</p> <p>Lgx00073719</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	SSV of MotionGroup Average Scan Time causes a jump in scan time	<p>If an SSV instruction with a value of zero is executed against the MotionGroup attribute TaskAverageScanTime, then a GSV instruction is executed. The average scan time jumps to an incorrect value. The larger the Coarse Update Period, the larger the jump will be. For example, with a Coarse Update Period of 26 ms, the average scan-time value can increase to over 300 ms.</p> <p>Lgx00071520</p>
	Axis ActualAcceleration tag is not updated for virtual axes.	<p>For the virtual axis, the Axis_tag.ActualAcceleration does not update, but the Axis_tag.CommandedAcceleration does. The actual acceleration is now updated for a virtual axis.</p> <p>Lgx00073829</p>
	MCT Error 61 with Extended Error 10 for zero length moves.	<p>You will get Error 61 with Extended Error 10 if you execute an MCT instruction on the same iteration as the .PC bit for a Motion Coordinated Linear Move (MCLM) or Motion Coordinated Circular Move (MCCM) is set for a zero length move, indicating that axes are moving or locked by some other operation.</p> <p>Lgx00075286</p>
	Setting invalid home sequence value via SSV instruction.	<p>Attempting to program an SSV instruction to set the home sequence to Torque or Torque Marker on a non-SERCOS drive produced a minor controller fault on any subsequent attempt to program this attribute via an SSV instruction.</p> <p>Lgx00068281</p>
	An MAOC in conjunction with an 1756-OB16IS Scheduled Output Module can overwrite memory	<p>An MAOC instruction used in conjunction with an 1756-OB16IS Scheduled Output Module can overwrite memory if 1756-OB16IS module is not configured with the default communications format "Scheduled Output Data per Point". If the format is changed to either "Listen Only – Output Data" or "Output Data", the memory allocated for the schedule data used by the MAOC instruction is not present.</p> <p>Lgx00082622, Lgx00078880, Lgx00084911</p>
	Duration Cam - Latch and Unlatch Delays	<p>Duration cams enable an application to turn an output on at a specific position and off after the configured Duration time. Latch and unlatch delays adjust the point at which an output turns on and off, regardless of axis speed.</p> <p>A positive latch delay time should extended your Duration time but instead shortens it. Additionally, a positive unlatch delay time should shorten your Duration time but instead extends it.</p> <p>The converse is also true. A negative latch delay time should shorten your Duration time but instead extends it. Additionally, a negative unlatch delay time should extend your Duration time but instead shortens it.</p> <p>If you execute a latch and unlatch delay for the identical value, no anomaly occurs, and the output remains on for the configured Duration time.</p> <p>Lgx00068599</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	Prevent execution of Motion Instructions while an MGS, MAS-ALL or MCS-All instruction is executing	<p>Previously, if certain Motion Instructions overlapped while Motion Stop Instructions were active, your application experiences unexpected behavior. When an instruction is actively stopping and a second instruction is initiated that overlaps the active instruction you see this anomaly.</p> <p>With firmware revision 17.02, if certain Motion Instructions overlapped while Motion Stop Instructions are active, you see Error Code #78. For more information about Error Code #78 and the affected Motion Instructions, see the Error Codes for Motion Instructions Appendix of the Logix5000 Controllers Motion Instructions Reference Manual, publication 1756-RM007.</p> <p>Lgx00083819</p>
	Jerk Parameters of Master Offset Move are Incorrectly Computed	<p>The Master Offset Moves are used to offset the Position cams.</p> <p>The Jerk parameters of the Master offset Move using a MAM instruction are incorrectly applied if the conversion constant of the master and the slave are different. The slave axis conversion constant is applied instead of the master axis conversion constant for master offset move.</p> <p>Lgx00081390</p>
	Motion Stop issues if Program Stop Action is Hard disable for a Virtual Axis	<p>If MCLM or MCCM instructions are in process and the controller transitions to Program Mode, the system's transition takes longer than expected for the axes to stop. Your controller experiences this issue only if the Program Stop Action configured in the axis properties is set to Hard Disable.</p> <p>With the corrected behavior in this release, the transition to the program mode is immediate.</p> <p>Lgx00077357</p>
	Parameter Combination Caused Non-Recoverable Fault on Controller	<p>A non-recoverable fault is caused by a very unlikely and unexpected combination of initial conditions when velocity = 0 and acceleration $< > 0$. The only way to achieve this combination of initial conditions is to stop the axis with an MAS instruction (Speed = 0) or an MCD instruction (Speed = 0) and to start the motion exactly one iteration before the MAS instruction or MCD instruction is complete.</p> <p>Lgx00082075</p>
	An armed MAOC will remain armed during a system power cycle.	<p>If an MAOC instruction is armed when a system power cycle occurs, the MAOC will remain armed at power up.</p> <p>The MAOC instruction may become disarmed if a physical axis fault is detected. Additionally, the MAOC instruction may cause a group overlap fault if a physical axis reports a large delta position during power-up.</p> <p>Lgx00085513</p>

