

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GE

IC697ALG440

SERIES 90-70 SIXTEEN-CHANNEL CURRENT INPUT EXPANDER

Used with the applicable GE 90-70 Series PLC configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: GE Fanuc High-Level Analog Input Subsystem, GFK-0385F

Analog Modules

Base Converter Module - IC697ALG230, Current Expander Module - IC697ALG440
Voltage Expander Module - IC697ALG441

GFK-0385F
August 1997

Analog Input System, High Level, 16 Channels

Features

- Complete Analog subsystem includes Base Converter and Expander modules
- Base Converter module has eight differential inputs individually configurable for voltage or current
- Accepts unipolar or bipolar Analog Inputs up to " 10 volts full scale
- Accepts 4 to 20 milliamp current loop signals
- Individual user scaling on each input channel on Base Converter module; scaling on a per module basis for Expander modules
- Fast update rate for Base Converter module
- Voltage and current Expander modules, each with 16 inputs, provides for additional inputs at a lower cost per point
- Complete subsystem can accept up to 120 inputs
- No jumpers or DIP switches to configure
- Easy configuration with MS-DOS® or Windows® programming software configuration function.

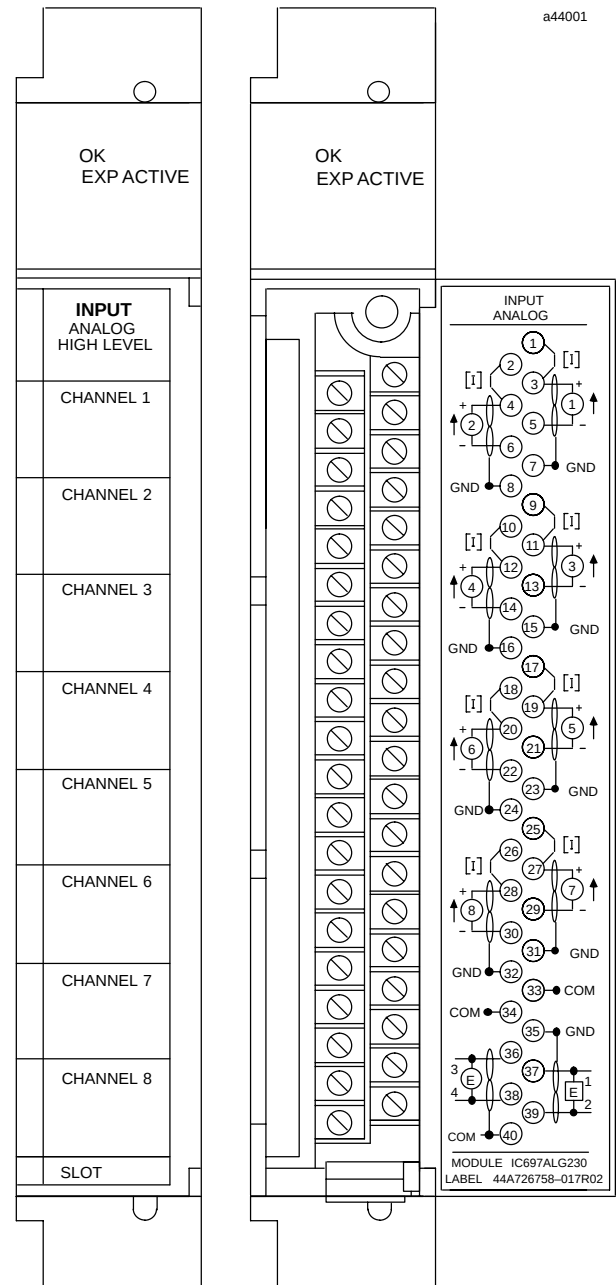


Figure 1. Base Converter Module

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Functions

The High Level Analog Input subsystem for the Programmable Logic Controller (PLC) accepts analog inputs of up to 10 volts full scale, or 4 to 20 milliamp current loop signals. These inputs are converted to digital form for use by the CPU or other controllers accessing analog inputs via the VME backplane.

