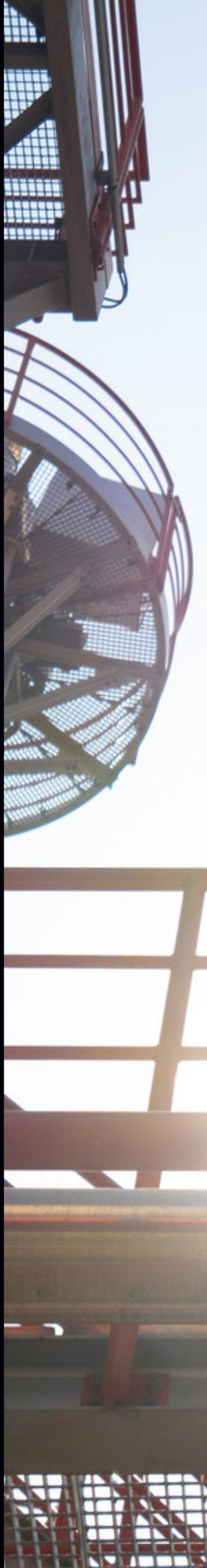




**blacklinesafety**

Oil and Gas





## No matter what challenges the Oil and Gas Industry face, **Blackline** gets workers home safe and sound.

Making sure every worker goes home safe after every shift is important to you – and it's what drives us. That means protecting your team from dangers like atmospheric hazards, explosions and fires, falls, confined spaces, and more. Blackline Safety protects workers in refineries, oil fields, petrochemical facilities, processing plants and other locations across the industry where safety is a priority.

Whether it's personal or area gas monitoring, confined space entry, protecting lone workers or the need to improve your safety overall, no one has you covered better than Blackline. With a suite of the most advanced and capable products on the market including software for data analytics and reporting, you now have access to a connected safety ecosystem that gives you visibility into your worksites like never before.

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**blacklinesafety**

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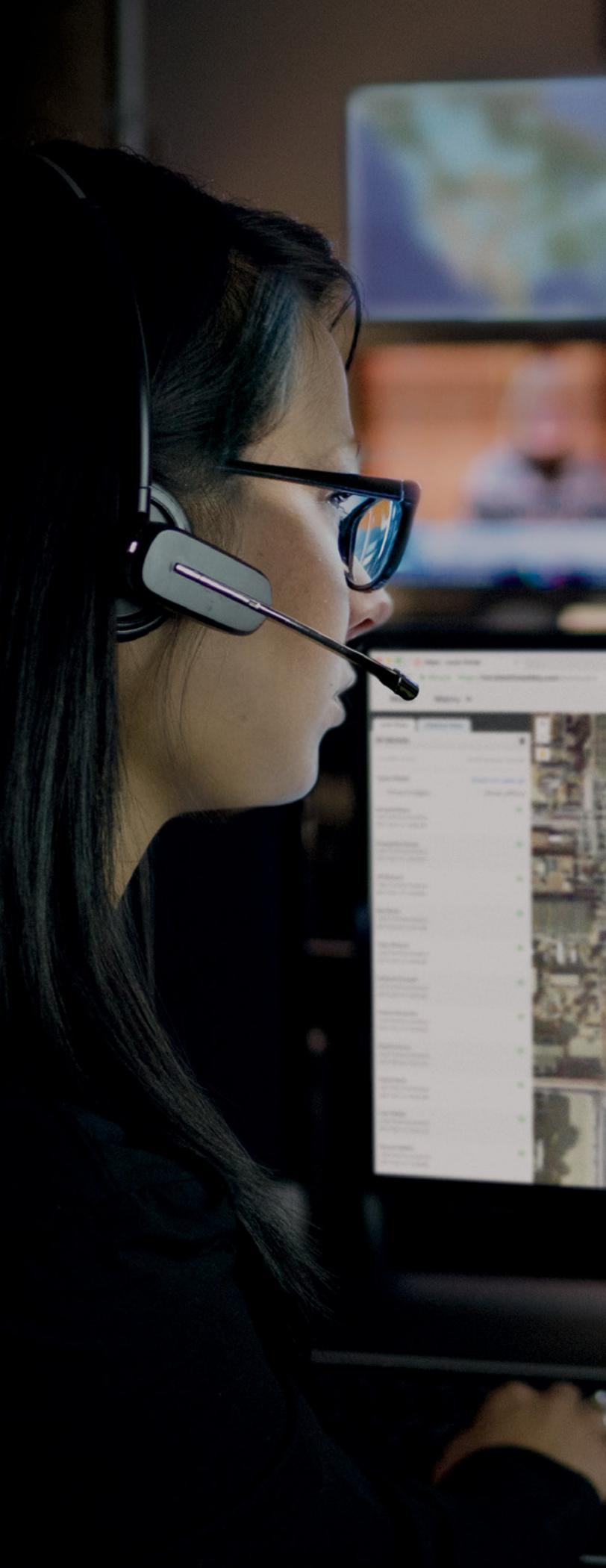
01

Benefits

# How we do it, and more importantly why we do it.

At Blackline Safety, our constant drive is to develop innovative solutions to protect workers, because when lives are on the line, there simply is no room for second best.





02  
Connectivity

## Protected Because They're Connected.

Whether it's a worker entering a confined space, an entire facility needing to be monitored for potential gas hazards, or initiating an emergency response or evacuation – reliable, connected safety devices are a critical link between workers and the help they need. No matter the situation, Blackline Safety has your connectivity covered.