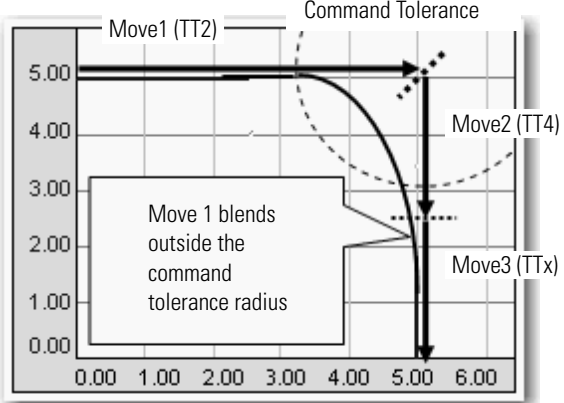
Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	Execution Time Change for Some Motion Instructions Lgx00085687	With controller firmware revision V17.02, there is a change in the instruction execution times for numerous motion instructions. For more information on execution times, see the Logix 5000 Controllers Execution Time and Memory Use Reference Manual, publication 1756-RM087. Lgx00085687
	Axis Experiences Unwanted Motion on Rotary Axis	You may experience unwanted motion if your application has the following conditions: <ul style="list-style-type: none"> • The axis is a rotary axis. • The axis position was less than 1/2 drive count away from unwind. • An MRP instruction was executed with a commanded position of zero. Lgx00078215
	Base Offset X1b with a negative value in Delta gives MCT Error 61 Exerr 15	For a 2 & 3 axes Delta robot, you can now use both negative and positive values for the X1 Base Offset. For both of these 2 Delta robot geometries , an error is now forced if: $L1 + X1b - x1e > L2$ Lgx00083890
	Axis may move in opposite direction for Rotary Positive or Rotary Negative moves	An axis may move in the opposite direction specified in a MAM instruction if the following events occur at the same time: <ul style="list-style-type: none"> • The servo loop for an axis is closed by an MSO instruction. and <ul style="list-style-type: none"> • A MAM instruction (with a Move Type of Rotary Positive or Rotary Negative) is configured with Merge Enabled and is executed in the same iteration as the MSO instruction. The axis doesn't reverse the direction but instead continues moving to the programmed end point in the direction of the MAM instruction. You may also experience similar issue for a non-merged move if a MAM Instruction with Move Type Rotary Positive or Rotary Negative is followed by a MAM instruction with a rotary move in the opposite direction while the move is in progress. The axis doesn't reverse the direction but instead continues moving to the programmed end point in the direction of the first MAM. Lgx00080848, Lgx00081561

