AB *Allen-Bradley*

SoftLogix Controllers, Version 18.02

Catalog Numbers 1789-L10, 1789-L30, 1789-L60

IMPORTANT	Before updating your controller, we strongly recommend that you review information pertinent to previous major firmware versions. For example, when updating from version 16.*x* to 18.*x*, view information for versions 16 and 17 in these publications:

- SoftLogix Controllers, Version 16 Release Notes, publication 1789-RN016
- SoftLogix Controllers, Version 17 Release Notes, publication 1789-RN017

Firmware release notes contain material for all minor versions subsequent to each major version. If your controller, for example, is at version 16.00, and not the last minor version, 16.03, you should view all of the information for version 16.0…16.03 before updating to version 17.*x*.

Release notes are available at: http://www.rockwellautomation.com/literature.

About This Publication

This publication describes enhancements, anomalies (known and corrected), and restrictions for SoftLogix controllers, version 18.00 and later.

Table 1 - Controllers and Versions in This Publication

Cat. No.	Version
1789-L10	18.00, 18.01, 18.02
1789-L30	
1789-L60	

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Compatible Versions of Software

To use version 18.00 and later, the following software versions are required.

Software	Required Version
RSLinx Classic	2.56 (CPR9, SR2)
RSLinx Enterprise	5.21 (CPR9, SR2)
RSLogix 5000	18.02 (CPR9, SR2)
RSNetWorx for ControlNet	10.00 (CPR9, SR2)
RSNetWorx for DeviceNet	
RSNetWorx for EtherNet/IP	
FactoryTalk Activation Client	3.02 (CPR9, SR 1)

Compatible PCI-based Cards and Drivers

This table lists PCI-based cards, firmware, and drivers that can be used with the SoftLogix controller, version 18.00 and later.

IMPORTANT	The PCI-based motion cards listed in this table are no longer available. However, if you already have the cards listed, you can use them with the SoftLogix controller, version 18.00, and Windows XP or Server 2003 operating system.

Table 2 - PCI-based Products Operating System, Firmware, and Driver Compatibility

PCI-based Products	Windows XP, Server 2003	Windows Vista, Server 2008	Compatible Versions
1784-PCIC/B, 1784-PCICS/B	Yes	Yes	Firmware revision 4.10
			Driver revision 4.06[1]
1784-PCIC/A, 1784-PCICS/A	Yes	Yes	Firmware revision 3.10
			Driver revision 4.06[1]
1784-PCIDS/B	Yes	No	Firmware revision 3.016
			Driver revision 2.01
1784-PCIDS/A	Yes	No	Firmware revision 2.008
			Driver revision 2.01
1784-PM16SE	Yes	No	Firmware revision 18.5
			Driver revision 18.10[2]
1784-PM02AE	Yes	No	Firmware revision 18.5
			Driver revision 18.10[2]

(1)   If you are installing a ControlNet card for the first time or if you already have a ControlNet card installed, use the instructions in the ControlNet Communication Card Installation Instructions, publication 1784-IN003, to install or update the driver as appropriate.

(2)   **Windows XP users:** If you are installing a motion card for the first time, use the instructions in the SoftLogix 5800 Controller Installation Instructions, publication 1789-IN001, to install the driver. If you already have a motion card installed, follow the procedure Update Motion Drivers in XP Systems on page 18.

System Requirements

This table identifies system requirements for the SoftLogix 5800 controller.

IMPORTANT	Treat the computer that is running the SoftLogix controller like an industrial controller, not a computer. The SoftLogix controller conducts real-time operations that can be disrupted by the use of other programs or applications of the computer when used at the same time.

Category	Requirement
Personal computer	IBM-compatible Pentium 4 1.6 GHz or greater[1] Other requirements include the following: • FactoryTalk Activation Client • Hard disk drive that supports bus mastering • You might also need bus-mastering drivers for the computer chip set. For Intel motherboards, this driver is called the 'Application Accelerator' • Applications that are demanding of the computer's resources, including applications that use sequential, motion, and other local applications running on the computer, may require a dual CPU to achieve performance requirements
Operating system	Supported operating systems: • Microsoft Windows XP with Service Pack 2, or higher (recommended) • Microsoft Windows 2003 Server • Microsoft Windows Vista See Compatible PCI-based Cards and Drivers on page 2 for information about supported PCI cards. • Microsoft Windows 2008 Serve See Compatible PCI-based Cards and Drivers on page 2 for information about supported PCI cards. • Virtual Windows operating systems are not supported for use with the SoftLogix controller
RAM	1 GB, min
Hard-disk space	64 MB of free hard-disk space per controller instance (or more based on application requirements)
Motion requirements	Only virtual axis can be used with Microsoft Windows Vista and Windows Server 2008

	A primary 32-bit PCI slot in the computer for each motion card. For use only with Microsoft Windows XP operating system.
	• 1784-PM16SE PCI card requirements:
	  – Four 1784-PM16SE cards per computer, max
	  – Associate only one 1784-PM16SE card with one controller
	• 1784-PM02AE requirements:
	  – Four 1784-PM02AE cards per computer, max
	  – Four 1784-PM02AE cards can be associated with one controller, max
	• Do not associate a 1784-PM02AE card with the same controller as a 1784-PM16SE card

Network requirements	Primary or extended 32-bit PCI slot (one slot per communication card) • ControlNet, 1784-PCICS card • DeviceNet, 1784-PCIDS card (not compatible with Windows Vista operating system) • EtherNet/IP, Ethernet port of the personal computer • Other third-party networks are supported through the Rockwell Automation Encompass Program
Video requirements	16-color VGA graphics adapter 640 x 480, or greater resolution (256-color, 800 x 600 min., for optimal resolution)

(1)   The SoftLogix controller has only been tested and qualified on genuine Intel processors.

