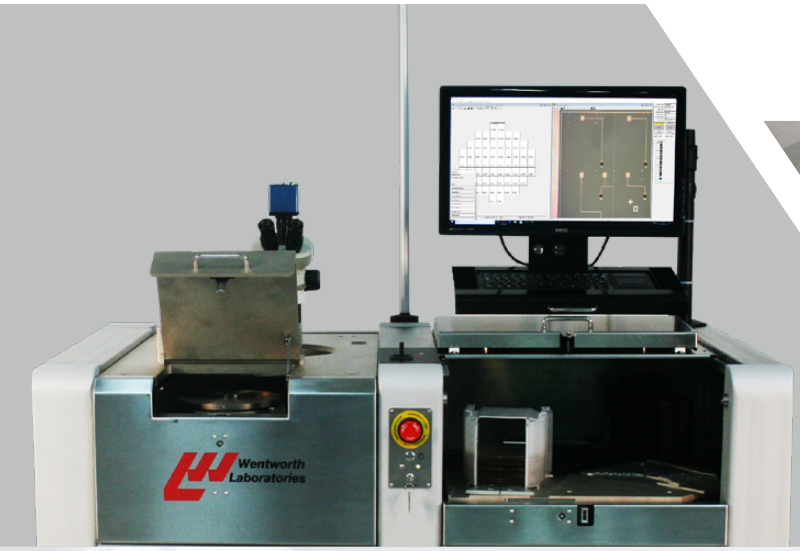
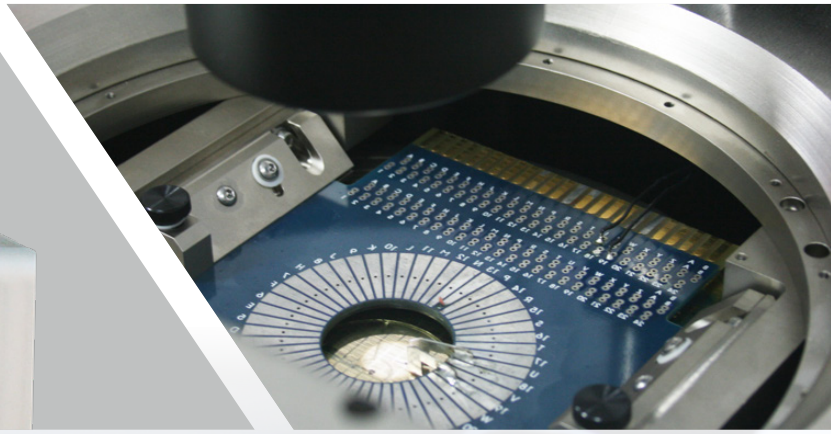
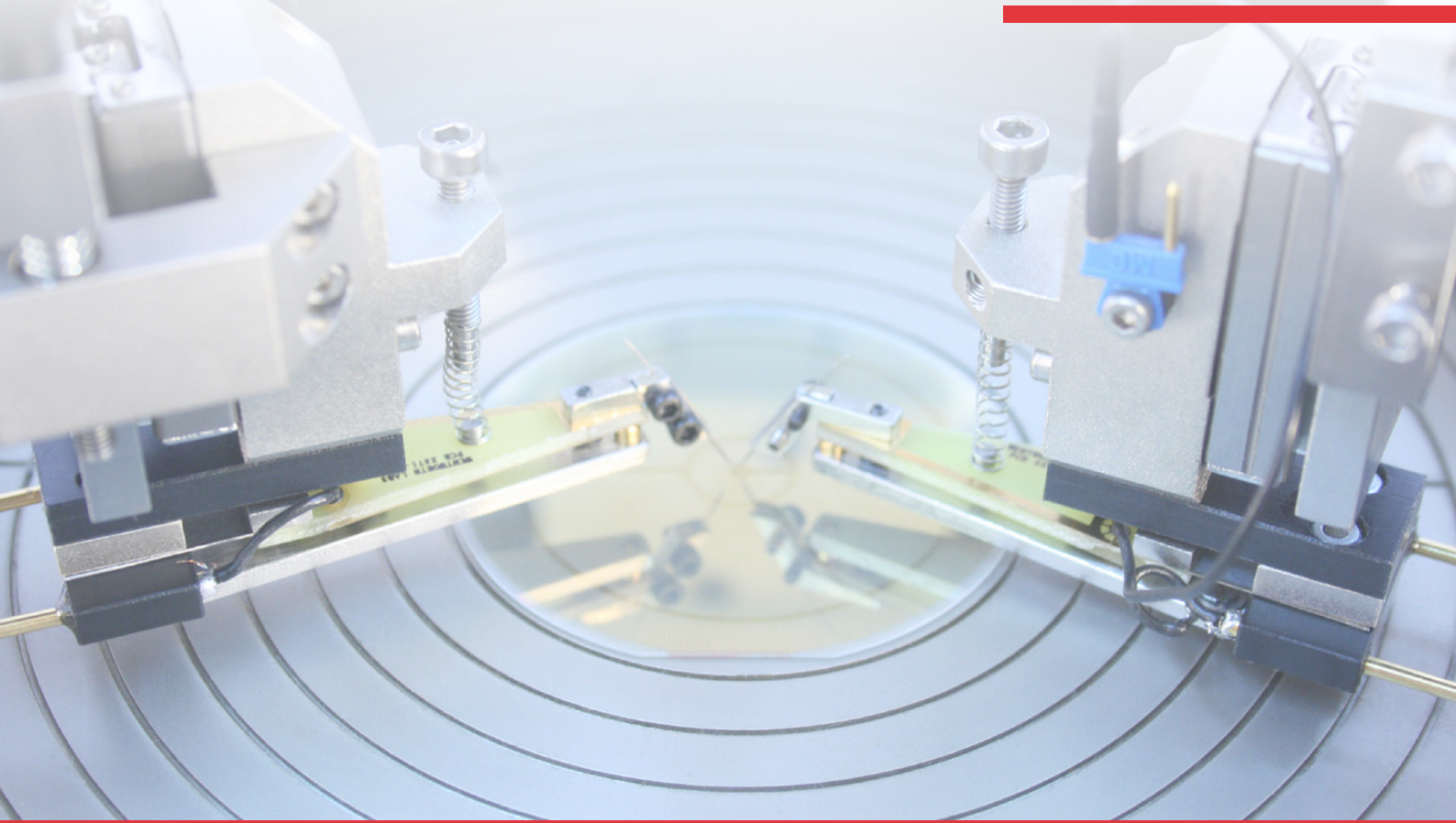
Wentworth Laboratories

