Allen-Bradley

1769 CompactLogix Controllers, Revision 17

Catalog Numbers 1769-L31, 1769-L32C, 1769-L32E, 1769-L35CR, 1769-L35E

IMPORTANT Before updating your controller, 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 CompactLogix™ Controllers, Revision 16 Release Notes, publication 1769-RN016, 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 16.03, and not the last minor revision, 16.21, you should view all of the information for revision 16.03…16.21 before updating to revision 17.*x*.

CompactLogix Controllers, Revision 16 Release Notes, publication 1769-RN016, are available at http://www.rockwellautomation.com/literature.

About This Publication

This publication describes enhancements and anomalies (known and corrected) for CompactLogix controllers, revision 17.

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 1769-L35E controller from revision 16.07...17.012, all of the information specific to revisions 16.07, 16.09, 16.20, 16.21, 17.03, 17.04, and 17.012 is applicable.

About Publication 1769-RN017

This revision of the firmware release notes, 1769-RN017, provides updated information specific to firmware revisions 17.012, 17.05, 17.04, 17.03, and 17.02 for all 1769-L3*x* CompactLogix controllers.

Compatible Versions of Software

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

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

Before You Begin

Consider this information before upgrading your controller firmware.

Continue to Use Care, Despite Changes with This Revision

While improvements to the controller firmware and the ControlFLASH™ software interface have been made to help avoid potential firmware upgrade issues, you still need to complete firmware upgrades with care.

For more information about enhancements made to the firmware for increased stability during an upgrade, see the Enhancements section of these release notes on page 5.

Avoid Interrupting the Firmware Upgrade

IMPORTANT

When upgrading your packaged controller firmware, it is **extremely** important to allow the upgrade to complete without interruption.

If you interrupt the firmware upgrade either in the software or by disturbing the physical media, you may render the controller inoperable.

During an upgrade of the CompactLogix firmware, the ControlFLASH utility displays various progress dialog boxes. The progress dialog boxes contain these status statements:

- Transmitting block…
- Polling for power-up…

It is crucial that you do not interrupt the firmware upgrade while these progress statements are displayed. Once the Update Status dialog box indicates that the firmware upgrade is complete, you may adjust your controller's network connection, make changes by using controller-related software, or cycle controller power.

For more information about upgrading your CompactLogix controller firmware, see information posted at http://www.rockwellautomation.com/knowledgebase/.

Avoid a Loss of Communication during the Firmware Upgrade

IMPORTANT

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

- Cycle controller power with the battery disconnected for 2…3 minutes, then successfully complete the upgrade.
- If a nonrecoverable fault occurs, then return the controller for factory repair.

Use the End Cap Properly

Verify that the end cap is attached and locked before upgrading your controller firmware. Failure to attach and lock the end cap may result in a failure of the firmware upgrade.

System Preparations Required before Upgrading

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 page 19. • 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 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.
You are attempting to upgrade the firmware on a 1769-L32E or 1769-L35E controller to revision 17	We recommend that you complete the following tasks before attempting a controller firmware upgrade: • First, check the status of the MS (module status) status indicator next to the Ethernet port. If it is flashing red before you begin the upgrade, additional action may be required. Contact Rockwell Automation Technical Support for more information. • Modify the Port Configuration for the Ethernet card so that the Network Configuration Type is set to Static and assign a valid IP address. • If RSWho is actively browsing the controller through an Ethernet or serial connection, close the RSWho window to stop the browse. • If other controllers are messaging to the 1769-L32E or 1769-L35E controller, take the other controllers off the network or put them in Program mode. • If there are controllers consuming tags from the 1769-L32E or 1769-L35E controller, remove them from the network. • If there are HMI devices connected to the controller, disconnect them from the network or shut them down. **IMPORTANT** If you cannot perform the tasks listed above before attempting a controller firmware upgrade, Ethernet traffic on the controller's Ethernet port may cause the ControlFLASH utility to timeout during the firmware upgrade. If the timeout condition is not handled properly, you may render the Ethernet port on the controller inoperable, requiring you to return the controller to Rockwell Automation for repair. In the event that a ControlFLASH timeout occurs, the software displays an error dialog indicating that the 'Target Device failed to report the new revision number', or that the upgrade 'Failed to begin update to the target device'. If the error dialog boxes display, check the MS status indicator. If the indicator is flashing red, the upgrade is still in progress and should not be interrupted. Do not cycle power to the controller while the status indicator is flashing red. If the upgrade completes, the controller power cycles itself and indicates the upgrade is complete with a solid green MS status indicator. The time required to complete the upgrade is dependent on the level of Ethernet traffic. If the controller does not complete the upgrade, the MS status indicator continues flashing red. In this case, contact Rockwell Automation Services and Support.

