

Q.bloxx A102

Universal Measurement Module with Analog Output

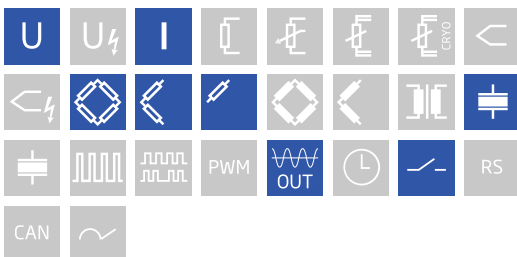
Q.bloxx is the ideal DAQ solution for widely distributed installations, electrical panels, and environmental enclosures. Q.bloxx measurement modules provide integrated signal conditioning and arithmetic functions, packaged in modular, DIN Rail mountable enclosures that easily snap together for quick system expansion. Flexibility in distribution allows for highly synchronized data that is less prone to noise due to shorter sensor cable runs to the actual point of measurement.

- RS 485 fieldbus interface up to 24 Mbps: LocalBus up to 115.2 kbps: Modbus-RTU, ASCII
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- Connectable to any Controller, e.g. Q.station, Q.gate or Q.pac
- Power supply 10 ... 30 VDC
- DIN rail mounting (EN60715)

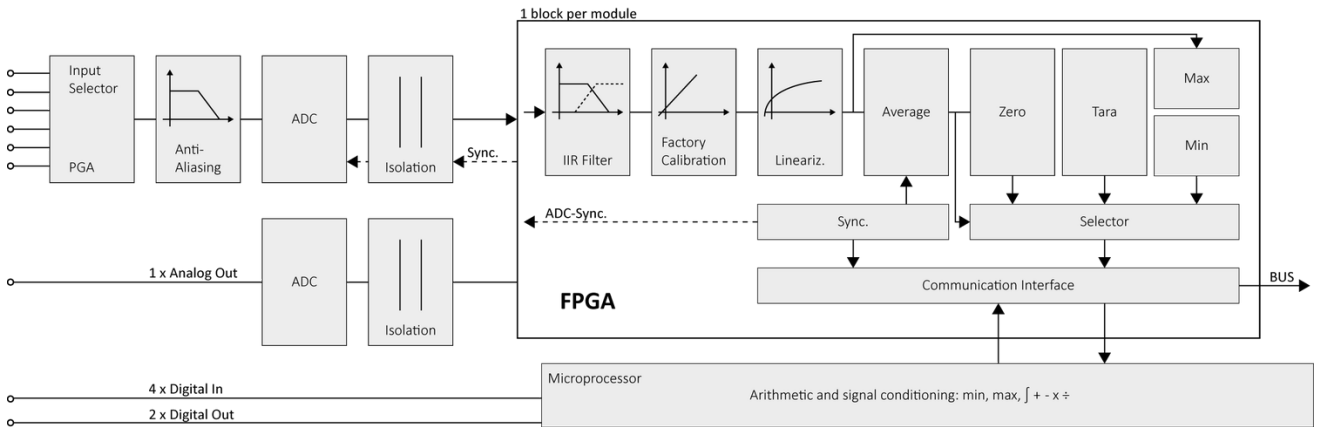


Key Features

- **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

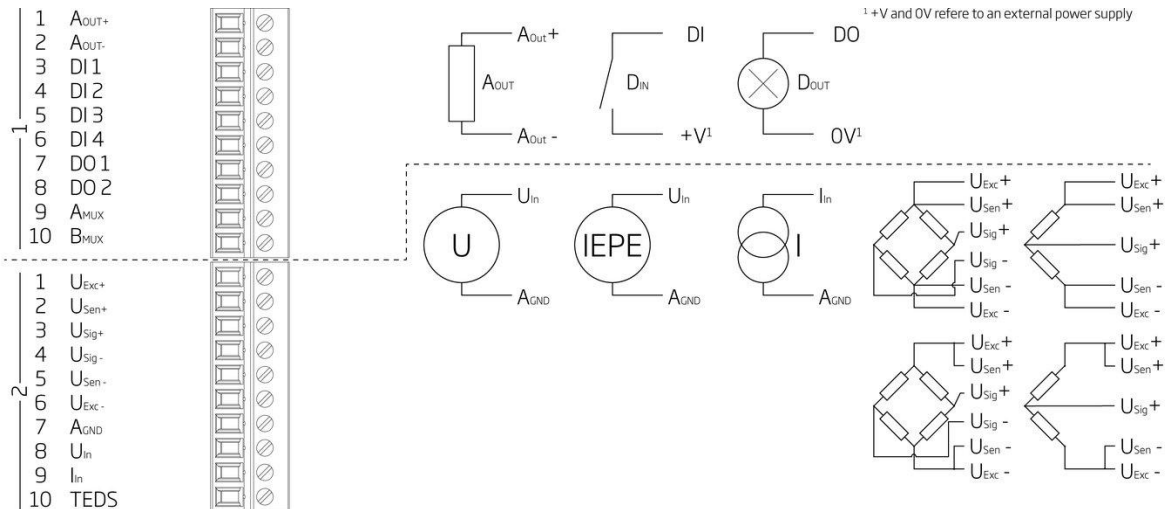


Block diagram



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) |

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Communication Interface

| | |
|---------------------|--|
| Protocols | proprietary Localbus (115200 bps to 24 Mbps, latency <100 ns) ASCII (19200 bps to 115200 bps) Modbus RTU Profibus-DP (19200 bps to 12 Mbps) (special Firmware required) |
| 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 | 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) | 27 x 120 x 105 mm |
| Weight | approx. 200 g |

Ordering Information

| | |
|----------------|---|
| Article number | 762179 |
| Accessories | Terminal B4/120-A102, article number 894185 |
| | Terminal B4/350-A102, article number 894286 |

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