

Operational Description

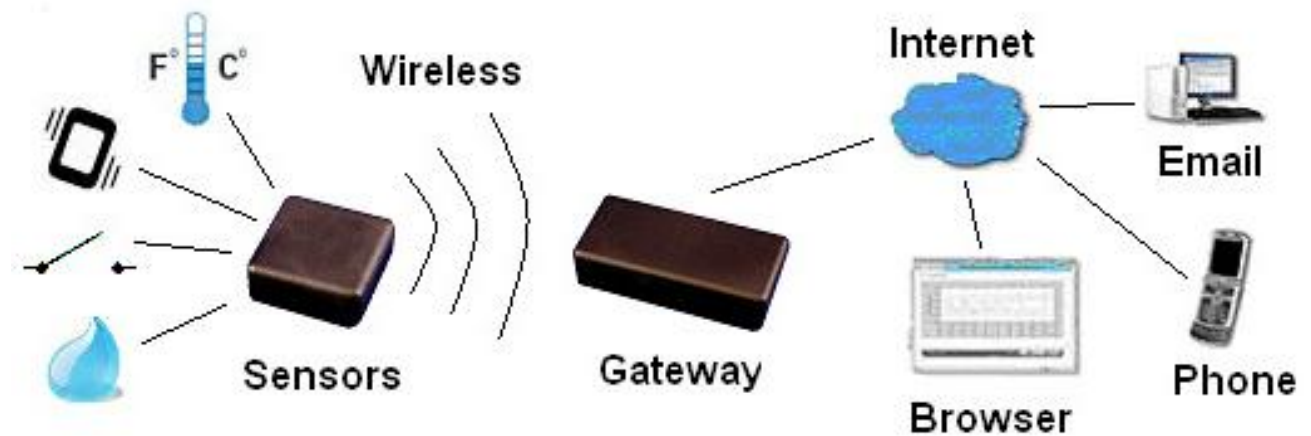
A 3V lithium battery is inserted into the sensor and the Microcontroller (MCU) receives a power on reset. The MCU initializes its functions using values stored in EEPROM. The MCU communicates with the RF Module using SPI protocol and puts it into a low power sleep mode. The Accelerometer is configured using an I2C interface to produce a wakeup on excessive shock. An ADC is done on the Temperature Sensor analog output.

The MCU processor periodically wakes up and checks all of the sensors. If there is an alarm condition on a sensor, a 1ms message is sent using the RF module. The WSNS can also periodically (programmable 1-9999 minutes) send a status message.

The RF Module consists of an IEEE 802.15.4 transceiver chip, balun, and $\frac{1}{4}$ wave board printed tilted whip antenna. The antenna radiates off board printed ground plain.

Wireless Sensor Network Products

Battery powered sensors monitor temperature, motion, moisture, and contact closure. The sensors send notifications to the gateway wirelessly. Using an Ethernet connection, the gateway relays notifications to an email account or text phone via the Internet. All sensors and gateway administration is done via web browser. The system is self-monitored and there are no monthly fees or special server software required.



All that is required is at least one Mi-Sensor-1, at least one Mi-Gateway-1, an Internet connection, and an email account to perform your own asset monitoring.

Mi-Sensor-1 Specifications

- ☐ User configurable notifications of Temperature exceeded, Motion present, Moisture present or Contact closure, and low battery condition.
- ☐ User configurable periodic reporting interval of 0 to 9999 minutes.
- ☐ User configurable sensor name.
- ☐ User accessible test button for sending test message and configuring sensor.
- ☐ Moisture/Contact sensing wire may be 2m long.
- ☐ 16 channel 2.4Ghz operating frequency with FCC and IC approvals.
- ☐ Integrated antenna with up to 100m open air operating range.
- ☐ Size 4cm x 4cm x 1.5cm and Weight 15g.
- ☐ User replaceable CR2032 battery with approximately 4 year life.

Mi-Gateway-1 Specifications

- ☐ Unlimited Sensors per Gateway.
- ☐ Web interface for user administration and status.
- ☐ Setup screen for Network IP, Host name, MAC address, Email parameters, RF channel and key.
- ☐ Configuration screen for setup of Sensor parameters.
- ☐ Status screen displays log of last 10 sensor notifications.
- ☐ SSL email delivery of encrypted wireless sensor notifications.
- ☐ User accessible test button for resetting network parameters.
- ☐ 16 channel 2.4Ghz operating frequency with FCC and IC approvals.
- ☐ Integrated antenna with up to 100m open air operating range.
- ☐ RJ45 Ethernet interface to LAN.
- ☐ Size 4cm x 8cm x 2cm and Weight 30g.
- ☐ 5V 200mA power requirement (AC/DC adapter supplied).

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