

# Aeres

UVDOAS Multi-gas Local Ambient Analyzer

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## High Sensitivity Multi-Gas Monitoring

Supports multiple  
sampling points

Quantifies components  
in a mixture

PPB Sensitivity

Non-contact optical  
measurement

Configurable alarms

Cannot be poisoned

Compatible with SAFER  
Systems

Featuring PPB level detection limits and simultaneous multi-gas capability, the Aeres analyzer is the clear choice for indoor and outdoor air safety monitoring and leak detection.

The Aeres detects Ammonia, Benzene, Toluene, Ethylbenzene, Xylene (BTEX), Chlorine, Mercury, and many more compounds simultaneously in real time. The Aeres analyzer features MODBUS and 4-20mA outputs for easy integration into existing sensing networks. Low cost of ownership is achieved with lifetime calibration and only two consumable components; a lamp and sample filter.



### CONTACT:

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## Accurate Readings Within Seconds

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# Aeres Analyzer Features and Benefits:

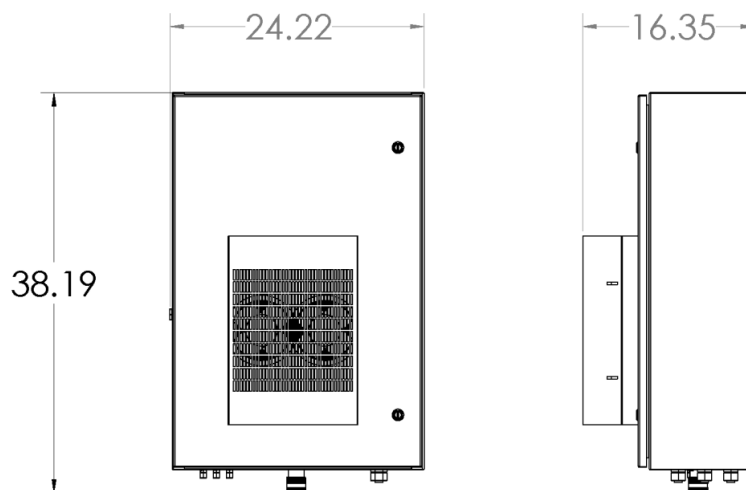
**The Cerex Aeres** is designed for fully autonomous and continuous operation. The performance issue with many analyzer technologies (electrochemical, FID, PID) is one of cross interferences causing false positives, sensor poisoning, and ppm level detection limits. Significant benefits of the Cerex Aeres include rejection of false positives, high precision and accuracy measurement, and ppb level minimum detection limits even within mixtures of gases. Cerex UVDOAS technology cannot be poisoned and clear down occurs immediately regardless of exposure.

Unlike infrared (FTIR or NDIR), UV has no absorption of water vapor, so there is no concern or issues of interferences. The same is true of the light hydrocarbons often found associated with VOC processing operations (methane, ethane, butane, etc). There are no absorbances within the UV spectrum.

No chemical conversion or complex filtering is necessary to isolate benzene from other VOC's. The system calibration is fixed, and requires no adjustment. Shifts in internal parameters are automatically performed by CMS software. However, the analyzer may be challenged at any time through the integrated zero-air and audit gas ports.

The system utilizes a broadband UV source, and a wide range miniature UV Spectrometer. The high resolution spectrometer enables the individual absorption peaks of individual gas compounds to be distinguished among the peaks of other gases in the mixture. The Aeres easily detects Ammonia—NH<sub>3</sub>, Benzene, Toluene, Ethylbenzene, and Xylene (BTEX), Nitric Oxide—NO, Nitrogen Dioxide—NO<sub>2</sub>, and Sulfur Dioxide—SO<sub>2</sub> with one analyzer. This spectrophotometric method is usually available only in much more costly systems. Many other gas compounds are available for measurement so inquire today!

