

UV Hound Series

Portable UVDOAS Multi-gas Analyzers

 **CEREX**
MONITORING SOLUTIONS, LLC.



Air Monitoring Where You Need it...

With PPB level detection limits and simultaneous multi-gas capability you can say goodbye to measuring "Total VOCs". Hound analyzers are the recognized choice for Industrial hygiene, leak detection, Hazmat first response and portable air quality monitoring.

Multi-Gas Capability

Individual VOCs

PPB Sensitivity

Integrated Networking

Automated Reporting

Configurable Alarms

Cannot be Poisoned

Fully Portable



...When You Need It, How You Need It.

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Three Models to Choose From:

Cerex Micro Hound, Mini Hound, and Hound Analyzers utilize the same core technology, differing in physical size and minimum detection limits. All are portable, capable of continuous air monitoring, and designed for years of service.

Micro Hound-FR: Our smallest and most portable model. Is equipped with a sealed external USB (1) Port as well as two internal USB ports. Despite the small size, the Micro Hound's 2 meter sample path allows PPB level detections of many gases. Weight is 27.5 pounds.

Mini Hound-FR: Our mid-size model balances low detection limits with excellent portability. This analyzer is equipped with sealed external LAN (1), WAN (1) and USB (1) ports as well as two internal USB ports. This unit has an 8.5 meter sample path and weighs less than 33lbs.

Hound-FR: Our largest and most sensitive model. This analyzer is equipped with sealed external LAN (1), WAN (1) and USB (1) ports as well as two internal USB ports for simple installation of USB peripheral devices such as cellular modem, GPS or streaming web camera. This unit offers excellent detection limits with a 17 meter sample path and is equipped with wheels for rolling transport: 38 Lbs.



All Hound Series Analyzers Feature:

Many of the features of the Hound analyzer series came as suggestions by the fire-fighters and hazmat first responders who spent over a year and half testing the Cerex Mini Hound in real world structure fires and hazmat first response applications. Hound Series Analyzers are equipped with an integrated touchscreen interface and computer running user familiar Windows® operating system. With simple, intuitive controls and large buttons, Hound analyzers are as easy to use as a PC or smartphone. Integrated WiFi makes remote access and control easy. Simply use a common VNC utility for full remote access.

- Integrated Computer with Windows®
- Touchscreen Interface
- Integrated WiFi
- .CSV data file output
- Simultaneous multi-gas detection capabilities
- Part per billion minimum detection limits
- Inherent calibration: No Bump Calibration, Ever!
- User configurable, multiple, staged alarms
- Audible, Visual and Email alarm functionality
- User configurable acquisition cycles
- Unaffected by humidity
- Cannot be Poisoned

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Cerex CMS Software:

Control is in your hands...

All Cerex analyzers use Continuous Monitoring Software. CMS provides user interface, data-logging and analytic gas detection and quantification functionality. CMS puts control where it belongs, in your hands. Target gas concentrations and alarm parameters are reported each user configured acquisition cycle. Alarms, acquisition time, background acquisition, detectable gases, and detection limits are all user configurable.

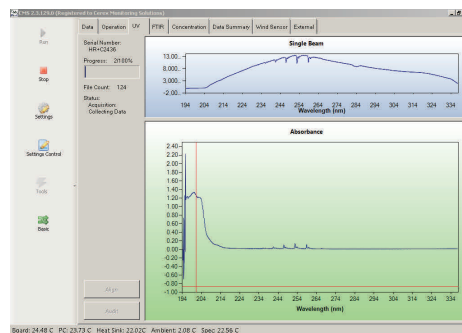
...from anywhere

Deploying a Hound analyzer with internet access, or adding an optional cellular USB modem adds powerful real-time remote control and data access functionality. Alarms may be automatically emailed to any email address when gas concentrations exceed user-configurable alarm thresholds, and data may be automatically emailed daily. The analyzer may be controlled and monitored from any pc or smartphone with Internet access.

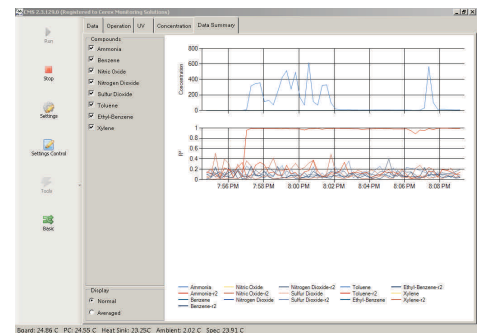
The CMS Data tab displays per acquisition gas concentration, data validity and visual alarms.