AUTOMATIC PRODUCTION PROBER:
PEGASUS™ A200







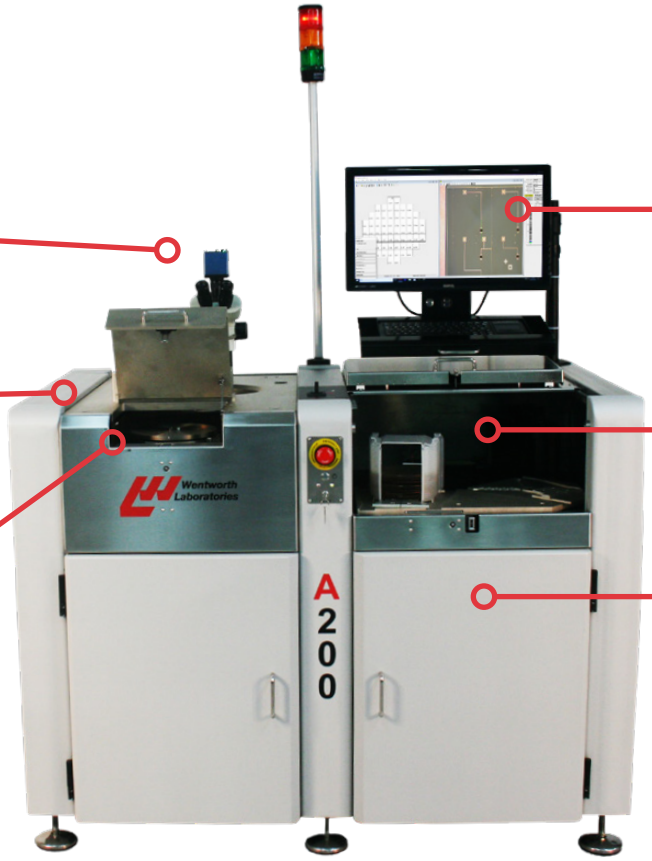
PEGASUS

KEY FEATURES

Microscope with optional camera
Variety of stereo zoom optics available to suit individual applications.

