H150 SERIES

Economy Hybrid Probe Station & Accessories

The H150 Series of manual probe stations has been designed specifically for the economical testing of hybrids, MCM's, wafers, substrates, and photonics devices. The wide range of options and accessories enables the user to customize the station to meet the specific needs of the application. Unlike other low-cost systems, the H150 provides complete control over the platen to DUT separation, with independent platen lift and height adjustment.

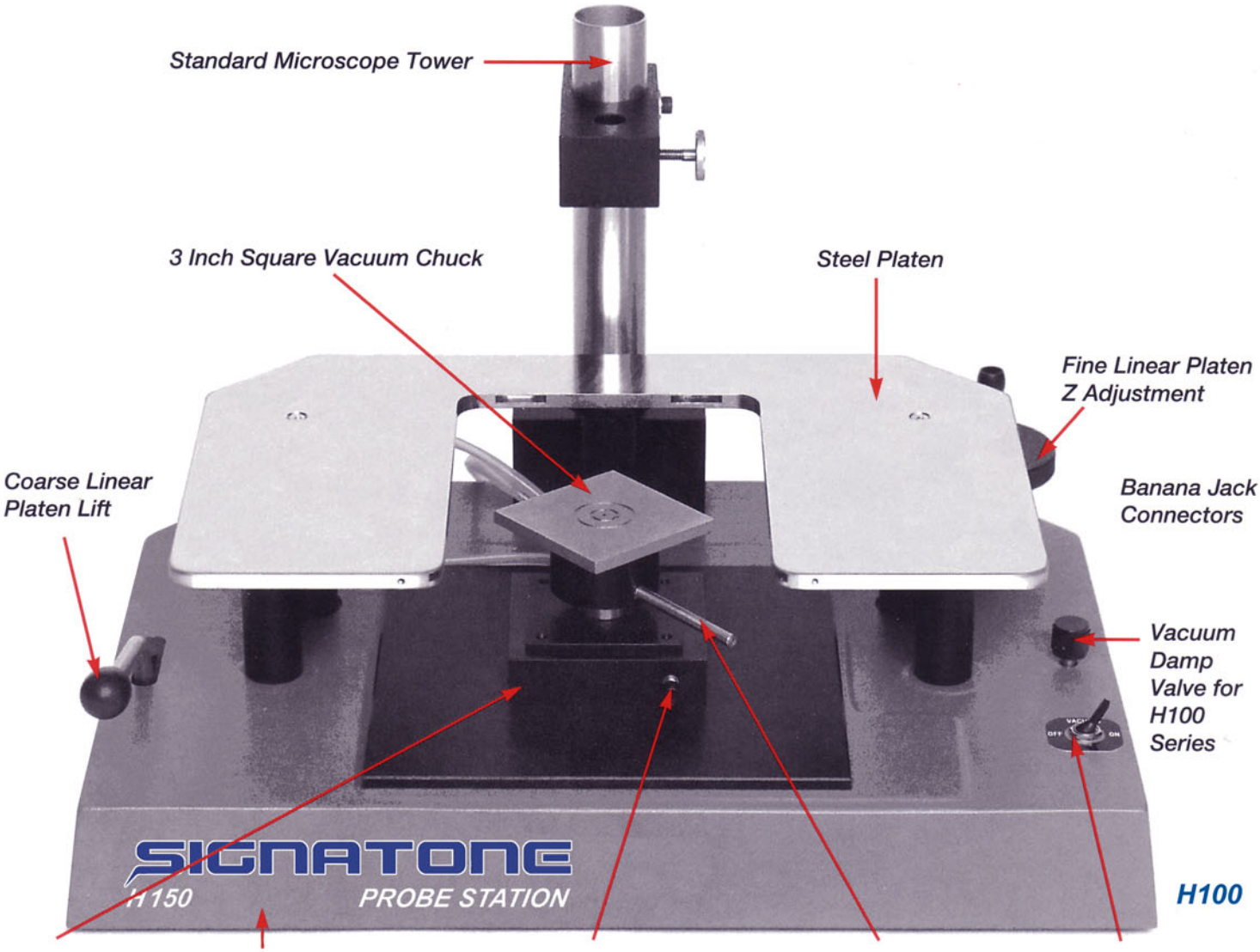
PERFORMANCE, QUALITY, VALUE

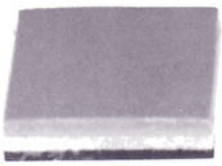
SIGNATONE®

Advanced Microprobing Solutions Since 1968

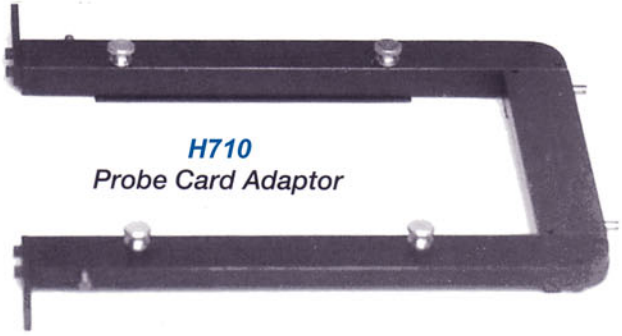
H150 SERIES

FEATURES





HK12
Foam Chuck



H710
Probe Card Adaptor

SPECIFICATIONS

Dimensions
Width - 18 inches
Depth - 15 inches
Height - 12 inches
Weight - 60 pounds

Facilities Required
Vacuum - 20 inches Hg
@ .1 CFM

H150 SERIES

CONFIGURATIONS

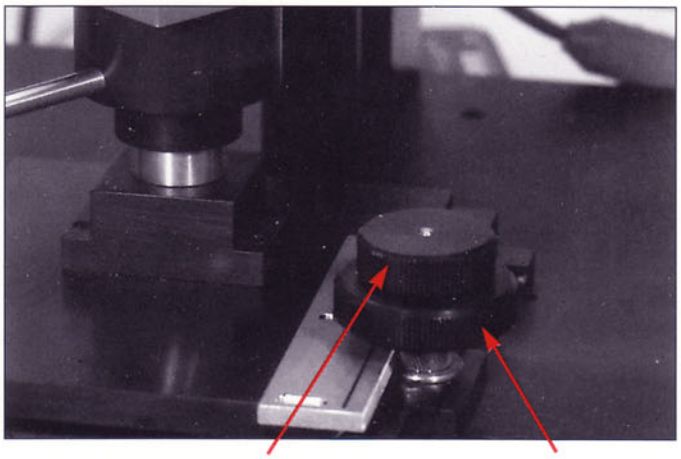
The H150 Series consists of three basic configurations: the H100, H120, and H150. Each of the configurations includes the following features:

1. A 4" X 4" stage movement for positioning samples up to 4" square.
2. A fine platen lift that allows accurate set-up positioning of wafers, ceramic substrates, or deep cavity packages.
3. A coarse platen lift lever that raises the platen 3/8" allowing the sample to be repositioned or changed, and then returns the probe tips to the same position with .0005" accuracy.

The coarse platen lift incorporates a friction clutch that allows the platen to be stopped at any position within its travel. The surface ground steel platen can accommodate up to six vacuum or magnetic base micropositioners. The 3" vacuum chuck is designed to hold down smooth surfaced DUT structures ranging in size from 1.4" to 3". The vacuum chuck may also be rotated 180° for alignment of the DUT.

Testers are typically connected to the station with banana connectors, although the H150 is compatible with the full range of Signatone micropositioners and probe tip holders. The microscope tower has been designed to accommodate most stereo-zoom microscopes utilizing the bonder arm bayonet mount. This allows the microscope to be swiveled to the right or left.

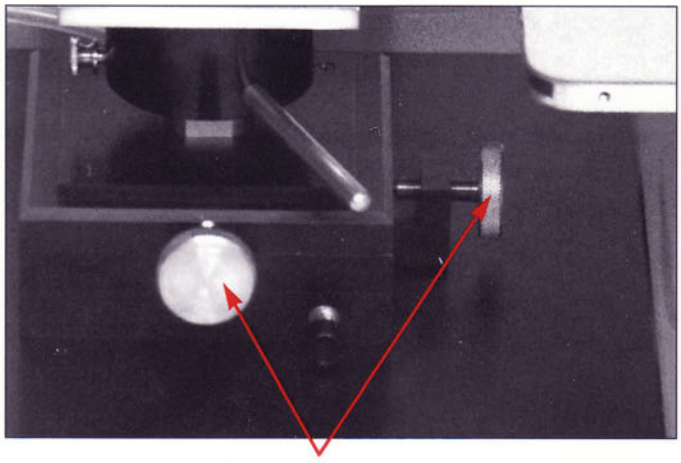
While similar, the three models of the H150 family differ in the manner in which the stage is controlled, and the inherent accuracy provided in DUT movement.



H150 X Stage Drive *H150 Y Stage Drive*

H100

The H100 includes all of the features previously mentioned. The chuck is held in place by means of an integrated vacuum base. Pressing a button on the base releases the vacuum and allows the chuck to be moved to any location on the base plate. When released, the vacuum holds the chuck in place. A master vacuum control allows the hold to be adjusted for various applications. The accuracy of chuck placement is primarily a function of the operator, but usually is in the .003" to .005" range.



H120 X-Y Fine Adjust

H120

Like the H100, the H120 also uses a vacuum hold-down chuck assembly, but also incorporates additional high-resolution X & Y control knobs. The fine motion range is .5", with a control pitch of 40 TPI. This typically yields 12µ or .0005" chuck placement accuracy. This added control feature is valuable where the DUT must be aligned to an previously aligned set of probes, or where a probe card is being used. As with the H100 a master vacuum damper control allows the desired holding force for the chuck assembly to be set.

H150

The H150 is the flagship of the Series, and features a precision rack and pinion gear driven stage, as used in our S-1160 Series of analytical probe stations. The chuck is positioned by turning the smooth compound knobs. The inner knob moves the stage in the X direction with a resolution of 1.25" per revolution. The outer knob moves the stage in the Y direction at a rate of 1.75" per revolution. The compound knobs provide quick and accurate positioning in the range of 3µ to 5µ. The straightforward design of the stage allows easy field service, and provides for many years of reliable probing.

H150 SERIES

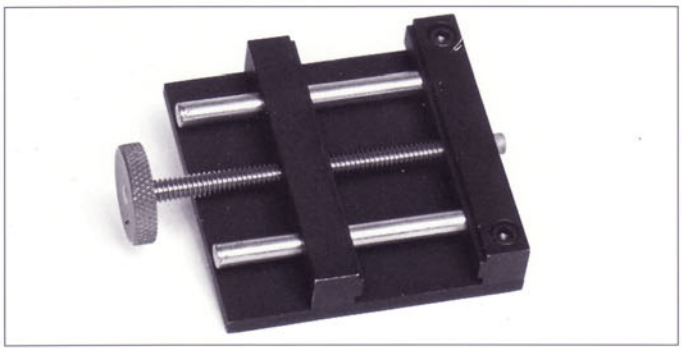
ACCESSORIES

HK10 Custom Vacuum Chuck

Certain Samples and substrates have shapes other than square or round, or may be too small to be held to the chuck by the standard vacuum pattern (1.2" diameter ring). The HK10 is a flat blank that allows the user to drill holes in a pattern that will fit the needs of his specific DUT outline. The custom fixture is then placed on the standard chuck, with the DUT installed in the fixture. Vacuum feed-throughs provide the means to hold both the fixture and the DUT securely in place.

