

EBR7915

Encoder for Spindle Tool Applications

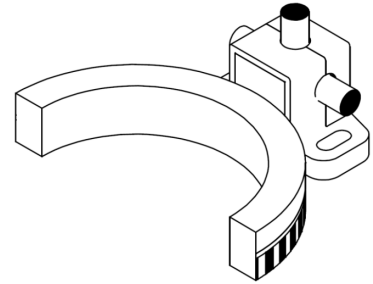
The sensor module ELR7915 contains an AMR (Anisotropic MagnetoResistive) position sensor, a TMR reference sensor and a signal conditioning ASIC for analog output.

The AL796 AMR sensor with PurePitch layout is designed for a magnetic scale with 2 mm magnetic pole pitch.

The TR961 TMR sensors is designed to detect a reference pole on a second track.

This combination of the magnetic scale with 2 mm pitch and the electronic module delivers two 90 degree phase shifted analog output signals with a square reference signal (see Fig. 1).

In combination with a sputtered SmCo pole ring such as MWIxxxxSAX-UU, this encoder is ideal for high-speed spindle applications.



Product Overview

Article description	Output Type	Description
EBR7915EDB-DA-IG	analoge	Incremental module for 2 mm pitch with an analog 1V _{pp} output. Cable vertical
EBR7915EDB-DB-IG	analoge	Incremental module for 2 mm pitch with an analog 1V _{pp} output. Cable horizontal left
EBR7915EDB-DC-IG	analoge	Incremental module for 2 mm pitch with an analog 1V _{pp} output. Cable horizontal right

Features

- Analog (1V_{pp}) output signal
- PurePitch sensor (2 mm)
- Integrated reference sensor
- Wide temperature range from -25°C up to +85°C

Advantages

- Compact design
- Robust and reliable
- Easy installation
- Reference detection
- Large working distance

Applications

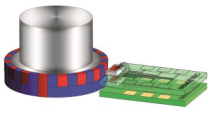
- Linear encoder
- Angular encoder
- Fast spindle application

Quick Overview

Symbol	Parameter	min.	typ.	max.	Unit
V _{DD}	Supply voltage	4.5	5.0	5.5	V
I _C	Current consumption	-	32.0	-	mA
V _{out}	Output voltage ¹⁾	0.8	1.0	1.2	V _{pp}
T _{amb}	Operating temperature	-25	-	+85	°C

¹⁾ Applies to the analog type only.

Measurement Setup

Depiction	Arrangement	Application
	EBR7915 with rotary scale, one track with incremental scale and one track with a single reference	Incremental length measurement with reference mark



Functional Description

Signal Path

The module output an analogue position signal. The sensor signal is offset, amplitude and phase corrected. The position is delivered as a sine/cosine signal. Additionally, a rectangular reference signal is created when the reference pole on the second track is detected.

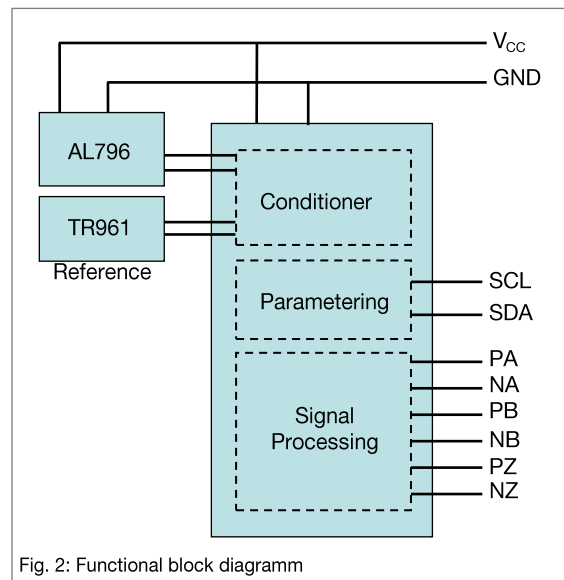
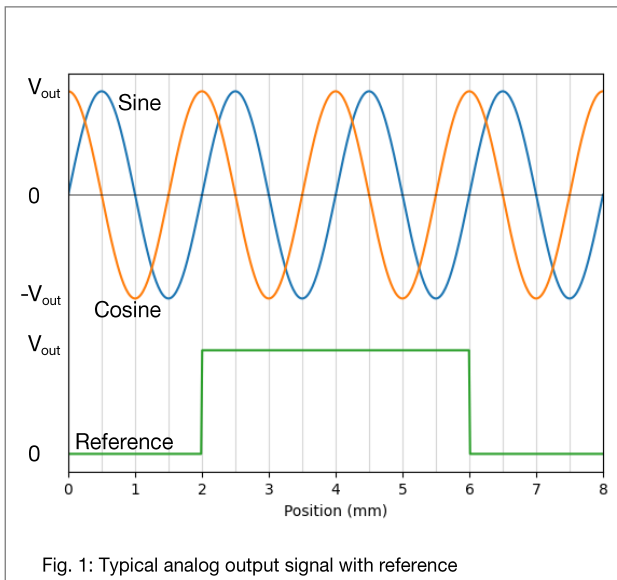
Special Feature

Housing of the module allows quick and safe installation. A fixed cable allows a quick integration of the sensor module in applications.

