

Q.bloxx XE A102

Universal Measurement Module with Analog Output

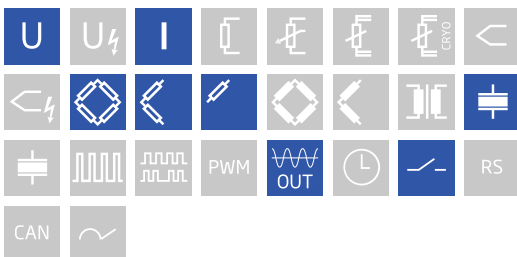
Q.bloxx XE is a new addition to the Q.series product family - the ideal EtherCAT DAQ solution for widely distributed installations that require higher performance and custom sensor terminations. Q.bloxx XE measurement modules possess integrated signal conditioning and arithmetic functions, packaged in modular, DIN Rail mountable enclosures that easily snap together for system expansion and are capable of measuring up to 100 kHz per channel with short cycle times and low jitter for accurate synchronization.

- RS-485, 2-wire, EtherCAT (LVDS)
- FoE (file access over EtherCAT, ETG.1000.5) and CoE (CAN over EtherCAT, ETG.50001.1)
- Configurable PDO mapping to optimize the data throughput
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- Power supply 10 ... 30 VDC and DIN rail mounting (EN60715)

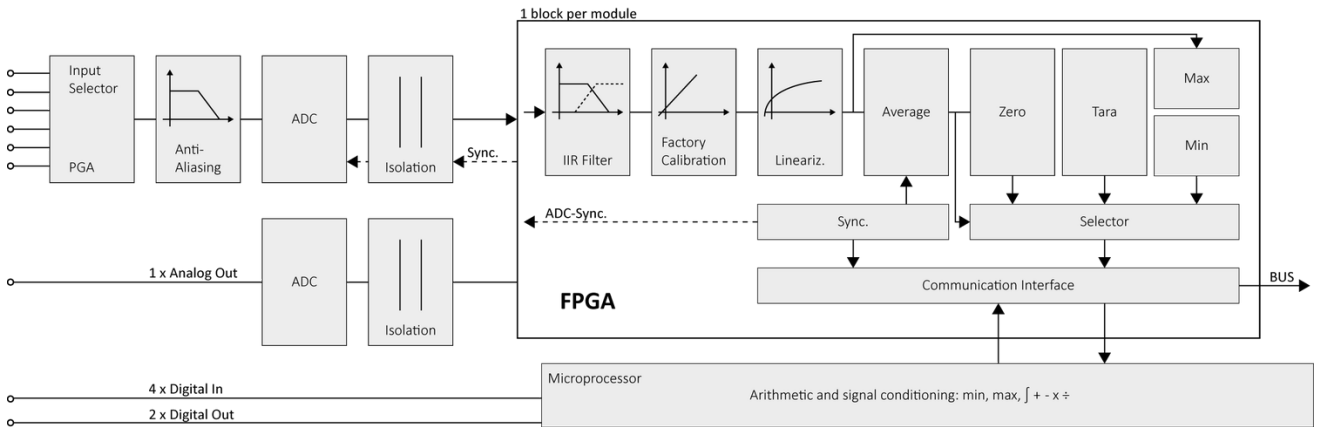


Key Features

- 1 Analog input channel
measuring half and full bridge, IEPE-sensor, voltage, current, quarter bridge with completion terminal
- 1 Analog output channel
voltage (± 10 V) or current (0 - 20 mA), 100 kHz update rate
- High-accuracy digitization
19-bit SAR ADC, 100 kHz sample rate
- 4 Digital inputs and 2 digital outputs
status, trigger, tare, alarm, command
- Signal conditioning
32 virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- 3-Way galvanic isolation
Channel to channel, channel to power supply, and bank

