

INDUSTRIAL
SCIENTIFIC

Innovations in Gas Monitoring Sandy Mays

October 2018

Agenda

- Introduction
- Equipment Review –Ventis Pro, Radius BZ1 Area Monitor
- Live Monitoring
- Data Collection

Industrial Scientific Corporation

- 700 employees dedicated to ending death on the job
- Global Headquarters in Pittsburgh, Pennsylvania, United States
- Manufacturing in Pittsburgh (US) and Shanghai (China)
- Sales & Service Operations in US, Canada, Mexico, Brazil, UAE, Qatar, Saudi Arabia (partnered with Zaff), China, Singapore, Indonesia, India, Australia, United Kingdom, France, Germany, Czech Republic, Netherlands, Belgium, Italy, and Poland

A modern, multi-story office building with a glass and steel facade, featuring large windows and a prominent entrance. The building is set against a clear sky with some light clouds. In the foreground, there are some small trees and landscaping.

**INDUSTRIAL
SCIENTIFIC**



Our Vision

Industrial Scientific people are dedicating their careers to eliminating death on the job, in this century.

Our Mission

**Preserving human life on, above and below the earth.
Delivering highest quality, best customer service...
every transaction, every time.**

Ventis Pro Series






- Up to 5 gas monitor
- Extensive sensor selection and configuration
- 12, 18, and 24 hour runtime options
- Non-pumped, integral pump, and external pump options
- Customizable user interface
- Man-down and panic alarms
- IP68
- Guaranteed for Life

Radius BZ1



- Up to 7 gases - LEL, CO, CO High Range, CO/H2 low, CO/H2S, H2S, O2, SO2, NO2, HCN, H2, NH3, Cl2, and PID
- 108 dB output at 1 meter
- Non-pumped and pumped
- Up to 7 day runtime
- LENS Wireless (Mesh)
- IP67
- Guaranteed for Life

Wireless Solutions

Applications	Type	Description	Product	Protocol
User and Site Assignment	NFC	Enables two devices to exchange encrypted data over short distances.	Ventis Pro	
Automatic Site Assignment and Proximity Alarms Lone Worker Live Monitoring	BLE	Used to communicate between devices within a short range (5-100m) and doesn't require Line of Sight	Ventis Pro w/iAssign Beacon	
Peer-to-Peer Live Monitoring	LENS	Mesh network that focuses on the peer-to-peer level and uses frequency hopping to find the best path of transmission.	Ventis Pro and Radius with LENS	

LENS Wireless Advantages

- No setup or IT assistance needed, works out of the box
- No infrastructure required
- Peer readings provide alarms *and* data
- Longer range communication up to 300 m (~1,000 ft) without sacrificing runtime
 - 100m between Ventis Pro
 - 300m between Radius



LENS Wireless – Ventis Pro and Radius

- Up to 25 monitors can be connected wirelessly in a network
- Range of Ventis Pro to Ventis Pro - 100m (or 5 hops to 500m)
- Range of Radius to Radius - 300m (or 5 hops to 1500m)

