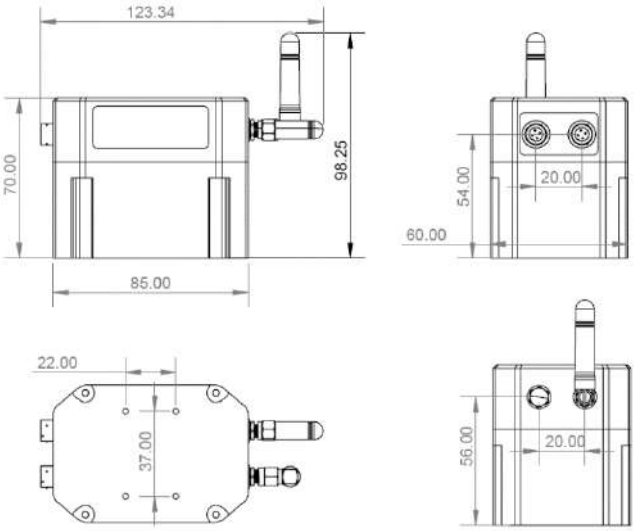
GSS Razor (Vibration & Tilt)

Data you want, when you want it…

A high precision wireless vibration and tilt sensor with built-in temperature compensation and multiple communication module options to suit your installation requirements. Configurable as a triaxial vibration monitor or biaxial tilt sensor. Schedule regular readings and set thresholds to receive alerts in seconds. Data is uploaded directly from the Razor to your preferred platform – no backend processing or APIs required.

Features

- Easy Installation and Removal – No technician required
- Modular Communications Module Options
  - Wi-Fi: Wi-Fi router required
  - Mesh: (Requires GSS gateway)
- Remotely Manageable and Configurable
- Bluetooth Communications with a Mobile App for onsite configuration and management
- Fully Sealed case with magnet-activated power switch
- Alert Management Functionality
- Low Power Battery Operation
- Powered by a single D Cell Lithium Primary Battery
- External Power Options (i.e. USB, Solar)
- 512MB Internal Storage (Industrial MicroSD)
- Built-in Temperature Compensation
- Auxiliary Expansion Port



Applications

- Structural Health Monitoring (Buildings, Bridges, Tunnels)
- Large Area and Long Distance Monitoring (Construction Sites, Railways, Pipelines)
- Natural Slopes / Cut Slope Monitoring
- Barrier Impact Detection
- Foundation Monitoring

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General Specifications	
Part Numbers	RZR-X01-W: Vibration & Tilt Monitor - Wi-Fi communication module RZR-X01-M: Vibration & Tilt Monitor - Wireless Mesh communication module
File Outputs	CSV, JSON, Binary (Decompression Tool Available)
Firmware Updates	Remote Over-the-Air-Programming (OTAP)
Management Access Port	USB serial interface
PC Software	GSS Console to view Vibration Peaks, Alerts and Waveforms in USBM format
Bluetooth Software	Bluetooth (BLE) using GSSLink available on Google Play
Storage	Industrial MicroSD Card - 512MB standard or 2GB (optional upgrade)
Time Keeping	Real Time Clock, Synched to NTP / Cell Tower
Vibration Specifications	
Vibration Limit (X, Y, Z)	±8G
Conformance	DIN45669-1
Maximum Response	1Hz to 1KHz
Accuracy	±2%
Sample Rate (Hz)	1000, 2000, 4000 samples/second
Peak Particle Velocity (by design)	0.003 mm/sec to 620 mm/sec
Peak Particle Velocity (validated)	Up to 620 mm/sec
Peak Ground Acceleration (by design)	0.003 g
Heartbeat Interval	30 sec to 12 hours
Time Stamping	Down to 1 millisecond
Buffer Size	8MB
Alert Thresholds	1 to 150 mm/sec (@ 2G Range)
Alert SMS Numbers	Can notify up to 5 mobile phones
Data Outputs	Zero Crossing. Peak amplitude/frequency values (1Hz to 1KHz), Peak Particle Velocity (mm/s), Peak Vector Sum (mm/s), and Threshold Alerts.

