Allen-Bradley

CompactLogix Controllers, Firmware Revision 16

Catalog Numbers 1768-L43, 1768-L45

IMPORTANT Before updating your controller, we strongly recommend that you review information pertinent to previous major firmware revisions. For example, when updating from revision 15.*x* to 16.*x*, view information for revision 15 in the CompactLogix™ Controllers, Revision 15 Release Notes, publication 1768-RN015, 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 16.06, you should view all of the information for revision 16.06…16.025 before updating to revision 16.025.

About This Publication

This publication describes enhancements and anomalies (known and corrected) for the CompactLogix controllers, revision 16.

Information that has been added or changed since the last revision of this publication is indicated by a change bar as shown to the right of this paragraph.

We strongly recommend that you review the information provided regarding previous firmware revisions. We recommend that you do so because, if you are upgrading your firmware through multiple previous revisions, all of the information specific to all of the revisions is applicable.

For example, if you need to upgrade your 1768-L43 controller from revision 16.07…16.025, all of the information specific to revisions 16.07, 16.09, 16.20, 16.21, 16.23, and 16.025 is applicable.

About Publication 1768-RN016J

This revision of the firmware release notes, 1768-RN016**J**, provides updated information specific to firmware revision 16.025 for the CompactLogix controllers.

About Previous Publication Revisions

Previous revisions of this publication included these controllers and firmware revisions.

Pub. Revision No.	Cat. No.	Major and Minor Revision No.
1768-RN016I	1768-L43 and 1768-L45	16.24
1768-RN016H	1768-L43 and 1768-L45	16.23
1768-RN016G		16.23
1768-RN016F		16.21
1768-RN016E		16.20
1768-RN016D(1)	1768-L43	16.09
1768-RN016B	1768-L43	16.07
1768-RN016A	1768-L43	16.06

(1) Publication 1768-RN016C was not released.

Information specific to previous minor firmware revisions is retained in these release notes and is identified accordingly.

Compatible Versions of Software

To use this controller revision, the following minimum software versions are required.

Software	Required Version
RSLinx® Classic RSLinx Enterprise	2.51 4.00
RSLogix™ 5000	16.00(1)
RSNetWorx™ for ControlNet	8.00
RSNetWorx for DeviceNet	
RSNetWorx for EtherNet/IP	

(1) Note that firmware revision 16.23, or later, is compatible with RSLogix 5000 software, version 16.00. However, with firmware revisions 16.23 and 16.24, the corrected anomalies and enhancements described in these release notes are available only when RSLogix 5000 software, version 16.03 or later is used.

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, then return the controller for factory repair.

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

If	Then
Your controller is close to its limits of memory	This revision may require more memory than previous revisions. To see what components of your current project require more memory, see Additional Memory Requirements on page 17.
Your controller is connected to a DH-485 network	Disconnect the controller 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 enhancement is provided with revision 16.025.

Firmware Revision	Cat. No.	Description
16.025	1768-L43, 1768-L45	Support for Series C controllers.

This table indicates enhancements provided with previous firmware revisions.

Table 1 - Enhancements Provided with Previous Firmware Revisions

Firmware Revision	Enhancement	Description
16.24	False Execution Time of Add-On Instructions Improved	With previous revisions, the false execution time of an Add-On Instruction was dependent on the number of parameters (input, output, and inout) configured for the instruction. The more parameters configured, the longer the false execution time of the Add-On Instruction. With this revision, the false execution time of an Add-On Instruction is now constant if a scan false routine is not created. To determine the false execution time of Add-On Instructions based on your controller, reference the values published in the Logix5000™ Controllers Execution Time and Memory Use Reference Manual, publication 1756-RM087. Lgx00106477
16.23	Support for Series B Controllers	Software and firmware compatible with series B controllers include: • RSLogix 5000 software, version 16.03 and later. • Controller firmware, revision 16.23 and later. **IMPORTANT** 1768 CompactLogix controllers, series B, are **not compatible with**: • RSLogix 5000 software, version 16.02 and earlier. • Firmware revision 16.21 and earlier. Attempting to use series B controllers with incompatible software and firmware can result in the following: • an inability to connect to the series B controller in RSLogix 5000 software. • unsuccessful firmware upgrades in ControlFLASH™ or AutoFlash utilities.

Table 1 - Enhancements Provided with Previous Firmware Revisions (continued)

