

PACSystems* RX3i

GFK-2482F

May 2014

Isolated Analog Input Modules, IC695ALG106-EA, IC695ALG112-EA

Product Description

Isolated Analog Voltage/Current Input module IC695ALG106 provides 6 isolated input channels.

Isolated Analog Voltage/Current Input module IC695ALG112, shown at right, provides 12 input channels.

Analog input channels can be configured for these ranges:

- Current: 0 to 20mA, 4 to 20mA, +/- 20mA
- Voltage: +/- 10V, 0 to 10V, +/- 5V, 0 to 5V, 1 to 5V

These modules must be installed in an RX3i Universal Backplane. The modules require the use of one front-mounted terminal block (ordered separately). Terminal blocks are available in the following different styles:

- Box-style (IC694TBB032),
- Extended Box-style (IC694TBB132),
- Spring-style (IC694TBS032), and
- Extended Spring-style (IC694TBS132).

Extended terminal blocks provide the extra shroud depth needed for shielded wiring. See GFK-2314, *PACSystems RX3i System Manual*, for more information about terminal blocks.

Note: Terminal blocks for this module must be ordered separately.

Module Features

- Completely software-configurable, no module jumpers to set
- On-board error-checking
- Open-circuit detection for all voltage and 4-20mA inputs
- Configurable scaling and offsets per channel
- High alarm, low alarm, high-high alarm, low-low alarm detection and reporting selectable per channel
- Module fault reporting
- Supports diagnostic point fault contacts in the logic program
- Flash memory for future upgrades
- Positive and negative Rate of Change Alarms
- Configurable interrupts for channel alarms and faults
- Terminal Block insertion or removal detection
- Hot-swappable— module may be inserted into or removed from a powered backplane



Shown with terminal block installed


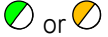



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Specifications




Input Ranges	Current: 0 to 20mA, 4 to 20mA, +/- 20mA Voltage: +/- 10V, 0 to 10V, +/- 5V, 0 to 5V, 1 to 5V		
Power Requirements (from the backplane)	ALG106: 230 mA maximum @ 5.0V +5% / -2.5%, 320 mA maximum @ 3.3V +5% / -3% ALG112: 490 mA maximum @ 5.0V +5% / -2.5%, 310 mA maximum @ 3.3V +5% / -3%		
Power Dissipation within Module	IC695ALG106: 2.97 watts maximum; with 20mA inputs on all 6 channels IC695ALG112: 4.89 watts maximum with 20mA inputs on all 12 channels		
Thermal Derating	No derating		
Resolution	16 bit ADC converted to Floating Point or Integer		
Input Data Format	Configurable as floating point IEEE 32 bit or 16-bit integer in a 32-bit field		
Filter Options	8Hz, 12Hz, 16Hz, 40Hz, 250Hz, 1000Hz		
Input Impedance	>500 Kohm voltage inputs		
Current Input Resistance	250 ohms +/- 1%		
Open Circuit Detection time	1 second maximum		
Overvoltage	+/-35 VDC continuous, maximum		
Overcurrent	+/-35mA continuous, maximum		
Normal Mode Noise Rejection (dB)		At 50Hz	At 60Hz
	8 Hz filter	90	75
	12 Hz filter	75	80
	16 Hz filter	35	75
Common Mode Noise Rejection	100dB minimum @ 50/60 Hz with 8 Hz filter 100dB minimum @ 50/60 Hz with 12 Hz filter		
Channel-Channel DC Crosstalk	-70 dB minimum		
Isolation Voltage terminal block to backplane/chassis and channel to channel	I-coupler, transformer isolated 250 VAC continuous/1500 VAC for 1 minute		
Analog Step Change Response	The analog input will settle to 0.1% of its final value within 1.7mS for a step change on the input pins of the module. (Any digital filtering is in addition to this time.)		
Digital Filtering Settling Time (milliseconds)	The settling time depends on the configured filter time. 8 Hz Filter: 127 mS 12 Hz Filter: 67 mS 16 Hz Filter: 56 mS 40 Hz Filter: 21 mS 250 Hz Filter: 3.1 mS 1000 Hz Filter: 0 mS (no digital filtering; analog front-end filter only)		
Analog Module Scan Time (milliseconds)	The modules provide a new sample every 1mS, regardless of the digital filtering selected. See Digital Filtering Settling Time for the amount of time required to have settled data.		
Calibrated Accuracy	0.1% of range at 25°C 0.2% of range over entire temperature span In the presence of severe RF interference (IC 801-3, 10V/M), accuracy may be degraded by 2.0% of range.		
Calibration Interval	12 months typical to meet accuracy specifications over time. Offset can be applied as a periodic calibration adjustment.		

