

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GENERAL ELECTRIC

IC694ALG222

ANALOG VOLTAGE INPUT MODULE

Used with the applicable PACSystems RX3i configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

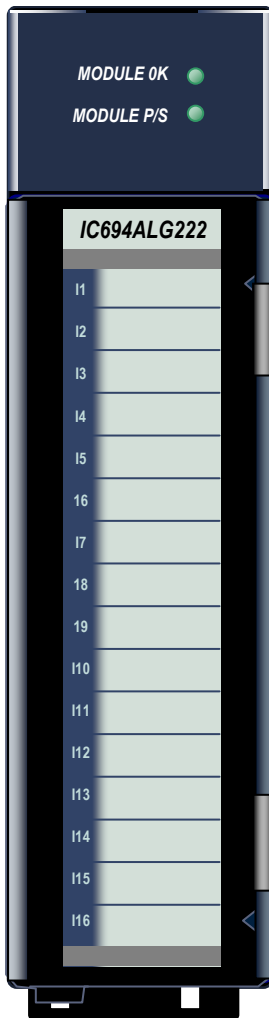
Source: GE Intelligent Platforms GFK-2654C, ALG222 voltage input module

PACSystems* RX3i and Series 90*-30

IC694ALG222 and IC693ALG222

GFK-2654C
May 2012

Analog Voltage Input Module – 16 Channel



The PACSystems* RX3i/Series 90* 16-Channel Analog Voltage Input module provides 16 single-ended or 8 differential input channels.

Each channel can be configured using the configuration software for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot that has a serial connector in an RX3i or Series 90-30 system.

Isolated +24 VDC Power

If the module is located in an RX3i Universal Backplane, an external source of Isolated +24 VDC is required to provide power for the module. The external source must be connected via the TB1 connector on the left side of the backplane.

If this module is located in an Expansion Backplane or Series 90-30 backplane, the backplane's power supply provides the Isolated +24 VDC for the module.

LEDs

The **MODULE OK** LED provides module status information on powerup:

- **ON:** status is OK, module configured
- **OFF:** no backplane power or software not running (watchdog timer timed out)
- **Continuous rapid blinking:** configuration data not received from CPU
- **Slow blinking, then OFF:** failed power-up diagnostics or encountered code execution error

The Module P/S LED indicates that the module's internally-generated +5 VDC supply is above a minimum designated level.

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Specifications: ALG222

Number of Channels	1 to 16 selectable, single-ended 1 to 8 selectable, differential
Input Voltage Ranges	0 V to +10 V (unipolar) or -10 V to +10 V (bipolar); selectable each channel
Calibration	Factory calibrated to: 2.5 mV per count on 0 V to +10 V (unipolar) range 5 mV per count on -10 to +10 V (bipolar) range
Update Rate	Single Ended Input Update Rate: 5 ms Differential Input Update Rate: 2 ms
Resolution at 0V to +10V	2.5 mV (1 LSB = 2.5 mV)
Resolution at -10V to +10V	5 mV (1 LSB = 5 mV)
Absolute Accuracy ^{1,2}	±0.25% of full scale @ 25°C (77°F) ±0.5% of full scale over specified operating temperature range
Linearity	< 1 LSB
Isolation, Field to Backplane (optical) and to frame ground	250 VAC continuous; 1500 VAC for 1 minute
Common Mode Voltage (Differential) ³	±11 V (bipolar range)
Cross-Channel Rejection	> 70dB from DC to 1 kHz
Input Impedance	>500K Ohms (single-ended mode) >1 Megohm (differential mode)
Input Filter Response	23 Hz (single-ended mode) 57 Hz (differential mode)
Internal Power Consumption	112 mA (maximum) from the backplane +5 VDC bus 110 mA (maximum) from the backplane isolated +24 VDC supply

- 1 In the presence of severe Radiated RF interference (IEC 61000-4-3, 10V/m), accuracy may be degraded to ±5% of full scale.
- 2 In the presence of severe Conducted RF interference (IEC 61000-4-6, 10Vrms), accuracy may be degraded to ±1% of full scale.
- 3 The sum of the differential input, common-mode voltage, and noise must not exceed ±11 volts when referenced to COM.

