



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.

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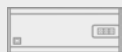
ChromaPoint Sensor Heads



Interferometric Point Controllers



ChromaLine Controllers



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ChromaVision Camera



Accessory



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.

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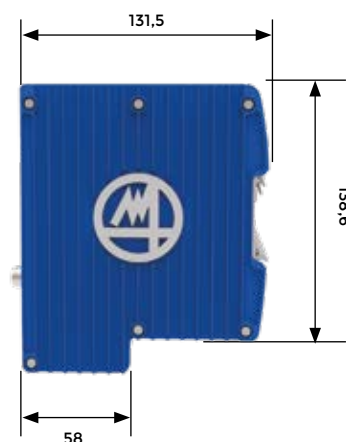
HORIZON

Technical Specifications

| Controller type | HORIZONS1 | HORIZONS2 | HORIZONT1 | HORIZONW1 | HORIZONL2 |
|---------------------|--|---------------------|---------------------|---------------------|---------------------|
| Order code | B830T400000 | B830T401000 | B830T404000 | B830T406000 | B830T405000 |
| Measuring principle | interferometric | interferometric | interferometric | interferometric | interferometric |
| Channels | 1 | 1 | 1 | 1 | 1 |
| Measure type | Thickness, distance | Thickness, distance | Thickness, distance | Thickness, distance | Thickness, distance |
| Sampling rate | 2000 | 2000 | 2000 | 2000 | 2000 |
| Light source | SLED | SLED | SLED | LED | LED |
| Wave lenght | 1310 | 1310 | 1020 | 350 ÷ 700 | 750 |
| Measuring range* | 37 ÷ 1850 | 74 ÷ 3700 | 15 ÷ 850 | 2,25 ÷ 225 | 60 ÷ 3000 |
| Accuracy | ≤ 1 µm | ≤ 2 µm | ≤ 1 µm | ≤ 0.5 µm | ≤ 1 µm |
| Axial resolution | 30 nm | 30 nm | 30 nm | 30 nm | 30 nm |
| Measuring mode | Distance Thickness | Distance Thickness | Distance Thickness | 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 | | | | |
| Wheight | 2,8 Kg | | | | |
| Dimension | 239 (w) x 157,5 (h) 131,15 (d) | | | | |

* In air with refractive index = 1

DIMENSIONS (mm)



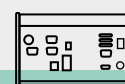
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Controllers



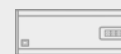
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Camera



Accessory



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THE PRODUCT LINE

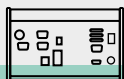
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Accessory



| 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 | • | | | | • |
| | HORIZONS2 | • | | | | • |
| | HORIZONT1 | | • | | | |
| | 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 | | • | | | | |
| | HORIZONS2 | | • | | | | |
| | HORIZONT1 | | | | | | |
| | HORIZONW1 | • | | • | • | • | • |
| | HORIZONL2 | | | | | | |

OPTICAL FIBER

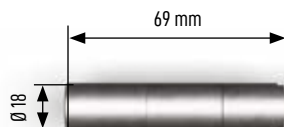
| Code | B2974000142 | B2974000123 | B2974000140 | B2974000126 | B29T5016320 | B2974000128 | B29T5016330 |
|-------------|------------------------------------|--|--|--|---|---|---|
| Description | SM9/125_3M_E2000/ APC-FC/APC_PP | SM9/125_4M_ E2000/APC-FC/ APC_PP | SM5.3/125_3M_ E2000/APC-FC/ APC_PP | 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 | • | • | | | | | |
| HORIZONS2 | • | • | | | | | |
| HORIZONT1 | | | • | • | | | |
| HORIZONW1 | | | | | | • | • |
| HORIZONL2 | | | | | • | • | |

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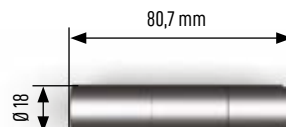
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Dimensions of optical sensors

