

PRODUCT CATALOG

RESEARCH & DEVELOPMENT



A UNIVERSE OF SOLUTIONS

CUSTOM SENSORS & INSTRUMENTATION

www.resrchintl.com



Background and History

Research International develops and manufactures leading edge products in the broad areas of physical and chemical sensing. Our target markets include medical diagnostics, chemical and biological weapons detection, and food safety. Portable and PC-based hardware solutions are emphasized as emerging niches within these markets. Company focus areas extend beyond sensors and their associated instrumentation and include micromachining, microfluidics and solid-state batteries.

Highlights:

- Formed in 1990
- Located in suburban Seattle area (Monroe, WA)
- Focus areas: sensors, instrumentation, chemical, biological, physical parameters, microfluidics
- Custom machining services
- Product manufacturing
- Manufacturers of air samplers and biodetection equipment for 13 years
- Regional provider of machining and molding services for 18 years

Business Objectives

Develop leading edge technology-based products in the broad areas of physical and chemical sensing. Target markets include medical diagnostics, environmental monitoring, CBW detection, and food safety. Portable and PC-based hardware solutions are emphasized.

Partial Customer/Partner List

- | | |
|-----------------------------------|---|
| ▪ BAE Systems (Licensee) | ▪ Germany |
| ▪ Canon Chemical (Licensee) | ▪ Israel |
| ▪ Centers for Disease Control | ▪ Italy |
| ▪ Department of Agriculture | ▪ France |
| ▪ Department of Defense | ▪ National Oceanic and Atmospheric Administration |
| ▪ Department of Homeland Security | ▪ Naval Research Laboratory |
| ▪ Finland | ▪ Netherlands |
| ▪ Food and Drug Administration | ▪ Norway |
| ▪ France | ▪ Lawrence Livermore National Lab |
| ▪ General Electric | |

SASS® 2300 Wetted-Wall Air Sampler

A portable multi-stage wetted-wall cyclone sampler that extracts particulates and water-soluble chemical vapors from air and transfers them to a liquid phase for later detection and analysis. It is highly automated and can be easily carried by a single person, and may operate unattended for extended time periods. This user-friendly sampler has been field-tested at a number of independent facilities and has been shown to possess excellent collection properties.

It is the only wet-type air sampler shown to efficiently collect virus-sized particles, and has been successfully used to detect the airborne viral pathogens that cause exotic Newcastle disease and hoof-and-mouth disease, as well as some strains of avian flu virus. Furthermore, it is the only portable sampler technology to receive U.S. Department of Homeland Security Certification under the U.S. Safety Act of 2002.



SASS 2300 Wetted-Wall Air Sampler Specifications	
Characteristic	Description
Air collection rate	390 LPM using 30,000 hr. life brushless fan.
Particulates collection range	1-10 µm. Contact Research International regarding vapor collection applications.
Concentration ratio	78,000/min., nominal.
Liquid inventory	4-5 cc range, adjustable by user. Proprietary control loop maintains a constant liquid volume in the sampler, independent of collection time, temperature, or humidity; useful for concentrating trace airborne analytes.
Make-up water	1 liter on-board reservoir; supplemental off-board reservoirs may be used in fixed installations: 0.8 cc/min typical evaporation rate at 20C/50% RH.
Physical size	18.4 cm x 21.3 cm x 34.3 cm (7.2" W x 8.4" D x 13.5" H).
Weight	3.7 kg without battery, 4.7 kg with battery (8.2/10.4 lbs). Add 1 kg (2.2 lbs) for 1 liter of water.
Air inlet	Industry-standard threaded adapter. It is recommended that third-party accessories have an airflow channel 2.54 cm diameter or larger.
Humidity range	Non-condensing conditions.
Operating temperature	Above freezing conditions to 66° C.
Power source	12 VDC BA-5590/U primary battery; or BA-5390/U extended life primary battery; or UBI 2590 rechargeable battery; or 82-265 Volt (47-63 Hz) AC lump-in-cord power supply.
Power consumption	1.33 amps @ 12 V, 16 W.
Sample extraction	On-board 12 cc/min peristaltic pump, manual or remotely controlled. Vial filling module included. Air sampling may continue during extraction.
System controls	Microprocessor controlled. RS-232 or optional wireless link for remote operation or reprogramming. Additional TTL and motor drivers available.
Sound level	60 dB (A).
Package	Lightweight two-piece molded plastic shell with swivel-style carrying handle.
Decontamination	Auto-flush protocol using onboard water, or manual flush with detergent and/or disinfectant. Disposable high-performance pull-through fan module.
Accessories	Carrying case; inlet hose; 8cc sample bottles; sample bottles; rechargeable battery and charger.
Approvals	U.S. Dept. of Homeland Security certified under U.S. Safety Act of 2002

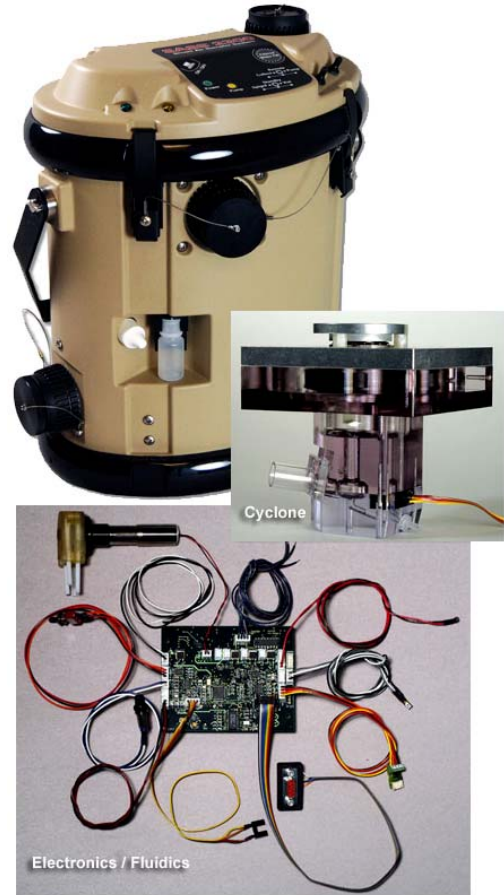
SASS® 2400 Low-Volume Wetted-Wall Air Sampler

Our smallest wetted-wall aerosol particle collection system. It is designed to operate with a much lower air flow and fluid sample volume than the SASS 2300, while still employing the highly successful wetted wall aerosol collection strategy that has received U.S. Department of Homeland Security Certification under the U.S. Safety Act of 2002.

The cyclone used in the SASS 2400 operates at a 40 LPM air processing rate and requires only 1 ml of fluid, whereas the larger SASS® 2300 processes 325 LPM of air and requires 4 to 5 ml of sample fluid. Water loss through evaporation is correspondingly reduced. Makeup water sources will last longer, or can be reduced in size.

Extremely long collection periods continue to be a product highlight – sample fluid is maintained at a constant amount independent of collection time, ambient air temperature, or relative humidity, providing unsurpassed monitoring capabilities in environments ranging from farmyards to hospitals to battlefields.

- Product Specifications On Following Page •



SASS 2400 Low-Volume, Wetted-Wall Air Sampler Specifications	
Characteristic	Description
Operating principle	Multi-stage wetted-wall cyclone with spray-enhanced particulate collection.
Air collection rate	40 LPM, nominal, when operating at a liquid charge of 1 cc.
Particulates collection range	1–10 μm
Concentration ratio	40,000/min, nominal.
Liquid inventory	1 cc, nominal, adjustable by user. Proprietary control loop maintains a constant liquid volume in the sampler, independent of collection time, temperature, or humidity.
Make-up water	1.3 liter on-board reservoir; supplemental off-board reservoirs may be used in fixed installations
Physical size	18.4 cm x 21.3 cm x 34.3 cm (7.2" W x 8.4" D x 13.5" H).
Weight	3.7 kg without battery, 4.7 kg with battery (8/10.2 lbs). Add 1.3 kg (2.2 lbs) for 1.3 liter of water.
Air outlet connection	Industry-standard threaded adapter. It is recommended that third-party accessories have an airflow channel 2.54 cm diameter or larger.
Humidity Operating Range	Non-condensing conditions.
Temperature Operating Range	Above freezing conditions to 66° C.
Power source	15 VDC BA-5590/U primary battery; BA-5390/U extended life primary battery; UBI 2590 rechargeable battery; 82-265 Volt (47-63 Hz) AC transformer for mains power.
Baseline power consumption	15 V @ 0.6 A, 9 W
Sample extraction	On-board 12 cc/min peristaltic pump, manual or remotely controlled. Vial filling module included. Air sampling may continue during extraction.
System controls	Microprocessor controlled. RS-232 or optional wireless link for remote operation or reprogramming.
Sound level	70 dB (A) at 1 meter
Package	Lightweight two-piece molded plastic shell with swivel-style carrying handle.
Accessories supported	Carrying case; inlet hose; inlet screen; sample bottles; rechargeable battery and charger.
Approvals	U.S. Dept. of Homeland Security certified under U.S. Safety Act of 2002

SASS® 3100 Dry Air Sampler

A high efficiency dry filter sampler developed for the collection of airborne particulates, especially pathogenic bacteria and spores. It is digitally smart, remotely controllable, and supports applications requiring a small, rugged low-power device equally comfortable in the arctic or desert. The system is fully portable and accepts both primary and rechargeable batteries.

The capture element is a 44 mm diameter felt-like polymer disc. Each fiber in the disc has an electric field frozen into it. These fields induce a charge in aerosols passing through the filter and provide a capture mechanism much more effective than impaction; up to 50X more efficient than conventional glass or cellulosic filters. This 'electret' media is stable to 70°C, is virtually inert, has a shelf life of 10 years, and has high holding capacity due to a large internal surface-to-volume ratio.

A microprocessor controls blower speed and provides diagnostics through fully dimmable LED indicators that warn when battery power is low, and when the fan is not rotating. The unit may be controlled remotely via an RS-232 communications link, or with an optional remote Bluetooth BioLink.



- Product Specifications On Following Page •

SASS 3100 Dry Air Sampler Specifications	
Characteristic	Description
Operating Principle	Collection by novel dry filter media.
Air Collection Rate	User adjustable 50-320 LPM
Collection Efficiency	0.5 µm dia: 50%
	1.0 µm dia: 75%
	2.0 µm >dia: 90%
Operating Temp. Range	-40 to 70°C
Storage Temp. Range	-40 to 70°C
Decontamination	Watertight design allows decon with 1 to 5% bleach solution.
Physical Size	
– Filter media	4.7 cm diameter filter (active area 4.3 cm) mounted in 6.0 cm diameter injection-molded holder.
– Overall Case	15 cm W x 17 cm L x 20 cm H
Weight	1.80 kg; add 1 kg for battery
Power Source	BA-5590/U primary battery; BA-5390/U extended life primary battery; UBI 2590 rechargeable battery; or 100–240 VAC/50–60 Hz lump-in-cord.
Power Consumption	8.3 W (CPU and fan running). Can run continuously for 24+ hours with primary battery. Operates for 10 days in standby.
System Controls	On-board microprocessor and GPS.
Communications	RS-232 (RF link optional)
Sound Level	45-61 dB (A) 1m
Package	EMI-resistant water-tight extruded aluminum case with carrying handle and 2 ea. 1/4-20 threaded bosses for tripod mounting.

SASS® 3010 Particle Extractor

The SASS® 3010 is used to extract and transfer to a small fluid volume, aerosols captured by Research International's electret filters. Captured particulates can be difficult to remove because induced dipole fields create a strong holding force and must be neutralized. Once particulates have been released, they must then be removed from within the fibrous filter matrix and collected in a small amount of sample fluid. These processes are efficiently performed in a matter of 1 to 2 minutes using the SASS 3010 manual extractor.

Extraction efficiencies are typically in the range of 70 to 80%. To test extraction efficiency, a SASS 3000 and several electret filters were used to collect airborne fluorescent polystyrene beads of 1.8 microns diameter. Each filter was operated for a period of 10 minutes. After the collection phase was completed, the filters were mounted in a SASS 3010 and captured beads transferred to 5 ml of extraction. Extraction efficiencies were then determined using fluorometric assay methods.

It was found that an average recovery of 77% was achieved. A second extraction with an additional 5 ml of extraction fluid resulted in recovery of another 17% of the embedded beads, while two more 5 ml extractions resulted in small 4.5% and 1.5% additions to the total number of beads recovered, respectively.



SASS 3010 Particle Extractor Specifications	
Characteristic	Description
Filter compatibility	For use with SASS 3000 and SASS 4000 filters
Extraction method	Acoustic vibration of the fluid-saturated filter is followed by counter flow discharge of the suspended aerosol particles.
Extraction efficiency	60-80% typical
Carry-over	1.1% with dry wiping, and 0.01% to 0.1% with a 5 ml flush
Extraction time	1 to 2 minutes, typical, with a flush cycle.
Extraction fluid	A pre-filled dropper bottle provides enough buffered extraction fluid to make a 5 ml sample.
Sample fluid storage	The extraction fluid bottle is also used for fluid sample storage upon extraction completion.
Physical size	<ul style="list-style-type: none"> • Body: 10.2 cm (W) x 13.4 cm (D) x 14.5 cm (H) • A 7.8 cm-high plunger protrudes from the extractor's top surface.
Weight	800 grams
Electrical power	Two size "D" primary batteries.
Operating temperature range	0° C to 70° C

SASS 4000 Concentrator

A highly efficient, high-volume aerosol concentration device. Many applications require the collection and analysis of aerosol particles, ranging from counter-terrorism to epidemiology, medicine, and agriculture. These applications typically involve the monitoring or collection of airborne plant, animal or human pathogens. But aerosol sample analysis is frequently plagued by three problems:

- The targeted pathogen is present at a very low concentration
- The collection process involves too small an air sample to be statistically valid; and/or
- Available bioassay methods are not sensitive enough.

In response to these issues, Research International is now offering the SASS 4000, the **highest-capacity portable** aerosol concentrator in production.



SASS 4000 Concentrator Specifications	
Characteristic	Description
Primary airflow:	3600+ liters/min is sampled uniformly from around the concentrator's circumference.
Secondary airflow:	30-325 LPM at +0.4 cm of water static head.
Secondary airflow connection:	Hose barb fitting on base surface for nominal 3.8 cm ID hose.
Concentration enhancement:	4 - 15 times, typical, depending on primary/secondary airflow ratio.
Overall size:	38 cm high x 25.4 cm diameter max.
Weight:	6.32 kg (13.9 lbs.)
Operating temperature range:	-40°C to 60°C
Power consumption:	<ul style="list-style-type: none"> • 90 watts for ECM drive motor. If operated from DC, please specify DC source voltage of 12, 24 or 28 VDC. • 100 to 230 VAC lump-in cord AD/DC converter supplied. Please specify AC voltage range required.
Sound level:	72 db-A @ 1 meter radius on inlet equatorial plane.
Mounting:	Quick-detach tripod legs; 0.53m to 1.46m adjustable height.
Accessories:	<ul style="list-style-type: none"> • Hard shell carrying case. • Electret sample filter assembly (for stand-alone operation).

SASS® 4100 Two-Stage Aerosol Collector

A direct offshoot of our highly successful SASS 4000 aerosol concentrator. In both devices, over 3500 liters/minute of ambient air is continuously sampled as a primary air stream. Particulates in this air stream are transferred to a much smaller secondary air stream using patent-pending centrifugal and virtual impaction principles.

Particles are routed into the secondary flow by forcing primary circuit air to circulate through specially shaped channels where centrifugal force and particle momentum isolate and concentrate the particles. The interior structure has been designed so that the smallest flow cross-section is a

channel 0.6 mm wide x 6.35 cm long, providing good resistance to clogging by larger particles. A coarse screened cover with 5.4 mm square openings further restricts the entrance of large debris.

The secondary flow can reach aerosol concentrations that are 4X to 15X higher than present in the incoming air, yet the velocity of this secondary aerosol concentrate flow is much lower than peak velocities in the primary circuit. The two-stage sampler therefore amplifies and slows down the captured ambient aerosol particles prior to their collection.

This aerosol concentrate is collected by directing the secondary air through an electret bulk filter media; devoid of particles, the secondary air is re-introduced into the primary air flow. Due to advantageous pressure differentials within the device, one prime mover fan drives both the primary and secondary flows.

This dry sampling method has several favorable attributes:

- The primary fan rotor is the only moving part.
- Maintenance is minimal.
- The operating temperature range is very wide.
- The structure is comparatively clog resistant.
- Sampled air volume is maximized, improving collection statistics.
- Organism viability is maximized by using low air flow velocities and a bulk electret filter media

• Product Specifications On Following Page •



SASS 4100 Two-Stage Aerosol Collector Specifications	
Characteristic	Description
Primary airflow:	3,600 liters/min is sampled uniformly from around the concentrator's circumference.
Aerosol collection media:	Fibrous electret bulk filter, RI part number 7100-134-230
Secondary airflow:	265 LPM with the electret filter in place
Air velocity at filter face	3 m/sec. (43.4 mm diameter filter active area)
Filter mount	Hat-shaped fixture that locks onto the device's baseplate
Overall size:	38 cm high x 25.4 cm diameter max.
Weight:	6.32 kg (13.9 lbs.)
Operating temperature range:	-40°C to 60°C
Ingress protection rating	45
Operating life	ECM fan rotor is only moving part. A bearing life of 30,000 hours is expected.
Power consumption:	90 watts. 100 to 230 VAC lump-in cord AD/DC converter supplied. If operated from DC, please specify DC source voltage of 12, 24 or 28 VDC.
Sound level:	72 db-A @ 1 meter radius on inlet equatorial plane.
Mounting:	Quick-detach tripod legs; 0.53m to 1.46m adjustable height.
Accessories:	<ul style="list-style-type: none"> • Hard shell carrying case. • Electret sample filter assembly

BioHawk® 8-Channel Collector/Bio-Identifier

Portable bioassay system integrated with an aerosol collector. It is suitable for the high-sensitivity monitoring of biological agents, toxins, explosives, and chemical contaminants. Assay results are typically available in 10 to 20 minutes. BioHawk can be programmed to monitor surrounding air for aerosol threats with the built-in air sampler, and to periodically transfer a wet concentrate from the air sampler to the biodetector portion.

Alternatively, a Sample Port may be used to introduce liquid samples for analysis from external sources, either manually or under software control. A built-in microcomputer provides unparalleled operating flexibility and sophistication.

Bioassays are performed within a small disposable credit card-sized plastic assay coupon. Unlike other assay technologies that are based on a "use once and discard" philosophy, this coupon and the reagents stored within it may be used for 10 or more assay procedures before being discarded. Since a single assay coupon can handle up to eight different analytes simultaneously, this means that up to 80 individual assays may be performed before discarding or removing the coupon. This capability simplifies field use and substantially reduces life cycle cost.

Assay results may be transmitted to users through the touch panel LCD display, an audible alarm, a pulsating light, or by wireless or RS-232 link to personnel at a remote location. System operation may also be remotely controlled in real time- virtually every fluid or air handling function is capable of being controlled remotely.

Although sophisticated and versatile, the unit is still very easy to use. Most global functions such as air sampling and biodetection are performed using multi-step recipes developed by Research International and stored in the system's computer memory. Users need only the most fundamental level of training since the internal processes and steps are preset through the built-in computerized recipes. For more professional users, bundled Windows-based software allows the user to develop their own customized sample collection and detection protocols.

The system is truly portable at a field weight of only 12.1 kg and volume of 17 liters. The system is capable of 14 to 42 hours of operation on the standard BA5590/U primary battery. Specific operating times will depend on climatic conditions and use profile. A rechargeable battery option is also available.

• Product Specifications On Following Page •



BioHawk® 8-Channel Collector and Bio-Identifier Specifications	
Characteristic	Description
Use profile	Indoor/outdoor sample collection, transfer, and assay; storage of 255 assay recipes; user in full MOPP gear either walking or in moving vehicle.
Collection principle	Multi-stage wetted-wall cyclone with enhanced particulate collection.
Assay method	Disposable wet assay coupon-reuseable up to 15 times. Eight simultaneous software-based assays. Antibody or nucleic acid. Coupon reseals on removal for archival storage.
Fluid Handling	Fluids manipulated under microprocessor control using peristaltic and syringe pumps; sample may be oscillated to lower assay time; reagent is recovered for reuse.
Fluids storage	Snap on 3-section fluid pack. Clean water: 1 liter; Buffer: 250 ml. Waste: 500ml. Assay samples may be optionally stored in a detachable 8cc vial for later analysis.
Human interface	Day/night Touchscreen LCD display. Usable in MOPP gear.
Digital communication	RS-232 bi-directional serial link
Physical size	35.6 cm W x 36.5 cm H x 17.1 cm D
Weight	21.7 lbs. dry; 26.7 lbs. with battery and fluids (9.8/12.1 kg).
Operating/storage	1 to 66°C and -29 to 66°C. Reagent deterioration can reduce upper limit significantly
Humidity	10% and above. May be operated in rain.
Survivability	MILSPEC 810F; MTBF of about 30,000 hours is determined by air sampler fan
Data storage	Flash memory retains raw/processed data for over 6000 assays.
Power Consumption	6.2 W at idle; 17.8W with fan operating and one assay performed each 30 minutes
Power source	<ul style="list-style-type: none"> ▪ Primary battery BA-5390A/U, 1.05 kg (2.3 lb); lifetime 14 to 45 hours. ▪ Rechargeable battery UBI-2590; lifetime is approximately 56% of the BA5390A/U primary battery. ▪ Universal lump-in-cord power supply, 82-265 Volt (47-63 Hz).
Alarm	Visual LED and 103 dB @0.6m waterproof horn; adjustable. RS-232 data link.
Decontamination	Auto-flush protocols using onboard water, or manual flush with detergent and/or disinfectant. High-performance pull-through fan easily remove if contaminated.
Sound level	60 dB (A).
Ancillary equipment	Heavy-duty hard-shell transport case with wheels.
BioHawk Bioassay Specifications	
Analyte range	Toxins, viruses, bacteria, spores, fungi, multi-cellular pathogens
Sensitivity	Analyte dependent, 1 to 10 ppb typical for toxins, 100 to 100,000 CFU/ml for bacteria.
Assay time	Dependent on assay; 10 to 20 minutes typical.
Reagent storage	Reagent stored onboard assay coupon; may be reused up to 15 times depending on assay protocol.
Confirmatory sample	Confirmatory sample may be stored in assay coupon or 8cc sample vial.
BioHawk Air Sampling Specifications	
Air collection rate	390 LPM, nominal.
Particulates collection range	1-10 µm
Concentration ratio	78,000/min., nominal.
Liquid inventory	4 to 5cc. Factory set but adjustable under computer control. Patented control process maintains a constant liquid volume in the sampler, independent of collection time, temperature, or humidity; useful for concentrating trace airborne analytes.
Air inlet	Screened rectangular opening. Hose adapters available.
Sample extraction	On-board 12 cc/min peristaltic pump under manual or remote computer control. Vial filling also supported. Air sampling may continue during extraction.

Introducing the New PLUS Product Lines

BioHawk Plus

Combines a highly efficient, high-volume aerosol concentrator (SASS 4000) with an 8-channel collector/bioidentifier system (BioHawk). This system concentrates particulates from ambient air then passes it on to a wetted-wall air sampler that extracts the particulates from the air stream into a liquid phase. The liquid sample is then automatically transferred to the bioidentifier to be analyzed by fluoroimmunoassay.



SASS 3100 Plus

Complete solution for your dry air sampling challenges. Combines the high-efficiency of our SASS 3100 dry filter sampler with our SASS 3010 Particle Extractor. This combination provides you with the ability to collect airborne particulates, pathogenic bacteria and spores and then extract and collect the sample into a liquid form for analysis.



SASS 4000 Plus

The SASS 4000 Plus combines a highly efficient, high-volume aerosol concentrator (SASS 4000) with a portable multi-stage, wetted-wall, cyclone sampler (SASS 2300) that extracts particulates and water-soluble chemical vapors from the concentrated air into to a liquid phase suitable for later analysis.



SASS 4100 Plus

The SASS 4100 Plus provides total sampling capability by combining Research International's highly efficient, two-stage, dry filter-based aerosol collection device with our SASS 3010 Particle Extractor.



RAPTOR™ Bioassay System

Portable, 4-channel fluorometric assay system that can be used for high-sensitivity monitoring of biological agents, toxins, explosives, and chemical contaminants. It represents a careful integration of optics, fluidics, electronics, and software into one compact system for use in laboratory settings and field assays. This unit can automatically perform a user-defined, multi-step, assay protocol while simultaneously tracking fluorescently-tagged chemical reactions occurring on the surface of each of the system's four disposable optical waveguide sensors.



Using immunoassay techniques, toxins and markers such as *Y. pestis* F1 antigen have been detected at levels below 1 ppb from samples of a few hundred microliters. Each waveguide may be functionalized with a different assay, allowing up to four different assays to be run simultaneously. The results of these assays are displayed on a four line x 16 character LCD. The RAPTOR can also be run from a desktop PC, via an RS-232 link, using Windows-based software that is provided with the system.

RAPTOR Specifications	
Parameter	Value
Use profile	Indoor/outdoor sample collection, transfer, and assay; storage of 63 assay recipes; user in full MOPP gear either walking or in slowly moving HumVee.
Physical size	18.6 cm L x 27.4 cm H x 17.3 cm W
Weight	5.6 kg (w/o battery)
Operating temperature range	1 to 50°C
Storage range	-29 to 66°C
Assay coupon	Four simultaneous assays, disposable, coded for assay identification. Coupon reseals upon removal for archival storage.
Fluids storage	On-board storage of buffer and reagent. Reagent stored at constant temperature in reusable thermal storage module.
Sensitivity	Dependent on analyte, 1 to 10 ppb is typical.
Assay time	Dependent on assay, 9 to 13 minutes is typical.
Data/command entry	Day-night visible keypad and display, usable in MOPP gear.
Visual	Liquid crystal display; display provides positive/negative/retest for each agent.
Communication	RS-232 bi-directional serial link and DB-15 accessory connector.
Data storage	EEPROM retains raw/processed data for over 200 assays.
Batteries	Primary battery BA-5590/U, 1.05 kg (2.3 lb.); lifetime 9 to 24 hours.
Humidity	20 to 90%, noncondensing.
Ancillary equipment	Nylon twill photographer's-style case, carry strap compatible with MOPP gear; weight 1.2 kg (2.6 lb.); lump-in-cord power supply.
Accessories support	Three digital input lines and six software-controlled external drivers.

Bluetooth BioLink™ Data Radios

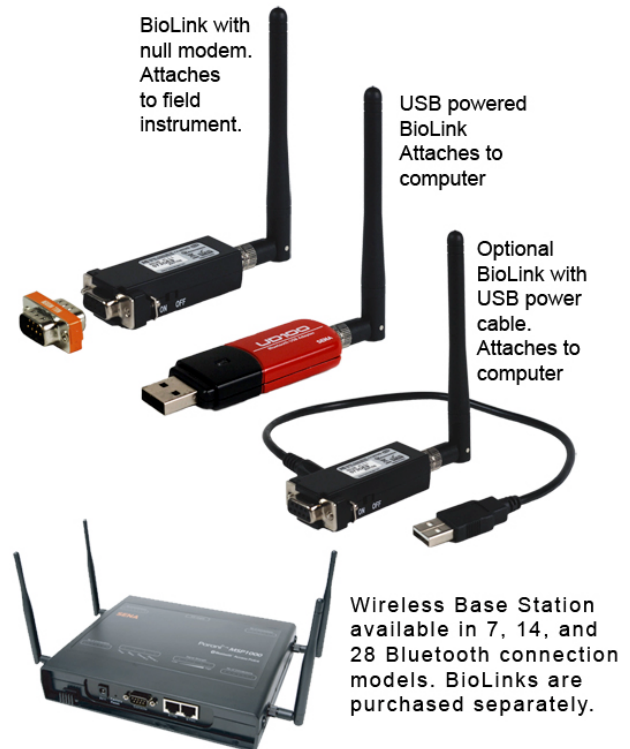
If you own any of the Research International family of air samplers or chemical and biological sensing instruments you know their value in providing fast and reliable data, both in the lab and in the field. Now you can eliminate all physical cabling in multi-instrument installations by using Bluetooth BioLink RF Data Radio technology.

The Bluetooth BioLink device draws all of its operating power from the RS232 data interface on Research International Samplers and Detection Instruments and has all radio functions built-in. The Bluetooth BioLink connected to the PC can be powered from any USB port directly, or via a supplied USB cable if an RS232 connector-equipped BioLink model is used at the PC.

Each device has a pairing button and LED that provides a quick and easy method for establishing a trusted device Bluetooth connection without the need for a PC. A four position dip switch sets the baud rate and enables or disables hardware handshaking. In a few minutes the wireless connection setup is complete.

A particularly attractive aspect is that each RF node is assigned a unique Bluetooth address, allowing a Bluetooth BioLink Base Station (available from Research International) to communicate discretely with different system nodes. For a BW application, these nodes might include a dry biotrigger; a wet air sampler; and a bioidentifier. The Bluetooth BioLink Base Stations are network enabled so they can be either connected to a host PC with an ethernet cable or connected directly to the internet.

The Bluetooth BioLinks are Class 1 devices with an open field range of 400 meters (1300 feet) with the supplied antennas. A range of 1000 meters is possible with an optional available antenna.



• Product Specifications On Following Page •

BioLink Bluetooth Wireless Specifications	
Characteristic	Description
Bluetooth specification	Bluetooth v2.0 + EDR
Max data transfer rate	3 MBPS with USB style 921.6 MBPS with RS-232 style
Working distance	100 meters with +1 dBi antenna 200 meters with +3 dBi antenna 400 meters with +5 dBi antenna
Operating temperature	-20 to 70C
Storage temperature	-40 to 85C
Humidity	90% noncondensing
Size	76 x 31 x 16 mm (RS-232)
72 x 22 x 10 mm (USB)	
Computer OS support (USB only)	Windows 2000/XP/Vista; Linux; MAC OS X (MAC OS X driver required)
Approvals	RS-232: CE, FCC, TELEC, MIC USB: CE, FCC, TELEC, KCC,Bluetooth SIG
Multi-Node Bluetooth Base Station	
Bluetooth specification	Bluetooth v2.0 + EDR, Class 1
Connectivity	Up to 28 nodes
Max data transfer rate	3 MBPS
Profiles	Serial Port, LAN access, PAN, Dial-up Networking, file transfer
Network protocols	IPv4, ICMP, ARP, TCP, HTTP, telnet, TFTP, SSH, HTTPS, SSL/TLS, DNS, SCP/SFTP/FTP, syslog, NTP, SMTP, Dynamic DNS
Working distance	100 meters with +1 dBi antenna 200 meters with +3 dBi antenna 400 meters with +5 dBi antenna
Operating temperature	0 to 50C
Storage temperature	-30 to 85C
Humidity	90% non-condensing
Size	203 x 170 x 44 mm
Weight	1470 gm
Power	6 W at 5V
Security	IP filtering, SSH v2, SSL/TLS, HTTPS, SCP, SFTP
CF port	Flash memory
Logging	Syslog server, CF memory
Management	Windows utility; Web, telnet, Serial Console
Customization	Python script engine, ELDK v4.0, 2MB internal user space
MBTF	30.5 years
Approvals	CE, TELEC, FCC