Enviro News
Winter 2015

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Doing things BETTER since 1983

How clean is the air we breathe?

Our Brand New State-of-the-Art Air Quality Monitoring Vehicle takes to UK streets to find out.

Measuring pollutants with the greatest impact on health, NO_2, particulates ($PM_{2.5}$ and PM_{10}) and ozone, and greenhouse gases - carbon dioxide and methane.

Welcome to our Winter 2015 edition of EnviroNews

Whilst those of us "in the industry" have long suspected that vehicle emission figures quoted by vehicle manufacturers just do not stack up with real-world transport emissions and air quality data, the VW scandal has, if nothing else, greatly increased the profile of air quality, and the serious health impacts from particles and NO_2.

Overshadowed in the past by PM_{10} $PM_{2.5}$ and ultrafine particles, NO_2 has been in the spotlight recently, and rightly so: it causes approximately the same number of premature deaths per year as do particles.

ET leads the way in both NO_2 and particulate monitoring. Whilst most mainstream NOx analysers don't actually measure NO_2 and just infer it, we have a range of technology that improves on traditional NOx analysers for NO_2. For instance the T500U CAPS direct-reading NO_2 analyser used in our AQMV and also the T200UP "blue-light" NOx analyser featured in the BT Tower case study.

We have also been busy expanding our particle monitoring portfolio with the MCERTS approved Grimm EDM180 simultaneous $PM_{10}/PM_{2.5}/PM_{1.0}$ analyser and at the lower price end of the spectrum, two new "indicative" products from Met One Instruments, the ES-642 and the web-enabled Neighborhood Monitor.

We hope you enjoy our newsletter, and please do get in touch to learn more about any of the products featured or case studies presented.

And should you wish to comment or feedback on any experiences dealing with ET, please email me at duncan.mounsor@et.co.uk

Duncan Mounsor
Managing Director

New faces

We have a few new faces we would like to welcome to our team.

Anthony Ingram
Customer Support Engineer

Anthony is based in Bath and works alongside Russell Cook providing service and maintenance for many of our industrial clients throughout the UK.

Emma Saddler
HR Advisor

Emma is providing HR advice and support to the management team as well as helping us improve all areas of our HR system.

Susan Cooper
Admin Coordinator

Susan supports our Customer Services Manager to ensure the smooth and efficient running of the Service Team and looks after the Admin / Stores and Workshop areas of the business.

We'd like to take this opportunity to thank our customers for their business throughout 2015 and wish you all a very Merry Christmas and a Prosperous and Happy New Year

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Due to its adverse effects on human health, NO_2 is part of the EU Air Quality Directive which sets limit values for hourly and annual mean exposure. The annual mean limit value of 40 $\mu g\,m^{-3}$ is exceeded in many urban centres throughout the UK, including London. Measures are in place to control the emissions of NOx (the sum of NO + NO_2) and UK emissions are projected to decline by about 35% between 2010 and 2020. It is known that ambient NO_2 does not respond linearly to reductions in the concentration of NOx, in part due to changes in diesel emission control technology leading to increases in directly emitted NO_2. Trends in ambient concentrations of NOx and NO_2 in the UK have generally shown a decrease in concentration from 1996 to 2002, followed by a period of more stable concentrations from 2004–2012. This is not in line with the expected decrease suggested by the UK emission factors, especially in London.

Measurements of NOx from the BT tower, 190 metres above central London street level are representative of an area of up to 20 km radius from the tower, thus giving information on average levels in the city. Data will be used to assess changes in NOx levels over the next 5-10 years, which is a critical time with respect to expected reductions in emissions due to new vehicle emission technologies introduced from 2014 onwards (so-called Euro VI standards). Previous standards have failed to deliver the expected reductions in emissions under 'real world' driving conditions and our measurements will help to assess the success of the latest standards. The **Teledyne API T200UP Chemiluminescent NOx Analyser with photolytic converter**, supplied by Enviro Technology, provides us with reliable measurements of NOx, including 'real' NO_2 via its blue light photolytic converter. This is crucial at this site as there would be the potential for significant interferences in the NO_2 measurement if we were using an instrument based on a catalytic converter.