**G7 wearables** instant connectivity allows you to locate any team member – anywhere, any time – as soon as it's turned on. With GPS, cellular or satellite connectivity and two-way communications, G7 is a true lifeline for workers. It automatically connects to the cloud, without the need for WiFi or network set up. And the **G7 EXO area monitor** delivers the same unmatched connectivity and visibility into your entire facility.

When real-time data isn't a priority, but connected safety is, **G6 wearables** provide a cost-effective, single-gas option that sends data to the cloud every 24 hours and automatically updates firmware, so it always has latest enhancements. If an alarm is triggered, G6 instantly connects, notifies monitoring personnel, and sends alarm data, so a fast and informed response can be initiated. Those archaic "beep and flash" detectors simply no longer cut it.

For businesses without a control room or always-available supervisors, Blackline's in-house Safety Operations Center (SOC) is staffed 24/7 with professionally trained monitoring agents focused exclusively on the wellbeing of your employees. Connect your team to the SOC to ensure industry-leading live monitoring is with them wherever they operate.

# 03

Visibility

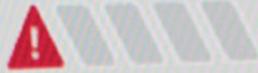
## **Visualize the Data to Keep Your Team Safe.**

Blackline Live, our safety and productivity software platform, helps protect your workforce by giving you in-depth visibility into their wellbeing and surroundings.

An important part of dealing with incidents is preventing them from happening in the first place. Having full awareness of every situation, from normal routines to when an incident occurs, lets you make informed decisions. With Blackline Live, vital device data is easily visualized, allowing you to gain insights into your operation and initiate preventative safety protocols.

With advanced data analytic capabilities, Blackline Live ensures you're constantly in the know with real-time compliance status of your entire fleet, comprehensive safety monitoring and unquestionable control of evacuation management. Through standard reports such as gas readings, alerts, usage, and bump tests and calibrations, you'll be able to quickly identify any potential safety concerns. The data recorded today helps provide measurable performance for tomorrow.

2 Alerts ▾



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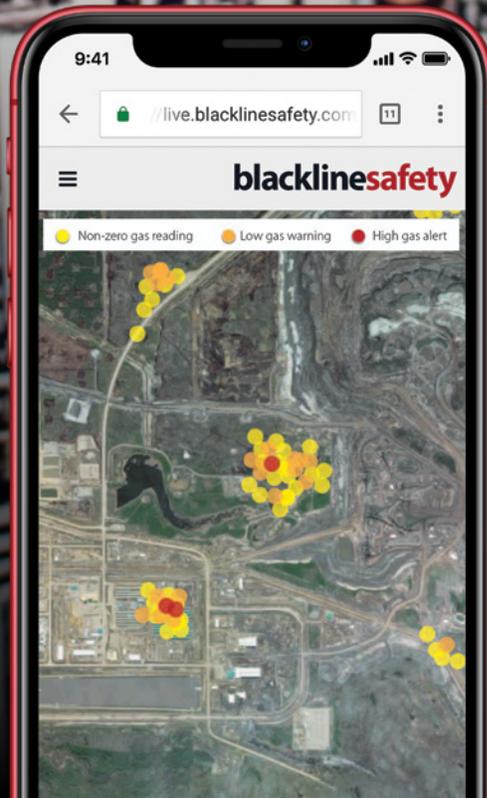
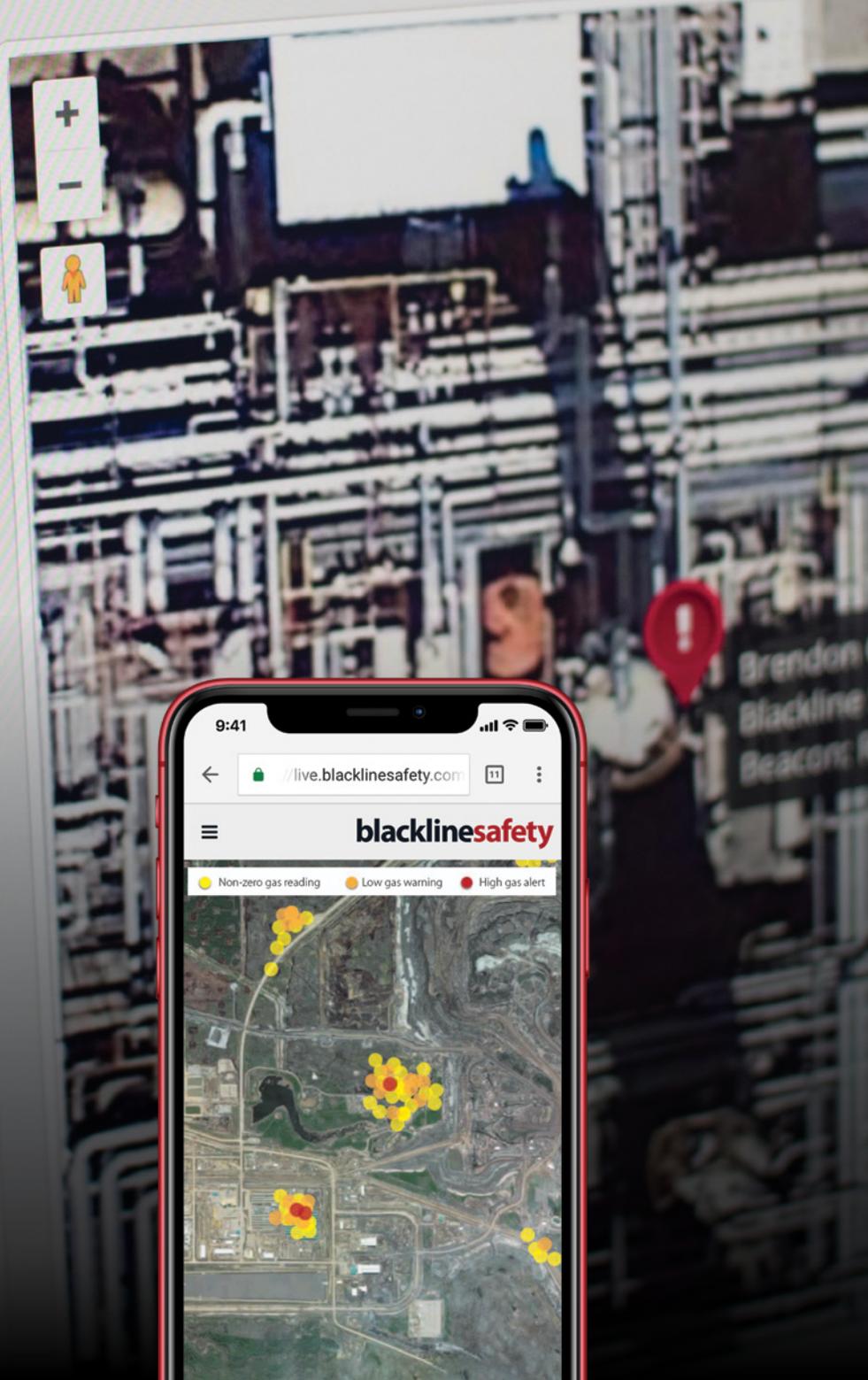
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st 24 hours

