

# Q.raxx slimline RS D101 -16

## Digital Measurement Module

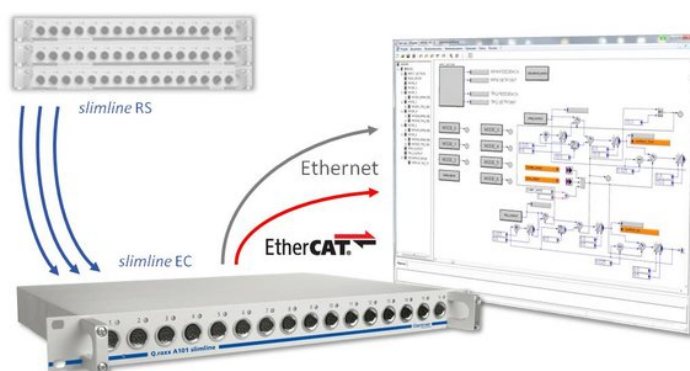
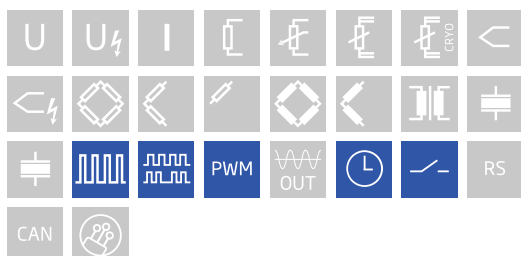
Q.raxx slimline RS is Q.series' highest density 19" 1U rackmount DAQ system - the ideal solution for boom box installations or applications that require maximum channel density and custom sensor terminations. Q.raxx slimline RS DAQ systems utilize an external high-performance controller for communication, control, and data logging purposes. Multiple systems can be synchronized to each other allowing for efficient DAQ distribution with low jitter and gradual expansion up to thousands of channels. In addition to available variations, the Q.raxx slimline RS is fully customizable to your specific measurement needs.

- RS485 fieldbus interface up to 24 Mbps
- Rack standard, 1 high unit (1 HU)
- Power supply 10 up to 30 VDC
- Connectable to any Controller, e. g. Q.gate or Q.pac



### Key Features

- **12 digital inputs and 4 digital outputs**  
configurable as counter, frequency, PWM and time inputs, frequency or PWM output, state in or output
- **State in and output**  
process- and host controlled
- **Frequency in and output**  
frequency measurement up to 1 MHz (Chronos method), frequency output up to 10 kHz
- **Counter**  
for/backward counter, quadrature counter with reference zero recognition and missing teeth detection, up to 1 MHz
- **PWM in and output**  
measurement of duty cycle and frequency, output with variable frequency and/or duty cycle
- **Time measurement**
- **Galvanic isolation**  
I/O-signals ( 4 x 4 I/Os) to power supply and to interface  
Isolation voltage 500 VDC



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## Technical Data

### Digital Inputs

|                      |   |
|----------------------|---|
| Channels             | 8   |
| 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 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

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### Function Digital Inputs

|   |   |
|---|---|
| Status  |   |
| Response time   | 10 µs   |
| 8-fold bit set  | specification such as simple state-input, but the binary coded information of 8 inputs can be transmitted as a single variable. This functionality covers all 8 inputs even if they are already used by other functionalities such as counter or frequency measurement. in case of a conflict the Bit-Set is lower prior. |
| Frequency measurement   |   |
| Method  | Chronos<br>optimized by combination of the time measurement and pulse counting,<br>recognition of direction of rotation (0 deg./90 deg.)  |
| Frequency range   | 0.1 Hz to 1 MHz   |
| Time base   | 0.001 s to 10 s   |
| Reference frequency   | 48 MHz  |
| Accuracy  | 0.01% at timebase > 1ms (-20°C to +60°C)  |
| Frequency measurement with recognition of direction of rotation | specification like frequency measurement, for the recognition of the rotation direction the phasing of both inputs is being used  |
| Pulse counting  |   |
| Counter depth   | 32-bit (±31-bit)  |
| Counter frequency   | max. 1 Mhz  |
| Forward and reverse counting                                    | with an additional input for the direction of counting  |
| Quadrature counter  | with an additional input for the direction recognition for phasing the inputs   |
| Quadrature counter with zero reference and reset/enable         | like quadrature counter but with two additional inputs for the 0-reference recognition and enabling the 0-reference recognition   |
| PWM measurement (duty cycle)                                    |   |
| Input frequency   | 0.1 Hz to 1 MHz   |
| Accuracy  | 0.01% Freq < 2 kHz, 0.1% 2 kHz to 20 kHz, 3% > 20 kHz (-20°C to +60°C)  |
| Resolution  | 21 ns   |