Enhancements

The enhancements in version 18.01 and later are available when used with RSLogix 5000 software, version 18.01.

IMPORTANT	The SoftLogix controller does not support the use of Integrated Motion on EtherNet/IP network, a feature available with RSLogix 5000 software, version 18.00.

Table 3 - Enhancements with Version 18.01 and Later

Enhancement	Description
Unicast I/O with EtherNet/IP Networks	You can configure a Logix5000 controller to communicate with other EtherNet/IP devices via Unicast communication. Unicast communication allows for direct point-to-point communication between two devices on a network. Unicast communication is useful when data does not need to be shared between multiple target devices. Support for Unicast communication is limited to standard I/O.
DF1 Radio Modem Broadcast Support	DF1 Radio Modem support has been expanded to include broadcast capability. The DF1 Radio Modem functionality was initially provided with version 16. With this expansion to include broadcast capabilities, you can configure a master or slave device to broadcast messages to all other stations in one instance.
High-integrity Add-On Instructions	With high-integrity Add-On Instructions, you can generate a unique signature ID based on the content of your instruction. This signature can be used to identify changes to the code, revision, data structures, and documentation associated with an Add-On Instruction. You can generate the signature by using the Add-On Instruction Definition dialog box. In addition, you can access the signature information programmatically for auditing purposes and transport Add-On Instructions between Logix controllers without impacting the signature. For more information about high-integrity Add-On Instruction signatures, see the Add-On Instruction Programming Manual, publication 1756-PM010.
Active Step Maintained During SFC Online Edit	Online edits to SFC routines do not always result in the SFC being reset to the initial step. Edits that alter the logic structure of the chart are the only edits that cause the SFC to reset to the initial step.
Data Access Control	Two new tag attributes are available: the External Access and Constant attributes. The External Access attribute defines how an external application (that is, an application outside of RSLogix 5000 software or your application code), such as an HMI, historian, or OPC data server, can access a tag. Options you can configure for the External Access attribute include the following: • Read/Write • Read Only • None The Constant attribute is used to keep the tag from being altered by the controller program or by specified users of RSLogix 5000 software. To keep the program from altering the tag, check the Constant attribute in the Tag Properties dialog box or in the Tag Editor. For complete functionality of the Data Access Control enhancements, you must use the software revisions listed in Compatible Versions of Software on page 2. For more information about tag data access attributes, see the Logix5000 Controllers I/O and Tag Data Programming Manual, publication 1756-PM004.

Table 3 - Enhancements with Version 18.01 and Later

Enhancement	Description
RPI Limitations and Negotiated Default for Multicast	An RPI limit can be set for produced/consumed tags in applications where multicast communication connections are used. When this option is configured, a producing controller verifies that the RPI of incoming connections are within the produced tag settings. If the consuming tag's RPI falls outside the configured range, a producing controller will reject the incoming RPI and may provide an RPI (default) to the consuming controller. This feature is not available with safety produced/consumed tags. For more information about RPI Limitations see the Produced and Consumed Tags Programming Manual, publication 1756-PM011.
Attributes of Add-On Instructions Available	You can configure GSV and SSV instructions to obtain attributes of Add-On Instructions. This enhancement provides that capability to program the controller to access Add-On Instruction definitions. For more information about the Add-On Instruction attributes, see the Add-On Instructions Programming Manual, publication 1756-PM010. Lgx00105714, Lgx00095246
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 revision 18.x, 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

Corrected Anomalies, Version 18.02

This anomaly has been corrected with controller version 18.02.

Table 4 - Corrected Anomaly with Controller Version 18.02

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	If both Source and Destination array names are the same and overlapping, the COP and CPS instructions do not give intended results. This behavior is seen only in SoftLogix controllers, versions V18.00 and V18.01. Lgx00114647

Corrected Anomalies, Version 18.01

These anomalies have been corrected with version 18.01.

Table 5 - Corrected Anomalies with Version 18.01

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	The ADD instruction in the Add-On Instruction within the program may not be executed. With version 18.01, the ADD instruction in the Add-On Instruction is executed correctly. Lgx00108800
	The MOD instruction gives different results based on different sets of numbers. With version 18.01, correct results are given. Lgx00112769

Corrected Anomalies, Version 18.00

These anomalies have been corrected with version 18.00.

Table 6 - Corrected Anomalies with Version 18.00

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	Creating and setting an SFC routine as the Main Routine within the Main Program while in Remote Run mode (online) results in a major fault. If you add an SFC routine, or edit the properties of an existing SFC routine, and set it as the Main Routine within the Main Program while in Remote Run mode (that is, when online with the controller), a major fault results. However, if the SFC routine is created while you are offline, then is set as the Main Routine when in Remote Run mode (online), the major fault does not occur. With SoftLogix version 18.00, creating and setting an SFC routine as the Main Routine while in Run or Remote Program modes does not result in a major fault. Lgx00101627, Lgx00087368
	The scan mode routines for prescan and postscan are not properly executed when the Add-On Instruction is nested. With version 18.00, a nested Add-On Instruction will execute as programmed. Lgx00105715, Lgx00095990
	After restarting the computer, the SoftLogix controller's wall clock time is ahead by five hours. If the SoftLogix controller is in Run mode and then computer is restarted, after the SoftLogix controller is placed in Run mode again, the hour value of the controller's wall clock is five hours ahead of the current time. With SoftLogix version 18.00, restarting the computer does not affect the wall clock time of the SoftLogix controller. Lgx00105716, Lgx00098039
	As a result of an issue with the TCP Windows WinSock driver, errors that are unusual or unexpected for the system may be reported when: • the module status attributes are retrieved by a GSV instruction. • I/O module status is viewed in the I/O Configuration tree of RSLogix 5000 software (errors are indicated with yellow warning triangles). These errors are reported because the TCP Windows WinSock driver attempts to bind the addresses of multiple messages sent from the controller at one time. Depending on the type of machine executing the application, the Windows WinSock driver attempting to bind the addresses may time out, and new binds attempted will vary in success. Lgx00105704, Lgx00103675, Lgx00105638, Lgx00105708

