MPI TS300-PCB | 300 mm Manual PCB Probe System

For Accurate and Reliable RF and mmW Measurements on PCB Boards

FEATURES / BENEFITS

Dedicated Use

- Designed for PCB probing in various DC/CV and RF measurement configurations
- Signal integrity
- SENTIO® option for efficient probing through microscope automation
- PCB holders from 2” x 2” to 24” x 20” size
- Integrated AUX chucks for RF calibration

Ergonomic Design

- Unique puck controlled air bearing stage for quick single-handed operation
- Rigid platen accommodates up to 10 DC or 4 RF positioners
- Highly repeatable platen lift design with three discrete positions for contact, separation, and loading

Upgradability

- Available with various chuck options and wide range of accessories such as DC/RF/mmW MicroPositioners, Optics, microscopes and EMI shielded dark box to support various application requirements

CHUCK STAGE MOVEMENT

Total XY travel range	330 x 420 mm (13.0 x 16.5 in)
Fine-travel range	25 x 25 mm fine micrometer control
Fine-travel resolution	< 1.0 µm (0.04 mils) @ 500 µm/rev
Planarity	< 10 µm
Theta travel (standard)	360°
Theta travel (fine)	± 5.0°
Theta resolution	7.5 x 10^{-3} gradient
Movement	Puck controlled air bearing stage

MICROSCOPE STAGE MOVEMENT

Total XY travel range	550 x 300 mm manual fast movement

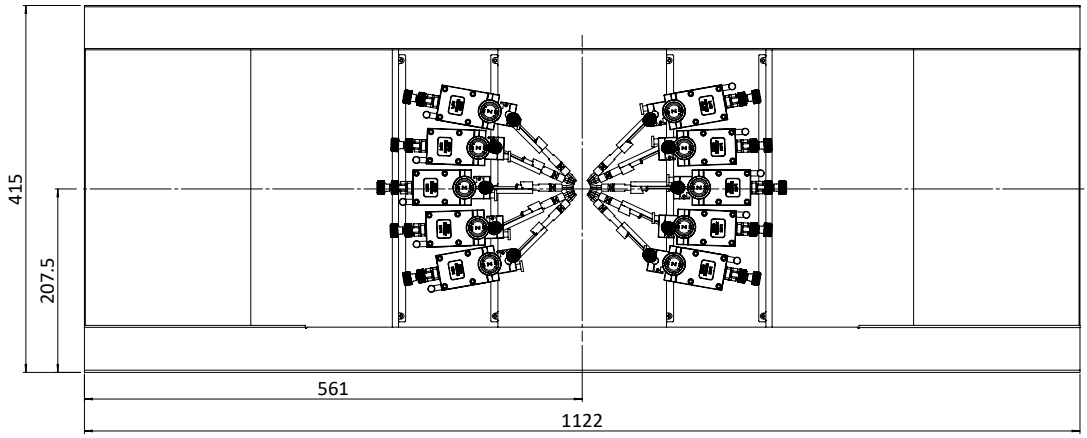
Fine travel option	**XYZ Programmable***	**XYZ manual**
XY - Travel range	50 x 50 mm	50 x 50 mm
Resolution	1 µm (0.04 mils)	< 5 µm (0.2 mils)
Repeatability	< 2 µm (0.08 mils)	N/A
Accuracy	< 5 µm (0.2 mils)	N/A
Z - Travel range	140 mm linear	90 degree tilt
Resolution	0.05 µm (0.002 mils)	N/A
Repeatability	< 2 µm (0.08 mils)	< 2 µm (0.08 mils)
Accuracy	< 4 µm (0.16 mils)	N/A

**Requires SENTIO® for manual systems*

PROBE PLATEN

Specifications

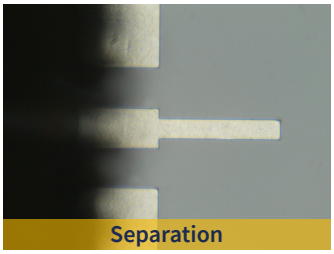
Material	Nickel plated steel
Dimension	See drawing
Chuck to platen height	Min. 28 mm
Max. No of MicroPositioners	10 DC or 4 RF
Platen lift control	3 positions - contact (0), separation (300 µm), and loading (3 mm)
Platen Z-height movement	Micrometer adjustment for fine control
Z-height adjustment range	Max. 20 mm (0.8 in)
Separation repeatability	± 1 µm (0.04 mils) by „Auto Contact“
RF MicroPositioner mounting	Magnetic with rectangular adjustment
DC MicroPositioner mounting	Magnetic
Probing area	500 x 460 mm

