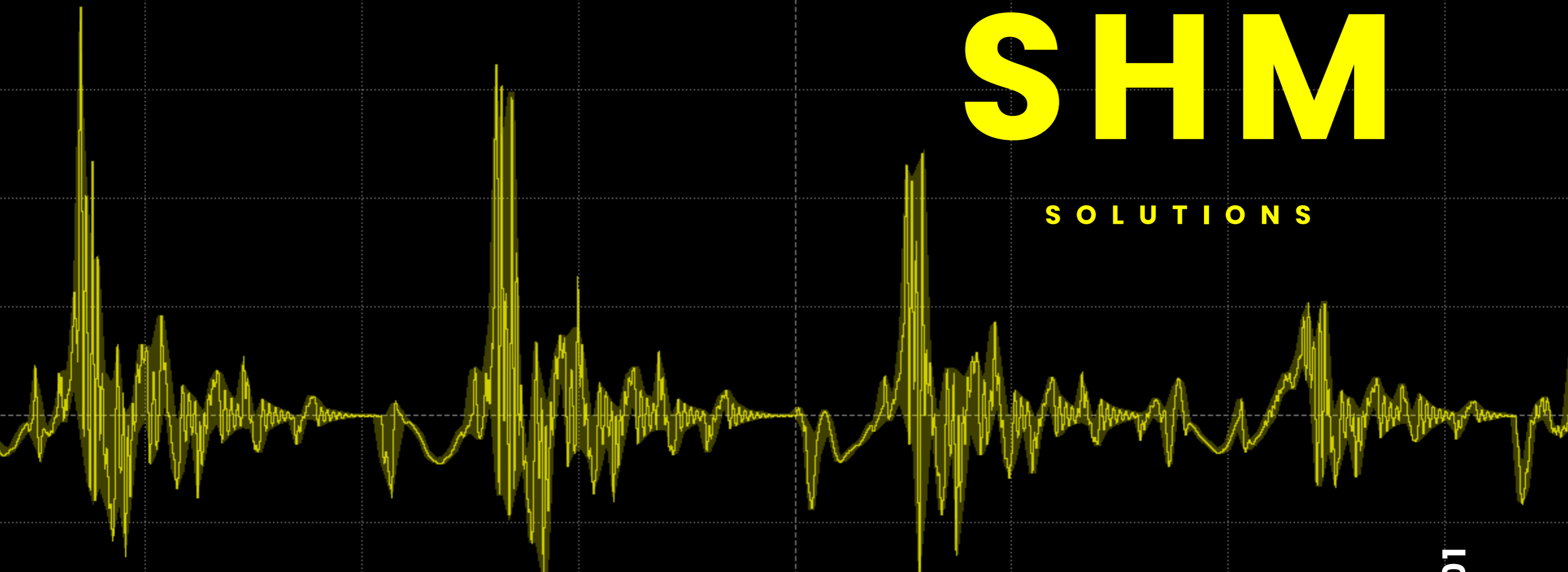


PRODUCTS CATALOG

SHM

SOLUTIONS



One Stop Solution
For Vibration Analysis

VOL. 01

SENPRONICS

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RTAP-335®

REAL-TIME ACCELERATION PLOTTER

FEATURES

- ⇒ 2-Axis sensing and plotting.
- ⇒ Easy mountable compact plastic package of 24 x 24 x 14 mm [Nodes].
- ⇒ Inbuilt Signal conditioning
- ⇒ Shock survival and temperature stability.
- ⇒ Low power consumption.

The RTAP-335® is a compact, rigid, low power, complete dual axis accelerometer signal data plotter. The product measures acceleration with a full-scale range of up to ±16g. It can measure the static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration resulting from motion, shock, or vibration.

The RTAP-335® is cable-free and compact real-time vibration data acquisition model that can scale to four units. As RTAP-335® connects to its dedicated gateway network it increases the reliability of data acquisition and security.

