Application Brief

Bluetooth Low Energy Ambient Humidity and Temperature Sensor

Features

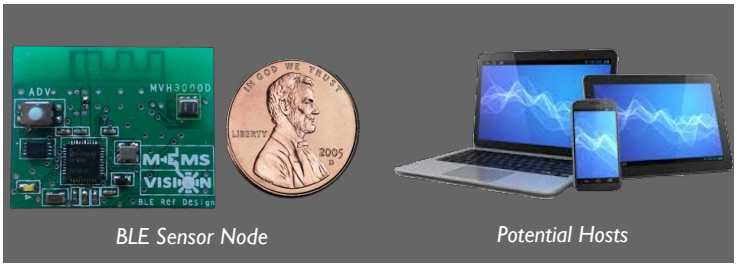
- Bluetooth Low Energy (BLE) Transceiver
  - Industry-standard wireless protocol
  - Ultra-low power consumption
- Smart phone connectivity
- High accuracy and low power relative humidity and temperature sensor
- Low power consumption
  - Battery powered from a coin cell
- Small form factor

Application

- Wireless ambient monitoring of relative humidity and temperature
- Enables multi-point relative humidity and temperature sensing for industrial, automotive, building automation, agriculture, and other sectors

User Benefits

- Easy connectivity: Each node interfaces directly with any Bluetooth Smart devices.
- Android application supports data from multiple sensor nodes, and provides RSSI and battery level information for each node.
- Calibrated Measurements: Built-in digital sensor calibration ensures high accuracy measurements in any sensing environment at no cost in calibration time.



BLE Sensor Node *Potential Hosts*

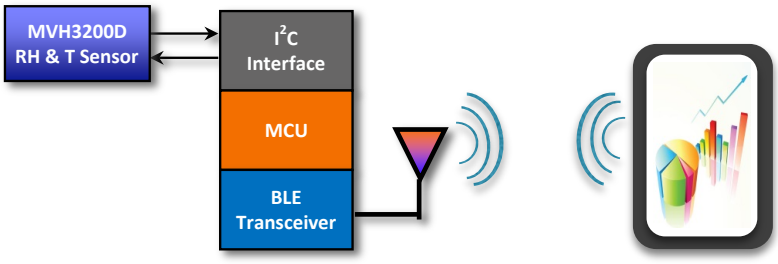
Description

These Bluetooth Low Energy sensor nodes provide high resolution monitoring of ambient relative humidity and temperature levels at various remote locations. Combined with a mobile device, these nodes can easily form a wide network of sensors. The small form factor makes these nodes suitable for almost any location, enabling a wide variety of applications.

Each node uses MEMS Vision's MVH3200D series of relative humidity and temperature sensor to enable fast measurements, low power operation and configurable sensing resolution. Built-in digital calibration algorithms ensure accurate and repeatable measurements over a wide range of operating conditions.

Each sensor node includes a Bluetooth Low Energy SoC, combining both the wireless transceiver and an ARM Cortex-M0 in a single package. The integrated PCB antenna enables each node to have a slim form-factor to enable easy insertion in tight spaces. Under normal usage conditions, the sensor node can operate for more than **2 years** on a single 16mm coin cell battery.

A software interface is used to display and log data collected by any node active in the communications radius. The nodes can also be configured using this app, and can provide signal strength information and an estimate of the battery level for each sensor node.



Sensing module functional diagram

The infinite possibilities of the infinitely small™

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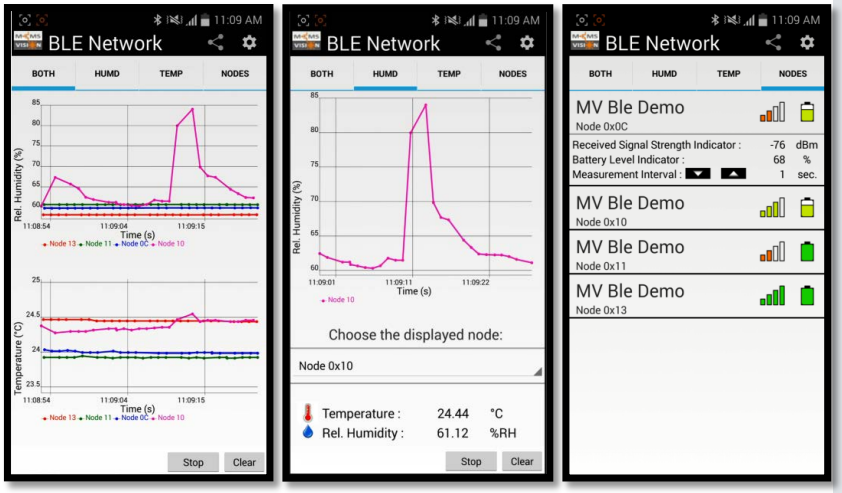
Operation

Each sensor node is programmed to execute a measurement and transmit the recorded data at a user-configurable rate. Using the MEMS-Vision Android App, any device with Bluetooth Low Energy capabilities can interface with all MEMS-Vision BLE sensor nodes within the communications radius.

The application interface decodes the data from each BLE sensor node and displays the measurement results in real-time. The user can view relative humidity and temperature data from all nodes at once, or from a single node if desired. The measurements are plotted versus time to visualize the trend in the environmental conditions at each node's location. The collected measurements can also be logged to a file and shared through e-mail or other apps for added flexibility.

The app can also be used to configure the measurement rate of a given node, and gain information regarding the network. This includes the wireless signal strength of each node, and the remaining battery lifetime.



Snapshots of the Android Interface
Global View (left), Single Node Humidity (center), Node Information (right)

COMPANY PROFILE

MEMS Vision provides miniaturized sensing products fabricated with a proprietary manufacturing platform, optimized over many years of R&D. This platform allows for our MEMS transducers to be fabricated directly above the electronics, and to be suitable for use in harsh environments. The results of this unique technology are ideal solutions for compact systems that meet the stringent performance and power consumption requirements of high-end or mobile applications. Notably, our products can be used in environmental sensing for the consumer electronics, automotive, industrial, and agricultural sectors.

MEMS Vision sensing products have very small footprints and provide high accuracy, robustness, reliability, and durability. Our experienced team also offers customized MEMS / IC design services and IP for MEMS-based highly integrated systems, with proven first-pass silicon success.

Harness the infinite possibilities of the infinitely small.
Reach the highest levels of system integration and performance.

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