

MPI TS3000-DS | 300 mm Automated Probe System

For Double- & Single Sided Optical-Electrical IC Device Testing

FEATURES / BENEFITS

Designed for Silicon Photonics Device Testing

- Testing devices from top and bottom side
- Supports O-O, E-O, E-O and E-E type devices
- Integrated Z-distance sensor for maintaining optical probe to device distance
- Temperature device cycling from ambient to +150°C

Optical Setup

- Hexapod-NanoPositioner combination, for high precision and ultra-fast fiber probe alignment
- Grating and Edge fiber probe coupling
- East and West configurations
- Double sided, top & bottom

Electrical Setup

- Probe card in 4.5 inch width format
- DC and RF MicroPositioners
- Single sided, top
- Optional high-pin count support, up to 35kg force

Ergonomic Design and Footprint

- Easy wafer or single DUT loading from the front
- Integrated active vibration isolation
- Intelligent integrated prober control, for fast and accurate operation
- Optional test instrumentation shelf for short cable routing, to support high speed – high dynamic range device testing



STAGE SPECIFICATIONS

Chuck XY Stage (Programmable)

Travel range	320 mm x 450 mm (12.6 x 17.7 in)
Resolution	0.5 μ m
Accuracy	< 2.0 μ m (0.08 mils)
Repeatability	< 1.0 μ m
XY stage drive	Closed-loop high precision stepper motors
Speed*	Slowest: 10 μ m / sec Fastest: 40 mm / sec

Chuck Z Stage (Programmable)

Travel range	10 mm (0.39 in)
Resolution	0.2 μ m
Accuracy	< 2.0 μ m
Repeatability	< 1.0 μ m
Z stage drive	Closed-loop high precision stepper motor
Speed*	Slowest: 10 μ m / sec Fastest: 4 mm / sec
Linear guide	Precision ball bearings

*Instantaneous speed. Average speed subject to accelerate and decelerate times

STAGE SPECIFICATIONS

Chuck Theta Stage (Programmable)

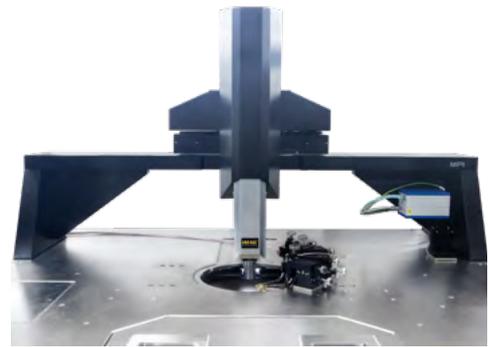
Travel range	± 5.0°
Resolution	0.0001° (0.24 µm @ 300 mm edge)
Accuracy	< 2.0 µm (measured at edge of chuck)
Repeatability	< 1.0 µm
Theta stage drive	High resolution stepper motor with linear encoder feedback system

TOP MICROSCOPE MOVEMENT

XYZ Programmable

XY - Travel range*	50 x 50 mm / 300 x 300 mm
Resolution	1 µm (0.04 mils)
Repeatability	≤ 2 µm (0.08 mils)
Accuracy	≤ 5 µm (0.2 mils)
Z - Travel range	140 mm
Resolution	0.05 µm (0.002 mils)
Repeatability	≤ 2 µm (0.08 mils)
Accuracy	≤ 4 µm (0.16 mils)

*In case of ShieldEnvironment™ X x Y: 25 mm x 25 mm



BOTTOM MICROSCOPE MOVEMENT

XY - Travel range	25 x 25 mm
Z - Travel Range	13 mm
Magnification	5x
Working distance	95 mm
Resolution	2.1 µm
Field of view	1.68 x 1.42 mm
Illumination	Coaxial and ring

SENTIO® camera

Resolution	5 MP (2448 x 2048)
Image sensor	2/3-inch GS-CMOS
Frame rate	35 fps
Pixel size	3.45 x 3.45 µm