Element	PPB	Max PPB
Ammonia	932.185	932.185
Benzene	3,417.463	14,801.363
Ethyl Benzene	11,347.843	53,427.961
Nitric Oxide	0.000	1,001.527
Nitrogen Dioxide	0.000	0.000
Sulfur Dioxide	0.000	0.000
Toluene	8,621.178	38,698.804
Xylene	0.000	0.000

Single beam and absorption plots are readily viewed in real time. Raw single beam data is always saved



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



Element

Element	PPB	R ²	Max PPB
Ammonia	132.923	0.952	6,315.238
Benzene	3,117.420	0.982	9,352.632
Ethylbenzene	0.000	0.034	0.000
Nitrogen Dioxide	0.000	0.698	0.000
Nitrogen Oxide	0.000	0.196	0.000
p-Xylene	0.000	0.048	0.000
Sulfur Dioxide	578.134	0.963	1,599.835
Toluene	0.000	0.008	0.000

Absorbance plot showing peaks for Ammonia, Sulfur Dioxide, and Benzene. Y-axis ranges from -0.21 to 0.79. X-axis shows Wavelength (nm).

Detection Capabilities

Cerex UVDOAS Delivers What Other Technologies Cannot

Unlike IR, NDIR, Electro-chemical, PID, FID and GC/MS based detection methods, Cerex UVDOAS delivers simultaneous monitoring of ppb levels of individual VOC species like Benzene, Toluene, Ethylbenzene, and Xylene in near real time. The method 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 analytic costs or sample handling costs. Results are immediate, and the raw data containing all the information necessary for gas identification and quantification is always saved.

UVDOAS Principle of Operation

Cerex Hound analyzers operate by sending a beam of UV light through the sample gas within the instrument. The UV beam is directed by a series of optics to a high resolution miniature spectrometer where the absorption due to target gases is measured and recorded. A classical least squares regression analysis compares the measured absorption spectrum to calibrated reference absorption spectra files. Beer's law is then used to determine gas concentrations per USEPA TO-16 Methodology. Hound series analyzers will detect many gases simultaneously at ppb concentrations within complex mixtures. Some gases however, like hydrogen sulfide must be monitored individually. The presence of high concentration interference species may obscure some gases or cause false positives under certain circumstances.

Single Gas Minimum Detection Limits

Parameter	HOUND	MINI HOUND	MICRO HOUND	Units
Ammonia (NH ₃) MDL	12	24	100	ppb
1,3 Butadiene MDL	12	24	100	ppb
Benzene MDL	16	31	134	ppb
Carbon Disulfide MDL	12	24	100	ppb
Chlorine (Cl ₂) MDL	294	588	2500	ppb
Ethyl Benzene MDL	18	35	150	ppb
Formaldehyde MDL	188	376	1600	ppb
Hydrogen Sulfide (H ₂ S) MDL	29	59	250	ppb
Mercury (Hg) MDL	.001	.002	.01	ppb
Naphthalene MDL	12	24	100	ppb
Nitrogen Oxide (NO) MDL	17	34	146	ppb
Nitrogen Dioxide (NO ₂) MDL	238	475	2020	ppb
Ozone (O ₃) MDL	118	235	1000	ppb
o-xylene MDL	222	444	1885	ppb
m-xylene MDL	21	41	175	ppb
p-xylene MDL	14	28	119	ppb
Styrene (C ₈ H ₈) MDL	36	71	300	ppb
Sulfur Dioxide (SO ₂) MDL	19	38	160	ppb
Toluene MDL	49	99	419	ppb
Accuracy (TYP)	±3	±3	±3	%FS
Path Length	17.00	8.50	2.0	Meters

The Cerex Hound series instruments are multi-gas analyzers available with our standard calibrated gas reference files (Table on left) to provide high sensitivity to mixtures of single gases in air.

Individual gas species or aggregate concentrations may be reported at the operator's discretion.

Hound analyzers are designed to minimize operational costs and maximize uptime.

Only two consumable items: The UV source and air intake filter. Both are field replaceable in under fifteen minutes.

UV sources are warranted for 4000 hours of operation. Actual lifetime typically exceeds 5000 hours.



Options that make sense for real world air monitoring

Powerful Communication Features

Internal and external USB ports make the addition of optional USB peripherals such as GPS, Cellular Modem or even a Streaming Webcam possible. This flexibility adds powerful real time monitoring, automated data reporting and automated alarm reporting functionality. Hound analyzers may be deployed and environmental conditions monitored by onsite personnel as well as remote decision makers via any PC or smartphone with an internet connection.

Integrated Meteorological Monitoring

Definitive data support is available by ordering a Hound analyzer with integrated temperature and 3-D ultrasonic wind modeling hardware. All data parameters are integrated into CMS data tables, and the anemometer is tripod mounted for rapid deployment.

External Battery Systems

Hound analyzers utilize an internal lithium polymer battery and external smart charger for operation. A variety of optional external batteries are available to extend continuous monitoring capability to 17 hours in the absence of power without recharge.

