Q.bloxx A102

Measurement Module for Bridge Sensors

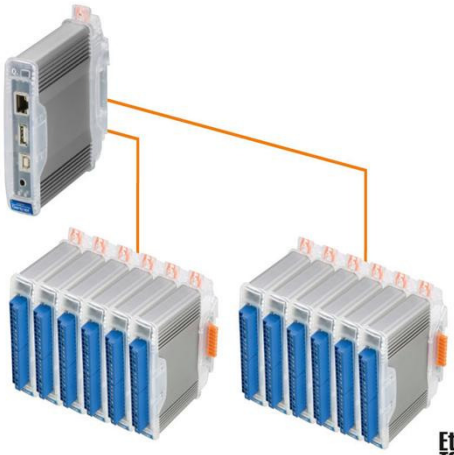
The Q.series has been designed for demanding measurements found in today's most industrial measuring and testing environments. The range of applications starts from single stand-alone solutions up to networked multi-channel applications in the field of component testing, engine testing, process performance testing and structural monitoring.

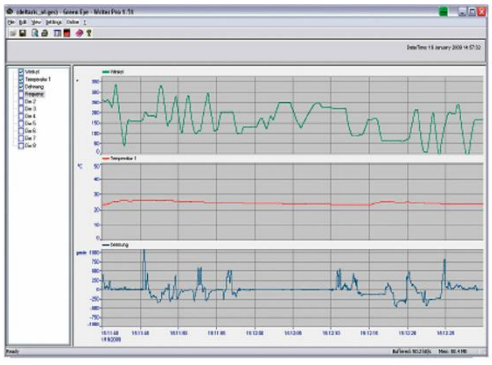
The range and flexibility of the modules allows an optimized solution for each single task:
Dynamic signal acquisition up to 100 kHz, inputs and outputs for all types of signals, galvanic isolation of inputs and outputs, multi-channel solutions, high density packaging and intelligent signal conditioning.

Data exchange between Test Controller and automation level is communicated via Ethernet TCP/IP or fieldbus systems like EtherCAT or Profibus-DP and additional Ethernet-based industrial standards.

Most important features:

- **1 analog input channel**
  measuring bridge (full, half, quarter), IEPE-sensors, voltage, current
- **1 analog output**
  voltage ±10 V and current 0 up to 25 mA selectable, 100 kHz
- **Fast high accuracy digitalization**
  19 Bit ADC - SAR (without delay time), 100 kHz sample rate
- **4 digital inputs, 2 digital outputs**
  input: state, tare, memory reset
  output: state, alarm, threshold
- **Signal conditioning**
  16 virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- **TEDS**
  class 1 and class 2, according IEEE 1541.4
- **RS485 fieldbus-interface**
  up to 48 Mbps: LocalBus
  up to 115.2 kbps: Modbus-RTU, ASCII
- **Additional RS 485 fieldbus interface**
  to control an 8-channel multiplexer for multi channel systems, 10Hz per channel
- **Galvanic isolation**
  of I/O-signals, power supply and interface
  Isolation voltage 500 VDC
- **Electromagnetic Compatibility**
  according EN 61000-4 and EN 55011
- **Power supply 10…30 VDC**
- **DIN rail mounting (EN 50022)**





Ethernet TCP/IP · EtherCAT · PROFIBUS · USB UNIVERSAL SERIAL BUS

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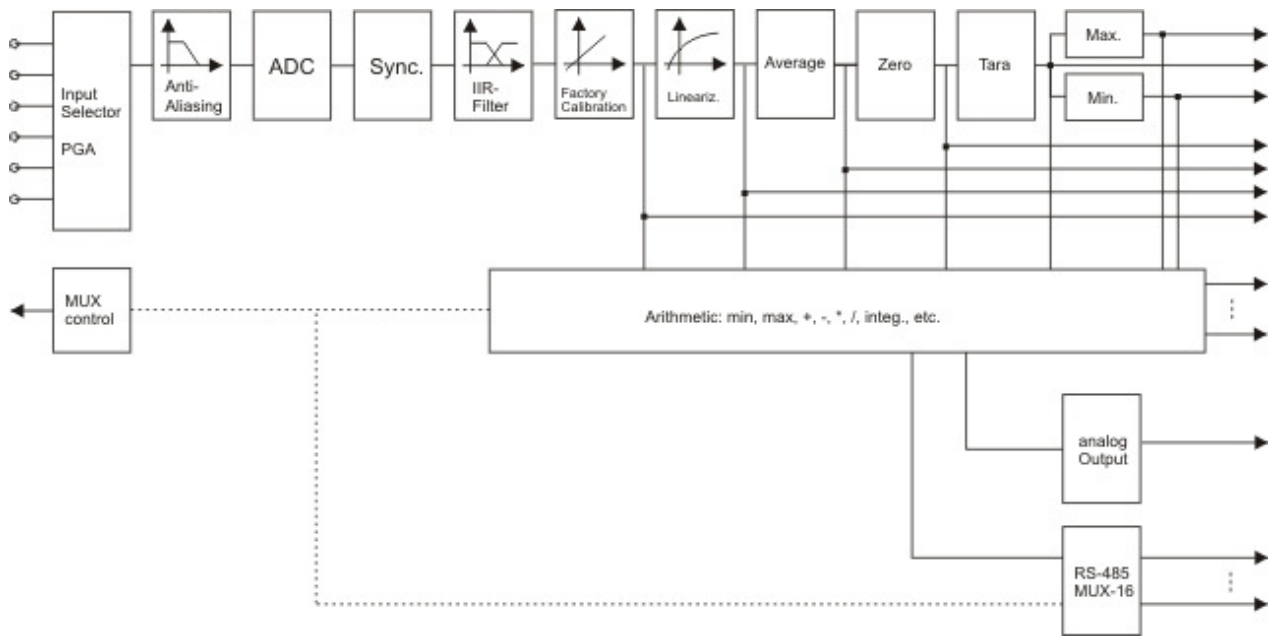
Block Diagram



