

# Q.bloxx EC A111

## Measurement Module for IEPE Sensors and Voltages

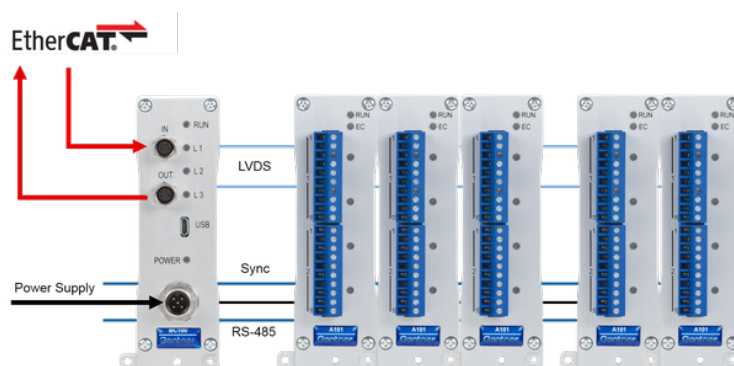
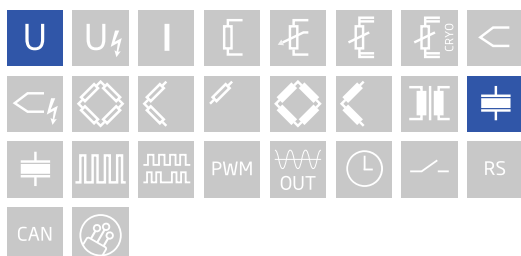
The Q.bloxx EC brings the high precision and performance of Q.bloxx to EtherCAT-based applications. Q.bloxx EC measurement modules possess integrated signal conditioning and arithmetic functions, packaged in environmentally secure (up to IP65), DIN Rail mountable enclosures that easily snap together 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  $\leq 100$
- 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

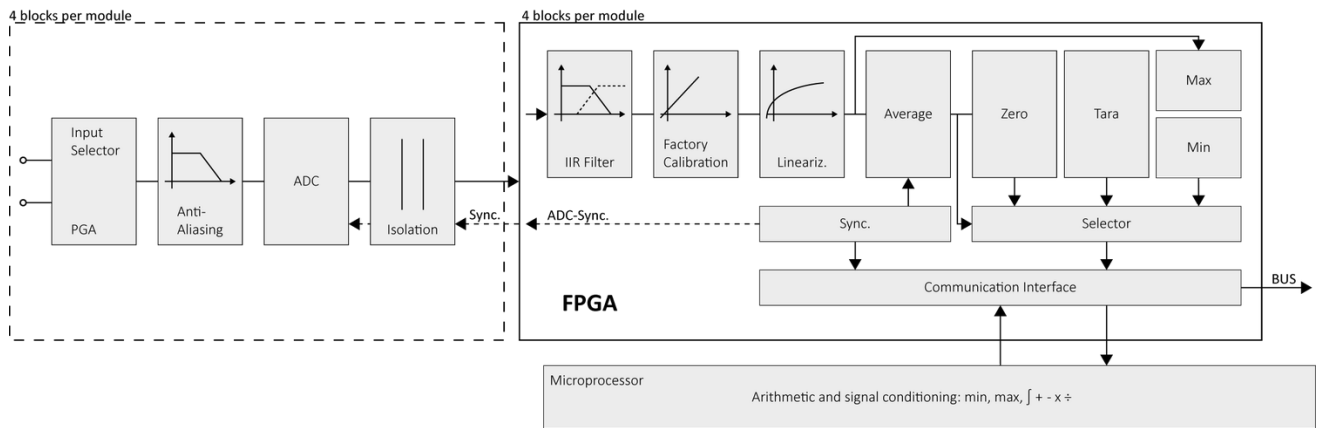


### Key Features

- 4 galvanic isolated analog input channels  
IEPE sensors, voltage
- Configurable input ranges  
 $\pm 100$  mV,  $\pm 1$  VDC,  $\pm 10$  VDC
- High-accuracy digitization  
24-bit ADC, 100 kHz sample rate per channel
- Signal conditioning  
16 virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- Galvanic isolation  
500 VDC channel to channel, channel to power supply, and bank



