



# Environmental Monitoring

Solution Snapshot



REDUCE YOUR ENVIRONMENTAL IMPACT







# ACOEM Ecotech Excellence


**At ACOEM Ecotech, problem solving is in our DNA. We have pioneered innovative solutions in environmental monitoring for over 40 years and are global leaders in the design, manufacture, operation and maintenance of air, water, gas, meteorology, blast, fine particulate and dust monitoring systems. We work with a broad range of industries including mining, government and processing.**

Founded and headquartered in Melbourne, Australia, Ecotech has a global footprint across 80+ countries with world-class manufacturing facilities (certified to ISO 9001 Quality Management standard) in India and Australia, and NATA accreditation for compliance with ISO/IEC 17025 for a range of testing and calibration services.

Every day we operate and manage over 440 real-time environmental monitoring sites worldwide, and employ over 220 people across Oceania and Southeast Asia.

In 2017, Ecotech became part of the ACOEM Group, a global leader headquartered in Lyon, France who helps companies and public authorities limit their environmental impact, offering products and services that enable them to prevent noise and vibration pollution, improve air quality, and increase the productivity and reliability of industrial machines.

# Solution Snapshot

 ACOEM ECOTECH OFFICES

 DISTRIBUTORS

 MANUFACTURING FACILITIES

 ACOEM OFFICES

## 1 GAS ANALYSERS

Serinus® 10	Ozone (O <sub>3</sub> )
Serinus® 30	Carbon Monoxide (CO)
Serinus® 40	Oxides of Nitrogen (NO, NO <sub>2</sub> , NO <sub>x</sub> )
Serinus® 44	Ammonia (NO, NO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> )
Serinus® 50	Sulfur Dioxide (SO <sub>2</sub> )
Serinus® 51	Sulfur Dioxide & Hydrogen Sulfide (SO <sub>2</sub> , H <sub>2</sub> S)
Serinus® 55	Hydrogen Sulfide (H <sub>2</sub> S)
Serinus® 56	Total Sulfur (TS)
Serinus® 57	Total Reduced Sulfur (TRS)
Serinus® 60	Nitrogen Dioxide (NO <sub>2</sub> )
AQMesh™	Small Sensor Air Quality Monitoring

## 2 GAS CALIBRATORS

Serinus® Cal 1000
Serinus® Cal 2000
Serinus® Cal 3000

## 3 PARTICULATE MONITORING

Neighbourhood Monitor  
Exactus™ BAM / E-BAM Plus (PM<sub>10</sub>)  
Spirant™ BAM  
MicroVol™ 1100 Low Volume Air Sampler  
HiVol™ 3000 High Volume Air Sampler



#### 4 AEROSOL MONITORING & MEASUREMENT

Aurora™ 1000	Clear choice for visibility monitoring
Aurora™ 2000	Real-time mass concentration
Aurora™ 3000	Proven results for long-term monitoring
Aurora™ 4000 Polar	Measuring the aerosol phase function
ACS™ 1000	Innovation in hygroscopic study

#### 5 GREENHOUSE GAS MEASUREMENT

Spectronus™ FTIR  
N<sub>2</sub>O, CH<sub>4</sub>, CO, CO<sub>2</sub> (including  $\delta^{13}\text{C}$  &  $\delta^{18}\text{O}$ )

#### 6 METEOROLOGICAL SENSORS

Wind Speed & Direction Sensors  
Relative Humidity & Temperature Sensors  
Solar Radiation Sensors  
Barometric Pressure Sensors  
Precipitation Sensors  
Visibility Monitors

#### 7 INTEGRATED SYSTEMS

Ambient Air Quality Monitoring Systems  
Trace/Background Air Monitoring Systems  
Water Quality Monitoring Systems  
Tunnel & Roadside Monitoring Systems  
Blast Monitoring Systems  
Continuous Emissions Monitoring Systems (CEMS)  
Solar, battery or mains powered Particulate Monitoring Systems  
Custom Designed Shelters to house monitoring systems  
Integro™ LIDAR Network dust measurement & monitoring system

#### 8 NOISE & VIBRATION MONITORING

ORION™	Smart Vibration Monitoring Terminal
DUO™	Sound Level Meter & Monitoring Station
FUSION™	Smart Sound & Vibration Analyser
CUBE™	Smart Noise Monitoring Terminal