- Individually monitor regulated VOCs and Combustion Gases without cross interference
- Automated Quality Assurance
- Integrated WiFi
- Integration, Remote Control via MODBUS, VNC
- Simultaneous multi-gas detection capabilities
- Part per billion minimum detection limits
- Inherent Calibration: No tedious calibration required for proper operation
- User Configurable Alarms
- Configurable Email alerts and data logs
- Low Cost of Ownership
- Unaffected by Humidity
- Cannot be Poisoned



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# Detection Capabilities

## Cerex UVDOAS Delivers What Other Technologies Cannot

Unlike Electro-chemical, PID, FID and GC/MS based detection methods, Cerex UltraViolet Differential Optical Absorption, UVDOAS, is unaffected by ambient humidity, requires no sample conditioning filter change prior to monitoring, requires no carrier gas, requires no wet chemistry, and incurs no sample handling costs. UVDOAS technology delivers simultaneous monitoring of ppb levels of individual VOC species like Benzene, Toluene, Ethylbenzene, and Xylene in real time. Results are immediate, and the raw data containing all the information necessary for gas identification and quantification is always saved.

## UVDOAS Principle of Operation

Similar in principle to more expensive FTIR, UV-DOAS offers better detection limits at lower cost without interference from water vapor. Unlike PID and FID, UVDOAS can identify individual gas compounds in real time without specialized one time use filters. The technology works by directing a UV beam through an ambient air sample then into a high resolution miniature spectrometer where the unique wavelength dependent absorptions due to target gases are individually measured and recorded. The included CMS software performs a classical least squares regression analysis to compare the measured absorption spectrum to calibrated reference absorption spectrum files. Gas concentrations are measured from the interaction of the gases with the UV light according to Beer's Law. This detection technology follows USEPA TO-16. The Aeres analyzer will detect many gases simultaneously at ppb concentrations within complex mixtures.

## Typical Minimum Detection Limits

Gas Product	Minimum Detectable Concentration	Units	The Cerex Aeres analyzer is a multi-gas analyzer with high sensitivity to mixtures and single gases in air. The table contains a sample of compounds available for real time analysis.  Individual gas species or aggregate concentrations may be reported at the operator's discretion.
Ammonia (NH <sub>3</sub> )	12	ppb	
1,3 Butadiene (C <sub>4</sub> H <sub>6</sub> )	12	ppb	
Benzene (C <sub>6</sub> H <sub>6</sub> )	16	ppb	
Carbon Disulfide (CS <sub>2</sub> )	12	ppb	
Chlorine (Cl <sub>2</sub> )	294	ppb	
Ethylbenzene (C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> CH <sub>3</sub> )	18	ppb	
Formaldehyde (HCHO)	188	ppb	
Hydrogen Sulfide (H <sub>2</sub> S)	29	ppb	
Mercury (Hg)	6	ppb	
Naphthalene (C <sub>10</sub> H <sub>8</sub> )	12	ppb	
Nitrogen Oxide (NO)	17	ppb	
Nitrogen Dioxide (NO <sub>2</sub> )	238	ppb	
Ozone (O <sub>3</sub> )	118	ppb	
m-Xylene (m-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>4</sub> )	21	ppb	
o-Xylene (o-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>4</sub> )	222	ppb	
p-Xylene (p-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>4</sub> )	14	ppb	
Sulfur Dioxide (SO <sub>2</sub> )	19	ppb	
Toluene ((CH <sub>3</sub> )C <sub>6</sub> H <sub>5</sub> )	49	ppb	
Accuracy (TYP)	±2	%FS	
Path Length	17.00	Meters	

### Minimal Operational Cost, Maximum Uptime

Only two consumable items: the UV source and sample intake filter. Both are field replaceable in minutes.

UV sources are warranted for 4000 hours of operation. Actual lifetime typically exceeds 5000 hours or 6 months of continuous use. The sample filter service interval depends on sample conditions.

Typical Annual Operating Expense: \$2000.00 USD

# Cerex CMS Software:

## Advanced analytics...

All Cerex analyzers use Cerex's Continuous Monitoring Software (CMS). CMS provides an easy to use interface for gas identification and gas concentration readouts while continuously logging all data. CMS can combine gas concentration data with external analog sensor inputs to serve as an advanced data acquisition logger. CMS features user configurable alarms for gas concentration thresholds, time weighted average concentration thresholds, external sensor levels, and self-diagnosed system faults.

