Q.bloxx XL A107

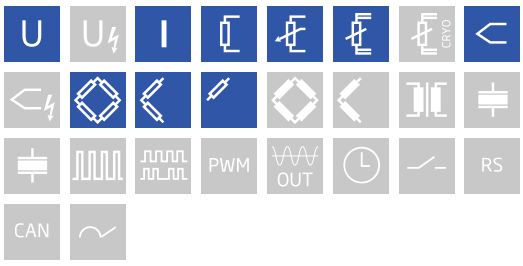
Universal Measurement Module

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**
  Channel to channel, channel to power supply, and channel to bus
- **Electromagnetic compatibility (EMC)**
  According to IEC 61000-4 and EN 55011



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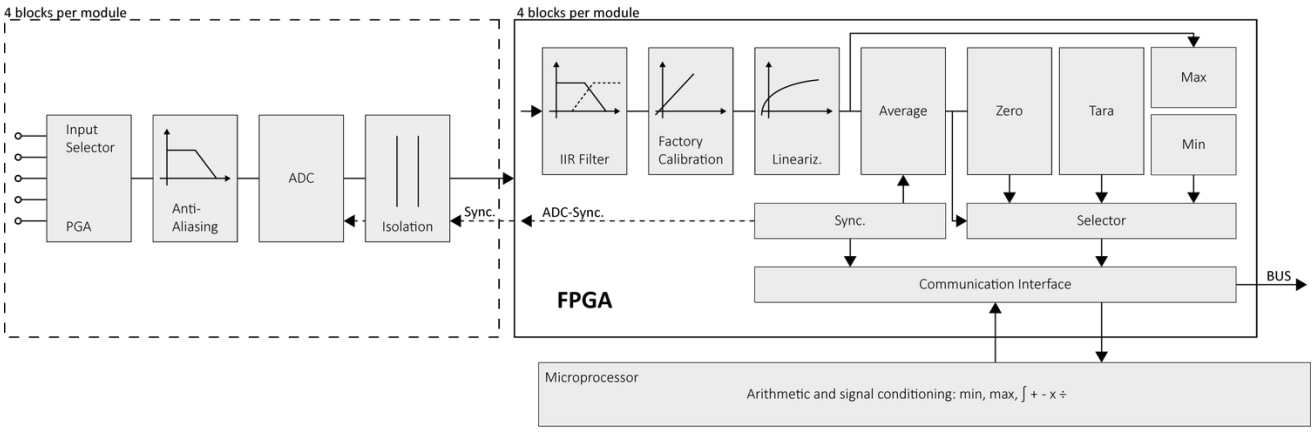
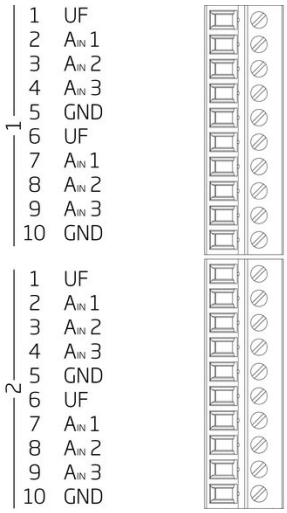
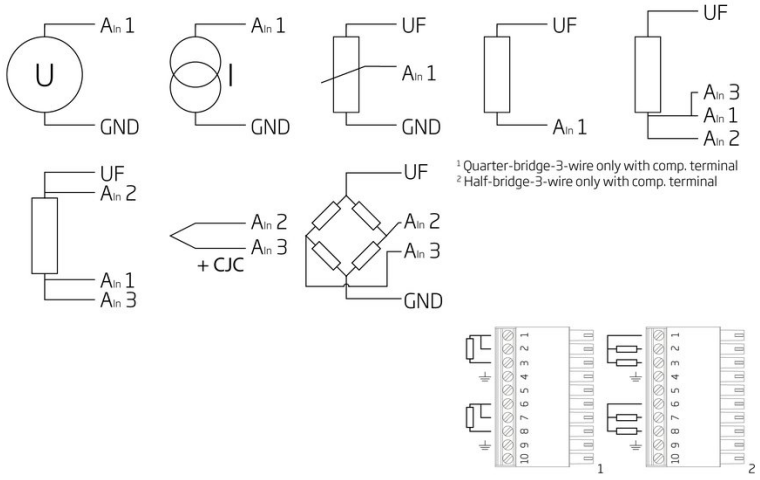
Block diagram



Technical Data

Terminal assignment 10pole screw





Analog Input

Channels	4
Isolation voltage	500 VDC channel to channel, to power supply, channel to bus[1]

[1] noise pulses up to 1000 VDC, continuous up to 250 VDC

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Measurement Mode Voltage

Range	±10 V	±1 V	±100 mV
max. Error	±2 mV	±200 µV	±20 µV
Resolution	1.2 µV	120 nV	12 nV

