

DATA SHEET

PAD4002A

Digital transducer electronics

SPECIAL FEATURES

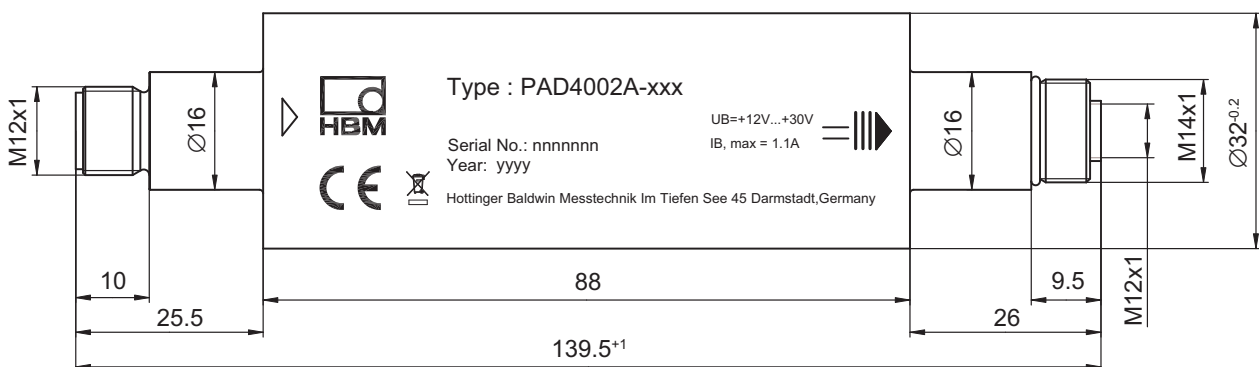
- Electronics for strain gage full bridge sensors to measure weight, force, pressure, strain
- Rugged connections, M12, 8-pin
- Degree of protection up to IP68/IP69K, depending on which plug is used
- Connection cables for sensor and digital output available as accessories
- 2 freely programmable digital I/Os, e.g. for filling or monitoring applications
- Digital interfaces CANopen or RS485 (4-wire, full-duplex)
- The intuitive and user-friendly software PanelX is available free of charge for configuration, measurement and analysis



DIMENSIONS

Sensor connection M12, inside

Plug connection: M12 design



Dimensions (in mm; 1 mm = 0.03937 inches)

SPECIFICATIONS

Type		PAD4002A-RS4, PAD4002A-CAN
Suitable for transducer types		Full bridge strain gages
Maximum number of calibration values as per OIML R76, Class III, IIII	d = e	6000 ¹⁾
Multi-range applications	d = e	2 x 3000 ¹⁾
Rated electrical output		
Input sensitivity legal-for-trade mode industrial mode	$\mu\text{V}/e$ $\mu\text{V}/d$	≥ 0.5 ≥ 0.1
Measurement range	mV/V	nominal ± 2 , max. $\pm 3,2$
Minimum transducer resistance	Ω	300
Maximum transducer resistance		1200
Transducer excitation voltage (carrier frequency 1.2 kHz)	V_{AC}	5
Load cell connection		4-wire circuit
Maximum cable length to transducer ¹⁾	m	6
Temperature coefficient of the zero signal per 10 K	%	± 0.0055
Temperature coefficient of the sensitivity per 10 K ²⁾		± 0.0083
Non-linearity ²⁾	% of meas. range	± 0.0025
Power supply Supply voltage U_B (DC) Power consumption (350 Ω transducer resistance) Max. current	V W A	+12 ... +30, nominal 24 V ≤ 3 1.1
Digital signal conditioning		
Measurement signal resolution	bit	24
Resolution of nominal measuring range	digits	5,120,000
Sample rate	1/s	4 ... 1200
Digital filter bandwidth	Hz	0.1 ... 120
Tare range (subtractive) legal-for-trade mode industrial mode	% of meas. range	+100 ± 100
Range of zero setting legal-for-trade mode industrial mode	% of meas. range	± 2 ± 2
Interfaces		
Max. number of bus nodes		90
CANopen interface Bit rate Maximum cable length	bit/s m	Standard CiA DS301 10,000 ... 1,000,000 ≤ 5000 (10 kbit/s) ... ≤ 100 (500 kbit/s) ... ≤ 25 (1 Mbit/s)
RS-485 interface Bit rate Maximum cable length	bit/s m	9600/19,200/38,400/57,600/115,200 50

Type		PAD4002A-RS4, PAD4002A-CAN
Digital HCMOS input ³⁾		
Allowed input voltage	V	0 ... +12
Low level	V	< 1
High level	V	> 4
Input resistance	kΩ	70
Digital PLC input ³⁾		
Allowed input voltage	V	0 ... +30
Low level	V	< 6
High level	V	> 10
Input resistance	kΩ	9
Control outputs ³⁾		
External supply voltage	V	11 ... +30
Max. current per output	A	< 0.5
Max. total current of all outputs	A	< 1
General information		
Nominal (rated) range of the ambient temperature	°C	-10 ... +40
Operating temperature range		-10 ... +50
Storage temperature range		-25 ... +75
Allowed relative humidity	%	10 ... 90
Degree of protection per EN 60529 (IEC 529)		IP68/69K ⁴⁾
Weight, approx.	kg	0.4
Material		
Housing		Stainless steel
Male connector		PVC

1) Depends on the sensor-sided cable length: 6000 e or 2 x 3000 e up to 3 m.

