

# Q.staxx A101

## Universal Measurement Module

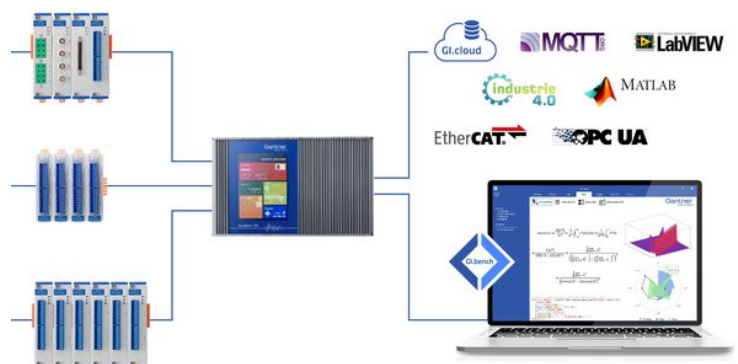
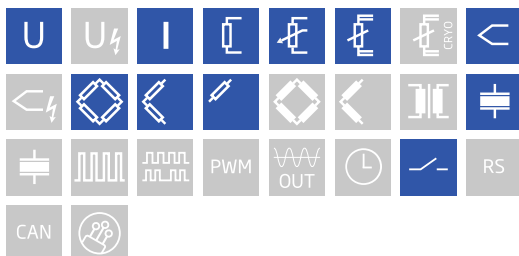
Q.staxx brings the high precision and performance of Q.bloxx into robust, pallet mount, cast aluminum (IP65) Harting enclosures - the ideal solution for extremely harsh test cell environments. Q.staxx modules are interchangeable and can be mounted directly onto pallet systems since the passive backplane does not require fans, filters or environmental conditioning further reducing setup time as sensors can remain fixed to an engine while the pallet transitions between test cells and measurement requirements.

- IP 65 (Dust Protected and water jet tested)
- Robust design for Pallet Systems
- Connectable to any Controller, e. g. Q.gate or Q.pac
- Power supply 10 ... 30 VDC

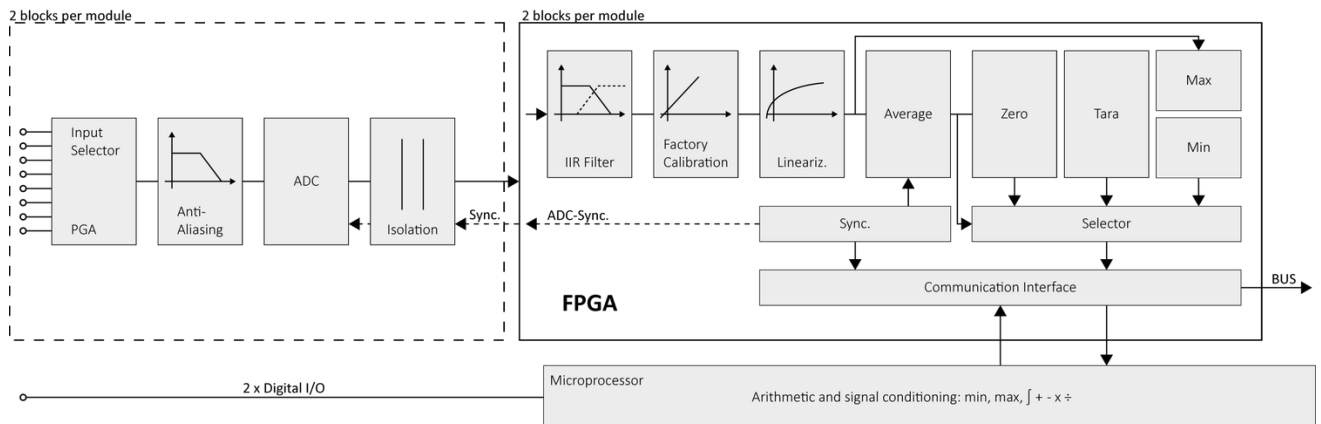


### Key Features

- 2 Universal analog input channels  
Voltage, current, resistance, potentiometer, RTD, thermocouple, strain gage (full-, half-, and quarter-bridge configuration), IEPE
- High-accuracy digitization  
24-bit ADC, 100 kHz sample rate per channel
- 2 Digital inputs or outputs  
Status, trigger, tare, alarm, command
- Signal conditioning  
16 virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- 3-Way galvanic isolation  
500 VDC channel to channel, channel to power supply, and bank