Indicator Light Emitting Diodes (LEDs)




MODULE OK – indicates the module’s ability to perform normal operations.

	Green, ON	Module OK and configured
 or 	Green or Amber, slow flashing	Module OK but not configured.
	Green, quick flashing	Error
	OFF	Not OK: no backplane power present or module is defective

FIELD STATUS – indicates the status of the module’s field connections.

	Green, ON	No faults on any enabled channel, and Terminal Block is present
	Amber, ON	Fault on at least one channel
	OFF	Terminal block not present or not fully seated

TB – indicates the status of the module’s connection to its terminal block.

	Green, ON	Terminal block present
	Red, ON	Terminal block not present or not fully seated
	OFF	No backplane power to module

Channel Diagnostic Data

The module can be configured to report channel diagnostics status data to the CPU. The CPU stores this data at the module’s configured *Diagnostic Reference Address*. Use of this feature is optional. For details on module configuration, refer to the *PACSystems RX3i System Manual*, GFK-2314.

The diagnostics data for each channel occupies 2 words whether the channel is used or not:

Bit	Value	Function
D0	0	Low alarm not Exceeded
	1	Low alarm Fault
D1	0	High Alarm not Exceeded
	1	High Alarm Exceeded
D2	0	Not Under Range
	1	Under Range
D3	0	Not Over Range
	1	Over Range
D4	0	No Open Wire
	1	Open Wire
D5	0	No Short Circuit
	1	Short Circuit
D6	0	Spare. Always set to zero
	1	Invalid value.
D7	0	No extended diagnostic Information
	1	See extended diagnostic Information in bits D8-D15.
D8-D15	—	Extended diagnostic Information (refer to GFK-2314)

Hardware Installation

Pre-installation Check

Upon receiving your RX3i equipment, carefully inspect all shipping containers for damage. If any part of the system is damaged, notify the carrier immediately. The damaged shipping container should be saved as evidence for inspection by the carrier.

As the consignee, it is your responsibility to register a claim with the carrier for damage incurred during shipment. GE Intelligent Platforms will fully cooperate with you, however, should such action be necessary.

After unpacking the RX3i equipment, record all serial numbers. Serial numbers are required if you should need to contact Customer Care during the warranty period. All shipping containers and all packing material should be saved should it be necessary to transport or ship any part of the system.

Verify that all components of the system have been received and that they agree with your order. If the system received does not agree with your order, contact Customer Care.

Installation Location

This product is intended for use with the RX3i control system. Its components are considered open equipment (having live electrical parts that may be accessible to users) and must be installed in an ultimate enclosure that is manufactured to provide safety. As a minimum, the enclosure shall provide a degree of protection against solid objects as small as 12mm (e.g. fingers). This equates to a NEMA/UL Type 1 enclosure or an IP20 rating (IEC60529) providing at least a pollution degree 2 environment. For details about installing RX3i rack systems, refer to GFK-2314.

Installation in Hazardous Areas

The following information is for products bearing the UL marking for Hazardous Areas or ATEX marking for explosive atmospheres:

CLASS 1 DIVISION 2 GROUPS ABCD

- This equipment is an open-type device and is meant to be installed in an enclosure suitable for the environment that is only accessible with the use of a tool.
- Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations, or nonhazardous locations only.



Warning – EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.



Warning – WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND



Warning – DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.



