CompactLogix Controllers Revision 15

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

When to Use These Release Notes

These release notes correspond to the controller revision 15.04.

Compatible Revisions

To use this controller revision, update your system to these software revision levels or later:

Update This Software	To This Revision or Later
RSLinx Classic RSLinx Enterprise	2.43 3.00
RSLogix 5000	15.00
RSNetWorx for ControlNet	5.11
RSNetWorx for DeviceNet	
RSNetWorx for EtherNet/IP	

Publication 1769-RN015B-EN-E - December 2005

Before You Update Your System

Before you update your controller to this revision, do the following preliminary actions:

<table>
<tr><th>If</th><th>Then</th></tr>
<tr><td>Your controller meets both of these conditions:
It has nonvolatile memory.
It is currently at revision 11.x or earlier.</td><td>Take these precautions:<table><tr><th>If The Controller</th><th>Then</th></tr><tr><td>Does not use a CompactFlash card</td><td>Save the project to an offline file. When you update the firmware of the controller, you erase the contents of the nonvolatile memory (revision 10.x or later).</td></tr><tr><td>Uses a CompactFlash card</td><td>Either:
Remove the CompactFlash card from the controller.
Check the Load Image option of the CompactFlash card. If it is set to On Power Up or On Corrupt Memory, first store the project with the Load Image option set to User Initiated.
Otherwise, you may get a major fault when you update the firmware of the controller. This occurs because the On Power Up or On Corrupt Memory options cause the controller to load the project from nonvolatile memory. The firmware mismatch after the load then causes a major fault.</td></tr></table></td></tr>
<tr><td>Your controller is close to its limits of memory.</td><td>This revision may require more memory than previous revisions.
To see what components of your current project require more memory.
Refer to page 10.
RSLogix 5000 software version 13.0 or later lets you estimate the memory requirements of the controller offline.
To upgrade to this revision, you may have to add an expansion memory card to the controller or use a larger memory card.</td></tr>
<tr><td>Your controller is connected to a DH-485 network.</td><td>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.</td></tr>
</table>

Known Anomaly

This revision of CompactLogix controllers has this known anomaly:

Anomaly	Description
LimitsInv and SelectLimitInv are swapped.	In the High/Low Limit (HLL) instruction: - LimitsInv parameter is set when the SelectLimit is invalid - SelectLimitInv parameter is set when the HighLimit and LowLimit parameters are invalid. Lgx00055977

Corrected Anomalies

This revision of CompactLogix controllers corrects these anomalies:

Corrected Anomaly	Description
Generated faults on the 1769-L3x controller held outputs in their last state rather than turning outputs off.	With the 1769-L3x CompactLogix controller, firmware revisions 15.01 to 15.03, the following functional issue existed: With a 1769-L3x controller, if 1769 I/O backplane faults or certain I/O module hardware faults occur, outputs were held in their last state at the time of the fault condition rather than the outputs turning off. This only occurred with 1769 I/O backplane faults and certain I/O module hardware faults such as loss of backplane termination or loss of 24V on an analog module configured to use external 24V and not with general controller faults such as a Watchdog timeout. This behavior is contrary to the information in the CompactLogix System User Manual, publication 1769-UM011. To correct this issue update the 1769-L3x controller firmware. The functional issue described above has been corrected in the 1769-L3x CompactLogix controller, firmware revision 15.04. Lgx00059797
The Batch recipe became inoperative.	If two PXRQ instructions that had been triggered on the same Phase were received by the batch server before the first PXRQ completes the Batch recipe became inoperative. Lgx00056918
MS light blinked red when going from version 13 to 15 on L32E and L35E products.	Because the Ethernet card took longer to respond to the controller when receiving data, a timer value has been increased. Lgx00059331
RSLogix 5000 software reported that POINT I/O connections were not scheduled even though they were scheduled and working on the network.	After associating the RSNetWorx for ControlNet file in RSLogix 5000 and scheduling the network, RSLogix 5000 software displayed an error while trying to save the configuration. The error stated that the POINT I/O connections were not scheduled even though they clearly were and working properly on the network. If you made changes to the program that didn't involve ControlNet changes, and then downloaded, you had to reschedule the ControlNet network. The work around was to remove the association before you saved. Revision 15.4 removes the need for this work around. Lgx00058517
PXRQ Instruction sometimes stayed in process and did not complete.	When executing phase request messages to a batch server, the PXRQ instruction would sometimes stay in process (IP bit set) and never complete. The same scenario could have occurred if the user took ownership of a phase from Logix5000 while a PXRQ instruction was in process. The only recovery method was to transition from program to run or to cycle power to the controller. Lgx00058484, 58631, 59317, 58390, 57760
An Attempt to Abort a Phase Request (PXRQ) caused all PXRQ's not to function.	If the abort bit was set in a PXRQ instruction with the IP or WA bit set, all remaining PXRQ's in the phase would stop operating correctly. Recovery from this situation required that you download the program again or to cycle power to the controller. Lgx00058678
CompactFlash LED	When accessing the CompactFlash card the CF LED did not operate as expected. Lgx00045715