Communication

The I²C communication interface can be used to change the conditioner parameters. All configuration and error correction values are stored in the on-board EEPROM.

Performance Data



Absolute Maximum Ratings

The ratings do not imply opening conditions; functional operation is not guaranteed. Beyond these values damage may occur.

Symbol	Parameter	Conditions	min.	max.	Unit
V _{DD}	Supply voltage	Referenced to GND	-0.3	5.5	V
T _{amb}	Ambient temperature		-25	+110	°C
T _{stg}	Storage temperature		-25	+110	°C
ESD _{HBM}	ESD tolerance according to HBM		-	2000	V

Electrical Data

T_{amb} = +25°C, V_{CC} = 5.0 V; unless otherwise specified

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
V _{CC}	Supply voltage		4.5	5.0	5.5	V
I _C	Current consumption	No load	-	32.0	-	mA
T _{amb}	Ambient temperature		-20	-	+85	°C
f _g	Cut-off frequency	C _L =250 pF	-	500	-	kHz
ESD _{HBM}	ESD tolerance according to HBM		-	-	2000	V
R _{load}	Load on output ¹⁾	differential	100	-	-	Ω
V _{out}	Output voltage ¹⁾		0.8	1.0	1.2	V

¹⁾ Applies to the analogue type only.

Mechanical Data

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
Δd	Working distance (scale surface ↔ sensor)		0.5	0.7	1.5	mm

Magnetic Data

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
H _{ext}	Magnetic field strength		5.0	25.0	-	kA/m

Pinout of the sensor module

Color ¹⁾	Symbol	Parameter
White	PZ	Positive reference output
Brown	NZ	Negative reference output
Green	PA	Positive incremental sine output
Yellow	NA	Negative incremental sine output
Grey	PB	Positive incremental cosine output
Pink	NB	Negative incremental cosine output
Red	V _{CC}	Supply voltage
Blue	GND	Ground
Black	SCL	Serial clock
Purple	SDA	Serial data

¹⁾ Color of standard cable.

