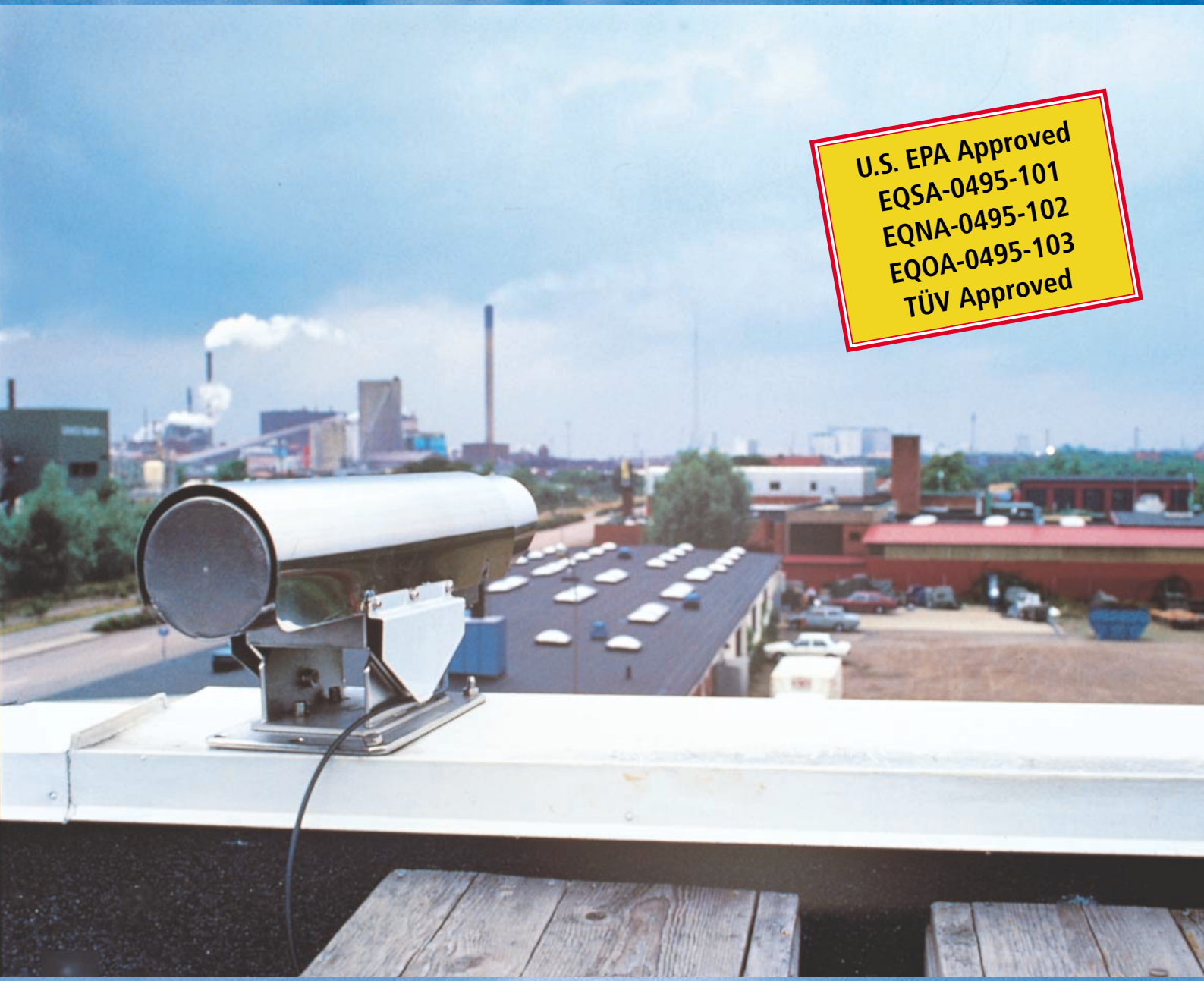
Ambient Air Quality Monitoring



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

OPSIS®

Fence-line Monitoring of Fugitive Emissions

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Fence-line Monitoring of Fugitive Emissions

An Opsis air quality monitoring system gathers data along one or more light paths, each of which may be some hundreds of metres. This makes Opsis an ideal fence-line monitor, since a light path will act as a tripwire to detect fugitive emissions.