HK12 Foam Chuck

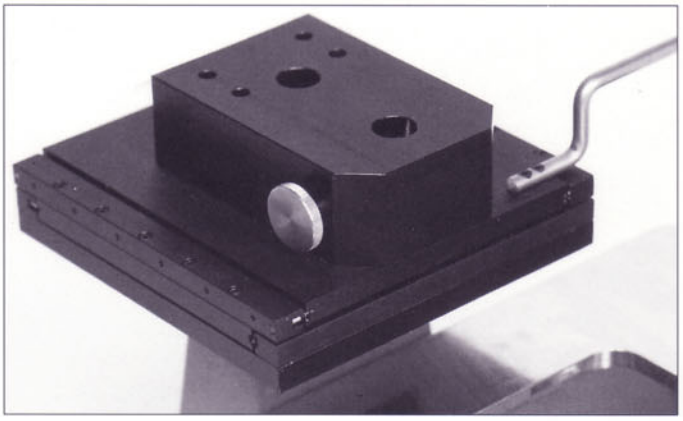
Samples which have metal leads and cannot be held by the standard vacuum pattern may be inserted into the non-conductive foam of the HK12 and held for probing. The HK12 is a flat piece of aluminum with a .5" layer of foam bonded to its top surface. After the sample is firmly inserted in the foam, the HK12 is then placed on the vacuum chuck and held securely by the vacuum rings.



HK18 Clamp Chuck

HK 18 Clamp Chuck

Two-sided hybrids, or samples that cannot be held with vacuum may be held in place by means of the HK12 Clamp Chuck. The Clamp Chuck is a miniature vise that grips the two edges of the DUT. The Clamp Chuck will accept samples up to 3.5" wide. After clamping, the entire assembly is placed on the vacuum chuck and held by chuck vacuum.



HK44 Microscope Stage

HK44 Microscope Transport

The HK44 quickly allows moving the microscope 4" X 4" in the XY plane. The microscope transport is ideal for applications where the probe tips must be placed in a pattern larger than the field of view of the microscope. Since the typical FOV for a stereo zoom microscope is in the range of .75" to 1" this is essential with larger DUT's.

HV14 Platen Vacuum Ports

Vacuum-based micropositioners allow for quick, precise coarse positioning of the probe tips, and offer excellent hold-down performance. The HV14 bolts to the underside of the platen, and supports up to 6 micropositioners.

HW4 Round or Wafer Chuck

The HW4 is a 4" diameter vacuum chuck which may be used in place of the standard 3" square chuck. The HW4 accepts from 2" to 4" wafers, and includes a substrate grounding screw. The HW4 is nickel-plated brass.

H710 Probe Card Adapter

The HT710 Probe Card Adapter accepts standard 4.5" probe cards, and is quickly mounted by 2 thumbscrews.

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S-1160 SERIES

General Purpose Analytical Probe Station

The Signatone S-1160 Series is designed to support a broad range of precision probing applications, including hybrids, MCM's, wafers, and packaged parts. With its comprehensive suite of optional accessories, and available 4", 6", and 8" wafer chucks and stages, the S-1160 is the ideal multi-purpose analytical platform, and the industry standard price and performance leader.

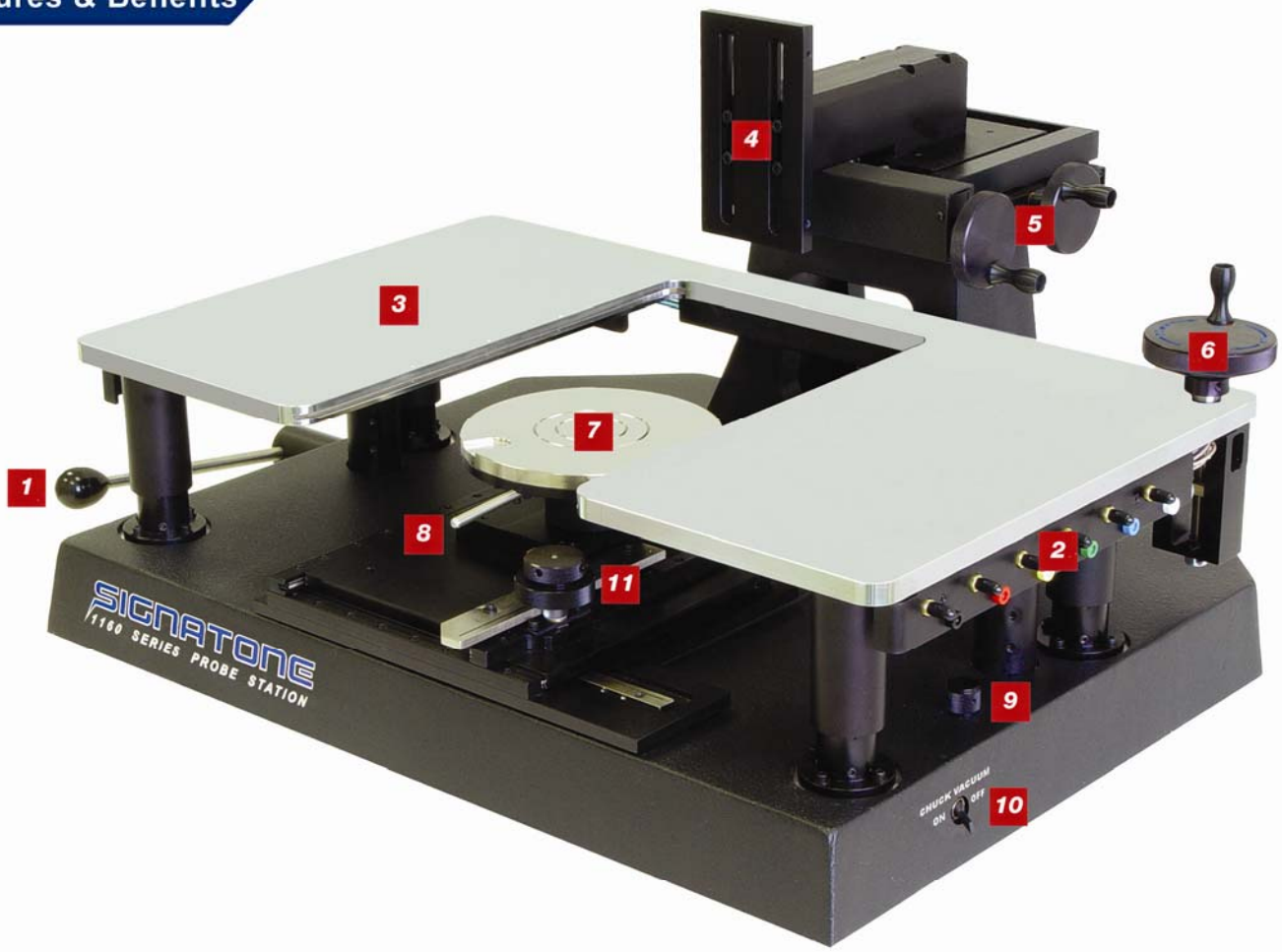
PERFORMANCE, QUALITY, VALUE

SIGNATONE®

Advanced Microprobing Solutions Since 1968

S-1160 SERIES

Features & Benefits



1 - Linear Platen Lift
Lifts the platen 3/8 inch in a linear motion avoiding wear on probe tips. The friction stop permits pausing the platen at any point in its travel, keeping the probe tips relatively in focus when moving the sample.

2 - Vacuum Ports and Signal Connections
Six vacuum ports on each side of the platen support vacuum based positioners. Color-coded signal jacks connect to the probes on the side of the platen and terminate at the rear of the station. Available with Triax, BNC, and banana terminations.

3 - Large Steel Platen
The large steel platen is ground flat, planarized to the chuck and will accept up to 10 vacuum or magnetic based micropositioners.

4 - Microscope Mount
The S-1160 offers three types of mounts. The 'A' style accepts both the Mitutoyo Finescope series and the A-zoom series of high-powered compound optics. The 'B' and 'C' styles accept StereoZoom microscopes.

5 - X-Y Microscope Stage
The X-Y microscope stage is easily moved with the control knobs. 2" of X-Y movement allows scanning of large circuits or hybrids without lifting the probe tips. (not included on S-1160C)

6 - Fine Platen Adjustment
This control knob allows the platen to be set to the desired fixture height, allowing for setting up for probing with probe cards, hot chucks, or packaged parts and hybrids.

7 - Vacuum Chuck
The standard vacuum chuck is flat to ± .0005 inches and has two vacuum grooves plus a center hole. The grooves may be blocked off and the center hole used only when setting up with a small sample. Chucks are available in 4" (100 mm), 6" (150 mm) or 8" (200 mm) configurations. The chuck is electrically isolated from the base station and a binding screw allows electrical connections.

8 – Chuck Rotation Lever
The rotation lever will rotate the chuck 360° making it very easy to align with probe cards in place. An optional rotation lock (model SRL-160) is available for locking the sample in place once properly aligned. The SRL is required when used in conjunction with a temperature chuck. It is also strongly recommended for RF/Microwave probing applications (S-1160-MW).

9 - Vacuum Port Damper Knob
This knob allows the user to set the amount of vacuum being supplied to the micropositioners thus adjusting the drag on positioners to the user's desired feel.

10 - Chuck Vacuum Switch
This toggle switch toggles the chuck vacuum on and off for holding the sample/fixture to the chuck.

11 - X-Y Stage Control Knobs
The X-Y stage is a rack and pinion gear assembly with high resolution positioning. The compound knob permits easy chuck movement in both axes simultaneously. Available in 4", 6", and 8" versions. The optional fine-pitch drive assembly provides even greater precision for controlling the X-Y stage.

S-1160 SERIES

ACCESSORIES

S-4710 Probe Card Adapter for 4.5-inch wide probe cards.

SRL-160 Rotation Lock, required when using a temperature chuck. This option locks the chuck rotation in place, allowing fine adjustment. Also recommended for use in RF/Microwave testing.

FS-160 An optional 0.5" high-resolution stage designed for ultra-fine chuck motion. Works in conjunction with the standard coaxial stage drive.

MY Mitutoyo FS-70 microscope complete with 10X eyepieces, 2X, 10X, and 20X objectives, 2:1 zoom, and fiber optic illumination. Provides 20X to 400X magnification.

