

Q.raxx XE A107

Universal Measurement Module

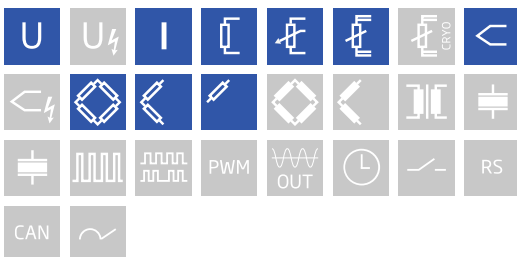
Q.raxx XE is an new addition to the Q.series product family - the ideal 19" rackmount EtherCAT DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx XE DAQ systems can consist of an integrated EtherCAT bus coupler for communication and 10 measurement modules capable of up to 100 kHz sampling per channel with short cycle times and low jitter for accurate synchronization

- According 19"-standard IEC
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- High density and flexibility with 13 modules in one system in any constellation
- FoE (file access over EtherCAT, ETG.1000.5) and CoE (CAN over EtherCAT, ETG.50001.1)

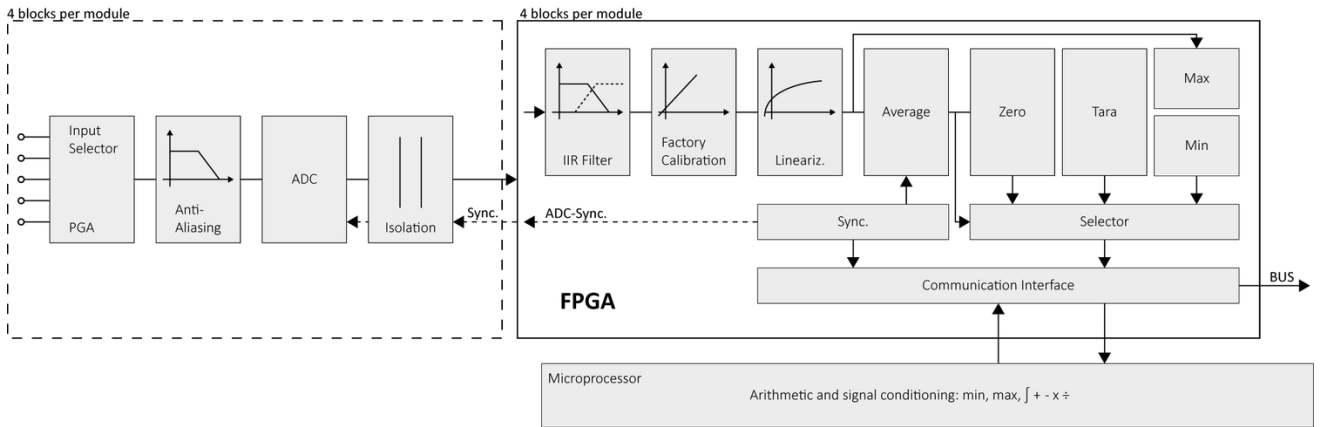


Key Features

- **4 Universal analog input channels**
voltage, current, resistance, potentiometer, RTD (Pt100 / Pt1000), thermocouple, strain gage
- **High-accuracy digitization**
24-bit ADC, 20 kHz sample rate per channel
- **Signal conditioning**
linearization, filtering, average, scaling, min/max, RMS, arithmetic, alarm
- **3-Way galvanic isolation**
Channel to channel, channel to power supply, and channel to bus
- **Electromagnetic compatibility (EMC)**
according to IEC 61000-4 and EN 55011

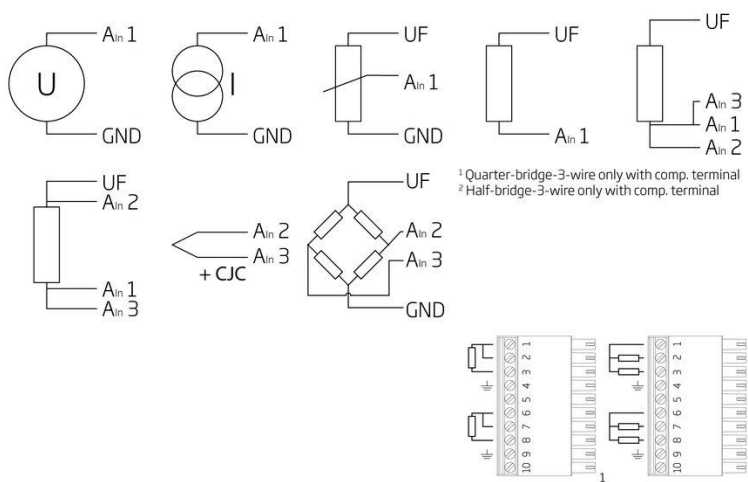
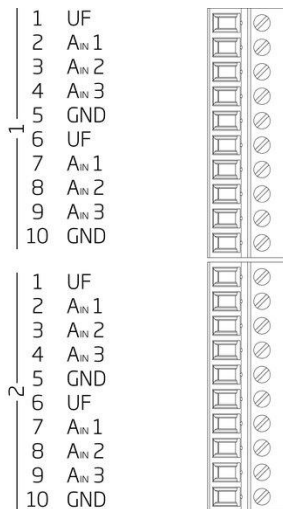


Block diagram



Technical Data

Terminal assignment 10pole screw



Analog Input

Channels	4
Isolation voltage	500 VDC channel to channel, to power supply, channel to bus ¹