Warning – EXPLOSION HAZARD - USB PORT IS ONLY FOR USE IN NONHAZARDOUS LOCATIONS, DO NOT USE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

ATEX Zone 2

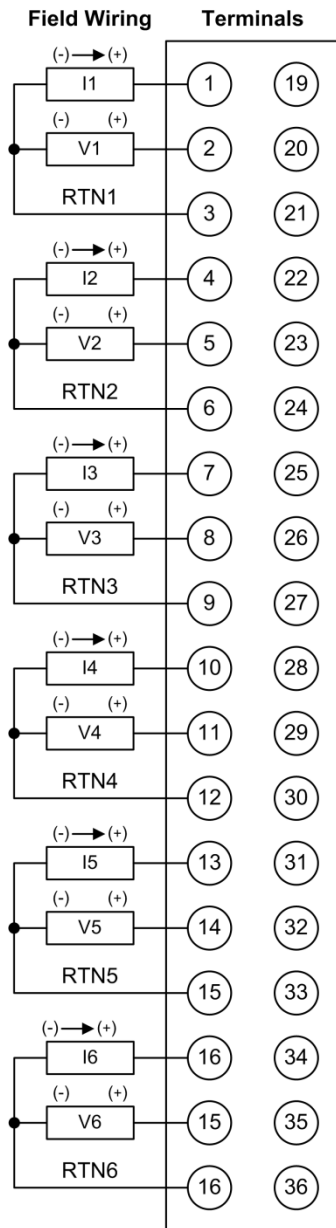
This product must be mounted in an enclosure certified in accordance with EN60079-15 for use in Zone 2, Group IIC and rated IP54. The enclosure shall only be able to be opened with the use of a tool.

Field Wiring

The following tables list wiring connections for the IC695ALG106 and ALG112 modules.

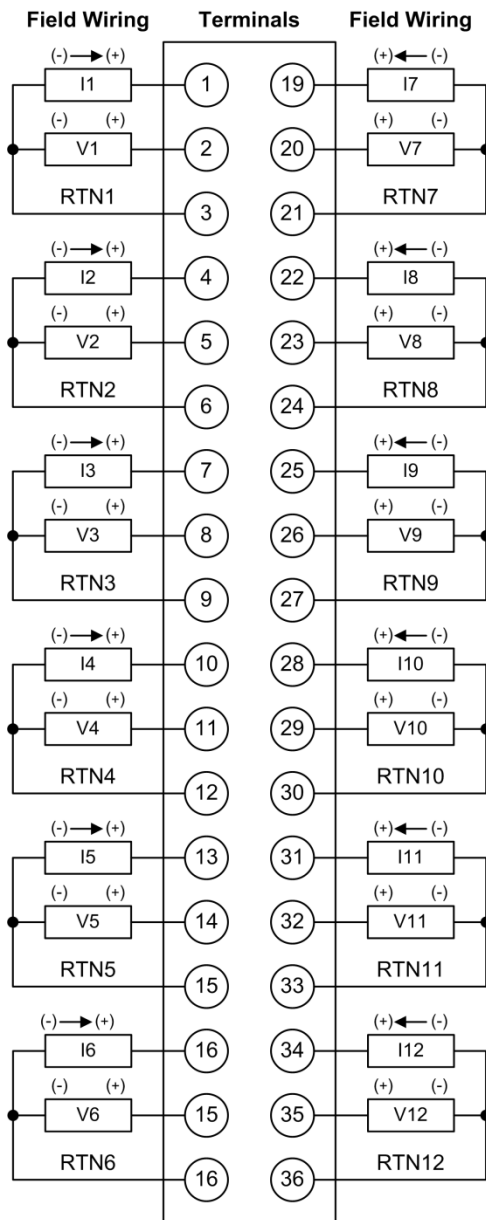
Note: There are no shield terminals on these modules. For shielding, tie cable shields to the ground bar along the bottom of the backplane. M3 tapped holes are provided in the ground bar for this purpose.

