

IMPORTANT PRODUCT INFORMATION

READ THIS INFORMATION FIRST

Product: **Programmable Controller CPU Module**
IC697CPU780-G

This document contains information that is not available in any other publication; therefore, we recommend you save it for future reference. Read this document (GFK-0838G) before installing or attempting to use the CPU780.

This is a production release of the Series 90-70 PLC CPU Module 780. The purpose of this release is to fix a hardware problem encountered during final factory testing of the module. The firmware version (4.70) is unchanged.

New Catalog Number	Replaces
IC697CPU780-G	IC697CPU780-F

Packaging Note

The user manual is no longer shipped in the box with every product. User manuals are available as a complete set with Logimaster 90 products, on CD-ROM, and as individual manuals.

Identification

The hardware and software identification for this release is summarized in the following tables:

H/W Identification

Cat. #	Board ID	Board Revision
IC697CPU780-G	CPHA2	44A731786-G01 R10 or later

S/W Identification

Cat. #	EPROM Location	EPROM/Diskette Label	Checksum
IC697CPU780-G	U72	397-027D 4.70	00441119
	U73	397-028D 4.70	0043C00A
	U74	397-030D 4.70	00F9B417
	U75	397-029D 4.70	00FC1518

Documentation

The following table lists the documentation for this CPU.

Cat. #	Data Sheet	IPI	User Manual
IC697CPU780-G	GFK-0837D	GFK-0838G	GFK-0827

Special Operation Notes

Expansion Memory Modules

This Release of the PLC CPU Redundancy Feature requires one of the following Series 90-70 32-Bit Expansion Memory modules:

IC697MEM731D or later
IC697MEM732C or later
IC697MEM733D or later
IC697MEM735D or later

Logicmaster 90 Compatibility

This release of the PLC CPU 780 module is compatible with Logicmaster 90-70 version 4.50 or later.

PCM and Bus Transmitter Module Compatibility

It is highly recommended that systems using PCMs use IC697PCM711J or later modules to take advantage of timing improvements and new features in Release 5 and later versions.

It is also highly recommended that systems using Bus Transmitter Modules use IC697BEM713B or later. Use of earlier revisions may result in reduced system performance.

PCM (to CPU) Communications Timeout

Versions of the Series 90-70 Programmable Coprocessor Module (PCM) prior to IC697PCM711V (release 4.03) have a backplane communications default timeout value of 5 seconds. After the PCM has sent a request to the Series 90-70 CPU, the PCM applies this timeout while it is waiting for a response from the CPU. In most cases the Series 90-70 CPU will respond well within the 5-second timeout. However, in certain situations the CPU can take longer than 5 seconds to respond. These cases are limited to LOAD and STORE operations on logic and/or configuration, especially if any logic blocks are larger than 8K bytes. Folders containing EXE blocks, especially with *.EXE files larger than 8K bytes, are most likely to present problems. Beginning in release 6.00, standalone C programs larger than 8K bytes also cause this issue.

Beginning in release 5.50 of the Series 90-70 CPU, the CPU is guaranteed to respond within 8 seconds. To ensure that PCMs older than release 4.03 do not report backplane timeouts, a file must be loaded to each release 3.03 or older PCM using the *termf* utility. See the *Series 90 Programmable Coprocessor Module and Support Software User's Manual*, GFK-0255, for information on using *termf*. The required file is a binary file named "CPU.ENV". The contents of the file are on page 3 (all values specified in hexadecimal).

Contents of CPU.ENV File

File Offset	Data
0000	4C 5A 01 01 00 00 00 00-00 00 00 00 01 00 00 00 LZ.....
0010	00 00 00 00 00 00 00 00-00 00 43 50 55 4C 49 4ECPULIN
0020	4B 2E 43 4F 44 00 2D 62-00 36 34 00 2D 74 00 32 K.COD.-b.64.-t.2
0030	30 30 00 00 43 50 55 4C-49 4E 4B 2E 44 43 42 00 00..CPULINK.DCB.
0040	00 4E 55 4C 4C 3A 00 4E-55 4C 4C 3A 00 4E 55 4C .NULL:.NULL:.NUL
0050	4C 3A 00 00 00 00 00 00-00 00 00 00 00 00 00 00 L:.....
0060	00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0070	00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00

Once the binary file CPU.ENV (above) is created, use *termf* to load CPU.ENV to each PCM older than release 4.03 in the Series 90-70 PLC. Then execute a soft reset of the PCM(s). After executing the soft reset the PCM backplane communications timeout will be 10 seconds.

