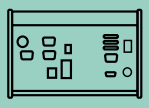
MARPOSS

HORIZON

INTERFEROMETRIC CONTROLLERS



Interferometric Point Controllers

HORIZON™ is a family of controllers designed to work with optical sensor heads for measuring thickness and distances. Based on interferometric technology and combined with a dedicated software package for data processing, it provides the ideal solution for high-accuracy measurements in applications where contact with the part is not possible.

HORIZON controllers allow high precision measurements without contact and without risk of damaging the parts.

Among the various advantages of these controllers is the measurement of distance and thickness at very high resolution on all types of surfaces and materials, including reflective surfaces.

The performance depends on the controller model and the dedicated optical sensor.

Thickness measurement on glass, as well as transparent and opaque films, is achieved with a single controller in combination with a high-precision sensor for sub-micron accuracy.

HORIZON controllers (visible and infrared light source) are compatible with all Marposs or Stil sensor heads with a performance adapted to each measurement range (thickness and distance).

HORIZON

Horizon offers the best price/performance rates for OEM integration.
It is available in 1CH version.
The HW and SW architecture can offer the best interface from the HW point of view (machine) and SW point of view (third-party SW).

With different light sources it offers best performance on the market. In combination with dedicated optical sensor heads, it is perfect for wafer, medical devices, electronic components and in general for all applications where non contact measure is required with extreme high accuracy.

Horizon is a complementary product family to Marposs P3IF family specifically designed for In Process BG applications in Semicon industry.

Benefits

- Interferometric technology is versatile, suitable for transparent, semi-transparent, and opaque materials, including advanced semiconductor coatings
- High Precision & Stability guarantee reliable measurement of thin films, wafers, and coatings with exceptional repeatability and accuracy.
- Possibility to be used in chain configuration for multi-points application (all measures are synchronized)
- Availability of SDK and protocol commands for easy integration into any system
- Synchronized measurement with encoder for dynamic acquisitions
- Several interfaces for communication: Ethernet, USB, RS232/422, analog, fieldbus

The **product**

Interferometric technology is an advanced solution for measuring thickness, distances, and dimensional variations with extremely high precision, down to sub-micron levels.

- In the electronics industry, interferometry is used to measure the thickness of thin layers in integrated circuits or displays, ensuring uniformity and flatness in high-density production processes.
- In the automotive sector, it is employed for dimensional inspections of reflective metal surfaces and transparent components, such as glass and optical films. It is also essential for ensuring precise alignment and coupling of mechanical parts.
- The medical field benefits from this technology in the production of precision devices like optical lenses, surgical instruments, and miniaturized sensors. Interferometry ensures these components meet the stringent quality standards required.
- In aerospace applications, it is used to measure the quality of composite materials and monitor structural deformations under extreme conditions. This technology enhances the reliability of critical components and minimizes the risk of failure.
- Interferometric solutions are also crucial in semiconductor industry. Real-Time Monitoring supports inline process control, reducing material waste and enhancing production efficiency.
- In the EV market segment, we may offer solutions to measure for example paint thickness on battery cells and coating thickness on magnet wire.

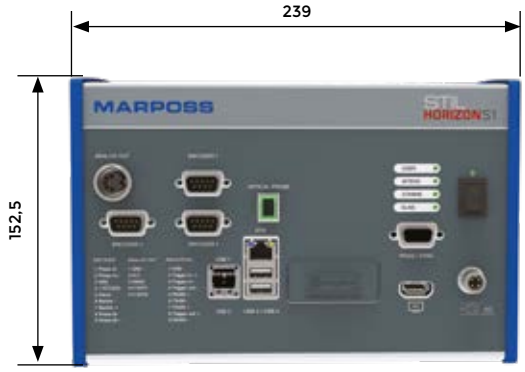
With the ability to adapt to various surfaces and materials, including highly reflective and transparent ones, interferometric technology is an indispensable choice for industries where precision, reliability, and measurement speed are critical.

