

Q.raxx XL A106

Measurement Module for Strain Gage and LVDT/RVDT

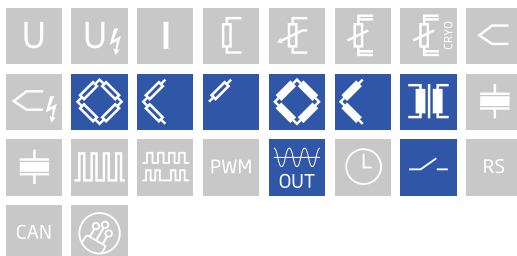
Q.raxx XL is a new addition to the Q.series product family - the ideal 19" rackmount DAQ solution for applications that require high channel density and custom sensor terminations. Q.raxx XL DAQ systems can utilize an integrated, high-performance controller for communication, control, and data logging purposes. With a controller, multiple Q.raxx XL 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
- Gantner's Quality Standard
integrated filtering, galvanic isolation & signal/sensor conditioning per channel

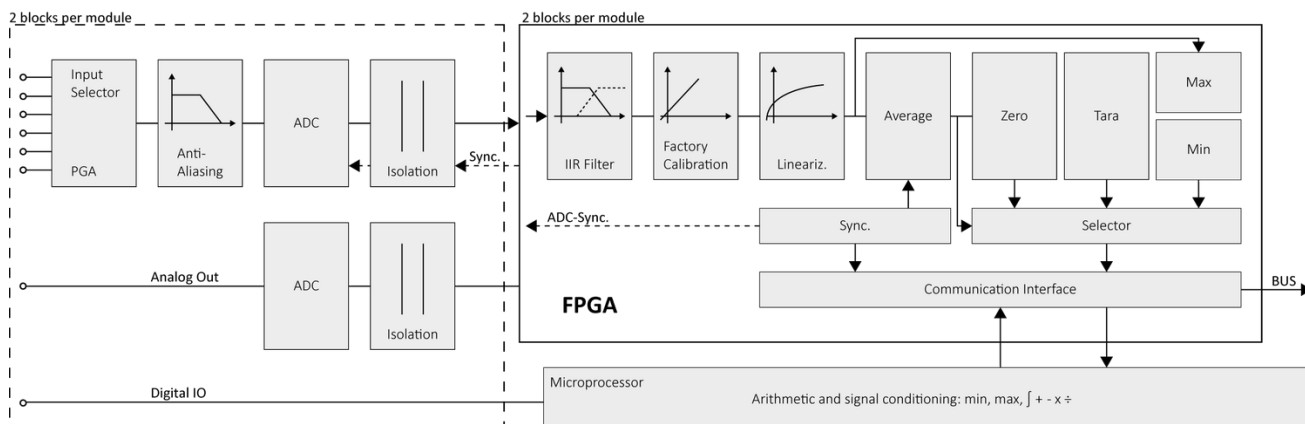


Key Features

- 2 galvanically isolated analog inputs channels
strain gage and inductive half and full bridges, LVDT, RVDT
quarter bridge with completion terminal
- DC and carrier frequency (CF) principle
2.5 and 5 VDC excitation, 2.5 and 5 VDCeff excitation carrier frequency,
600 Hz or 4.8 kHz configurable per channel
- 2 Analog output channels
 ± 10 VDC, 20 kHz update rate per channel
- High-accuracy digitization
24-bit ADC, 20 kHz sample rate per channel
- 4 digital I/Os
input: state, tare, memory reset, output: state, alarm, threshold
- 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



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	0.01 % typical (within 24 hrs)
Input impedance	>10 MΩ
Isolation voltage	500 VDC channel to 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, continuous up to 250 VDC

Analog-to-Digital Conversion

Resolution	24-bit
Sample rate	20 kHz per channel
Modulation method	sigma-delta
Anti-aliasing filter	2 kHz, 3th order (DC excitation) 1 kHz, 3th order (4.8 kHz CF excitation) 100 Hz, 3th order (600 Hz CF excitation)
Digital filters	Infinite impulse response (IIR), low-pass, high-pass, band-pass, band-stop, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 1 kHz in steps of 0.1 (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

