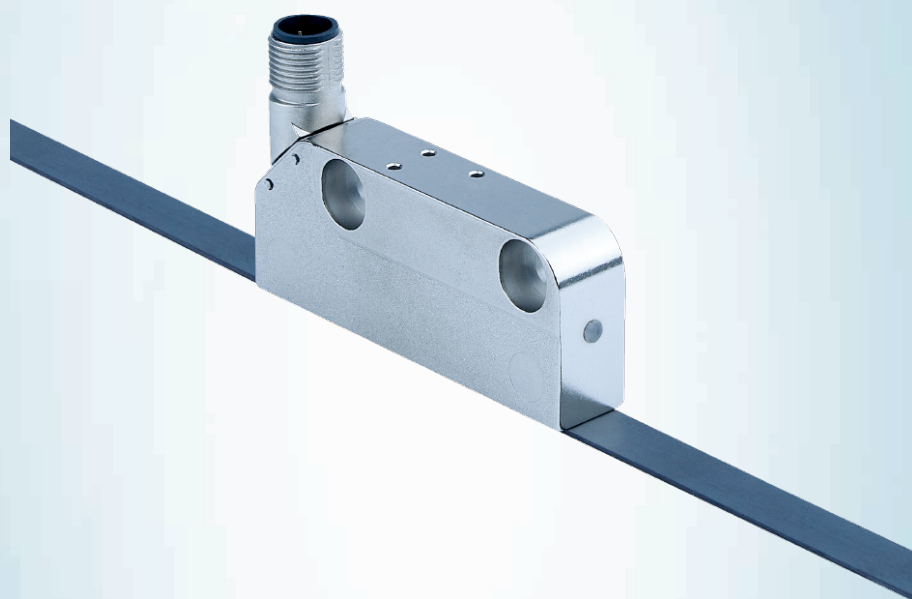




STL70-0HA8

STL/ETL70

MAGNETIC LINEAR ENCODERS

SICK
Sensor Intelligence.

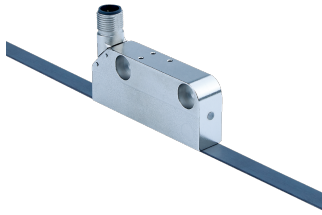


Illustration may differ



Ordering information

Type	part no.
STL70-0HA8	1116912

Other models and accessories → www.sick.com/STL_ETL70

Detailed technical data

Features

Items supplied	Magnetic tape not included with delivery
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Safety-related parameters

MTTF_D (mean time to dangerous failure)	135 years (EN ISO 13849) ¹⁾
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¹⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 60°C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Performance

Measuring range	0 mm ... 16,384 mm
Resolution	0.448 µm, For interpolation of the sine/cosine signals with e.g. 12 bit
Length of period	2 mm
Traversing speed	4.5 m/s up to which the absolute position can be reliably produced ≤ 10 m/s Maximum traversing speed when switching on
Repeatability	< 1 µm
Max. reading distance	0.8 mm

Interfaces

Communication interface	HIPERFACE®
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Electronics

Supply voltage	7 V DC ... 12 V DC
Current consumption	< 200 mA
Connection type	Male connector, M12, 8-pin, universal ¹⁾
Status display	RGB LED

¹⁾ The universal connection is rotatable so that it is possible to position the connector in the radial or axial direction.

Mechanics

Dimensions	See dimensional drawing
Scope of delivery	Magnetic tape not included with delivery
Read head material	Zinc diecast

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 ¹⁾
Enclosure rating	IP67, with mating plug inserted (IEC 60529)
Operating temperature range	–30 °C ... +85 °C
Storage temperature range	–40 °C ... +85 °C, without package
Permissible relative humidity	100 %, condensation permitted
Resistance to shocks	500 m/s ² , 11 ms (EN 60068-2-27)
Resistance to vibration	100 m/s ² , 10 Hz ... 2,000 Hz (EN 60068-2-6)

¹⁾ According to the listed standards, EMC is guaranteed if the motor feedback system is connected to the central grounding point of the motor controller via a cable shield and the encoder housing lays over a large area of the motor potential. If other shielding concepts are used, users must perform their own test.