Firmware Revision	Enhancement	Description
16.20	1768-L45 CompactLogix Controller Support	This firmware revision supports the 1768-L45 CompactLogix controller.
	Radio Modem Protocol Support	With this revision, the DF1 Radio Modem protocol, already supported by SLC™ 500 and MicroLogix™ products, has been implemented and enabled in the ControlLogix™, CompactLogix, FlexLogix™, and DriveLogix™ controllers. Legacy and Logix5000 controllers can be mixed and can support both master and slave and store and forward configurations.
	Motion Planner Enhancements	Several Motion Planner enhancements have been made and enabled by this firmware revision. For more information about Motion Planner enhancements, see the Motion Planner Application Solution, publication RA-AP031.
16.06	Add-On Instructions	With version 16 of RSLogix 5000 programming software, you can design and configure sets of commonly used instructions to increase project consistency. Similar to the built-in instructions contained in Logix5000 controllers, these instructions you create are called Add-On Instructions. Add-On Instructions reuse common control algorithms. With Add-On Instructions, you can: • ease maintenance by animating logic for a single instance. • protect intellectual property with password-protected instructions. • reduce documentation development time. For more information about using Add-On Instructions, see the Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM001.
	Logix5000 Firmware Supervisor	Use of the Logix5000 Firmware Supervisor with ControlLogix controllers and certain I/O modules enables you to program the controller to complete firmware updates by using a GSV or SSV instruction. The controller uses a firmware kit loaded on a CompactFlash card and can complete firmware updates in Program and Run modes. In GuardLogix® controllers, this enhancement is available for use with standard I/O modules.
16.06	FactoryTalk Alarms and Events Features	Alarms are now embedded in the controller with two new instructions, ALMD and ALMA, available in RSLogix 5000 software. These digital and analog alarm instructions are fully self-contained.
	Ability to Unicast Producer/Consumer Tags on EtherNet/IP Networks	Revision 16 enables you to use RSLogix 5000 software to set Producer and Consumer tag connections to Unicast. Setting the tags to Unicast decreases the network bandwidth and simplifies Ethernet switch configuration.
	Logix Date Base Changed to be January 1, 1970	The Logix real-time clock operates as a 64-bit binary number that counts microseconds from a fixed date. Prior to revision 16, the base date was January 1, 1972. Recent developments with the Common Industrial Protocol (CIP) specification have resulted in the selection of a different base date of January 1, 1970 by the Open DeviceNet Vendors Association (ODVA). With revision 16, the date base that Logix products use has been changed to bring it into alignment with the CIP specification. Additionally, in support of the changes to the real time clock, several other GSV attributes were also added: LocalDateTime, TimeZoneString, ApplyDST (daylight savings time), and DSTAdjustment. Generally, the date and time were accessed via the GSV instruction within a Logix program by using the “DateTime” attribute, which breaks down the date and time to its various components (µsec, sec, min, hour, day, month, year). Applications that use this attribute to the real time clock should not be impacted by this change. However, the time was also available in its 64-bit form by using the “CurrentValue” GSV attribute. A GSV to “CurrentValue” of wall clock was changed to the number of microseconds from the new base date. Any applications that interpreted the old 1972 64-bit number may now require a change.

Table 1 - Enhancements Provided with Previous Firmware Revisions (continued)

Firmware Revision	Enhancement	Description
16.06	EtherNet/IP Reduced Heartbeat	The Reduced Heartbeat feature reduces the rate at which heartbeat packets are sent from a device in an I/O connection or a Produced/Consumed connection. This feature preserves bandwidth in EtherNet/IP network installations. The change is automatic and requires no selection. You will notice a reduction in the packets per second used on your EtherNet/IP network for several cases including all input modules and Produce/Consume tags. **IMPORTANT** If you upgrade your Logix controller's firmware to revision 16.*x*, you must also upgrade these adapters' firmware revisions to 2.003: • 1734-AENT, POINT I/O™ EtherNet/IP adapter • 1738-AENT, ArmorPOINT™ I/O EtherNet/IP adapter Failure to upgrade your EtherNet/IP adapter firmware may impact your application if more than one Logix controller is connected to POINT I/O or ArmorPOINT I/O modules. For more information on using the 1734-AENT or 1738-AENT adapters with Logix controllers that have been upgraded to firmware revision 16.*x* or later, see: • POINT I/O EtherNet/IP Adapter Release Notes, publication 1734-RN002. • ArmorPOINT I/O Release Notes, publication 1738-RN002.
	System Overhead Time Slice	The System Overhead Time Slice (SOTS) lets you reserve a percentage of the controller processing resources for the handling of communication. Prior to this release, any unused part of the SOTS was used by the controller to resume the continuous task. This firmware revision lets you configure the unused portion of SOTS to either: • run the continuous task (default/legacy mode), allowing for faster execution of application code. • reserve it for communication, providing for more predictable and deterministic continuous task scan time. This enhancement allows the full impact of communication on the continuous task to be determined if time reserved for communication were always fully used.
	AutoFlash for sercos Drives	The functionality of the AutoFlash feature has been enhanced to allow for the Kinetix® 2000, Kinetix 6000, Kinetix 7000, 1394, Ultra™3000, and 8720MC Rockwell Automation® sercos drives to be firmware upgraded. This simplifies the software upgrade process by, in one step, upgrading firmware for the controller module, motion modules, and Rockwell Automation sercos rings when downloading the application.

Table 1 - Enhancements Provided with Previous Firmware Revisions (continued)

