CLAIMS

What is claimed is:

1. A device comprising:

an enclosure assembly comprising:

a cap;

a base mechanically coupled with the cap; and

a support bracket mechanically coupled with the base;

and

a printed circuit board (PCB) assembly comprising:

a processor;

a memory electrically coupled with the processor

a first sensor electrically coupled with the processor;

a second sensor electrically coupled with the processor;

a third sensor electrically coupled with the processor; and

a communication interface electrically coupled with the processor,

wherein:

the first sensor is a low-sensitivity vibration sensor configured to operate in a sleep state of the device and further configured to trigger the device into an active state;

the second sensor is a temperature sensor; and

the third sensor is a high-sensitivity vibration sensor configured to operate in the active state of the device.

2. The device of claim 1, wherein the communication interface is a wireless communication interface and at least a portion of the cap is substantially radio frequency (RF) transparent.

3. The device of claim 2, wherein the device when installed generally forms a shape of a tapered cylinder having a maximum height of 2.1 inches and a maximum diameter of 1.2 inches.

4. The device of claim 3, wherein the wireless communication interface is a Bluetooth® Low Energy (BLE) interface.

~~5. The device of claim 1, wherein the first sensor is a vibration sensor.~~

~~6~~5. The device of claim ~~5~~1, wherein the vibration sensor is an accelerometer sensor.

~~7. The device of claim 1, wherein the second sensor is a temperature sensor.~~

~~8~~6. The device of claim ~~7~~1, wherein the temperature sensor comprises at least one of a thermocouple or a thermistor.

~~9~~7. The device of claim 1 further comprising a battery clamp.

~~10~~8.The device of claim ~~9~~7, wherein the battery clamp is positioned on the PCB assembly.

~~11~~9.The device of claim ~~9~~ 7 further comprising a battery.

~~12~~10. The device of claim ~~11~~9, wherein the battery is a lithium battery.

~~13~~11. The device of claim 1, wherein the processor and the memory are embedded in a microcontroller.

~~14. The device of claim 1 further comprising a third sensor, wherein:~~
~~the first sensor is a low-sensitivity vibration sensor configured to operate in a sleep state of the device and further configured to trigger the device into an active state;~~
~~the second sensor is a temperature sensor; and~~

~~the third sensor is a high-sensitivity vibration sensor configured to operate in the active state of the device.~~

~~15~~12. The device of claim ~~14~~1, wherein:

the third sensor is a triaxial accelerometer sensor having an x-axis, a y-axis, and a z-axis; and

the triaxial accelerometer sensor is positioned such that the z-axis is approximately perpendicular to a mounting surface of the base.

~~16~~13. The device of claim ~~15~~12, wherein:

the base is configured to allow the mounting surface to be attached to a machine surface to allow monitoring of machine vibration and machine temperature;

the base is configured to allow the support bracket to be rotated by a user around a perpendicular axis of the mounting surface; and

the PCB assembly and the triaxial accelerometer sensor are stationary relative to the support bracket.

~~17~~14. The device of claim ~~16~~13, wherein the base comprises a threaded mounting stud positioned approximately perpendicular the mounting surface.

~~18~~15. The device of claim 1, wherein the PCB assembly comprises three rigid sections for component placement electrically coupled using two flexible PCB interconnects.

~~19~~16. A method of manufacturing a device, the method comprising:

mechanically assembling a printed circuit board (PCB) assembly comprising:

a processor;

a memory electrically coupled with the processor

a first sensor electrically coupled with the processor;

a second sensor electrically coupled with the processor;

a third sensor electrically coupled with the processor; and

a communication interface electrically coupled with the processor,

wherein:

the first sensor is a low-sensitivity vibration sensor configured to operate in a sleep state of the device and further configured to trigger the device into an active state;

the second sensor is a temperature sensor; and

the third sensor is a high-sensitivity vibration sensor configured to operate in the active state of the device;

and

mechanically assembling the PCB assembly within an enclosure comprising;

a cap;

a base mechanically coupled with the cap; and

a mount mechanically coupled with the base.

~~20~~17. A method comprising:

installing a device on a machine, the device comprising:

an enclosure assembly comprising:

a cap;

a base mechanically coupled with the cap; and

a support bracket mechanically coupled with the base;

a printed circuit board (PCB) assembly comprising:

a processor;

a memory coupled with the processor

a first sensor coupled with the processor;

a second sensor coupled with the processor;

a third sensor coupled with the processor; and

a communication interface coupled with the processor,

wherein:

the first sensor is a low-sensitivity vibration sensor configured to operate in a sleep state of the device and further configured to trigger the device into an active state;

the second sensor is a temperature sensor; and

the third sensor is a high-sensitivity vibration sensor configured to operate in the active state of the device;

and

a battery;

and

receiving first sensor data, ~~and~~ second sensor data and third sensor data transmitted via the communication interface.