



# Firmware for ControlNet PLC-5 Programmable Controllers

Series F, Revision D  
Series E, Revision J  
Series D, Revision K  
Series C, Revision T

## Introduction

Use these release notes with the following series and releases of ControlNet PLC-5<sup>®</sup> processors:

Series/Revision	Catalog Numbers
Series F, Revision D	1785-L20C15, -L40C15, -L46C15, -L80C15
Series E, Revision J	1785-L20C15, -L40C15, -L46C15, -L80C15
Series D, Revision K	1785-L20C15, -L40C15, -L60C15, -L80C15
Series C, Revision T	1785-L20C15, -L40C15

## What This Document Describes

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## Before You Begin

### IMPORTANT

ControlNet PLC-5 programmable controllers in a hot backup system must have compatible firmware revisions. Refer to the table below to determine compatibility.

## Firmware Compatibility and Maintenance Requirements

### For General Applications

If your version of RSNetworx does not recognize a newer ControlNet PLC-5, you may need to update your RSNetworx software or the Electronic Data Sheet for the PLC-5. To update your EDS file, contact Rockwell Automation Technical Support at 440-646-5800.

### For Backup Applications

This Series/Revision of Firmware:	Is only compatible with:
Series F/Revision D	Series F/Revision D
Series F/Revisions C, C.1, C.2 and C.3	Series F/Revisions C, C.1, C.2 and C.3
Series F/Revisions B and B.1	Series F/Revisions B and B.1
Series F/Revisions A, A.1, A.2 and A.3	Series F/Revisions A, A.1, A.2 and A.3

Be sure that all **spare** ControlNet PLC-5 hot backup processors contain compatible firmware.

## Software Requirements

Use the following table to understand specific features that are only available with specific versions and releases of software:

If you want this feature:	You need both of these versions of software:	
	RSLogix5	RSNetworx
Standard functionality	2.2 or later	1.8 or later
Hot Backup (1771 and Flex I/O)	3.21 or later	1.8 or later
Multicast Outputs	3.21 or later	3.0 or later
SLC I/O (also with Hot Backup)	5.0 or later	3.0 or later

## ControlNet PLC-5 Corrected Anomalies

*Series F, Revision D,  
Series E, Revision J  
Series D, Revision K  
Series C, Revision T*

The following table describes the corrected anomalies in this release of ControlNet PLC-5 processors.

<b>Anomaly:</b>	<b>Description:</b>
Duplicate DH+ nodes would cause the programmable controller to fault with memory loss.	If the programmable controller detects duplicate DH+ nodes and the condition is not corrected, the controller may eventually fault with memory loss. The fault may occur immediately, or over an extended period of time. This anomaly has been corrected in Revision S of the DH+/RIO communication plug firmware so that if there are uncorrected duplicate DH+ nodes, the programmable controller will not fault with memory loss.
Multiple retries on Remote I/O scanner when configured to 230Kbaud.	On the remote I/O scanner, when channel 1B or 2B is configured at 230Kbaud and the corresponding channel 1A or 2A is configured to DH+ or Remote I/O adapter mode at 230Kbaud, excessive retries may occur. The Revision T firmware of the DH+/RIO communication plug was revised to minimize the number of retries in this configuration.
Setting .TO bit may lock-up Ethernet Sidecar message.	Setting the .TO bit of an active Ethernet Sidecar message may cause the message to lock-up with the .EN and .ST bit set. This anomaly has been corrected so that when you set the .TO bit of an active message, it properly aborts the message with an .ER bit set and the .ST bit reset.
Writing to the Global Status flags file causes fault with memory loss.	If you write through a communication channel to the Global Status Flags file, the PLC-5 processor may fault with memory loss. This anomaly has been corrected.

## ControlNet PLC-5 Enhancement

*Series E, Revision J  
Series D, Revision K  
Series C, Revision T*

The following table describes the enhancement in this release of ControlNet PLC-5 processors.

<b>Enhancement:</b>	<b>Description:</b>
Enhanced diagnostics	Additional diagnostic information is saved when a fault with memory loss occurs.

## ControlNet PLC-5 Corrected Anomalies

The following table describes the corrected anomalies in this release of ControlNet PLC-5 processors.