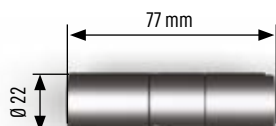
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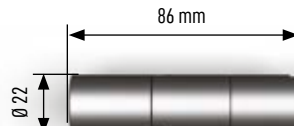
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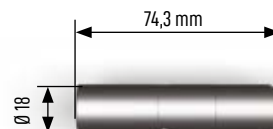
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B3PITW10A00



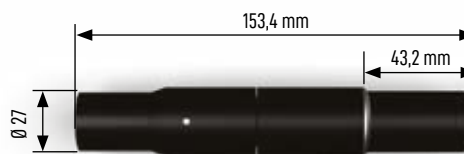
B3PITS20A00



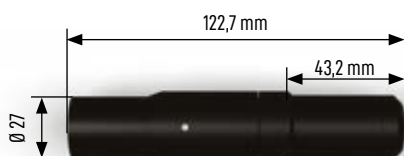
O3PS05D1401



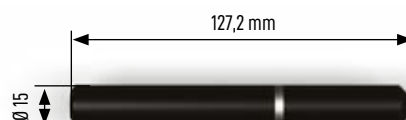
O3PS05T7001



O3PS05T3501



O3PS0500001



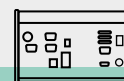
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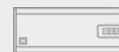
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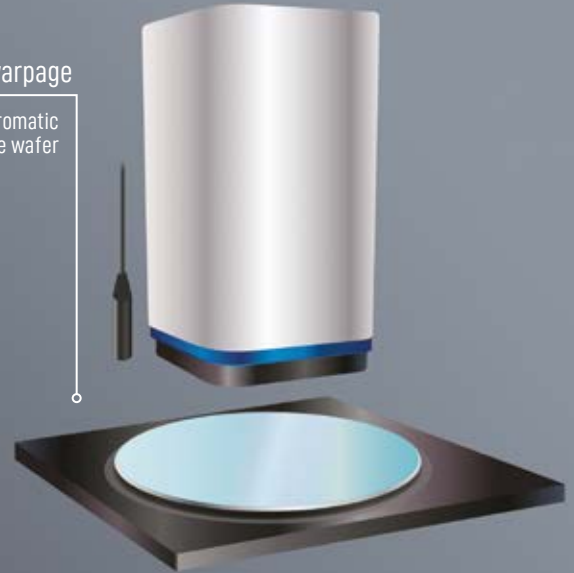
Accessory



Application examples

AOI machine - Silicon Wafer thickness and warpage

HORIZON (interferometry) combined with ZENITH (chromatic confocal) controller are the proper solutions for a precise wafer thickness and shape control.

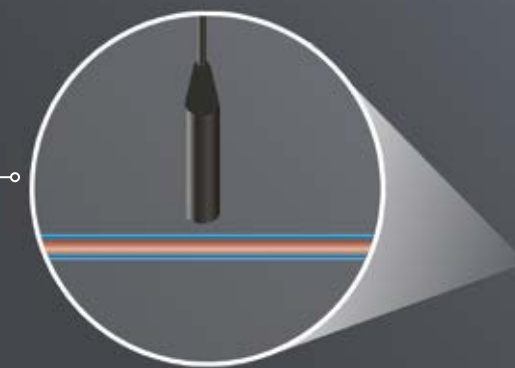
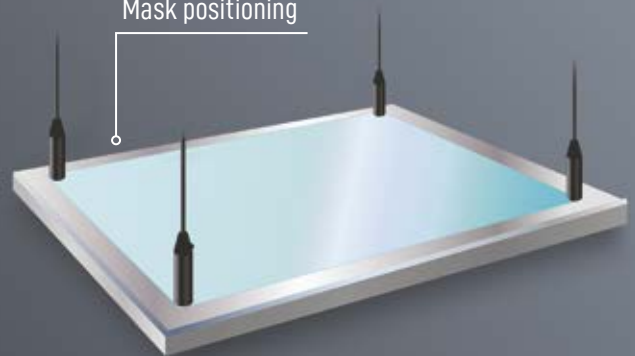


Wafer thickness measurement

HORIZON can supply an accurate to measure not only for silicon but even for the new compound semiconductor wafers (like SiC and GaN)