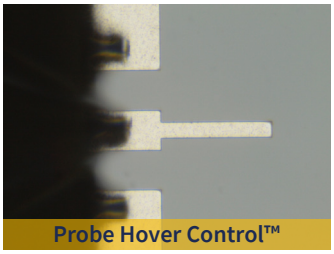


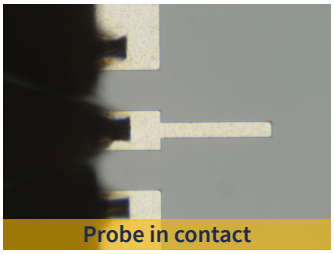
Universal probe platen design for up to 10 DC MicroPositioners

PLATEN LIFT WITH PROBE HOVER CONTROL™

MPI Probe Hover Control™ comes with hover heights (50, 100 or 150 µm) for easy and convenient probe to pad alignment.


Separation

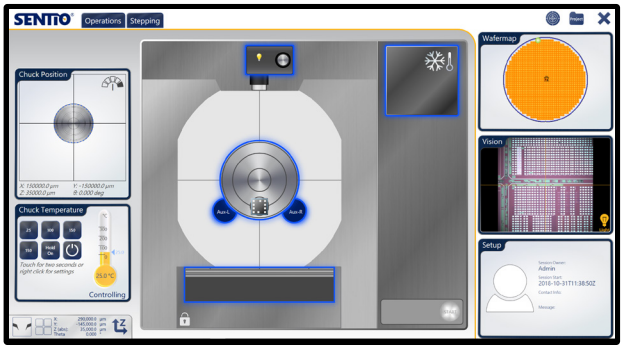

Probe Hover Control™

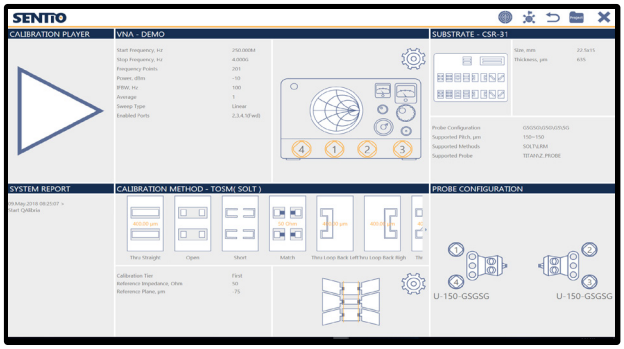

Probe in contact

SENTIO® FOR MANUAL SYSTEMS OPTION

MPI offers SENTIO® optionally for manual probe systems. The revolutionary multi-touch, single window GUI is designed for easy and intuitive system operation and saves significant training time. The scroll, zoom, and move commands mimic modern smart mobile devices, so anyone can become an expert in minutes. Switching between the active application and the rest of the APPs is just a matter of a simple finger swipe. GPIB and TCP/IP interface is also available for remote control.

By implementing intuitive multi-touch operation, QAlibria® provides crisp and clear guidance to the RF calibration process, minimizes configuration mis- takes and helps to reach accurate calibration results in fastest time. QAlibria® offers industry standard and advanced calibration methods. QAlibria® includes TOSM (SOLT), TMR, TMRR methods, and 4-port calibration capability additionally to the integration of NIST StatistiCal calibration packages providing easy access to the NIST multiline TRL metrology-level calibration and uncertain analysis.





SENTIO® for manual probe systems has all controls fully integrated. The intelligent hardware control panel is designed to provide faster, safer and more convenient system control and test operation. Keyboard and mouse are strategically located to operate the Windows® 10 based operating system.
Control of the thermal chuck can be accessed via the fully integrated touchscreen display, conveniently placed in front of the operator for quick operation and immediate feedback.
USB connection to the systems controller is located right in front for easy data exchange.

