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GE Fanuc Automation

Programmable Control Products



GE Fanuc Automation

*P.O. Box 8106
Charlottesville, VA 22906
GFZ-0086*



***Series 90TM-70
Programmable Controller***

Troubleshooting Guide



GE Fanuc Automation

Programmable Control Products

Series 90TM-70 Programmable Controller Troubleshooting Guide

GFZ-0086

November 1993

Notice

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained in this document does not purport to cover all details or variations in hardware and software, nor to provide for every contingency in connection with installation, operation and maintenance. This document may describe features not present in all hardware and software systems. GE Fanuc Automation assumes no obligation of notice to holders of this document with respect to changes subsequently made.

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Modelmaster	Series Three	VuMaster
ProLoop	CIMPLICITY PowerTRAC	Series Five
Workmaster	Genius Power TRAC	

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Safety Considerations

General Warnings When Troubleshooting

Stand clear of controlled equipment when power is applied. If the problem is intermittent, sudden unexpected machine motion could occur, causing injury. Also reference NFPA 70E Part II for additional guidelines for safety practices.

Never reach into a machine to operate a switch since unexpected motion could occur, causing injury.

Remove all electrical power at the Main Power Disconnect to ensure total power removal.

Always remove power before inserting or removing modules, or before connecting I/O cabling.

Preface

This guide describes a logical sequence for troubleshooting your Series 90–70 programmable controller. The Series 90–70 PLC is a member of the Series 90™ family of programmable logic controllers from GE Fanuc Automation.

Revisions to this Troubleshooting Guide

This is the first release of this Troubleshooting Guide. Included are models CPU models 731, 732, 771, 772, 781, 782, and CPM914. CPU models 788 and 789 are also included; however, troubleshooting these models may require techniques beyond the scope of this Troubleshooting Guide.

Related Publications

Series 90™–70 Programmable Controller Installation Manual (GFK–0262).

Logicmaster™ 90–70 Programming Software User's Manual (GFK–0263)

Series 90™–70 Programmable Controllers Reference Manual (GFK–0265)

Series 90™–70 Programmable Controller Data Sheets (GFK–0600)

We Welcome Your Comments and Suggestions

At GE Fanuc Automation, we strive to produce quality technical documentation. After you have used this troubleshooting guide, please take a few moments to write us with your comments and suggestions. Our address is: Manager Technical Publications, GE Fanuc Automation, PO Box 8106, Charlottesville, VA 22906

Drake C. Fink

Sr. Staff Systems Engineer

SYMBOLS USED IN THIS GUIDE

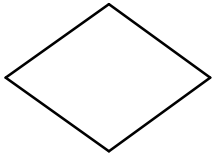


BEGIN AT THIS SYMBOL
ON THE FIRST CHART.



FOLLOW THE PATH WITH
THE CORRECT ANSWER IN
THE DIRECTION OF THE
ARROW

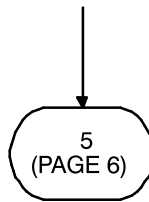
SYMBOLS USED THROUGHOUT THE GUIDE
ARE GEOMETRICALLY CODED



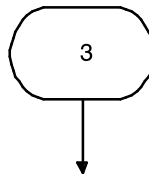
A DIAMOND ASKS A
QUESTION



A RECTANGLE TELLS
YOU TO DO SOMETHING



A NUMBERED BUBBLE WITH
AN ARROW INTO THE BUBBLE
INDICATES THAT THE
PROCEDURE IS CONTINUED
AT A CORRESPONDINGLY
NUMBERED BUBBLE ON THE
INDICATED PAGE NUMBER.



A NUMBERED BUBBLE WITH
AN ARROW OUT OF THE
BUBBLE INDICATES THE
START OF A PROCEDURE ON
THAT PAGE.

USING

ADDITIONAL TROUBLESHOOTING TIPS FOR THE 90–70 PLC

Although your PLC CPU may be running in *RUN/IO ENABLED* mode, and you may have communications between the PLC and Logicmaster 90, the system may not be operating correctly. The following pages suggest some areas to investigate:

Grounding:

- Verify all power supply mounting screws are tightened.
- Verify the green grounding wire provided with the power supply is securely attached to the rack grounding stud.
- Verify all racks are grounded to a common ground. Reference the System Grounding Procedures in the *Series 90–70 Programmable Controller Installation Manual* (GFK–0262) for additional information.