Dr James Lee, National Centre for Atmospheric Science
Department of Chemistry, University of York

ET are pleased to announce we are now registered with Achilles

As a leading supplier of MCERTS Approved Continuous Emissions Monitoring Systems, Achilles registration on top of our existing ISO 9001, ISO 14001 and ISO 18001 certification demonstrates our commitment and capability across our entire CEMS customer base.

UVDB empowered by Achilles Registered

AQMV

Air Quality Monitoring Vehicle

"Air pollution causes more than 50,000 deaths a year in the UK and costs the economy billions. We have developed the Air Quality Monitoring Vehicle to give local authorities and researchers a powerful new tool to plan action to clean up our air and tackle one of our greatest public health challenges."

Duncan Mounsor, MD

ET's new Air Quality Monitoring Vehicle (AQMV) is the UK's greenest and most sophisticated mobile air quality monitoring laboratory using state of the art, next generation measurement battery-powered equipment in an electric van.

Creating no pollution or greenhouse gas emissions of any kind AQMV is able to measure key pollutants and greenhouse gases with extreme accuracy, both at static locations and on the move. It is also able to switch between monitoring outside air and air inside the driver's cab.

The mobile laboratory carries state-of-the-art instrumentation which is more sensitive, more accurate, and faster than the UK's standard monitoring network, particularly regarding NO_2. It makes direct measurements in real time, using lasers, LEDs and sophisticated optical equipment.

Mounted in a Nissan eNV-200 van powered solely by batteries with a 100-mile range between charges. The lightweight equipment runs on less than 300 Watts and It is powered by lithium ion batteries, which provide up to nine hours' operation and can be recharged within an hour.

AQMV measures:

- Pollutants with the most damaging health impacts: NO_2, particulates (PM_{10}, $PM_{2.5}$), and ozone. It can add equipment to measure ultrafine particles.
- The most significant greenhouse gases: CO_2 and methane.
- GPS locations –allowing air quality data to be mapped and identifying pollution hotspots.
- Meteorological conditions affecting air pollution – wind speed and direction, temperature and pressure.

'The availability of Enviro Technology Services' new Air Quality Monitoring Vehicle is an important step forward for the UK. Although London and the UK has extensive fixed site air quality monitoring sites the deployment of a mobile unit will provide instantaneous, on-site data directly relating to a multitude of air quality issues. A priority for the use of this mobile unit must be a more proactive approach to improving air quality by ensuring compliance with ambient air quality standards.'