MT Motic PSM-1000 microscope complete with 10X eyepieces, 2X, 10X, and 20X objectives, 1X/2X magnifier, polarizer port, laser-ready, and fiber optic illumination. Provides 20X to 400X magnification.

SMZ-168 Motic StereoZoom microscope complete with 10X eyepieces, 1.5X objective, CCD port, fiber-optic illumination, 6.7:1 zoom, and focus mount. Allows magnification of 11.25X to 75X

SZX-7 Olympus StereoZoom microscope complete with 10X eyepieces, 1.5X objective, CCD port, fiber-optic illumination, 7:1 zoom, and focus mount. Allows magnification of 12X to 84X.

Micropositioners Depending on the type of microscope and the magnification selected, Signatone offers a variety of micropositioners to choose from. Most popular for use with the high-powered microscopes are the S-926 and SP-150 Series. With StereoZoom microscopes, the S-725 series is the best choice.

PSDB-1160 Light-tight enclosure for isolating the entire probe station. A shock assisted lift door and utility feed-throughs for the S-1160 are provided. Removable connector panels allow users to configure their own signal jacks or Signatone offers a variety of pre-assembled panels as well.

Hot Chucks Signatone offers a wide range of thermal chucks and controllers. The 'T', 'F' and 'X' series are designed to work well with the S-1160.

PSDB-1160

SPECIFICATIONS

Width	27 inches
Depth	22 inches
Height (with microscope)	19.5-22 inches
Shipping Weight	125 pounds
Vacuum Chuck	4", 6", or 8" diameter - supports single die through 8" wafers
X-Y Stage Resolution	X motion @ 1.125" per knob revolution Y motion @ 1.6" per knob revolution
Coarse Platen Lift	3/8" linear with continuous friction stop
Fine Platen Lift	1 1/3" @ .025" per knob revolution
X-Y Microscope Stage	2" X motion @ .1" per knob revolution 1.8" Y motion @ .1" per knob revolution
Facilities Required	Vacuum: 20" Hg @ .1 CFM, Power for Microscope: 120V/60 Hz, 20 Watts

WL-1160

S-1160B

CONFIGURATIONS

ORDERING INFORMATION - *Select the S-1160 best suited for your application*

S-1160 [ ] - [ ]

Microscope Mount Type
A = High-Powered Optics Mount
B = StereoZoom Optics Mount
C = StereoZoom Rigid Mount
D = 6" X 6" High-Powered Optics Mount

Chuck & Stage Range
4 = 4 inch (100mm)
6 = 6 inch (150mm)
8 = 8 inch (200mm)

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CHECKMATE *Series*

At Signatone we like to think of the CheckMate Series as the Swiss Army Knife™ of analytical probe stations, which shouldn't be confused with the *One-Size-Fits-All* (or two) approaches of the competition. Why should you have only 2 choices - manual or semiautomatic? The CheckMate Series can be configured with as much, or as little automation as you need today, with the flexibility to upgrade as your needs change, which they no doubt will - SIGNATONE - your partner for intelligent probing solutions.

PERFORMANCE, QUALITY, VALUE

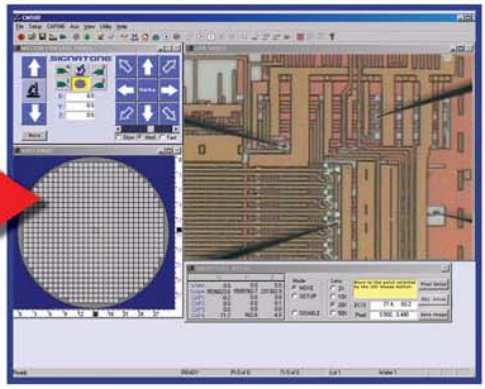
SIGNATONE®

Advanced Microprobing Solutions Since 1968

UPWARD MOBILITY FOR PROBE STATIONS

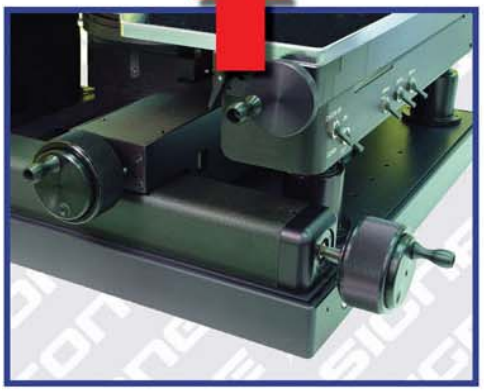
Put velvety-smooth 17 axis control in the palm of your hand with the ThumbDrive joystick. Sub-micron control has never been so easy, or precise. An FA "must have".

OS independence? Our customers demanded it. As long as your controller has either USB or GPIB, we've got you covered. No more surprises when you install the latest S/W.



The culmination of over 15 years of probe station automation, FlexProbe seamlessly integrates all elements of control into a highly-intuitive, single-layer user interface.

Option 200 adds motorized axes with proportional joystick control, along with convenient stage and microscope transport selection and remote chuck up/down control.



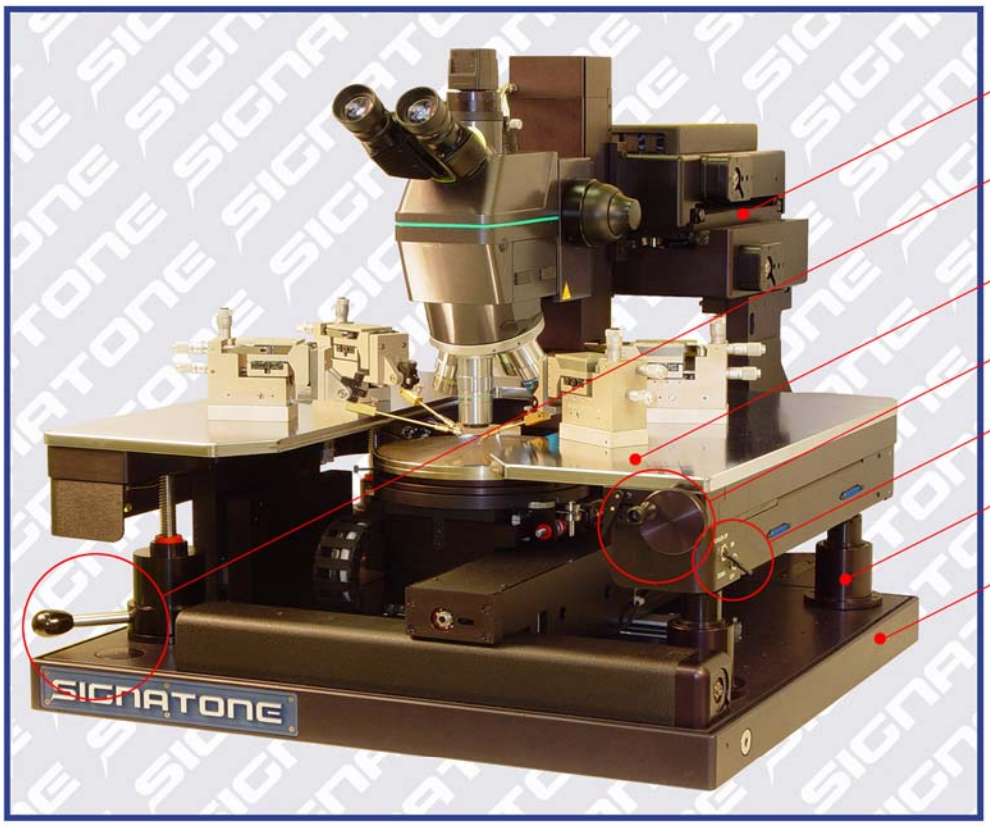
CheckMate manual stations utilize coaxial coarse and fine drive knobs for the utmost in control and convenience. As your needs change, so can your prober, *In Your Lab!*

The CheckMate Series of analytical probe stations reflects a very simple philosophy of design - make it strong, make it stable, make it accurate, but above all, make it easy to use. At Signatone we believe that when you get it right, it's simple. Since your probing applications are varied and complex, the ideal prober will be able to adapt as your needs change, and setup changeovers should be measured not in hours, but in minutes.

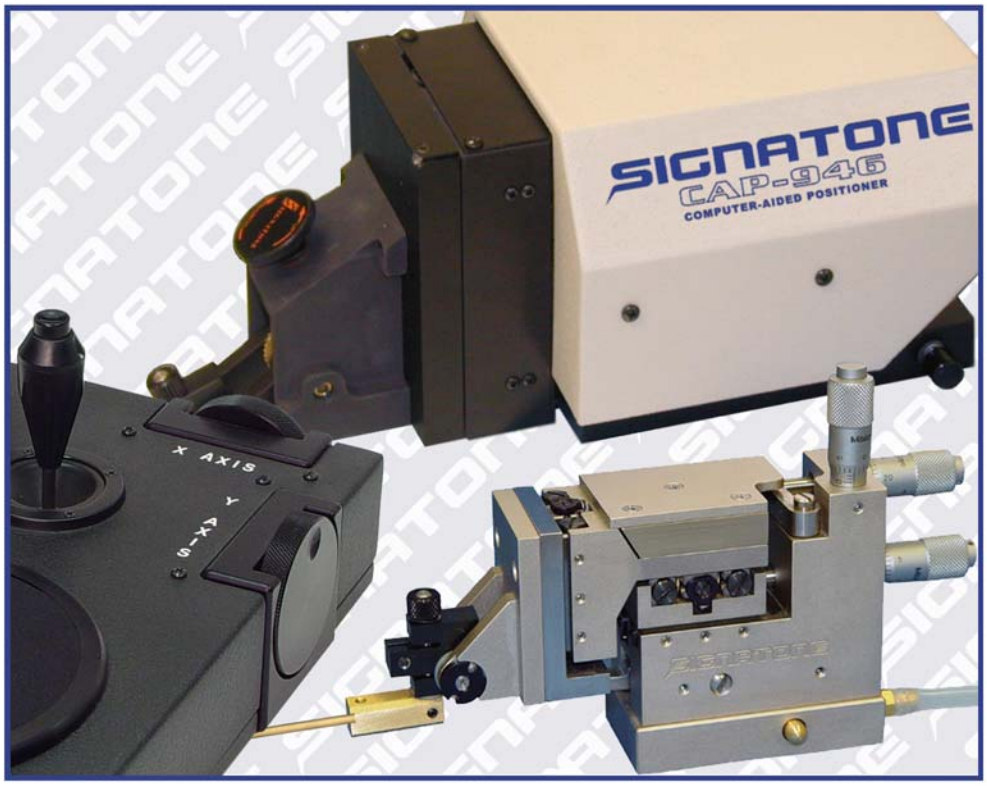
You should also be able to maintain your probing investment over time. The average life expectancy of a modern prober exceeds a decade, yet the semiconductor industry changes daily, often radically. That's where CheckMate's modular architecture can be your salvation. Want to motorize your manual station? Upgrade to semiautomatic? Need to add programmable positioners for Failure Analysis, but don't need a fully automated station? *No problem!* Want to do it in your lab? Quickly? *No problem!* That modularity also benefits you when you buy your station initially. Purchase only the level of automation you need, and know that when you need more technology, it'll be available, at no penalty. Signatone -

We Listened!