RTAP-335® can be powered through the USB-C port. The led's on the gateway indicates the number of devices conned to it at

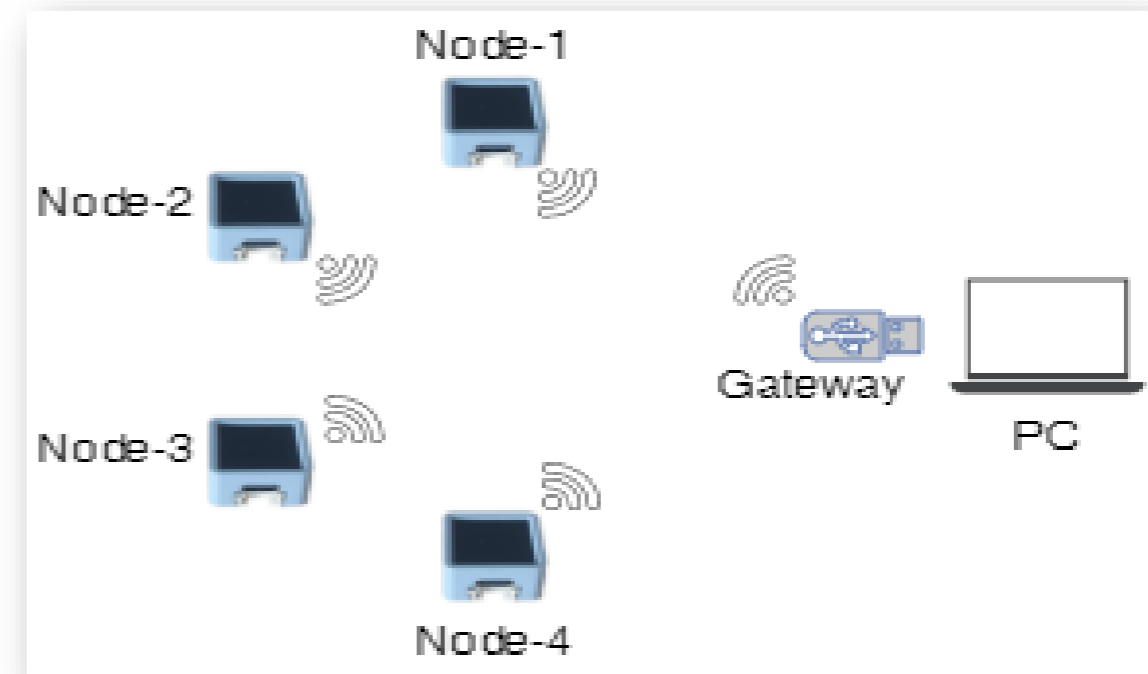
APPLICATIONS

- ⇒ Continuous structure monitoring.
- ⇒ Remote structure vibration monitoring.
- ⇒ Sensitive low power data sensing applications.
- ⇒ Multiple point simultaneous monitoring.
- ⇒ Real time data visualisation.