Converted data is presented as 2's complement (sign + 15 bits). The basic converter is 14 bits resolution (1 part in 16384); an oversampling and averaging technique further enhances this resolution. Inputs are protected against transient and steady-state overvoltage conditions.

Analog inputs use %AI references in the programmable controller. A maximum of 8K words of %AI memory is currently available in the programmable controller. Each input channel uses one word (16 bits) of %AI memory.

Field wiring is made to a removable terminal board and the module is mechanically keyed to ensure correct replacement with a similar module type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.

Configuration is done using the configuration function of the MS-DOS® or Windows® programming software running on Windows® 95 or Windows NT® over Ethernet TCP/IP or through the SNP port. The Programming Software configuration function is installed on the programming device. The programming device can be an IBM® XT, AT/PS/2® or compatible Personal Computer.

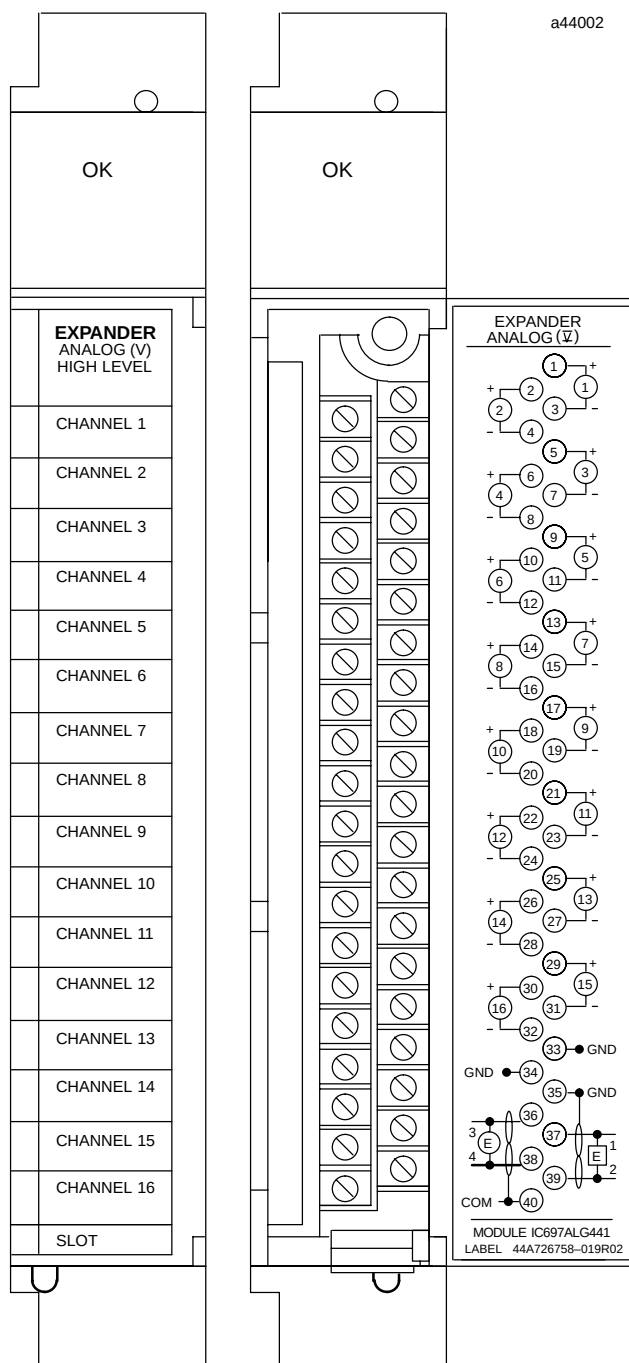


Figure 2. Expander Module

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Table 7. Analog Input Specifications †