Refer to the applicable manual for product standards, general operating specifications, and installation requirements:

Series 90-30 Installation Manual, GFK-0356

Series 90-30 systems: *Installation Requirements for Conformance to Standards*, GFK-1179

PACSystems RX3i System Manual, GFK-2314

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ALG222 Configuration

Configurable parameters for the ALG222 module are described below.

Module Settings

Parameter	Choices	Description
Active Channels	1 to 16 for Single-ended mode, or 1 to 8 for Differential mode	The number of channels to be scanned. Channels are scanned in sequential, contiguous order.
Mode	Single-ended (default), or Differential	In Single-ended mode, there are 16 inputs referenced to a single common. In Differential mode, each of the 8 inputs has its own signal and common.
Channel Value Reference Address	Valid memory type: %AI	The starting address for input data from the module.
Channel Value Reference Length	Read-only.	Each channel provides 16 bits (1 word) of analog input data to the Controller CPU.
Module Status Reference Address	Valid memory type: %I	The starting address for status information from the module.
Module Status Reference Length	0, 8, 16, 24, 32, 40	The number of status bits (0 to 40) reported to the Controller. When set to 0, status reporting is disabled. To enable status reporting, set this parameter to a value other than 0. Data formats are shown on page 4.
I/O Scan Set	1 through 32	Assigns the module to an I/O Scan Set defined in the CPU configuration

Input Channel Data

Parameter	Choices	Description
Voltage	0 to 10 V (default) or -10 to 10 V	In the 0 to 10 V default range, input voltage values from 0 to 10 V the module reports 0 to 32,000 integer values to the CPU. In the -10 to 10 V range, input voltage values from -10 to 10 V, the module report s-32000 to 32,000 integer values to the CPU.
Alarm Low (Engineering Units)	0 to 10 V Range = 0 to 32760 -10 to 10 V Range = -32767 to 32752	Each channel can be assigned a low alarm limit alarm. Values entered without a sign are assumed to be positive. Be sure the alarm low values are appropriate for the selected range.
Alarm High (Engineering Units)	0 to 10 V Range = 0 to 32760 -10 to 10 V Range = -32767 to 32752	Each channel can be assigned a high alarm limit. Values entered without a sign are assumed to be positive. Be sure the alarm high values are appropriate for the selected range.

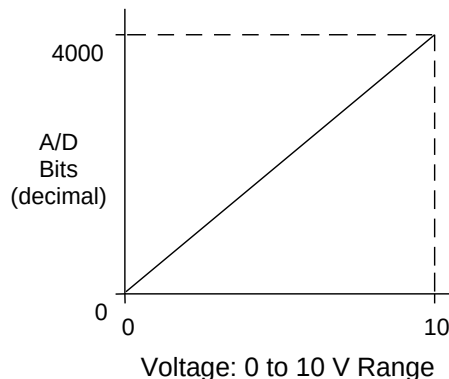
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Input Scaling

The default input mode and range is single-ended, unipolar. In 0 to 10V mode, input data is scaled so that 0 volts corresponds to a count of 0 and 10 volts corresponds to a count of +32000.

The bipolar range and mode can be selected by changing the module's configuration parameters. In bipolar mode, -10 V corresponds to a count of -32000, 0 V corresponds to a count of 0, and +10 V corresponds to a count of +32000.

Factory calibration adjusts the analog value per bit (resolution) to a multiple of full scale (2.5 mV per bit for unipolar; 5 mV per bit for bipolar). The data is then scaled with the 4000 counts over the analog range. The data is scaled as shown below.



ALG222 Data Format

The 12-bit resolution module analog input data is stored in the Controller CPU in 16-bit 2's complement format in the unipolar range as shown below.

MSB													LSB		
X	11	10	9	8	7	6	5	4	3	2	1	0	X	X	X