SYSTEM CONTROLLER SPECIFICATIONS

CPU	Intel® Core™ i7-7700, 3.6 GHz, 8M Cache, 14nm, 65W TDP, LGA1151 (4C/8T)
RAM	DDR4 2400 MHz 16 GB x 1
64 bit operating system	Windows 10 Professional (English)
Power	460 W
Storage	SSD 500 GB
LAN	One internal and one external TCP/IP ports
USB Ports	Internal (on PC) x3, external x1
GPIB interface	Optional
Power of general probe system	100-240 V AC nominal ; 50/60 Hz

NON-THERMAL CHUCKS

Standard Wafer Chuck

Connectivity	Coax BNC (f)
Diameter	310 mm
Material	Stainless steel
Chuck surface	Planar with centric engraved vacuum grooves
Vacuum holes sections (diameter)	3, 27, 45, 69, 93, 117, 141, 164, 194, 214, 254, 294 mm
Vacuum actuation	Multizone control - All connected in meander shape, center hole in 3 mm diameter
Supported DUT sizes	Single DUTs down to 4 x 4 mm size or wafers 50 mm (2 in) thru 300 mm (12 in)*
Surface planarity	≤± 5 µm
Rigidity	< 15 µm / 10 N @edge

**Single DUT testing requires higher vacuum conditions dependent upon testing application.*

RF Wafer Chuck

Connectivity	Coax BNC (f)
Diameter	310 mm with 2 integrated AUX areas
Material	Nickel plated aluminum (flat with 0.5 mm holes)
Chuck surface	Planar with 0.5 mm diameter holes in centric sections
Vacuum holes sections (diameter)	3, 27, 45, 69, 93, 117, 141, 164, 194, 214, 254, 294 mm
Vacuum actuation	Manual switch between Center (4 holes), 150, 200, 300 mm (6, 8, 12 in)
Supported DUT sizes	Single DUTs down to 4 x 4 mm size or wafers 150 mm (6 in) thru 300 mm (12 in)*
Surface planarity	≤± 5 µm
Rigidity	< 15 µm / 10 N @edge

**Single DUT testing requires higher vacuum conditions dependent upon testing application.*

Auxiliary Chuck

Quantity	2 AUX chucks
Position	Integrated to rear side of main chuck
Substrate Size (W x L)	Max. 25 x 25 mm (1 x 1 in)
Material	Ceramic, RF absorbing material for accurate calibration
Surface planarity	≤± 5 µm
Vacuum control	Controlled independently, separate from chucks

Electrical Specification (Coax)

Operation voltage	In accordance with EC 61010, certificates for higher voltages available upon request
Maximum voltage between chuck top and GND	500 V DC
Isolation	> 2 GΩ