Previous Release Notes

These release notes correspond to the controller revision 15.03.

Known Issues

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

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

  You can use various strategies to resolve minor faults due to task watchdog timeout and/or task overlap. For more information, see RSLogix5000 Online Help "Identifying and Managing Tasks". In the case of a minor fault caused by VA task overlap, increase the RPI until the overlap no longer occurs.

- If a 1769 I/O fault occurs, you must cycle power to the CompactLogix controller after clearing the major fault. I/O communications are 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.

Enhancements

This revision of CompactLogix controllers adds these enhancements:

- The PhaseManager option provides a state model for your equipment. It includes:
  - equipment phase to run the state model.
  - PHASE data type.
  - equipment phase instructions (relay ladder and structured text only).

If You Want To	Use This Instruction
Signal a phase that the state routine is complete so go to the next state	Equipment Phase State Complete (PSC)
Change the state or substate of a phase	Equipment Phase Command (PCMD)
Signal a failure for a phase	Equipment Phase Failure (PFL)
Clear the failure code of a phase	Equipment Phase Clear Failure (PCLF)
Initiate communication with RSBizWare Batch software	Equipment Phase External Request (PXRQ)
Clear the NewInputParameters bit of a phase	Equipment Phase New Parameters (PRNP)
Set up breakpoints within the logic of a phase	Equipment Phase Pause (PPD)
Take ownership of a phase to either: • prevent another program or RSBizWare Batch software from commanding a phase • make sure another program or RSBizWare Batch software does **not** already own a phase	Attach to Equipment Phase (PATT)
Relinquish ownership of a phase	Detach from Equipment Phase (PDET)
Override a command	Equipment Phase Override Command (POVR)

- Support for 100 programs and equipment phases (combined) per task
- In function block diagram instructions, DeltaT for periodic timing in a periodic task now includes fractional values.
- **1769-L32E and 1769-L35E only**
  - Support for duplicate IP address detection. When you change the IP address or connect one of these controllers to an EtherNet/IP network, the controller checks to make sure that the IP address assigned to this controller is not the same as that for any other device already on the network.
  - Support for Dynamic Host Configuration Protocol (DHCP) software. This software automatically assigns IP addresses to client stations logging onto a TCP/IP network.
  - Updated web pages to monitor diagnostics