Platen
Suitable for probe card holders and Pegasus™ Probes.

Wide range of chucks
Thermal and non-thermal chucks.



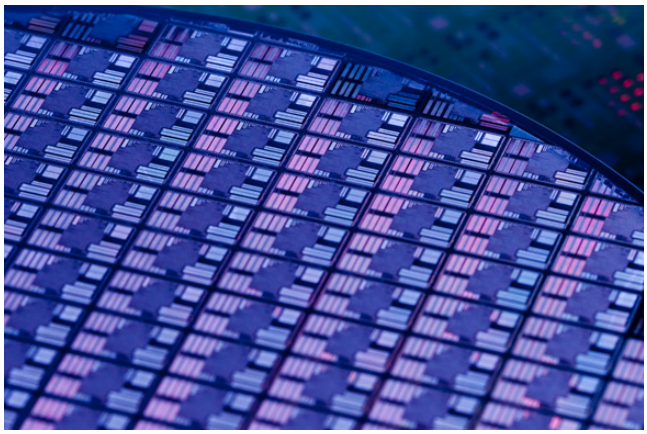
LabMaster™ Pro software
Simple to integrate with LabVIEW™ software and other standard industry platforms.

Wafer handler
Flexible handling system for a wide range of applications.

Pegasus™ controller
Configurable for multi-axis applications.

FULLY AUTOMATIC PROBE STATION

The Pegasus™ A200 is an automatic production 200 mm wafer prober, delivering advanced automation for high volume probing applications requiring special handling, such as GaN, GaAs, saw frames and thin wafers.



THE DESIGN

VERSATILE AND COST-EFFECTIVE PROBING

The Pegasus™ A200 series offers dual-end, parallel processing of wafers which optimizes wafer handling for maximum throughput.

Designed for easy access when manually loading and unloading wafers, the Pegasus™ A200 has a capacity of two cassettes, each containing 25 wafers.

Featuring a highly advanced, single-stage wafer detection pre-alignment and transportation system, the A200 ensures long-term accuracy and repeatability.

PATTERN RECOGNITION & WAFER HANDLING SYSTEM

An extensive range of control and monitoring parameters enable users to operate Pegasus™ A200 series probers at peak performance, including:

- Menu-driven, push button control via proprietary LabMaster™ Pro control and monitoring software
- Real-time monitoring and test setup
- Yield analysis of both the wafer and batch under test
- Premium mapping capability
- Image analysis
- Configurable to voltages up to 10 kV for specialized applications
- Optional thermal chuck capability

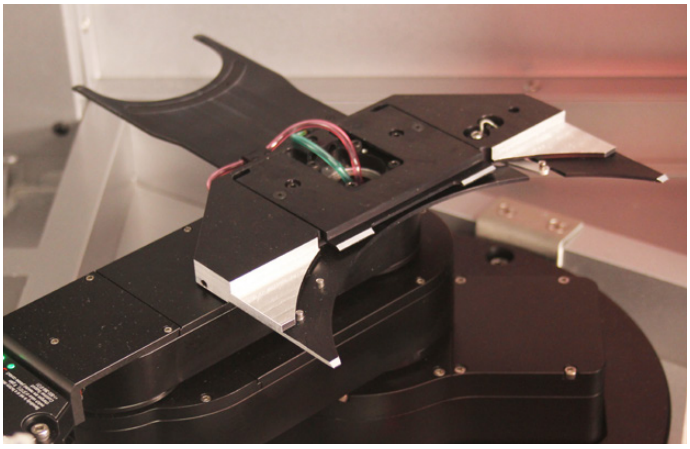
THERMAL CHARACTERIZATION

Our high performance thermal chuck solutions for device testing cover temperatures from -60°C to +400°C.

