

ControlLogix ControlNet Interface Module, Series D

Catalog Numbers 1756-CNB/D, 1756-CNBR/D

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About This Publication

These release notes cover the ControlLogix ControlNet Interface Module Series D firmware, revision 7.15 and earlier.

Enhancements

These enhancements have been made to the firmware.

Revision	Description
5.50	Firmware ASSERTs display the firmware revision along with the source file and line numbers.
	To provide easier diagnostics for the customer, the module has changed its failure display when it encounters a failed backplane interface ASIC. Instead of displaying a file name and line number, the module scrolls the message FAILED BACKPLANE INTERFACE ASIC should a failed backplane interface ASIC be detected.
	Implemented a more efficient method of processing the CPU utilization, resulting in a more accurate value at high utilizations.

Revision	Description
5.44	Provided a more descriptive scrolling message for certain fatal error conditions. These include the setting of the node address to zero in any system or to 99 in a redundant system. Also, not being able to communicate with the backplane ASIC or receiving conflicting data from the backplane ASIC will also produce a scrolling error message. For example: • ADDRESS SWITCHES = 00, ILLEGAL <file name> <line number> • ADDRESS SWITCHES = 99, ILLEGAL IN REDUNDANT SYSTEM <file name> <line number> • TIMED OUT WAITING FOR SRM TO POWER-UP AND RELEASE THE BACKPLANE SIGNAL <file name> <line number> • UNABLE TO COMMUNICATE WITH CHASSIS BACKPLANE <file name> <line number> • CONFLICTING RACK SIZE OR SLOT DATA FROM BACKPLANE ASIC <file name> <line number> • UNABLE TO COMMUNICATE WITH BACKPLANE ASIC <file name> <line number> • SRM RESPONDING TO BACKPLANE PING BUT NOT REDUNDANCY CONNECTION <file name> <line number>
5.39	Changed the n U # # diagnostic 4-character display to these two displays: • U c x x where xx is the number of unconnected client buffers, up to 20, used by the 1756-CNB module The display is enabled when usage is 80% or greater and turns off when usage drops below 50% of the available buffers. • U s x x where xx is the number of unconnected server buffers, up to 20, used by the 1756-CNB module The display is enabled when usage is 80% or greater and turns off when usage drops below 50% of the available buffers.

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Revision	Description
5.38.40	Beginning with this version of the firmware, a sub-minor revision will be added to the revision of the firmware (major rev., minor rev., sub-minor rev.> for example, 5.38.40). The sub-minor revision number is added to help to better identify and differentiate pre-released products. There should be no change in user behaviors when referencing the firmware revisions of released products. This number is not printed on the product label, however; it is scrolled on the displayed upon module powerup.
	Enhanced the rate at which ControlNet network configuration, station status, and error counter information is gathered. With this enhancement, this data will be gathered and updated every 3 seconds to more closely match other system timing such as connection re-establishment.
5.36	Enhanced the internal RAM memory test to improve memory fault coverage.
5.32	The 1756-CNBR modules can now be used with the 1756-CNB I/O Configuration entry in RSLogix 5000 under compatible keying.
	This version of the product is ControlNet International (CI) conformance tested. All future releases will continue to be CI-compliant.
5.27	Optimized the 1756-CNBR module for the ControlLogix Redundancy system.
	Added the ability to present diagnostic information on the 4-character display on the module.
	Added 16-bit minor fault counters internal to the module for these fault conditions (this feature was introduced in version 5.22): • Bandwidth exceeded – increments whenever there are no receive buffers available to handle incoming ControlNet data • Network error count – increments whenever a lonely or network mismatch condition is detected • ControlBus receive error count – increments whenever the 1756-CNB module detects a backplane error on the module • ControlBus address error count – increments whenever the 1756-CNB module detects a backplane address error on the module These read-only counters are accessible to ladder programs using CIP generic messaging. These counters are continuous and will roll over from 65,535 to 0. The counts are reset only at power is applied to the module.

Corrected Anomalies

These anomalies have been corrected in firmware revisions 7.15 and earlier.

