Allen-Bradley

1768 CompactLogix Controllers, Revision 20

CompactLogix Catalog Numbers 1768-L43, 1768-L45

Compact GuardLogix Catalog Numbers 1768-L43S, 1768-L45S

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IMPORTANT

Consider the following before upgrading the firmware on your Logix5000™ controller:

- Before updating your controller, we strongly recommend that you review information pertinent to previous major firmware revisions. For example, when updating from revision 18.*x* to 20.*x*, view information in the following publications:
  - 1768 CompactLogix™ Controllers, Revision 18 Release Notes, publication 1768-RN018
  - 1768 CompactLogix Controllers, Revision 19 Release Notes, publication 1768-RN019

  Firmware release notes contain material for all minor revisions subsequent to each major revision. If your controller, for example, is at revision 18.11, and not the last minor revision, 19.11, you should view all of the information for revisions 18.11...19.11 before updating to revision 20.*x*.

  Release notes are available at: http://www.rockwellautomation.com/literature.
- After upgrading the firmware on your module, we strongly recommend that you **retest and/or validate your application offline before going online.**

About This Publication

This publication describes enhancements and anomalies (known and corrected) for 1768 CompactLogix and Compact GuardLogix® controllers, firmware revisions 20.012 and 20.011.

Information that has been added or changed since the last revision of this publication is indicated by a change bar as shown to the side of this paragraph. In addition to information specific to the most recent firmware revision, the information from previous minor revisions is retained in these release notes.

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-L4*x* controller from revision 20.011...20.012, all of the information specific to revisions 20.011 and 20.012 is applicable.

About Publication 1768-RN020B-EN-P

This revision of the firmware release notes, 1768-RN020**B**, provides updated information specific to firmware revision 20.012 for all CompactLogix controllers. The controllers and catalog numbers included in firmware revision 20.012 are listed in this table.

Table 1 - Controllers and Firmware Revisions Identified in Publication 1768-RN020B

Cat. No.	Major and Minor Revision No.
1768-L43	20.012
1768-L45	
1768-L43S	
1768-L45S	

About Publication 1768-RN020A-EN-P

This revision of the firmware release notes, 1768-RN020**A**, provides updated information specific to firmware revision 20.011 for all CompactLogix controllers. The controllers and catalog numbers included in firmware revision 20.011 are listed in this table.

Table 2 - Controllers and Firmware Revisions Identified in Publication 1768-RN020A

Cat. No.	Major and Minor Revision No.
1768-L43	20.011
1768-L45	
1768-L43S	
1768-L45S	

Compatible Software Versions

To use firmware revision 20.012, these minimum software versions are required.

Table 3 - Compatible Software Versions

Software	Required Software Version, Min
Compare Tool	3.20.02
ControlFLASH™	11.00.00
FactoryTalk® AssetCentre	4.00.00 (CPR 9, SR3)
FactoryTalk Services Platform	2.50.00 (CPR 9, SR5)
FactoryTalk Activation	3.50.00 (CPR 9, SR5)
RSLinx® Classic	2.59.01 (CPR 9, SR5)
RSLinx Enterprise	5.50.04 (CPR 9, SR5)
RSLogix™ 5000	20.01.00 (CPR 9, SR5)
RSNetWorx™ for ControlNet	11.00.00 (CPR 9, SR5)
RSNetWorx for DeviceNet	
RSNetWorx for EtherNet/IP	

For system requirements, go to http://www.rockwellautomation.com/rockwellsoftware/design/rslogix5000/sysreq.html.

Before You Begin

Before you upgrade your firmware, consider the following.

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

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

These preliminary actions are required before upgrading your controller firmware.

Table 4 - Before You Begin

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 17. • 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 need 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.

Enhancements

These enhancements are available when firmware revisions 20.012 and 20.011 are used with RSLogix 5000 software, version 20.00.00 or later.

Table 5 - Enhancements with Firmware Revision 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	Security To enhance system and device-level security in systems that use our products, Rockwell Automation prescribes validated, defense-in-depth measures and design practices to enhance system and device-level security. For the latest information on security solutions and enhancements, visit http://www.rockwellautomation.com/solutions/security.
	Automatic Device Configuration for Drives This feature supports the automatic device replacement functionality for drives. This makes it easier to perform quick, efficient drive replacement without requiring any laptop, software, or user intervention aside from wiring in the new drive and setting a network address. Previously, device configuration data for PowerFlex® drives was kept in the ACD file and had to be manually managed via the AOP of the device. Now, when a module is replaced, the controller will automatically send it to the configuration data.Always supported by Sercos and CIP motion drives. Version 20 extends ADC support to the PowerFlex 755 drives.
	Electronic Data Sheet AOP This feature allows select devices that have properly configured EDS sheets to integrate directly with Logix without the need for a device profile. This improves the flexibility of the Integrated Architecture™ by providing a richer integrated experience to more devices.
	Finding/Adding Devices to the Logix Tree Enhancements to the Select Module dialog box make it easier to use and find devices. The Select Module dialog box now shows all registered devices. It also includes new string and category filters, a wildcard search, and a favorites list.
	Unicast Support for Safety I/O Unicast became the standard communication format for EtherNet/IP I/O in version 18 of RSLogix 5000 software. Version 20 of RSLogix 5000 software now allows Logix controllers to communicate with Safety I/O via unicast.
	MDSC – Master Driven Speed Control MDSC allows time based moves to be driven by position or velocity information instead of time. The external input can be any virtual or physical axis. There are several move types that can now be driven by position: MAM (motion axis move), MAJ (motion axis jog), MATC (time based CAMing), MCLM (linear interpolation) and MCCM (circular interpolation).
	Interpolated Actual Position Acceleration Compensation Interpolated axis positions returned by the motion planner when queried now compensate for axis acceleration. This improves the accuracy of the interpolated position by accounting for axis acceleration.
	Socket Connections Socket connections in version 20 allow connectivity with non-CIP devices such as printers or scanners, vision systems. Using MSG instructions in RSLogix 5000 software, programs can create, open, and close socket connections with other devices, assuming they have detailed information on how to communicate to the device. Communication modules that support sockets include 1756 -EWEB and 1768-EWEB, with a 500-byte maximum per data packet and a maximum of 20 connections, and 1756-EN2*x* ,1756-EN3TR, and CompactLogix 5730 series controllers, with a 3900-byte maximum per data packet and a maximum of 32 connections. There are four types of socket connections: UDP Socket (sending and receiving UDP datagrams), TCP Client (RSLogix 5000 software initiates a TCP connection to another device), TCP Server (other devices initiate a TCP connection to RSLogix 5000 software), and TCP Listen Connection (listens on a specified port for incoming connections).