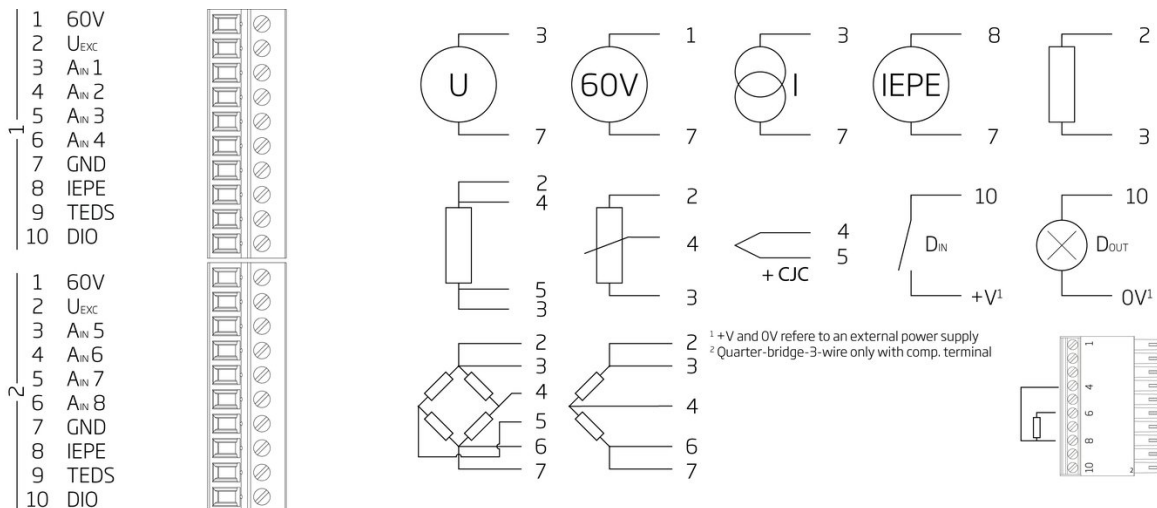


### Block diagram



### Technical Data

#### Terminal assignment



### Analog Input

|                   |                                                                        |
|-------------------|------------------------------------------------------------------------|
| Channels          | 2                                                                      |
| Accuracy          | 0.01 % typical                                                         |
|                   | 0.025 % in controlled environment <sup>1</sup>                         |
|                   | 0.05 % in industrial area <sup>2</sup>                                 |
| Linearity error   | 0.01 % typical full-scale                                              |
| Repeatability     | 0.003 % typical (within 24 h)                                          |
| Isolation voltage | 500 VDC channel to channel to power supply channel to bus <sup>3</sup> |

<sup>1</sup> according to EN 61326 2006: appendix B

<sup>2</sup> according to EN 61326 2006: appendix A

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

### Measurement Mode Voltage

|                                            |                  |             |                   |
|--------------------------------------------|------------------|-------------|-------------------|
|                                            | Range            | max. Error  | Resolution        |
|                                            | ±60 V            | ±15 mV      | 7.2 µV            |
|                                            | ±10 V            | ±2 mV       | 1.2 µV            |
|                                            | ±1 V             | ±200 µV     | 120 nV            |
|                                            | ±100 mV          | ±20 µV      | 12 nV             |
| Input impedance > 10 MΩ                    | Range ±10 V      | Range ±60 V |                   |
|                                            | > 1 MΩ           | > 3 MΩ      |                   |
| Long-term drift at input range ± 1 V       | < 20 µV / 24 h   |             | < 200 µV / 8000 h |
| Temperature influence at input range ± 1 V | Offset drift     |             | Gain drift        |
|                                            | < 50 µV / 10 K   |             | < 0.01 % / 10 K   |
| Signal-to-noise ratio                      | > 90 dB at 1 kHz |             | > 120 dB at 1 Hz  |