### Block diagram



### Technical Data

#### Analog Input

Channels	4
Accuracy	0.01 % typical 0.025 % in controlled environment <sup>1</sup> 0.05 % in industrial area <sup>2</sup>
Linearity error	0.01 % typical full-scale
Repeatability	0.003 % typical (within 24 hrs)
Input impedance	> 10 MΩ (unless otherwise stated)
Isolation voltage	500 VDC channels, to power supply, channel to bus <sup>3</sup>
Overvoltage protection	±30 V
Max. Common-mode voltage (CMV)	250 VDC

<sup>1</sup> according to EN 61326 2006: appendix B

<sup>2</sup> according to EN 61326 2006: appendix A

<sup>3</sup> noise pulses up to 1000 VDC, continuous up to 250 VDC

#### Measurement Mode Voltage

Input range	Margin of error	Resolution	Input impedance
±100 mV	±20 μV	12 nV	> 1 MΩ
±1 V	±200 μV	120 nV	> 1 MΩ
±10 V	±2 mV	1.2 μV	> 1 MΩ
Long-term stability (range ±1 V)	< 20 μV / 24 hrs	< 200 μV / 8000 hrs	
Temperature drift (range ±1 V)	< 50 μV / 10 K Offset drift	< 0.01 % / 10 K Gain drift	
Signal-to-noise ratio	> 90 dB at 1 kHz	> 120 dB at 1 Hz	
Dynamic range	109 dB @ ±10 V		
Input impedance	1.2 MΩ    330 pF		

### Measurement Mode IEPE

Input range	Margin of error	Resolution	Input impedance
±1 V	±1 mV	120 nV	>1 MΩ
±10 V	±10 mV	1.2 μV	>1 MΩ
Sensor excitation	4 mA ±10% constant current		
Compliance voltage	24 VDC ±10%		
Input frequency range	0.5 Hz to 20 kHz		
Temperature drift (range ±1 V)	<50 μV / 10 K Offset drift	<0.025 % / 10 K Gain drift	

### Analog/Digital Conversion

Resolution	24-bit
Sample rate	100 kHz per channel
Modulation method	sigma-delta
Anti-aliasing filter	20 kHz, 3rd order
Digital filters	Infinite impulse response (IIR), low-pass, high-pass, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 20 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	2.5 W (approx.)
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

### 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 124 mm
Weight	approx. 400 g

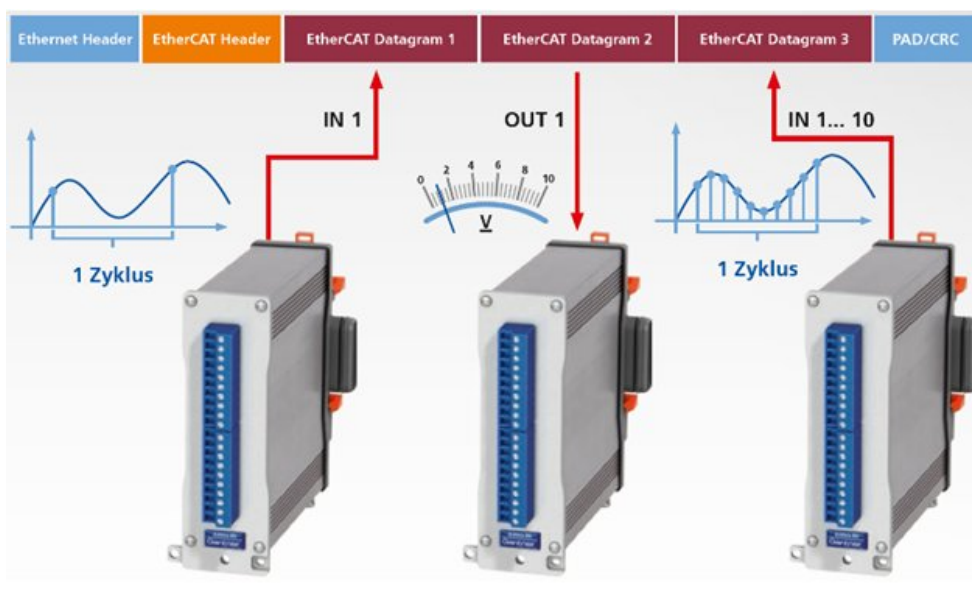
### Oversampling

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	697135
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