

## Signatone CM - 350 300 mm Semi-Automatic Probe System

For reliable and accurate DC/CV, High Power Test and RF Measurements

### ❖ FEATURES / BENEFITS

#### Designed for a Variety of On-Wafer Analytical and Semi-Production Applications

- DC, CV/IV, pulsed –IV applications
- High Power Application up to 12KV /600A
- IC Design / test verification Ambient, +300°C
- RF applications up to 110GHz 2 & 4 port setup
- mmW 110GHz -1.5THz 2-Port

#### Product Versatility

- Designed for full or partial wafer probing
- Roll-Out stage for ease of wafer loading
- Active Vibration Isolation table (optional)
- Ambient, Hot (+25°C to +300°C) configurations

#### Options and Configurations

- Standard Platen Supports up to 10x DC MicroPositioners or 2x RF + 4 DC and/or 4.5" wide probe card
- Available in multiple configurations including a variety of chuck options, DC/RF/High Power positioners, Computer Aided Probes, microscopes, camera's, Dark Box's, lasers for various applications



### ❖ ROLL - OUT STAGE -Optional

- Roll-Out Stage designed for easy Loading and Unloading of Wafer Samples and single ICs
- Excellent for use with probe cards and multi probe/complex setups
- Allows easy access to AUX -chucks
- Lock and Un-Lock position indicator
- Presentation 285mm / 95%
- Easy access to vacuum-zone selector knob

## ❖ SPECIFICATIONS

### Chuck XY Stage (Programmable)

Travel range	308 mm x 308 mm (12.126 x 12.126 in)
Resolution	0.5 $\mu$ m
Accuracy	$\pm$ 5.0 $\mu$ m
XY stage drive	Closed-loop high precision servo motor PID control
Speed	Variable Speed XY chuck stage control
Max. movement speed	120 mm / sec.

### Chuck Z Stage (Programmable)

Travel range	12.5 mm (0.5 in)
Resolution	0.25 $\mu$ m
Accuracy	$\pm$ 2.0 $\mu$ m
Repeatability	$\pm$ 1.0 $\mu$ m
Z stage drive	Closed-loop micro stepper motor
Speed	Variable Mode and Speed selection
Max. movement speed	15 mm / sec.

### Chuck Theta Stage (Programmable)

Travel range	$\pm$ 10° (total range = 20°)
Resolution	0.000035°
Accuracy	< 1.0 $\mu$ m (measured at the edge of the 300 mm chuck)
Repeatability	< 1.5 $\mu$ m
Theta stage drive	High resolution stepper motor, rotary encoder feedback system

### Roll Out / Loading Stage

Lock / Un-Lock	Software indicates when in Un-Lock Position
Wafer Presentation	95% (see image pg. 1)
Return repeatability	< 1 $\mu$ m

### Motorized Microscope Stage (linear)

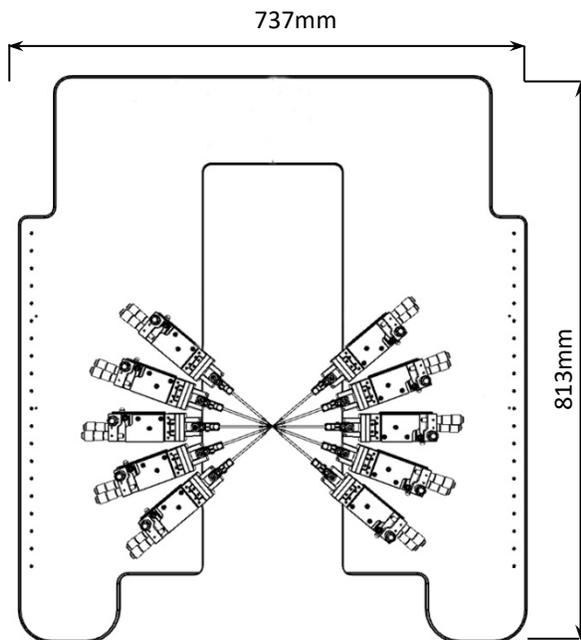
Movement range	50mm X 50mm (2"x2")
Resolution	0.02 $\mu$ m (20 Nano meters)
Scope lift	101 mm (4") Vertical Pneumatic (Motorized- optional)
Scope lift motorized (optional)	50mm motorized + 50 mm pneumatic / combination = 101mm (4")

