

Signatone WL-310-LE 300 mm Manual Probe System with Local Enclosure for reliable and accurate DC/CV, RF and mmW measurements

❖ FEATURES / BENEFITS

Multi – Use

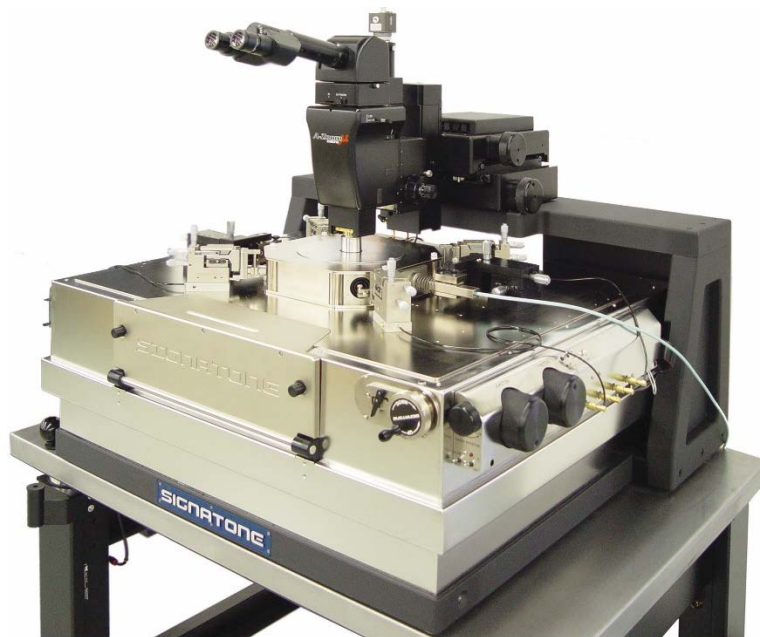
- Designed for a wide variety of applications including: Failure Analysis, RF and mmW wafer Level Reliability and Device Characterization.

Local Enclosure for Accurate Measurements

- Designed for advanced EMI / RFI / Light-Tight Shielding.
- FemtoAmp low-leakage abilities
- Accepts Temperatures: -60 °C to +300 °C

Ergonomics and Optional Configurations

- Easy use of X-Y Stage knobs located in the front –right side of the prober. (away from thermal chuck)
- Available in multiple configurations including a variety of chuck options, DC/RF/mmW Micro positioners, microscopes, camera’s, lasers for various applications
- Local enclosure included in system configuration



❖ SPECIFICATIONS

Chuck XY Stage (Standard)

Travel range	305 X 305 mm (12 x 12 in)
Fine-travel range	0.1 μm (3.94 x 10 ⁻⁷ mils) @ 204.8μm/rev
Fine-travel resolution	1μm (4 X 10 ⁻⁵ mils) @ 2048μm/rev
Planarity	< 10 μm
Theta travel (course speed)	± 6° 1.5 x 10 ⁻⁴ gradient
Theta travel (fine Speed)	± 6° 1.5 x 10 ⁻⁵ gradient
Theta resolution	1.5 x 10 ⁻⁵ gradient
Movement	Lead Screw

Chuck Z Stage

Travel range	254μm (.01 mils)
Fine-travel resolution	Pneumatic
Chuck to Platen Separation (Quick Lift)	3.175mm (1/8")
Chuck to Platen Separation (Fine Adjust)	38.1mm (1.5")

Manual Microscope Stage (Linear)

