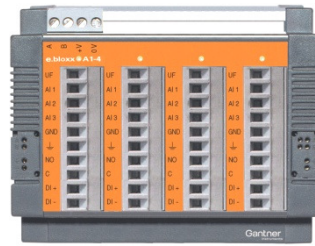


e.bloxx A1-1



e.bloxx A1-4

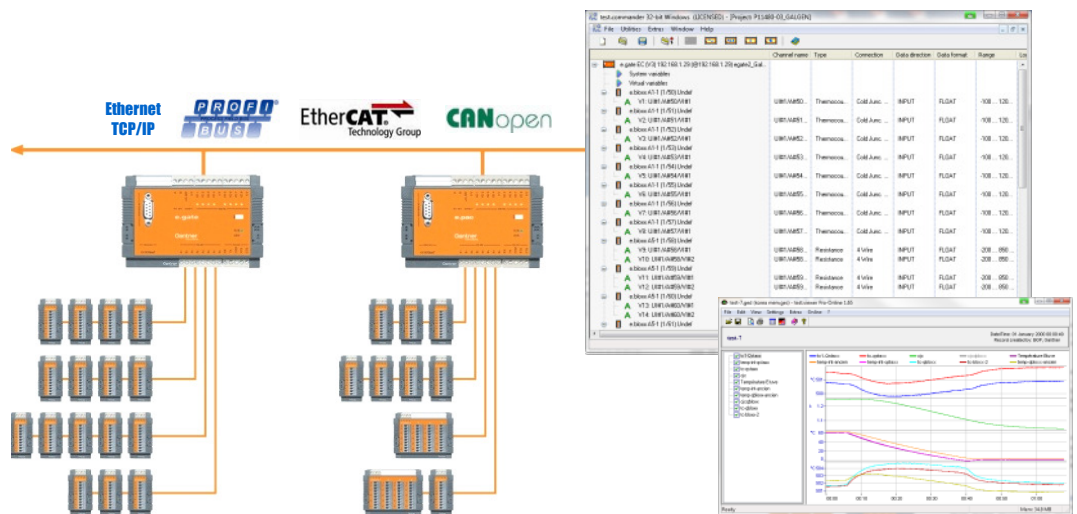
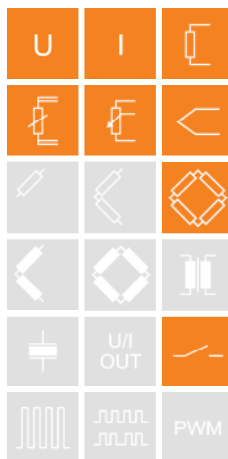
The e.bloxx series is designed for industrial and experimental test systems requiring precise high speed measurement of electrical, thermal, and mechanical quantities in engine and component test beds.

All units are based on a clean modular design, and easily connect to the wide variety of field devices used in today's test beds. Sample rates up to 1000 Hz and resolutions up to 19 bit are possible depending on the module and signal type used. Standardized communication protocols (Profibus-DP and Modbus-RTU) allow the e.bloxx family to work with a wide variety of application hardware and software.

Adding an e.series Test Controller dramatically increases the system's throughput and connectivity options. An e.series Test Controller is a data concentrator, communication gateway, and optionally a Programmable Automation Controller (PAC) with 100Mbps Ethernet, Profibus-DP, EtherCAT, or CANopen.

**Most important features:**

- **Accuracy 0.01**
- **1 or 4 universal analog inputs**  
Voltage, current, resistance, Potentiometer, Pt100, Pt1000, thermocouples, bridges
- **High accuracy digitalization**  
19 bit ADC, 1000 Hz sample rate
- **1 digital input per channel**  
Status, tare, reset peak hold
- **1 solid state relay output per channel**  
Status, alarm, limit value, tolerance band
- **Signal conditioning**  
Linearization, digital filtering, averaging, scaling, minimum/maximum, arithmetic, alarm
- **RS 485 fieldbus interface**  
Profibus-DP, Modbus-RTU, ASCII as well as connectable to any e.series Test Controller
- **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 (EN50022)**



## Analog Input

|               |   |
|---------------|---|
| Accuracy      | 0.01 % typical<br>0.02 % in controlled environment <sup>1</sup><br>0.05 % in industrial area <sup>2</sup> |
| Repeatability | 0.003 % typical (within 24 h)   |

| Measurement | Range | Accuracy | Resolution |
|-------------|-------|----------|------------|
|-------------|-------|----------|------------|

|         |         |         |         |
|---------|---------|---------|---------|
| Voltage | ±10 V   | ±2 mV   | 40 µV   |
|         | ±1 V    | ±0.2 mV | 4 µV    |
|         | ±100 mV | ±20 µV  | 0.4 µV  |
|         | ±10 mV  | ±10 µV  | 0.04 µV |

|                                   |         |       |       |
|-----------------------------------|---------|-------|-------|
| Current<br>(internal shunt 100 Ω) | 4-20 mA | ±4 µA | 80 nA |
|                                   | ±20 mA  | ±4 µA | 80 nA |

|                                 |      |        |        |
|---------------------------------|------|--------|--------|
| Resistance<br>(2, 3 and 4 wire) | 4 kΩ | ±1 Ω   | 0.05 Ω |
|                                 | 2 kΩ | ±0.6 Ω | 0.03 Ω |

