Q.bloxx A102

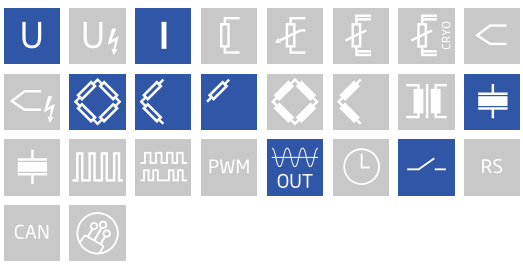
Universal Measurement Module with Analog Output

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
- Connectable to any Controller, e.g. Q.station, Q.gate or Q.pac
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- 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 to 20 mA), 100 kHz update rate
- **High-accuracy digitization**
  19-bit SAR ADC (zero latency), 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
- **Additional RS 485 fieldbus interface**
  to control an 8 or 16 or 24 channel multiplexer for multi channel systems, 10Hz per channel
- **3-Way galvanic isolation**
  500 VDC channel to channel, channel to power supply, and bank



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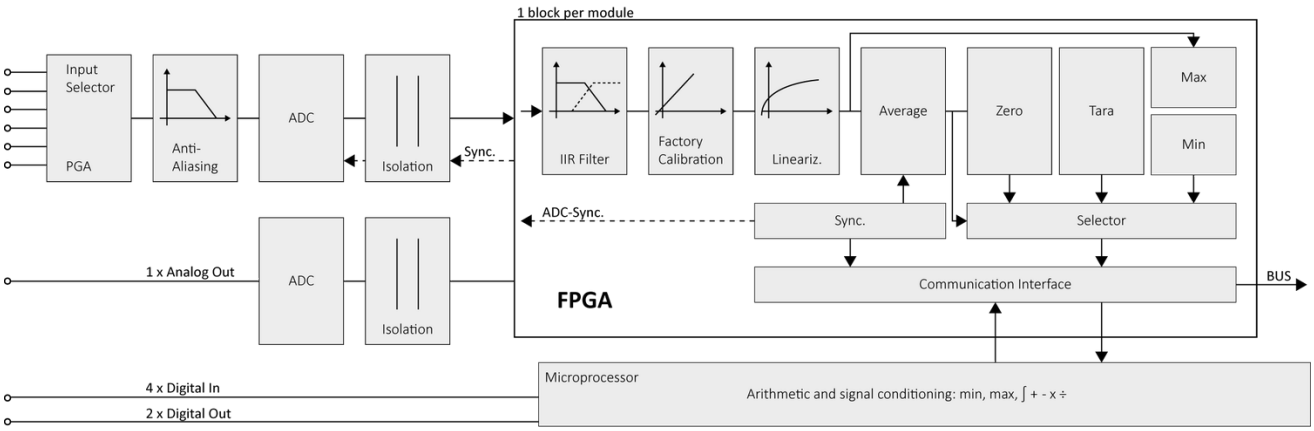
Block diagram



Technical Data

Analog Input

Channels	1
Accuracy	0.01 % typical
	0.025 % in controlled environment[1]
	0.05 % in industrial area[2]
Linearity error	0.01 % typical full-scale
Repeatability	0.003 % typical (within 24 h)
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

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	±20mV/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

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

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Enviromental

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

Warm-up time	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)	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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