Upward Mobility For Probe Stations



- 10” cross-roller bearings for smooth, stable operation and load support
- Leadscrew-driven contact/ separate control with hard “down stop” for repeatability
- Choose from nickel steel or aluminum platen
- 2” platen range with lock
- Pneumatic chuck contact/ separate switch
- 4-point platen support and lift
- 2” base plate for superior rigidity

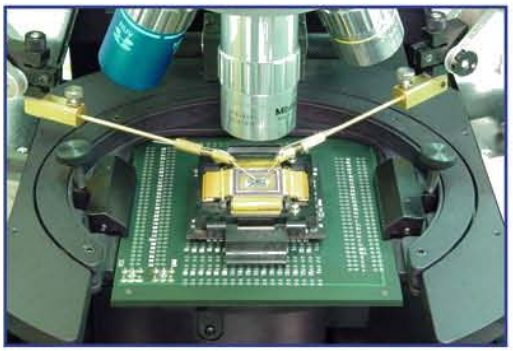


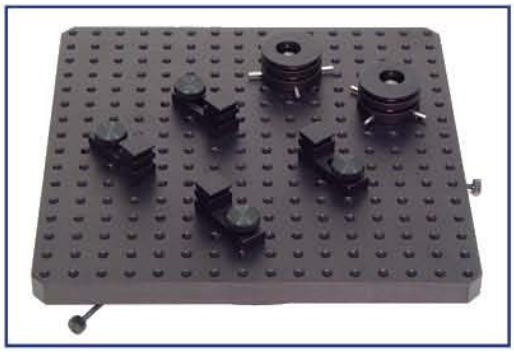
As geometries continue to shrink the need for ever increasing resolution, and in some cases, hands-off operation, becomes more and more critical. For manual users we recommend the SP-150, which mounts all three micrometers in a rigid rear apron, which minimizes vibration coupling. For deep sub-micron work we offer our 50 nM CAP-946 programmable positioner, with our ThumbDrive joystick, which yields unmatched precison and control. This provides additional utility in light-tight applications requiring remote positioning.

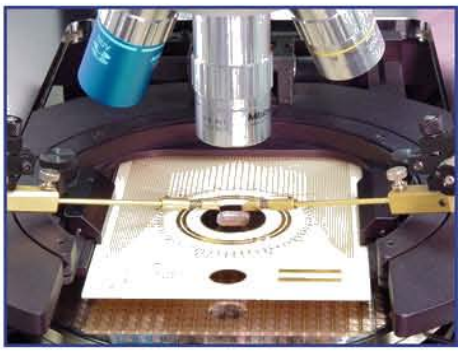
CHECKMATE Series

Specifications

	CM-21X/31X	CM-22X/32X	CM-23X/33X	CM-25X/35X
X-Y Stage				
Travel	200mm/300mm	200mm/300mm	200mm/300mm	200mm/300mm
Resolution	Manual	Motorized Manual	0.1µm	0.1µm
Repeatability	Manual	Motorized Manual	1.0µm	1.0µm
Accuracy	Manual	Motorized Manual	3.0µm	3.0µm
Speed	5mm/.5mm Per Turn	20mm/Sec	50mm/Sec	50mm/Sec
Bearings	Carriage & Rail	Carriage & Rail	Carriage & Rail	Carriage & Rail
Stage Drive	Coarse/Fine Knobs	DC Motors, Joystick	DC Motors, Encoded	AC Servo, W/Scales
Z Stage & Theta				
Z Range	Contact/Separate	Contact/Separate	Contact/Separate	0.375"
Resolution	Pneumatic ↑↓	Pneumatic ↑↓	Pneumatic ↑↓	0.06µm
Repeatability	2.0µm	2.0µm	2.0µm	0.1µm
Contact/Separate	0.015"	0.015"	0.015"	Programmable
Theta Range	± 7.5 Degrees	± 7.5 Degrees	± 7.5 Degrees	± 6.0 Degrees
Resolution	0.35µm/0.55µm	0.35µm/0.55µm	0.35µm/0.55µm	0.055µm/0.075µm
Chuck				
Diameter	200mm/300mm	200mm/300mm	200mm/300mm	200mm/300mm
Metallurgy	Au/Ni Plated Al	Au/Ni Plated Al	Au/Ni Plated Al	Au/Ni Plated Al
Vacuum	Multiple Zones	Multiple Zones	Multiple Zones	Multiple Zones
Flatness – Ambient	< 6µm/8µm	< 6µm/8µm	< 6µm/8µm	< 6µm/8µm
Thermal	< 20µm/25µm	< 20µm/25µm	< 20µm/25µm	< 20µm/25µm
Platen				
Z Range	2", Locking	2", Locking	2", Locking	2", Locking
Contact/Separate	0.15"	0.15"	0.15"	0.15"
Lift	4 Pt. Leadscrew Driven	4 Pt. Leadscrew Driven	4 Pt. Leadscrew Driven	4 Pt. Leadscrew Driven
Metallurgy	Ni or Al	Ni or Al	Ni or Al	Ni or Al
Positioner Support	Vac./Mag./Bolt-Down	Vac./Mag./Bolt-Down	Vac./Mag./Bolt-Down	Vac./Mag./Bolt-Down
Microscope Transport				
Range	2" x 2"	2" x 2"	2" x 2"	2" x 2"
Resolution	Manual	Motorized Manual	0.1µm	0.1µm
Repeatability	Manual	Motorized Manual	2.0µm	2.0µm
Accuracy	Manual	Motorized Manual	10.0µm	10.0µm
Z-Lift	4" Pneumatic	4" Pneumatic	4" Pneumatic	4" Pneumatic
Facilities & Mechanical	**200mm**	**300mm**		
Dimensions (HxWxD)	55 x 66 x 78.5 (21.6" x 26.0" x 30.9")	59 x 75 x 98 (23.0" x 29.5" x 38.7")		
Net Weight	91 kg (200 lb.)	160 kg (375 lb.)		
Shipping Weight	150 kg (325 lb.)	205 kg (450 lb.)		
Air	2 CFM @ 30 PSI	2 CFM @ 30 PSI		
Vacuum	400mm/15" Hg	400mm/15" Hg		







Signatone offers a wide range of standard and custom accessories for wafer and non-wafer applications. Contact us for more information.

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CM-460 SERIES

150mm Semi-Automatic Probe Station

The perrenial workhorse in the SIGNATONE product offering, the CM-460 Series of 6" semi-automatic analytical probe stations represents mature technology at its best. Based on our proven linear motor technology, which virtually eliminates accuracy and repeatability issues, the CM-460 will deliver years of worry-free performance where and when you need it.

PERFORMANCE, QUALITY, VALUE

SIGNATONE®

Advanced Microprobing Solutions Since 1968

CM-460 SERIES

Specifications

Wafer Stage

- 150mm XY linear motor drive mounted on 2" aircraft aluminum base

	CM-461-XX	CM-465-XX
X & Y Axis Resolution:	0.1µ	1µ
X & Y Axis Repeatability:	0.5 µ	1µ
X & Y Axis Accuracy:	1µ	3µ
Z Axis Resolution:	0.1µ	0.1µ
Z Axis Accuracy:	0.25µ	0.25µ

- Programmable Z speed with Soft-Z edge-sense option

Positioner Platen

- 0.5" aluminum platen (steel optional) with 1" aluminum channel sub-platen brace
- Leadscrew-driven Z motion: 0.15" Contact/Separate, 1.75" height adjustment range with lock

Microscope Transports

- 2"x2" manual (**-22**) and programmable (**-2M**) transports with 4" pneumatic Z-lift
  - 10" X 6mm cross-roller bearings
  - 100+ pound load rating
- 4"X4" StereoZoom option with microscope tilt-back (**-44**)

Motion Control Features

- Local and Remote operation (RS-232C, GPIB, ActiveX)
- USB or Ethernet controller to prober communication to eliminate bus conflicts
- Joystick option with 2-axis joystick and optically-encoded thumbwheels for sub-µ control
- Integrated support for up to 4 Computer-Aided Positioners

System Software Features

- Single level user interface with icons and ToolTips
- 2-point software theta auto-alignment
- Programmable Z with **Contact/Separate/Overdrive** presets
- On-screen live video display with image capture/save
- Integrated Wafer Map and editor
  - Click to Move
  - Go To Row & Column navigation
  - Local Step & Repeat debug mode
- Unlimited Save/Restore of prober setup files and wafer maps
- Color-coded wafer map with 256 user-defined binning colors
- Sub-Site probing capability with editor
- Learn Mode for saving program probe points
- Integrated thermal chuck control
- Point & Shoot, Drag & Drop, Measure Mode, Probe/Scope Tracking
- Microscope objective compensation
- Dual inker support (Inkers not included)
- Supports: LABView, Keithley KITE, Agilent VEE, ICS Metrics

Integrated Applications

- CV, IV, V_{th}, T_{ox},
- Lucas Labs Resistivity Measurement Suite
- RF/Microwave with optional calibration chuck

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WAVELINK WL-1160

The Value Leader In Manual RF Probing

The **WL-1160** is ideally suited for Wireless and Bluetooth applications, and like all **WAVELINK** probe stations incorporates independent wafer and calibration chucks, eliminating the tedious realignment step after cal. With 4-Point platen lift and support, 1.5" of platen travel, and non-resonant .5" steel platen, saving money doesn't mean accepting compromises. 6 and 8 inch models are available.

PERFORMANCE, QUALITY, VALUE

SIGNATONE®

Advanced Microprobing Solutions Since 1968

WAVELINK

Features & Benefits

1. Linear Platen Lift
This allows the platen to be raised up to .375" in a linear/planar motion for safe probe tip contact/separate. A friction clutch permits pausing the platen at any point in the travel, keeping the probe tips relatively in focus when moving the D.U.T. yet insures a hard "down-stop" to maximize over-travel correlation between calibration and test. An independent platen height adjustment (see #7) offers 1.75" of travel to support all your testing applicaitons.