Known Anomaly

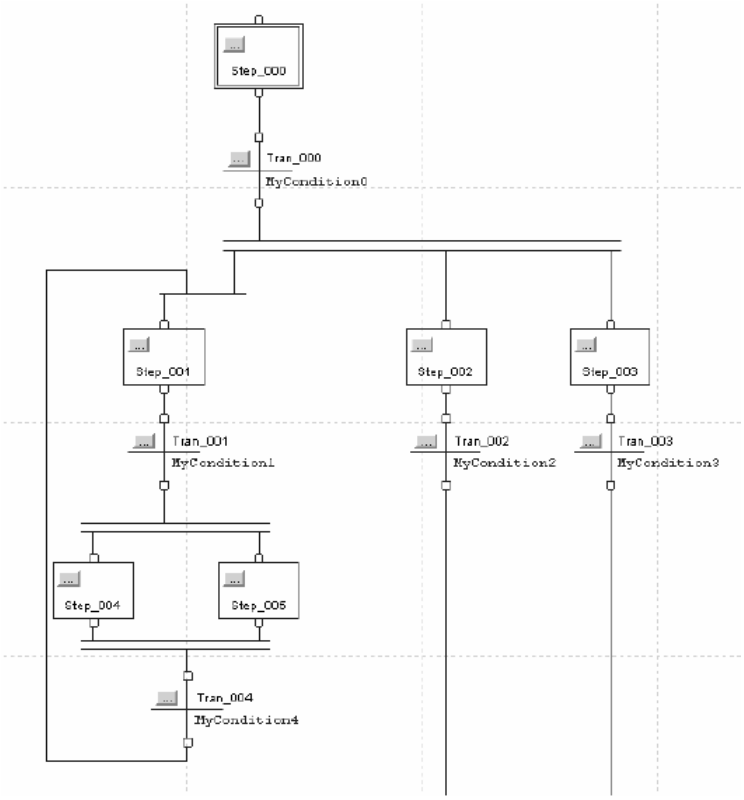
This revision of CompactLogix controllers has this known anomaly:

Restriction	Description
LimitsInv and SelectLimitInv Are Swapped in an HLL Instruction	In the HLL instruction, the LimitsInv parameter is set when the SelectLimit is invalid, and the SelectLimitInv parameter is set when the HighLimit and LowLimit parameters are invalid. Lgx00055977

Corrected Anomalies

This revision of CompactLogix controllers corrects these anomalies:

Corrected Anomaly	Description
Large Write MSG Instructions	This revision of CompactLogix firmware adds more stringent range checks when reading to or writing from tags. Message packets are now limited to 240 bytes. This could cause some MSG instructions that worked in previous firmware revisions to not work in revision 15 firmware. For example, use a CIP Generic MSG instruction to perform a Get Attribute Single service. The attribute is 4 bytes in length. Assume the destination tag is an INT data type (2 bytes in length). In revision 13 firmware, the MSG instruction places the first 2 bytes of the attribute in the destination tag. In revision 15 firmware, the MSG instruction errors because the destination tag is not large enough. To correct this error, change the destination tag to a DINT data type. Lgx00052504
The File Search Compare (FSC) instruction caused a non-recoverable fault	The FSC instruction caused an non-recoverable fault if both of these conditions occurred: • A major fault was declared from within the expression of an FSC instruction • The user fault routine cleared the fault When the user fault routine attempted to recover, information previously saved was not properly restored, which resulted in corrupted system registers and a non-recoverable fault. Lgx00055522
Programmatic change of MSG status bits could cause the MSG to appear to remain active (EN Set)	If you programmatically reset the DN or ER bits of a MSG due to the asynchronous nature of the MSG, the MSG could appear to remain active (EN set). In fact, the MSG was not active. The MSG required manual intervention to trigger it to execute again. Revision 15 removes the need for manual intervention to trigger the MSG to execute again. Lgx00053112

