

Series Three I/O Modules in a Series Five I/O System

The following Series Three PLC I/O modules can be used in conjunction with a Series Five CPU. An interface module is required to connect a Series Three rack to a Series Five Rack. For complete details and specifications on these modules, refer to the Series Three User's Manual, GEK-25376.

Table 1-6. Series Three PLC I/O Modules

PART NO. IC630	NAME	CIRCUITS	VOLTAGE RANGE	CURRENT (MAX.)
MDL325	115Vac Input	16	97-132Vac/dc	11ma
MDL375	115Vac Output	16	97-265Vac	2 amps
MDL327	230Vac Input	16	180-265Vac	18ma
MDL301	24Vdc Input	16	21.5-26.5Vdc	15ma
MDL306	24Vdc Input	32	21.5-26.5Vdc	7ma
MDL311	24Vac/dc Source Input	16	20-28Vac/dc	13ma
MDL303	5-12Vdc Input (TTL Compatible)	32	4.75-13.2Vdc	8ma
MDL351	24Vdc Sink Output	8	21.5-26.5Vdc	2 amps
MDL352	24Vdc Sink Output	16	21.5-26.5Vdc	1 amp
MDL357	24Vdc Source Output	16	5-24Vdc	1 amp
MDL356	24Vdc Output	32	21.5-26.5Vdc	0.5 amp
MDL354	5-12Vdc Output (TTL Compatible)	32	4.75-13.2Vdc	0.5-1.5ma
MDL380	Relay Output (NO)	16	5-265Vac/dc	4 amp (Resistive)
MDL326	115Vac Input (Isolated)	8	97-132Vac/dc	11ma
MDL376	115/230Vac Output (Isolated)	8	97-265Vac	2 amps
MDL310	High Speed Counter	1	10Khz pulse	16ma
MDL324	I/O Simulator (16 Inputs)	16		
MDL316	Analog Input	2	1-5Vdc 1-10Vdc 0-10Vdc	4-20ma
MDL366	4-20ma Analog Output	2	1.6-8Vdc	20ma
MDL367	-10 to +10Vdc Analog Output	2	-10 to +10 Vdc	20ma
MDL368	0-10Vdc Analog Output	2	0-10Vdc	20ma

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Series Five Interface and Intelligent Modules

In addition to the Series Five and Series Three I/O modules listed previously, other Series Five modules include system interface modules and intelligent modules. These modules and basic descriptions of each module are listed below.