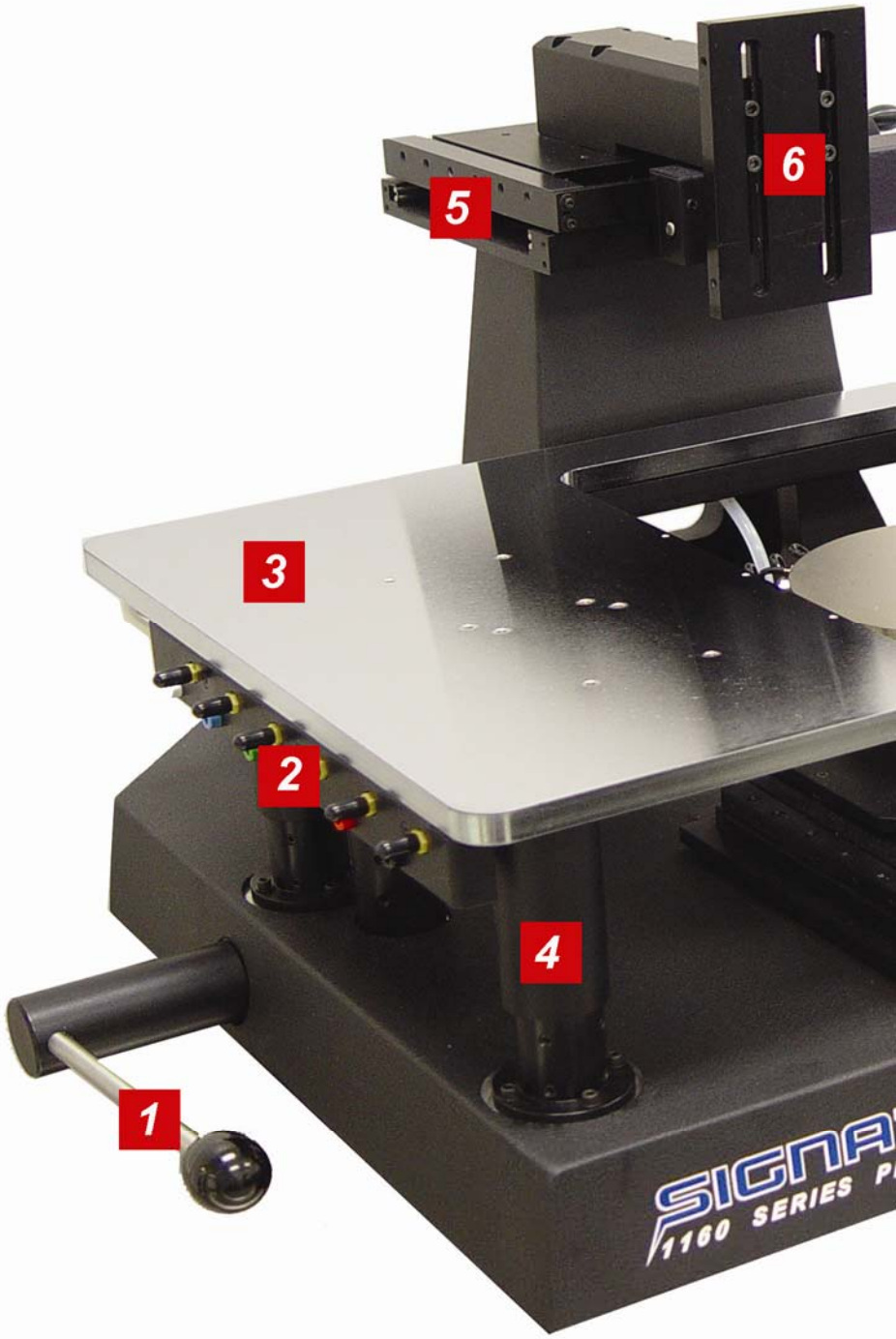
2. Vacuum Ports & Signal Connections
The standard WL-1160 supports up to 6 vacuum positioners per side, and includes color-coded electrical connectors terminated on the back apron. Banana connections are standard, with Triax or BNC connectors available as an option.

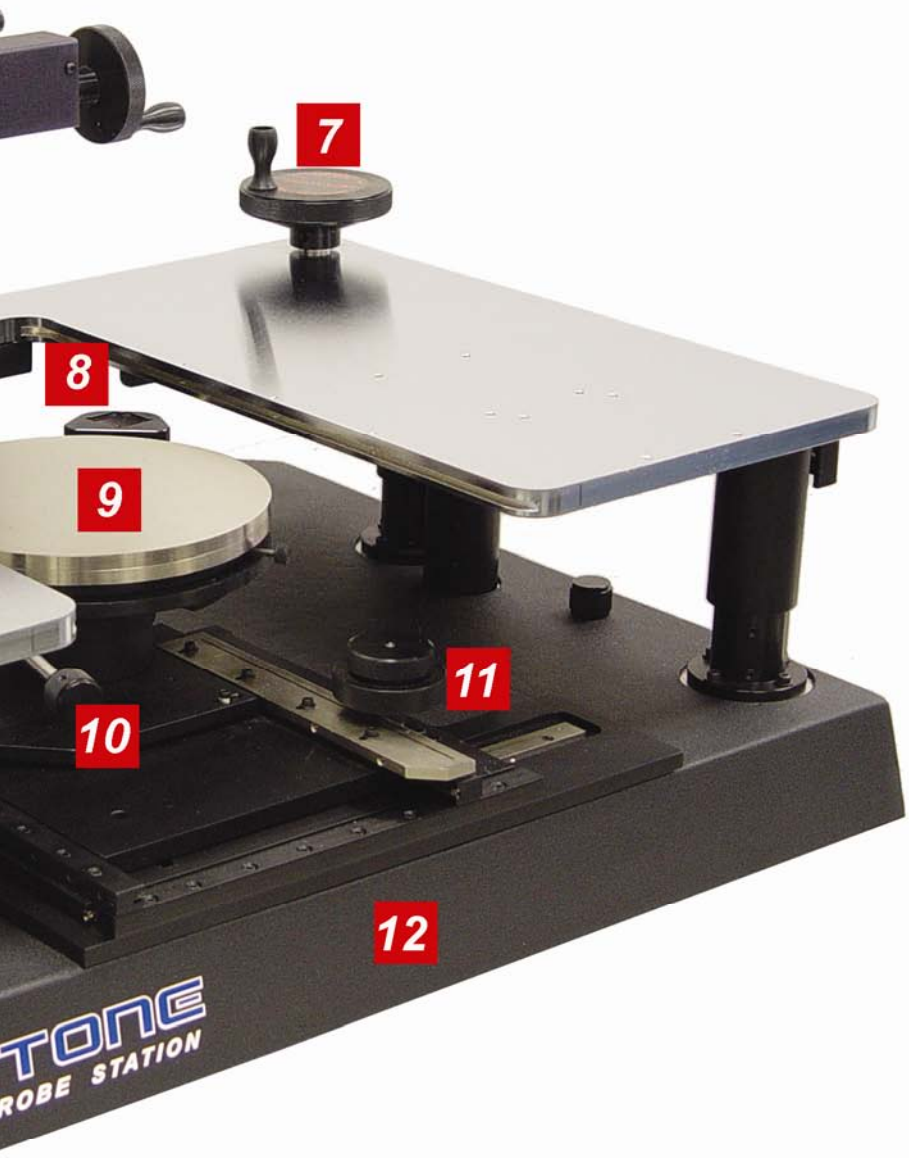
3. Large Steel Platen
The large steel platen is ground flat, planarized to the chuck, and provides bolt-down mounting of up to four 4-axis RF positioners, with room for additional vacuum and magnetic positioners for bias and control probes. An optional platen insert can be added for even more positioner flexibility.

4. 4 Point Platen Support & Lift
Designed to insure planarity of probe contact and to eliminate the resonance problems of cantilevered implementations. Four leadscrews are slaved together to insure that the platen remains planar thoughout it's 1.75" Z travel range.

5. X-Y Microscope Transport
The standard WL-1160 microscope transport features independent X and Y knobs for true rectilinear control, rather than the more common and inconvenient boom-stand. The base configuration incorporates a rigid cast aluminum support tower for improved image stability and strength.

6. Microscope Mount
The WL-1160 offers 4 variants for mounting a wide range of optics. These cover the range from a simple fixed mount for stereo zoom microscopes, up to a 6" X 6" large-area transport X-Y with 2" X 2" fine motion for high-power optics.





7. **Fine Platen Adjustment**
This control knob enables the platen to be set for the desired fixture height, allowing for probe card setup, hot chucks, or fixtures for packaged parts and MCM's.

8. **Calibration Chuck**
The calibration chuck allows the user to perform calibrations without removing the wafer under test. Both portrait and landscape format substrates are supported, and the chuck is made from a non-resonant polymer for use at frequencies up to 110GHz.

9. **RF/Microwave Chuck**
Micro-machined vacuum holes avoid the resonnance problems of vacuum ring designs. Chucks are available in 6", and 8" diameters, and are electrically isolated from the base station. A variety of chuck electrical connection methods may be employed to support your specific applicaiton.

10. **Chuck Rotation Lever**
The rotation lever will rotate the chuck 360º making it very easy to align with probe cards installed. An optional rotation lock (**SRL-160**) is available for locking the chuck in place once the D.U.T. has been properly aligned. The **SRL-160** is required for thermal chuck applications, and is strongly recommended for RF/Microwave applications.

11. **XY Stage Control Knobs**
The X-Y stage utilizes a rack & pinion drive for high precision positioning. The compound knobs permit easy chuck movement in both axes simultaneously. 6" and 8" versions are available and are field-upgradeable as your needs change. An optional fine-pitch drive assembly (**FS-160**) provides even greater precision in controlling the X-Y stage.

12. **Rigid Cast Aluminum Base**
The WL-1160 is built on a cast aluminum base with internal stabilizer ribs, resulting in a low-profile prober with internal mechanisms for platen support and lift, without sacrificing strength.

WAVELINK WL-1160

Features & Benefits

The **WL-1160** RF/Microwave probe station has been designed for high-frequency, high-power, and millimeter-wave applicaitons where non-resonant operation is critical.

Intended for holding a wide variety of devices under test, the **WL-1160** is available in either 150mm or 200mm configurations. The isolated calibration chucks are independently adjustable for theta, sparing you the need to realign the wafer after each calibration cycle. This eliminates a significant error term, improving calibration and test correlation at higher frequencies. The WL-1160 comes with a single calibration chuck, with a second chuck optionally available (as shown).

The base configuration includes a 2" X 2" microscope transport for optimal viewing of the test area. The **WL-1160** supports most StereoZoom and high-powered microscopes in use today.

The **WL-1160** uses the same stable platform as its sister product, the **S-1160** multipurpose probe station. The **S-1160** and **WL-1160** share the same versatility that allows the use of probe cards, magnetic, vacuum, and bolt-down base micropositioners, thermal chucks, light-tight enclosures, and many more essential accessories that give users the tools they need to do their work.

Features:

- 150mm & 200mm manual X-Y motion control
- 50mm X 50mm microscope stage control
- Separate contact/separate and platen height control
- Up to 30mm Z motion control of platen
- Holds up to four S-96MW microwave micropositioners
- Vacuum and DC manifolds standard

The calibration chucks offer independent theta adjustment, eliminating the need to realign the wafer after calibration.

