

# Sentry-MS

Open Path Multi-gas UVDOAS Analyzer



## Cost Effective Perimeter & LDAR Monitoring

Ammonia

Benzene

Carbon Disulfide

Chlorine

Formaldehyde

Naphthalene

Nitrogen Dioxide

Nitrogen Monoxide

Sulfur Dioxide

Toluene

Xylenes

The Sentry-MS offers perimeter monitoring with among the lowest cost per meter monitored of any modern gas analysis system. A single analyzer is capable of monitoring more than one kilometer of fence line. Gapless perimeter monitoring not possible with point sensor technology is the norm, and long life low maintenance design ensures continued value for monitoring investments.

***Direct SAFER Systems Integration***

***MODBUS TCP Integration***

***VNC Remote Control***

***Part per Trillion Sensitivity***

***Automated Reporting***

***Automated Alarms***

***Simple .csv or .txt Data Logging***

***Easily configured for your application***

***Tripod mount or fixed installation***

***Optional Hazardous Location Hardware***

Sentry-MS Corrosive Atmosphere Option, Purged and Vortex Cooled



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...Precise, Species Specific

CEREX MONITORING SOLUTIONS  
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# Cost Effective Perimeter and LDAR Monitoring

## Multi-Compound Detection Capabilities

Offering real time quantification of multiple compounds, the Cerex Sentry-MS provides dramatic cost savings in perimeter monitoring applications. One analyzer is capable of monitoring linear path lengths in excess of 1000 meters, while reliably delivering accurate data without reporting inflated concentrations due to interfering background gases. The Sentry-MS is offered fully configured to meet the requirements of your air quality monitoring application. Target gases are selected from Cerex's library of UV compounds. Changing target gases incurs no additional costs and is simple as copying and pasting.

## Low Maintenance Costs, Increased Uptime

The Sentry-MS is designed for fully autonomous continuous operation. Inherent calibration eliminates the need for time consuming and expensive routine calibration. Quality assurance audits require only small quantities of primary standard gas. Synthetic background implementation zeros the analyzer each acquisition cycle without concern for background gas concentrations. The UV source is the only consumable, and carries a 2000 hour manufacturer half-life warranty. Optical surfaces are sealed and may be cleaned as necessary with household cleaner.



Left: Standard Sentry-MS

Below Left: Stainless Steel Option

Below: C1 Div 2 A-D HAZLOC Option



## **Low Cost Installation and Integration**

For many installations complete perimeter monitoring may be achieved with only two power and communication installation locations. MODBUS TCP and VNC via Ethernet are standard communication and remote control protocols.

## **Enhanced Early Detection Performance**

Part per trillion to low part per billion detection limits and wide dynamic ranges enhance early leak detection and release characterization. Concentrations of gases below the detection thresholds of traditional sensor arrays are readily detectable with the Sentry-MS and without interference from common background gases or water vapor. Early detection translates into quicker response times, reduced environmental impact, decreased plant downtime and reduced exposure. The analyzer likewise cannot be poisoned, and even after exposure to high concentrations of gas, clear down is immediate.

## **Direct Integration with SAFER Systems Modeling**

The Sentry-MS seamlessly integrates with SAFER Systems' emergency response software. SAFER's patented software is used in conjunction with Cerex hardware in several different ways; pre-emergency for preparation and training, during an emergency for emergency response, and post-emergency for future event mitigation, regulatory reporting, and litigation response. The complete solution utilizes live streaming data from on-site weather stations and Cerex gas detection sensors to generate a visualized model of the chemical plumes or soot clouds released during an emergency. The models automatically update as weather/sensor data changes so that emergency response teams know who or what will be impacted by the emergency (whether on-site or off-site), who needs to be evacuated or shelter in place, and how long the event will last. In the case of highly flammable chemicals, the models show where the combustion particulates will be deposited as well as the chemical composition of the soot clouds. All of the models and data are archived so they can be used for post-emergency analysis of the event, in response to odor complaints and litigation, and for reporting to regulatory agencies when needed. Not only can response teams use pre-defined scenarios prior to an emergency, but they can also use the archived data and models to base their emergency drills and training on actual events that may have occurred.

