Q.raxx A104

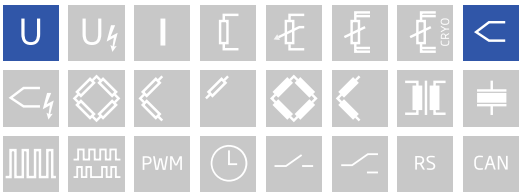
Thermocouple and Low Voltage Measurement Module

Q.raxx is the ideal 19" rackmount DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx DAQ systems can utilize an integrated, high-performance controller for communication, control, and data logging purposes. With a controller, multiple Q.raxx systems can be synchronized to each other allowing for efficient DAQ distribution with low jitter and gradual expansion up to thousands of channels.

- High Density
  up to 13 I/O modules per Q.raxx 3U chassis with up to 16 channels per I/O module
- User Friendly
  front panel indicators for module status, power, and input range error
- Fully Customizable
  multiple front panel termination options available
- Maximum Flexibility
  parallel communication available in TCP/IP, CAN, PROFIBUS, Modbus, and EtherCAT

Key Features

- 8 analog input channels
  thermocouple (type B / E / J / K / L / N / R / S / T / U), voltage (±80 mV)
- High-accuracy digitization
  24-bit ADC, 100 Hz sample rate per channel, 50/60 Hz mains rejection
- Automatic linearization correction
  optimal position of the interpolation points adjusted to the input range
- Built-in cold junction compensation
  stable voltage reference with a built-in CJC per terminal block
- Open thermocouple detection
  detect broken wire, loose connection or thermocouple burnout
- 3-Way galvanic isolation
  100 VDC channel to channel, 500 VDC channel to power supply and bank
- Electromagnetic compatibility (EMC)
  according to IEC 61000-4 and EN 55011



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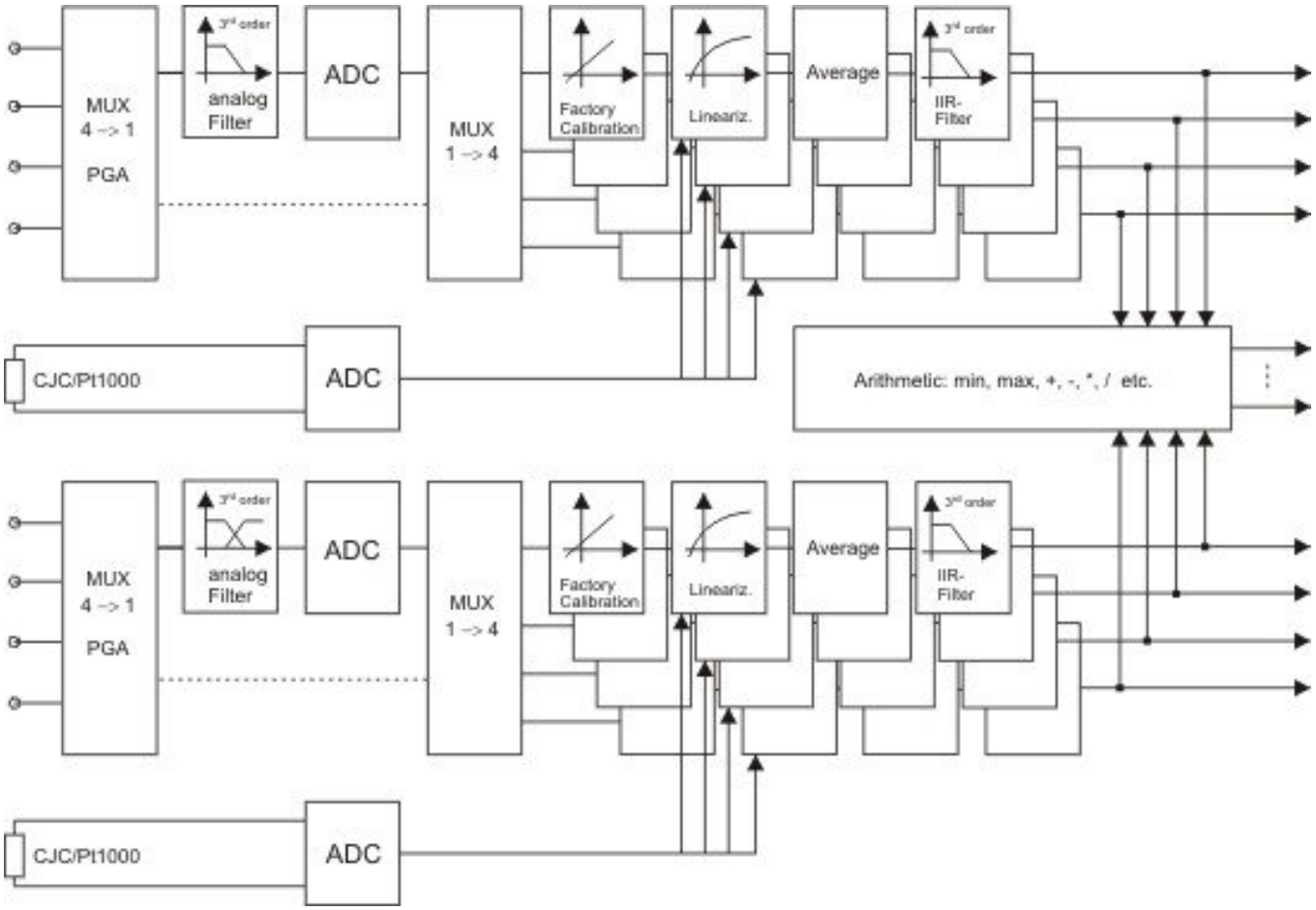
Block diagram