Enhancements

This enhancement is provided with revision 17.012.

Table 1 - Enhancements with Revision 17.012

Firmware Revision	Cat No.	Description
17.012	1769-L32E, 1769-L35E	Support for Series B controllers.

These enhancements have been provided with previous firmware revisions.

Table 2 - Enhancements with Previous Firmware Revisions

Firmware Revision	Enhancement	Description
17.05	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. Lgx00101630, Lgx00091647, Lgx00085092
17.02	Amount of time required to complete a firmware upgrade is reduced	We have reduced the amount of time it takes a firmware upgrade to complete by increasing the packet size of data that can be transferred to the controller during the firmware upgrade. Lgx00081591
	Increased firmware upgrade stability	With this firmware revision, changes to the firmware have been made in order to increase the stability of the controller in the event of a problem during the firmware upgrade. One observable aspect of this enhancement is the controller's ability to handle some errors that may occur during an upgrade. If an error occurs during your firmware upgrade, in some cases, the controller may revert to boot firmware, that is firmware revision 1.*x*. To determine if your controller has reverted to boot firmware (revision 1.*x)*, cycle power to the controller, then go online with it to determine the current firmware revision. If it is at revision 1.*x,* your controller is still operable and you can attempt to upgrade your firmware again. If you are unable to go online with the controller after the firmware upgrade error, contact Rockwell Automation Technical Support.

Table 2 - Enhancements with Previous Firmware Revisions

Firmware Revision	Enhancement	Description
17.02	Advanced Process Control Instructions	Three new instructions targeted for process applications have been added. The new instructions are: • 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 by using up to three control variables. Instructions need to be purchased separately and licensed per use. The catalog numbers and associated use types are: • 9324-RLDAPCENE – Provides a license to use the instructions in RSLogix 5000 software and provides a license to use them in a single Logix controller. • 9324-RLDAPCCLENE - Provides a license to use the instructions in an additional controller, pay-to-deploy.
	Runtime Partial Import	You can now import programs, equipment phases, routines, rungs, and new Add-On Instructions into a running system. 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.
	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 revision 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. Revision 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	Status information can be included with produced and consumed tags. 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.(1)

(1) Note that RSNetWorx software, version 9.00.00 or later, is required when scheduling a ControlNet network that has Produced/Consumed tags with status.

Corrected Anomalies

These anomalies have been corrected in previous firmware revisions.

Table 3 - Anomalies Corrected in Previous Firmware Revisions

Cat. No.	Revision No.	Anomaly	Description
769-L31, 1769-L32C, 1769-L32E, 1769-L35CR, 1769-L35E	17.07	Under certain power-cycling conditions, when the on and off times of the controller are typically 10 seconds or less, the controller can power up with no program loaded. The controller will be in one of two states.	• The OK and DCH0 status indicators will be green and the others will be off. • The OK status indicator will be blinking red, the DCH0 status indicator will be green, and the others will be off. The controller will have logged a Type 1 Code 60 major recoverable fault. When attempts are made to upload debug information from the controller, no information can be uploaded. To recover, redownload the application. Lgx00112776, Lgx00112878, Lgx00112879
1769-L31, 1769-L32C, 1769-L32E, 1769-L35CR, 1769-L35E	17.05	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 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 a download or change to the controller mode. Lgx000104437, Lgx00102840
1769-L31, 1769-L32C, 1769-L32E, 1769-L35CR, 1769-L35E	17.05	Online edits result in major nonrecoverable 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 nonrecoverable 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 nonrecoverable 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 Lgx00096513

