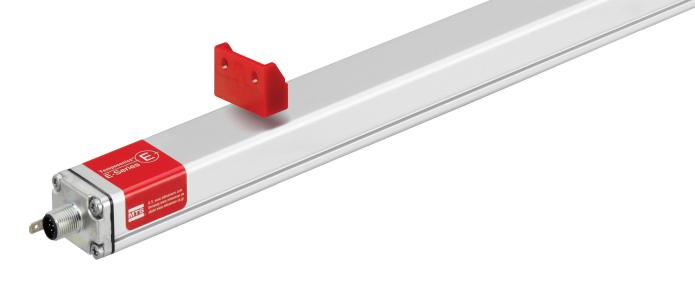




Magnetostrictive Linear Position Sensors

EP2 IO-Link Data Sheet

- Flexible mounting
- Operating temperature up to +75 °C (+167 °F)
- Smooth & compact



MEASURING TECHNOLOGY

The absolute, linear position sensors provided by MTS Sensors rely on the company's proprietary Temposonics® magnetostrictive technology, which can determine position with a high level of precision and robustness. Each Temposonics® position sensor consists of a ferromagnetic waveguide, a position magnet, a strain pulse converter and supporting electronics. The magnet, connected to the object in motion in the application, generates a magnetic field at its location on the waveguide. A short current pulse is applied to the waveguide. This creates a momentary radial magnetic field and torsional strain on the waveguide. The momentary interaction of the magnetic fields releases a torsional strain pulse that propagates the length of the waveguide. When the ultrasonic wave reaches the end of the waveguide it is converted into an electrical signal. Since the speed of the ultrasonic wave in the waveguide is precisely known, the time required to receive the return signal can be converted into a linear position measurement with both high accuracy and repeatability.

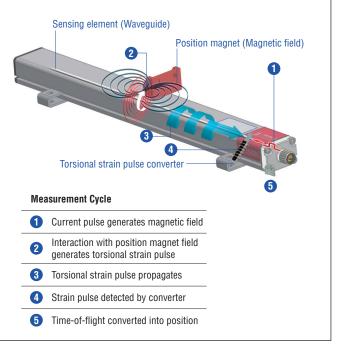


Fig. 1: Time-of-flight based magnetostrictive position sensing principle

EP2 SENSOR

Robust, non-contact and wear free, the Temposonics[®] linear position sensor provide high durability and precise position measurement feedback in harsh industrial environments. Measurement accuracy is tightly controlled by the quality of the waveguide manufactured exclusively by MTS Sensors.

The compact and smooth aluminum profile offers flexible mounting options and easy installation. Moreover, the position magnet can travel along the entire flat housing profile. The EP2 is ideal for industrial applications including plastics molding and processing, factory automation and packaging. Temposonics[®] EP2 with IO-Link allows customers to adjust parameters including measuring direction, resolution or offset. In addition, a switching state can be outputted in parallel to the transfer of the position value. The switching points as well as the switching logic can be parameterized. IO-Link is an open standard according to IEC 61131-9. It is a serial, bi-directional point-to-point connection for signal transmission and energy supply. The bi-directional communication enables consistent communication between sensors and the controller as well as consistent diagnostic information down to the sensor level.