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	An MCD Instruction on Rotary Unidirectional moves with reduced deceleration may cause a Non-Recoverable Fault	<p>Your controller occasionally experiences a non-recoverable fault if the following sequence of events occurs:</p> <ul style="list-style-type: none"> • A rotary axis is programmed to move in either a positive or negative only mode in an MAM instruction. • The rotary axis is currently decelerating. • An MCD instruction is issued to stop such an axis by a programmed speed of 0. <p>A slight overshoot may result when the axis finally comes to a stop. When this axis is restarted again by another MCD , the non-recoverable fault may occur.</p> <p>Lgx00080762</p>
	An Incremental MCCM Move with Merge Enabled May Cause Error#46: Circular R1 R2 Mismatch Error	<p>Your controller occasionally sees a Circular R1 R2 Mismatch error on a merge of a MCCM instruction with:</p> <ul style="list-style-type: none"> • Circle Type = Center and Move Type = Incremental <p>or</p> <ul style="list-style-type: none"> • a Circle Type = Center Incremental and any Move Type <p>Whether the occurred error was a function of the parameters of the circle and the merge point of the circle.</p> <p>Lgx00079059</p>
	MCT not configured with a 1-to-1 Ratio can cause loss of position or axis jump	<p>You may experience a loss of position or an axis jump after coordinate transform is activated via a MCT instruction. The problem occurs if: any axes' motion are programmed and the Coordination Units Conversion Ratios of the Source and/or Target Coordinate Systems and the axes contained therein are not configured with a 1-to-1 conversion ratio and Coordinate Transforms are activated, that is, an MCT instruction has been programmed.</p> <p>The problem only occurred if the system had not been configured properly.</p> <p>Lgx00078679</p>

Corrected Anomalies

Firmware Revision	Anomaly	Description
17.02	Combination of Termination Types may cause you to miss the target position	<p>You may have missed hitting the end point of a move with Termination Type 4 or 5 (TT4/5) when it was preceded by another move with Termination Type 2 or 3 (TT2/3). See figure below as one possible combination:</p>  <p>Lgx00088549</p>

Known Anomalies

This firmware revision contains these known anomalies

Known Anomalies

Firmware Revision	Anomaly	Description
17.02	PI function block appears to stop executing as the output does not change and no instruction faults are logged.	<p>If the PI instruction is being used in Linear mode, this floating-point equation is used to calculate the ITerm.</p> $Kp \times Wld \times \frac{WldInput + WldInput_{n-1}}{2} \times DeltaT + ITerm_{n-1}$ <p>Due to the use of the single-precision floating point values, it may be possible, depending on the values of WLD and KP, for the ITerm value to be small enough, less than 0.0000001, to be lost when adding to the ITerm_{n-1}.</p> <p>For more information regarding the PI instruction, see the Logix5000 Controllers Process Control and Drives Instructions User Manual, publication 1756-RM006.</p> <p>Lgx00070832</p>
	Changes made to a timeout in the alarms system require a new download of the program to controller.	<p>To verify that the timeout change is used by the controller, you must download the program to the controller after each change to the timeout variable.</p> <p>Lgx00069461</p>

