

# Ambient Air Quality Monitoring



U.S. EPA Approved  
EQSA-0495-101  
EQNA-0495-102  
EQQA-0495-103  
TÜV Approved



## Monitoring Background Levels

# Monitoring Background Levels

In this application Opsis monitors background levels of air pollution in urban or remote areas, such as mountainous districts. Opsis' benefits include its ability to simultaneously monitor very low levels of different kinds of gaseous pollution. Opsis multi-analytical capabilities are extremely valuable when studying the relationship between various pollutants in the atmosphere.

Continuously generated air quality data is stored by the system's analyser, allowing information to be presented as averages for any user-defined interval – minutes, hours or days – either in real time or retrospectively.

Opsis will monitor any compound characterized in its software. In background air quality monitoring applications, this allows one system to measure for example nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), nitrous acid (HNO<sub>2</sub>), nitrate radical (NO<sub>3</sub>), as well as formaldehyde and other hydrocarbons.

## The Opsis Technique

A basic Opsis system includes an analyser connected by a fibre optic cable to a light path created by a light emitter and a receiver. Several light paths may be run from a single analyser. The system may be permanently installed or operated from a mobile facility such as a specially equipped vehicle.

In either case the analyser will accept data from other devices producing a continuous 4–20 mA or a digital output. This allows information from meteorological sensors (wind strength and direction, temperature etc.) to be presented with air quality data to give a more detailed picture of environmental conditions.

Please refer to separate data sheets on the AR 500 series analyser, on the ER 110 and ER 150 light emitter and receiver sets for fixed systems and on the ER 130 for mobile systems.

## Tests and Approvals

Opsis has been tested and approved by a number of internationally recognized institutes and authorities. The system meets the requirements of the U.S. EPA and the German authorities. Full details are available on request.

