IMPORTANT PRODUCT INFORMATION

GFK-2501F

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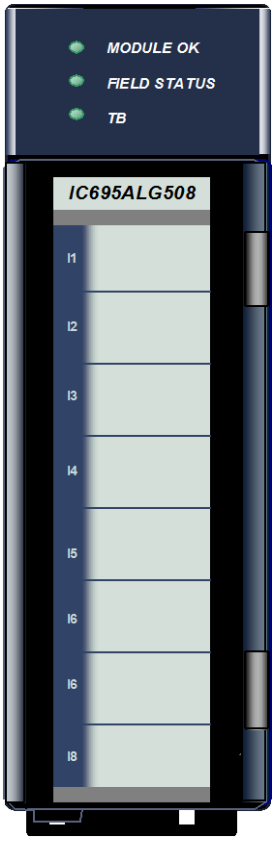
PACSystems™ RX3i

ISOLATED 8-CHANNEL RTD INPUT MODULE

(IC695ALG508)



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Product Description

The I**solated RTD Input module**, IC695ALG508, provides eight isolated differential RTD input channels. IC695ALG508CA is the conformally coated version. Each channel can be individually configured for:

RTD Inputs: 50, 100, 200, 500, and 1000 ohm Pt 385
50, 100, 200, 500, and 1000 ohm Pt 391.6
100, 200, 500, and 1000 ohm Ni 618
120 ohm Ni 672
604 ohm NiFe 518
10, 50 and 100 ohm Cu 426

Resistance Inputs: 250, 500, 1000, 2000, 3000, and 4000 Ohms

The module must be located in an RX3i Universal Backplane. It requires an RX3i CPU with firmware version 5.5 or later. PAC Machine Edition Version 5.8 Logic Developer-PLC or later must be used for configuration.

These modules 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

- Completely software-configurable, no module jumpers to set
- RTD Linearization based on ITS-90
- Supports Removal and Insertion Under Power
- 32-bit IEEE floating point or 16 bit integer (in 32 bit field) input data format selectable per channel
- Temperature units selectable in degrees C and F
- User Scaling
- Programmable notch filter from 2.3 Hz to 28 Hz per channel
- Under range/Over range alarm detection and reporting by channel
- Alarm dead band for high alarm, low alarm, high-high alarm, and low-low alarm by channel
- Wire-off (open circuit) condition support for all inputs.
- Module fault status reporting (Watchdog, Ram Fail, Flash Fail)
- Module identity and status reporting including LED status indicators
- Support for 2, 3, or 4 wire RTD types for each channel.
- For Resistance inputs, fixed 2-wire measurement mode.
- Periodic Lead Resistance compensation measurement update enable/disable control for 3 wire RTDs. When enabled, the module will switch to measure the lead resistance once every 100 samples, and will use this value for the next 100 samples.
- RTD user offset support for all channels
- Terminal Block detection switch.