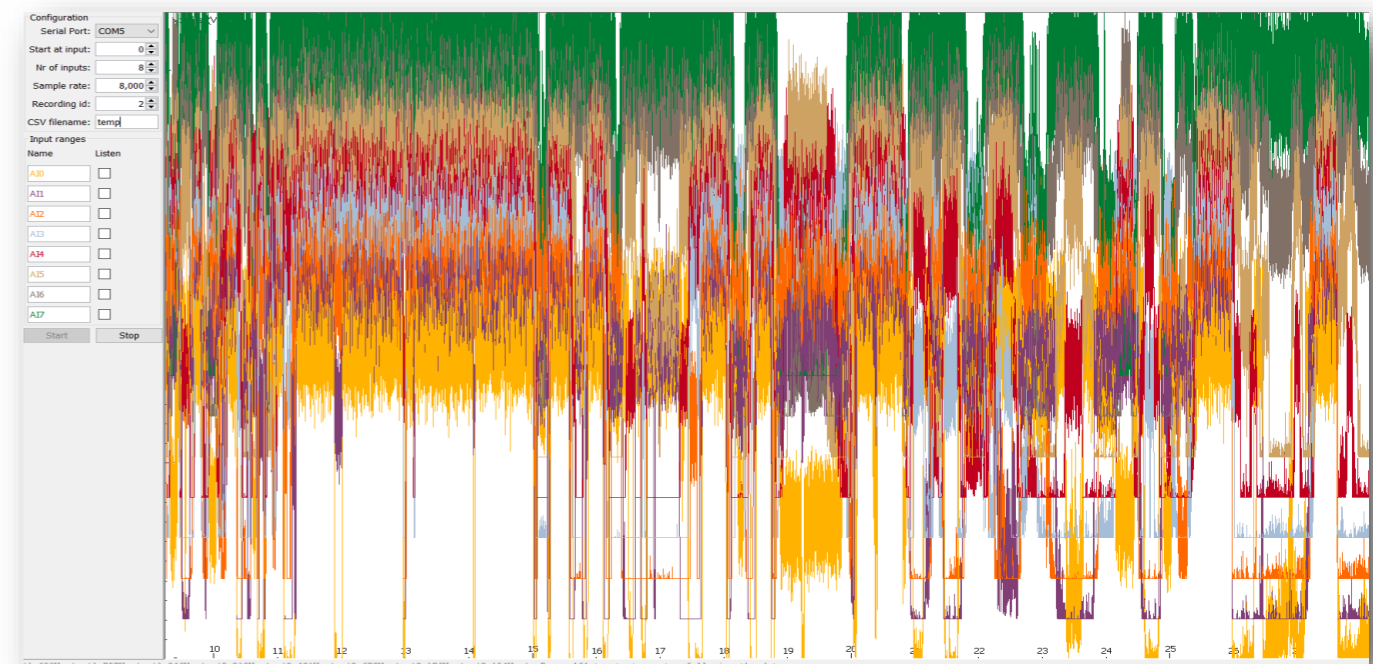
SPECIFICATION

PARAMETER	DETAILS
Sensor	Tri-Axial MEMS based
Channels	X and Y
Connector	USB-C Type [Power]
Button	1-Reset
FSR [TBD]	±2g, ±4g, ±8g,, ±16g
ADC Resolution	16 Bits
Operating Temperature	-40°C to +85°C
Cross-Axis Sensitivity	±4.5 %
ODR	2000 Hz
Operating Voltage	5 VDC
Supply Current	350 µA

NODE CONNECTION



SOFTWARE



RLVDT-335®

REAL-TIME LVDT TRANSMITTER

Applications

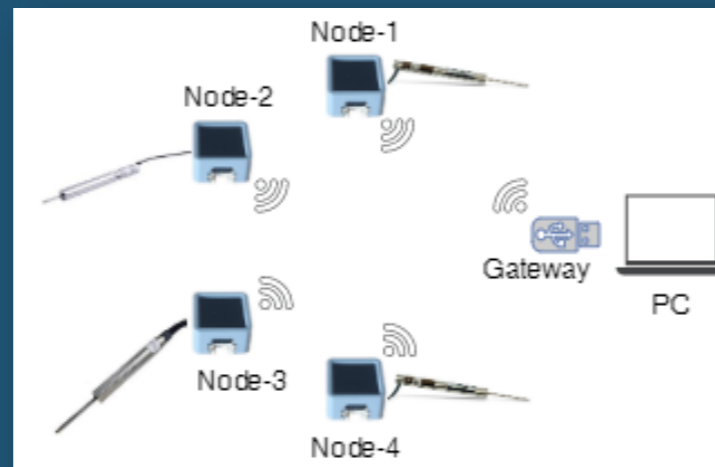
- ◇ Machine Tools
- ◇ On-board weighing
- ◇ Platform weighing
- ◇ Belt scales
- ◇ Overhead track scales
- ◇ Hopper scales
- ◇ Weighing agricultural produce
- ◇ Medical equipment



