



Gas Detection in Water Treatment



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About Us



- NL owned founded in 1991
- Subsidiary of Hetek Solutions in 2022
- Based in NL with nation wide support
- Providing instrumentation for a Safer, Healthier Environment
- ISO 9001:2015 Certified

Portable and Fixed Control Systems



**SALES | RENTALS | SERVICE | TRAINING
DATA RECOVERY**

Topics for Discussion

- **What purpose is Gas Detection Anyway**
- **Water Treatment require Gas Monitoring**
- **Fixed verses Portable Gas Detection**
- **Bump Testing / Calibration / Maintenance**
- **Operator Certified Training**
- **What To Expect In The Future**

In Water Treatment, Do Gas Detectors



WHY WE ARE HERE

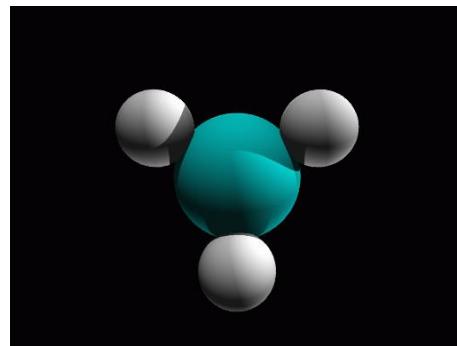
blacklinesafety

Have your Back?

What Is Gas?

Gas

- State of matter with no definite shape or volume
- Gas molecules move randomly, colliding with each other and anything else around it. Speed depends on the temperature.
- Gas molecules will fill any available space and rapidly mix into any atmosphere



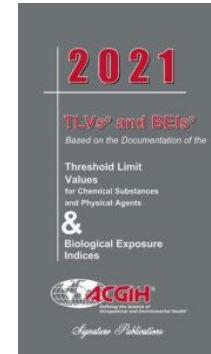
Guidelines To Live By

Threshold Limit Values (TLVs):

- Maximum exposure **to toxic gases** that a worker can safely be exposed to on a daily basis for a working lifetime.
- IE: Chlorine, Hydrogen Sulfide, Ammonia, etc;

Developed by ACGIH.

1. **TLV-TWA:** Average exposure over 8-hr period
2. **TLV-STEL:** Average exposure over 15-min period



Since these TLVs are regulated, (NL, Federal, Maritime Regs) in order to be compliant, gas detectors must continuously calculate and log these averages.

NL Regs. Sect 42 (7) (c) An employer shall ensure that exposure of a worker to hazardous substances is as minimal as is reasonably practicable, and where a threshold limit value has been established by the ACGIH, exposure shall not exceed the threshold limit value;

Water Treatment Gas Detection Applications

- Chlorination Plants and Pump Houses
- Cl2 TWA 0.1ppm STEL 0.4ppm
- Wastewater Lift Stations and Manholes
- H2S TWA 1.0ppm STEL 5.0ppm
- Treatment Facilities Lagoons and Ponds
- Various Confined Spaces O₂, CO, NH₃

What are the Gas Monitoring Challenges?

Challenge	Solution
<ul style="list-style-type: none">• “I need to comply.”• “I don’t have time for setup.”• “Detectors have to work out of the box!” Fixed monitors must be dependable.• “It has to be easy.”• “Our workers need to concentrate on their jobs. It’s dangerous.• They aren’t productive”	<ul style="list-style-type: none">• Always on Charge, connected instruments.• Real-time data feed.• Pre-configured Pack with power, batteries. Turn-key system. Easy to turn on and use.• Workers feel safer. Reduced stress. Higher productivity. Fewer mistakes.

Introducing Solutions For Confined Space Issues

For

- Worker Health & Safety
- Regulatory Compliance
- Optimized Operations
- Increase productivity

Hazards

- Oxygen Deficiency
- Flammable gases
- Toxic Gases
- Physiological Stress



Common Dangers in Many Situations

Why Communicate about and in a Confined Space?

**Exposed People need “HELP” to make a decision re:
gas concentrations or where a Man Down Alarm may occur**

INFORMED TRAINING	“Help me to take a decision”. “I can’t decide myself.” “Stay in or evacuate (what's the danger)?”
CONNECTED	“Make sure I understand the alarms.” “I can’t see or hear my gas monitor alarm.” “Do I have a Buddy near”?
PROTECTED	“Rescue me” Every Second Counts When I cannot react myself ! (“4 min” to rescue - lack of Oxygen).