Table 3 - Anomalies Corrected in Previous Firmware Revisions (continued)

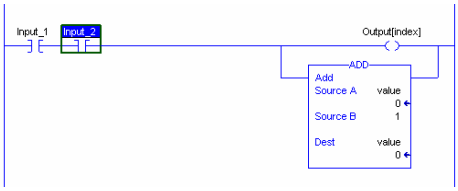
Cat. No.	Revision No.	Anomaly	Description
1769-L31, 1769-L32C, 1769-L32E, 1769-L35CR, 1769-L35E	17.05	Fault handlers can be defined at the controller and program scope levels.	These fault handlers are typically used to handle major recoverable faults that can occur during runtime execution of an application 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 nonrecoverable 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.  Lgx00106482, Lgx00104782, Lgx00097014
1769-L31, 1769-L32C, 1769-L32E, 1769-L35CR, 1769-L35E	17.04	Outputs remotely located via a network may not go to their predefined PROGRAM mode state on a change out of RUN mode	When a controller changes from RUN mode to a non-RUN mode state, that is to PROGRAM mode or a **recoverable** faulted state, the controller's outputs may not transition to their predefined PROGRAM mode state. Any of the following transitions from RUN mode to a non-RUN mode may cause this anomaly to occur: • 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. If your experience a major **nonrecoverable fault** on your controller, the controller's outputs will transition to their predefined fault mode state. Lgx00099405
	17.04	The CONNECTION_STATUS.RunMode indication in a Produced tag may not indicate correctly.	When using Produced/Consumed tags with CONNECTION_STATUS, the CONECTION_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. Lgx00099405
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.03	A motion group-synchronization error occurs in applications that use a virtual axis. The error displays after controller power is cycled and motion instructions are executed.	This anomaly may be observed in 1769-L3*x* applications where a virtual axis is used and a motion instruction is carried out either by the program or by a Motion Direct Command. This anomaly may occur with these actions: 1. The 1769-L3*x* controller is set as the Coordinated System Time (CST) master. 2. Controller power is cycled. 3. Any motion instruction is executed via programming or a Motion Direct Command. 4. When the motion instruction attempts to execute, an error displays indicating that the 'Motion Group is not in the Synchronized State (err 19D or 0013H)'. Upon further troubleshooting, if the CST master property of the controller is unchecked and applied, then checked and applied, motion instructions can be executed properly. This firmware revision corrects this anomaly by synchronizing the CST upon powerup if the controller is set to be the CST master. Lgx00093619

Table 3 - Anomalies Corrected in Previous Firmware Revisions (continued)

