

Imacc Open-Path FTIR

An Industrial Monitor for Open Path, Stack, and Process Applications



Monostatic Open Path System



Bistatic Open Path System

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

FEATURES

- Stable, rugged, industrialized system
- Monitors multiple compounds in real time
- Correction for spectral interference from other gases
- Rigorous corrections for non-linearity
- Graphical interface and display systems
- Total remote access via modem/LAN link
- Optional reference cell for internal calibration
- Simple automatic operation



Industrial Monitor & Control Corporation

Description and Principle of Operation

The **Imacc-FTIR** is a rugged Fourier Transform Infrared Industrial Monitor designed to be modular, allowing for open path and extractive (source) monitoring utilizing inexpensive accessories.

The **Imacc Open Path FTIR** in transmission mode propagates an infrared beam through the open air or through an industrial process and measures the absorption of the infrared light by any molecules present. In passive radiance mode no source is used but the infrared emissions of hot gases are detected directly without using an infrared source. Both can identify the compounds present and measure their concentrations, in many cases down to low ppb-levels.

Configurations Offered:

The Imacc transmission monitors can be monostatic or bistatic in configuration. A monostatic system has a telescope at one end of the path and one or several corner cube arrays at the other end. The bistatic system has a transmitter telescope at one end and a receiver telescope at the other end. It is double ended.

The monostatic system can monitor one or several paths sequentially using a motorized or manual tripod mount. The bistatic system monitors one or two adjacent paths. The bistatic system has higher signal to noise and lower detection limits than the monostatic but it is harder to set up initially and requires a communication cable (or microwave link) between the two ends. It is also limited to two paths.

A special configuration of the monostatic system is for passive radiance measurements. This system looks at a hot source (stack, flare, etc) with a single telescope and detects the infrared light emitted by the gases themselves. It can identify and quantify gases just like the monostatic and bistatic transmission systems above although its lower detection limit is in part dictated by the temperature of the gases observed.

Applications

Stack gas monitoring: continuous emission monitoring in stacks, vents, or abatement systems.

Process control: real time monitoring of industrial processes or gas streams with continuous feedback and alarm systems.

Buildings, storage rooms, chemical plants, landfills, mines: monitoring for worker exposure to emissions or build up of gases in closed spaces.

Plant perimeter: open air monitoring over variable paths around the perimeter of a plant or process area. Allows for accidental release detection or fugitive emission detection

Detection Limits

The Imacc FTIR is supplied with a customized analysis routine tailored to your specific monitoring needs. The detection limits depend on the target species, the path length used and the response time required. Detection limits will improve with longer path length and longer sampling time.

Typical Detection Limits for Imacc Open Path System

Species	400m Path	Species	400m Path
	(PPB)		(PPB)
acrolein	3.8	Isopropanol	7.5
ammonia	1.5	Methylene Chloride	3.8
1,3-butadiene	1.5	methyl methacrylate	3.8
carbon monoxide	0.8	Nitric acid	0.8
carbon tetrachloride	1.5	Ozone	2.3
chloroform	1.5	Phosgene	0.8
1,4 Dioxane	0.5	Silane	0.8
ethylene oxide	7.5	Styrene	0.8
furan	2.3	Trichloroethylene	1.5
hydrogen chloride	1.5	1,1,1 Trichloroethane	3.0
hydrogen cyanide	3.8	Vinyl Chloride	3.0

Software Packages

A complete Windows[®]-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 Specifications

Detection Limits:	low ppbv levels depending on path and averaging time
Dynamic Range:	ppb-levels to percent
Response time:	Typically 30 sec. to 1 min.
Calibration:	None required but internal reference cell available
Output:	Continuous Analog 4-20 mA RS-232, RS 485, or LAN link
Environment:	0°C - +40°C 0 - 98% RH

Physical Specifications:

FTIR	Base unit 17" (l) x 20" (w) x 8" (h)
Open-path	12" telescope with 180" focal length typical divergence < 0.5 milliradians
Retro Array	20"X20" 67-element, 30 arc-second Optional 21"X21" 60-element, 5 arc second
Electronics:	All versions: interface electronics internal to base unit, computer internal or external
Power:	120-240 VAC; < 700 W
Options:	Liquid Nitrogen auto-fill systems, TE cooled detectors, ambient temperature detectors.



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