# Q.brixx XL A109

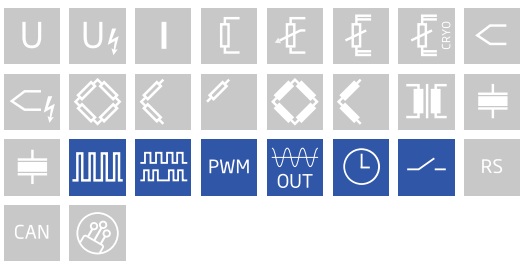
## Analog Output Module with Digital I/Os

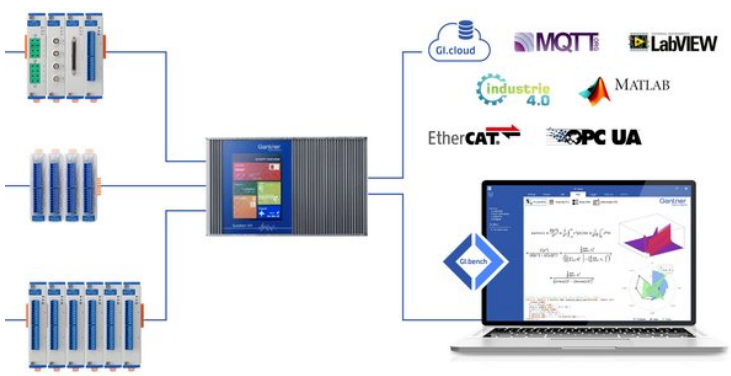
Q.brixx XL is a new addition to the Q.series product family - the ideal DAQ solution for on-the-go applications requiring higher performance in potentially harsh environments. Q.brixx XL DAQ systems consist of up to 16 measurement modules and an integrated, high-performance controller for communication, control, and data logging purposes, all within a robust aluminum housing capable of withstanding severe shock and vibration without sacrificing performance.

- High density and flexibility with16 modules in one system in any constellation
- Connectable to Controller Q.station
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- Power supply 10 ... 30 VDC


## Key Features

- **4 Analog output channels**
  voltage (±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



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## Analog Output Module with Digital I/Os

## 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 [1] |

[1] 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 [1] |

[1] noise pulses up to 1000 VDC, continuous up to 250 VDC

## Digital Input Modes

| | |
|---|---|
| **Status** | |
| Response time | 10 µs |
| **Frequency measurement** | |
| 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 |
| **Pulse counting** | |
| Accuracy | 0.01% at timebase > 1ms |
| Resolution | 21 ns |
| Counter frequency | 1 MHz |
| Mode(s) of operation | - Forward and reverse counting (additional input for direction of counting)<br>- Quadrature counter (additional input for detection of rotational direction)<br>- Quadrature counter with zero reference and reset/enable (two additional inputs) |
| **Pulse-width measurement** | |
| 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 [1] |

[1] 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 | | |

# Q.brixx XL A109

## Analog Output Module with Digital I/Os

### Digital to Analog Conversion

| | |
|---|---|
| Resolution | 16-bit |
| Update rate | 100 kHz per channel |
| Settling time | 3 µs |

### 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 |
| Measurements (W x H x D) | 30x 137 x 135mm |
| Weight | approx. 500 g |

### Ordering Information

| | |
|---|---|
| Article number | 523523 |

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