

# DSE-HIE

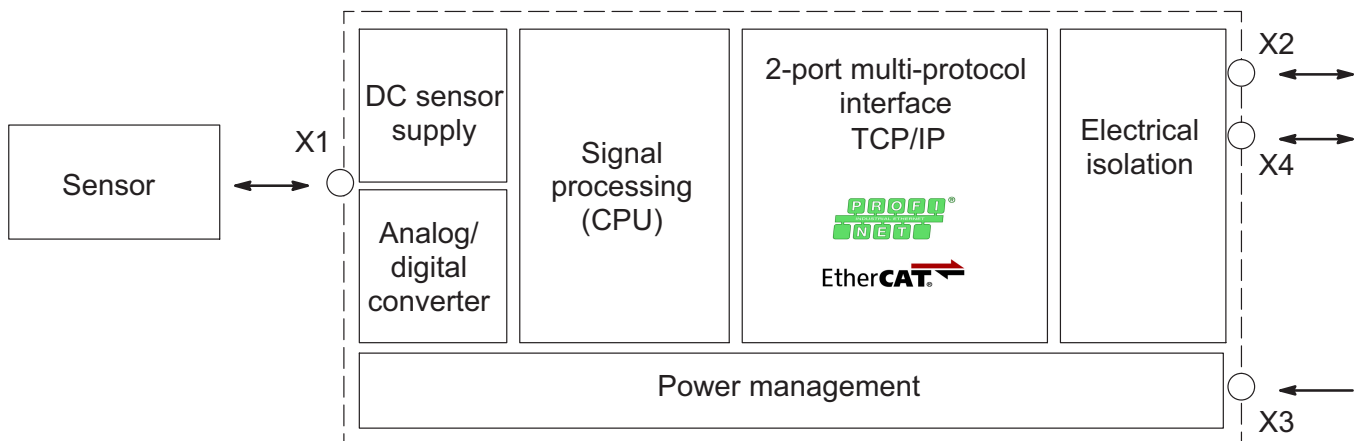
## Digital Sensor Electronics – Hygienic Industrial Ethernet



### Special features

- Freely configurable full-bridge strain gage measuring amplifier
- High accuracy and signal resolution based on 24 bit A/D converter with 2 kHz sample rate
- Communication protocols: PROFINET® (RT/IRT), EtherCAT® and Ethernet (TCP/IP), (more in preparation)
- Easy configuration via integrated web user interface
- Optimized precision-adjustable filters for dynamic production and weighing applications
- Designed for daisy-chain topology
- Robust and compact metal housing
- Developed according to EHEDG and with equipment protection level up to IP69k
- Designed for legal-for-trade applications (in preparation)