Firmware Revision	Enhancement	Description
16.06	Programmable Jerk Control	You can specify acceleration and deceleration jerk rates on single axis moves directly via operands in the instruction faceplate for S-curve profile motion. Jerk rates for S-curve motion can be specified as either "Units/Sec3", "% of Maximum", or a new "% of Time", letting you optimize the need for speed and smoothness. The configured maximum jerk rates are accessible programmatically via GSV/SSV instructions. Earlier revision of projects using S-curve velocity profiles will be automatically migrated forward and prepopulate the new Jerk Operands in the MAM, MAJ, and MAS instructions with default values for Jerk rate as "100% of Time".
	Home to Torque (Kinetix 2000, 6000, and 7000 drives)	Motion homing capabilities have been extended to provide two additional homing modes. • Torque Level allows the homing position to be set when a configured torque limit is reached. • Torque Level-Marker lets the homing position to be set when the configured torque limit is reached and feedback marker is detected. These capabilities allow for enhanced application flexibility by removing the need for a home switch.
	Kinetix 2000 Drive Support	The Kinetix 2000 Servo drive 230V ac family is now supported. Power range is 100 W…1.5 kW. The Kinetix 2000 drive can also be configured to operate with single-phase or three-phase power.
	Kinetix 7000 Drive Analog Input Configuration	This feature allows an analog device to be connected to the Kinetix 7000 drive analog inputs. The drive transmits to the controller an integer number with a range of -16,384...16,384 representative of the analog value. The analog values are accessible programmatically via the GSV instruction. These inputs are useful for "converting" applications with load cell (measuring web force on a roller) or "dancer" (measuring web force/position directly) that can be directly connected to the drive controlling the web.
	Configurable Power Loss Fault Action	A fault action called Phase Loss has been added for the Kinetix 6000 and Kinetix 2000 drives. This addition allows configuration of the fault action during a phase loss situation. The configurable fault actions are Shutdown (default), Disable Drive, Stop Motion, and Status Only. When the Phase Loss fault group is configured as Status Only, Logix5000 motion commands continue and the drive uses available stored dc-bus energy to operate axes. This attribute cannot be set via an SSV. For a description of user application logic needed to support this feature on Axis Modules (AMs), refer to the topic titled Phase Loss Fault-action for AM vs. IAM on Kinetix 2000 and 6000 in the Application Note section of the online help.
	Positive and Negative Rotary Move Types for MAM Instruction	Previously, the move type of the Motion Axis Move (MAM) instruction generated a directional reversal if the deceleration distance was longer than the distance between the start point and the end point. In this revision, two new rotary-move types (Rotary Negative and Rotary Positive) have been added for the MAM instruction. These two move types travel in a unidirectional path to reach the end point. The unidirectional path is continued until the end point is reached even if that means additional turns or unwinds are required.
16.06	S-curve MCS stop adjustment via Dynamics Configuration Bits	Bits for user definable configuration have been added to the COORDINATE_SYSTEM data type to allow for more adjustment to the deceleration mechanism for S-curve profile moves. The DynamicsConfigurationBits attribute allows for configuration setting for these three items: • Reduced S-curve stop delay • Reduced S-curve velocity reversal • Reduced S-curve velocity overshoot This attribute can be accessed via GSV/SSV.
	Online Changes in Output CAM Editor	Parameter values can be changed for the output CAM profile either on the grid or by using the graphical view. Insertion and/or deletion of points while in Run mode are not allowed. A new status rectangle icon has been added to the Output CAM Editor dialog to show the state of the control. The color of the rectangle is green when the controller is in Run mode, cyan while in Program mode, and gray while in the offline state.

Corrected Anomalies

These anomalies have been corrected in previous versions of controller firmware.

Table 2 - Anomalies Corrected in previous Firmware Revisions

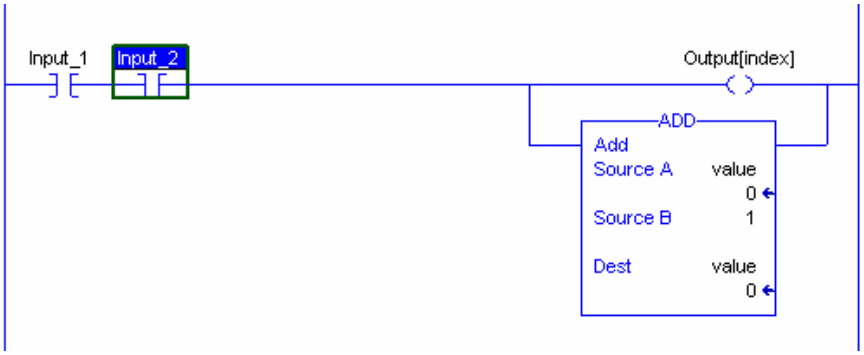
Firmware Revision	Description
16.24	A Digital Alarm (ALMD) configured to trigger when the input condition of the alarm is false does not trigger if the alarm condition is false when you conduct a download or return to Run mode. When the Condition parameter of the ALMD instruction is not set (that is, Input = 0) **and** either the program has recently been downloaded to the controller, or the controller has been changed from Run to Program and back to Run mode, the alarm is not activated (that is, the InAlarm bit is not set). These behaviors may result, depending on your application: • Programming designed to respond to the activated alarm is not executed. • Messages designed to be indicated at the operator station in response to the activated alarm are not indicated. • The alarm's history log does not indicate that the alarm was activated. If you choose not to upgrade to this revision, you must toggle the Condition parameter from set (that is, Input = 1) to not set (that is, Input = 0) to activate the alarm. If your Condition parameter is set, then the alarm activates as expected after you download or change the controller mode. Lgx000104434
	Fault handlers can be defined at the controller and program scope levels. These fault handlers are typically used to handle major recoverable faults that can occur during runtime execution of an application due to programming errors. A typical example of this would be handling indirect addressing that has gone out of range; MyTag[`index`], where `index` is larger than the size of the array. Faults can also be handled by the controller during pre-scan of the controller program on the transition to Run mode. Again, for example, the handling of indirect addressing that has gone out of range. There is an anomaly when these methods attempt to handle a fault. These are the possible ways the anomaly can manifest itself: • The controller will experience a major non-recoverable fault. I/O goes to their configured safe state, and the user application is cleared from memory. At this point, a Code 1 Type 60 or 61 major recoverable fault will be logged in the controller. This requires you to redownload the application. • Tag data corruption. • Online saving or uploading failures. • Anomalous program execution. For example, if a rung is being scanned false and there is an instruction that has false execution, the fault handler executes so the remainder of the rung will scan true. In the example below, the OTE instruction has an index out of range. After returning from the fault handler, the ADD instruction will execute, even though the rung input conditions are false.  Lgx00106481, Lgx00107423, Lgx00100766, Lgx00106478
16.23	Messages through the 1769-SDN scanner to a missing node may not report error. In rare instances, messaging to missing nodes on the DeviceNet network through the 1769-SDN scanner may complete without error. This anomaly may also result in browse messages being dropped. Lgx00086271
	Data sent to a local output module when using an Immediate Output instruction (IOT) is not received by the output module. If an IOT instruction is used to update data for a local output module, the output module does not receive the updated data. The local output module will not receive the updated data whenever the IOT instruction is scanned true. When the IOT is active, the outputs change to the state specified in the instruction and are not controlled by any other part of the program. When the IOT is inactive, outputs return to their normal state and can be controlled by other parts of the program. Lgx00089846