### Measurement Mode Current

|                              |                 |            |                  |
|------------------------------|-----------------|------------|------------------|
| Error                        | Range           | max. Error | Resolution       |
| Internal shunt resistor 50 Ω | ±25 mA          | ±5 µA      | 3.0 nA           |
| Long-term drift              | < 0.5 µA / 24 h |            | < 5 µA / 8000 h  |
| Temperature influence        | Offset drift    |            | Gain drift       |
|                              | < 1 µA / 10 K   |            | < 0.025 % / 10 K |

### Measurement Mode Resistance / RTD

|                           |                            |            |                  |
|---------------------------|----------------------------|------------|------------------|
| Error                     | Range                      | max. Error | Resolution       |
| Resistance, 2-wire        | 100 kΩ                     | ±100 Ω     | 12 mΩ            |
| Resistance, 2- and 4-wire | 4 kΩ                       | ±1 Ω       | 0.5 mΩ           |
| Resistance, 2- and 4-wire | 400 Ω                      | ±0.1 Ω     | 48 µΩ            |
| Pt100, 2- and 4-wire      | -200 to +850°C             | ±0.25°C    | 0.2 m°C          |
| Pt1000, 2- and 4-wire     | -200 to +850°C             | ±1°C       | 0.2 m°C          |
| Long-term drift           | < 0.01°C / 24 h            |            | < 0.1°C / 8000 h |
| Temperature influence     | Offset drift (range 400 Ω) |            | Gain drift       |
|                           | < 10 mΩ / 10 K             |            | < 0.025 % / 10 K |

### Measurement Mode Potentiometer, Relative Measurement

|                                    |                        |  |                  |
|------------------------------------|------------------------|--|------------------|
| Allowable potentiometer resistance | 1 kΩ to 10 kΩ          |  |                  |
| Long-term drift                    | < 0.01 % / 24 h        |  | < 0.1 % / 8000 h |
| Temperature influence              | Offset drift (Range 1) |  | Gain drift       |
|                                    | < 0.0001 / 10 K        |  | < 0.02 % / 10 K  |

### Measurement Mode Bridge

|                         |                                                                                       |                         |                |
|-------------------------|---------------------------------------------------------------------------------------|-------------------------|----------------|
| Bridge configuration(s) | half- and full-bridge, (5-/6-wire), quarter-bridge with completion terminal, (3-wire) |                         |                |
| Accuracy class          | 0.05                                                                                  |                         |                |
| Bridge resistance       | >100 $\Omega$                                                                         |                         |                |
| Bridge excitation       | 2.5 VDC, nominal                                                                      |                         |                |
| Measurement range       | $\pm 2.4$ mV/V                                                                        | $\pm 20$ mV/V           | $\pm 500$ mV/V |
| Long-term drift         | <0.12 $\mu$ V/V / 24 h                                                                | <1.2 $\mu$ V/V / 8000 h |                |
| Temperature influence   | Offset drift (Range 2.4 mV/V)                                                         |                         | Gain drift     |
|                         | <0.2 $\mu$ V/V / 10 K                                                                 |                         | <0.05 % / 10 K |