IC695ALG106



Terminal	Connection	Connection	Terminal
1	CH 1 Current In	No Connection	19
2	CH 1 Voltage In	No Connection	20
3	CH 1 RTN	No Connection	21
4	CH 2 Current In	No Connection	22
5	CH 2 Voltage In	No Connection	23
6	CH 2 RTN	No Connection	24
7	CH 3 Current In	No Connection	25
8	CH 3 Voltage In	No Connection	26
9	CH 3 RTN	No Connection	27
10	CH 4 Current In	No Connection	28
11	CH 4 Voltage In	No Connection	29
12	CH 4 RTN	No Connection	30
13	CH 5 Current In	No Connection	31
14	CH 5 Voltage In	No Connection	32
15	CH 5 RTN	No Connection	33
16	CH 6 Current In	No Connection	34
17	CH 6 Voltage In	No Connection	35
18	CH 6 RTN	No Connection	36

IC695ALG112



Terminal	Connection	Connection	Terminal
1	CH 1 Current In	CH 7 Current In	19
2	CH 1 Voltage In	CH 7 Voltage In	20
3	CH 1 RTN	CH 7 RTN	21
4	CH 2 Current In	CH 8 Current In	22
5	CH 2 Voltage In	CH 8 Voltage In	23
6	CH 2 RTN	CH 8 RTN	24
7	CH 3 Current In	CH 9 Current In	25
8	CH 3 Voltage In	CH 9 Voltage In	26
9	CH 3 RTN	CH 9 RTN	27
10	CH 4 Current In	CH 10 Current In	28
11	CH 4 Voltage In	CH 10 Voltage In	29
12	CH 4 RTN	CH 10 RTN	30
13	CH 5 Current In	CH 11 Current In	31
14	CH 5 Voltage In	CH 11 Voltage In	32
15	CH 5 RTN	CH 11 RTN	33
16	CH 6 Current In	CH 12 Current In	34
17	CH 6 Voltage In	CH 12 Voltage In	35
18	CH 6 RTN	CH 12 RTN	36

Additional Information

PACSystems RX3i User Manuals

PACSystems RX3i and RX7i CPU Reference Manual, GFK-2222

PACSystems RX3i System Manual, GFK-2314

User manuals, product updates and other information sources are available on our Support website, <http://www.ge-ip.com/support>, under *Controllers and IO, RX3i Controllers*.

GE Intelligent Platforms Contact Information

Americas: 1-800-433-2682 or 1-434-978-5100

Global regional phone numbers are available on our website www.ge-ip.com

Important Product Information

Release History

Version	Firmware Revision	Date	Description
IC695ALG106-EA IC695ALG112-EA	1.00	November 2013	Hardware design updated to address component obsolescence. No change in functionality, performance, or compatibility. Product labeling and documentation of backplane power consumption revised as a result of UL testing.
IC695ALG106-DA IC695ALG112-DA	1.00	September 2010	Label change only. No change in functionality, performance or compatibility.
IC695ALG106-CA IC695ALG112-CA	1.00	July 2009	Modified the terminal block detector switch to increase the size of the switch lever. The increased size of the switch lever allows additional tolerance to assure contact with the terminal block actuator.
IC695ALG106-BA IC695ALG112-BA	1.00	June 2009	UL approval
IC695ALG106-AA IC695ALG112-AA	1.00	October 2007	Initial Release

Firmware Upgrades

[Not applicable – original firmware still used.]

New Features in This Release

[No new features.]

Issues Resolved in This Release

Issue Resolved	Description
Obsolescence of components	Designs updated to accommodate new replacement components. The hardware changes do not affect form, fit, or function of the designs.
UL testing identified product labeling and documentation issues with specification of backplane power consumption.	Labels and specifications have been corrected.

Functional Compatibility

Subject	Minimum Version Required
Programmer version requirements	Proficy* Machine Edition Logic Developer, Version 5.6, Service Pack 11
RX3i CPU version requirements	PACSystems RX3i CPU Release 5.0

Restrictions and Open Issues

[None]

Operational Notes

These modules have separate enable/disable options for Diagnostic Reporting and Interrupts. Normally, disabling a diagnostic (such as Low/High Alarm or Over/Under range) in the configuration means that its diagnostic bit is never set. However, if interrupts are enabled for a condition and that interrupt occurs, the diagnostic bit for that condition is also set during the same controller logic scan. The next PLC input scan always clears this interrupt status bit back to 0, because Diagnostic Reporting has it disabled.