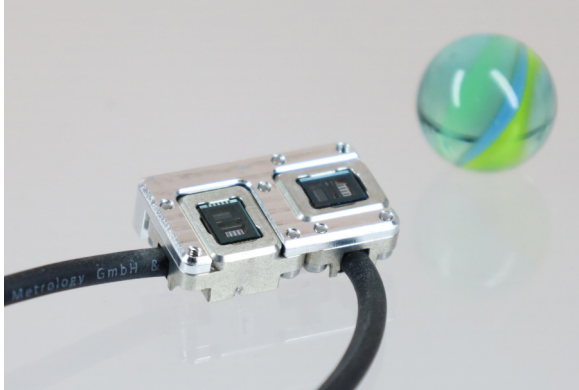


METIRIO 2D Specifications

DESCRIPTION



The **METIRIO 2D** is a powerful 2-dimensional encoder that combines two individual encoder units and a special **2D scale** to allow closed-loop position feedback in two dimensions simultaneously.

The light and robust design made of aluminum is optimized for a compact integration as mounting adapters and screws fit into a tiny package.

It outputs analogue sine and cosine signals and is offered with standard D-Sub connector.

Features

- Compact size: 15 x 11.2 x 6.2 mm
- Light weight: 8.4 g ^a
- High resolution: <1nm
- Easy and compact mounting
- Cabling: UL AWM Style 20963
- Scales: 2D grid with 20 µm pitch

^aWithout cabling

Applications

- Tracking 2-dimensional movements
- Deviation measurement along a linear axis

General specifications

Parameter	Symbol	Condition	Value	Unit
Max. Resolution	$r_{\max}$	1 kHz low-pass filter	1	nm
Bandwidth	$f_{3\text{db}}$		500	kHz
Max. Speed	$v_{\max}$		10	m/s
Typical Resolution	r		5.7	nm
Supply voltage	V_{DD}	to GND	3.3 to 5.0	V
Typical Current	I_{DD}	per Encoder	20	mA
Typical Power Consumption		per Encoder	100	mW
Central Emission Wavelength	λ_{pk}	—	850	nm
Radiant Power	ϕ_e		≤ 45	mW
Analog Output	V_{pp}	differential Sine, Cosine	1	V
Integrated noise			50	μV_{RMS}
Reference Signal	U_{ref}		RS485	square signal
Dimensions			15.0 x 11.2 x 6.2	mm ³
Weight			8.4	g

Operating conditions

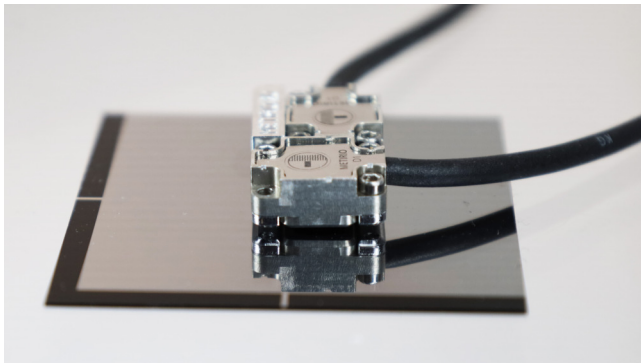
Parameter	Symbol	Condition	Value	Unit
Operating temperature	T_O	no dew condensation	0 to +80	°C
Storage temperature	T_S	no dew condensation	-20 to +80	°C
Humidity	$\varphi_{\max}$	EN 60068-2-78	80	%

Absolute Maximum Ratings

Parameter	Symbol	Condition	Value	Unit
Max. power consumption	P_{el}	all outputs terminated	310	mW
Max. radiant output power	$\Phi_{\max}$	short circuit current $I_F = 1000$ mA	<360	mW
ESD susceptibility	V_{ESD}	contact discharge (IEC 61000-4-2)	4000	V

REFLECTIVE SCALES

Encoders of the **METIRIO** family are suitable to read a broad variety of reflective linear, convex and rotary scales. However, the **METIRIO 2D** only works in conjunction with a special 2D scale. In contrast to linear scales which use a line pattern with a 20 μm pitch, this 2-dimensional scale uses a regular grid pattern with 20 μm pitch to allow motion tracking in x and y-direction. The maximum size for square scales is 1 m $\times$ 1 m. Rectangular slides may be longer, e.g. 1.4 m $\times$ 0.01 m. For more information please refer to our scale catalogue.