THERMAL CHUCKS

Specifications of MPI ERS AirCool® PRIME Technology

	Ambient to 200 / 300 °C	20 °C to 200 / 300 °C	Ambient to 200 / 300 °C	20 °C to 200 / 300 °C
Chuck type	RF	RF	Ultra low noise	Ultra low noise
Connectivity	Kelvin Triax (f)	Kelvin Triax (f)	Kelvin Triax (f)	Kelvin Triax (f)
Temperature control method	Cooling air / Resistance heater	Cooling air / Resistance heater	Cooling air / Resistance heater	Cooling air / Resistance heater
Coolant	Air (user supplied)	Air (user supplied)	Air (user supplied)	Air (user supplied)
Smallest temperature selection step	0.1 °C	0.1 °C	0.1 °C	0.1 °C
Chuck temperature display resolution	0.01 °C	0.01 °C	0.01 °C	0.01 °C
External touchscreen display operation	Yes	Yes	Yes	Yes
Temperature stability	±0.5 °C	±0.05 °C	±0.05 °C	±0.05 °C
Temperature accuracy	±0.1 °C	±0.1 °C	±0.1 °C	±0.1 °C
Control method	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID
Chuck pinhole surface plating: 200 °C / 300 °C	Nickel / Gold	Nickel / Gold	Nickel / Gold	Nickel / Gold
SmartVacuum™ distribution	In front for single DUT 4x4 mm (4 holes) and 75 mm (3 in) In center for 150, 200, 300 mm (6, 8, 12 in)			
Temperature sensor	Pt100 1/3DIN, 4-line wired	Pt100 1/3DIN, 4-line wired	Pt100 1/3DIN, 4-line wired	Pt100 1/3DIN, 4-line wired
Temperature uniformity	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C
Surface flatness and base parallelism	< ±12 µm	< ±12 µm	< ±12 µm	< ±12 µm
Max. Voltage between				
Force-to-GND	600 V DC	600 V DC	600 V DC	600 V DC
Force-to-Guard	100 V DC	100 V DC	600 V DC	600 V DC
Heating rates	35 to 200 °C < 15 min 35 to 300 °C < 25 min	20 to 200 °C < 18 min 20 to 300 °C < 28 min	35 to 200 °C < 18 min 35 to 300 °C < 28 min	20 to 200 °C < 20 min 20 to 300 °C < 30 min
Cooling rates*	200 to 35 °C < 28 min 300 to 35 °C < 35 min	200 to 20 °C < 30 min 300 to 20 °C < 38 min	200 to 35 °C < 30 min 300 to 35 °C < 38 min	200 to 20 °C < 33 min 300 to 20 °C < 40 min
Leakage @ 10 V	N/A	N/A	< 15 fA at 25 °C < 30 fA at 200 °C < 50 fA at 300 °C	< 15 fA at 25 °C < 30 fA at 200 °C < 50 fA at 300 °C
Electrical isolation	> 5 T Ω at 25 °C > 1 T Ω at 200 °C > 0.5 T Ω at 300 °C	> 5 T Ω at 25 °C > 1 T Ω at 200 °C > 0.5 T Ω at 300 °C	N/A	N/A
Capacitance				
Force-to-Guard	< 1600 pF	< 1600 pF	< 600 pF	< 600 pF
Guard-to-Shield	< 2000 pF	< 2000 pF	< 2000 pF	< 2000 pF

** All data are relevant for chucks in ECO mode.*

ERS and MPI's joint product AirCool® PRIME Chuck won "Electronics Industry Awards 2018" in the category, "Test, Measurement and Inspection Product of the year".

FACILITY REQUIREMENTS

Thermal Chuck Electrical Supply

Electrical Supply	Hot only thermal chucks			
Electrical primary connection	100 to 240 VAC auto switch			
Frequency	50 Hz / 60 Hz			
Compressed Air Supply				
Operating pressure	6.0 bar (0.6 MPa, 87 psi) at specified flow rate			
CDA dew point	≤ 0 °C			

Controller Dimensions / Power and Air Consumption

System Type	W x D x H (mm)	Weight (kg)	Power Cons. (VA)	max. Air Flow (l/min)
35/20 to 200 °C	300 x 360 x 135	12	1200	400
35/20 to 300 °C	300 x 360 x 135	12	1200	400

Gerneral Probe System

Power	100-240 V AC nominal; 50/60 Hz for optical accessories* only
Vacuum	-0.5 bar (for single DUT) / -0.3 bar (for wafers)
Compressed air	6.0 bar

