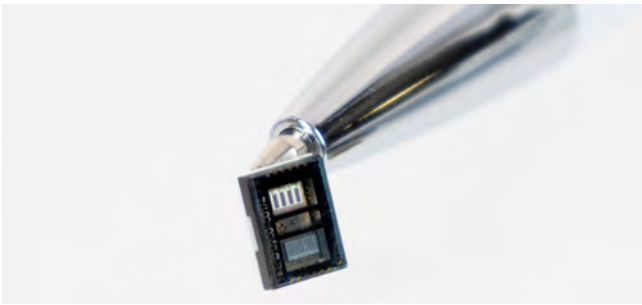




METIRIO®

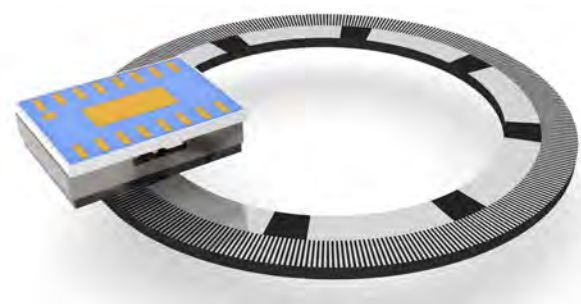
Optical Encoder

METIRIO® Encoder - Compact Design, High Precision



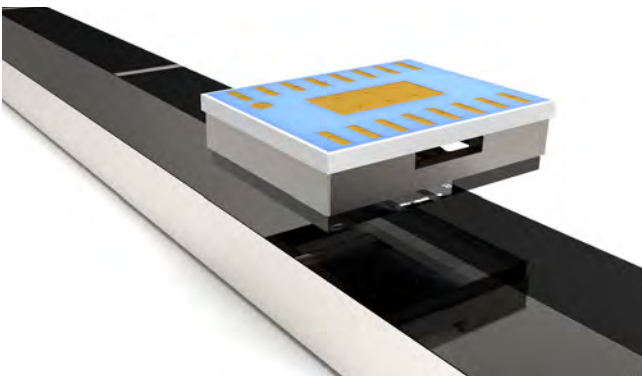
SmarAct has tailored the METIRIO optical encoder for closed-loop positioning with nanometer resolution in an exceptionally compact form factor. Designed by professionals for professionals, this high-precision analog encoder is a stand-alone optical solution for your measurement needs. The use of low outgassing materials, minimal power consumption, and a wide operating temperature range make METIRIO encoders adaptable to diverse environments and a wide range of applications.

Key Benefits

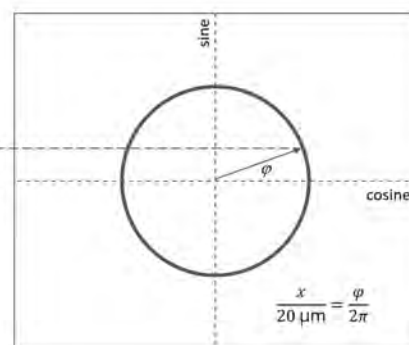
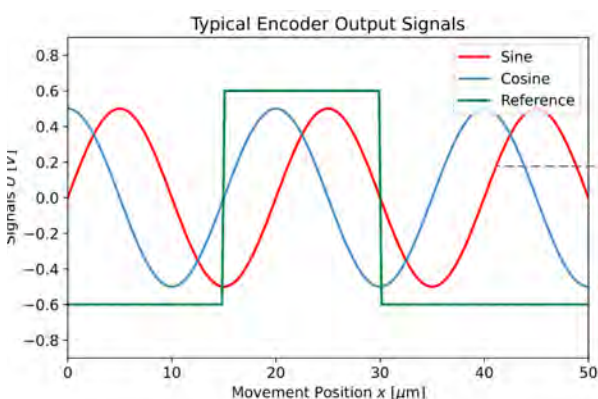