To reduce thermal effects and keep the probing environment controlled, our propriety heating and cooling management system is an integral part of GuardMaster™, utilizing CDA or nitrogen.

OPTIONS	
Temperature	Control
-60°C to +300°C	Air cooled high end system combining very low and high temperatures within one chuck system
-60°C to +300°C	Liquid cooled for high power applications
up to +400°C	Details available on request

Pegasus™ A200 probe station



Dual application end effector

USER INTERFACE

LABMASTER™ CONTROL & MONITORING SOFTWARE

LabMaster™ Pro is a simple-to-use Windows based graphical interface which allows real-time, fully integrated monitoring and control. It integrates with LabVIEW™ and other industry standard platforms and controls the Pegasus™ prober via either an RS232 interface or a GPIB (IEEE488.2) interface using the National Instruments PCI-GPIB board.

Wafer Map

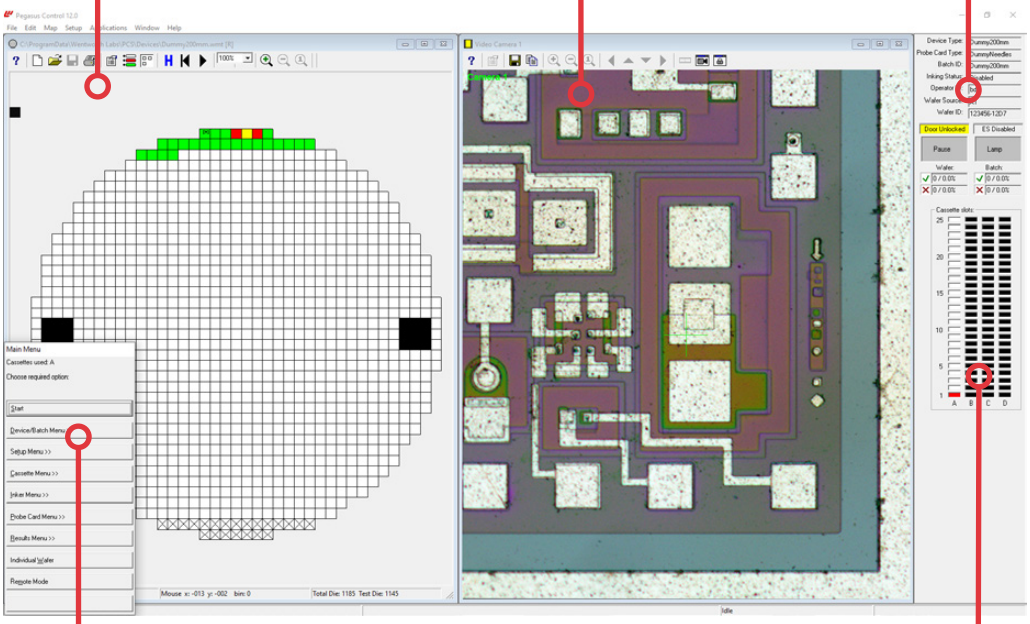
LabMaster™ Pro provides the capability of being able to import wafer map files or create new libraries on-the-fly. With 256 bin allocations and numerical or color die identification possible, the wafer map module provides great flexibility.

Video Window

Primarily used by the A200 to run the PR solution for wafer alignment, LabMaster™ Pro can also be switched to live video for probe mark inspection, ink dot inspection as well as pin-to-pad-alignment.

Prober Status

Key prober parameters can be easily monitored via the prober status window. Device types, batch details and probe card reference numbers are all recorded along with easy pause buttons. Percentage completion logs are also available.



Main Menu

The LabMaster™ Pro menu system provides protected access to all set-up of the A200, programming and run functionality. From the operator access to start, stop and make simple process changes, to the engineer access to run ad-hoc wafer test or diagnostics, the A200 provides simple but intuitive menus.

Cassette Allocation

Most probers have facilities to mount two cassettes whereas LabMaster™ Pro can process up to four. Using automatic cassette scanning by the wafer handler, the slots will highlight if a wafer has been detected within a given slot. The tracking is dynamic, so if users wish to use different cassettes for tested and untested wafer, the occupied slots will be highlighted.