Input Ranges:	Voltage: -10 volts to +10 volts Current: 4 to 20 milliamps
Resolution:	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage No missing codes over 14 bits on current NOTE: User scaling may introduce skipped codes in the lower 2 or 3 bits depending upon the factors used.
Accuracy: Calibration	Factory set at full scale = 10 volts ± 2 millivolts on Base Converter module. Maximum errors at 25° C (77°F) are: <i>Base Converter Voltage</i> , $\pm 0.01\%$ of full scale, $\pm 0.02\%$ of value <i>Base Converter Current</i> , $\pm 0.05\%$ of full scale, $\pm 0.1\%$ of value <i>Expander Voltage</i> , $\pm 0.03\%$ of full value, $\pm 0.02\%$ of value <i>Expander Current</i> , $\pm 0.07\%$ of full scale, $\pm 0.1\%$ of value
Base Converter	Continually self-calibrates for zero and positive full scale (before user scaling) values. Field calibration not normally required; there is no zero adjustment. A trimpot on the Base Converter adjusts full scale value at 10V input. For critical applications this can be reset to compensate for ageing of the reference.
Accuracy: Linearity Temperature Coefficient	$\pm 0.02\%$ of full scale over entire negative to positive range. ± 5 PPM per °C typical ± 15 PPM per °C maximum, voltage ± 30 PPM per °C maximum, current
Input Impedance:	Voltage Inputs: Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. Current Inputs: 250 ohm, 0.1% precision shunt
Common Mode Rejection:	Voltage Range - Peak signal input must be between +13 and -13 volts with respect to the ANLGCOM terminal.
Sensitivity:	Response to common mode signals within the above limits is typically 70 dB CMRR, corresponding to a .02% full scale reading for a 0V input at 10 volts common mode. NOTE: Continuous input signals beyond the common mode range can result in abnormal conversions without causing alarms.
Crosstalk:	High-speed inputs on the Base Converter module may show some interaction between adjacent channels. This is typically .04% of the difference between the affected input and the adjacent channel input levels. The effect can be minimized by arranging inputs with similar levels on adjacent channels. There is no measurable interaction between Expander input channels.
Conversion Rate:	Base Converter inputs updated sequentially about every 2.4 ms to 2.8 ms (maximum) for all 8 channels. One Expander input updated during each scan of the Base Converter inputs. Time between Expander updates = $44.8 \times N$ ms (N = number of Expander modules present).

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Table 5. Analog Input Specifications (continued) †

Response Time:	Each input has a low pass filter with a 100 radian / second (0.01 second) cutoff. A digital filter on the Base Converter input channels adds a second pole at 450 radians / second. A sample and hold maintains full resolution. Settling times, to the specified accuracies, for a zero to full scale step input are as follows: 5.0% 30 milliseconds 1.0% 42 milliseconds 0.5% 51 milliseconds 0.1% 67 milliseconds
Input Protection: Impulse: Electrostatic Discharge: Continuous Overvoltage:	Inputs isolated from VME backplane - but not between input channels. They are, however, protected from overvoltage to the levels listed below. Inputs normally not affected by common mode damped ring wave of up to 1000 volts peak. Common or transverse mode peaks up to 2500 volts cause no damage, but may cause occasional bad data if they occur coincidentally with conversion of the affected channel. Inputs survive up to 15KV ESD. Inputs survive common mode or normal mode 120 VAC or 125 VDC fault for at least 1 minute. Longer times may damage input current limiting resistor. Damage limited to only the affected input.
Power Requirements: Rack Backplane Field Side	+5 volts at 0.8A (4 watts) maximum for Base Converter +5 volts at 0.4A (2 watts) for each Expander module No power required for the module; however, current for 4 to 20 mA inputs must be user supplied.

† Refer to GFK-0867B, or later for product standards and general specifications. For installations requiring compliance to more stringent requirements (for example, FCC or European Union Directives), refer to *Installation Requirements for Conformance to Standards*.

Table 8. Ordering Information

Description	Catalog Number
Analog Input Base Converter Module	IC697ALG230
Analog Input Expander Modules	
Current, 4 to 20 mA	IC697ALG440
Voltage, -10 to +10 Volts	IC697ALG441

Note: For Conformal Coat option, or Low Temperature Testing option please consult the factory for price and availability.