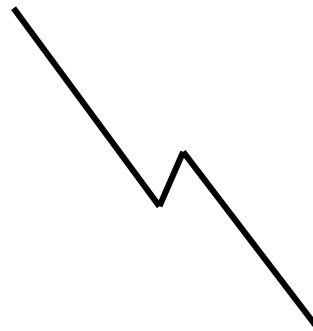


LENS™
WIRELESS

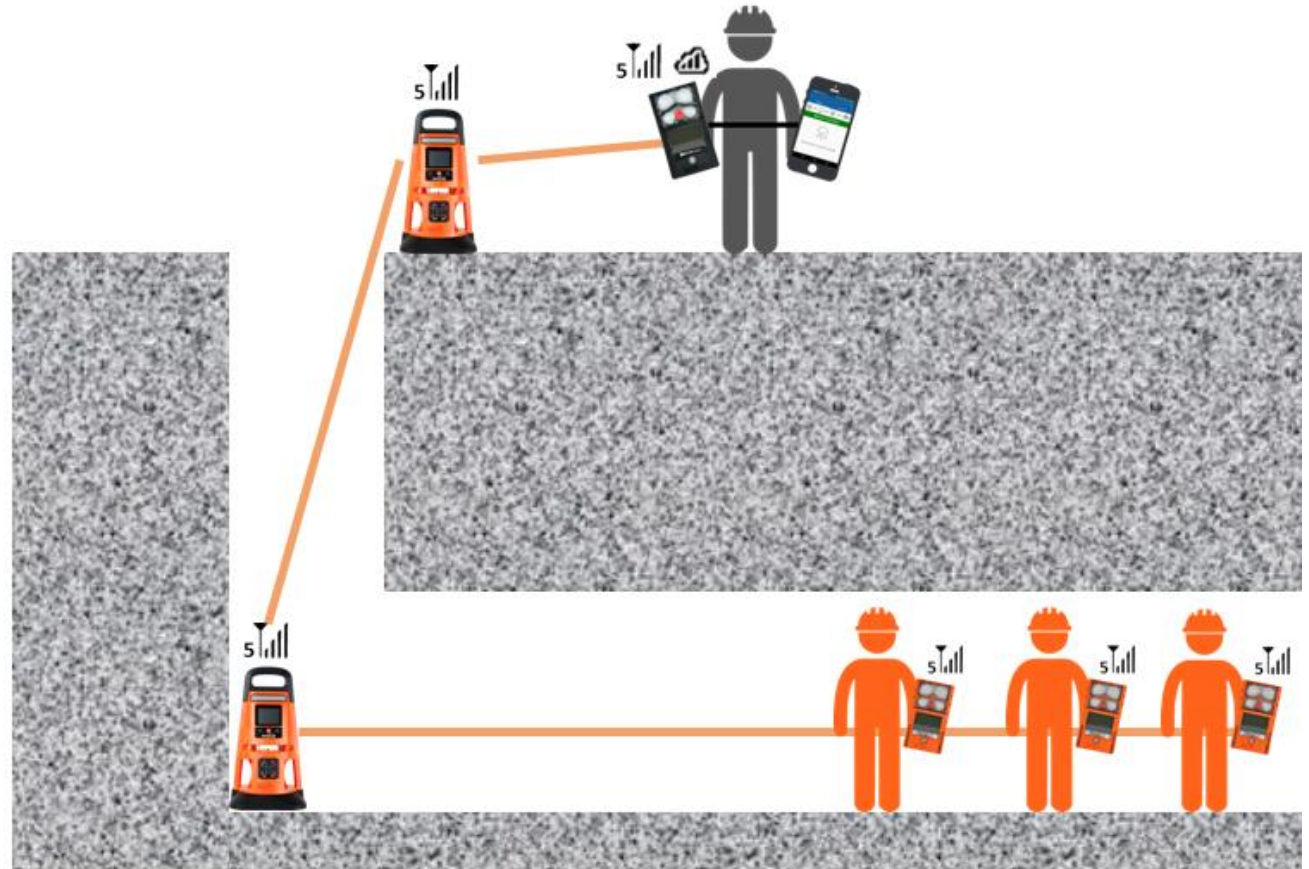
Ventis Pro *Connected* to Radius



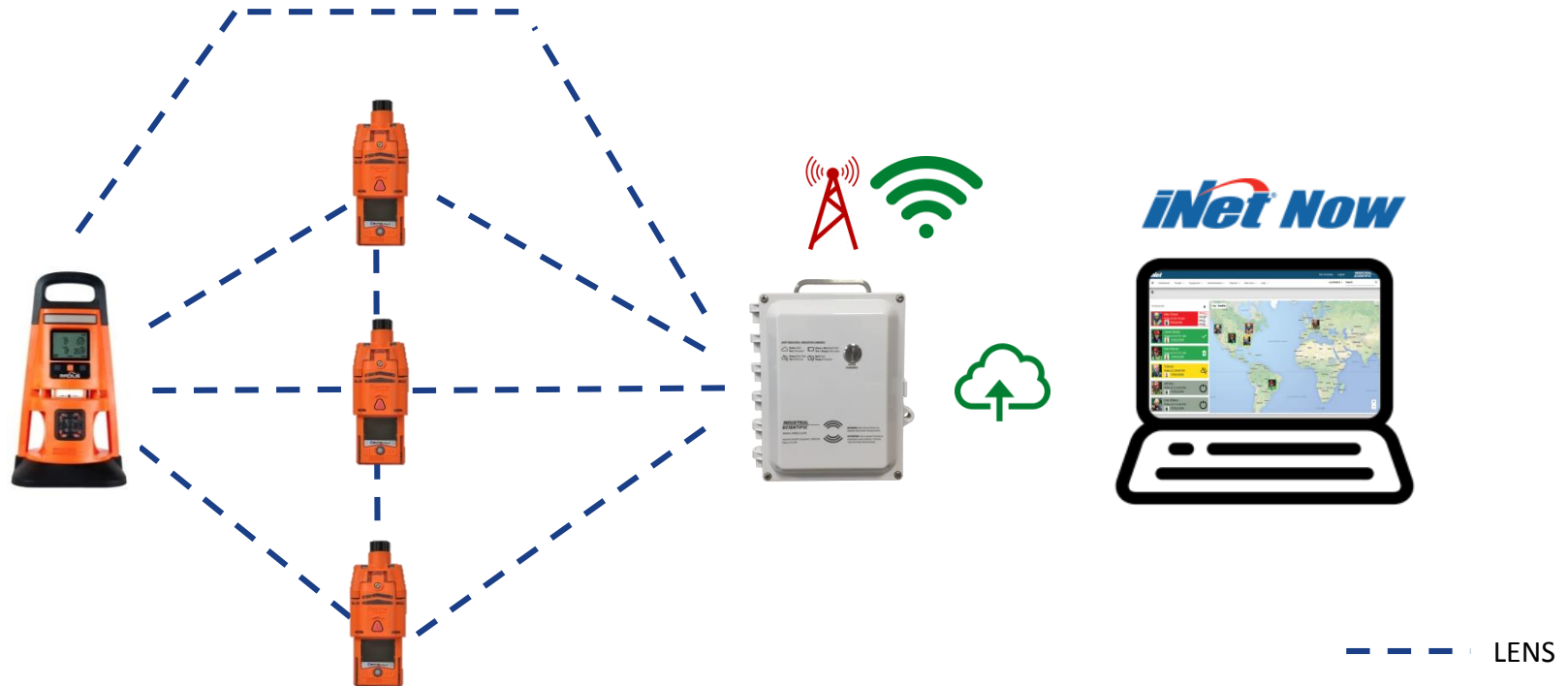
 **LENS™**
WIRELESS



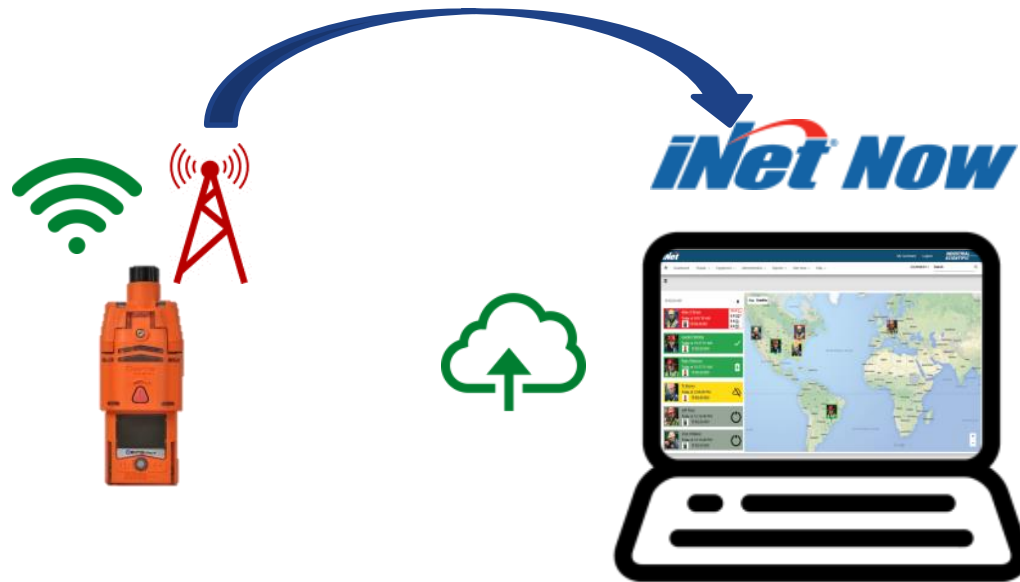
Peer to Peer



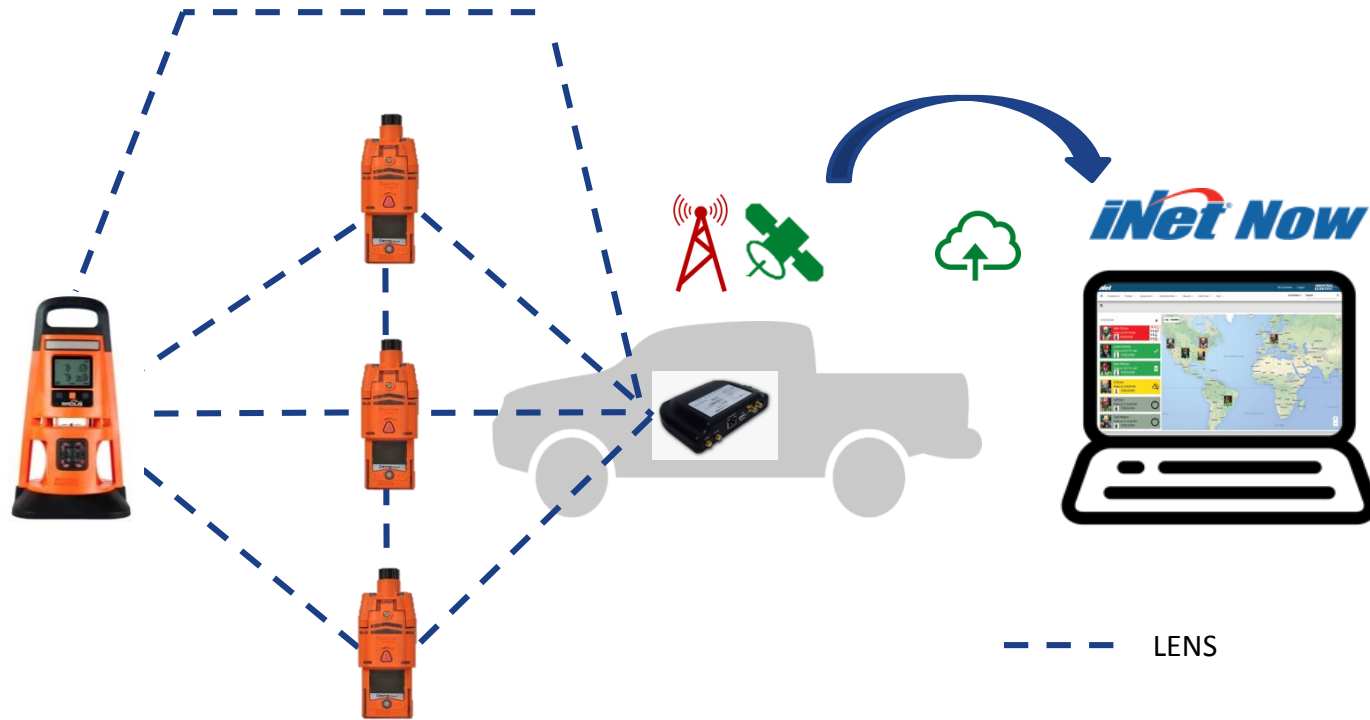
Using Ventis Pro or Radius instruments combined with an RGX gateway.



Using cellular or Wi-Fi Ventis Pro



Using Ventis Pro or Radius BZ1 instruments combined with a vehicle gateway:



What is Live Monitoring?

Live monitoring enables safety leaders to understand worker and instrument status and alerts in real-time and pinpoint their location.



Why Use Live Monitoring?

- Takes Hours or Days to Learn of Incidents
 - Safety outcomes improve the closer you can get to **The Moment**



Why Use Live Monitoring?

- Can't be certain workers are safe or where they are located
 - Lack of situational awareness can drive down safety and productivity