Revision	Anomaly	Description
7.15	Single-channel 1756-CNB module at lowest node causes network disruption	Using a single-channel 1756-CNB module as the lowest node on a ControlNet network that has media redundancy configured for channels A and B OR as a B only network may prevent normal network operation. Symptoms include: • Loss of all scheduled connections for the network • New devices are prevented from joining the network • Module fault with ASSERT: smacdrv.c line 3440 showing on the display Lgx00076887
	ControlNet network channel media redundancy state not configured correctly	A 1756-CNB or 1756-CNBR module that is the current Active Keeper may not apply the channel media redundancy state correctly after a new RSNetWorx software project has been downloaded. Lgx00074794

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Revision	Anomaly	Description
7.15	Enhancement for new extended status code of 16#812	The 1756-CNB and 1756-CNBR modules now report error code 16#812 whenever the modules' node address does not match the expected address. Lgx00075549
	Power cycle racks caused persistent fault 16#0304	A 1756-CNB or 1756-CNBR module that is also the current Active Keeper may fail any connections with an error code 16#304 No Scheduled Configuration if lower nodes are power cycled just after a major network disruption. Lgx00075848
	Fault due to unterminated ControlNet network cable	Leaving the ControlNet network unterminated for long periods of time may cause the 1756-CNB or 1756-CNBR modules to fault with ASSERT: smacisr.c showing on the display. Lgx00077216
	OK status indicator remains flashing red	After recovering from a NET ERR condition, the OK status indicator may remain flashing red until the first connection has been established through the module. Lgx00081279
	Fault during flash update	Under very rare conditions the 1756-CNB module may fault with ASSERT: icpserv.c showing on the display during a ControlFLASH update if it has any active connections. Lgx00080851
7.12	Downloading RSNetWorx software project through bridge to 1756-CNB or 1756-CNBR modules fails	The RSNetWorx software project may fail with this error message: Unable to send message to the online active-keeper device due to resource limitations... while performing either a download or an online save when the online path is through a gateway and the last hop is a 1756-CNB or 1756-CNBR module. Lgx00066853

Revision	Anomaly	Description
7.11	An incorrectly configured outbound MSG can cause all inbound messages to fail with error 16#204	An incorrectly configured outbound MSG may cause problems if the 1756-CNB module is also receiving a large number of unconnected messages through the ControlNet network. Specific conditions for the anomaly include: • Outbound MSG configured as Unconnected • The outbound MSG configured with the 1756-CNB module's own ControlNet network node address in the communication path • MSG is sent when all ControlNet incoming unconnected buffers are in use Each time all of the above conditions are met the 1756-CNB module will lose one of its incoming unconnected buffers. Incoming messages performance may slowly degrade until all buffers are lost, at which point all incoming unconnected messages will begin to fail with an error code 16#204. Lgx00064807
	Module fault under heavy unscheduled load	Module may rarely fault with ASSERT fifo.c line 0744 showing on the display when five or more unscheduled packets are to be sent at the same time. Lgx00063510
7.10	Module no longer responds to network traffic	After recovering from a major network disruption the 1756-CNB or 1756-CNBR modules may become unresponsive to network traffic. Lgx00063368
	Transmission of scheduled data delayed by one Network Update Time (NUT)	After a major network disruption, the transmission of scheduled data may be permanently delayed by one network interval. Lgx00061468

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Revision	Anomaly	Description
7.10	Changes in electronic keying	A redundant media 1756-CNBR module can no longer replace a non-redundant media 1756-CNB module if a connection specifies the electronic keying to be exact match.
	Module freezes when using Add I/O Online	The 1756-CNB module may become unresponsive with the display frozen when you use the Add I/O Online feature. This occurs when the connection is configured as a multi-hop connection. Lgx00058180
	Fault due to unterminated ControlNet network cable	Leaving the ControlNet network unterminated for long periods of time may cause the 1756-CNB or 1756-CNBR modules to fault with ASSERT: icn_ucmm showing on the display.
	Module fault when using Add I/O Online and Change of State	Module may fault with ASSERT icpint.c line 294 showing on the display when using unscheduled connections that send data rapidly on the backplane. All the following conditions must be true: • Module added to I/O tree using Add I/O Online feature • Module configured for Change of State. • Rapid changes in module inputs trigger rapid data production Lgx00058434

