

ABB MEASUREMENT & ANALYTICS

HoverGuard™

UAV-based natural gas leak detection solution



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01 HoverGuard flying
over a city

Overview

ABB's HoverGuard enables detection and mapping of natural gas leaks while flying with unprecedented speed, accuracy and reliability. By combining patented LGR-ICOS™ laser technology, wind velocity and Global Navigation Satellite System sensors, and advanced data analytics, the HoverGuard solution allows customers to detect leaks far from hard-to-reach sources in minutes. Furthermore, the solution includes ABB's advanced leak detection mapping capability, deployed worldwide in the MobileGuard™ vehicle-based solution, providing estimates of leak locations on geospatial maps and emissions rates.

The HoverGuard solution operates on low-cost commercial unmanned aerial vehicles (UAV) capable of carrying a payload of 3 kg (6.6 lbs) to allow detection while flying at heights of 40 meters (130 ft) or higher. This permits operators to detect leaks far from natural gas distribution and transmission pipelines, gathering lines, storage facilities, and other potential sources quickly, safely and reliably. HoverGuard automatically generates digital reports that summarize results and can be shared in minutes after a survey.

HoverGuard detects natural gas leaks around hard-to-reach sites such as bridges, high-rise buildings, areas with right-of-way restrictions or vegetation coverage, and pipelines.

Measurement made easy.

Features and benefits

- Ultrahigh sensitivity and precision enables detection of large, small, and even hidden leaks far from sources.
- Fast response (2.5 Hz, 1/e) enables measurements while flying at high speed.
- Fast data rate (10 Hz) allows high spatial resolution maps.
- Proprietary software provides estimates of leak origin and emissions volumetric flow rate.
- Patented ABB laser technology provides high accuracy measurements at the precise UAV location.
- Advanced analytics and mapping software provide real-time results.
- Software autonomously generates advanced digital reports easily shareable via cloud connectivity.
- Cybersecurity validation gives customers confidence their data and systems always remain safe and secure.

- 01 HoverGuard surveying over a large, remote area
- 02 HoverGuard survey map generated after field investigation

A unique solution

Unlike other laser-based systems that rely on detecting a scattered or reflected laser beam, HoverGuard provides spatially resolved concentration measurements, not a path-averaged approximation, by rapidly sampling the local air as it flies.

This comprehensive UAV-based solution can detect, precisely locate, and estimate the size of natural gas leaks at a rate that covers 10-15 times more land area per minute than traditional methods.

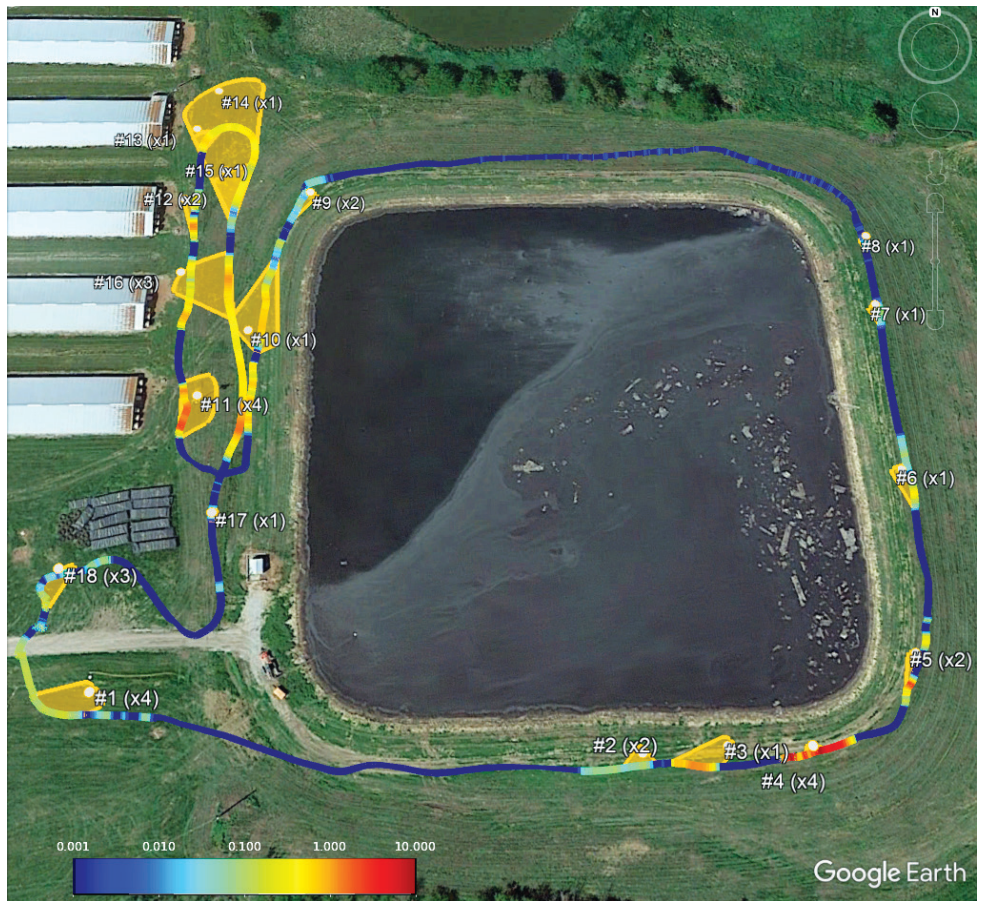
This saves considerable time and allows users to rapidly survey locations inaccessible by road or on foot. Additionally, with its extremely sensitive technology and fast response rate, HoverGuard can quickly detect leaks more than 100 meters from their source.