Dimensions

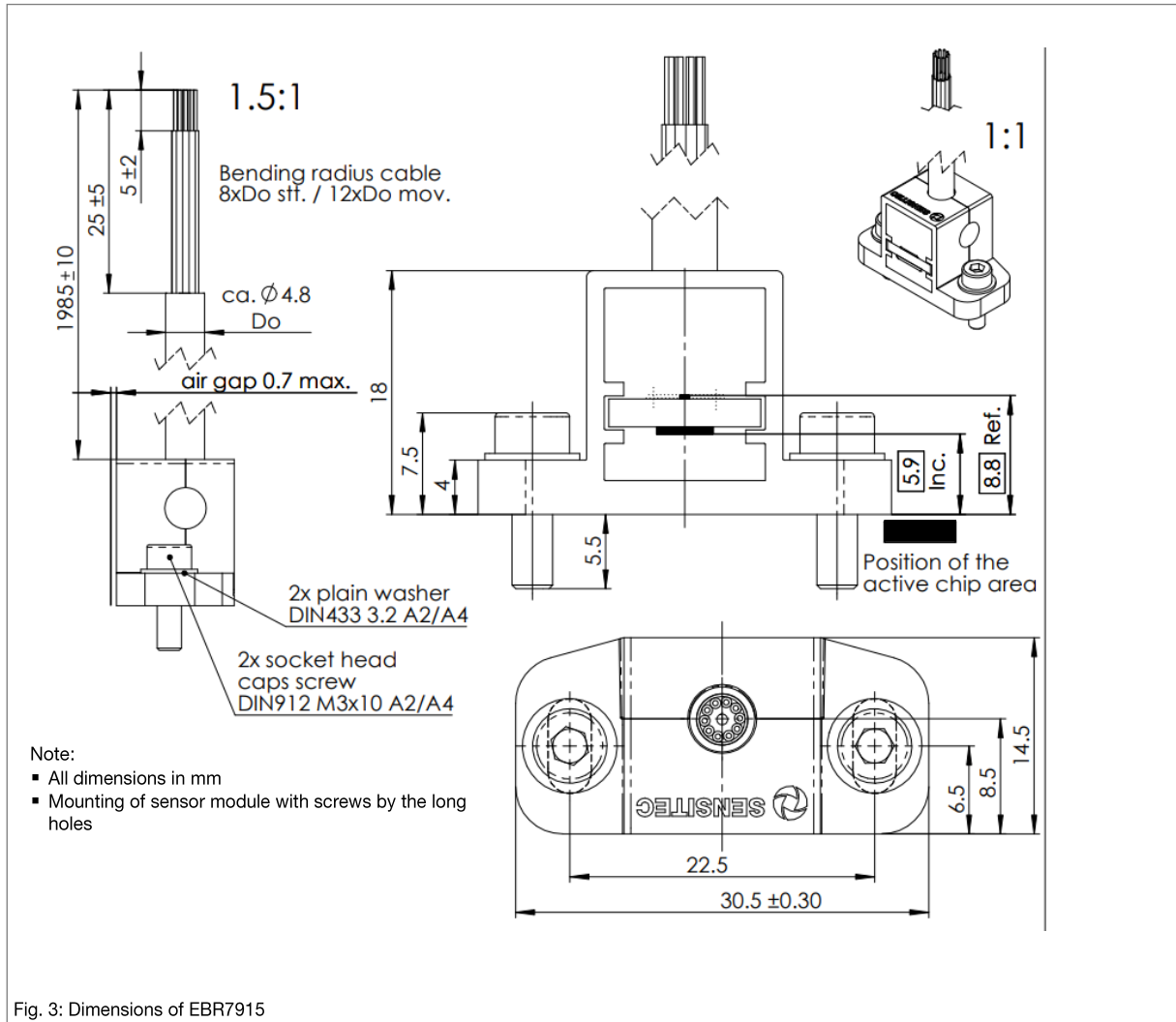
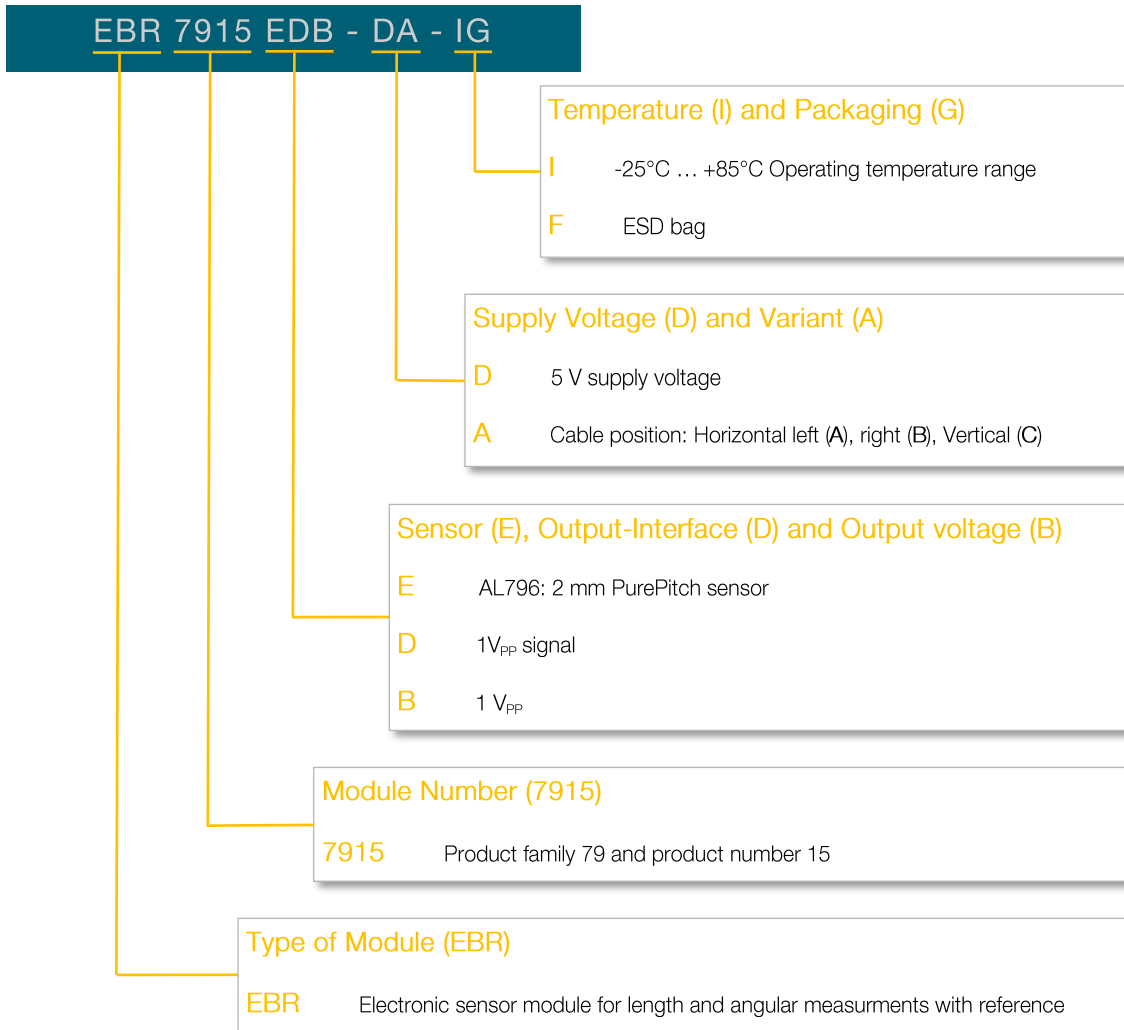


Fig. 3: Dimensions of EBR7915

Additional Information on Ordering Code



General Information

Product Status

Article	Status
EBR7915EDB-DA-IG	The product is under development.
Note	The status of the product may have changed since this data sheet was published. The latest information is available on the internet at www.sensitec.com .

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Changelist

Version	Description of the Change	Date
EBR7915.DSE.00	Original (pp. 1-7)	05/2024

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