

Q.raxx XE A192

Universal Measurement Module with Analog Output

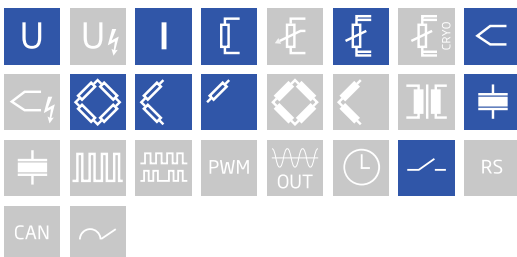
Q.raxx XE is an new addition to the Q.series product family - the ideal 19" rackmount EtherCAT DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx XE DAQ systems can consist of an integrated EtherCAT bus coupler for communication and 10 measurement modules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

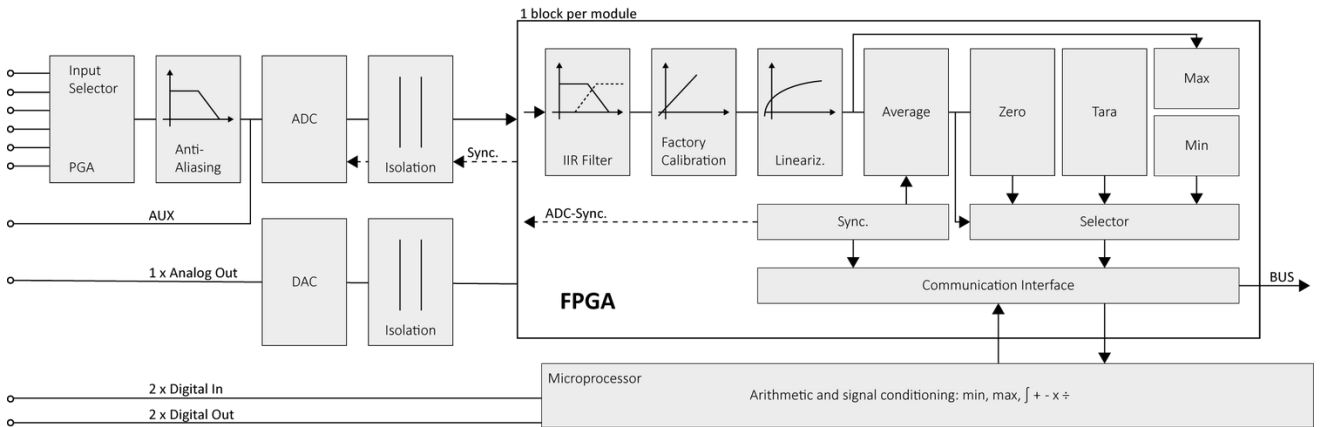


Key Features

- 1 Universal analog input channel
voltage, current, resistance, RTD, thermocouple, strain gage (full-, half-, and quarter-bridge configuration), IEPE
- 1 Analog output channel
voltage (± 10 VDC) or current (± 20 mA)
- 2 digital in and 2 digital outputs
state, tare, reset
- High-accuracy digitization
24-bit ADC, 100 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