\*All data relevant for use with Precision package

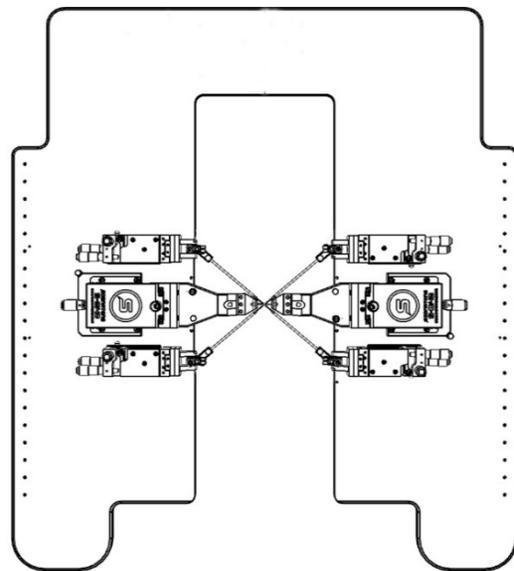
## ❖ PROBE PLATEN

### Specifications

Material	Nickel Plated Aluminum (Steel optional)
Dimension	L = 813mm x W = 737mm x H = 12.7mm (See drawing)
Chuck to Platen Separation	Min. 2 mm (Variable Separation with Fine Platen Adjust)
Max. No of Micro Positioners	10 x DC or 2x RF + 4 x DC or a combination
Quick Platen Lift Control (CVL)	Continuous Variable Lift (0 to 3.175 mm)
Contact Repeatability	< 1 $\mu$ m (0.04 mils) by Manual Control
DC MicroPositioner mounting	Magnetic or Vacuum (with Steel option)
RF MicroPositioner mounting	Magnetic or Bolt Down (with Steel option)



Sample 1: Probe Configured with 10 DC Probes



Sample 2: Probe Configured with 2 RF + 4 DC Probes

## ❖ ONE PLATEN - Three BENEFITS

### Signatone Multi Benefit /Two in One Platen Features:

- "Quick Lift" with CVL for easy probe to pad separation and alignment
- "Fine Adjust" for Probe card and variable Chucks and DUT thickness setup
- "Position Lock" allows for secure "lock" of user defined platen height setup



## ❖ SYSTEM CONTROLS

The S1080 thermal chuck controller features touch screen commands, triple safety circuits, and 0.1° resolution. **ProbeMaster** software features thermal control from the probe station.

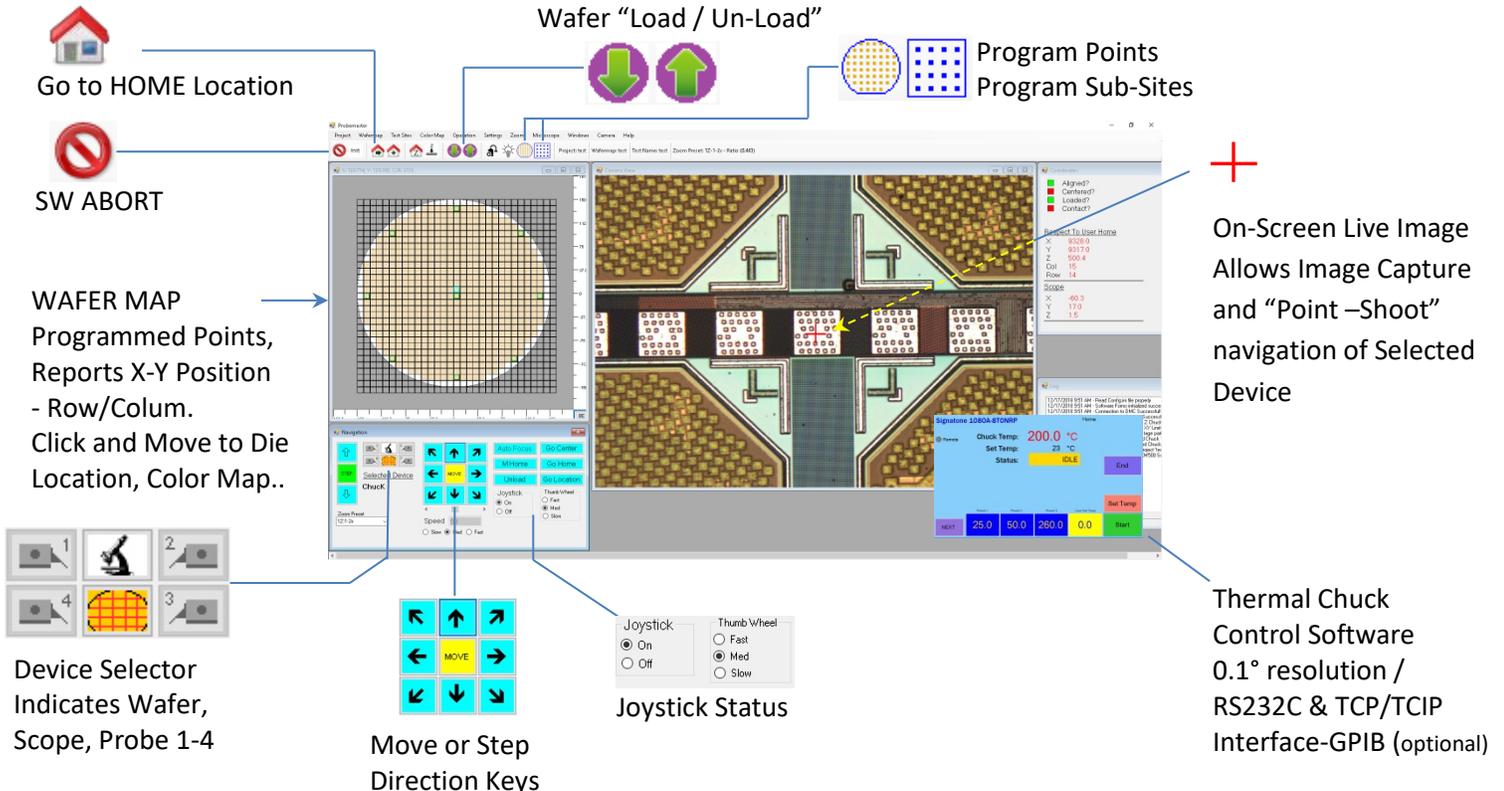
Hardware accessories including keyboards and mouse can be easily integrated into the table's instrumentation rack providing greater ease of use, ergonomics, and minimizing the overall system dimensions. System and thermal controllers may also be integrated.