Cat. No.	Revision No.	Anomaly	Description
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.02	Setting the message timeout bit (.TO) causes a major nonrecoverable fault (MNRF).	Setting a message timeout bit (.TO) in the message control structure while the message is active may result in a MNRF on the controller. To avoid causing a MNRF, do not change the message timeout bit (.TO). Instead, change the values for the unconnected timeout (.UnconnectedTimeout) and connection rate (.ConnectionRate) in the message control structure. For more information about changing the values in the message control structure, see the Logix5000 Controllers General Instruction Reference Manual, publication 1756-RM003. Lgx00098991
1769-L31	17.02	A 1769-L31 controller firmware upgrade fails if configured at 38,400 bps or higher.	When upgrading firmware on a 1769-L31 controller, if the serial DF1 driver is configured to operate at a baud rate higher than 19,200 bps, the upgrade may fail. If an upgrade fails, you must cycle power to the controller, reset the baud rate to 19,200 bps, and initiate a new upgrade. Lgx00070538
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.02	Changing the configuration of an 1769-HSC module results in a Major Nonrecoverable Fault.	If the configuration of a 1769-HSC module is altered either by editing the module configuration and re-downloading the project, or, by using a MSG instruction to change a configuration parameter, the controller and the 1769-HSC module fault. The Major Nonrecoverable Fault (MNRF) is logged in the Major Faults tab of the controller's Properties dialog box. The fault is also indicated by the controller's OK and I/O status indicators being red or flashing red and the 1769-HSC module's OK status indicator being steady red. With this anomaly correction, changes to the1769-HSC module's configuration does not result in a MNRF. Lgx00077949, Lgx00080933
		When the nonvolatile restore option is set to load On Corrupt Memory, the program may not restore.	This anomaly typically occurs with new controllers or controllers that register a Major Nonrecoverable Fault. If the nonvolatile restore option is set to load On Corrupt Memory and a corrupt memory condition is detected, the controller program may not be restored. Lgx00064843
		Cycling CompactLogix controller power results in large quantities of minor faults.	Conducting a power cycle of the CompactLogix controller may result in a high quantity of minor faults that read, 'Serial Port Unable to Keep Up with Incoming Data'. The number of minor faults logged may be in the thousands, though the functionality of your CompactLogix controller and execution of the program are not affected. This anomalous behavior results from enhancements made to serial port functions in revision 16 firmware and with this correction, the minor faults no longer occur. Lgx00077829, Lgx00063117
1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR		Specifying an invalid channel in an ASCII instruction results in a major nonrecoverable fault.	When channel 1 is specified in an ASCII instruction (ABL, ACB, ACL, AHL, ARD, ARL, AWA, or AWT) where no channel 1 exists on the controller (that is, any CompactLogix controller except for the 1769-L31 controller), a Major Nonrecoverable Fault (type 1, Code 60) occurs. With this correction, if an ASCII instruction has an invalid channel specified for the controller in use, a minor error is logged. Lgx00080688

Table 3 - Anomalies Corrected in Previous Firmware Revisions (continued)

Cat. No.	Revision No.	Anomaly	Description
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.02	Firmware upgrades using the ControlFLASH utility are unsuccessful if the CompactFlash card is removed.	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. Reinserting the CompactFlash card restores the ability to upgrade firmware. Lgx00073863
		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
		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 16.02…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. 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. Lgx00077845
		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 faster than the 9 seconds, use the GSV instruction to monitor the entry status of the connection as it updates faster than the SlotStatusBit. Lgx00072696
		When the SFC instruction's Last Scan of Active Steps option is set to Automatic Reset, a Major Nonrecoverable Fault occurs.	A Major Nonrecoverable 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 contain Simultaneous Branches. • The Last Scan of Active Steps option (specified in the SFC Execution tab of the controller Properties dialog box) is set to Automatic Reset. To avoid a Major Nonrecoverable Fault when these elements are present, set the Last Scan of Active Steps to Don't Scan or to Programmatic Reset. Lgx00072702
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.02	An SFC R action continues to post-scan on the specified action.	This anomaly occurs if the SFC Last Scan of Active Steps option is set only 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 keep 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
		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

Table 3 - Anomalies Corrected in Previous Firmware Revisions (continued)