**e.g. microscope illumination, CCD cameras, monitors.*

REGULATORY COMPLIANCE

- Certification: CE
- Power Supplies: CE, NRTL certified

WARRANTY

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

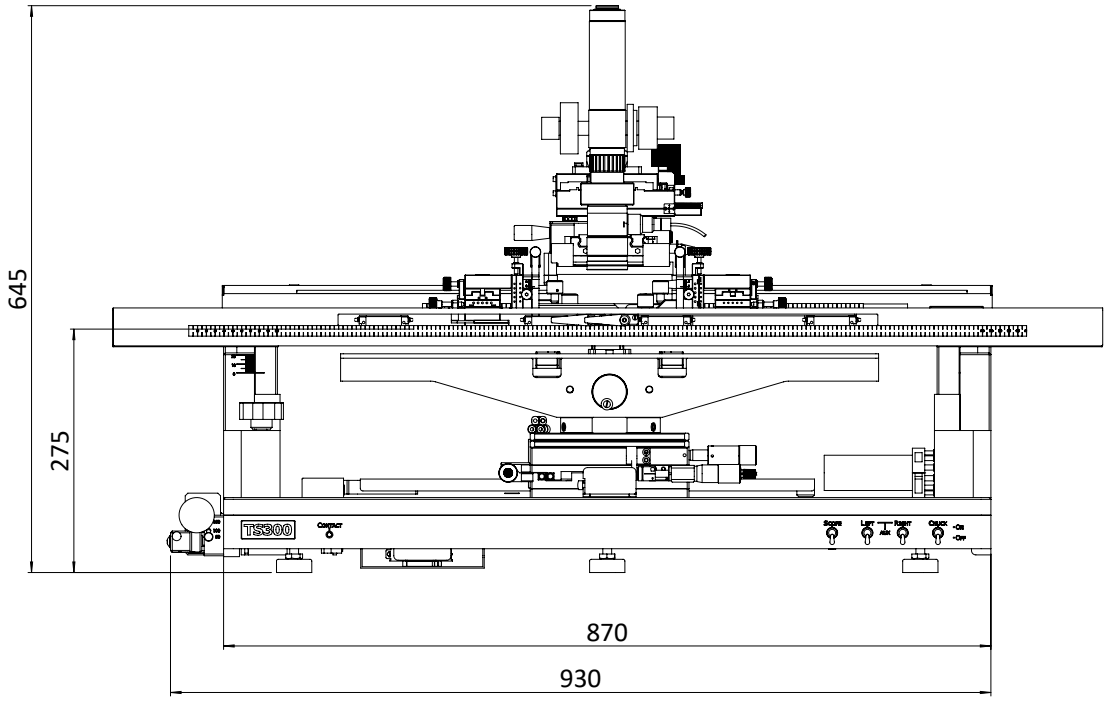
**See MPI Corporation's Terms and Conditions of Sale for more details.*

