



# HGS (INDIA) LIMITED



## SPECIFICATION SHEET – SIGMA 4+ Recording System

### *The Robust and Versatile Nodal Seismograph*

#### **SIGMA 4+ Improvements:**

- New Streamlined Case Design
- Less Weight (33% less)
- Same excellent performance as Sigma 4
- Optional Internal Co-Processing RABbit Board

#### **Hardware Features:**

- **Continuous Recording Standard:** For Monitoring and Autonomous Operation
- **Internal or External GPS:** For clock discipline and location information
- **Optional Mesh Radio Network:** A low-power network for deployment, command & control of nodes
- **Cable, Wi-Fi, or Cellular Ethernet:** Provides “in the field” data offloading while recording
- **Hot-Swap External Storage Option:** For collecting data while recording
- **Optional Internal Battery (99 watt/hour):** Provides about 48 hours of operation
- **Optional Internal Sensor (2 Hz geophones):** As per customer requirement
- **Sensor By-Pass Connector:** For calibration of ADC or internal sensors, also connection of other external sensors
- **Trigger Connector:** Trigger via hammer switch or voltage level change
- **Rugged IP67 Case:** For extended field durability



*New and improved Sigma 4+*

#### **Available Software:**

- Event Monitor (local monitoring)
- Tremor Cloud (Remote Monitoring)
- Optional Active Acquisition Package
- All necessary utilities

#### **Acquire Active Data:**

- Vibroseis w/ Force 3
- Dynamite w/ BoomBox 3
- Impulsive w/ RTM 3

#### **Acquire Passive Data:**

- Hydraulic Fracture Monitoring
- Surface Wave Acquisition
- Long-term Permanent Monitoring
- Earthquake Monitoring



Original Sigma 4



New Sigma 4+



<b>Sigma 4 Comparative Specifications</b>					
<b>Parameter</b>	<b>Gain</b>	<b>Sigma 4-3</b>	<b>Sigma 4-4</b>	<b>Sigma 4-3+</b>	<b>Sigma 4-4+</b>
<b>Electronics</b>					
Input Channels		3	4	3	4
Convertor Circuit		Sigma 3	DAQ4	Sigma 3	DAQ4
PreAmp Gains		Low x1 (0 dB) High x16 (24 dB)	Low x1 (0 dB) Mid x4 (12 dB) High x16 (24 dB)	Low x1 (0 dB) High x16 (24 dB)	Low x1 (0 dB) Mid x4 (12 dB) High x16 (24 dB)
Maximum Input	Low	5 volts P2P	7 volts P2P	5 volts P2P	7 volts P2P
	Mid	-	1.662 Volts P2P	-	1.662 Volts P2P
	High	0.313 volts P2P	0.4375 volts P2P	0.313 volts P2P	0.4375 volts P2P
Typical Dynamic Range @500sps	Low	126 dB	125 dB	126 dB	125 dB
	Mid	-	124 dB	-	124 dB
	High	122 dB	120 dB	122 dB	120 dB
Typical Harmonic Distortion @500sps	Low	0.0001%	0.0001%	0.0001%	0.0001%
	Mid	0.0001%	-	0.0001%	-
	High	0.0001%	0.0001%	0.0001%	0.0001%
Typical Noise Floor @500sps	Low	0.8 uVolts RMS	1.2 uVolts RMS	0.8 uVolts RMS	1.2 uVolts RMS
	Mid	-	-	-	-
	High	0.8 uVolts RMS	0.15 uVolts RMS	0.8 uVolts RMS	0.15 uVolts RMS
Sample Rates		125, 250, 500, 1000, 2000 & 4000 sps	125, 250, 500, 1000, 2000, 4000, 8000, 16000, 32,000 & 64,000 sps	125, 250, 500, 1000, 2000 & 4000 sps	125, 250, 500, 1000, 2000, 4000, 8000, 16000, 32,000 & 64,000 sps
Sample Intervals		8000, 4000, 2000, 1000, 500 & 250 µSecs	8000, 4000, 2000, 1000, 500, 250, 125, 62.5, 31.25, 15.625 µSecs	8000, 4000, 2000, 1000, 500 & 250 µSecs	8000, 4000, 2000, 1000, 500, 250, 125, 62.5, 31.25, 15.625 µSecs
Low Cut Filters		Digital	Digital	Digital	Digital
High Cut Filters		85% Nyquist	85% Nyquist	85% Nyquist	85% Nyquist
Bandwidth		DC to 85% Nyquist	DC to 85% Nyquist	DC to 85% Nyquist	DC to 85% Nyquist
Maximum Trace Length		Continuous Recording	Continuous Recording	Continuous Recording	Continuous Recording
Input Impedance		20 kOhm	100 kOhm	20 kOhm	100 kOhm
<b>Features</b>					
External USB		Ruggedized 19-pin	Ruggedized 19-pin	Ruggedized 19-pin	Ruggedized 19-pin
Mesh Radio Network		Optional	Optional	Optional	Optional
100Base-Tx Ethernet		Rugged 10 pin MS style	Rugged 10 pin MS style	Rugged 10 pin MS style	Rugged 10 pin MS style
External Trigger		Yes	Yes	Yes	Yes
Internal Memory		8 Gbytes	8 Gbytes	8 Gbytes	8 Gbytes
Internal Battery		Optional	Optional	Optional	Optional
Internal Coprocessor		No	Optional	No	Optional
Internal Sensor		Optional	Optional	Optional	Optional
<b>Physical</b>					
Power Requirement		0.4 watts/channel	0.4 watts/channel	0.4 watts/channel	0.4 watts/channel
Voltage Requirement		9-28 volts	9-28 volts	9-28 volts	9-28 volts
Case Type		Aluminium	ABS	Aluminium	ABS
Size		393x140x57 mm 15.5x5.5x2.25 in	353x140x66 mm 13.9x5.5x2.6 in	393x140x57 mm 15.5x5.5x2.25 in	353x140x66 mm 13.9x5.5x2.6 in
Weight (with options)		7.1 lbs (3.7 kg)	5.8 lbs (2.5 kg)	7.1 lbs (3.7 kg)	5.8 lbs (2.5 kg)
Temperature Range		-40 C to +80 °C	-40 C to +80 °C	-40 C to +80 °C	-40 C to +80 °C



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<b>Ordering Information</b>	
<b>Item Discription</b>	<b>Part No.</b>
Sigma 4 - 3 Channel	MK000284
Sigma 4 – 3+ Channel	MK001250
Sigma 4 - 4+ Channel	MK001165



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