Note: A copy of this CPU.ENV file can be obtained from the GE Fanuc PLC Technical Support World Wide Web site. CPU.ENV can be found at <http://www.gefanuc.com/support/plc> through the *Series 90-70* and *Files* links.

Caution

When a hard reset is performed on the PCM, the CPU.ENV file, if present, will be ignored. Hard resets are normally used only for debugging PCM applications. A manual soft reset, “soft reset” COMMREQ (See the next paragraph.), or power cycle must be performed after every hard reset of the PCM to assure the backplane communications timeout is set to 10 seconds.

Please note that it is possible to issue a “hard reset” COMMREQ from a Ladder Diagram application. Applications that use this feature must be modified to perform the required soft reset from a “soft reset” COMMREQ. See Appendix B-1 in the *Series 90 Programmable Coprocessor Module and Support Software User’s Manual*, GFK-0255K, for information on issuing reset COMMREQs.

Notice to Upgrade GBC Firmware

With the introduction of new features in release 5.01, timings with the Genius Bus Controllers (GBCs) changed; this uncovered a problem in the GBC firmware. GBCs in expansion racks could be lost if the system is fully configured and only the main rack cycles power.

There is also a problem with input data coherency in previous versions of the GBC. In a system with a large CPU sweep time and a short Genius bus scan time, a problem can occur if a Genius device is lost. Input data could be defaulted off while the CPU is reading the data from the GBC.

It is recommended to update existing GBCs to IC697BEM731M or later when updating the PLC CPU firmware to release 5.01 or later. Operation of the IC697BEM731M, in conjunction with release 6.02 of the 90-70 CPU, will result in a slight impact to the I/O scan time of the 90-70 PLC.

Reference Tables

Reference tables will not be changed during any programmer STORE operation unless you specifically select storing of reference tables.

Foreign VME Modules

Logicmaster 90 does not allow foreign VME modules to be configured with the Model 780 for these five modes: INTERRUPT ONLY, BUS INTERFACE, FULL MAIL, REDUCED MAIL, and I/O SCAN. NONE is the only value allowed for the configuration mode setting with the Model 780 CPU.

Serial Communications

The following operational restrictions exist for the Serial Communications feature:

1. Serial communications may add as much as 5 milliseconds of time to any given sweep. This should be taken into account when setting the watchdog timer and constant sweep time.
2. The following procedure is recommended when changing baud rates in the PLC and serial programmer. First enter the configuration package and change the baud rate on the PLC, then store the new configuration. Now power off the PLC and then go to the serial communications setup screen and change the serial port baud rate. Finally, power the PLC back on.
3. The programmer Link Idle Time settings for SNP communications should be set to 10 seconds or greater (for example, in the Communications Configuration Utility). Otherwise, a communications failure will occur when storing a configuration to the PLC.

Parallel Logicmaster 90 Attach

Do not connect or disconnect an IC697BEM713 parallel programmer port cable while the Logicmaster 90 host computer is powered on. This action may cause a running PLC to switch roles from active to standby if running synchronized or go to STOP if running non-synchronized.

Expansion Rack ID

Expansion racks for Series 90-70 PLCs are shipped with the rack ID strapped for rack 0 (the main rack). If the rack jumper is not changed the PLC CPU will not recognize the rack at all and may not properly identify the error.

Expansion Rack Cable

Connection and disconnection of an expansion rack cable while the CPU is running should not be attempted. This will cause the PLC to go to the STOP/HALT state.

Expansion Rack Power

Expansion racks should be powered up at the same time the main rack is powered up or they should be powered up after the main rack has completed its power up initialization. Do not power up an expansion rack while the PLC CPU is running power-up diagnostics.