Table 1-7. Other Modules for the Series Five PLC

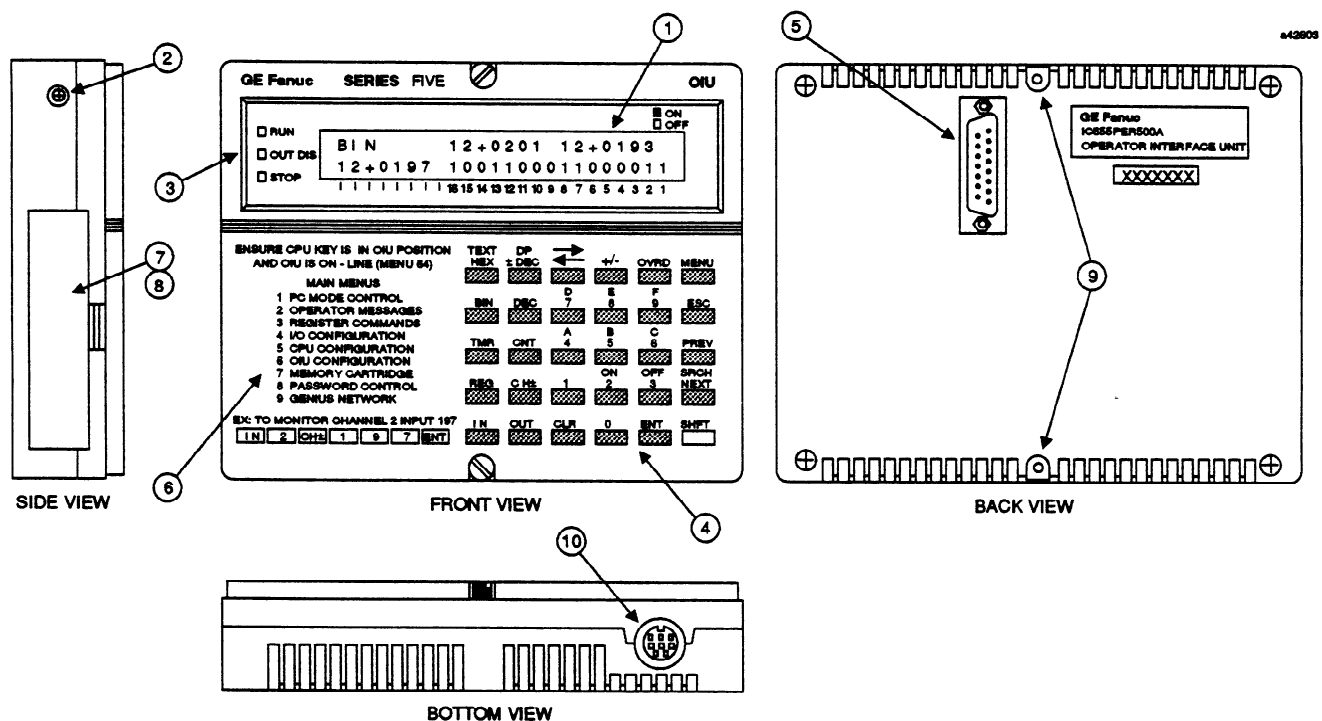
Module	Description
Local I/O Interface	Interfaces the parallel I/O bus to Series Five I/O modules in an I/O expansion base unit up to 200 feet * (60 meters) from the CPU. One of these modules must be installed in each I/O expansion base unit used in a Local I/O system.
Series Three I/O Interface Module	Series Three I/O Interface - Allows use of existing Series Three I/O modules in a Series Five Local I/O system - controlled by the Series Five CPU.
Genius Bus Controller Module	Interfaces Series Five PLCs to the Genius serial bus. Allows use of Genius I/O and/or a Genius communications network which provides for CPU-to-CPU communications between multiple Series Five CPUs. Up to eight units can be installed.
CCM Communications Module	Provides a serial communication link to other PLCs or host computers using the GE Fanuc CCM2 and CCM3 protocols. Allows master-to-slave communications with user selectable baud rates. Up to eight units can be installed.
ASCII/BASIC Module	Programmable in BASIC language with custom commands. 32K of user logic on board, expandable to 56K by using Series Five memory cartridges. Two on-board serial ports for communications with terminals, bar-code readers, magnetic card readers, or other ASCII/BASIC modules. A Trap Monitor feature prevents unauthorized access and listing of programs. Up to eight units can be installed.
High Speed Counter Module	Allows counting pulses up to 50 kHz. Has a single preset. Can be located anywhere in the Local I/O chain. Up to eight units can be installed.
Axis Positioning Module	Provides a single axis positioning controller for simple point-to-point positioning tasks and has programmable velocity and acceleration parameters. Can be installed in any I/O slot in the Series Five I/O system. Multiple units can be installed in the same system.

* All base units in the Local I/O chain must be connected to a common ground point and AC powered supplies must operate from the same AC power source.

Operator Interface Unit

The Series Five Operator Interface Unit (OIU) is a compact device that allows an operator to access the CPU for set up and operation; allows on-line monitoring of I/O and registers and writing to I/O and registers, on-line monitoring of timers and counters, and writing to timers and counters; provides a convenient means of programming EPROMs; provides a way of displaying user defined messages in ASCII format controlled by the user logic program; provides user access to password functions (lock and unlock CPU); and allows configuration of the Series Five Genius Bus Controller.

The viewing screen on the OIU is an LCD display that has two lines with 24 characters in each line. The OIU plugs directly onto the CPU or attaches to the CPU by a 5 or 10 foot cable for hand-held operation. It can also be mounted on a panel using an optional mounting bracket.



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|------------------------------|--------------------------------|
| 1. Liquid Crystal Display | 6. Main Menu List |
| 2. Contrast Adjustment Screw | 7. Memory Cartridge Slot |
| 3. CPU Mode LEDs | 8. EPROM Memory Burner |
| 4. Keypad | 9. Captive Screw Fasteners |
| 5. Port Connector | 10. RS-232 Communications Port |

Figure 1-8. Operator Interface Unit

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GENET Factory LAN

For applications requiring much broader communications capabilities than the Communications Module can provide, or a Local Area Network (LAN) for communications with other factory automation equipment, the GENet Factory LAN is an available option for use with a Series Five PLC. The GENet Factory LAN is a 10M bps broadband token passing bus which provides high speed communications between GE Fanuc equipment, including Programmable Logic Controllers, Numerical Control equipment and higher level factory level management control systems.

The GENet Factory LAN is based on accepted industry standards. It uses the International Standards Organization's Open System Interconnection (OSI) model as the basis for its communications architecture. GENet complies with the General Motors Manufacturing Automation Protocol (MAP) specification and with the ANSI/IEEE Standard 802.4-1985 for token bus networks.

The Programmable Logic Controllers and Numerical Control equipment interface to the broadband token bus through a Bus Interface Unit (BIU). The BIU is tailored by loading device specific software to provide the required interface to the various automation products. As an example, any device supporting the CCM protocol can access the GENet Factory LAN with translation to MAP through the BIU.

