

Methane lidar camera



Detect, locate, visualize, and quantify methane emissions, and prioritize remedial actions



Sensitivity:

Detects leaks as small as 0.4 kg/h



Range:

Up to 200-m [656-ft] distance



Accuracy:

Estimates leak rate within a \pm factor of two, 68% confidence



Laser output:

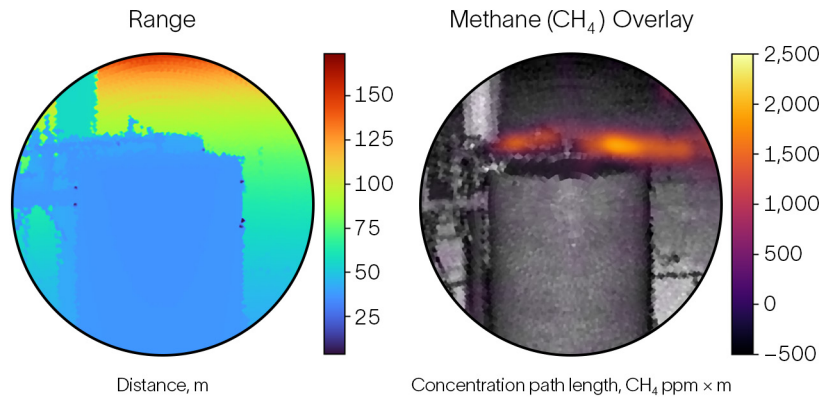
Class 1 laser, eye safe

Applications

- Oil and gas production and processing facilities, onshore
- Compliance with continuous monitoring requirements outlined in EPA OOOOa/b/c regulations

How it is unique

- Camera with lidar (laser imaging, detection, and ranging) quantifies methane emission rates
- Overlaid methane and traditional images reveal individual emission sources unambiguously
- High-sensitivity sensors detect emissions as small as 0.4 kg/h at a distance of up to 200 m under favorable conditions
- Gas leak visualization and pinpointing occurs in real time, day or night, and in light precipitation
- Insensitive to temperature or sunlight interference
- Methane-specific detection with no interference from other gases or water vapor
- 3D imaging, range, and context imagery using lidar signal
- Single-photon sensitivity for long-range, low-power, eye-safe imaging



The methane lidar camera from SLB End-to-end Emissions Solutions (SEES) provides continuous methane monitoring across a wide variety of onshore oil and gas production and processing facilities.* It detects methane from a distance of up to 200 m [656 ft] and reveals the exact location of an emissions source. Multiple cameras can be deployed for large facilities or locations with limited line of sight to potential emissions sources.

How it reduces emissions

The methane lidar camera uses quantum technology to detect, locate, visualize, and quantify methane emissions. Permanently mounted on a pole or mast, the camera overlays a methane image on a traditional camera image, showing the exact location of an emissions source. Additionally, the images are analyzed to quantify the emission rate.

Under favorable conditions, the camera can detect methane emissions as small as 0.4 kg/h from a distance of up to 200 m. Unlike traditional methane cameras, the methane lidar camera quantifies methane emissions regardless of temperature, sunlight, and other gases including water vapor. The sensitivity and accuracy of the sensor, the high-image quality, and the lack of background interference ensure reliable and autonomous leak detection and quantification.

Using the methane lidar camera, you can achieve simple, robust, and precise visualization and quantification of gas emissions on a continuous basis—from a compact, readily available, and cost-effective equipment platform.

Limits of detection with 90% probability**

	<1 m/s wind speed	<5 m/s wind speed	<10 m/s wind speed
<100-m [<328-ft] distance	0.2 kg/h	1.0 kg/h	2.0 kg/h
<200-m [<656-ft] distance	0.4 kg/h	2.0 kg/h	4.0 kg/h

All specifications are subject to change without notice.

**Target specifications, subject to situational verification.

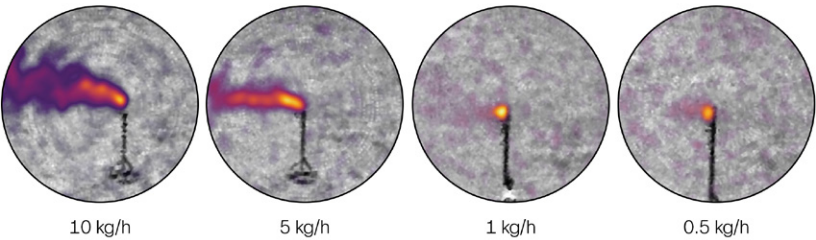
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How it works

The methane lidar camera uses a new technique called tunable diode lidar (TDLidar), which combines the advantages of a range of gas-detection technologies to enable remote spectroscopy and ranging with low-power semiconductor diode lasers. It uses differential absorption lidar (DIAL) technology to quantify methane emissions; tunable diode laser absorption spectroscopy (TDLAS), which can detect very low methane concentrations; and time-correlated single-photon counting (TCSPC), which enables long-range, low-power, eye-safe imaging.

The automated camera scans the entire facility within its field of view and zooms in on any detected leaks to identify the leaking component. This technology enables measurement of plume size and shape, as well as gas emission rate, duration, location, persistence, and timing. Equipped with this information, you can report emissions and prioritize repairs.

Lidar Images of Methane Emissions



The lidar camera visualizes methane emissions over a wide range of rates.

Methane Lidar Camera Specifications

Quantification accuracy	Estimates leak rate within a \pm factor of two, 68% confidence; under favorable conditions
False positives	Zero (with 10 subsequent images)
Laser output	Class I, eye safe
Camera quality	Color, autofocus, 1080 pixels
Ambient lighting	Day or night Can handle bright sunlight on nonmirrored surfaces, but not direct sun reflection
Precipitation	Operates in light fog, rain, and snow. Heavy fog or precipitation and wet melting snow will increase the leak detection threshold.
Relative humidity	0% to 95%, noncondensing
Altitude	–400 to 3,000 m [–1,312 to 9,842 ft]
Dimensions	43×18×18 cm [16.9×7.1×7.1 in]
Weight	8 kg [17.6 lbm], including pan and tilt mount
Ingress Protection rating	IP64
Operating temperature	–40 to 50 degC [–40 to 122 degF]
Communications connection	Ethernet, WiFi, cellular
Mounting	Bracket provided; optional mast available
Power consumption	10 W

All specifications are subject to change without notice.

