PACSystems* RX3i

Universal Analog Input Module

GFK-2348L June 2017

The PACSystems Universal Analog Input module IC695ALG600 provides eight general purpose input channels and two Cold Junction Compensation (CJC) channels. Inputs are divided into two equal groups of four. Channels can be individually-configured using the Proficy* Machine Edition software for:

- Any combination of up to eight channels of voltage, current, thermocouple, RTD, and resistance inputs.
- Thermocouple Inputs: B, C, E, J, K, N, R, S, T
- RTD Inputs: PT 385 / 3916, N 618 / 672, NiFe 518, CU 426
- Resistance Inputs: 0 to 250 / 500 / 1000 / 2000 / 3000 / 4000 Ohms
- Current: 0–20 mA, 4–20 mA, <u>+</u>20 mA
- Voltage: <u>+</u>50mV, <u>+</u>150 mV, 0–5 V, 1–5 V, 0–10 V, <u>+</u>10V

This module must be located in an RX3i Universal Backplane. An RX3i CPU with firmware version 2.80 (Build ID 43A1) or later. Proficy Machine Edition 5.0 SP1A LD-PLC Hotfix 1) or later is required for configuration.

This module can be used with a Box-style (IC694TBB032), Extended Box-style (IC694TBB132), Spring-style (IC694TBS032), or Extended Spring-style (IC694TBS132)) Terminal Block. Extended terminal blocks provide the extra shroud depth needed for shielded wiring. See the *PACSystems RX3i System Manual*, GFK-2314 revision B or later for more information about Terminal Blocks. Terminal Blocks are ordered separately.

Module Features

- Module supports hot insertion/extraction
- Terminal Block insertion or removal detection
- Module Status, Field Status, and TB LEDs
- Module meets CE, UL/CUL 508 and 1604, and ATEX requirements
- Flash memory for future upgrades
- Autocalibration at power-up
- Completely software-configurable, no module jumpers to set
- Six hardware analog-to-digital filter frequencies, individually-selectable by channel
- Rapid channel acquisition times based on filter frequency
- On-board error-checking
- Open-circuit detection for most input types
- Short-circuit detection for RTDs.
- User-defined scaling
- Module fault reporting
- Overrange, underrange, high alarm, low alarm, high-high alarm, low-low alarm and calibration fault alarm detection and reporting on a per-channel basis.
- Positive and negative Rate of Change Alarms
- Configurable interrupts for channel alarms and faults
- Supports diagnostic point fault contacts in the logic program.
- CJC compensation on terminal block
- Temperature in Celsius or Fahrenheit

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Specifications

Backplane Power Requirements	190 mA maximum @ 5.0V	
(no external power requirements)	250 mA maximum @ 3.3V	
Power Dissipation within Module	5.4 watts maximum	
Thermal Dissipation		
LEDs	One green LED to indicate the n	nodule status
	One bi-color green/yellow LED to in	o indicate the tield status adjecte the terminal block status
Per Channel Acquisition Time (Fach	10 msec @ 1000 Hz 13 msec @	200 Hz 27 msec @ 40 Hz 67 msec @ 16 Hz 87 msec @
group scanned independently)	12 Hz, 127 msec @ 8 Hz	
Channel Update Time	The sum of the channel acquisition times for a bank of 4 channels plus one of the following if applicable:	
	1. RTD Lead resistance meas	urement time (equals channel acquisition time)
	2. CJC acquisition time 7 mse	PC.
Input resolution	11 to 16 bits, depending on con	figured range and A/D filter frequency.
Inputs in Ohms	Resistance	0-250, 0-500, 0-1000, 0-2000, 0-3000, 0-4000
	Platinum 385	100, 200, 500,1000
	Platinum 3916	100, 200, 500,1000
	Nickel 672	120
	Nickel 618	100,200, 500,1000
	Nickel-Iron 518	604
	Copper 426	10
RTD Inputs	Copper 426	-100 to 260°C
	Nickel 618	-100 to 260°C
	Nickel 672	-80 to 260°C
	Nickel-Iron 518	-100 to 200°C
	Platinum 385	-200 to 850°C
	Platinum 3916	-200 to 630°C
Thermocouple Inputs	Туре В	300 to 1820°C
	Type C	0 to 2315°C
	Туре Е	-270 to 1000°C
	Type J	-210 to 1200°C
	Type K	-270 to 1372°C
	Type N	-210 to 1300°C
	Type R	0 to 1768°C
	Type S	0 to 1768°C
	Type T	-270 to 400°C
Voltage Inputs	-10V to +10V, 0V to +10V, 0V to	+5V, 1V to +5V, -50mV to +50mV, -150mV to +150mV
Current Inputs	-20mA to +20mA, 4 to 20mA, 0 to 20mA	
Configurable Input Filter	8 Hz, 12 Hz, 16 Hz, 40 Hz, 200 Hz, 1000 Hz	
Scaling	Floating point user scaling.	
Max RTD Cable Impedance	25 ohm	
RTD Wire Length	1000 ft max w/settling time of 1mSec	
Input Impedance	>1M ohm for TC/V/RTD	
Current Input Resistance	249 ohm +/- 1%	

