RAE SYSTEMS by Honeywell

Bid Specifications

MicroRAE Wireless 4 gas Monitor

Sensor Requirements

- Instrument shall have a 4 distinct dedicated sensor sockets
  - ✓User shall be able to enable or disable individual sensors

Combustible Gas Sensors	Range	Resolution
Catalytic LEL	0 to 100% LEL	1% LEL

✓Manufacturer should be able to provide at least 30 LEL sensor Correction Factors.
✓LEL sensor should be available with either H_2S or H_2S+Si LEL sensor filters for better protection against poisoning and inhibition effects.

Sensors for Toxic Gases and O_2	Range	Resolution
Carbon Monoxide (CO)	0 to 1,000 ppm	0 – 250 ppm / 0.1 ppm 250 – 1,000 ppm / 3 ppm
Hydrogen Cyanide (HCN)	0 to 50 ppm	0.2 ppm
Hydrogen Sulfide (H_2S)	0 to 100 ppm	0 – 50 ppm / 0.1 ppm 50 – 100 ppm / 1 ppm
Oxygen (O_2)	0 to 30% Vol.	0.1% Vol

✓Readings for all toxic sensors shall be displayed either in ppm, mg/m^3 or µmol/mol (user-selectable)

Sampling

Sampling Type: Instrument shall be available in diffusion

External Filters: Auxiliary filter should be available for use in high dust concentration environment (porosity 90-130 µm)

Quality

Quality: Instrument manufacturer must be certified to ISO 9001 or higher

Sourcing Control: Critical components like sensors must be manufactured in-house

User Interface

Display Readouts: The monitor shall display the sensor names, measurement units, and real-time readings simultaneously for all enabled sensors, plus:
- Wireless modem's on/off status and connection quality (if available),
- Battery life indicator,
- Datalogging on/off status,
- Pump on/off status,
- "Man Down Alarm enabled" icon, and
- "All sensors tested and calibrated" check mark

Keypad:
- Monitor shall have no more than 2 buttons
- Buttons must be fully usable with more than one layer of gloves on

Alarms

Alarms:
- Instrument shall be equipped with a 100 dB (at 11.8"/ 30 cm, typical) audible alarm, built-in vibration alarm, and 4 or more flashing high-visibility alarm lights
- Monitor shall be capable of producing alarm notifications locally as well as transmitting them wirelessly to Ecosystem
- Instrument shall provide audible, visual, and vibrating alarms if an alarm thresholds including STEL or TWA are exceeded or in case of a fault, such as low battery, etc.
- Instrument shall provide option to implement "Low Low Alarm" on Oxygen measurement
- Instrument shall have a gravity sensor-driven Man Down Alarm with a configurable pre-alarm and real-time remote wireless notification
- Alarms shall be configurable as latching with manual override or automatically resetting
- Alarm thresholds, including STEL and TWA, for all applicable sensors shall be user-configurable
- Wi-Fi module equipped device should provide panic function capability.

Features

Policy Enforcement:
- The instrument shall have features to help enforce policies pertaining to bump testing and calibration requirements, including making instrument inoperable if it has not been bump tested and calibrated to policies
- Instrument shall record bump test and calibration policy violations which shall be downloadable to the PC as reports

Visual Indication of Compliance: Instrument shall display a check mark icon when all the enabled sensors have been tested and calibrated to policy

Should instrument not be compliant it should be able to use LED to indicate non conformity.

Last Bump Test and Calibration Dates: Instrument must be able to display last successful bump test and calibration dates for each sensor

Bump Test and Calibration Reports:	Bump test and calibration reports must be recorded and stored on the instrument and shall be downloadable to the PC
Protection from Tampering and Accidental Shutoff:	• Programming and Diagnostic menus must be password-protected • Instrument shall be protected against accidental shutoff with a required 5-second countdown to shutoff
Glance mode	Instrument should offer ability to access product configuration without entering in instrument menu

Wireless

Wireless Capability:	The instrument shall be configurable to wirelessly transmit sensor readings and alarm status including Man Down Alarm
Integrated Modem:	Instrument shall be configurable with a built-in wireless modem with at least a 100-meter (300 ft.) direct communications range
Short distance: Communication module	Instrument shall be available with standard built-in Bluetooth Low Energy module
Integrated GPS:	Instrument offer configuration with built in GPS
Frequencies	The instrument's wireless modem shall operate on ISM license free band. IEEE 802.15.4 Sub 1 GHz (Mesh 868MHz and 915MHz) IEEE 802.11 bands b/g 2.4 GHz (Wi-Fi)

Data Management

Datalogging:	• The instrument shall have a built-in data logger capable of recording 6 months' worth of data taken at 1-minute intervals for 5 sensors under 24/7 operation • Automatic or manual datalogging options shall both be available
Data Management Software:	Software shall be included at no extra charge with updates available via the manufacturer's web site
Data Download:	• Data and reports shall be downloadable directly from the instrument to a PC via USB and via a compatible automatic test and calibration system • All data download and PC communications accessories shall be included with the instrument at no extra charge

Battery Options

Battery:	Instrument shall have a rechargeable Li-ion battery
Battery Runtime:	Instrument shall deliver at least 11hours of continuous operation on full wireless configuration (BLE+ Mesh+ GPS or BLE+ Wi-Fi + GPS) - room temperature Instrument shall deliver at least 15hours of continuous operation for non-wireless module equipped units- room temperature

Physical Specifications

Size:	Size should not exceed 4.6" H x 3.0(2.6)3.0" W x 0.9" D 117 mm H x 76(66)74 mm W x 24 mm D
Weight:	Weight with sensors, wireless modules and battery installed shall not exceed 7.03 oz. (206 g)

Environmental Specifications

Temperature:	Instrument shall be certified for operation within a -4° to 140°F (-20° to 60°C) temperature range (T4 temperature code)
Humidity:	0 - 95% relative humidity (non-condensing)
IP Rating:	The instrument shall have an IP rating for water and dust ingress protection of IP-67 or higher (granted by 3rd party)

Certifications

Hazardous Area Approvals:	• cCSAus:	Class I, Division 1, Groups A, B, C and D, T4 -20°C ≤ Tamb ≤ +60°C
	• ATEX:	II 2G Ex ia d IIC T4 Gb Ta= -20°C to +60°C I M1 EX ia I Ma Ta= -20°C to +60°C
	• IECEx:	Ex ia d IIC T4 Gb Ex ia d I Ma
Wireless Approvals:	FCC Part15, CE R&TTE, Bluetooth 4.0, GPS	
EMI / RFI:	Monitor shall be highly resistant to electromagnetic and radio frequency interference (EMI / RFI) and compliant with EMC Directive 2004/108/EC	