

# Q.raxx XE A102

## Universal Measurement Module with Analog Output

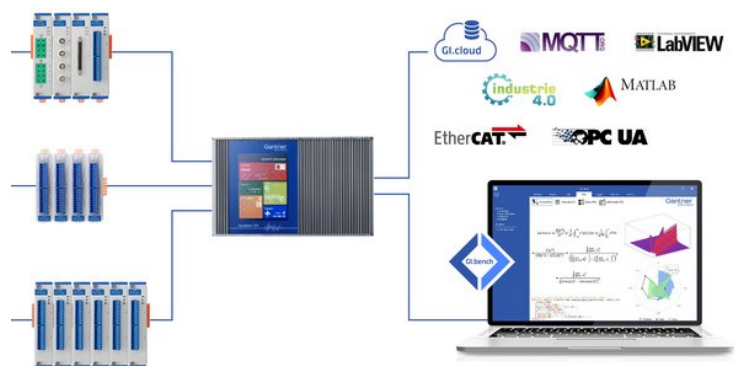
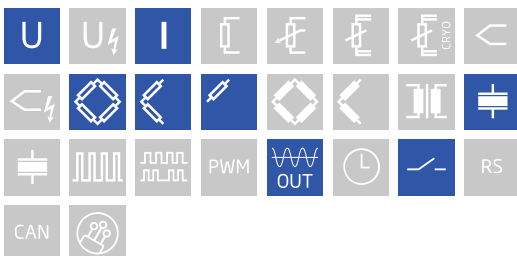
Q.raxx XE is an new addition to the Q.series product family - the ideal 19" rackmount EtherCAT DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx XE DAQ systems can consist of an integrated EtherCAT bus coupler for communication and 10 measurement modules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

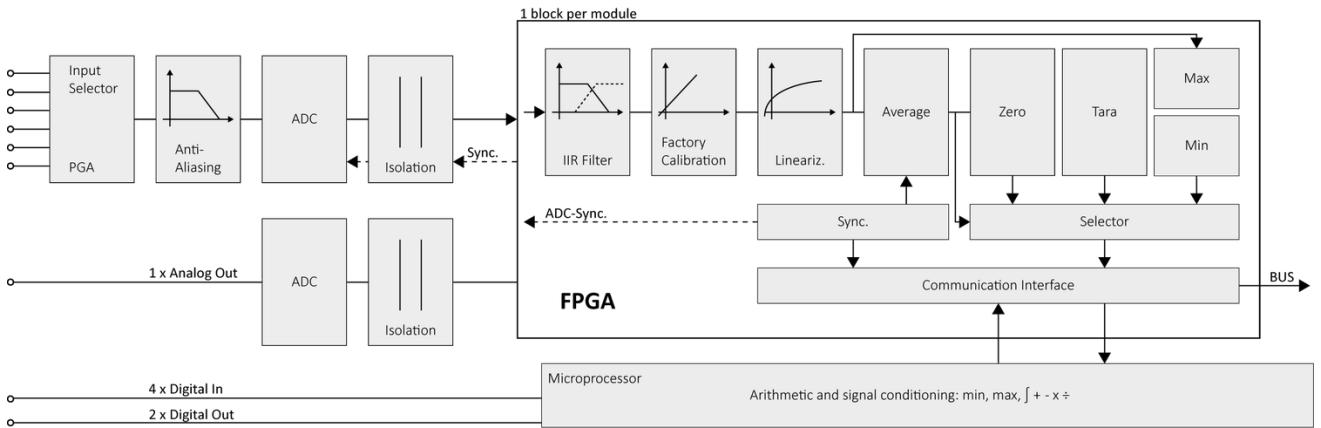


### Key Features

- **1 Analog input channel**  
measuring half and full bridge, IEPE-sensor, voltage, current, quarter bridge with completion terminal
- **1 Analog output channel**  
voltage ( $\pm 10$  V) or current (0 - 20 mA), 100 kHz update rate
- **High-accuracy digitization**  
19-bit SAR ADC, 100 kHz sample rate
- **4 Digital inputs and 2 digital outputs**  
status, trigger, tare, alarm, command
- **Signal conditioning**  
32 virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- **Additional RS 485 fieldbus interface**  
to control an 8 or 16 or 24 channel multiplexer for multi channel systems, 10Hz per channel
- **3-Way galvanic isolation**  
500 VDC channel to channel, channel to power supply, and bank



### Block diagram



### Technical Data

#### Analog Input

Channels	1
Accuracy	0.01 % typical
	0.025 % 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 h)
Isolation voltage	500 VDC channel to channel to power supply channel to bus <sup>3</sup>

