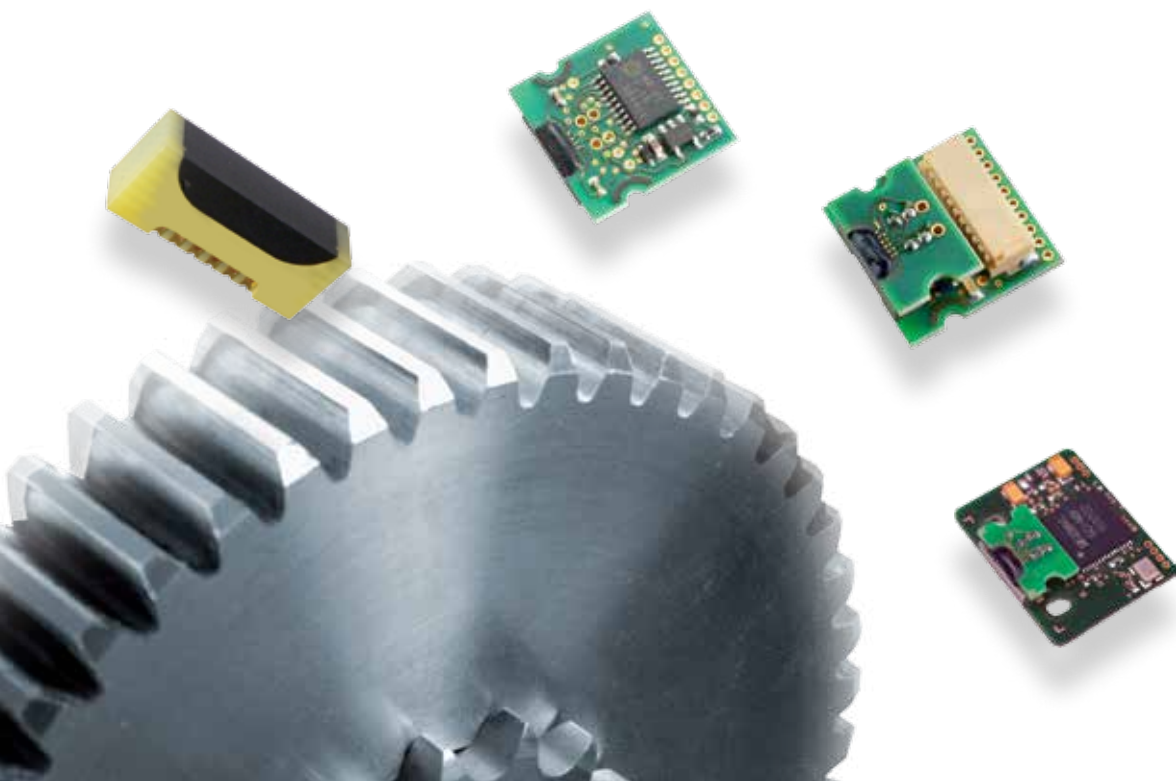
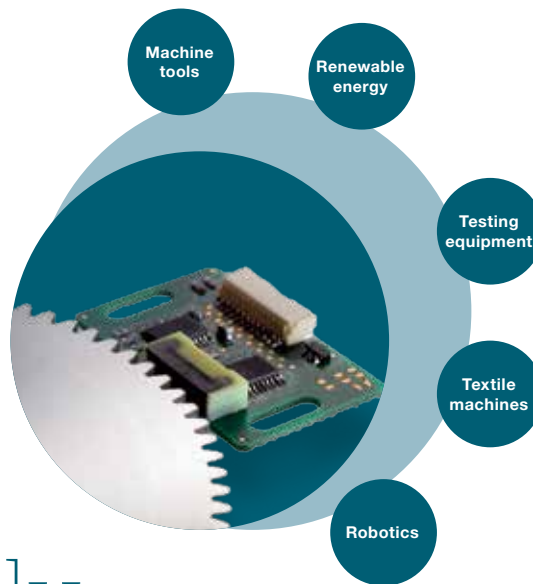


Tooth Sensor Modules and Kits.