## **Core Data Acquisition and Integrated Meteorological Monitoring**

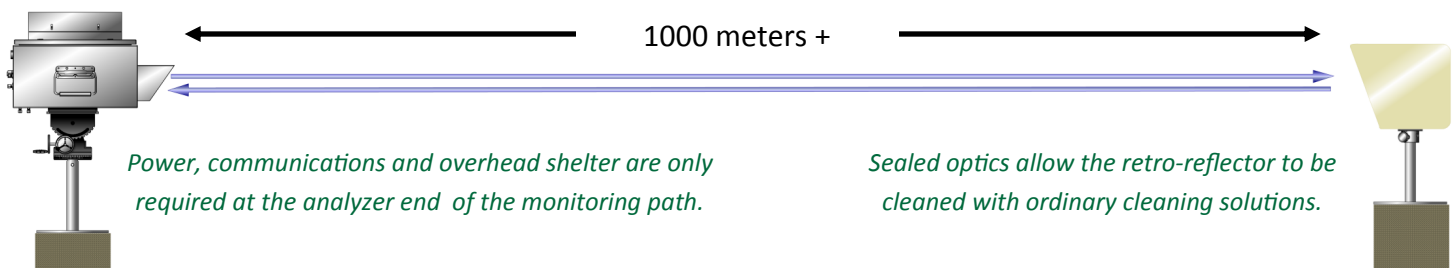
With optional inputs the Sentry-MS may be configured to acquire and integrate data from ancillary analyzers and meteorological monitoring hardware to offer definitive records of site conditions.

## Open Path UVDOAS Principle of Operation

The Cerex Sentry-MS operates by sending a beam of UV light through the open air. The UV beam is reflected back to the analyzer by a retro-reflector array (mono-static), where the absorption due to target gases is measured and recorded. The analyzer uses a classical least squares regression analysis to compare the measured absorption spectrum to calibrated reference absorption spectra files. Beer's Law is used to report accurate gas concentrations.

## Mono-static Design and Installation

The Sentry-MS mounts to a precision pan and tilt head which may be used with a tripod for rapid deployment, or with a fixed mount for permanent installations. The retro-reflector array is housed in a protective enclosure and may be tripod or fixed mounted to a mast, pole or superstructure. Power and overhead shelter are required on at the analyzer end of the monitoring path. Maximum path length depends upon the UV source chosen for the analyzer and the target gases. For the deuterium source maximum path length is approximately 225 meters, for a Xenon source path lengths in excess of 1 Km are possible.



## Sentry-MS Features

Software and hardware features are specifically designed to simplify integration , automate operation and reduce maintenance. Tedious calibrations are unnecessary and the use of synthetic background functionality allows continuous and accurate quantification of gases that are always present without the need for complex background acquisition procedures.

### Sentry– MS Features

- Simultaneous multi-gas detection capabilities
- Part per billion minimum detection limits (gas specific)
- Inherent calibration: No need for ongoing calibrations
- Automated background acquisition
- Automated synthetic background implementation
- Integrated Computer with Windows®
- User configurable alarms and data acquisition rate
- Integrated WiFi , LAN, USB
- MODBUS TCP and Ethernet VNC Networking
- Integrated instrument air conditioning



## Detection Performance

The Sentry-MS reports concentrations of individual species of gases without feat of over-reporting inflated gas concentrations due to interferent species.

### **Sentry-MS Single Gas Minimum Detection Limits for Deuterium and Xenon Sources**

Compound	Path Integrated MDL (PPM-m)	
	Xenon Source	Deuterium Source
Ammonia (NH <sub>3</sub> )	0.6*	0.20
Acetaldehyde (C <sub>2</sub> H <sub>4</sub> O)	3.20	3.00
1,3 Butadiene (C <sub>4</sub> H <sub>6</sub> )	<i>Non-detect</i>	0.20
Benzene (C <sub>6</sub> H <sub>6</sub> )	0.27	0.27
Carbon Disulfide (CS <sub>2</sub> )	13.31	13.31
Chlorine (Cl <sub>2</sub> )	5.00	5.00
Ethylbenzene (C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> CH <sub>3</sub> )	0.30	0.30
Formaldehyde (CH <sub>2</sub> O)	3.20	3.20
Mercury (Hg)	0.00002	0.00002
Naphthalene (C <sub>10</sub> H <sub>8</sub> )	0.20	0.20
Nitrogen Oxide (NO)	0.29*	0.29
Nitrogen Dioxide (NO <sub>2</sub> )	3.04*	3.04
Ozone (O <sub>3</sub> )	2.00	2.00
Phenol (C <sub>6</sub> H <sub>5</sub> OH)	0.30	0.30
Styrene (C <sub>8</sub> H <sub>8</sub> )	0.60	0.60
Sulfur Dioxide (SO <sub>2</sub> )	0.68	0.32
Toluene (C <sub>7</sub> H <sub>8</sub> )	0.84	0.84
m-Xylene (C <sub>8</sub> H <sub>10</sub> )	0.35	0.35
o-Xylene (C <sub>8</sub> H <sub>10</sub> )	3.77	3.77
p-Xylene (C <sub>8</sub> H <sub>10</sub> )	0.24	0.24