### Measurement Mode Thermocouple

|                                             |               |                  |                                          |                                 |
|---------------------------------------------|---------------|------------------|------------------------------------------|---------------------------------|
| Deviation in the relevant Temperature range | Type          | Range            | Adjusted with cold junction compensation | Not adjusted, with CJC terminal |
|                                             | Type B        | 400°C to 1820°C  | < ±1.5 °C                                | < ±2.5°C                        |
|                                             | Type E, J, K  | -100 to 1000°C   | < ±0.7°C                                 | < ±1.2°C                        |
|                                             | Type E        | -270°C to 1000°C | < ±1°C                                   | < ±1.2°C                        |
|                                             | Type K        | -270°C to 1372°C | < ±1°C                                   | < ±1.2°C                        |
|                                             | Type L        | -200°C to 900°C  | < ±0.7°C                                 | < ±1.2°C                        |
|                                             | Type N        | -100°C to 1000°C | < ±0.7°C                                 | < ±1.2°C                        |
|                                             | Type N        | -270°C to 1300°C | < ±1°C                                   | < ±1.2°C                        |
|                                             | Type R, S     | -50°C to 1768°C  | < ±1.2°C                                 | < ±1.5°C                        |
|                                             | Type T, U     | -100°C to 400°C  | < ±0.7°C                                 | < ±1.2°C                        |
|                                             | Type T        | -270°C to 400°C  | < ±1°C                                   | < ±1.2°C                        |
| Input impedance                             | > 10 MΩ       |                  |                                          |                                 |
| Long-term drift                             | <0.1°C / 24 h |                  | <0.2°C / 8000 h                          |                                 |
| Temperature influence                       | Offset drift  |                  | Gain drift                               |                                 |
|                                             | <0.1°C / 10 K |                  | <0.02% / 10 K                            |                                 |
| Uncertainty CJC                             | <0.3°C        |                  |                                          |                                 |

### Measurement Mode IEPE Sensor

|                       |                           |             |                 |
|-----------------------|---------------------------|-------------|-----------------|
| Error                 | Range                     | max. Error  | Resolution      |
|                       | $\pm 10$ V                | $\pm 10$ mV | 1.2 $\mu$ V     |
|                       | $\pm 1$ V                 | $\pm 1$ mV  | 120 nV          |
| Supply                | constant current 4 mA     |             |                 |
| Input frequency range | 0.5 Hz to 10 kHz          |             |                 |
| Temperature influence | Offset drift (range 10 V) |             | Gain drift      |
|                       | <10 $\mu$ V / 10 K        |             | <0.025 % / 10 K |

### Analog to Digital Conversion

|                      |                                                                                                                                                                                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resolution           | 24-bit                                                                                                                                                                          |
| Update rate          | 100 kHz (measurement thermocouple 8 Hz)                                                                                                                                         |
| Modulation method    | Sigma-Delta                                                                                                                                                                     |
| Anti-aliasing filter | 20 kHz, 3rd order                                                                                                                                                               |
| Digital filters      | Infinite impulse response (IIR), low-pass, high-pass, band-pass, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 10 kHz (adjustable via software) |
| Averaging            | configurable or automatic according to the selected data rate                                                                                                                   |

### Digital In-/Outputs

|                               |                               |
|-------------------------------|-------------------------------|
| Channels                      | 2 (1 digital I/O per channel) |
| Response time                 | 0.2 ms                        |
| Input                         | status, tare, reset           |
| Input voltage / input current | max. 30 VDC / max. 0,5 mA     |
| Lower / upper threshold       | < 2.0 V (low) / > 10 V (high) |
| Output                        | status, alarm                 |
| Contact                       | open drain p-channel MOSFET   |
| Load capacity                 | 30 VDC / 100 mA (ohmic load)  |

### Communication Interface

|                     |                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protocols           | proprietary Localbus (115200 bps to 24 Mbps, latency < 100 ns)<br>ASCII (19200 bps to 115200 bps)<br>Modbus RTU<br>Profibus-DP (19200 bps to 12 Mbps) (special Firmware required) |
| Data format         | 8E1                                                                                                                                                                               |
| Electrical standard | ANSI/TIA/EIA-485-A, 2-wire                                                                                                                                                        |

### Power Supply

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

### Environmental

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

### Remarks

|              |                                                                                              |
|--------------|----------------------------------------------------------------------------------------------|
| Warm-up time | Validity of all listed specifications are subject to a warm-up period of at least 45 minutes |
|              | Specifications subject to change without notice                                              |

# Q.staxx A101

Universal Measurement Module

## Mechanical information

|                          |                   |
|--------------------------|-------------------|
| Material                 | Aluminum          |
| Measurements (W x H x D) | 45 x 120 x 113 mm |
| Weight                   | approx. 700 g     |

## Ordering Information

|                |        |
|----------------|--------|
| Article number | 171627 |
|----------------|--------|

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