Table 2 - Anomalies Corrected in previous Firmware Revisions (continued)

Firmware Revision	Description
16.21	Online edits result in major non-recoverable faults (MNRFs). Causes of this anomaly include: • a controller that was or is near its limits in memory. • doing many online edits (tag additions and deletions) without downloading again. • using RSLinx Enterprise software (CPR9). When this anomaly occurs, the controller generates a major non-recoverable fault during an online edit (tag additions and deletions). I/O goes to their configured safe state, and the user application is cleared from memory. At this point, a Code 1 Type 60 or 61 major fault will be logged in the controller. This requires you to download the application again. When online edits are made to a controller, RSLinx Enterprise software (CPR9) monitors them. When a large number of edits are made to a controller, RSLinx Enterprise software (CPR9) re-optimizes communication to the controller. Two anomalies in RSLinx Enterprise software (CPR9) are aggravating factors to this controller anomaly: • The algorithm used to determine if communication re-optimization is needed causes communication re-optimization to occur too often. • When the communication re-optimizations occur, the connections to the controller should close. However, these connections do not close. This causes the controller to orphan all information related tags on scan by RSLinx Enterprise software (CPR9). You must upgrade your controller firmware and apply RSLinx Enterprise patches. The RSLinx Enterprise patches reduce the likelihood of the controller faulting and remove the excessive memory consumption. The firmware upgrade eliminates the controller major non-recoverable faults caused by this anomaly. These RSLinx Enterprise patches are on the Rockwell Automation Knowledgebase, http://www.rockwellautomation.com/knowledgebase: • RSLinx Enterprise software version 5.00 CPR9, ID number 65818 • RSLinx Enterprise software version 5.17 CPR9 SR1, ID number 65819 • RSLinx Enterprise software version 5.20 CPR9 SR2, ID number 65820 Lgx00106378, Lgx0075608
	The controller does not receive incoming connections. New connections fail to be made after some time when using a 1768-ENBT module to communicate with the controller. Established incoming communication continues to function properly, however, new connections fail. Typical anomalous behavior includes: • a red X appears over the controller when viewed using RSLinx software. • a message sent to the controller from another controller results in error 16#204 (Unconnected time out). • a consume connection errors with 16#204 (Unconnected time out). • HMIs unable to connect and connection errors occurring. The workaround was to cycle the controller power. Lgx00074973
	The Alarms and Events Buffer times out sooner than expected. The Alarms and Events Buffer, when configured to use values higher than 72 minutes, may time out sooner than configured to. The early timeout may result in the loss of some Alarm data. Lgx00077990
	Serial/DF1 connections may timeout unexpectedly. Serial connections made to the controller may timeout. Timeouts may be noticed in these situations: • If the programming terminal connection is made by using the controller serial port, the timeout results in a lost connection between RSLogix 5000 software and the controller. • If communication is configured by using the DF1 driver in RSLinx software, the events log may contain notices of errors in the connection with the controller. • Message instructions may error and display error codes 16#203 (Connected timeout) and 16#204 (Unconnected timeout). Lgx00080320

Table 2 - Anomalies Corrected in previous Firmware Revisions (continued)

