

# ETL70-0KA4

STL/ETL70

MAGNETIC LINEAR ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

Type	part no.
ETL70-0KA4	1116913

Other models and accessories → [www.sick.com/STL\\_ETL70](http://www.sick.com/STL_ETL70)

### Detailed technical data

#### Features

<b>Items supplied</b>	Magnetic tape not included with delivery
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#### Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	86 years (EN ISO 13849) <sup>1)</sup>
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<sup>1)</sup> 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

<b>Measuring range</b>	0 mm ... 16,384 mm
<b>Resolution</b>	1 µm
<b>Length of period</b>	2 mm
<b>Traversing speed</b>	4.5 m/s up to which the absolute position can be reliably produced ≤ 10 m/s Maximum traversing speed when switching on
<b>Repeatability</b>	< 1 µm
<b>Max. reading distance</b>	0.8 mm

#### Interfaces

<b>Communication interface</b>	HIPERFACE DSL®
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#### Electronics

<b>Supply voltage</b>	7 V DC ... 12 V DC
<b>Current consumption</b>	< 200 mA
<b>Connection type</b>	Male connector, M12, 4-pin, universal <sup>1)</sup>
<b>Status display</b>	RGB LED

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

#### Mechanics

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

## Ambient data

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

<sup>1)</sup> 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.

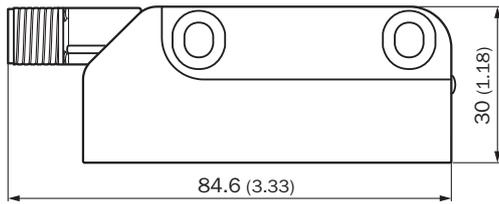
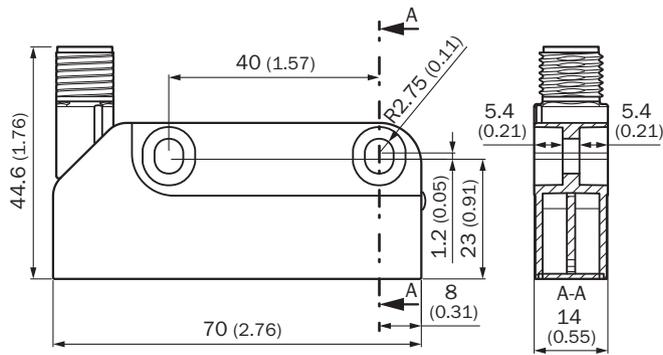
## Certificates

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

## Classifications

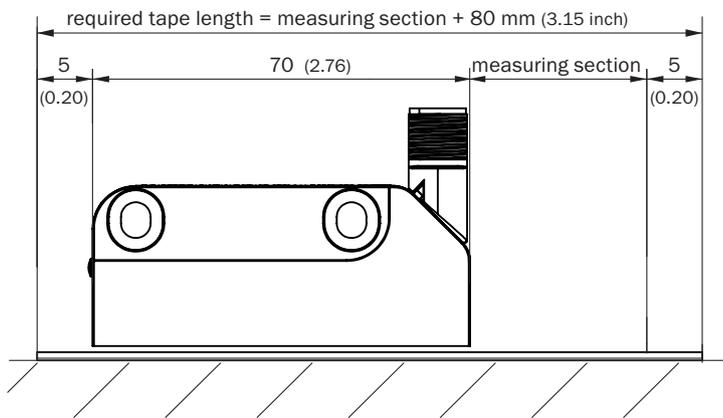
<b>ECLASS 5.0</b>	27270705
<b>ECLASS 5.1.4</b>	27270705
<b>ECLASS 6.0</b>	27270705
<b>ECLASS 6.2</b>	27270705
<b>ECLASS 7.0</b>	27270705
<b>ECLASS 8.0</b>	27270705
<b>ECLASS 8.1</b>	27270705
<b>ECLASS 9.0</b>	27270705
<b>ECLASS 10.0</b>	27270705
<b>ECLASS 11.0</b>	27270705
<b>ECLASS 12.0</b>	27273902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

Dimensional drawing

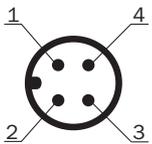


Dimensions in mm (inch)