Overview of System

Linear variable displacement transducers provide a method of measuring displacements with very high accuracy and infinite resolution. These type of transducers utilize a precision linear variable differential transformer as a measuring source together with hybrid ICs which include an oscillator, demodulator and filter. This combination provides a self-contained unit that accepts a dc voltage input and provides a dc voltage output relative to armature position. This voltage is fed to ADC present inside the microcontroller which provides the displacement data after performing internal calculations. The calculated data is shown on the software through gateway.

Arrangement



Internal Process

Dual core Microcontroller is used for simultaneous sampling and transferring of data, thus the sampling rate remains the same for effective analysis of data.

Technical Specifications

Parameters	Details	Description
LVDT Type	DC	3.3—5 VDC
Connectors	2	charging , LVDT
Switch	2	ON/OFF , Reset
Resolution	12 Bits	SAR ADC
Sampling Mode	Synchronized	Low Duty Cycle
Sampling Rate	1 Sample / Hr — 1000 Hz	
Network Capacity	50 Nodes	Based on Individual Data Rate
Wireless Communication Range	Outdoor/line-of-sight: 0.5 km (ideal)* 200 m (typical)** Indoor/obstructions: 20 m (typical)**	
Radio Frequency Transceiver Carrier	802.11 b/g/n	Wi-Fi
Power Source	3.7 VDC / 2000mAh Internal Lithium Polymer [Rechargeable] 3.2 VDC to 9 VDC External Supply	
Power Consumption	Based on Transmission Speed and Sampling	
Operating Temperature Range	-20 °C to +60 °C	Higher Range is optional
Enclosure material	ABS Plastic	

REAL STRAIN®

REAL-TIME LOAD/STRAIN TRANSMITTER

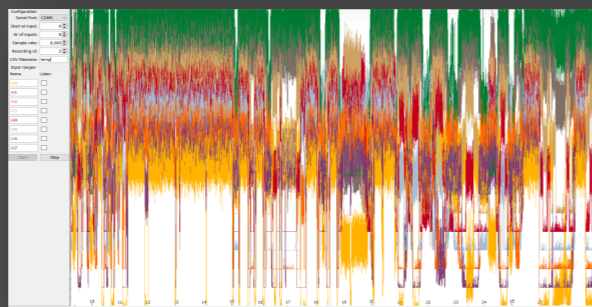
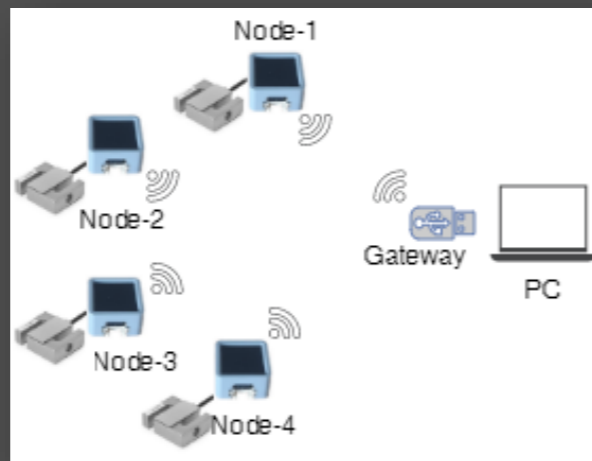
Applications

- ◇ Machine Tools
- ◇ Tensile test stands
- ◇ Aerospace test - landing gear, actuators, control surface positioning, hydraulics
- ◇ Automotive and Train tests - movements of suspension systems
- ◇ Power generation - turbine testing
- ◇ Robotics - position feedback
- ◇ Manufacturing - Automation, process controls
- ◇ Pulp & Paper - tensioning arms positioning

Overview of System

A load cell is a *force* transducer. It converts a force such as tension, compression, pressure, or torque into an electrical signal that can be measured and standardized. As the force applied to the load cell increases, the electrical signal changes proportionally. This signal is fed to high precision ADC. The microcontroller reads the data and derives weight data after performing internal calculations. Similar set up will be for strain gauge. The calculated data is shown on the software through a gateway.