*Series E, Revision J*

*Series D, Revision K*

*Series C, Revision T*

<b>Anomaly:</b>	<b>Description:</b>
Major Faults 200 and 201 declared in Program Mode.	Previously, when the ControlNet PLC-5 was in Program mode and would experience a network disturbance, it could declare a Major Fault 200 or 201. The firmware has been changed so that these faults will only be declared when the PLC-5 is in Run or Test mode.
Message instruction locks-up with.EW and.DN bits set.	In applications where an STI or PII could take longer than the time it takes to complete a message instruction - the message instruction may lock-up with the.EW and.DN bits set. It locks up by not allowing another message to start.
Keeper drops network resource.	The initial download or save of an RSNetWorx for ControlNet project may intermittently fail with a "Network Resource Lost" error under the following conditions: <ul style="list-style-type: none"> <li>• the active keeper is a PLC-5C <b>and</b></li> <li>• the PLC-5C is not a valid keeper (for example invalid configuration, default memory, etc.)</li> </ul>

*Series E, Revision J*

*Series D, Revision K*

<b>Anomaly:</b>	<b>Description:</b>
The 1785-L80C15 could lose user memory when power down occurred during power up.	Occasionally, the PLC-5 would lose its memory when a powerdown occurred during a powerup, typically during unreliable power conditions. This anomaly has been corrected so that user memory is preserved should a powerdown occur during a powerup.

## Updated Timeout Switchover Formula for Hot Backup Applications

*Series F, Revision C.3*

**Timeout Switchover** occurs when the secondary processor loses communication with the primary processor for a certain length of time, times out the primary processor, and then performs a switchover. The following events can cause a Timeout Switchover:

- Primary PLC-5 system failure.
- Loss of power to the primary PLC-5 system
- Problems with the ControlNet network which causes loss of the handshake connection with the primary processor.

The following formula determines the length of time the secondary system waits before timing out the primary processor:

Primary Timeout = (3 x NUT) or 20ms, whichever is greater + 10ms + 1ms for every 8 scheduled connections.

**For example:** If the NUT is 5ms with 20 scheduled connections, the Primary Timeout is 20 + 10 + 2 or 32ms. If the NUT is 10ms with 80 scheduled connections, the Primary Timeout is 30+10+10 or 50ms.

The Primary Timeout is not the only factor in the Timeout Switchover Time. There is also processing which must occur on the secondary system after a Primary Timeout occurs. This processing can take up to 5ms. The formula for the Timeout Switchover Time is:

Timeout Switchover Time = Primary Timeout + 5ms.

So, if the NUT is 5ms with 20 scheduled connections, the Timeout Switchover Time is equal to 32ms plus 5ms, or 37ms.

## ControlNet PLC-5 Corrected Anomalies

Series F, Revision C.3

The following table describes corrected anomalies in this release of ControlNet PLC-5 programmable controllers.

Anomaly:	Description:
ControlNet PLC-5 could fault with memory loss on powerup with channel configured at 230Kbaud.	Occasionally, the programmable controller could fault with memory loss during powerup when channel 1A was configured for 230Kbaud, and was configured as either DH+ or adapter mode, and another node on the channel was sending traffic on channel 1A. This anomaly was corrected in Revision R of the DH+/RIO communication plug firmware so that the programmable controller would no longer fault with memory loss on powerup.
Message instruction locked-up with.EW and.DN bits set (Series F, Revision C.2 firmware only).	In applications where an STI or PII could take longer than the time it took to complete a message instruction - the message instruction would lock-up with the.EW and.DN bits set. It locked up by not allowing another message to start.
Keeper dropped network resource.	The initial download or save of an RSNetWorx for ControlNet project could intermittently fail with a "Network Resource Lost" error under the following conditions: <ul style="list-style-type: none"> <li>• the active keeper is a PLC-5C with this revision (F/C.2, D/F.2, E/E.2 and C/P.2) of firmware, <b>and</b></li> <li>• the PLC-5C is not a valid keeper (for example invalid configuration, default memory, etc.)</li> </ul>
Major Faults 200 and 201 declared in Program Mode.	Previously, when the ControlNet PLC-5 was in Program mode and would experience a network disturbance, it would declare a Major Fault 200 or 201. The firmware was changed so that these faults will only be declared when the programmable controller is in Run or Test mode.
The 1785-L80C15 could lose user memory when power down occurred during power up.	Occasionally, the programmable controller could lose its memory when a powerdown occurred during a powerup, typically during unreliable power conditions. This anomaly was corrected so that user memory is preserved should a powerdown occur during a powerup.
In ControlNet Hot Backup applications with a large number of connections, dual primary conditions would occur.	Previously, with a large number of scheduled connections (40+) and a low Network Update Time (5ms or less), the handshake connection between the PLC-5 controllers would time out and cause dual primary conditions. This would cause a major fault code 232 or would cause a requalification to occur if the requalification options was configured. This anomaly was corrected so that the timeout value is adjusted to prevent the handshake connection from timing out during these conditions.
In ControlNet Hot Backup applications with a large number of connections, dual primary conditions would occur during online editing.	Previously, with a large number of scheduled connections (40+) and a low Network Update Time (5ms or less), the handshake connection between the PLC-5 controllers could time out and cause dual primary conditions after either the accept edits or assemble edits was performed while doing online edits. This would cause a major fault code 232 or would cause a requalification to occur if the requalification options was configured. This anomaly was corrected so that online edits have no impact on the timing out of the handshake connection.
In ControlNet Hot Backup applications, crossloading error could cause qualification failure.	A qualification could fail due to a crossloading error with an MSG error code 137 (No Msg Buffers).