SPECIFICATIONS

Width	27 inches
Depth	22 inches
Height (with microscope)	19.5-22 inches
Shipping Weight	125 pounds
Vacuum Chuck	6" or 8" diameter - supports single die through 8" wafers
X-Y Stage Resolution	X motion @ 1.125" per knob revolution Y motion @ 1.6" per knob revolution
Coarse Platen Lift	3/8" linear with continuous friction stop
Fine Platen Lift	1 1/3" @ .025" per knob revolution
X-Y Microscope Stage	2" X motion @ .1" per knob revolution 1.8" Y motion @ .1" per knob revolution
Facilities Required	Vacuum: 20" Hg @ .1 CFM, Power for Microscope: 120V/60 Hz, 20 Watts

CONFIGURATIONS

ORDERING INFORMATION - *Select the WL-1160 best suited for your application*

WL-1160 [ ] - [ ]

Microscope Mount Type
A = High-Powered Optics Mount
B = StereoZoom Optics Mount
C = StereoZoom Boom Stand

Chuck & Stage Range
6 = 6 inch (150mm)
8 = 8 inch (200mm)

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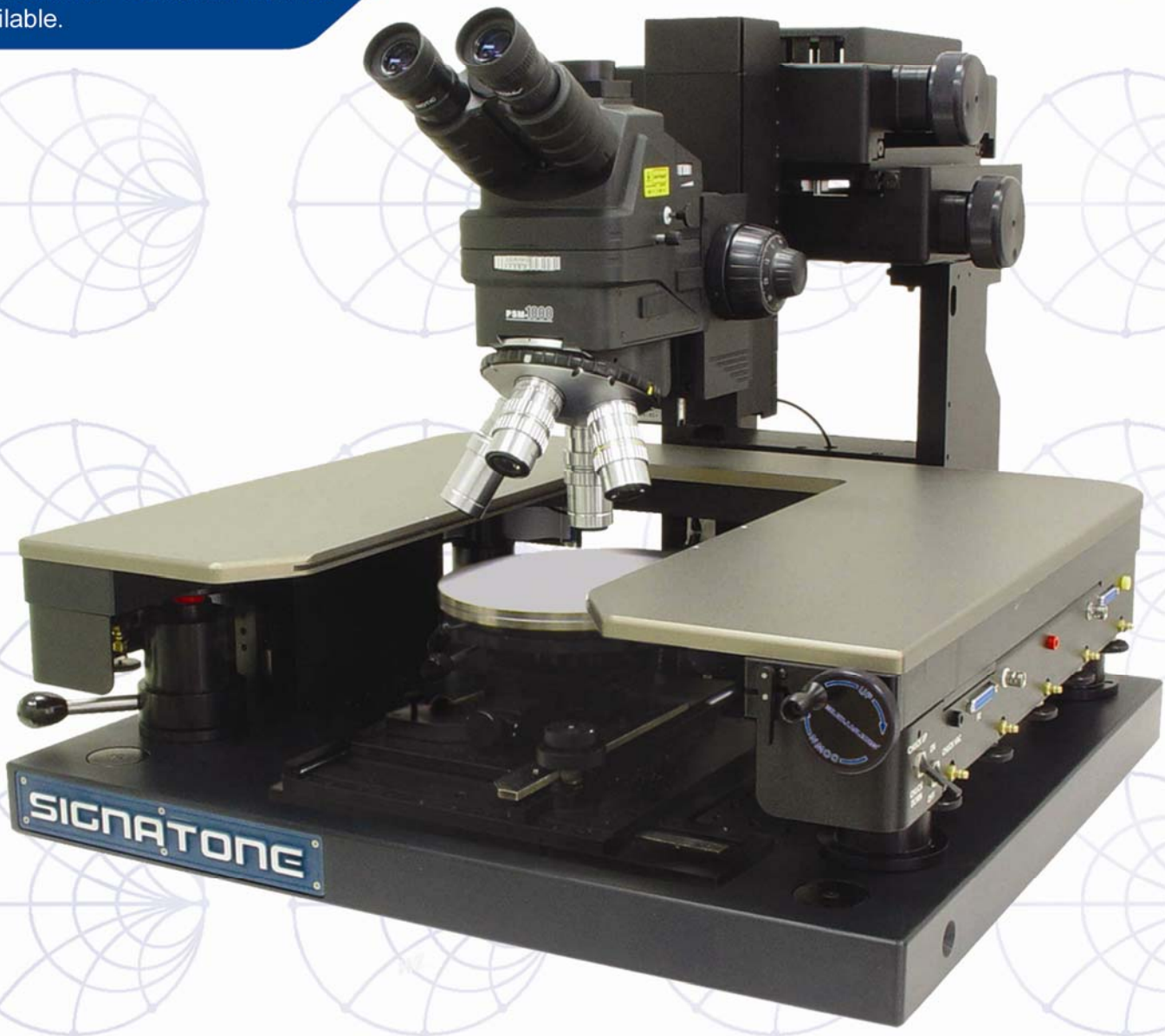
WAVELINK WL-170

High-Stability Manual RF Probe Station

The **WL-170** incorporates the base, platen assembly and microscope transport from the **WL-210** and the stage drive from the **WL-1160** to provide an ultra-stable probing platform. While not upgradeable to the extent that the **WL-210** is, the 4-point platen lift and support, 1.5" of platen travel, and .625" thick over-sized platen, the **WL-170** easily supports all your leading-edge applications. 6 & 8 inch models available.



PERFORMANCE, QUALITY, VALUE

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WAVELINK WL-170

Features & Benefits

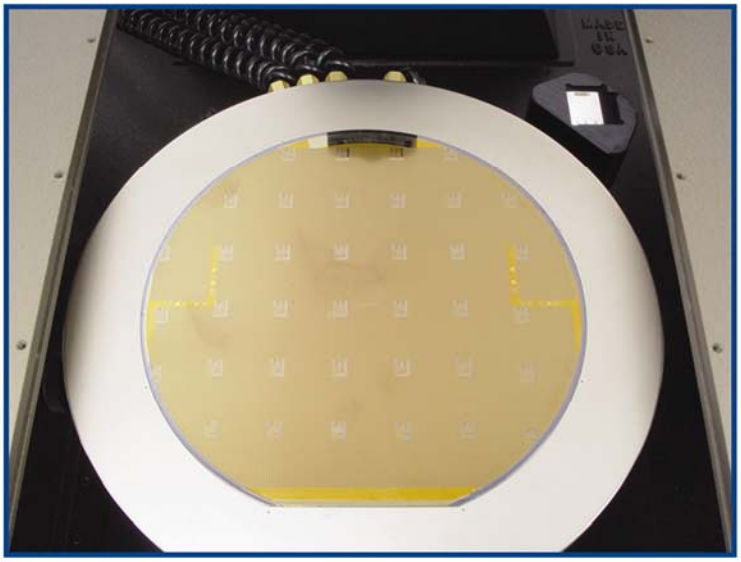
The **WL-170** High-stability RF/Microwave probe station was designed for millimeter-wave applications, and the large tuner assemblies required. This technology dictates that the station offer improved structural strength and rigidity, a larger platen, and superior non-resonant performance.

The **WL-170** includes a 2" X 2" microscope stage for optimal viewing of the test area and supports most StereoZoom and high-powered microscopes on the market today.

The **WL-170** incorporates many of the performance and convenience features of **WL-210**, with the cost-effective XY wafer stage of the **WL-1160**. The WL-170 and WL-1160 share the same versatility that allows the use of probe cards, magnetic, vacuum, and bolt-down base micropositioners, thermal chucks, light-tight enclosures and many more essential accessories that provide you the tools you need.

Features:

- 150mm & 200mm Rack & Pinion stage options
- 50mm X 50mm microscope stage standard
- Separate contact/separate and platen height controls
- 1.5" of platen Z control, locking
- Holds up to four S-96MW microwave micropositioners
- Optional steel platen



The calibration chuck supports both landscape and portrait formats

SPECIFICATIONS

Width	27 inches
Depth	22 inches
Height (with microscope)	19.5-22 inches
Shipping Weight	125 pounds
Vacuum Chuck	6" or 8" diameter - supports single die through 8" wafers
X-Y Stage Resolution	X motion @ 1.125" per knob revolution Y motion @ 1.6" per knob revolution
Coarse Platen Lift	3/8" linear with continuous friction stop
Fine Platen Lift	1. 5" @ .025" per knob revolution
X-Y Microscope Stage	2" X motion @ .1" per knob revolution 1.8" Y motion @ .1" per knob revolution
Facilities Required	Vacuum: 20" Hg @ .1 CFM, Power for Microscope: 120V/60 Hz, 20 Watts

CONFIGURATIONS

ORDERING INFORMATION - *Select the WL-170 best suited for your application*

WL-170 [ ] - [ ]

Microscope Mount Type
A = High-Powered Optics Mount
B = StereoZoom Optics Mount
C = StereoZoom Rigid Mount
D = 6" X 6" High-Powered Optics Mount

Chuck & Stage Range
4 = 4 inch (100mm)
6 = 6 inch (150mm)
8 = 8 inch (200mm)

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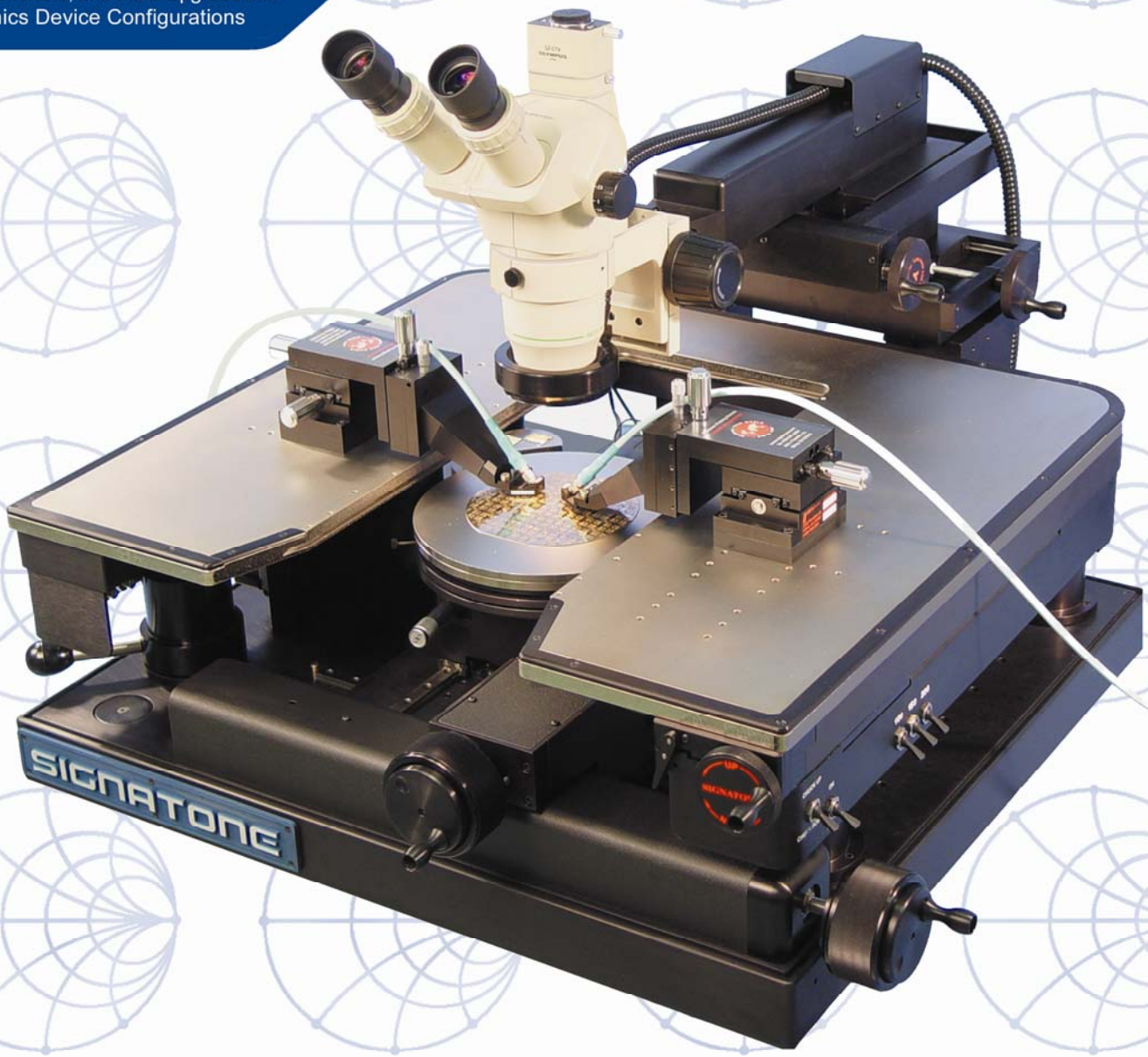
WAVELINK WL-210