Professor Frank Kelly, Professor of Environmental Health, King's College London,

AQMV takes to the streets to study NO_2 levels inside and outside

Recent pilot study

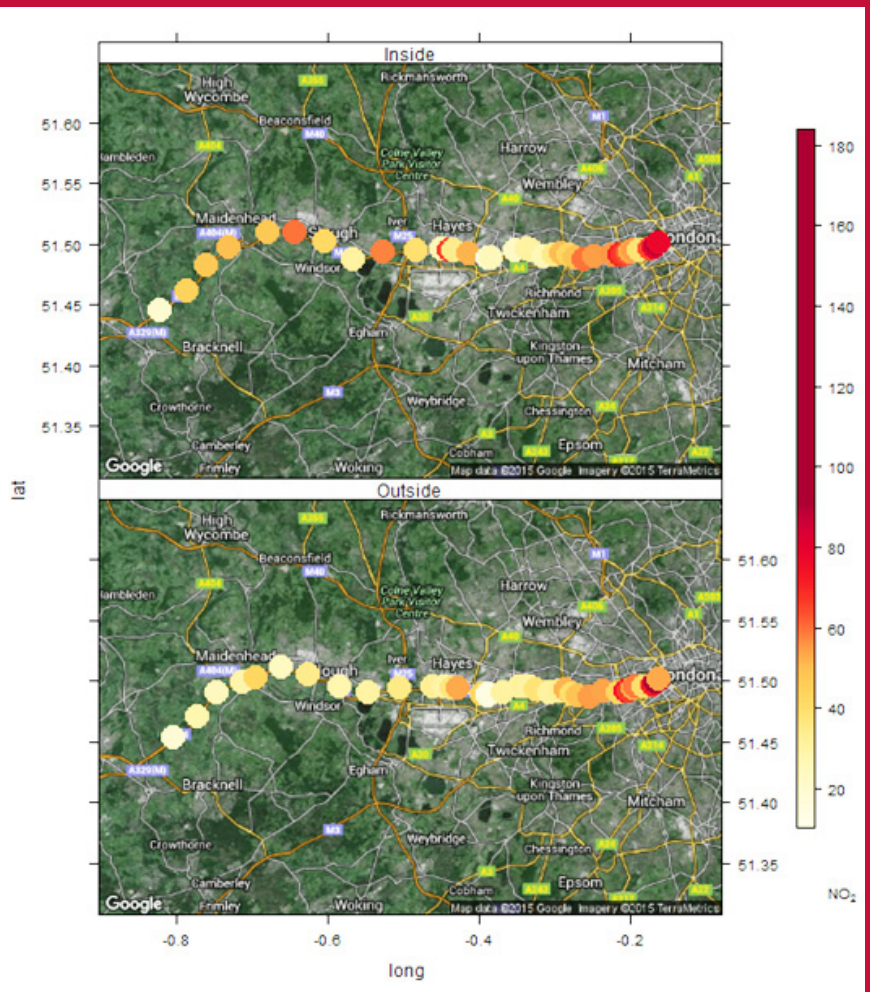
AQMV conducted a pilot NO_2 study on a two hour journey from Reading along the M4 and through central London to Waterloo Bridge using its new capabilities. It found that the driver and passenger were consistently exposed to levels of NO_2 the same as or higher than those on the road outside. Mean average concentrations of NO_2 outside the vehicle were 66 µg m3 (micrograms per cubic metre) but 21% higher inside the vehicle at 80 µg m3.