Data sheet



## Specifications

Transducer technology		Full bridge strain gages		
Number of load cell verification intervals as per OIML R76, Class III (in preparation)	d=e	10000		
Number of steps in multi-range and multi-interval applications		3		
Number of sensor inputs and types		1 6-wire and 4-wire via M12 A-coded 8-pin		
Supply voltage	V <sub>DC</sub>	typically 24; min: 15; max: 30		
Current consumption at 24 V	mA	60 ± 15 (typ.)		
Inrush current	A	< 0.4		
Power consumption	W	1.5 (typ.); ≤3 max. via M12 T-coded 4-pin		
Communication protocols		PROFINET(RT/IRT), Ethernet(TCP/IP) via M12 D-coded 4-pin		
Signal bandwidth (-3 dB)	Hz	200		
Sample rate	S/s	2000		
Analog/digital converter		24-bit delta/sigma converter		
Measuring range	mV/V	nominal ±2; max. ±4		
Transducer impedance	Ω	200 ... 4500		
Transducer excitation voltage	V DC	5 ± 5 %		
Peak-to-peak noise (at 25 °C, 350 Ω or 4500 Ω impedance for 3σ)	μV/V	No filter @ 350 Ω OFF 0.200	IIR @ 350 Ω 40 Hz 0.100 10 Hz 0.060 1 Hz 0.025	FIR @ 350 Ω 30 Hz 0.085 10 Hz 0.060 2 Hz 0.025
		No filter @ 4500 Ω OFF 0.300	IIR @ 4500 Ω 40 Hz 0.135 10 Hz 0.080 1 Hz 0.030	FIR @ 4500 Ω 30 Hz 0.110 10 Hz 0.075 2 Hz 0.030
Temperature drift – zero signal (TC <sub>0</sub> ) <sup>1)</sup>	% / 10 K	± 0.0025		
Temperature drift – full scale value signal (TC <sub>S</sub> ) <sup>1)</sup>		± 0.0025		
Non-linearity <sup>1)</sup>	%	± 0.0025		
Operating temperature	°C	-10 ... +50		
Storage temperature		-25 ... +75		
Relative humidity in operation and storage	%RH	10 ... 70		
Sensor cable length	m	≤3		
Power supply cable length		≤30		
Interface cable length		≤100		
Module weight	g	270		
Overvoltage protection	V	up to 35		
Reverse polarity protection		up to ±35		
Switch-on time before initial data acquisition	s	< 1		
Digital filter	Hz	IIR low pass: 0.1 ... 30 FIR low pass: 3 ... 30 Moving average: 1 ... 100 Comb filter: 1 ... 100		
Weighing functions		Checkweigher with pre- and post-trigger, trigger either level-controlled or via external light barrier; Filling and Batching for filling or emptying, with coarse and fine flow control as well as automatic optimization of target weight		

## Specifications (continued)

<b>IP rating (to EN 60529)</b>		IP67 / IP68 / IP69K
<b>Oscillation according to Class III</b> (following DIN IEC 68 part 2 to 6)		
Frequency range	Hz	5 ... 65
Duration	min	30 per direction
Acceleration	m/s <sup>2</sup>	50
<b>Shock according to Class III</b> (following DIN IEC 68 part 2 to 27)		
Number		10 in each of the six possible directions
Duration	ms	6
Acceleration	m/s <sup>2</sup>	350
<b>EMC standards</b>		IEC 61326-1: 2012; EN 61326-1: 2013-07; EN 45501: 2015-02
<b>Configuration</b>		Via web-based TCP/IP user interface or via fieldbus
<b>Firmware update</b>		Via integrated web server with multilingual operator dialogs

1) Reference values only, and valid for nominal measuring range at 350 ohms

## Fieldbuses

The fieldbus type can be switched from PROFINET to EtherCAT<sup>®1)</sup> in the device via the ClipX web server. A maximum of one network connection (Ethernet or fieldbus) is possible.





PROFINET		
<b>Cable type (recommended)</b>		Standard Cat-5, shielded
<b>Cable length (max.)</b>	m	100
<b>Real-time classes</b>		1 (RT), 3 (IRT)
<b>Device access point</b>		
Cycle class 1 (RT)	ms	1 / 2 / 4
Cycle class 3 (IRT)	ms	0.5 / 1 / 2 / 4
<b>Supported protocols</b>		RTC (Real-Time Cyclic) Class 1 unsynchronized Class 3 synchronized
		RTA (Real-Time Acyclic)
		DCP (Discovery and Configuration)
		CL / RPC (Connectionless / Remote Procedure Call)
		LLDP (Link Layer Discovery Protocol)
		PTCP (Precision Transparent Clock Protocol)
		SNMP (Simple Network Management Protocol)
<b>Media redundancy</b>		MRP client
<b>Identification &amp; Maintenance</b>		I&M0 ... I&M3 read and write
<b>Device description (GSD file)</b>		Downloadable from device




1) EtherCAT<sup>®</sup> is a registered brand and patented technology, licensed by Beckhoff Automation GmbH, Germany.