WL-210 RF / Microwave Probe Station

SIGNATONE Analytical RF/Microwave probe stations are designed specifically for high-frequency, high-power, and millimeter-wave applications where non-resonant operation is critical.

Package, Multi-Chip, Hybrid, and Wafer Level Probing
Accurate S-Parameter, Load-Pull, 1/f, Noise-Figure
Thermal, Shielded, and Local Enclosure Options
Engineering, Reliability, and Production Options
Superior Low-Noise Electrical Performance
Multiple Levels of Accurate Motion Control
Stable, Flexible, and Field-Upgradeable
Photonics Device Configurations



PERFORMANCE, QUALITY, VALUE

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WAVELINK WL-210

WL-210 RF / Microwave Probe Station

SIGNATONE analytical probe stations are recognized as the performance / value leaders in the microprobing market. The WAVELINK Series extends this expertise into the RF & MW segment, historically dominated by more expensive alternatives.

While this has long been held to be the realm of voodoo, the occult, and black magic, this is no longer the case. Any modern probe station precise enough to contact a sub-micron line is certainly stable enough to hit a 100µ pad with a 50µ RF probe. In the past decade network analyzers have gotten more stable, accurate, and easy to use. Shouldn't your probe station?

Building on the proven CheckMate architecture, and in consultations with our installed base of RF technologists, SIGNATONE has incorporated many features into the WAVELINK Series unique to the world of VNA's and coplanar probes.

Take another look at SIGNATONE – Perhaps for the first time. We listened, and we think you'll like what you see.

The **WL-210** calibration chuck offers 3 substrate sites which support either landscape or portrait format calibration substrates.

The tilt-back microscope provides unobstructed fixturing access.

Common Features

Massive 2" one-piece machined aircraft aluminum base for stability

Large Heavy-duty nickel steel platen with 4-point support and lift

Compound coarse/fine X-Y stage drive for fast, precise positioning

Separate calibration chuck eliminates the error-inducing step of removing the wafer under test and substituting the substrate in it's place for calibration

Accepts shards through 8" wafers, substrates, PCB's, and thinned wafers

Independent platen height (locking) and contact/separate controls

Non-ferrous chuck and stage reduces ferromagnetic resonance and crosstalk

Supports bolt-down, vacuum, and magnetic base micropositioners

Banana, BNC, and Triax chuck bias connections

Quick-Change probe card holder option with independent Θ adjustment

In-The Field upgrade options for motion control, local enclosure and thermal configurations

Specifications

X-Y Stage
Travel: 200mm X 200mm
Bearings: Carriage & Rails
Stage Drive: Coarse/Fine Coaxial
Resolution: 5 mm/turn, .5 mm/turn

Wafer Chuck
Size: 200 mm
Metallurgy: Nickel/Gold plated Aluminum
Vacuum: Shard, 100mm, 150mm 200mm
Isolation: > 100 MΩ, > 600V breakdown
Bias Input: Triax, BNC, Banana
Flatness: ± 6 µm across chuck
Theta: ± 10°, independent of cal chuck
Z: .025" pneumatic actuation

Platen
Adjustment Range: 2", locking
Contact/Separate: .125"
Lift: 4-point, planar
Metallurgy: .625" Nickel-plated steel
Positioner Support: Bolt down, Magnetic, Vacuum

Microscope Transport
Low-Power: 4" X 4", 20 TPI, manual tilt-back
High-Power (Optional): 2" X 2", 40 TPI, 4" vertical lift

Calibration Chuck
Sites: 3
Orientation: Landscape or portrait

Facilities/Mechanical
Dimensions: 55 (21.6") X 66 (26.0") X 78.5 (30.9")
Net Weight: 91 kg (200 lb.)
Shipping Weight: 150 kg (325 lb.)
Air: > 2 cfm, 30 psi
Vacuum: > 400 mm/15 in. Hg

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WAVELINK — WL-210E

200mm E-Manual Probe Station

Many applications benefit from an isolated probing environment, such as full-range thermal, 1/f, noise-figure, load-pull, and low-leakage CV/IV probing, yet don't require a fully-automated platform. Offering mechanical isolation and precise sub-µ positioning, the **WL-210E** is the ideal choice, while still retaining the option to upgrade to semi-automatic in the future. SIGNATONE - You asked - *We Listened!*

PERFORMANCE, QUALITY, VALUE

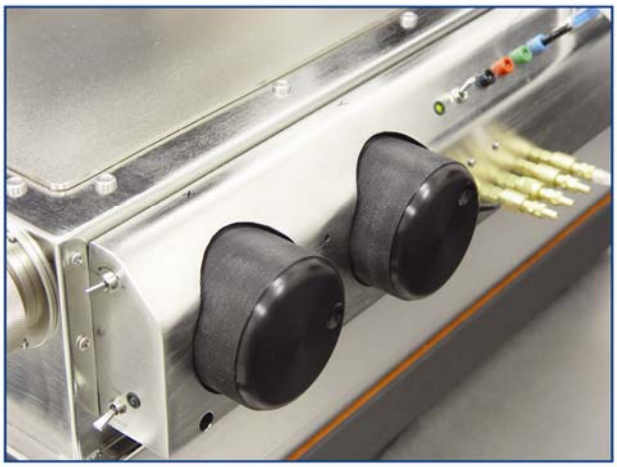
SIGNATONE®

Advanced Microprobing Solutions Since 1968

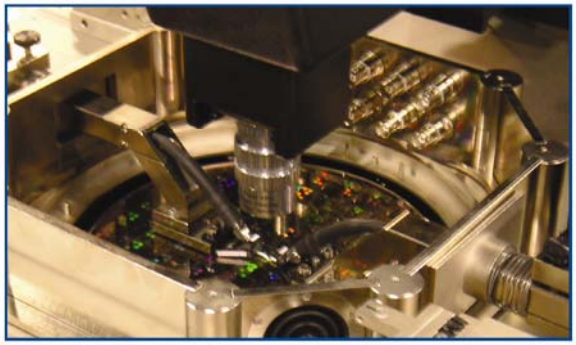
WAVELINK WL-210E

200mm E-Manual Station

A significant portion of leading-edge probing applicaitons require that the wafer be enclosed in an environmental chamber, either for electrical shielding or to provide frost-free probing. Traditional approaches use a variety of methods to provide this functionality, but they all share one significant limitation; mechanical interference between the stage and the enclosure. This makes ultra-fine positioning of the wafer extremely difficult, if not impossible. By eliminating the sliding plates commonly used to close off the bottom of the enclosure, and utilizing remote motor control, **SIGNATONE E-Manual stations** give the best of both worlds; mechanical isolation and sub-µ positioning. A 10:1 vernier switch solves the problem inherent in conventional manual leadscrew designs by providing rapid motion for large moves and precise control for final positioning of the wafer. Like all SIGNATONE probe stations, the WL-210E is fully upgradeable to support future probing requriements, including full-range thermal and semi-automatic configurations.



The **WL-210E** features large control knobs with a 10:1 vernier function for optimum control of the wafer stage.



The ovesized tophat provides ample room for probing and supports simultaneous probecard and positioner probing

Features & Benefits

Massive 2" one-piece machined aircraft aluminum base for stability

Large Heavy-duty nickel steel platen with 4-point support and lift

Coarse/fine X-Y stage drive for fast, precise positioning

Separate calibration chuck eliminates the error-inducing step of removing the wafer under test and substituting the substrate in it's place for calibration

Accepts shards through 8" wafers, substrates, PCB's, and thinned wafers

Independent platen height (locking) and contact/separate controls

Non-ferrous chuck and stage reduces ferromagnetic resonance and crosstalk

Supports bolt-down, vacuum, and magnetic base micropositioners

Banana, BNC, and Triax chuck bias connections

Quick-Change probe card holder option with independent Θ adjustment

In-The Field upgrade options for motion control and thermal configurations

Specifications

X-Y Stage
Travel: 200mm X 200mm
Bearings: Carriage & Rails
Stage Drive: Coarse/Fine
Resolution: 5 mm/turn, .5 mm/turn

Wafer Chuck
Size: 200 mm
Metallurgy: Nickel/Gold plated Aluminum
Vacuum: Shard, 100mm, 150mm 200mm
Isolation: > 100 MΩ, > 600V breakdown
Bias Input: Triax, BNC, Banana
Flatness: ± 6 µm across chuck
Theta: ± 10°, independent of cal chuck
Z: .025" pneumatic actuation

Platen
Adjustment Range: 2", locking
Contact/Separate: .125"
Lift: 4-point, planar
Metallurgy: .625" Nickel-plated steel
Positioner Support: Bolt down, Magnetic, Vacuum

Microscope Transport
Low-Power: 4" X 4", 20 TPI, manual tilt-back
High-Power (Optional): 2" X 2", 40 TPI, 4" vertical lift

Calibration Chuck
Sites: 3
Orientation: Landscape or portrait

Facilities/Mechanical
Dimensions: 55 (21.6") X 66 (26.0") X 78.5 (30.9")
Net Weight: 135 kg (300 lb.)
Shipping Weight: 150 kg (330 lb.)
Air: > 2 cfm, 30 psi
Vacuum: > 400 mm/15 in. Hg