Table 6 - Corrected Anomalies with Version 18.00

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	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 firmware checks the tag to verify that is not in use (that is, the tag is not being scanned or referenced) by RSLinx Classic or Enterprise software. If the tag is being used by RSLinx software, the deletion is not allowed and an error dialog box indicates 'Failed to delete tag'.
	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 the following:
	• Motion Axis
	• Motion Group
	• Digital Alarm
	• Analog Alarm
	• Message
	With this version, tags being used by RSLinx software cannot be deleted while online with the controller.
	Lgx00086136, Lgx00085678
	SSV class name SerialPort, attribute PendingComDriverID, does not set.
	With this version, attempts to use a SSV instruction to set the SerialPort class, PendingComDriverID attribute, are successful.
	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 is because tasks cannot have a priority of 0 (permissible priority values are 1…15).
	With this version, you cannot set a task priority to 0 using an SSV instruction. Attempting to set a task priority to 0 via the SSV instruction results in a minor fault.
	Lgx00105709, Lgx00076850
	A velocity spike may occur when an MCCD instruction is executed.
	Under certain application conditions, you may see a velocity spike if you are using termination type 4 or 5 with coordinated moves and you execute an MMD instruction on the last iteration of a move.
	For more information about this anomaly, see the Technical Note titled 'Possible Velocity Spike When a Motion Coordinated Change Dynamics (MCCD) Instruction is Executed', #53928, in the Technical Support Knowledgebase (available at http://www.rockwellautomation.com/knowledgebase/).
	With this version, the potential velocity spike has been corrected.
	Lgx00088802

Table 6 - Corrected Anomalies with Version 18.00

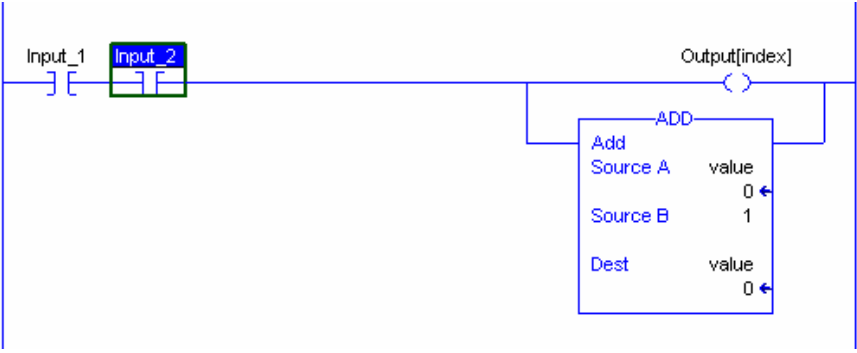| Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	Setting the Read/Write Buffer size parameter before enabling the Echo Mode does not result in a message echo.
	In the User Protocol tab of the Controller Properties dialog box, if the Read/Write Buffer size is specified before Echo Mode is checked, the message echo does not execute.
	For the message echo to execute, first check Echo Mode, then specify the Read/Write Buffer size.
	With this version, you can specify the Read/Write Buffer size and set the Echo Mode in any order to achieve a message echo.
	Lgx00087052, Lgx00087176
	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 RSEmulate 5000 software.
	To workaround this anomaly, do one of the following:
	• Use multiple soaks to achieve your total soak times greater than 1024 minutes.
	• Use the RMPS in periodic task that has a Period on 10 ms or greater.
	This anomaly has been resolved with this version. You can use an RMPS instruction in a continuous task with a Soak Time value greater than 1024 minutes.
	Lgx00105713, Lgx00085036, Lgx00083654
	Axis StoppingStatus bit is incorrect for the MAS(All) instruction with Coordinated Motion.
	If you execute a MAS of Type=ALL on motion that started with an MCLM instruction, the Axis.StoppingStatus bit briefly transitions to true but then transitions back to false and remains in that state until the axis comes to a complete stop.
	With this version, the StoppingStatus bit of the MAS(All) instruction updates correctly.
	Lgx00085033

Table 6 - Corrected Anomalies with Version 18.00

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	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 a download or return to run mode.
	When the Condition parameter of the ALMD instruction is not set (that is, the 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 version, 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
	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.
	With this version, the Carry Status flag is set when the conversion results in the generation of a carryout of the most significant bit.
	Lgx00105710, Lgx00074175
	The controller log has been updated so that completing a partial import while online, or adding I/O online no longer is identified as 'Partial Import Online or Add I/O Online modified controller'.
	Instead, the completion of a partial import while online or adding I/O while online is indicated by a 'Transaction Commit' entry in the controller log. Other transactions that are conducted may also cause a 'Transaction Commit' entry to be logged in the controller log. These transactions include the following:
	• Completing an SFC edit while online that does not result in a reset of the Sequential Function Chart
	• Accepting any pending edits to the routine
	• Creating a tag
	• Creating a module or editing module properties
	• Deleting components
	• Modifying tag properties
	• Conducting a partial import online
	• Copying, pasting, or cutting any tag or program elements
	• Moving tags between collections
	Lgx00098523, Lgx00094306