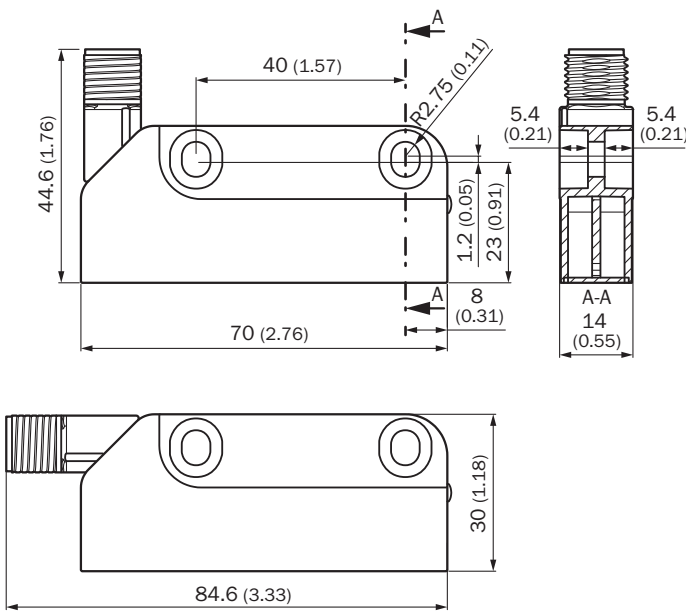
Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China-RoHS	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Classifications

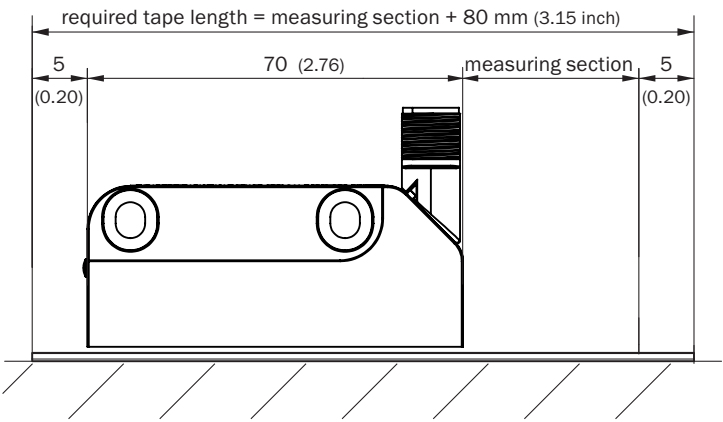
ECLASS 5.0	27270705
ECLASS 5.1.4	27270705
ECLASS 6.0	27270705
ECLASS 6.2	27270705
ECLASS 7.0	27270705
ECLASS 8.0	27270705
ECLASS 8.1	27270705
ECLASS 9.0	27270705
ECLASS 10.0	27270705
ECLASS 11.0	27270705
ECLASS 12.0	27273902
ETIM 5.0	EC002544
ETIM 6.0	EC002544
ETIM 7.0	EC002544
ETIM 8.0	EC001486
UNSPSC 16.0901	41111613

Dimensional drawing

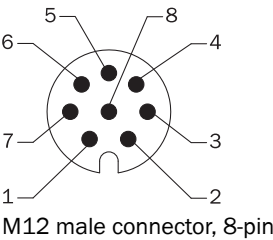


Dimensions in mm (inch)

Order note for magnetic tape length



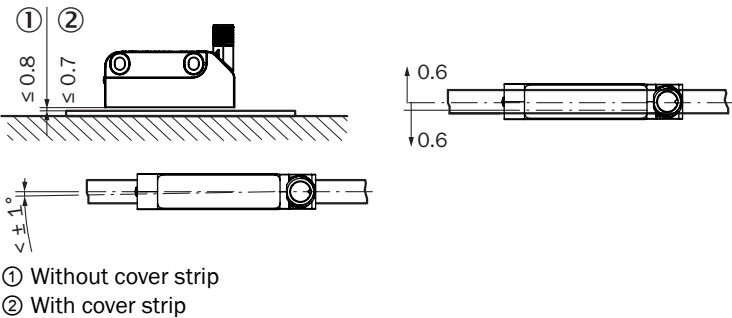
PIN assignment HIPERFACE[®]



