Q.bloxx XL A116

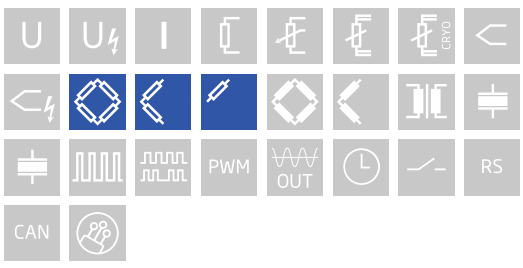
Strain Gage Measurement Module

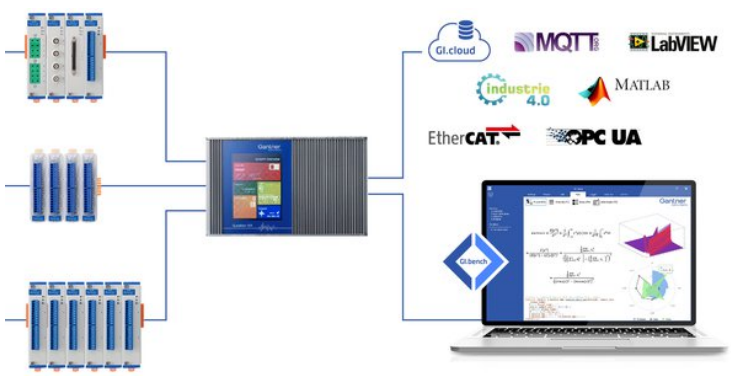
Q.bloxx XL is a new addition to the Q.series product family - the ideal DAQ solution for widely distributed installations that require higher performance and custom sensor terminations. Q.bloxx XL products are packaged in modular, DIN Rail mountable enclosures that easily snap together for system expansion.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

- **8 analog input channels for strain gages**
  full-, half-, and quarter-bridge configuration, configurable per channel
- **Selectable input ranges for optimal signal-to-noise ratio**
  2.5 or 10 mV/V for half- and full-bridge, 1 or 10 mV/V for quarter-bridge
- **High-accuracy digitization**
  24-bit ADC, 20 kHz sample rate per channel
- **Active lead wire resistance compensation**
  online compensation signal (OCS) for continuous compensation of lead wire resistance changes
- **Shunt calibration per channel**
- **Build-in shunt resistor**
  Shunt verification of the complete measurement chain.
- **Galvanic Isolation**
  channel to supply to interface