GMR sensor modules for toothed structures.



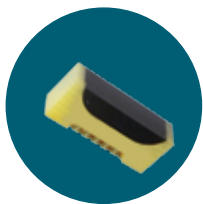
» Ideally suited
for highly
dynamic
applications! «



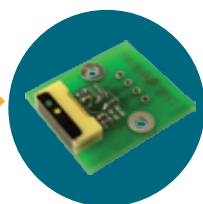
Product Family.

GLM700 and EBx7800.

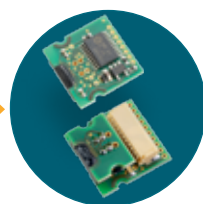
Raw sensor
GLM



Sensor + Amplification
GLAM

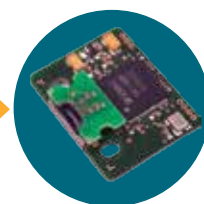


Sensor module + Interpolation + Reference
EBI7811



Sensor module + 1 V_{SS} - Interface + Reference
EBR7811

Vernier sensor module for absolute measurement value
EBS7821



Based on the GLM module technology a flexible sensor family has been developed which can be used in a wide range of applications. In addition to sensor modules providing analogue output signals with high bandwidth for dynamic applications there are further modules available with high resolution incremental output signals.

To complete this product family we offer a vernier based absolute sensor module which uses two tooth structures to generate the absolute positioning information, which then is provided to the end-user via SPI interface. For easy and fast evaluation of the tooth sensor technology a simple module with amplification can be supplied.

GLM700 Family.

GMR Tooth Sensor Modules for Length and Position Measurement.



GLM tooth sensor modules offer new possibilities for the simple, flexible sensing of ferro-magnetic, metallic toothed structures. By using the GMR technology in combination with a matched bias magnet a compact, highly integrated component can be realised. Existing machine elements can be applied as a measurement scale to achieve a considerable reduction of design and assembly effort for the user.

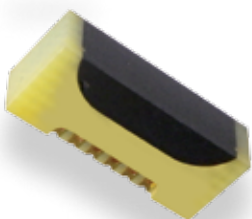
The sensors are based on the giant magneto-resistive effect (GMR). They feature Sensitec's patented FixPitch* design for toothed structures and cover tooth pitches from 0.94 mm (module 0.3) to 3 mm for non-contacting sensing of periodic tooth structures. The sensors also incorporate an integrated filter for higher harmonics, which ensure that the sine signal generated by the sensor has a low distortion and an excellent signal-to-noise ratio. The optimal matching of the bias magnet to the sensor element and the very strong applied magnetic field close to the sensor combine to make the module robust with respect to magnetic interference fields.

* FixPitch design: sensor chip matched to the pitch of the toothed structure.

Tooth sensors of the **GLM700ASB** family are available as SMD components and therefore can be mounted directly on the PCB. The sensor element and the required magnet are integrated in an optimized manner so that the assembly effort for the user is considerably reduced. A special feature of the GLM module are the variable mounting positions. The module can be surface mounted with the sensor parallel or perpendicular to the PCB to suit the available space and the orientation of the gearwheel target. This means for the user a considerable reduction of packaging and assembly effort and enables a fast „time-to-market“.

Evaluation boards (GLAM7xx) are available for all tooth pitches with a parallel mounted GLM module, for the development and testing of your sensor module application. The board provides amplified sine and cosine sensor signals. Based on the GLM module technology sensor modules with extended signal processing capability are also available.

GLM7xx



>> Existing tooth structures of machine elements, e. g. gearwheels, can be used as measurement scale. <<

EBx Family.

Sensor Modules with Incremental or Absolute Output.