elow to view its history

2017-07-17 11:08:55 MDT | Fall





## Reliability and Durability

# Devices as **Tried and True** as Your Workers

Whether it's the harsh environment of a refinery, a confined space entry or an extended job in harsh weather, the last thing you need to worry about is your equipment. With Blackline, you get the most rugged, reliable, and durable safety products on the market that provide exceptional performance in extreme conditions. It's about saving money, time, and headaches you don't need. Most importantly, it's about saving your team from having to worry about their safety rather than the task at hand.

With 100-day battery life and rugged design, the G7 EXO area monitor can outlast any project and stand up to any environment. Going to be on a drill site for three weeks or longer? Need to have extended access to a confined space and don't want to re-permit? G7 EXO won't need a battery replacement – it's an area monitor with built-in cost and time savings. If the situation calls for extra power, add it via the intrinsically safe charging port or optional solar panel to continuously monitor the safety of your worksite indefinitely.

While G7 wearables lead the way for connected single-gas to five-gas detectors with or without pump, they are so much more than that – taking worker safety to the next level. With extensive man-down safety features including fall detection, missed check-in alarms, no motion detection and an S.O.S. latch to call for immediate assistance, G7 has your workers' back in potentially risky situations beyond gas detection. With two-way communications and push-to-talk functionality (similar to a walkie talkie but with unlimited range), your team's safety are always taken care of.

Add in pre-calibrated sensor cartridges and other options, and you've got a versatile, customizable solution that enhances safety and productivity.

With a four-year warranty and rechargeable battery that lasts for up to one year, the G6 single-gas wearables save you money in multiple ways – from an extended lifespan, find-my-device technology for lost devices, and buying options that fit your needs. Through its connectivity, you can quickly locate people and devices to aid emergency situations, minimize the cost of lost devices and see current compliance status. Automatic over-the-air updates with the latest features and enhancements ensure that G6 always has the latest features during its entire lifespan and won't cause waste like static, disposable devices that require regular replacement.

Built-in capabilities offer more precise short-term exposure limit (STEL) monitoring to reduce false alarms and associated costs. G6 is our solution to keeping your workers connected and steps ahead of potential incidents without breaking the budget.

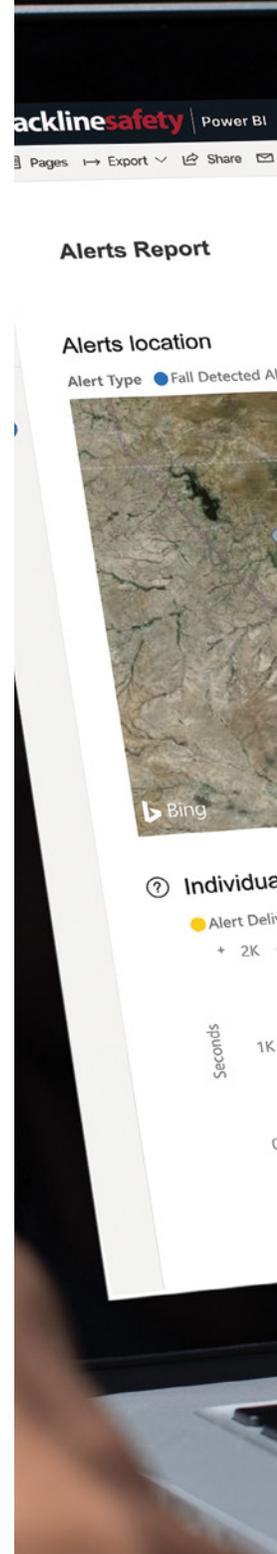
The flexibility to buy, lease, or rent gives added options for Operations Managers, Safety Managers, and contractors to acquire products as needed, depending on both short- or long-term project requirements. For turnarounds in particular, the ability to rent devices for only the days workers are onsite is a cost saving measure that can positively impact your bottom line.