Revision	Anomaly	Description
5.50	Illegal ControlNet network schedule	An illegal ControlNet network schedule can be imposed on a network after a project is downloaded to a Logix controller. After the download, the illegal schedule may require a 1756-CNB module on the network to transmit more data in a single Network Update Time (NUT) than ControlNet network specifications allow. Revision 5.50 will fail the module when an illegal schedule is detected; however, a more descriptive message will be scrolled across the 1756-CNB display. The display will scroll FAULT: Rev 5.50 Build 010 SCHEDULE LIMIT REACHED, INHIBIT CONNECTIONS, RESET MODULE THEN RESCHEDULE. This message indicates the steps you need to take to recover from this condition. Some of the connections through this 1756-CNB module have to be inhibited so that the 1756-CNB module can be reset and rejoin the network without again detecting the problem and faulting. Once the connections are inhibited, the 1756-CNB module can be safely reset and the network rescheduled. Once the network is rescheduled to a valid configuration, the connections can be uninhibited. Be sure to save the project.

Revision	Anomaly	Description
5.50	1756-CNB module assert during network disruption	When a 1756-CNB module goes lonely, the module could assert when messages are received from the backplane. This version includes a fix that properly handles this backplane traffic. Module may assert in smacsr.c during ControlNet network disruption - After a network disruption, the module now waits for the communications chip to reset before allowing traffic to be received. Module may assert in icn_ucmm.c during ControlNet network disruption - If a retry to an unconnected request is received at the same time the original reply is being sent, the module may assert.
	Delay in sending scheduled data	When operating with a fully loaded schedule, the 1756-CNB module may delay in sending scheduled data by one network interval. Modified the firmware to more efficiently guarantee data delivery according to the network schedule.
	NET ERR display	1756-CNB or 1756-CNBR modules with firmware revisions later than 5.39.10 may permanently display NET ERROR after either a major network disruption or a complete system power cycle. While the module is in this state, no communication is possible for any device on the same network.
	UCMM server count	The number of UCMM servers being displayed on the 1756-CNB module does not match the number of servers being used. The number of UCMM servers was not being decremented when they timed out, leaving the count out of sync with the number actually being used.

Revision	Anomaly	Description
5.50	Multiple products coming on line together	If a 1756-CNB or 1756-CNBR module and a 1407-CGCM module were power cycled together on the same ControlNet network, occasionally the 1407-CGCM module would not complete going on line to the ControlNet network and would not acknowledge network traffic. The initializing 1756-CNB module was broadcasting a reply message instead of sending it specifically to the requested node. The reply is no longer broadcast.
	NET ERR permanently displayed, and network permanently disabled	Applying power to a 1756-CNB module as low node on a network that is running unconfigured network parameters would cause the 1756-CNB module to permanently display NET ERR as well as permanently disable the network. The 1756-CNB module now correctly goes through the network attachment sequence without disrupting other nodes.
5.45	Counter rollover causes unexpected message management	After 497 days of uninterrupted module operation, an internal counter that tracks unscheduled message connection time-outs rolls over. When the rollover occurs, the ControlNet module no longer manages connections as expected, and the module's unconnected buffers eventually become unavailable. You must cycle power or reset the module to restart the counter.
	Controller major Fault due to power-up timing	If you used a 1756-CNB or 1756-CNBR module with firmware revision 5.45.10, enabled 'Major Fault on connection loss', and cycled power to the system, the controller experienced a major fault. Changes in the power-up procedure of the 1756-CNB module with firmware revisions later than 5.39.10 may delay the establishment of connections and cause the controller to major fault after a power cycle. This version significantly shortens the power-up time of the 1756-CNB module so that connections can be established before the controller major faults.