EtherCAT® <sup>1)</sup>		
Type		EtherCAT complex slave
Cable type		Standard Cat-5, shielded
Cable length, max.	m	100
Connector socket		2 x M12 D-socket
Hot-plug possible		Yes
Input data, max.	bytes	1024
Output data, max.	bytes	1024
Device description (ESI file)		Downloadable from <a href="https://www.hbm.com/DSE">https://www.hbm.com/DSE</a>
Data transfer rate, max.	kHz	2
Distributed clocks		Not supported

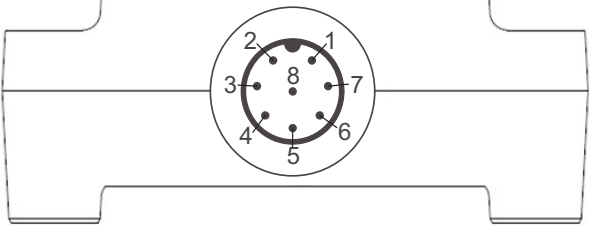
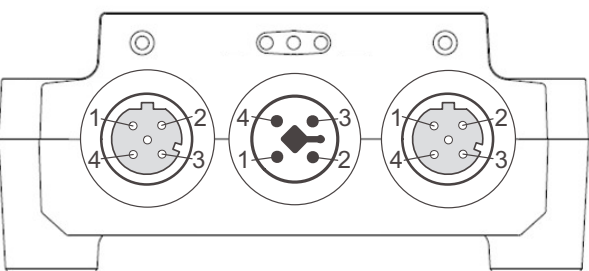
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## Status LEDs

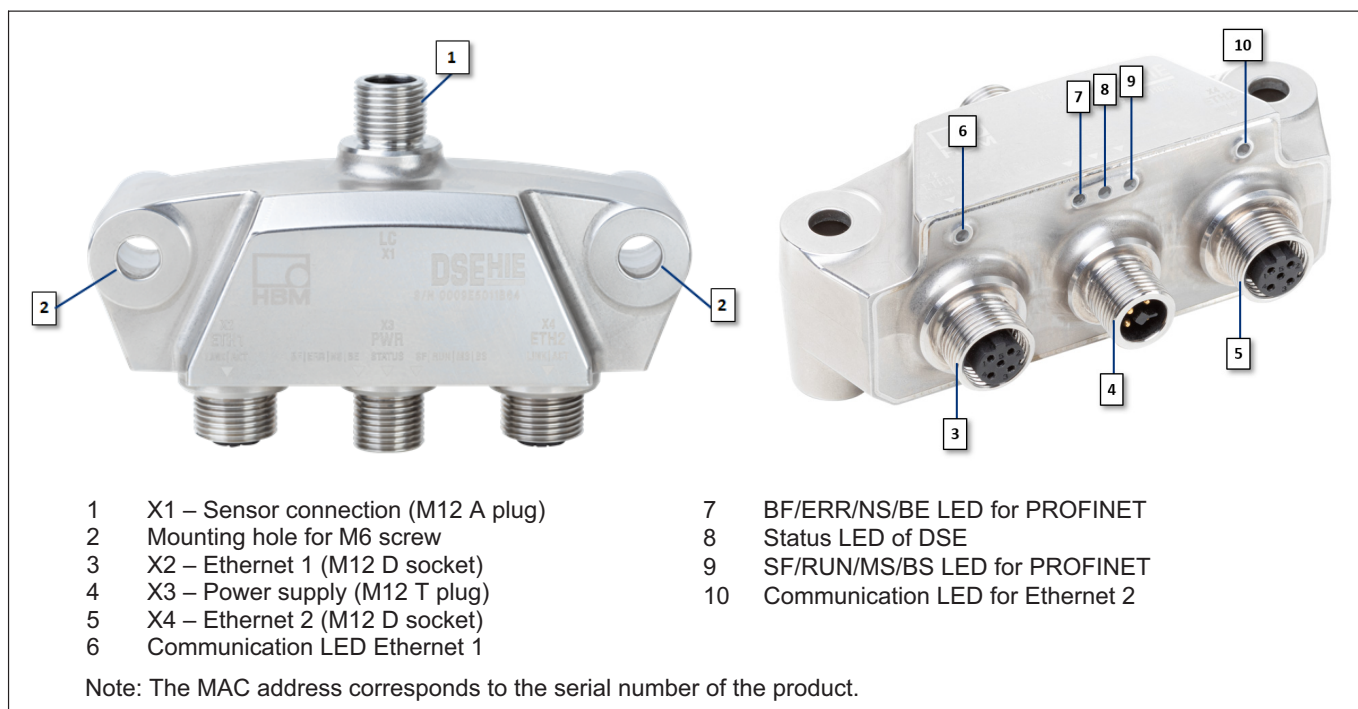
SF LED	Status	Meaning (system error LED)	BF LED	Status	Meaning (bus error LED)
	Off	No error.		Off	No error.
	Flashing (1 Hz for 3 s)	A DCP signal service is triggered via the bus.		Flashing (2 Hz)	No data exchange.
	On	Watchdog timeout; channel, general or advanced diagnostics available; system error.		On	Error: no configuration, slow or no physical connection.