Table 5 - Enhancements with Firmware Revision 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	Security Authority Binding By checking the Require Matching Security Authority ID for Authentication and Authorization checkbox, you can bind the project file to a specific instance of the FactoryTalk Security directory. This lets you to verify the identity of the FactoryTalk Security directory that was used to authenticate and authorize users of a secured project file or secured controller. Once this is assigned, the project file or the controller containing the project file cannot be accessed by any users unless they are authenticated by this specific FactoryTalk Security directory. For more information, see the FactoryTalk Security System Configuration Guide, publication FTSEC-QS001.
	Restricted Communication By clicking the 'Restrict Communications Except Through Selected Slots,' software products including RSLinx, RSLogix 5000, and ControlFLASH software will not be able to communicate with the controller except via communication cards loaded in the selected slots. Communication from the controller to other devices, such as, remote I/O modules, other controllers, are not impacted by this setting. This setting is useful to be sure that configuration changes to the controller can only by made through selected networks. When this setting is enabled, these software products will not be able to communicate with the controller via the USB port. For more information, see the ControlLogix System User Manual, publication 1756-UM001.
	Change Detection When online with a controller, a 64-bit integer is displayed in the Audit Value dialog box. This Audit Value changes every time an event listed in the Changes To Detect configuration dialog box occurs. By inspecting this value, you can quickly determine if the behavior of a controller has been modified since the last time it was inspected. The Change Detection Audit Value is also exposed as a predefined tag by RSLinx Enterprise software for use in HMI displays or other applications. Additionally, it is included in every entry of the Controller Log. For more information, see the ControlLogix System User Manual, publication 1756-UM001.

Corrected Anomalies

These anomalies have been corrected with these firmware revisions:

- Corrected Anomalies with Firmware Revision 20.012 on page 7
- Corrected Anomalies with Firmware Revision 20.011 on page 7

These anomalies have been corrected in firmware revision 20.012.

Table 6 - Corrected Anomalies with Firmware Revision 20.012

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	**CORRECTED:** The 'Home to Torque Level - Marker' on SERCOS drives operated correctly in version 19.00.00, but does not in version 20.00.00. This functionality is now fixed. 'Home to Torque' without marker was not affected. Lgx00125135, Lgx00127942
	CORRECTED: When inhibiting any connection that contains output data on the local CompactBus, under certain timing conditions, the outputs can stay on even though the connection is inhibited. Lgx00127938, Lgx00126405
	CORRECTED: Overshooting of an MCLM instruction while using an MCCD instruction may occur. In an application, the AccOverrideFactor may not be changed, but an open list of path segments is processed. Lgx00124758, Lgx00124134
	CORRECTED: Safe State Values out does not work for 1794-IE4X0E2, 1794-0E12, and 1794-0E8H modules. **Important:** This is an RSLogix 5000 software anomaly that requires version 20.01.00 software for the correction (PSA 2012-2-006). Lgx00126967, Lgx00126968, Lgx00127022

These anomalies have been corrected in firmware revision 20.011.

Table 7 - Corrected Anomalies with Firmware Revision 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	**CORRECTED:** 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 work around 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, Lgx00082610
	CORRECTED: A small window exists where, when the .PC bit is set on a Motion Group Stop (MGS) instruction configured as Stop Mode = Fast Disable, all axes in the selected group are not disabled. However, the axes in the group are disabled after the next Coarse Update. Lgx00113546, Lgx00106782
	CORRECTED: The .ACCEL and .DECEL Motion status bits operate differently than in RSLogix 5000 programming software, version 17*.x*, because the axis status bits of the consumed axis are recalculated instead of reusing the axis status bits of the producer axis. Lgx00107454

