

Q.raxx A102

Universal Measurement Module with Analog Output

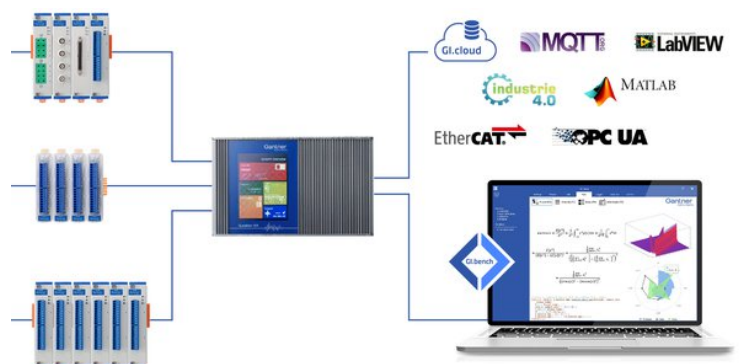
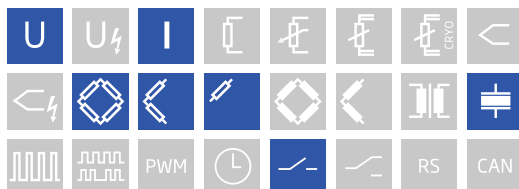
Q.raxx is the ideal 19" rackmount DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx DAQ systems can utilize an integrated, high-performance controller for communication, control, and data logging purposes. With a controller, multiple Q.raxx systems 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

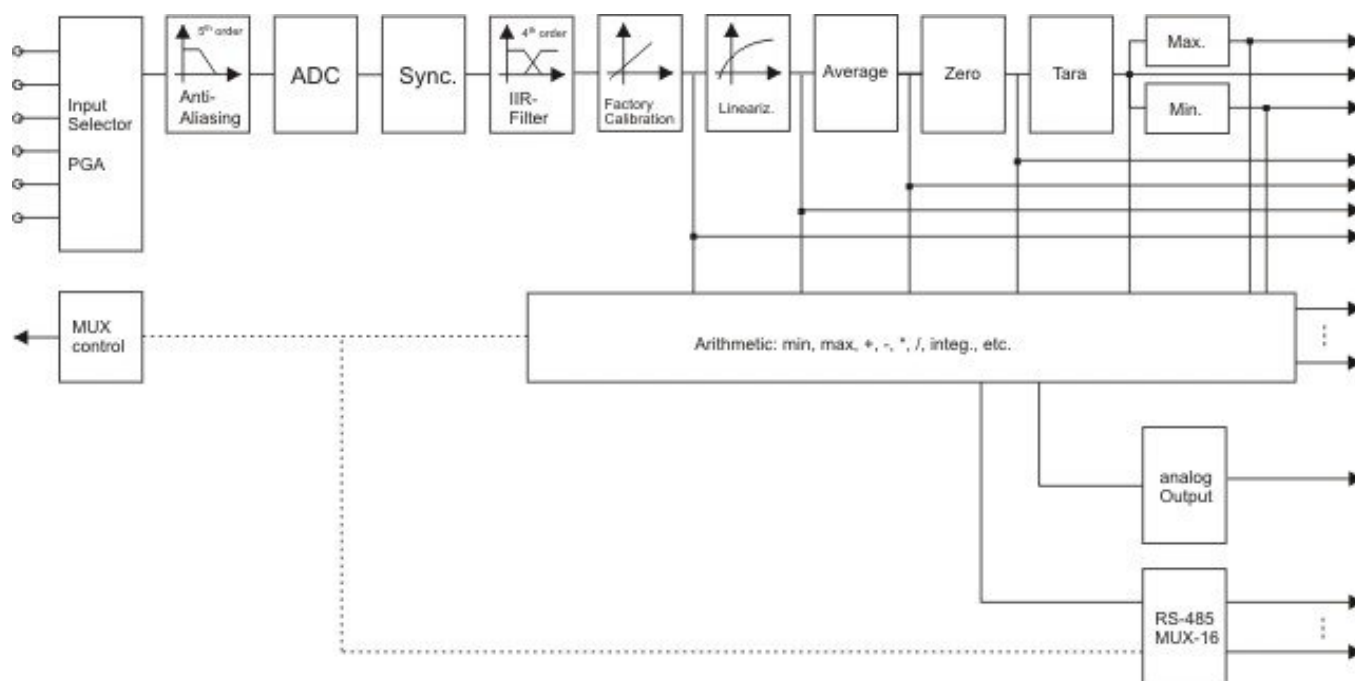
- **1 Analog input channel**
voltage, current, strain gage (full-, half-, and quarter-bridge configuration), IEPE
- **1 Analog output channel**
voltage (± 10 V) or current (0 - 20 mA), 100 kHz update rate
- **4 Digital inputs and 2 digital outputs**
status, trigger, tare, alarm, command
- **High-accuracy digitization**
19-bit SAR ADC (zero latency), 100 kHz sample rate
- **Signal conditioning**
linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- **3-Way galvanic isolation**
500 VDC channel to channel, channel to power supply, and bank



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Block diagram



Technical Data

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 h)
Isolation voltage	500 VDC channel to channel channel to power supply channel to bus ³

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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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	range ±100 mV	range ±1 V	range ±10 V
	> 10 MΩ	>10 MΩ	>1 MΩ
Long term drift at input range ± 1 V	<10 μV / 24 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		
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 kΩ			
Bridge excitation (nominal)	10.0 VDC	5.0 VDC	2.5 VDC	1.0 VDC
Allowable bridge resistance	>300 Ω	>100 Ω	>80 Ω	>50 Ω
Measurement range	±100 mV/V	±200 mV/V	±500 mV/V	±1000 mV/V
	±25 mV/V	±50 mV/V	±100 mV/V	±200 mV/V
	±2.5 mV/V	±5 mV/V	±10 mV/V	±20 mV/V
	±1 mV/V	±2.5 mV/V	±5 mV/V	±10 mV/V
Long term drift (range 2.5 mV/V)	<0.15 µV/V / 24 h			<1.5 µV/V / 8000 h
Temperature influence	offset drift (range 2.5 mV/V)		gain drift	
	<0.2 µV/V / 10 K		<0.05 % / 10 K	

Measurement Mode IEPE Sensor

Error	range	max. error	resolution
	±10 V	±10 mV	40 µV
Supply	constant current 4 mA		
Input frequency range	2 Hz to 10 kHz		
Temperature influence	offset drift (range 10 V)	gain drift	
	<10 µV / 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	IIR, low-pass, high-pass, band-pass, 4th order, 1 Hz to 10 kHz in steps of 1, 2, 5
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	< 1mV / 24 h	< 2,5 mV / 8000 h
Current output	0 to 20 mA	
Allowable load burden	< 400 Ω	
Burden influence	< 0.25 μA / Ω	
Accuracy at 100 Ω	±4 mA	
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)

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Communication Interface

Electrical standard	RS-485, 2-wire
Protocols	local bus: 115200 bps to 48 Mbps, Format 8e1, Modbus RTU, ASCII: 19200 bps to 115200 bps

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

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

Ordering Information

Article number	101620
Accessories	Terminal B4/120-A102, article number 894185
	Terminal B4/350-A102, article number 894286