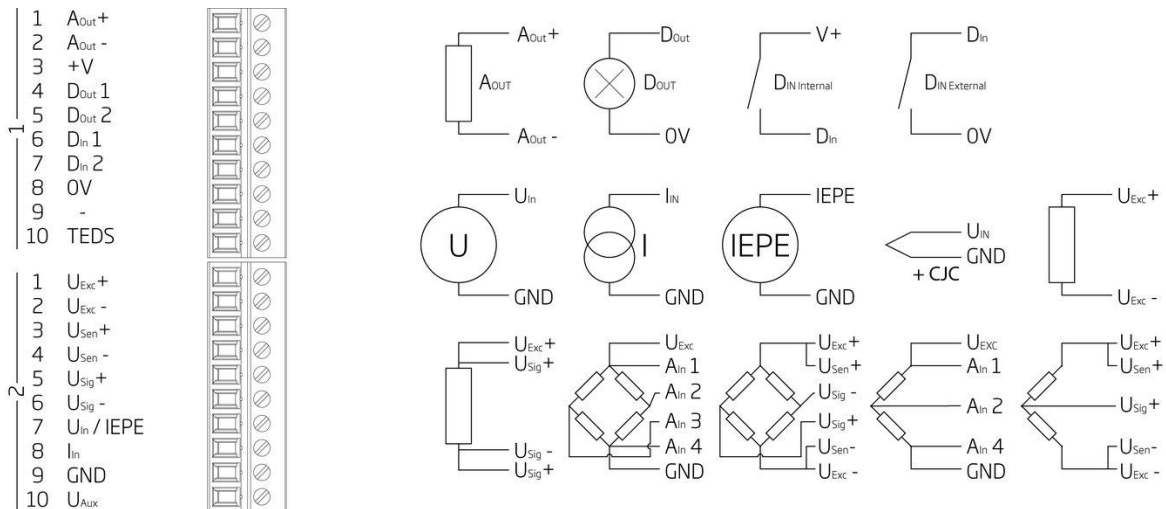


Block diagram



Technical Data

Terminal assignment 10pole screw



Analog Input

Channels	1
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 hrs)
Isolation voltage	500 VDC channel to channel, to power supply, channel to bus ³
Input impedance	100 MΩ
Oversoltage protection	±100 VDC
CMRR	> 110 dB at DC 50 / 60 Hz
CMV	± 300 V

¹ according to EN 61326 2006: appendix B

² according to EN 61326 2006: appendix A

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

Analog to Digital Conversion

Resolution	24-bit
Sample rate	100 kHz per channel
Modulation method	sigma-delta
Anti-aliasing filter	20 kHz, 3rd order
Digital filters	Infinite impulse response (IIR), low-pass, band-pass, band-stop, high-pass, Butterworth or Bessel (8th order), frequency range 1 Hz to 10 kHz (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

Voltage Measurement

Range	±10 V	±5 V	±1 V	±100 mV	±10 mV
Accuracy	±2 mV	±1 mV	±0.2 mV	±40 µV	±10 µV
Offset Drift	<0.2 mV / 10 K	<0.1 mV / 10 K	<20 µV / 10 K	<2 µV / 10 K	<1 µV / 10 K
Gain Drift	<0.01 % / 10 K	<0.01 % / 10 K	<0.01 % / 10 K	<0.01 % / 10 K	<0.01 % / 10 K
Long-term offset stability	<0.2 mV / 24 h	<0.1 mV / 24 h	<20 µV / 24 h	<2 µV / 24 h	<1 µV / 24 h
	<1 mV / 8000 h	<0.5 mV / 8000 h	<0.1 mV / 8000 h	<10 µV / 8000 h	<5 µV / 8000 h
Long-term stability	<0.005 % / 24 h				
	<0.01 % / 8000 h				

Current Measurement

Range	±25 mA
Internal shunt resistor	20 Ω
Accuracy	±5 µA
Offset Drift	<2.5 µA / 10 K
Gain Drift	<0.01 % / 10 K
Long-term offset stability	<1 µA / 24 h
	<3 µA / 8000 h
Long-term stability	<0.005 % / 24 h
	<0.01 % / 8000 h

Resistance / RTD Measurement

Range	5000 Ω	500 Ω	Pt100	Pt500	Pt1000
Accuracy (4-Wire)	0.5 Ω	0.05 Ω	0.2 °C	0.6 °C	0.3 °C
Accuracy (2-Wire)	1 Ω	0.25 Ω	0.5 °C	0.6 °C	0.3 °C
Sensor excitation	0.1 mA	1 mA	1 mA	0.1 mA	0.1 mA
Offset Drift	<0.5 Ω / 10 K	<0.05 Ω / 10 K			
Gain Drift	<0.01 % / 10 K	<0.01 % / 10 K			
Long-term offset stability	<0.1 Ω / 24 h	<0.01 Ω / 24 h			
	<0.3 Ω / 8000 h	<0.03 Ω / 8000 h			
Long-term stability	<0.005 % / 24 h				
	<0.01 % / 8000 h				

Thermocouple Measurement

Type	Range	Accuracy ¹
Type A	-100 °C to 1000 °C	< ±0.7 °C
Type B	400 °C to 1820 °C	< ±1.5 °C
Type C	0 °C to 2315 °C	< ±1.5 °C
Type E, J, K	-100 °C 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
Long-term stability	<0.1 °C / 24 h	<0.2 °C / 8000 h
Temperature drift	Offset drift	Gain drift
	<0.1 °C / 10 K	<0.02 % / 10 K
CJC uncertainty	<0.3 °C	