Table 7 - Corrected Anomalies with Firmware Revision 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	**CORRECTED:** When a Master Axis Position Cam (MAPC) instruction, with Execution Schedule = Pending, is executed, its master axis is ignored. However, its master axis' scaling constant is used to scale the Master Scaling parameter instead of the scaling constant on the axis that is currently active. Using the incorrect scaling constant results in incorrect overall scaling of the PCAM. You can take one of the following actions to work around this anomaly: • Set the PCAM's master axis to be identical to the active master axis. • Update the Master Scaling coefficient off the pending move to achieve desired scaling factor. Lgx00113538, Lgx00112356
	CORRECTED: When using Add-On Instructions, if you use the same backing/reference tag for multiple Add-On Instructions that are in different tasks, the controller may experience a major non-recoverable (MNRF) fault. For example, you have an Add-On Instruction called Motor_Start that is used twice in the application, once in Periodic Task 1 and once in Periodic Task 2, in both cases the Motor_Start Add-On Instruction uses the same backing/reference tag Pump_Motor_Start. The following events may occur when the program is executing: 1. Periodic Task 1 is executing and the Motor_Start is being scanned. 2. Periodic Task 2 preempts Periodic Task 1. 3. Periodic Task 2 runs and the Motor_Start is executed. 4. Periodic Task 1 is allowed to again execute and completes scanning of the Motor_Start. 5. Upon completion of scanning Motor_Start the controller can MNRF. The MNRF occurs if one instance of the Motor_Start scans false and the other scans true. To work around this anomaly, use individual backing/reference tag for all Add-On Instructions. Lgx00122436, Lgx00113448
	CORRECTED: When you perform a Partial Import Online (PIO) of a function block routine that contains S-Curve function blocks across Logix platforms, set the .Initialize bit in the backing tag control structure of all S-Curve instructions. This configuration causes the S-Curve instructions to re-initialize themselves. Failure to set the .Initialize bit in the backing tag control structure of all S-Curve instructions, may cause the S-Curve function block to execute with uninitialized values. Lgx00114927, Lgx00114935
	CORRECTED: When using the 1769 generic profile, if the input and output assembly instances are set to 248 bytes (communications format Data Int) and the module is in slot 1, the connection to the module will error with 203 connection time out. Lgx00118171, Lgx00117237

Table 7 - Corrected Anomalies with Firmware Revision 20.011

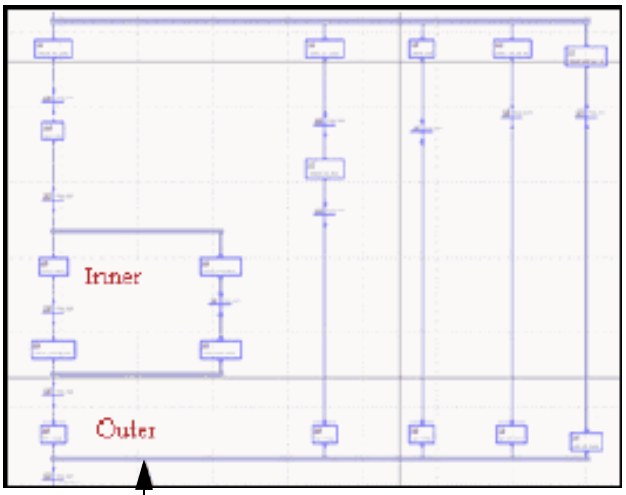
Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	**CORRECTED:** An anomaly can occur when you nest simultaneous branches in a Sequential Function Chart (SFC) routine as shown below.  Bottom-most Steps During normal operations, the logic does not step out of a simultaneous branch until all of the incoming legs have reached their bottom-most step. In the example shown, the logic does not step out of the Outer simultaneous branch until the leftmost leg has stepped out of the Inner simultaneous branch. The first time through the SFC routine, the application works as expected. On subsequent scans, however, the chart steps out of the Outer simultaneous branch even though the left leg has not reached the Inner simultaneous branch yet. This behavior occurs because the information in the bottom step, that is, the step next to the word Outer, remains from the previous scan. This stale information incorrectly causes the transition to move on as if the left leg is at the bottom step when it actually is not. To work around this anomaly, confirm all of the incoming legs have reached their bottom steps in the transition. You can check the .x bits to make sure the bottom-most step of each converging leg is active before allowing the chart to advance. This check can be added to the transition logic already present. For example, the steps in the following expression are the bottom steps (see graphic above) of the incoming legs. Each step has a timer. The transition does not move on until all of the step timers have reached their preset value. The expression can be modified to be sure those steps are truly active. This is the **original expression**: // Unit is ready to Transition Step1_ready.dn and Step2_ready.dn and Step3_ready.dn and Step4_ready.dn and Step5_ready.dn This is the **modified expression** to work around this anomaly. // Unit is ready to Transition Step1_ready.*x* and Step2_ready.*x* and Step3_ready.*x* and Step4_ready.*x* and Step5_ready.*x* and Step1_ready.dn and Step2_ready.dn and Step3_ready.dn and Step4_ready.dn and Step5_ready.dn **IMPORTANT**: The *x* bit is cleared when the chart transitions out of a step. Adding this check to the condition forces the engine to wait until all of those steps are genuinely active before advancing out of the simultaneous branch. Lgx00118188, Lgx00116506
	CORRECTED: Applications that have a large quantity of HMI tags on scan in the controller can experience a non-recoverable major fault when doing online edits. Lgx00118192, Lgx00115817

