RSN 5000

Remote Sensor Nodes

Integrated wide-area CBRN monitoring

Features

- Full CBRN monitoring capability and GPS location
- 200 LPM air sampling rate
- Sample collection upon alarm
- Optional weather station and video
- Portable: 12 hours on battery power
- High speed 100 MHz wireless network
- 2 km range, up to 64 nodes per network
- Network operating software - no license fee
- Plume dispersion software

Application Areas

- Public spaces
- Sporting events
- Homeland security
- Military
- Power plants
- Environmental

The RSN 5000 is a portable CBRN monitoring device suitable for the detection of toxic gases, aerosolized biological agents, and nuclear materials. CBRN sensors are mounted within its tough cylindrical aluminum shell while other sensors, such as video or thermal IR cameras, can be connected to the node wirelessly.

Security features A built-in tripod is used to position the unit, or it may be secured to an adjacent structure using locking rings built into the exterior surface. Anti-theft features similar to those used for automobiles have been incorporated due to their portability.

Communication The RSN can transmit data wirelessly transmitted to a remote local receiver positioned up to two kilometers away. Collected data from multiple nodes may be transferred to a headquarters location 50-70 km distant using commercial RF digital transceivers.

Air sampling rate Air is drawn into the unit through a top cap at the rate of 200 liters/minute and discharged through a perforated cylindrical exhaust section near the unit's base.

Customizable The RSN 5000 is modular in design. Depending on customer preferences, multiple types of CBRN threats can be rapidly detected.

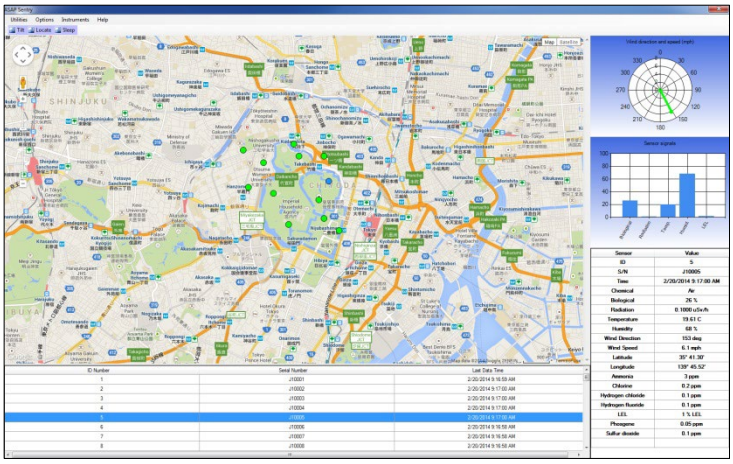
- Toxic gases can be identified by one or more of four state-of-the-art methods.
- Suspicious changes in bioaerosol concentrations are reported by an ultraviolet fluorescence-based biodetector.
- A sensitive gamma ray radiation detector warns of suspicious changes in background radiation levels.

If user-adjustable alarm levels are exceeded, a secondary sampling circuit can be automatically activated that collects an aerosol particle sample onto a special high-efficiency filter. The materials collected can then be examined using rapid response assay protocols.

Optional Features

Weather Station - A portable weather station is available (as an option) that can be rapidly mounted to the unit and deployed to a height of 3 meters. If a toxic incident is encountered, the weather station provides invaluable information on wind speed and direction as well as GPS location, temperature and relative humidity. This information is needed to predict how the toxic material will disperse in the atmosphere and whether crowds or population need to be moved out of harm's way. Detection of a toxic incident is only the first step in minimizing its impact.

Camera Surveillance - A high resolution video or thermal IR camera may also be associated with the Remote Sensor Node, either being physically mounted to it or placed at a location with good visibility and electronically connected to it by a wireless link. This optional feature is highly recommended as it can be used to monitor a large area for suspicious individuals and can be a deterrent for a wide range of terrorist activities.



ASAP Sentry software map view. Boxes on the bottom of the screen are monitoring up to 64 nodes in real-time (all data simulated to protect customer privacy)

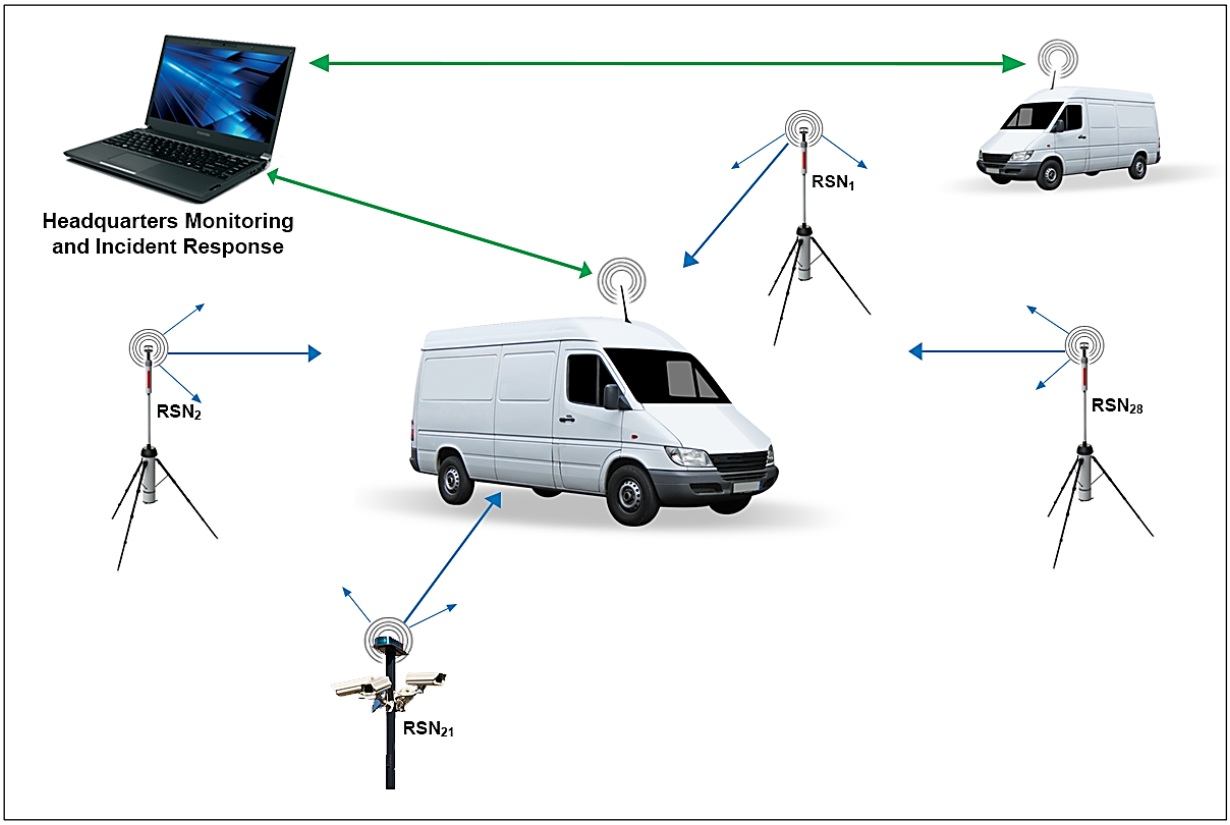
Toxic Plume Tracking - Software is available for integrating the data from multiple Remote Sensor Nodes onto maps of the local area and for predicting toxic plume concentrations and movement based on weather data provided by the portable weather station or by local meteorological stations. These models have been developed by the U.S. government for use by its municipalities. An area-monitoring gas detector is also available that can be remotely located and connected by wireless link.

Robotic Deployment - The unit may also be mounted to a robot for semi-automated deployment. This allows the sensor module to be rapidly moved from place to place. If a toxic event occurs, one robotic detection unit is capable of creating a detailed picture of the toxic plume's concentration and movement by being positioned for short periods of time at a number of points within the plume's downwind profile. This can create a rich actionable database not possible with fixed location devices. The robotic device is capable of operation in areas far too toxic or with radiation levels too high to be tolerated by emergency personnel.

Robotic mounting method for Remote Sensor Node, shown in active/field use position.

Mobile Systems

Research International can also furnish complete turn-key systems for use with vehicles. These systems can be designed to function as local area network monitoring points or mobile sensor platforms, or both. In a typical case, a van will be equipped with built-in desks, storage areas for sensors and protective suits, auxiliary generator and power points, external antenna mounts, air conditioning, etc. If the van is to be used in hostile environments, both the front driving cab and rear work areas can be hermetically sealed to protect drivers and other personnel from exposure to toxic materials surrounding the vehicle.



Remote Sensor Nodes will wirelessly connect to a central monitoring station.

Example Sprinter-based mobile laboratory space.

RSN 5000 Specifications

Toxic gas detector – Type I	Identification of up to 20 gases simultaneously at ppb/ppm levels using IMS technology.
Toxic gas detector – Type II	Identification of up to 40 gases simultaneously at ppm levels using infrared signature technology over a distance of up to 50 meters. Located externally and connected by wireless link.
Toxic gas detector – Type III	Electrochemical cells per customer selected type maximum of 6 channels
Bioaerosol detector	Detect sudden changes in biological aerosols, send sampling command
Radiation detector	Sensitive gamma ray monitor
Sampling fan	200 liters/minute
Sampling filter device	Collect samples when an alarm level is exceeded or by remote command
Weather station	Provide wind speed and direction as well as GPS, temperature, and humidity (optional)
Thermal and/or high-resolution video camera	Monitor for suspicious activity and movement, detect explosion clouds. Can be located either on the node or externally and connected by wireless link
Industrial process control computer	Collect and store sensor data
Wireless links	Local link to sensors not mounted on Remote Sensor Node; and second link for data transmission to a remote receiver up to 2 km distant
Wireless link to listening post	TCP/IP protocol, 2.4 GHz ISM band mesh-type network
Security against theft or tampering	Chain lock and automotive-type theft alarm
Size	0.2 m diameter x 1.0 m high without weather probe
Weight	25 kg; add 7 kg for portable weather station
Operating temperature range	–30°C to 60°C
Operating time	12 hours on battery; 1 week or more on mains power

Research International reserves the right to change specifications without prior notice.

RESEARCH INTERNATIONAL

U.S. Headquarters Office

Research International, Inc.
17161 Beaton Rd. S.E.
Monroe, WA 98272-1034 USA

Tel: 1.800.927.7831
info@resrchintl.com
www.resrchintl.com

U.S. East Coast Office

Mr. Jon Tobelmann
1.703.625.8381
jontobelmann@resrchintl.com

International Offices

Please contact the U.S. Headquarters office to locate a representative in your region.