¹ specifications are only valid with mains frequency rejection enabled

Strain Gage Measurement

Bridge excitation	Voltage	1 V to 12 V adjustable in steps of 1 mV (continuous short circuit proof)			
	Current	max. 50 mA			
	Accuracy	±0.05 %			
	Drift	±0.05 % / 10 K			
Accuracy class	0.05 %				
Gain-Drift	<0.05% / 10 K				
Long-term drift	<0.02 % / 24 h				
	<0.03 % / 8000 h				
bridge excitation	1 V	2.5 V	5 V	10 V	Gain
bridge resistance	>20 Ω	>50 Ω	>100 Ω	>200 Ω	
Range	±1000 mV/V	±400 mV/V	±200 mV/V	±100 mV/V	1
	±100 mV/V	±40 mV/V	±20 mV/V	±10 mV/V	10
	±50 mV/V	±20 mV/V	±10 mV/V	±5 mV/V	20
	±20 mV/V	±8 mV/V	±4 mV/V	±2 mV/V	50
	±10 mV/V	±4 mV/V	±2 mV/V	±1 mV/V	100
	±5 mV/V	±2 mV/V	±1 mV/V	±0.5 mV/V	200
	±2 mV/V	±0.8 mV/V	±0.4 mV/V	±0.2 mV/V	500
	±1 mV/V	±0.4 mV/V	±0.2 mV/V	±0.1 mV/V	1000

IEPE Vibration Measurement

Sensor excitation current	1 mA to 12 mA adjustable in steps of 10 μ A
Sensor excitation accuracy	0.5 %
Range	\pm 10 V
Input frequency range	0.5 Hz to 20 kHz
Accuracy	\pm 10 mV
Offset drift	<1 mV / 10 K
Gain drift	<0.01 % / 10 K
Long-term offset stability	<1 mV / 24 h
	<3 mV / 8000 h
Long-term gain drift	<0.02% / 24 h
	<0.05 % / 8000 h

Analog Output

Channels	1
Accuracy	0.02 % typical
Output type	voltage or current
Rated output resistance	<1 Ω , continuous short circuit proof

Digital to Analog Conversion

Resolution	16-bit
Update rate	100 kHz per channel
Settling time	3 μ s

Voltage Output

Output voltage	\pm 10 VDC	
Allowable load resistance	>1 k Ω	
Long-term drift	<1 mV / 24 h	<2.5 mV / 8000 h
Temperature influence	<2 mV / 10 K Offset drift	<0.05 % / 10 K Gain drift
Noise voltage	<10 mV at 1 kHz	<2 mV at 10 Hz

Current Output

Output current	0 to \pm 20 mA	
load burden	<500 Ω	
burden influence	<0.02 μ A / Ω	
Long-term stability	<2 μ A / 24 h	<5 μ A / 8000 h
Temperature drift	<4 μ A / 10 K Offset drift	<0.05 % / 10 K Gain drift
Noise current	<20 μ A at 1 kHz	<4 μ A at 10 Hz

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Digital I/Os

Channels	2 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

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

Input Power

Input voltage	10 - 30 VDC, overvoltage and overcurrent protection
Power consumption	3 W (approx.)
Input voltage influence	<0.001 % / V

Environmental Specifications

Electromagnetic compatibility	according to IEC 61000-4 and EN 55011
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

Specifications subject to change without notice

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Universal Measurement Module with Analog Output

