

SLE-LI Series

Miniature, LIK REPLACEMENT Linear Encoders



Description

The SMAC LI linear encoder can be considered as a drop-in replacement for the JENA LIK Linear encoder. This model is a miniature non-contacting high-resolution incremental linear encoder, which delivers two count channels in quadrature (called A and B) as output signals. The two output waveforms are 90 degrees out of phase and indicate both the position and the movement direction: when Channel A leads Channel B, for example, then the movement is from left to right of the scale when viewing the pattern side of the scale. Otherwise, if B leads A, then the displacement is in the opposite direction. This encoder has a $5\ \mu\text{m}$ resolution.

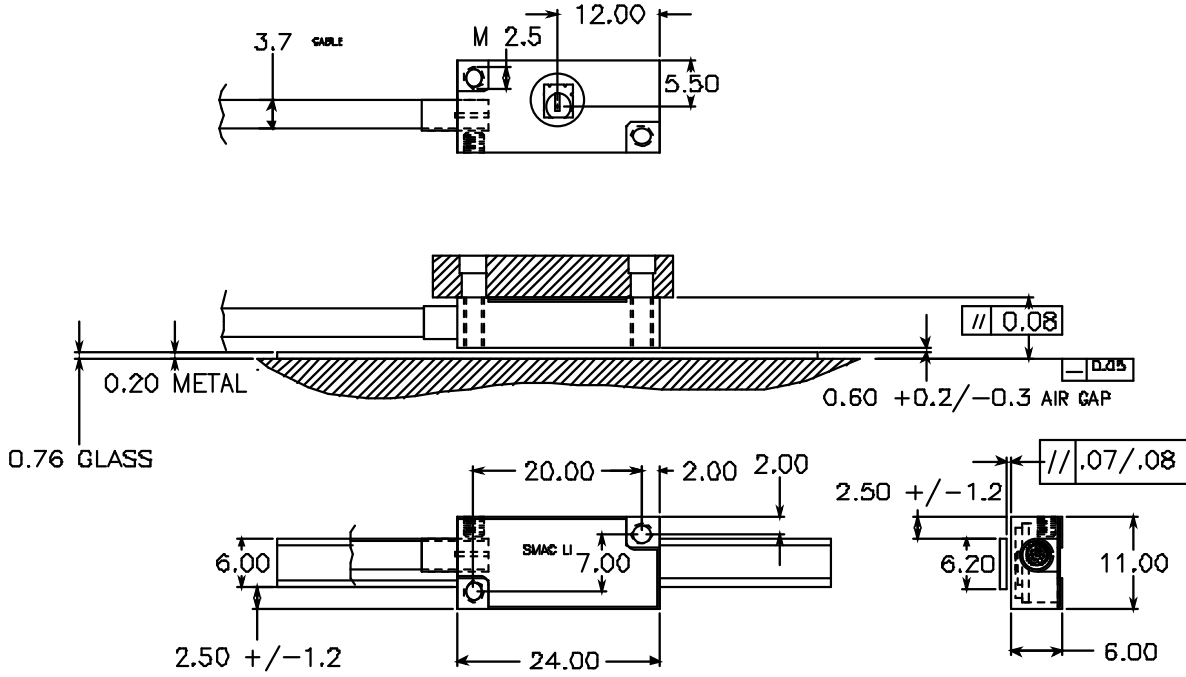
Features

- Light Source: Light Emitting Diode;
- Light Sensor: AEDR Optical Asic;
- Resolution after quadrature:
- Output Format: Differential RS422 line driver output. Two count channels A and B in quadrature with an optional ZR output;
- Quadrature spec.: $90^\circ \pm 22^\circ$ at maximum conditions;
- Rise and Fall Time: 1 μs max. into 1000 pF load;
- Travel length: up to 150 mm.

Applications

- Data Storage Applications
- Motion Control
- Assembly Applications
- Electronics

Package Dimensions



STANDARD CONFIGURATION
1/4 CYCLE INDEX, GATED WITH CH A
1/2 M CABLE

ORDERING CODE

SLE-LI - X - X

RESOLUTION

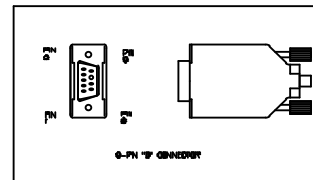
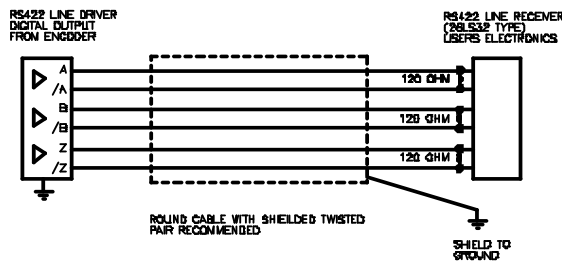
- 1 = 1 MICRON
- 2 = 0.5 MICRONS
- 3 = 0.1 MICRONS

CABLE

- 01 = NO CONNECTOR
- 09 = 9 PIN "D"
- 15 = 15 PIN "D"

FUNCTION
+5 VDC (RED)
Z- (GRAY)
Z+ (BROWN)
B- (BLUE)
B+ (YELLOW)
A- (GREEN)
A+ (ORANGE)
GND (BLACK)

RECOMMENDED SIGNAL TERMINATION



Absolute Maximum Ratings

Storage Temperature Range	-25 °C to 85 °C
Operating Temperature Range	0 °C to 85 °C
Supply Voltage	+ 5V DC \pm .25V
Output Current per channel	50 mA
Frequency Response	5 Meters per Second (5Micron)

Note: Absolute Maximum Ratings represent the limits that must not be overcome in order to guarantee a safe operation of the device. This does not mean that the device should be operated with such values.

Recommended Operating Conditions

Parameter Units	Min.	Typical	Max.
Supply Voltage	+4.75 Vdc	+5 Vdc	+ 5.25 Vdc
Temperature	- 25		+85 °C
Output Frequency		10	kHz

Mechanical characteristics

Parameter Units	Dimension/Details	Tolerance
Housing Material	Aluminum	
Scale Length	150 MM Std. up to 264 MM available	
Mounting Screw Size	M1.6	
Scale Material	Soda-Lime Glass	
Scale Thickness	0.75/1.5 MM (0.75 standard)	

Connector on encoder JST # SM08B-SRSS-TB (PVC jacketed cable)

Mechanical and Environmental Tests

Parameter	Reference	Conditions
Shock	IEC 68-2-27	10 G at 11 ms
Humidity	IEC 68-2-3	98 % RH (non-condensing)

Theory of Operation

The SMAC LI, Reflective linear encoder, transforms the linear motion of a linear scale into a digital output signal. The main components of the SMAC LI series are: an IR Light Emitting Diode (LED), a focusing lens, a high-precision linear scale, an IC photo-detector with a set of uniquely configured photodiode Interlaced Array, an IC interpolator, and an IC line driver.

The light source is emitted by the LED and is reflected off the code pattern of the scale to produce a set of analog signals, by means of the modulation from the optical ASIC detector producing proper compensation and interpolation factors, the analog signals are used to produce the digital A and B signals. Therefore, these digital signals feed the IC line driver in order to obtain the differential outputs for channels A, B and I and their complements.

Pin Assignment

Pin		Signal
Description		
Pin 1	+5	Input
Pin 2	Z-	ZR
Pin 3	Z+	ZR
Pin 4	B-	Digital
Pin 5	B+	Digital
Pin 6	A-	Digital
Pin 7	A+	Digital
Pin 8	GND	Ground