DATA SHEET · MANUAL PROBE SYSTEMS

Signatone S-1160 150 mm – 200 mm Manual Probe System

Designed for reliable and accurate analytical testing of DC, CV-IV, and high-power applications.

Series **S-1160 / S-1160A / S-1160B / S-1160S** Wafer sizes **10 – 200 mm** Probes **DC · RF-mmW · HP to 10 kV**

FEATURES / BENEFITS

Multi-use by design

- Designed for a **wide variety of DC / HP test**.
- **Robust design** and multiple setup and configuration options allow for a maximum of measurement dynamics.
- **Single-handed X-Y stage knobs** for quick movement plus fine knob control.
- **Quick platen lift** with adjustable platen separation.
- Chuck **fine rotation and lock**.
- Steel platen accepts **DC / HP / CAP positioners** (magnetic or vacuum mount).
- Multiple configurations: chuck options, **DC / RF / 1 to 10 kV**, micro positioners, microscopes, cameras, PCB holders, and more.
- Optional instrumentation racks, vibration isolation tables, thermal chucks, dark box...

S-1160 with stereo-zoom microscope and micropositioners

SPECIFICATIONS

Stage & platen

Chuck X-Y stage (standard)

Travel range	203 mm × 203 mm (8 × 8 in)
Fine-travel range	12 mm × 12 mm (0.5″ × 0.5″) (optional)*
Fine-travel resolution	<1 µm (0.001 mm) @ 250 µm/rev
Planarity	< 10 µm
Theta travel (standard)	360°
Theta travel (fine)	± 6.0° (optional)*
Theta resolution	1.5×10^{-5} gradient
Motion control	Coaxial knob gear drive stage

Chuck to platen

Separation (quick lift)	9.375 mm (3/8″)
Separation (fine adjust)	38.1 mm (1.5″)

Manual microscope stage (linear)

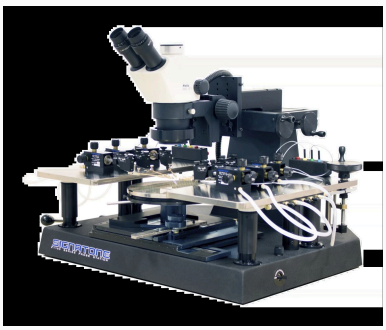
Movement range	50 × 50 mm (2″ × 2″)
Resolution	1° = 2.54 µ (0.0001″)
Scope “Z” range	25 mm – 100 mm* (dependent on microscope selection)
Motion control	Independently controlled X and Y knobs

* All data are relevant with optional configuration.

CONFIGURATIONS

Three microscope-mount options

S-1160A — 50 mm X-Y microscope mount, for high-powered optics



S-1160B — 50 mm X-Y microscope mount, for low-powered optics

S-1160S — “boom”-style microscope mount, for low-powered optics

Sample microscope selection guide

TYPE	MAGNIFICATION	DETAILS	EXAMPLE
High-powered microscope	up to 2000×	1–4 objectives · rotatable turret · 1X–2X zoom · 50 mm manual “Z” focus adjust · camera port	Motic PSM-1000
Mono-zoom video scope	100×–600×	Single objective · camera port (no eyepieces) · fiber-optic illumination · 25 mm “Z” focus adjust	Seiwa S-12Z
Stereo-zoom low-power microscope	7.5×–50×	Long working distance (113 mm) · camera port · fiber-optic or LED illumination · 50 mm “Z” focus adjust	Motic SMZ-171

Motic PSM-1000

Seiwa S-12Z

Motic SMZ-171

PROBE PLATEN

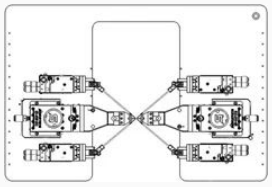
Four-post platen, up to 10 positioners

Design	Four-post support
Dimension	L = 406.5 mm × W = 610 mm × H = 12.7 mm (16″ × 24″ × 0.5″)
Chuck to platen top	Min. 14.7 mm (variable separation with fine platen adjust)
Max. no. of micro positioners	10 × DC/HP/RF (multiple probe / test configurations)
Quick platen lift control (CVL)	Continuous variable lift (0 to 9.375 mm)
Contact repeatability	< 1 µm (0.04 mils) by manual control
DC / high-power micro positioner mounting	Magnetic or vacuum
CAP946 micro positioner mounting	Magnetic or bolt-down

