Research International, Inc. – RSN 5000

GENERAL DESCRIPTION:

Research International's Remote Sensor Node 5000 (RSN 5000) is a portable CBRN monitoring device suitable for the detection of toxic gases, aerosolized biological agents, and nuclear materials. It is the only product of its kind currently available in the world, integrating detection technologies from the world's leading suppliers into a complete, networked CBRN monitoring solution. It has been developed for use in military, homeland security, public safety and public health applications.

Some sensors are mounted within its tough cylindrical aluminum shell of 20 cm diameter and 1 meter height, others, including GPS and a weather station, mount on the outside, while other sensors, such as video or thermal IR cameras, can be mounted nearby and connected to the node via wireless. A built-in tripod is used to position the unit or it may be secured to structure using locking rings built into the exterior surface. Portable anti-theft features similar to those used for automobiles have been incorporated to protect the unit during unattended operation.

TECHNICAL DESCRIPTION:

The RSN 5000 is modular in design and is constructed to customer requirements. Available sensors include:

- One or more of four state-of-the-art chemical detectors.
- An ultraviolet fluorescence-based biological particle detector for suspicious changes in bioaerosol concentrations.
- A sensitive gamma ray detector that detects suspicious changes in background radiation.

iThe RSN 5000 normally operates in a background monitoring mode, sampling air at 200 liters/minute. The air stream can be analyzed with an ion mobility spectrometer to detect and identify chemical warfare agents. It can be further analyzed with an array of 6 electrochemical gas detectors for common toxic industrial chemicals. A gamma ray monitor is used to detect radiation in the air sample. Finally, this air sample is tested for suspicious increases in bioaerosol concentration with the TacBio bioaerosol monitoring instrument. If an instrument alarms (or under remote control), a secondary sampling line, based on the SASS 3100 dry air sampler, is activated that collects particulates onto a proprietary electret filter for later analysis of captured biological or other particulates.

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	Top Tier	Second Tier	Second Tier
MOBILE Laboratory	Third Tier	Second Tier	Third Tier
DIAGNOSTIC Laboratory	Fourth Tier	Second Tier	Third Tier
ANALYTICAL Laboratory	Fourth Tier	Third Tier	Third Tier

Survey Source

Vendor Supplied Information

CONTACT INFORMATION

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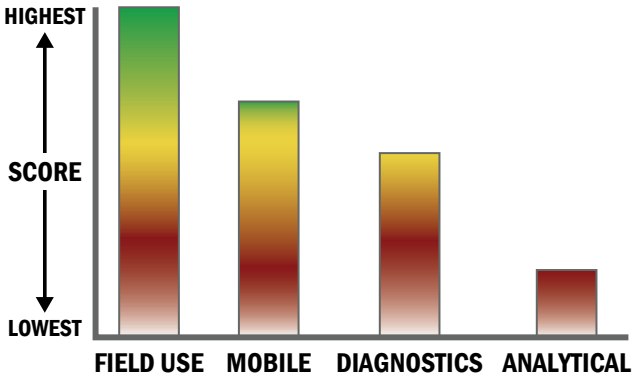
COST

- $90,000–$150,000/system
- N/A/analysis

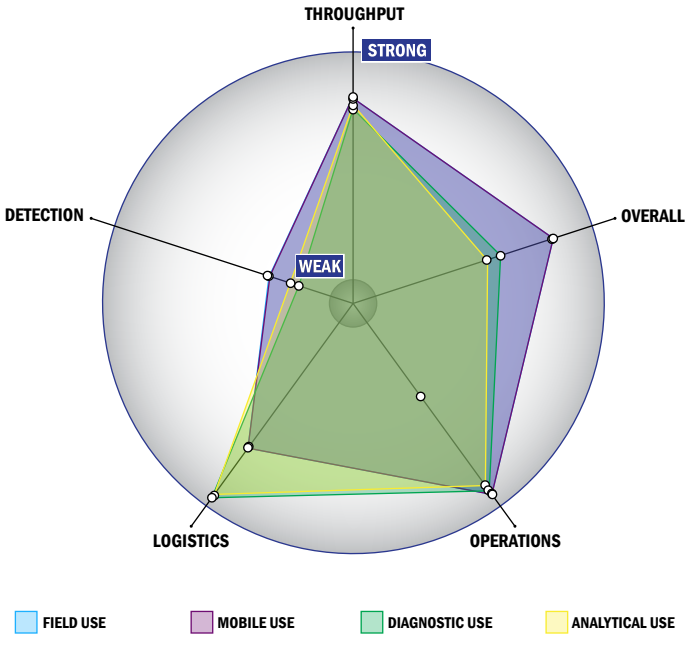
Scoring Analysis

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.



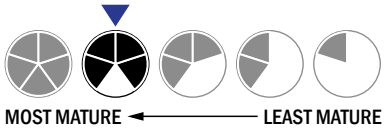
Evaluation Criteria

Throughput:

- 2 minutes or less for detection
- Continuous operation with no defined runs
- 349-96 samples every 2 hours
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 0-1 solutions, buffer, eluents, and/or reagents
- 0 components
- Greater than 20 minutes is required for set-up
- Automatic detection

Logistics:

- Very brief (minutes-hours) training and minimal technical skills
- Approximately the size of a carry-on luggage suitcase
- Between 25 and 50 kg
- Wireless and wired connections are available
- System or device uses batteries
- 4–8 hours battery life



Operations:

- Can be used from < -21°C to > 42°C (All temperatures)
- This system does not require consumable components
- Performance is not influenced by relative humidity
- 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 open but modification requires licensing
- The system hardware is closed and not available for modification

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
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- Spore lysis not necessary for detection by system
- > $1x10^{-3}$ mg/m^3
- System currently can identify aerosolized chemical agent
- System currently can identify liquid chemical agent
- Only dose rate
- Down to background level radiation for dose rate
- System is used for area air sampling