Table 6 - Corrected Anomalies with Version 18.00

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	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.
	With this version, the second and third CVs of the MMC instruction are manipulated, even if the first CV is within the range indicated by CVxHLimit and CVxLLimit.
	Lgx00100721, Lgx00091924
	Setting the WallClockTime to an invalid value by using an SSV instruction results in a Major Nonrecoverable Fault (MNRF).
	With this version, if a WallClockTime object's DateTime attribute is invalid, a minor fault results.
	Lgx00101632, Lgx00097459
	Attempts to use the FIND instruction to search a large string of characters results in a Major Recoverable Fault (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.
	With this version, the FIND instruction can successfully search a source-data string as large as 65,535 characters, the largest amount of characters that can be used in a string.
	Lgx00101633, Lgx00094007
	Use of an STOD instruction and a program upgrade from version 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.
	With this version, the program-scan time returns to the time observed with revision 16.
	Lgx000102979, Lgx00095528
	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.
	With this version, this anomaly has been corrected.
	Lgx000103551, Lgx00096621
1789-L10, 1789-L30, 1789-L60	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.
	With this version, when an SFC is reset to a specified step the transitions occur as expected.
	Lgx00105147, Lgx00099968, Lgx00099805, Lgx00099132
	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.
	With this version, a connection in the process of closing during a service communication interrupt of >300 ms occurs does not cause a major nonrecoverable fault (MNRF).
	Lgx00103549, Lgx00098734
	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.
	With this version, the instruction recognizes the invalid input value. It ignores the invalid value and the output of the PID instruction will not change. When developing your application, verify that the value passed into the PID instruction is valid.
	Lgx00105712, Lgx00082890

Table 6 - Corrected Anomalies with Version 18.00

Cat. No.	Description
	Fault handlers can be defined at the controller and program scope levels. These fault handlers are typically used to handle major recoverable faults that can occur during runtime execution of an application due to programming errors. A typical example of this would be handling indirect addressing that has gone out of range; MyTag[index], where index is larger than the size of the array.
	Faults can also be handled by the controller during pre-scan of the controller program on the transition to Run mode. Again, for example, the handling of indirect addressing that has gone out of range.
	There is an anomaly when these methods attempt to handle a fault.
	These are the possible ways the anomaly can manifest itself:
	• The controller will experience a major non-recoverable fault. I/O goes to their configured safe state, and the user application is cleared from memory. At this point, a Code 1 Type 60 or 61 major recoverable fault will be logged in the controller. This requires you to redownload the application.
	• Tag data corruption.
	• Online saving or uploading failures.
	• Anomalous program execution.
	For example, if a rung is being scanned false and there is an instruction that has false execution, the fault handler executes so the remainder of the rung will scan true. In the example below, the OTE instruction has an index out of range. After returning from the fault handler, the ADD instruction will execute, even though the rung input conditions are false.
	Lgx00105703, Lgx00100144, Lgx00101800, Lgx00102339, and Lgx00104782

Known Anomalies

These anomalies have been identified with version 18.00 and later.

Table 7 - Known Anomalies with Version 18.00 and Later

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	Consecutive XPY instructions on DINTs give different results based on different sets of numbers. The XPY instruction works correctly on variables of the REAL data type. Lgx00112837
	The use of Windows Vista or Server operating systems does not result in an expected EtherNet/IP configuration error. If you are using Windows XP operating system and have two EtherNet/IP modules in the same chassis configured with the same IP address, an error is indicated by a red X on top of the last EtherNet/IP module added to the SoftLogix chassis configuration. This is the expected behavior for such a configuration when any of the operating systems is used. However, if you are using Windows Vista or Server operating systems, you can configure two EtherNet/IP modules in one SoftLogix chassis with both EtherNet/IP modules configured to use the same IP address. Use of the two modules in this configuration with the Windows Vista or Server operating systems does not result in an error - though it should. Lgx00107669
	If you are running the SoftLogix controller on a computer that has limited processor speed, you may continue to experience errors indicated by yellow warning triangles on I/O modules in the I/O Configuration tree of RSLogix 5000 software. If left to run for an extended period of time, these errors may result in the system crashing. Lgx00105708
	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
	Changes made to the Buffer Timeout value for FactoryTalk Alarm and Events subscribers do not take effect until the existing buffer has been deleted. The FactoryTalk Alarm and Events 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 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, you can do one of the following. • Redownload the project to the controller. • Disconnect the FactoryTalk Alarm and Events subscriber and leave it disconnected until the existing timeout expires. Lgx00069461

Table 7 - Known Anomalies with Version 18.00 and Later

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	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, Lgx00082610
	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/sec3) than the original MAM instruction. You should note, though, lower value of jerk in % of time results in higher value of jerk (in Units/sec3).
	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
	Only in a program that is configured with Stop mode set to Fast Disable, the axis status bit 'DriveEnableStatus' is set to **true** for one coarse update after a Motion Group Stop (MGS) instruction transitions to the Process Complete (.PC) state. The axis status bit **should be false** when the MGS instruction transitions to the .PC state but **remains true**.
	You may need to delay initiation of other motion instructions until the enable status has cleared.
	Lgx00106782

Table 7 - Known Anomalies with Version 18.00 and Later

Cat. No.	Description
1789-L10, 1789-L30, 1789-L60	The Command Update Delay Offset feature is typically used with generic SERCOS drives that have different dynamic responses. The feature aligns the command position for each drive to compensate for the different dynamic responses. The Command Delay Compensation Offset parameter for each drive is adjusted as needed.
	However, the Command Update Delay Offset feature does not affect a CIP axis. An SSV instruction of 'CommandUpdateDelayOffset' on a CIP axis is accepted but has no effect on the Command Delay Compensation Offset feature. Even though the axis attributes can be modified, the instruction execution does not alter the command position of a CIP axis.
	Lgx00107320
	IMPORTANT This anomaly only occurs 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.
	Workaround - To avoid this anomaly, do not enable the VelocityFeedback attribute until the RSLogix 5000 program is online.
	Lgx00107793

Restrictions

The SoftLogix controller has these restrictions.

