

Praxis/OPCube: air quality monitor

The South Coast Science Praxis/OPCube offers an out-of-the-box solution for urban air quality monitoring. The Praxis/OPCube answers both the challenge of capturing accurate data in variable climate conditions and the need for fine-grained air quality monitoring networks. South Coast Science has responded to the call for a gas *and* particulate monitor, suitable for roadside monitoring, environmental health and local authority investigations.

Indicative air quality monitoring ...

- Alphasense optical particle counter (OPC-N3): **PM₁**, **PM_{2.5}** and **PM₁₀**.
- Plus one of the following: **CO**, **H₂S**, **NO**, **NO₂**, **O₃**, **SO₂**, **VOCs** or **CO₂**.
- **High frequency sampling**: up to 30 samples a minute.
- **Up to 1 hour operation** in event of external power loss.
- **Enclosure designed for ultra-low noise** and harsh climate.



... in practice

- **Ultra low noise** sensing for gases (ppb) and particulates ($\mu\text{g}/\text{m}^3$).
- **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.
- **Consistent device function** within broad climate range (T/rH) and casing rating for hostile environments.

The OPCube's big brother, the 'Urban' was designed in consultation with the UN Environment Program and where possible, its attributes have been carried over to make this another robust & simple to use product.

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/OPCube Specifications

Sensing

- One Alphasense electrochemical sensor or NDIR for CO₂ or PID for VOCs (*avail. soon*)
- Ultra low-noise circuitry maximises repeatability of electrochemical sensing.
- Alphasense OPC-N3 particle counter, plus approximated readings up to 40 microns.
- Sensirion temperature and relative humidity sensor.
- Data correction refined through co-location with government reference equipment.
- Variable sampling rates with a frequency up to every two seconds.

Communications

- 4G mobile comms for real-time data delivery to the cloud.
- GPS / GLONASS receiver.

Platform

- Runs Debian Linux operating system for robust operation and ease of integration with other sensor systems.
- SAMA5D27 CPU.
- 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

- Wide DC power input from 7 to 24 Volts, lithium iron phosphate (LiFePO₄) rechargeable backup battery (≥ 1 hour operation).
- Environmental range from -40 to +50 C.
- Measures 154 x 154 x 130 mm.
- Weight 2 kg.

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