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Revision	Anomaly	Description
5.44	Dropped connections	When module utilization exceeds 90% and large amounts of unscheduled traffic exists, the network experiences dropped connections. Modified module operation to guarantee proper scheduled connection management.
	Incorrect scheduling	When module utilization exceeds 90%, the module could incorrectly send scheduled traffic. Modified module operation to guarantee proper scheduled traffic integrity.
	Last two bytes of a full 510 byte scheduled MAC frame may be overwritten	Rarely, an anomaly could occur where the last two bytes of a full 510-byte, scheduled MAC frame may be overwritten. A 510-byte MAC frame is the largest achievable scheduled communication from a node in any one Network Update Time (NUT). Refer to Tech Note #G91952649 in Rockwell Automation's Knowledgebase at http://www.rockwellautomation.com/knowledgebase/ .
	Delayed forwarding scheduled data by one Actual Packet Interval (API)	Under certain timing conditions, the 1756-CNB module delays forwarding scheduled data by one Actual Packet Interval (API). We modified the module to handle this condition.
5.38.40	Redundancy	Corrected anomalies related to ControlLogix Redundancy systems.
5.37	Scheduled data timing	Corrected an anomaly in which, on rare occasions, scheduled data connections timed out, or scheduled data were sent on the wrong ControlNet network update time (NUT). On very rare occasions, this condition could persist for a few NUT cycles and potentially result in a connection timeout. Connections would then be automatically re-established by the controller. The connection timeout and automatic reconnection process yields a connection loss of approximately three seconds. During this time, affected I/O connections use their fault states.

Revision	Anomaly	Description
5.36	Redundancy	Corrected several system redundancy related issues with the 1756-CNB and 1756-CNBR modules.
5.32	Handling delayed ACK messages	Improved the tolerance of the 1756-CNB module to handle delayed ACK messages from third party devices.
	Node address verified	The 1756-CNB module now verifies the node address when doing forward open signature checks.
	Improved recovery times	Corrected long recovery times for connections after multiple connection interruptions.
	ASSERT errors	Corrected the ASSERT in redunob.c error. This typically occurs when the module is in a rack containing a large number of controller, 1756-CNB, or 1756-DNB modules.
		Corrected the ASSERT in smacdrv.c line 2042 error.
	NET ERR state	Corrected the problem of the module stuck in NET ERR state.
5.27	Module access error	Accessing a 1756-CNB module as a PLC-5 processor from RSView software caused a red light and an exception handlers ASSERT error.
	ASSERT error	A 1756-CNB keeper ASSERT error was intermittently seen at node 1 at powerup. The workaround prior to this repair was to change the 1756-CNB module node address to something other than 1.
		An ASSERT in txlist.c error was intermittently seen on a two-node network when a cable was broken.
	Failure to form two-node network	A 1784-PCICS card and a single-media 1756-CNB module failed to form a two-node network.
	Mismatch error	RSNetWorx software would display On-Line/Off-Line Mismatch continuously, even after saving the latest edits successfully.

Revision	Anomaly	Description
5.27	CPU utilization calculation	Corrected the manner in which the CPU utilization was calculated. Previous values were high by as much as 10% in the 10% CPU utilization range. The error reduced linearly by 1% for each 10% increment in CPU utilization and therefore was high by only 1% in the 90% CPU utilization range.

ControlLogix I/O Rack Connection Limitations

When using ControlLogix I/O with a remote ControlNet network adapter (1756-CNB or 1756-CNBR module), as many as five controllers can create rack optimization connections to the ControlNet adapter. All subsequent rack connection requests will fail.

It is possible that more than one ControlLogix controller can configure the same remote 1756-CNB module for rack optimization, since each RSLogix 5000 software project configures the I/O for only one ControlLogix controller. As many as five ControlLogix controllers can communicate to the same 1756-CNB (or 1756-CNBR) module via a rack optimization connection.

If more than five ControlLogix controllers configure the same 1756-CNB module for rack optimization, RSNetWorx for ControlNet software will schedule the network, but only five ControlLogix controllers will communicate to that 1756-CNB module. The RSLogix 5000 software project files for the ControlLogix controllers that fail to communicate to that 1756-CNB module will show that 1756-CNB module as faulted, with the message, 16#011a Connection Request Error: Out of Connection Resources, showing on the module display.

Additional Resources

These documents contain additional information concerning related Rockwell Automation products.

Resource	Description
ControlLogix ControlNet Bridge Module, Series C and D Installation Instructions, publication 1756-IN571	Provides guidelines for installing ControlNet single-media and redundant bridge modules.
ControlLogix Redundancy System User Manual, publication 1756-UM523	Guides the design, development, and implementation of a redundancy system for a ControlLogix controller.
ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002	Provides ControlNet network planning information.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

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

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