#### 9 SOFTWARE & HARDWARE SOLUTIONS

Congrego®	Data Logger
Airodis™	Data Collection, Validation & Reporting
AMS™	Asset Management System

#### 10 OPERATION & MAINTENANCE



# 1 | Gas Analysers & Small Sensor Monitors



## SMALL SENSOR AIR QUALITY MONITORING SYSTEM

**AQMesh™** is the tried and tested name in hyperlocal small sensor technology for commercial use.

- 110+ published scientific and research papers\*
- Thousands of hours of real-world trials and commercial placements in more than 30 countries
- No other commercially available small sensor system demonstrates better accuracy\*\*
- Designed to work alone or in harmony with new or existing reference quality AQMS
- Improve spatial resolution of air quality monitoring networks.



## REFERENCE QUALITY GAS ANALYSERS

The Ecotech range of Serinus® gas analysers have been designed using our experience and knowledge gained from operating large air quality monitoring networks for more than 40 years.

### SERINUS® 10

Ozone Analyser  
(O<sub>3</sub>)

### SERINUS® 30

Carbon Monoxide Analyser  
(CO)

### SERINUS® 40

Oxides of Nitrogen Analyser  
(NO, NO<sub>2</sub>, NO<sub>x</sub>)

### SERINUS® 44

Ammonia Analyser  
(NO, NO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub>)

### SERINUS® 50

Sulfur Dioxide Analyser  
(SO<sub>2</sub>)

### SERINUS® 51

Sulfur Dioxide &  
Hydrogen Sulfide Analyser  
(SO<sub>2</sub>, H<sub>2</sub>S)

### SERINUS® 55

Hydrogen Sulfide Analyser  
(H<sub>2</sub>S)

### SERINUS® 56

Total Sulfur Analyser  
(TS)

### SERINUS® 57

Total Reduced Sulfur Analyser  
(TRS)

### SERINUS® 60

Nitrogen Dioxide Analyser  
(NO<sub>2</sub>)



## 2 | Gas Calibrators

- **Highly flexible:** Gas dilution calibrations, ozone analyser precision checks, gas phase titrations and ozone transfer calibrations
- **New user interface,** conceived and designed using customer input, is simple to configure and intuitive to use
- **Class-leading performance:** Accuracy, traceability, repeatability.

### SERINUS® CAL 1000

The Serinus® Cal 1000 performs gas dilution calibrations and is used in conjunction with regulatory traceable gases and a zero air generator.

### SERINUS® CAL 2000

With all the features of the Serinus® Cal 1000, the Serinus® Cal 2000 adds features essential for calibrations of NO<sub>x</sub> and O<sub>3</sub> analysis equipment. An internal ozone generator enables regular ozone checks and Gas Phase Titrations (GPT).

### SERINUS® CAL 3000

With all the features of the Serinus® Cal 1000 and 2000, the Serinus® Cal 3000 adds an ozone photometer for the accurate creation and delivery of ozone concentrations when calibrating ozone analysers.



\* Google Scholar as of 30 May 2019

\*\* Environmental Instruments Ltd 2016, "Looking for a 'low cost' air quality monitoring solution? 10 reasons why you should choose AQMesh", 25 Jul



## 3 | Particulate Monitoring

With more than 25 different particulate monitors to choose from in the entire Ecotech range, the Neighbourhood Monitor, Exactus™ BAM and Spirant™ BAM are three examples of the latest particulate monitoring technology to incorporate the following features:

- Solar or mains powered
- Totally self-contained system\*
- Integrated weatherproof enclosure\*
- Remote communications
- Nomadic relocation
- Rapid redeployment
- Minimal site preparation
- Cloud based data options
- Short time average continuous data
- 1 min intervals if required
- TSP, PM<sub>10</sub>, PM<sub>2.5</sub> size selective inlets.



MICROVOL™ 1100  
Low Volume Air Sampler



HIVOL™ 3000  
High Volume Air Sampler



Spirant BAM™ Particulate Monitor

### NEIGHBOURHOOD MONITOR

- Low cost dust management monitor
- Rugged & lightweight
- Highly portable
- Internal GPS
- Minimal servicing
- Plug & play set up.