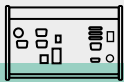
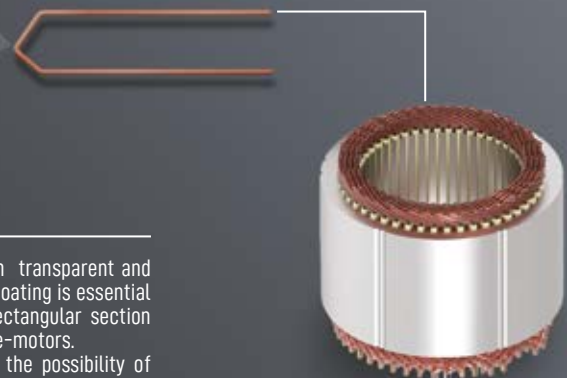


Mask positioning



Coating thickness measurement of magnet wire

HORIZON has the capability to control the uniformity of both transparent and opaque coatings. Controlling the thickness of the insulation coating is essential in the manufacturing of magnet wire, particularly in the rectangular section versions used in the production of hairpin stators for traction e-motors. The interferometric technology used in Horizon guarantees the possibility of measuring the thickness of the insulating coating even on magnet wire with extruded PEEK, which are not transparent to white light.



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.

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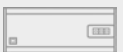
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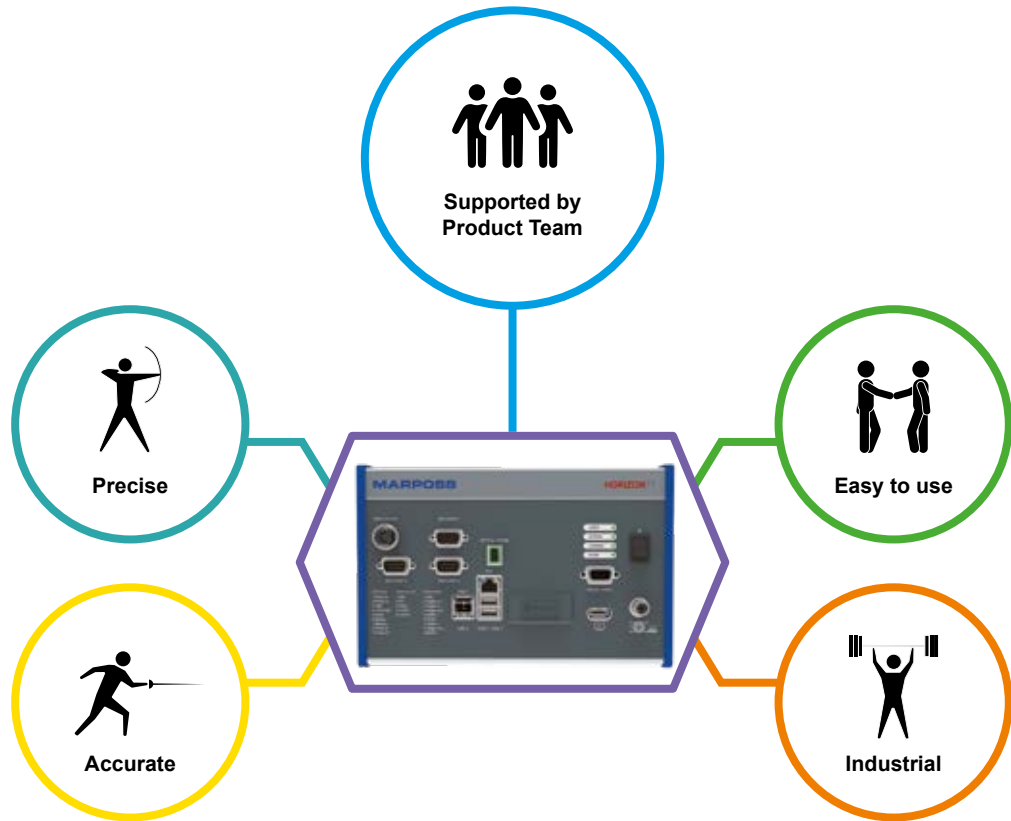


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THE PRODUCT LINE

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.



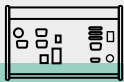
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