

# Q.bloxx XL A109

Analog Output Module with Digital I/Os

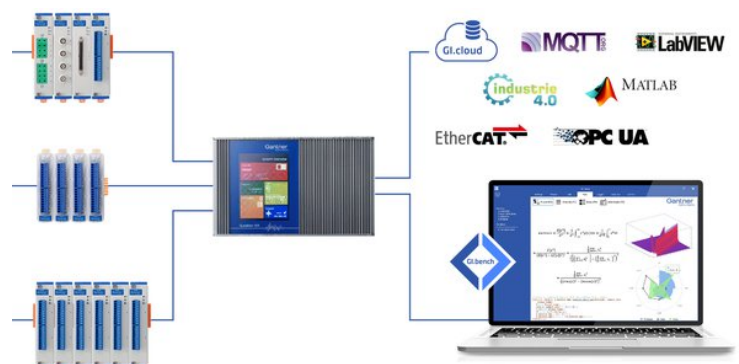
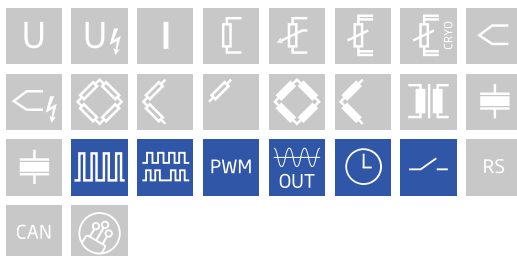
Q.bloxx XL is a new addition to the Q.series product family - the ideal DAQ solution for widely distributed installations that require higher performance and custom sensor terminations. Q.bloxx XL products are packaged in modular, DIN Rail mountable enclosures that easily snap together for system expansion. Flexibility in distribution allows for highly synchronized data that is less prone to noise due to shorter sensor cable runs to the subject.

- RS485 fieldbus interface up to 48 Mbps: LocalBus, up to 115.2 kbps: Modbus-RTU, ASCII
- Connectable to Controller Q.station X
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- Power supply 10 ... 30 VDC
- DIN rail mounting (EN60715)



## Key Features

- 4 Analog output channels  
voltage ( $\pm 10$  VDC) or current (0 - 20 mA), configurable per channel
- DAC-resolution 16 bit  
100 kHz each channel
- Outputs freely scalable
- 4 digital inputs and outputs  
configurable as 2 counter, 2 frequency, or 2 PWM inputs, 4 frequency out, 4 PWM output or 4 state out
- Frequency measurement  
Frequency measurement up to 1 MHz, direction detection
- Counter  
Forward-backward counter, quadrature counter with reference position recognition (reset/enable), up to 1 MHz
- PWM input  
Measurement of duty cycle and frequency
- 3-Way galvanic isolation  
500 VDC channel to channel, channel to power supply, and bank



### Technical Data

#### Analog Output

|                   |  |
|-------------------|--|
| Channels          | 4  |
| Accuracy          | 0.02 % typical   |
| Output type       | voltage or current, configurable per channel                           |
| Isolation voltage | 500 VDC channel to channel to power supply channel to bus <sup>1</sup> |

<sup>1</sup> noise pulses up to 1000 VDC, continuous up to 250 VDC

#### Output Mode Voltage

|                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| Output voltage            | ±10 VDC                   |                           |
| Allowable load resistance | >2 kΩ                     |                           |
| Long-term drift           | <1 mV / 24 hrs            | <2.5 mV / 8000 hrs        |
| Temperature influence     | <2 mV / 10 K Offset drift | <0.05 % / 10 K Gain drift |
| Noise voltage             | <10 mV at 1000 Hz         | < 2 mV at 10 Hz           |

#### Current Output

|                     |                           |                           |
|---------------------|---------------------------|---------------------------|
| Output current      | 0 - 20 mA                 |                           |
| Load burden         | <400 Ω                    |                           |
| burden influence    | <0.1 μA / Ω               |                           |
| Long-term stability | <2 μA / 24 hrs            | <5 μA / 8000 hrs          |
| Temperature drift   | <4 μA / 10 K Offset drift | <0.05 % / 10 K Gain drift |
| Noise current       | <20 μA at 1000 Hz         | <4 μA at 10 Hz            |

#### Digital Input

|                      |   |
|----------------------|---|
| Channels             | 4   |
| Logic levels         | TTL or 24 VDC according to IEC 61131-2, Type 1                              |
| TTL logic voltage    | < 0.8 VDC (Low)<br>> 3 VDC (High)   |
| 24 VDC logic voltage | -3 to 5 VDC (Low)<br>11 to 30 VDC (High)                                    |
| Input type           | PNP (current sinking)   |
| Input voltage        | 30 VDC max.   |
| Input current        | 2 mA max.   |
| Isolation voltage    | 500 VDC, group to group, group to power supply, channel to bus <sup>1</sup> |