Like other ABB gas leak detection solutions, HoverGuard is cloud-connected, records data ten times a second and analyzes data locally. Finally, this new generation system automatically produces electronic digital

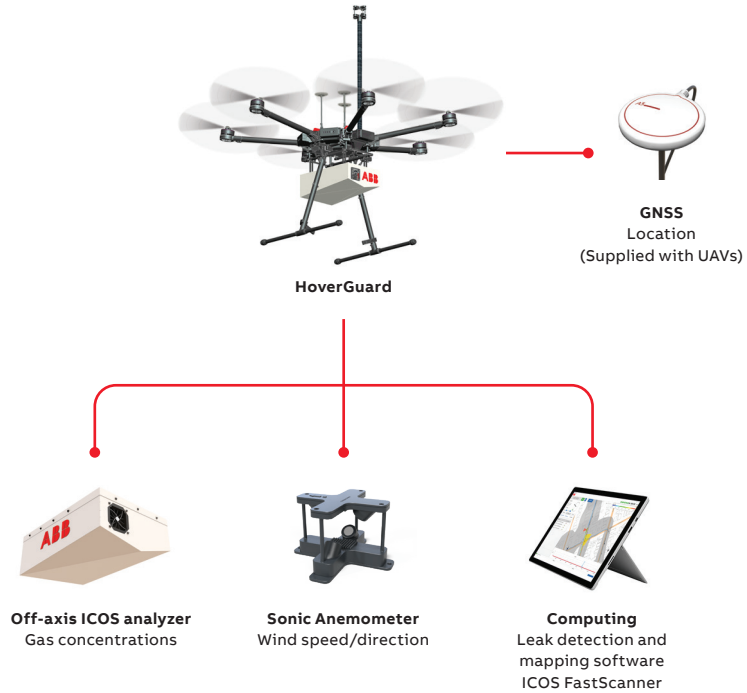
reports that are accessible on a mobile device locally and can be shared securely and easily loaded into customer geographic information systems (GIS).

The combination of speed, accuracy and operational efficiency helps pipeline and other operators meet the demand for fast, accurate and transparent data while streamlining their operations and complying with current cybersecurity and environmental standards and expectations.

HoverGuard uses patented cavity-enhanced laser absorption spectroscopy to detect methane with a sensitivity and precision more than 1000 times higher than conventional leak detection tools.



HoverGuard operates from a UAV to detect gas leaks while flying



HoverGuard technical specifications

Specification	Value	Notes
Precision, methane	0.9 ppb or 0.05% of reading	1 σ RMS in 1 sec
Air flow response rate (1/e)	2.5 Hz	Characteristic flow response rate
Data rate, user selectable	1-10 Hz	Up to 1 data point every 0.1 seconds
Dynamic range, methane (GLA133-MEA)	0.01-10,000 ppm	High sensitivity and wide range
Power	35 W, 11-30 V DC, 5 A (max)	Uses UAV battery (external DC power)
Weight	3 kg	
Dimensions	11 cm x 34 cm x 22 cm	
Area classification	General purpose	
Operating temperature	0 to 45 °C	
GPS/GNSS position accuracy	< 1 m	
Digital report generation		Comprehensive report generated after each investigation
Cybersecure		Independently tested and validated

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