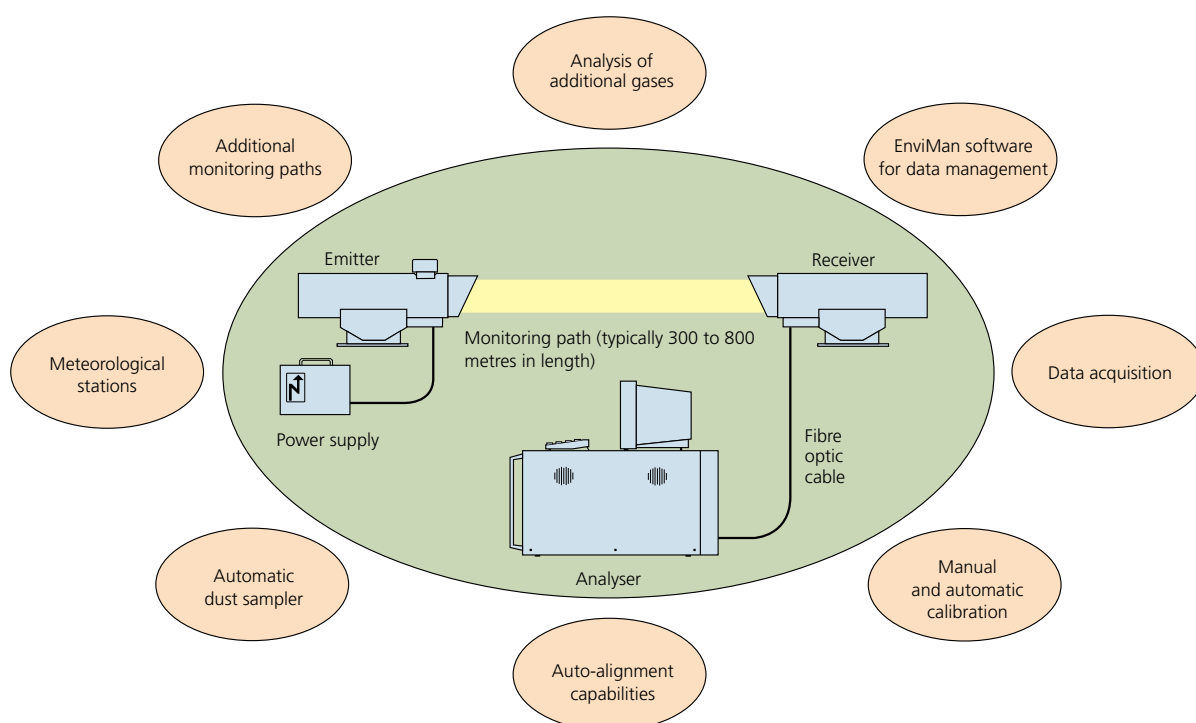
# Opsis – the Total Monitoring Solution

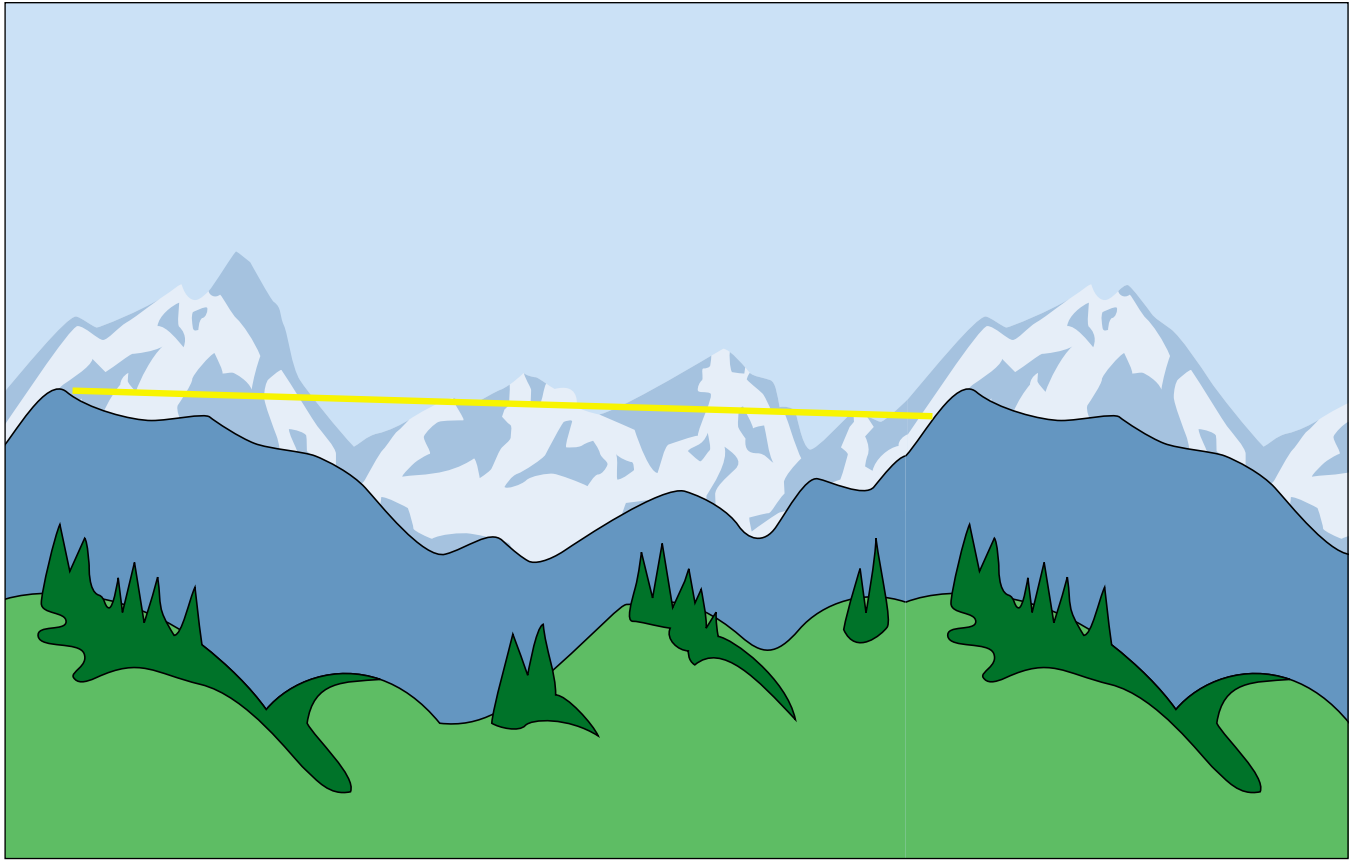
The Opsis long-path air quality monitoring system brings new standards of accuracy and data quality to environmental monitoring. Every minute, several thousand cubic metres of air interact with the light between the light source – the emitter – and the receiver. When captured by the receiver, this light contains information on gases in the air it has penetrated.

