

Important Product Information

READ THIS INFORMATION FIRST

Product: **Series 90™-30 Ethernet NIU**

Catalog Number;	IC693NIU004-AA
Firmware ID:	NIU Version 11.20
	NIU Boot Firmware Revision 11.20
	Ethernet Version 1.02
	Ethernet Boot Version 1.00
Program Revision	EIO_010

This is the first release of the Series 90-30 Ethernet NIU.

Compatibility

- The Series 90-30 Ethernet NIU supports a subset of Series 90-30 I/O modules. In general only discrete and analog I/O modules are supported. Communication, Fieldbus, Motion, and Specialty modules are not supported. The Hardware configuration catalog in CIMPLICITY® Machine Edition Version 4.00 SP3 Special 4 and later, shows the modules which are supported.
- The Series 90-30 Hand-Held Programmer (IC693PRG300) cannot be used with this module.
- CIMPLICITY® Machine Edition Version 4.00 SP3 Special 4 or later must be used to configure the IC693NIU004.
- A High Capacity Power Supply (IC693PWR330, IC693PWR331, or IC693PWR332) is required when using the IC693NIU004. The ENIU is not compatible with any of the Standard Series 90-30 power supplies.

Power consumption of the IC693NIU004 and its supporting devices are listed below:

- IC693NIU004 requires 1.48A @ +5VDC (= 7.4 Watts).
- If used, the converter in the IC690ACC901 serial cable assembly requires 100mA at 5VDC (=0.5 Watts).
- If used, the IC690ACC900 RS-422/RS-485 to RS-232 converter requires 170mA at 5 VDC (=0.85 Watts).
- The IC693NIU004 is not compatible with versions “F” and earlier of the IC693ALG220/221 Analog Input Modules. Version “G” or later of the IC693ALG220/221 must be used with the IC693NIU004. If a Version “F” or earlier IC693ALG220/221 module is used with an IC693NIU004, the %AI values reported by the module may exhibit erratic behavior.

Operating Notes

- **Program Revision:** The Series 90-30 Ethernet NIU has a single program block, which is called by _Main. The name of this single program block is the revision of the program. The initial release of the Series 90-30 Ethernet NIU has a program revision of EIO_010 EIO_ identifies this as the Ethernet NIU program. First “0” is reserved, “1” is major revision, “0” is minor revision.
- **Station Manager Style:** The Series 90-30 Ethernet NIU uses a “Style B” Station Manager.
- **Heavy Load Can Block Station Manager:** A heavy EGD or SRTP load can block Station Manager operation.
- **Battery Backup Limitations:** The expected life of a standard Series 90-30 3-volt lithium battery used to back up a NIU is 1.2 months when used continuously. If a longer battery backup period is required, the Auxiliary Battery Module (IC693ACC302) is available. The Auxiliary Battery Module provides a battery backup period

of 15 months for the NIU. See the IC693ACC302 Auxiliary Battery Module PLC Data Sheet (GFK-2124) for additional information.