Table 8 - Restrictions with Version 18.00 and Later

Restriction	Description
Adding modules to the chassis is unsuccessful.	If you install the SoftLogix controller after RSEmulate software has been installed and removed, you may not be able to add modules to the SoftLogix chassis. This is because the removal of RSEmulate software did not clear a registry key.
	For more information about troubleshooting this issue, see the Rockwell Automation Technical Support Knowledgebase ID 40036.
Remotely accessing the SoftLogix controller results in a system crash.	Do not attempt to remotely access the computer running the SoftLogix controller. If you attempt to remotely access a computer running the SoftLogix controller, the system running the SoftLogix controller crashes.
External access options have software requirements.	For best results with the new External Access tag attributes provided with RSLogix 5000 software, version 18.00, and controller version 18.00, use RSLinx Classic software, version 2.56, and RSLinx Enterprise software, version 5.21 and later.
	Using earlier versions of RSLinx Classic and RSLinx Enterprise software may result in anomalous behavior from the data servers with the External Access options Read Only and None.
	For more information about tag data access attributes, see the Logix5000 Controllers I/O and Tag Data Programming Manual, publication 1756-PM004.
	Lgx00103263
Repeated minor faults can cause the controller to display a red X.	If your SoftLogix controller experiences repeated minor faults, it may display a red X. This only happens in systems in which minor faults are repeatedly generated on each program scan. To avoid this, correct any programs that may cause repeated minor faults to occur.

Table 8 - Restrictions with Version 18.00 and Later

Restriction	Description
Trends may momentarily block the RSLogix 5000 thread from executing.	Running or stopping a trend momentarily blocks the RSLogix 5000 thread from executing. Depending on your application and system performance, this can affect motion by causing increased errors in axis position or velocity. Controllers containing programs that generate motion should be in Program mode when starting or stopping a trend.
Downloading to a SoftLogix controller while another controller in the chassis is running a motion application may affect the motion application.	Do not perform a download to a SoftLogix controller in the chassis while another controller in the same chassis is running a motion application. Doing so can cause the motion application to glitch.
Make sure to only single-click on the SoftLogix 5800 button during installation.	Do not double-click on the SoftLogix 5800 button on the installation browser screen. This can cause two copies of the SoftLogix 5800 installation procedure to launch. If two copies of the installation program start, you may not be able to perform a normal uninstall. If this occurs, you will see this error message when an uninstall is attempted: 'Failed to load dll: _UninstallTmp'.
	If this situation occurs, you have to manually uninstall the program. The manual uninstall procedure is available as the P19762551 technical note document.
Avoid mixed operand types between the destination and its inputs.	For maximum portability across platforms, it is best to avoid mixed operand types between the destination and its inputs. If getting identical results for similar operations across languages is important to you, make sure to perform floating point operations. The trade-off is that floating point operations come at a price in terms of performance. Other considerations exist as well such as how compatible your operands are with that of the I/O being used and so on. See below for more details on typed operations across Logix platforms and across languages.

Performing Typed Operations

Consider the following when performing typed operations.

Typed Operation	Description
Across Logix platforms	Due to the fact that the SoftLogix family is based on open systems technology, the controller performs computational operations much the same way as open systems platforms and tools do it. This becomes important when performing mixed typed operations such as dividing two integers and storing the result in a real. Integer operations typically truncate the rational portion of a computation result while floating point operations preserve it.
	For example, when a SoftLogix program performs "a = n / m" where the data types for 'a', 'n', and 'm' are real, integer, and integer respectively, this specifies an integer divide between 'n' and 'm' and places the answer into 'a', performing an integer to real conversion. If 'n' = 800 and 'm' = 1000, the result is 0 and gets stored into 'a' as 0.0.
	Alternatively, when a ControlLogix program performs the same "a = n / m" where the data types for 'a', 'n', and 'm' are real, integer, and integer respectively, this specifies a floating point divide between 'n' and 'm' and places the answer into 'a', with no conversion needed. If 'n' = 800 and 'm' = 1000, the result is 0.8 and gets stored into 'a' as 0.8.
	In SoftLogix software, the input operand types dictate the operation while in ControlLogix, if any of the operands are real, a floating point operation is performed. SoftLogix software performs the operation exactly like a C routine would.
Across languages	There are instruction differences across programming languages as well as across Logix platforms. The following examples use the operation "i = n / m" where all the operands are integers.
	Ladder DIV instructions perform an integer divide operation and store the immediate result in the destination. For 'n' = 800 and 'm' = 1000, 'i' is equal to 0. The DIV function block instructions only does floating point operation;. The function block instruction converts the inputs to reals (if necessary) and then converts the result from a real to the destination type (if necessary). In this example, 'n' is converted to 800.0 and 'm' is converted to 1000.0. The result of the operation is 0.8. That result then gets converted to an integer where rounding rules apply and the final destination value is 1.
	This difference between ladder and function block instructions applies to all Logix platforms. Function block instructions only perform floating point operations.

Functionality Issues in Specific Circumstances

You may experience some or all of these issues when programming or using your SoftLogix 5800 controller.