Technical Data

Analog Input

Channels	8
Accuracy	0.01 % typical
	0.025 % in controlled environment[1]
	0.05 % in industrial area[2]
Linearity error	0.01 % typical full-scale
Repeatability	0.003 % typical (within 24 h)
Input impedance	>10 MΩ
Isolation voltage	500 VDC channels channel to power supply channel to bus[3]
	100 VDC permanent, channel to channel

1 according to EN 61326 2006: appendix B

2 according to EN 61326 2006: appendix A

3 noise pulses up to 1000 VDC, permanent up to 250 VDC

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Analog-to-Digital Conversion

Resolution	24-bit
Sample rate	100 Hz per channel fast mode 10 Hz per channel with 60 Hz mains frequency rejection 6 Hz per channel with 50 Hz mains frequency rejection
Modulation method	sigma-delta
Digital filters	low-pass, frequency range 0.1 Hz to 10 Hz
Averaging	configurable or automatic according to the user-defined data rate

Thermocouple Measurement

Range and error	**type**	**range**	**margin of error with CJC [1]**
	Type B	400°C to 1820°C	< ±1.5 °C
	Type E, J, K	-100 to 1000°C	< ±0.5°C
	Type E	-270°C to 1000°C	< ±0.8°C
	Type K	-270°C to 1372°C	< ±0.8°C
	Type L	-200°C to 900°C	< ±0.5°C
	Type N	-100°C to 1000°C	< ±0.5°C
	Type N	-270°C to 1300°C	< ±0.8°C
	Type R, S	-50°C to 1768°C	< ±1.0°C
	Type T, U	-100°C to 400°C	< ±0.5°C
	Type T	-270°C to 400°C	< ±0.8°C
Long-term stability	<0.025°C / 24 hrs	<0.05°C / 8000 hrs	
Temperature drift	<0.05°C / 10 K offset drift	<0.02°C / 10 K gain drift	
CJC uncertainty	<0.3°C		

[1] specifications are only valid with mains frequency rejection enabled

Voltage Measurement

Input range	±80 mV	
Margin of error	±10 µV	
Resolution	10 nV	
Long-term stability	<1 µV / 24 hrs	<10 µV / 8000 hrs
Temperature drift	<20 µV / 10 K offset drift	<0.02 % / 10 K gain drift
Signal-to-noise ratio	>100 dB at 100 Hz	

Communication Interface

Electrical standard	RS-485, 2-wire
Data format	8E1
Protocols	local bus (115200 bps to 24 Mbps) ASCII (19200 bps to 115200 bps) Modbus RTU

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Input Power

Input voltage	10 - 30 VDC, overvoltage and overcurrent protection
Power consumption	2 W (approx.)
Input voltage influence	<0.001 % / V

Environmental Specifications

Operating temperature	-20°C to +60°C
Storage temperature	-40°C to +85°C
Relative humidity	5 - 95 % at 50°C (non-condensing)

Remarks

Validity of all listed specifications are subject to a warm-up period of at least 45 minutes
Specifications subject to change without notice

Ordering Information

Article number	101721
Accessories	Terminal CJC-A104, article number 791080

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