<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

Error	Range	max. Error	Resolution
	±10 V	±2 mV	40 µV
	±1 V	±200 µV	4 µV
	±100 mV	±20 µV	0.4 µV
Input impedance	> 10 MΩ (Range ±10 V = 1 MΩ)		
Long-term drift at input range ±1 V	<10 µV / 24 h	<100 µV / 8000 h	
Temperature influence at input range ±1 V	Offset drift	Gain drift	
	<50 µV / 10 K	<0.02 % / 10 K	
Signal-to-noise ratio	>90 dB at 1 kHz	>120 dB at 1 Hz	

#### Current Measurement

Error (Internal shunt resistor 50 Ω)	range	max. error	resolution
	±25 mA	±6 µA	100 nA
Long-term drift	<0.5 µA / 24 h	<5 µA / 8000 h	
Temperature influence	Offset drift	Gain drift	
	<1 µA / 10 K	<0.02 % / 10 K	

### Measurement Mode Bridge

Bridge configuration(s)	half- and full-bridge, (5-/6-wire), quarter-bridge with completion terminal, (3-wire)			
Accuracy class	0.05			
Internal shunt resistor resistance	100 k $\Omega$			
Bridge excitation (nominal)	10.0 VDC	5.0 VDC	2.5 VDC	1.0 VDC
Allowable bridge resistance	>300 $\Omega$	>100 $\Omega$	>80 $\Omega$	>50 $\Omega$
Measurement range	$\pm 100$ mV/V	$\pm 200$ mV/V	$\pm 500$ mV/V	$\pm 1000$ mV/V
	$\pm 25$ mV/V	$\pm 50$ mV/V	$\pm 100$ mV/V	$\pm 200$ mV/V
	$\pm 2.5$ mV/V	$\pm 5$ mV/V	$\pm 10$ mV/V	$\pm 20$ mV/V
	$\pm 1$ mV/V	$\pm 2.5$ mV/V	$\pm 5$ mV/V	$\pm 10$ mV/V
Temperature influence	Offset drift (range 2.5 mV/V)		Gain drift	
	<0.2 $\mu$ V/V / 10 K		<0.05 % / 10 K	

### Measurement Mode IEPE Sensor

Error	Range	max. Error	Resolution
	$\pm 10$ V	$\pm 10$ mV	40 $\mu$ V
Supply	constant current 4 mA		
Input frequency	2 Hz		
Limit frequency	10 kHz		
Temperature influence	Offset drift	Gain drift	
	<10 $\mu$ V / 10 K	<0.025 % / 10 K	

### Analog to Digital Conversion

Resolution	19-bit
Update rate	100 kHz
Modulation method	SAR (successive approximation)
Anti-aliasing filter	20 kHz, 3rd order
Digital filters	Infinite impulse response (IIR), low-pass, high-pass, band-pass, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 10 kHz (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

### Analog Output

Accuracy	0.02 %	
Output type	configurable: voltage or current	
DAC resolution	16-bit	
Update rate	100 kHz	
Voltage output	±10 VDC	
Allowable load resistance	> 2 kΩ	
Temperature influence	Offset drift	Gain drift
	< 2 mV / 10 K	< 0.05 % / 10 K
Noise voltage	< 10 mV at 1 kHz	< 2 mV / 10 Hz
Long-term drift	< 1 mV / 24 h	< 2,5 mV / 8000 h
Current output	0 to 20 mA	
Allowable load burden	< 400 Ω	
Burden influence	Accuracy at 100 Ω	Gain drift
	± 4 μA	< 0.25 μA / Ω
Temperature influence	Offset drift	Gain drift
	4 μA / 10 K	0.05 % / 10 K
Noise current	< 20 μA at 1 kHz	< 4 μA / 10 Hz
Long-term drift	< 2 μA / 24 h	< 5 μA / 8000 h

### Digital In- / Outputs

Channels	4 inputs, 2 outputs
Response time	0.2 ms
Input	status, tare, reset
Input voltage / input current	max. 30 VDC / max. 0.5 mA
Lower / upper threshold	< 2.0 V (low) / > 10 V (high)
Output	status, alarm
Contact	open drain p-channel MOSFET
Load capacity	30 VDC / 100 mA (ohmic load)

### Communication Interface EtherCAT

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

### Power Supply

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

### Environmental

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

# Q.raxx XE A102

Universal Measurement Module with Analog Output

## Remarks

Warm-up time	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	528427
Accessories	Terminal B4/120-A102, article number 894185
	Terminal B4/350-A102, article number 894286

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