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WAVELINK WL-250

200mm Semi-Automatic Probe Station

The **WaveLink 250** represents the upper limit in computer-controlled analytical wafer probing. Designed to be the flagship of our RF/MW line, it is equally at home at 5 fA as it is at 110 GHz. Whether you simply need EMI or RFI isolation, or frost-free characterization at -65 °C, the WL-250 should be your platform of choice. SIGNATONE, you asked - *We Listened!*

PERFORMANCE, QUALITY, VALUE

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Advanced Microprobing Solutions Since 1968

WAVELINK WL-250

Specifications

- 200mm XY stage travel
- Independent cal and wafer chuck
- 50mm platen range, with lock
- 50mm programmable microscope transport
- Pneumatic 4" microscope lift

X-Y Motion Control

- "Point & Shoot" movements
- 8 directional arrows with variable speed control
- Wafer map "Pick & Move"
- "Go To" commands

Z Motion Control

- Separate contact/overdrive height
- Z motion speed control
- Safety lock
- Soft Z with edge sense circuit (for use w/probe card edge sense)

User-Friendly Features

- Stores setup and programs for easy retrieval
- Icons for most applications
- Basic Run mode guides the user through basic operations
- On-Screen video display option
- Wafer map position indicator

Integrated Probing Solutions For Testing

- S-Parameters, 1/f
- Load-Pull, Noise Figure
- V_{TH}
- T_{OX}
- CV/IV
- Sub-Threshold Leakage to 5 fA
- Resistivity
- WLR
- Dark Current
- Pulse mode 10A/100V Measurements

- Chuck X-Y Resolution: .1µ
- Chuck X-Y Repeatability: 1µ
- Chuck X-Y Accuracy: ±3µ
- Chuck Z Resolution: .1µ
- Chuck Z Accuracy: .25µ
- Chuck Θ: ±6 degrees

Programming

- Wafer Map design editor
- Selective programming
- Learn position
- Subroutine with chuck or Computer aided Probe

Interfacing

- DDE interface integrated with ICS Metrics for instrument control of most Keithley and Agilent instruments
- Application SW for Keithley 2400 Series
- DDE compatible with HP VEE
- DDE compatible with NI LABView
- GPIB compatible with NI LABView

Other Features

- Microscope X-Y-Z and Zoom control
- Color wafer bin mapping with 16 colors
- Hot chuck interface and control
- Accepts probe cards
- Available vibration isolation tables
- Optional Controller/Instrumentation rack

ICS-Metrics Software

ICS-Metrics integrates Agilent and Keithley DC/CV instrumentation for the automated characterization of semiconductor parameters

- Graphical user interface for all instrument functions
- Simple, pre-configured test formats for semiconductor devices
- Data collection and storage
- Sequential test execution
- Data analysis and reporting

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WAVELINK WL-350

300mm Semi-Automatic Probe Station

The **WaveLink 350** represents the upper limit in computer-controlled analytical wafer probing. Designed to be the flagship of our RF/MW line, it is equally at home at 5 fA as it is at 110 GHz. Whether you simply need EMI or RFI isolation, or frost-free characterization at -55 °C, the WL-350 should be your platform of choice. SIGNATONE, you asked - *We Listened!*

PERFORMANCE, QUALITY, VALUE

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Advanced Microprobing Solutions Since 1968

WAVELINK WL-350

Specifications

Wafer Stage

- 300mm wafer chuck and XY stage with 2 independent theta calibration chucks.

X & Y Axis Resolution:	0.1µ
X & Y Axis Repeatability:	0.5 µ
X & Y Axis Accuracy:	± 3µ
Z Axis Resolution:	0.1µ
Z Axis Accuracy:	0.25µ
Theta Range:	± 6°

- Programmable Z speed with Soft-Z edge-sense option for probe card applications

Mechanical Features

- 2" aircraft aluminum base with integrated vibration isolation
- 0.625" aluminum platen (steel optional) with 1" aluminum channel sub-platen brace
- Leadscrew-driven platen drive: 0.15" Contact/Separate, 1.75" height adjustment range with lock
- 2"x2" programmable microscope transport with 10" X 6mm cross-roller bearings, 4" pneumatic Quick-lift
- Roll-out wafer stage for convenient wafer loading

Motion Control Features

- Local and Remote operation (RS-232C, GPIB, ActiveX)
- USB or Ethernet controller to prober communication to eliminate bus conflicts
- Joystick option with 2-axis joystick and 3-axis optically-encoded thumbwheels for sub-µ control
- Integrated standard support for up to 4 Computer-Aided Positioners

System Software Features

- Single level user interface with icons and ToolTips
- 2-point software theta auto-alignment
- Programmable Z with *Contact/Separate/Overdrive* presets
- On-screen live video display with image capture/save
- Integrated Wafer Map and editor with *"Click to Die"* and *"Row/Column Navigation"*
- Local Step & Repeat debug/diagnostic mode
- Unlimited Save/Restore of prober setup files and wafer maps
- Color-coded wafer map with 256 user-defined binning colors
- Sub-Site probing capability for wafer stage or Computer-Aided Positioners, with editor
- Learn Mode for saving program probe points
- Integrated thermal chuck control
- *Point & Shoot*, *Drag & Drop*, *Measure Mode*, and *Probe/Scope Tracking*
- Microscope objective compensation
- Dual inker support (Inkers not included)
- Supports: LABView, Keithley KITE, Agilent VEE, IC-CAP, ICS Metrics

Supported Applications

- S-Parameters, 1/f, Load-Pull, Noise Figure, Pulsed RF
- Low-leakage (<5fA), CV/IV, V_{TH}, T_{ox}, WLR,
- Lucas Labs Resistivity Measurement Suite

Hardware Options

- Local enclosure for dry, dark, and EMI/RFI shielded probing
- Opto-Electronic configurations with optical breadboard drilled platen and/or base
- Hot-only (to 300°C) and full-range (-55°C to 300°C) **SIGNATONE** thermal chuck systems
- Temperature-controlled platen and chuck mount for improved thermal settling and safety

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THERMAL SYSTEMS

One Vendor - Multiple Solutions

Signatone has been designing and building its own thermal chuck systems for over 25 years. Thermal testing is critical in modern probing applications, and each requirement poses unique challenges. Whether you need a fluid chuck for liquid crystal work, or a full-range triaxial system for WLR, its been engineered to meet exacting performance and reliability standards. At SIGNATONE compromise is not an option.

PERFORMANCE, QUALITY, VALUE

SIGNATONE®

Advanced Microprobing Solutions Since 1968

THERMAL SYSTEMS

OVERVIEW

For over 25 years **SIGNATONE** has designed and manufactured its own thermal chuck systems. While we routinely integrate systems from other vendors, the real advantage that we can offer our customers is a ***single-source*** solution. Temperature testing has become an integral part of wafer probing, and the ability to characterize and control the interaction between the chuck and the rest of the station has become increasingly important. The vast number of thermal chuck systems on the market precludes our undertaking this effort for any designs other than our own. By manufacturing our own thermal systems we can control all critical aspects of the design and manufacture. By avoiding reliability-prone technologies we can insure greater up-time, and by minimizing our reliance on 3rd party service we can be more responsive in the unlikely event you ever do experience a problem.

S-1070 SERIES

The **S-1070 Series** Thermal Chuck Systems are the latest offerings in the SIGNATONE temperature control product line. Utilizing the latest in materials and technology these products represent a new standard in performance and reliability. Switching DC power supplies are used to drive the embedded chuck heater cores, and the on-board computer offers superior temperature compensation over traditional linear interpolation methodologies. Temperature resolution on all models is 0.1°C. The cool-down function is provided by either a recirculating water source, or by one of several self-contained chiller systems, with the lower temperature set-point determined by the cooling system used.

In the full-range variants of the **S-1070 Series** systems the **Mercury Series** chucks are used, based on proprietary, patented technolgy designed to the minimize reliability problems common in Peltier-based designs. The coolant temperature never exceeds +20°C which also eliminates the flash-point and volitalization problems seen with more conventional implementations, and widens the choice of coolants that can be used safely . **Mercury Series** chucks are offered in both coaxial and triaxial configurations.

S-1070A	S-1070B	S-1070C
200mm: 25ºC to 300ºC	200mm: -50ºC to 300ºC	200mm: -65ºC to 300ºC
300mm: 25ºC to 200ºC	300mm: -40ºC to 200ºC	300mm: -65ºC to 200ºC

S-1060 SERIES

The **S-1060 Series** Thermal Chuck Systems is SIGNATONE's workhorse product line for on-wafer thermal probing. Based on the industry-standard **ATHENA** controller module,the **S-1060 Series** incorporates all temperature control functions in a single unit, including DC heater drivers and cool-down water management. The controller is available in standard (**S-1060-R**) and high-temperature variants (**S-1060-H**), and offer 1°C temperature resolution. The Model **S-1061-R** controller features 0.1°C resolution and a $\mathbf{T_{MAX}}$ of 200°C.

The **S-1060 Series** systems can be used with either our standard series hot chucks for stand-alone applications, or thinner models (**T-Series**) optimized for mounting on wafer probe stations. Gold and nickel plating is a user-configured option on all our chucks, with palladium plating required for temperature chucks operating above 300°C. Chucks are available in 100mm, 150mm, and 200mm diameters, with triaxial configurations offered in the 150mm and 200mm sizes.

S-1060-R	S-1061-R	S-1060-H
100mm: 25ºC to 400ºC	100mm: 25ºC to 200ºC	100mm: 25ºC to 550ºC
150mm: 25ºC to 350ºC	150mm: 25ºC to 200ºC	150mm: 25ºC to 500ºC
200mm: 25ºC to 300ºC	200mm: 25ºC to 200ºC	200mm: 25ºC to 450ºC

S-1050 SERIES

The **S-1050 Series** Thermal Chuck Systems is ideal for probing applictions that have a limited temperature range, but require fine resolution and high temperature stability. Typical uses include liquid crystal hot-spot detection, and heatsink applications for power and photonic devices. The heart of the system is a closed-loop recirculating water bath that maintains 0.1ºC temperature stability. The standard temperature range is 10ºC to 85ºC, and is offered in 150mm and 200mm versions. Custom shapes and temperature ranges are also available as custom products. Please consult the factory for price and delivery for your specific requirement.

S-1040 SERIES

The **S-1040 Series** is our economy line of ambient to 200ºC Thermal Chuck Systems. Based on the ATHENA proportional controller and AC heaters, the **S-1040 Series** is ideal for applications where AC line noise isn't as critical, but price is. These include RF S-Parameter testing, functional test, and probe card alignment systems. The S-1045 is a 1ºC resolution system available in 100mm, 150mm and 200mm chuck sizes. The S-1046 has the same feature set and functionality, but with 0.1ºC programmability. Both configurations are available with either gold or nickel plated chucks, and an optional high-frequency vacuum surface add-on option that eliminates vacuum ring resonances.

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