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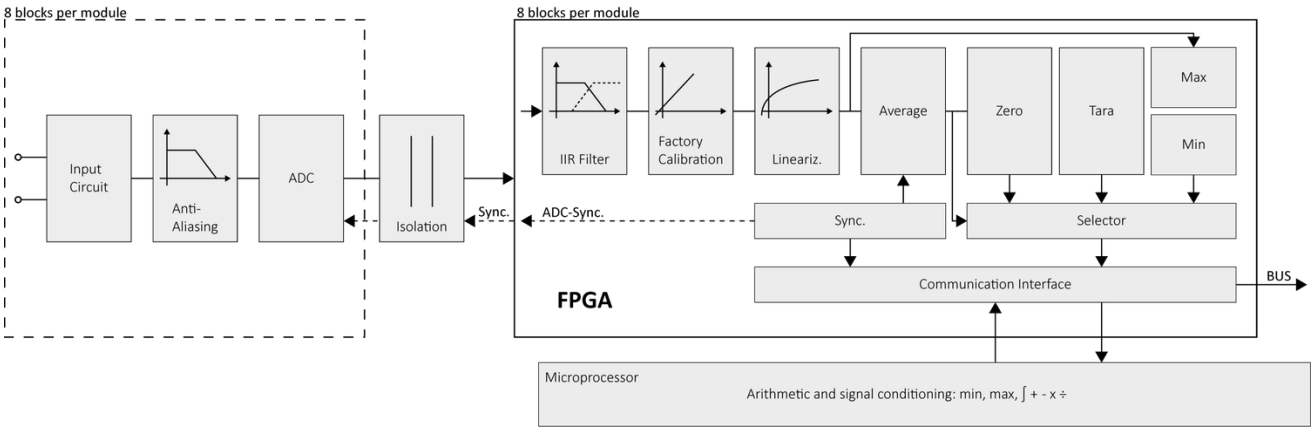
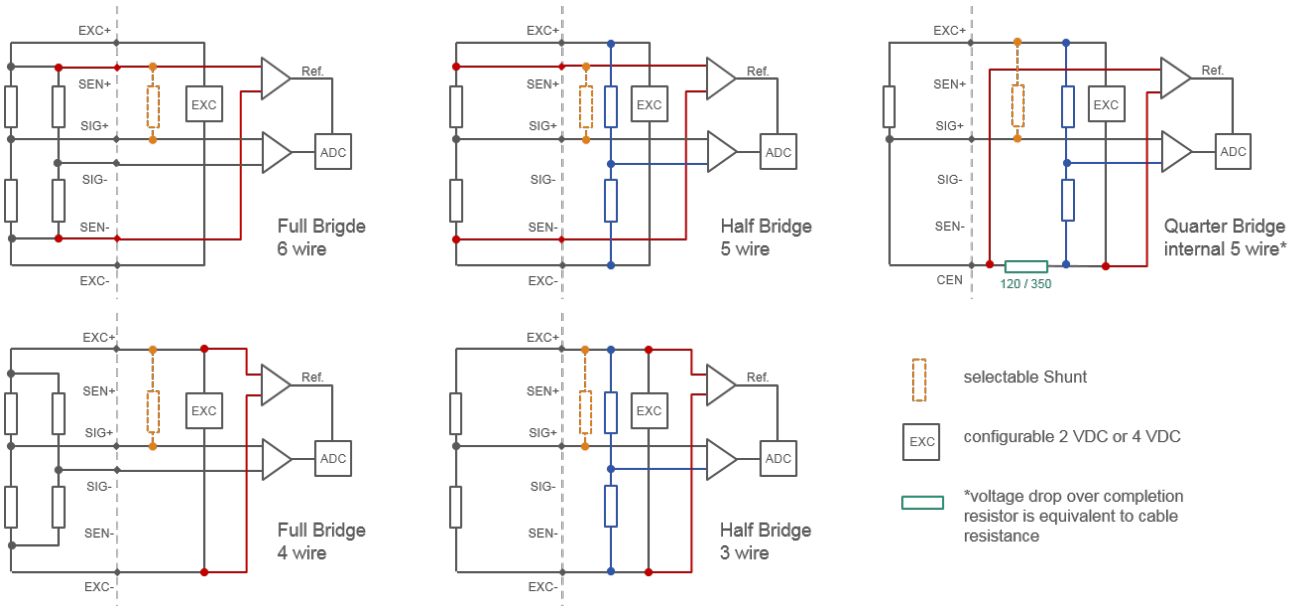
Block diagram



Technical Data

Strain Gage Wiring Diagram



Analog Input

Channels	8
Accuracy	0.02 % typical
	0.05 % in controlled environment [1]
	0.1 % in industrial area [2]
Linearity error	0.01 % typical (within 24 h)
Input impedance	> 10 MΩ
Isolation voltage	500 VDC channel to input voltage to interface[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

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Analog-to-Digital Conversion

Resolution	24-bit
Sample rate	20 kHz per channel
Modulation method	sigma-delta (group delay time 600 µs)
Anti-aliasing filter	1 kHz, 3rd order
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 2 kHz (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

Strain Gage Measurement

Bridge configuration(s)	resistance full-bridge (4/6-wire) resistance half-bridge (3/5-wire) resistance quarter-bridge (3-wire, with lead wire resistance compensation)	
Accuracy class	0.05	
Bridge completion resistor	selectable 120 Ω or 350 Ω per channel (others upon request)	
Temp. Coefficient of Resistance (TCR)	0.05 ppm/K	
Input range	full-bridge ±2.5 mV/V or ±10 mV/V half-bridge ±2.5 mV/V or ±10 mV/V quarter-bridge ±1 mV/V or ±10 mV/V (±2000 µm/m or ±20000 µm/m with k=2) selectable per channel	
Shunt resistor	100 kΩ internal resistor	
Bridge excitation	selectable 2 VDC or 4 VDC per channel	
Allowable sensor resistance	<200 Ω at 4 VDC <100 Ω at 2 VDC	
Maximum sensor cable length	full-bridge 300 m half-bridge 300 m quarter-bridge 100 m	
Long term stability	<0.2 µV/V / 24 hrs	<2 µV/V / 8000 hrs
Temperature drift	<0.5 µV/V / 10 K Offset drift	0.05 % / 10 K Gain drift
Noise	<0.3 µV/V (at 10 Hz)	
Linearity deviation	< 0.02 % f.s.	

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

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

Mechanical information

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

Ordering Information

Article number	495834
Accessories	Connection Terminal A116, article number 600725

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