

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GE 90-30 SERIES PLC

IC693CPU350-EJ

CPU 350 CONTROLLER

Used with the applicable Series 90-30 controllers configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: GE official manufacturer documentation

IMPORTANT PRODUCT INFORMATION

READ THIS INFORMATION FIRST

Product: IC693 CPU Modules with Firmware Release 10.60

IC693CPU350-CG

IC693CPU360-CH

IC693CPU363-BF

Introduction

This document contains information that is not available in any other publication; therefore, we recommend you save it for future reference. This document discusses firmware release 10.60, which fixes the problems listed in “Problems Resolved by this Release” (page 4).

No new features are added by this release.

Hardware Identification

The following table shows the revision level of the circuit boards used in the current version of these CPUs.

CPU Catalog Number	Circuit Board ID	Circuit Board Version
IC693CPU350-CG	CX3A1 or CX3B1	44A739579-G01R04 or later 44A749514-G01R00 or later
IC693CPU360-CH	CX3A1 CX3B1	44A739579-G01R04 or later 44A749514-G01R00 or later
IC693CPU363-BF	CX3A1	44A739579-G01R05 or later

Firmware Upgrade Kits

If you wish to upgrade an existing CPU350 or CPU360 to firmware version 10.00, you may purchase the applicable kit identified in the following table. All previous versions are capable of being upgraded.

Firmware Upgrade Kit Catalog Numbers	
CPU Catalog Number	Firmware Upgrade Kit Catalog Numbers
IC693CPU350-(all versions)	44A747145-G06
IC693CPU360-(all versions)	44A747148-G07
IC693CPU363-BF	44A747766-G05

Firmware Identification

CPU Catalog Number	Motherboard Firmware Version	Daughterboard Firmware Version
IC693CPU350-CG	Main: R10.60 (38A1) Boot: R9.00 (33A1)	N/A
IC693CPU360-CH	Main: R10.60 (38A1) Boot: R9.00 (33A1)	N/A
IC693CPU363-BF	Main: R10.60 (38A1) Boot: R9.00 (33A1)	Main: R10.00 (49A1) Boot: R2.00 (30A1)

Firmware Upgrade Hardware Requirements

Note: The Model 350 and 360 CPU operating firmware is stored in FLASH memory. The firmware upgrade is provided on a floppy disk and must be serially downloaded from a Personal Computer. An IBM AT personal computer or better PC with a minimum 640K of RAM, one 3.5" floppy drive, MS-DOS version 3.3 or later (or Windows 95 or later), a hard drive, and one RS-232 serial port is required. In addition, a serial cable and RS-232/RS-485 converter are required. The following serial cable/converter kit is available from GE Fanuc:

IC690ACC901 Mini Converter (RS-232/RS-485) Kit with serial cable

Functional Compatibility

- CIMPLICTY Machine Edition PLC Logic Developer version 2.11 or later, or VersaPro version 1.1 or later is required to utilize the features introduced in release 10.00 firmware.
- PLC Logic Developer, VersaPro version 2.00 or later, or Control software version 2.00 or later is required for C programming.
- Version 4.00 or later of the C toolkit must be used for C programming.
- Control software version 2.00 or later must be used to take advantage of Sequential Function Chart (SFC) subroutines.
- Logicmaster software version 9.02 or later must be used to take advantage of the features introduced in firmware release 9.00.

Operating Notes

User Information Cleared when Upgrading Firmware

User information, consisting of program, configuration, CPU ID (used for SNP communications), and status tables in RAM memory, will automatically be cleared if the CPU firmware in flash memory is changed. You will need to restore these if upgrading firmware. A recommended procedure is to first back up your user information from RAM memory to Flash memory. Then write your new firmware to Flash memory (firmware is stored in a different location in Flash memory than that used for storing user information such as program, configuration, etc.). Finally, write your user information back out of Flash into RAM memory. As an alternative, your user information (program, configuration, etc.) can be restored from a computer-based backup program folder using your PLC programming software. The SNP ID, if required, must be set separately using the programming software or the Hand-Held Programmer (HHP).

