Personal Air Monitor™

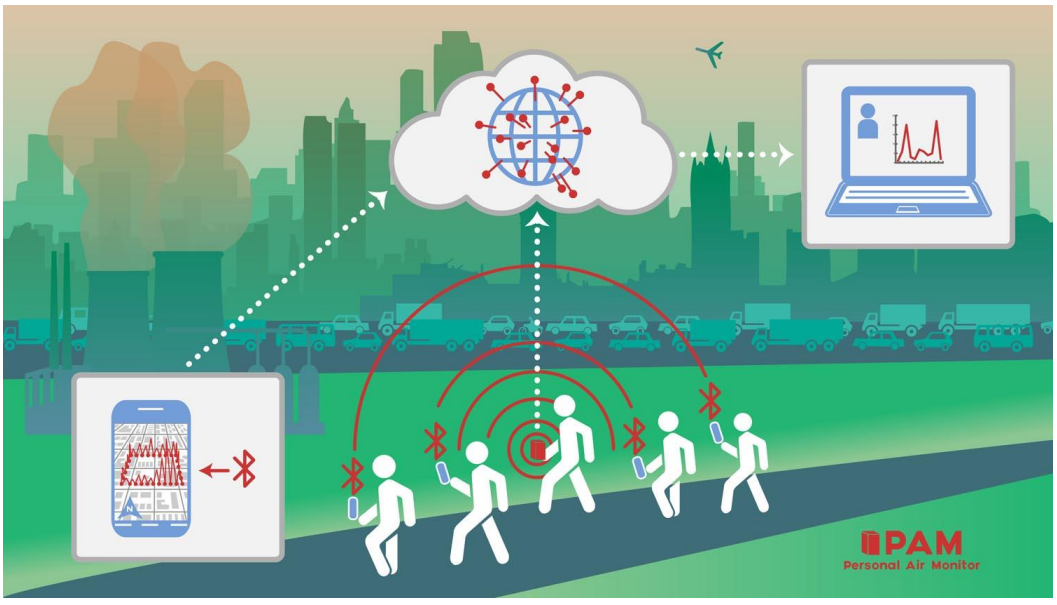
The 2B Technologies Personal Air Monitor (PAM) uses air pollution sensors in a compact, portable package. It maps and graphs pollution levels in 2B Tech's free Smartphone app, with option for uploading data via cellular service to the 2B Tech Data Portal.

The PAM measures the air pollutants for which sensors are highly reliable, which includes particulate matter (PM_1, $PM_{2.5}$) and carbon dioxide (CO_2). Carbon dioxide is of interest outdoors because it is the principal greenhouse gas responsible for global warming, but also indoors because CO_2 builds up inside buildings due to human respiration and affects human cognitive abilities at concentrations above about 1,000 ppm. $PM_{2.5}$ and PM_1 are important size ranges because only particles smaller than 2.5 µm enter the lungs, where they have adverse health effects such as triggering asthma attacks.

In addition to the above sensors for PM_1, $PM_{2.5}$ and CO_2, any two of the following sensors can be added to the PAM's measurement suite: CO, SO_2, NO_2, total VOCs. The options make the PAM ideal for tracking air pollution arising from automobile exhaust, power plants, forest fires and other combustion sources.

Features:

- Sensors to measure CO_2, PM_1, and $PM_{2.5}$, plus choice of any 2 of: CO, SO_2, NO_2, total VOCs
- Handheld and portable battery operation
- Micro-SD card data output, and option for cellular data upload to the Cloud
- Real-time Smartphone data access via Bluetooth for multiple users (students, researchers, others)



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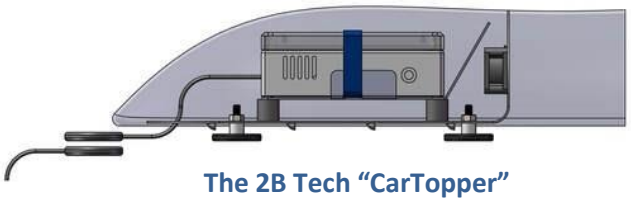
Options

- Choice of any two of these sensors: CO, NO_2, SO_2, total VOCs
- Cellular capability
- Vehicle-mounted enclosure (CarTopper) for mobile monitoring
- Stationary enclosure for fixed-site monitoring



The 2B Tech "CarTopper"

Specifications

Overall Specifications	
Weight	0.9 lbs (0.41 kg)
Power Requirements	< 1 amp at 12 V, 10 watt max
Dimensions	6.3" L × 3.1" W × 2.2" H (16 cm × 8 cm × 5.7 cm)

Sensor Specifications (per manufacturer)	
Carbon Dioxide (CO_2) **Sensor:** Telaire T6713 (NDIR) **Measurement Range:** 0-5000 ppm **Accuracy:** 400-5000 ppm: ± 30 ppm, ± 3% of reading **Response Time:** < 3 min for 90% step change	**Particulate Matter (PM_1, $PM_{2.5}$)** **Sensor:** Plantower PMS7003 (Laser Scattering) **Particle Size Range:** 0.3-10 µm **Mass Concentration Range:** 0-999 µg/m^3 **Count Accuracy:** 50% @ 0.3 µm, 98% @ ≥ 0.5µm **Response Time:** < 10 s
Carbon Monoxide (CO) **Sensor:** Alphasense CO-A4 (Electrochemical) **Response Time:** < 30 s for a 10-ppm step change **Precision:** contact 2B Tech for information **Measurement Range:** 0-500 ppm	**Total VOCs** **Sensor:** ION Science Mini-PID2 HS (Photoionization) **Measurement Range:** 0 to 3 ppm **Minimum Detection Limit:** 0.5 ppb **Response Time:** < 12 s **Sensitivity:** > 600 mV per ppm
Nitrogen Dioxide (NO_2) **Sensor:** Alphasense NO2-A43F (Electrochemical) **Measurement Range:** up to 20 ppm **Noise (± 2 SD):** ± 15 ppb equivalent **Response Time:** < 80 s from 0 to 2 ppm NO_2	**Sulfur Dioxide (SO_2)** **Sensor:** Alphasense SO2-A4 (Electrochemical) **Measurement Range:** up to 50 ppm **Noise (± 2 SD):** ± 15 ppb equivalent **Response Time:** < 20 s from 0 to 2 ppm SO_2
Pressure **Sensor:** Bosch BME680 **Measurement Range:** 300 to 1100 hPa **Accuracy:** ±1.0 hPa **Resolution:** 0.18 Pa **Long-Term Stability:** ±1.0 hPa per year	**PAM Temperature and Relative Humidity** **Sensor:** Honeywell HIH8120 (Platinum RTD/Capacitive) **Measurement Range:** 0-65 °C / 0 to 100 %RH **Accuracy:** ± 0.5 °C from 5 °C to 50 °C / ± 2 %RH **Response Time (RH):** 8 s