Arrangement & Software



Internal Process

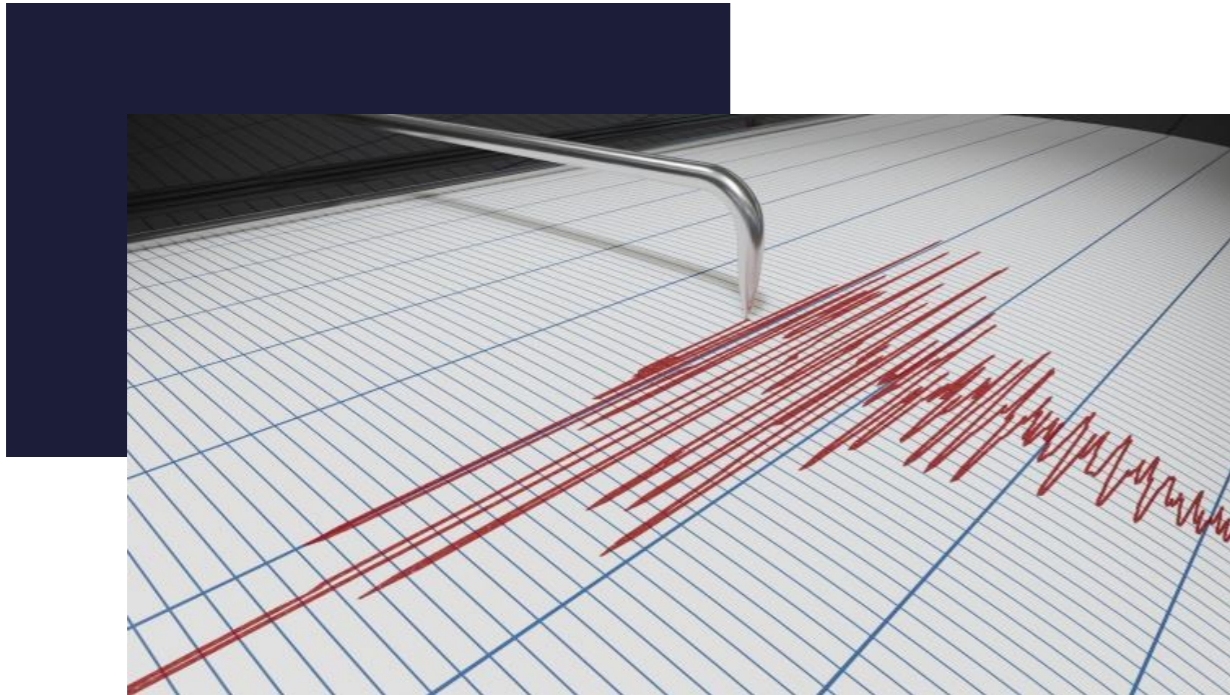
Dual core Microcontroller is used for simultaneous sampling and transferring of data, thus the sampling rate remains the same for effective analysis of data.

Technical Specifications

Parameters	Details	Description
Sensor Type	Strain gauge /Load cell	2.6—5.5 VDC
Connectors	2	charging , sensor
Switch	2	ON/OFF , Reset
Resolution	24 Bits	ADC
Sampling Mode	Continuous	Low Duty Cycle
Sampling Rate	10/80 Sample	
Averaging	Internal 1/2/4/8	Based on Application
Wireless Communication Range	Outdoor/line-of-sight: 0.5 km (ideal)* 200 m (typical)** Indoor/obstructions: 20 m (typical)**	
Radio Frequency Transceiver Carrier	802.11 b/g/n	Wi-Fi
Power Source	3.7 VDC / 2000mAh Internal Lithium Polymer [Rechargeable] 3.2 VDC to 9 VDC External Supply	
Power Consumption	Based on Transmission Speed and Sampling	
Operating Temperature Range	-30 °C to +80 °C	Higher Range is optional
Enclosure material	ABS Plastic	