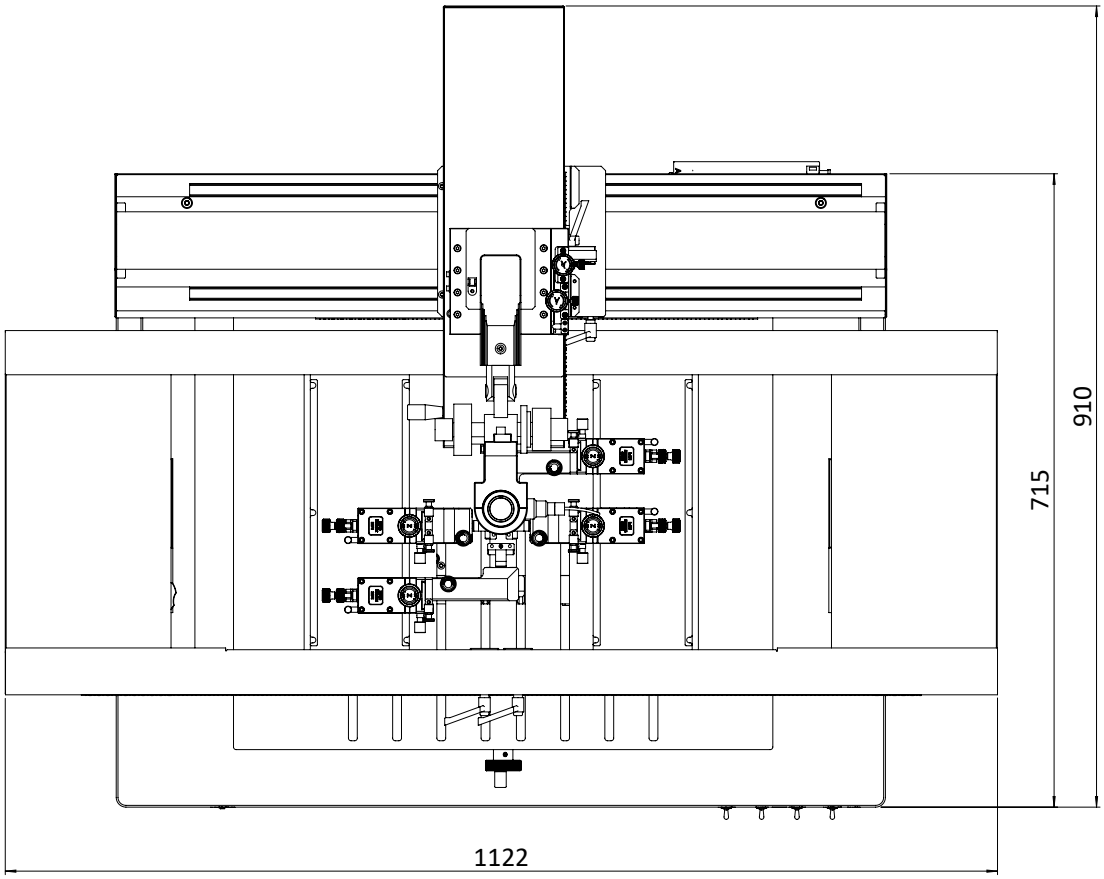
PHYSICAL DIMENSIONS

Station Platform with Bridge*

Dimensions (W x D x H)	930 x 910 x 645 mm (36.6 x 35.8 x 25.4 in)
Weight	~110 kg (242 lb.)

**Station accessories, such as different microscopes, cameras, or laser cutters, may change the total height.*





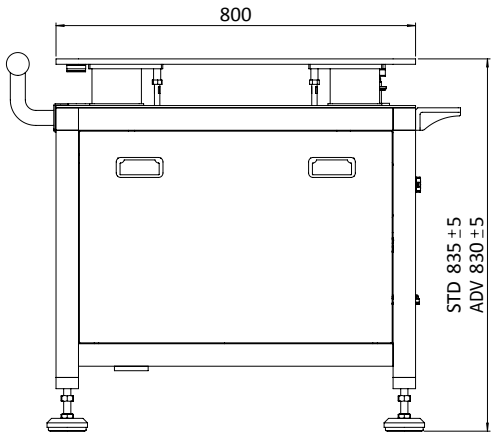
VIBRATION ISOLATION OPTION

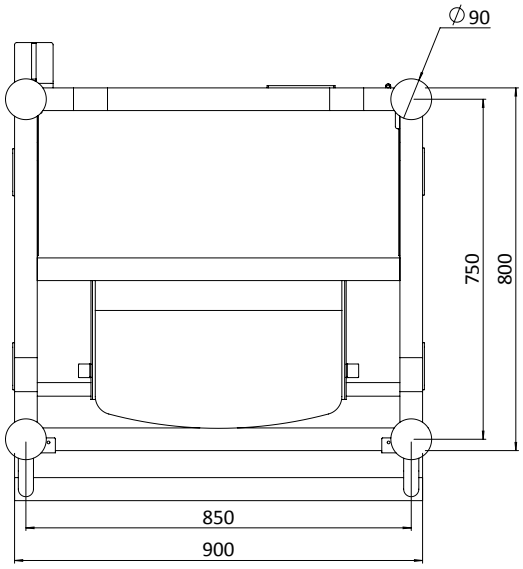
The probe station has been designed for bench top use and includes a vibration absorber base. In addition to that a standard or advanced vibration isolation table is available.

Vibration Isolation Table*

	Standard	Advanced
Dimensions (W x D x H)	900 x 800 x 835 mm (35.4 x 31.5 x 32.9 in)	900 x 800 x 830 mm (35.4 x 31.5 x 32.7 in)
Feature	Adjustable air damping system	Automatic load leveling
Keyboard / Mouse Tray Included	Yes	
Front Protection Bar	Yes	
Castors Included	Yes	
Shelves Included	Upper and Lower	
Accessories Accepted	Monitor Stand(s) and Instrument Shelf	
Weight	Approx. 210 kg (463 lb.)	Approx. 210 kg (463 lb.)

**Vibration Isolation Table can be selected optionally..*





Direct contact:
Asia region: ast-asia@mpi-corporation.com
EMEA region: ast-europe@mpi-corporation.com
America region: ast-americas@mpi-corporation.com

MPI global presence: for your local support, please find the right contact here:
www.mpi-corporation.com/ast/support/local-support-worldwide

MPI Global Presence

© 2021 Copyright MPI Corporation. All rights reserved.