# 05 Safety Beyond Compliance.

With Blackline's connected safety solutions, you can stay ahead of the curve while ensuring the safety and efficiency of your entire worksite. Blackline's data enables you to review gas exposure reports, analyze heat maps of hazardous incident locations and see compliance trends over time.

Unsure of the current bump test and calibration status of every device in the field for your entire operation? Blackline Live provides real-time visibility into the status of every connected device so you can take steps to ensure the safety of every worker.

With connected wearables and software that deliver data analytics for real-time compliance, you'll have complete confidence in the safety of your team.



? **Median Delivery Time (Seconds)** ? **33**
? **Median Acknowledgement Time (Seconds)** ? **7**
? **Median Resolution Time (Seconds)** ? **214**

Reset page



Date

4/1/2018 4/13/2018

Organization

All

Group

All

Assigned User

All

Device ID

All

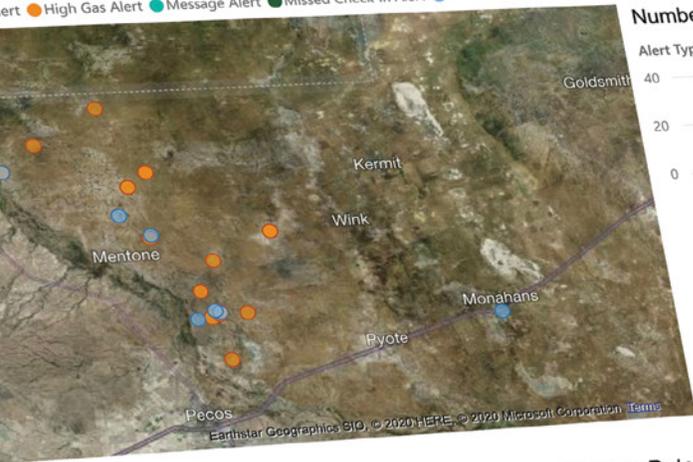
Alert Type

Multiple selections

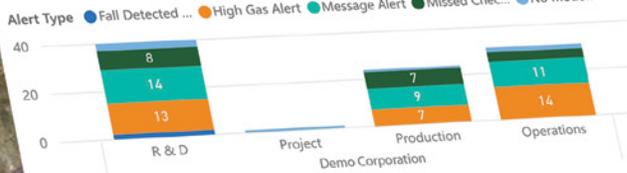
Resolution Reason

All

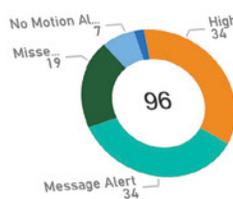
High Gas Alert Message Alert Missed Check-in Alert No Motion Alert



Number of alerts



Number of alerts by type

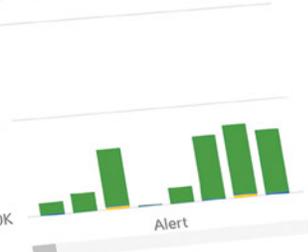


Number of resolutions by reason



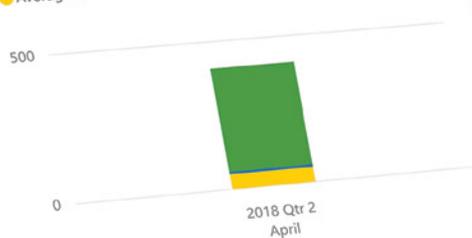
Alert processing time

Alert Ack... Alert Resol...



Average Alerts Processing Time by Date

Average of Alert D... Average of Aler... Average of Aler...



Number of alerts by date



06

Application

# The Comprehensive Ecosystem That's There When You Need It.







# 07 Turnarounds and Shutdowns.

Periodically, oil and gas facilities need to take processes offline and suspend production for scheduled maintenance, repairs, cleaning or unexpected equipment failures. Whether it's a planned turnaround, shutdown or an unforeseen outage, there are many challenges these short-term operations face.

These include having visibility into workplace productivity and safety for not only regular employees but also contract workers that are less familiar with the facility and standard safety procedures. Blackline Vision can help you minimize lost revenue and avoid safety incidents.

## **blacklinevision**

---

Blackline Vision takes the data already being collected from your connected devices and utilizes data science processes and algorithms to uncover opportunities to increase operational efficiency and productivity during a turnaround or shutdown. This can save hours or days of work which, in turn, gets production back online faster – potentially adding millions in revenue that otherwise would have been lost.

# 08

## Evacuation and Incident Management.

During an evacuation, speed and visibility are vital to the safety of your team. With G7, you have complete awareness and mass notification ability to direct teams and individuals to the nearest muster point. Push-to-talk functionality provides constant communication between onsite workers, while Blackline Live provides real-time visibility of gas readings, team wellbeing and other information to gauge the emergency response.

