

Hamilton Sundstrand Corporation - Chemical Biological Mass Spectrometer/Chemical Biological Detection System (CBMS/CBDS)



GENERAL DESCRIPTION:

The CBMS is a mass spectrometer for the detection of liquid Chemical Warfare Agents (CWAs) on the ground from a moving military reconnaissance vehicle via a ground sampling system. The CBDS version adds an air sampler and pyrolysis module to enable the detection of Biological Warfare Agents (BWAs) via an air intake. In either mode, the system operates continuously and autonomously, reporting alarms both on a display screen and electronically.



TECHNICAL DESCRIPTION:

CWA detection employs direct ion trap mass spectrometric with MS/MS capability for the analysis of the vapor molecules. BWA detection concentrates aerosols during a collection period and pyrolyzes the accumulated material, and then the composite mass spectrum is analyzed for patterns indicating the presence of target BWAs.

CONTACT INFORMATION

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COST

- \$160,000-\$240,000/system
- \$0.1/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
FIELD USE System			N/A
MOBILE Laboratory			N/A
DIAGNOSTIC Laboratory			N/A
ANALYTICAL Laboratory			N/A

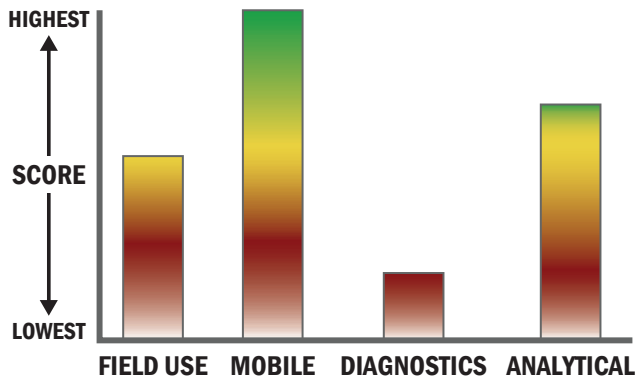
Survey Source

Vendor Supplied Information



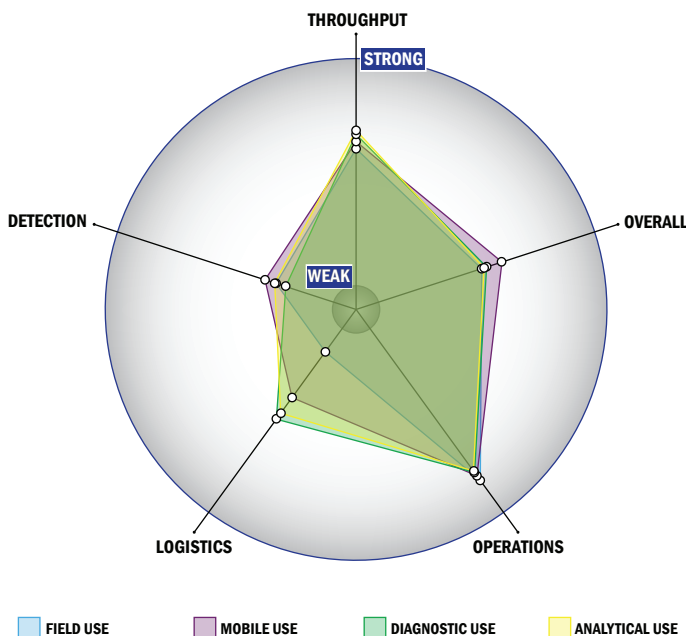
Scoring Analysis

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.



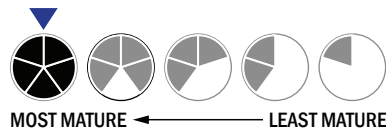
Evaluation Criteria

Throughput:

- Between 2 and 15 minutes for detection
- Multiple samples, multiple tests/sample per run
- 349-96 samples every 2 hours
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 3 solutions, buffer, eluents, and/or reagents
- 1 component
- Greater than 20 minutes is required for set-up
- 1-2 steps are required for detection

Logistics:

- More than a day of training and significant technical skills are required
- Approximately the size of a home dishwasher
- More than 50 kg
- Wired connections are available
- System or device requires multiple outlets or a dedicated circuit breaker



Operations:

- Can be used from -21°C to 42°C (All temperatures)
- Performance is not influenced by relative humidity
- Between 1 to 3 years shelf life
- Greater than 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 closed and not available for modification

Detection:

- Less than $10\ \mu\text{L}$
- Good specificity. System has a consistently low level of false alarms (2-5%)
- Spore lysis not necessary for detection by system
- $1 \times 10^{-3}\ \text{mg}/\text{m}^3$
- System could be adapted to identify aerosolized chemical agent
- System currently can identify liquid chemical agent