



# Firmware for ControlNet PLC-5 Programmable Controllers

Series F, Revision D.1

## Introduction

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

Series/Revision	Catalog Numbers
Series F, Revision D.1	1785-L20C15, -L40C15, -L46C15, -L80C15

## 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 (EDS file) for the controller. To update your EDS file, contact Rockwell Automation Technical Support at 440-646-3223.

### For Backup Applications

This Series/Revision of Firmware:	Is only compatible with:
Series F/Revision D, D.1	Series F/Revision D, D.1
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 controllers 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

## Series F, Revision D.1 ControlNet PLC-5 Corrected Anomalies

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

Anomaly	Description
Possible fault with memory loss when the controller reestablishes communication on the ControlNet network.	Although very unlikely, when the controller reestablishes communication on the ControlNet network, an internal selftest may inadvertently fail, causing the controller to fault with memory loss. This anomaly has been corrected.
Connection path greater than 127 words becomes corrupted.	In ControlNet, it was possible that the connection path would become corrupted if the size of the path was greater than 127 words. This anomaly has been corrected so that connection path sizes greater than 127 words can no longer become corrupted.
Intermittent memory loss with memory cartridge and uninitialized RAM.	It was possible that the controller would incur a fault with memory loss at powerup if it had uninitialized RAM and had a memory cartridge installed and configured to load RAM at powerup. This anomaly has been corrected so that under these conditions, this fault is no longer possible.
Two-minute serial port lockup possible when altering Channel 1A configuration through serial port.	When altering Channel 1A configuration (through configuration changes or during downloading) when connected to the serial port (Channel 0), it was possible that the serial channel would lockup for 2 minutes and then resume normal operation. This anomaly has been corrected so that under these conditions, the lockup can no longer occur.
In ControlNet Hot Backup applications, crossloading over DH+ could corrupt data table files.	When using the controller's hot backup feature to perform crossloads over the DH+ channel, it was possible for the data tables on the secondary controller to become corrupted by having the data copied into the wrong file. This anomaly has been corrected so that data table files crossloaded from the primary controller to the secondary controller are loaded into the correct file.
In ControlNet Hot Backup applications, a Major Fault 232 (dual primary condition) can be caused by scheduled connection opening or closing.	When using the controller's hot backup feature, it was possible for a Major Fault 232 (dual primary condition) to occur when either opening or closing a scheduled connection on the controller. Examples of opening or closing scheduled connections include inhibiting or uninhibiting the scheduled connection or physical network problems that cause connection timeouts. This anomaly has been corrected so that opening and closing of scheduled connections will not cause a dual primary condition to occur.
In ControlNet Hot Backup applications, redundant connections with zero length outputs may cause inaccurate Output Ownership Invalid Counts.	Configuring redundant owner connections to modules that have no output data would cause the controller to not send ownership information to those modules. This would cause the Output Ownership Invalid Counts to be inaccurate. This anomaly has been corrected to allow ownership information to be shared and gathered correctly even when modules have no output data.

## Previous Releases of ControlNet PLC-5

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

### *Corrected Anomalies*

The following table describes the corrected anomalies in the Series F, Revision D, Series E, Revision J, Series D, Revision K and Series C, Revision T releases of ControlNet PLC-5 controllers.

<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. This anomaly has been corrected by the Revision T firmware of the DH+/RIO communication plug. The plug's firmware 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 controller may fault with memory loss. This anomaly has been corrected.

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

### *Enhancement*

The following table describes the enhancement in the Series E, Revision J, Series D, Revision K and Series C, Revision T releases of ControlNet PLC-5 programmable controllers.

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

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

***Corrected Anomalies***

The following table describes the corrected anomalies in the Series E, Revision J, Series D, Revision K and Series C, Revision T releases of ControlNet PLC-5 controllers.

<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 controller 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. This anomaly has been corrected.
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 ControlNet PLC-5 <b>and</b></li> <li>• the ControlNet PLC-5 is not a valid keeper (for example invalid configuration, default memory, etc.)</li> </ul> This anomaly has been corrected.

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

***Corrected Anomaly***

<b>Anomaly</b>	<b>Description</b>
The 1785-L80C15 could lose user memory when power down occurred during power up.	Occasionally, the controller 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.

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## Series F, Revision C.3 Updated Timeout Switchover for Hot Backup Applications

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

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

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

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.

## Series F, Revision C.3

### *Corrected Anomalies*

The following table describes corrected anomalies in the Series F, Revision C.3 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. This anomaly has been corrected.
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 ControlNet PLC-5 with this revision (F/C.2, D/F.2, E/E.2 and C/P.2) of firmware, <b>and</b></li> <li>• the ControlNet PLC-5 is not a valid keeper (for example invalid configuration, default memory, etc.)</li> </ul> This anomaly has been corrected.
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 has been 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 has been 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 has been 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). This anomaly has been corrected.