Take advantage of real-time, relevant communications and post-evacuation assessment tools to find faster routes ensuring everyone finds safe ground. Plus, since you'll be able to see the location of each connected worker, you can eliminate time-consuming and inaccurate manual headcounts. If a worker doesn't reach a muster point, you'll know their precise location so personnel can initiate a rapid and informed response. These combined factors can save hundreds of thousands of dollars each year during drills and actual evacuations. You never want to experience evacuations, but when you do, you'll want Blackline by your side.





# 009 G6 Wearable Product Features At-A-Glance



Gas	Sensor type	Sensor model	Range	Resolution
Carbon monoxide (CO)	Electrochemical	Citytech, 4CF+ CTTiceL	0-500 ppm	1 ppm
Hydrogen sulfide (H <sub>2</sub> S)	Electrochemical	City Technology, 4HS+ Hydrogen Sulfide CTTiceL	0-100 ppm	0.1 ppm
Oxygen (O <sub>2</sub> )	Electrochemical	City Technology, 4OxLL Longlife Oxygen CTTiceL	0-25% vol	0.1% vol
Sulfur dioxide (SO <sub>2</sub> )	Electrochemical	City Technology, 4S Rev. 2 Sulfur Dioxide CTTiceL	0-100 ppm	0.1 ppm

## Standard features

Single-gas monitoring - CO, H<sub>2</sub>S, O<sub>2</sub>, or SO<sub>2</sub>  
 Direct-to-cloud connectivity  
 Over-the-air configurations  
 Automatic over-the-air updates  
 Integrated GPS location technology  
 Find My G6  
 Up to 1-year battery life  
 Rechargeable battery  
 Automatic bump tests and calibrations through G6 Dock

## Standard safety features

Device location, gas readings, bump and calibration data, and alarms automatically uploaded daily  
 High gas notification  
 Low gas notification  
 Short-term exposure limit (STEL) notification  
 Bump test and calibration notification  
 Bump test and calibration failure notification

## Size & weight

Size: 71mm x 110mm x 37mm (2.8" x 4.3" x 1.5")  
 Weight: 146g (5.2 oz)

## User interface

240 x 320 pixel graphical, high contrast, 6-bit color liquid crystal display  
 Menu system and power-on driven by threebutton keypad  
 Multi-language support: EN, FR, ES, DE, IT, NL, PT

## User notification

Visual: Color display and multi-color lights on top and side  
 Sensory: Vibrating  
 Audible: ~95 dB @ 30 cm (11.8")

## Power & battery

Rechargeable Li-ion battery: 1200 mAh  
 Battery life: Up to 1 Year at 20°C (68°F) under normal usage  
 Charge time: 4 hours

## Approvals

SAR, RoHS, CE, RCM  
 FCC ID: W77G62 IC: 8255A-G62  
 Contains FCC ID: XPY1EIQ24NN, IC: 8595A-1EIQ24NN  
 Canada & USA: Class I Division 1 Group A,B,C,D,T4; Class I Zone 0 AEx ia IIC T4; Ex ia IIC T4 Ga  
 IECEx: Ex ia IIC T4 Ga  
 ATEX: Ex ia IIC T4 Ga  
 UKCA: Ex ia IIC T4 Ga

## Location technology

GPS Radio: 48-channel high sensitivity  
 Assisted-GPS: Yes  
 GPS Accuracy: ~5 m (16 ft) Outdoors  
 Location update frequency: During high urgency events and once per day

## Cellular Communication

LTE-M and NB-IoT

## Environmental

Storage temperature: -30°C to 60°C (-22°F to 140°F)  
 Operating temperature: -20°C to 55°C (-4°F to 131°F)  
 Charging temperature: 0°C to 45°C (32°F to 113°F)  
 Ingress Protection: Designed to meet IP67

## Warranty

Four-year limited warranty

## Blackline Live web application

Cloud-hosted safety monitoring web application is customizable for every customer requirement. Includes compliance dashboard, map, user roles, device configurations, notification setups, and essential reporting

