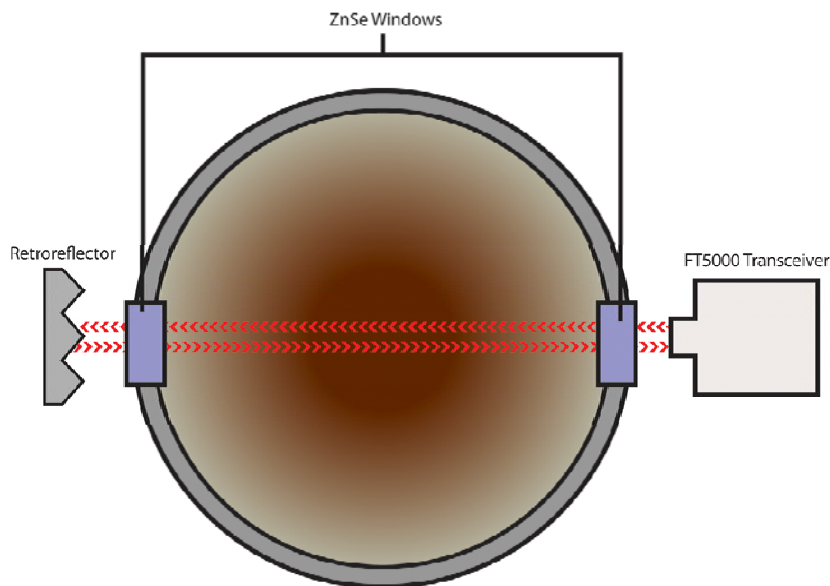


# FT5000



## Continuous Emission Monitoring for Cross Stack Applications



FT5000 has very sensitive detection limits due to the monostatic optical design. The use of a reflector allows the beam to pass through the stack gas 2 times. Installation is simplified with all the electronics and power located on one side of the stack.

**Literally, Hundreds of Gases can be Chosen to be Monitored**

Cerex Monitoring Solutions, LLC is pleased to announce the Cerex FT5000 Portable FTIR Cross Stack Analyzer system. The system is capable of multi-gas analysis and can easily be installed in various size stacks. The FT5000 utilizes a DOAS cross-stack beam of infrared light to detect and quantify the gases of interest. The system quoted is a real-time air monitoring system that can provide detections for many common compounds found in stacks. The FT5000 is a full spectrum FTIR based on the widely acclaimed Bomem MB3000. This system represents the most reliable FTIR with the lowest cost of ownership. The MB3000 has regulatory compliance with CE and TUV. The system is provided with a library of over 400 compounds from which to choose from. Using our standard optics, the system can be used on stacks up to 5 meters in diameter. Other UV DOAS cross stack systems are limited in the number of compounds they can detect. So the cost goes up and up as other monitors such as NDIR and Laser must be added. With the Cerex FT5000, all the compounds are covered with a single analyzer, resulting in the very highest system-wide reliability.



# Easy and accurate cross stack measurements.

## Approvals

The FT5000 system meets the U.S. EPA requirements, 40 CFR Parts 60 and 75. Meets equivalent methods of TUV Germany, and EMC UK Environment Agency. System based on the latest FTIR technology produced by ABB Bomem.

## Calibration

Easy calibration to verify performance. Optional auto-zero and auto calibration. Excellent long term stability and drift characteristics.

## Maintenance

The FT5000 incorporates the latest technology advancements in FTIR analyzers. The system requires replacement of only 2 subcomponents (IR source and detector cooler) once per year. The system requires no other maintenance, other than a simple window cleaning (in some stacks).

## Detection Method

The FT5000 detects gas concentrations by measuring IR absorption – the unique drop in the IR intensity within a particular wavelength region where the gas of interest absorbs. The spectrum is compared to spectrum from a known concentration of gas and used for qualitative and quantitative analysis.

## Stack Adapters

The analyzer requires that a 50mm beam of light pass through the center diameter of the stack. This will require cutting two ports at the height in which the monitor will be used. Cerex will supply adapters to cover the ports. This will allow clean room (ambient) air to be drawn into the port by the natural updraft created by the stack gas. This mechanism will act to keep any particulates or gas from coming in contact with either the main analyzer or the retroreflector. Two of these adapters will be provided for each stack.

