

# Q.bloxx XE A106

## Measurement Module for Strain Gage and LVDT/RVDT

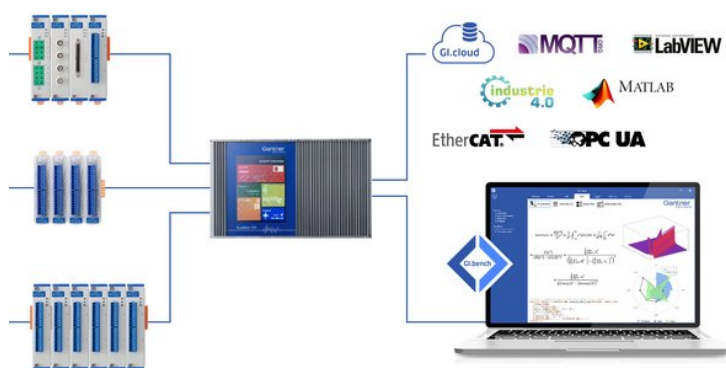
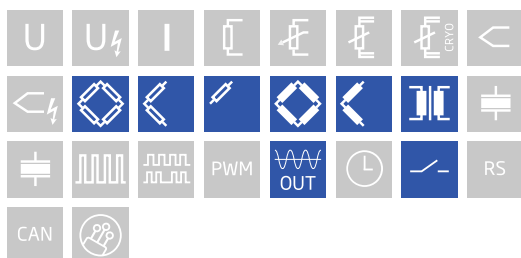
Q.bloxx XE is a new addition to the Q.series product family - the ideal EtherCAT DAQ solution for widely distributed installations that require higher performance and custom sensor terminations. Q.bloxx XE measurement modules possess integrated signal conditioning and arithmetic functions, packaged in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

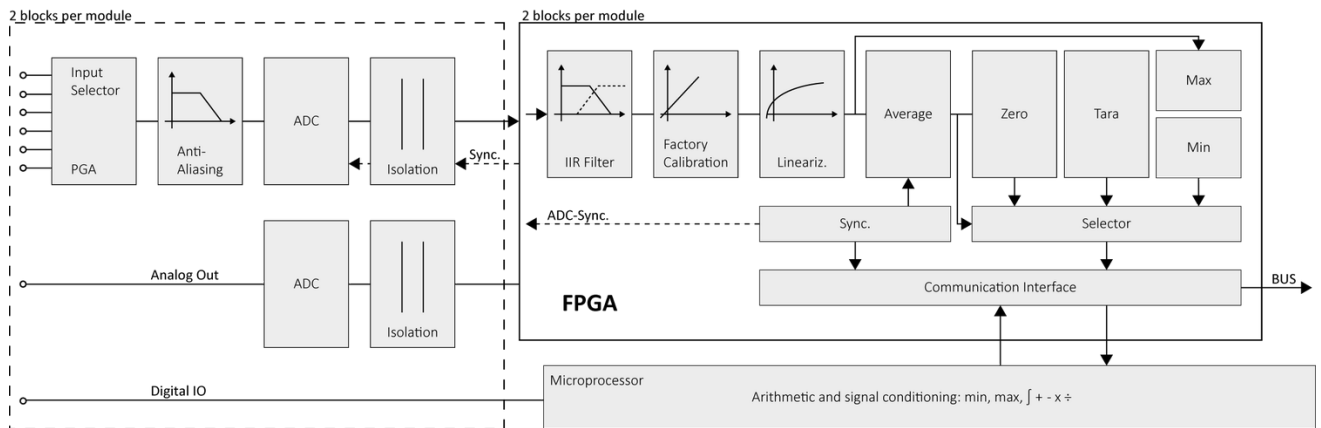


### Key Features

- 2 galvanically isolated analog inputs channels  
strain gage and inductive half and full bridges, LVDT, RVDT quarter bridge with completion terminal
- DC and carrier frequency (CF) principle  
2.5 and 5 VDC excitation, 2.5 and 5 VDCeff excitation carrier frequency, 600 Hz or 4.8 kHz configurable per channel
- 2 Analog output channels  
 $\pm 10$  VDC, 20 kHz update rate per channel
- High-accuracy digitization  
24-bit ADC, 20 kHz sample rate per channel
- 4 digital I/Os  
input: state, tare, memory reset, output: state, alarm, threshold
- Signal conditioning  
linearization, filtering, average, scaling, min/max, RMS, arithmetic, alarm
- 3-Way galvanic isolation  
500 VDC channel to channel, channel to power supply, and channel to bus



### Block diagram



### Technical Data

#### Analog Input

Channels	2
Accuracy	0.02 % typical 0.05 % in controlled environment <sup>1</sup> 0.1 % in industrial area <sup>2</sup>
Linearity error	0.02 % typical full-scale
Repeatability	0.01 % typical (within 24 hrs)
Input impedance	>10 MΩ
Isolation voltage	500 VDC channel to channel, to power supply, channel to bus <sup>3</sup>