Known Anomalies

Firmware Revision	Anomaly	Description
17.02	Deleting program tags while online is successful, even though they are being referenced by RSLinx software and should not be deleted.	<p>RSLogix 5000 software and Logix5000 controller firmware provide the ability to delete program tags while online with the controller. As a precaution, the software checks the tag to verify that is not in use (that is, the tag is not being scanned or referenced) by RSLinx Classic or Enterprise software. If the tag is being used by RSLinx software, the deletion is not allowed and an error dialog box indicates "Failed to delete tag".</p> <p>However, with certain tags, the deletion is always allowed - even if the tag is being used by RSLinx software. Tag types that are always deleted, even if being used by RSLinx software include:</p> <ul style="list-style-type: none"> • Motion Axis • Motion Group • Digital Alarm • Analog Alarm • Message <p>Lgx00086136, Lgx00085678</p>
	SSV class name SerialPort, attribute PendingComDriverID, does not set.	<p>Attempting to use a SSV instruction to set the SerialPort class, PendingComDriverID attribute, is unsuccessful.</p> <p>Lgx00073954</p>
	Using an SSV instruction to set a task priority of 0 results in unexpected execution times.	<p>If you use a SSV instruction to set a task's priority at 0 (by using the class name Task, attribute Priority), abnormal task execution times result. This because tasks cannot have a priority of 0 (permissible priority values are 1...15).</p> <p>To avoid abnormal task execution times, do not use the SSV instruction to set a task's priority at 0.</p> <p>Lgx00076850</p>
	Setting the Read/Write Buffer size parameter before enabling the Echo Mode does not result in a message echo.	<p>In the User Protocol tab of the Controller Properties dialog box, if the Read/Write Buffer size is specified before Echo Mode is checked, the message echo does not execute.</p> <p>For the message echo to execute, first check Echo Mode, then specify the Read/Write Buffer size.</p> <p>Lgx00087052, Lgx00087176</p>

Known Anomalies

Firmware Revision	Anomaly	Description
17.02	Unsuccessful MSG execution results in subsequent unsuccessful messages in master/slave controller configurations.	<p>When a DF-1 serial connection is used between a master and slave controller, a MSG instruction is not successfully executed and an in-polling sequence error occurs if the master station address is not listed in the poll node list.</p> <p>However, with this anomaly, after the in-polling sequence error, subsequent MSG instructions are also unsuccessful.</p> <p>To workaround this anomaly, change the master controller's station address to a different value or re-execute the unsuccessful MSG instruction in Master Transmit mode and use the Between Station Polls parameter.</p> <p>Lgx00083882</p>
	RMPS instruction in a continuous task does not countdown.	<p>If a RMPS instruction is used in a continuous task and a Soak Time value greater than 1024 minutes is specified, the countdown (SoakTimeLeft) does not countdown and the RMPS instruction appears to stop executing. This anomaly does not occur if the RMPS is used in a periodic task or the continuous task program is run in SoftLogix 5800 or Emulator 5000 software.</p> <p>To workaround this anomaly, either:</p> <ul style="list-style-type: none"> • Use multiple soaks to achieve your total soak times greater than 1024 minutes. • Use the RMPS in periodic task that has a Period on 10 ms or greater. <p>Lgx00085036, Lgx00083654</p>
	Axis Stopping Status bit is incorrect for MAS(All) Instruction with Coordinated Motion	<p>If you execute a MAS of Type=ALL on motion that started with an MCLM instruction, the Axis.StoppingStatus bit briefly transitions to true but then transitions back to false and remains in that state until the axis comes to a complete stop.</p> <p>Lgx00085033</p>
	Multiple Absolute MAM Instructions with S curve and Merge Enabled can overshoot target position	<p>Overshoot may occur with MAM instruction with Merge Enabled if there is not enough distance until the end of the move for the programmed dynamic jerk parameters, that is decel jerk and axis decel, in the merged move.</p> <p>Overshoot may be avoided by increasing the decel jerk or not using the merge.</p> <p>Lgx00078822</p>
	Possible Velocity Spike When a MCCD Instruction is Executed	<p>Under certain application conditions, you may see a velocity spike if you are using termination type 4 or 5 with coordinated moves and you execute an MMD instruction on the last iteration of a move.</p> <p>For more information about this anomaly, see the Tech Note titled "Possible Velocity Spike When a Motion Coordinated Change Dynamics (MCCD) Instruction is Executed", #53928, in the Technical Support Knowledgebase.</p> <p>Lgx00088802</p>

Install the Controller Revision

To install the latest ControlLogix controllers revision, go to <http://support.rockwellautomation.com> to download your revision. Then use the ControlFlash utility to upgrade your controller.