Order note for magnetic tape length



PIN assignment HIPERFACE DSL<sup>®</sup>

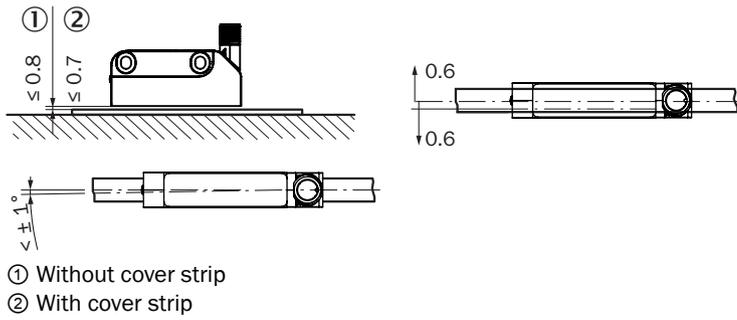


M12 male connector, 4-pin

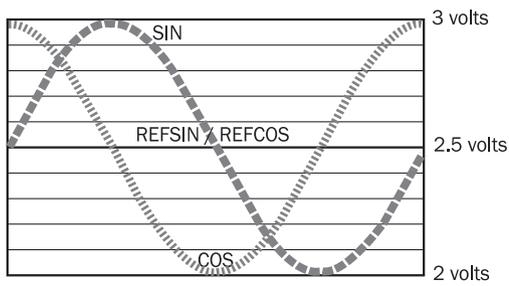
Signal	PIN
DSL+ / 12V	1
DSL- / GND	2

Signal	PIN
Temperature	3
Temperature	4

**Position tolerance**



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



### Operation note Supported resources for HIPERFACE DSL®

Resource Index	Function	Size (max. Offset)	Read access	Write access	Time overrun [ms]	Name
000h	Root node		0	-	10	ROOT
001h	Identification note		0	-	10	IDENT
002h	Monitoring node		0	-	10	MONITOR
003h	Administration node		0	-	10	ADMIN
005h	Data storage node		0	-	10	DATA
080h	Type of encoder	2	0	-	10	ENTYPE
081h	Resolution	4	0	-	10	RESOLUTN
082h	Measurement range	4	0	-	10	RANGE
083h	Type name	18	0	-	10	TYPECODE
084h	Serial number	10	0	-	10	SERIALNO
085h	Device version	20	0	-	10	FWREVNO
086h	Firmware date	8	0	-	10	FWDATE
087h	EEPROM size	2	0	-	10	EESIZE
0C0h	Temperature range	4	0	-	10	TEMPRNG
0C1h	Temperature	2	0	-	10	TEMPRTUR
100h	Reset/shut down	0	-	0	250	RESET
101h	Set position	8	0	4	100	SETPOS
104h	Set access level	8	0	0	30	SETACCES
105h	Change access key	8	-	0	40	CHNGEKEY
109h	Encoder index	2	0	3	20	ENCIDENT
130h	Load file	8	-	0	160	LOADFILE
131h	Read/write file	8	0	0	60	RWFILE
132h	File status	4	0	-	30	FILESTAT
133h	Create/delete/change file	8	-	0	160	MAKEFILE
134h	Directory	8	0	-	40	DIR
200h	Access simple I/O	4	0	0	70	ACCESSIO

### Operation note Overview of warnings and fault indications

Error type	Error register	Error bit	Description
Position (incremental)	ENC_ST0	0	A Protocol reset was executed
		1	Acceleration overflow, invalid position
		5	Internal error in vector length, invalid position
Position (absolute)	ENC_ST1	0	Error in absolute position in a rotation
Initialization	ENC_ST2	0	
Checking	ENC_ST3	0	Critical encoder temperature
Access to resources	ENC_ST4	0	Invalid argument given during resource access procedure
		1	Resource access refused due to incorrect access level
		2	Internal error during resource access
		3	Error when accessing a user file

### Operation note Supported access levels

Access level	User	Standard access key
0	Execute (default setting)	- (no key required)
1	Operator	1111 (31 31 31 31h)
2	Maintenance	2222 (32 32 32 32h)
3	Authorized client	3333 (33 33 33 33h)
4	User service	4444 (34 34 34 34h)

## Recommended accessories

Other models and accessories → [www.sick.com/STL\\_ETL70](http://www.sick.com/STL_ETL70)

	Brief description	Type	part no.
magnets			
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-01000	6078482
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-03000	6078485
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-04000	6078486
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-06000	6078487
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-08000	6078488
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-10000	6078489
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-12000	6078490
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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</li> </ul>	BTL70-14000	6078491

	Brief description	Type	part no.
	<ul style="list-style-type: none"> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> <li><b>Product segment:</b> Magnets</li> <li><b>Product:</b> Magnetic tapes</li> <li><b>Description:</b> 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 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m</li> <li><b>Material:</b> Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m</li> </ul>	BTL70-16300	6078492
<b>Mounting systems</b>			
	<ul style="list-style-type: none"> <li><b>Description:</b> Mounting kit for SIL2 applications for safe and easy mounting of the TTK70S; 2x titan cylinder screws, 2x galvanized steel lock washers, 2x washers, 2x female connectors</li> </ul>	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.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)