## Series F, Revision C.2

### *Corrected Anomalies*

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

<b>Anomaly</b>	<b>Description</b>
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 controller could fault with memory loss. This fault only occurred if a corresponding block transfer read was being performed to the same resident module. This anomaly has been corrected.
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 controller 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> This anomaly has been corrected.
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 has been 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. This anomaly has been corrected.

## Series F, Revision C.1

### *Corrected Anomalies*

<b>Anomaly</b>	<b>Description</b>
Losing DSR signal from the modem could cause various problems.	When the controller was configured for DF1 master or slave mode operation on the serial port, and the DSR signal was lost from the modem, the controller could clear diagnostic counters, lose memory buffers or fault with memory loss. This anomaly has been corrected.
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 and has been corrected.
Controller faulted with memory loss when writing to a protected controller with uninitialized RAM.	Writing to a 1785-L46C15 protected controller with uninitialized RAM would cause the controller to fault with memory loss. This anomaly has been corrected.
Partial ControlNet configuration loss after EEPROM restore.	During an EEPROM restore, the controller would not load information relevant to RSNetWorx and the controller's scan list. This would make the scan list in RSNetWorx to appear empty, even though the controller had scheduled connections. This anomaly only occurred with RSNetWorx 2.0 or later. This anomaly has been corrected.
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. This anomaly has been corrected.
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 controllers on that network. This anomaly has been corrected.
ControlNet cable disconnect or noisy network conditions caused controller to fault with memory loss or experience other problems.	If the ControlNet cable was disconnected, or noisy network conditions developed, the controller would fault with memory loss or experience other problems. This anomaly has been corrected and tolerance to network noise has been improved.

## Series F, Revision C

### *Corrected Anomalies*

<b>Anomaly</b>	<b>Description</b>
Sensitivity to channel noise or cable reconnect.	Various issues were addressed which make the controller more tolerant of a noisy ControlNet channel, or when the controller was connected and reconnected to a ControlNet network. This included when the controller lost communications or when keepers on the network became invalid. This anomaly has been corrected.
Intermittent ControlNet configuration download failure.	When downloading the ControlNet configuration, RSNetWorx would report a download failure. This anomaly has been corrected.
Increase in configured ControlNet activity caused major fault #205.	This anomaly has been corrected so that the controller 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. This anomaly has been corrected.

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<b>Anomaly</b>	<b>Description</b>
Temporary incorrect connection status to Logix5550 controller.	Controller would not show correct status of a connection to a Logix5550 controller until the controller went into Run mode. This anomaly has been corrected.
Password class change denied with 8 nodes.	When 8 different nodes or workstations were logged into a controller with a class password through one channel, and one node wanted to change its class, the controller would deny it and RSLogix5 would send an invalid password message. This anomaly has been corrected.
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 anomaly has been 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. This anomaly has been corrected.
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. This anomaly has been corrected.

## Previous Releases of ControlNet PLC-5 Hot Backup

### Series F, Revision C.1

#### *Corrected Anomalies*

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

<b>Anomaly</b>	<b>Description</b>
Possible long qualification time during change to Run mode.	The controller 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 controllers 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 controller. If the entries in the ControlNet configuration files were not identical, the data in the file on the secondary controller 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 controller. This anomaly has been corrected.

## Series F, Revision C

### Corrected Anomalies

Anomaly	Description
"Resource Unavailable" error message occurred.	This error message occurred whenever RSLogix5 or RSNetWorx remotely transitioned a ControlNet Hot Backup controller to Run mode. This anomaly has been corrected.
Program prescan reset crossloaded data in backup systems.	During the qualification process, the data table was crossloaded from the primary to secondary controllers. When the qualifying controller went into Run mode, some of the crossloaded data would be reset due to the program prescan. This anomaly has been corrected in this release so that the program prescan occurred before the data table was crossloaded between controllers.
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 controller if it powered up immediately in Run mode. This anomaly has been corrected in this release so that this feature is available. You can enable this feature by setting bit S:26/1.
Controller hung in qualification (Series F, Revision B firmware only).	Occasionally, a controller 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 and has been corrected.

## ControlNet PLC-5 Known Anomalies

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

- Under certain network configurations, the PLC-5/80C will only support 127 (out of a possible 128) I/O Map Table Entries. The controller 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 ControlNet PLC-5 with the previous revision (F/C.2, D/F.2, E/E.2 and C/P.2) of firmware, **and**
  - the ControlNet PLC-5 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.

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