MODEL ED32i TTL LINEAR ENCODER

Reliable non-contact measurement

Can be used for rotary as well as linear measurements

Differential 5V TTL A/B-Quadrature output

Error detection like out of range or missing scale

Programmable reference mode and position

- **Field programmable resolution**

DESCRIPTION

The ED32i is a linear incremental encoder based on the well established magnetoresistive sensor technology. The contactless magnetic measuring principle is used for precise incremental displacement measurement by utilizing a magnetized scale with alternating north and south poles. Air gaps up to 2mm are possible between scale and the read head. The encoder device is equipped with an internal sine / cosine interpolation unit that transforms the input signals directly into A/B-quadrature output signals. The special arrangement of the used AMR sensors allows a resolution in the area of a few micrometers in combination with high travel speeds. An integrated magnetic sensor detects magnetic reference marks. Optional adaptor plates solve special mounting needs for customer specific applications easily.

A special feature of the ED32i is the possibility of parameter programming with or firmware updates, even after field installation.

FEATURES

- **Precise contactless incremental measurement**
- **Accuracy: +/-1 increment**
- **Resolution: ≥10µm**
- **Differential 5V TTL A/B-quadrature output**
- **Lost scale/magnet recognition**
- **Programmable reference modus**
- **Programmable resolution (continuously)**
- **Firmware update possible**
- **2 status LEDs**
- **Customized adaptor-plate for easy assembly**

APPLICATIONS

- **Measurement of positions, movements, velocities**
- **Angular measurement utilizing pole wheels**
- **Position measurement in harsh environments**
- **XYZ Tables**
- **Linear & cross stages**

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ABSOLUTE MAXIMUM RATINGS

Absolute maximum ratings are limiting values of permitted operation and should never be exceeded under the worst possible conditions either initially or consequently. If exceeded by even the smallest amount, instantaneous catastrophic failure can occur. And even if the device continues to operate satisfactorily, its life may be considerably shortened.

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	Vcc	Measured versus GND	**-0.3**		**5.5**	V
Operating Temperature	Top		**-25**		**85**	℃
Storage temperature	Tstor		**-40**		**85**	℃

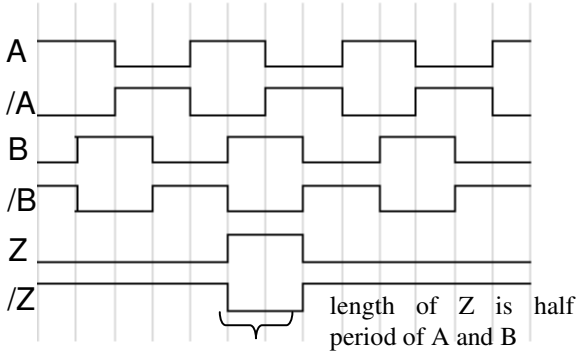
Stress above one or more of the limiting values may cause permanent damage to the device. Exposure to limiting values for extended periods may affect device reliability.

OPERATING CONDITIONS

If not otherwise noted, 25℃ ambient temperature, 5V supply voltage applied.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply voltage	Vcc	Measured versus GND		**5**		V
Supply Current	I	Full ambient temp. range, no output load		**60**		mA
Digital Output Clock Rate (A/B)	A,A,B,B		**20**		**100**	kHz

TYPICAL PERFORMANCE CURVE



- channel A and B are phase shifted for 90°
- index channel Z could be placed at every position
- length of channel Z could be quater and half period of signal A and B

