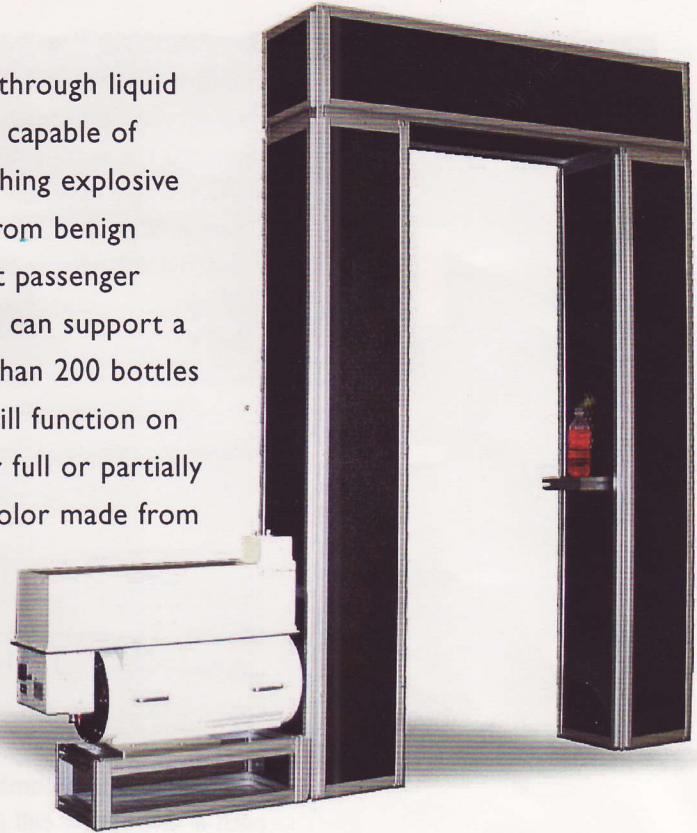


RAM2000™ Portal Monitor

RAM2000™ Portal Monitoring System

The RAM2000™ walkthrough liquid screening portal is fully capable of detecting and distinguishing explosive and flammable liquids from benign liquids. When utilized at passenger checkpoints the system can support a throughput of greater than 200 bottles per hour. The system will function on open containers (either full or partially full) of any shape and color made from glass, plastic, paper or other materials which are typically found in the marketplace and passenger stream of commerce.



Passengers with liquid containers will enter the door frame portal, place their open containers on a sniffer shelf, and wait four to ten seconds for a go - no go indication which is based on a comprehensive chemical analysis.

The RAM2000™ FTIR technology is highly mature, simple and swift to use. Passengers can easily step into the walk through portal, place an open liquid container on the "sniffer" shelf, and wait seconds for the analytical results. Air that is gently drawn into the portal's upright sides is exhausted once the RAM2000™ analysis is complete. Personnel can direct passengers in a similar manner to currently employed screening tools.

The entire liquids screening process is non-intrusive. There are no "blasts" of air, closed doors, or hand "wanding" that some passengers may find intrusive. The passengers maintain control of their liquid containers throughout the entire process. There are no known limitations relative to the volume of the container being tested and there is not a specific bottle type, shape or other container requirement.

The RAM2000™ will detect, identify and quantify more than 250 volatile organic compounds (VOC's), more than 110 Hazardous Air Pollutants (HAP's) and many Toxic Industrial Chemicals (TIC's). These include industrial solvents, the BTEX family, alcohols and virtually all gases and vapors that have absorption spectra in the 2 to 14 micron region of the infrared spectrum. Other chemical references can easily be added to the reference library to support emerging threats.

The RAM2000™ system is an FTIR (Fourier Transform InfraRed) spectrometer that collects infrared spectra and determines whether selected chemicals are present. When configured with a combination open-path & extraction cell (OPEX) portal, it allows multiple chemicals to be detected at ppb sensitivity in seconds. The FTIR collects a complete infrared spectrum by merely sending energy through the sample vapor. As the interferometer scans, wavelengths of light are measured along with depletions of energy due to chemicals present.

For liquids screening, EDO's RAM2000™ FTIR projects a 25-cm diameter beam out of the spectrometer and optically bends the beam completely around the upright

channeled portion of a portal door frame twice. The channel containing the IR beam is configured to draw air from uncovered liquid containers which are set on a "sniffer" shelf. Uncovered liquids will slightly volatilize into gases that can be quickly detected by the spectrometer. Air vacuumed to the portal channel creates a Bernoulli-effect over the liquid surface and draws an elongated chemical plume into the optical beam path for fast identification. Air can also be drawn through orifices near the passenger's body. High sensitivity is achieved by effectively creating a 10 meter length cell with a fully contained 25-cm diameter beam.

This OPEX-FTIR design for liquids screening combines the benefits of two powerful FTIR techniques: open-path & extractive. The broad diameter beam from the open path technique requires less sensitivity for optical alignment, interacts with more molecules than a narrow beam, and can monitor great distances. Multiple passes through the sample from the extractive technique increases interaction between the beam and the sample, yielding increased chemical sensitivity. By combining the advantages of both techniques passengers carrying liquids can be screened to detect low concentration chemicals with high reliability.