Input impedance	> 100 MΩ		
Temperature influence offset drift	< 500 µV / 10 K	< 50 µV / 10 K	< 5 µV / 10 K
Temperature influence gain drift	< 0.01 % / 10 K	< 0.01 % / 10 K	< 0.01 % / 10 K
Signal-to-noise ratio	> 90 dB at 1 kHz		
	> 120 dB at 1 Hz		
Long-term stability	< 200 µV / 24 h	< 20 µV / 24 h	< 2 µV / 24 h
	< 2000 µV / 8000 h	< 200 µV / 8000 h	< 20 µV / 8000 h
Overvoltage protection	±20 V (±30 V for 5 sec)		

Measurement Mode Current

Range	±25 mA
max. Error	±5 µA
Resolution	3.0 nA

Internal shunt resistor	50 Ω
Temperature influence offset drift	< 1 µA / 10 K
Temperature influence gain drift	< 0.03 % / 10 K
Long-term stability	< 0.5 µA / 24 h
	< 5 µA / 8000 h

Measurement Mode Potentiometer, Relative Measurement

Allowable potentiometer resistance	1 kΩ to 10 kΩ

Temperature influence offset drift	< 0.0001 / 10 K
Temperature influence gain drift	< 0.02 % / 10 K
Long-term stability	< 0.01 % / 24 h
	< 0.1 % / 8000 h

Measurement Mode Resistance / RTD

	resistance 2-Wire	resistance 2-Wire and 4-Wire		
Range	100 kΩ	10 kΩ	4 kΩ	400 Ω
Accuracy	±100 Ω	±10 Ω	±1 Ω	±0.1 Ω
Resolution	12 mΩ	1.2 mΩ	0.5 mΩ	48 µΩ

Temperature influence offset drift[2]	< 10 mΩ / 10 K
Temperature influence gain drift[2]	< 0.025 % / 10 K
Long-term stability	< 0.01 °C / 24 h
	< 0.1 °C / 8000 h

	resistance 2-Wire and 4-Wire	
Range	Pt100	Pt1000
Accuracy	±0.25 °C	±1 °C
Resolution	0.2 m°C	0.2 m°C

Temperature influence offset drift[2]	< 10 mΩ / 10 K
Temperature influence gain drift[2]	< 0.025 % / 10 K
Long-term stability	< 0.01 °C / 24 h
	< 0.1 °C / 8000 h

[1] The specifications are valid for 4-wire measurement
[2] only with range 400 Ω

Thermocouple Measurement

	Type	Range	Accuracy[1]	
	Type B	0 °C to 1820 °C	100 °C to 400 °C	< ±5.0 °C
			200 °C to 1820 °C	< ±2.5 °C
	Type E	-270 °C to 1000 °C	-250 °C to -100 °C	< ±2.5 °C
			-100 °C to 1000 °C	< ±1.0 °C
		-200 °C to 1000 °C	-200 °C to -100 °C	< ±1.5 °C
			-100 °C to 1000 °C	< ±0.8 °C
	Type J	-210 °C to 1200 °C	-210 °C to -100 °C	< ±1.5 °C
			-100 °C to -1200 °C	< ±0.8 °C
	Type K	-270 °C to 1372 °C	-250 °C to -100 °C	< ±2.0 °C
			-100 °C to 1372 °C	< ±1.0 °C
		-200 °C to 1200 °C	-200 °C to -100 °C	< ±1.5 °C
			-100 °C to 1200 °C	< ±0.8 °C
	Type L	-200 °C to 900 °C	-200 °C to 0 °C	< ±1.5 °C
			0 °C to 900 °C	< ±0.8 °C
	Type N	-270 °C to 1300 °C	-250 °C to -100 °C	< ±2.0 °C
			-100 °C to 1300 °C	< ±1.0 °C
		-200 °C to 1300 °C	-200 °C to -100 °C	< ±1.5 °C
			-100 °C to 1300 °C	< ±0.8 °C
	Type R	-50 °C to 1768 °C	-50 °C to 100 °C	< ±2.0 °C
			400 °C to 1768 °C	< ±1.5 °C
	Type S	-50 °C to 1768 °C	-50 °C to 400 °C	< ±2.0 °C
			400 °C to 1768 °C	< ±1.5 °C
	Type T	-270 °C to 400 °C	-250 °C to -100 °C	< ±2.0 °C
			-100 °C to 400 °C	< ±1.0 °C
		-200 °C to 400 °C	-200 °C to -100 °C	< ±1.5 °C
			-100 °C to 400 °C	< ±0.8 °C
	Type U	-200 °C to 600 °C	-200 °C to -100 °C	< ±2.0 °C
			-100 °C to 400 °C	< ±0.8 °C
Uncertainty CJC	< 0.3 °C			

Input impedance	> 10 MΩ
Temperature influence gain drift	< 0.02 % / 10 K
long-term stability	< 0.1 °C / 24 h
	< 0.2 °C / 8000 h

[1] The specifications are valid with activated mains suppression 50 Hz or 60 Hz

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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	0.1	
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
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

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

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

Are subject to a warm-up period of at least 45 minutes
In a controlled electromagnetic environment[1]
With configuration: Low-pass 10Hz[2]
Specifications subject to change without notice

1 according to IEC 61326-1:2020

2 unless otherwise stated

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Mechanical information

Material	Aluminium and ABS
Measurements (W x H x D)	30 x 145 x 135mm
Weight	approx. 500 g
Protection class	IP20

Data Standard - supported

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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