Issue	Description
Performance issues	Performance-related considerations that should be made are as follows. • The latest drivers for various items like video and networking devices may be required for satisfactory system operation. We recommend that you use Microsoft-certified drivers for video cards and Ethernet NICs if performance problems are observed when running motion applications. Certified drivers can be found on Microsoft's website. You can also use Windows Update to update drivers on Windows 2000/XP systems or see the website of the hardware manufacturer. • All graphical (especially OpenGL) screen savers should be disabled when running motion applications.
General issues	If you use drive image software to duplicate your hard disk drive in order to deploy multiple SoftLogix 5800 systems, follow these steps to ensure proper operation of the systems. The installation of SoftLogix 5800 on a computer generates a unique CIP serial number that is used to identify messages from that node on the network. This serial number must be unique for every SoftLogix 5800 computer in the system. 1. Prior to running the drive image software to produce the master image, make sure that there are no controllers in the chassis and then terminate the Chassis Monitor by right-clicking on the icon in the tool tray and selecting Shutdown Monitor. 2. Delete the key ASASerialNumber from the Windows registry using the regedit.exe tool provided with your Windows operating system. 3. HKEY_LOCAL_MACHINE\SOFTWARE\Rockwell Automation\ VirtualBackplaneMonitor\Installed Modules\0001!000E!000F ASASerialNumber 4. Create the drive image with the computer in this state, making sure that you do not run the Chassis Monitor again since that will cause the CIP serial number to be regenerated in the registry. After the master image is copied to your new computer and the computer is re-booted, a unique CIP serial number will be generated the first time that the Chassis Monitor is launched.
Instruction set issues	• If you run SoftLogix 5800 software and you perform continuous messaging or block-transfers where the instructions are triggered by their own enable bits (.EN), there is a potential for the instructions to stop executing and remain in a state with only the enable bit set. The SoftLogix 5800 controller may stop responding and require removal and re-insertion in the virtual chassis to recover from this fault. The RSLogix 5000 project will also have to be re-downloaded. You can prevent this problem by using the Cache Connections option on the Communications tab of the message configuration dialog. You can cache as many as 32 instructions with any combination of message instructions and block-transfer instructions. For example, you can cache 28 message instructions and 4 block-transfer instructions. If you configure more than 32 cached connections, some of the connections will be made without caching, which causes this issue to continue to occur. In general, lower the frequency of less critical messages/block-transfers and use caching for critical messages/block-transfers. • The SoftLogix 5800 controller executes on a 32-bit microprocessor, which can perform 80-bit floating point operations. Due to extensive accuracy, comparisons between one REAL operand and another could reveal small differences in the lesser significant digits (for example, 1.000005 and 1.000052). As an alternative, use the LIM instruction when REAL operands are involved.
Motion card issues	**IMPORTANT** If you have a virtual axis on a SoftLogix 5800 controller as a master reference, you must also have a physical axis in the same motion group on the same controller. Avoid producing a virtual axis on one controller and then consuming that axis on another controller in the virtual chassis that contains the slave axis. You cannot obtain smooth motion on any of the slave axes in this scenario if the controller with the virtual axis does not contain a physical axis.

Issue	Description
1784-PCIDS DeviceNet module issues	• If you place the SoftLogix 5800 controller in Program mode with DeviceNet I/O currently mapped through a 1784-PCIDS module, and then you use RSNetWorx software to change the data mapping on the network, the controller does not detect this change until the 1784-PCIDS module is reset. You can reset the module in the RSLogix 5000 Controller Organizer. Right-click the module, choose Properties, then click the Module Info tab and click Reset Module. You can also reset the module by removing and re-inserting the module in the SoftLogix chassis. You can reset the module while the SoftLogix controller is running. The connections are automatically established after the 1784-PCIDS module is reset.

> ⚠ Do not reset a module that is currently being used for control. The connection to the module will be broken and control might be interrupted.

• The 1784-PCIDS card in the SoftLogix 5800 chassis uses the CommandRegister bits the same way as a 1756-DNB module. Use the CommandRegister.Run bit to enable/disable output data on the DeviceNet I/O network.

When CommandRegister.Run is set to	The 1784-PCIDS card
Zero (0)	Is in Idle mode.
	In Idle mode, the card still receives inputs from its slave devices on the network, but the card does not send active output data to the devices.
One (1)	Is in Run mode.
	In Run mode, the card sends active outputs on the network and receives inputs.

For more information on configuring your SoftLogix 5800 system, see the SoftLogix 5800 System User Manual, publication <u>1789-UM002</u>.

Install Version 18.00

To install the controller, run the install.exe file on the installation CD. This launches a browser that lets you install the SoftLogix 5800 controller.

> **IMPORTANT** Install RSLinx software before installing the SoftLogix 5800 controller.
>
> Before you are able to connect to the SoftLogix controller using RSLogix 5000 software, you must add the virtual backplane driver to slot 0 of the SoftLogix controller. If you do not install the virtual backplane driver, you will not be able to use persistent storage.
>
> Also, make sure .Net is installed on your computer before installing the SoftLogix 5800 controller. .Net can be installed from the SoftLogix or RSLogix 5000 software CD.
>
> During installation of the SoftLogix controller, the installation utility verifies that the correct version of .Net is installed. If you do not have .Net on your computer, you cannot install the controller.

Use Add/Remove Programs in the control panel to remove previous versions of the SoftLogix 5800 controller. When installing or uninstalling, note any messages that recommend a system restart. Failure to follow the reboot instructions can render your installation inoperable.

For more information about installing the controller, see the SoftLogix 5800 Controller Installation Instructions, publication 1789-IN001.

Update Motion Drivers in XP Systems

This procedure explains how to update the drivers of your PCI-based motion card.

> **TIP**   PCI-based motion cards are no longer available.
>
> If you already have a PCI-based motion card and are upgrading to the SoftLogix controller, version 18.00, on a Windows XP operating system, use this procedure to upgrade the drivers of your card.

If you are using Windows XP and have a motion card in your system, you must update the driver for the motion card by using the procedure below.

1. Right-click My Computer and choose Manage.

2. Open Device Manager under System Tools.

3. Expand the A-B Virtual Backplane folder.

4. Right-click the appropriate motion device and choose Properties.

5. Select the Driver tab and click Update Driver.

6. Use the wizard to install a new driver.

   a. Select 'Install from a list or specific location (Advanced)' and click Next.

   b. Verify that 'Include this location in the search' is checked and click Next.

   c. Click Browse and locate the new driver in directory:
      <CD-drive letter>\SoftLogix 5800\Drivers\Win2k
      or
      C:\Program Files\Rockwell Automation\SoftLogx5800\Drivers\Win2k
      (the path will be different if you did not install the SoftLogix controller in the default directory)

   d. Click Next to update the motion driver.

   e. If asked to overwrite newer versions of files, select YES.

   f. Click Finish to complete the update wizard.