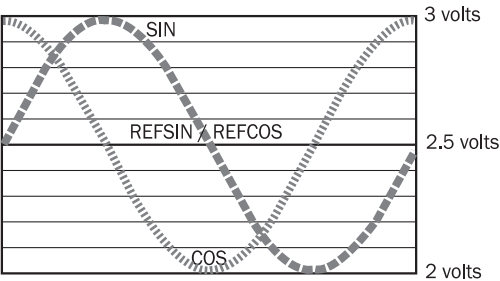
PIN	Signal	Explanation
1	REFSIN	Process data channel

PIN	Signal	Explanation
2	+ SIN	Process data channel
3	REFCOS	Process data channel
4	+ COS	Process data channel
5	Data +	Parameter channel RS 485
6	Data -	Parameter channel RS 485
7	GND	Ground connection
8	U _S	Supply voltage
-	-	Housing

Position tolerance



Diagrams Signal diagram for clockwise shaft rotation, looking in direction “A” (see dimensional drawing)
1 period = 360° : 64/128/256



Operation note Charactersitics applicable to all permissible environmental conditions

Signal	Values/unit
Signal peak, peak V _{SS} of SIN, COS	0.9 V ... 1.1 V
Signal offset REFSIN, REFCOS	2.2 V ... 2.8 V

Operation note Overview of supported commands for HIPERFACE[®]

Overview of supported commands			STL70
Command byte	Function	Code 0 ¹⁾	Comments
42h	Read position (5 bits per sine/cosine period)		62.5 µm (2 mm system)
43h	Set position	■	
44h	Read analog value		Channel number 48h
			Temperature [°C] ²⁾
46h	Read counter		
47h	Increase counter		
49h	Reset counter	■	
4Ah	Read data		
4Bh	Save data		
4Ch	Determine status of a data field		
4Dh	Create data field		
4Eh	Determine available memory area		
4Fh	Change access code		
50h	Read encoder status		
52h	Read out name plate		Encoder type = FFh
53h	Encoder reset		
55h	Allocate encoder address	■	
56h	Read serial number and program version		
57h	Configure serial interface	■	
67h	Change serial interface temporary		
6Ah	Set position with interanal synchronization	■	
6Bh	Sensor adjustment (during commissioning)	■	

¹⁾ The commands thus marked include the parameter "Code 0". Code 0 is a byte inserted into the protocol to provide additional protection of vital system parameters against accidental overwriting. When the device is supplied, "Code 0" = 55h.

²⁾ The temperature value will be reliably formed approx. 2 s after power on/reset or at command.

Operation note Overview of status messages for HIPERFACE[®]

Error type	Status code	Description	STL70
Initialization	00h	The encoder has recognized no error	■
	01h	Adjustment data faulty	■
	02h	Faulty internal angular offset	■
	03h	Data field partitioning table destroyed	■
	04h	Analog limit values not available	■
	05h	Internal I ² C bus not operational	■
	06h	Internal checksum error	■
Protocol	09h	Parity error	■
	0Ah	Checksum of the data transmitted data is incorrect	■
	0Bh	Unknown command code	■
	0Ch	Number of data transmitted is incorrect	■
	0Dh	Command argument transmitted is not allowed	■
Data	0Eh	The selected data field may not be written to	■
	0Fh	Incorrect access code	■
	10h	Size of data field stated cannot be changed	■
	11h	Word address states, is outside data field	■
	12h	Access to non-existent data field	■
Position	20h	Sensor is not adjusted or is in adjustment mode	■
	21h	Distance magnetic tape/sensor too high	■
	23h	Positional error	■
Other	1Ch	Monitoring the value of analog signals (process data)	■
	1Eh	Encoder temperature critical	■
	08h	Counter overflow	

For more information on the interface see HIPERFACE[®] - description, part no. 8010701

Operation note Model-specific settings

Type-specific settings	STL70
Model ID (command 52h)	FFh
Free E ² PROM [bytes]	1.792
Address	40h
Mode_485 ¹⁾	E4h
Codes 0 to 3	55h
Counter	0

1) The linear length measuring system STL/ETL70 supports the following baud rates: 600, 9200, 19200 und 38400.