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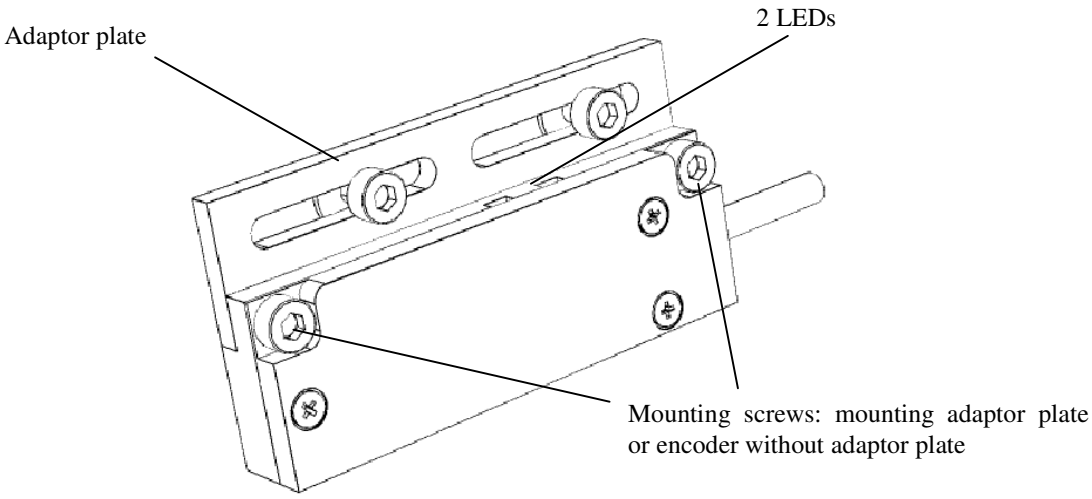
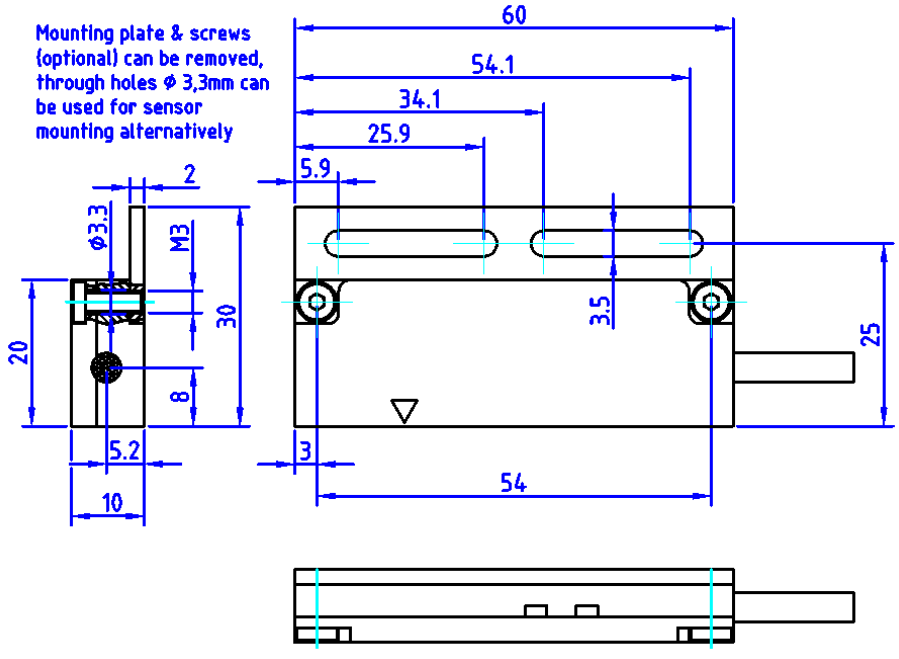
MECHANICAL DIMENSIONS





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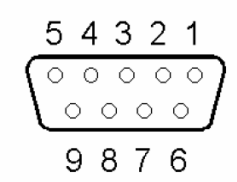
CONNECTORS (OPTIONAL)

Name	Description	Color: Cable end open (Standard)	D-SUB 9 pin no.
/A	Channel A - inverted	grey	5
GND	Ground	yellow	4
/B	Channel B - inverted	green	3
ERROR	Error Signalisation	red	2
/Z	Reference Channel - inverted	orange	1
A	Channel A	blue	9
+5V	Supply Voltage	violet	8
B	Channel B	brown	7
Z	Reference Channel	black	6
PE/Earth	Screen	Shield	Shield