- ***NIU Consumes EGD Exchanges Produced to a Group Address even if the NIU is configured to consume from an IP address:*** The NIU consumes EGD exchanges based solely on their producer ID and exchange ID. Unlike other GE Fanuc products, the NIU does not filter consumed exchanges based on the IP multicast group address. Group numbers must not be used as the means of distinguishing EGD exchanges to be consumed by the NIU. When Group numbers are used they must be used in conjunction with the Producer ID and exchange ID.
- ***Multicast Data Not Filtered:*** The NIU does not do hardware filtering of multicast data over Ethernet. This means extraneous multicast messages on the network cause an additional load on the NIU, and may significantly degrade performance. Sufficient load can cause the NIU to reset its Ethernet interface. It is recommended that Series 90-30 Ethernet NIUs be isolated from additional traffic by either running on a separate network or isolating the NIUs through Ethernet switches which block unwanted IP addresses and Group addresses.
- ***Downloading Very Large Configurations/Initial Values Using a Serial Programmer:*** When downloading very large configurations and initial values, you may need to increase the request timeout value in the programming software to avoid receiving a request timeout message during the write to Flash memory. (The NIU always writes to flash memory during a download operation.) An upper limit of 25 seconds is typically satisfactory. For further details, see the item “Write of Logic, Configuration, or Initial Values to Flash or EZ Program Store device May Cause Loss of Ethernet Communications”.
- ***Simultaneous Upload and Download:*** When operating with multiple programmers attached, initiating a download operation from one programmer during an upload operation from another programmer will cause the upload to fail.
- ***Upgrading Firmware with Many Modules in Rack:*** The process of upgrading the NIU firmware with the WinLoader utility may fail when multiple I/O modules are in the main, expansion, or remote racks, due to the extra time it takes to restart the NIU. If the upgrade process fails, wait until the OK LED on the power supply stops blinking and then click the **Retry** button on the WinLoader **Firmware Update Failed** dialog box. If the upgrade fails again, move the NIU to a rack without IO modules and restart the upgrade process.
- ***Configuration of IP Address is Required Before Using Ethernet Communications:*** The Ethernet interface within the NIU cannot operate on a network until a valid IP address is configured. The necessary Ethernet addressing information must be configured prior to actual network operation. Use one of the following methods:
 - A. Perform the initial configuration using a PLC Programmer connected through the NIU’s power supply serial port.
 - B. Connect a serial terminal to the station manager port of the NIU. Then use the CHSOSW command to enter a temporary IP address. The Ethernet Interface can then be accessed over the network (such as by an Ethernet PLC Programmer). See the *TCP/IP Ethernet Communications Station Manager Manual*, GFK-1186, for details.
 - C. Temporarily assign an IP address to the module using the Ethernet network. Refer to Appendix D of the *TCP/IP Ethernet Communications Station Manager Manual*, GFK-1186, for details.
- ***Proper IP Addressing is Always Essential:*** The NIU’s embedded Ethernet interface must be configured with the correct IP Address for proper operation in a TCP/IP Ethernet network. Use of incorrect IP addresses can disrupt network operation for the NIU and for other nodes on the network. Refer to the *TCP/IP Ethernet Communications for the Series 90™ PLC User’s Manual*, GFK-1541, for important information on IP addressing.
- ***Name Resolution:*** The IC693NIU004 does not support Name Resolution.
- ***BOOTP:*** The IC693NIU004 does not support BOOTP.
- ***AUP Files:*** The IC693NIU004 does not support Advanced User Parameter (AUP) files.

- **Ethernet Programmer May Briefly Lose Communications When Configuration Stored:** Storing an NIU configuration containing Ethernet configuration values may require the Ethernet NIU to restart itself in order to use any changed configuration values. When the Ethernet interface restarts, an Ethernet PLC Programmer briefly reports a loss of communications. If this occurs, the Ethernet interface will post two or more faults in the Fault Table in the NIU, (the NIU fault tables show up in the programmer labeled as PLC and IO), with the text “LAN system-software fault; resuming” and fault-specific data starting with 080008 and/or 080042. In addition, faults with text “Bad remote application request; discarded request” (1B0021) and “Local request to send rejected; discarded request” (110005) may occur. When these faults occur, the STAT LED on the NIU is turned off to indicate posting of faults to the Fault Table in the NIU. In some cases, a 10-second delay may occur before loss of communications is detected. Normal operation resumes once the Ethernet interface restarts. The STAT LED can be reset using the Station Manager OK command.

When the NIU’s configuration is stored from an Ethernet PLC Programmer, the communications loss occurs immediately after successful completion of the store.
- **Write of Logic, Configuration, or Initial Values to Flash or EZ Program Store Device May Cause Loss of Ethernet Communications:** While writing the NIU’s logic, configuration, and/or initial values to Flash memory or to the EZ Program Store device, Ethernet data communications may be lost. (The NIU always writes to flash memory during a download operation.) Normal data transfers are temporarily suspended during a Flash or EZ Program Store device operation. In these cases, Ethernet data transfers (such as used by an Ethernet PLC Programmer connection) will fail when the write exceeds the 16-second maximum period allowed for completion. Upon completion of the write, normal operation will resume. If a timeout occurs during a write to Flash or EZ Program Store device, the timeout value should be increased in the programming software being used. See the User’s Manual for the programming software for more details.
- **Ethernet Flash Test Failure:** The Ethernet interface within the NIU continually tests the integrity of its flash memory. In the extremely unlikely event that corrupted flash is detected, a “Module software corrupted; requesting reload” fault is posted to the NIU’s Fault table and the Ethernet interface enters firmware loader mode. However, attempting to reload the firmware always fails when a hard failure of a flash memory device has occurred.
- **Invalid Ethernet Restart Event:** After power is applied, the restart event (event 1H) in the Ethernet Station Manager exception log may occasionally contain 000cH in entry 3, erroneously indicating that a timeout of the Ethernet watchdog timer occurred. This condition does not produce a fault in the NIU’s Fault Table or turn off the Ethernet STAT LED, and it has no effect on subsequent operation. It is unlikely to occur when a power supply recommended in *Power Supply Compatibility and Requirements* from page 1 of this document is used. Note that an actual watchdog timeout produces a “Reset of daughter board” fault in the NIU’s Fault table.
- **First Ping Response Lost after Restart of Ethernet Interface:** Immediately after restarting the Ethernet interface, the first response to a PING large enough to require more than one IP packet (1466 bytes or larger) is not generated.
- **Multiple Zero Period EGD Exchanges May Not Produce Similar Numbers of Samples:** If more than one produced EGD exchange is configured for a production period of zero, the exchanges may not produce similar numbers of samples. Due to the way scheduling occurs when multiple exchanges are scheduled “as fast as possible”, some zero period exchanges may produce significantly more samples than others. It is recommended that “as fast as possible” not be used as it will decrease the performance of the NIU.
- **Changing IP Address While SRTP Connection Open May Generate Log Events:** SRTP connections established to the client are not terminated gracefully when the NIU’s IP address is changed. SRTP channels report either a 9690H or 0190H status, and possibly remain open until the connections are terminated as a result of client timeouts.

