

Clearway inViro

Air Quality Monitoring



Air pollution is the fourth leading cause of death globally after high-blood pressure, smoking and poor diet according to the State of Global Air 2020, with long-term exposure to air pollution killing one in 19 people in the UK, according to researchers at Centre for Cities. Coronary heart disease, strokes, lung cancer and child asthma are all strongly associated with air pollution.

Air pollution caused by air pollutants such as chemicals, smoke, dust or allergens is an increasing concern in urban areas. Tiny airborne particulates (such as PM_{2.5}) are especially dangerous because they can penetrate deep into the lungs and cause a wide range of adverse health effects.

Effective air quality monitoring can help us to measure levels of pollution, identify trends and variations and understand when and where changes are needed.

The inViro unit was designed in consultation with the UN Environment Programme

Pollutants measured



inViro

Why Clearway inViro?

- ✓ Accurately monitors and senses multiple pollutants – particulates and gases
- ✓ Suitable for outdoor and indoor use
- ✓ Quick to deploy portable unit
- ✓ Environmentally friendly with solar power option
- ✓ Temperature stability - tested in both sub zero and sub Saharan African temperatures
- ✓ MCERTS accreditation pending

Overview

The Clearway Group is proud to offer an out-of-the-box solution for urban air quality monitoring. inViro meets the challenge of capturing accurate data in variable climate conditions and the need for fine grained air quality monitoring networks.

The Clearway inViro air quality monitoring system is the latest in smart environmental technology. It comes with both battery and solar powered options; eliminating the need for any hard wire installation and making it quick and easy to deploy. Data is easily collected, analysed, and shared to assist government bodies and the private sector in creating safer places for us all to live, work and play.



Clearway inViro

Outdoor use: monitor pollutants from traffic and view the peak distributions and perform kerbside sampling and get minute by minute accurate (MCERTS) verified data.

Ideal for outside schools and hospitals and in construction and demolition environments as InViro can support dust management/environmental monitoring plans.

Indoor use: identify polluting events, construction or painting for example or from failed air filtration systems. You can then use this information to look at the health of the public and/or staff within their working environment.



The Clearway InViro system is:

Accurate – pending MCERTS accreditation and compared (co located) with the Government national network - the AURN (Automated Urban and Rural Network). It gives averaging times as 1min, 15min, 1 hour and 24-hour which is comparable with the national standards.

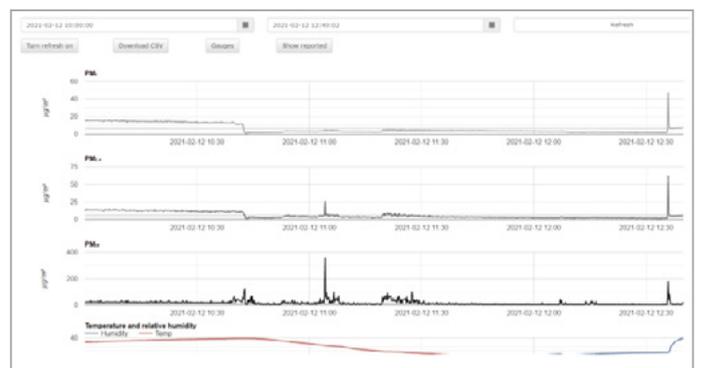
Simple to use – get data when you want it where you want it and share it with clients and other stakeholders.

Robust – designed to withstand harsh environments. The InViro unit has been tested in many African countries as part of the UN Environment Agency program and is also currently being used by the British Antarctic Survey.

Environmentally Friendly – low power requirement means this system is quick and simple to deploy without the need for planning requirements to draw power from the grid by means of street lighting power connections, for example. A well-designed solar system means the monitoring can provide year-round survey capability.

Technical

- Dust monitor, optical particle counter (OPC-N2/N3): PM1 PM2.5 PM10
- 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
- The enclosure is designed for ultra-low noise and harsh climate
- Ultra-low noise sensing for gasses (ppb) and particulates (µg/m)
- 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



Dashboard showing data output



Scientific air quality monitoring

Cell	Range	Resolution	Accuracy
H ₂ S	0-20000ppb	0.1ppb	5ppb
NO ₂	0-20000ppb	0.1ppb	5ppb
O ₃	0-20000ppb	0.1ppb	5ppb
SO ₂	0-20000ppb	0.1ppb	5ppb
CO ₂	0-5000ppm	1ppm	20ppm
CO	0-50000ppm	1ppb	5ppb
Particulate	0.3 to 40um	0.1um	1 micron



The Clearway inViro can easily be attached to our inView CCTV towers.



Technical information

Sensing

- Sensing - 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 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: 4G standard or LoRA transceiver

Processor

- BeagleBone Black or BeagleBone Black industrial

Clock

- Realtime clock with battery backup. Time synchronisation is via GPS receiver, network time protocol or real-time 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
- Solar option available

Data infrastructure

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



Clearway Technology is part of the Clearway Group.

The UK's most successful, innovative and rapidly expanding security and environmental property services company - Securing tomorrow, today.

See how we can help you, talk to our experts today

T: 0344 811 7100 E: enquiries@clearway.co.uk

www.clearway.co.uk     

