Praxis/Urban: ambient air quality monitor

The South Coast Science Praxis/Urban offers an out-of-the-box solution for urban air quality monitoring. The Praxis/Urban answers both the challenge of capturing accurate data in variable climate conditions and the need for fine-grained air quality monitoring networks.

Indicative air quality monitoring ...

- Alphasense optical particle counter (OPC-N3): **PM_1**, **$PM_{2.5}$** and **PM_{10}**
- Alphasense electrochemical sensors: **CO**, **H_2S**, **NO**, **NO_2**, **O_3**, **SO_2**
- (PID): **VOCs** and (NDIR) **CO_2**
- Temperature, humidity **(T/rH)** and barometric pressure **(pA**) sensors
- **High frequency sampling**: up to one sample per two seconds
- **Up to two hours operation** in event of external power loss
- **Enclosure designed for ultra-low RF noise** and harsh climates

… in practice

- **Ultra low noise** sensing for gases (ppb) and particulates ($\mu g/m^3$)
- **Support for multiple analysis techniques** including any sampling rate and real-time access
- **High density air quality network** using low-cost, individually baselined devices
- **Open source device firmware** for highly customisable sensing, data delivery and analysis
- **Remote Diagnostics, over-the-air software update and data-interpretation upgrade** all available with SCS data infrastructure

The South Coast Science Praxis/Urban was designed in consultation with the United Nations Environment Programme (UNEP)

About South Coast Science

South Coast Science has its roots in environmental science and is a specialist in air quality monitoring. In collaboration with Alphasense, leader in environmental gas sensors, South Coast Science develops and builds precision monitoring equipment engineered for deployment of high density air quality networks.

Praxis/Urban Specifications

Sensing

- Alphasense analogue front-end (AFE) supporting up to four A4 electrochemical sensors. Additional NDIR CO_2 via a separate interface. Other combinations on request
- Particulate monitoring uses Alphasense OPC-N3 particle counter
- Sensirion temperature and relative humidity sensor
- TDK barometric pressure sensor
- Ultra low-noise circuitry maximises repeatability of electrochemical sensing
- Data correction refined through co-location with UK government reference equipment

Communications

- Wired: ethernet via RJ45 connector
- Wireless: 4G cellular modem
- GPS receiver

Platform

- AM335x ARM Cortex-A8 through BeagleBone Black
- Real-time clock with battery backup. Time synchronisation is via GPS receiver, network time protocol or real-time clock, as available.

Data infrastructure

- Sense data messaging, control messaging and data storage using Amazon Web Services (AWS) or customer's own infrastructure
- Local microSD data storage

General

- DC power input from 7 to 12 V, rechargeable battery (approximately two hours operation)
- Environmental range from -40 to +50 °C
- Dimensions: 250 x 200 x 147mm
- Weight: 4 Kg
- Power consumption: ~4 W

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