Typical Communication Distances

Distance between monitors / Host :

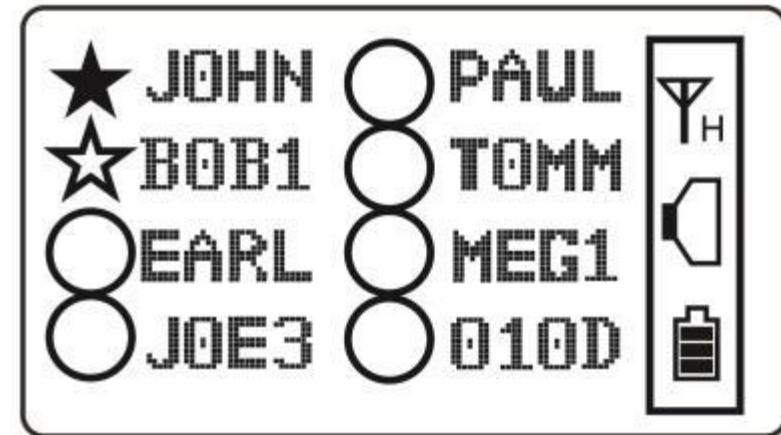
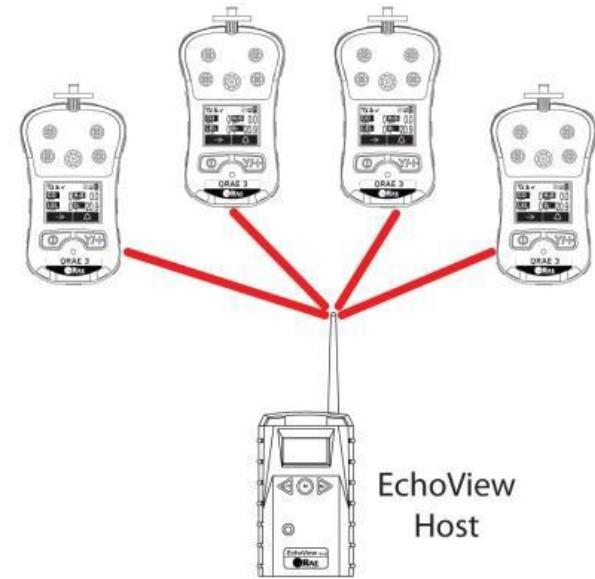
660 ft (200 m) using 900Mhz signal