Table 7 - Corrected Anomalies with Firmware Revision 20.011

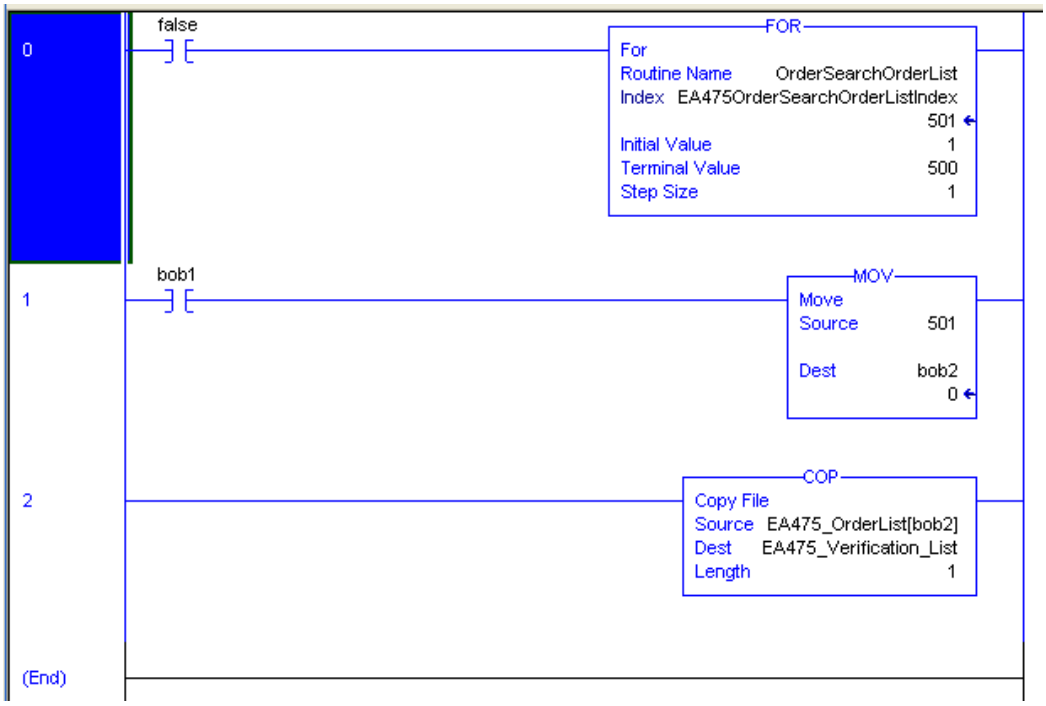
Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	**CORRECTED:** If a FOR instruction is scanned true and an instruction has an index out of range that references a UDT or multi-dimensional array, the controller will fault. Clearing the fault and returning to run mode will cause a nonrecoverable major fault.  Lgx118589, Lgx113423
	CORRECTED: When producing a UDT that ends with a single BOOL data type and is consumed as a unicast connection, the values in the produced tag are not seen by the consumer and a 203 connection timeout error is shown. Lgx00118911, Lgx00116634
	CORRECTED: When performing indirect addressing of Boolean arrays that are inside UDTs, only Boolean arrays are affected. This figure is an example of a UDT that contains a Boolean array. Members: Data Type Size: 16 byte(s) Name / Data Type / Style / Des Boolean_Array / BOOL[64] / Decimal Test_Bit / BOOL / Decimal Dint_Value / DINT / Decimal If application code utilizes indirect addressing to manipulate bits in Boolean_Array, it is extremely important to keep indexes within valid limits. If application code uses an index greater than 63 for Boolean_Array, a major recoverable fault of Type 04/Code20 should occur. However, in this scenario, the controller will not fault. Instead, the data will be written to the next tag below Boolean_Array. For example, if the index is 64, it will actually manipulate the member Test_Bit. If the value of index is greater than 64, it will then begin affecting the member Dint_Value. The major recoverable fault Type 04/Code 20 will be logged if the value in the indirect address causes the code to write outside the UDT. Lgx00122441, Lgx00120456
	CORRECTED: If the data types do not match in the JSR and SBR when passing a BOOL data type into a subroutine with the JSR and SBR, data corruption can occur. Lgx00123921, Lgx00123385

Table 7 - Corrected Anomalies with Firmware Revision 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	**CORRECTED:** Executing a Home Command (MAH) could cause unintended motion, equal to the negative unwind distance, when the controller executes the final offset move to the home position. The Conversion Constant and the Drive Resolution are the main contributor along with being a rotary axis. Other parameter settings that contribute to this condition are as follows: – Home Mode = Active – Home Sequence = Marker or Switch-Marker – Home Offset = Small incremental distance (that is, 5 degrees) – Rotary Configuration with an unwind To solve, upgrade to version 20 of ControlLogix, or for versions prior to V20, set the Home Offset position to 0, use a MAM instruction to move the offset distance, then MRP (Motion Redefine Position) to the home position. Lgx00124698, Lgx00123947
1768-L43S, 1768-L45S	**CORRECTED:** During a download, if an application causes the controller to exceed the number of allowed connections and the exceeding is caused by Safety connections, the controller will experience a nonrecoverable major fault. Lgx00117497, Lgx00109688

Known Anomalies

These anomalies have been identified with firmware revisions 20.012 and 20.011.

Table 8 - Known Anomalies with Firmware Revisions 20.012 and 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	In Axis-Servo-Drive data types (SERCOS), the axis is not allowing execution of motor feedback or marker test while the axis' safe-off input is open. This operated correctly in version 19.00.00, but does not operate correctly in version 20.00.00. Lgx00125300, Lgx00128827
	When using the Automatic Device Configuration (ADC) feature, the Logix controller 'owns' the configuration in the drive. Do not use the HIM or other external tools, such as DriveExplorer™ software, to change drive parameters. Doing so may cause a sequence of events to occur that results in the connection between the controller and the drive to be dropped, and causes the controller to not be able to re-establish the connection. Consider using the Write Mask function (drive Parameter 888 - [Write Mask Cfg]) to prevent tools connected to ports other than the Embedded EtherNet/IP port from writing to the drive. Lgx00129012, Lgx00129165
1768-L43S, 1768-L45S	The use of a safety tag with several multicast consuming controllers at varying firmware revisions can result in a connection timeout. If your application is configured with Compact GuardLogix controllers consuming safety tags produced by a Compact GuardLogix controller at revision 18.*x*, and the consuming controllers of one safety tag are at varying firmware revisions, you may experience a connection timeout with error code 0x203. In the event of a connection timeout, all of the consuming controllers appear to connect to the tag and run for some time, but then the connection timeout occurs. If you use a single consumer of a safety tag, that consumer will connect and remain connected. To work around this anomaly, set the revision of the producing controller to the same revision as the lowest revision of the consumers connecting to the safety tag. For example, if you have consuming Compact GuardLogix controllers at revisions 17.*x* and 18.*x*, set the producing controller to revision 17.x to match the lowest revision of the consumers. Lgx00104877