Firmware Revision	Description
16.21	Continuous task continues to be scanned in Program mode. After the Logix controller has been placed into Program mode after being in Run mode (either by using the key switch or by using the RSLogix 5000 software menus), the Continuous Task may continue to be scanned as though it were still in Run mode. This issue occurs only when the System Overhead Time Slice is set to Reserve for System Tasks, for example, Communications. This issue is more likely to occur when the System Overhead Time Slice is increased (the higher the percentage, the more likely the occurrence of the issue). When the controller is switched to Program mode and the Continuous Task continues to scan, these system behaviors take place: – The RUN status indicator turns off. – The Continuous Task continues to be scanned and logic within the Continuous Task is solved. This behavior is observable in the logic window for the Continuous Task in RSLogix 5000 software. – Any computer terminals online with the controller indicate that the controller is in Program mode. – All Periodic and Event-based tasks are put into Program mode. – All I/O modules are put into and behave as in Program mode. Specifically, on output modules, output values will not update, even though the Continuous Task programming may try to update or change them. – All motion groups are put into Program mode (see the last bullet below for more information about motion behaviors). – Produced/consumed data continues to transfer. – All out-going communication (messages) are stopped. The following anomalous behaviors may result (depending on your application): • The producing controller may not be identified as being in Program mode. • Unexpected changes in outputs may occur when switched back to Run mode. • Load/Store into nonvolatile memory may not complete successfully. • Motion instructions may continue to be executed when in Program mode. Lgx00080240
16.20	Changing the controller mode from Run to Program is unsuccessful. When the controller mode is changed from Run to Program and an alarm instruction has a delivery state of In Progress, the controller does not change modes. To view the delivery state, open the Alarm Properties dialog and click the Messages tab. This anomaly may occur even when the controller is not connected to a FactoryTalk Alarm server. Lgx00075913
	Simultaneous branches in a sequential function chart may not execute at the same time or in the same scan. When executing a simultaneous branch, it may take two scans of the routine before all of the simultaneous branches execute. It does not take more than two scans for all simultaneous branches to completely execute. Lgx00075143
	During PreScan, a Major Recoverable Fault, Type 6, Code 1, occurs. Each task programmed for a Logix controller has a PreScan Watchdog of 5 seconds. You cannot change this setting in RSLogix 5000 software. The fault typically occurs when these elements are present in the program: • Add-On Instructions that use PreScan mode. • A large program with many tasks and subroutines where a majority of the application memory is used by the application code and not tags. Other elements and factors may also cause the fault, however, those listed are the most common. When the fault occurs, the PreScan Watchdog has been exceeded. With this firmware revision, the PreScan Watchdog has been increased to 60 seconds. Lgx00077337
	Use of an ACL with other ASCII Serial Port instructions may result in a Major Non-Recoverable Fault. If an ACL instruction is executed while other ASCII instructions are active, a Major Non-Recoverable Fault may occur. Lgx00076857
	Add-On Instructions yield unexpected results. When calling an Add-On Instruction, if the data types of the tags passed into or out of the instruction do not match the parameter definitions, unexpected behavior can result. In the logic of an Add-On Instruction, reading a tag of type INT can also yield incorrect results. Lgx00075524
	Digital alarms (ALMD) may prematurely report an in-alarm state. The tag InAlarm reports the alarm (InAlarm=1) before the time entered in the MinDurationPRE tag expires. Lgx00075889

Table 2 - Anomalies Corrected in previous Firmware Revisions (continued)

Firmware Revision	Description
16.20	Circular colinearity error. In addition to the circular colinearity error (44) for a coordinate system with three primary axis, we have now added the same error check for a coordinate system with two primary axes. The current error check for a three-axes system generates the error if the specified start, end, and center points are colinear in any order. However, for a two-axes coordinate system, the error is generated only if the specified points are both colinear and in this order: Start Point -> End Point -> Center Point For example, for a two-axis coordinate system with these three points: • Error 44 is generated: Start Point = (0,0) -> End Point = (10,0) -> Center Point = (20,0) • No error is generated: Start Point = (0,0) -> End Point = (20,0) -> Center Point = (10,0) Lgx00069493
	MAS IP bits may remain set if an MGS instruction is initiated. If an MGS instruction is issued while MAS-All instructions are being executed, the MAS instruction in-process bit would remain latched true. All axis motion would stop, but the MAS instructions would remain in process. Lgx00076212
	Position overshoot on velocity-limited moves. For moves with very special combinations of fast velocities, slow decelerations and distances that produced velocity-limited moves, it was possible to sometimes overshoot a programmed end point and then return to it. Lgx00069310
	Configuration of an MAS instruction for a single axis. If your program has an active MAS instruction with a StopType of All (0), Jog (1), Move (2), Gear (3), Home (4), Tune (5), Test (6), Position Cam (7), Time Cam (8), or Master Offset Move (9) and it is followed by an MAS instruction with a StopType of All (0), then the motion of the axis is not stopped. The process complete bit (.PC) for the MAS (All) instruction may appear to be set; however, the instruction is ignored by the system. To stop motion, you must configure an additional MAS instruction with a StopType of Move (2) that has the same instruction operands and execution time as the MAS instruction with the StopType of All (0). For more information, see the Advisory Information for Configuring Motion Axis Stop Instructions for an Axis with CompactLogix, ControlLogix, and SoftLogix™ Controllers technical note in the Technical Support Knowledgebase. Lgx00075962
16.09	PanelView™ Plus operator terminals utilizing the serial port to communicate with the controller will not establish communication at startup. When the application on the PanelView™ Plus operator terminal begins to initialize communication with the controller, the controller responds with packets that exceed the 500-byte packet size. The PanelView Plus operator terminal then stops attempting communication with the controller. When this occurs, data is not updated on the PanelView Plus operator terminal. Lgx00074400
	Using FFL (FIFO load) or LFL (LIFO load) instructions in the same program as an Add-On Instruction may cause the controller to experience a Major Non-Recoverable Fault. If an Add-On Instruction is executed after a FFL or LFL instruction in a given program, the internal registers are incorrectly written to and the result is a Major Non-Recoverable Fault. For the fault to occur, all of the following must be true: • The Add-On Instruction and FFL and LFL instruction must be in the same program in a Logix application. If the application has two programs defined and the Add-On Instruction is in program A and the FFL or LFL are in program B, no anomaly will be seen. • The FFL/LFL instruction must load a scalar type (SINT, INT, DINT, or REAL). If the source value is a structure, no anomaly will be seen. • The FFL/LFL instruction must be scanned before the Add-On Instruction. If the Add-On Instruction comes first in the code, no anomaly will be seen. The rung condition does not matter. If the required conditions exist, the fault will occur during prescan. Lgx00074725
16.07	Changes to RPI are not correlated between all workstations when multiple workstations are connected to the controller. If you are online with one controller from two or more workstations and you alter the RPI setting for an I/O connection on one workstation, the change in RPI does not register on the other workstations. The change in RPI registers only if the altered RPI program is uploaded from the controller by the other workstations. Lgx00070714
	LimitsInv and SelectLimitInv are swapped. In the High/Low Limit (HLL) instruction: • LimitsInv parameter is set when the SelectLimit is invalid. • SelectLimitInv parameter is set when the HighLimit and LowLimit parameters are invalid. Lgx00055977