Option Module Revision Requirements

- **Ethernet Interface Module Compatibility.** All IC693 Ethernet Interface (IC693CMM321) modules used with these CPUs should be updated to IC693CMM321 firmware release 1.10 or later. This is also a requirement of the TCP/IP Ethernet version of the MS-DOS programming software. During a Run Mode Store (Alt + S hot key combination) of a large program block (greater than 14 kilobytes), the Ethernet module may time out, causing communications to fail. Changing the Communications Window to Run-to-Completion mode, or storing the program in Stop mode, will allow the store to take place successfully.
- **FBC Compatibility.** FBC version 3 or later is required for these CPUs.

Writing to Flash Using the Windows PLC Programming Software

When writing very large programs to flash memory, it may be necessary to increase the Windows PLC programming software request timeout value to avoid receiving a request timeout message. An upper bound of 25 seconds is typically satisfactory

Storing Large Configurations

The IC693 PLC normally supports 20 DSM314 modules in a system. This number may be reduced by other modules in the system, such as APM and GBC modules. It may also be further reduced if using datagrams that read the reference or fault tables. If the configuration and user program are stored at the same time, the presence of either C blocks within the LD program, or a C logic program may also affect the number of DSM314 modules that may be included in a system. If the store fails, it may be possible to work around this problem by first storing the logic program and then storing the configuration on a separate store request. The number of modules supported may be further reduced by the size of CPU user memory.

No Model Number Checking with DOS-based programmer

The No Model Number Checking feature does not support storing a 311, 313, 321, 323 or 331 configuration to a Release 9.0 or later CPU.

Simultaneous Load and Store

When operating with multiple programmers attached, if a store operation is initiated by one programmer, while a load operation is already in progress, the load request will fail.

Transition Tables are not cleared when the reference tables are cleared.

The transition tables are not cleared upon clearing the reference tables through the programmer.

Problems Resolved by this Firmware Release (10.60)

CPU won't handle 11K byte smart module init file

With the new version of Horner PBM and the new version of VersaPro, both of which create and expect an 11K byte init file, logic analyzer traces show that the data received from the SI30 on the module are incorrect. That is, the data coming across the backplane was corrupted. A LOAD or VERIFY of the configuration works properly, so it appears that the data within the PLC is correct.

Load of large (>32K) DSM zip files fails

Load greater than 32K through 364 (stored over SNP)

Failed with the following station manager log.

= log

<<< Exception Log >>>

Log initialized using valid RAM information

Log last cleared 01-JAN-2000 03:32:49.7

Date	Time	Event	Count	Entry
01-JAN-2000	03:33:17.2	8H	21H	00H 0024H 0202H 0000H 0001H 0000H
->01-JAN-2000	03:33:25.9	8H	1H	00H 0008H 0000H 0097H 002eH 0000H

Restrictions and Open Issues

Timing Issue with ALG220/221 Modules May Result in Incorrect %AI Values Read by CPU

A problem was found with the IC693ALG220/221F (and earlier versions) where the actual %AI values reported by the card may exhibit erratic behavior (versions F and earlier may show this problem; the problem was fixed in version G or later). Certain current or voltage levels within the input range applied to the card could cause the %AI values to report incorrectly. The problem stems from the use of particular optocouplers, which may exhibit timing issues with these CPU35x/36x modules. (NOTE: CPUs 341, 331, 321, 313, and 311 have not exhibited this problem.)

The IC693 PLC will generate a fatal fault if a ladder containing DOIO function block calls to a smart module is repeatedly placed in RUN then STOP mode

A problem was found with the CPU where a ladder containing a call to a DOIO function block would cause the PLC to run out of system memory. This is caused when the PLC transitions to run mode and back to stop mode several times. If the configuration is stored, the system memory will be freed, and the PLC will resume normal operation.

IC693 PLC CPU may Develop Fatal Fault During Store of Folders with Large Configurations

The IC693 PLC CPU may generate a fatal fault during a store of a folder with an especially large configuration. This may be made worse by storing a program and configuration at the same time, or by having datagrams from a programmer present during the store.