### EXACTUS™ BAM / E-BAM PLUS (PM<sub>10</sub>)

- Compliance monitor for PM<sub>10</sub>
- US EPA designation
- Emergency responder
- Deployable in 15 mins
- Fence line monitoring
- Lightweight & rugged construction.

### SPIRANT™ BAM

- Compliance monitors
- US EPA designation
- Air quality networks
- TSP, PM<sub>10</sub>, PM<sub>2.5</sub> sample inlets available
- Easier to service, enhanced reliability & lower power consumption than competing instruments
- Almost 60 mins of sampling per hour delivers improved sensitivity and time resolution.

### CERTA™ 1100 / FIDAS 200S

- EN certified
- Compliance & research monitoring
- Simultaneous TSP, PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>4</sub>, PM<sub>1</sub>
- Almost 60 mins of sampling per hour delivers improved sensitivity and time resolution
- 64 size channels
- Adjustable time resolution from > 1 sec to 24 hrs
- Reliable function
- Very high data availability > 99 %
- Remote monitoring, maintenance & control
- No consumables
- IP65 enclosure.

### MICROVOL™ 1100 LOW VOLUME AIR SAMPLER

- PM<sub>10</sub>, PM<sub>2.5</sub> or TSP
- Flexible sampling platform for particulates and basic meteorological parameters
- Light weight, rugged weatherproof
- Indoor & outdoor applications
- Wind direction & speed used to activate/de-activate sampler
- Quiet operation, ultra-efficient, long life DC pump
- Optional battery or solar power.

### HIVOL™ 3000 HIGH VOLUME AIR SAMPLER

- PM<sub>2.5</sub>, PM<sub>10</sub> or TSP
- Remote unattended sampling along with basic meteorological parameters
- US EPA approved
- Only high volume sampler with CE and C-tick approval
- Volumetric flow control automatically corrected to standard reference temperature
- Programmable reference temperatures
- Industrial brushless motors (100k hours continuous field operation)
- Weatherproof marine quality anodised aluminium cabinet
- Wind direction & speed used to activate/de-activate sampler
- Simple programming of sampling periods & remote control from PC.

\*Excluding Spirant™ BAM



## 4 | Aerosol Monitoring & Measurement

**Comprehensive range of Ecotech Aurora™ nephelometers from single or three wavelength integrating nephelometers to a polar three wavelength integrating nephelometer.**

- Total remote control including calibration
- Rugged and robust. Proven capability in remote, unattended locations for long term monitoring
- Fully integrated with Airodis™ data collection, validation and reporting software by Ecotech
- User friendly and easy to maintain in the field
- Uncompromising performance with low cost of ownership.



### **AURORA™ 1000**

#### **Clear choice for visibility monitoring**

Uncompromised in its reliability and designed to run in extreme conditions, the Aurora™ 1000 is a highly cost-effective entry level instrument for any air quality monitoring system.

### **AURORA™ 2000**

#### **Real-time mass concentration**

Using a single wavelength nephelometer to measure aerosol light scattering in conjunction with a Spirant™ BAM, the Aurora™ 2000 uses the reading from the Spirant™ BAM's hourly average to calculate a correlation factor to drive real-time PM<sub>2.5</sub> concentrations. When the Spirant™ BAM is not connected the user can manually derive and enter a correlation factor.

### **AURORA™ 3000**

#### **Proven results for long-term monitoring**

The favoured choice of researchers, the Aurora™ 3000 facilitates simultaneous measurement across three wavelengths, enabling wide and in-depth analysis of the interaction between light and aerosols.

### **AURORA™ 4000 POLAR**

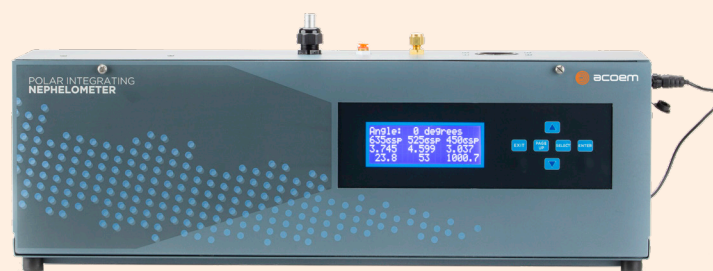
#### **Measuring the aerosol phase function**

The Aurora™ 4000 Polar provides measurements of light scattering with up to 18 user selectable angular sectors using varied backscatter shutter positioning. This can be used to determine the phase function of aerosols crucial to climate research and modelling.