Table 2 - Anomalies Corrected in previous Firmware Revisions (continued)

Firmware Revision	Description
16.07	Unexpected motion can happen when you home a rotary axis of a sercos drive. A rotary axis of a sercos drive can move with unexpected motion if you use a Homing Offset when you home the axis. The axis starts to move at a high speed until a position error fault happens. Once the fault happens, the axis responds with the configured fault action. For example, the default fault action is Disable Drive. In that case, the controller disables the axes and the drive stops the axes. This issue happens under this specific combination of circumstances. • The type of axis is AXIS_SERVO_DRIVE (sercos interface drive). • The Positioning mode of the axis is Rotary. • The axis has a **Homing** Offset that is near or greater than the Position Unwind value of the axis. • A Motion Axis Home (MAH) instruction executes when the axis is near its unwind position. For more information, see the Technical Support Knowledgebase, technical note ID 34404. Lgx00061613 and Lgx00056675
	MAOC instruction output remains ON when enable input is low. An Output CAM element is configured with a Latch type of Position and Enable, and Unlatch type of Position and Enable. While the CAM element is active (the output is ON) the application sets the Unlatch Position to the value of the Latch Position. The output remains ON even if the Enable Input is dropped. For more information, see Technote 37835. Lgx00069685
	In coordinated motion, a rotary axis always moves. When there is a rotary axis configured for the Coordinate System, the rotary axis makes one complete revolution even if the current command position is equal to the position in the Motion Coordinated Linear Move (MCLM) instruction. Lgx00056359
	SlaveAxis.PositionCamLockStatus is reset when master axis stops/starts quickly using a Motion Axis Jog (MAJ) instruction. When the manual jog input is cycled ON and OFF at a rapid rate, the SlaveAxis.PositionCamLockStatus gets reset and the SlaveAxis.PositionCamStatus remains set. Lgx00066064
	While an axis is accelerating and a MAS is initiated, a delay is experienced before the axis begins to decelerate to a stop. This occurs with Stop Move and Stop Jog in combination with S-curve velocity profiles. While an MAM or MAJ is accelerating, an MAS is initiated to stop it. Even though the deceleration rate is higher than the ones specified in the MAM or MAJ, the axis begins to slow at a lower rate before decelerating at the higher rate programmed in the MAS. Lgx00055080
	A Cam Profile can become locked such that an MCCP instruction can no longer update it. This anomaly may occur if an MCSV executing in an application task is interrupted by the motion task, which has a MAPC instruction currently in-process. Lgx00060994
	On a unidirectional home, the .IP bit is cleared, the AxisHomedStatus attribute is set, but the .PC bit is not set. If the home direction is unidirectional and the home offset is less than the distance to decelerated, then the axis is simply decelerated to a stop. The axis does not reverse direction to move to the home position. In this case, the .PC bit of the MAH instruction is not set. The .PC bit is set when the axis stops at the configured home position. Lgx00063431
	Processing of denormalized number exceptions causes a Major Non-Recoverable Fault. A denormalized number is any 32-bit, floating-point value that is less than $1.75494210 \times 10^{-38}$ or greater than $-1.75494210 \times 10^{-38}$, excluding zero. Denormalized numbers typically occur when very small real numbers are divided by very large real numbers. This anomaly typically occurs when the following sequence takes place. 1. The controller is handling an exception of a floating-point denormalized number in task A. 2. Then task B begins to execute and handles an exception of a floating-point denormalized number. 3. And, task B completes as task A begins again. Lgx00057774

Known Anomalies

This table lists known anomalies for firmware revision 16.

Table 3 - Known Anomalies for Firmware Revisions 16.06…16.025

Anomaly	Description
An invalid Process Variable (PV) used by a Proportional Integral Derivative (PID) instruction results in a control loss of the PV.	When an invalid Process Variable (PV) value, for example, a positive infinity (INF) or not a number (NaN), is used by the Proportional Integral Derivative (PID) instruction, the PID instruction becomes stuck and control of the PV is lost. To reset the instruction and recover control, you have to access the .Data array of the PID instruction and clear any values that are invalid. The PID instruction would then begin to control the PV. Lgx00082890
Use of an FFU instruction in an SFC program results in a major nonrecoverable fault (MNRF).	Use of an FFU instruction in an SFC program results in a major nonrecoverable fault (MNRF) when the last scan of the SFC is configured to Auto Reset. Lgx00096621
Use of FIND instruction results in a major recoverable fault (MRF)	Attempts to use the FIND instruction to search a large string of characters results in a MRF. If you attempt to use the ASCII FIND instruction to search a source-data string of 32,767 characters, or more, a major fault Type 4 Code 51 results. Lgx00094007
Carry Status flag not set as expected.	When certain values are converted from a floating-point number to an integer, the Carry Status flag (S:C) is not set as expected for the value being converted. Lgx00074175
Using an SSV instruction to set a task priority of 0 results in unexpected execution times.	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). To avoid abnormal task execution times, do not use the SSV instruction to set a task's priority at 0. Lgx00076850
Setting the WALLCLOCKTIME object may result in a Major Nonrecoverable Fault (MNRF) or an incorrect WALLCLOCKTIME value.	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. The discrepancy in the WALLCLOCKTIME may also result in a MNRF during controller power down or just after controller power has been cycled. 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. Lgx00078925
Setting the message timeout bit (.TO) causes a major nonrecoverable fault (MNRF).	Setting the message timeout bit (.TO) within the message control structure while the message is active may result in a MNRF of the controller. To avoid the MNRF, do not manipulate the message timeout bit (.TO). Instead, change the values for the unconnected timeout (.UnconnectedTimeout) and connection rate (.ConnectionRate) in the message control structure. Changing the unconnected timeout (.UnconnectedTimeout) and connection rate (.ConnectionRate) values from their defaults to smaller values causes the message instruction to error earlier and avoids the MNRF. For more information about changing the values in the message control structure, see the Logix5000 Controllers General Instruction Reference Manual, publication 1756-RM003. Lgx00098991
Produced tag updates are missed when sent by an Immediate Output instruction (IOT).	The use of an IOT instruction to send Produce Tag data in certain applications results in the consuming controllers missing that data from the producing controller. For the missed Produce Tag to occur, all of these conditions must be used in the application: 1. An IOT instruction is used to send Produce Tag data. 2. The IOT instruction is used in a Periodic Task. 3. The Consume Tag is configured at an RPI within 1 ms of the Periodic Task rate. For example, if the Periodic Task rate is configured at 4 ms, this anomaly will occur if the Consume Tag RPI is configured at 3…5 ms. The closer the Consume Tag RPI (within the 1 ms), the more likely the occurrence of this anomaly. Lgx00080446
Serial-port control structure bit RN inaccurately cleared.	This anomaly occurs when using firmware revision 16.20 or later. 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. Lgx00081063

