

Praxis/Cube2: ambient air quality monitor

The South Coast Science Praxis/Cube2 offers an out-of-the-box solution for urban air quality monitoring. The Praxis/Cube2 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 particulate *and* gas 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 (soon two) 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



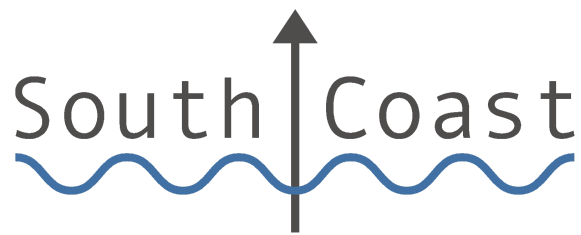
...in practice

- **Ultra low noise** sensing for gases (ppb) and particulates ($\mu\text{g}/\text{m}^3$)
- **Support for multiple analysis techniques**, any sampling rate and real-time access
- **High density air quality network** using low-cost, calibrated devices.
- **Open source device firmware** for sensing, data delivery & analysis
- **Remote Diagnostics**, for over-the-air software update and data-interpretation upgrade
- **No heated air inlet** reducing cost, complexity and power consumption

The Cube's big brother, the 'Urban' was designed in consultation with the UN Environment Program and where possible, specifications 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/Cube2 Specifications

Sensing

- Two Alphasense electrochemical sensors and/or NDIR for CO₂ or PID for VOCs
- Ultra low-noise circuitry maximises repeatability of electrochemical sensing
- Alphasense OPC-N3 particle counter, plus approximated readings up to 40 microns
- Sensirion temperature/relative humidity sensor, TDK digital barometer
- 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
- Wired: ethernet via RJ45 connector

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

- DC power input from 7 to 24 Volts, rechargeable backup battery (≥ 1 hour operation)
- Environmental range from -40 to +50 C
- Dimensions 154 x 154 x 130 mm
- Weight 2 kg
- Power consumption: 2 W

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