Use Motion Drivers in Windows XP

The Windows XP System Restore feature affects how motion runs on a SoftLogix 5800 controller. When System Restore is enabled, random motion retries occur, which may result in irregular motion and/or motion glitches.

About System Restore

The System Restore feature provides a way to restore the system to a previously known state that would otherwise require you to reinstall an application or even the entire operating system. Applications that are compatible with Windows XP integrate with System Restore to create a restore point before an installation begins. By default, the feature creates a restore point every 24 hours while the system is up. It does this by creating a restore point directory and then creating a snapshot a set of critical system files, including parts of the registry. System Restore tracks changes to files and directories, and saves copies of files that are being changed or deleted in a change log. Restore point data is maintained on a per-volume basis.

Disable System Restore

For motion to operate correctly, you must disable System Restore.

1. From the Start Menu, right-click My Computer and choose Properties.

   The System Properties page displays.

2. Select the System Restore tab from the System Properties page.

3. Check the box labeled Turn off System Restore.

4. Click OK so the change takes effect.

Additional Memory Requirements

This firmware version may require more memory than previous versions (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.
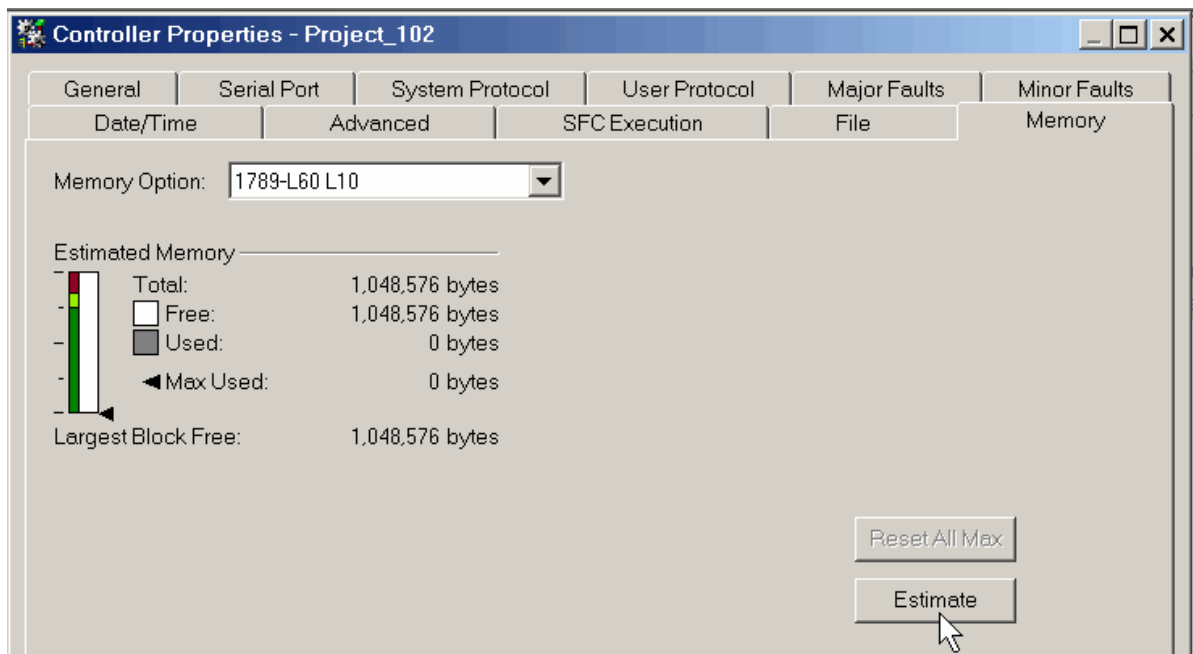
Estimate Based on Application Components

If you do not have the desired version of RSLogix 5000 software, see [Additional Memory Requirements per Application Component on page 21](#), to estimate the additional memory that your project may require.

If you are upgrading your system through multiple firmware versions, add all components your application uses for each of the versions you upgrade through. For example, if you are upgrading from version 15.*x* to version 18.*x*, total your application components for versions 15.*x* to 16.*x*, 16.*x* to 17.*x*, and 17.*x* to 18.*x*.

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from version (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory	
	Component	**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**
17.x to 18.x	Program	+ 8 bytes		ü
	Equipment Phase	+ 20 bytes		ü
	Add-On Instruction	+ 12 bytes		ü
	Each tag In addition, if you use a tag of the types listed below, increase the memory as indicated for each instance:	+ 4 bytes		ü
	Produced tag	+ 36 bytes + (24 bytes • number of consumers)	ü	
	Consumed tag	+ 24 bytes	ü	
	Data Access Control	+ 4 bytes per symbol		ü
	Tag that uses ALARM_ANALOG data type	- 20 bytes		ü
	Tag that uses ALARM_DIGITAL data type	+ 28 bytes		ü
	Tag that uses MOTION_GROUP data type	+ 76		ü
	Tag that uses AXIS_SERVO_DRIVE or AXIS_GENERIC_DRIVE data type	+ 786 bytes		ü
	Tag that uses AXIS data type other than AXIS_SERVO_DRIVE or AXIS_GENERIC_DRIVE	+ 818 bytes		ü
	Tag that uses COORDINATE_SYSTEM data type with no transform dimensions	+ 40 bytes		ü
	Tag that uses COORDINATE_SYSTEM data type with transform dimensions	+ 100 bytes		ü
	Module input connection	+ 20 bytes		ü
	Module output connection	+ 24 bytes		ü
	Safety controller	- 8 bytes		ü
	Safety partner	- 8 bytes		ü