Alternatively, if you have installed RSLogix 5000 software, version 16, and related firmware, you may not need to complete the tasks described. The AutoFlash feature of RSLogix 5000 software detects if your controller firmware needs upgraded upon a program download to the controller. If a firmware upgrade is necessary, AutoFlash will initiate an update.

After you have completed your firmware upgrade, you should complete these steps to verify that the upgrade was successful.

1. Cycle power to the controller.
2. Go online with the controller and view controller properties.
3. Verify that the firmware revision listed matches the firmware to which you intended to upgrade.
4. If the controller's firmware is not correct, initiate another firmware upgrade.

For more information about errors when completing a ControlFlash upgrade, see the ControlFlash Firmware Upgrade Kit Quick Start, publication [1756-QS105](#).

Additional Memory Requirements

This firmware revision may require more memory than previous revisions (for example, 10.x, 11.x). To estimate the additional memory that your project may require, use this table.

If you have this firmware revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory	
	Component	Increase/Decrease Per Instance	I/O	Data and Logic
17.x or earlier	Task	+ 4 bytes		✓
	Program	+ 4 bytes		✓
	Equipment Phase	+ 8 bytes		✓
	LD Routine	+ 12 bytes		✓
	FBD Routine	- 8 bytes		✓
	SFC Routine	+ 28 bytes		✓
	ST Routine	+ 4 bytes		✓
	Add-On Instruction	- 12 bytes		✓
	Produced Tag	+ [4 bytes + (4 bytes x number of consumers)]	✓	
	Consumed Tag	+ 8 bytes	✓	
	Tag that uses MESSAGE data type	+ 4 bytes		✓
	Tag that uses ALARM_ANALOG data type	- 64 bytes		✓
	Tag that uses ALARM_DIGITAL data type	- 28 bytes		✓
	Tag that uses AXIS_SERVO_DRIVE or AXIS_GENERIC_DRIVE data type	- 34 bytes (2 bytes x number of output cam execution targets)		✓
	Tag that uses AXIS data type other than AXIS_SERVO_DRIVE or AXIS_GENERIC_DRIVE	- 52 bytes (2 bytes x number of output cam execution targets)		✓
	Tag that uses COORDINATE_SYSTEM data type of 2 dimensions with 2 transform dimensions	+ 20 bytes		✓
	Tag that uses COORDINATE_SYSTEM data type of 3 dimensions with 3 transform dimensions	+ 108 bytes		✓

If you have this firmware revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory	
	Component	Increase/Decrease Per Instance	I/O	Data and Logic
16.x or earlier	Tag that uses ALARM_ANALOG data type (with no associated tag references)	+ 16 bytes		✓
	Tag that uses ALARM_DIGITAL data type (with no associated tag references)	+ 4 bytes		✓
	Tag that uses ALARM_ANALOG data type (if associated tags are configured for the ALARM_ANALOG tag)	+ 22 bytes + (9 x the number of configured, associated tags) + (3 x the sum of the bytes used by the data type of each of the configured associated tags) For example, an analog alarm moved to V16.03 with two Associated Tags – one DINT (4 bytes) and one STRING (88 bytes) would need to add: $22 + 9(2) + 3(92) = 316$ bytes		✓
16.x or earlier	Tag that uses the COORDINATE_SYSTEM data type	+ 132 bytes		✓
15.x or earlier	Input module	+ 4 bytes	✓	
	Produced tag	+ 12 bytes	✓	
	Consumed tag	+ 4 bytes	✓	
	Task	+ 20 bytes		✓
	Program or equipment phase	+ 24 bytes		✓
	Routine	+ 4 bytes		✓
	Tag that uses COORDINATE_SYSTEM data type	+ 748 bytes		✓
	Tag the uses any AXIS data type	+ 800 bytes		✓
	Serial port	+ 1120 bytes		✓
	Project	+ 4012 bytes		✓