Loss of Rack Fault:

- Verify all inter-rack cables are securely connected on both ends. Verify cables connect to all racks.
- Verify the bottom connector on the last Bus Receiver Module has a terminator plug. (No terminator is needed on a Bus Transmitter Module when there are no expansion racks.)
- Verify all power supplies are powered on (Green LEDs on). Follow the same troubleshooting procedures for expansion racks power supplies as you use for the main rack.
- Verify each expansion rack has a unique address. *ONLY* the rack containing the CPU is address zero. All other racks are in the range 1 to 7. *NO* rack is in the range 8 to 15.

- If all the above are true and you still have LOSS OF RACK, then:
- Power off all racks. Remove expansion rack cable from bottom connector on the Bus Transmitter Module (BTM) in the main rack. Power on the main rack. You should see LOSS OF RACK faults for all expansion racks in the PLC Fault Table. Place the PLC in *RUN* mode. (If you have configured the LOSS OF RACK fault to be FATAL, you will have to clear the PLC Fault Table before you can place the PLC in *RUN* mode.)
- Power off all racks. Connect expansion cable to next rack, so previous rack is still in the chain. Connect terminator plug to bottom connector on BRM. Power on all expansion racks. Power on main rack. LOSS OF RACK faults for all non-connected expansion racks should appear in the PLC CPU Fault Table. Place PLC in *RUN* mode. Replace BRM and cable if LOSS OF RACK fault persists.
- Continue debugging the expansion rack chain one rack at a time until all racks have been added to the chain and no LOSS OF RACK faults occur.

Other Faults:

- Position the cursor on the fault. Using Release 4 Logicmaster, press the ZOOM (F10) key. Read the fault explanation and follow the suggestions for eliminating the fault.

No Input:

- Verify no LOSS OF MODULE fault for the module containing the input in the I/O Fault Table. Replace the module if the LOSS OF MODULE fault is present.
- Verify no ADDITION OF MODULE fault occurs in the I/O Fault Table when you power cycle the PLC or store the configuration to the PLC. If so, the module physically resides in the slot, but is not present in the PLC configuration. Add the module to the configuration and restore the configuration.
- Verify the %I address assigned for the input in the configuration is the same %I address as used in the program.
- Verify pins in the VME bus connector are not bent or corroded.
- Verify the input device functions correctly.
- Verify wiring from input device through terminal strip to input module is intact.
- Verify presence of power at the input device.

- Verify no fuses are blown.
- Replace the module if other input channels on this module function.

No Output:

- Verify no LOSS OF MODULE fault for the module containing the output in the I/O Fault Table. Replace the module if the LOSS OF MODULE fault is present.
- Verify no ADDITION OF MODULE fault occurs in the I/O Fault Table when you power cycle the PLC or store the configuration to the PLC. If so, the module physically resides in the slot, but is not present in the PLC configuration. Add the module to the configuration and restore the configuration.
- Verify the %Q address assigned for the output in the configuration is the same %Q address as used in the program.
- Verify pins in the VME bus connector are not bent or corroded.
- Verify fuse on output module (if present) is not blown.

- Verify the output device functions correctly.
- Verify wiring from output module through the terminal strip to the field device is intact.
- Verify presence of power at the output module.
- Verify no fuses are blown in the path from the output module to the field device.
- Replace the module if other output channels on this module function.