Characteristic	Info
Grating Type	Reflective amplitude Grating
Scale Pitch	20 μm
Scale Types	glass with 2D-grid pattern

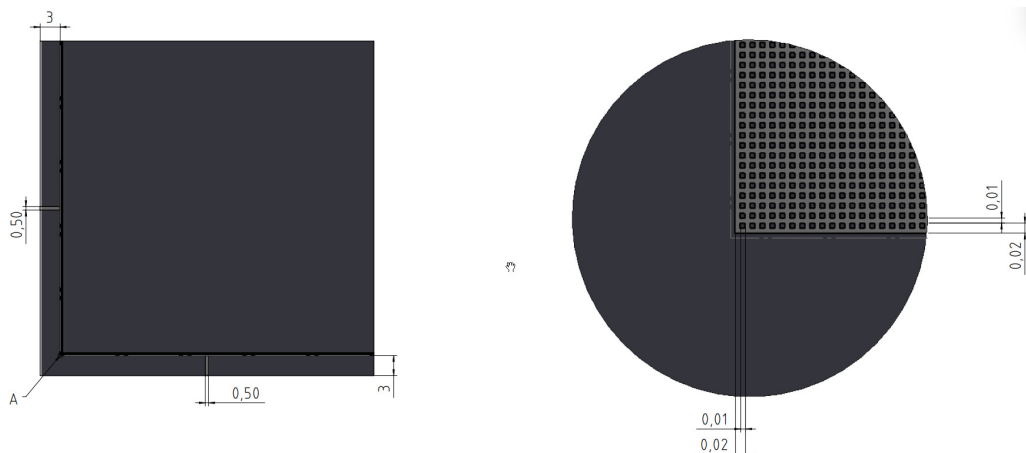


Figure 1. Schematic drawing of a 2-dimensional scale. Scales can be square and rectangular. Reference marks for quasi-absolute positioning are located in the center of each side.

OUTPUT SIGNALS

METIRIO is an analogue encoder that outputs 1V peak-to-peak sine and cosine signals as well as a TTL-shaped signal for the reference mark.

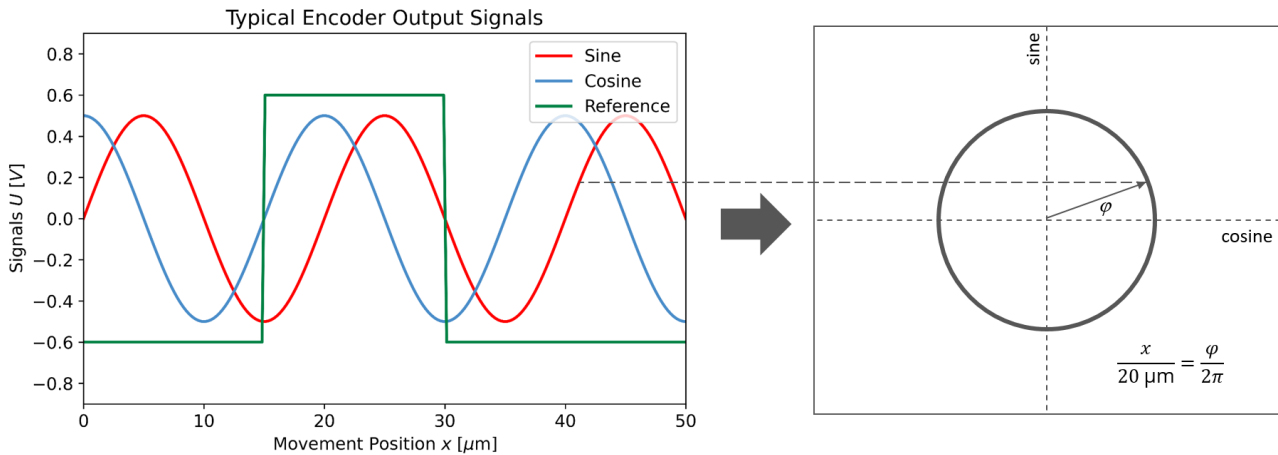


Figure 2. Typical output signals

From the analog sine and cosine signals the position can be calculated, since one period of the signal equals one $20 \mu\text{m}$ period of the scale grating.