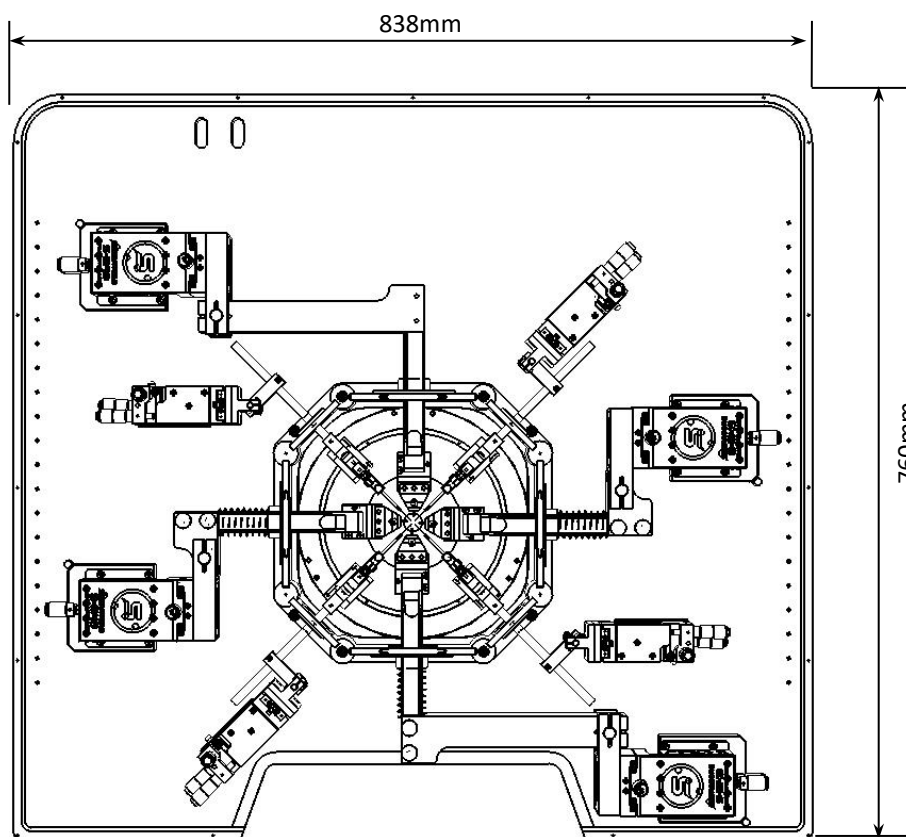
Movement range	50 X 50 mm (2 x 2 in)
Resolution	< 2µm (2 X 10 ⁻⁴ mils)
Scope lift	101 mm (4 in) vertical Pneumatic (Manual-optional)

❖ PROBE PLATEN

Specifications

Material	Nickel Plated Steel (Al optional)
Dimension	L = 580mm x W = 637mm x H = 12.7mm (See drawing)
Chuck to Thermal Shield Separation	Min. 2 mm (Variable Separation with Fine Platen Adjust)
Max. No of Micro Positioners	8x DC or 4x DC + 2x RF or 2x DC + 4x RF or 4x DC + 4x RF
Quick Platen Lift Control (CVL)	Continuous Variable Lift (0 to 3.175 mm)
Contact Repeatability	< 1 µm (0.04 mils) by Manual Control
RF MicroPositioner mounting	Magnetic or Bolt Down
DC MicroPositioner mounting	Magnetic or Vacuum
Thermal Isolation (Optional)	Platen Temp = +15 °C to +40°C /chuck @ -60 °C to +300°C

Universal Platen Designed for Multiple Probe Configurations



Sample Probe Configured with 4 RF + 4 DC Probes in Local Enclosure

❖ **ONE PLATEN x 4 BENEFITS**

Signatone Multi Benefit Ergonomically Correct Platen Adjust and 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
- “Thermal Isolation” maintains a safe temperature of probes and platen surface while chuck is at extreme temperatures (optional)



Platen “Quick Lift”



Platen “Fine Adjust” and
“Position Lock”

❖ **Local Enclosure**

Signatone’s Local Enclosure is a high performance environmental chamber that provides an excellent EMI shielded and light-tight environment for low noise and low capacitance measurements. Local Enclosure accommodates 4-port RF or 8-ports DC/Kelvin and connector panel or a combination of RF/DC. The Signatone “Top Hat” provides for easy reconfiguration of Micro positioners, cables, connectors and additional customer defined fixtures allowing multiple setups while maintaining ease of use

Local Enclosure Electrical Specifications

EMI shielding	> 30 dB (typical) @ 1 kHz to 1 MHz
Light attenuation	≥ 130 dB
Spectral noise floor	≤ -180 dBVrms/rtHz (≤ 1 MHz)
System AC noise	≤ 5 mVp-p (≤ 1 GHz)

❖ 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

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



Coax Probe



Triax Probe



Coax Kelvin Probe

❖ 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



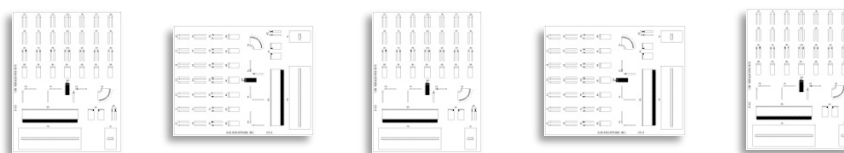
HCP-100

❖ RF PROBE –SELECTION GUIDE



Cable Interface

	SP-40A	SP-50A	SP-67A	SP-110H	SP-145
Frequency	DC-40GHz	DC-50GHz	DC-67GHz	DC-110GHz	DC-145GHz
Connector	2.92mm	2.4mm	1.85mm	1.0mm	0.8mm
Tip Configuration	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GSG
Pitch Range	50μ - 2540μ	50μ - 1250μ	50μ - 1250μ	50μ - 1250μ	50μ - 200μ
Insertion Loss	<.8db	<1.0db	<1.1db	<1.5db	<1.75db
Return Loss	> 18db	>18db	>14db	>15db	>15db