PID Integral Contribution

The PID Integral Contribution is not calculated correctly with an integral rate of 0 or 1.

A CPU360 Configuration Stored to CPU352 may Cause Fatal Fault

If a CPU360 configuration file is stored to a CPU352, the PLC may generate a fatal fault when transitioning to run mode.

Reading from an Invalid Flash Part may Cause a Watch Dog Timeout

If a corrupted flash part is read, the Watch Dog Timer on the PLC may be triggered. This can be fixed by completing a valid flash store.

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Fatal Fault Occurs when Configuring a Module with the HHP Following a Maximum Size PLC Store

The IC693 PLC CPU may generate a fatal fault while attempting to configure a module with the Hand-Held Programmer (HHP) following a maximum size store to the PLC.

Firmware Update Fail Following Power-up with Clear M/T and a Write to Flash

Firmware update may fail following a power-up with Clear M/T pressed on the Hand-Held Programmer and a write to flash. Cycling power on the PLC will enable the upgrade to proceed.

Documentation

Instructions for using these two modules can be found in the latest version of the following manuals:

Hardware Description, Installation Instructions: *IC693 Installation and Hardware Manual*

General Configuration Instructions: *IC693 PLC Programming Software User's Manual*

System Operation: *IC693 PLC System Manual*

System Operation and Instruction Set: *IC693 PLC Reference Manual*

IC693CPU350 Data

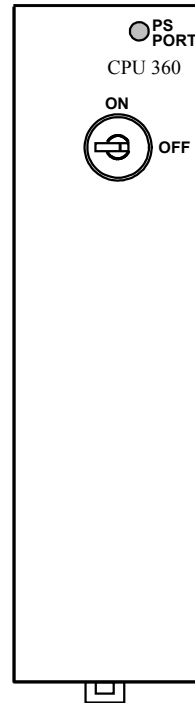
CPU Type	Single slot CPU module
Total Baseplates per System	8 (CPU baseplate + 7 expansion and/or remote)
Load Required from Power Supply	670 milliamps from +5 VDC supply
Processor Speed	25 MegaHertz
Processor Type	80386EX
Typical Scan Rate	.22 milliseconds per 1K of logic (Boolean contacts)
User Program Memory (maximum)	32K Bytes (not configurable)
Discrete Input Points - %I	2,048
Discrete Output Points - %Q	2,048
Discrete Global Memory - %G	1,280 bits
Internal Coils - %M	4,096 bits
Output (Temporary) Coils - %T	256 bits
System Status References - %S	128 bits (%S, %SA, %SB, %SC - 32 bits each)
Register Memory - %R	9,999 words
Analog Inputs - %AI	2,048 words
Analog Outputs - %AQ	512 words
System Registers (for reference table viewing only; cannot be referenced in user logic program)	28 words (%SR)
Timers/Counters	>2,000
Shift Registers	Yes
Built-in Serial Port(s)	1 (uses connector on PLC power supply). Supports SNP, SNP-X slave protocols. Requires CMM module for SNP/SNP-X master, CCM, or RTU (slave) protocol support. Requires PCM module for RTU master support.
Communications	LAN – Supports multidrop. Also supports Ethernet, FIP, Profibus, GBC, GCM, and GCM+ option modules.
Override	Yes
Battery Backed Clock	Yes
Interrupts	Supports the periodic subroutine feature.
Type of Memory Storage	RAM and Flash
PCM/CCM Compatibility	Yes
Floating Point Math Support	Yes, firmware-based in firmware releases 9.0 and later.