Table 3 - Known Anomalies for Firmware Revisions 16.06…16.025 (continued)

Anomaly	Description
Use of revision 16 firmware and the controller serial port results in extended program scan times.	If you use firmware at revision 16, including revisions 16.06...16.20, 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. This anomaly only occurs when the controller serial port is used and there is no workaround. Lgx00077845
Indirectly addressing an instance tag in an Add-On Instruction results in a Major Non-Recoverable Fault.	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. See the Restrictions section on page 15 for more information about this anomaly. Lgx00077261
Motion Redefine Position (MRP) Error 13 for Positions within the range.	You may get the error "Parameter out of Range" if the MRP is executed when: Current Position + MRP Position > 2^{31}/Axis Conversion Constant. Or Current Position + MRP Position <- 2^{31}/Axis Conversion Constant. For example, assume that the: • axis conversion constant = 120,000.0 feedback counts/1.0 unit. • current command position = 17,893.0 units. If you MRP with a position of five units, which exceeds 2^{31}/Axis Conversion Constant, the MRP will error. To work around this anomaly, move the axis to a value within the acceptable range specified above. Lgx00073719
SSV of MotionGroup Average Scan Time causes a jump in scan time.	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. Lgx00071520
Axis ActualAcceleration tag is not updated for virtual axes.	For the virtual axis, the Axis_tag.ActualAcceleration does not update, but the Axis_tag.CommandedAcceleration does. The actual position of a physical axis is based on actual motor feedback, which is why the virtual Actual Acceleration tag does not update on a virtual axis. To work around this anomaly, use these command-based tags: • Virtual_Axis.CommandPosition • Virtual_Axis.CommandVelocity • Virtual_Axis.CommandAcceleration Lgx00073829
Setting invalid home sequence value via SSV instruction.	Do not attempt to program a set system value (SSV) instruction to set the home-sequence to torque or torque marker if the drive is not a sercos drive. If you do so on a non-sercos drive, any subsequent attempt to program this attribute via an SSV will produce a minor controller fault. Lgx00068281
Duration Cam - Latch and Unlatch Delays.	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. If you enter a latch delay, your application will adjust the point at which your output turns on. For example, a latch delay of 0.5 seconds will cause your output to turn on 0.5 seconds sooner and then remain on for the configured Duration time, in addition to the 0.5-second head start. However, using this example, currently, the total time your application's output remains on is being decreased by 0.5 seconds. If you enter an unlatch delay, your application will adjust the point at which your output turns off. For example, an unlatch delay of 0.5 seconds will cause your output to turn off 0.5 seconds sooner. However, using this example, currently, the total time your application's output remains on is extended by 0.5 seconds above and beyond the configured Duration time. If you execute a latch and unlatch delay for the identical value, no anomaly occurs, and the output will remain on for the configured Duration time. Lgx00068599
PI function block appears to stop executing as the output does not change and no instruction faults are logged.	If the PI instruction is being used in Linear mode, this floating-point equation is used to calculate the ITerm. $Kp \times Wld \times \frac{WldInput + WldInput_{n-1}}{2} \times DeltaT + ITerm_{n-1}$ 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 $ITerm_{n-1}$. For more information regarding the PI instruction, see the Logix5000 Controllers Process Control and Drives Instructions User Manual, publication 1756-RM006. Lgx00070832

Table 3 - Known Anomalies for Firmware Revisions 16.06…16.025 (continued)