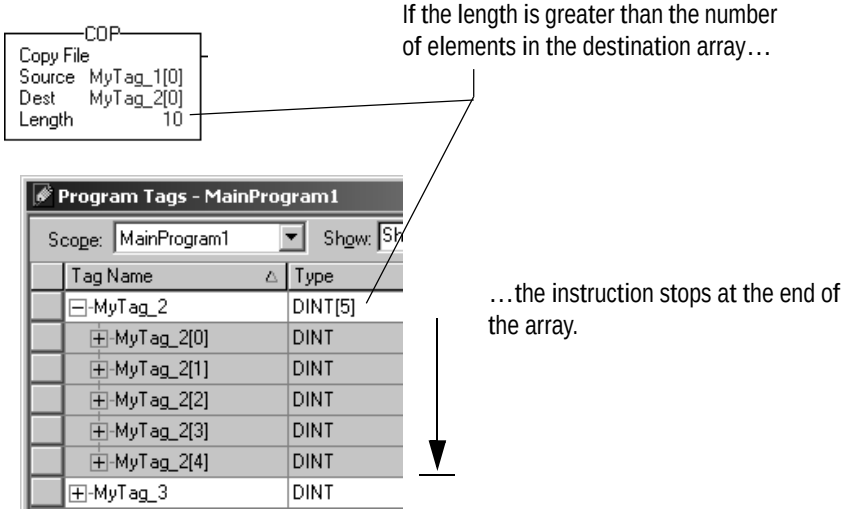
Corrected Anomaly	Description
An SFC could execute the wrong step	If you had an SFC with nested simultaneous branches, the controller could begin execution at an unexpected step. Following the convergence of a nested simultaneous branch, if the SFC looped back to the initial step of the parent branch, instead of executing that step, the SFC could jump to a step of another path in the nested simultaneous branch. For example:  Execution starts at Step_000. When Tran_000 becomes true, Step_001, Step_002 and Step_003 should become active. However, because the nested simultaneous branch in the left path converged and looped back to its parent step (Step_001), the active steps were actually **Step_005**, Step_002 and Step_003. Lgx00054247
1769-L32E and 1769-L35E cleared user program if too many messages were sent on the EtherNet/IP network.	Occasionally, the 1769-L32E and 1769-L35E controllers cleared their user programs if an high number of messages were sent on EtherNet/IP network. Lgx00056184
Controller failed to connect to a 1769-ASCII module if the module immediately followed a 1769-SDN Module	If your application used any of the CompactLogix controllers and you set-up your local I/O rail with a 1769-ASCII module immediately following a 1769-SDN scanner, the CompactLogix controller failed to make a connection to the 1769-ASCII module. Lgx00053778

Restrictions

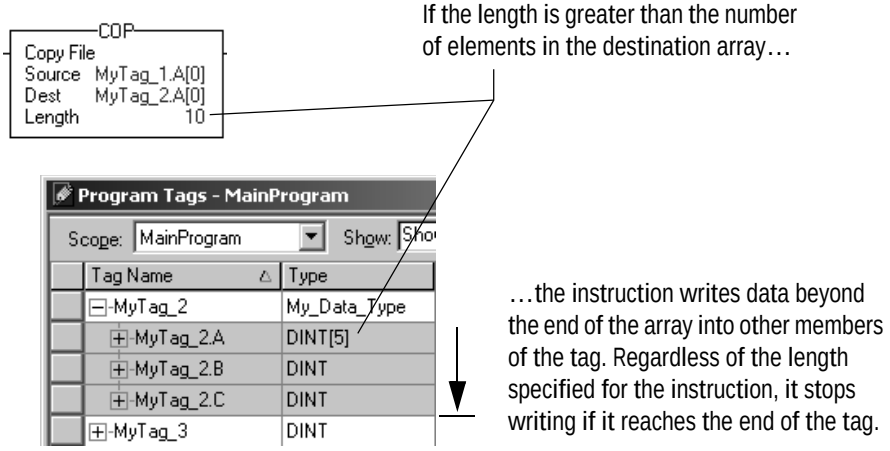
This revision of CompactLogix controllers has these restrictions:

Restriction	Description
In a tag of a user-defined data type, an instruction may write past the end of an array.	If you write too much data to an array that is within a user-defined data type, some instructions write beyond the array and into other members of the tag.

Example 1: Instruction Stops at the End of the Array



Example 2: Instruction Writes Beyond the Array



The following instructions write beyond the array into other members of the tag:

BSL	FBC	LFL
BSR	FFL	LFU
COP	FFU	SQL
CPS	FLL	SRT
DDT	GSV	SSV

This restriction also applies to all previous revisions.