Restrictions and Open Problems

- **NIU Cleared / Hardware Fault Received when Using EZ Program Store Device:** The logic, configuration, initial values, and fault tables are cleared and a “CPU Hardware Fault” is logged when the keyswitch is set to the “B” position and the EZ Program Store device is used to program the NIU.
- **NIU does not Revert to Backup Ethernet Configuration after Interrupted Store from EZ Program Store Device:** The NIU retains its current Ethernet configuration instead of reverting to the backup configuration when a pushbutton store from the EZ Program Store device is interrupted (for example, by disconnecting the EZ Program Store device during the store.)
- **Power Supply Serial Port does not Respond to SNP/SNPX Requests:** The Power Supply Serial Port does not respond to SNP or SNPX requests including the break character if an attach message is received that is missing the last character before the BCC, or a message is received that has an invalid BCC or is corrupted so the calculated BCC doesn’t match the BCC specified in the message. Power to the NIU must be turned off and back on to regain communications.
- **EZ Program Store Device not able to Update OEM Protection Locked Machines:** The NIU cannot be updated with the EZ Program Store device if it has its OEM protection locked, even if the EZ Program Store device has the OEM password programmed into it.
- **Faults Exist Status Bit Always Set if NIU Operated without a Battery:** The “Faults Exist” status bit always indicates the NIU is faulted if it is operated without a battery. This occurs because a “Failed battery signal” fault is logged in the NIU’s PLC Fault Table. This fault reoccurs if the NIU’s PLC Fault Table is cleared.
- **Number of SRTP Requests Tallied May Vary:** When running multiple SRTP channels, the number of requests, as reported by the client and the server, may differ between the connections.
- **Reporting of Duplicate IP Address:** The NIU does not log an exception or a fault in its own PLC Fault Table when it detects a duplicate IP address on the network. The duplicate IP address is reported in the STAT F output only.
- **TCP Connections May Remain Half-Open on NIU Server if Client is Lost:** If an SRTP client with open connections to a NIU server is turned off and back on (or is otherwise reset) the server’s TCP connection may remain open for a long time (until the TCP keep-alive timer expires) once the client is restarted and attempts to reopen the communication.
- **Large Number of IP Reassembly Failures on Large PING:** When sending PINGs large enough to require more than one IP packet (1466 bytes or larger), the number of IP ReasmFai tallies seen on the client is larger than expected. A corresponding number of “no timely response” errors are seen in the PING results. Large SRTP transfers do not exhibit the same behavior. EGD messages always fit in a single packet, and thus are not subject to this problem.
- **REPP Does Not Save Results of Aborted PING:** The Station Manager REPP command does not retain the results of a PING that is aborted due to error. The PING results are reported when the PING is aborted, but subsequent REPP commands give the results of the last successfully terminated PING.
- **STAT C Command Reports Invalid Rack/Slot Location:** The Station Manager STAT C command reports the NIU is located in Rack 0 Slot 15 instead of Rack 0 Slot 1.
- **Multiple Log Events:** The NIU’s Ethernet interface sometimes generates multiple exception log events and PLC Fault Table entries in the NIU when a single error condition occurs. Under repetitive error conditions, the exception log and/or the NIU’s PLC Fault Table can be completely filled with repetitive error messages.