Challenges of Doing Nothing

Grand Forks
Herald

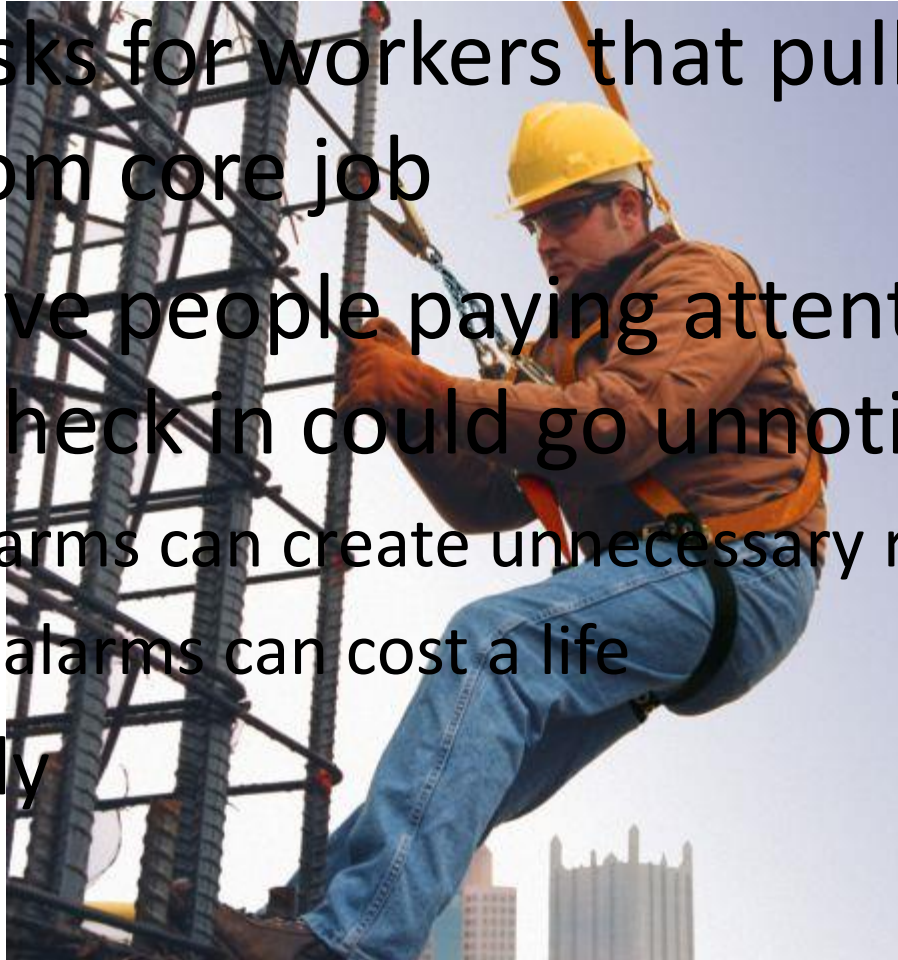
Worker dies on Dakota Access Pipeline

By [Kalsey Stults](#) on Aug 27, 2016 at 4:16 p.m.

"One of the bigs that we've put together is that the individual was working by himself so they weren't working in pairs," he said. "So when the accident happened, who knows how long it was from when he got injured until the foreman found him."

Challenges of Manual Processes

- Extra tasks for workers that pulls them away from core job
- Must have people paying attention, or lack of check in could go unnoticed
 - False alarms can create unnecessary responses
 - Missed alarms can cost a life
- Not timely



Challenges of Buddy Systems

- Inefficient
- Hazards can impact both workers
- Buddies not always available after hours

The Washington Post

One by one, 3 utility workers descended into a manhole.
One by one, they died.

By Samantha Schmidt January 18



WPLG Local 10 News
@WPLGLocal10

Follow

#UPDATE Officials now say 3 utility workers in Keys have died after being overcome by fumes bit.ly/2jBBEvo

11:08 AM - 16 Jan 2017



Louis O'Keefe, 49



Elway Gray, 34



Robert Wilson, 24



Leonardo Moreno,
injured in rescue attempt

Challenges with Live Monitoring

- Live monitoring solutions currently on the market are complex
 - Both in getting started, and in ongoing use



Ways to Deploy Live Monitoring

- Local software

- F

- I

- (



local laptop
view data

- Cloud software

- Ins

- Dis

- An



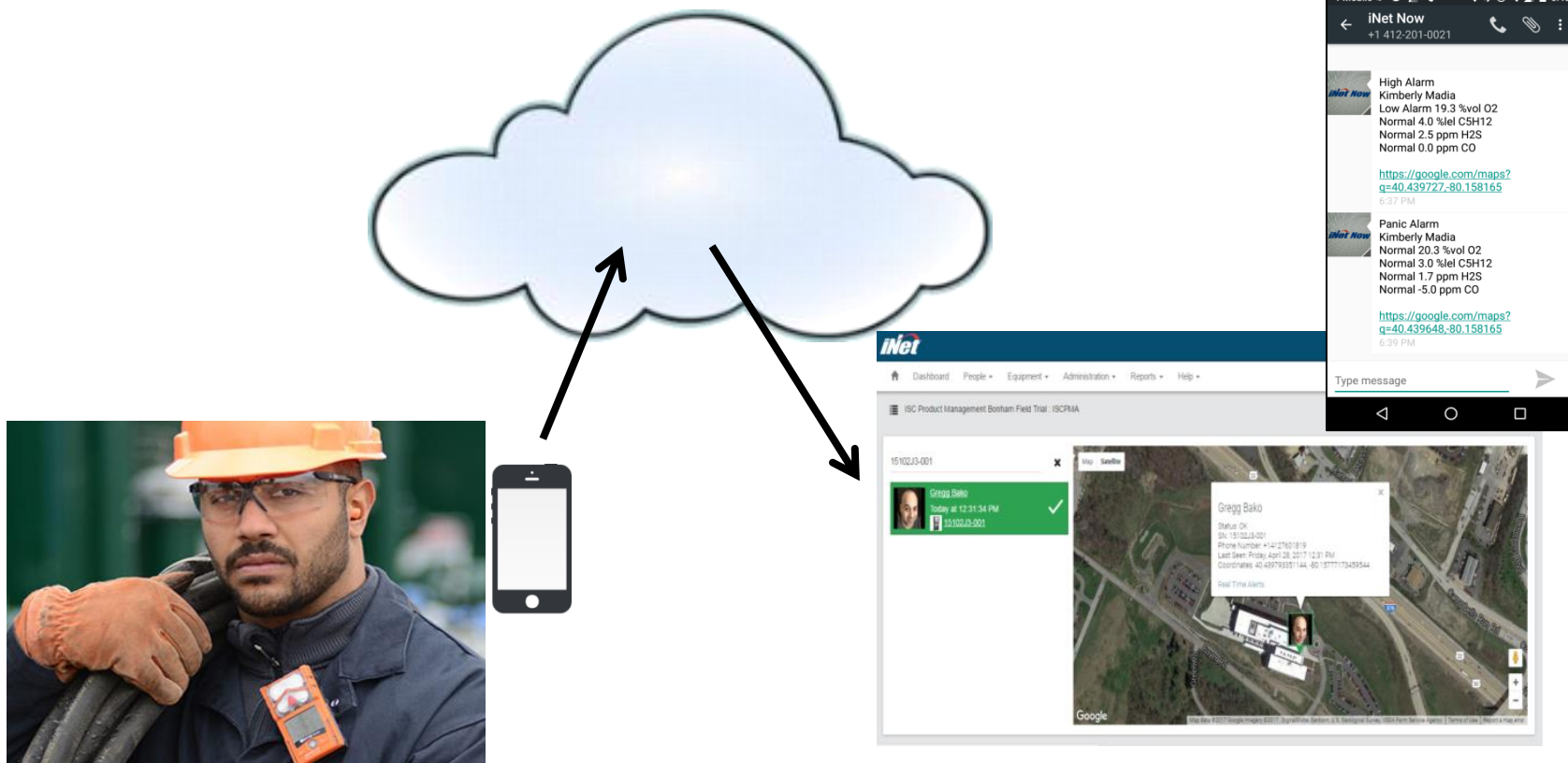
IT needed
and location
see data

iNet Now Live Monitoring Software

- Cloud-based
- Sends real-time, customized alerts for gas, panic, and man-down alarms
- Enables supervisors or other safety leaders to continuously monitor worker and instrument status on a map



