

Praxis: urban air quality monitor

The South Coast Science Praxis offers an out-of-the-box solution for urban air quality monitoring. The Praxis 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 in practice

- Alphasense optical particle counter (OPC-N2/N3): **PM₁** **PM_{2.5}** **PM₁₀**
- Alphasense electrochemical sensors: **CO**, **H₂S**, **NO**, **NO₂**, **O₃**, **SO₂**
- Photoionisation detection (PID): **VOCs**
- Non-dispersive infra-red (NDIR): **CO₂**
- High frequency sampling: up to two samples per second
- Up to 2 hours operation in event of external power loss
- Praxis enclosure designed for ultra-low noise and harsh climate
- **Ultra low noise** sensing for gasses (*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 rated for hostile environments

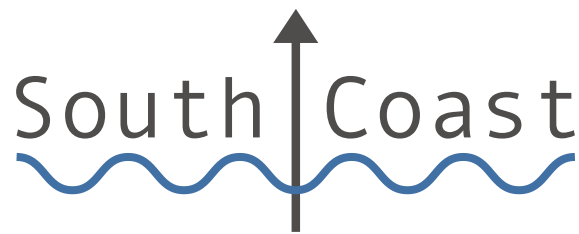


The South Coast Science Praxis device was designed in consultation with the UN Environment Programme

About South Coast Science

South Coast Science 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 monitoring networks.

South Coast Science offers open source tools with flexible equipment and components. As well as offering the complete Praxis device, it works with OEMs by supplying electronic subsystems and data infrastructure for production of a range of equipment.



Praxis Specifications

Sensing

- Alphasense analogue front-end (AFE) supporting up to four A4 electrochemical sensors, or three electrochemical sensors plus a PID.
- NDIR for CO₂ sensing via separate interface.
- Ultra low-noise circuitry maximises repeatability of electrochemical sensing.
- Particulate monitoring uses Alphasense OPC-N2, OPC-N3 or OPC-R1 particle counters.
- Temperature and relative humidity via enclosed Sensirion device.

Communications

- Wired: ethernet via waterproof RJ45 connector.
- Wireless: 2G cellular modem (4G available shortly) or LoRA transceiver.

Processor

- BeagleBone Black or BeagleBone Black industrial.
- Raspberry Pi 3 or Zero.

Clock

- Realtime clock with battery backup. Time synchronisation is via GPS receiver, network time protocol or realtime clock, as available.

Power

- 90 to 240 V AC Mains or 7 to 24 V DC input.
- Internal battery backup for up to 2 hours operation.
- Environment Operating range: -10 to 50 Centigrade.

Data infrastructure

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

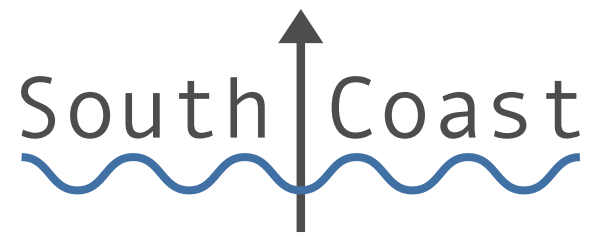
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South | Coast

The logo consists of the words "South" and "Coast" in a dark grey, sans-serif font, separated by a vertical line. The vertical line has a small black arrowhead pointing upwards. Below the text is a blue wavy line that spans the width of the text.