DSE LED	Device status	Meaning (system error LED)
	On	DSE error-free and within specification.
	Flashing (1 Hz)	For identifying the DSE.
	On	Values outside operating range, check function.
	Flashing	DSE outside specification
	On	Device error, check all settings or contact our Technical Support

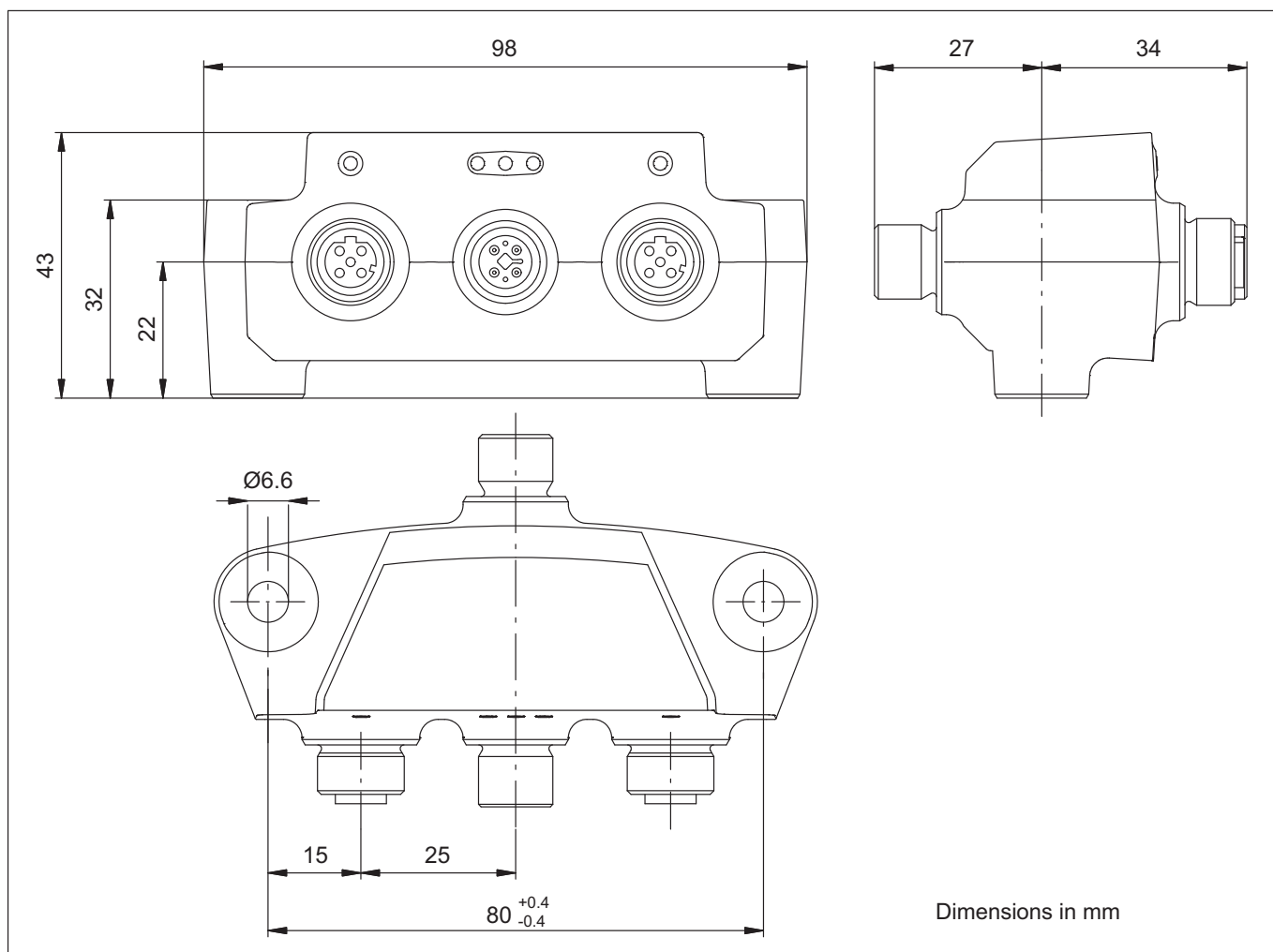
## Pin assignment

			
Sensor – A-coded plug		Ethernet – D-coded socket	
1	Measurement signal +	5	Sense lead –
2	NC	6	Excitation voltage –
3	Sense lead +	7	Excitation voltage +
4	NC	8	Measurement signal –
		Power supply – T-coded plug	
		1	Supply voltage +
		2	NC
		3	GND
		4	NC

## Connections



## Dimensions



## Accessories (not included in the scope of supply)

Accessories for applications that do not require EHEDG compliance:

Designation	Description	Ordering number
Sensor connection	Cable socket M12, 8-pin, with straight cable outlet, A-coded, IP67	1-CON-S3003
	Cable socket M12, 8-pin, with angled (90°) cable outlet, A-coded, IP67	1-CON-S3004
	Connection cable with M12 socket on both ends, 8-pin, 0.3 m long, A-coded, IP67	1-KAB189-0.3
Ethernet cable	Ethernet connection cable CAT5, M12 plug on both ends (daisy-chain), 4-pin, D-coded, 0.3 m long, IP67	1-KAB2144-0.3
	Ethernet connection cable CAT5, M12 plug on RJ45, 4-pin, D-coded, 2 m long, IP67	1-KAB284-2
	Ethernet connection cable CAT5, M12 plug on RJ45, 4-pin, D-coded, 5 m long, IP67	1-KAB2149-5