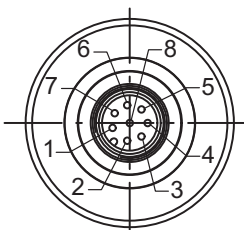
2) The values for non-linearity and temperature coefficient of sensitivity are recommended values. The sum of these values is within the accumulated error limit specified by OIML R76.

3) The electronics have 2 digital I/Os that can each be connected as a control input or an output, as required. Additional information can be found in the mounting instructions and in the command documentation.

4) When connectors and connection cables are fitted with the appropriate type of protection.

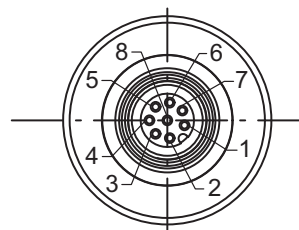
ELECTRICAL CONNECTION, PAD4002A

Transducer connection



M12 connector, 8-pin

Digital output



Connector socket, 8-pin; this side has an M12 internal thread (for HBM cable 1-KAB165) and an M14 external thread (for HBM cable 1-KAB173); commercially available M12 plugs can be connected via the M12 internal thread.

Pin	Transducer connection	Pin	Digital output	
			RS-485	CANopen
1	Measurement signal (+)	1	GND	GND
2	Not in use	2	IN2/OUT2	IN2/OUT2
3	Additional excitation voltage line (+)	3	RA	CAN High IN
4	Not in use	4	IN1/OUT1	IN1/OUT1
5	Additional excitation voltage line (-)	5	RB	CAN Low IN
6	Bridge excitation voltage (-)	6	TB	CAN Low OUT
7	Bridge excitation voltage (+)	7	TA	CAN High OUT
8	Measurement signal (-)	8	U _B	U _B

A 4-wire cable is sufficient for connecting the transducer. If you use a 6-wire cable, you must directly connect the bridge excitation voltage and the additional line at the transducer, always plus to plus (7 and 3) and minus to minus (6 and 5), to avoid interference effects. This is already the case in the specified HBM cables.

PRODUCT NUMBERS

Type	Explanation	Ordering number
PAD4002A-RS4	1 plug for transducer connection, 1 RS-485 socket for output, with digital inputs/ outputs	1-PAD4002A-RS4
PAD4002A-CAN	1 plug for transducer connection, 1 CAN socket for output, with digital inputs/ outputs	1-PAD4002A-CAN

INSTALLATION ADVICE

The diameter of the housing fits into commercially available mounting clamps for electrical installation (size M32).

ACCESSORIES

The (free) setup and evaluation software PanelX is available to download from the HBM website: www.hbm.com Services & Support - Downloads - Firmware & Software - PanelX.

Suitable connection cables (digital output connector socket)

Type	Ordering number
Connection cable with M12 M plug, 8-pin, stainless steel IP68/IP69K, TPE cable sheath, 3 m long ¹⁾	1-KAB173-3-1
Connection cable with M12 M plug, 8-pin, stainless steel IP68/IP69K, TPE cable sheath, 6 m long ¹⁾	1-KAB173-6-1
Connection cable with M12 M plug, 8-pin, IP67, PUR cable sheath (halogen-free), 3 m long ²⁾	1-KAB165-3
Connection cable with M12 M plug, 8-pin, IP67, PUR cable sheath (halogen-free), 6 m long ²⁾	1-KAB165-6
Connection cable with M12 M plug, 8-pin, IP67, PUR cable sheath (halogen-free), 12 m long ²⁾	1-KAB165-12

¹⁾ For connecting to the M14 external thread of the PAD4002A.

²⁾ For connecting to the M12 internal thread of the PAD4002A.

Suitable connection cables (connector plugs for transducer connection)

Type	Ordering number
Connection cable with M12 M plug, 8-pin, hygienic version (aseptic), 3 m long	1-KAB175-3-1
Connection cable with M12 M plug, 8-pin, hygienic version (aseptic), 6 m long ¹⁾	1-KAB175-6-1
Connection cable with M12 M plug, 8-pin, hygienic version (aseptic), 12 m long ¹⁾	1-KAB175-12-1
Connection cable with M12 M plug, 8-pin, TPU IP67, PUR cable sheath (halogen-free), 5 m long	1-KAB168-5
Connection cable with M12 M plug, 8-pin, TPU IP67, PUR cable sheath (halogen-free), 20 m long	1-KAB168-20

¹⁾ Connection cables more than 6 m long are not suitable for legal-for-trade use.

Additional connection cable data can be found in the HBM Cables and Plugs data sheet (B3643).

Suitable cable couplings for 1-KAB175-3-1, 1-KAB175-6-1 and KAB168-5

Type	Ordering number
Connection plug for HBM transducer cable KAB175/KAB168 incl. shrink hose	1-CON-S3003
Connection plug for HBM transducer cable KAB175/KAB168 incl. shrink hose, 90° angled	1-CON-S3004

Hottinger Brüel & Kjaer GmbH

Im Tiefen See 45 · 64293 Darmstadt · Germany
Tel. +49 6151 803-0 · Fax +49 6151 803-9100
www.hbkworld.com · info@hbkworl.com

Subject to modifications. All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability.