



## ICx Biosystems - RapidPlex

### GENERAL DESCRIPTION:

RapidPlex is a fully automated system for environmental monitoring of bacteria, viruses, and toxins. This advanced system has automated sample preparation, detects with high sensitivity, and identifies with high accuracy up to 20 different pathogens at once. Detected threats include toxins, DNA viruses, RNA viruses, bacteria, and bacterial spores. The RapidPlex identifier is capable of detecting at least 10-20 threat targets in a single test and utilizes multiple (2-3) independent biomarkers per threat target to ensure high levels of detection confidence and to minimize false positives, especially from non-pathogenic near-neighbors that are often present in the environment. The analyzer's total analysis time is configurable dependent on sensitivity requirements, but in its most sensitive mode, provides sample-to-answer times of less than 30 minutes. RapidPlex was developed initially for unattended environmental monitoring, but is adaptable to other biodetection applications such as clinical diagnostics and food/water testing.



### TECHNICAL DESCRIPTION:

RapidPlex employs fast multiplex PCR to amplify DNA and RNA target sequences and a rapid multiplexed antibody sandwich assay for detection of toxins and surface proteins on viruses and bacteria. DNA amplicons and protein targets are detected by capturing them with specific capture probes on tens of thousands of microbeads. Each microbead is color coded to identify which threat hypothesis is being tested. This fluorescent imaging readout of thousands of assay microbeads enables coverage of a long threat list without the loss of sensitivity associated with sample splitting. The analyzer uses multiple molecular markers per threat to reduce false positives.

### CONTACT INFORMATION

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### COST

- \$45,000/system
- <\$70/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>			

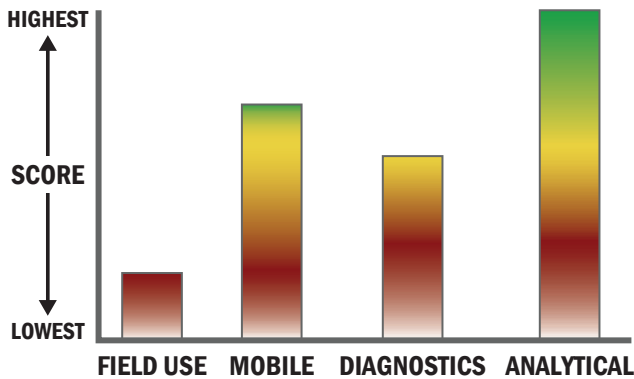
### Survey Source

Vendor and Internet Supplied Information



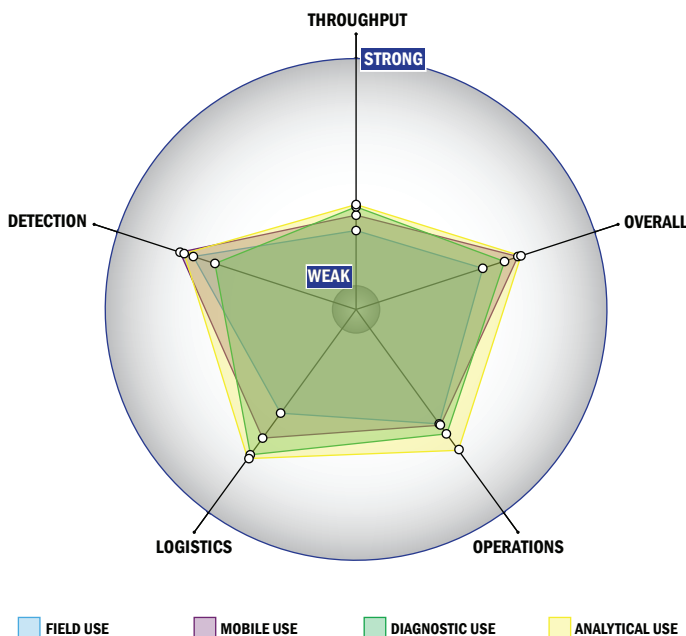
## Scoring Analysis

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.



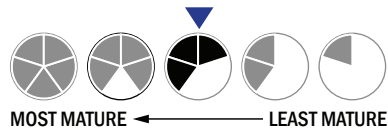
## Evaluation Criteria

### Throughput:

- Between 15 and 30 minutes for detection
- 1 sample, single test/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 components
- 5-10 minutes is required for set-up
- 1-2 steps are required for 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 has 110V electrical requirement



### Operations:

- Can be used from 25 °C to 37 °C
- Components must be stored at room temperature (27 °C)
- Between 6 months and 1 year shelf life
- Results cannot be viewed in real-time
- The system or device is currently fully autonomous
- The system software is open and available for modification
- The system hardware is open and available for modification

### Detection:

- Less than 100 µL
- 100-1,000 CFU per mL
- 1,000-10,000 PFU per mL
- 1-10 ng per mL
- Fully automated spore lysis