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from version (add all that apply)	Then add the following memory requirements to your project		Which comes from this type of memory	
	Component	**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**
17.x to 18.x	For each controller (> 1K bytes change):			
	1756-L6x, 1756-L6xS, 1756-L63XT	+ 16728 bytes		ü
	1768-L4x, 1768-L4xS	+ 14448 bytes		ü
	1769-L2x	+ 35084 bytes	ü	
	1769-L31	+ 14740 bytes	ü	
	1769-L32C, 1756-L35CR	+ 35400 bytes	ü	
	1769-L32E, 1756-L35E	+ 35036 bytes	ü	
	1789-L10, 1789-L30, 1789-L60	+ 4992	ü	
	PowerFlex 700S 2	+ 55340 bytes	ü	
16.x to 17.x	Task	+ 4 bytes		ü
	Program	+ 4 bytes		ü
	Equipment Phase	+ 8 bytes		ü
	LD Routine	+ 12 bytes		ü
	FBD Routine	- 8 bytes		ü
	SFC Routine	+ 28 bytes		ü
	ST Routine	+ 4 bytes		ü
	Add-On Instruction	- 12 bytes		ü
	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)]	ü	
	Consumed Tag	+ 8 bytes	ü	
	Tag that uses MESSAGE data type	+ 4 bytes		ü
	Tag that uses ALARM_ANALOG data type	- 64 bytes		ü
	Tag that uses ALARM_DIGITAL data type	- 28 bytes		ü
	Tag that uses AXIS_SERVO_DRIVE or AXIS_GENERIC_DRIVE data type	- 34 bytes (2 bytes x number of output cam execution targets)		ü
	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)		ü
	Tag that uses COORDINATE_SYSTEM data type of 2 dimensions with 2 transform dimensions	+ 20 bytes		ü
	Tag that uses COORDINATE_SYSTEM data type of 3 dimensions with 3 transform dimensions	+ 108 bytes		ü

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from version (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**
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		ü
	Tag that uses ALARM_DIGITAL data type (with no associated tag references)	+ 4 bytes		ü
	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		ü
	Tag that uses the COORDINATE_SYSTEM data type	+ 132 bytes		ü
14.x to 15.x	Input module	+ 4 bytes	ü	
	If you use a tag of the types listed below, increase the memory as indicated for each instance:			
	Produced tag	+ 12 bytes	ü	
	Consumed tag	+ 4 bytes	ü	
	Tag that uses COORDINATE_SYSTEM data type	+ 748 bytes		ü
	Tag the uses any AXIS data type	+ 800 bytes		ü
	Task	+ 20 bytes		ü
	Program or equipment phase	+ 24 bytes		ü
	Routine	+ 4 bytes		ü
	Serial port	+ 1120 bytes		ü
	Project	+ 4012 bytes		ü

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from version (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**
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		ü
	Tag that uses any AXIS data type	+ 4 bytes		ü
12.x to 13.x	Program	+ 12 bytes		ü
	Task	+ 4 bytes		ü
	User-defined data type	+ 4 bytes		ü
	I/O module	+ 16 bytes	ü (8 bytes)	ü (8 bytes)
	If you use a tag of the types listed below, increase the memory as indicated for each instance:			
	Produced tag	+ 8 bytes	ü	
	Consumed tag	+ 8 bytes	ü	
11.x to 12.x	I/O module with a comm format = Rack Optimization	+ 90 bytes		ü
	I/O module with a comm format = something other than Rack Optimization (such as a direct connection)	+ 144 bytes		ü
	CompactLogix 1769 I/O module	+ 170 bytes		ü
	Bridge module with a comm format = None	+ 160 bytes		ü
	Bridge module with a comm format = Rack Optimization	+ 220 bytes		ü
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		ü
	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		ü
9.x to 10.x	Program	+ 12 bytes		ü
	Routine	+ 16 bytes		ü

Table 9 - Additional Memory Requirements per Application Component

If you upgrade from version (add all that apply)	Then add the following memory requirements to your project		Increase/Decrease Per Instance	Which comes from this type of memory	
	Component		**Increase/Decrease Per Instance**	**I/O**	**Data and Logic**
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		ü
7.x to 8.x	Project		+ 1050 bytes	ü	
	Tag		+ 0.55 bytes		ü
	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	ü	
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		ü
	Alias tag		+ 16 bytes		ü
	Produced tag	DINT	4	+ 12 bytes	ü	
		REAL	4	+ 12 bytes	ü	
	Consumed tag	DINT	4	+ 12 bytes		
		REAL	4	+ 12 bytes		
	Routine		+ 68 bytes		ü

Additional Resources

These documents contain additional information concerning related Rockwell Automation products.

Resource	Description
Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM001	Contains information specific to Add-On Instructions and other programming information.
SoftLogix 5800 Controllers version 16 Release Note, publication 1789-RN016	Describes anomalies and enhancements related to controller version 16.
SoftLogix Controllers, Version 17 Release Notes, publication 1789-RN017	Describes anomalies and enhancements related to controller version 17.
Logix5000 Process Controls and Drives Instructions Reference Manual, publication 1756-RM006	Contains information specific to the PI instruction.
Logix5000 Controllers General Instructions, publication 1756-RM003	Provides details about each available instruction for a Logix-based controller.
Logix5000 Controllers Execution Time and Memory Use Reference Manual, publication 1756-RM087	Provides calculations of execution times and memory use for Logix5000 controllers.

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

Tech Notes and other resources are available at http://www.rockwellautomation.com/knowledgebase.

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