Analog Inputs			
Number	1		
Accuracy	0.01 % typical		
	0.02 % in controlled environment[1]		
	0.05 % in industrial area[2]		
Linearity error	0.01 % of the final value typical		
Repeatability	0.003 % typical (within 24 h)		
Sensor identification	TEDS		
Measurement Voltage	**Range**	**max. Deviation**	**Resolution**
	±10 V	±2 mV	40 µV
	±1 V	±0,2 mV	4 µV
	±100 mV	±20 µV	0,4 µV
Input resistance	>10 MΩ (at range ±10 V = 1 MΩ)		
Noise voltage	<50 µVpp		range ±10 V
Long term drift	<1 µV/24 h		
Perm. common mode voltage	500 V permanent		
Temperature influence	on zero	on sensitivity	
	1 µV/10 K	0.05 %/10 K	
Signal-noise-ratio	>90 dB at 1 kHz	>120 dB at 1 Hz	

[1] according EN 61326: 1997, appendix B
[2] according EN 61326: 1997, appendix A

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Measurement Module for Bridge Sensors

Measurement Current	**Range**		**max. Deviation**	**Resolution**
(internal shunt 50 Ω)	0…25 mA		±5 µA	3.0 nA
Long term drift	<0.1 µA/24 h			
Perm. common mode voltage	500 V permanent			
Temperature influence	on zero		on sensitivity	
	<0.1 µA/10 K		<0.03 %/10 K	
Measuring Bridge				
Accuracy class	0.05			
Sensor type	full bridge, half bridge (5/6 wire), quarter bridge with completion terminal (3 wire)			
Supply	10.0 V	5.0 V	2.5 V	1.0 V
Perm. sensor resistance	>300 Ω	>100 Ω	>80 Ω	>50 Ω
Measurement range	±100 mV/V	±200 mV/V	±500 mV/V	±1000 mV/V
	±25 mV/V	±50 mV/V	±100 mV/V	±250 mV/V
	±2.5 mV/V	±5 mV/V	±10 mV/V	±20 mV/V
	±1 mV/V	±2.5 mV/V	±5 mV/V	±10 mV/V
Shunt calibration	yes, within one bridge section, internal shunt resistance			
Temperature influence	on zero		on sensitivity	
	<10 µV/V/10 K		<0.05%/10 K	
Measurement IEPE Sensor	**Range**		**max. Deviation**	**Resolution**
	±10 V		±10 mV	1.2µV
Supply	constant current 4 mA			
Minimum input frequency	2 Hz			
Limit frequency	10 kHz			
Temperature influence	on zero		on sensitivity	
	<10 µV/10 K		0.05 %/10 K	
Analog/Digital-Conversion				
Resolution	19 bit			
Sample rate	100 kHz			
Conversion method	SAR (successive approximation)			
Antialiasing Filter	20 kHz, 5th order			
Digital filter	IIR, low pass, high pass, 4th order			
	1 Hz up to 10 kHz in steps 1, 2, 5, automated sample reduction for lower frequencies			
Analog Output				
Accuracy	0.02 %			
Output type	configurable output: voltage ±10 V or current 0 up to 25 mA			
DAC resolution	16 bit			
Sample rate	100 kHz			
Filter:	programmable smoothing filter for 1kHz, 10kHz and 100kHz			
Output voltage	±10 VDC			
Perm. load resistance	>2 kΩ			
Temperature influence	on zero		on sensitivity	
	<2 mV/10 K		<0.05 %/10 K	

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Analog Output continued		
Noise voltage in the range of	<10 mV at 1 kHz	<2 mV at 10 Hz
Long term drift	<1 mV/48h	
Output current	0 up to 25 mA	
perm. burden	<400 Ω	
Temperature influence	on zero	on sensitivity
	4 µA/10 K	0.05 %/10 K
Noise current in the range of	<20 µA at 1 kHz	<4µA at 10 Hz
Long term drift	<2 µA/48h	
Digital In/Outputs		
Number	4 inputs, 2 outputs, 1 slave RS485 interface for controlling the M108	
Input	state, tare, reset	
Input voltage	max. 30 VDC	
Input current	max. 0.5 mA	
Upper threshold	>10 V (high)	
Lower threshold	<2.0 V (low)	
Output	state, alarm	
Contact	open drain p-channel MOSFET	
Load	30 VDC/100 mA (ohmic load)	
Power Supply		
Power supply	10 up to 30 VDC, overvoltage and overload protection	
Power consumption	approx. 2 W	
Influence of the voltage	0.001 %/V	
Environmental		
Operating temperature	-20°C up to +60°C	
Storage temperature	-40°C up to +85°C	
Relative humidity	5 % up to 95 % at 50°C, non condensing	
Communication Interface		
Standard	RS-485, 2-wire	
Data format	8e1	
Protocols	Local-Bus: 115200 bps up to 48 Mbps	
	Modbus-RTU, ASCII: 19200 bps up to 115200 bps	
Connectable devices	max. 32	
Mechanical		
Case	Aluminum and ABS	
Dimensions (W x H x D)	(27 x 120 x 105) mm	
Weight	approx. 200 g	
Mounting	DIN EN-rail	

Warm Up Time
All declarations are valid after a warm up time of 45 minutes.

Valid from April 15rth 2010. Specification subject to change without notice
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