Industry proven precision Joy Stick/ thumbwheel combination, intuitive selector panel for DUT, Microscope, and 1-4 Computer Aided Probes (CAP). LED indicator for active device, Multi-speed thumbwheels offer sub-micron positioning.



## ❖ SYSTEM SOFTWARE

Signatone's powerful navigation software **ProbeMaster** drives all Signatone semiautomatic probing systems. **ProbeMaster** simplifies navigation to a test site by using arrow keys, wafer graph or *point and shoot* on the live image. The optional vision control module includes *auto align*, *auto start*, *probe exact*, and *sure touch* features. Supports many popular interface protocols \* *see supported software platforms*



## ❖ DC PROBE –SELECTION GUIDE

	Coax Probe (C)	Triax Probe (T)	Kelvin Probe (K)
Max voltage	500 V	500 V	500 V
Temperature range	-60 °C to 300 °C	-60 °C to 300 °C	-60 °C to 300 °C
Leakage current	< 50fA	< 20fA	< 20fA
Connectivity	BNC	Standard Triax	SSMC
Connectivity type	Single Coaxial	Single low noise Triaxial	Force/Sense Coax
Characteristics impedance	50 Ohms	50 Ohms	50 Ohms
Residual capacitance	< 80fF	< 80fF	< 80fF
Probe holder material	Brass	Brass	Brass
Probe tips material	Tungsten	Tungsten	Tungsten
Probe tips sizes	0.5 μm – 25 μm	0.5 μm – 25 μm	0.5 μm – 25 μm
Minimum pad size	25 μm x 25 μm	25 μm x 25 μm	25 μm x 25 μm



Coax Probe



Triax Probe



Coax Kelvin Probe

\*All leakage tests conducted in an enclosed environment with Keithley 4200, or equivalent, in sampling mode with 10 PLC, auto-ranging. 0.25s interval

## ❖ High Voltage/High Current PROBE –SELECTION

Model	High Voltage Probes			High Current Probe
	HVP-CX-3	HVP-TX-3	HVP-CX-10	HCP 100
Max Voltage	3 kV	3 kV	10 kV	500 V
Max Current	1 A DC/30 A Pulsed	120 mA DC	20 mA DC	10 A DC/100 A Pulsed
Temperature Range	-60 °C to 300 °C	-60 °C to 300 °C	-60 °C to 300 °C	-60 °C to 300 °C
Leakage Current	< 200 pA @ 3 kV, < 5 pA @ 10 V	< 1 pA @ 3 kV, < 100 fA @ 10 V	< 100 pA @ 10 kV	N/A
Connector Type	SHV	HV Triax	UHV Coax	HV Banana
Replaceable Tip	Yes	Yes	Yes	Yes
Probe Material	W	W	W	BeCu or W



