

# PORTHOS™ *Portable Spectrometer*



## Summary

- Portable passive FTIR
- On board spectral processing
- Rapid identification of Chemical Warfare Agents (CWAs), Toxic Industrial Chemicals (TICs) and other gases

## Key Benefits & Advantages

- Compact, lightweight, rugged design
- Real-time, built-in video and spectral analysis
- Battery operated

## Description

PORTHOS™ is a small, rugged, lightweight, highly sensitive multiple chemical agent detector and identification system, based on Block's proven and validated passive Fourier Transform Infrared (FT-IR) technology. It works in the long wave infrared spectral band, functions day or night and is capable of either short or long term operation in military or Homeland Security ground or air operation.

Within seconds it detects and presents to the user the name of a dangerous chemical vapor at distances of 0.1 to 5 km. Stored data includes raw interferograms, alarm type and time. The unit has both automated self-calibration and status monitoring of all critical points.

One important feature of the PORTHOS is that the chemical detection processing is done "on board" within the PORTHOS electronics and only a low bandwidth detection signal need be sent to a command/control center or recorded on board.

PORTHOS detects and identifies all the Military C-Agents (Nerve, Blood, and Blister) required of the JSLSCAD system and has been tested against the full list of military interferents.

The following lists of TICs have been programmed and tested in a chamber: Ammonia, Boron Trichloride, Phosgene, Nitric Acid, Sulfur Dioxide, Arsine, Boron Trifluoride, Carbon Disulfide, and Hydrogen Cyanide. Additional chemicals can be programmed as needed.

## Other Product Configurations

Block has adapted PORTHOS for airborne applications including use in UAVs. We have also developed a portable tripod mounted version with a 1/2° field of view (32 pounds, 1 cu. ft.).

Also by re-optimizing the entire system, Block estimates that the PORTHOS weight can be reduced to 10 lbs and the size reduced to 1/3 cubic foot.

PORTHOS incorporates a compact packaging of Block's M-100 chemical sensor, which has been tested extensively by US and foreign governments.

## Block Engineering

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Parameter	Specification
Wavelength Range	7.5-13.5 $\mu\text{m}$
Field of View (FOV)	1.5° or .5°
Spectral Acquisition Rate (@ 8 $\text{cm}^{-1}$ & 5 $\text{cm}/\text{sec}$ )	20 spectra/sec
Noise Equivalent Spectral Radiance (13 $\mu\text{m}$ , 769 $\text{cm}^{-1}$ )* per scan	< 14.1 x 10 <sup>-9</sup> watts/( $\text{cm}^2\text{cm}^{-1}\text{Sr}$ )
NESR (11 $\mu\text{m}$ , 909 $\text{cm}^{-1}$ )* per scan	< 12.7 x 10 <sup>-9</sup> watts/( $\text{cm}^2\text{cm}^{-1}\text{Sr}$ )
NESR (8 $\mu\text{m}$ , 1250 $\text{cm}^{-1}$ )* per scan	< 7.92 x 10 <sup>-9</sup> watts/( $\text{cm}^2\text{cm}^{-1}\text{Sr}$ )
Remote Display	Standard NTSC (RS-170a) TV black and white display with overlay characters and graphics
Indicators/Data Alarm Potential signal of interest	Named chemical species Prompts user to record spectra
Finger Touch Controls	Numerous functions controlled by user in camcorder fashion
Sensor Volume	0.8 $\text{ft}^3$
Weight	20 pounds
Dimensions	30.5 W x 39.4 L x 19.1 H cm (12 W x 15.5 L x 7.5 H inches)
Software	Built-in, complete identification capability
Power Voltage Startup/with Cal Steady State (30°C ambient)	22-32 VDC 53 Watts (@23.9 VDC) 43 Watts
Environmental Operating RH Storage RH Altitude	0 to 50°C 0-95% non-condensing -40 to 70°C 0-100% non-condensing 0-10kft (adaptable for higher altitudes)

(\*At 4 $\text{cm}^{-1}$  resolution, 10  $\text{cm}/\text{sec}$ )