Q.bloxx A101

Universal Measurement Module

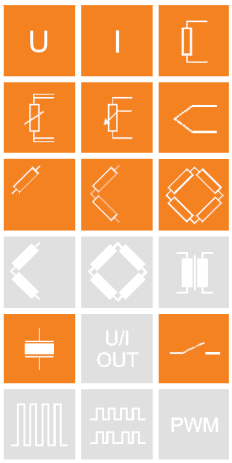
The Q.series has been designed for demanding measurements found in today's most industrial measuring and testing environments. The range of applications starts from single stand-alone solutions up to networked multi-channel applications in the field of component testing, engine testing, process performance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

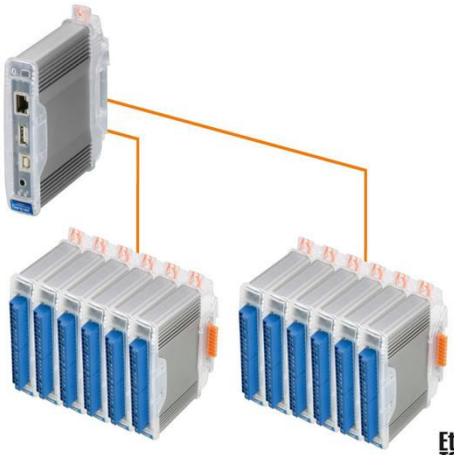
The range and flexibility of the modules allows an optimized solution for each single task:
Dynamic signal acquisition up to 100 kHz, inputs and outputs for all types of signals, galvanic isolation of inputs and outputs, multi-channel solutions, high density packaging and intelligent signal conditioning.

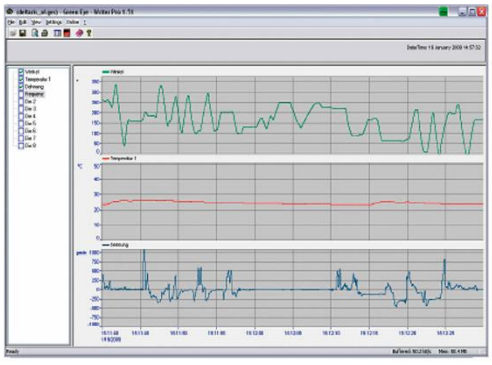
Data exchange between Test Controller and automation level is communicated via Ethernet TCP/IP or fieldbus systems like EtherCAT or Profibus-DP and additional Ethernet-based industrial standards.

Most important features:

- **2 universal analog input channels**
  voltage, current, resistance, potentiometer, Pt100, Pt1000, thermocouples, measuring bridges, IEPE-sensors
- **Fast high accuracy digitalization**
  24 bit ADC, 100 kHz sample rate per channel
- **1 digital in or output per channel**
  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
- **Connectable to any Test Controller**
  e.g. Q.gate or Q.pac
- **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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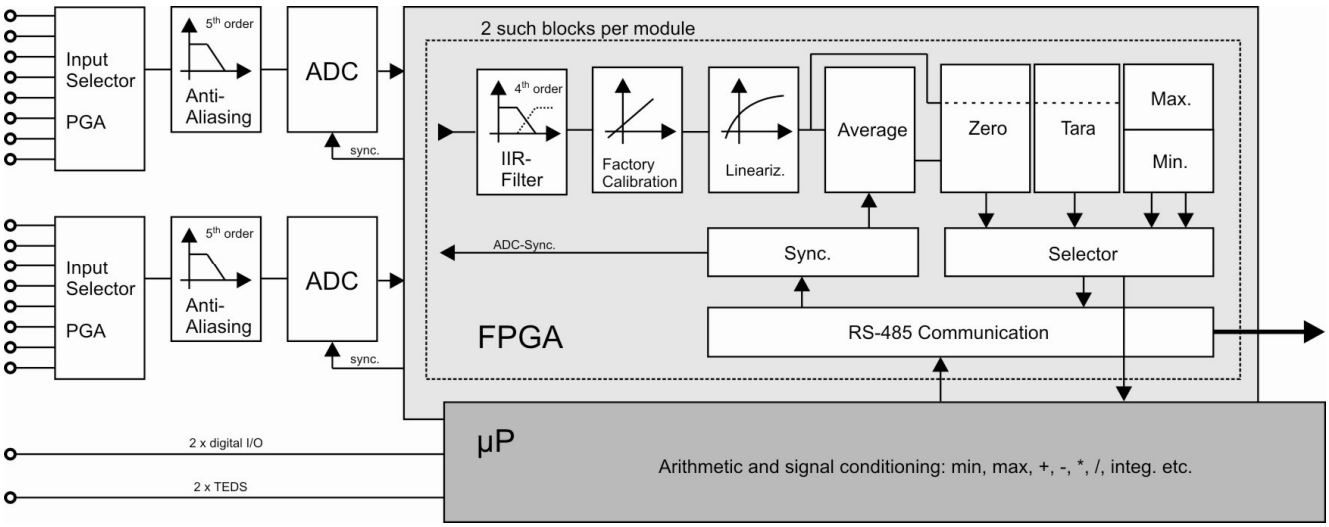
Universal Measurement Module