If you have this firmware revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory	
	Component	Increase/Decrease Per Instance	I/O	Data and Logic
14.x or earlier	Tag that uses the COORDINATE SYSTEM data type	+ 60 bytes		✓
	Tag that uses any AXIS data type	+ 4 bytes		✓
13.x or earlier	Program	+ 12 bytes		✓
	Task	+ 4 bytes		✓
	User-defined data type	+ 4 bytes		✓
	I/O module	+ 16 bytes	✓ (8 bytes)	✓ (8 bytes)
	Produced or consumed tag	+ 8 bytes	✓	
12.x or earlier	I/O module with a comm format = Rack Optimization	+ 90 bytes		✓
	I/O module with a comm format = something other than Rack Optimization (such as a direct connection)	+ 144 bytes		✓
	CompactLogix 1769 I/O module	+ 170 bytes		✓
	Bridge module with a comm format = None	+ 160 bytes		✓
	Bridge module with a comm format = Rack Optimization	+ 220 bytes		✓
11.x or earlier	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 Not the use of that data type in tags 	+ 128 bytes		✓
	Indirect address (using a tag as the subscript for an array in an instruction, such as an Array_A[Tag_B]). This memory change applies only if the array: <ul style="list-style-type: none"> uses a structure as its data type does not use one of these data types: CONTROL, COUNTER, PID, or TIMER has only one dimension (such as UDT_1[5]) 	- 60 bytes		✓
10.x or earlier	Program	+ 12 bytes		✓
	Routine	+ 16 bytes		✓
9.x or earlier	Tag that uses the MESSAGE data type	+ 376 bytes		✓

If you have this firmware revision (add all that apply)	Then add the following memory requirements to your project			Which comes from this type of memory	
	Component	Increase/Decrease Per Instance		I/O	Data and Logic
7.x or earlier	Project	+ 1050 bytes		✓	
	Tag	+ 0.55 bytes			✓
	Message that transfers more than 500 bytes of data and targets 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 tag		+ 24 bytes		✓
	Alias tag		+ 16 bytes		✓
	Produced or consumed tag	Data type	Bytes per tag		
		DINT	4	+ 12 bytes	✓
		REAL	4	+ 12 bytes	✓
6.x	Routine	+ 68 bytes			✓
5.x or earlier	Routine	+ 116 bytes			✓

Additional Resources

These documents contain additional information concerning related Rockwell Automation products.

Resource	Description
Logix5000 Controllers Common Procedures Reference Manual, publication 1756-PM001	Contains information specific to the use of Add-On Instructions and other procedures related to programming your controller.
ControlLogix Combination Controller and SERCOS Interface Card Revision 16 Release Notes, publication 1756-RN642	Describes anomalies and enhancements related to controller revision 16.
Motion Planner, Version 16.03 Application Solution, publication RA-AP031	Describes Motion Planner enhancements made with RSLogix 5000 software, version 16.03.
Logix5000 Controllers Process Control and Drives Instructions Reference Manual, publication 1756-RM006	Contains information specific to the PI instructions.
Possible Velocity Spike When a Motion Coordinated Change Dynamics (MCCD) Instruction is Executed", ID 53928	Further describes the Velocity Spike anomaly.
ControlFlash Firmware Upgrade Kit Quick Start, publication 1756-QS105	Contains informations about firmware upgrades, installation instructions, and error messages.

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

Tech Notes and other resources are available at the Technical Support Knowledgebase, <http://www.rockwellautomation.com/knowledgebase>.

Allen-Bradley, Rockwell Automation, RSLinx Classic, RSLinx Enterprise, RSNetWorx for ControlNet, RSNetWorx for DeviceNet, RSNetWorx for EtherNet/IP, SoftLogix and TechConnect are trademarks of Rockwell Automation, Inc.

Trademarks not belonging to Rockwell Automation are property of their respective companies.

www.rockwellautomation.com

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

Publication 1756-RN655B-EN-E - July 2009

Supersedes Publication 1756-RN655A-EN-E - July 2008

PN-50865

Copyright © 2009 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.