Cat. No.	Revision No.	Anomaly	Description
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.02	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 memory corruption. These conditions are required for Major Recoverable Fault or data memory corruption: • 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). 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 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 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
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.02	Acknowledging an analog or digital alarm does not clear the alarm's unacknowledged (InAlarmUnack) tag.	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). This anomalous behavior occurs with both digital (ALMD) and analog (ALMA) alarms. Lgx00081999
		Writing 483 SINT values to another controller by using a MSG instruction causes an error.	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). Lgx00057515
		Message errors may occur when using a CIP data table read or write message.	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). Lgx00083193
		Attempts to rename Alias tags for bits within in a DINT referenced by an HMI are unsuccessful.	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. Lgx00079805
		Use of certain Function Block instructions causes various minor faults.	The use of these Function Block instructions may result in various minor faults when your program executes; BAND, BOR, BNOT, BXOR, CTUD, D2SD, D3SD, DFF, JKFF, OSFI, OSRI, RESD, SETD, TONR, TOFR, RTOR, and OSC. The minor faults result because the Overflow status flag (S:V) is set each time an instruction listed above is carried out. Lgx00045364, Lgx00028500
		Nested SFCs, when configured to Automatic Reset, are prescanned rather than postscanned.	Normally, if in an SFC where the configuration of the last scan is set to Automatic Reset, 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. With this anomaly, if an action in the SFC contains a JSR to another SFC, the suburoutine is prescanned rather than postscanned (that is, the incorrect scan mode is set). Many instructions, especially motion instructions, remain inactive during a postscan, but re-initialize during a prescan. Lgx00086725

Table 3 - Anomalies Corrected in Previous Firmware Revisions (continued)

Cat. No.	Revision No.	Anomaly	Description
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	17.02	The SPCascadeInv value of a PIDE instruction is set any time SPCascade exceeds the SP limits.	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. Lgx00065664
		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 by 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
		Totalizer (TOT) instruction may continually remain in Program mode.	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. Lgx00077908
		Serial messages broadcast from a master controller to station address 255 results in other messages failing.	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. Lgx00079116

Known Anomalies

This table lists known anomalies for CompactLogix controllers at all minor revisions of major 17.

Table 4 - Known Anomalies with Firmware Revisions 17.02…17.012

Cat. No.	Anomaly	Description
1769-L32E, 1769-L35E	Use of the controller within Ethernet connection limits, but at or near maximum limits, may result in No Buffer Memory, error code 0x301.	If you are upgrading from an earlier firmware revision, and have previously used your controller at, or very near, the maximum Ethernet connection limits with produced/consumed tags, upgrading to firmware revision 17 may cause you to experience over-connection limit errors. This anomaly will only be experienced if your configured RPI rates are not binary multiples of 2 ms. This is because the CompactLogix controllers round the RPI down to the nearest binary multiple to make connections (for example, setting an RPI of 100 ms results in the controller sending data at 64 ms). If you are updating your controller and experience this anomalous behavior, adjust the RPI of controllers consuming data from the CompactLogix controller until the RPI rates are within the capabilities of the controller. In addition, determine which communication module has exceeded the connection limit and adjust its RPI accordingly. Lgx00087882

Table 4 - Known Anomalies with Firmware Revisions 17.02…17.012 (continued)

Cat. No.	Anomaly	Description
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	Clearing a fault results in program loss.	After clearing a fault due to a missing I/O module and cycling power to the CompactLogix controller, the program is lost from controller memory and no fault is logged.
	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
	The Modular Multivariable Control (MMC) instruction may not use the second or third control variable (CV).	The Modular Multivariable Control (MMC) instruction may not use the second or third control variable (CV) parameters to achieve the process variable (PV) setpoint when certain limits are specified for the CV. In applications where the MMC function block is used to control one PV through manipulation of up to three CVs, only the first CV is manipulated by the instruction if the CVxEUMax, CVEUMin, CVxHLimit, and CVxLLimit input parameters for the first CV are set at conflicting values. These input parameters conflict when the CVxHLimit or CVxLLimit keeps the CV clamped at a value inside the range specified with the CVxEUMax and CVxEUMin parameters. If the CV does not extend outside the CVxEUMax and CVxEUMin parameters, the second and third CVs of the MMC instruction are not used to manipulate the PV. Lgx00100721, Lgx00091924
	Using an SSV instruction to set the WallClockTime causes a fault.	Setting the WallClockTime to an invalid value by using an SSV instruction results in a Major Nonrecoverable Fault (MNRF). Lgx00097399
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	Use of a 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
	Use of STOD instruction when upgrading from revision 16 cause a scan time increase.	Use of an STOD instruction and a program upgrade from revision 16 to revision 17 results in the program-scan time increasing. When an STOD is used in an application that has been upgraded from revision 16 to revision 17, the program scan time dramatically increases due to an anomaly correction made to the STOD instruction in revision 17. Lgx00102980
	Use of a FFU instruction in an SFC program results in a major nonrecoverable fault (MNRF).	Use of an FFU instruction in a SFC program results in a major nonrecoverable fault (MNRF) when the last scan of the SFC is configured to Auto Reset. Lgx00096621
	Partial import of a project developed and run on a SoftLogix™ controller causes fault.	Completing a partial import of a project developed and run on a SoftLogix controller causes a Major Nonrecoverable Fault if certain instructions are used in the program. A Major Nonrecoverable Fault occurs on the controller when a program is developed and run on a SoftLogix controller, and then a partial import online is completed to a Logix5000 controller while the Logix5000 controller is in Run mode (online). A Major Nonrecoverable Fault occurs if the imported project contains these instructions: • Coordinated Control (CC) • Internal Model Control (IMC) • Modular Multivariable Control (MMC) The Major Nonrecoverable Fault occurs after the partial import is completed and the edits to the program are finalized. Lgx00103562