Calibration Substrates

GSG	SP-CS-5	SP-CS-9	SP-CS-10	SP-CS-18
Pad Size	50μ X 50μ 100μ X 100μ 150μ X 150μ	100μ X 100μ	150μ X 150μ	300μ X 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 X 50μ 100μ X 100μ 150μ X 150μ	100μ X 100μ	150μ X 150μ	300μ X 300μ
Pitch Range	50μ - 200μ	200μ - 400μ	400μ - 1250μ	750μ - 2540μ

GSG > 110GHz	SP-CS-15
Pad Size	25μ X 25μ
Pitch Range	40μ - 150μ (SOLT) 30μ - 150μ (LRM)



RF Cables

	RFC-40	RFC-50	RFC-67	RFC-110
Frequency Range	DC - 40GHz	DC - 50GHz	DC - 67GHz	DC - 110GHz
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

❖ NON-THERMAL CHUCKS

Standard Wafer Chuck

Connectivity	Coax BNC (m)
Diameter	308 mm
Material	Nickel Plated Brass
Chuck surface	Zone selector knob with Peppered vacuum patterns
Vacuum hole pattern sections(diameter)	12mm, 68mm, 138mm, 187mm, 288mm
Vacuum actuation	Selector Knob allows individual activation of vacuum zones
Supported DUT sizes	15mm, 75mm, 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 (f)
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

Auxiliary Chuck

Quantity	1-2 AUX chucks (one standard second optional)
Position	Independently isolated (located on back left and right)
Substrate Size (L x W)	Max 25mm x 25mm (1"x 1")
Material	Ceramic, Ultem, NI plated brass (standard)
Surface Planarity	≤± 5 μm
Vacuum Control	Controlled independently, separate from wafer chucks

Typical Specifications of *Signatone* Thermal Technology

Nominal Description	300mm Standard Hot	300mm Hot/Cold Triax	300mm Hot/Cold 3kV Triax
Temperature Range	+25 °C to +300 °C	-55 °C to +200 °C	-55 °C to +200 °C
Connectivity	Coax (m)	Triax (m)	SHV Triax (m)
Temperature control method	Liquid Cooled / Resistance heater	Liquid Cooled / Resistance heater	Liquid Cooled / Resistance heater
Coolant	Water	HFE	HFE
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	RS232C	RS232C
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	< ±12 μm	< ±12 μm	< ±15μm
Electrical isolation - Coax BNC (m)	150nA	> 5TΩ	> 5TΩ
Heating Rates	25°C to 300°C < 20 min	25°C to 200°C < 22 min	25°C to 200°C < 28 min
Cooling Rates	300°C to 25°C < 16min	25 to -50°C < 45min	25 to -50°C < 50min
Leakage @ 10 V Kelvin Triax (m)	N/A	<100fA	<400fA
Residual Capacitance		<1pF	<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, 200,300 mm	2, 50, 100, 150, 200,300 mm	2, 50, 100, 150, 200, 300mm

➤ **THERMAL SYSTEM FACILITY REQUIREMENTS**

Thermal chuck controller, electrical	S1080A	S1080C	S1080C
Voltage	208-240V A/C	208-240V A/C	208-240V A/C
Frequency	50/60Hz	50/60Hz	50/60Hz
Peak Watts	1400	1400	1400
Chiller electrical	TCII	FP89-HL 60Hz	FP89-HL 60Hz
Voltage	110-120V A/C	220-230V A/C	220-230V A/C
Frequency	60Hz	60Hz	60Hz
Peak Watts	1000	2850	2850
Chiller electrical	TCII-220	FP89-HL 50Hz	FP89-HL 50Hz
Voltage	215-240V A/C	215-240V A/C	215-240V A/C
Frequency	50Hz	50Hz	50Hz
Peak Watts	1000	3000	3000