RAM2000™ has successfully completed the EPA's technology verification program (ETV) for open path FTIR (http://www.epa.gov/etv/pdfs/vrvs/01_vr_ail.pdf). Testing was designed to verify manufacturers' claims of detectability, sensitivity and accuracy for a variety of industrial chemicals.

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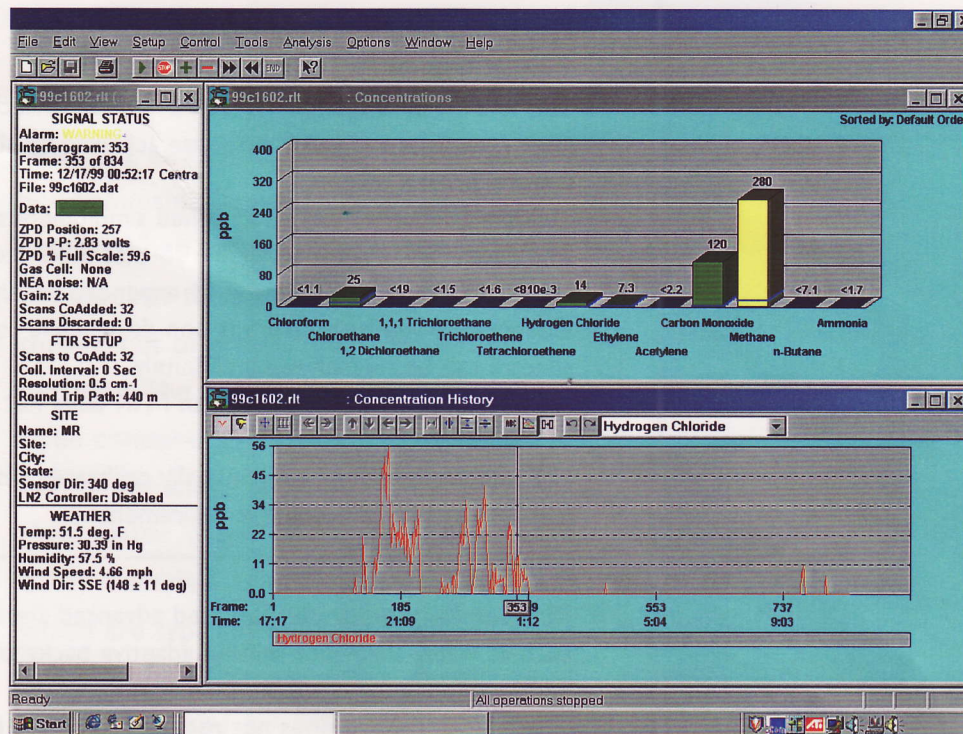
RmmSoft™ Windows™-Based Software

DISPLAY CHOICES

- 3-D BAR GRAPH
(As Shown)
- 2-D BAR GRAPH
- LINE VALUES WITH
ERROR-BAR LIMITS
- SUBSYSTEM STATUS

STATUS COLUMN SHOWS

- SYSTEM STATUS
- FTIR SETUP
- SITE INFORMATION
- WEATHER
- USER-DEFINED
INFORMATION



Windows™-based software enables easy-to-use operation.

The RAM2000™ system operation and display components may be located in a facility control room and integrated with a facility's network. The built-in analytical software includes multi-component regression algorithms that automatically identify and quantify the individual components in complex chemical mixture without any operator intervention. Each target chemical's concentration is displayed on a bar graph with individual user specified

warning and trigger levels that are color coded for display. In addition, the RAM2000™ will measure and display the concentration of each chemical present in ppm*meter, ppb*meter or as path averaged concentrations in ppm, ppb, mgram/m³ or mgram/m³. The software performs data quality checks on each data set to maintain high data quality. Report generation is simplified by computing concentration averages in addition to keeping track of maximum values and the time of their occurrence.

RAM2000™ Portal Monitor

RAM2000™ Operational Advantages

- Easy to use by a non technical operator
- Traveler friendly
- This is a minor adaptation to a proven, tested technology.
- High sensitivity and quick response achieved by slightly adapting an existing, mature, proven technology
- Multiple containers can be screened simultaneously.
- The chemical library is adaptable so that the system can be optimized for known threats and can readily be expanded to support emerging threats.
- Collection of each spectrum is non-destructive to the sample and stored spectra can be re-analyzed indefinitely.
- Identification of chemicals with an FTIR does not depend on complex handling of the sample.
- FTIR spectrometers are intrinsically calibrated since concentrations are calculated from differential measurements.

RAM2000™ Technical Advantages

- RMMSoft™ incorporates patented advanced signal processing algorithms such as water-alignment shifting, adaptive background filtering and multi-component regression techniques.
- The FTIR technique does not require ionization, (sorting & detection) or sample conditioning (dilution, heating, evacuation) to make a measurement.
- Complex chemical mixtures do not require pre sampling separation techniques such as gas chromatography.
- FTIR interferometers measure each wavelength of light rather than separating light energy into individual frequencies which can be time consuming.
- FTIR interferometers have high energy throughput compared to dispersive infrared instruments. This results in better signal to noise, higher resolution and better sensitivity to weakly absorbing chemicals.
- FTIR interferometers use an internal laser to index the wavelengths resulting in high accuracy measurements.

■ Specifications subject to change without notice

■ Visit our web site at www.edocorp.com

■ EDO Defense Systems is ISO9001 registered

For further information contact:
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