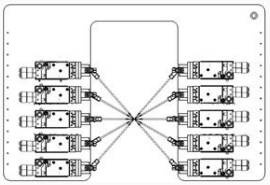
- **“Quick Lift”** with continuous variable lift (CVL) for easy probe-to-pad separation and alignment.
- **“Fine Adjust”** for probe card and variable chucks and DUT thickness setup.

Platen “Quick Lift”

Platen “Fine Adjust”



Sample: 2 RF + 4 DC probes



Sample: 10 DC probes

MICRO POSITIONERS

Choose the positioner that fits your application

- The **SP-100 series** — 100 TPI linear X-Y-Z motion with in-line micrometer knobs for high-precision probing of sub-micron features at high magnification. Great for multi-probe applications.
- The **S-926 series** — 100 TPI rectilinear X-Y-Z motion, good for probing down to 1 micron, at a very competitive price.
- The **S-725 series** — 80 TPI, economically priced, low profile, great for pad / large-contact probing.

Probe connector panels

The S-1160 series includes mounting for various probe connector panels. Probes supply one of three basic connection styles:

- Single-line wire with mini-phone tip — **DC-M160**
- Micro-coax wire with coaxial BNC — **BNC-M160**
- Triaxial wire with triax connector — **TRX-M160**

SP-100PV · S-926-PLV · S-725-PLM

DC-M160

BNC-M160

TRX-M160

DC PROBES

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	< 50 fA	< 20 fA	< 20 fA
Connectivity	BNC	Standard triax	SSMC
Connectivity type	Single coaxial	Single low-noise triaxial	Force/sense coax
Characteristic impedance	50 Ω	50 Ω	50 Ω
Residual capacitance	< 80 fF	< 80 fF	< 80 fF
Probe holder material	Brass	Brass	Brass
Probe tip material	Tungsten	Tungsten	Tungsten
Probe tip sizes	0.5 µm – 25 µm	0.5 µm – 25 µm	0.5 µm – 25 µm
Minimum pad size	25 µm × 25 µm	25 µm × 25 µm	25 µm × 25 µm

High-voltage / high-current probe selection

MODEL	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

RF PROBES

RF probe selection guide

Cable interface

	SP-40A	SP-50A	SP-67A	SP-110H	SP-145
Frequency	DC–40 GHz	DC–50 GHz	DC–67 GHz	DC–110 GHz	DC–145 GHz
Connector	2.92 mm	2.4 mm	1.85 mm	1.0 mm	0.8 mm
Tip configuration	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GSG
Pitch range	50 µ – 2540 µ	50 µ – 1250 µ	50 µ – 1250 µ	50 µ – 1250 µ	50 µ – 200 µ
Insertion loss	< 0.8 dB	< 1.0 dB	< 1.1 dB	< 1.5 dB	< 1.75 dB
Return loss	> 18 dB	> 18 dB	> 14 dB	> 15 dB	> 15 dB

Calibration substrates

GSG	SP-CS-5	SP-CS-9	SP-CS-10	SP-CS-18
Pad size	50µ–150µ sq.	100µ × 100µ	150µ × 150µ	300µ × 300µ
Pitch range	75µ – 250µ	250µ – 600µ	600µ – 1250µ	1250µ – 2540µ

GS/SG	SP-CS-8	SP-CS-14	SP-CS-11	SP-CS-17
Pad size	50µ–150µ sq.	100µ × 100µ	150µ × 150µ	300µ × 300µ
Pitch range	50µ – 200µ	200µ – 400µ	400µ – 1250µ	750µ – 2540µ

