Q.bloxx XE A105 CR

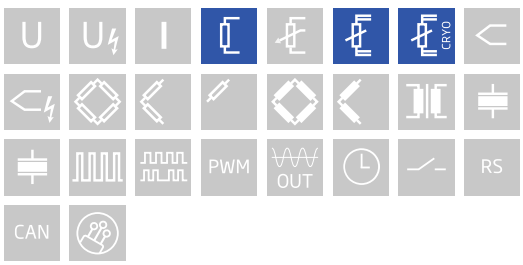
Measurement Module for Cryogenic Temperature (RTD) and Resistance

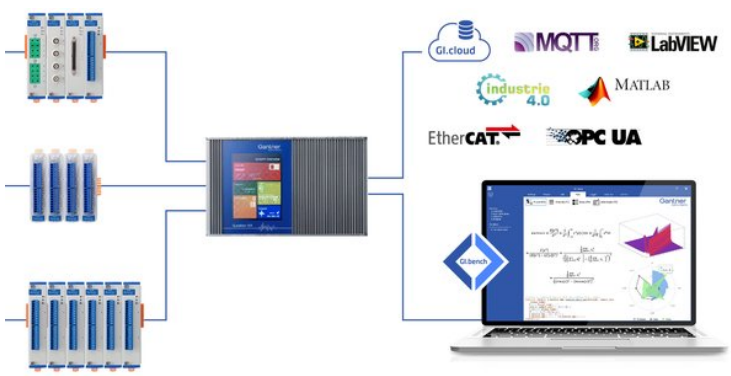
Q.bloxx XE is a new addition to the Q.series product family - the ideal EtherCAT DAQ solution for widely distributed installations that require higher performance and custom sensor terminations. Q.bloxx XE measurement modules possess integrated signal conditioning and arithmetic functions, packaged in 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

- **4 analog input channels**
  RTD sensors, resistance 6500 Ω and 20000 Ω, 2-, 3- or 4-wire
- **Low excitation current**
  7.5 µA effective, to minimize sensor self-heating errors
- **Individual linearization of the sensor characteristics**
  Sensor specific linearization by using 32 nodes and archive in a sensor data file. Import of manufacturers calibration data
- **High-accuracy digitalization**
  24-bit ADC, 10 Hz sample rate per channel
- **Signal conditioning**
  linearization, filtering, average, scaling, min/max storage, RMS, arithmetic, alarm
- **3-Way galvanic isolation**
  500 VDC channel to channel, channel to power supply, and channel to bus





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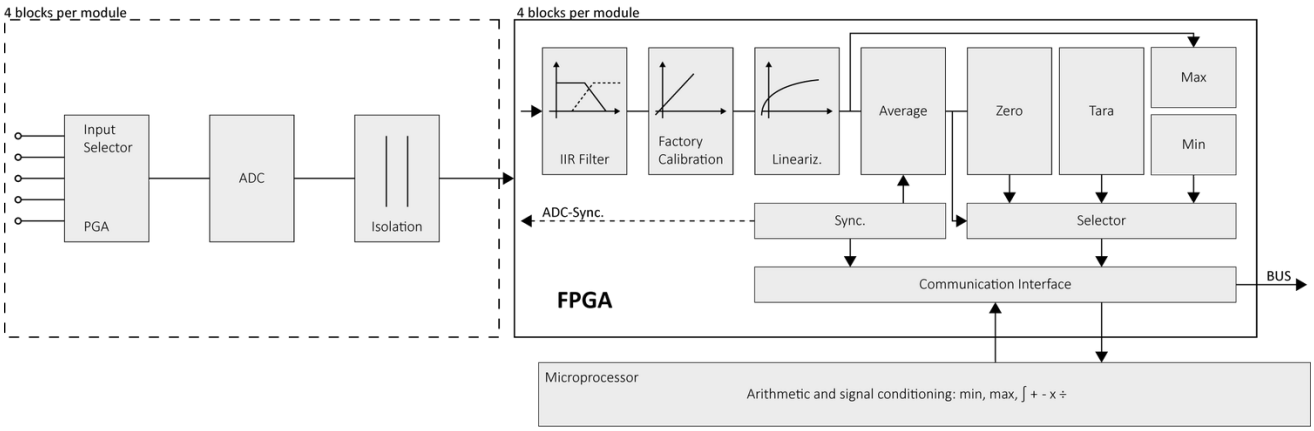
Block diagram



Technical Data

Analog Input

Channels	4
Accuracy	0.01 % typical
	0.02 % 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]
Sensor excitation	15 µA max. 7.5 µA effective

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

Measurement Mode Resistance (6500 Ω)

Accuracy (4-wire)	0.65 Ω
Resolution	0.01 Ω
Temperature drift	0.5 Ω /10 K
Long-term stability	0.3 Ω / 24 h | 1 Ω / 8000 h

Measurement Mode Resistance (20000 Ω)

Accuracy (4-wire)	2 Ω
Resolution	0.03 Ω
Temperature drift	2 Ω/10 K
Long-term stability	1 Ω / 24 h | 3 Ω / 8000 h

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Example Cernox CX1050

Range	0 Ω to 6500 Ω	0 Ω to 20000 Ω
Error at 293 K (approx.. 70Ω)	1 % of measurement value	3 % of measurement value
Error at 100 K (approx.. 150Ω)	0.5 % of measurement value	1.5 % of measurement value
Error at 5 K (approx.. 3500Ω)	0.02 % of measurement value	0.05 % of measurement value
Error at 2 K (approx.. 10000Ω)	-	0.02 % of measurement value

Example TVO CCS A1

Range	0 Ω to 6500 Ω	0 Ω to 20000 Ω
Error at 293 K (approx.. 850Ω)	0.075 % of measurement value	0.25 % of measurement value
Error at 100 K (approx.. 1160Ω)	0.06 % of measurement value	0.2 % of measurement value
Error at 5 K (approx.. 3900Ω)	0.02 % of measurement value	0.06 % of measurement value
Error at 2 K (approx.. 11000Ω)	-	0.02 % of measurement value

Analog to Digital-Conversion

Resolution	24-bit
Update rate	10 kHz, reduced by averaging to 10 Hz
Modulation method	Sigma-Delta
Anti-aliasing filter	500 Hz, 3rd order
Digital filters	Infinite impulse response (IIR), low-pass, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 10 Hz (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

Power Supply

Input voltage	10 to 30 VDC, overvoltage and overcurrent protection
Power consumption	approx. 2.5 W
Input voltage influence	<0.001 % / V

Communication Interface EtherCAT

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

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

Mechanical information

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

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Measurement Module for Cryogenic Temperature (RTD) and Resistance

Ordering Information

Article number	615020

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