Q.bloxx XL A107

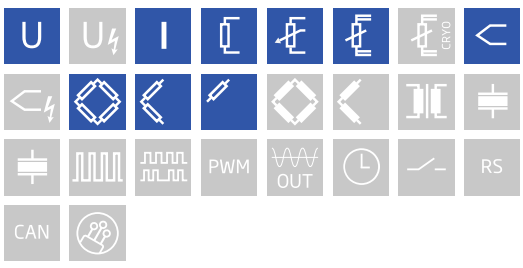
Universal Measurement Module

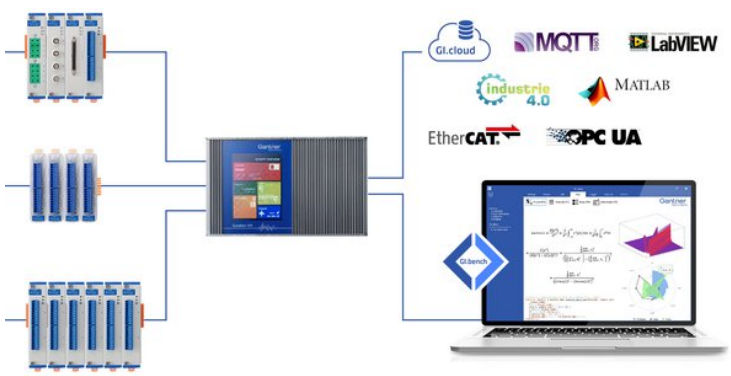
Q.bloxx XL is a new addition to the Q.series product family - the ideal DAQ solution for widely distributed installations that require higher performance and custom sensor terminations. Q.bloxx XL products are packaged in modular, DIN Rail mountable enclosures that easily snap together for system expansion. 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

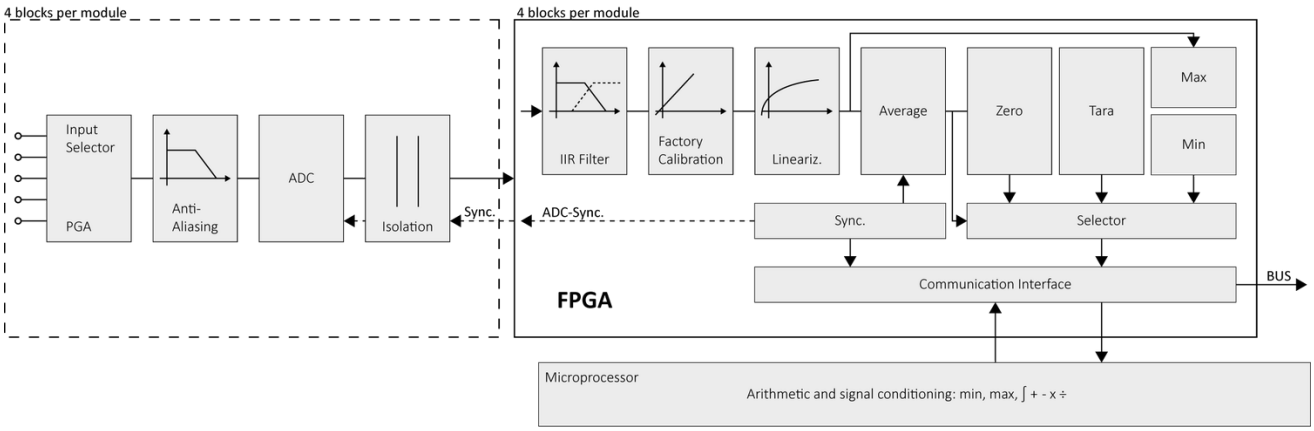




Q.bloxx XL A107

Universal Measurement Module

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		

Q.bloxx XL A107

Universal Measurement Module

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

Q.bloxx XL A107

Universal Measurement Module

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

Q.bloxx XL A107

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Mechanical information

Material	Aluminum 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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