OFFLINE TOOLS

The Wentworth Laboratories' **Wafer Map Editor** is an offline editor/viewer for LabMaster™ compatible wafer map files and wafer map file templates. It allows for wafer map templates to be created and modified prior to being used for wafer testing. Wafer result files can also be viewed in this application and used to generate further template files.

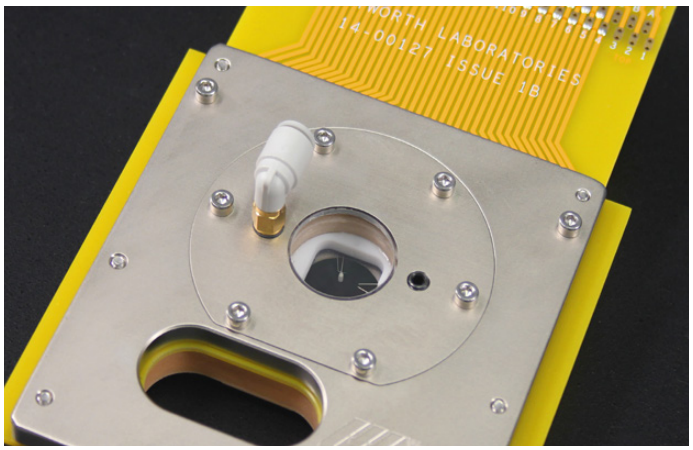
LEADING EDGE APPLICATIONS

HIGH POWER

A high power configuration addresses today's power semi-conductor test challenges with low contact resistance measurements requiring accuracy at high voltages. Kelvin chucks and reverse side probing solutions allow contact resistance measurements in the milliohm range.

High current probes and probe cards (up to 100 A) handle and distribute excessive current loads. Dedicated HV and HC probes reduce probe and device destruction at high voltages/currents by preventing arcing at the tip.

SPECIFICATIONS	
Voltage	3 kV (triax), 10 kV (coax)
Current	200 Amps (pulsed)
Leakage	<1 pA (3 kV)



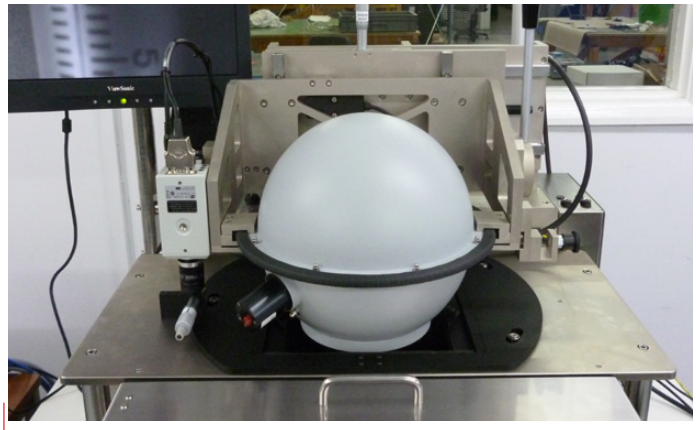
High voltage probe card

OPTO ELECTRONICS

Our FA series probers can be specifically designed for production sampling and analytical probing of semiconductor light emitting diodes (LEDs), laser diodes and optical MEMS devices.

Chuck solutions allow handling of full wafers, shards, single chips and packaged parts. The set-up can accommodate spectrometer probes, fibre optics, integrating spheres, glass chucks, thermal imaging cameras and more.