Fig. 2: Plastic granulate for injection molding or extrusion

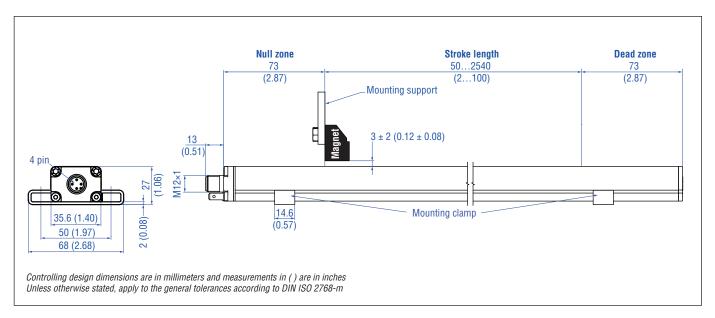
TECHNICAL DATA

Interface Digital Transmission protocol IO-Link VI.1 Data format 32 bit signed (position in µm) Data transmission rate COM3 (280.4 kBaud) Process data device – master 4 bytes Process data device – master 4 bytes Process data master – device 0 bytes Process data master – device 0 bytes Resolution 1 5 µm, 10 µm, 20 µm, 50 µm or 100 µm Cycle time minimum 1 ms (master dependent) Linearity ≤ 0.02 % F.S. (minimum ±90 µm) Repeatability ≤ ± 0.02 % F.S. (minimum ±20 µm) Operating damperature +0+75 °C (-40+167 °F) Humidity 90 % rel: humidity, no condensation Ingress protection 3 IP67 (ff mains cable connector is correctly fitted) Shock test 100 g (single shock) IEC standard 60068-2-27 Vibration test 8 g / 102000 Hz/EC standard 60068-2-27 Vibration test 8 g / 102000 Hz/EC standard 60068-2-27 Vibration test 8 g / 102000 Hz/EC standard 60068-2-27 Vibration test 8 g / 102000 Hz/EC standard 60068-2-27 Vibration test 8 g / 102	Output	
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Connection typeM12 (4 pin) male connectorOperating voltage+24 VDC (±25 %)Ripple≤ 0.28 VppCurrent consumption< 50 mA	Mounting instruction	Please consult the technical drawings and the brief instructions (document number: <u>551684</u>)
Operating voltage +24 VDC (±25 %) Ripple ≤ 0.28 V _{pp} Current consumption < 50 mA	Electrical connection	
Ripple ≤ 0.28 V _{pp} Current consumption < 50 mA	Connection type	M12 (4 pin) male connector
Current consumption< 50 mA	Operating voltage	+24 VDC (±25 %)
Current consumption< 50 mA	Ripple	
Dielectric strength500 VDC (DC ground to machine ground)Polarity protectionUp to -30 VDC		
Polarity protection Up to -30 VDC		500 VDC (DC ground to machine ground)
	Polarity protection	
		Up to 36 VDC

1/ Selectable via IO-Link master

2/ The IP rating IP67 is only valid for the sensors electronics housing, as water and dust can get inside the profile.

TECHNICAL DRAWING



CONNECTOR WIRING

D44		
M12 A-coded	Pin	Function
3	1	+24 VDC (±25 %)
(ค ้ ค)	2	DI/DQ
	3	DC Ground (0 V)
	4	C/Q

Position magnet	Cord sets		Mounting clamp
$\begin{array}{c} 33 (1.3) \\ 19.5 (0.77) \\ \hline \\ 60 \\ \hline \\ \\ \\ 60 \\ \hline \\ \\ \\ \\ 60 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	$ \begin{array}{c} \emptyset \ 15 \\ (\emptyset \ 0.6) \\ \emptyset \ 12.2 \\ (\emptyset \ 0.48) \\ \emptyset \ 11.6 \\ (\emptyset \ 0.46) \\ (0.16) \end{array} \right) \begin{array}{c} M12 \times 1 \\ 45.5 \\ (1.8) \\ (1.8) \\ (0.16) \end{array} $	$ \begin{array}{c} \emptyset \ 15 \\ (\emptyset \ 0.6) \\ M12 \times 1 \\ \emptyset \ 8.8 \\ (\emptyset \ 0.35) \\ \emptyset \ 11.6 \\ (\emptyset \ 0.45) \end{array} \begin{array}{c} 26.5 \\ (1.04) \\ 31.5 \\ (1.24) \\ 0 \\ (1.24) \end{array} $	4 Holes Ø 5.4 (Ø 0.21) 31 (1.22) 9 (0.35) 5 (1.97) 68 (2.68) 68 (2.68) Mounting clamp width : 14.6 (0.57)
Block magnet L Part no. 403 448	M12 (5 pin) female, straight Part no. 370 673	M12 (5 pin) female, angled Part no. 370 675	Mounting clamp Part no. 403 508
Material: Hard ferrite Weight: Ca. 20 g Operating temperature: –40+75 °C (–40+167 °F) Fastening torque for M4 screws: 1 Nm	Ingress protection: IP67 Cable: Shielded, pigtail end Cable length: 5 m (16.4 ft.)	Ingress protection: IP67 Cable: Shielded, pigtail end Cable length: 5 m (16.4 ft.)	

FREQUENTLY ORDERED ACCESSORIES – Additional options available in our Accessories Guide 🗍 551444

Controlling design dimensions are in millimeters and measurements in () are in inches

ORDER CODE

1 2 3 4 5 6 7 E P 2 2 2 2 2 a b	8 9 10 11 D 4 4 C	12 13 1 K d e	
aSensor modelEP2Smooth profile			
b Stroke length X X X M 00502540 X X X M 002.0100. Standard stroke length (mm)*			
Stroke length 50 500 mm 500 2540 mm Standard stroke length (in.)*	Ordering steps 25 mm 50 mm		
Stroke length 2 20 in. 20100 in.	Ordering steps 1.0 in. 2.0 in.	DELIVERY	
cConnection typeD44M12 (4 pin) male control	nnector	• Sensor • 2 mour up to 1 stroke	nt 12
d Operating voltage 1 +24 VDC (±25 %)		+ 1 mc each 5 additio	οι Ο
e Output		Operation m	ิล

K IO-Link

! mounting clamps s up to 1250 mm (50 in.) stroke length

+ 1 mounting clamp for each 500 mm (20 in.) additional stroke length Accessories have to be ordered separately.

Operation manuals & software are available at: **www.mtssensors.com**

 $^{\star/}$ Non standard stroke lengths are available; must be encoded in 5 mm / 0.1 in. increments



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