HVP-CX-3



HVP-TX-3



HVP-CX-10



HCP-100

## ❖ NON-THERMAL CHUCKS

### Standard Wafer Chuck

Connectivity	Coax BNC (m)
Diameter	308 mm
Material	Nickel Plated Brass (gold optional)
Chuck surface	Zone selector knob with Peppered vacuum patterns
Vacuum hole pattern sections(diameter)	22mm, 50mm, 91mm, 135mm, 168mm, 265mm
Vacuum actuation	Selector Knob allows individual activation of vacuum zones
Supported DUT sizes	25mm, 75mm, 100mm, 150mm, 200mm, 300mm
Surface planarity	±6.5μ
Rigidity	<3μ / 10N at edge of the chuck

### Electrical Specification (Coax)

Operation voltage	Designed for operation at -200V to + 200VDC
Maximum voltage between chuck top and GND	500 V DC
Isolation	> 150 GΩ

### Wafer Chuck (Triaxial)

Connectivity	Triax (m)
Diameter	308 mm
Material	Gold Plated Brass
Chuck surface	Independent Vacuum zones with vacuum rings
Vacuum hole pattern sections(diameter)	0mm, 65mm, 112mm, 162mm, 265mm
Vacuum actuation	Multi-Zone Adjustable Control
Supported DUT sizes	3mm, 75mm, 125mm, 200mm, 300mm
Surface planarity	± 5 μm
Rigidity	<3μ / 10N near at edge of the chuck

### Electrical Specification (Triax)

Chuck isolation	Measured @ 10V DC
Force to guard	> 2 TΩ
Guard to shield	> 7 TΩ
Force to shield	> 15 TΩ

## ❖ SIGNATONE THERMAL CHUCKS

### Typical Specifications of *Signatone* Thermal Technology

	300mm Standard Hot	300mm Hot/ Triax	300mm Hot/ 3kV Triax
Temperature Range	+25 °C to +300 °C	+25 °C to +200 °C	+25 °C to +200 °C
Connectivity	Coax (m)	Triax (m)	HV Triax (m)
Temperature control method	Liquid Cooled / Resistance heater	Liquid Cooled / Resistance heater	Liquid Cooled / Resistance heater
Coolant	Water	Water	Water
Smallest temperature selection step	0.1 °C	0.1 °C	0.1 °C
Chuck temperature display resolution	0.01 °C	0.01 °C	0.01 °C
External touchscreen display operation	Yes	Yes	Yes
Temperature stability	±0.1 °C	±0.1 °C	±0.1 °C
Temperature accuracy	±0.5 °C	±0.5 °C	±0.5 °C
Control method	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID
Interfaces	RS232C & TCP/TCIP	RS232C & TCP/TCIP	RS232C & TCP/TCIP
Optional Interfaces	GP-IB	GP-IB	GP-IB
Chuck surface plating	Nickel	Gold	Gold
Temperature sensor	RTD	RTD	RTD
Temperature uniformity	±0.5 °C at ≤ 200 °C ±1.5 °C at > 200 °C	±0.5 °C at ≤ 100 °C ±2.5 °C at 200 °C	±0.5 °C at ≤ 100 °C ±3.5 °C at 200 °C
Surface flatness	< ±10 μm	< ±8 μm	< ±15μ
Electrical isolation - Coax BNC (m) / SHV Triax	150nA	> 5TΩ	> 5TΩ
Heating Rates	25°C to 300°C < 12 min	25°C to 200°C < 9 min	25°C to 200°C < 28 min
Cooling Rates	300°C to 25°C < 9min	200°C to 25°C < 8min	200°C to 25°C < 8min
Leakage @ 10 V Kelvin Triax	N/A	<25fA	<400fA
Residual Capacitance		<200fF	<1pF
Maximum voltage between chuck top and GND	500V	500V	3kV
3 Safety Circuits	Yes	Yes	Yes
Vacuum Pattern	Rings	Pin hole	Pin hole
Vacuum Zone (DUT Size)	50, 100, 150, 200,300mm	2, 50, 100, 150, 200,300mm	2,50, 100, 150, 200, 300mm