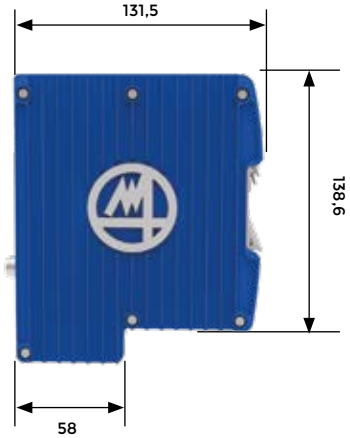
Technical Specifications

Controller type	HORIZON S1	HORIZON 90S1	HORIZON S2	HORIZON 90S2	HORIZON T1	HORIZON 90T1	HORIZON W1	HORIZON L2
Order code	B830T400000	B830T410000	B830T401000	B830T411000	B830T404000	B830T414000	B830T406000	B830T405000
Measuring principle	interferometric	interferometric	interferometric	interferometric	interferometric	interferometric	interferometric	interferometric
Channels	1	1	1	1	1	1	1	1
Measure type [µ]	Thickness, distance	Thickness, distance	Thickness, distance	Thickness, distance	Thickness, distance	Thickness, distance	Thickness, distance	Thickness, d istance
Sampling rate hz	2000	90000	2000	90000	2000	90000	2000	2000
Light source	SLED	SLED	SLED	SLED	SLED	SLED	LED	LED
Wave lenght [nm]	1310	1310	1310	1310	1020	1020	350 ÷ 700	750
Measuring range* [µ]	37 ÷ 1850	37 ÷ 1850	74 ÷ 3700	74 ÷ 3700	15 ÷ 850	15 ÷ 850	2,25 ÷ 225	60 ÷ 3000
Accuracy [µ]	≤ 1 µm	≤ 1 µm	≤ 2 µm	≤ 2 µm	≤ 1 µm	≤ 1 µm	≤ 0.5 µm	≤ 1 µm
Axial resolution [nm]	30 nm	30 nm	30 nm	30 nm	30 nm	30 nm	30 nm	30 nm
Measuring mode	Distance Thickness	Distance Thickness	Distance Thickness	Distance Thickness	Distance hickness	Distance hickness	Distance Thickness	Distance Thickness
Encoder input	3 digital (TTL/HTL Differential/Single Ended)							
Digital port	USB / ETH / RS442							
Analog output	2 (0-10Vdc)							
Synchronization	1 Synchro input (TTL) / 1 Synchro output (TTL)							
Interfaces	Ethernet (10/100 Mbit) [RS232 / RS422 as option]							
Network connection	YES							
Power supply	12 ÷ 24 Vdc (+20% / - 15%)							
Power consumption	30 W							
Protection degree	IP40							
Wheigt	2,8 Kg							
Dimension	239 (w) x 157,5 (h) 131,15 (d)							

* In air with refractive index = 1

DIMENSIONS (mm)





Probe code			B3PITS20A01	B3PITT10A00	B3PITL20A01	B3PITL20A00	B3PITS20A00
Description			PROBE IF-S1-S2 10 mm	PROBE IF-T1 100 mm	PROBE IF-L2 50 mm	PROBE IF-L2 50 mm	PROBE IF-S1-S2 100 mm
Distance			-	-	-	-	-
Tickness			●	●	●	●	●
Axial			●	●	●	●	●
Stand off (SO)		[mm]	10	100	50	50	100
Max. Slope Angle		[°]	2.6	1,5	5	2,6	1,5
Spot size		µm	20	15	70	180	25
Dimensions - [mm]		Ø	18	18	22	22	18
		L	69	80,7	86	77	74,3
Controller	HORIZONS1 / 90S1		●				●
	HORIZONS2 / 90S2		●				●
	HORIZONT1 / 90T1			●			
	HORIZONW1						
	HORIZONL2				●	●	

