Q.bloxx EC A121

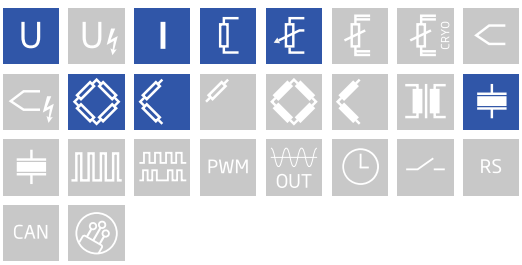
High Isolation Multi-Purpose Module

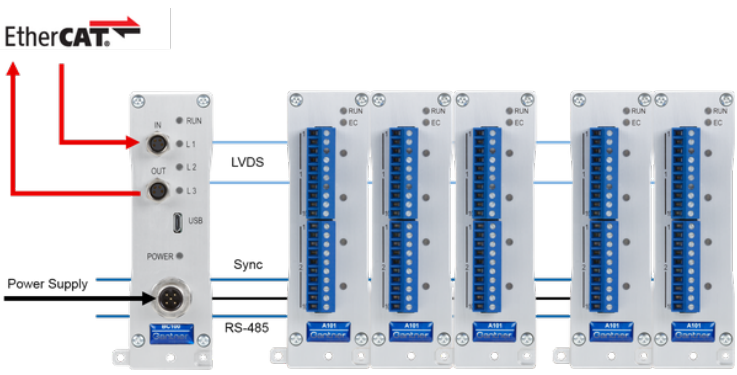
The Q.bloxx EC brings the high precision and performance of Q.bloxx to EtherCAT-based applications. Q.bloxx EC measurement modules possess integrated signal conditioning and arithmetic functions, packaged in environmentally secure (up to IP65), DIN Rail mountable enclosures that easily snap together for system expansion. With measurement speeds of up to 100 kHz per channel, short cycle times, and low jitter for accurate synchronization, Q.bloxx EC is the ideal solution for EtherCAT applications.

- CoE (CAN over EtherCAT) according to Modular Device Profil ETG.5001.1
- XFC technology for oversampling, oscilloscope function, cycle times 1 ms up to 0.1 ms, oversampling ≤100
- Configurable PDO Mapping to optimize the data throughput
- Module Configuration via SDO or FoE and alternative via configuration software
- Modular design for DIN Rail Mounting

Key Features

- **2 high galvanic isolated input channels**
  voltage, current, Pt100, potentiometer, full- and half bridges, IEPE, isolation voltage 1200 VDC permanent
- **Signal conditioning**
  linearization, digital filter, average, scaling, min/max storage, arithmetic, alarm
- **Fast high accuracy digitalization**
  24 bit ADC, 100 kHz sample rate each channel
- **Galvanic isolation**
  channel to channel to power supply and to interface
  isolation voltage 1200 VDC / 848 VACrms
  test voltage 5 kVDC over 1 minute
- **Categories**
  1000 V CAT II and 600 V CAT III





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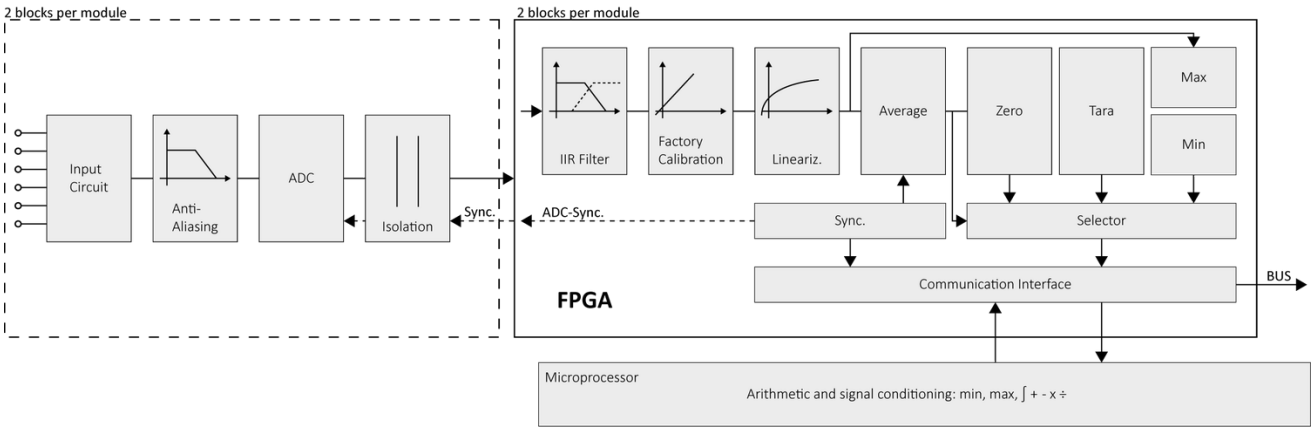
Block diagram



Technical Data

Analog Inputs

Channels	2
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	1200 VDC continuous, channel to channel to power supply channel to bus

[1] according to EN 61326 2006: appendix B
[2] according to EN 61326 2006: appendix A

Measurement Mode Voltage

Error	range	max. error	resolution
	±10 V	±2 mV	1.2 µV
	±1 V	±0,2 mV	120 nV
	±100 mV	±20 µV	12 nV
Input impedance	>10 MΩ		
Long-term drift	< 20 µV / 24 h	< 200 µV / 8000 h	
Temperature influence	Offset drift	Gain drift	
	<50 µV / 10 K	<0.02 % / 10 K	
Signal-to-noise ratio	>100 dB at 100 Hz		