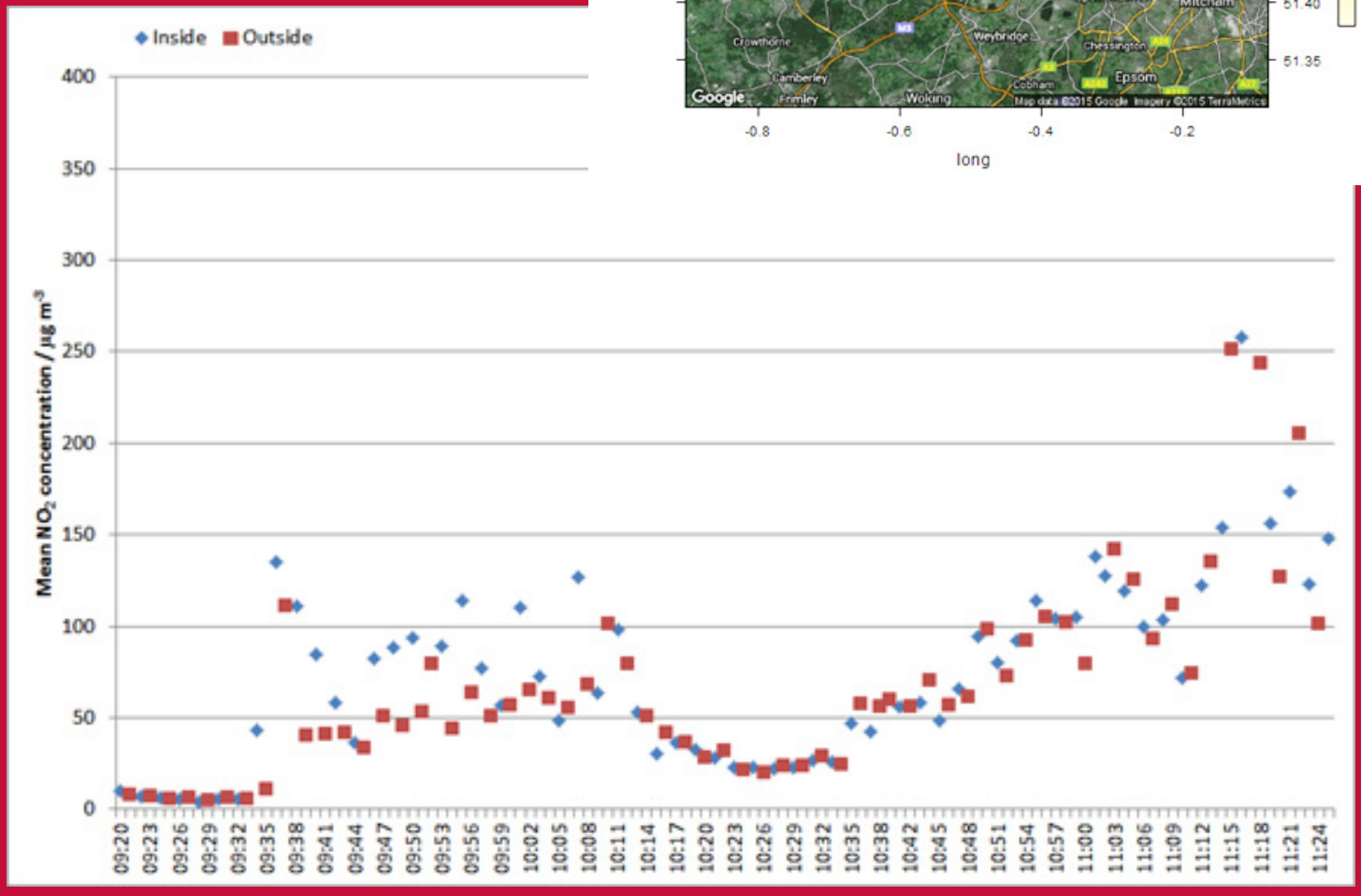
The Air Quality Monitoring Vehicle also found levels of NO_2 inside the vehicle reaching up to 350µg m3 for brief periods in central London. The EU sets an hourly safety limit of 200 µg m3 and an annual limit of 40 µg m3.

Data provided by Dr Ben Barratt, King's College London

Inside and Outside NO_2 levels in micrograms per cubic metre plotted by location.

NO_2 levels reported in micrograms per cubic metre





Product NEWS

Introducing the EDM180 Environmental Dust Monitor from Grimm Aerosol Technik.

This is the ultimate solution to measure PM_{10}, $PM_{2.5}$, PM_{1} and the TC (Total counts) simultaneously and in real time.

- No consumables needed
- No loss of semi-volatile compounds due to nafion dryer
- Real-time measurements (6 seconds)
- Option to add particle counts - 31 size channels
- Certified to EN12341 and EN14907
- Proven in the field for over 10 years

AL 4021 Continuous Formaldehyde Monitor

The Aero-Laser formaldehyde monitor AL4021 is an extremely sensitive chemical analyser. It features the detection of formaldehyde down to lowest concentrations of 100ppt (parts per trillion) for gaseous samples, and 150ng/liter (eq. 2×10 molar) for liquid samples, respectively.

Originally designed for environmental and climate research, the AL4021 has became a major instrument in the field of formaldehyde emission monitoring of products based on wood, plastics or fibres, within the last years.

AL 2021 Continuous Hydrogen Peroxide Monitor

The H_2O_2 monitor AL2021 from Aero-Laser has an extraordinary high sensitivity and a unique low detection limit of 100ppt (parts per trillion) for gaseous samples and 100 ng/liter (eq. 2×10 molar) for liquid samples, respectively.

