# **ML-150 FTIR Mobile Laboratory**

A Transportable FTIR Laboratory for Ambient Air or Emergency Response Monitoring



## FOR REAL-TIME MEASUREMENT OF UP TO 200 DIFFERENT GASES INCLUDING ORGANICS, INORGANICS, ACIDS, AND VOCs

### FEATURES

- Stable, rugged, industrialized system
- Simple automatic operation
- Developed for unmanned operation for weeks or months at a time
- Monitors up to 50 compounds continuously in real time

- Correction for spectral interference from other gases present
- Graphical interface and display systems
- Total remote access via modem link
- Capable of low ppb-level detection for most compounds

Industrial Monitor & Control Corporation

#### **Description and Principle of Operation**

The **ML-150** is a rugged Fourier Transform Infrared (FTIR) monitor mounted in a tow behind or self-propelled trailer for mobile use. It utilizes two 150-meter path glass cells which provide single-digit ppb-level detections for most compounds.

The **ML-150** introduces the sample into one or the other of the cells and then propagates an infrared beam through the cell. This beam is bounced back and forth in the cell more than 100 times to provide up to 150 meters of path in the sample. The instrument measures the absorption of the infrared light by molecules present in the cell and both identifies the compounds present and determines their concentrations to very low ppb-levels.

The system is equipped with two cells so one can be filled over a specified sampling period while the other is being analyzed. All pumping of the cells, operation of the valves, and control of the FTIR is automated and under computer control. This allows for totally unmanned operation if desired.

The use of two cells also allows for sample conditioning in one or both cells. Because  $H_2O$  and  $CO_2$  can be interferents in FTIR detection, these compounds can be scrubbed out before the sample is admitted to the cell reducing detection limits by more than a factor of 10 in many cases (e.g. BTEX,  $SO_2$ , NOx).

#### Applications

*Mobile Ambient Air Monitoring:* continuous monitoring of ambient air quality in urban, industrial areas, or remote areas

*Emergency Response Monitoring:* real-time monitoring at accident or spill sites to evaluate public exposure to released compounds.

*Compliance Monitoring:* Monitoring of emissions downwind of industrial sites to assess total facilities emissions or compliance with permitted emissions levels.

#### **Detection Limits**

The FTIR ML-150 is supplied with a customized analysis routine tailored to the specific monitoring needs of the

customer. The detection limits depend on the target species, the cell path length used and the measurement time used. Detection limits will improve with longer path length and longer measurement time. Typical values for are shown in the table below

#### Nominal Detections for Select Compounds (ppb)

Species	150 m	Species	150 m
	Cell*		Cell*
Acetaldehyde	20	1,4 Dioxane	2
Acetylene	1	Ethylene	2
Acrylonitrile	7	Ethylene Oxide	10
Ammonia (SL)	2	Formaldehyde	5
Benzene**	2	Propylene Oxide	10
1,3-Butadiene	2	Hydrogen Chloride	3
Butyl Acetate	5	Hydrogen Cyanide	3
Carbon Monoxide	3	Methylene Chloride	5
Carbon	1	Styrene	1
Tetrachloride			
Chloroform	1	Sulfur Dioxide	20
Methyl	3	Tetrachloroethylene	1
Methacrylate			
Nitric Oxide	13	Toluene**	7
Nitrogen dioxide	33	1,1,1-	7
		Trichloroethane	
Nitrous Acid	5	Trichloroethylene	2
Ozone	3	Vinyl Chloride 3	
Phosgene	1	(m,o,p)-Xylene** 7	

\* Drying of sample necessary to reach some of these limits

\*\* CO<sub>2</sub> scrubbing may be necessary to reach these limits

#### **Software Packages**

A complete Windows<sup>®</sup>-based control and display software package is provided with every instrument. This software allows non-technical people to operate the unit easily. The graphical display packages produce a variety of plots/displays in real time, including: gas concentrations as a function of time, bar charts of concentrations versus alarm levels, and correlation plots showing the relationship between various detected compounds. The reporting software allows for generation of custom tabular reports by the user.

FTIR-CIM Spec	ifications	Physical Spe	cifications:	
Detection Limits: Dynamic Range:	low ppbv levels depending on path and averaging time ppb-levels to percent		FTIR Base unit 16" (l) x 20" (w) x 9" (h) Interface Box: 30"(l) x 35" (w) X 10" (h) Cells: 59" (l) X 10" dia.	
Response time:	Typically 1 min. to 5 min.	Typical Trailer		
Calibration:	None required but internal reference cell available	Typical IIa	12' (l) x 8' (w) w/o tongue 16' (l) X 8' (w) maximum w/o tongue	
Output:	Continuous Analog 4-20 mA, RS-232, RS 485, or LAN link	Electronics:	All systems: interface electronics internal to base unit, computer internal or external	
Environment:	0°C - +40°C, 0 - 98% RH	Power:	120-220 VAC, 50-60 Hz; 4 KVA	
	Van: temperature controlled	<b>Options:</b>	Cell heaters, heated extraction lines, integral meteorological station, trailer.	

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