*All specifications subject to change without notice.*

# G7 Wearable Product Features At-A-Glance



Gas	Sensor type	Sensor model	Range	Resolution
Ammonia (NH <sub>3</sub> )	Electrochemical	Citytech, Sensoric NH3 3E 100 SE	0–100 ppm	0.1 ppm
High-range ammonia (NH <sub>3</sub> )	Electrochemical	Sensoric NH3 E3 500 SE	0–500 ppm	1 ppm
Carbon monoxide (CO)	Electrochemical	Citytech, 4CF+ CiTiCeL	0–500 ppm	1 ppm
High-range carbon monoxide (CO)	Electrochemical	Citytech 4CM	0–2000 ppm	5 ppm
Hydrogen resistant carbon monoxide (CO-H)	Electrochemical	Citytech 2CF3	0–500 ppm	1 ppm
Carbon dioxide (CO <sub>2</sub> )	NDIR	Gas Sensing Solutions, MiniR	0–50,000 ppm	50 ppm
Chlorine (Cl <sub>2</sub> )*	Electrochemical	Citytech, Sensoric Cl2 3E 50	0–20 ppm	0.1 ppm
Chlorine dioxide (ClO <sub>2</sub> )*	Electrochemical	Sensoric ClO2 3E 1 O	0–2 ppm	0.01 ppm
COSH	Electrochemical	Citytech, 4COSH Dual Gas CO/H <sub>2</sub> S Sensor	0–500 ppm CO, 0–100 ppm H <sub>2</sub> S	1 ppm CO, 0.1 ppm H <sub>2</sub> S
Hydrogen cyanide (HCN)	Electrochemical	Sensoric HCN 3E 30 F	0–30 ppm	0.1 ppm
Hydrogen sulfide (H <sub>2</sub> S)	Electrochemical	City Technology, 4H5+ Hydrogen Sulfide CiTiCeL	0–100 ppm	0.1 ppm
High-range hydrogen sulfide (H <sub>2</sub> S)	Electrochemical	City Technology, 4H5+ Hydrogen Sulfide CiTiCeL	0–500 ppm	0.5 ppm
LEL-MPS™	Molecular property spectrometer™	Nevada Nano, LEL MPS™	0–100% LEL	0.1% LEL
LEL-infrared (LEL-IR)	NDIR	MIPEX, 02-X-X.1	0–100% LEL	1% LEL
Nitrogen dioxide (NO <sub>2</sub> )	Electrochemical	City Technology, 4ND	0–50 ppm	0.1 ppm
Oxygen (O <sub>2</sub> )	Pumped electrochemical	City Technology, 4OxLL Longlife Oxygen CiTiCeL	0–25% vol	0.1% vol
Ozone (O <sub>3</sub> )*	Electrochemical	Sensoric O3 3E 1	0–1 ppm	0.01 ppm
Photoionization (PID)	PID	Ion Science, MiniPID 2	0–4,000 ppm	Dynamic resolution**, 0.1 ppm
Sulfur dioxide (SO <sub>2</sub> )	Electrochemical	City Technology, 4S Rev. 2 Sulfur Dioxide CiTiCeL	0–100 ppm	0.1 ppm

\*Does not work with the pump module. \*\*Dependant on correction factor.

## Functional settings

**Fall detection and No-motion detection:** Tri-axis accelerometer, tri-axis gyro, software processing, configurable sensitivity, configurable time for no-motion  
**SOS latch:** Pull latch to trigger SOS alert  
**Silent SOS:** Press and hold latch to trigger SOS alert  
**Low-battery:** Configurable threshold  
**Worker check-in:** Configurable timer (30 – 180 min, or off), automatic check-in when driving

## Gas cartridge features

Under limit  
 Over limit  
 Time-weighted average (TWA)  
 Short-term exposure limit (STEL)  
 High gas alert  
 Low gas alert  
 Bump test and calibration notification  
 Bump test and calibration failure

## Size & weight

**G7 with Standard Cartridge**  
**Size:** 64 mm x 124 mm x 29 mm (2.52" x 4.88" x 1.06")  
**Weight:** 162 g (5.7 oz)  
**G7 with Single-gas Cartridge**  
**Size:** 64 mm x 128 mm x 29 mm (2.52" x 5.04" x 1.06")  
**Weight:** 167 g (5.9 oz)  
**G7 with Multi-gas diffusion Cartridge**  
**Size:** 66 mm x 150 mm x 29 mm (2.52" x 5.91" x 1.06")  
**Weight:** 192 g (6.8 oz)  
**G7 with Multi-gas pump Cartridge**  
**Size:** 66 mm x 151 mm x 38.5 mm (2.6" x 5.95" x 1.52")  
**Weight:** 238 g (8.4 oz)  
**Target flow rate:** 300ml/min  
**Maximum hose length:** 99ft (30.2 m)

## Wireless updates

**Device configuration changes:** Yes  
**Device firmware upgrade over-the-air (FOTA):** Yes

## User interface

**Display:** 168 by 144 pixel graphical, high contrast, liquid crystal display with front lighting  
**Menu system:** Driven by three-button keypad  
**Power button:** On/off  
**SOS latch:** Press emergency alert  
**Multi-language support:** EN, FR, ES, DE, IT, NL, PT

## User notification

**Green SureSafe® light:** Blinking (powered), continuous (connected)  
**Yellow top and front lights:** Yellow pending alarm and yellow warning alarm  
**Red top and front lights:** Red alert communicated  
**Blue LiveResponse™ top and front lights:** Confirmation that a monitoring team has acknowledged the alert  
**Alarm Indicators:** Speaker, LED lights and vibration motor  
**Speaker sound pressure level:** ~95 dB @ 30 cm (~95 dB @ 11.8")  
**Voice calling:** Speakerphone and phone modes (G7c model only)

## G7c wireless radio

**Wireless coverage:** 100 countries, 200 wireless carriers  
**North America:** 3G/4G radio, 3G UMTS bands 2 and 5; 4G bands 2, 4 and 5  
**International:** 2G/4G radio, 2G G ESM bands E-GSM and PCS; 4G bands 3, 7 and 20  
**Antenna:** Internal regionally optimized

## G7x wireless radio

Works with G7 Bridge satellite base station  
**Radio:** 902.0 – 928.0 MHz, 1 Watt  
**AS/NZ Radio:** 915.0-928.0 MHz  
**Antenna:** Internal  
**Radio link range:** 2 km (1.25 mi)

## Location technology

**GPS Radio:** 48-channel high sensitivity  
**Assisted-GPS:** Yes (G7c model only)  
**GPS Accuracy:** ~5 m (16 ft) outdoors  
**Indoor location technology:** Blackline Safety location beacons  
**Location update frequency:** G7c 5 min, G7x 15 min defaults

## Power & battery

**Rechargeable Li-ion battery:** 1100 mAh Li-ion  
**Battery Life:** 18 hours at 20°C (68°F) under normal usage  
**Charge time:** 4 hours