With a D101 - 2 x 4 terminals for digital inputs are available. Those will accept all mentioned signals as it required. The following combinations are possible.

| Connector 1  |              |   |              | Connector 2  |              |                               |              |
|--|--------------|---|--------------|--|--------------|-------------------------------|--------------|
| Terminal 1.6   | Terminal 1.7 | Terminal 1.8  | Terminal 1.9 | Terminal 2.6   | Terminal 2.7 | Terminal 2.8                  | Terminal 2.9 |
| Status   | Status       | Status  | Status       | Status   | Status       | Status                        | Status       |
| 1 ch. signal   | Status       | 1 ch. signal  | Status       | 1 ch. signal   | Status       | 1 ch. signal                  | Status       |
| Status   | Status       | Status  | Status       | Status   | Status       | 2 channel signal <sup>1</sup> |              |
| Status   | Status       | Status  | Status       | 2 channel signal <sup>1</sup>  |              | 2 channel signal <sup>1</sup> |              |
| Status   | Status       | Status  | Status       | 4 channel signal <sup>2</sup>  |              |                               |              |
| Status   | Status       | 2 channel signal <sup>1</sup>   |              | 2 channel signal <sup>1</sup>  |              | 2 channel signal <sup>1</sup> |              |
| Status   | Status       | 2 channel signal <sup>1</sup>   |              | 4 channel signal <sup>2</sup>  |              |                               |              |
| 2 channel signal <sup>1</sup>  |              | 2 channel signal <sup>1</sup>   |              | 4 channel signal <sup>2</sup>  |              |                               |              |
| 2 channel signal <sup>1</sup>  |              | 2 channel signal <sup>1</sup>   |              | 2 channel signal <sup>1</sup>  |              | 2 channel signal <sup>1</sup> |              |
| 4 channel signal <sup>2</sup>  |              |   |              | 4 channel signal <sup>2</sup>  |              |                               |              |
| <sup>1</sup> All digital functionalities except status and quadrature counter with zero reference and reset/enable |              |   |              | <sup>2</sup> Quadrature counter with zero reference and reset/enable |              |                               |              |
| Time measurement   |              |   |              |  |              |                               |              |
| Function   |              | Measuring of time between two edges, measuring of high time, low time and high/low relation |              |  |              |                               |              |

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|            |                   |
|------------|-------------------|
| Time range | 1 $\mu$ s to 32 s |
| Resolution | 21 ns             |

### Digital Outputs

|                |                              |
|----------------|------------------------------|
| Channels       | 8                            |
| Output voltage | 12 V to 30 VDC               |
| Load capacity  | 30 VDC / 500 mA (ohmic load) |
| Contact        | open drain p-channel MOSFET  |

### Function Digital Outputs

|   |  |             |              |
|---|--|-------------|--------------|
| Status  |  |             |              |
| Response time<br>(depending on load capacity) | >0.5 A   | >0.1 A      | <0.1 A       |
|   | 10 $\mu$ s   | 100 $\mu$ s | 1000 $\mu$ s |
| 8-fold bit set                                | specification such as simple state-output, but the binary coded information of 8 outputs can be transmitted as a single variable. This functionality covers all 8 outputs even if they are already used by other functionalities such as counter or frequency measurement. in case of a conflict the Bit-Set is lower prior. |             |              |
| Frequency output                              |  |             |              |
| Frequency range                               | 0.1 Hz to 1 kHz / 10 kHz depending on load capacity  |             |              |
| Accuracy                                      | 0.1 %  |             |              |
| Resolution                                    | 1 $\mu$ s  |             |              |
| PWM output                                    |  |             |              |
| Frequency range                               | 0.1 Hz to 1 kHz / 10 kHz depending on load capacity  |             |              |
| Accuracy                                      | 0.1 %  |             |              |
| Resolution                                    | 1 $\mu$ s  |             |              |

### 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 |

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### 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  |

### Mechanical information

|                          |                      |
|--------------------------|----------------------|
| Type                     | 19" Standard, 1 Unit |
| Measurements (W x H x D) | 444 x 44 x 260 mm    |
| Weight                   | approx. 2000 g       |

### Ordering Information

|                |        |
|----------------|--------|
| Article number | 110822 |
|----------------|--------|

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