

# FLIR Systems, Inc. - IBAC Bio-Aerosol Detector and Collector



## GENERAL DESCRIPTION:

The IBAC provides real-time biological agent detection, sample collection, and the capability of alerting first responders and emergency personnel. The sensor provides an indoor and outdoor biological agent discrimination capability based on elastic scattering and fluorescence emission of biological particles.



IBAC sensors can operate independently or as part of a network configuration to form the "first tier" of a building air-security system. A battery powered sensor provides a mobile capability for first responders that have the mission of homeland protection in a biologically contaminated environment. Potential applications for the sensor include mass transit facilities, military forward operating bases, national monuments, elements of national infrastructure, and office buildings.

The IBAC has the following functions:

- Continually monitor the ambient air for changes consistent with a high probability of biological warfare agent attack;
- Automatic detection algorithms will respond via alarms once a biological warfare agent is determined to be present;
- Collect, concentrate, and preserve samples for confirmatory and identification analysis;
- Provide transmission of the data collected by the sensor to local and remote command and control centers.

## TECHNICAL DESCRIPTION:

Air particles are pulled into the sensor by means of a diaphragm pump at 4 liters/minute. The particles pass through an optical illumination region where they are excited by a continuous-wave laser diode. Light emitted from these particles is scattered elastically (no change in wavelength) and may also emit fluorescence if biological material is present. In the IBAC, the elastically scattered light and the auto-fluorescence produced light are observed simultaneously on independent optical channels.

Once per second, the IBAC measures an environment's particle counts, fluorescence, and particle size information. To trigger an alarm, the real-time detection algorithm analyzes changes in background particle activity. This rolling-average algorithm operates unattended and can trigger an alarm within 30 seconds of detecting a biological agent. Separate algorithm settings have been developed for indoor and outdoor use. All of the processing is performed within the sensor without the need for an attached computer. All acquired data may optionally be stored on an internal flash memory card for retrieval and analysis.

## Tier Selection

Final tier assignment is based on overall product score.

- Top Tier
- Second Tier
- Third Tier
- ◐ Fourth Tier
- Bottom Tier

### RANKINGS

	Biological	Chemical	Radiological
<b>FIELD USE System</b>	●	○	○
<b>MOBILE Laboratory</b>	○	○	○
<b>DIAGNOSTIC Laboratory</b>	◐	○	○
<b>ANALYTICAL Laboratory</b>	●	○	○

## Notes

IBAC units are being utilized by the US National Guard.

## Survey Source

Vendor Supplied Information

## CONTACT INFORMATION

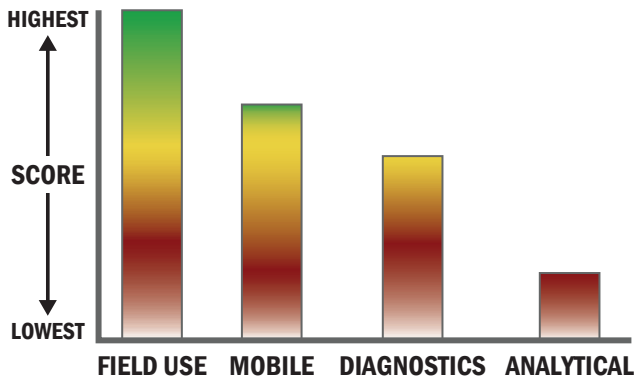
FLIR Systems, Inc.  
 CBRNE Detection  
 6610 Amberton Drive Suite 400  
 Elkridge, MD 21075  
 410-540-8660

## COST

- \$24,500/system
- <\$1/analysis

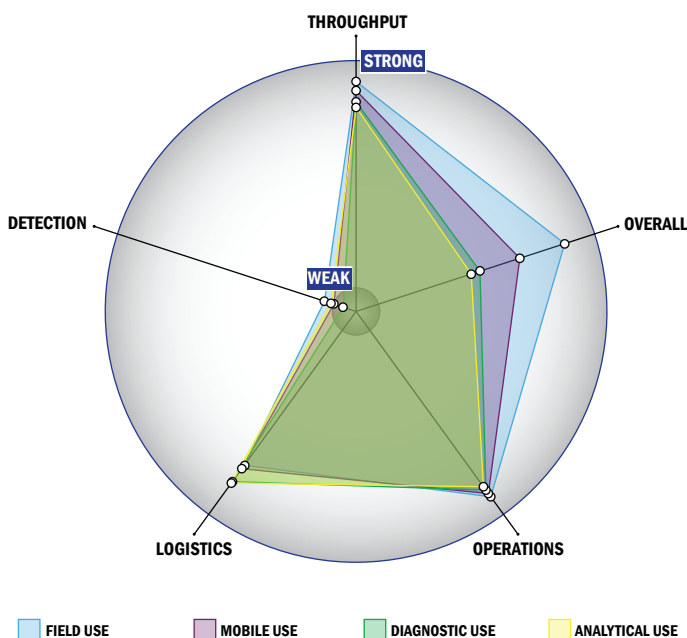
## Scoring Analysis

System scores are compared across the four scenarios and ranked from highest to lowest.



## Impact Chart

The Impact Chart is a spider graph representing specific categories and designed to give the reader a visual depiction of how a particular system is expected to operate across the four different scenarios. The score for each of the seven categories is presented as the percentage of the total possible score. Higher category scores extend the spokes of a graphic toward the outer edge of the chart. The area graphed for each of the four scenarios relates to how well the system performed in that scenario. Graphics for each of the four scenarios are super-imposed for ease of comparison.



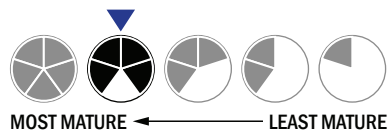
## Evaluation Criteria

### Throughput:

- Detection is instantaneous
- Continuous operation with no defined runs
- System is continuous and provides real time analysis with no defined tests/samples
- Device or system is intended for multiple detection assays
- 0-1 solutions, buffer, eluents, and/or reagents
- 1 component
- Less than 5 minutes is required for set-up
- Automatic detection

### Logistics:

- An afternoon of training and some technical skills required
- Approximately the size of a toaster
- Between 1 and 5 kg
- Wireless and wired connections are available
- System or device has 110V electrical requirement
- 4-8 hours battery life



### Operations:

- Can be used from -21 °C to 41 °C
- Performance is not influenced by relative humidity
- 5-10 years expected life
- Results can be viewed in real-time
- The system or device is currently fully autonomous
- The system software is closed and not available for modification
- The system hardware is open but modification requires licensing

### Detection:

- Possible the system could receive 510K clearance, no current efforts at this time
- Possible the system could receive FDA approval, no current efforts at this time
- This system does not test liquids
- Good specificity. System has a consistently low level of false alarms (2-5%)
- Spore lysis not necessary for detection by system