Additional Sensor Capabilities

Up to five additional sensors may be added to the Hound, three to the Mini Hound and one to the Micro Hound to provide monitoring of gases not sensitive to UVDOAS technology. Data from additional sensors is fully integrated into CMS and displayed per acquisition cycle as well as integrated into CMS .csv data summary tables. Below is a table of commonly requested additional sensors. Additional sensors must be ordered at the time of manufacture, or the analyzer returned to Cerex for retro-fit.

CEREX UV HOUND Series Optional Sensors						
Compound	Technology	TYP Lifetime	Range	LDL	Accuracy	T-90
Arsine (AsH3)	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 (CO2)	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 (CH4)	Infrared	5 + Years	0 - 100% LEL	1% LEL	±5% FS	30 S
Oxygen (O2)	Galvanic Cell	2-3 Years	0 - 25% Vol	0.1% FS	±0.5% Vol	20 S
Hydrogen Sulfide (H2S)	Electrochemical	2-3 Years	0 - 100 PPM	2% FS	±5% FS	45 S

Specifications and Dimensions

CEREX HOUND Series Analyzer Dimensions	
HOUND	35.75" x 13.50" x 5.25" (90.8 x 34.3 x 13.3 cm) 38.5 Lbs
MINI HOUND	24.75" x 19.375" x 8.75" (61.6 x 49.22 x 22.23) 32.8 Lbs
MICRO HOUND	22" x 17.75" x 5" (55.9 x 45.1 x 12.7 cm) 27.5 Lbs

CEREX HOUND Series Analyzer Specifications	
Input Voltage	100VAC to 240VAC , Single Phase 47-63Hz
Input Current	4A Max
Operating Ambient Temperature	0 to +45°C
Storage Temperature	-10 to 60 °C
Operating and Storage Humidity	0-99%
Lamp Life	4000 Hour Manufacturer Warranty
Internal Battery Life (TYP)	3.5 Hours, optionally to 17.5 Hours
Spectral Range	195nm to 400nm*
Spectral Resolution	0.05nm – 0.20nm*
Intake Particulate Filter	5 Micron OR optional HEPA 0.3 Micron
Sample Intake Rate	7.9 CFM (3.5 CFM HEPA Filter)
Probe Length	3 meters, with quick connect fitting
*Dependent upon spectrometer installed.	

TO-16 Methodology

Currently there are a number of definitions of “detection limits” used to characterize the performance of air monitoring systems. A common definition of is the magnitude of the absorbance spectra that is twice the system noise. The U.S. Environmental Protection Agency’s “Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air - Second Edition Compendium Method TO-16 Long-Path Open-Path Fourier Transform Infrared Monitoring Of Atmospheric Gases” defines detection limits as the following:

The detection limit of the Hound system is a dynamic quantity that will change as the atmospheric conditions change. The variability of the target gas, and all of the other interfering species concentrations contributes to the variability of this measurement. The detection limit as determined in this procedure is the result of a calculation using a set of 15 individual absorption spectra. The 16 individual single beam spectra used for this determination are acquired in 5-min intervals and no time is allowed to elapse between them. The absorption spectra are then created by using the first and the second single beam spectra, the second and the third, and the third and the fourth, and so on until the 15 absorption spectra are obtained. These absorption spectra are analyzed in exactly the same way that all field spectra are to be analyzed and over the same wave number region. The analysis should result in a set of numbers that are very close to zero because most of the effects of the gas variability have been removed. The numerical results should be both positive and negative and for a very large set of data should average to zero. Three times the standard deviation of this calculated set of concentrations is defined to be the detection limit.

Although Method TO-16 was written for open path FTIR, the Cerex Hound system is unique among UV systems in that the raw data is essentially identical to an FTIR “Single beam” file. Hence the direct correlation drawn to TO-16. Using the detection limit definition described in TO-16, CEREX developed the detection limits that are listed here. It should be noted that the actual detection limits achieved in the field will vary. This is primarily due to the fact that variations in interfering species will result in variability in detection limits. Cerex considers the detection limits listed to be a very conservative estimate. The end-user of the equipment will likely achieve much better results in the field. Cerex believes it is a good policy to not oversell a capability to our potential customers.

Cerex manufactures a full line of UVDOAS and FTIR Multi-gas Analyzer products for CEMs, Process Monitoring, PAAM, Leak detection, Zone Monitoring, and Indoor Air Quality Monitoring as well as custom analyzers for specific monitoring needs.



Contact us for a demonstration of our technology.

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Minimal maintenance
The only consumables are the
UV source and intake filter.

Cannot be poisoned

Individual gas species
detection

Data and alarms can automati-
cally be sent to email address-
es, website or control room.

Inherent calibration
No ongoing calibration re-
quired, No Bump Calibration

User-configurable auto-
background functionality

User-configurable alarms

Fail to safe operation

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