SPECIFICATIONS	
Reverse emission	Glass chuck, reverse side



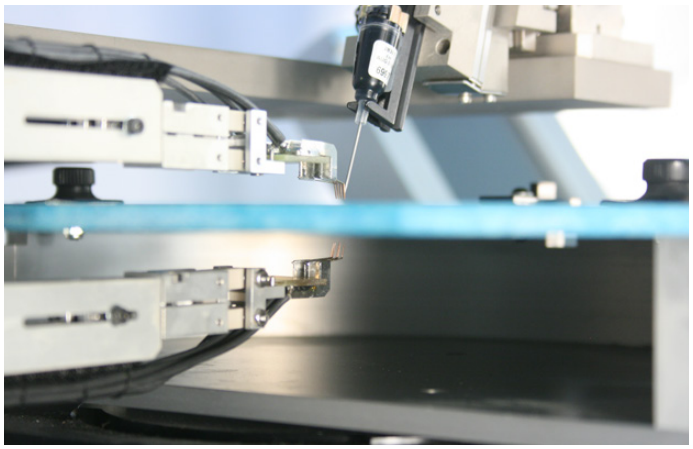
Opto electronics test

DOUBLE SIDED PROBING

The Pegasus™ A200D series offers simultaneous, double-sided probing of up to 200 mm (8") wafers in a compact and easy to use fully automatic probing platform. It delivers advanced automation for high volume probing of power devices.

The A200D features highly developed upper and lower probe arm calipers which can be synchronised to contact the top and bottom side of the wafer at the same time using multiple needle probe cards. A proprietary mechanism ensures a constant pre-set needle load.

Using proprietary wafer ring clamping chucks, the A200D has a capacity to load from two cassettes, each containing up to 25 wafers.



Double sided probing

OPTIONS & ACCESSORIES

MICROSCOPE MOUNTS

Type	Travel X/Y	Travel Z	Resolution	Drive	Recommended Microscope	Application
Manual stereozoom (MMM)	50x50 mm	50 mm*	0.9 µm	High precision lead screws	Binocular or trinocular stereozoom microscope	General probing, pad sizes down to 50 µm x 50 µm
Manual high powered (MMM)	50x50 mm	75 mm quicklift + 50 mm**	0.9 µm	High precision lead screws	Compound high mag objective microscope	Small geometry pad or line probing down to 1-2 µm
Programmable (PMM)	50x50 mm	100 mm + 50 mm**	0.1 µm	Stepper motors	Compound high mag objective microscope	Small geometry pad or line probing down to 1-2 µm

*achieved through standard stereozoom focus arm

** when using heavy duty focus block

MICROSCOPES

Microscope Type	Models Available	Application
Stereo zoom	Wentworth, Leica	Pad probing and internal features down to 5 µm
High magnification	Mitutoyo FS-70 Series	Offers the most flexibility and options for features down to 0.5 µm
Without eyepieces	A-Zoom micro	Use with CCD or video systems.

COMMUNICATION INTERFACES

Type	Vendors
TTL	(2) 15-way D plugs each providing (4) TTL signal outputs & (8) TTL inputs
RS232	Serial 9-pin D connector
GPIB (IEEE488.2)	8-bit parallel multi-master interface bus
Ethernet	48-bit MAC address

ACCESSORIES

Probes: Triaxial, coaxial, low impedance, Kelvin, high power	**Automatic 2-point align:** Provides system automation and fast device set-up routine
Probe tips: Tungsten, Tungsten-Carbide, Be Cu, gold plated	**Pattern recognition:** Automatic die detection and probe to pad alignment
GuardMaster™: Combined light-tight and EMC shielded enclosure for low level measurements and frost-free low temperature probing	**Probe card holders:** 4.5" and 6" low profile probe card holder (PCH)
Pin Hole chucks: Designed for thin wafers <150 µm thick. Definable vacuum patterns and single device holders	**Chuck solutions:** Standard, gold plated, waffle tray, single devices, interchangeable, glass, ceramic, double sided, Kelvin
Camera and monitors: Facilitates contacting bond pads or taking images	**Supplies:** Vacuum pumps and air compressors
Interface panels: Coax BNC, triax BNC, SHV, HV triax, D-SUB, SSMA, SMB, banana	**LabMaster™ Pro:** Control and monitoring graphical user interface
Thermal chucks: Heating, cooling, fast ramp/cool times	**Quiet Mode:** Removes power to all motors to reduce the noise floor.
Probe cards: Ceramic blade, epoxy cantilever, custom solutions	**Triaxial chucks:** For reduced leakage and capacitance measurements

