

Digital instrumentation amplifier for strain gage sensors with IO-Link interface

MODEL **9210** **NEW**



 **IO-Link**

Highlights

- Universal strain gage amplifier with IO-Link interface
- Non-linearity < 0.005 % F.S.
- Specified for use in harsh environments
- IP65 degree of protection and high vibration resistance
- Installation-friendly, ultra compact design

Applications

- Mechanical and plant engineering
- Assembly and joining equipment
- Measuring cell expansion during battery production



Product description

The new strain gage amplifier with IO-Link interface enables digitalization of the measurement technology right from the sensor. Its compact design and high degree of protection allow the instrumentation amplifier to be used practically anywhere in the field.

Strain gage sensors typically have an output voltage of a few millivolts. In industrial environments, e.g. in the vicinity of electric motors or frequency converters, interference can affect the measurement result when transmitting analog signals. This is reliably avoided using the new strain gage amplifier with IO-Link interface. The analog link between the sensor and instrumentation amplifier is kept as short as possible, the standardized IO-Link communication is fully digital and interference-free. The amplifier is powered directly via the IO-Link interface – a standardized 5-wire cable with M12 socket. Strain gage sensors can be connected via a 4-pin M8 connector.

The high-grade amplifier electronics enable precise measurements with a non-linearity of < 0.005 % F.S. 24-bit A/D conversion ensures that the digital signals have sufficient resolution.

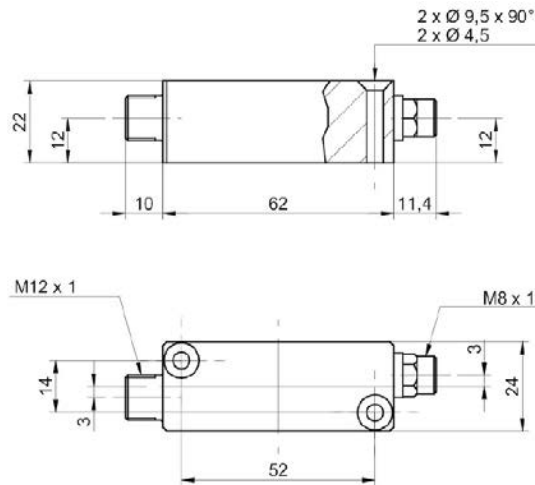
The new strain gage amplifier with IO-Link interface enables immense flexibility. With a suitable choice of IO-Link master, the instrumentation amplifier can be integrated into almost any fieldbus network. Depending on how many ports the master module provides, multi-channel measurement tasks can be implemented simply and cost-effectively.

Technical data

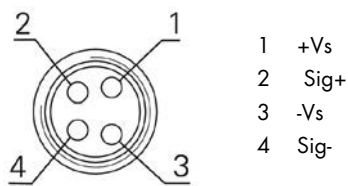
Compatible sensors	
Full-bridge strain gage	
Excitation voltage	2.5 V, short-circuit proof
Connection options	4-wire
Measuring range	±9.5 mV; configurable rated outputs up to ±3.8 mV/V
General data	
Supply voltage	18 ... 30 V DC via IO-Link interface
Current consumption	< 40 mA
Installation	2 holes, diameter 4.5 mm. 2 x M4 screws supplied
A/D conversion	24-bit
Max. measurement rate	1000 values per second
Non-linearity	< 0.005% of full scale
Thermal zero drift	< 0.01 %/10 K
Repeatability	< 0.01 %
Signal-to-noise ratio at 1 mV/V	> 75 dB
IO-Link interface	
IO-Link version	1.1
IO-Link port type	Class A
Baud rate	230.4 kbaud (COM3)
Process data length	32 bits
Cycle time	≥ 1 ms
SIO mode	Yes
Process data (cyclical)	Process value Scale exponent SSC 1 SSC 2 Quality Alarm
Housing	
Material	Aluminum, EN AW-6060, chemically passivated
Dimensions	62 x 22 x 24 mm (L x H x D)
Protection class	IP65
Connections	4-pin M8 socket, 5-pin M12 socket
IO-Link functionalities	
Configurable	Process input Unit (N, kg, µm/m) freely selectable Tare Teach-in mode I/O functionality fully configurable
Additional features	Low-pass filter Peak value memory Hold function Two digital switching points (SSC) Remote operation
Additional data	Diagnostic data Error detection
Ambient conditions	
Operating temperature range	-40 ... +85 °C
Storage temperature range	-40 ... +85 °C
Degree of protection EN 60529, ISO 20653	IP65
Vibration IEC 60068-2-6	10 ... 57 Hz: 1.5 mm p-p, 58 ... 2000 Hz: 10 g
Random IEC 60068-2-64	20 ... 1000 Hz: 0.1 g ² /Hz
Shock IEC 60068-2-27	50 g / 11 ms, 100 g / 6 ms
Conformity and approvals	
Conformity	CE