Table 4 - Known Anomalies with Firmware Revisions 17.02…17.012 (continued)

Cat. No.	Anomaly	Description
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	Using a SFC Reset (SFR) to a step that is not the initial step cause the program to stay at the reset step.	When an SFC Reset (SFR) instruction that is executed specifies a target step that is not the initial step, and the step is anywhere below (but outside) a simultaneous branch, the chart will no longer execute. The chart will remain in the step it was reset to, and attempts to progress via a Transition, Force, or Step Through are unsuccessful. To begin executing the chart again, you must execute an SFR instruction to the initial step or to a step above the first simultaneous branch. Lgx00099805
	Interrupted service communication during a connection closure causes a fault.	Depending on the structure of your program, if your service communication is interrupted for longer than 300 ms (as determined by the System Overhead Time Slice setting) and a connection is in the process of closing, a major nonrecoverable fault (MNRF) may result. The connection that is closing could be a connection used for I/O, a message instruction, a forward open, and so on. Lgx00101330
	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
	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 4 - Known Anomalies with Firmware Revisions 17.02…17.012 (continued)

Cat. No.	Anomaly	Description
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	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
	Deleting program tags while online is successful, even though they are being referenced by RSLinx software and should not be deleted.	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 RSLinx 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'. 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: • Motion Axis • Motion Group • Digital Alarm • Analog Alarm • Message Lgx00086136, Lgx00085678
	SSV class name SerialPort, attribute PendingComDriverID, does not set.	Attempting to use a SSV instruction to set the SerialPort class, PendingComDriverID attribute, is unsuccessful. Lgx00073954
	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 Read/Write Buffer size parameter before enabling the Echo mode does not result in a message echo.	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. For the message echo to execute, first check Echo mode, then specify the Read/Write Buffer size. Lgx00087052, Lgx00087176
1769-L31, 1769-L32E, 1769-L32C, 1769-L35E, 1769-L35CR	Unsuccessful MSG execution results in subsequent unsuccessful messages in master/slave controller configurations.	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. However, with this anomaly, after the in-polling sequence error, subsequent MSG instructions are also unsuccessful. 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. Lgx00083882
	RMPS instruction in a continuous task does not countdown.	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 RSLogix Emulate 5000 software. To workaround this anomaly, either: • use multiple soaks to achieve your total soak times greater than 1024 minutes. • use the RMPS in periodic task that has a Period of 10 ms or greater. Lgx00085036, Lgx00083654

Restrictions

These restrictions apply to the use of CompactLogix controllers at all minor revisions of major firmware revision 17.

