Q.bloxx EC A146 350

High Density Strain Gage Measurement Module

Gantner instruments

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

- **16 analog input channels for strain gages**
  quarter-bridge configuration

- **High-accuracy digitization**
  24-bit ADC, 10 kHz sample rate per channel

- **Selectable input ranges for optimal signal-to-noise ratio**
  2 or 20 mV/V (±4000 µm/m or ±40000 µm/m with k=2)

- **Active lead wire resistance compensation**
  online compensation signal (OCS) for continuous compensation of lead wire resistance changes

- **Build-in shunt resistor**
  Shunt verification of the complete measurement chain.

- **Galvanic isolation**
  channel to supply to interface

- **Electromagnetic compatibility (EMC)**
  according to IEC 61000-4 and EN 55011

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High Density Strain Gage Measurement Module
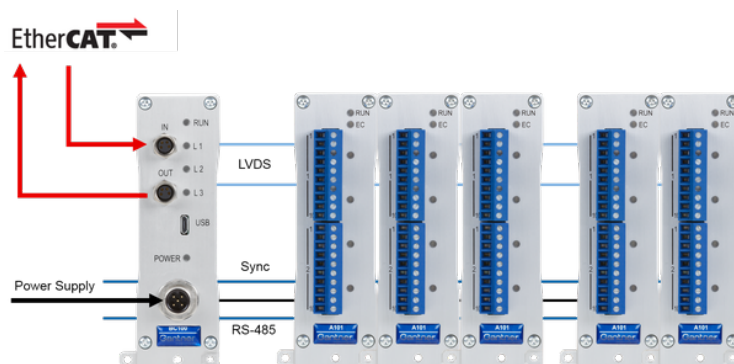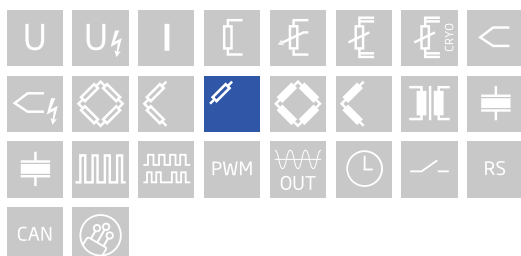
Block diagram
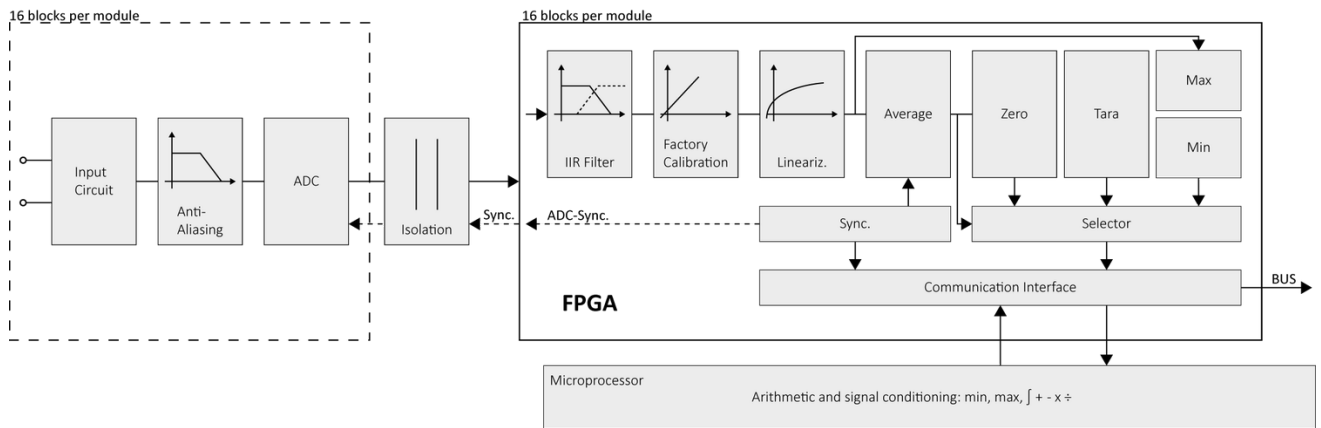
Technical Data