For **digital communication** an interface module that translates the analogue signals either to ABZ- or BissC-protocol, is available.

CONNECTION

The **METIRIO 2D** is equipped with three standard D-Sub 15 male connectors with shielded AWG 36 cable with Polyurethane (PUR) sheath. Standard cable length is 1.5 m but can be customized up to 3 m. This variant is compatible with most Motion controllers. The cable fulfills the requirements of "UL AWM Style 20963" which allows the cable to be used in drag chain applications. Also, it is flame retardant.

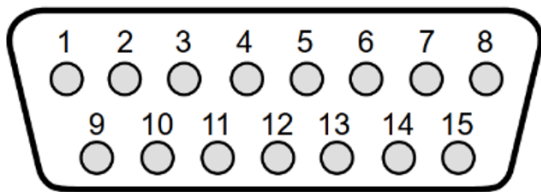


Figure 3. Pin assignment of the D-Sub 15 male connector of the **METIRIO**

Pin	Description	Pin	Description
1	n.c.	9	n.c.
2	n.c.	10	SCL
3	n.c.	11	SDA
4	GND	12	$U_{\text{sin-}}$
5	$U_{\text{sin+}}$	13	$U_{\text{cos-}}$
6	$U_{\text{cos+}}$	14	$U_{\text{Ref-}}$
7	$U_{\text{Ref+}}$	15	V_{DD}
8	n.c.	Housing	Shield

Alternatively, the **METIRIO 2D** is available with the same cable but with different connectors or without connector. The available cable lengths are the same as for the D-sub variant.

MECHANICAL DIMENSIONS

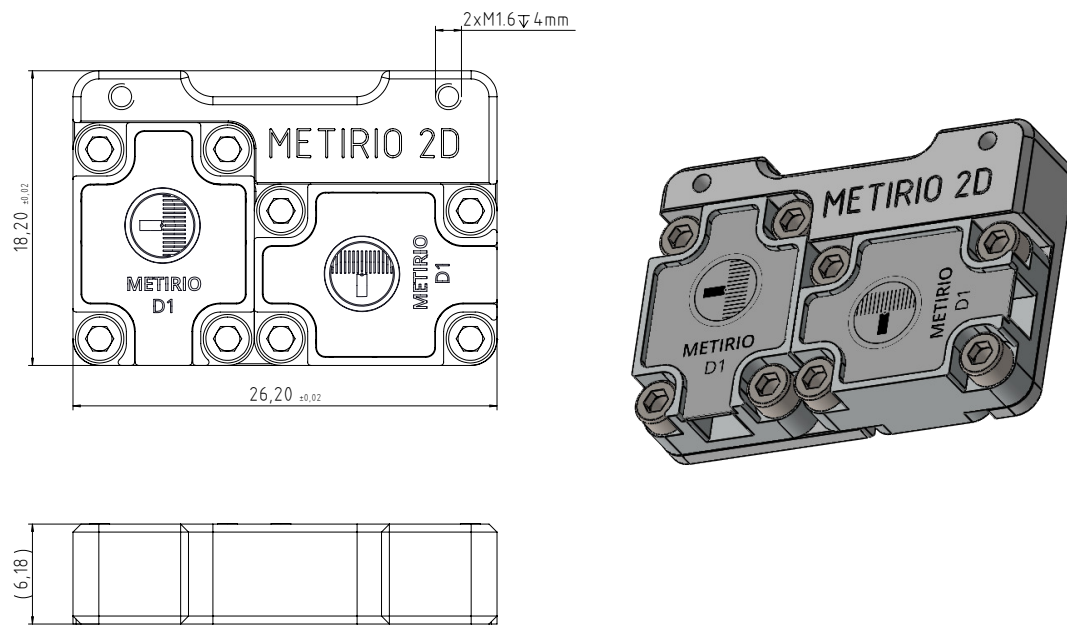


Figure 4. Dimensional outline of the **METIRIO 2D**

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