TOP PROBE PLATEN

Specifications

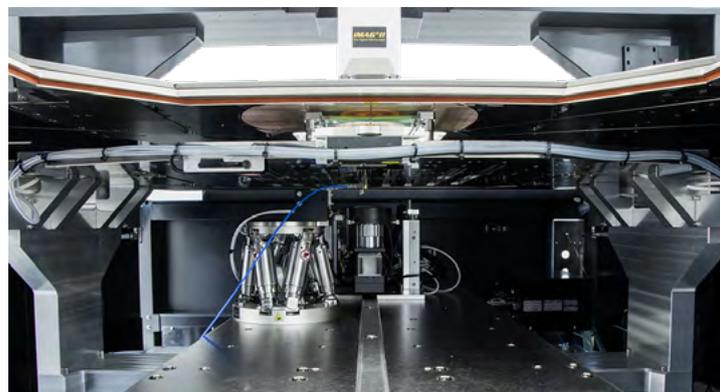
Material	Nickel plated steel
Chuck top to platen top	Min. 50 mm
Platen cooling	Fully integrated CDA cooling, by using the chiller CDA
Configuration	Probe card holder 4.5 x 7" and/or MicroPositioners
Max. No. of MicroPositioners	10x DC MicroPositioners or 4x DC + 4x HF MicroPositioner Setup
RF MicroPositioner mounting	Magnetic with guided rail
DC MicroPositioner mounting	Magnetic



Large Probe Platen supporting up to 10x DC or 4x DC + 4x RF MicroPositioners or standard 4.5" probe card holder

BOTTOM PROBE PLATEN

Z - Travel Range	40 mm
Resolution	0.2 μm
Accuracy	2 μm
Repeatability	2 μm
Speed	Slowest 10 $\mu\text{m}/\text{sec}$ Fastest 4 mm/ sec



KEY FEATURES

Wafer Loading

Loading and unloading of double- or single sided wafers or substrates is straight forward via the front lid. Wafer sizes supported are 300mm double sided and 100~300mm single sided. Probing and testing of wafer fragments, bar and dies are supported via designated areas on the chuck.



Integrated Controls

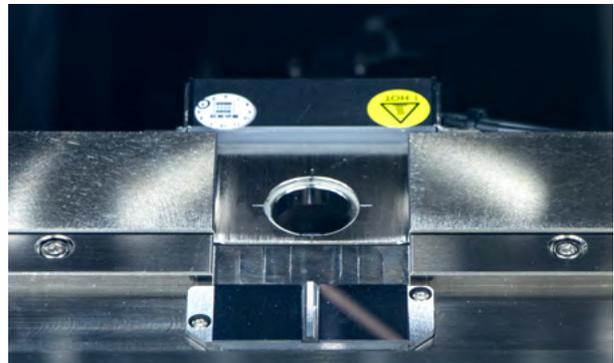
The intelligent and fully integrated hardware control panel enables fast and accurate system configuration and control. The strategically positioned keyboard and mouse facilitate system operation and control of Windows-based instrumentation. A front-facing USB port is conveniently located for easy access and data exchange.



SiPH Optical Calibration Area

Both the thermal- and non-thermal GridChuck™ include two calibration areas; one on the top and one on the bottom. Optical fiber probe to DUT height is calibrated in these areas to ensure repeatable probe placement during serial device testing.

The thermal GridChuck™ features calibration as a function of temperature, compensating for temperature-related expansion and contraction of devices under test.



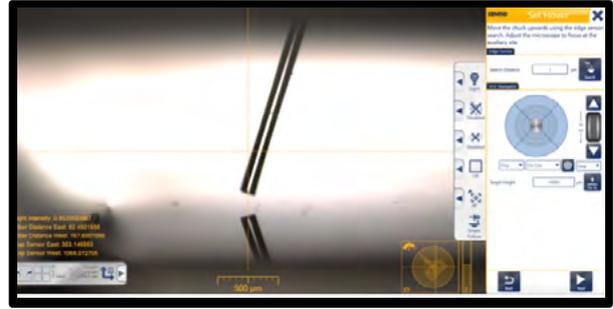
SENTIO® - Probe Station Control Software

MPI automated engineering probe systems are controlled by the unique and revolutionary SENTIO® Software Suite, featuring multitouch operation. Its simple and intuitive interface significantly reduces training time. Scroll, zoom, and move commands mimic those of modern smart devices, allowing users to become proficient in just minutes. Switching between the active application and other apps is as easy as a simple finger swipe.