Open circuit detection time	5 seconds max. Open circuit detection is available for all configurations except +/- 20mA current, 0-20mA current, and +/-10V voltage.	
Max Overvoltage	+/-14.5VDC continuous	
Max Overcurrent	28 mA continuous	
Normal Mode Noise Rejection	95 dB minimum @ 50/60 Hz with 8 Hz filter	
	85 dB minimum @ 50/60 Hz with 12 Hz filter	
Common Mode Noise Rejection	120dB minimum @ 50/60 Hz with 8 Hz filter	
	110dB minimum @ 50/60 Hz with 12 Hz filter	
Settling time to 5% of Full Scale (notch filter dependent)	<80 mS	
Calibrated Accuracy at 25°C	Better than 0.1% of range (except 10 ohm CU RTD)	
	Accuracy depends on A/D filter, data format, input noise, and ambient temperature.	
Calibration interval	12 months typical to meet accuracy specifications over time. Module will allow for user offset to be applied as a periodic calibration adjustment.	
Input Offset Drift with Temperature	3.0 milliohm/°C maximum	
	2.0 uV/°C maximum	
Gain Drift with Temperature	50 ppm/°C typical (90 ppm/°C maximum)	
Module error over Full Temp range	0.5% of range typical (depends on range)	
	1.0% of range maximum	
Module Scan Time	(Assumes 2 ADC's running in parallel, no CJC or lead resistance)	
(notch filter dependent)	10 ms per Channel × 4 Channels = 40 ms (1K Hz filter)	
	Channels that are disabled are not scanned, shortening scan time.	
Module conversion method	Sigma-delta	
Isolation Voltage	Opto-isolated, transformer isolated	
channel to channel	+-12.5Vdc channel to channel Tc/V/I/RTD	
group to group	250 VAC continuous/1500 VAC for 60 seconds	
terminal block to backplane/chassis	250 VAC continuous/1500 VAC for 60 seconds	

LEDs

The **Module OK** LED indicates module status. The **Field Status** LED indicates the presence of a fault on at least one channel or a terminal block error. The TB (Terminal Block) LED indicates the presence or absence of the terminal block. LEDs are powered from the backplane power bus.

LED	Indicates	
Module OK	ON Green: Module OK and configured.	
	Slow Flashing Green or Amber: Module OK but not configured.	
	Quick Flashing Green: Error.	
	OFF: Module is defective or no backplane power present	
Field Status	ON Green: No faults on any enabled channel, and Terminal Block is present.	
	ON Yellow: Fault on at least one channel.	
	OFF: Terminal block not present or not fully seated.	
ТВ	ON Red: Terminal block not present or not fully seated.	
	ON Green: Terminal block is present.	
	OFF: No backplane power to module.	