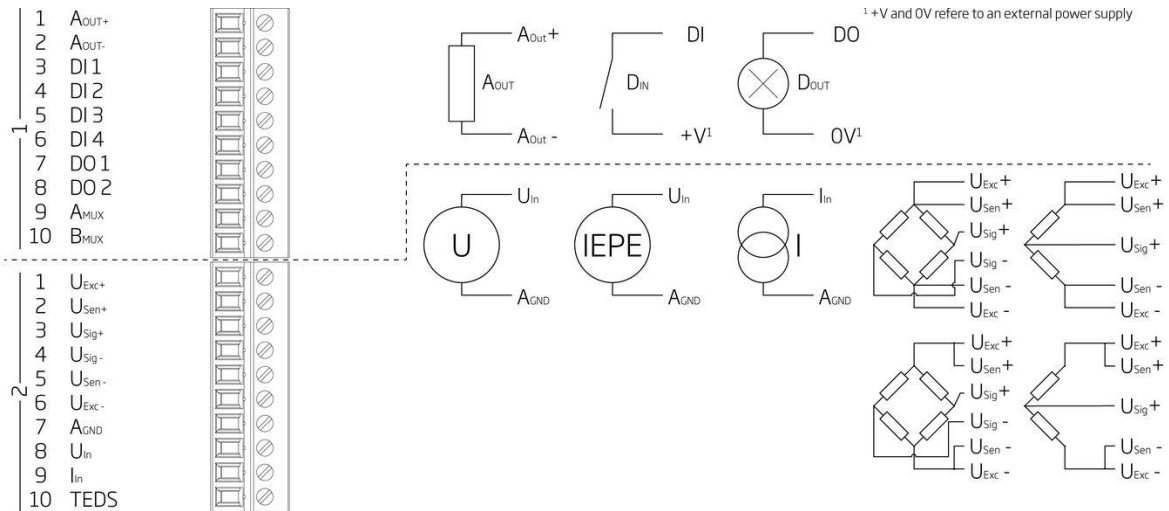


Block diagram



Technical Data

Terminal assignment 10pole screw



Analog Input

| | |
|-------------------|--|
| Channels | 1 |
| 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

Voltage Measurement

| | | | |
|--|------------------------------|------------------|------------|
| Error | Range | max. Error | Resolution |
| | ±10 V | ±2 mV | 40 µV |
| | ±1 V | ±200 µV | 4 µV |
| | ±100 mV | ±20 µV | 0.4 µV |
| Input impedance | > 10 MΩ (Range ±10 V = 1 MΩ) | | |
| Long-term drift at input range ± 1 V | <10 µV / 24 h | <100 µV / 8000 h | |
| Temperature influence at input range ± 1 V | Offset drift | Gain drift | |
| | <50 µV / 10 K | <0.02 % / 10 K | |
| Signal-to-noise ratio | >90 dB at 1 kHz | >120 dB at 1 Hz | |

Current Measurement

| | | | |
|--------------------------------------|----------------|----------------|------------|
| Error (Internal shunt resistor 50 Ω) | range | max. error | resolution |
| | ±25 mA | ±6 µA | 100 nA |
| Long-term drift | <0.5 µA / 24 h | <5 µA / 8000 h | |
| Temperature influence | Offset drift | Gain drift | |
| | <1 µA / 10 K | <0.02 % / 10 K | |

Measurement Mode Bridge

| | | | | |
|------------------------------------|---|-----------|----------------|------------|
| Bridge configuration(s) | half- and full-bridge, (5-/6-wire), quarter-bridge with completion terminal, (3-wire) | | | |
| Accuracy class | 0.05 | | | |
| Internal shunt resistor resistance | 100 kΩ | | | |
| Bridge excitation (nominal) | 10.0 VDC | 5.0 VDC | 2.5 VDC | 1.0 VDC |
| Allowable bridge resistance | >300 Ω | >100 Ω | >80 Ω | >50 Ω |
| Measurement range | ±100 mV/V | ±200 mV/V | ±500 mV/V | ±1000 mV/V |
| | ±25 mV/V | ±50 mV/V | ±100 mV/V | ±200 mV/V |
| | ±2.5 mV/V | ±5 mV/V | ±10 mV/V | ±20 mV/V |
| | ±1 mV/V | ±2.5 mV/V | ±5 mV/V | ±10 mV/V |
| Temperature influence | Offset drift (range 2.5 mV/V) | | Gain drift | |
| | <0.2 µV/V / 10 K | | <0.05 % / 10 K | |