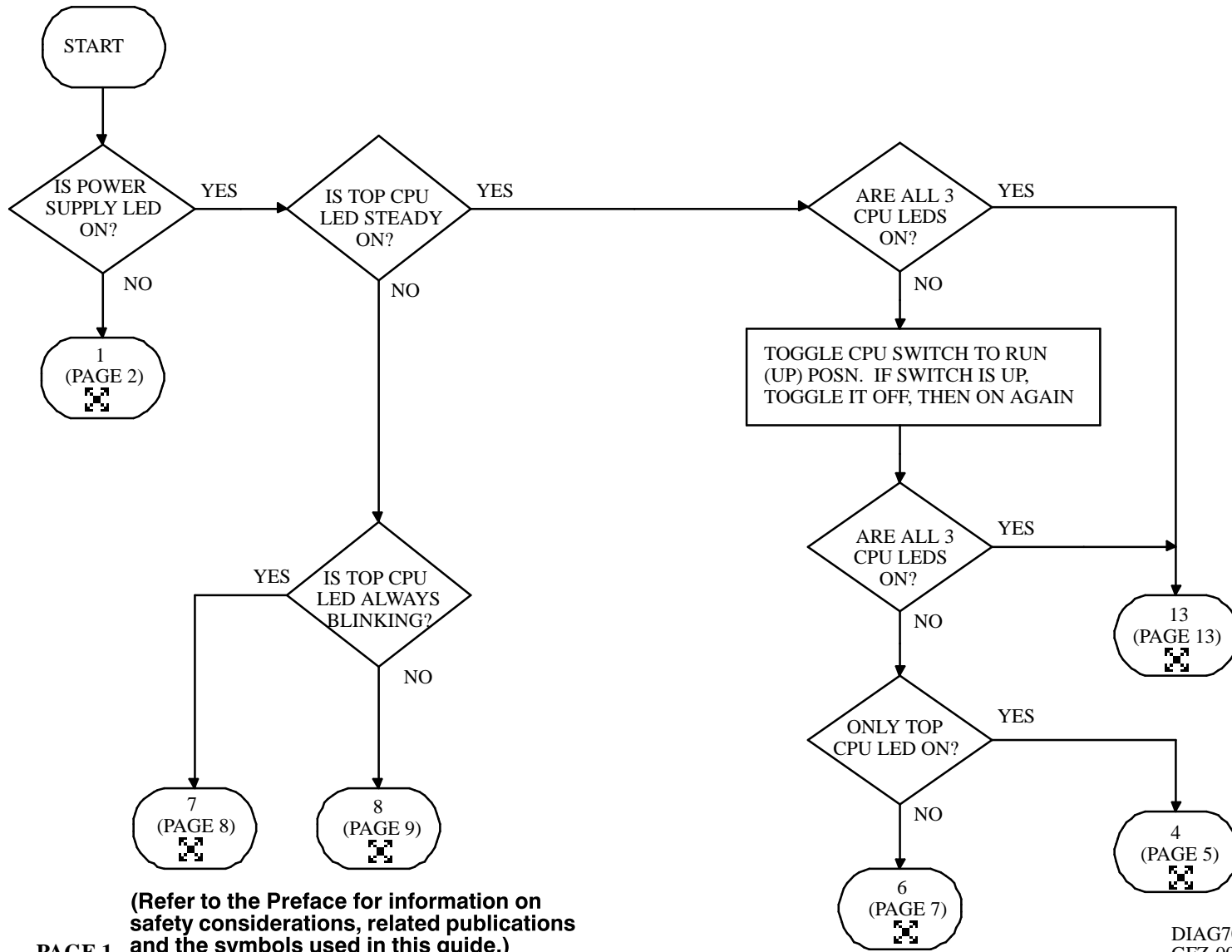
Genius Devices Do Not Function:

- Verify the Genius Bus Controller appears in the configuration and the configuration in the PLC and LM90 are equal.
- Verify the %I/%Q addresses assigned to the Genius device in the configuration match those used in the ladder logic.
- Follow the general debug guidelines above for No Input and No Output.
- Refer to the *Series 90–70 Programmable Controller Genius Bus Controller & Genius I/O System Troubleshooting Guide* for more detailed Genius Troubleshooting.

Notes and Precautions

1. **WARNING:** Do not discard the lithium–manganese dioxide battery in fire. Do not attempt to discharge the battery. The battery may burst or burn or release hazardous materials. Dispose of the battery as you would any hazardous material.
2. **CAUTION:** After a power fault, the system will come back on in the mode (*STOP/IOENABLED*, *STOP/IODISABLED*, *RUN/IOENABLED*, *RUN/IODISABLED*) in which it was operating before power loss, unless a fatal fault occurs during the power up process.
3. Supply (input) voltage tolerances for Series 90–70 power supplies:

IC697PWR710 & 711:	93 to 132 VAC, for nominal 115 VAC input; 180 to 264 VAC, for nominal 230 VAC input; 47 to 63 HZ
IC697PWR722	21.6 to 26.4 VDC for 24VDC nominal input
IC697PWR732	122.5 to 137.5 VDC for 125VDC nominal input
4. Total cable length must not exceed 50 feet between the CPU rack (rack 0) and the last expansion rack. No termination plug is needed on a Bus Transmitter Module in a one–rack system.



(Refer to the Preface for information on safety considerations, related publications and the symbols used in this guide.)