Table 8 - Known Anomalies with Firmware Revisions 20.012 and 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	Log On to FactoryTalk Dialog Box Displays When Launching RSLogix 5000 Software When launching RSLogix 5000 software, the Log On to FactoryTalk dialog box may be displayed. This dialog box may be seen when you do not have Administrator privileges on the personal computer and the current user does not exist in the FactoryTalk directory. If this dialog box is cancelled, the RSLogix 5000 software will not be launched. When the dialog box is displayed, entering the credentials for a user that has Administrator privileges on the personal computer will then allow RSLogix 5000 software to be launched. To avoid seeing this dialog box, you can add the current user or user group to the FactoryTalk directory. Follow these steps to add a user or user group to the FactoryTalk directory. 1. Launch the FactoryTalk Administration Console (available from the Start menu). 2. Select the Network directory when prompted. (You may need to provide credentials for a user with Administrator privileges in order to continue.) 3. To allow access for a particular user, navigate to Network\System\Users and Groups\Users, right-click the Users folder and choose New>Windows Linked User. 4. Click Add and provide the domain\logon name for the desired user. (You can click Check Names to verify that the name was found.) 5. To allow access for all authenticated users, navigate to Network\System\Users and Groups\User Groups, right-click the User Groups folder and choose New>Windows Linked User Group. 6. Click Add and type the name of the user group, Authenticated Users. The Log On to FactoryTalk dialog box may also display when using Remote Desktop to connect to the personal computer running RSLogix 5000 software. This is due to FactoryTalk Security not recognizing the computer name. To enable access through Remote Desktop for a specific computer, you should add the name of the computer initiating the Remote Desktop connection to the Network\System\Computers and Groups\Computers folder in the FactoryTalk Administration Console. To allow all computers to connect, follow these steps. 1. Open the FactoryTalk Administration Console and log in to the Network directory using your domain credentials. 2. Navigate to Network\System\Security Policy. In the Computer Policy Settings section, set Identify terminal server clients using the name of to Server Computer. **NOTE**: If Use single sign-on is set to disable in FactoryTalk software, then the Log On to FactoryTalk dialog box will be displayed each time RSLogix 5000 software is launched and proper user credentials must be entered in order to continue. (By default, 'Use single sign-on' is set to **enable**.) Lgx00124955
	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 8 - Known Anomalies with Firmware Revisions 20.012 and 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	Changes made to the Buffer Timeout value for FactoryTalk Alarms and Events subscribers do not take effect until the existing buffer has been deleted. The FactoryTalk alarm buffer (stored in Logix controller memory) is designed to persist through power cycles. If you change the Buffer Timeout value (via the Communication Setup dialog box in FactoryTalk View SE software), the controller does not use the new timeout value until the existing buffer is deleted and then recreated.To force recreation of this buffer, do one of the following: • Redownload the project to the controller • Disconnect the FactoryTalk Alarms and Events subscriber and leave it disconnected until the existing timeout expires. Lgx00069461
	Under some rare occurrences, if a Motion Axis Move (MAM) instruction with Merge Enabled is activated during the deceleration segment of an active MAM instruction then the new MAM instruction **may** overshoot its programmed endpoint. The occurrence of the overshoot depends on the following factors: • The original MAM instruction's remaining travel distance at the time of the merge and the new MAM instruction's remaining travel distance • The relationship of the decel jerk of the new MAM instruction to the decel jerk of the original MAM instruction • If the original MAM instruction is decelerating Typically, the overshoot does not occur. If **either** of the following conditions exist, you will avoid the overshoot: • The new MAM instruction is programmed with Merge Disabled. If there is no other motion active at the time of the merge, then the Merge Disable results in the same operation as the Merge Enable. • The new MAM instruction has a slightly higher jerk (in units/seconds^3) than the original MAM instruction. You should note, though, lower value of jerk in % of time results in higher value of jerk (in units/seconds^3). Lgx00078822
	If a Motion Group Shutdown Reset (MGSR) instruction is executed while a Motion Group Shutdown (MGSD) is still executing, motion error #7, that is, Shutdown State Error, results. The purpose of an MGSR instruction is to bring an axis group out of the shutdown state. However, when the scenario described in the previous paragraph exists, the MGSR instruction is not executed because the shutdown procedure, initiated by the MGSD instruction, has precedence. Thus, the MGSR instruction generates motion error #7 because the shutdown procedure has not completed. The shutdown procedure must complete before any attempt to reset the shutdown. Lgx00095484
	The MinDurationPRE and MinDurationACC members of ALARM_ANALOG and ALARM_DIGITAL tags are defined as DINT (signed double integer) but they are treated as UDINT (unsigned double integer) by Logix firmware. This causes negative values of the tag members to be handled as large positive numbers when they should be handled as zero. Lgx00119996, Lgx00119981
	In SFCs, when using time-limited actions in steps, if the program stays on a given step for greater than 24 days (2**32 ms) the timer's accumulator (ACC) will roll over and the action body starts to execute again. The time-limited action initializes its timer when it starts (step is first scanned). On subsequent scans, it compares the timers PRE and ACC value. If ACC<PRE, the action body will execute. If ACC >=PRE, it is not executed. When the roll over occurs, the ACC,PRE and the action body will again execute when it should not. Lgx00124689, Lgx00124697
	The controller only supports three active reconfigure messages at a time. If more than three are triggered at a time, they will complete (DN bit will go high), but not all the modules will be reconfigured. For example, if you send five reconfiguration messages at the same time, three reconfigure messages will truly complete (DN bit will go high), and the I/O modules will be reconfigured. The other two reconfigure messages will indicate complete (DN bit will go high), but the I/O modules will not be reconfigured. In this case, the last two should have errored (ER bit), but do not. Lgx00125204, Lgx00124996