Other basic components of the GENet Factory LAN are the Network Management Console (NMC) and the Head End Remodulator. The NMC provides overall system configuration management and control. It operates on a Workmaster or Cimstar I industrial computer equipped with PLC-BIU hardware and network management software. The head end contains the equipment required to provide for RF operation on the broadband cable. For further information on the GENet Factory LAN, refer to the *System User's Manual, GEK-96608* and the *Network Management Console User's Manual, GEK-96607*.

The following figure illustrates a typical configuration for a GENet Factory Local Area Network.

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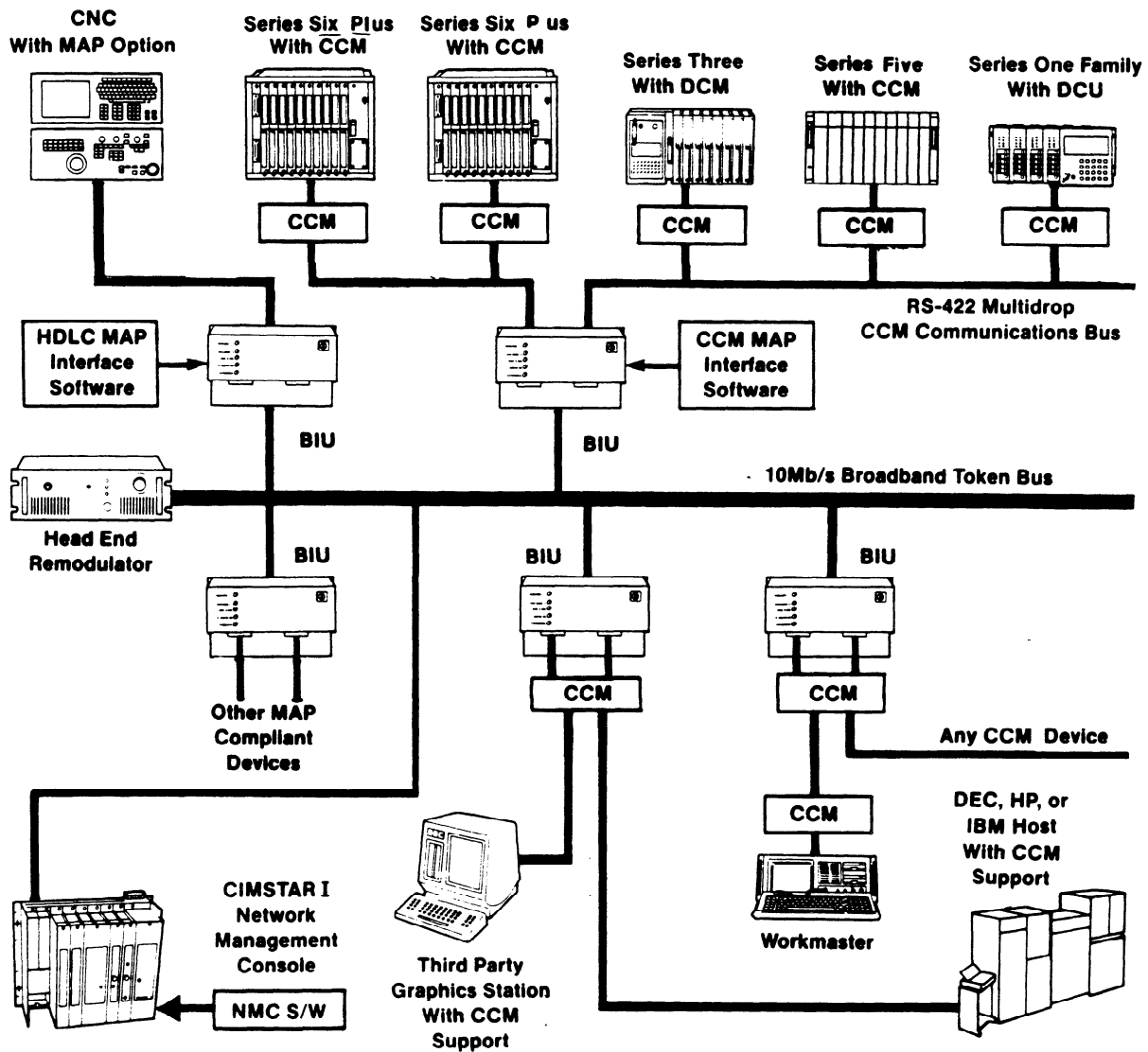


Figure 1-9. GENET Factory LAN

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RS-232/RS-422 Adaptor Unit

The RS-232/RS-422 Adaptor Unit (IC655CCM590) converts RS-232 signal levels to RS-422 signal levels and can be used to isolate and repeat communications signals. If a device uses RS-422 signal levels for communications, the Adaptor, when connected between those devices and devices requiring RS-232 signal levels can be used with no loss in baud rate. The Adaptor unit also has a multidrop capability that can expand a normal eight device RS-422 link into a 64 device link by using eight Adaptor units. If an RS-422 link should be required to extend beyond its normal 4000 feet (1.2 Km), the Adaptor can be used as a repeater to boost the signal levels and obtain another 4000 feet of driving distance for the signals.