Memory Usage

A general rule-of-thumb for memory usage is 48 bytes per I/O point plus register memory in bytes.

Timer Operation

Care should be taken when timers (ONDTR, TMR, and OFDTR) are used in program blocks that are NOT called every sweep. The timers accumulate time across calls to the sub-block unless they are reset. This means that they function like timers operating in a program with a much slower sweep than the timers in the main program block. For program blocks that are inactive for large periods of time, the timers should be programmed in such a manner as to account for this catch up feature.

Related to this are timers that are skipped because of the use of the JUMP instruction. Timers that are skipped will NOT catch up and will therefore not accumulate time in the same manner as if they were executed every sweep.

Fanuc I/O Link

When the PLC CPU powers on with a drained battery or no battery, and one or more IC697BEM721 Fanuc I/O Link modules are present in the PLC, an incorrect "Loss of Module" fault will be logged for each Fanuc I/O Link module. The PLC CPU will not consider these modules as lost, and the modules will continue to operate properly.

Constant Sweep

Constant Sweep time, when used, should be set at least 10 milliseconds greater than the normal sweep time to avoid any over-sweep conditions when monitoring or performing on-line changes with the programmer. The smallest valid constant sweep time setting is 10 milliseconds for the Model 780. Window completion faults will occur if the constant sweep setting is not high enough.

Interaction of Logicmaster 90 with Closed Programmer Window

Logicmaster 90's PLC Sweep Control and Monitor screen can not be used to change the PLC Sweep Modes or timers (Constant Sweep Time, Program Window Times, etc.) while the programmer window is closed. Use Service Requests #1 - #4 from SVCREQ function blocks in the PLC application to perform these functions.

Caution

Logicmaster 90 can not be used to change the PLC mode (STOP, RUN, etc.) while the programmer window is closed. Use the toggle switch on the CPU module instead.

Loss of Option Module

With Hot Standby Redundancy, it is recommended to leave the fault action of Loss of Option Modules faults to DIAGNOSTIC. If changed to FATAL, it is possible that a faulted Redundant Communication Module would cause both systems to go to STOP/FAULTED mode at power-up.

Simplex Mode

Simplex mode, the mode in CPU Redundancy where the PLC CPU 780 can operate in a single PLC CPU system, is not supported. The PLC CPU 780 can operate as a non-synchronized CPU with a Redundant Communications Module configured via Logicmaster 90.

Problems Resolved by this Upgrade

None.

New Features and Functionality

No new features or functionality have been added with this hardware release.

Restrictions/Open Problems

1. If an expansion rack powers up while the CPU in the main rack is in the RUN mode, the slot fault contacts will prematurely indicate that the modules in the expansion rack are not faulted *before* they complete their power up.
2. In a multi-rack system false LOSS OF RACK faults may occur when the system loses power. If this fault is configured to be fatal, the system will power up in STOP mode.
3. When there is no logic stored in a CPU module the %Q and %M tables will be cleared when the CPU is placed in RUN mode. In this context “no logic stored” means that no program had ever been stored or that the clear function on Logicmaster 90 had been used to clear both logic and configuration.
4. If the CPU toggle switch is moved to STOP and back to RUN while a C block is sending text through the serial port, the port will stop working. The CPU must be power cycled to allow SNP communications and C Block messages to work again.
5. When the Bit Sequencer sequences from one step to another, the negative transitional contact that corresponds to the original step is not set. The transition contact for the new step is set and remains set until the sequencer sequences to the next step. This operation is identical to the operation of previous versions of CPU firmware.
6. If multiple faults exist in a Series 90-70 Remote Drop and one of them is corrected, a FAULT contact that uses the Remote Drop’s module reference will incorrectly indicate that no faults exist at the Remote Drop.
7. User Application faults logged for Service Request #21 can use only error codes between 0 and 2047. Use of any other error codes could cause the PLC CPU to treat the alarms as Remote Scanner alarms.
8. When power is cycled on an expansion rack in a system that is running a large sweep time when Logicmaster 90 is not connected, Genius Bus Controllers in that rack may not be properly configured. This can be corrected by cycling power on the main and expansion racks.