

Ambient Air Monitoring Systems



The Ecotech Ambient Air Monitoring System

has evolved from over 28 years of world-wide field experience. It is a system designed to provide high quality air pollution and meteorological data and to minimise the time spent on maintenance and calibration.

Ecotech has spent the past 28 years developing and refining its expertise in the design, manufacture, supply, service, maintenance and operation of ambient air monitoring systems. These systems have become widely accepted as leaders in the field for reasons that include:

- Ecotech has supplied systems to many major industrial companies and environmental protection agencies around the world we have the experience and resources needed to ensure that all projects are successfully completed.
- We currently have systems operating in Australia, New Zealand, Cyprus, Switzerland, India, Sri Lanka, South Korea, Thailand, Malaysia, Bangladesh, Indonesia, Mexico, Brazil, Colombia and Chile.
- Our engineers are highly experienced in the design, manufacture, installation, commissioning, servicing and operation of air monitoring systems.

- Ecotech's fully equipped state-of-the-art Master Calibration and Test Laboratory ensures that every system manufactured is fully tested for a minimum of one week prior to leaving the factory.
- At Ecotech we have excellent control over the quality and design of our systems as the analysers, calibrators, zero air generator, data acquisition systems and software are all manufactured by us. Other components and instruments are only sourced from the highest quality suppliers.
- Our ISO 9001 Quality Accreditation and NATA⁽¹⁾ Accreditation ensures all design, manufacturing and operational processes meet the highest international quality standards.
- Ecotech's training courses can be held anywhere in the world and are customised to meet our clients' exact requirements.



An Ecotech Ambient Air Monitoring installation in Cyprus.

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System Components

ANALYSERS

The Ecotech systems incorporate analysers designed by Monitor Labs and now manufactured by Ecotech. These analysers for the measurement of O₃, CO, NO_x and SO₂ are approved U.S. EPA Equivalent Reference Methods. Ecotech's systems may also incorporate real time particulate monitors, hydrocarbon and BTX analysers from other world-leading manufacturers such as Rupprecht & Patashnick, Opsi and Dani.

METEOROLOGICAL SENSORS

Meteorological sensors used in Ecotech systems are sourced from around the world. We have sensors to measure wind speed, wind direction, temperature, relative humidity, barometric pressure, rainfall, solar radiation and net radiation.

AUTOMATIC CALIBRATION SYSTEM

Ecotech's Air Monitoring Systems incorporate a state-of-the-art dilution gas calibrator, NIST or NATA traceable calibration gases and a high performance zero air generator to calibrate all of the analysers used. The system's Data Acquisition System can be configured to automatically control calibration cycles at any specific time during the day or night. This allows synchronisation of calibration data gaps with periods of low expected pollution levels. The period between calibration cycles can be varied by the user.

ENCLOSURES

A variety of custom designed air-conditioned insulated shelters are available for the system. These include mobile vans, caravans and relocatable shelters. If required the system can be installed in a shelter provided by the customer.



SAMPLE MANIFOLD INLET

Our systems are supplied with a glass sample manifold that meets US EPA specifications for sampling of atmospheric pollutants. An exhaust manifold is used to vent exhaust gases under the floor of the shelter thus preventing their build up inside the enclosed space.

POWER CONDITIONER

In many locations, the quality of power supply is poor, so we incorporate a power conditioner so that only the highest quality power is used by the system.



DATA ACQUISITION SYSTEM

The heart of the Air Monitoring System is our proven state-of-the-art Data Acquisition System (DAS). This is specifically designed for unattended use in ambient air monitoring systems.

The DAS interfaces to the analysers via a RS232 multi-drop serial link. This allows the DAS to collect data directly from the instrument in digital format thus eliminating Digital to Analog and Analog to Digital conversion errors.

All non-digital sensors, such as meteorological sensors, are connected via a lightning-suppressed termination panel and their signals are digitised by a 16 bit A/D converter.

The Data Acquisition System has sufficient data storage to hold over ten years worth of historical data. The use of a SVGA colour monitor allows data and set up parameters to be viewed any time.

A variety of data collection methods can be utilised: telemetry links, cellular telephone links, network data transfers, TCP/IP ethernet links, direct computer-to-computer or floppy disk transfer. The DAS even has the capability to send SMS messages to a cellular phone should the system develop a fault or concentration limits exceed preset limits.

WINCOLLECT SOFTWARE

WinCollect is Ecotech's Windows 98/2000/XP based software which provides direct communication with the Ecotech Data Acquisition System. It is designed to collect, validate and report on air quality data. WinCollect is specifically designed to provide the specialised functionality required for air quality data analysis.

