

# Bid Specifications: SAFEMTX™ Multi-Threat Gas Detector

## PHYSICAL CHARACTERISTICS

Size	Unit shall not exceed 12"W x 12.5"H x 7.75"D in total size
Weight	Unit shall not exceed 11 lbs. / 12 lbs. with SAW sensor
Enclosure Type	The enclosure shall be impact-modified Lexan 243R with an impact padded sanoprene boot.
Transportability	Unit shall have the ability to be transportable.
Ingress Protection Rating	IP65 rated; defined as totally protected against dust and protected against low pressure jets of water from all directions.
Enclosure Type Rating	3R; defined as an enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against rain, and snow, undamaged by the external formation of ice on the enclosure.
Temperature Class Rating	T5

## OPERATION

Deployment	The SAFESITE shall be capable of being quickly deployed and used in a stealth mode or permanently wired for continuous monitoring.
Sensor Capacity	The SAFEMTX shall have the capacity to utilize up to six different sensors to detect for: <ul style="list-style-type: none"> <li>• Chemical Warfare Agents utilizing SAW technology</li> <li>• Gamma Radiation utilizing CZT technology</li> <li>• Volatile Organic Compound utilizing PID technology</li> <li>• Toxic Gases utilizing Electrochemical sensor technology</li> <li>• Combustible gases utilizing Catalytic Bead technology</li> <li>• Oxygen deficiency/enrichment utilizing Electrochemical sensor technology</li> </ul>
Smart sensor technology	Toxic, VOC, combustible and oxygen sensors shall be configured in a common housing, allowing for interchangeability and quick changeout. The display shall auto-recognize smart sensors installed and update the LCD display with sensor type and range.
LCD Display	Shall indicate up-to six threat readings simultaneously and indicate - through smart symbols - RF signal strength, horn and beacon status, GPS status and password protection.
Keypad	Shall utilize three buttons to power unit on and off, set alarm levels and settings, calibrate sensors, review RF diagnostics, and set system configurations.
RF Diagnostics	System software shall indicate, on the LCD display, radio signal strength and data transmission success rate between the detector and Command Center. There will be no need to contact Command Center to determine if placement of detector is providing sufficient RF signal strength.
Radio	Shall utilize a 900 MHz, 1W, spread spectrum, frequency-hopping radio

## GAMMA RADIATION DETECTOR

Technology	Gamma Radiation shall be detected using a Cadmium Zinc Telluride (CZT) technology		
CZT Specifications	<b>Range</b>	<b>Saturation</b>	<b>Minimum Detectability</b>
	0-100 mRem/hr	120,000 cpm	0.1 mRem/hr
	0-1000 mRem/hr	120,000 cpm	1.0 mRem/hr

## VOLATILE ORGANIC COMPOUND DETECTOR

Technology	Volatile Organic Compounds (VOC's) shall be measured using Photoionization Detector (PID) technology.		
VOC Detector Specifications	<b>Gas Type</b>	<b>Range</b>	<b>Minimum Detectability</b>
	VOC	0-200 ppm	0.1 ppm
	VOC	0-1500 ppm	1 ppm

## CHEMICAL WARFARE AGENT DETECTOR

CWA Detector Specifications	<b>Gas Type</b> Nerve Agents (GA Tabum, GB Sarin, GD Soman, GF)	<b>Minimum Detectability</b> $<0.5 \text{ mg/m}^3$
	Blister Agents (HD Sulfur Mustard and HN-3 Nitrogen Mustard)	$<2 \text{ mg/m}^3$
Technology	CWAs shall be detected using the Surface Acoustic Wave Microsensor Array Technology (SAW)	
Selectivity	The CWA detector shall provide high selectivity of CWA agents, identifying Nerve (G) or Blister (H) agents, preventing misleading warnings to preclude unnecessary false positive readings.	