## ControlNet PLC-5 Corrected Anomalies

The following tables describe anomalies that have been corrected in all series of ControlNet 1.5 PLC-5 processors:

### Series F, Revision C.2

Anomaly:	Description:
PLC-5 faulted with memory loss when writing data to resident I/O module through RSLogix5 I/O configuration utility.	After modifying a module's configuration, the RSLogix5 I/O configuration utility prompted you to download the new configuration immediately to the module. If the download was performed to a resident I/O module (in the local chassis), the processor could fault with memory loss. This fault only occurred if a corresponding block transfer read was being performed to the same resident module.
Unusual network or channel noise conditions caused PLC-5 to lose communication or fault with memory loss.	If unusual network or channel noise conditions occurred, the processor could: <ul style="list-style-type: none"> <li>• fault with memory loss</li> <li>• lose ControlNet communication with channel LEDs flashing RED/OFF simultaneously</li> <li>• lose ControlNet communication despite channel LEDs indicating normal operation</li> </ul>
Longer RSLogix5 download time for projects with large program files.	Recent releases of ControlNet firmware (F/C, E/E, D/F and C/P) caused longer download times for RSLogix5 projects with large program file sizes. This anomaly was corrected so that original and shorter download times occur.
RSNetWorx status screen indicates "Keeper Not Present."	This anomaly prevented RSNetWorx from determining the keeper state of a PLC-5 that was reattached to a network with RSNetWorx edits enabled. This caused the "Keeper Not Present" status.

### Series F, Revision C.1

Anomaly:	Description:
Losing DSR signal from the modem could cause various problems.	When the processor was configured for DF1 master or slave mode operation on the serial port, and the DSR signal was lost from the modem, the processor could clear diagnostic counters, lose memory buffers or fault with memory loss.
Memory card restore could not restore Ethernet sidecar module IP address.	When a memory card was used to restore an application (including channel configuration), it would not restore the Ethernet sidecar module's configuration, including its IP address. This anomaly only occurred with the 1785-ENET Series B, Revision B release.
Processor faulted with memory loss when writing to a protected processor with uninitialized RAM.	Writing to a 1785-L46C15 protected processor with uninitialized RAM would cause the processor to fault with memory loss.
Partial ControlNet configuration loss after EEPROM restore.	During an EEPROM restore, the processor would not load information relevant to RSNetWorx and the processor's scan list. This would make the scan list in RSNetWorx to appear empty, even though the processor had scheduled connections. This anomaly only occurred with RSNetWorx 2.0 or later.
Generic CIO dropped last byte of an odd-numbered byte reply.	When the length of a reply packet of a Generic CIO had an odd number of bytes, the last byte was dropped and not copied into the data table.
RSNetWorx download failed when the 1756-CNB ControlNet Bridge was the master keeper.	When downloading an RSNetWorx ControlNet project through a 1756-CNB, and it was the master keeper, the download would fail to all processors on that network.
ControlNet cable disconnect or noisy network conditions caused processor to fault with memory loss or experience other problems.	If the ControlNet cable was disconnected, or noisy network conditions developed, the processor would fault with memory loss or experience other problems. This anomaly was corrected and tolerance to network noise has been improved.