	Ethernet connection cable CAT5, M12 plug on RJ45, 4-pin, D-coded, 10 m long, IP67	1-KAB2149-10
Power supply	Cable socket M12, 4-pin, with straight cable outlet, T-coded, IP67	1-CON-S1023
	Connection cable with M12 socket on free ends, 4-pin, 1 m long, T-coded, IP67	1-KAB2150-1
Cap	To close off an M12 socket (e.g. Ethernet), IP67	1-CON-A2004

Accessories for EHEDG-compliant hygienic design:

Designation	Description	Ordering number
Sensor connection	Connection cable with M12 socket on both ends (e.g. for PW37P, PW25), 8-pin, 0.3 m long, A-coded, IP69k, EHEDG-compliant	1-KAB186-0.3
	Connection cable with M12 socket on both ends, 8-pin, 0.3 m long, A-coded, IP69k, EHEDG-compliant	1-KAB187-0.3
Ethernet cable	Ethernet connection cable CAT5, M12 plug on both ends (daisy-chain), 4-pin, D-coded, 0.3 m long, IP69k, EHEDG-compliant	1-KAB2141-0.3
	Ethernet connection cable CAT5, M12 plug on RJ45, 4-pin, D-coded, 10 m long, IP69k, EHEDG-compliant	1-KAB2142-10
Power supply	Connection cable with M12 socket on free ends, 4-pin, 1 m long, T-coded, IP69k, EHEDG-compliant	1-KAB2143-1
Cap	To close off an M12 socket with M14 cap (the external thread is used, e.g. for Ethernet connection), IP69k, EHEDG-compliant	1-CON-A2003

For the Microsoft Windows operating system you can download an openAPI and executable examples from the HBM website: <https://www.hbm.com/DSE>.

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

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