## TOXIC / O<sub>2</sub> / COMBUSTIBLE GAS SENSOR

Technology	Toxic Industrial Chemicals (TIC's) and oxygen sensor shall be measured using electrochemical sensors. Combustible sensors shall be measured using catalytic bead sensors.		
	<b>Gas Type</b>	<b>Range</b>	<b>Minimum Detectability</b>
Toxic Sensor Detection	Carbon Monoxide - CO	0-100 ppm	1 ppm
	Carbon Monoxide - CO	0-500 ppm	2 ppm
	Carbon Monoxide - CO	0-1000 ppm	1 ppm
	Hydrogen Sulfide - H <sub>2</sub> S	0-10 ppm	0.1 ppm
	Hydrogen Sulfide - H <sub>2</sub> S	0-50 ppm	0.1 ppm
	Hydrogen Sulfide - H <sub>2</sub> S	0-100 ppm	1 ppm
	Hydrogen Sulfide - H <sub>2</sub> S	0-500 ppm	1 ppm
	Chlorine - Cl <sub>2</sub>	0-5 ppm	0.1 ppm
	Chlorine - Cl <sub>2</sub>	0-10 ppm	1 ppm
	Chlorine - Cl <sub>2</sub>	0-20 ppm	1 ppm
	Chlorine Dioxide - ClO <sub>2</sub>	0-3 ppm	0.1 ppm
	Sulfur Dioxide - SO <sub>2</sub>	0-25 ppm	1 ppm
	Sulfur Dioxide - SO <sub>2</sub>	0-100 ppm	1 ppm
	Nitric Oxide - NO	0-100 ppm	1 ppm
	Nitrogen Dioxide - NO <sub>2</sub>	0-10 ppm	0.1 ppm
	Hydrogen Cyanide - HCN	0-50 ppm	1 ppm
	Hydrogen Chloride - HCL	0-50 ppm	1 ppm
	Phosphine - PH <sub>3</sub>	0-2 ppm	0.1 ppm
	Arsine - AsH <sub>3</sub>	0-2 ppm	0.1 ppm
	Bromine - Br <sub>2</sub>	0-5 ppm	0.1 ppm
Ammonia - NH <sub>3</sub>	0-100 ppm	1 ppm	
Ammonia - NH <sub>3</sub>	0-1000 ppm	10 ppm	
Ethylene Oxide - ETO	0-10 ppm	0.1 ppm	
Oxygen Sensor	Oxygen - O <sub>2</sub>	0-10%	0.10%
	Oxygen - O <sub>2</sub>	0-25%	0.10%
Combustible Sensor	Combustible Gas	0-100% LEL	1% LEL

## SENSING TECHNIQUE

Diffusion	The system shall work in a diffusion mode.	
Pump	The system shall have the ability to use a sample draw to pull a sample into the enclosure and across each of the sensors.	
Flow Specification	No Sample Line	350 cc/min
	50 ft. Sample Line	190 cc/min

## MAINTENANCE REQUIREMENTS

Maximum System Maintenance	The system shall require periodic checking of sensor response to a known concentration of gas and periodic checks on the chemical warfare agent pump and smart sensor pump, when applicable.
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## USER INTERFACES

Communication	Unit shall communicate to a computer command center or an alternate communication host within a wireless network.
Command Center	Command center shall be the SAFECOM Command Center.

## CALIBRATION REQUIREMENTS

TIC / VOC / O <sub>2</sub> / Combustible	Shall be calibrated using a calibration port and individual calibration cylinders.
CWA and RAD	No calibration shall be required. Units shall be able to simulate alarm conditions to test.

## ENVIRONMENTAL

Temperature with SAW module	-20° to +50°C (-4° to +122°F) 0° to +40°C (32° to 104°F)
Humidity	Operating Humidity range 0-95% RH, non-condensing

## POWER REQUIREMENTS

System Power Requirements	The system shall operate on a battery, 110-120 VAC, 50/60 Hz power or a 12VDC power supply.
Battery Type	Unit shall use a Lithium-ion or alkaline battery.
Battery Run-Time	Lithium-ion Battery shall have a minimum 24 hour runtime without SAW sensor and 7 hours with SAW sensor (battery run-time may be affected at temperatures below -10 °C or above 40°C).
Battery Charge-Time Requirement	The system shall have a built-in charger. The battery shall have a maximum charge time of 3 hours while the unit is not in operation and 5.5 hours while the unit is in operation.

## WARRANTY

Base Unit and Sensors	Instrument shall have one year parts and labor standard warranty with extended five year warranty available.
CWA Detector	Chemical Warfare Agent detector shall have a one year or 1200 hour parts and labor warranty, whichever comes first.