**Series F, Revision C**

<b>Anomaly:</b>	<b>Description:</b>
Sensitivity to channel noise or cable reconnect.	Various issues were addressed which make the processor more tolerant of a noisy ControlNet channel, or when the processor was connected and reconnected to a ControlNet network. This included when the processor lost communications or when keepers on the network became invalid.
Intermittent ControlNet configuration download failure.	When downloading the ControlNet configuration, RSNetWorx would report a download failure.
Increase in configured ControlNet activity caused major fault #205.	This anomaly has been corrected so that the processor can manage higher levels of ControlNet activity before declaring a #205 fault.
Intermittent block integrity problems using an Immediate Data Instruction (IDI) .	During an IDI instruction, transferred data to the data table could not guarantee block integrity.
Temporary incorrect connection status to Logix5550 controller.	Processor would not show correct status of a connection to a Logix5550 controller until the controller went into Run mode.
Password class change denied with 8 nodes.	When 8 different nodes or workstations were logged into a processor with a class password through one channel, and one node wanted to change its class, the processor would deny it and RSLogix5 would send an invalid password message.
Using "remove all forces" command on SFCs could cause checksum error.	When using this command while there were no actions in the SFC chart, a checksum error could occur. This was corrected to only remove SFC forces in the current SFC file, even if the SFC chart did not contain any actions.
Mode change caused loss of SFC subchart highlighting .	An active SFC subchart lost its highlighting because of a mode change. The mode could be changed via software, keyswitch or power cycle. Upon return to Run mode, the active step in the subchart was no longer highlighted.
Ladder MSG instructions could randomly timeout.	When 32 or more ladder MSG instructions were executing, one of the MSG instructions could timeout with an error code 55.

## ControlNet PLC-5 Hot Backup Corrected Anomalies

*Series F, Revision C.1*

The following tables describe ControlNet Hot Backup anomalies that have been corrected in all series of ControlNet 1.5 PLC-5 processors:

Corrected Anomaly:	Description:
Possible long qualification time during change to Run mode.	The processor could experience long qualification time when either entering Run mode after power up or when an online edit was made in Program mode and subsequently put into Run mode. This anomaly occurred in Series F, Revision C processors only.
Some ControlNet files inadvertently crossloaded.	When using RSNetWorx 2.0 or later, the ControlNet configuration file would be crossloaded from the primary to the qualifying secondary processor. If the entries in the ControlNet configuration files were not identical, the data in the file on the secondary processor could have been altered. Also, if the DIF or DOF file was greater than 1000 words, all DIF and DOF files (except the first file) would be crossloaded from the primary to the secondary processor.

*Series F, Revision C*

Corrected Anomaly:	Description:
"Resource Unavailable" error message occurred.	This error message occurred whenever RSLogix5 or RSNetWorx remotely transitioned a ControlNet Hot Backup processor to Run mode.
Program prescan reset crossloaded data in backup systems.	During the qualification process, the data table was crossloaded from the primary to secondary processors. When the qualifying processor went into Run mode, some of the crossloaded data would be reset due to the program prescan. This anomaly was corrected in this release so that the program prescan occurred before the data table was crossloaded between processors.
Powerup protection after power loss was not working in Hot Backup systems.	This feature was designed to provide protection after power loss by allowing the you to Major Fault the processor if it powered up immediately in Run mode. This anomaly was corrected in this release so that this feature is available. You can enable this feature by setting bit S:26/1.
Processor hung in qualification (Series F, Revision B firmware only).	Occasionally, a processor would hang in qualification. The QUAL LED flashed between yellow and green while transitioning into Run mode. This anomaly only existed in Series F, Revision B firmware release.

## Known Anomalies

The following is a known anomaly that has **not** been corrected in any series of PLC-5/80C processors:

- Under certain network configurations, the PLC-5/80C will only support 127 (out of a possible 128) I/O Map Table Entries. The processor may fault with memory loss when all 128 I/O Map Table Entry connections are established.

The following is a known anomaly in the previous revision of firmware (F/C.2, D/F.2, E/E.2 and C/P.2):

- The initial download or save of an RSNetWorx for ControlNet project may intermittently fail with a “Network Resource Lost” error under the following conditions:
  - the active keeper is a PLC-5C with the previous revision (F/C.2, D/F.2, E/E.2 and C/P.2) of firmware, **and**
  - the PLC-5C is not a valid keeper (for example invalid configuration, default memory, etc.)

If the initial download failed, repeat the operation.

The download failure should not recur because the conditions noted above have been eliminated.

See the Keeper Status dialog in RSNetWorx for ControlNet for information on the active and valid keepers on the network.

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## Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using our 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 our 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.

[www.rockwellautomation.com](http://www.rockwellautomation.com)

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Publication 1785-RN062H-EN-P - March 2004

Supersedes Publication 1785-RN062G-EN-P - April 2003

PN 957867-26

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