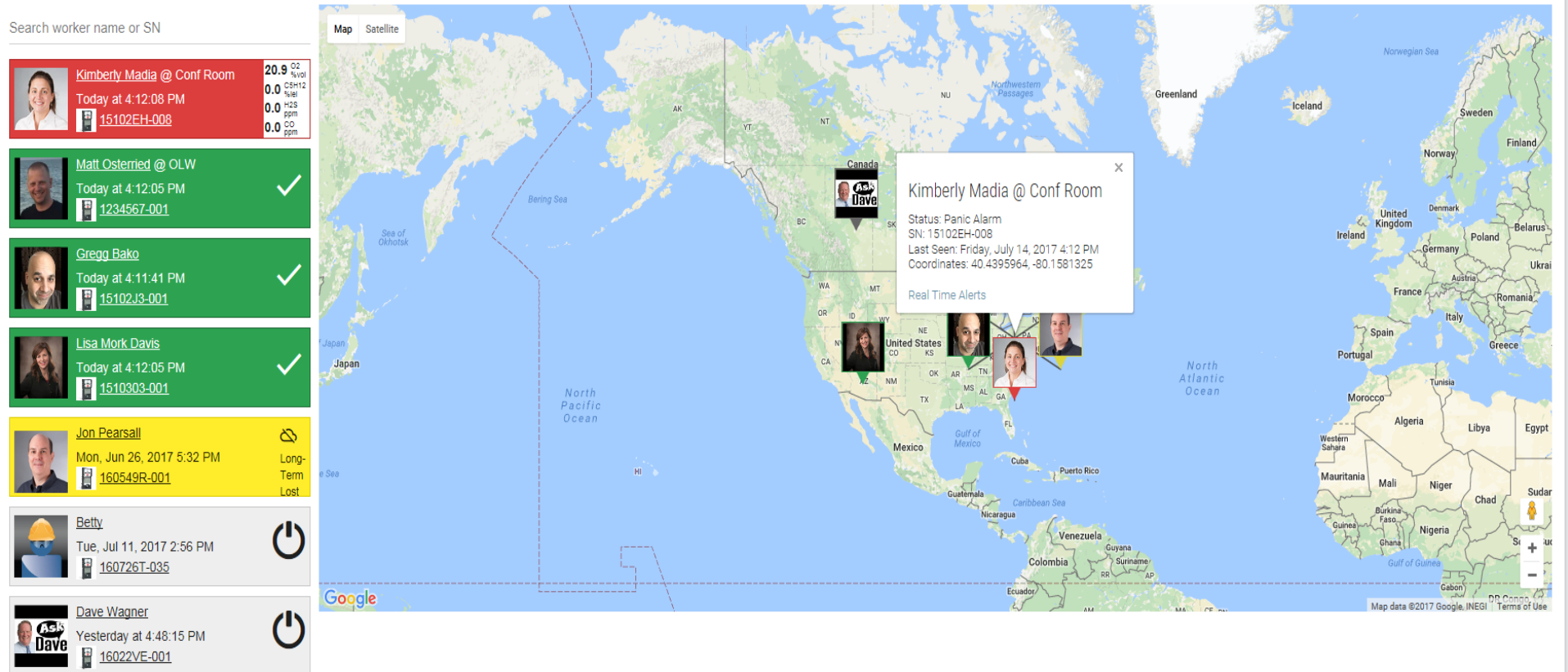
iNet Now



Worker Uses Gas Detector assigned to them and a Smart Device

Safety Leader Receives Real-Time Alerts via text or email and views the iNet Now Website

Map Shows Workers Status and Location




**Worker in
Alarm**


No Hazards

**Lost Connection
to Cloud**

**Instrument
Turned Off**

Texts/Emails Deliver Real-Time Alerts

 **WARNING**
Panic Alarm


[15102EH-008](#)

USER: Kimberly Madia
LOCATION: [Map It](#)
ALARM TYPES: Panic Alarm
SENSORS: Normal 20.3 %vol O2
Normal 3.0 %lel C5H12
Normal 1.7 ppm H2S
Normal -5.0 ppm CO
SMART DEVICE USER: Kimberly Madia
ALARM TIME: May 2, 2017 6:39:46 PM GMT-04:00

[View →](#)

This message was sent to by Industrial Scientific. To ensure you receive emails from Industrial Scientific, please add alert@indsci.com to your address book or contact list. You are receiving this email because of alert subscriptions set in iNet Control. Visit [iNet Control](#) to modify your subscriptions.


Alert ID: 3009583776944

1-877-FOR-INET (367-4638) // InetAdmin@indsci.com // Fax: 1-800-788-8383


© Industrial Scientific 2015 - The Gas Detection People

T-Mobile

iNet Now
+1 412-201-0021



High Alarm
Kimberly Madia
Low Alarm 19.3 %vol O2
Normal 4.0 %lel C5H12
Normal 2.5 ppm H2S
Normal 0.0 ppm CO
<https://google.com/maps?q=40.439727,-80.158165>
6:37 PM



Panic Alarm
Kimberly Madia
Normal 20.3 %vol O2
Normal 3.0 %lel C5H12
Normal 1.7 ppm H2S
Normal -5.0 ppm CO
<https://google.com/maps?q=40.439648,-80.158165>
6:39 PM

Type message

Alerts Can Be Highly Customized

☐ Send me iNet Now alerts via text

☐ Send me iNet Now alerts via email

Subscribe to:

An instrument alarm occurred during live monitoring ☐

- ☐ Custom Alarm
- ☐ High Alarm (includes all oxygen alarms)
- ☐ Low Alarm
- ☐ Man-down Alarm
- ☐ Panic Alarm
- ☐ STEL Alarm
- ☐ TWA Alarm

