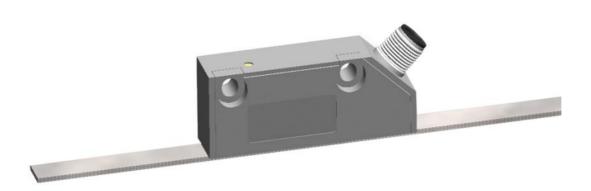


EMAX-HI

Magnetic Absolute Linear Encoder with High-Resolution



- Magnetic absolute length measuring system
- ullet High performance and resolution of 1 $\mu \mathrm{m}$
- Automatic distance detection via LED
- For dynamic control tasks (e. g. linear drives)
- Interfaces: SSI, CANopen (DS406) or RS422 On request: BISS-C or CAN BASIC ELGO
- Optionally, incremental square wave (A, B) or
 1 Vss sine-cosine-signals for dynamic movement control

EMAX-HI - Magnetic Absolute Linear Encoder with High-Resolution

General:

EMAX-HI is an absolute magnetic length measuring system with high-resolution. The sensor technology and the evaluation electronic are integrated in one housing.

The magnetic tape is attached to a flat surface using the adhesive tape included in the delivery. **EMAX-HI** can be installed with a distance of up to 0.5 mm from the magnetic tape (without cover tape).



Advantages of EMAX-HI:

- Absolute measurement up to 8 m
- Direct, contactless and wear-free measurement
- Various output interfaces available
- High resolution of 0.001 mm at ± 1 increment repeating accuracy
- No referencing necessary: position changes are detected even in de-energized state
- The distance between the sensor and the magnetic tape can vary between 0.1 and 0.5mm (without cover tape)
- Automatic distance detection if the distance between sensor and tape gets too big: the LED on the housing will turn RED if the permissible distance is exceeded.
- Very robust against dirt (increased IP65 protection with sealed version option "V")
- Optionally, incremental square wave (A, B) or sine-cosine-signals (1 Vss) for dynamic movement control

Interfaces:

Various options of interfaces are available: SSI, CANopen (DS406) or RS422 (see "Type Designation"). On request: BISS-C or CAN BASIC ELGO.

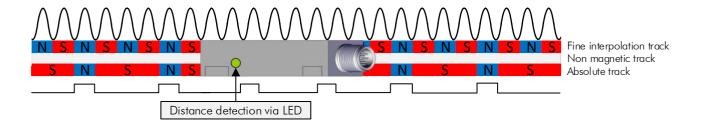
Applications:

Typical applications are linear drives and other dynamic tasks where are a high control performance is required.

Functional principle:

A line of hall sensors and a magneto-resistive resistance bridge element are guided along a magnetic tape encoded with two tracks; one absolute track and one fine interpolation track. The line of sensors provides an absolute value by scanning the absolute track and the fine interpolation electronic provides the high resolution of the system by scanning the fine interpolation track.

The fine interpolation track consists of alternating north and south poles with a length of 1mm which are scanned by the resistance bridge and provide the resolution of 0.001mm. The absolute value is provided by the line of individual hall sensors which scan the code of the north and south poles.



EMAX-HI - Magnetic Absolute Linear Encoder with High-Resolution

Technical data:

Machanical Data	
Mechanical Data	
Measuring principle	absolut
Repeat accuracy	±1 increment
System accuracy in μ m at 20 °C	$\pm (10 + 20 \times L)$ L = measuring length in meters
Distance sensor / tape	0.1 max. 0.5 mm (without cover tape)
Sensor housing material	aluminium
Housing dimensions	$L \times W \times H = 70 \times 16 \times 30 \text{ mm}$
Required magnetic tape	AB20-10-10-2-R-11
Basic pole pitch	1 mm
Max. measuring length	8 m
Anschlussart	12 pin M12 round connector (external)
Type of connection	5 m standard length as accessory, drag chain suitable, (other cable lengths on request)
Sensor cable (5 m)	DKA-00-RCF0-050-XXXX-12-T-D-S
Cable bending radius	min. 60 mm
Sensor weight	approx. 50 g without cable
Cable weight (accessory)	approx. 60 g pro Meter
Electrical data	
Power supply voltage	10 30 VDC
Residual ripple	<10 %
Current consumption	150 mA
Interfaces	SSI, CANopen (DS406) or RS422 (BISS-C or CAN BASIC ELGO on request)
Resolution	0.001 mm
Max. operating speed	1 m/s with continuous absolute position scanning, 10 m/s with sin/cos scanning, 2 m/s with TTL scanning
Further options	additional incremental A/B square wave signals or 1 Vss sin/cos
Environmental conditions	
Storage temperature	-10 +70° C
Operating temperature	-25 +85° C
Relative humidity	(relative) 95 %, non-condensing
Air pressure (storage/ transport)	700 1060 hPa
Air pressure (operation)	750 1060 hPa
Protection class	IP40 (Standard) IP65 (Option V) higher on request

