Q.bloxx A105

Measurement Module for RTD (Pt100, Pt1000) and Resistance

The Q.series has been designed for the demanding measurements found in today's industrial measuring and testing environments. Applications range from single, stand-alone solutions to networked, multi-channel systems in real-world areas such as component testing, engine testing, process performance testing, materials testing and structural monitoring.

The range and flexibility of the modules allows for an optimized solution for each and every measurement and control point:

- Dynamic signal acquisition up to 100 kHz per channel
- inputs and outputs for all types of signals and sensors
- Galvanic isolation (up to 1200V) of inputs and outputs
- Multi-channel, High-density packaging
- Intelligent signal conditioning on every channel.

All modules connect to a Q.series test controller (Q.gate, Q.pac, or Q.station) for synchronization and buffering, and data exchange between the test controller and automation system is handled via Ethernet TCP/IP, EtherCAT, Profibus-DP, CANopen, or through additional industrial fieldbus standards.

Key Features:

- **4 input channels**
  Pt100, Pt1000, or resistance in 3- or 4-wire RTDs

- **High accuracy**
  Max. deviation of 0.05°C, Temperature influence 0.02/10K

- **Sensor excitation**
  Pt100: 1 mA, Pt1000: 100 µA

- **High accuracy digitalization**
  24 bit ADC, 10 Hz sample rate per channel

- **Signal conditioning**
  linearization, digital filter, average, scaling, min/max storage, arithmetic, alarm

- **RS485 fieldbus interface**
  up to 48 Mbps: LocalBus
  up to 115.2 kbps: Modbus-RTU, ASCII

- **Connectable to any Test Controller**
  e.g. Q.station, Q.gate or Q.pac

- **Galvanic isolation**
  channel to channel to power supply and to interface
  Isolation voltage 500 VDC