Lost contact with instrument during live monitoring ☐

- ☐ Long term lost
- ☐ Short term lost

Real-Time Alert Records Kept

General Information

Description: Panic Alarm
User: Dave Wagner
Site: DW 5
Equipment SN: 16022VE-001
Alert Time: 7/13/2017 3:24:12 PM
Occurred On: 7/13/2017 3:24:10 PM
Equipment Group: CFD
Sync App User: Dave Wagner

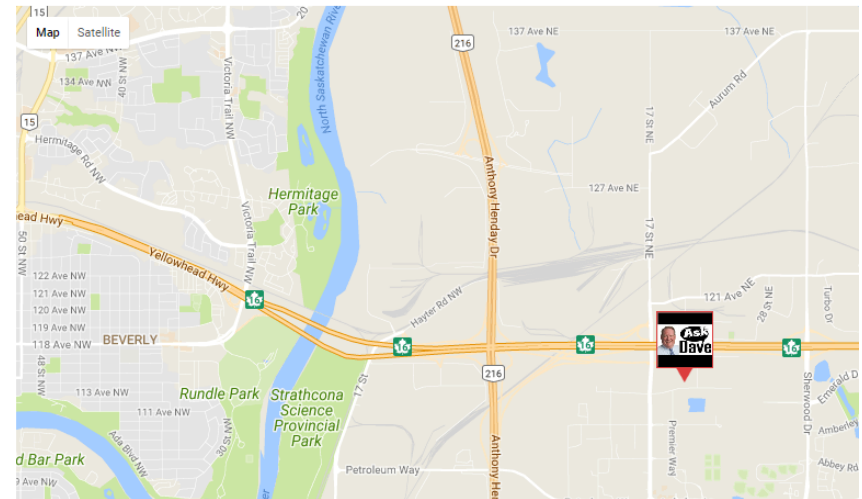
Alert Status

Cleared: Yes ✓
Date Cleared: 7/13/2017 3:26:53 PM
Cleared By: iNet - Auto

Recipients

Email Recipients: sjubeck@indsci.com, dwagner@indsci.com
SMS Recipients: +14123521039, +14124279223

iNet Now Info



Gas Code Description	Reading	Alarm Type
Oxygen	21.1 %vol	

Notes

Add Note

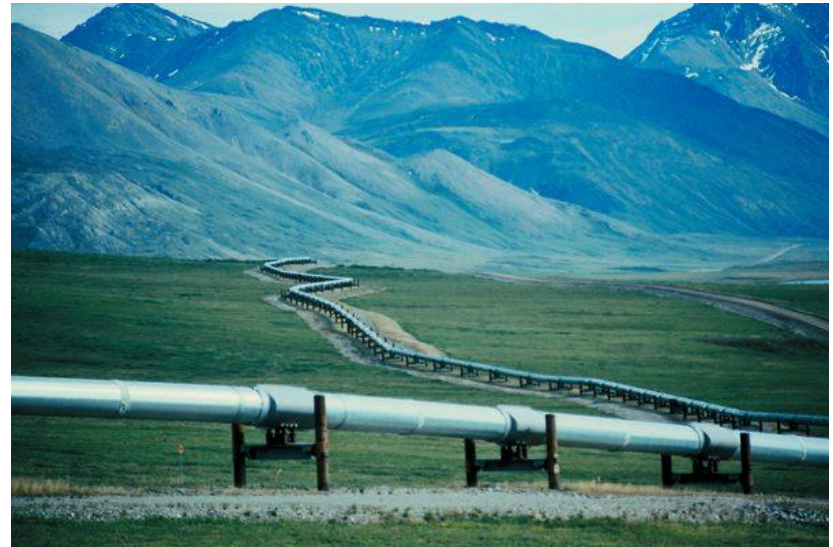
Many Applications of iNet Now

CURRENTLY

- Lone workers
- Mobile worker crews
- In-plant monitoring
- Real-time area monitoring
- e-Permitting
- Many more

Lone Workers

- Work in isolation without supervision
- Can be far away from help
- Examples:
 - Remote pipelines
 - Tank farm
 - Off-peak hours work