Analog Output

Channels	2		
Accuracy	0.02 % typical		
Voltage output	±10 VDC		
Allowable load resistance	> 2 kΩ		
Long-term drift	<1 mV / 24 hrs	<2.5 mV / 8000 hrs	
Temperature drift	<1 mV / 10 K Offset drift	<0.05 % / 10 K Gain drift	
Noise voltage	<2 mV at 10 Hz	<10 mV at 1 kHz	

Digital Input & Output

Channels	4 configurable I/Os		
Mode(s) of operation	status		
Logic voltage	< 2 VDC (Low) >10 VDC (High)		
Input type	PNP (current sinking)		
Input voltage	30 VDC max.		
Output voltage	10 to 30 VDC (external supply required)		
Contact	open drain p-channel MOSFET		
Load capacity	30 VDC / 100 mA (ohmic load)		

Strain Gage Measurement

Bridge configuration(s)	resistive full-bridge (4/6-wire) resistive half-bridge (3/5-wire) resistive quarter-bridge 120 Ω or 350 Ω (3-wire, with bridge completion terminal)			
Allowable sensor cable length	< 300 m (DC and 600 Hz CF excitation) < 100 m ¹ (4.8 kHz CF excitation)			
Shunt resistor	100 kΩ internal resistor			
Bridge excitation	2.5 - 5 VDC 2.5 - 5 Veff (Carrier Frequency)			
Bridge excitation stability	< 0.01% / 24 hrs			
Bridge excitation drift	< 0.02% / 10 K			
	5 VDC	5 Veff (CF)	2.5 VDC	2.5 Veff (CF)
Allowable sensor resistance	> 300 Ω	> 300 Ω	> 100 Ω	> 100 Ω
Input 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
Long-term stability	< 0.2 μV/V / 24 hrs (DC excitation) < 0.1 μV/V / 24 hrs (CF excitation)		< 2 μV/V / 8000 hrs (DC excitation) < 1 μV/V / 8000 hrs (CF excitation)	
Temperature drift (range 2.5 mV/V)	< 0.2 μV/V / 10 K Offset drift		< 0.05 % / 10 K Gain drift	
Signal-to-noise ratio	< 0.3 μV/V at 10 Hz		< 1 μV/V at 100 Hz	

¹ low capacity sensor cable is strongly recommended

LVDT/RVDT Measurement

Sensor connection	4- / 6-wire	
Sensor excitation (selectable)	5 V_{eff}	2.5 V_{eff}
Allowable sensor resistance	> 300 Ω	> 100 Ω
Input range	±1.25 mV/V	±2.5 mV/V
	±2.5 mV/V	±5 mV/V
	±25 mV/V	±50 mV/V
	±50 mV/V	±100 mV/V
	±100 mV/V	±200 mV/V
	±200 mV/V	±400 mV/V
	±500 mV/V	±1000 mV/V
Allowable sensor cable length	< 100 m ¹	
Long-term stability	< 0.1 μV/V / 24 hrs	< 1 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
Signal-to-noise ratio	< 0.3 μV/V at 10 Hz	< 1 μV/V at 100 Hz

¹ low capacity sensor cable is strongly recommended

Digital-to-Analog Conversion

Resolution	16-bit
Update rate	20 kHz per channel
Settling time	3 μs

Communication Interface Localbus

Protocols	proprietary Localbus (115200 bps to 48 Mbps, latency < 100 ns) ASCII (19200 bps to 115200 bps) Modbus RTU
Data format	8E1
Electrical standard	ANSI/TIA/EIA-485-A, 2-wire

Power Supply

Input voltage	10 to 30 VDC, overvoltage and overcurrent protection
Power consumption	2.5 W (approx.)
Input voltage influence	< 0.001 % / V

Environmental Specifications

Electromagnetic compatibility (EMC)	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

Validity of all listed specifications are subject to a warm-up period of at least 45 minutes
Specifications subject to change without notice

Q.raxx XL A106

Measurement Module for Strain Gage and LVDT/RVDT

Mechanical information

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

Ordering Information

Article number	529226
Accessories	Terminal B4/120-A106, article number 894387
	Terminal B4/350-A106, article number 894488

Gantner Instruments

Austria | Germany | France | Sweden | India | USA | China | Singapore
Montafonerstraße 4 · A-6780 Schruns · T +43 55 56 · 77 463-0

office@gantner-instruments.com
www.gantner-instruments.com