Q.bloxx EC A104 TCK

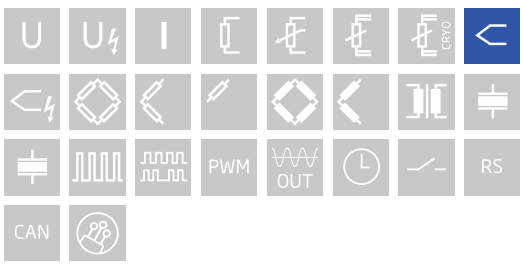
Thermocouple and Low Voltage Measurement Module

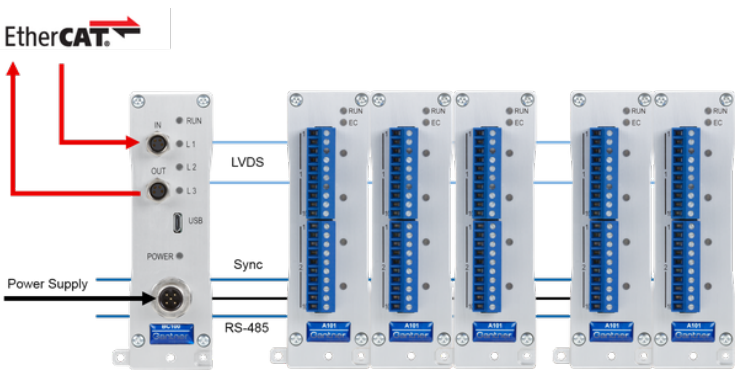
The Q.bloxx EC brings the high precision and performance of Q.bloxx to EtherCAT-based applications. Q.bloxx EC measurement modules possess integrated signal conditioning and arithmetic functions, packaged in environmentally secure (up to IP65), DIN Rail mountable enclosures that easily snap together 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

- **8 analog input channels**
  thermocouple (type B / E / J / K / L / N / R / S / T / U), voltage (±80 mV)
- **High-accuracy digitization**
  24-bit ADC, 100 Hz sample rate per channel, 50/60 Hz mains rejection
- **Automatic linearization correction**
  optimal position of the interpolation points adjusted to the input range
- **Simplified wiring**
  direct connectivity with mini-TC plugs, built-in cold junction compensation
- **Open thermocouple detection**
  detect broken wire, loose connection or thermocouple burnout
- **3-Way galvanic isolation**
  100 VDC channel to channel, 500 VDC channel to power supply and bank
- **Electromagnetic compatibility (EMC)**
  according to IEC 61000-4 and EN 55011





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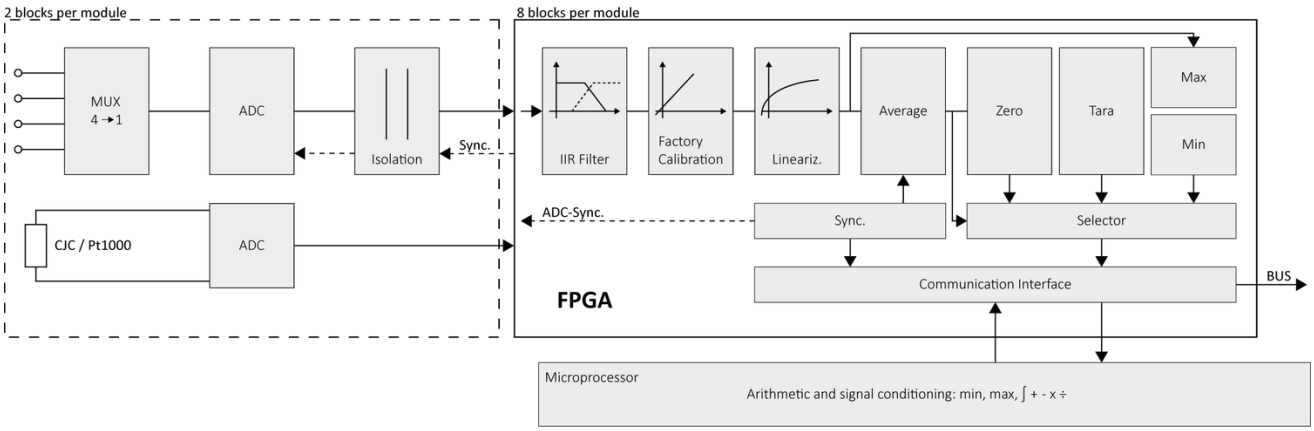
Block diagram



