

Q.brixx XE A116

Strain Gage Measurement Module

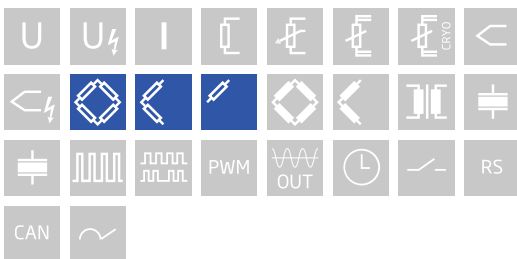
Q.brixx XE is a new addition to the Q.series product family - the ideal EtherCAT DAQ solution for on-the-go applications in potentially harsh environments. Q.brixx XE DAQ systems consist of up to 10 measurement modules capable of up to 100 kHz sampling per channel and an integrated EtherCAT bus coupler providing short cycle times and low jitter for accurate synchronization, all within a robust aluminum housing capable of withstanding severe shock and vibration without sacrificing performance.

- DC (distributed clock) for data synchronization
- 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



Key Features

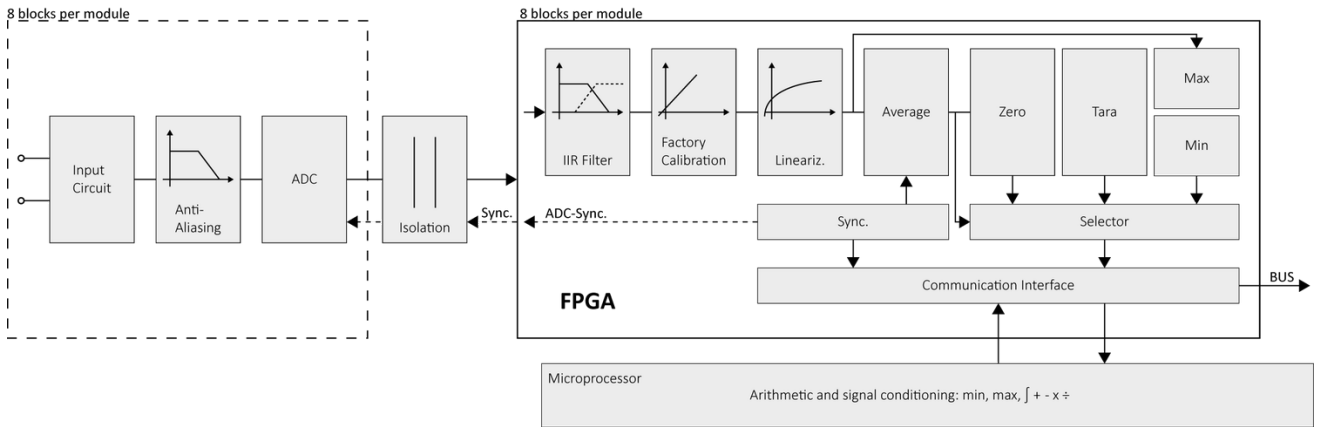
- 8 analog input channels for strain gages
full-, half-, and quarter-bridge configuration, configurable per channel
- Selectable input ranges for optimal signal-to-noise ratio
2.5 or 10 mV/V for half- and full-bridge, 1 or 10 mV/V for quarter-bridge
- High-accuracy digitization
24-bit ADC, 20 kHz sample rate per channel
- Active lead wire resistance compensation
online compensation signal (OCS) for continuous compensation of lead wire resistance changes
- Shunt calibration per channel
- Build-in shunt resistor
Shunt verification of the complete measurement chain.
- Galvanic Isolation
channel to supply to interface



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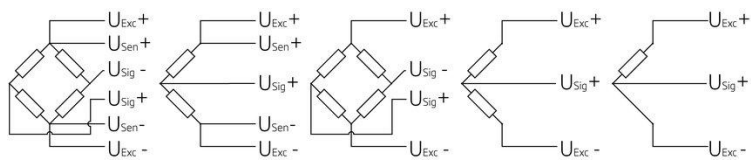
Block diagram