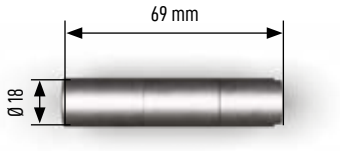
Probe code			B3PITW10A00	B3PIRS20A01	O3PS05D1401	O3PS05T7001	O3PS05T3501	O3PS0500001
Description			PROBE IF-WL 28 mm	PROBE IF-S1-S2-REF 15 mm	"OPILB-LWD-D +MG140"	"OPILB-LWD-T +MG70"	"OPILB-LWD-T +MG35"	OPILB
Distance			-	●	●	-	-	-
Tickness			●	●	●	●	●	●
Axial			●	●	●	●	●	●
Stand off (SO)		[mm]	28	15	4,6	9,2	9,2	42
Max. Slope Angle		[°]	7	2,6	17	17	17	5,4
Spot size		µm	70	20	5,7	11,4	22,9	32
Dimensions - [mm]		Ø	20	30	27	27	27	15
		L	138	147	191,3	153,4	122,7	127,2
Controller	HORIZONS1 / 90S1			●				
	HORIZONS2 / 90S2			●				
	HORIZONT1 / 90T1							
	HORIZONW1		●		●	●	●	●
	HORIZONL2							

OPTICAL FIBER

Code	B2974000142	B2974000123	B2974000140	B2974000126	B29T5016320	B2974000128	B29T5016330
Description	SM9/125_3M_ E2000/APC-FC/ APC_PP	SM9/125_4M_ E2000/APC-FC/ APC_PP	SM5.3/125_3M_ E2000/APC-FC/ APC_PP	SM5.3/125_4M_ E2000/APC-FC/ APC_PP	MM50/125_3M_ E2000/APC-FC/ APC_PP	MM50/125_4M_ E2000/APC-FC/ APC_PP	MM50/125_3M_ E2000/APC-FC/ APC_PP
Lenght [m]	3	4	3	4	3	4	3
Type	Not armored 3mm	Not armored 3mm	Not armored 3mm	Not armored 3mm	Not armored 3mm	Not armored 3mm	Not armored 3mm
Ø [mm]	3	3	3	3	3	3	3
HORIZONS1 / 90S1	●	●					
HORIZONS2 / 90S2	●	●					
HORIZONT1 / 90T1			●	●			
HORIZONW1						●	●
HORIZONL2					●	●	