Filtering Standards / Frequency Range			
ISEE_SEISMOGRAPH	2 – 250 Hz	NS_8176_COMFORT	1 – 80 Hz
DIN_4150_3	1 – 315 Hz	NS_8141_CONSTRUCTION	5 – 300 Hz
DIN_4150_2_KB	1 – 80 Hz	NS_8141_1	3 – 400 Hz
BS_7385	1 – 300 Hz	SS_4604866_BLAST	5 – 300 Hz
AS_2187_2_2006	2 – 250 Hz	SS_025211_SHAFT	2 – 150 Hz
ONORM_S_9012	1 – 80 Hz	SS_4604861_COMFORT	1 – 80 Hz
ISO_8569_ACC	5 – 300 Hz	GEOPHONE	5 – 500 Hz
IN1226	1 – 150 Hz	ICPE_CIRCULAR_86	1 – 150 Hz

Tilt Specifications	
Tilt Readings	Pitch ±90°, Roll ±90°
Resolution	0.0035°
Accuracy	±0.005°
Alert Thresholds	0.05° to 70.0°
Temperature Stability	+/- 0.005° (-45° to 85°C)
Stabilisation Time	10 secs
Reading Interval	10 sec to 12 hours
Data Outputs	Exponential Moving Average Filter (EMA). Attitude estimates in Euler angles (Pitch, Roll). Euler threshold alerts and historical trend.

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Communication Specifications	
Wi-Fi Communication Module	
Wi-Fi Modem	GSS Wi-Fi Communication Module
Frequency	2,402 to 2,480 MHz
Modulation	802.11b/g
Transmission Rate	1 – 11 Mbps for 802.11b; 6-54 Mbps for 802.11g
Antenna	2.4GHz Right Angle Antenna
Mesh Communication Module	
Mesh Modem	GSS Mesh Communication Module
Standards	2.4 GHz 6LoWPAN and 802.15.4e standards
Range	Up to 300m line of sight (3dB antenna)
Upload Rate	~3.2Kb/s
Antenna	2.4GHz Whip Antenna
Bluetooth Communication Module (Standard)	
Bluetooth Modem	GSS Bluetooth Communication Module
Standards	2.4 GHz
Range	Up to 10m line of sight
Antenna	2.4GHz Straight Stub Antenna
Auxiliary Expansion Port	
Optional External Sensors	GSS are designing devices that connect into the auxiliary expansion port including microphones and external sensors. Ask GSS for details.
Operating Specifications	
Power & Environmental	
Est Battery Life (19Ah D Cell Lithium)	Up to 6 months in Vibration mode (Dependent on communication module and upload schedule). Extend battery life with external power (USB, solar, external batteries)
Operating Temperature	-40 °C TO +85 °C (Dependency on operating temperature of the battery brand selected)
Mechanical Shock Limit	500 G (Calibration Unaffected) 1000 G (Bias Affected) 5000 G (Survivability)
MTBF	1.1 Million Hours (Telcordia Method I, GF/30C) 0.4 Million Hours (Telcordia Method I, GM/35C)
Dimensions of Base Unit	L:85mm x W:60mm x H:42.6mm
Weight (grams)	400g
Connectors	
Antennas	2 x SMA RP Male Antenna Connectors
USB/External Power	1 x 6-pin LEMO keyed connector with metal cap (IP67) and chain
Auxiliary	1 x 4-pin LEMO keyed connector with metal cap (IP67) and chain
Calibration	
Calibration Certification	Provided with device. Recalibration must be performed by GSS or a GSS certified laboratory
Options	
Sound Microphone	GSS MIC-S01 Microphone can be connected using the Auxiliary Port. Please refer to MIC-S01 technical specification for more details.

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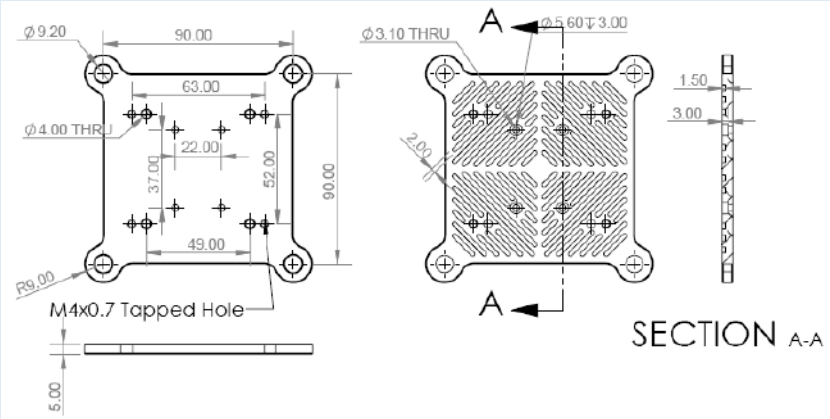
Mounting Brackets	Custom Mounting Brackets are available. Please enquire for more details. 
Accessories	
USB Cable	1 meter cable with USB connector to 6-pin LEMO connector
Solar Power Cable	1 meter cable with barrel jack connector to 6-pin LEMO connector
External Battery Cables	1 meter cable with terminal connector to 6-pin LEMO connector
Microphone Cable	1.5 meter cable with 4-pin LEMO connector to 4-pin LEMO connector

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