

STRAIN GAUGE AMPLIFIER IO-LINK



IO-Link

 AMPLIFIERType: **EMMA**

- 1 STRAIN GAUGE FULL BRIDGE
- IO-LINK · 16 BIT
- RECORDS ITS LOAD SPECTRUM
- IP65 · POTTED ELECTRONICS



IO-Link



IP65



M12

KEY DATA

Input	1 strain gauge full bridge
Bridge resistance	min. 350 Ω
Measuring range	freely adjustable within -32000 ... +32000
Output	IO-Link
Resolution	16 bit
Bridge supply	3 V DC
Accuracy	0.05 % of range
Housing	PBT GF30 black · at least IP65
Dimensions	72 × 28 × 35 mm without electrical connection
Load spectrum	operating hours per load band, stored in the device

The amplifier is delivered unconfigured; range and filter are set over IO-Link.



OVERVIEW

For force and pressure measurement with a strain gauge bridge, wherever the value should reach the controller over IO-Link instead of an analogue chain. The amplifier leaves the factory unconfigured: range, switch-off threshold, smoothing and pre-filter are set over the bus. It then reports the measured value together with its head temperature and four status bits. On top, it records a load spectrum in the device: it counts the operating hours per load band, from below 0 % to above 100 % of the observation range, and per head temperature. Over IO-Link it can be read at any time how long the measuring point has worked in which load band.

INPUT AND MEASUREMENT

- 1 strain gauge full bridge, 3 V supply
- min. 350 Ω bridge resistance
- range -32000 ... +32000, freely adjustable
- resolution 16 bit
- accuracy 0.05 % of range
- load spectrum stored in the device

OUTPUT AND SUPPLY

- IO-Link, 0/24 V signal level
- head temperature in the process data
- 4 status bits, overload among them
- response time 20 ms, smoothing 0 ... 60 s
- 24 V DC · < 30 mA
- operating hours per head temperature



TECHNICAL DATA

INPUT AND MEASUREMENT

Sensor type	strain gauge full bridge
Bridge supply	3 V DC
Bridge resistance	min. $1 \times 350 \Omega$ for 1 full bridge · min. $2 \times 700 \Omega$ for 2 full bridges
Further full bridges	possible, the minimum resistance rises accordingly
Measuring range	freely adjustable within $-32000 \dots +32000$
Measuring unit	unitless, others on request
Resolution	16 bit

PRECISION

Accuracy	max. 0.05 % of range + sensor error
Filter setting	0.5 s
Switch-on delay	< 5 s
Response time	20 ms

ENVIRONMENT AND MECHANICS

Operating temperature	$-20 \dots +80 \text{ }^{\circ}\text{C}$
Storage temperature	$-20 \dots +85 \text{ }^{\circ}\text{C}$
Housing	PBT GF30, black (other colours on request) · UL94 HB
Dimensions	$72 \times 28 \times 35 \text{ mm}$ without connectors · approx. 95 mm with M12 connectors
Mounting	$4 \times \varnothing 4.6 \text{ mm}$, $45.5 \times 26 \text{ mm}$ · any fitting position
Weight	60 g

FUNCTIONS

Load spectrum	operating hours per load band: < 0, 0 ... 5, 5 ... 50, 50 ... 75, 75 ... 100, > 100 % of the observation range · stored in the device
Temperature spectrum	operating hours per head temperature: < 60, 60 ... 70, 70 ... 80, > 80 °C
Process data	measured value · head temperature in $0.1 \text{ }^{\circ}\text{C}$ · 4 status bits
Status bits	overload switch-off threshold reached · signal < -0.5 · sensor > 100 % load · head temperature > $85 \text{ }^{\circ}\text{C}$
Switch-off threshold	freely adjustable $-32000 \dots +32000$; sets the status bit only, the amplifier itself never switches off
Diagnosis	current and maximum load in % FSO · maximum value · maximum head temperature
Operating hours	in total · since the last archiving · since the reset of the observation
Archive	10 archive records for operating hours, TAG number, facility and site

OUTPUTS AND INTERFACES

Interface	IO-Link
Signal level	0/24 V as per IO-Link specification
Connection to sensor	M12x1 socket, 5-pole · cable 2 m
Connection to evaluation	M12x1 plug, 4-pole
Cable length	max. 2 m to the sensor element · max. 20 m to the IO-Link master

DISPLAY AND OPERATION

Operation	over IO-Link (IODD), no display on the device
Factory setting	unconfigured measuring amplifier
Signal smoothing	0 ... 60 s in steps of 0.1 s
Pre-filter	special pre-filtering on / off

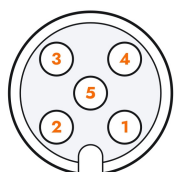
POWER SUPPLY

Supply voltage	24 V DC
Current consumption	< 30 mA · switching current (SIO) max. 100 mA · total max. 130 mA
Reverse voltage protection	yes (no function, no damage)



ELECTRICAL CONNECTION

Electrical connection sensor · M12x1 socket, 5-pole



1	U+	bridge supply · brown
2	S+	signal · white
3	U-	GND · blue
4	S-	signal · black
5	—	not used

M12x1 socket to the sensor, 5-pole · front view, notch at the bottom

Electrical connection IO-Link · M12x1 plug, 4-pole

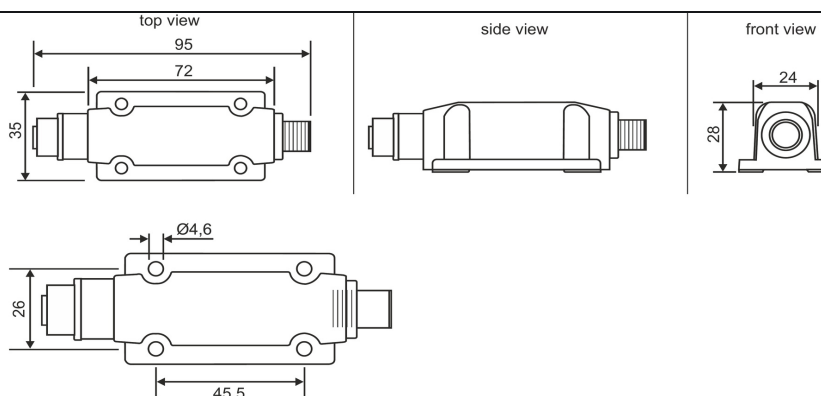


1	U+	supply + · 24 V DC
3	U-	supply –
4	C/Q	IO-Link communication

M12x1 plug to the evaluation (IO-Link master), 4-pole

Sensor side: the sensor's 5-pole M12x1 plug into the socket, wire colours of the 4-pole cable (2 m), cable length max. 2 m. IO-Link side: the 4-pole M12x1 socket of the IO-Link master onto the plug, cable length max. 20 m. The product label of the specific device always applies. Type designation: EPG-IO.

DIMENSIONS (mm)



Below: mounting, 4 holes Ø 4.6 mm, 45.5 × 26 mm. Approx. 95 mm long with the M12 connectors.

COMPLIANCE AND CERTIFICATION



CE

EMC tested to EN 61000-6-2:2005 and EN 61000-6-4:2007 + A1:2011



IO-Link

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signal level 0/24 V as per IO-Link specification



IP65

Protection Rating

at least IP65 (electronics), PCB fully potted

