



## Q.bloxx A104

Multi Channel Module for Thermocouples and Voltages



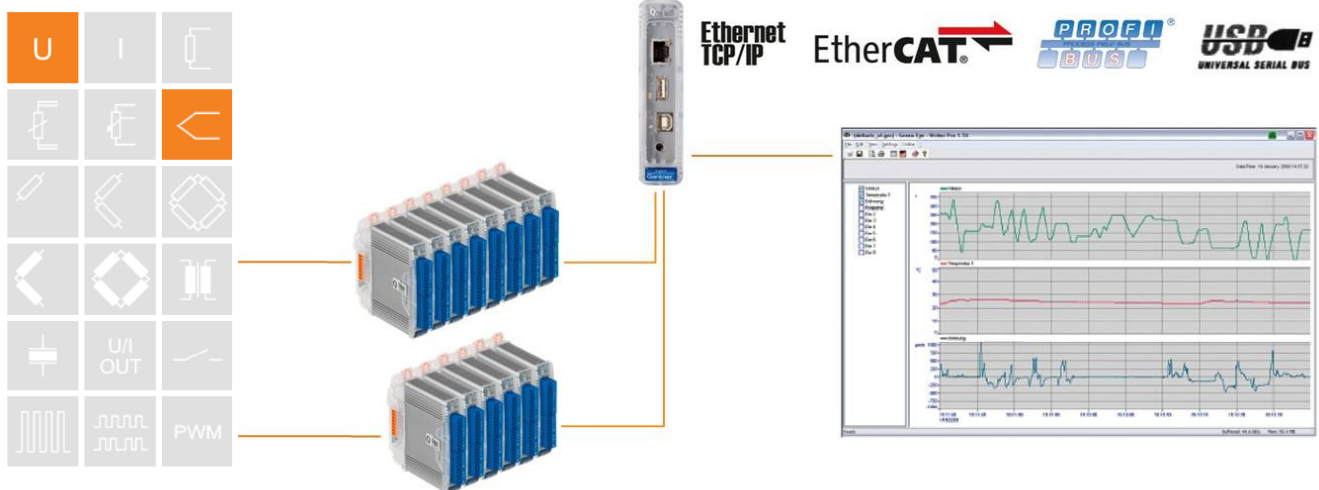
The Q.series has been designed for demanding measurements found in today's most industrial measuring and testing environments. The range of applications starts from single stand-alone solutions up to networked multi-channel applications in the field of component testing, engine testing, process performance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

- **8 galvanic isolated input channels**  
thermocouples and voltages in the range of  $\pm 80$  mV  
Isolation voltage 100 VDC
- **Cold junction compensation**  
good thermal coupling by means of cold junction compensation per connector
- **Dynamic linearization**  
optimized positioning of the interpolation points within the selected range, type B, E, J, K, L N, R, S, T, U
- **High accuracy digitalization**  
24 bit ADC, 100 Hz sample rate per channel,  
sum sample rate 800 Hz
- **Signal conditioning**  
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.gate or Q.pac
- **Galvanic isolation**  
channels to power supply and to interface  
Isolation voltage 500 VDC
- **Electromagnetic Compatibility**  
according EN 61000-4 and EN 55011
- **Accuracy class 0,01**
- **Power supply 10...30 VDC**
- **DIN rail mounting (EN 50022)**

