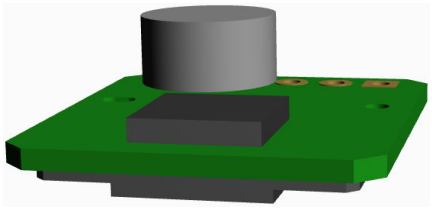
Rotational Absolute Magnetic Kit Encoder Version 16 mm Medium Precision Position Sensor



FEATURES

- On-axis rotational absolute magnetic encoder
- Especially dedicated to motor drive, to robot's position and industrial motion control with accurate positioning
- Rotation speed up to 10 000 rpm
- High repeatability, high precision, single turn
- Hall effect technology
- Not sensitive to moisture and pollution
- Especially dedicated for harsh conditions (vibrations, shocks, …)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

LINKS TO ADDITIONAL RESOURCES

3D Models | Infographics | Capabilities and Custom Options

QUICK REFERENCE DATA	
Sensor type	ROTATIONAL, magnetic technology
Output type	Pads, wires, or connector
Market appliance	Industrial
Dimensions	16 mm x 14 mm

ELECTRICAL SPECIFICATIONS	
PARAMETER	
Voltage power supply (on sensor connector)	5 V_{DC} ± 0.5 V_{DC}
Supply current at 5 V_{DC}	≤ 50 mA
Output format	SSI
Useful electrical angle	360°
Accuracy at 25 °C	≥ 10 bits (0.35°)
Micro-linearity error	≤ ± 2 LSB
Output noise (at static position)	≤ ± 1 LSB
Resolution	Better than 16 384 points (14 bits, ≈ 0.022°)
Startup time	≤ 3 ms (TBD)
Data latency time	≤ 200 µs (TBD)
Maximum sampling rate	4.6 kHz (TBD)

MECHANICAL SPECIFICATIONS	
PARAMETER	
Mechanical angle	360°
Maximum rotation speed	10 000 rpm (more on request)
Rotor weight	≤ TBD g
Stator weight	< TBD g

For technical questions, contact: mcbprecisionpot@vishay.com

SAP PART NUMBERING GUIDELINES										
TYPE	MODEL	DESIGN	SIZE (mm)	TYPE	FUNCTION	ACCURACY (BITS)	RESOLUTION (BITS)	OUTPUT	PACKAGING	OPTION
R = rotational	AM	K = kit	016	I = industrial	1	10	14	J = SSICCW (1)	B = box	xxx = customized design

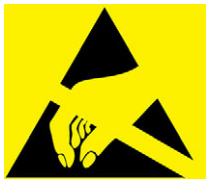
Note

(1) On request: SPI or BiSS-C output

PERFORMANCE	
PARAMETER	
Standard operating temperature range	-40 °C to +125 °C
Storage temperature range	-40 °C to +125 °C
Environmental protection	Coating on PCB components side (on request)

EMC PARAMETERS	
PARAMETER	
ESD susceptibility at all outputs	HBM, 100 pF discharged through 1.5 kΩ, 2 kV

OTHER INFORMATION

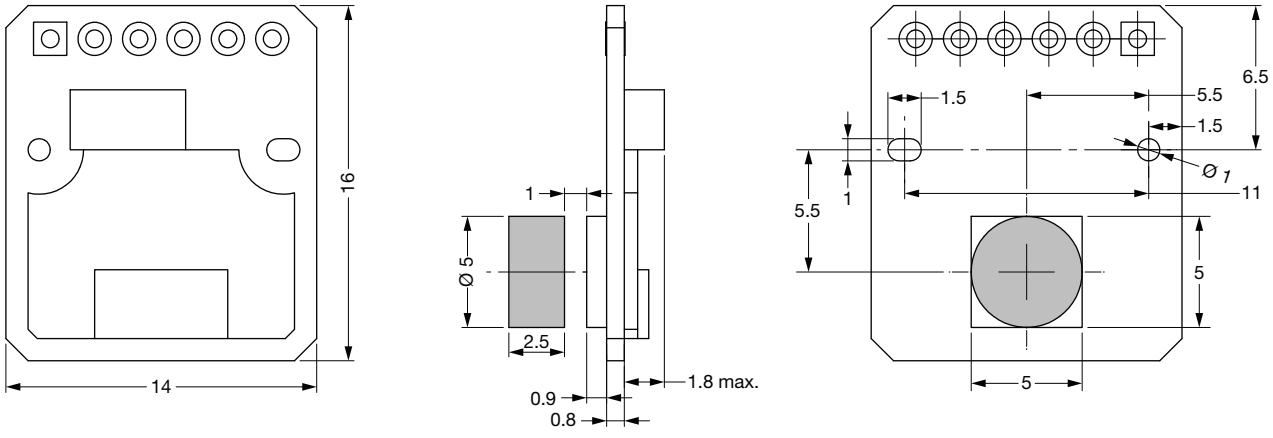


ATTENTION!
Observe Precautions for Handling Electrostatic Sensitive Devices!

Warning: the rotor and the stator must have the same serial number!

