

# Resonant Sensors Incorporated - Bioassay Sensor System



## GENERAL DESCRIPTION:

Resonant Sensors Incorporated (RSI) has developed a new class of label-free biosensor systems for rapid biochemical detection. Our products include disposable sensor plates (in 96-well or 384-well formats) and associated benchtop reader systems that quantify biochemical reactions in real time with outstanding accuracy and repeatability. This differentiating technology provides new assay tools for laboratories that will dramatically reduce the labor time and cost of biochemical tests. The system is fully controlled through advanced software, which includes data analysis features to provide either kinetic or end-point information.



Our sensor platform can be applied to monitor virtually any bio- or chemical reaction. Selectivity can be imparted on the sensor element using standard surface chemistries (such as silane) to covalently attach commercially available and validated specific antibody, aptamer, or DNA layers. As the binding assay begins, the analyte binds to the detection-layer target, and the system monitors instantaneous changes at the sensor surface, thus providing real-time data. Test time is limited only by the chemical binding dynamics, and is typically less than 15 minutes. Qualitative data is available immediately after sample introduction.

The RSI sensor plates are readily adaptable to standard immunoassay, cell-based, DNA, or microbial testing methods. The sensors are integrated into standard microwell formats so that laboratories may still use existing automated sample handling equipment. RSI sensor plates are available in a variety of reactive surfaces (bare dielectric, silane or others). They may also be purchased pre-sensitized for specific assays, such as S. aureus, S. enterotoxin A and B, and others.

## TECHNICAL DESCRIPTION:

RSI's products are based upon guided-mode resonance (GMR) sensor technology that occurs in subwavelength waveguide- gratings. When these sensors are illuminated with a broadband light source, a specific wavelength of light is reflected. Interaction of a target analyte with a biochemical layer on the sensor surface yields measurable spectral shifts that directly identify the binding event without additional processing or foreign tags. The GMR sensor surface may be optimized with an array of capture molecules, allowing rapid detection of multiple analytes within a single test.

## 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>	○	N/A	N/A
<b>MOBILE Laboratory</b>	○	N/A	N/A
<b>DIAGNOSTIC Laboratory</b>	●	N/A	N/A
<b>ANALYTICAL Laboratory</b>	●	N/A	N/A

## Survey Source

Vendor Supplied Information

## CONTACT INFORMATION

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 416 Yates Street, NH518, Box 19016  
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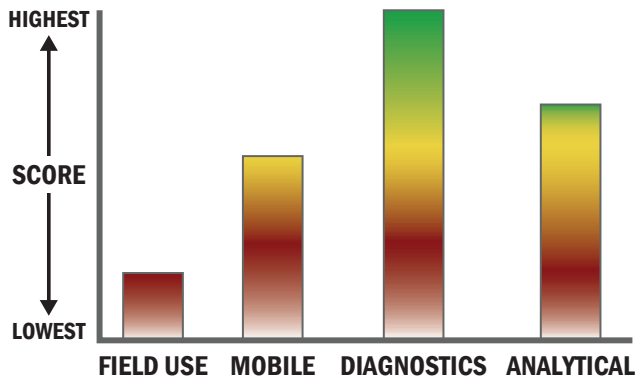
## COST

- \$65,000/system
- \$4-\$18/analysis



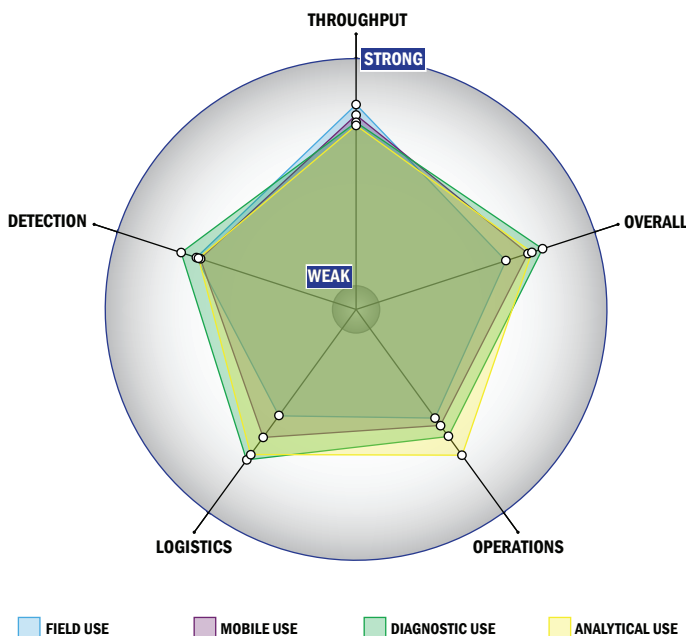
## Scoring Analysis

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.



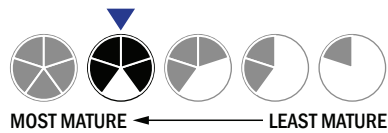
## Evaluation Criteria

### Throughput:

- Between 2 and 15 minutes for detection
- Multiple samples, multiple tests/sample per run
- 749-350 samples every 2 hours
- The system could easily be adapted into a fully automated system
- 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
- 1-2 steps are required for detection

### Logistics:

- An afternoon of training and some technical skills required
- Approximately the size of a carry-on luggage suitcase
- Between 25 and 50 kg
- Wireless and wired connections are available
- System or device has 110V electrical requirement



### Operations:

- Can be used from 4 °C to 41 °C
- Components must be stored at 4 °C
- Between 1 to 6 months shelf life
- 5-10 years expected life
- Results can be viewed in real-time
- The system could be adapted to a fully autonomous system with some effort
- The system software is closed and not available for modification
- The system hardware is closed and not available for modification

### Detection:

- Efforts are underway to achieve 510K clearance
- Efforts are underway to achieve FDA approval
- Less than 50 µL
- Good specificity. System has a consistently low level of false alarms (2-5%)
- 1,000-10,000 CFU per mL
- 1,000-10,000 PFU per mL
- 100-1,000 ng per mL
- Manual kit not integrated with the system handles spore lysis