Table 8 - Known Anomalies with Firmware Revisions 20.012 and 20.011

Cat. No.	Description
1768-L43, 1768-L45, 1768-L43S, 1768-L45S	**IMPORTANT** This anomaly occurs only in SERCOS applications that use Kinetix® SERCOS drives and linear motors. Under certain conditions, it is possible that the Real Time Axis attribute VelocityFeedback contains an incorrect value. The inaccuracy is the result of incorrect scaling of that attribute. Your program will have an incorrect value for the VelocityFeedback attribute if you follow these steps. 1. While offline, you write your RSLogix 5000 program and, as part of that program, the VelocityFeedback attribute is selected. 2. You save the program and download it to the controller. 3. You go online. The VelocityFeedback attribute value is incorrect because that attribute was enabled before the program was saved, downloaded, and put online. To work around this anomaly, do not enable the VelocityFeedback attribute until the RSLogix 5000 program is online. Lgx00107793
	When you accept edits in LD, ST, and FBD, the controller will log an 'Online Edit' entry in the controller log. Accepting edits in a SFC routine is done by performing a partial import, resulting in a 'Transaction Commit' entry in the controller log. This is confusing because you can select to mask both entries separately. Selecting only Online edits would cause the Audit Value to change only when FBD, ST, and LD edits are made. SFC online edits would change the Audit Value only if the 'Partial Import Online Transaction Completed' bit was set. Lgx00122528, Lgx00122622

Restrictions

These restrictions exist for firmware revisions 20.012 and 20.011.

Restrictions with Firmware Revisions 20.012 and 20.011

<table>
<tr><th>Cat. No.</th><th>Description</th></tr>
<tr><td rowspan="3">1768-L43,
1768-L45,
1768-L43S, 1768-L45S</td><td>The end cap must be attached to the CompactLogix system before you upgrade the controller or I/O module.</td></tr>
<tr><td>Enabling the time synchronization feature of a CompactLogix controller results in the controller becoming the local master. It does not result in the controller becoming synchronized with other wall clock times in the system.</td></tr>
<tr><td>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.</td></tr>
<tr><td rowspan="5">1768-L43,
1768-L45,
1768-L43S, 1768-L45S</td><td>With RSLogix 5000 programming software, version 20 and controller firmware revision 20.011, the Fault/Program states for Compact I/O™ modules are not supported and cannot be configured by using the Module Configuration dialog box.
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. These tags are still created when you add the I/O modules to the configuration.
Attribute Tags to Avoid
<table>
<tr><th>For Digital Output Modules</th><th>For Analog Output Modules</th></tr>
<tr><td>• ProgToFaultEn
• ProgMode
• ProgValue
• FaultMode
• FaultValue</td><td>• CHxProgToFaultEn
• CHxProgMode
• CHxFaultMode
• Where CHx = the channel number</td></tr>
</table></td></tr>
<tr><td>Arithmetic State flags anomalies.

1. When dealing with Floating point numbers, the controller does not truncate denormalized values or -0.0…0.0.
2. For an integer divide, when the denominator is 0, the S:N and S:Z are not set.
3. For the MOD instruction, the S:V is not set if an overflow occurred during the calculation.

Lgx00122480</td></tr>
<tr><td>In the Revision 18 Release Notes, a corrected anomaly was worded incorrectly. The wording was:

‘SSV class name SerialPort, attribute PendingComDriverID, does not set. With revision 18.11, attempts to use a SSV instruction to set the SerialPort class, PendingComDriverID attribute, are successful. Lgx00073954’

It should have stated that SSV’ing the PendingComDriverID is no longer supported.

Lgx00122787</td></tr>
<tr><td>The Logix CPU security tool does not work with version 20 controllers.</td></tr>
<tr><td>The RSLogix 5000 Clock Update tool does not support Windows 7 or Windows Server 2008 operating systems.</td></tr>
<tr><td>1768-L43S, 1768-L45S</td><td>We recommend that you configure the Compact GuardLogix controller so that it becomes the CST master. To do so, select Enable Time Synchronization on the Date/Time tab of the Controller Properties dialog box. If you do not configure the Compact GuardLogix controller to become the CST master and your project uses safety tags that are produced, I/O faults can occur when the project is downloaded.
For more information about enabling the Compact GuardLogix controller to become the CST master, see the Compact GuardLogix Controllers User Manual, publication 1768-UM002.

Lgx00104194</td></tr>
</table>

Install the Controller Revision

To download the latest controller firmware revision, go to http://www.rockwellautomation.com/support/downloads and select your desired revision. Then, use the ControlFLASH utility to upgrade your controller.

Alternatively, if you have installed RSLogix 5000 software, version 20.00.00, and related firmware, you may not need to complete the tasks described. The AutoFlash feature of RSLogix 5000 software detects if your controller firmware needs to be 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.