PERFORMANCE SPECS

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Operating Voltage		Vcc		**5**		V
Resolution				**10 (*)**		µm
System accuracy	+/- 1 Increment			**+/- 20 (*)**		µm
Pole pitch		d_{N-S}		**5**		mm
Gap sensor / magnetic stripe			**0.1**	**1.0**	**2.0**	mm
Velocity		V	**0**		**4**	m/s
Max. Output Freq./Channel	resolution: 10µm	fout			**100**	kHz
Output circuit	Quad 5V RS485					
Output signals	A, /A, B, /B, Z, /Z		**0**		**5**	V
Operating Temperature		T_{OP}	**-40**		**+85**	℃
Storage Temperature			**-55**		**+85**	℃
Cable length	cable end open			**2.0**		m
Dimension	L x B X H			**60 x 10 x 20**		mm

* Parameters like resolution can be set within the ED32i with an external device, see section 'Parameter Programming'.

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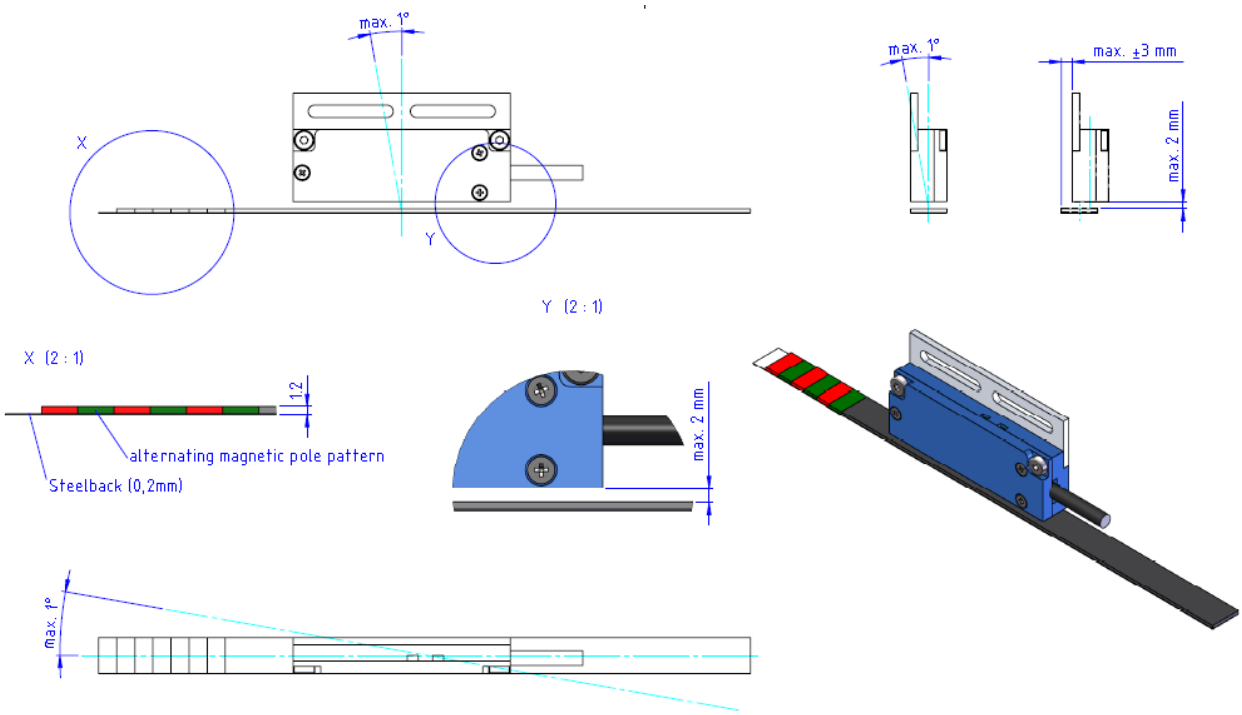
ENCODER TO SCALE MOUNTING

The ED32i encoder need to be adjusted within the given mechanical tolerances of the figure mentioned below. In order to read accurately, the tilt should not exceed +/-1°. The magnetic scale has a steel-band on the back that gives mechanical stability and avoids temperature based expansion. The air gap between encoder and scale could be 2.00 mm in maximum.