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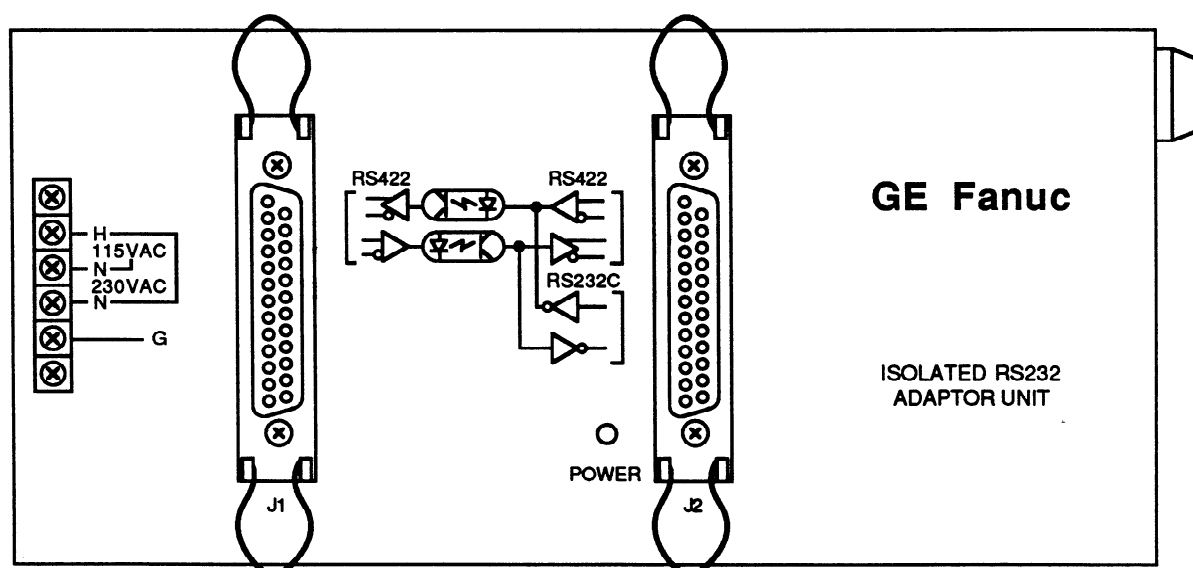


Figure 1-10. RS-232/RS-422 Adaptor Unit

System Planning

Decisions such as the number of 115 V ac solenoids, 24 V dc solenoids, motor starters, limit switches (operating voltages), control panel lamps (voltage required), pushbuttons, and external relays have a major impact on the configuration of any PLC. These parameters should be established as early as possible in the overall design of the control system. Being a flexible device, the PLC configuration, either on paper or in hardware, can easily be changed if requirements change. Typically, the user provides the field devices, wires them to the I/O section, and provides the power source to operate them.

Typical Applications Using PLCs

Programmable Logic Controllers are used in a wide variety of machine and process control applications. These applications range from replacing a few relays to controlling complete factory automation projects. The following table contains a partial list of typical applications that can be controlled by a Series Five PLC.

This list is only a very small sampling of possible PLC applications. Many other applications are possible and more are being identified all the time. For further information on any of the applications listed here or any other application you may have, contact your local GE Fanuc Programmable Logic Controller Distributor, GE Fanuc sales office or GE Fanuc Automation North America, Inc. in Charlottesville, Virginia.

Table 1-8. Typical PLC Applications

Auto Insertion	Energy Management	Railroad Switching
Bagging	Engines	Robots
Baking	Engine Test Stands	Rolling
Bonding	Extrusion	Routing
Boxing	Forging	Security Systems
Brewing	Gas Fields	Sewage Treatment
Capping	Gauging	Solar Energy
Casting	Generators	Sorting
Cement Batching	Grinding	Spool winding
Combustion Control	Heat Treating	Stackers
Compression Molding	Injection Molding	Tire Body Building
Conveyors	Joining	Traffic Control
Cranes	Milling	Treating
Cutting	Mining Operations	Turbines
Data Collection	Navigation	Water Treatment
Dipping	Nuclear Plants	Weaving
Drawing	Oil Fields	Welding
Drilling	Pipelines	Well Flooding