¹ noise pulses up to 1000 VDC, continuous up to 250 VDC

Voltage Measurement

Range and error	input range	margin of error	resolution
	±10 V	±2 mV	1.2 µV
	±1 V	±200 µV	120 nV
	±100 mV	±20 µV	12 nV
Long-term stability	input range	24 hrs	8000 hrs
	±10 V	<200 µV	<2000 µV
	±1 V	<20 µV	<200 µV
	±100 mV	<2 µV	<20 µV
Temperature drift	input range	Offset drift	Gain drift
	±10 V	<500 µV / 10 K	<0.01 % / 10 K
	±1 V	<50 µV / 10 K	<0.01 % / 10 K
	±100 mV	<5 µV / 10 K	<0.01 % / 10 K
Signal-to-noise ratio	>90 dB at 1 kHz	>120 dB at 1 Hz	
input impedance	> 100 MΩ		
Overtoltage protection	± 20 V (± 30 V for 5 sec)		

Current Measurement

Input range	±25 mA (Internal shunt resistor 50 Ω)		
Margin of error	±5 µA		
Resolution	3 nA		
Long-term stability	<0.5 µA / 24 hrs	<5 µA / 8000 hrs	
Temperature drift	<1 µA / 10 K Offset drift	<0.03 % / 10 K Gain drift	

Potentiometer Measurement

Resistance range	1 kΩ to 10 kΩ		
Long-term stability	<0.02 % / 24 hrs	<0.2 % / 8000 hrs	
Temperature drift	<0.0001 / 10 K Offset drift	<0.03 % / 10 K Gain drift	

Resistance / RTD Measurement

Range and error	input range	margin of error	resolution
Resistance, 2-wire	100 kΩ	±100 Ω	12 mΩ
Resistance, 2-, 3- and 4-wire	4 kΩ	±1 Ω	0.5 mΩ
Resistance, 2-, 3- and 4-wire	400 Ω	±0.1 Ω	48 µΩ
Pt100, 2-, 3- and 4-wire	-200 to +850°C	±0.25°C	0.2 m°C
Pt1000, 2-, 3- and 4-wire	-200 to +850°C	±1°C	0.2 m°C
Sensor excitation	640 µA (< 4 kΩ) 15 µA (> 4 kΩ)		
Long-term stability	<10 mΩ / 24 hrs	<100 mΩ / 8000 hrs	
Temperature drift (range 400 Ω)	<10 mΩ / 10 K Offset drift	<0.03 % / 10 K Gain drift	

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	< ±0.7°C
	Type E	-270°C to 1000°C	< ±1°C
	Type K	-270°C to 1372°C	< ±1°C
	Type L	-200°C to 900°C	< ±0.7°C
	Type N	-100°C to 1000°C	< ±0.7°C
	Type N	-270°C to 1300°C	< ±1°C
	Type R, S	-50°C to 1768°C	< ±1.2°C
	Type T, U	-100°C to 400°C	< ±0.7°C
	Type T	-270°C to 400°C	< ±1°C
Input impedance	> 10 MΩ		
Long-term stability	<0.1°C / 24 hrs	<0.2°C / 8000 hrs	
Temperature drift	<0.2°C / 10 K Offset drift	<0.025% / 10 K Gain drift	
CJC uncertainty	<0.3°C		

¹ specifications are only valid with mains frequency rejection enabled

Strain Gage Measurement

Bridge configuration(s)	resistive full-bridge (4-wire) resistive half-bridge (3-wire, with bridge completion terminal) resistive quarter-bridge 120 Ω or 350 Ω (3-wire, with bridge completion terminal)		
Accuracy class	0.05		
Allowable bridge resistance	>100 Ω		
Bridge excitation (nominal)	2.5 VDC		
Input range	±2.5 mV/V ±50 mV/V ±500 mV/V		
Long-term stability (range 2.5 mV/V)	<0.12 μV/V / 24 hrs	<1.25 μV/V / 8000 hrs	
Temperature drift (range 2.5 mV/V)	<0.2 μV/V / 10 K Offset drift	<0.05 % / 10 K Gain drift	

Analog to Digital Conversion

Resolution	24-bit		
Sample rate	20 kHz per channel (thermocouple 10 Hz)		
Modulation method	sigma-delta		
Anti-aliasing filter	2 kHz, 3rd order		
Digital filters	Infinite impulse response (IIR), low-pass, high-pass, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 1 kHz (adjustable via software)		
Averaging	configurable or automatic according to the user-defined data rate		

Kommunikationsschnittstelle

Electrical standard	RS-485, 2-wire		
Protocols	EtherCAT (LVDS)		

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Input Power

Input voltage	10 to 30 VDC, overvoltage and overcurrent protection
Power consumption	2.5 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

Are subject to a warm-up period of at least 45 minutes

in a controlled electromagnetic environment¹

With configuration: Low-pass 10Hz²

Specifications subject to change without notice

¹ according to EN 61326 2006: appendix B

² according to EN 61326 2006: appendix A

Mechanical information

Material	Aluminum
Measurements (W x H x D)	30x 128 x 120mm
Weight	approx. 200 g

Ordering Information

Article number	529428
Accessories	Terminal B4/120-A107, article number 894589
	Terminal B4/350-A107, article number 894690
	Terminal CJC-A107, article number 893790

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