15-20 ft use Bluetooth-Cell-Global

One Team – Up to 3 Observers

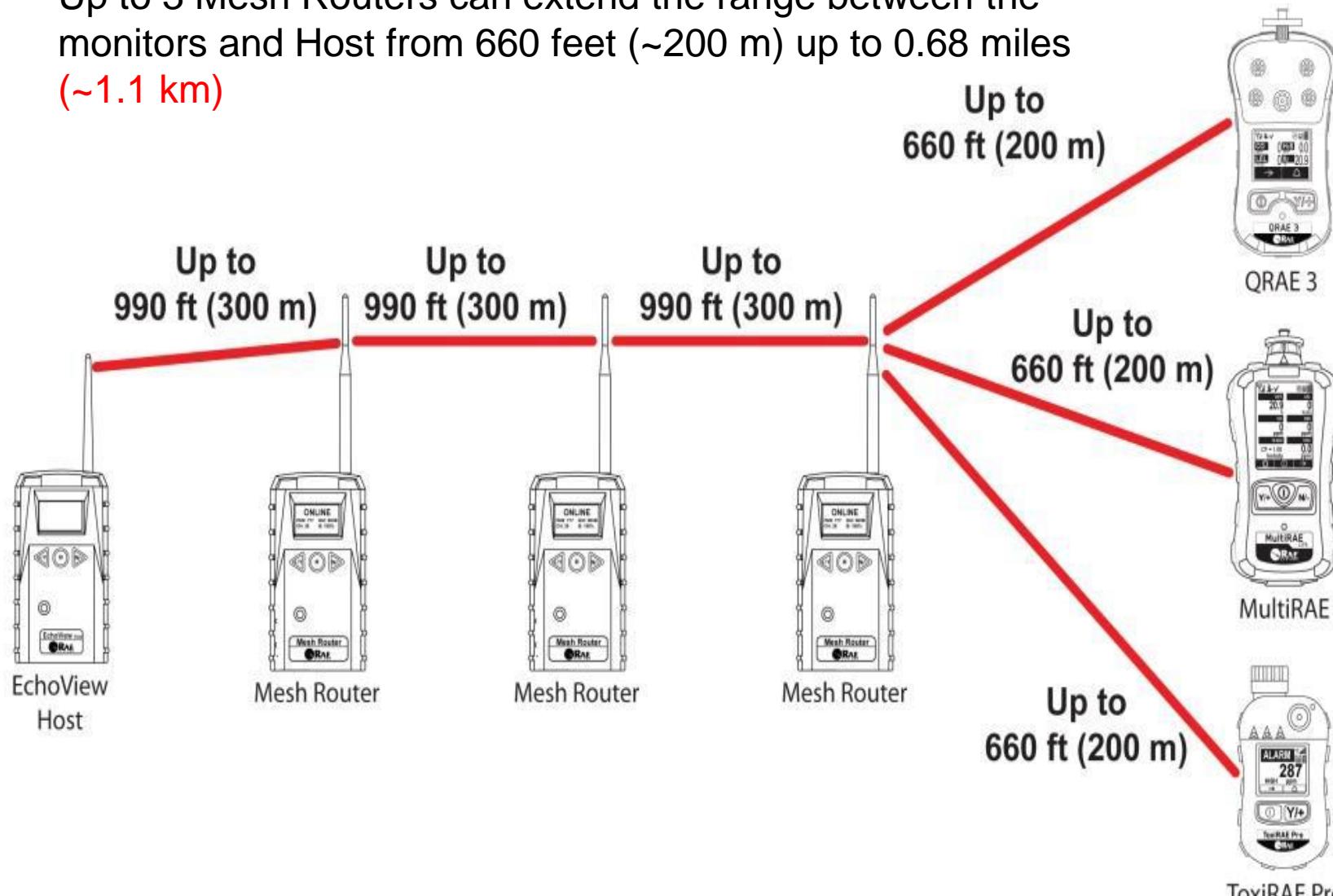
24/7 monitoring at site or 3rd party

Host User Interface can be modified by user to show either the end User's Name, Unit ID or Site Location.



OPTIONAL - Mesh Routers

Up to 3 Mesh Routers can extend the range between the monitors and Host from 660 feet (~200 m) up to 0.68 miles (~1.1 km)



ConneXt Pack

Turn-Key Kits



ConneXt Plus

Configured Systems



ConneXt Pro

Enterprise Solutions



Team/Area

Group/Zone

Facility-Wide

8

64

2000+

Task

Project

Operations

Periodically

Routinely

Daily

Hours

Days

24 x 7

NA (Stand-alone Controller)

Portable Personal Modems

Fixed Area Access Points

Where are we going with Fixed Systems ?

- ***Leak & OFF Gas Monitoring:***
 - *Calibration / operation in live environment*
 - *Site, Vessel, Plant, Control Systems Unlimited Sensors*
 - *Sample capture in harsh environment*
 - *Dispersion Modelling advances Lagoons & Ponds*
- ***Real Time Data Transmission:***
 - *Secure communications link (2-way) for control of & monitoring sensor channels & ventilation controls*
 - *Data Transfer (Local-Global)*
 - *Satellite & cell communications to deliver data directly to client systems.*

Why monitor Hydrogen Sulfide and Chlorine?



- Over Exposure Deadly to the workers and public
- Both H₂S & Cl₂ Heaver than Air pushing out O₂
- Source of corrosion to infrastructure
- Odour complaints & Ventilation Design
- Direct resources for asset protection
- Sewer rehabilitation program

Gas Loggers for Odor Control

Odalog Gas Logger

- Designed for harsh Wastewater Environments
- Long battery life of up to 12 months
- Up to 42,000 data points recording
- Free OdaStat-G software



LONE WORKER MONITORING



- Personnel working beyond sight & sound of others
- Automatic
 - Fall detection
 - No-motion (man-down) detection
 - Employee check-in
- Manual
 - SOS latch

BUMP TEST verses CALIBRATION

Bump Test: A Simple Test That Could Save Your Life!

- While in operating mode simply apply a concentration of gas that can activate the alarms.
<Fixed and Portables>

Zeroing

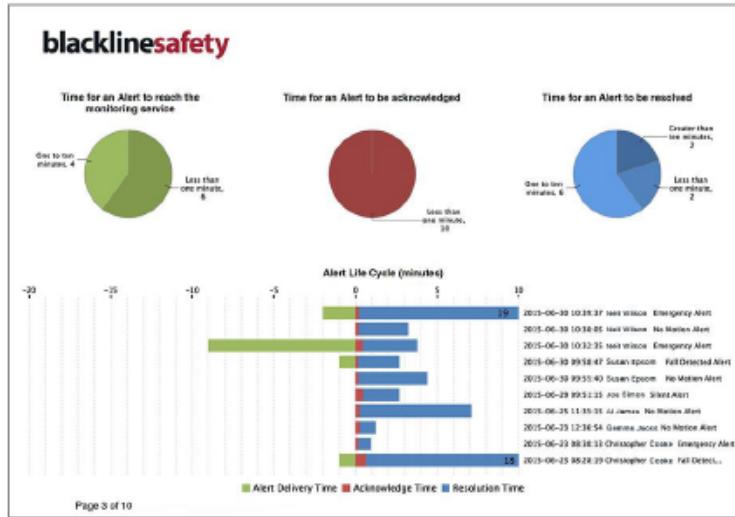
- Setting the sensor response to normal atmospheric readings.

Calibrate or Span:

- To use a known quantity of gas to set/adjust instrument response parameters

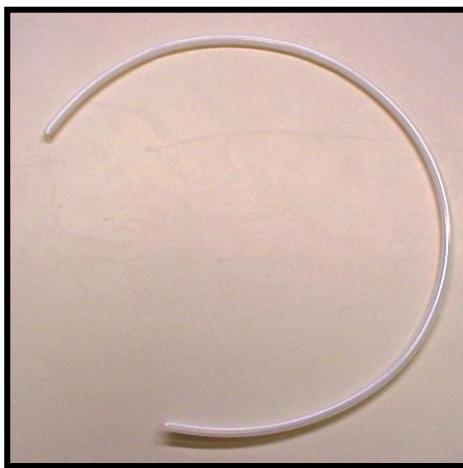
The only thing worse than a portable gas detector that you know doesn't work, is a portable gas detector that you - don't know - doesn't work. A sensor reading of Zero may also be a Faulty sensor!

REPORTING



- Sustain a world-class safety program
- Hours of use — address gaps proactively
- Emergency response time
- Alert management performance
- All safety alerts timestamped and annotated for incident reporting

Cautions – Sample Tubing



- ***Always use Teflon or similar non-reactive tubing***
 - Will not absorb chemicals but might get coated
 - Clean with anhydrous methanol if it gets dirty
 - Custom Lengths
 - Replace Filters Regularly
 - Check Sample Train for Leaks
- ***Never Use Tygon tubing for Corrosive Gas Monitoring!***
 - Absorbs chemicals like a “sponge”
 - Reduces ppm readout when chemicals exist
 - Causes “false positives” when chemicals don’t exist

Our present capabilities



Where are we going ?



**EnviroShelter for community monitoring
Water, Air/Gas, Noise, and Meteorological
Parameters**



**2022 Experimental VOCs Detection
...Coming to Canada**

Confined Space Entry Drone



The EnviroMed Safety Vision

- Always on, always connected instruments
- Real-time data feed, shared across entire company
- Instruments spanning full-range Fixed, Semi-fixed, portable and personal
- “Thousands” of points, aggregated and analyzed
- Historical data is logged for future planning and analysis
- First Responders know Gas Levels prior to Entry
- Lone Worker connected to Local Response Team
- Prevention verses Event Evacuation
- Rescue Verses Recovery
- “Honey I’m Home” Everyone’s Ultimate Goal?

The Future In Rescue



The Future in Travel



Taxi Anyone?