### System Controller / Dimensions / Weight / Power Consumption

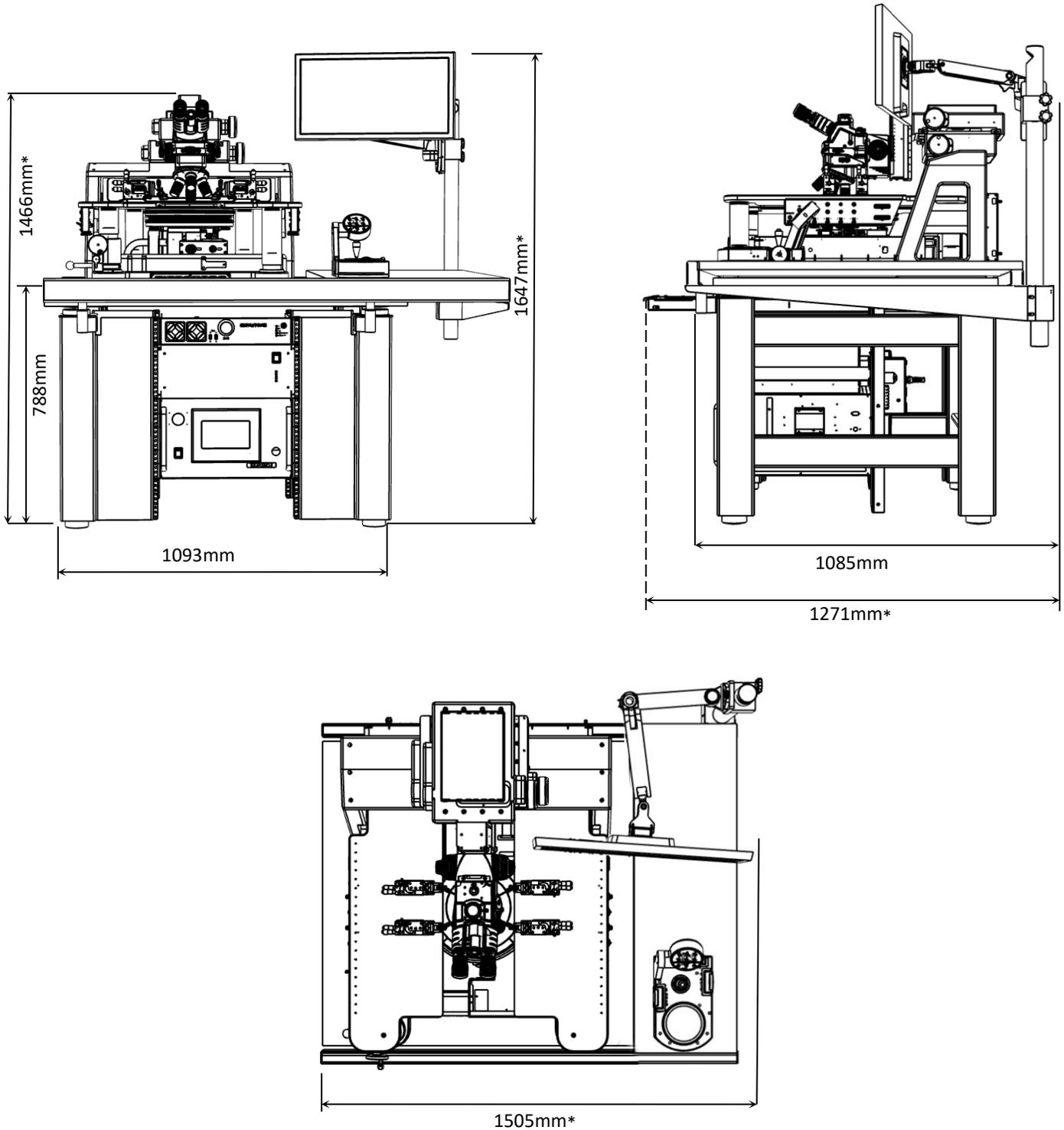
System Model	W x D x H (mm)	Weight (kg)	Weight (Lbs.)	Power cons. (VA)
S-1080	558 x 483 x 178	20.4	45	2000
TC-II	355 x 711 x 610	50.8	112	1500

**❖ SYSTEM DIMENSIONS INCLUDING TABLE**

**CM-350 / Vibration Isolation Table /Monitor and Keyboard Mount**

Dimensions (L x D x H)	863x 1085 x 1466 mm	(34 x 42.7 x 57 In )
Weight	340 kg	(750 lbs.)

\* Can vary dependent on monitor, keyboard (roll out drawer) position and Microscope selection



## ❖ WARRANTY

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- Standard Warranty 12 months \*
- For Extended Warranty and Service Contracts : Contact Signatone Corp. for more information

\* See *Signatone Corporate Terms and Conditions of Sale* for further details.

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