GSG > 110 GHZ	SP-CS-15
Pad size	25µ × 25µ
Pitch range	40µ – 150µ (SOLT) · 30µ – 150µ (LRM)

RF cables

	RFC-40	RFC-50	RFC-67	RFC-110
Frequency range	DC–40 GHz	DC–50 GHz	DC–67 GHz	DC–110 GHz
Length	4 ft.	4 ft.	3 ft.	*
Connectors	2.92 M – 2.92 F	2.4 M – 2.4 F	1.85 M – 1.85 F	1.0 M – 1.0 F

* Contact factory.

CHUCKS

Non-thermal chucks

Standard wafer chuck

Connectivity	Coax BNC (m)
Diameter	203 mm
Material	Nickel-plated brass (gold optional)
Chuck surface	Zone selector knob with pin-hole vacuum patterns
Vacuum hole pattern sections (dia.)	5, 22, 50, 91, 135, 168 mm
Vacuum actuation	Selector knob allows individual activation of vacuum zones
Supported DUT sizes	10, 25, 75, 100, 150, 200 mm
Surface planarity	±6.5 µ
Rigidity	<3 µ / 10 N at edge of the chuck

Wafer chuck (triaxial)

Connectivity	Triax (m)
Diameter	203 mm
Material	Gold-plated brass
Chuck surface	Independent vacuum zones with pin-hole vacuum patterns
Vacuum hole pattern sections (dia.)	0, 65, 112, 162 mm
Vacuum actuation	Multi-zone adjustable control
Supported DUT sizes	3, 75, 125, 200 mm
Surface planarity	±5 µm
Rigidity	<3 µm / 10 N near edge of the chuck

Electrical specification (coax)

Operation voltage	Designed for operation at −200 V to +200 V DC
Max voltage chuck top to GND	500 V DC
Isolation	> 150 GΩ

Electrical specification (triax, @ 10 V DC)

Force to guard	> 2 TΩ
Guard to shield	> 7 TΩ
Force to shield	> 15 TΩ

THERMAL

Signatone thermal chucks

	200 MM STANDARD HOT	200 MM HOT / TRIAX	200 MM HOT / 3 KV TRIAX
Temperature range	+25 °C to +300 °C	+25 °C to +200 °C	+25 °C to +200 °C
Connectivity	Coax (m)	Triax (m)	SHV triax (m)
Temperature control	Liquid-cooled / resistance heater · coolant: water		
Smallest temp. selection step	0.1 °C	0.1 °C	0.1 °C
Display resolution	0.01 °C	0.01 °C	0.01 °C
External touchscreen display	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 · interfaces: RS232C (GP-IB optional)		
Chuck surface plating	Nickel	Gold	Gold
Temperature sensor	RTD	RTD	RTD
Temperature uniformity	±0.5 °C at ≤200 °C · ±1 °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	< ±1 µm	< ±8 µm	< ±15 µm
Electrical isolation	150 nA	> 5 TΩ	> 5 TΩ
Heating rates	25→300 °C < 12 min	25→200 °C < 9 min	25→200 °C < 28 min
Cooling rates	300→25 °C < 9 min	200→25 °C < 8 min	200→25 °C < 8 min
Leakage @ 10 V Kelvin triax	N/A	<25 fA	<400 fA
Residual capacitance	—	<200 fF	<1 pF
Max voltage chuck top to GND	500 V	500 V	3 kV
3 safety circuits	Yes	Yes	Yes
Vacuum pattern	Rings	Pin hole	Pin hole
Vacuum zone (DUT size)	50, 100, 150, 200 mm	2, 50, 100, 150, 200 mm	2, 50, 100, 150, 200 mm

System controller — dimensions / weight / power

SYSTEM MODEL	W × D × H (MM)	WEIGHT (KG)	WEIGHT (LBS.)	POWER CONS. (VA)
S-1080	432 × 483 × 267	20.4	45	2000
TC-II	355 × 711 × 610	50.8	112	1500