The AL2021 was originally developed for environmental and climate research and is employed worldwide in atmospheric monitoring stations.

Model 430 Compact Ozone Analyser

TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

The 430 is a compact analyser that uses the proven UV Absorption principle.

The small footprint and robust design make it ideal for a variety of applications including, but not limited to, rural and remote monitoring, urban saturation studies, "hot spot" identification, enhanced ambient network monitoring, atmospheric research and citizen science/ community scale monitoring.

Product NEWS

N_2O/CO Analyser

By popular demand LGR have launched The NEW Ultraportable N_2O / CO Analyser.

LGR's N_2O/CO Analyzer is capable of continuously measuring ambient levels of nitrous oxide and carbon monoxide with high precision in real time.

Designed for many demanding applications including trace-gas (air quality) monitoring (e.g., GAW stations), eddycorrelation flux measurements, chamber flux measurements, and combustion diagnostics.

Los Gatos Research
A MEMBER OF THE ABB GROUP

Simplify Soil Studies

$CH_4/CO_2/H_2O/NH_3$ Analyser

The NEW Ultraportable $NH_3/CH_4/CO_2/H_2O$ Greenhouse Gas Analyser is ideal for soil studies, compliance monitoring, leak detection, air quality and agricultural studies, and wherever measurements of trace gases are needed.

Now for the first time a single instrument can measure greenhouse gases and ammonia.

Dissolved Gas Extraction Unit

The Dissolved Gas Extraction Unit (DGEU) allows continuous concentration measurements of dissolved gases in water and other liquids in real time.

The Unit is controlled via software on selected LGR analysers to provide autonomous measurements in the field.

Product NEWS

Met One Instruments

ES-642 Particulate Monitor

The ES-642 is a type of nephelometer which automatically measures real-time airborne PM_{10}, $PM_{2.5,}$ or TSP particulate concentration levels using the principle of forward laser light scatter.

Applications include:

- Rail and roadside monitoring
- Schools and playgrounds
- Underground facilities
- Solar power installations
- Wind energy installations
- Farms and ranches
- Hotels and public venues
- Construction Dust

All-In-One Weather Sensor (AIO 2)

The All-In-One (AIO) 2 Weather Sensor, is a the next-generation weather instrument that measures temperature, relative humidity, wind speed, wind direction, and barometric pressure in a single compact, rugged unit.

BC-1050 Black Carbon Monitor

The BC-1050 Black Carbon Monitor measures black carbon through optical attenuation and absorption principles in both the infrared and ultraviolet spectral regions.

- Dual IR and UV Light Sources

The BC-1050 is simple, reliable, cost effective and produces defendable BC data with high time resolution that may be used for:

- Air quality surveillance
- Global warming studies
- Particulate emissions studies
- Near-roadside monitoring
- Visibility studies

PM Data Where and When you want it

Neighborhood Particulate Monitor

The Met One Instruments Neighborhood Air Monitor is a versatile and inexpensive $PM_{2.5}$ sensor that continuously monitors air quality on the neighborhood scale and makes data available immediately in the "Cloud".

Simple

Affordable

Wireless

Software NEWS

NumaView™

NumaView™ software has arrived.