PARAMETER PROGRAMMING

The ED32i can be parameterized via a programming device. Parameters that can be set are:

Resolution:	1µm ... 5mm continuously
Reference Mode:	none, periodic at Reference Position, once at Reference Position
Reference Position:	Reference Position within 5mm, combined with external Reference Mark
Reference Pulse Length:	half or quater length of A, B period
Amplitude Borders:	A_min and A_max for operating window
Measurement Visualisation:	1 Step - 0.5 * Resolution, blinking frequency of green LED

For further information on tailored parameters please contact *Measurement Specialities*.

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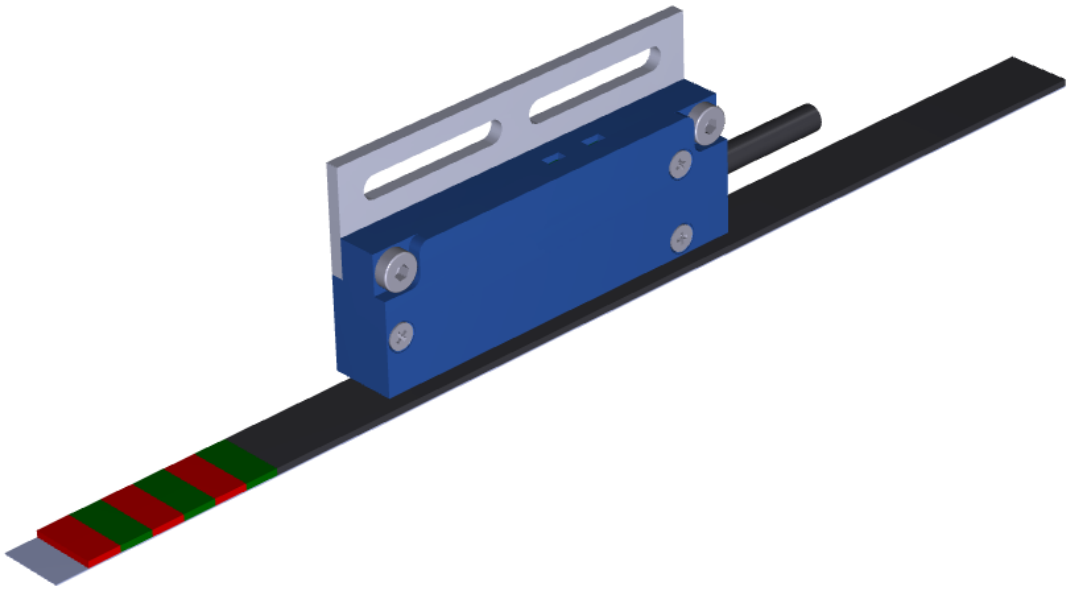
INSTALLATION

Mount the ED32i as shown in the following figure:



After power on, both LEDs (red and green) should be on. When the red LED goes off, the encoder is in measurement mode. Every millimeter the green LED toggles to give a visual feedback of the measurement. The red LED depicts a missing magnet function, which means the scale is too far away from the encoder or wrong mounted.

Step	LED red Status	LED green Status	Description
Power on	**On**	**On**	ED32i startup mode
ED32i without scale, wrong mounted	**On**	**Off**	ED32i too far away from scale / wrong mounting
Measurement (ED32i correct mounted over scale)	**Off**	**On/Off**	green LED visualizes measurement step (act. 1mm, programmable)

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ORDERING CODES

Article number **G-MRED-100**

ORDERING INFORMATION

This datasheet contains **preliminary** information and can be subject to changes without notice.

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