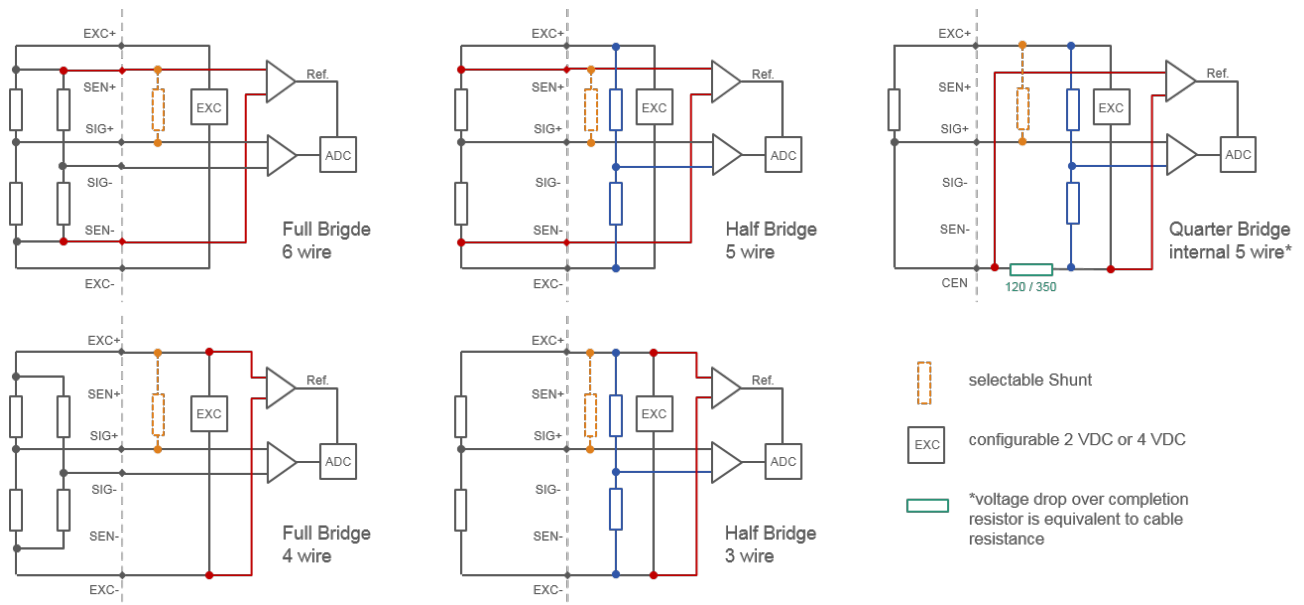
Technical Data

Terminal assignment 68pole harting

U_{Exc+}	A3	U_{Exc+}	A19
U_{Exc-}	A4	U_{Exc-}	A20
U_{Sen+}	B4	U_{Sen+}	B20
U_{Sen-}	A5	U_{Sen-}	A21
U_{Sig+}	B3	U_{Sig+}	B19
U_{Sig-}	B5	U_{Sig-}	B21
U_{Exc+}	A7	U_{Exc+}	A23
U_{Exc-}	A8	U_{Exc-}	A24
U_{Sen+}	B8	U_{Sen+}	B24
U_{Sen-}	A9	U_{Sen-}	A25
U_{Sig+}	B7	U_{Sig+}	B23
U_{Sig-}	B9	U_{Sig-}	B25
U_{Exc+}	A11	U_{Exc+}	A27
U_{Exc-}	A12	U_{Exc-}	A28
U_{Sen+}	B12	U_{Sen+}	B28
U_{Sen-}	A13	U_{Sen-}	A29
U_{Sig+}	B11	U_{Sig+}	B27
U_{Sig-}	B13	U_{Sig-}	B29
U_{Exc+}	A15	U_{Exc+}	A31
U_{Exc-}	A16	U_{Exc-}	A32
U_{Sen+}	B16	U_{Sen+}	B32
U_{Sen-}	A17	U_{Sen-}	A33
U_{Sig+}	B15	U_{Sig+}	B31
U_{Sig-}	B17	U_{Sig-}	B33



Strain Gage Wiring Diagram



Analog Input

Channels	8
Accuracy	0.02 % typical
	0.05 % in controlled environment ¹
	0.1 % in industrial area ²
Linearity error	0.01 % typical (within 24 h)
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	20 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 (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

Strain Gage Measurement

Bridge configuration(s)	resistance full-bridge (4/6-wire) resistance half-bridge (3/5-wire) resistance quarter-bridge (3-wire, with lead wire resistance compensation)	
Accuracy class	0.05	
Bridge completion resistor	selectable 120 Ω or 350 Ω per channel (others upon request)	
Temp. Coefficient of Resistance (TCR)	0.05 ppm/K	
Input range	full-bridge ±2.5 mV/V or ±10 mV/V half-bridge ±2.5 mV/V or ±10 mV/V quarter-bridge ±1 mV/V or ±10 mV/V (±2000 μm/m or ±20000 μm/m with k=2) selectable per channel	
Shunt resistor	100 kΩ internal resistor	
Bridge excitation	selectable 2 VDC or 4 VDC per channel	
Allowable sensor resistance	>200 Ω at 4 VDC >100 Ω at 2 VDC	
Maximum sensor cable length	full-bridge 300 m half-bridge 300 m quarter-bridge 100 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)	
Linearity deviation	<0.02 % f.s.	

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	2.5 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

Are subject to a warm-up period of at least 45 minutes

Specifications subject to change without notice

Mechanical information

Material	Aluminum
Measurements (W x H x D)	30x 137 x 135mm
Weight	approx. 500 g
Protection class	IP40

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Strain Gage Measurement Module

Ordering Information

Article number	524221
Accessories	Connection Terminal A116, article number 600725

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