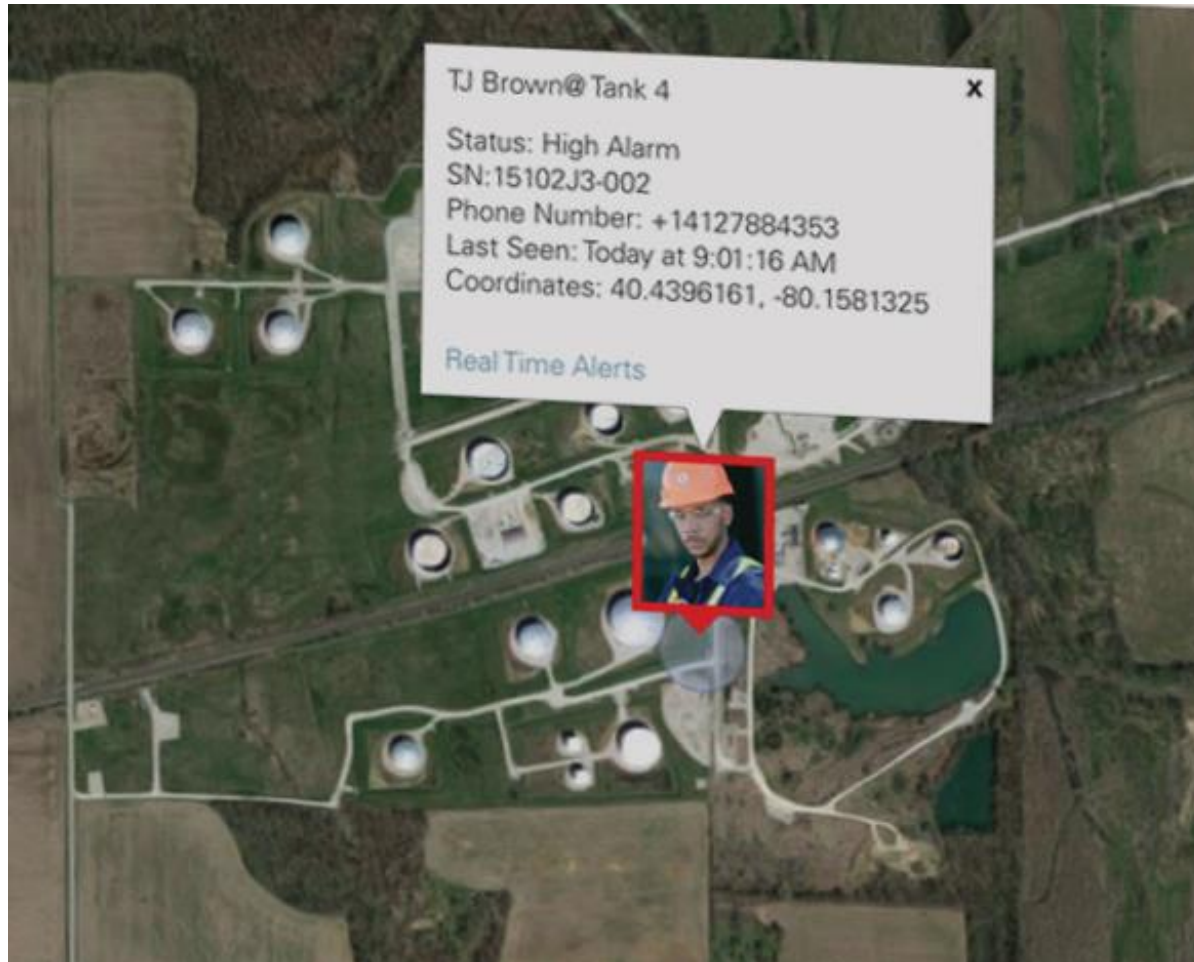
Lone Worker Regulations

- USA (OSHA guidance, not regulated)
- Canada (Federal Bill C-45, provincial rules)
- Others
 - Australia
 - France
 - Germany
 - United Kingdom
 - Spain



iNet Now: A Worker-Centric Solution

Real-Time Gas, Panic, Man Down Alerts



Smart Devices for Lone Workers

- Many already carry smartphones
- For workers in classified locations
 - Safety leaders weighing the added benefit of workers in touch vs. risk of non-IS smartphones
 - Risk reduced if worker using a gas detector with an LEL sensor
 - Some cases available to make smartphones IS for Division 2/Zone 2
 - Note: no IS smartphones work with iNet Now *(yet)*

Mobile Work Crews

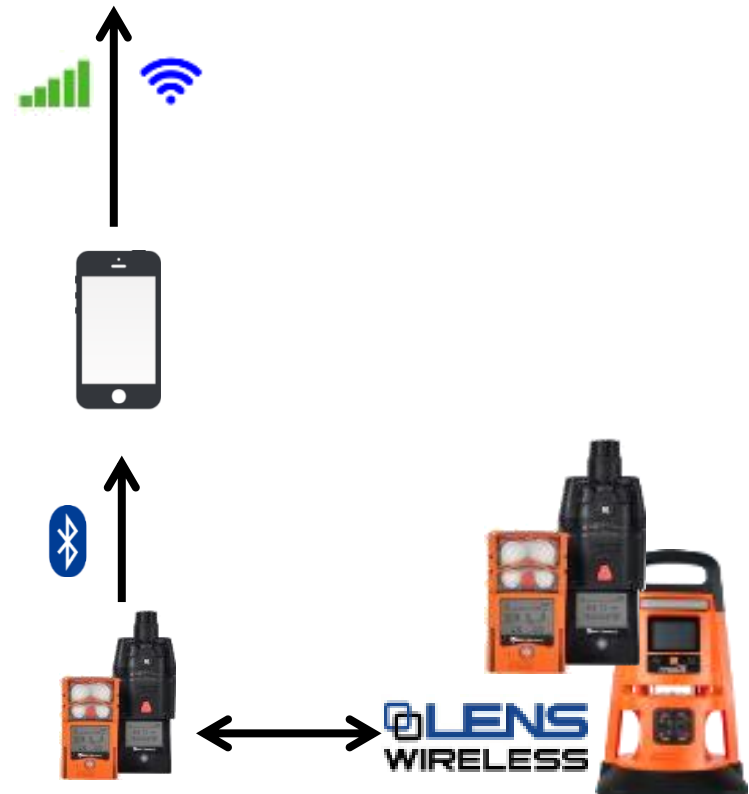
- Small teams that work outside of facilities, isolated from the core team of industrial workers
- Similar challenges to lone workers, but can at least watch each others' back (if they stay connected)
 - Remote locations
 - Urban settings
 - Inspections
 - Confined spaces



LENS Wireless with iNet Now

Connect LENS Wireless groups up to 6 instruments in size to iNet Now, provided one is a Ventis Pro within Bluetooth range of a smart device gateway