- The most compact encoder of its class
- One encoder suitable for a wide range of scales
- Integration and housing variants available
- Sub-nanometer resolution: < 1 nm
- High bandwidth: 500 kHz (10 m/s)
- Ultra-high vacuum (UHV) compatibility: down to 10^{-11} mbar
- Low current consumption: 20 mA, down to 1mA in the power down function

METIRIO Working Principle



The built-in light source illuminates a reflective scale with an incremental grating of $20\ \mu\text{m}$ pitch. The reflected light creates an interference pattern, which is captured by the diode array inside the read head. As the read head experiences relative motion to the scale, it produces analog sine and cosine signals from which the relative position (x) can be derived. This is shown in the image below. Additionally, the scale features a track for reference marks to allow absolute positioning. When passing a reference mark the read head produces a TTL-shaped voltage signal.



Modular Concept for METIRIO® Products



Optional: Interface module to obtain digital signals

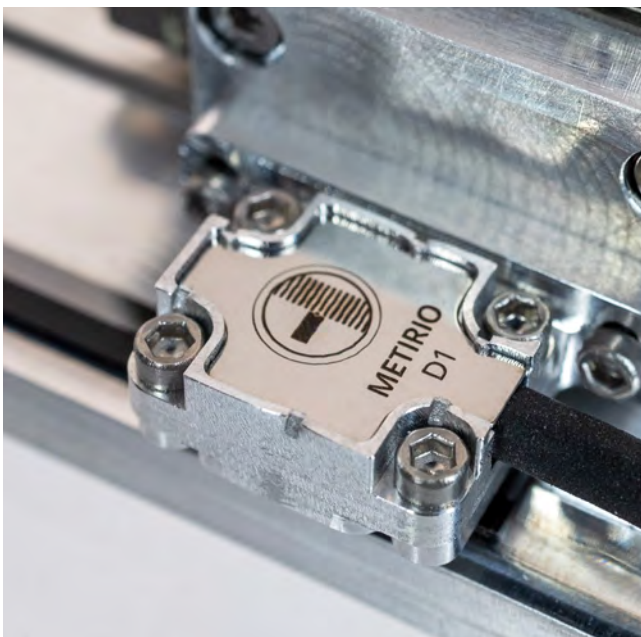
Since many customer controllers have a digital ABZ input, SmarAct Metrology also provides a separate signal converter, which is connected between the read head and the customer's controller. The **ENCODER INTERFACE MODULE (IM)** is an electronic interface adapter to digitize the analog output signals of the METIRIO read head and convert them to standard quadrature signals. The IM can directly be connected to the METIRIO D1 D-Sub 15 connector.



Optional: Evaluation module for easy diagnosis

The **ENCODER EVALUATION MODULE** is a setup comprising an electronic box and a software. It is intended to be used for diagnosis and electronic signal adjustment. It can be used to quickly attach a METIRIO for diagnosis since the opto-mechanical setup corresponds to the standard setup for METIRIO encoders.

Modular METIRIO® Product Family



The METIRIO product range boasts a consistent modularity. The extremely compact read head is designed for seamless integration by customers into various machine components and motion platforms. The ready-to-use housing variant METIRIO D1 is available for seamless plug-and-play integration. Upon request, custom housings are available to facilitate straightforward integration, catering to a broad spectrum of customer needs. The selection between the METIRIO read head and alternative modular housing options offers a multitude of installation possibilities for METIRIO encoders, including:

- Soldering on PCB
- Mounting via screws
- Adhesive mounting

SmarAct Metrology GmbH & Co. KG develops sophisticated equipment to serve high accuracy positioning and metrology applications in research and industry within fields such as optics, semiconductors and life sciences. Our broad product portfolio – from miniaturized interferometers and optical encoders for displacement measurements to powerful electrical nanoprobbers for the characterization of smallest semiconductor technology nodes – is completed by turnkey scanning microscopes which can be used in vacuum, cryogenic or other harsh environments.

We maintain the complete production in house for a high level of customization so that we can always provide you the optimal individual or OEM solution. We also offer feasibility studies, measurement services and comprehensive support to accompany you along your projects.

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