## Environmental

**Storage temperature:** -30°C to 60°C (-22°F to 140°F)  
**Operating temperature:** -20°C to 55°C (-4°F to 131°F)  
**Charging temperature:** 0°C to 45°C (32°F to 113°F)  
**Ingress Protection:** Designed to meet IP67  
**Approvals**  
**G7c:** SAR, RoHS, CE, RCM  
**Unit ID 3570xxxxxx**  
**FCC ID:** W77G7C2 IC: 8255A-G7C2  
**Contains FCC ID:** XPY1EIQ24NN IC: 8595A-1EIQ24NN  
**G7 TECHNICAL USER MANUAL || 57**  
 or

## Unit ID 3567xxxxxx

**FCC ID:** W77G7C IC: 8255A-G7C  
**Contains FCC ID:** XPY1CGM5NNN, IC: 8595A-1CGM5NNN  
 or  
**Unit ID 3566xxxxxx**  
**Contains FCC ID:** XPY1CGM5NNN, IC: 8595A-1CGM5NNN  
**Canada & USA:** Class I Division 1 Group A,B,C,D T4; Class I Zone 0 AEx da ia IIC T4; Ex da ia IIC T4 Ga  
**IECEx:** Ex da ia IIC T4 Ga  
**ATEX:** Ex da ia IIC T4 Ga  
**LEL:** CSA C22.2 No.152; ISA 12.13.01  
**LEL Pump Cartridge:** CSA C22.2 No.152; 0°C ≤ Ta ≤ 40°C; ANSI/ISA-12.13.01; -10°C ≤ Ta ≤ 40°C  
**G7x:** SAR, RoHS, RCM  
**FCC ID:** W77G7X IC ID: 8255A-G7X  
**Canada & USA:** Class I Division 1 Group A,B,C,D T4; Class I Zone 0 AEx da ia IIC T4; Ex da ia IIC T4 Ga  
**IECEx:** Ex ib IIC T4 Gb  
**LEL:** CSA C22.2 No.152; ISA 12.13.01  
**LEL Pump Cartridge:** CSA C22.2 No.152; 0°C ≤ Ta ≤ 40°C; ANSI/ISA-12.13.01; -10°C ≤ Ta ≤ 40°C  
**Warranty**  
**G7:** two years limited warranty  
**Cartridges:** lifetime with service plan  
**Blackline Complete:** three year operating lease with three year warranty  
*All specifications subject to change without notice.*

# G7 EXO Area Gas Monitor

## Product Features At-A-Glance



Gas	Sensor type	Sensor model	Range	Resolution
Ammonia (NH <sub>3</sub> )	Electrochemical	Citytech, Sensoric NH3 3E 100 SE	0–100 ppm	0.1 ppm
High-range ammonia (NH <sub>3</sub> )	Electrochemical	Sensoric NH3 E3 500 SE	0–500 ppm	1 ppm
Carbon monoxide (CO)	Electrochemical	Citytech, 4CF+ CiTiceL	0–500 ppm	1 ppm
High-range carbon monoxide (CO)	Electrochemical	Citytech 4CM	0–2000 ppm	5 ppm
Hydrogen resistant carbon monoxide (CO-H)	Electrochemical	Citytech 2CF3	0–500 ppm	1 ppm
Carbon dioxide (CO <sub>2</sub> )*	NDIR	Gas Sensing Solutions, MiniR	0–50,000 ppm	50 ppm
Chlorine (Cl <sub>2</sub> )*	Electrochemical	Citytech, Sensoric Cl2 3E 50	0–20 ppm	0.1 ppm
Chlorine dioxide (ClO <sub>2</sub> )	Electrochemical	Sensoric ClO2 3E 1 O	0–2 ppm	0.01 ppm
COSH	Electrochemical	Citytech, 4COSH Dual Gas CO/H <sub>2</sub> S Sensor	0–500 ppm CO, 0–100 ppm H <sub>2</sub> S	1 ppm CO, 0.1 ppm H <sub>2</sub> S
Hydrogen cyanide (HCN)	Electrochemical	Sensoric HCN 3E 30 F	0–30 ppm	0.1 ppm
Hydrogen sulfide (H <sub>2</sub> S)	Electrochemical	City Technology, 4HS+ Hydrogen Sulfide CiTiceL	0–100 ppm	0.1 ppm
High-range hydrogen sulfide (H <sub>2</sub> S)	Electrochemical	City Technology, 4HS+ Hydrogen Sulfide CiTiceL	0–500 ppm	0.5 ppm
LEL-infrared (LEL-IR)	NDIR	MIPEX, O2-X-X-X.1	0–100% LEL	1% LEL
LEL-MPS™	Molecular property spectrometer™	Nevada Nano, LEL MPS™	0–100% LEL	0.1% LEL
Nitrogen dioxide (NO <sub>2</sub> )	Electrochemical	City Technology, 4ND	0–50 ppm	0.1 ppm
Oxygen (O <sub>2</sub> )	Pumped electrochemical	City Technology, 4OxLL Longlife Oxygen CiTiceL	0–25% vol	0.1% vol
Ozone (O <sub>3</sub> )*	Electrochemical	Sensoric O3 3E 1	0–1 ppm	0.01 ppm
Photoionization (PID)	PID	Ion Science, MiniPID 2	0–4,000 ppm	Dynamic resolution**, 0.1 ppm
Sulfur dioxide (SO <sub>2</sub> )	Electrochemical	City Technology, 4S Rev. 2 Sulfur Dioxide CiTiceL	0–100 ppm	0.1 ppm

\*Does not work with the pump module.

