

BOREAL

Application Bulletin LASER

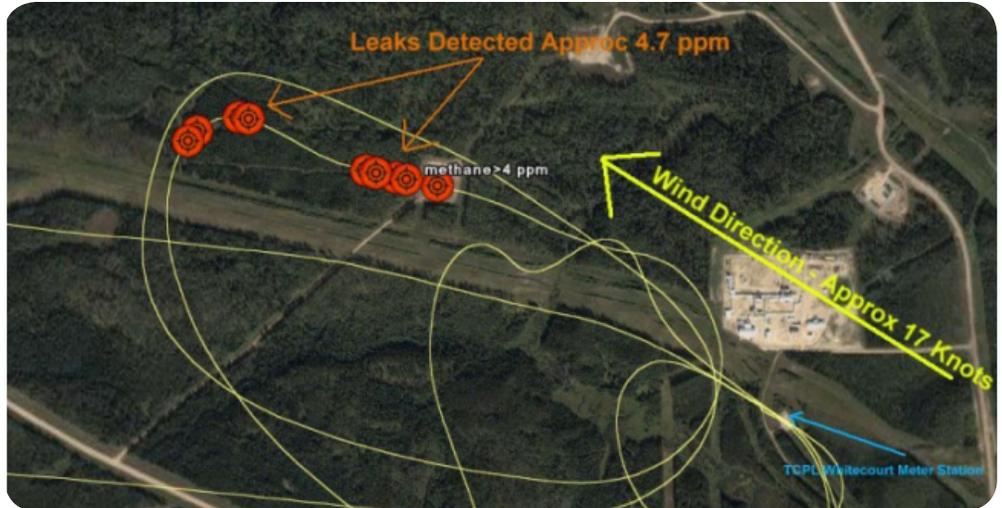
Leak Detection in Natural Gas Pipelines

Natural gas pipeline owners require improved routine monitoring of pipelines for safety, economic and regulatory reasons. Leaking natural gas can cause explosions leading to loss of life and property. Loss of product through undetected leaks dramatically reduces a pipeline operator's profitability.

Traditional ground based leak detection with hand held or vehicle mounted FID detectors is slow and labour and maintenance intensive. IR detectors have been used for both airborne and vehicle mounted surveys, but with limited success because of cross interference from other atmospheric gases.

Boreal Laser's GasFinder CH₄ detector enables both airborne and ground based pipeline monitoring with the same analyzer. With over 10 years of experience, and thousands of kilometers of pipeline surveyed, Boreal's GasFinder has detected many pipeline leaks that would not otherwise have been detected. Recently, the robust external probe, proven in the airborne system, has been adapted for ground based measurements on a truck, car.

Unlike other optical methods which can be confused by other gases present in the air, the single line laser spectroscopy technology in the GasFinderFC responds only to methane.



Helicopter mounted GasFinderAB detects elevated levels of CH₄ in plumes resulting from leaks in high pressure natural gas pipelines

Features

Patented Features provide laser gas detector leadership in price, performance, and ease of use.

"No phase adjustment" detection technology enables paths from 1m to 750m without requiring any phase adjustments or calibration.

Built in, permanent calibration reference cell means GasFinders are delivered calibrated stay in calibration and never need to be recalibrated.

One Analyzer, two probe options, airborne probe for helicopter surveys, or a vehicle probe for truck/car/quad surveys.

Benefits

Methane Specific

No interferences and no false alarms

High Resolution - down to 0.2ppm CH₄

Wide Measurement Range

Fast response time - as low as 0.33 sec

Survey vehicle can fly/drive at normal speed

Direct measurement - no sample line

Robust, solid state instrument

No need for instrument operator

Easy installation and removal

Optional GPS

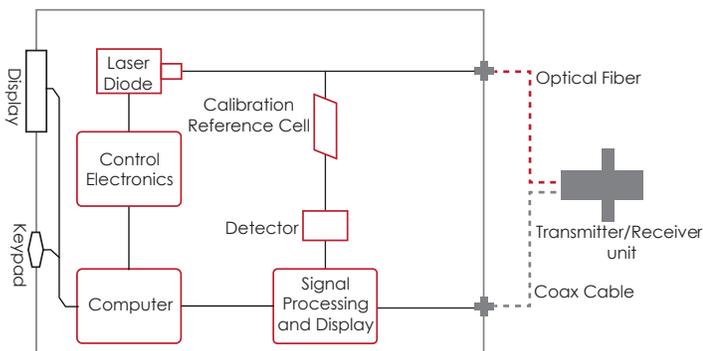
GasFinderAB

How GasFinder Works

The heart of the system is a GasFinderFC CH₄ gas analyzer (see schematic below). The GasFinderFC houses a laser diode, drive electronics, and micro computer subsystems. A fibre optic cable carries the laser light to an external measurement probe. The laser light makes multiple passes through this probe and is focused on a photo detector. The resulting photo current is returned to the GasFinderFC control unit via coaxial cable for analysis. The airborne probe employs a robust mechanical design with simple, stable optical components. A foam shroud minimizes dust and debris entering the path, but allows free passage of ambient air into the measurement zone. The vehicle probe employs the same basic design but is simpler and shorter. Both probes have a sensitivity of 0.2 ppm and a range of 0 to 200 ppm. The airborne probe takes 3 readings per second. The vehicle probe takes readings once per second.

A portion of the laser beam is passed through a stable built in reference cell inside the GasFinderFC to provide a continuous calibration update. Real time readings are provided on a local display unit and transferred via serial interface to a data logging PC, which enables CH₄ data to be mapped along the survey route.

Schematic Representation



Physical Specifications

GasFinderAB

Weight 12 kg
 Dimensions(cm) 26Lx20Wx16H
 Power Requirement < 2 A 12 VDC
 Ambient Temperature -20°C to +40°C

External Vehicle Probe

Weight 6.5kg
 Dimensions (L x dia) 112 x 18
 Ambient Temperature -20°C to 40°C
 Resolution 0.2 ppm (CH₄)
 0.2 to 200 ppm (CH₄)
 Sampling rate 1 reading per second
 Recommended Driving Speed
 30 to 80 km/hr

External Airborne Probe

Weight 11 kg
 Dimensions(cm) 150Lx28Wx15H
 Power Requirement < 2 A 12 VDC
 Ambient Temperature -30°C to +50°C

Accessories

GPS Receiver
 Rugged Laptop
 Display Unit with Alarm
 28Vdc Power Converter
 Cables

Operational Specifications

Detection Limit & Accuracy <1ppm (CH₄)
 Range 0 to 100 ppm (CH₄)
 Alarm Settings Programmable
 Default 10 ppm
 Data Rate 3 readings per second
 Recommended driving speed <28km/hr
 Data Handling

GPS included
 Data Storage on rugged laptop for subsequent processing
 On board alarm