## Super-Cooled Detector

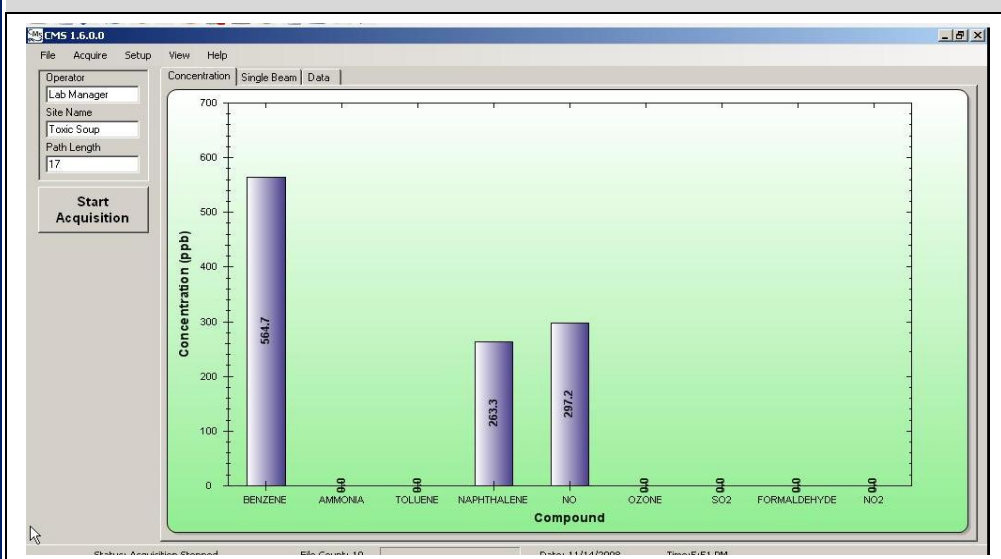
Cerex's FT5000 utilizes an ultra-sensitive MCT detector element that requires cooling to cryogenic temperatures (77 kelvin). The cooling is accomplished with an automated stirling engine cryocooler. Cryocooler devices were originally developed for use in missile technology, and have since been adapted to commercial detector cooling applications. MDL's are improved up to 100X over non-cooled or DTGS detectors.

## Software Highlights

- Full multi-gas capability. Analysis is rapidly performed and results presented in real-time.
- Outputs are available in a variety of formats, ranging from analog (voltage, 4-20mA) to digital (RS232, ethernet, MODBUS, wireless, internet connectivity).
- Data collection rate is user selectable. The spectrometer interface allows rapid acquisition, and the ability to control the averaging to any desired reporting interval.
- The raw "single beam" (intensity vs. wavelength) transmission spectra are saved for each scan.
- Raw spectra are saved in .csv text format. Easily manipulated in Excel.
- Post-processing module is included to allow any archived data set to be reprocessed using an alternate background file, or selection of chemical species.
- Spectral absorbance features can be characterized and saved as a "library reference" Then, each transmission spectra can be analyzed against that library reference using a quantitative classical least squares regression analysis routine.

## Performance Data for Most-Requested Compounds Found in Stacks

Compound	Max Measurement Range (1 meter path)	Min. Detectable Quantities (Monitoring path "L" is diameter of the stack)	Zero Drift (1 m path, max. per month)	Span Drift (per month, better than)	Linearity Error (of measurement range, better than)
NO	0 - 2000 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	±2 mg/m <sup>3</sup>	±2%	±1%
NO <sub>2</sub>	0 - 2000 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	±2 mg/m <sup>3</sup>	±2%	±1%
SO <sub>2</sub>	0 - 5000 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	±2 mg/m <sup>3</sup>	±2%	±1%
NH <sub>3</sub>	0 - 1000 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>	±1 mg/m <sup>3</sup>	±2%	±1%
HCl	0 - 10,000 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	±20 mg/m <sup>3</sup>	±2%	±1%
H <sub>2</sub> O	0 - 100% Vol.	.5% Vol.	±1% Vol.	±2%	±1%
HF	0 - 1000 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	±10 mg/m <sup>3</sup>	±2%	±1%
CO <sub>2</sub>	0 - 100% Vol.	.5% Vol.	±1% Vol.	±2%	±1%
Benzene	0 - 1000 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	±2 mg/m <sup>3</sup>	±2%	±1%



