

Q.bloxx XL A107

Universal Measurement Module

marmatek[®]
measurement technologies

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instruments

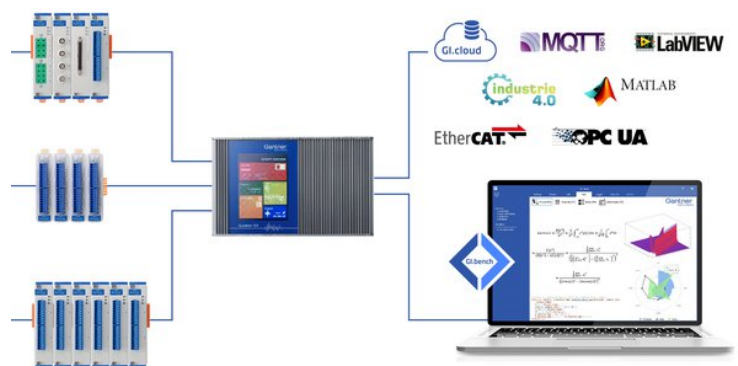
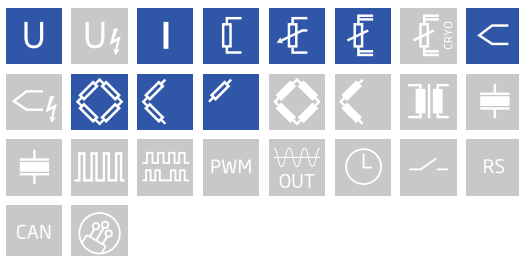
Q.bloxx XL is a new addition to the Q.series product family - the ideal DAQ solution for widely distributed installations that require higher performance and custom sensor terminations. Q.bloxx XL products are packaged in modular, DIN Rail mountable enclosures that easily snap together for system expansion. Flexibility in distribution allows for highly synchronized data that is less prone to noise due to shorter sensor cable runs to the subject.

- RS485 fieldbus interface up to 48 Mbps: LocalBus, up to 115.2 kbps: Modbus-RTU, ASCII
- Connectable to Controller Q.station X
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- Power supply 10 ... 30 VDC
- DIN rail mounting (EN60715)

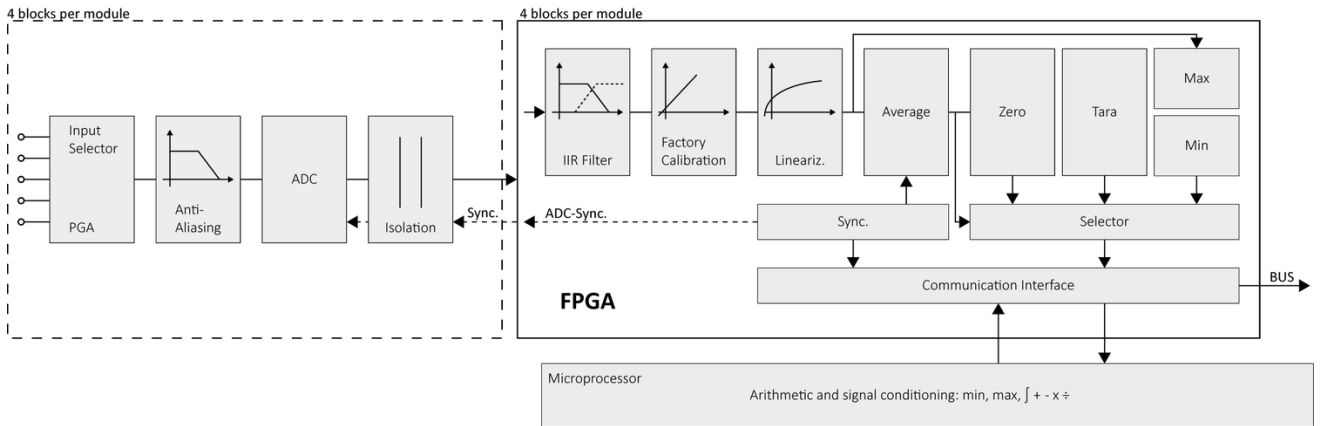


Key Features

- 4 Universal analog input channels
voltage, current, resistance, potentiometer, RTD (Pt100 / Pt1000), thermocouple, strain gage
- High-accuracy digitization
24-bit ADC, 20 kHz sample rate per channel
- 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
- Electromagnetic compatibility (EMC)
according to IEC 61000-4 and EN 55011