SiPH SENTIO® Integration

Necessary optical alignment stages, such as the he-xapod, are fully integrated into the SENTIO® probe station control software. They are operated just like any other automated positioner, including additional auto- optical alignment features. Integration goes beyond the multi-touch software, making optical-electrical integrated device measurements easy to perform.



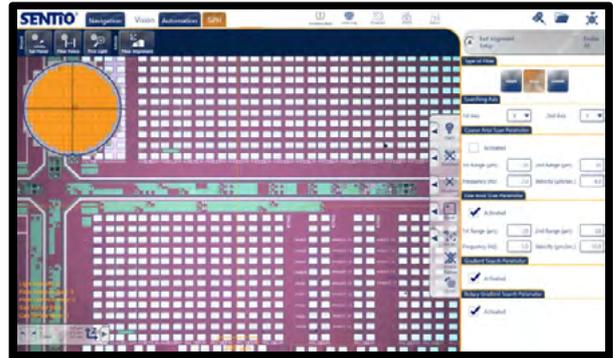
SENTIO® SmartFence™

SENTIO® offers additional useful functions for measurements on photonic integrated circuits. For example, setup wizards guide the user through the configuration process, and the integrated SmartFence™ enables safe and convenient manual fiber navigation.



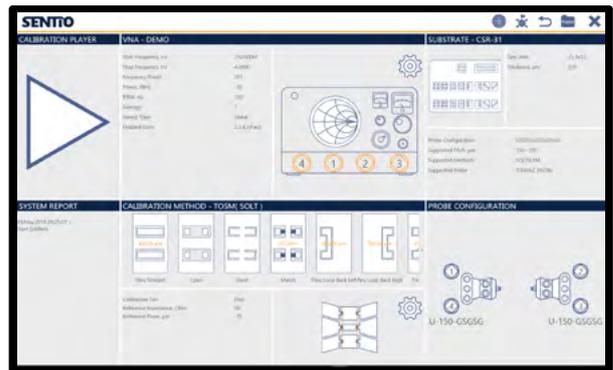
Fiber Probe Handling

Different fiber probe types are managed via the graphical user interface, allowing a wide variety of integrated photonic devices to be tested conveniently. To support easy test executive integration, MPI provides free sample scripts covering all necessary operations for automated testing. These embedded scripts can be used to trigger test instrumentation for optical device characterization, such as IL and PDL, etc.



QAlibria® - RF Calibration Software

By implementing intuitive multi-touch operation, QAlibria® provides clear and concise guidance through the RF calibration process, minimizing configuration errors, and helps achieve accurate calibration results in the shortest possible time. QAlibria® supports both industry-standard and advanced calibration methods, including TOSM (SOLT), TMR, and TMRR, as well as 4-port calibration. It also integrates NIST StatistiCal calibration packages, enabling easy access to NIST multiline TRL metrology-level calibration and uncertainty analysis.



NON-THERMAL CHUCK

- The ambient GridChuck™ supports electrical probing from the top and optical from the bottom
- Customized backside opening according to 300 mm wafer layout
- Nickel plated top with vacuum holes
- Dedicated vacuum controlled areas for customized single-Die, 100 mm and centrally for 300 mm double sided wafer probing.
- Optical calibration areas on top and bottom for accurate fiber probe alignment
- Insulated banana chuck connection

THERMAL CHUCK

- The thermal GridChuck™ +35...+150°C, supports electrical probing from the top and optical from the bottom
- Customized backside opening according to 300 mm wafer layout
- Nickel plated top with vacuum holes
- Dedicated vacuum controlled areas for customized single-Die, 100 mm and centrally for 300 mm double sided wafer probing.
- Optical calibration areas on top and bottom for accurate fiber probe alignment
- Chuck coaxial connection