Table 5 - Restrictions With 17.*xx*

Restriction	Description
Attempting a firmware upgrade without the controller end cap attached does not complete.	When upgrading your controller firmware, verify that your controller end cap is properly attached and locked. If you attempt to upgrade without the end cap attached, your firmware upgrade may not complete successfully. Lgx00085396, Lgx00085396
The controller faults if power to any one I/O bank's power supply is interrupted.	If you are using banks of I/O with your CompactLogix controller and the power supplies of either the second or third bank is disconnected, the OK, MS, and CompactFlash status indicators turn steady red and the controller goes into Reset mode. Upon reapplication of power to the I/O bank, the controller status indicators return to their normal operating states and the controller program begins executing again. Lgx00086647

Known Issues

These sections describe known issues associated with this controller firmware revision that may affect the use of your controller.

Controller Bridging via Serial Ports (1769-L31 controller only)

With a 1769-L31 controller, you cannot bridge from one serial port to the other. However, you can bridge from either serial port to a DeviceNet network via the 1769-SDN scanner.

VA Task Overlap (all 1769 CompactLogix controllers)

Tasks are the basic scheduling mechanism for executing a program and are created as part of the project and program creation process. In addition to other internal tasks, the CompactLogix controllers have an internal task to provide communication with the 1769 I/O modules. This task executes periodically at the Requested Packet Interval (RPI) selected in the properties of the CompactBus. If the task has not completed before it is time to execute again, a task overlap occurs. This task overlap causes the controller to declare a minor fault of Type = 6 (Task Overlap), Code = 4 (VA task).

You can use various strategies to resolve minor faults due to task watchdog timeout and/or task overlap. For more information, see RSLogix 5000 Online Help 'Identifying and Managing Tasks'. In the case of a minor fault caused by VA task overlap, increase the RPI until the overlap no longer occurs.

Major Fault Related to 1769 I/O Requires Power Cycle to Clear (all CompactLogix controllers)

If a 1769 I/O fault occurs, you must cycle power to the CompactLogix controller after clearing the major fault. I/O communication is not restored until after the power cycle. You should never use the fault handling routine to clear local I/O faults. You should clear local I/O faults manually on a per case basis, and then the controller should be power cycled.

Fault/Program Action Feature Not Enabled (all CompactLogix controllers)

When 1769 CompactLogix I/O modules are used as local I/O modules in a CompactLogix system, the CompactLogix controller does not support the ability to trigger the Fault/Program Action features, even though you can configure these options in RSLogix 5000 software via the Module Properties dialog box.

If a local I/O module loses communication with the controller, or, the controller is placed in Program mode, the local I/O modules turn their outputs off - regardless of the configuration specified in the Fault/Program Action tab.

In addition, RSLogix 5000 software creates tags for modules when you add them to the I/O configuration. The 1769 module tags define configuration (C) data type members that may include attributes for alternate outputs (that is, Fault or Program output states).

Because the CompactLogix system does not provide support for local modules to use the alternate outputs, do not configure the attributes or tags listed below.

Table 6 - Attributes and Tags To Avoid

For Digital Output Modules	For Analog Output Modules
• ProgToFaultEn • ProgMode • ProgValue • FaultMode • FaultValue	• CHxProgToFaultEn • CHxProgMode • CHxFaultMode • Where CHx = the channel number

Lgx00086275

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 17, and related firmware, you may not need to complete the tasks described. The AutoFlash feature of RSLogix 5000 software, version 17, 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		(memory requirements) That come 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		✓
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		✓

If you have this firmware revision (add all that apply)	Then add the following memory requirements to your project		(memory requirements) That come from this type of memory	
	Component	**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**
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		✓
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		✓

Additional Resources

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

Resource	Description
Logix5000 Controllers Common Procedures Reference Manual, publication 1756-PM001	Lists related Logix5000 publications.
CompactLogix Controllers Revision 16 Release Notes, publication 1769-RN016	Describes anomalies and enhancements related to controller revision 16.
Logix5000 Controllers Process Control and Drives Instructions Reference Manual, publication 1756-RM006	Contains information specific to the PI instruction.
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://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.

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.

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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/.

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