Dimensions of optical sensors

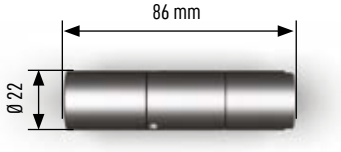
PROBE IF-S1-S2



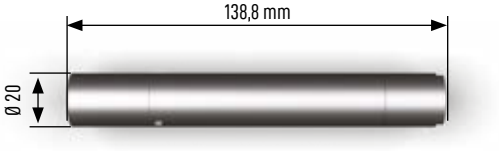
PROBE IF-T1

PROBE IF-L2

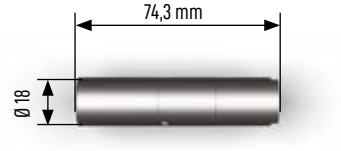
PROBE IF-L2



PROBE IF-WL



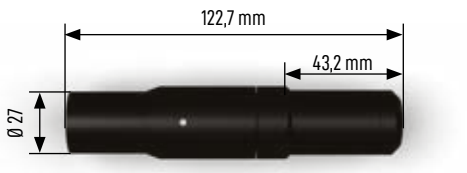
PROBE IF-S1-S2



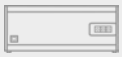
OPILB-LWD-D+MG140

OPILB-LWD-T+MG70

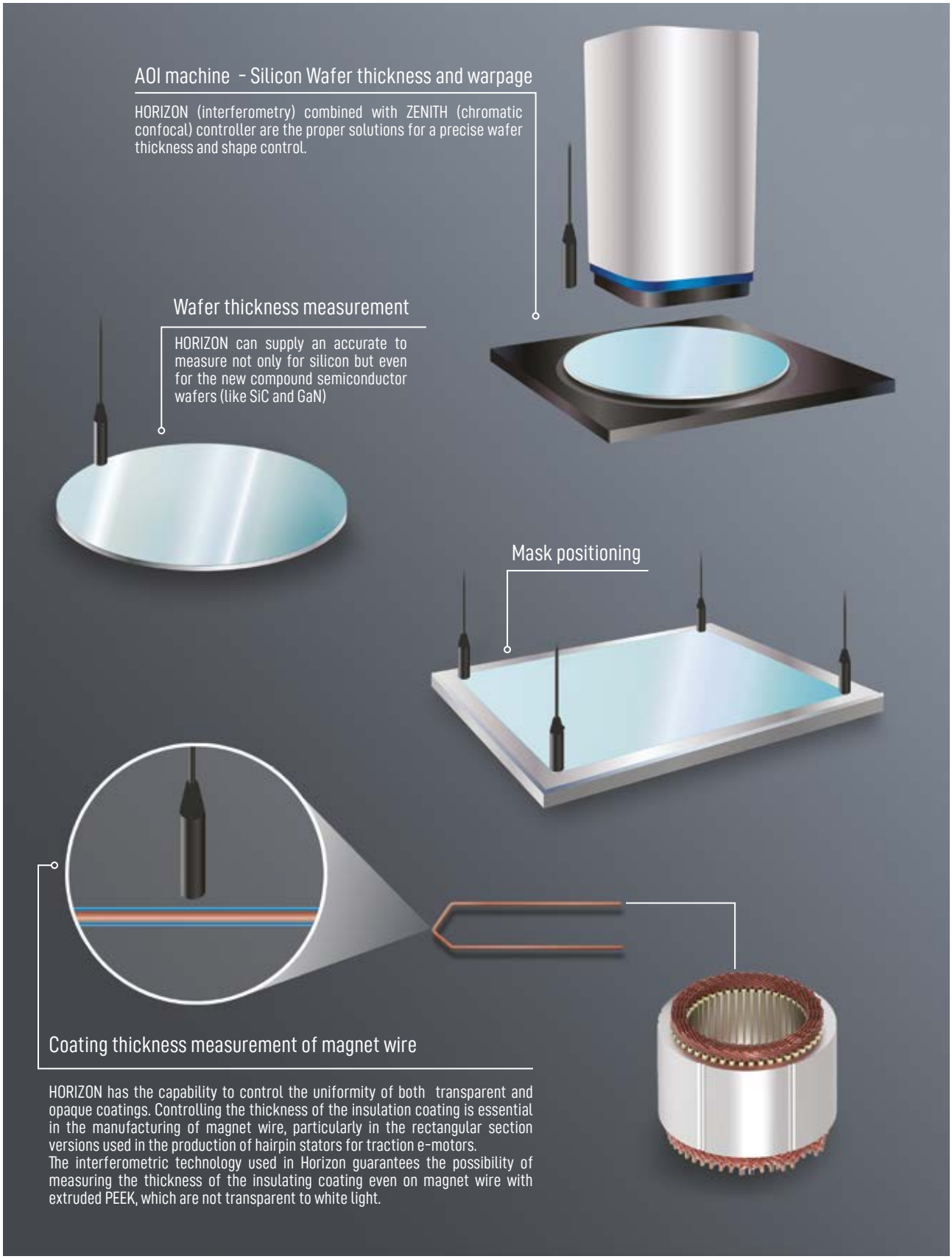
OPILB-LWD-T+MG35



OPILB



Application examples



Connections

HORIZON is a controller designed for easy HW integration.

The device is complete and fully equipped with the following:

- **2 x Analog Output 0-10V**
  It makes simple to get the measure value directly connected to PLC Analogue Input card.
- **3 x Encoder Input**
  High precision synchronization is available to 3D profile reconstruction or dynamic measure performed
- **in line 1 ETH connection** for device configuration and machine interface.
- **4 x USB** – FW Update & Service
- **Anybus Expansion Slot**
  To get extremely high flexibility compatible with the most industrial communication bus:
  - EtherCAT
  - Profinet
  - Modbus TCP
  - CANopen
  - Others are available
- **IO Synch Connection**
  It is possible to use HW trigger for measure acquisition or use this function to let a chain of controllers working fully synchronized.