- The sensor is delivered in an ESD packaging. To ensure safe handling, remove the sensor from its ESD bag only in an Electrostatic Protected Area (EPA)
- Do not damage the rotor disk surface
- Do not use cleaning product or chemical product
- Environmental protection: conformal coating or potting on request for use in heavy-duty environments (metallic particles, oils, greases, salt spray, moisture, corrosion...)

SENSOR DIMENSIONS in millimeters



COMMUNICATION INTERFACE

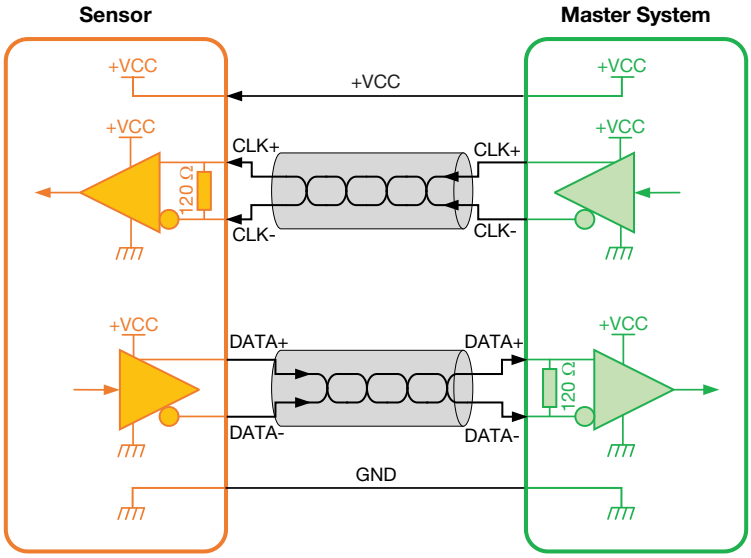
The SSI signals comply with the RS-422 electrical standard, using differential signaling for both the CLOCK and DATA lines.

To ensure robust EMC immunity, the use of twisted-pair wiring is strongly recommended:

- SSI signals: CLK+ twisted with CLK-, and DATA+ twisted with DATA-
- Power supply: twisting is not required

The typical characteristic impedance of the signal lines is 120 Ω.

COMMUNICATION DIAGRAM



PINOUT		
TWISTED PAIR NO.	**SIGNAL NAME**	**WIRE COLOR**
1	VCC	**Red**
	GND	**White**
2	DATA+	**Green**
	DATA-	**Black**
3	CLK+	**Blue**
	CLK-	**Yellow**

SSI OUTPUT FORMAT

SSI Frame Timing Diagram

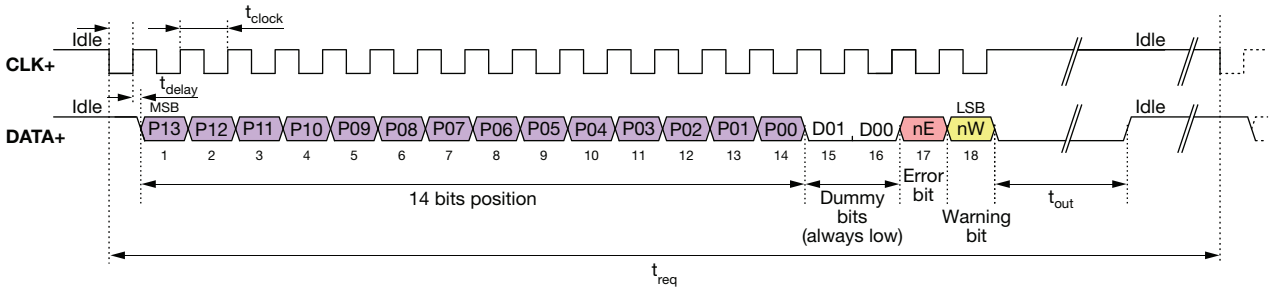


Fig. 1

SSI PARAMETERS		
PARAMETER	INFORMATION	
	MIN.	MAX.
SSI configuration	SLAVE mode only	
Clock and data interface	RS422 according to the EIA-RS422	
Position data (P13 to P00)	14 bits, binary code, MSB first (0 to 16 383)	
Dummy bits (D01 to D00)	2 bits	
Error and warning detection (nE / nW)	Active-low bits **nE bit**: activated if the Hall signal amplitude is out of range (too low or too high) **nW bit**: activated if magnet rotation speed is excessive	
Total number of bit	18 bits	
Time out period (t_{out})	20 µs	
Master clock frequency ($f_{clk} = 1/t_{clock}$)	150 kHz	4 MHz
Master request frequency (freq = $1/t_{req}$)	-	30 kHz

ACCESSORIES AND OPTION ON REQUEST

- For the mechanical interface: mechanical parts could be added on the magnet and / or on the PCB to fasten the design (rotor and stator) to the customer equipment
- For the electrical interface some customizations are feasible:
  - Output by wires
  - Output by cable
  - Output by cable and connector
  - Shielded sleeve
- Soldering with lead available (= variant not RoHS)

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