

# Q.raxx XE A107 4M1

## Universal Measurement Module with Sensor Supply

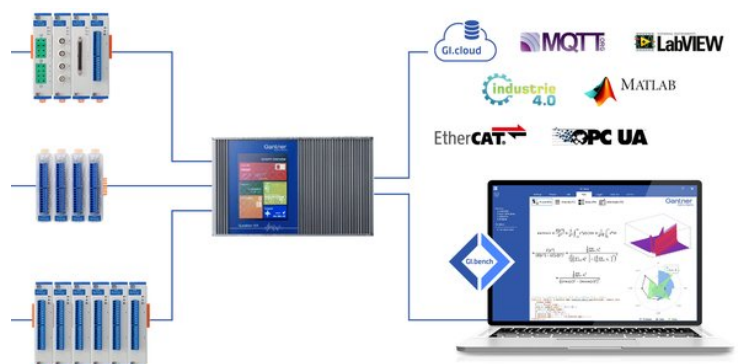
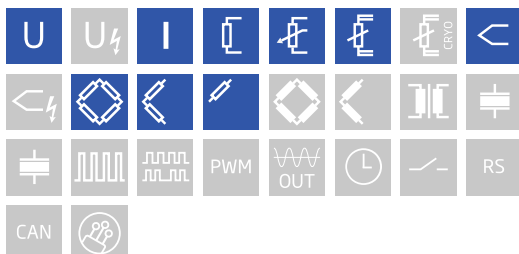
Q.raxx XE is an new addition to the Q.series product family - the ideal 19" rackmount EtherCAT DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx XE DAQ systems can consist of an integrated EtherCAT bus coupler for communication and 10 measurement modules 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)

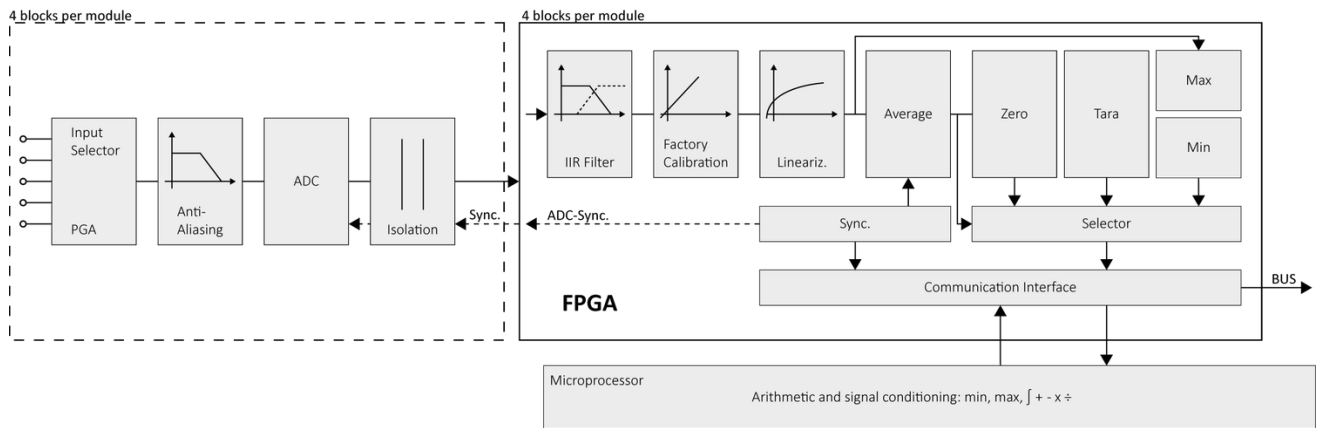


### Key Features

- For MEMS based sensors  
like single axis accelerometers
- 4 Universal analog input channels  
voltage, current, resistance, potentiometer, RTD (Pt100 / Pt1000), strain gage full and half bridge.  
Thermocouple and strain gage quarter bridge with completion terminal  
Completion terminal is currently not available.
- Sensor supply for each channel  
15 VDC max 20 mA, galvanic isolated
- 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  
500 VDC channel to channel, channel to power supply, and channel to bus
- Electromagnetic compatibility (EMC)  
according to IEC 61000-4 and EN 55011