Technical Data

Analog Input

Channels	8
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 hrs)
Input impedance	>10 MΩ
Isolation voltage	100 VDC channel to channel 500 VDC 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

Input range	±80 mV	
Margin of error	±10 µV	
Resolution	10 nV	
Long-term stability	<1 µV / 24 hrs	<10 µV / 8000 hrs
Temperature drift	<20 µV / 10 K Offset drift	<0.02 % / 10 K Gain drift
Signal-to-noise ratio	>100 dB at 100 Hz	

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Thermocouple Measurement

Deviation in the relevant Temperature range	**Type**	**Range**	Adjusted with cold junction compensation
The specifications are valid with enabled mains frequency rejection 50 Hz resp. 60 Hz	Type K	-100 to 1000°C	< ±0.5°C
		-270°C to 1372°C	< ±0,8°C
Long-term drift	<0.025°C / 24 h	<0.05°C / 8000 h	
Temperature influence	Offset drift	Gain drift	
	<0.05°C / 10 K	<0.02% / 10 K	
Uncertainty CJC	<0.3°C		

Analog-to-Digital Conversion

Resolution	24-bit
Sample rate	100 Hz per channel fast mode 10 Hz per channel with 60 Hz mains frequency rejection 6 Hz per channel with 50 Hz mains frequency rejection
Modulation method	sigma-delta
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

Communication Interface EtherCAT

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

Input Power

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

Environmental Specifications

Operating temperature	-20°C to +60°C
Storage temperature	-40°C to +85°C
Relative humidity	5 - 95 % at 50°C (non-condensing)

Remarks

Validity of all listed specifications are subject to a warm-up period of at least 45 minutes
Specifications subject to change without notice

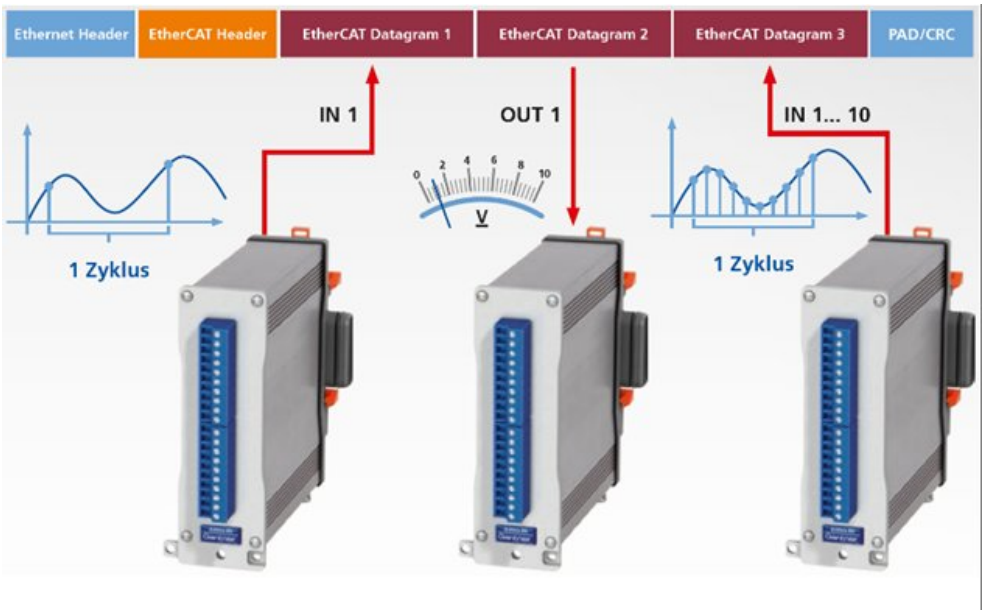
Mechanical Information

Material	Aluminum and ABS
Measurements (W x H x D)	35.6 x 118.8 x 162 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	528936

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