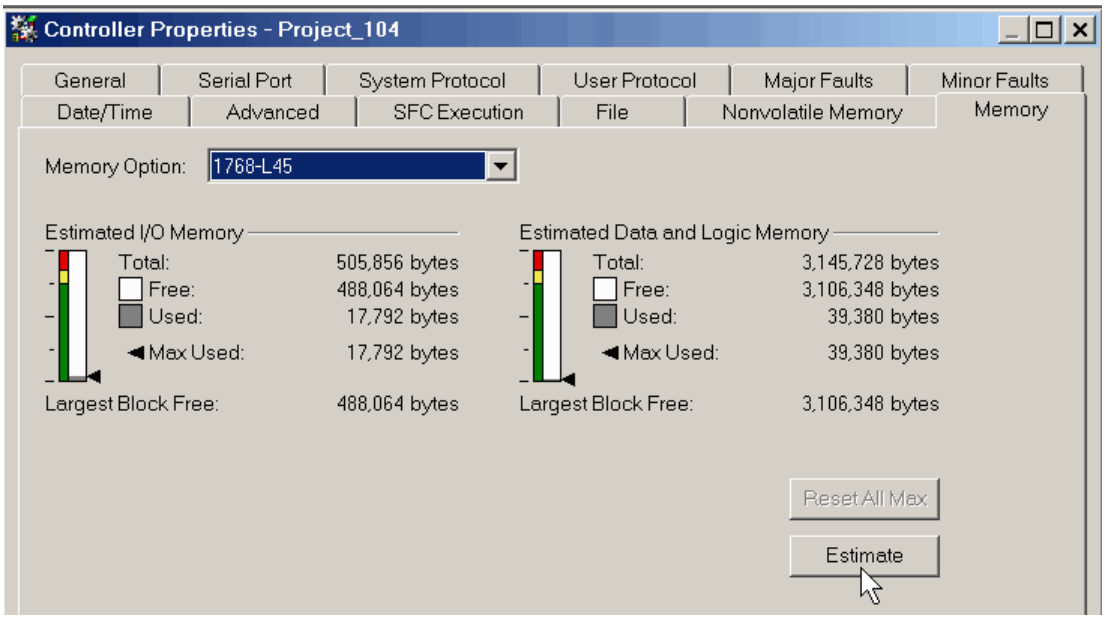
For more information about errors when completing a ControlFLASH upgrade, see the ControlFLASH Firmware Upgrade Kit Quick Start, publication 1756-QS105.

Additional Memory Requirements

This firmware revision may require more memory than previous revisions (for example, 10.*x*, 11.*x*). To estimate additional memory requirements for your application, you can either use the memory estimation tool provided with RSLogix 5000 software or the tables provided in these release notes.

Use the Estimate Tool

To estimate the amount of memory required by your application, convert the project to the controller revision desired and use the Estimate tool available in the Memory tab of the Controller Properties.



Estimate Based on Application Components

If you do not have the desired version of RSLogix 5000 software, use this table to estimate the additional memory that your project may require.

If you are upgrading your system through multiple firmware revisions, add all components your application uses for each of the revisions you upgrade through. For example, if you are upgrading from revision 16.*x* to revision 20.*x*, total your application components for revisions 16.*x* to 17.*x*, 17.*x* to 18.*x*, 18.*x* to 19.*x,* and 19.*x* to 20.*x*.

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory		
	Component	Increase/Decrease Per Instance	I/O	Data and Logic	Safety
19.*x* to 20.*x*	Task	+ 1312 bytes		✓	
	Program	+ 16 bytes		✓	
	Equipment Phase	+ 8 bytes		✓	
	Routine	+ 24 bytes		✓	
	Add-On Instruction	+ 32 bytes		✓	
	Project with any tags that use ALARM_ANALOG or ALARM_DIGITAL data type	- 76 bytes		✓	
	Tag that uses ALARM_ANALOG data type	+ 4 bytes		✓	
	Tag that uses ALARM_DIGITAL data type	+24 bytes		✓	
	Tag that uses MOTION_GROUP data type	+ 56 bytes		✓	
	Tag that uses COORDINATE_SYSTEM data type	+ 940 bytes		✓	
	Tag that uses AXIS_CIP_DRIVE data type	+ 676 bytes		✓	
	Tag that uses AXIS data type other than AXIS_CIP_DRIVE	+672 bytes		✓	
	Standard Produced Tag	+ 4 bytes + (4 bytes x number of consumers)	✓		
	Standard Consumed Tag	+12 bytes	✓		
	Safety Produced Tag	+ 4 bytes		✓	
	Safety Consumed Tag	+ 4 bytes		✓	
	I/O Module	+8 bytes		✓	
	Module input connection	+ 4 bytes		✓	
	Module output connection	+ 4 bytes		✓	
	For each controller (> 1K bytes change):				
	1756-L6*x*	+1264 bytes		✓	
	1756-L6*x*	+1268 bytes	✓		
	1756-L6*x*S	+1264 bytes		✓	
	1756-L6*x*S	+1316 bytes	✓		
	1756-L6*x*S	+ 1312 bytes			✓

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory		
	Component	**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**	**Safety**
19.*x* to 20.*x*	1756-L7*x*	+ 5588 bytes		✓	
	1756-L7*x*	+ 1296 bytes	✓		
	1768-L4*x*, 1768-L4*x*S	+1212 bytes		✓	
	1768-L4*x*	+ 1292 bytes	✓		
	1768-L4*x*S	+ 1340 bytes	✓		
	1768-L4*x*S	+ 1312 bytes			✓
	1769-L23	+2488 bytes	✓		
	1769-L31	+2492 bytes	✓		
	1769-L32C, 1769-L35CR	+ 2812 bytes	✓		
	1769-L32E, 1769-L35E	+ 2496 bytes	✓		
18.*x* to 19.*x*		<no change>			
17.*x* to 18.*x*	Program	+ 8 bytes		✓	
	Equipment phase	+ 20 bytes		✓	
	Add-On Instruction	+ 12 bytes		✓	
	Each tag In addition, if you use a tag of the types listed below, increase the memory as indicated for each instance:	+ 4 bytes		✓	
	Produced tag	+ 36 bytes + (24 bytes * number of consumers)	✓		
	Consumed tag	+ 24 bytes	✓		
	Data access control	+ 4 bytes per symbol		✓	
	Tag that uses ALARM_ANALOG data type	- 20 bytes		✓	
	Tag that uses ALARM_DIGITAL data type	+ 28 bytes		✓	
	Tag that uses MOTION_GROUP data type	+ 76 bytes		✓	
	Tag that uses AXIS_SERVO_DRIVE or AXIS_GENERIC_DRIVE data type	+ 786 bytes		✓	
	Tag that uses AXIS data type other than AXIS_SERVO_DRIVE or AXIS_GENERIC_DRIVE	+ 818 bytes		✓	
	Tag that uses COORDINATE_SYSTEM data type with no transform dimensions	+ 40 bytes		✓	
	Tag that uses COORDINATE_SYSTEM data type with transform dimensions	+ 100 bytes		✓	
	Module input connection	+ 20 bytes		✓	
	Module output connection	+ 24 bytes		✓	
	Safety controller	- 8 bytes		✓	
	Safety partner	- 8 bytes		✓	