An Opsis system will simultaneously monitor several user-defined compounds. More information is included on the reverse page, but typical examples are nitric oxide (NO), ammonia (NH_3), sulphur dioxide (SO_2), formaldehyde, benzene, toluene, phenol and other hydrocarbons. It is therefore possible to specify a system to monitor the emissions from for instance an industrial estate or a manufacturing complex.

Because Opsis will monitor the entire length of a boundary, and because it monitors several compounds simultaneously, it is more efficient and cost-effective than a number of point monitors for individual compounds. Continuously generated data is stored by the system's analyser. This allows information to be presented as averages for any user-defined interval – minutes, hours or days – either in real time or retrospectively.

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 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 events. In the same way, Opsis will accept information from devices such as radiation monitors.

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.

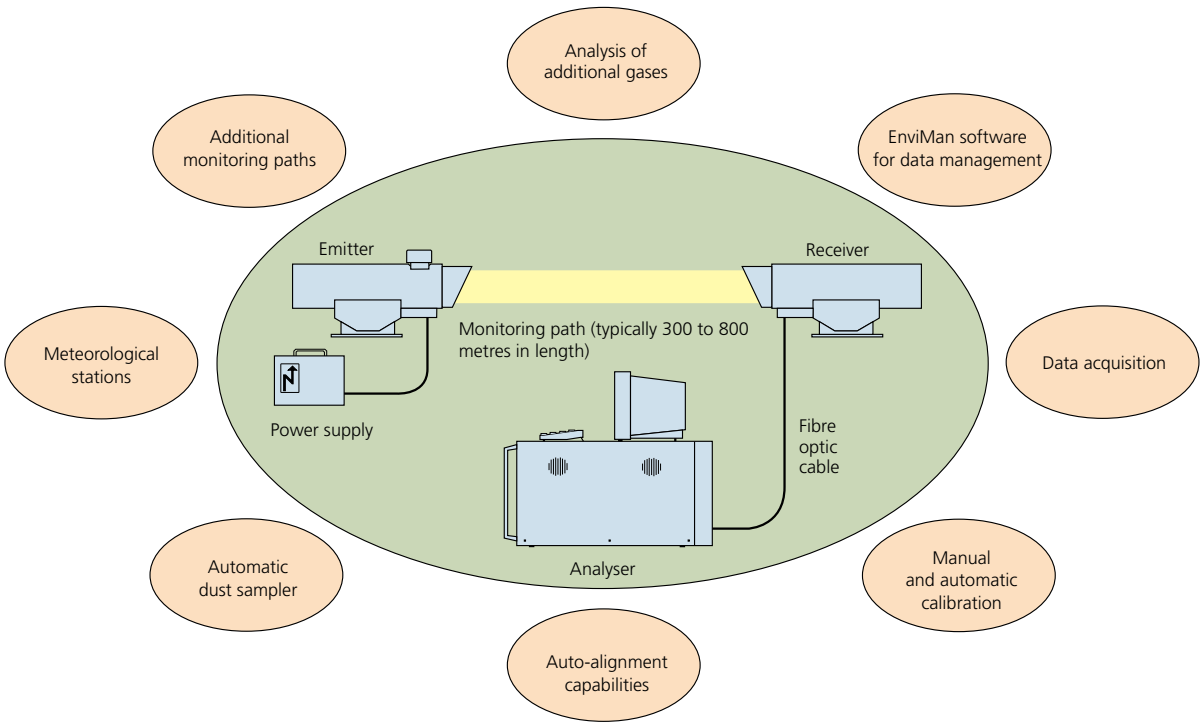
Opsis – the Total Monitoring Solution

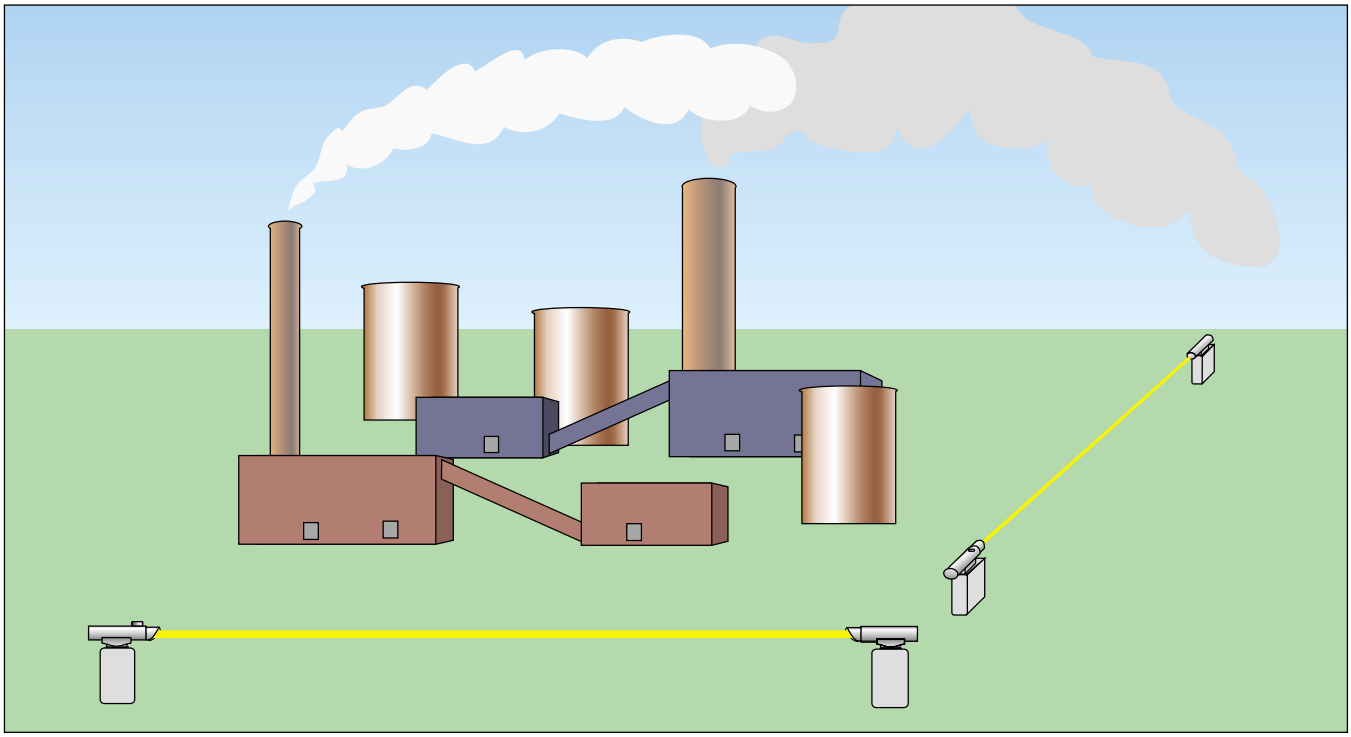
The Opsis long-path air quality monitoring system brings new standards of accuracy and data quality to environmental monitoring. Every minute, several thousand cubic metres of air interact with a beam of light between the light source – the emitter – and the receiver. When captured by the receiver, this 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 system acting as a fence-line monitor detecting fugitive emissions

Performance Data (typical data which may vary significantly depending on application)