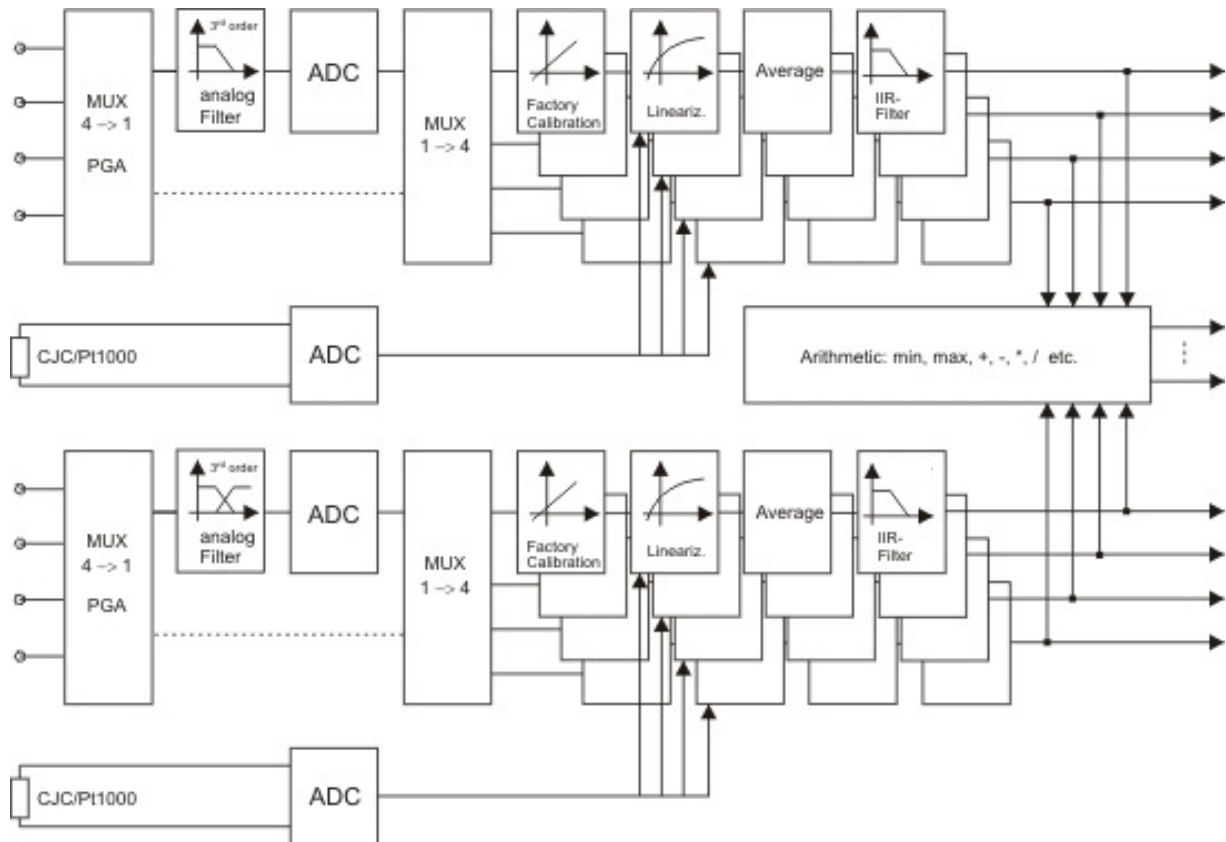




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### Block Diagram



| Analog Inputs         |  |                |                |
|-----------------------|--|----------------|----------------|
| Number                | 8  |                |                |
| Accuracy              | 0.01 % typical   |                |                |
|                       | 0.02 % in controlled environment <sup>1</sup>              |                |                |
|                       | 0.05 % in industrial area <sup>2</sup>                     |                |                |
| Linearity error       | 0.01 % of the final value typical                          |                |                |
| Repeatability         | 0.003 % typical (within 24 h)                              |                |                |
| Input resistance      | >10 MΩ   |                |                |
| Isolation voltage     | 100 VDC permanent channel to channel                       |                |                |
|                       | 500 VDC channels to power supply to interface <sup>3</sup> |                |                |
| Measurement Voltage   |  |                |                |
|                       | Range  | max. Deviation | Resolution     |
|                       | ±80 mV   | ±10 μV         | 320 nV         |
| Long term drift       | <1 μV/24 h; 2.5 μV/8000 h                                  |                |                |
| Temperature influence | on zero  |                | on sensitivity |
|                       | <1 μV/10 K   |                | <0.005 %/10 K  |
| Signal-noise-ratio    | 100 dB at 100 Hz   |                |                |

<sup>1</sup> according EN 61326: 1997, appendix B

<sup>2</sup> according EN 61326: 1997, appendix A

<sup>3</sup> noise pulses up to 1000 VDC, permanent up to 250 VDC



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### Multi Channel Module for Thermocouples and Voltages

| Measurement Thermocouple               | Type  | whole range incl. cold junction compens.            |
|--|---|---|
|  | Type B  | better than $\pm 2.5^{\circ}\text{C}$ <sup>1)</sup> |
|  | Type E, J, K, L, T, U   | better than $\pm 0.5^{\circ}\text{C}$ <sup>1)</sup> |
|  | Type N  | better than $\pm 1^{\circ}\text{C}$ <sup>1)</sup>   |
|  | Type R, S   | better than $\pm 1.5^{\circ}\text{C}$ <sup>1)</sup> |
| Long term drift                        | <0.05°C / 24 h; <0.15°C / 8000 h  |   |
| Temperature influence (Type K)         | on zero   | on sensitivity                                      |
|  | <0.025°C / 10 K   | <0.005 % / 10 K                                     |
| Uncertainty cold junction compensation | <0.3°C  |   |
| <b>Analog/Digital-Conversion</b>       |   |   |
| Resolution                             | 24 bit  |   |
| Sample rate                            | 100 Hz at 8 channels, 400 Hz at 2 active channels, 10 Hz each channel using 50/60 Hz filter |   |
| Conversion method                      | Sigma-Delta   |   |
| Anti-aliasing filter                   | low pass 3 <sup>rd</sup> order per channel (-3 dB at 20 Hz)                                 |   |
| Digital filter                         | variable digital low pass filter 1 <sup>st</sup> order                                      |   |
| Averaging                              | sliding 10 x 10 ms for optimization of the precision (always active)                        |   |
|  | in addition optional filter for mains rejection 50 Hz/60 Hz, measuring rate is 10 Hz        |   |
| <b>Power Supply</b>                    |   |   |
| Power supply                           | 10 up to 30 VDC, overvoltage and overload protection  |   |
| Power consumption                      | approx. 2 W   |   |
| Influence of the voltage               | <0.001 %/V  |   |
| <b>Environmental</b>                   |   |   |
| 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  |   |
| <b>Communication Interface</b>         |   |   |
| 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   |   |

<sup>1)</sup> with activated mains rejection 50 Hz resp. 60 Hz.



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| <b>Mechanical</b>      |                     |
|------------------------|---------------------|
| 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 January 2011. Specification subject to change without notice  
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