- **Electromagnetic Compatibility**
  according EN 61000-4 and EN 55011

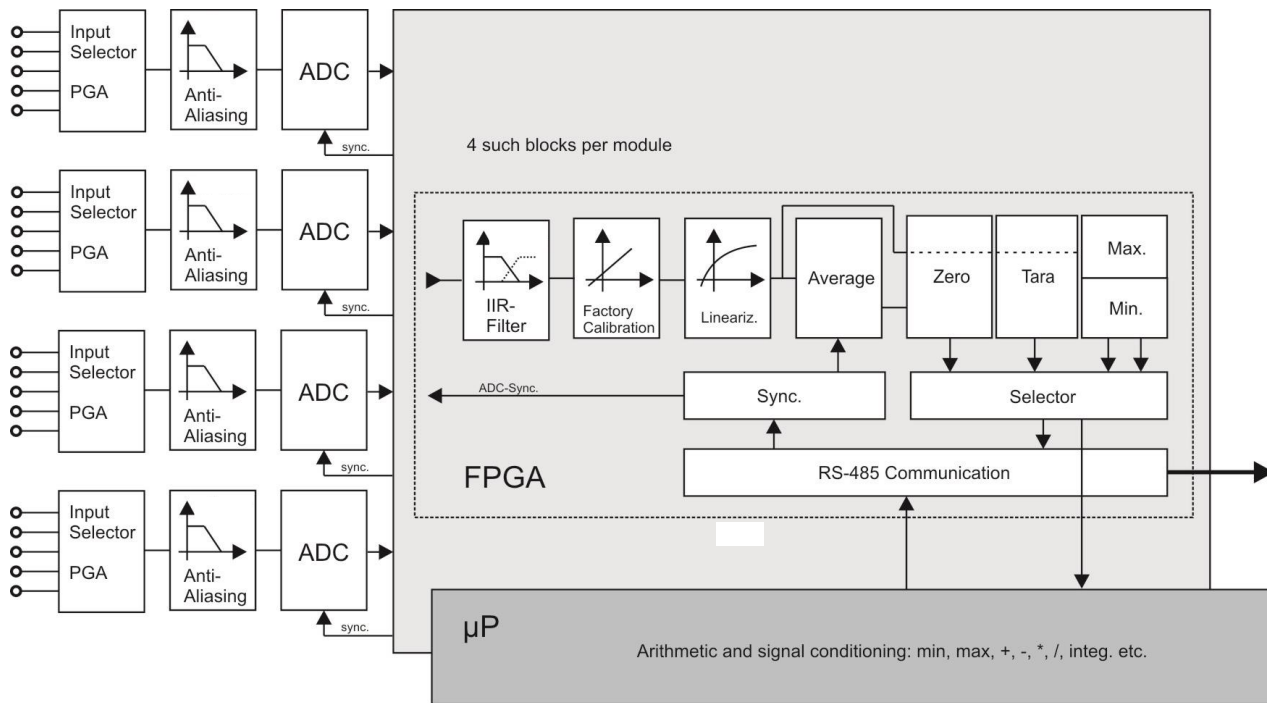- **Power supply 10…30 VDC**

- **DIN rail mounting (EN 60715)**
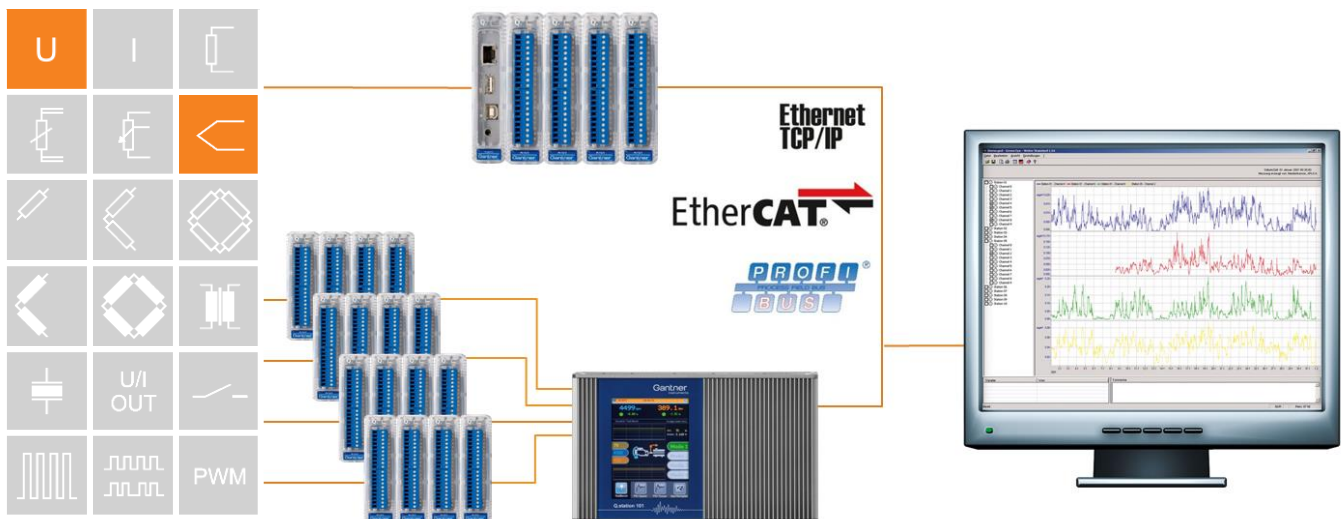
Block Diagram

Analog Inputs	
Number	4
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)
Isolation voltage	500 VDC channel to channel to power supply to interface[3]
Sensor excitation	Pt100: 1 mA (500 µA effective), Pt1000: 100 µA (50 µA effective)
Input resistance	470 kΩ

[1] according EN 61326: 2006, appendix B
[2] according EN 61326: 2006, appendix A
[3] noise pulses up to 1000 VDC, permanent up to 250 VDC

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Measurement Pt100 RTD (3 or 4-wire)

Range	-200°C to +350°C
Accuracy	0.05°C
Resolution	0.0001°C
Temperature influence	0.02°C/10 K
Long term drift	0.01°C/24 h, 0.05°C/8000 h
Range	-200°C to +850°C
Accuracy	0.08°C
Resolution	0.0001°C
Temperature influence	0.04°C/10 K
Long term drift	0.02°C/24 h, 0.1°C/8000 h

Measurement P1000 RTD (3 or 4-wire)

Range	-200°C to +850°C
Accuracy	0.1°C
Resolution	0.0005°C
Temperature influence	0.1°C/10 K
Long term drift	0.05°C/24 h, 0.4°C/8000 h

Measurement Resistance up to 400 Ω

Range	0 Ω to 400 Ω
Accuracy (4-wire)	0.015 Ω
Resolution	0.0002 Ω
Temperature influence	0.01 Ω/10K
Long term drift	10 mΩ/24 h, 20 mΩ/8000 h

Measurement Resistance up to 4000 Ω

Range	0 Ω to 4000 Ω
Accuracy (4-wire)	0.015 Ω
Resolution	0.002 Ω
Temperature influence	0.04 Ω/10K
Long term stability	100 mΩ/24 h, 1500 mΩ/8000 h

Analog/Digital-Conversion

Resolution	24 bit
Sample rate	10 kHz, reduced by averaging to 10 Hz
Conversion method	Sigma Delta
Anti-aliasing filter	500 Hz, 3rd order
Digital filter	IIR, low pass 1st order, 1 Hz, 2 HZ, 5 Hz
Averaging	Configurable or automated according to the selected data rate

Power Supply

Power supply	10 up to 30 VDC, overvoltage and overload protection
Power consumption	approx. 2.5 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

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.