## Common Options

### **Sentry-MS Options**

- Integrated Meteorological Monitoring
- Analog inputs, integrated data logging
- Collocated Particulate Monitoring
- Modbus RTU, 4-20mA, 0-5VDC
- RS-232, 422, 485 output
- USB Cellular Modem or RF Modem
- Internal Flow Through QA Cell
- External QA Cell
- Extended Temperature Range
- Alarm driven control outputs
- HAZLOC Z-Purge, Air Conditioning
- Intermediate Mirrors

**Cellular Modem provides remote access to user interface, data and alarms**

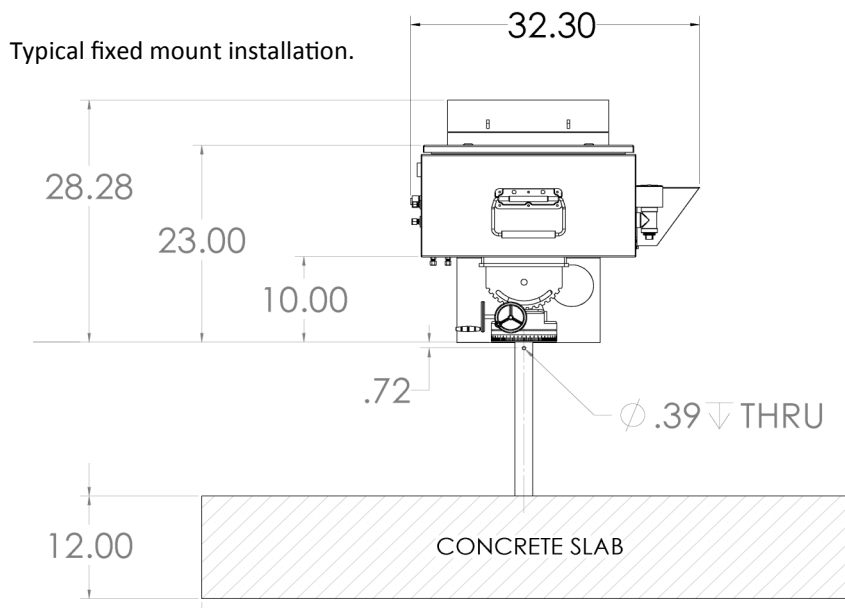
## Consumables

The Sentry-MS has only one consumable components: The UV source.

UV sources are warranted for a 2000 hour half life. Typical operation exceeds 3000 hours and the UV source is field replaceable.

## Sentry-MS Multi-Gas Analyzer Specifications

Analyzer	Sentry MS
Application	Open Path Mono-static Multi-Gas Analyzer
<b>Maintenance</b>	
Bulb Life	2000 Hour Half-Life Warranty (Xenon and Deuterium)
<b>Installation</b>	
Operating Temperature	0 to +50°C (extended ranges optional)
Cooling	Instrument AC
Operating Humidity	0-100%
Power	120 or 240VAC, 100W (DC Optional)
Enclosure	Steel or Aluminum
Weight	105 Lbs.
Dimensions	16 x 16.9 x 12.3 (in)
Mounting	Pan and Tilt Head via Dovetail
<b>Performance</b>	
Dynamic Range	Application Specific
Background Drift (TYP)	Not Applicable
Linearity Drift (TYP)	< 2%, Self-Compensating
Accuracy	Application Specific: TYP 3.5% Reading or Better
Technology	UVDOAS
UV Source	Application Specific: Deuterium or Xenon
<b>Data Output</b>	.CSV via VNC, ASCII via MODBUS TCP
Data Output Options	RS-232, 422, 485, RF Stream, MODBUS RTU, MODBUS TCP/IP, Email, 4-20mA, 0-5VDC
<b>Alarms</b>	
Networking	Sealed LAN, WAN and USB Ports, optional cellular modem, optional radio modem



[Individual gas species](#)

[detection](#)

[Data and alarms can automatically be sent to email addresses, website or control room.](#)

[Analog outputs available](#)

(4-20ma, VDC)

[Inherent calibration](#)

No ongoing calibration required.

[Synthetic Background](#)

Eliminates need for clean air background acquisition.

[User-configurable alarms](#)

[Fail to safe operation](#)

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