SLE-LI Series

Miniature, LIK REPLACEMENT Linear Encoders

Description

The SMAC SLE-LI series 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.

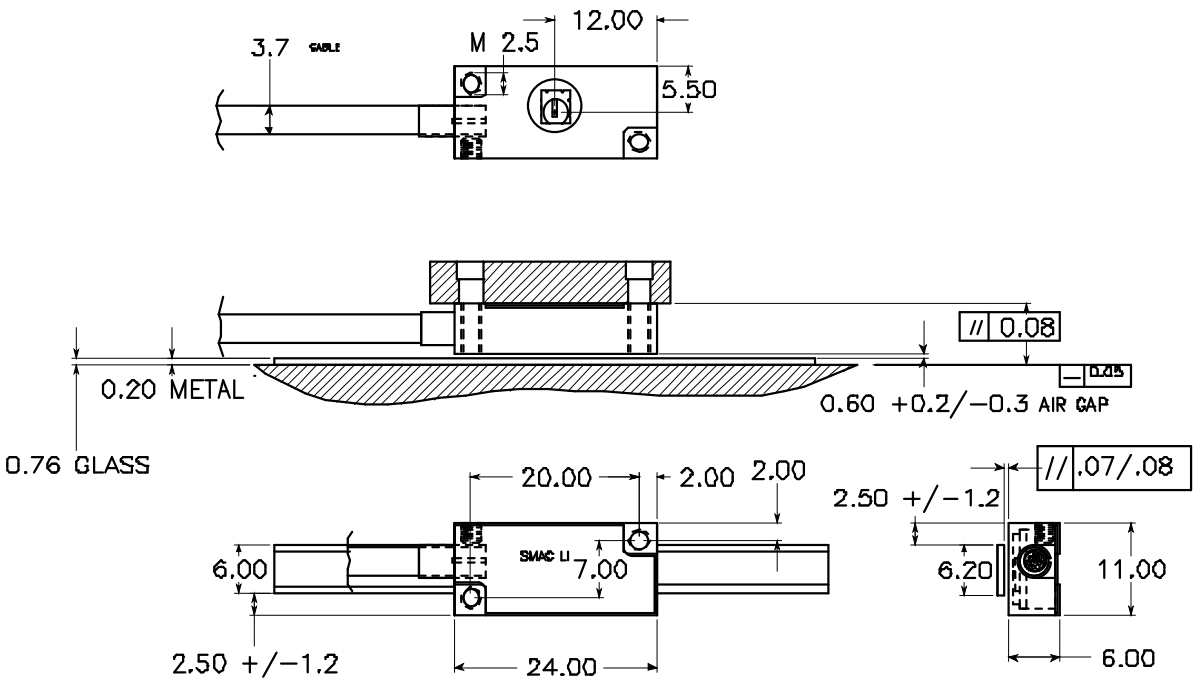
Features

- 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° ±22° at maximum conditions;
- Rise and Fall Time: 1µs max. into 1000 pF load;

Applications

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

Package Dimensions

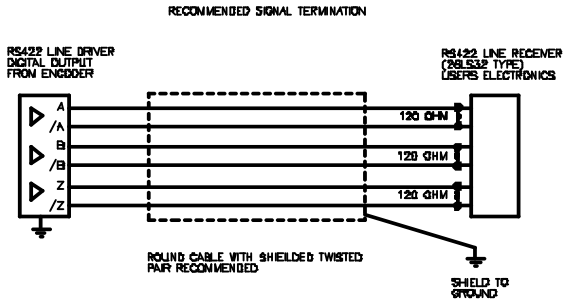


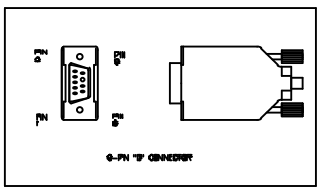
Ordering Code:

SLE-LI-YY-ZZ-M

Resolution: (optional)	Cable Termination:	Cable Jacket Material
01 = 1 micron	00 = Flying Lead	0 = PVC (Standard)
10 = 0.1 micron	09 = 9 pin D-sub	1 = mPPE (Low Off-Gassing)
15 = 0.5 micron	15 = 15 pin D-sub	

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





Absolute Maximum Ratings

Storage Temperature Range	-25 °C to 85 °C
Operating Temperature Range	0 °C to 85 °C
Supply Voltage	+ 5V DC ± .25V
Output Current per channel	50 mA
Frequency Response	9.6 Meters per Second (1um) 6.4 Meters per Second (0.5um) 1.3 Meters per Second (0.1um)

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	Min.	Typical	Max.	Units
Supply Voltage	+4.75 Vdc	+5 Vdc	+ 5.25	Vdc
Temperature	- 25		+85	°C
Output Frequency		1 micron 0.5 micron 0.1 micron	9.6 MHz 12.8MHz 12.8MHz	

Mechanical characteristics

Parameter	Dimension/Details	Tolerance	Units
Housing Material	Aluminum		
Mounting Screw Size	M1.6		
Cable Insulation Material	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: a 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 Voltage
Pin 2	Z-	ZR Output
Pin 3	Z+	ZR Output
Pin 4	B-	Digital Output
Pin 5	B+	Digital Output
Pin 6	A-	Digital Output
Pin 7	A+	Digital Output
Pin 8	GND	Ground

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Standard Scale Order Code Key

SLS-WWW-XXXX-Y-Z

W		Material Details	
	1WW	Glass*	
		160	0.75±0.01mm Thick, 6mm width
		162	3.0mm Thick, 6mm width
	2WW	Mylar	
		260	0.3mm Thick, 6mm width

Scale can be cut to a desired length.

X		Scale Length in mm

Y		Scale Pitch
	A	80mm Pitch
	B	20mm Pitch

Z		Backing
	A	No Adhesive Backing
	B	Peel and Stick Adhesive Backing

		Encoder Models						
Scale Part Number SLS-WWW-XXXX-Y-Z	Scale Length [mm]	SLE-LI-01	SLE-LI-10	SLE-LI-15	SLE-LL-01	SLE-LL-05	SLE-35-10	SLE-35-25
SLS-160-0164-A	164	X	X	X	X	X	X	
SLS-160-0128-B	128							X
SLS-162-0314-B	314							X
SLS-260-0600-A	600	X			X	X		

- - Consult factory for lengths not listed.