➤ **POWER REQUIREMENTS (PROBE STATION)**

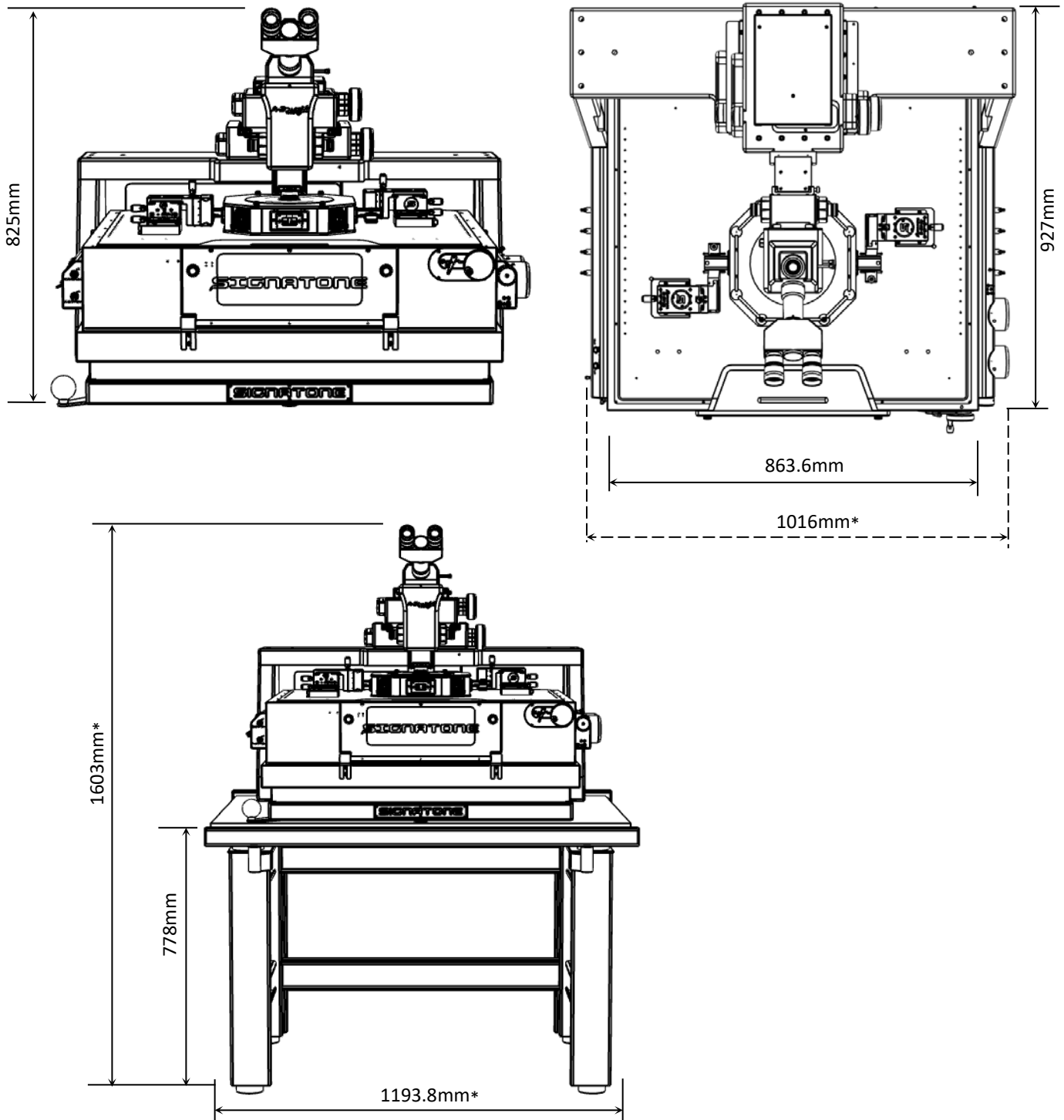
	Voltage / Watts	
	115V 60Hz	230V 50Hz
General Probe System	100W	100W
Optical Accessories	200W	200W
M-VAC (vacuum pump)	14W	15W
Camera System (with Monitor)	183W	183W

❖ **SYSTEM DIMENSIONS – TABLE OPTIONAL**

WL- 310-LE / including microscope*

Dimensions (L x D x H)	863.6 x 927 x 825mm	(40" x 36.5" x 32.5")
Weight	265.6kg	(585 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. for more information

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

- **North America:** Sales.NA@signatone.com
- **Europe:** Sales.Europe@signatone.com
- **Asia:** Sales.Asia@signatone.com