To prevent writing beyond the limits of the destination array, make sure the length operand of the instruction is less than or equal to the number of elements in the array.

Lgx00033747

Load Controller Firmware

The controller ships without working firmware. You must download the current firmware before you can use the controller. The firmware for all CompactLogix controllers is available on the website and on the RSLogix 5000 CD. To load firmware, you can use:

- ControlFlash utility that ships with RSLogix 5000 programming software.
- AutoFlash that launches through RSLogix 5000 software when you try to open or create a project and the controller does not have the current firmware.
- a 1784-CF64 CompactFlash card with valid memory already loaded.

See the controller installation instructions for more information about using these utilities to load firmware.

- If you load firmware via an EtherNet/IP connection, browse through the Ethernet port, across the virtual backplane, and select the 1769-L32E, -L35E controller.
- If you load firmware via a ControlNet connection, browse through the ControlNet port, across the virtual backplane, and select the 1769-L32C, -L35CR controller.

Additional Memory Requirements

Revision 15.0 or later may require more memory than previous revisions (for example, 10.x, 11.x). To estimate the additional memory that your project may require, use the following table:

If You Have This Firmware Revision (add all that apply)	Then Add the Following Memory Requirements To Your Project		Which Comes From This Type of Memory	
	Component	Increase Per Instance	I/O (base)	Data and Logic (expansion)
15.x or earlier	Tag that uses the COORDINATE SYSTEM data type	60 bytes		4
13.x or earlier	Program	12 bytes		4
	Task	4 bytes		4
	User-defined data type	4 bytes		4
	I/O module	16 bytes	4 (8 bytes)	4 (8 bytes)
	Produced or consumed tag	8 bytes	4	
12.x or earlier	I/O module with a comm format = Rack Optimization	90 bytes		4
	I/O module with a comm format = something other than Rack Optimization (that is, direct connection)	144 bytes		4
	CompactLogix 1769 I/O module	170 bytes		4
	Bridge module with a comm format = None	160 bytes		4
	Bridge module with a comm format = Rack Optimization	220 bytes		4
11.x or earlier	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		4
	Indirect address (using a tag as the subscript for an array in an instruction, for example, 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 (for example, UDT_1[5])	(-60 bytes)		4
10.x or earlier	Program	12 bytes		4
	Routine	16 bytes		4
9.x or earlier	Tag that uses the MESSAGE data type	376 bytes		4

If You Have This Firmware Revision (add all that apply)	Then Add the Following Memory Requirements To Your Project				Which Comes From This Type of Memory	
	Component			Increase Per Instance	I/O (base)	Data and Logic (expansion)
7.x or earlier	Project			1050 bytes	4	
	Tag			0.55 bytes		4
	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	4	
6.x or earlier	Base tag			24 bytes		4
	Alias tag			16 bytes		4
	Produced or consumed tag	Data type	Bytes per tag			
		DINT	4	12 bytes	4	
		REAL	4	12 bytes	4	
				3 x bytes per tag	4	
				3 x bytes per tag	4	
6.x	Routine			68 bytes		4
5.x or earlier	Routine			116 bytes		4

Hold Last State and User-defined Safe State Not Supported

When 1769 Compact I/O modules are used as local I/O modules in a CompactLogix system, the local I/O modules do not support the Hold Last State or User-defined Safe State features, even though you can configure these options in the programming software.

- If a local I/O module fails such that its communication to the controller is lost, or if any module is disconnected from the system bus while under power, the controller will go into the fault mode. All outputs turn off when the system bus or any module faults.

- RSLogix 5000 software creates tags for modules when you add them to the I/O configuration. The 1769 module tags define configuration (C) data type members which may include attributes for alternate outputs. CompactLogix does not enable local modules to use the alternate outputs. Do not configure the attributes listed below:

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

Any 1769 Compact I/O modules used as remote I/O modules in a CompactLogix system do support the Hold Last State and User-defined Safe State features.

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Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using its products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

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

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running:

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

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

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

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