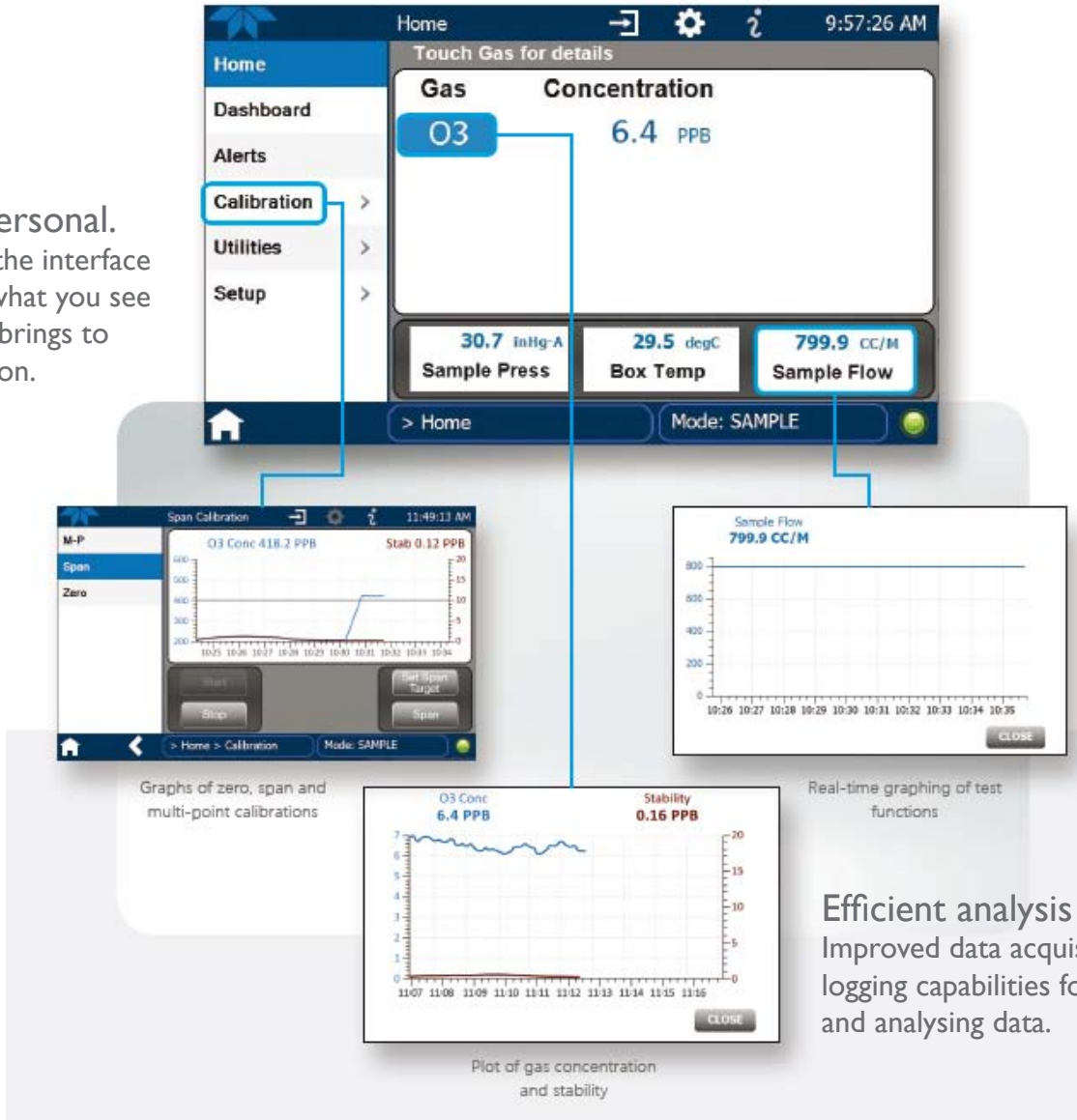
ET are pleased to announce the release of NumaView software: a premier interface for the T Series product line.

Immediate productivity.

Efficient navigation, a full touchscreen and graphing tools deliver results instantly.

Make it personal.

Customize the interface to control what you see and what it brings to your attention.



Graphs of zero, span and multi-point calibrations

Real-time graphing of test functions

Plot of gas concentration and stability

Efficient analysis of data.

Improved data acquisition and logging capabilities for collecting and analysing data.

This is a no-cost option for the T100 SO_2, T200 NOx, T300 CO and T400 O_3 Analysers.

Alternatively NumaView can be installed on older T Series analysers as a chargeable upgrade.