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IC693CPU360 Data

CPU Type	Single slot CPU module
Total Baseplates per System	8 (CPU baseplate + 7 expansion and/or remote)
Load Required from Power Supply	670 milliamps from +5 VDC supply
Processor Speed	25 MegaHertz
Processor Type	80386EX
Typical Scan Rate	.22 milliseconds per 1K of logic (Boolean contacts)
User Program Memory (maximum)	240K (245,760) Bytes. Note: Actual size of available user program memory depends on the amounts configured for the %R, %AI, and %AQ configurable word memory types (described below).
Discrete Input Points - %I	2,048
Discrete Output Points - %Q	2,048
Discrete Global Memory - %G	1,280 bits
Internal Coils - %M	4,096 bits
Output (Temporary) Coils - %T	256 bits
System Status References - %S	128 bits (%S, %SA, %SB, %SC - 32 bits each)
Register Memory - %R	Configurable in 128 word increments, from 128 to 16,384 words with DOS programmer, and from 128 to 32,640 words with Windows programmer Ver. 2.2 or VersaPro version 1.0.
Analog Inputs - %AI	Configurable in 128 word increments, from 128 to 8,192 words with DOS programmer, and from 128 to 32,640 words with Windows programmer Ver 2.2 or VersaPro version 1.0.
Analog Outputs - %AQ	Configurable in 128 word increments, from 128 to 8,192 words with DOS programmer, and from 128 to 32,640 words with Windows programmer Ver. 2.2 or VersaPro version 1.0.
System Registers (for reference table viewing only; cannot be referenced in user logic program)	28 words (%SR)
Timers/Counters	>2,000
Shift Registers	Yes
Built-in Serial Port(s)	1 (uses connector on PLC power supply). Supports SNP, SNP-X slave protocols. Requires CMM module for SNP/SNP-X master, CCM, or RTU (slave) protocol support. Requires PCM module for RTU master support.
Communications	LAN – Supports multidrop. Also supports Ethernet, FIP, Profibus, GBC, GCM, and GCM+ option modules.
Override	Yes
Battery Backed Clock	Yes
Interrupts	Supports the periodic subroutine feature.
Type of Memory Storage	RAM and Flash
PCM/CCM Compatibility	Yes
Floating Point Math Support	Yes, firmware-based in firmware release 9.0 and later.



IC693CPU363 Data

CPU Type	Single slot CPU module
Total Baseplates per System	8 (CPU baseplate + 7 expansion and/or remote)
Load Required from Power Supply	890 milliamps from +5 VDC supply
Processor Speed	25 MegaHertz
Processor Type	80386EX
Typical Scan Rate	.22 milliseconds per 1K of logic (Boolean contacts)
User Memory (total)	240K (245,760) Bytes. Note: Actual size of available user program memory depends on the amounts configured for the %R, %AI, and %AQ configurable word memory types (described below).
Discrete Input Points - %I	2,048
Discrete Output Points - %Q	2,048
Discrete Global Memory - %G	1,280 bits
Internal Coils - %M	4,096 bits
Output (Temporary) Coils - %T	256 bits
System Status References - %S	128 bits (%S, %SA, %SB, %SC - 32 bits each)
Register Memory - %R	Configurable in 128 word increments, from 128 to 16,384 words with DOS programmer, and from 128 to 32,640 words with Windows programmer Ver. 2.2 or later, or VersaPro version 1.0 or later.
Analog Inputs - %AI	Configurable in 128 word increments, from 128 to 8,192 words with DOS programmer, and from 128 to 32,640 words with Windows programmer Ver 2.2 or later, or VersaPro version 1.0 or later.
Analog Outputs - %AQ	Configurable in 128 word increments, from 128 to 8,192 words with DOS programmer, and from 128 to 32,640 words with Windows programmer Ver. 2.2 or later, or VersaPro version 1.0 or later.
System Registers (for reference table viewing only; cannot be referenced in user logic program)	28 words (%SR)
Timers/Counters	>2,000 (depends on available user memory)
Shift Registers	Yes
Built-in Serial Ports	3 (one uses connector on PLC power supply). Supports SNP/SNPX slave (on all three ports) and RTU slave and Serial I/O (on Ports 1 and 2). Requires CMM module for CCM and PCM module for RTU master.
Communications	LAN – Supports multidrop. Also supports Ethernet, FIP, Profibus, GBC, GCM, and GCM+ option modules.
Override	Yes
Battery Backed Clock	Yes
Interrupt Support	Supports the periodic subroutine feature.
Type of Memory Storage	RAM and Flash
PCM/CCM Compatibility	Yes
Floating Point Math Support	Yes, firmware-based