This information is extracted by spectrographic analysis. Results are logged as data that can be collected for further analysis by modem – from anywhere in the world.

Opsis offers the total monitoring solution including software for data handling and management. In addition, Opsis offers dust monitors and conventional analysers.

Opsis technology is subject to a continual process of development. This, with the modular construction of Opsis systems, means that it is always possible to expand or update an installation without redundancy of viable equipment.





An Opsis installation monitoring background levels in a mountainous district

### Performance Data (additional compounds can be monitored)

Compound	Max. measurement range (500 m path) <sup>3)</sup>	Min. detectable quantities (monitoring path 500 m, measurement time 1 min.)	Zero drift (500 m path, max. per month)	Span drift (per month, better than)	Span drift (per year, better than)	Linearity error (of measurement range, better than)	Max. length of fibre optic cable (when measuring several compounds) <sup>1)</sup>	Hardware requirement
<b>AR 500 / AR 520 Analyser</b>								
NO <sub>2</sub>	0–1000 µg/m <sup>3</sup>	0.3 µg/m <sup>3</sup>	±0,6 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
SO <sub>2</sub>	0–1000 µg/m <sup>3</sup>	0.3 µg/m <sup>3</sup>	±0,6 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
O <sub>3</sub>	0–1000 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	±2 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
NO <sub>2</sub> <sup>2)</sup>	0–500 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	±2 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
NH <sub>3</sub> <sup>2)</sup>	0–500 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	±2 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
NO <sub>3</sub>	0–500 µg/m <sup>3</sup>	0.1 µg/m <sup>3</sup>	±0.2 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
HNO <sub>2</sub>	0–500 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	±2 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
Formaldehyde	0–500 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	±2 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 500/520
<b>AR 550 Analyser</b>								
CO <sub>2</sub> <sup>2)</sup>	0–100 g/m <sup>3</sup>	100 µg/m <sup>3</sup>	±200 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 550
CO <sub>2</sub> <sup>2)</sup>	0–100 g/m <sup>3</sup>	1 mg/m <sup>3</sup>	±2 mg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 550
CH <sub>4</sub> <sup>2)</sup>	0–100 g/m <sup>3</sup>	50 µg/m <sup>3</sup>	±100 µg/m <sup>3</sup>	±2%	±4%	±1%	10 m	AR 550
H <sub>2</sub> O <sup>2)</sup>	0–100 g/m <sup>3</sup>	0.1% vol	±0.2% vol	±2%	±4%	±1%	10 m	AR 550

<sup>1)</sup> When monitoring individual compounds, fibre optic cables of extended lengths are available.

<sup>2)</sup> Based on 200 m path. Recommended monitoring path length: 100 to 200 metres.

<sup>3)</sup> Recommended monitoring path length: 300 to 800 metres.

Please contact your Opsis supplier to discuss your particular system requirements, including the compounds you wish to monitor. Separate product sheets are available describing individual items of Opsis system hardware.

*Specifications subject to change without notice*

## Why Opsis?

Total monitoring solution

Cost-effective, open-path technology

High-performance monitoring of criteria pollutants

Low detection limits

Direct monitoring, no sampling required

Direct monitoring of NO<sub>2</sub>, no converter required

Representative path-integrated data

Easily calibrated

Operates with a minimum of maintenance

U.S. EPA approved

TÜV approved