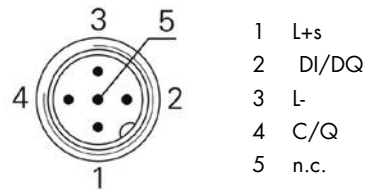
Dimensional drawings (mm)



Electrical connection

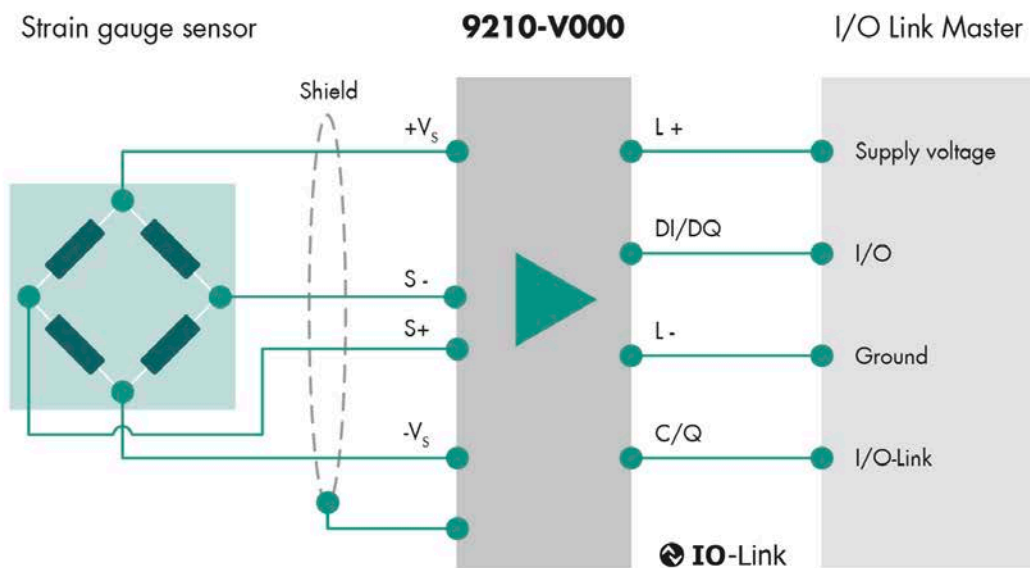


Electrical connection sensor end



Electrical connection control end

Block diagram



Accessories

Order code	
9900-V147	M8 connector, IP67, for connecting strain gage sensors, 90° angled
9900-V148	M8 connector, IP67, for connecting strain gage sensors, straight

Adjustment for measurement chains

Adjustment	
92ABG	Compensation of measurement chain in preferential direction of the sensor
92ABG-S	Compensation of measurement chain according to customer request

Calibration certificate with accreditation symbol

Calibration certificate with accreditation symbol for instrumentation amplifier 9210. The calibration is based on the accreditation of the calibration laboratory D-K-15141-01-00 for the scope of accreditation listed in the annex. The traceability to national standards as well as wide international recognition (DAkkS as a signatory of the multilateral agreements of EA, ILAC and IAF) are guaranteed.



Calibration certificates for instrumentation amplifiers

Standard factory calibration certificate for instrumentation amplifiers (WKS)	
On request	Calibration is performed by electrical simulation of the input variables.
Calibration certificate with accreditation symbol for instrumentation amplifiers (DKD)	
On request	Our ISO 17025 accredited calibration laboratory (DAkkS) offers accredited calibrations in accordance with its scope of services. Calibration is performed by electrical simulation of the input variables.

Calibration certificates for measurement chains

Standard factory calibration certificate for measurement chains (WKS)	
Optional available	Normally, our standard factory calibration certificate contains measuring points which are recorded starting from zero in 5 steps (distributed as evenly as possible over the measuring range) until the nominal sensor value is reached. In this process, the change of the physical input variable takes place with increasing and decreasing signal with unchanged installation position of the sensor. Calibration is performed in conjunction with a transducer (sensor) for physical quantities and is based on the procedure specified in the sensor data sheet.
Special factory calibration certificate for measurement chains (WKS)	
On request	We are happy to calibrate sensors and measurement chains to the customer's specification.
Calibration certificate with accreditation symbol for measurement chains (DKD)	
Optional available	Our ISO 17025 accredited calibration laboratory (DAkkS) offers accredited calibration certificates according to its scope of services. The applied calibration procedures can also be taken from the data sheet of the used transducer (sensor). Calibration is performed in conjunction with a transducer (sensor) for physical quantities

Example order

Order number	
8431-6002-NOD0S000	Precision miniature tension & compression load cell with fitted M8 connector
9210-V000	Instrumentation amplifier
92ABG	Calibration of measuring chain

Order code

Order number	
9210-V000	Strain gage amplifier with IO-Link interface