EMD-1202®

EARTHQUAKE MOTION DETECTOR



APPLICATIONS

- ◇ Structural health monitoring
- ◇ Critical infrastructure monitoring
- ◇ Skyscrapers Monitoring
- ◇ Bridges & Dams Health Monitoring
- ◇ Ancient Building health monitoring and analysing

FEATURES

- ◇ Single Axis sensing and velocity detection.
- ◇ Inbuilt Filtering and FFT Processing
- ◇ Peak Frequency and Velocity detection
- ◇ Low-power consumption of 150mA [Typ] .
- ◇ Rechargeable power-supply of 4.2 V Li-ION batteries.
- ◇ Excellent shock survival and temperature stability
- ◇ IP65 compliant enclosure

GENERAL DESCRIPTION

The EMD-1202® is a compact, rigid, low power, uni-axial motion detector.

The EMD-1202® is cable-free and compact real-time vibration detector unit that can scale to tens of units. As EMD-1202® connects to your local Wi-Fi network it increases the flexibility of installing the device within that specific network range.

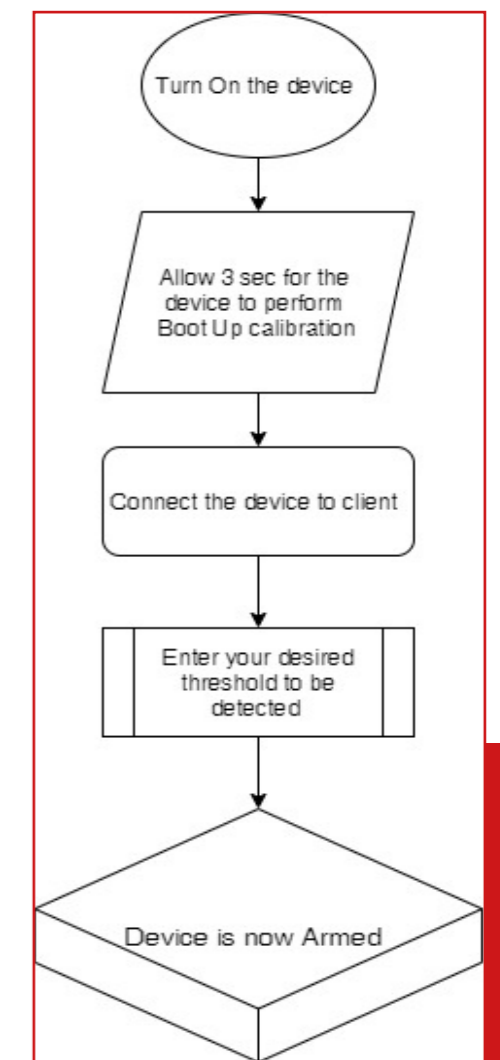
OPERATION

EMD-1202® contains a complete tri-axial acceleration measurement system and radio relay system inside the waterproof plastic case. To turn it on/off, just press the power button. The advantage of this system is that the least-skilled personnel can deploy the units without using complex keyboard/display devices.

The wireless unit will run from a rechargeable lithium-polymer battery. Depleted batteries can be replaced in the field. The status of the batteries is monitored continuously from the Central recording system, If radio connectivity is lost, the RF transmission circuitry allows automatic connection when network is available again. Additional options for data storage is available on request. When radio connectivity is restored, buffered data are wirelessly transmitted to the central recorder.

BOOT-UP PROCEDURE

EMD-1202® is designed for effortless configuration, Once the unit is setup during installation, the system runs autonomously. The flow chart to the right shows a detailed and clear description of how to set up the device initially.