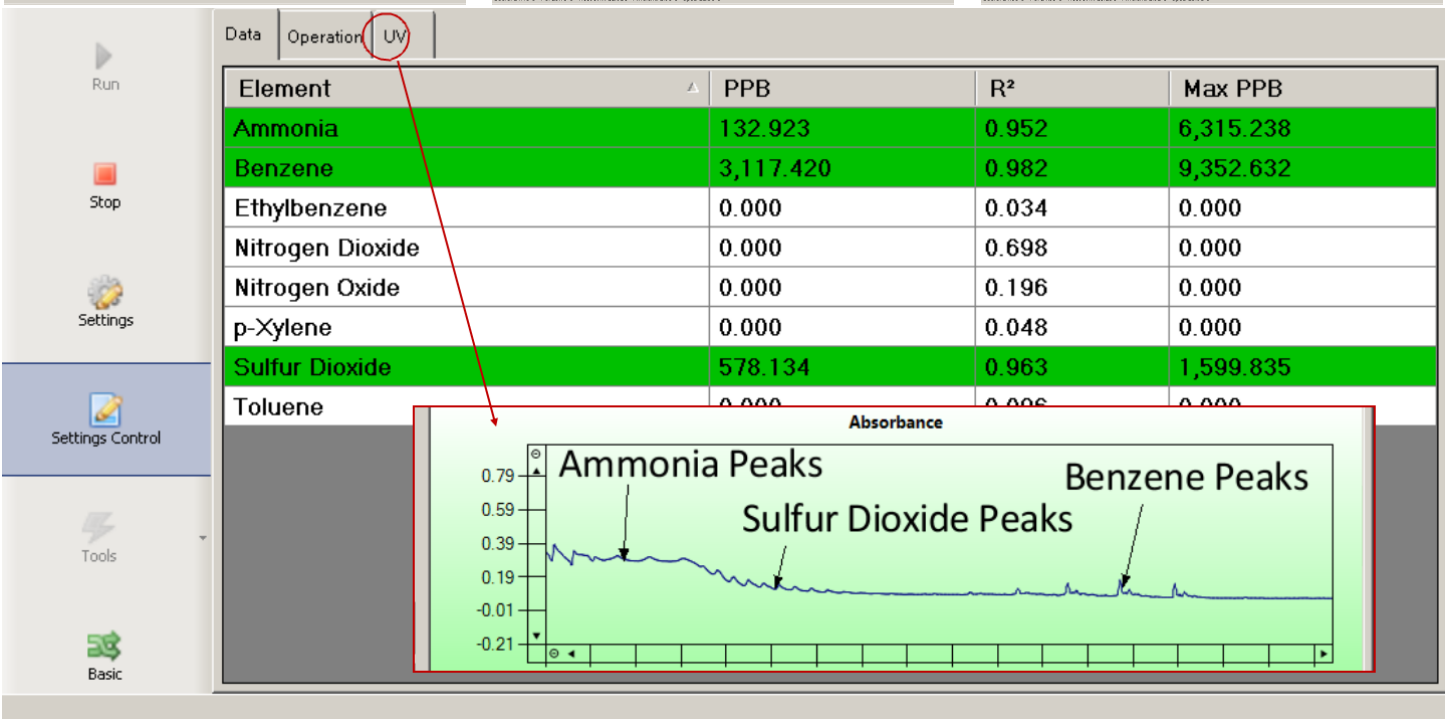
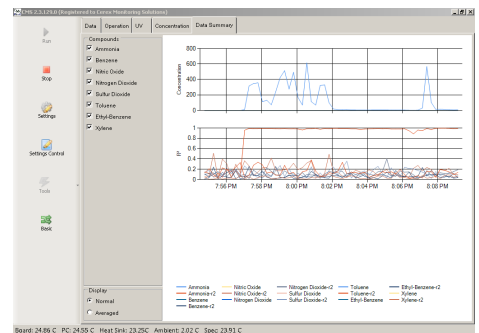
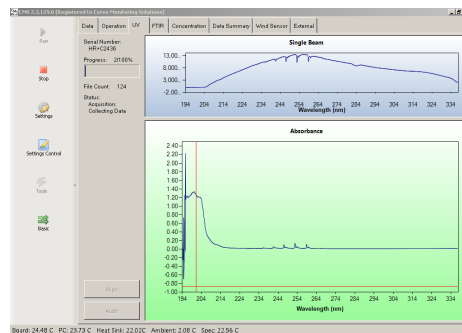
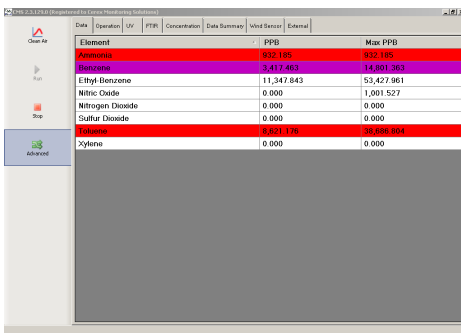
## ...and communication

Integrated WiFi network or optional Cellular Modem adds powerful interconnected real time monitoring, automated data reporting, and automated alarm reporting functionality. The Aeres analyzer may be installed with meteorological sensors and SAFER Systems emergency response software to provide decision makers with real time leak detection and automated evacuation alarms.