Analog Input

Channels	16
Accuracy	0.02 % typical
	0.05 % in controlled environment [1]
	0.1 % in industrial area [2]
Linearity error	0.01 % typical full-scale
Input impedance	<10 MΩ
Isolation voltage	500 VDC channel to input voltage to interface [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

Analog-to-Digital Conversion

Resolution	24-bit
Sample rate	10 kHz per channel
Modulation method	sigma-delta
Anti-aliasing filter	1 kHz, 3rd order
Digital filters	Infinite Impulse Response (IIR), low-pass, high-pass, band-pass, band-stop, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 2 kHz
Averaging	configurable or automatic according to the user-defined data rate

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Strain Gage Measurement

Bridge configuration(s)	resistance quarter-bridge (3-wire, with lead wire resistance compensation)
Accuracy class	0.05
Bridge completion resistor	350 Ω (others upon request)
Temp. Coefficient of Resistance (TCR)	0.05 ppm/K
Input range	selectable ±2 mV/V or ±20 mV/V per channel (±4000 µm/m or ±40000 µm/m with k=2)
Shunt resistor	100 kΩ internal resistor
Bridge excitation	2 VDC per channel
Maximum sensor cable length	150 m
Long-term stability	<0.2 µV/V / 24 hrs	<2 µV/V / 8000 hrs
Temperature drift	<0.5 µV/V / 10 K Offset drift	0.05 % / 10 K Gain drift
Noise	<0.3 µV/V (at 10 Hz)

Communication Interfae 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

Electromagnetic compatibility (EMC)	according to IEC 61000-4 and EN 55011
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

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## High Density Strain Gage Measurement Module

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
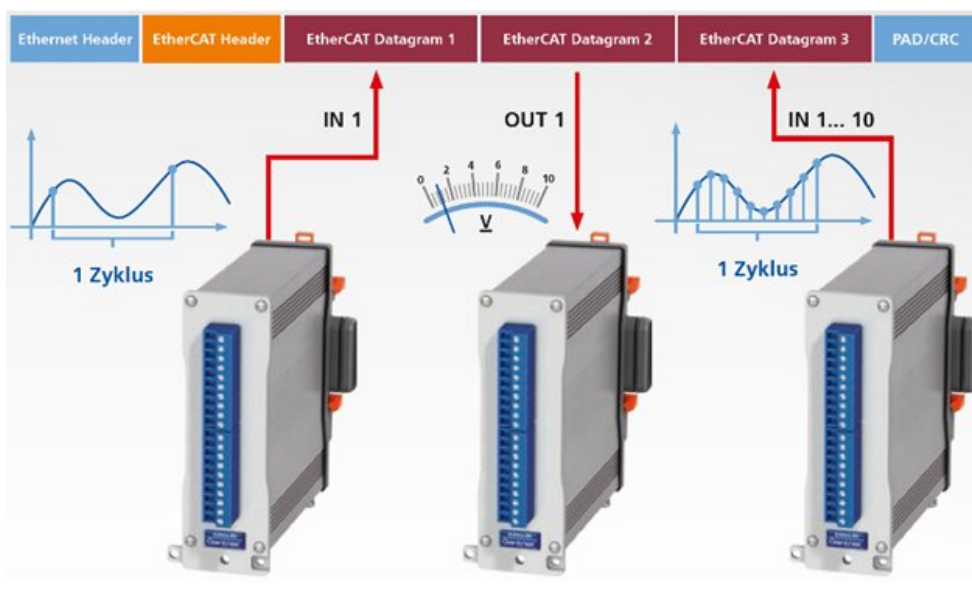
Ordering Information

Article number	536123

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