Measurement Mode Current

Error Internal shunt resistor 50 Ω	range	max. error	resolution
	±25 mA	±5 µA	3.0 nA
Long-term drift	<0.5 µA / 24 h	<5 µA / 8000 h	
Temperature influence	Offset drift	Gain drift	
	<1 µA / 10 K	<0.025 % / 10 K	

Measurement Mode Resistance / RTD

Error	range	max. error	resolution
Resistance, 2-wire	100 kΩ	±100 Ω	12 mΩ
Resistance, 2- and 4-wire	4 kΩ	±1 Ω	0.5 mΩ
Resistance, 2- and 4-wire	400 Ω	±0.1 Ω	48 µΩ
Pt100, 2- and 4-wire	-200 to +850°C	±0.25°C	0.2 m°C
Pt1000, 2- and 4-wire	-200 to +850°C	±1°C	0.2 m°C
Long-term drift	<0.01°C / 24 h	<0.1°C / 8000 h	
Temperature influence	Offset drift (range 400 Ω)	Gain drift	
	<10 mΩ / 10 K	<0.025 % / 10 K	

Measurement Mode Potentiometer

Allowable potentiometer resistance	1 kΩ to 10 kΩ	
Long-term drift	<0.01 % / 24 h	<0.1 % / 8000 h
Temperature influence	Offset drift	Gain drift
	<0.0001 / 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	
Bridge resistance	>100 Ω	
Bridge excitation	2.5 VDC, nominal	
Measurement range	±2.5 mV/V, ±5 mV/V, ±10 mV/V, ±25 mV/V, ±500 mV/V	
Long-term drift	<0.12 µV/V / 24 h	<1.2 µV/V / 8000 h
Temperature influence	Offset drift	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	1.2 µV
	±1 V	±1 mV	120 nV
Supply	constant current 4 mA		
Input frequency range	0.5 Hz to 10 kHz		
Temperature influence	Offset drift (range 10 V)	Gain drift	
	<10 µV / 10 K	<0.025 % / 10 K	

Analog/Digital Conversation

Resolution	24-bit
Update rate	100 kHz (measurement thermocouple 8 Hz)
Modulation method	Sigma-Delta
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 selected data rate

Communication Interface EtherCAT

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

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
Pollution degree	1

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

High Voltage Warnings

- Attention High voltage device, Danger for life and health in case of non regular use.
- Only special and sufficient educated persons are permitted to handle this device only.
- all metal housing parts must be safely and continuous connected to protected earth (PE)
- Only contact protection plugs and cables may be used. All parts must be approved for voltages up to 1200 VDC.
- During installation, the whole system must be without voltage and safely be disconnected from the mains.
- All relevant safety regulations must be considered.

Base is the european standard EN61010-1

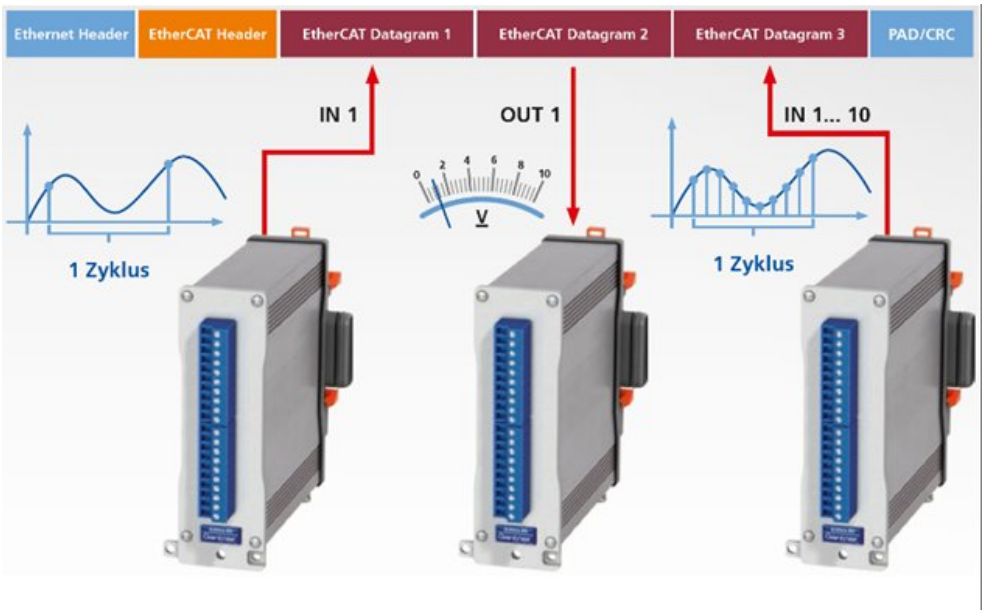
Mechanical information

Material	Aluminum and ABS
Measurements (W x H x D)	35.6 x 118.8 x 124 mm
Weight	approx. 400 g

Oversampling

EtherCAT also enables transmitting of very high data rates at low bus cycle by over sampling. In this case, a higher number of values of one channel per PDO transmitted so as to reduce protocol overhead.

Example: bus cycle 1 kHz, 100 times over sampling
=> 100 values are transferred per bus cycle
=> effective sample rate 100 kHz



Ordering Information

Article number	473224

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