Block Diagram



Analog Inputs			
Number	2		
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**
	±60 V	±12 mV	7.2 µV
	±10 V	±2 mV	1.2 µV
	±1 V	±0.2 mV	120 nV
	±100 mV	±20 µV	12 nV
Input resistance	>10 MΩ (@ range ±10 V = 1 MΩ; ±60 V = 3 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 Current (internal shunt 50 Ω)	**Range**	**max. Deviation**	**Resolution**
	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	
Measurement Resistance / RTD	**Range**	**max. Deviation**	**Resolution**
Resistance, 2-wire	100 kΩ	±100 Ω	12 mΩ
Resistance, 2- and 4-wire*	4 kΩ	±1 Ω	0.5 mΩ
Resistance, 2- and 4-wire*	400 Ω	±0.1 Ω	48 µΩ
Pt100, 2- and 4-wire*	-200 up to +850 °C	±0.5 °C	0.2 m°C
Pt1000, 2- and 4-wire*	-200 up to +850 °C	±1 °C	0.2 m°C
Linearity error	<0.05% of final value at range 100 kΩ		
Measuring Bridge			
Accuracy class	0.05		
Bridge Type	full bridge, half bridge, 5-/6-wire connection, quarter bridge with completion terminal		
Sensor resistance	>100 Ω		
Supply	2.5 V		
Measurement range	±2.5 mV/V	±50 mV/V	±500 mV/V
Temperature influence	on zero	on sensitivity	
	<10 µV/V/10 K	<0.05 %/10 K	
Measurement Thermo Couple	**Whole range**	**-100 °C...upper limit**	
Type B	better than ±5 °C	better than ±2.5 °C	
Type E, J, K, L, T, U	better than ±1 °C	better than ±0.5 °C	
Type N	better than ±2 °C	better than ±1 °C	
Type R, S	better than ±3 °C	better than ±1.5 °C	
Input resistance	> 10 MΩ		
Perm. common mode voltage	500 V permanent		
Temperature influence	on zero	on sensitivity	
	<1 µV/10 K	<0.02%/10 K	
Measurement IEPE sensor	**Range**	**max. Deviation**	**Resolution**
	±10 V	±10 mV	1.2 µV
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	

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Analog/Digital-Conversion	
Resolution	24 bit
Sample rate	100 kHz
Conversion method	Sigma-Delta (group delay time 380 µs)
Anitaliasing 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
Digital In/Outputs	
Number	2 (1 digital I/O per channel)
Responde time	0.2 ms
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 15th 2010. Specification subject to change without notice
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