Smiths Detection - Hazardous Gas and Vapor Identifier (HGVI)

GENERAL DESCRIPTION:

HGVI (Hazardous Gas and Vapor Identifier), designed for first responders to identify high level threats, is the first handheld instrument that simultaneously detects, identifies, and quantifies CWA's and TIC's. It also incorporates a gamma radiation detector to warn the operator of radiation threats that may be encountered. Handheld and weighing only 7.5 pounds (3.4 kg), HGVI can be easily carried into the Hot Zone with its shoulder strap, freeing up both hands to do other duties. As soon as the incident is cleared the HGVI can be removed from the Hot Zone and decontaminated by simply turning the system off and wiping the exterior with a bleach-soaked cloth. HGVI is simple to operate and designed with input from Emergency Responders. The system features an easy-to-see LCD screen with an integrated light sensor that automatically adjusts the backlight based on lighting conditions. Intuitive software, one-handed operation during use, and multiple alarms make the system ideal for use in all types of environments. HGVI also includes an integrated GPS receiver and wireless modem for use with the optional HGVI LINX accessory, which can be used to monitor up to 16 HGVI units and display their locations on industry-standard street maps.

TECHNICAL DESCRIPTION:

HGVI has extended the usefulness of its core IMS technology by also incorporating a Photoionization Detector (PID) and an array of Taguchi Gas Sensors (TGS) that are integrated into the system.

The IMS module in HGVI contains a non-radioactive source and parallel positive and negative ion paths. The use of a chemically doped sieve pack provides state-of-the-art interference rejection for a handheld IMS. The PID contains a 10.6-eV ionization bulb that makes it responsive to most volatile organic compounds. The array of six TGS's allows the system to detect a very broad range of gases and vapors and provides a rough chemical signature for each substance.

HGVI's H-Fusion Decision Enhancement Software combines the data from the system's three orthogonal chemical sensor modules to rapidly and automatically provide identification and quantitation. This data fusion facilitates greater discrimination of materials and reduces the number of incorrect identifications typically associated with IMS technology.

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
FIELD USE System	N/A	◐ (Second Tier)	⚪ (Third Tier)
MOBILE Laboratory	N/A	⚪ (Third Tier)	⚪ (Third Tier)
DIAGNOSTIC Laboratory	N/A	◖ (Fourth Tier)	⚪ (Third Tier)
ANALYTICAL Laboratory	N/A	◖ (Fourth Tier)	⚪ (Third Tier)

Survey Source

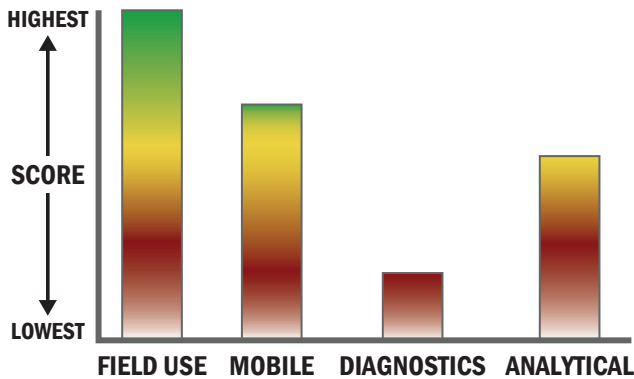Vendor Supplied Information

CONTACT INFORMATION

Smiths Detection
21 Commerce Dr
Danbury, CT 06810

COST

- $28,000/system
- <$1.00/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.


FIELD USE   MOBILE USE   DIAGNOSTIC USE   ANALYTICAL USE
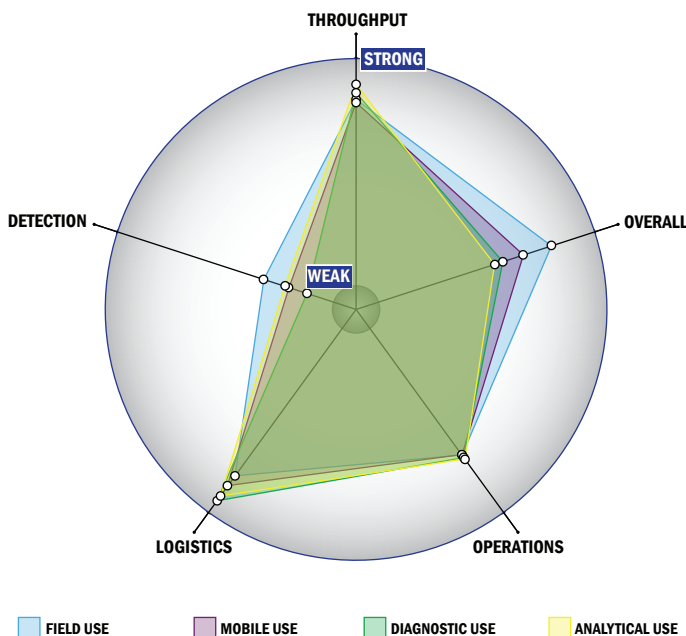
Evaluation Criteria

Throughput:
• 2 minutes or less for detection
• Continuous operation with no defined runs
• System is continuous and provides real time analysis with no defined tests/samples
• The system or device is currently semi-automated
• 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 5 and 25 kg
• Wireless and wired connections are available
• System or device uses batteries
• 4-8 hours battery life

MOST MATURE ◄——— LEAST MATURE
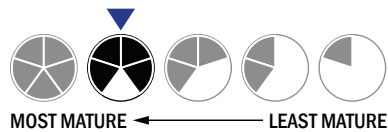
Operations:
• Can be used from 4°C to 37°C
• Components must be stored at room temperature (27°C)
• Device or system has peak performance at normal relative humidity conditions
• Greater than 3 years shelf life
• 5-10 years expected life
• Results cannot be viewed in real-time
• The system or device is currently fully autonomous
• The system software is closed and not available for modification
• The system hardware is closed and not available for modification

Detection:
• This system does not test liquids
• Good specificity. System has a consistently low level of false alarms (2-5%)
• $>1x10^{-3}$ mg/m^3
• System currently can identify aerosolized chemical agent
• Only total dose and dose rate
• Display indicates 0 until more than 1 mR/hr is detected for dose rate
• System is used for personnel detection