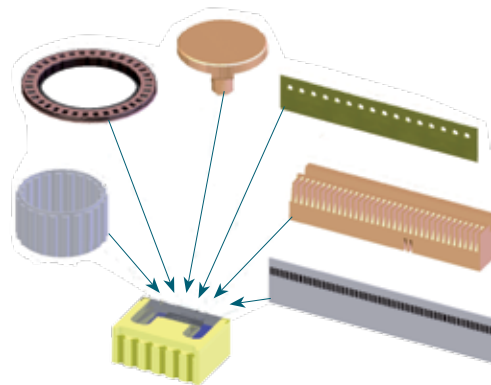
Equipped with an efficient interpolator the **EBx7811** sensor module provides a programmable resolution up to 400 increments per tooth pitch, which corresponds to a linear resolution of 2.5 μm for a 1 mm tooth pitch. Optionally this module can be supplied with an additional reference signal. In a short time we will offer a further sensor module called **EBS** which uses two tooth structures with vernier principle to generate absolute position information and to provide this via digital interface to the user. Another variant with an analogue 1 V_{SS} interface is also available.

In addition to well-known toothed structures, such as gearwheels or toothed racks, other machine elements can be used as a measurement scale. A depth of less than 1 mm for a periodic structure is enough to allow reliable operation of a GLM module. The diagram below shows a variety of different possible structures. As a special service Sensitec offers assistance in designing a tooth structure for you or in analysing an existing structure. If a complete sensor kit is required we will be pleased to deliver the suitable tooth structure as measurement scale.

Your Benefits

- ✓ Integrated, optimized magnet
- ✓ No user-side adjustment necessary between magnet and sensor
- ✓ Existing tooth structures of machine elements can be used
- ✓ Can be used with low structure depths < 1 mm
- ✓ High signal quality

Possible Tooth Structures



EBI7811



EBR7811



EBS7821



Technical Data

Symbol	Parameter	GLM711	GLM712	GLM713	GLM714	GLM715	Unit
P	Tooth pitch	1.0	2.0	3.0	0.94 (Module 0.3)	1.57 (Module 0.5)	mm
d	Air gap	~200	~400	~600	~190	~310	µm
V _{cc}	Supply voltage	5					V
R _B	Bridge resistance	5.5	5.7	5.7	5.6	5.8	kΩ
R _S	Sensor resistance	2.75	2.85		2.8	2.9	kΩ
f	Frequency range ¹⁾	< 1					MHz

¹⁾ Without significant loss of signal amplitude
The data given in the table are characteristic values. Data sheets with complete technical specifications can be found at www.sensitec.com.

Sensor module detecting a piston rod



Technical Data

Product code	Product photo	Sin/Cos differential	Sin/Cos amplified	1 V _{ss}	A/B differential	Reference signal	SPI interface	Dimensions in mm
GLM7xxASB		✓						13 x 5.5 x 3.5
GLAM7xx Evaluation Board			✓					24 x 21 x 5.1
EBI7811xBx					✓ (up to 400 flanks/pitch)			15 x 15 x 5.2
EBR7811xBx					✓ (up to 400 flanks/pitch)	✓		15 x 15 x 7.0
EBI7811xDB		✓		✓				15 x 15 x 5.2
EBR7811xDB		✓		✓		✓		15 x 15 x 7.0
EBS7821xSx			✓				✓	20 x 25 x 6.3

The sensors of the GLM700 family are also available as individual chips (as wafer, diced on foil or in waffle pack). Please contact your Sensitec sales engineer for more information on the delivery form. Gearwheels or other toothed structures, respectively, are available from many suppliers. It is important to use ferromagnetic material, as only these materials affect the working magnetic field. In special cases, e. g. the rods of pneumatic cylinders, the toothed structures have to be sealed to achieve a smooth surface. There are different technologies to realise a smooth surface in spite of the magnetically soft toothed structure under the surface. Please contact us for further information.

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Subject to technical changes.

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