\*\*Dependant on correction factor.

## Functional settings

**SOS latch:** Pull latch to trigger SOS alert  
**Low-battery:** Configurable threshold  
**Connection lost:** Configurable threshold  
**Two-way messages:** Custom messages and 10 preconfigured sent to monitoring personnel  
**Maintenance code:** Configurable 4 digit  
**Push-to-talk:** Send and receive voice messages to other G7 devices

## Gas cartridge features

High gas alert  
Low gas warning alarm  
Under limit (UL)  
Over limit alerts (OL)  
Bump test and calibration notification  
Bump test and calibration failure

## Size & weight

**Material:** Rugged housing built from aluminum, plastic and rubberized bumpers  
**Size:** 385 mm x 188 mm x 220 mm (15.1" x 7.4" x 8.7")  
**Weight:** 12.25Kg 27 lbs

## Wireless updates

**Device configuration changes:** Yes  
**Device firmware upgrade OTA:** Yes

## Interface ports

Intrinsically safe, configurable external signal ports designed to integrate with external alarms and electrical systems.

## User interface

**Display:** : 4.4" diagonal, 480 by 640 pixel, eight-colour active matrix liquid crystal display  
**Menu system:** driven by three-button keypad  
**Power button:** On/off  
**SOS latch:** Send SOS alert  
**Multi-language support:** EN, FR, ES, DE, IT, NL, PT

## User notification

**Green connectivity light:** Blinking (powered), continuous (connected)  
**360-degree visible yellow and red lights**  
**Yellow light:** Warning alarms  
**Red light:** Alerts  
**Blue LiveResponse™ indicator light:** Confirmation that a monitoring team has acknowledged an alert

## Cellular wireless radio

**Wireless coverage:** 100 countries, 200 wireless carriers  
**North America:** 3G/4G radio; 3G UMTS bands 2 and 5; 4G bands 2, 4 and 5  
**International:** 2G/4G radio; 2G GSM bands E-GSM and PCS; 4G bands 3, 7 and 20  
**Asia Pacific:** 3G/4G radio; 3G UMTS band 1; 4G bands 3, 8 and 28  
**Antenna:** Internal

## Satellite module

User-upgradeable satellite module allows EXO to connect to the Iridium satellite network for remote areas outside of cellular connectivity  
**Optional module:** Yes  
**Network:** Iridium, global coverage  
**Radio:** 1621 MHz, 2 Watts  
**Antenna:** Internal

## Four-channel pump module

**Optional module:** Yes  
**Number of pump channels:** 4  
**Sampling period per channel:** Adjustable  
**Tubing length per channel:** Up to 30 m (100 ft)  
**Size:** 18x9.5x8 cm (7x3.7x3.1 in)  
**Weight:** 272 g (0.6 lb)

## IS trickle charge port

Can be used to hard-wire an IS power supply to run EXO indefinitely

## Environmental

**Storage temp.:** -40°C to 60°C (-40°F to 140°F)  
**Operating temp.:** -20°C to 50°C (-4°F to 122°F)  
**Ingress protection:** Designed to meet IP65  
**Location technology**  
**Multi-constellation:** GPS/QZSS, Galileo, Beidou  
**Receiver type:** 72-channel  
**Assisted-GNSS:** Yes  
**GNSS Accuracy:** 5m (16feet), CEP 50%, 24 hours static

## Power & battery

**Rechargeable battery capacity:** 144 Ah (LiFePO<sub>4</sub>)  
**Battery life in diffusion mode:** 100 days at 20°C (68°F), LEL-IR, H<sub>2</sub>S, CO and O<sub>2</sub> configuration  
**Battery life in pump mode:** 30 days at 20°C (68°F)  
**Charge time:** ~12 hrs  
**Charge temp.:** 0°C to 45°C (32°F to 113°F)

## A/B interface ports

Intrinsically safe, highly configurable external signal ports designed to integrate with external alarms and electrical systems.

## Four pins per interface port

**Pin 1:** Low side switch  
Voc=24Vdc, Isc=3.33A, Co=0F, Lo=0H  
**Pin 2:** Ground  
**Pin 3:** High voltage out  
Voc=18Vdc, Isc=268mA, Co=0.194uF, Lo=495uH  
**Pin 4:** Low voltage out  
Voc=3.2Vdc, Isc=32mA, Co=100uF, Lo=23.9uH

## Approvals

RoHS, CE, RCM  
**Canada & USA:** Class I Division 1 Group A,B,C,D T3;  
Class I Zone 0 AEx ia IIC T3; Ex ia IIC T3 Ga  
**IECEX:** Ex ia IIC T3 Ga  
**ATEX:** Ex ia IIC T3 Ga  
**LEL:** CSA C22.2 No.152; ISA 12.13.01  
**FCC ID:** W77EXO IC: 8255A-EXO  
**Contains:** FCC ID: XPY1EIQ24NN, Q639603N  
IC: 8585A-1EIQ24NN, 4629A-9603N

## Warranty

Three-year hardware warranty  
Extended warranty available

*All specifications subject to change without notice.*



FOR MORE INFORMATION, VISIT:  
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