Order designation:

When ordering, please use the following ordering code:

HMAX AABBBCCC D DDEEEEFGGGGH I JJJJ

A SN Number

00 standard version

B Signal cable length (cable length in dm)

000 standard without cable

C Resolution in μ m

1 μ m - at system accuracy in μ m \pm (10 + 20 x L)

D Interface

SBO SSI-Interface (25-bit binary code)
SGO SSI-Interface (25-bit Gray code)
CAO CANopen (DS406)

CNO CAN BASIC ELGO (on request)

420 RS422

E Bitrate

09k6 9600 Bit/s - Standard bitrate for RS422

 19k2
 19200 Bit/s for RS422

 38k4
 38400 Bit/s for RS422

 125k
 125000 Bit/s for CAN

 250k
 250000 Bit/s for CAN

 500k
 500000 Bit/s for CAN

 1MHz
 1000000 Bit/s for CAN

Additional options

F F Device address 0.. F

(Standard setting: device address 0)

G ---- Standard version always with 12-pin M12 round connector

H V sealed version

A without terminating resistor

J Incremental signals

H001incremental square wave signals HTL with 1 μm resolution
incremental square wave signals HTL with 5 μm resolutionH010incremental square wave signals HTL with 10 μm resolutionT001incremental square wave signals TTL with 1 μm resolutionT005incremental square wave signals TTL with 5 μm resolutionT010incremental square wave signals TTL with 10 μm resolutionSC10sine-cosine-signal 1 Vss, 1 mm pole pitch

Please note: options which are not required are filled in with "-"!

Order examples:

EMAX-HI with SSI binary interface, 25 bits

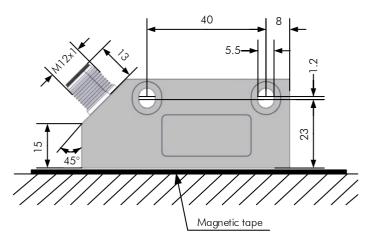
HMAX 00000 00 1 S G 0 -- -- - - - - - - - T 0 0 5 A A B B B C C C D D D E E E E F G G G G H I J J J J

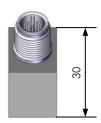
EMAX-HI with SSI Gray interface, 25 bits, TTL square wave signals and 5 $\mu \rm m$ resolution

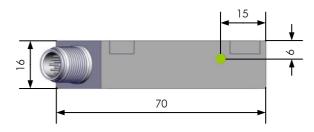
HMAX 00000 00 1 C N 0 1 2 5 k 0 - - - - - - - - - - - - - - A A B B B C C C D D D E E E E F G G G H I JJ JJ

EMAX-HI $\it ELGO$ standard with CAN BASIC ELGO interface, 125 kbit/s and device address 0

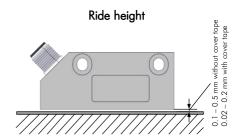
Dimensions:

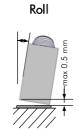


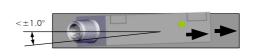




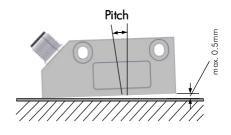
Mounting tolerances:

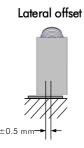






Yaw angle





Accessories:

Order designation	Description
AB20-10-10-2-R-11	Absolute encoded Magnetic Tape for EMAX-HI (max. measuring length 8 m)
Magnetic tape end cap set 10 mm	2 end caps (10 mm) and 2 x M3 screws; Additional fixation for linear or radial application, as well as for protection of magnetic tape ends. Art. No. 731031002
FS-1000, FS-1500, FS-2000	Guide rails for EMAX-HI (length indication in mm)
PNO1	SSI/ PROFIBUS converter
DKA-00-RCF0-050-XXXX-12-T-D-S	Connection cable for EMAX-HI with RCF0 = female M12 round connector, 050 = cable length 5,0 meters, 12 = 12-pin M12 round connector (female), T = twisted pairs, D = drag chain suitable, S = with screen/shield

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