ERS high-power thermal chucks (HV 200 mm)

	25 °C TO 200 °C	25 °C TO 300 °C
Connectivity	Kelvin triax (M) 3 kV, or 10 kV coaxial	
Temperature control	Cooling air / resistance heater · coolant: air (user-supplied)	
Smallest temp. selection step	0.1 °C	0.1 °C
Display resolution	0.01 °C	0.01 °C
External touchscreen (optional)	Yes	Yes
Temperature stability	±0.08 °C	±0.08 °C
Temperature accuracy	±0.1 °C	±0.1 °C
Control method	Low-noise DC / PID · interfaces: RS232C	
Chuck surface plating	Gold-plated with pinhole surface	
Temperature sensor	Pt100 1/3 DIN, 4-line wired	
Temperature uniformity	< ±0.5 °C at ≤200 °C	< ±0.5 °C at ≤300 °C
Surface flatness / parallelism	< ±10 µm	< ±10 µm
Heating / cooling rates*	25→200 °C <30 min · 200→25 °C <30 min	25→300 °C <35 min · 300→25 °C <35 min
Leakage @ 3000 V Kelvin triax	5 pA (25 °C) · 10 pA (200 °C)	5 pA (25 °C) · 10 pA (200 °C) · 15 pA (300 °C)
Leakage @ 10 kV coax UHV/SHV	6 nA (25–200 °C)	6 nA (25–300 °C)
Max voltage chuck top to GND	10 kV DC	10 kV DC

* All data are relevant for chucks in ECO mode.

Controller / chiller dimensions and power / air consumption

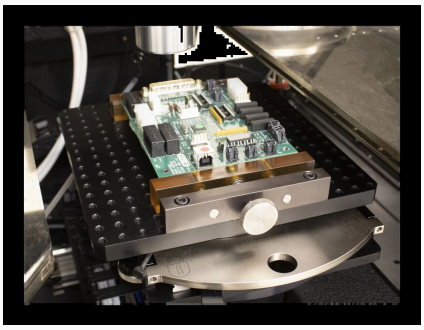
SYSTEM TYPE	W × D × H (MM)	WEIGHT (KG)	POWER CONS. (VA)	MAX. AIR FLOW (L/MIN)
25 to 200 °C	300 × 360 × 135	12	1300	220
25 to 300 °C	300 × 360 × 135	12	1300	220

SYSTEM OPTIONS

Accessories

- **PSDB-1160 — probe station dark box.** Light-tight, electrically shielded enclosure. Excellent for low-leakage, high-power, thermal, and light-sensitive measurements. Door and panel interlock options are typically used for high-voltage and high-temperature safety.
- **S-4710 — probe card adapter.** For use with 4.5″-wide probe cards.
- **CM-BMVC — board-mount vice chuck.** 200 mm × 200 mm adjustable vice chuck for clamping various sizes and shapes of devices — packaged parts, PCBs, single chips, MEMS, BioMEMS, or virtually anything you want to hold, view, and probe. Vice clamps are non-conductive (ULTEM).
- **M-VAC — AC linear-piston quiet vacuum pump.** Supports vacuum hold-down of DUT and mounting of 1–10 micro positioners (11 in. Hg @ 115 VAC / 428 mbar @ 230 VAC). Includes power cord, on/off switch, 10′ flexible vacuum tubing, 5 A fuse, vibration-dampening feet, easy-grip handle.

PSDB-1160 dark box



CM-BMVC board-mount vice chuck

System dimensions (table optional)

WL-1160 / including microscope*

Dimensions (L × D × H)	546 × 597 × 528 mm (21.5″ × 23.5″ × 20.78″)
Weight	56.7 kg (125 lbs.)

* Can vary dependent on monitor, probes, shelf, and microscope selection.

Warranty

- Standard warranty **12 months**.*
- For extended warranty and service contracts, contact Signatone Corp.

* See Signatone corporate terms and conditions of sale for further details.

Worldwide support

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