BEVO Beacon

Building EnVironment and Occupancy (BEVO) Beacon: An all-in-one indoor environment sensor

A close up of a sign

Description automatically generated

Variables measured:

* **Carbon Dioxide:** Carbon dioxide is measured using the Sensirion SCD30 through an inlet at one of the ends of the sensor. CO­2 helps us understand a little about ventilation (more CO2, less ventilation) and occupancy (more CO2, more occupants).
* **Particulate Matter (PM):** Particulate matter is another term for airborne dust. There are different size bins for PM that we care about – ultrafine, fine, and coarse – and the Sensirion SPS30 on the BEVO Beacon is capable of measuring all three, but most accurately measures fine PM. There are a wide variety of sources for indoor dust, some of the biggest being indoor smoking/candles/incense, cooking, and tracking dirt indoors from out.
* **Total Volatile Organic Compounds (TVOCs):** TVOCs are a *very* broad group of pollutants that are typically associated with cleaning products, personal care products, and their scents. Our TVOC sensor measures a wide-range of organic compounds and gives us an aggregate measurement – we are not able to tell what exactly the compound is.
* **Carbon Monoxide (CO):** The carbon monoxide sensor measures concentrations to a similar accuracy as your typical home monitoring alarm. CO is mostly associated with incomplete combustion (i.e. anything that burns) and is perhaps the most toxic pollutant we measure.
* **Nitrogen Dioxide (NO2):** The NO2 sensor is located just next to the CO sensor and measures pollutants typically associated with traffic and vehicle emissions. These values are typically low inside homes, but can be worse for homes near major roadways.
* **Light:** The light sensor we use measures the illuminance in the room in addition to the infrared and UV levels.
* **Temperature/Relative Humidity:** Three of our sensors are capable of measuring temperature and relative humidity. One of these is the CO2 sensor housed inside the device while the other two are the CO and NO2 sensors that are flush with the outside of the device and give a more representative measurement.

Basic Specifications:

* Device measures 6 in. by 12 in. by 12 in.
* Power is supplied via an outlet to micro-USB cable supplied with the device.
* The device measures from all sensors every minute and then averages the last five values to output a five-minute interval.
* Data are stored on the device and can store about two-year’s worth of data at 5-minute increments.
* Device has a fan inside to help cool the electronics and makes a very quiet humming noise.