|                                       |               |
|---------------------------------------|---------------|
| Potentiometer<br>Permitted resistance | 1 kΩ to 10 kΩ |
|---------------------------------------|---------------|

|                       |                          |         |         |
|-----------------------|--------------------------|---------|---------|
| RTD (2, 3 and 4 wire) | Pt100 (-200 to +850 °C)  | ±0.5 °C | 0.1 °C  |
|                       | Pt100 (-200 to +250 °C)  | ±0.2 °C | 0.01 °C |
|                       | Pt1000 (-200 to +850 °C) | ±1 °C   | 0.1 °C  |
|                       | Pt1000 (-200 to +140 °C) | ±0.3 °C | 0.01 °C |

|               |                       |                   |
|---------------|-----------------------|-------------------|
| Thermocouples | Type B:               | better than ±5 °C |
|               | Type E, J, K, L, T, U | better than ±1 °C |
|               | Type N                | better than ±2 °C |
|               | Type R, S             | better than ±3 °C |

|                                |            |           |          |
|--------------------------------|------------|-----------|----------|
| Bridge<br>(Supply 5 VDC/120 Ω) | ±1000 mV/V | ±1 mV/V   | 50 µV/V  |
|                                | ±200 mV/V  | ±200 µV/V | 10 µV/V  |
|                                | ±20 mV/V   | ±20 µV/V  | 1 µV/V   |
|                                | ±8 mV/V    | ±8 µV/V   | 0.4 µV/V |
|                                | ±2 mV/V    | ±2 µV/V   | 0.1 µV/V |

|                       |                           |        |
|-----------------------|---------------------------|--------|
| Input resistance      | > 10 MΩ                   |        |
| Common mode voltage   | 500 V permanent           |        |
| Linearity deviation   | 0.01 % of the final value |        |
| Signal to noise ratio | voltage measurement       |        |
|                       | 1 kHz                     | 90 dB  |
|                       | 1 Hz                      | 120 dB |

|                       |                 |   |
|-----------------------|-----------------|---|
| Temperature influence | on zero         | 1 µV / 10 K   |
|                       | on sensitivity  | 0.02 % / 10 K   |
|                       | Long-time drift | 1 µV / 24 h; 0.1 µA / 24 h<br>2.5 µV / 8000 h; 0.25 µA / 8000 h |

## Analog/Digital Conversion

|                   |   |
|-------------------|---|
| Resolution        | 19 bit  |
| Sample rate       | 1000 samples/sec for voltage, current<br>potentiometer, bridge  |
|                   | 10 samples/sec for resistance, RTD  |
|                   | 5 samples/sec for thermocouples   |
| Conversion method | Sigma-Delta   |
| Filter            | Anti-aliasing Bessel filter 4 <sup>th</sup> ord. 200 Hz<br>variable digital low pass filter 1 <sup>st</sup> order<br>averaging, sliding averaging |

## Digital In/output

|                           |                     |
|---------------------------|---------------------|
| Input                     | Status, tare, reset |
| Input voltage             | max. 30 VDC         |
| Input current             | max. 1.5 mA         |
| Upper switching threshold | > 10 V (high)       |
| Lower switching threshold | < 2.0 V (low)       |

|                    |                              |
|--------------------|------------------------------|
| Output             | Solid State Relay output     |
| Contact            | Opto – MOSFET                |
| Nominal load       | 60 VDC / 100 mA (ohmic load) |
| Galvanic isolation | 500 V                        |

## Communication Interface

|                      |   |
|----------------------|---|
| Standard             | RS 485, 2-wire  |
| Data format          | 8E1   |
| Protocols            | ASCII, Modbus-RTU, Profibus-DP<br>Local-Bus               |
| Baud rate            | 19.2; 38.4; 57.6; 93.75; 115.2 kBaud                      |
| ASCII and ModBus-RTU | 19.2; 93.75; 187.5; 500; 1500 kBaud                       |
| Profibus-DP          | 19.2; 38.4; 57.6; 93.75; 115.2;<br>187.5; 500; 1500 kBaud |
| Local-Bus            |   |
| Connectable devices  | up to 32  |
| Galvanic isolation   | 500 V   |

## Power Supply

|                          |   |
|--------------------------|---|
| Power supply             | 10 to 30 VDC<br>overvoltage and overload protection |
| Power consumption        |   |
| e.bloxx A1-1             | approx. 1.5 W                                       |
| e.bloxx A1-4             | approx. 6 W   |
| Influence of the voltage | 0.001 %/V   |

## Mechanical

|                                      |                         |
|--------------------------------------|-------------------------|
| Case                                 | Aluminium and ABS       |
| Dimensions (W x H x D)<br>and weight |                         |
| e.bloxx A1-1                         | 45 x 90 x 83 mm, 160 g  |
| e.bloxx A1-4                         | 104 x 90 x 83 mm, 500 g |
| Protective system                    | IP20                    |
| Mounting                             | DIN EN-Rail             |

## Environmental

|                       |  |
|-----------------------|--|
| Operating temperature | -20 °C to +60 °C                       |
| Storage temperature   | -40 °C to +85 °C                       |
| Relative humidity     | 5 % to 95 % at 50 °C<br>non condensing |

## Warm Up Time

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

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

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

Valid from Nov. 2010. Specification subject to change without notice.

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