SYSTEM CONTROLLER SPECIFICATIONS

CPU	Intel Core i9
RAM	16 GB
64 bit operating system	Windows 11 Enterprise LTSC (English) 64 bit
Storage	500 GB SSD
LAN	1 x internal, 1 x external TCP/IP port
USB Ports	3 x internal, 1 x external
GPIB interface	Optional

SUPPORTED SOFTWARE PLATFORMS

Drivers	WaferPro / IC-CAP & EasyEXPERT from Keysight, BSIMPro & NoisePro from ProPlus, ACS from Keithley
Emulation mode	Available for various prober control software*

*Please contact your [local MPI contact](#) for more details.

FACILITY REQUIREMENTS

General Probe System

Power	100-240 V AC nominal ; 50/60 Hz, maximum 500 VA
Vacuum	-0.9 bar
Compressed air	6.0 bar

REGULATORY COMPLIANCE

3rd party, TÜV tested according to

- IEC 61010-1: 2010 + Am1:2016; EN 61010-1: 2010; IEC/EN 61010-2-010: 2014; IEC/EN 61010-2-081: 2015; EN ISO 12100: 2010; UL 61010-1: 2012/R: 2016-04; UL 61010-2-010: 2015; CAN/CSA-C22.2 No. 61010-1: 2012/U2: 2016-04; CAN/CSA-C22.2 No. 61010-2-010:2015

and certified for CE and US/Canada (NRTL), SEMI S2 and S8.

Copies of certificates are available on request

■ WARRANTY

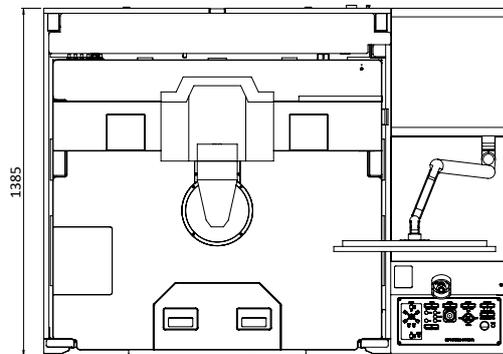
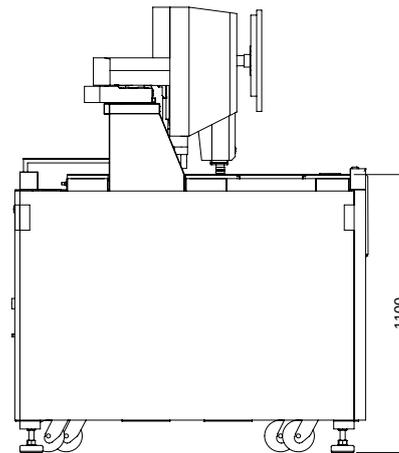
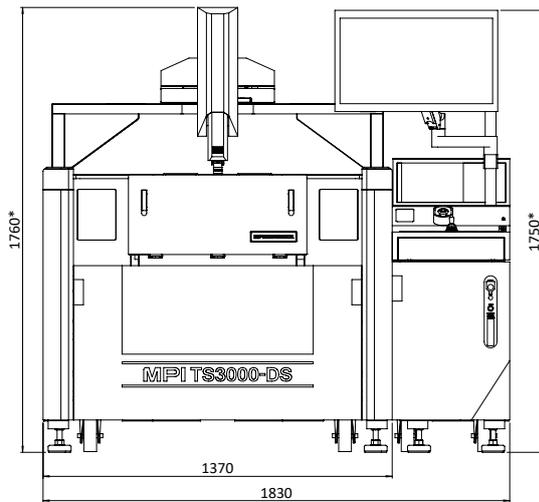
- Warranty*: 12 months
- Extended service contract: contact MPI Corporation for more information

*See MPI Corporation's Terms and Conditions of Sale for more details.

■ PHYSICAL DIMENSIONS

TS3000-DS

System dimensions (W x D x H)	1830 x 1385 x 1760 mm (72.0 x 54.5 x 69.3 in)
Weight	~2000 kg



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MPI global presence: for your local point of contact, visit:
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