MEASUREMENT PARAMETERS

The Ecotech Ambient Air Monitoring System is capable of measuring almost any gas which is present in the atmosphere, as well as a wide range of meteorological parameters, as the table below shows.

Compound	Range	Accuracy	Technique employed
Oxides of Nitrogen	0-20 ppm	0.5 ppb	Chemiluminescence or DOAS Open Path
Sulphur Dioxide	0-20 ppm	0.5 ppb	Fluorescence dual channel ratiometric phase detection or DOAS open path
Ozone	0-20 ppm	0.5 ppb	UV Photometrics or DOAS Open Path
Carbon Monoxide	0-200 ppm	50 ppb	Gas filter correlation or DOAS Open Path
Carbon Dioxide	0-3000 ppb	50 ppb	Gas filter correlation or DOAS Open Path
Benzene, Toluene, Xylene	0-5 ppm	0.5 ppb	Gas Chromatography or DOAS Open Path
Non Methane Hydrocarbons	0-1000 ppm	0.01 ppm	FID or DOAS Open Path
Methane	0-1000 ppm	0.01 ppm	FID or DOAS Open Path
Particulates (PM10, TSP, PM2.5)	0-5 g/m ³	0.1 ug/m ³	Tapered Element Oscillating Microbalance
Carbon Particulates	0-5 g/m ³	0.25 ug/m ³	Thermal CO2 Method
Local Visual Distance	0-16 km	+/- 10%	Nephelometer
Wind Speed	0-70 m/s	0.22 m/s	Anemometer
Wind Direction	0-540°	+/- 3°	Airfoil Vane
Ambient Temperature	-50 to 100°C	+/- 0.1°C	Solid State Thermistor
Relative Humidity	0-100 %	+/- 2%	Thin film capacitor
Barometric Pressure	800-1200 mb	+/- 1.3mb	Solid state transducer
Precipitation	NA	0.1 mm	Tipping Bucket Rain Gauge
Solar Radiation	250-2800 nm	9mv/kwm ²	Pyranometer
Net Radiation	250-60000 nm	8mv/kwm ²	Net Radiometer

Note: A wide variety of additional gases can also be measured. Ecotech will provide specific details.

WinCollect interrogates and controls ambient air monitoring systems and networks, simplifying the tasks of automatically or manually retrieving and viewing measurement data, collating and storing of data into a database, and the summarising of data into comprehensive reports. It additionally provides the ability to view in real time both measurement and diagnostic data, control calibration sequences, as well as other station and analyser functions.

WinCollect can interrogate Data Acquisition Systems from either a local computer directly connected to the logger, or from a remote computer located anywhere in the world, and connected to the logger via TCP/IP ethernet, short haul

modems, radio, switched telephone, cellular telephone, or satellite telephone networks.

Two major versions of WinCollect are available; the standard version, and a multi-user version that stores data in a central MS SQL Server 7 Database. This version allows multiple users to view, collect, and validate the data depending on their designated level of access.



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Ecotech Services

TRAINING

Comprehensive training courses are provided by experienced Ecotech personnel. These courses provide in-depth training on system operation, maintenance, calibration, trouble-shooting, validation of data and generation of data reports. These courses are designed to meet the customers specific requirements and may range from a short one day course to courses as long as two weeks. These courses use a range of audio/visual aids and hands-on training is a key component.

Customers, amongst others who have benefited from Ecotech training courses, include:

- EPA's throughout Australia
- Alcoa
- Pacific Power
- Dept. of Pollution Control (Thailand)
- Ministry of Transport (Sri Lanka)
- UNHCR (United Nations)
- Ministry of Labour (Cyprus)
- Malaysian Meteorological Service
- EPA - Mexico
- BAPEDAL (Indonesia)
- EGAT (Thailand)

INSTALLATION & COMMISSIONING

Ecotech has the resources and experience to install its systems anywhere in the world. Once installed, our engineers will commission the system providing a complete system check and perform a calibration of all analysers.



SERVICE CONTRACTS

Ecotech offers service and maintenance contracts which can be customised to meet your special requirements. These contracts can include repair, maintenance, calibration and operation of the system. Ecotech is NATA⁽¹⁾ accredited for the collection and validation of data and the generation of data reports. These services are designed to comply with your local regulatory authority requirements for valid data capture.

⁽¹⁾ NATA - National Association of Testing Authorities, Australia

Celebrating over 25 years of service

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