Measurement Mode IEPE Sensor

| | | | |
|-----------------------|-----------------------|-----------------|------------|
| Error | Range | max. Error | Resolution |
| | ±10 V | ±10 mV | 40 µV |
| Supply | constant current 4 mA | | |
| Input frequency | 2 Hz | | |
| Limit frequency | 10 kHz | | |
| Temperature influence | Offset drift | Gain drift | |
| | <10 µV / 10 K | <0.025 % / 10 K | |

Analog to Digital Conversion

| | |
|----------------------|---|
| Resolution | 19-bit |
| Update rate | 100 kHz |
| Modulation method | SAR (successive approximation) |
| Anti-aliasing filter | 20 kHz, 3rd order |
| Digital filters | Infinite impulse response (IIR), low-pass, high-pass, band-pass, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 10 kHz (adjustable via software) |
| Averaging | configurable or automatic according to the user-defined data rate |

Analog Output

| | | |
|---------------------------|----------------------------------|------------------|
| Accuracy | 0.02 % | |
| Output type | configurable: voltage or current | |
| DAC resolution | 16-bit | |
| Update rate | 100 kHz | |
| Voltage output | ±10 VDC | |
| Allowable load resistance | >2 kΩ | |
| Temperature influence | Offset drift | Gain drift |
| | <2 mV / 10 K | <0.05 % / 10 K |
| Noise voltage | <10 mV at 1 kHz | <2 mV / 10 Hz |
| Long-term drift | <1mV / 24 h | <2,5 mV / 8000 h |
| Current output | 0 to 20 mA | |
| Allowable load burden | <400 Ω | |
| Burden influence | Accuracy at 100 Ω | Gain drift |
| | ±4 μA | <0.25 μA / Ω |
| Temperature influence | Offset drift | Gain drift |
| | 4 μA / 10 K | 0.05 % / 10 K |
| Noise current | <20 μA at 1 kHz | <4 μA / 10 Hz |
| Long-term drift | <2 μA / 24 h | <5 μA / 8000 h |

Digital In- / Outputs

| | |
|-------------------------------|------------------------------|
| Channels | 4 inputs, 2 outputs |
| Response time | 0.2 ms |
| Input | status, tare, reset |
| Input voltage / input current | max. 30 VDC / max. 0.5 mA |
| Lower / upper threshold | <2.0 V (low) / >10 V (high) |
| Output | status, alarm |
| Contact | open drain p-channel MOSFET |
| Load capacity | 30 VDC / 100 mA (ohmic load) |

Communication Interface EtherCAT

| | |
|---------------------|-----------------|
| Electrical standard | RS-485, 2-wire |
| Protocols | EtherCAT (LVDS) |

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Universal Measurement Module with Analog Output

Power Supply

| | |
|-------------------------|--|
| Input voltage | 10 to 30 VDC, overvoltage and overcurrent protection |
| Power consumption | approx. 2 W |
| Input voltage influence | <0.001 %/V |

Environmental

| | |
|-----------------------|-------------------------------------|
| 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 environment¹

With configuration: Low-pass 10Hz²

Specifications subject to change without notice

¹ according to EN 61326 2006: appendix B

² according to EN 61326 2006: appendix A

Mechanical information

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

Ordering Information

| | |
|----------------|---|
| Article number | 506625 |
| Accessories | Terminal B4/120-A102, article number 894185 |
| | Terminal B4/350-A102, article number 894286 |

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