Anomaly	Description
Changes made to a timeout in the alarms system require a new download of the program to controller.	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. Lgx00069461
The Slot Status bit for an I/O connection is slow to update if the connection is lost.	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. 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. Lgx00072697
When the SFC instruction's Last Scan of Active Steps option is set to Automatic Reset, a Major Non-Recoverable Fault occurs.	A Major Non-Recoverable Fault may occur when these elements are present in the program: • 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. 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. Lgx00072702
A function block is initiated, either directly or indirectly by an SFC instruction, when the parent step becomes active.	During the first scan of an SFC step, the Step.FS bit is set. In addition, the S:FS bit is set, which allows the logic in any associated actions to easily detect the first scan state. This behavior is useful when a subroutine that is called by multiple actions that may be connected to other steps) is used. The first scan state can be detected without programming a reference to the tag of a specific step. Many function blocks contain internal data that must be initialized before the block can be used. One of the methods a block uses to determine if it should initialize is by evaluating the S:FS bit, which the function block identifies as the first scan following a prescan. Lgx00071558
An SFC R action continues to post-scan on the specified action.	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. 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. 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. These observable behaviors may result: • 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. Lgx00069295
MCT instruction .PC bit operational but not defined.	Within an MCT instruction control word there is a default .PC bit. When the MCT instruction transitions from true to false, the .PC bit may set to 1. The MCT instruction is not intended to have operation associated with this bit and we recommend that you do not use the .PC bit in your application. Lgx00073233
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.)	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. 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. Lgx00071250
A major fault may occur during rapid power cycles.	Occasionally, when power is cycled (with specific timing), a timing parameter is not re-initialized properly. This results in an early timeout being declared in the handshake with the backplane ASIC, which precipitates a major fault condition. Lgx00077713

Restrictions

These restrictions apply to the use of CompactLogix controllers at all minor revisions of major firmware revision 16 (that is, all firmware revisions through 16.025).

Table 4 - Restrictions for Firmware Revision 16…16.025

Restriction	Description
Outputs controlled by an MAOC instruction can remain ON in some configurations.	This anomaly occurs when the output CAM ON window positions are redefined while the output controlled by the output CAM element is active. In some instances, the Motion Planner may not detect the off-crossing of the window and the output controlled by the output CAM element remains ON. This issue is applicable to any output point or virtual output controlled by an MAOC instruction. For more information, see Technote 37835.
Use of an indirectly-indexed tag within an Add-On Instruction instance tag is not accepted by the RSLogix 5000 program.	In RSLogix 5000 software, version 16.00, if you use an indirectly-indexed array in an instance tag of an Add-On Instruction, anomalous behavior may result. For example, in the instruction call `MyAOI(AOIData[Index])`, the value `[Index]` selects the `AOIData` tag element used to call `MyAOI.` The use of `[Index]` results in anomalous behavior when the program is executed. In RSLogix 5000, version 16.03 software, and controllers firmware revision 16.20, if an indirectly-indexed tag is used in an instance tag, the edit is not accepted by the program. Instead, use a directly-indexed instance tag. For example, instead of using tag `MyAOI(AOIData[Index]),` use tag `MyAOI(AOIData[2])` or similar so that the exact element of the array is directly-indexed. The program accepts directly-indexed instance tags. You may continue to use indirectly-addressed tags in Add-On Instruction parameters without anomalous behavior in RSLogix 5000 software, versions 16.00 and 16.03. Lgx00077261
Passing a User-defined Data Type (UDT) into an Add-On Instruction results in a Major Recoverable Fault or data memory corruption.	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 data memory corruption. Conditions required for Major Recoverable Fault or data memory corruption include: • A one-dimensional array tag that is based on a UDT 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. Examples: `UDT array[0].memberArray[x]` 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. `UDT array[0].memberArray[x]` 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. Lgx00077270 and Lgx00076136
An upload of an Add-On Instruction with a literal boolean input parameter modifies offline image.	When an Add-On Instruction containing a literal value for one of it's 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. 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. Lgx00077802

Install the Controller Revision

To install the latest CompactLogix controllers revision, go to http://www.rockwellautomation.com/support 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, version 16, 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

Revision 16.06 or later may require more memory than previous revisions. To estimate the additional memory that your project may require, use this table.

If you have this firmware revision	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)**
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		✓
	Tag that uses the COORDINATE_SYSTEM data type	132 bytes		✓
15.*x*	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		✓

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Logix5000 Controllers Common Procedures Reference Manual, publication 1756-PM001	Contains information specific to Add-On Instructions.
CompactLogix Controllers Revision 15 Release Notes, publication 1768-RN015	Describes anomalies and enhancements related to controller revision 15.
Motion Planner, Version 16.03 Application Solution, publication RA-AP031	Describes Motion Planner enhancements made with RSLogix 5000 software, version 16.03.
ControlLogix Combination Controller and SERCOS Interface Module Revision 16 Release Notes, publication 1756-RN642	Describes anomalies and enhancements specific to the 1756-L60M03SE Combination Controller and Sercos Interface Module.
Logix5000 Process Control and Drives Instructions Reference Manual, publication 1756-RM006	Contains information specific to the PI instruction.
Outputs Controlled by MAOC Instruction Tech Note, ID 37835	Further describes the MAOC instruction anomaly.
ControlFlash Firmware Upgrade Kit Quick Start, publication 1756-QS105	Contains informations about firmware upgrades, installation instructions, and error messages.
POINT I/O™ EtherNet/IP Adapter Release Notes, publication 1734-RN002	Further describes the firmware upgrade to 2.003.
ArmorPOINT I/O Release Notes, publication 1738-RN002	Further describes the firmware upgrade to 2.003.

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

Technotes and other resources are available at the Technical Support Knowledgebase, http://www.rockwellautomation.com/knowledgebase.

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support, you can find technical manuals, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools. You can also visit our Knowledgebase at http://www.rockwellautomation.com/knowledgebase for FAQs, technical information, support chat and forums, software updates, and to sign up for product notification updates.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect℠ support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

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

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

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 NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, 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 1768-RN016J-EN-E - February 2013 PN-188538
Supersedes Publication 1768-RN016I-EN-E - February 2010