

Q.raxx A106

Universal Measurement Module for Bridges

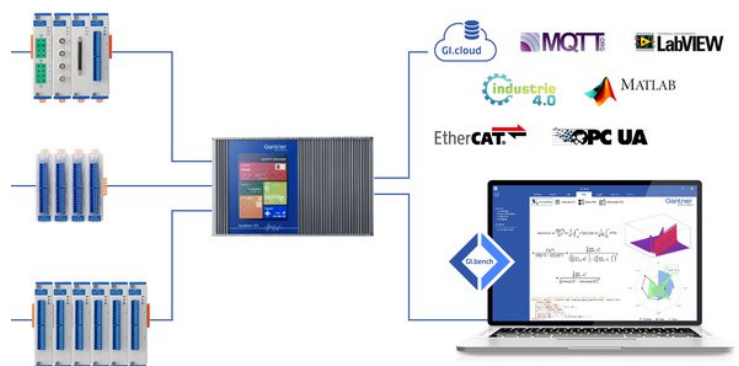
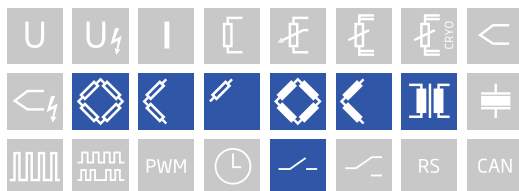
Q.raxx is the ideal 19" rackmount DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx DAQ systems can utilize an integrated, high-performance controller for communication, control, and data logging purposes. With a controller, multiple Q.raxx systems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

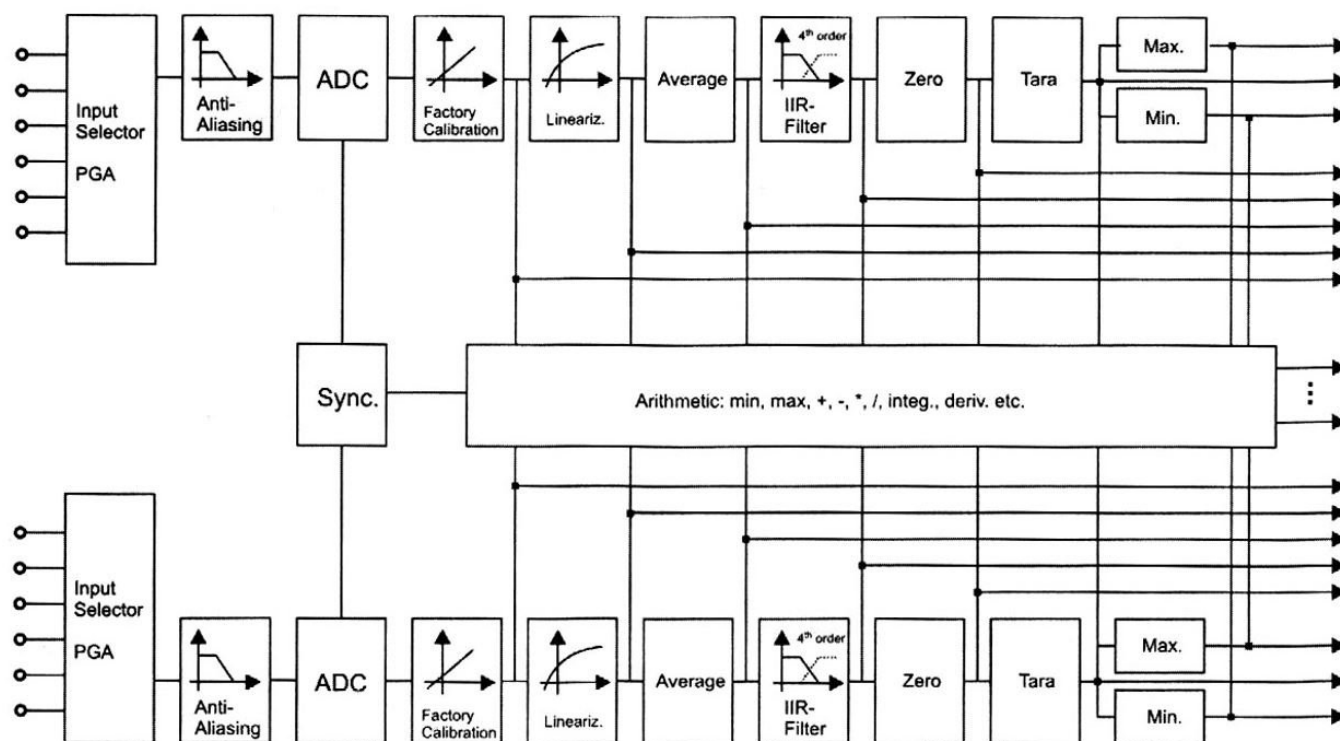
- **2 analog input channels**
strain gauge and inductive measuring bridges (full, half, quarter), LVDT, RVDT
- **DC and carrier frequency (CF) principle**
DC excitation, 600 Hz CF excitation, 4.8 kHz CF excitation for bridges
- **1 analog output per channel**
voltage ± 10 V, 10 kHz
- **Fast high accuracy digitalization**
24 bit ADC, 20 kHz conversion rate per channel
- **4 digital in or outputs**
input: state, tare, memory reset output: state alarm, threshold
- **Signal conditioning**
linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- **Galvanic isolation**
channel to channel, power supply and interface, isolation voltage 500 VDC