**THANK YOU
FOR YOUR ATTENTION!**

-Lee Parmiter

“QUESTIONS”



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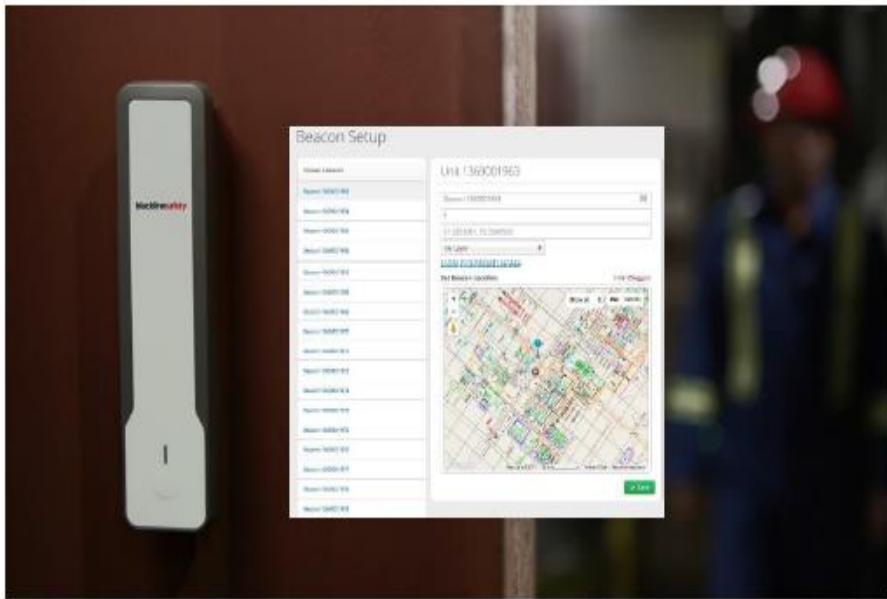
One Team – Multiple Observers



This 900Mhz system allow Up to three observers to monitor the same instruments simultaneously.

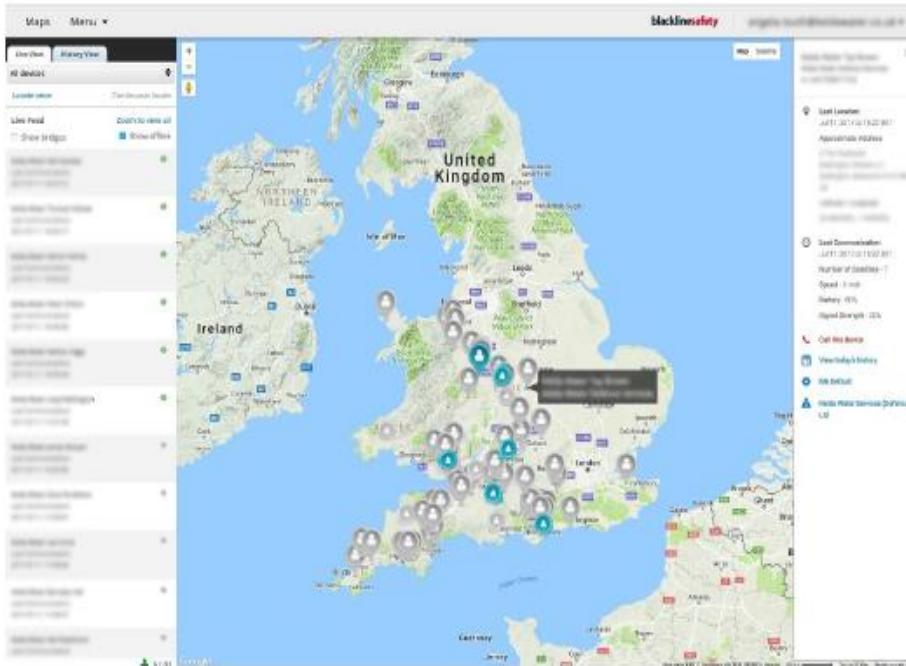
With cell and satellite- data accessibility is endless.

LOCATION TECHNOLOGY



- Assisted-GPS for outdoor use
 - GPS signals can be blocked and reflected by concrete and steel
- Beacons provide robust proximity-based locations (inexpensive)
- Self-powered (6–8 years)
- Intrinsically safe, IP67
- Installation is 'peel-and-stick'
- Import floor and site plans

CASE STUDY



- Kelda Water Services Defence:
- Work in partnership with the Ministry of Defence and manage a £1billion 25 year Public Private Partnership (PPP) contract
- Delivers water and wastewater services to nearly 1,100 defence sites across England and Wales.
- 83 Loner M6 devices
- Personnel working at and between water/wastewater locations