Compound	Max. measurement range (500 m path)[3]	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)[1]	Hardware requirement
AR 500 / AR 520 Analyser								
NO_2	0-2000 µg/m³	1 µg/m³	±2 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
SO_2	0-5000 µg/m³	1 µg/m³	±2 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
O_3	0-1000 µg/m³	3 µg/m³	±6 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
NO[2]	0-2000 µg/m³	2 µg/m³	±4 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
NH_3[2]	0-500 µg/m³	2 µg/m³	±4 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
NO_3	0-500 µg/m³	0.1 µg/m³	±0.2 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
HNO_2	0-2000 µg/m³	1 µg/m³	±2 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
HF	0-2000 µg/m³	20 µg/m³	±40 µg/m³	±2%	±4%	±1%	10 m	AR 520
Hg	0-2000 ng/m³	20 ng/m³	±40 ng/m³	±2%	±4%	±1%	10 m	AR 500/520
H_2O	0-100 g/m³	0.2 g/m³	±0.4 g/m³	±2%	±4%	±1%	10 m	AR 500/520
Styrene	0-2000 µg/m³	5 µg/m³	±10 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
CS_2	0-2000 µg/m³	20 µg/m³	±40 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
Formaldehyde	0-2000 µg/m³	2 µg/m³	±4 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
Acetaldehyde	0-2000 µg/m³	20 µg/m³	±40 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
Phenol	0-2000 µg/m³	1 µg/m³	±2 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
Benzene	0-2000 µg/m³	3 µg/m³	±6 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
Toluene	0-2000 µg/m³	3 µg/m³	±6 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
p-, m-Xylene	0-2000 µg/m³	3 µg/m³	±6 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
o-Xylene	0-2000 µg/m³	10 µg/m³	±20 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
o-, m-, p- Cresol	0-2000 µg/m³	5 µg/m³	±10 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
C_6H_5Cl	0-2000 µg/m³	5 µg/m³	±10 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
$C_6H_4Cl_2$	0-2000 µg/m³	5 µg/m³	±10 µg/m³	±2%	±4%	±1%	10 m	AR 500/520
AR 550 Analyser								
CO[2]	0–100 g/m³	100 µg/m³	±200 µg/m³	±2%	±4%	±1%	10 m	AR 550
CO_2[2]	0–100 g/m³	1 mg/m³	±2 mg/m³	±2%	±4%	±1%	10 m	AR 550
NH_3	0–100 g/m³	20 µg/m³	±40 µg/m³	±2%	±4%	±1%	10 m	AR 550
HCl	0–100 g/m³	20 µg/m³	±40 µg/m³	±2%	±4%	±1%	10 m	AR 550
HF	0–10000 µg/m³	1 µg/m³	±2 µg/m³	±2%	±4%	±1%	10 m	AR 550
CH_4[2]	0–100 g/m³	50 µg/m³	±100 µg/m³	±2%	±4%	±1%	10 m	AR 550
H_2O[2]	0–100 g/m³	0.1% vol	±0.2% vol	±2%	±4%	±1%	10 m	AR 550

[1] When monitoring individual compounds, fibre optic cables of extended lengths are available.
[2] Based on 200 m path. Recommended monitoring path length: 100 to 200 metres.
[3] Recommended monitoring path length: 300 to 800 metres.
• Besides the compounds above, the Opsis system monitors the following compounds: hydrogen cyanide (HCN), hydrogen bromide (HBr), hydrogen chloride (HCl), chlorine dioxide (ClO_2), chlorine (Cl_2), carbon dioxide (CO_2), phosgene ($COCl_2$), ethylbenzene ($C_6H_5C_2H_5$), methane (CH_4), ethane (C_2H_6), ethylene (C_2H_4), acrylonitrile (CH_2=CHCN), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and others.

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?

Integrated UV and IR monitoring

A great number of gases can be measured

Total monitoring solution

Cost-effective, open-path technology

High-performance monitoring of criteria pollutants

Representative path-integrated data

Easily calibrated

Operates with a minimum of maintenance

U.S. EPA approved

TÜV approved

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