## Additional VOC Gases

The FT5000 system comes standard with a library of over 500 compounds. If additional gases are identified, these can easily be added to the system, even remotely via internet. The FT5000 can measure each of the VOC gases listed to the right...

Name	CAS NUM	Formula	Spectrum file name	Chapter and Spectrum Letters	Molecular Weights	GAS
Benzene	71-43-2	C6H6	dahxbenz.spc	DA	78.11	VOC
N- Butane	106-97-8	C4H10	adnzbu.spc	AD	58.12	VOC
1-Butene	106-98-9	C4H8	aenz1bte.spc	AE	56.1	VOC
cis-2-Butene	590-18-1	C4H8	afnzc2bu.spc	AF	56.1	VOC
Ethylene	74-85-1	C2H4	aknzety.spc	AK	28.05	VOC
Formaldehyde	50-00-0	CH2O	grnzfa.spc	GR	30.03	VOC
Isobutane	75-28-5	C4H10	alnzibu.spc	AL	58.12	VOC
Isobutylene	115-11-7	C4H8	amnziby.spc	AM	56.1	VOC
Methane	74-82-8	CH4	annzme.spc	AN	16.04	VOC
n-Pentane	109-66-0	C5H12	bdnzpent.spc	BD	72.15	VOC
Propane	74-98-6	C3H8	aonzpp.spc	AO	44.1	VOC
Propylene	115-07-1	C3H6	apnzppy.spc	AP	42.08	VOC
Styrene	100-42-5	C8H8	djnzsty.spc	DJ	104.15	VOC
Toluene	108-88-3	C7H8	dlnztol.spc	DL	92.14	VOC
Xylene	108-38-3	C8H10	dnnzxml.spc	DN	106.17	VOC
Ethylbenzene	100-41-4	C8H10	dbhzebz.spc	DB	106.17	VOC
trans-2-Butene	624-64-6	C4H8	agnzt2bu.spc	AG	56.1	VOC
Ethane	74-84-0	C2H6	ainzet.spc	AI	30.07	VOC

## Additional PAH Gases

The FT5000 system comes standard with the capability to monitor a large number of Polycyclic Aromatic Hydrocarbon (PAH) gases. A sample list of the FT5000's PAH capability is presented to the right....

Name	CAS NUM	Formula	Spectrum file name	Chapter and Spectrum Letters	Molecular Weights	GAS
Benzo nitrile	100-47-0	C7H5N	ndnzbznl.spc	ND	103.12	PAH
Benzotrichloride	98-07-7	C7H5Cl3	sanzbztc.spc	SA	195.48	PAH
Fluoro benzene	462-06-6	C6H5F	sjnzfbz.spc	SJ	96.11	PAH
Naphthalene	91-20-3	C10H8	dhnznaph.spc	DH	128.17	PAH
Pyrene	129-00-0	C16H10	szjnpyr.spc	SZ	202.25	PAH
Chrysene	218-01-9	C18H12	zcninichr.spc	ZC	228.29	PAH
Phenanthrene	85-01-8	C14H10	mwjytrph.spc	MW	178.23	PAH

## Calibration and Hardware

The auto-calibration system is presented as option. The data output is available in many useful formats; Alarms for each gas, 4-20mA or other analog, RS232/Modbus. Each analyzer is internet-ready. This can allow anyone with access the ability to view the instrument performance and data remotely from any internet connection, anywhere in the world.

## Hazardous Zone Operation

Operation of the equipment in hazardous zones is presented as an option. The system meets European ATEX codes. Specifically, the system will meet all the conditions required under *Class 1 Division 2 Groups A, B, C, and D* (Factory purge air supply is required)