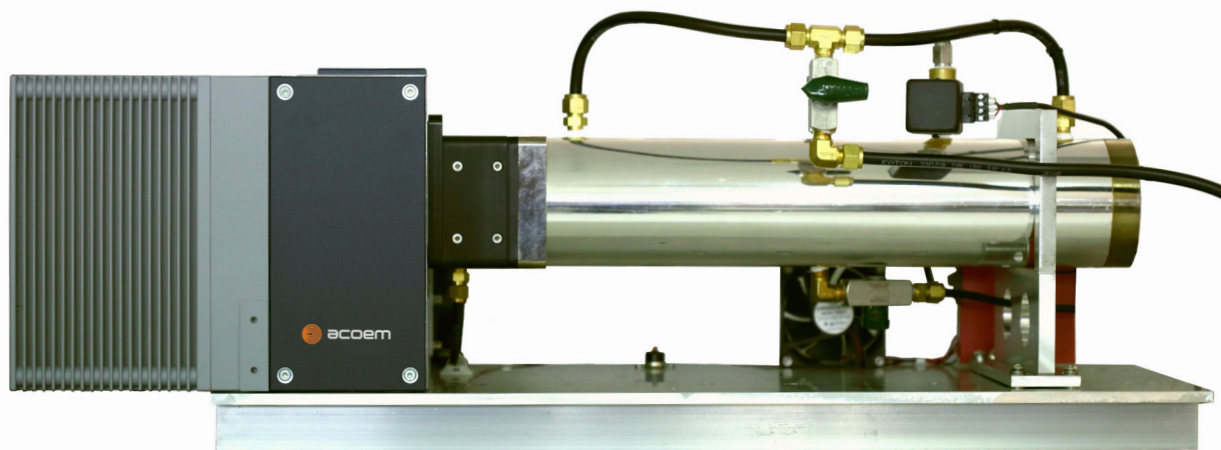
### **ACS™ 1000**

#### **Innovation in hygroscopic study**

The Aerosol Condition System (ACS™) 1000 can be used with most aerosol monitoring instruments, adjusting relative humidity with minimal particle loss to measure the effect of water uptake on the properties of aerosols. The ACS™ 1000 simultaneously controls differing relative humidity levels in two sample channels, allowing real-time measurement by parallel instruments for comparison.