Module Pins

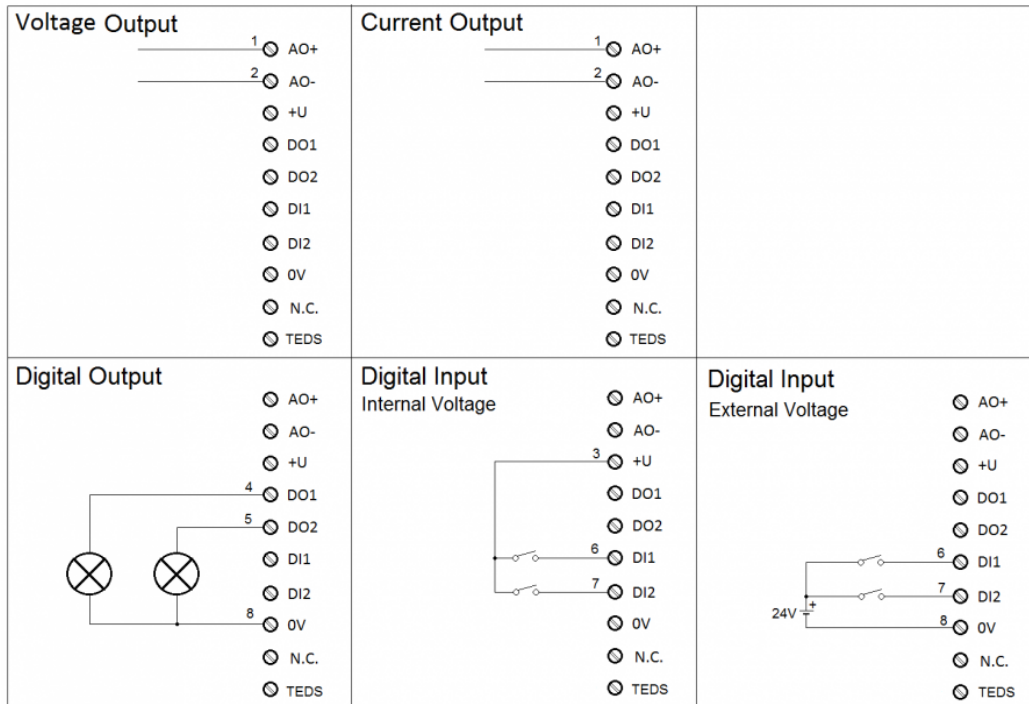
Connector 1	1	1	$A_{OUT} +$
	2	2	$A_{OUT} -$
	3	3	+ V
	4	4	DO 1
	5	5	DO 2
	6	6	DI 1
	7	7	DI 2
	8	8	0 V
	9	9	NC
	10	10	TEDS
Connector 2	1	1	$U_{EXC} +$
	2	2	$U_{EXC} -$
	3	3	$U_{Sen} +$
	4	4	$U_{Sen} -$
	5	5	$U_{Sig} +$
	6	6	$U_{Sig} -$
	7	7	$U_{In} / IEPE$
	8	8	I_{IN}
	9	9	GND
	10	10	U_{AUX}

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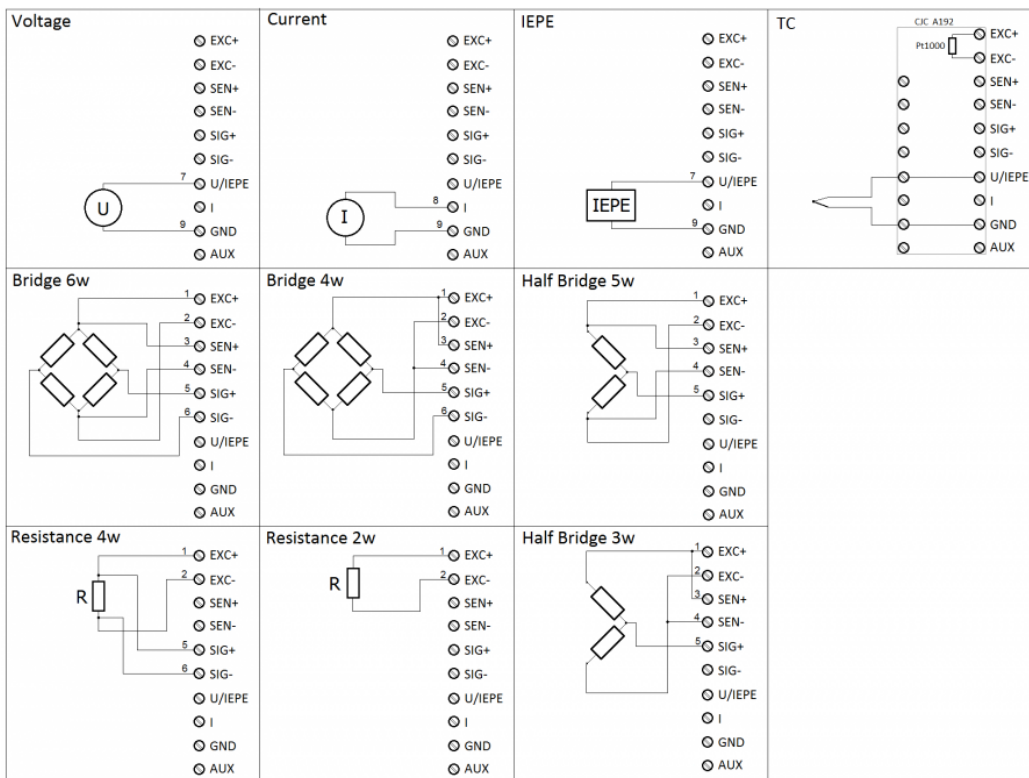
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Connection

Connector 1



Connector 2



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Mechanical information

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

Ordering Information

Article number	646226
Accessories	Terminal CJC-A192, article number 647631

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