*The CMS Data tab displays gas concentration, detection confidence factor, and visual alarms.*

*For advanced users, signal throughput and detection plots are readily viewed in real time. All data is always saved.*

*Trended concentration data is available at a glance on the CMS Data Summary tab.*



# Available Options

## Powerful SAFER Systems Integration

An Aeres utilizing an IP network, optional serial RF network, or optional Cellular Modem add powerful integration with new or existing SAFER Systems real time monitoring and reporting networks. Cerex Monitoring Solutions works with SAFER Systems to ensure seamless integration in facilities protected by SAFER Systems plume modeling and emergency management software. Inquire today on how to add Cerex's powerful multi-gas analyzers to your leak detection and emergency response program.

## Integrated Meteorological Monitoring

Integrate meteorological data by ordering an Aeres with temperature sensing and 3-D ultrasonic wind measurement hardware. Particulate monitor integration is also available. All data parameters are integrated into CMS data tables.

## RF Communication

The Aeres analyzer may be equipped with a 900MHz RF modem or Cellular modem for wireless communication to a control center. Adding Internet access allows alarms and data to be archived and emailed according to the user configuration.

## Additional Sensor Capabilities

Up to six additional sensors may be added to the Aeres to provide monitoring of gases not sensitive to UVDOAS technology. Data from additional sensors is fully integrated into CMS, displayed in real time, and integrated into the data logs. Below is a table of commonly requested additional sensors.

CEREX Aeres Optional Gas Sensors						
Compound	Technology	TYP Lifetime	Range	LDL	Accuracy	T-90
Arsine (AsH <sub>3</sub> )	Electrochemical	2-3 Years	0 - 1.5 PPM	2% FS	±5% FS	60 S
Carbon Monoxide (CO)	Electrochemical	2-3 Years	0 - 300 PPM	2% FS	±5% FS	30 S
Carbon Dioxide (CO <sub>2</sub> )	Infrared	5 + Years	0 - 5000 PPM	2% FS	±5% FS	30 S
Hydrogen Cyanide (HCN)	Electrochemical	2-3 Years	0 - 15 PPM	2% FS	±5% FS	60 S
LEL (General Purpose)	Catalytic	2-3 Years	0 - 100% LEL	2% FS	±5% FS	30 S
Methane (CH <sub>4</sub> )	Infrared	5 + Years	0 - 100% LEL	1% LEL	±5% FS	30 S
Oxygen (O <sub>2</sub> )	Galvanic Cell	2-3 Years	0 - 25% Vol	0.1% FS	±0.5% Vol	20 S
Hydrogen Sulfide (H <sub>2</sub> S)	Electrochemical	2-3 Years	0 - 100 PPM	2% FS	±5% FS	45 S

## Specifications and Dimensions

Cerex Aeres Analyzer Physical Specifications	
Dimensions	36 x 24 x 14 in 91.4 x 61 x 35.6 cm
Weight	153 Lbs 69kg
Enclosure Rating	NEMA 4 (4X optional) IP66 equivalent

Cerex Aeres Analyzer Specifications	
Input Voltage	110-120VAC or 220-240VAC
	Single Phase 47-63Hz
Power Requirement	1200W
Operating Ambient Temperature	0 to +55°C (-40°C optional)
Storage Temperature	-10 to 60 °C
Operating and Storage Humidity	0-90% Non-Condensing
Lamp Life	4000 Hour guaranteed half-life
Sample Cell Volume	1.5, 4, or 7 liters
Audit Gas Port Size	1/4in or 6mm Swagelok
Minimum Response Time*	5 seconds
Intake Particulate Filter	0.3 Micron
Sample Flow Rate	80 LPM
Available Data Output Formats	MODBUS RTU, TCP, or 4-20mA
*Dependent upon sample flow rate.	

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