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory		
	Component	**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**	**Safety**
17.*x* to 18.*x*	For each controller (> 1K bytes change):				
	1756-L6*x*, 1756-L6*x*S, 1756-L63XT	+ 16728 bytes		✓	
	1768-L4*x*, 1768-L4*x*S	+ 14448 bytes		✓	
	1769-L2*x*	+ 35084 bytes	✓		
	1769-L31	+ 14740 bytes	✓		
	1769-L32C, 1756-L35CR	+ 35400 bytes	✓		
	1769-L32E, 1756-L35E	+ 35036 bytes	✓		
	1789-L10, 1789-L30, 1789-L60	+ 4992 bytes	✓		
16.*x* to 17.*x*	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		✓	
	If you use a tag of the types listed below, increase the memory as indicated for each instance:				
	Produced tag	+ [4 bytes + (4 bytes * 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		✓	

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory		
	Component	**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**	**Safety**
15.*x* to 16.*x*	If you use a tag of the types listed below, increase the memory as indicated for each instance:				
	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		✓	
14.*x* to 15.*x*	Input module	+ 4 bytes	✓		
	If you use a tag of the types listed below, increase the memory as indicated for each instance:				
	Produced tag	+ 12 bytes	✓		
	Consumed tag	+ 4 bytes	✓		
	Tag that uses COORDINATE_SYSTEM data type	+ 748 bytes		✓	
	Tag the uses any AXIS data type	+ 800 bytes		✓	
	Task	+ 20 bytes		✓	
	Program or equipment phase	+ 24 bytes		✓	
	Routine	+ 4 bytes		✓	
	Serial port	+ 1120 bytes		✓	
	Project	+ 4012 bytes		✓	

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from revision (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory		
	Component	**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**	**Safety**
13.*x* to 14.*x*	If you use a tag of the types listed below, increase the memory as indicated for each instance:				
	Tag that uses the COORDINATE SYSTEM data type	+ 60 bytes		✓	
	Tag that uses any AXIS data type	+ 4 bytes		✓	
12.*x* to 13.*x*	Program	+ 12 bytes		✓	
	Task	+ 4 bytes		✓	
	User-defined data type	+ 4 bytes		✓	
	I/O module	+ 16 bytes	✓ (8 bytes)	✓ (8 bytes)	
	If you use a tag of the types listed below, increase the memory as indicated for each instance:				
	Produced tag	+ 8 bytes	✓		
	Consumed tag	+ 8 bytes	✓		
11.*x* to 12.*x*	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		✓	
10.*x* to 11.*x*	User-defined data type • Number of user-defined data types in the controller organizer > Data Types folder > User-Defined folder • **Not** the use of that data type in tags	+ 128 bytes		✓	
	Indirect address (using a tag as the subscript for an array in an instruction, such as an Array_A[Tag_B]). This memory change applies only if the array: • uses a structure as its data type • does **not** use one of these data types: CONTROL, COUNTER, PID, or TIMER • has only one dimension (such as UDT_1[5])	- 60 bytes		✓	
9.*x* to 10.*x*	Program	+ 12 bytes		✓	
	Routine	+ 16 bytes		✓	
8.*x* to 9.*x*	If you use a tag of the types listed below, increase the memory as indicated for each instance:				
	Tag that uses the MESSAGE data type	+ 376 bytes		✓	
7.*x* to 8.*x*	Project	+ 1050 bytes	✓		
	Tag	+ 0.55 bytes		✓	
	Message that transfers more than 500 bytes of data and targets a controller in the same chassis This memory is allocated only when the MSG instruction is enabled. To estimate, count the number of these messages that are enabled and/or cached at one time	+ 2000 bytes	✓		

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from revision (add all that apply)	Then add the following memory requirements to your project				Which comes from this type of memory		
	Component			Increase/Decrease Per Instance	I/O	Data and Logic	Safety
6.*x* to 7.*x*	If you use a tag of the types listed below, increase the memory as indicated for each instance:						
	Base tag			+ 24 bytes		✓	
	Alias tag			+ 16 bytes		✓	
	Produced tag	DINT	4	+ 12 bytes	✓		
		REAL	4	+ 12 bytes	✓		
	Consumed tag	DINT	4	+ 12 bytes			
		REAL	4	+ 12 bytes			
	Routine			+ 68 bytes		✓	
5.*x* to 6.*x*	Routine			+ 116 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 procedures related to programming your controller.
1768 CompactLogix Controllers, Revision 17 Release Notes, publication 1768-RN017	Describes anomalies and enhancements related to controller revision 17.
1768 CompactLogix Controllers, Revision 18 Release Notes, publication 1768-RN018	Describes anomalies and enhancements related to controller revision 18.
1769 CompactLogix Packaged Controllers, Revision 19 Release Notes, publication 1769-RN014	Describes anomalies and restrictions specific to revision 19 of the CompactLogix packaged controllers.
Logix5000 Controllers Execution Time and Memory Use Reference Manual, publication 1756-RM087	Provides calculations of execution times and memory use for Logix5000 controllers.
ControlFLASH Firmware Upgrade Kit Quick Start, publication 1756-QS105	Contains informations about upgrading firmware and related error messages.

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.

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

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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/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

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