SPECIFICATIONS

PEGASUS™ A200 FULLY AUTOMATIC PROBE STATION

PROBER	
Chuck Stage	
X-Y Stage	
Type	High precision recirculating ball screws
Stage travel	210 x 210 mm (8.3 x 8.3")
Resolution	1.25 µm
Repeatability	± 4.0 µm
Accuracy	± 7.0 µm over 200 mm
Planarity	8.0 µm
Maximum speed	100 mm/sec
Automatic alignment repeatability	± 5.0 µm
Z Stage	
Precision ball-screws & stepper motors	
Travel	11 mm (0.43")
Resolution	1.0 µm
Repeatability	± 1.0 µm
Theta Stage	
Precision ball-screws & stepper motors	
Travel	± 8.0°
Resolution	0.2 µm, 0.0001° measured at edge of 200 mm (8") chuck
Graphical User Interface	
	Windows 7, 8.1 and 10
Communication Interfaces	
PC	TTL, RS232, GPIB (IEEE488.2), ETHERNET
Utilities	
Power	100-240 VAC; 50/60 Hz auto select; 600 VA
Vacuum	0.5 cfm @ 208 mm (20") Hg (min)
Dimensions (w x d x h)	
Excludes monitor, lights & optics	1,420 x 850 x 1,080 mm (55.9 x 33.5 x 42.5")
Weight	
	400 kg (882 lbs)

WAFER HANDLER	
Configuration	
Wafer Size	up to 450 mm (17.8")
Arm configuration(s)	2 link: 133.4–133.4 mm (5.25–5.25") 2 link: 184.2–184.2 mm (7-25–7.25") 3 link: 101.6–203.2–101.6 mm (4–8–4")
End effectors types	Vacuum, edge-gripping, gravity
Wafer mapping	Reflective; through-beam
Physical Properties	
Size (diameter/ length)	247.9 mm (9.76") body DIA/ 768.4 mm (30.25")
Vertical stroke– body height	177.8–345.4 mm (7.0–13.6") 304.8–472.4 mm (12.0–18.6") 431.8 –599.4 mm (17.0–23.6") 508–675.6 mm (20.0–26.6")
Axes	**3 - T, R, Z**
Range of motion	T: 500° R: 160–160 cm (5.25'-5.25') 221–221 cm (7.25'-7.25') 101.6–203.2–101.6 mm (4–8–4") Z: 177.8; 304.8; 431.8; 508 cm (7;12;17;20")
Performance	
Payload (dynamic/ static)	907 g (2 lbs)
Repeatability	T: +/- 0.01° R: +/- 0.001" Z: +/- 0/001"
Environment	
Cleanliness	ISO class 1 compatible
Wafer contact material	Vespel, peek, teflon impregnated anodized Al, alumina, stainless steel

ABOUT US

A LEADING AUTHORITY IN FLEXIBLE PROBING SOLUTIONS SINCE 1967

Wentworth Laboratories is a leader in performance wafer probe stations and advanced cantilever probe cards. In close association with our customers, we play a pivotal role in the conception and development of cost-effective, productivity-enhancing wafer probing solutions for the semiconductor device test market. Our ability to craft customised and integrated wafer test solutions, with meticulous project communication and post-project monitoring, is second to none.

Our standard cantilever products accommodate blade and epoxy technology for a range of applications such as memory, RF and logic probe cards. Engineered solutions offer an impressive array of cantilever products for high voltage, extreme high and low temperatures and an unprecedented portfolio of bespoke products. We also offer design services for high speed, digital, analogue, mixed signal and memory applications.

Our global team supports probe card and wafer probing projects with sophisticated design, proven technology, experienced applications and technical support. Wentworth wafer prober products have been selected for many leading-edge wafer test applications across the semiconductor technology landscape, culminating in such products as hand-held devices, video game stations, PCs and medical diagnostic equipment, amongst others. As award-winning wafer test industry innovators, we are skilled in delivering wafer probers and cantilever probe card solutions that enable our customers to maximise their productivity and reduce cost.

The company was founded in 1967, has global representation and manufactures two major product lines. In our UK facilities, we manufacture wafer probers and cantilever probe cards whilst in the US, we manufacture cantilever probe cards and needle holder assemblies.

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