Recommended accessories

Other models and accessories → www.sick.com/STL_ETL70

	Brief description	Type	part no.
magnets			
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 1.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: stainless steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	BTL70-01000	6078482
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 3.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: stainless steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	BTL70-03000	6078485
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 4.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: stainless steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	BTL70-04000	6078486
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 6.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: stainless steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	BTL70-06000	6078487
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 8.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: stainless steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	BTL70-08000	6078488
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 10.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	BTL70-10000	6078489
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 12.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	BTL70-12000	6078490
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 14.08 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 2 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m	BTL70-14000	6078491

	Brief description	Type	part no.
	• Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11 ± 1) $\mu\text{m/K/m}$	BTL70-16300	6078492
	• Product segment: Magnets • Product: Magnetic tapes • Description: Magnetic tape length: 16.5 m, magnetic tape width: 10 mm, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 2 mm, operating temperature range: $-20\text{ }^{\circ}\text{C} \dots 100\text{ }^{\circ}\text{C}$, storage temperature range: $-30\text{ }^{\circ}\text{C} \dots 100\text{ }^{\circ}\text{C}$, temperature coefficient: (11 ± 1) $\mu\text{m/K/m}$ • Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11 ± 1) $\mu\text{m/K/m}$		

	Brief description	Type	part no.
connectors and cables			
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 2 m, 8-wire, PUR, halogen-free Description: Incremental, shielded SSI Connection systems: Flying leads	DOL-1208-G02MAC1	6032866
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 5 m, 8-wire, PUR, halogen-free Description: Incremental, shielded SSI Connection systems: Flying leads	DOL-1208-G05MAC1	6032867
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 10 m, 8-wire, PUR, halogen-free Description: Incremental, shielded SSI Connection systems: Flying leads	DOL-1208-G10MAC1	6032868
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 20 m, 8-wire, PUR, halogen-free Description: Incremental, shielded SSI Connection systems: Flying leads	DOL-1208-G20MAC1	6032869
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 25 m, 8-wire, PUR, halogen-free Description: Incremental, shielded SSI Connection systems: Flying leads	DOL-1208-G25MAC1	6067859
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE[®], Incremental Cable: 2 m, 8-wire, PUR, halogen-free Description: HIPERFACE[®], shielded Incremental	DOL-1208-W02MAC1	6037724
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE[®], Incremental Cable: 5 m, 8-wire, PUR, halogen-free Description: HIPERFACE[®], shielded Incremental	DOL-1208-W05MAC1	6037725
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE[®], Incremental Cable: 10 m, 8-wire, PUR, halogen-free Description: HIPERFACE[®], shielded Incremental	DOL-1208-W10MAC1	6037726
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE[®], Incremental Cable: 20 m, 8-wire, PUR Description: HIPERFACE[®], shielded Incremental	DOL-1208-W20MAC1	6037727
	Connection type head A: Flying leads Connection type head B: Flying leads Signal type: HIPERFACE[®], HIPERFACE[®] Items supplied: By the meter Cable: 8-wire, PUR, halogen-free Description: HIPERFACE[®], shielded, HIPERFACE[®]	LTG-2708-MW	6028361
programming devices			
	Product segment: Programming devices Product family: PGT-11-S Description: SVip[®] LAN programming tool for all motor feedback systems Items supplied: 1x programming tool PGT-11-S LAN, 1x power supply unit 100-240 V AC / 12 V DC, primary adapter (Europe, UK, USA/Japan, Australia), Ethernet cable 3 m	PGT-11-S LAN	1057324

	Brief description	Type	part no.
Mounting systems			
	Description: Mounting kit for SIL2 applications for safe and easy mounting of the TTK70S; 2x titanium cylinder screws, 2x galvanized steel lock washers, 2x washers, 2x female connectors	BEF-MK-S12	2105618

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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