<sup>1</sup> noise pulses up to 1000 VDC, continuous up to 250 VDC

### Digital Input Modes

|                                |   |
|--------------------------------|---|
| <b>Status</b>                  |   |
| Response time                  | 10 µs   |
| <b>Frequency measurement</b>   |   |
| Method                         | Chronos method (optimized by a combination of time measurement and pulse counting), detection of rotational direction (0 deg. / 90 deg.)  |
| Frequency range                | 0.1 Hz to 1 MHz   |
| Time base                      | 0.001 s to 1 s  |
| Internal reference frequency   | 48 MHz  |
| Accuracy                       | 0.01% at timebase > 1ms   |
| Resolution                     | 21 ns   |
| <b>Pulse counting</b>          |   |
| Accuracy                       | 0.01% at timebase > 1ms   |
| Resolution                     | 21 ns   |
| Counter frequency              | 1 MHz   |
| Mode(s) of operation           | <ul style="list-style-type: none"> <li>- Forward and reverse counting (additional input for direction of counting)</li> <li>- Quadrature counter (additional input for detection of rotational direction)</li> <li>- Quadrature counter with zero reference and reset/enable (two additional inputs)</li> </ul> |
| <b>Pulse-width measurement</b> |   |
| Input frequency                | 0.1 Hz to 1 MHz   |
| Accuracy                       | 0.01% at timebase > 1ms   |
| Resolution                     | 21 ns   |

### Digital Output

|                   |   |
|-------------------|---|
| Channels          | 4   |
| Contact           | open drain p-channel MOSFET   |
| Output voltage    | 12 to 30 VDC (external supply required)                                     |
| Load capacity     | 30 VDC / 500 mA (ohmic load)  |
| Isolation voltage | 500 VDC, group to group, group to power supply, channel to bus <sup>1</sup> |

<sup>1</sup> noise pulses up to 1000 VDC, continuous up to 250 VDC

### Digital Output Modes

|                  |                 |   |                 |                  |
|------------------|-----------------|---|-----------------|------------------|
| Status           |                 |   |                 |                  |
|                  | Response time   | 10 μs (>0.5 A)  | 100 μs (>0.1 A) | 1000 μs (<0.1 A) |
| Frequency output |                 |   |                 |                  |
|                  | Frequency range | 0.1 Hz to 1 kHz / 10 kHz (depending on load capacity) |                 |                  |
|                  | Accuracy        | 0.1 %   |                 |                  |
|                  | Resolution      | 1 μs  |                 |                  |
| PWM output       |                 |   |                 |                  |
|                  | Frequency range | 0.1 Hz to 1 kHz / 10 kHz (depending on load capacity) |                 |                  |
|                  | Accuracy        | 0.1 %   |                 |                  |
|                  | Resolution      | 1 μs  |                 |                  |

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## Digital to Analog Conversion

|               |                     |
|---------------|---------------------|
| Resolution    | 16-bit              |
| Update rate   | 100 kHz per channel |
| Settling time | 3 $\mu$ s           |

## Communication Interface Localbus

|                     |  |
|---------------------|--|
| Protocols           | proprietary Localbus (115200 bps to 48 Mbps, latency <100 ns)<br>ASCII (19200 bps to 115200 bps)<br>Modbus RTU |
| Data format         | 8E1  |
| Electrical standard | ANSI/TIA/EIA-485-A, 2-wire   |

## Input Power

|                         |  |
|-------------------------|--|
| Input voltage           | 10 to 30 VDC, overvoltage and overcurrent protection |
| Power consumption       | 2 W (approx.)  |
| Input voltage influence | <0.001 % / V   |

## Environmental Specifications

|                               |                                       |
|-------------------------------|---------------------------------------|
| Electromagnetic compatibility | according to IEC 61000-4 and EN 55011 |
| Operating temperature         | -20°C to +60°C                        |
| Storage temperature           | -40°C to +85°C                        |
| Relative humidity             | 5 - 95 % at 50°C (non-condensing)     |

## Remarks

Validity of all listed specifications are subject to a warm-up period of at least 45 minutes

Specifications subject to change without notice

## Mechanical information

|                          |                  |
|--------------------------|------------------|
| Material                 | Aluminum and ABS |
| Measurements (W x H x D) | 30x 145 x 135mm  |
| Weight                   | approx. 500 g    |

## Ordering Information

|                |        |
|----------------|--------|
| Article number | 495632 |
|----------------|--------|

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