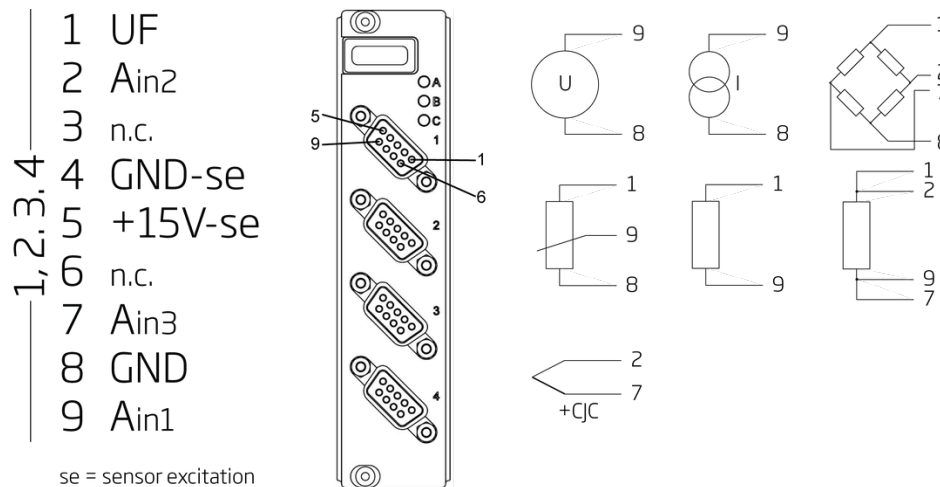


### Block diagram



### Technical Data

#### Terminal assignment DSUB 9 female



### Analog Input

Channels	4
Accuracy	0.01 % typical 0.02 % in controlled environment <sup>1</sup> 0.05 % in industrial area <sup>2</sup>
Linearity error	0.01 % typical full-scale
Repeatability	0.003 % typical (within 24 hrs)
Isolation voltage	500 VDC channel to channel, to power supply, channel to bus <sup>3</sup>
Connector type	DSUB 9 pole (female)

<sup>1</sup> according to EN 61326 2006: appendix B

<sup>2</sup> according to EN 61326 2006: appendix A

<sup>3</sup> noise pulses up to 1000 VDC, continuous up to 250 VDC

### Voltage Measurement

Range and error	<b>input range</b>	<b>margin of error</b>	<b>resolution</b>
	±10 V	±2 mV	1.2 µV
	±1 V	±200 µV	120 nV
	±100 mV	±20 µV	12 nV
Long-term stability	<b>input range</b>	<b>24 hrs</b>	<b>8000 hrs</b>
	±10 V	<200 µV	<2000 µV
	±1 V	<20 µV	<200 µV
	±100 mV	<2 µV	<20 µV
Temperature drift	<b>input range</b>	<b>Offset drift</b>	<b>Gain drift</b>
	±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		
Overvoltage 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	<b>input range</b>	<b>margin of error</b>	<b>resolution</b>
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 pulsed (< 4 kΩ) 15 µA pulsed (> 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 <sup>1</sup>
	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		

<sup>1</sup> 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

# Q.raxx XE A107 4M1

Universal Measurement Module with Sensor Supply

## Sensor excitation

Channels	4
Voltage	15 V
Current	max. 20 mA (short circuit proof)
Accuracy	< 3 %
Load regulation	< 0.1 %
Noise	1.2 mV (RMS)

## Communications Interface EtherCAT

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

## Input Power

Input voltage	10 to 30 VDC, overvoltage and overcurrent protection
Power consumption	3 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

## Mechanical information

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

## Ordering Information

Article number	659432
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