Specifications

Specification	Description		
Number of Channels	8		
Measuring method selectable per channel	RTD/resistance: up to 4k ohms		
RTD input types	▪ 50, 100, 200, 500, and 1000 ohm Platinum 385 (IEC751 1983, Amend 2 1995; JISC 1604 1997) ▪ 50, 100, 200, 500, and 1000 ohm Platinum 391.6 (JISC 1604: 1981) ▪ 100 ohm, 200 ohm, 500 ohm, and 1000 ohm Nickel 618 (DIN 43760 Sept. 1987) ▪ 120 ohm Nickel 672 (MINCO Application Aid #18, 5/90 Type Ni) ▪ 10, 50, and 100 ohm Copper 426 (SAMA RC21-4-1966) ▪ 604 ohm Nickel-Iron 518		
Resistance Input Types	0-260, 0-525, 0-1050, 0-2100, 0-3150, 0-4200 ohms		
Maximum RTD Lead Resistance	25 ohms each side, for a total of 50 ohms.		
RTD and Resistance Input Types	Input Type	Ohms Supported	Excitation Current
	Resistance	0-260, 0-525	0.717 mA
		0-1050, 0-2100, 0-3150, 0-4200	0.238 mA
	Platinum 385	50	1.175 mA
		100	0.717 mA
		200, 500, 1000	0.238 mA
	Platinum 391.6	50	1.175 mA
		100, 200	0.717 mA
		500, 1000	0.238mA
	Nickel 672	120	0.717 mA
	Nickel 618	100,200	0.717 mA
		500,1000	0.238 mA
	Nickel-Iron 518	604	0.238 mA
	Copper 426	10	1.654 mA
		50, 100	1.175 mA
RTD Ranges	RTD Type	Low temp (°C)	High temp (°C)
	Copper 426	-100.0	+260.0
	Nickel 618	-100.0	+260.0
	Nickel 672	-80.0	+260.0
	Nickel-Iron 518	-100.0	+200.0
	Platinum 385	-200.0	+850.0
	Platinum 391.6	-200.0	+630.0
Temperature accuracy for inputs from 4-wire RTDs over temperature span (2.3, 4, and 4.7 Hz filters). This data does do not include the RTD sensor accuracy, which must be included when determining the overall system performance. Three-wire RTDs have similar accuracies, but depend on the lead resistances being balanced. For 2-wire RTDs, the lead resistance of the RTD contributes to the temperature error.	RTD Type	+25°C	0°C to +60°C
	50 Ω Platinum 385	+/- 1.0°C	+/- 1.7°C
	100 Ω Platinum 385	+/- 0.7°C	+/- 1.2°C
	200 Ω Platinum 385	+/- 0.6°C	+/- 1.0°C
	500 Ω Platinum 385	+/- 0.5°C	+/- 0.9°C
	1000 Ω Platinum 385	+/- 0.5°C	+/- 0.9°C
	100 Ω Platinum 391.6	+/- 0.6°C	+/- 1.1°C
	200 Ω Platinum 391.6	+/- 0.5°C	+/- 0.9°C
	500 Ω Platinum 391.6	+/- 0.4°C	+/- 0.8°C
	1000 Ω Platinum 391.6	+/- 0.4°C	+/- 0.8°C
	Nickel 672	+/- 0.3°C	+/- 0.5°C

Specification	Description		
All tolerances double when 24Hz or 28Hz filters are used.	Nickel 618:	+/- 0.3°C	+/- 0.5°C
	Nickel-Iron 518	+/- 0.4°C	+/- 0.7°C
	10 Ω Copper 426	+/- 1.0°C	+/- 2.4°C
	50 Ω Copper 426	+/- 0.8°C	+/- 1.9°C
	100 Ω Copper 426	+/- 0.8°C	+/- 1.9°C
Temperature accuracy for Resistance inputs	Resistance	+25°C	0°C to +60°C
	250 ohms	+/- 0.25 Ω	+/- 0.35 Ω
	500 ohms	+/- 0.3 Ω	+/- 0.45 Ω
	1000 ohms	+/- 0.5 Ω	+/- 0.8 Ω
	2000 ohms	+/- 0.9 Ω	+/- 1.5 Ω
	3000 ohms	+/- 1.3 Ω	+/- 2.2 Ω
	4000 ohms	+/- 1.7 Ω	+/- 2.9 Ω
Measurement Units	Degrees C or F, or Ohms		
Repeatability	0.05% of span at a constant temperature over a 30-second period (0.1% for 10-ohm copper, 28Hz filter)		
Diagnostics reported to the controller	User configurable for Over Range, Under Range, High and Low Alarm, High-high and Low-low alarm, Open Circuit Detection, Positive and Negative Rate of change alarm		
Service Requests	Report module firmware revision		
Hot-Swap	Supports removal and replacement under power as described in the RX3i System Manual (GFK-2314).		
Calibration	Module should be field calibrated via the configuration software.		
Channel-to-channel crosstalk	70 dB minimum at 120mS update rate for all channels		
Common Mode Rejection	2.3 Hz filter, 50/60Hz: 100 dB for 4-wire, 90 dB for 2 and 3 wire 4 Hz filter, 50/60Hz: 100 dB 4.7 Hz filter, 50/60Hz: 100 dB 24 Hz, 28 Hz filter 50/60 Hz: 80 dB		
Default or Hold Last State	For each of fault and disabled modes, the configuration will specify either to default a channel input to 0 or hold the last state of the input		
Fault Reporting	The configuration can enable or disable fault reporting for either of under or over range alarm, open circuit, and rate of change alarm.		
Rate of change	For each channel, the configuration can enable/disable and specify positive and negative rate of change alarms.		
Channel Value Format	16-bit integer (in a 32-bit field) or 32-bit real number data for each channel.		
Backplane Current Consumption	3.3V: 315mA 5V: 120mA		
Excitation Current	0.238mA-1.654 mA, depending on the input range.		
Power Dissipation	2.5W max		
Isolation Voltage (Field to Backplane and Channel to Channel)	250VAC Continuous 1500VAC 1 minute 2550VDC 1 second		
Normal Mode Noise Rejection	2.3 Hz filter, 50Hz: 67dB 2.3 Hz filter, 60Hz: 67dB 4 Hz filter, 50Hz: 80dB 4.7 Hz filter, 60Hz: 80dB 24 Hz filter, 50Hz: 25dB 28 Hz filter, 60Hz: 25dB		