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Block diagram



Technical Data

Analog Input

Channels	2			
Accuracy	0.02 % typical			
	0.05 % in controlled environment ¹			
	0.1 % in industrial area ²			
Linearity error	0.02 % typical full-scale			
Repeatability	0.003 % typical (within 24 h)			
Input impedance	> 10 MΩ			
Isolation voltage	500 VDC channel to channel channel to power supply channel to bus ³			
Sensor type	DC mode	600 Hz carrier frequency mode	4.8 kHz carrier frequency mode	
	resistive half- and full-bridge (5/6 wire), quarter-bridge with completion terminal (3 wire)	resistive half- and full-bridge (5/6 wire), quarter-bridge with completion terminal (3 wire)	resistive half- and full-bridge (5/6 wire), inductive half- and full-bridge, LVDT and RVDT sensors	
Allowable sensor cable length	< 300 m	< 300 m	< 100 m ⁴	
Sensor connection	with or without sense leads for compensation of cable influences full-bridge 4 or 6 wire half-bridge 3 or 5 wire quarter-bridge 3 wire in combination with completion terminal 120 Ω or 350 Ω			
Shunt calibration	internal resistor 100 kΩ, Vexc+ - Vsig+			
Sensor excitation (selectable)	DC: 5 VDC	CF: 5 Veff	DC: 2.5 VDC	CF: 2.5 Veff
Allowable sensor resistance	> 300 Ω	> 300 Ω	> 100 Ω	> 100 Ω
Measurement range	±1.25 mV/V	±1.25 mV/V	±2.5 mV/V	±2.5 mV/V
	±2.5 mV/V	±2.5 mV/V	±5 mV/V	±5 mV/V
	±25 mV/V	±25 mV/V	±50 mV/V	±50 mV/V
	±50 mV/V	±50 mV/V	±100 mV/V	±100 mV/V
	±100 mV/V	±100 mV/V	±200 mV/V	±200 mV/V
	±200 mV/V	±200 mV/V	±400 mV/V	±400 mV/V
	±500 mV/V	±500 mV/V	±1000 mV/V	±1000 mV/V
Temperature influence offset drift (range 2.5 mV/V)	< 0.2 μV/V / 10 K	< 0.2 μV/V / 10 K	< 0.2 μV/V / 10 K	< 0.2 μV/V / 10 K
Temperature influence gain drift (measuring value)	< 0.05 % / 10 K	< 0.05 % / 10 K	< 0.05 % / 10 K	< 0.05 % / 10 K
Long term drift	< 0.2 μV/V / 24 h	< 0.1 μV/V / 24 h	< 0.2 μV/V / 24 h	< 0.1 μV/V / 24 h
	< 2 μV/V / 8000 h	< 1 μV/V / 8000 h	< 2 μV/V / 8000 h	< 1 μV/V / 8000 h
Signal-to-noise ratio	< 0.3 μV/V at 10 Hz		< 1 μV/V at 100 Hz	

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

⁴ low capacity sensor cable is strongly recommended, CF 4.8 kHz is possible with limitations only

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Analog/Digital-Conversion

Resolution	24-bit		
Update rate	20 kHz		
Modulation method	Sigma-Delta (group delay time 600 µs)		
Anti-aliasing filter	DC: 2 kHz, 4th order	600 Hz CF: 100 Hz, 4th order	4.8 kHz CF: 1 kHz, 4th 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

Channels	2 voltage Outputs	
Accuracy	0.02 %	
DAC resolution	16-bit	
Update rate	10 kHz	
Voltage output	±10 VDC	
Allowable load resistance	> 2 kΩ	
Temperature influence	offset drift	gain drift
	<1 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

Digital In-/Outputs

Channels	4 configurable I/Os	
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	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. 2.5 W
Input voltage influence	<0.001 %/V

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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	111318
Accessories	Terminal B4/120-A106, article number 894387
	Terminal B4/350-A106, article number 894488