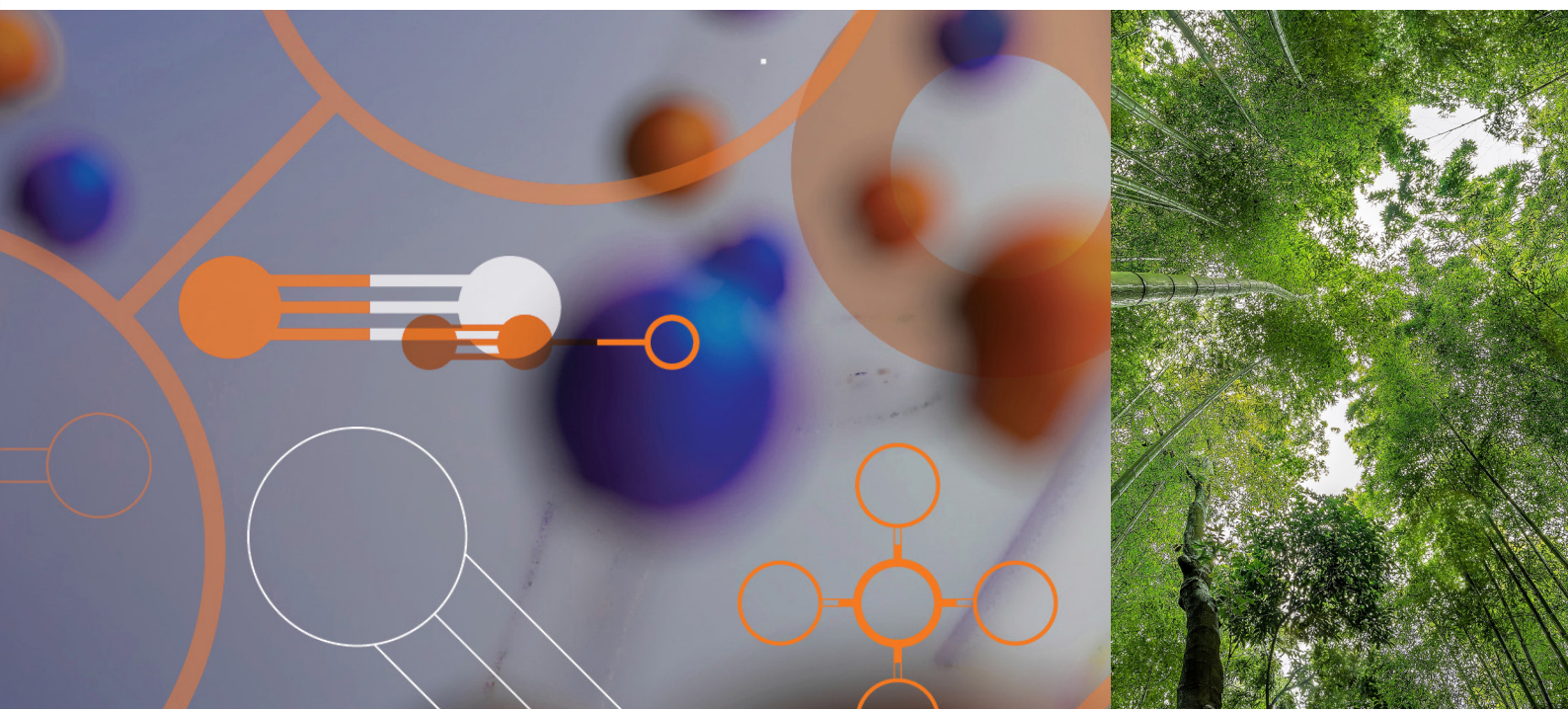


## 5 | Greenhouse Gas Measurement



### **Spectronus™ FTIR – Trace Greenhouse Gas and Isotope Analyser** **Simultaneous & real-time measurement of N<sub>2</sub>O, CH<sub>4</sub>, CO, CO<sub>2</sub>** **(including δ<sup>13</sup>C & δ<sup>18</sup>O)**

The Spectronus™ FTIR analyser by Ecotech combines a Fourier Transform Infrared (FTIR) spectrometer, multi-pass gas sample cell and a high performance detector to provide simultaneous measurement of multiple greenhouse gas species with high repeatability and excellent reproducibility without the need for frequent gas calibrations.





## 6 | Meteorological Sensors

**Meteorological sensors that best suit the climatic and weather conditions of any country.**

Meteorological sensors include:

- Wind Speed & Direction Sensors
- Relative Humidity & Temperature Sensors
- Solar Radiation Sensors
- Barometric Pressure Sensors
- Precipitation Sensors
- Visibility Monitors.



## 7 | Integrated Systems

Designed to withstand the toughest environments from urban cities and industrial sites to tropical rainforests and frozen landscapes, Ecotech designs integrated systems to meet the demands of unique environmental monitoring applications.

Ecotech design, manufacture, install, commission and maintain bespoke integrated systems throughout the world including:

- Integrated Noise Monitoring Systems
- Ambient Air Quality Monitoring Systems
- Trace/Background Air Monitoring Systems
- Water Quality Monitoring Systems
- Tunnel & Roadside Monitoring Systems
- Blast Monitoring Systems
- Continuous Emissions Monitoring Systems (CEMS)
- Solar, battery or mains powered Particulate Monitoring Systems
- Custom Designed Shelters to house monitoring systems
- Integro™ LIDAR Network dust measurement & monitoring system.





## 8 | Noise & Vibration Monitoring

### ORION™

#### Smart Vibration Monitoring Terminal

An all-in-one vibration monitoring system with integrated sensor, 3G modem, Wi-Fi and GPS. It is robust, waterproof, easy to configure and use, and features seven measurement channels and smart integration of vibration standards.