<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

#### Analog-to-Digital Conversion

Resolution	24-bit
Sample rate	20 kHz per channel
Modulation method	sigma-delta
Anti-aliasing filter	2 kHz, 3th order (DC excitation) 1 kHz, 3th order (4.8 kHz CF excitation) 100 Hz, 3th order (600 Hz CF excitation)
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 1 kHz in steps of 0.1 (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

### Analog Output

Channels	2		
Accuracy	0.02 % typical		
Voltage output	±10 VDC		
Allowable load resistance	> 2 kΩ		
Long-term drift	<1 mV / 24 hrs	<2.5 mV / 8000 hrs	
Temperature drift	<1 mV / 10 K Offset drift	<0.05 % / 10 K Gain drift	
Noise voltage	<2 mV at 10 Hz	<10 mV at 1 kHz	

### Digital Input & Output

Channels	4 configurable I/Os		
Mode(s) of operation	status		
Logic voltage	< 2 VDC (Low) >10 VDC (High)		
Input type	PNP (current sinking)		
Input voltage	30 VDC max.		
Output voltage	10 to 30 VDC (external supply required)		
Contact	open drain p-channel MOSFET		
Load capacity	30 VDC / 100 mA (ohmic load)		

### Strain Gage Measurement

Bridge configuration(s)	resistive full-bridge (4/6-wire) resistive half-bridge (3/5-wire) resistive quarter-bridge 120 Ω or 350 Ω (3-wire, with bridge completion terminal)			
Allowable sensor cable length	< 300 m (DC and 600 Hz CF excitation) < 100 m <sup>1</sup> (4.8 kHz CF excitation)			
Shunt resistor	100 kΩ internal resistor			
Bridge excitation	2.5 - 5 VDC 2.5 - 5 Veff (Carrier Frequency)			
Bridge excitation stability	< 0.01% / 24 hrs			
Bridge excitation drift	< 0.02% / 10 K			
	<b>5 VDC</b>	<b>5 Veff (CF)</b>	<b>2.5 VDC</b>	<b>2.5 Veff (CF)</b>
Allowable sensor resistance	> 300 Ω	> 300 Ω	> 100 Ω	> 100 Ω
Input range	±1.25 mV/V	±1.25 mV/V	±2.5 mV/V	±2.5 mV/V
	±2.5 mV/V	±2.5 mV/V	±5 mV/V	±5 mV/V
	±25 mV/V	±25 mV/V	±50 mV/V	±50 mV/V
	±50 mV/V	±50 mV/V	±100 mV/V	±100 mV/V
	±100 mV/V	±100 mV/V	±200 mV/V	±200 mV/V
	±200 mV/V	±200 mV/V	±400 mV/V	±400 mV/V
	±500 mV/V	±500 mV/V	±1000 mV/V	±1000 mV/V
Long-term stability	< 0.2 μV/V / 24 hrs (DC excitation) < 0.1 μV/V / 24 hrs (CF excitation)		< 2 μV/V / 8000 hrs (DC excitation) < 1 μV/V / 8000 hrs (CF excitation)	
Temperature drift (range 2.5 mV/V)	< 0.2 μV/V / 10 K Offset drift		< 0.05 % / 10 K Gain drift	
Signal-to-noise ratio	< 0.3 μV/V at 10 Hz		< 1 μV/V at 100 Hz	

<sup>1</sup> low capacity sensor cable is strongly recommended

### LVDT/RVDT Measurement

Sensor connection	4- / 6-wire	
Sensor excitation (selectable)	<b>5 V<sub>eff</sub></b>	<b>2.5 V<sub>eff</sub></b>
Allowable sensor resistance	> 300 Ω	> 100 Ω
Input range	±1.25 mV/V	±2.5 mV/V
	±2.5 mV/V	±5 mV/V
	±25 mV/V	±50 mV/V
	±50 mV/V	±100 mV/V
	±100 mV/V	±200 mV/V
	±200 mV/V	±400 mV/V
	±500 mV/V	±1000 mV/V
Allowable sensor cable length	< 100 m <sup>1</sup>	
Long-term stability	< 0.1 μV/V / 24 hrs	< 1 μV/V / 8000 hrs
Temperature drift (range 2.5 mV/V)	< 0.2 μV/V / 10 K Offset drift	< 0.05 % / 10 K Gain drift
Signal-to-noise ratio	< 0.3 μV/V at 10 Hz	< 1 μV/V at 100 Hz

<sup>1</sup> low capacity sensor cable is strongly recommended

### Digital-to-Analog Conversion

Resolution	16-bit
Update rate	20 kHz per channel
Settling time	3 μs

### 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 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

# Q.bloxx XE A106

Measurement Module for Strain Gage and LVDT/RVDT

## Mechanical information

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

## Ordering Information

Article number	507323
Accessories	Terminal B4/120-A106, article number 894387
	Terminal B4/350-A106, article number 894488

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