Specification		Description	
Filter Settings, Update Times, Rejection, Resolution	Filter Frequency (-3dB frequency)	Update Time (milliseconds)	Normal Mode Rejection at 50/60 Hz
	2.3 Hz	120 (130 max)	67dB @ 50/60 Hz
	4 Hz	70 (80 max)	80dB @ 50 Hz
	4.7 Hz	60 (70 max)	80dB @ 60 Hz
	24 Hz	20 (30 max)	25dB @ 50 Hz
	28 Hz	15 (25 max)	25dB @ 60 Hz

Update Time

The module update time (see above) assumes all channels are configured with the same parameters. If channels are configured differently, the module update time corresponds to the slowest channel update time chosen. Update time is the time required for the module to sample and convert the input signals provide the resulting data values to the processor. The channel times include channel scan time and filter delay time.

Module Resolution

The module resolution depends on the input type and the filter chosen. The following table summarizes the effective resolution for the module by filter chosen, and input type selected for 2- or 4-wire modes. If 3-wire mode is used, the resolution values shown are reduced by 1.2 bits. If integer format is used, the resolution is limited to 16 bits.

RTD Type / Filter Setting	2.3Hz		4.0 and 4.7 Hz		24 Hz		28 Hz	
	Bits[1]	m°C	Bits[1]	m°C	Bits[1]	m°C	Bits[1]	m°C
Platinum 385	16.5	13.2	16.3	15.2	13.4	113	12.8	172
Platinum 391.6	16.5	10.6	16.3	12.2	13.4	91.0	12.8	138
Nickel 672	16.5	5.2	16.3	6.0	13.4	44.7	12.8	67.8
Nickel 618	16.2	7.3	16.0	8.3	13.1	56.2	12.5	94.3
Nickel-Iron 518	16.5	5.7	16.3	6.5	13.4	48.6	12.8	73.7
Copper 426								
10 ohm	13.6	29.0	13.4	33.3	10.5	249	9.9	377
50 ohm	15.6	7.8	15.4	8.9	12.5	66.5	11.9	101
100 ohm	16.2	5.2	16.0	5.9	13.1	44.3	12.5	67.2
Resistance	**Bits**	**mOhm**	**Bits**	**mOhm**	**Bits**	**mOhm**	**Bits**	**mOhm**
250	16.6	2.6	16.4	3.0	13.5	22.4	12.9	34.0
500	16.6	5.3	16.4	6.1	13.5	45.3	12.9	68.7
1000	16.6	10.6	16.4	12.1	13.5	90.6	12.9	137
2000	17.0	16.0	16.8	18.4	13.9	137	13.3	208
3000	16.6	31.7	16.4	36.4	13.5	272	12.9	412
4000	17.0	32.0	16.8	36.8	13.9	275	13.3	416

[1] *The effective number of bits is based on the full-scale range of the input type.*

Release History