### DUO™

#### Sound Level Meter & Monitoring Station

All-in-one: FUSION™ and CUBE™ in a single instrument. DUO™ is completely modular with a comprehensive range of options that lets you use it either as a sound level meter or a fully-fledged noise monitoring station.

### FUSION™

#### Smart Sound & Vibration Analyser

The first sound level meter to offer completely wireless vibration measurement. Connect FUSION™ to a powerful vibration sensor and it will record and store 3-axis vibrations in parallel, audio signals and all noise indicators.

### CUBE™

#### Smart Noise Monitoring Terminal

Designed to fit into a variety of different casings, from fixed plastic or metal cabinets to portable weatherproof cases. Antennas (WiFi, 3G and GPS) are easily connected via three accessible ports which can be relocated to the exterior of the casing.



FUSION™ Smart Sound  
& Vibration Analyser

Orion™ Smart Vibration  
Monitoring Terminal

DUO™ Sound Level Meter  
& Monitoring Station

CUBE™ Smart Noise  
Monitoring Terminal

## 9 | Software & Hardware Solutions

### CONGREGO® DATA LOGGER

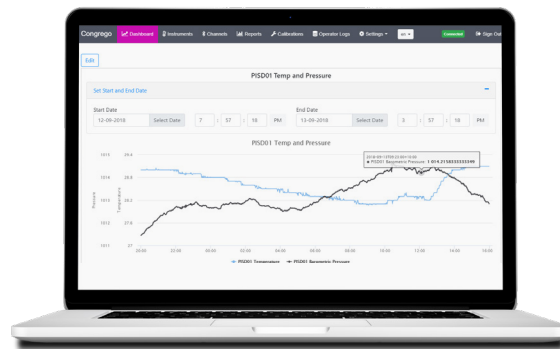
Total data control and logging for air quality and continuous emission systems. Simple set-up and easy to install. Intuitive and customisable user interface. Compatible with a wide range of analogue and digital monitoring instruments. Congrego® fulfills the “traceability of records” requirement of ISO 17025.

### AMS™ ASSET MANAGEMENT SYSTEM

Designed to meet the unique operator requirements of complex monitoring networks with tens or hundreds of individual pieces of environmental monitoring equipment, AMS™ provides a critical tool to manage maintenance scheduling down to task level as well as a central point where all relevant calibration and equipment maintenance records can be stored. This greatly facilitates any internal or external audit process and improves access to records for data validation.

### AIRODIS™ DATA COLLECTION, VALIDATION & REPORTING

Airodis™ is an environmental data management software package that automates the process of retrieving data from multiple data loggers allowing users to validate data and generate a wide range of reports. Airodis™ is designed to easily manage valuable data and maximise user productivity while ensuring accuracy and traceability.




## 10 | Operation & Maintenance

Ecotech offers a range of environmental monitoring services including:

- Technical support
- Expert onsite service and maintenance
- Third party audits
- Calibrations
- In house service and repairs
- Data reporting
- ISO 9001 certified manufacturing facilities
- ISO/IEC 17025 accredited testing laboratories, calibration laboratory and blast monitoring service.





### About ACOEM: Reduce your environmental impact

The ACOEM Group is a global leader in providing sustainable solutions for the development of smart cities of the future. It is committed to helping companies and public authorities meet challenges by offering products and services that:

- Prevent and control air, noise and vibration pollution
- Increase the productivity and reliability of industrial machinery
- Contribute to the development of effective, robust & noiseless solutions
- Protect soldiers, sites and vehicles in military operations.

Across the world, ACOEM's 700+ employees innovate in the measurement, analysis and control of environmental parameters through its 01dB, ECOTECH, ONEPROD, FIXTURLASER, MEAX, DYNOPTICS, TUNNEL SENSORS and METRAVIB brands.

### About ACOEM Ecotech:

For over 40 years, ACOEM Ecotech has pioneered innovative solutions in environmental monitoring for air, water, gas, noise, vibration, blast, meteorology, fine particulate and dust. Headquartered in Australia, and certified to internationally recognised quality standards, ACOEM Ecotech operates in more than 80 countries, managing and maintaining over 500 real-time environmental monitoring sites consisting of thousands of individual pieces of precision equipment.

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