Live monitoring



Confined Space Entry



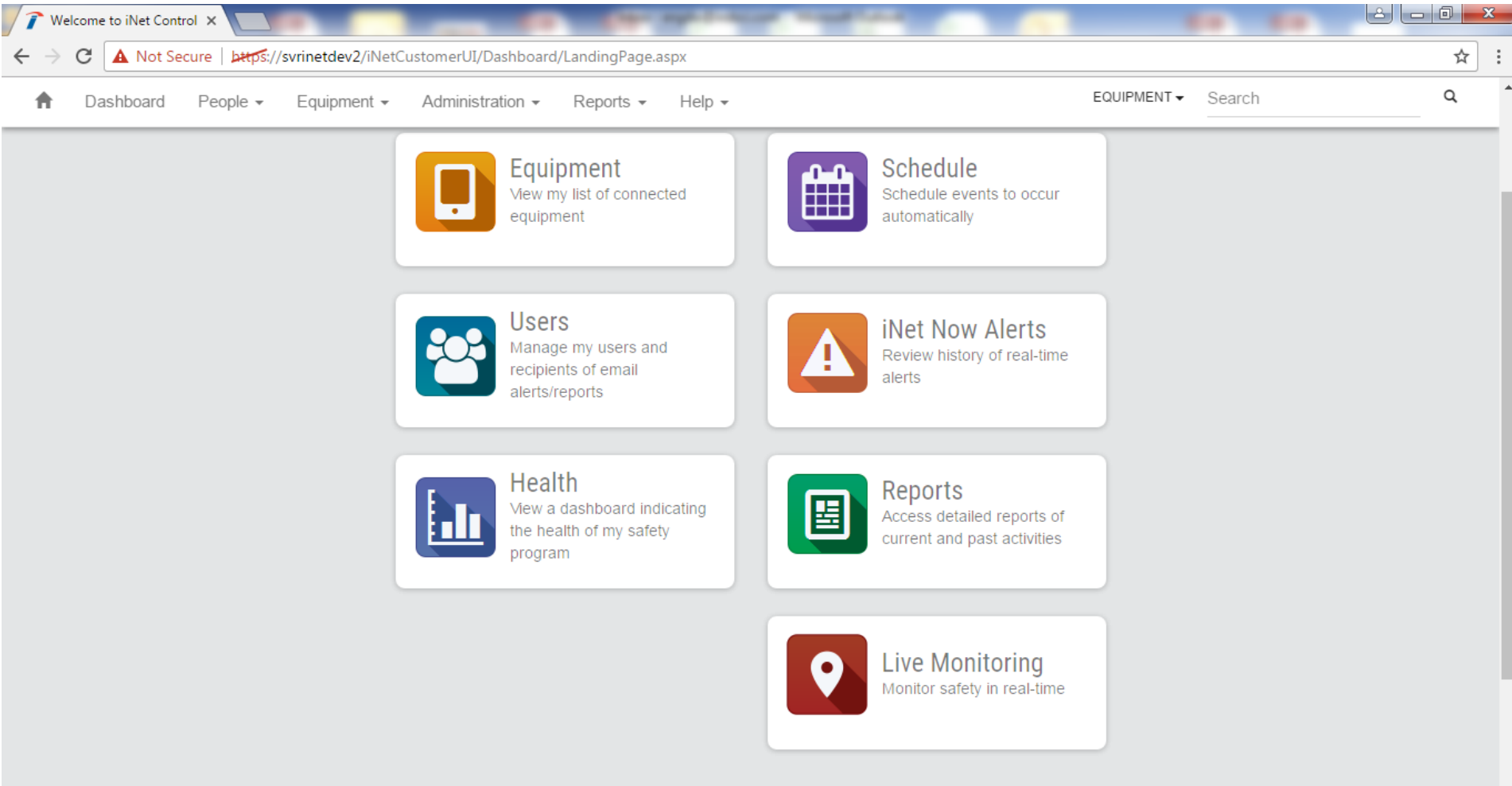
Get worker and their assigned instrument's status and location in real time and respond

Customized SMS/email alerts, as well as the iNet Now Web application with its live map, get the right information to the right people so they can:

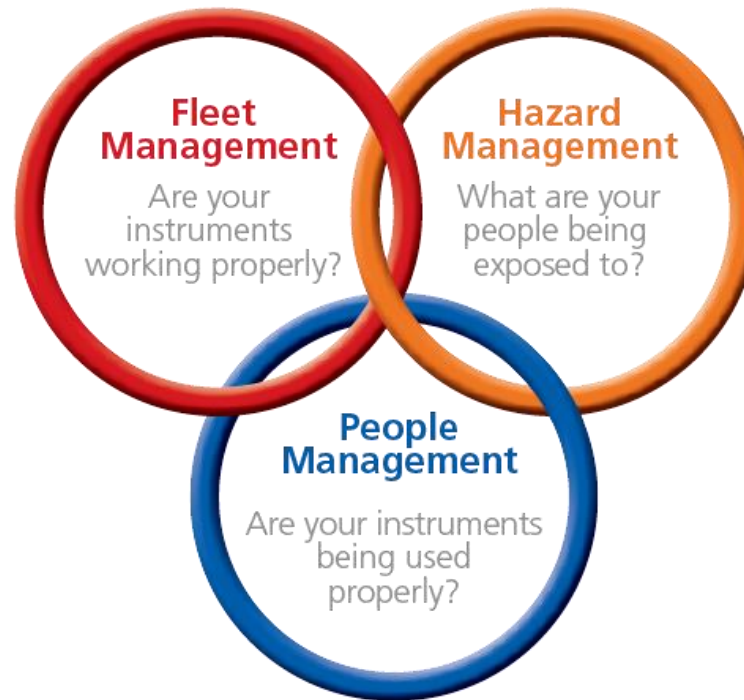
- Understand the hazard at a glance
- Know where workers are
- Initiate emergency response, if needed
- Review, investigate, and document alert details

Live monitoring solutions currently on the market are complex

Data Collection with iNet Control



iNet Control Features & Benefits



Fleet Management



iNet Control tells you that your instruments are working properly through:

- **Event Schedules** for bump testing and calibration to ensure your instruments are tested and calibrated when they are supposed to be
- **Automatic firmware updates** that ensure your operating systems are up to date
- **Instrument settings verification and update** when docked to ensure your units are configured properly
- **History of bump/calibration certificates** ensuring you have complete documentation when you need it
- **Emailed alerts** indicating sensors that have marginal sensitivity or have failed their last calibration
- **Calibration gas monitoring** with auto replenishment so that calibration gas is available every time it is needed

People Management



iNet Control tells you that your instruments are being used properly through:

- **Instrument user assignments** and history so you know who has what instrument when and where
- **Emailed alerts** to let you know when an instrument has been
 - Used without being bump tested or calibrated
 - Turned off during a critical alarm event
 - Has critical settings changed by the user
- **Complete datalog** documenting when instruments are used and how users respond during dangerous gas exposure incidents
- **Documented history of instrument** bump test and calibration indicating practices of individual users

Hazard Management



iNet Control tells you what people are exposed to in the field through:

- **Emailed alerts** detailing each gas alarm event
- **Recurring, scheduled alarm summary reports** which highlight all instrument alarm events
- **Documentation of all alarm events** detailing:
 - Gas type
 - Alarm duration
 - Peak gas concentration
 - Average gas concentration
 - Instrument
 - Instrument user
 - Instrument location
- **Detailed history** showing all gas reading data by instrument and user

Questions?