Sw TOOL

Device Configuration

HORIZON is provided by MIC Tool, its configurator software to perform dedicated settings in relation to part to be measured and application requirements.

To simplify integration, each controller comes equipped with a comprehensive Software Development Kit (MIC TOOL SDK).

Device Integration

HORIZON can be integrated through 2 main tools:

• SDK toolset

• Quick SPC™

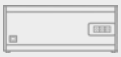
SDK toolset has been designed using the most robust and efficient software environments C++, C, and C# leveraging state-of-the-art development technologies to ensure high performance and reliability. Integration examples are included, and you will benefit from Marposs's dedicated support to streamline your integration process.

The SDK toolset will make easy and simple the integration in third-party SW.

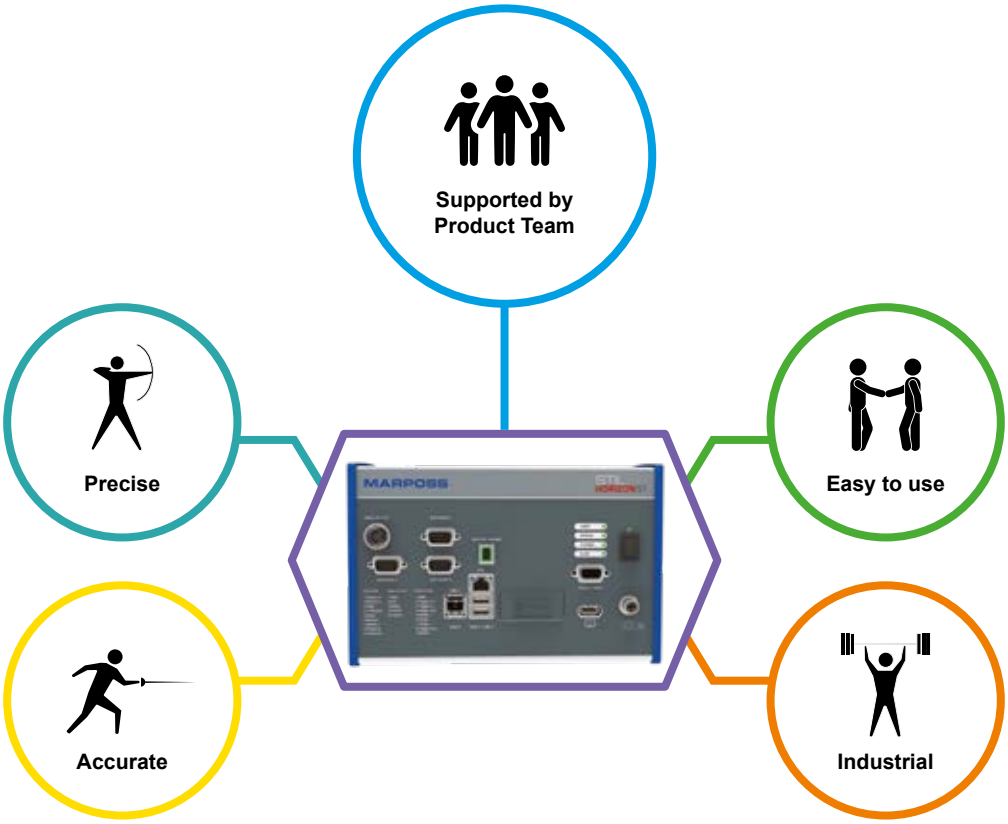
Quick SPC™ for Windows® is a suite of software products designed to comply with any requirement ranging from simple measurement acquisition to complex gauging applications.

This SW for Process and QUALITY control is born to be framed with a simple, wizard-driven, common user interface that make possible to complement the base product using software Add-ons purposely conceived for specialized industry fields.

QUICKSPC



HORIZON™ is the perfect solution for applications where precision, accuracy, reliability, and ease of use are essential requirements. As the interferometric solution from the Marposs group, Horizon combines advanced technology with dedicated application consulting, working together with our partners to shape innovative solutions for the future.



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