NETWORK ARRANGEMENT

As most of the devices in today's world is equipped with 2.4GHz Wi-Fi feature, we have used the same communication protocol to connect EMD-1202® to desired device.

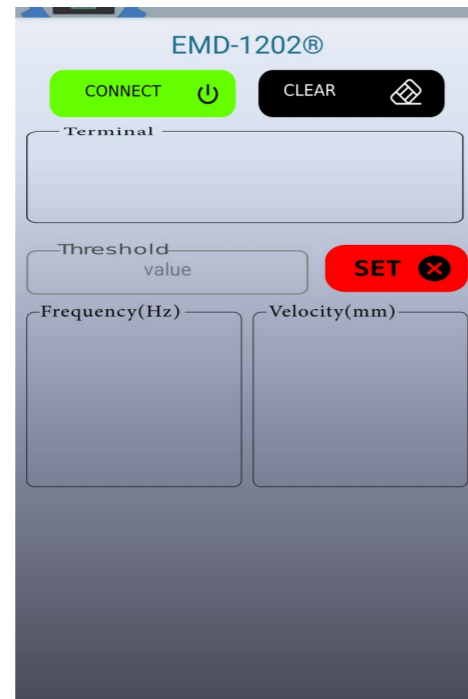
One has to turn the EMD-1202® ON and it automatically connects to your local network, the android application developed by us will be used to set the trigger point and ARM the device. If any vibration exceeded the threshold value set by the app will trigger an alarm and will also send the Velocity, Peak Acceleration along with the acceleration point at which the threshold was crossed to the same android device.

Once this data is sent out, EMD-1202® will automatically re-start its operation and does the same process in a loop.



SHM SOLUTIONS

MOBILE SOFTWARE [APK]



Android application developed specifically for easy visualization is a handy tool to configure EMD-1202® and get it into action within a matter of minutes. **CONNECT** button will connect that android device to EMD-1202®. As soon as the connection is established, EMD-1202® will ask for the user to set desired threshold limit, this can be seen in the **TERMINAL** window. **Drop down box** is used to set the desired Threshold value more conveniently, **SET** button is used to set the selected threshold value in EMD-1202®. Once these procedures are done you will get to see ARMED symbol on the same terminal window above SET button. In the event of any vibration crossing the acceleration to go above the given threshold value will trigger the alarm and the respective **FREQUENCY** and **VELOCITY** data will be displayed in the respective columns along with the time data.

SPECIFICATIONS

Parameters	Details	Description
General Details		
Sensor Type	MEMS	
Channels	1	x/y/z – Axis
Connectors	2	For Charging and Debugging [Factory Use]
Switch	1	Power On/Off
Mounting	Screw Mount	3mm Diameter
Accelerometer Details		
Measurement Range	±2g/4g	±2g [Typical]
Cross-Axis Sensitivity	±1.5	%
Resolution	24 Bits	Delta-sigma ($\Delta\Sigma$)
Sampling		
Sampling Rate	1160 SPS	
Sampling Rate Stability	±5 ppm	
Operating Parameters		
Wireless Communication Range	Outdoor/line-of-sight: 10m (ideal)* 20 m (typical)**	Outdoor/line-of-sight: 0.5 km (ideal)* 20 m (typical)**
Radio Frequency Transceiver Carrier	802.11 b/g/n	Wi-Fi
Power Source	5 VDC / 2000mAh Internal Lithium Polymer [Rechargeable]	5 VDC / 2000mAh Internal Lithium Polymer [Rechargeable]
Operating Temperature Range	3.2 VDC to 9 VDC External Supply -20 °C to +60 °C	3.2 VDC to 9 VDC External Supply Higher Range is optional
Physical Specifications		
Dimensions	120 mm × 65 mm × 40 mm	Length x Breadth x Height
Environmental Rating	IP65/ IP66 Enclosures	Indoor Use
Enclosure material	ABS Plastic	
Mounting	3mm Holes	Horizontal