Block diagram



Technical Data

Analog Input

Channels	4
Accuracy	0.01 % typical 0.02 % 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

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

Voltage Measurement

Range and error	input range	margin of error	resolution
	±10 V	±2 mV	1.2 µV
	±1 V	±200 µV	120 nV
	±100 mV	±20 µV	12 nV
Long-term stability	input range	24 hrs	8000 hrs
	±10 V	<200 µV	<2000 µV
	±1 V	<20 µV	<200 µV
	±100 mV	<2 µV	<20 µV
Temperature drift	input range	offset drift	gain drift
	±10 V	<500 µV / 10 K	<0.01 % / 10 K
	±1 V	<50 µV / 10 K	<0.01 % / 10 K
	±100 mV	<5 µV / 10 K	<0.01 % / 10 K
Signal-to-noise ratio	>90 dB at 1 kHz	>120 dB at 1 Hz	
input impedance	> 100 MΩ		

Current Measurement

Input range	±25 mA (Internal shunt resistor 50 Ω)	
Margin of error	±5 µA	
Resolution	3 nA	
Long-term stability	<0.5 µA / 24 hrs	<5 µA / 8000 hrs
Temperature drift	<1 µA / 10 K offset drift	<0.03 % / 10 K gain drift

Potentiometer Measurement

Resistance range	1 kΩ to 10 kΩ	
Long-term stability	<0.02 % / 24 hrs	<0.2 % / 8000 hrs
Temperature drift	<0.0001 / 10 K offset drift	<0.03 % / 10 K gain drift

Resistance / RTD Measurement

Range and error	input range	margin of error	resolution
Resistance, 2-wire	100 kΩ	±100 Ω	12 mΩ
Resistance, 2-, 3- and 4-wire	4 kΩ	±1 Ω	0.5 mΩ
Resistance, 2-, 3- and 4-wire	400 Ω	±0.1 Ω	48 µΩ
Pt100, 2-, 3- and 4-wire	-200 to +850°C	±0.25°C	0.2 m°C
Pt1000, 2-, 3- and 4-wire	-200 to +850°C	±1°C	0.2 m°C
Sensor excitation	640 µA pulsed (< 4 kΩ) 15 µA pulsed (> 4 kΩ)		
Long-term stability	<10 mΩ / 24 hrs	<100 mΩ / 8000 hrs	
Temperature drift (range 400 Ω)	<10 mΩ / 10 K offset drift	<0.03 % / 10 K gain drift	

Thermocouple Measurement

Range and error	Type	range	margin of error with CJC ¹
	Type B	400°C to 1820°C	< ±1.5 °C
	Type E, J, K	-100 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
Input impedance	> 10 MΩ		
Long-term stability	<0.1°C / 24 hrs	<0.2°C / 8000 hrs	
Temperature drift	<0.2°C / 10 K offset drift	<0.025% / 10 K gain drift	
CJC uncertainty	<0.3°C		

¹ specifications are only valid with mains frequency rejection enabled

Strain Gage Measurement

Bridge configuration(s)	resistive full-bridge (4-wire) resistive half-bridge (3-wire, with bridge completion terminal) resistive quarter-bridge 120 Ω or 350 Ω (3-wire, with bridge completion terminal)	
Accuracy class	0.05	
Allowable bridge resistance	>100 Ω	
Bridge excitation (nominal)	2.5 VDC	
Input range	±2.5 mV/V ±50 mV/V ±500 mV/V	
Long-term stability (range 2.5 mV/V)	<0.12 μV/V / 24 hrs	<1.25 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

Analog to Digital Conversion

Resolution	24-bit	
Sample rate	20 kHz per channel (thermocouple 10 Hz)	
Modulation method	sigma-delta (group delay time 600 μs)	
Anti-aliasing filter	2 kHz, 3rd order	
Digital filters	Infinite impulse response (IIR), low-pass, high-pass, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 1 kHz (adjustable via software)	
Averaging	configurable or automatic according to the user-defined data rate	

Communications 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	

Input Power

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

Environmental Specifications

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

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Mechanical information

Material	Aluminium and ABS
Measurements (W x H x D)	30x 145 x 135mm
Weight	approx. 500 g

Ordering Information

Article number	495430
Accessories	Terminal B4/120-A107, article number 894589
	Terminal B4/350-A107, article number 894690
	Terminal CJC-A107, article number 893790

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