DIAL

DIFFERENTIAL ABSORPTION LIDAR

THE PROBLEM WITH AIR EMISSIONS

The oil and gas industry is under increasing regulatory scrutiny for heavy emissions of benzene and volatile organic compounds, which escape primarily from their refining facilities. Modern methane leak detection technology has also revealed that facility losses of potentially saleable methane (natural gas) can reach up to $1 million per-facility per-year.

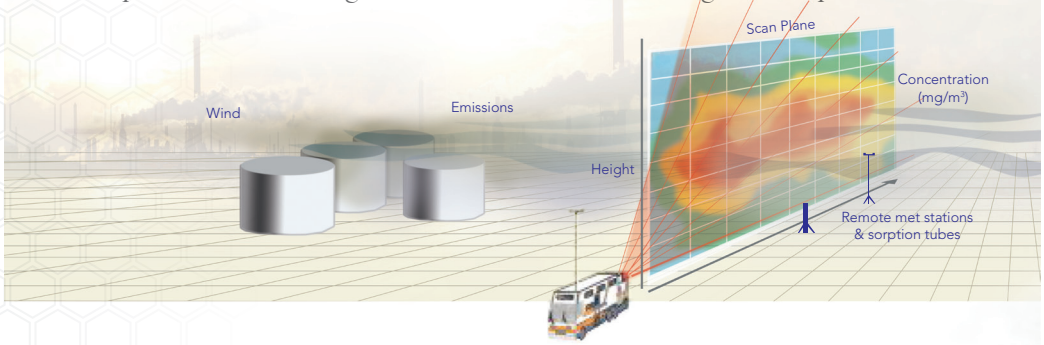
Despite increased awareness of the health and ecomonic impact of air emissions, U.S. regulators have been unable to enact suitable regulations. This is due to the exceedingly high cost of detecting and measuring these emissions. Adequate technology options to address the need for leak detection and measurement are in short supply, and the technology options that do exist are too expensive and frequently unavailable.

THE DIAL PROGRAM

The Energy Dynamics Laboratory (EDL) is developing an advanced Differential Absorption LIDAR (DIAL) technology for the oil and gas industry. DIAL will not only serve the industry's current need for advanced-process leak measurement, but it will also be inexpensive and accessible. This will allow regulators to enact enforceable standards that are more appropriate than what we have. In addition, EDL's DIAL unit will be considerably smaller and lighter than today's options are, making it available for use in previously untenable applications, such as wellhead extraction sites and offshore gas exploration.

PROGRESS AND PLANS

EDL has successfully tested the necessary processes to build a preliminary DIAL instrument. EDL is now well prepared to design and build an initial prototype that will assist in the process of repairing leaks of methane, a potent greenhouse gas. In the near future, EDL will begin the process of designing and building a second DIAL prototype capable of assisting in the effective control of even more types of air pollutants, including benzene and other volatile organic compounds.



POTENTIAL USES OF EDL'S NEW DIAL TECHNOLOGY:

1. Detecting and measuring previously unknown sources of benzene emissions at oil and gas exploration sites and processing facilities
2. Locating and measuring methane (natural gas) leaks at gas facilities for the purpose of saving fuel and money
3. Monitoring miles of natural gas pipeline to help discover and repair costly leaks

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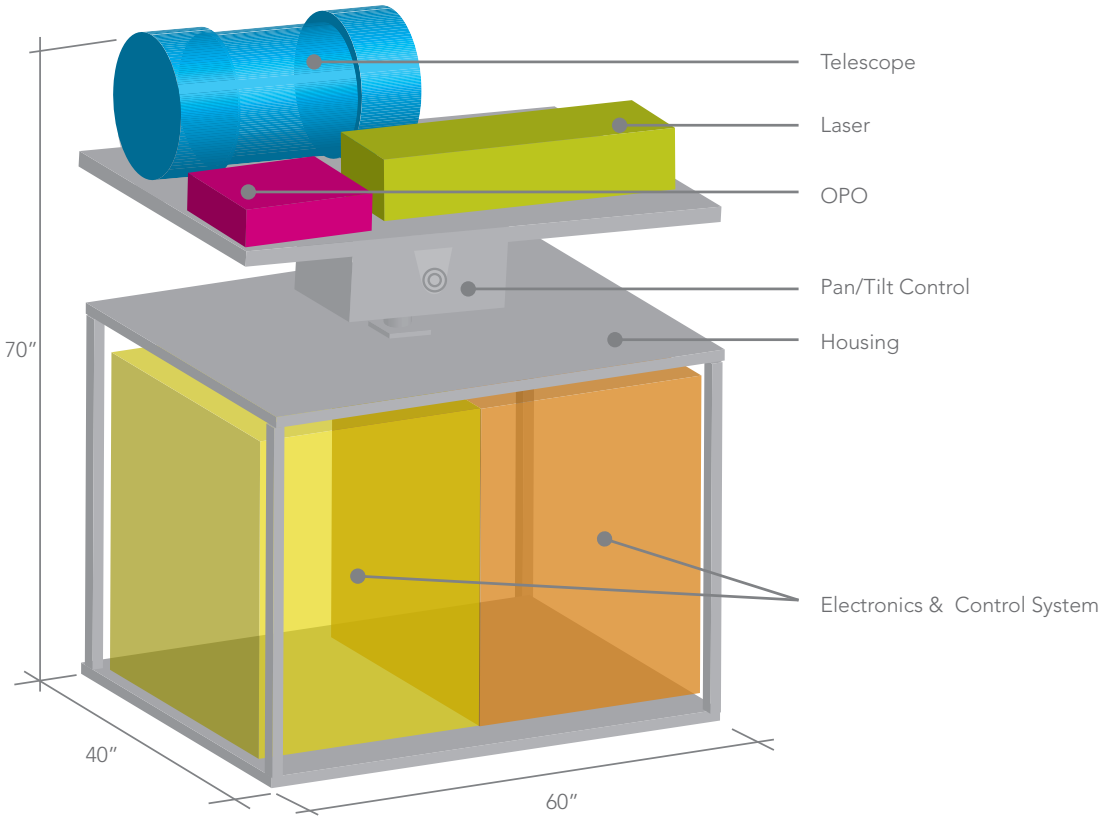
DIAL

Differential Absorption LIDAR

METHANE DIAL SYSTEM
EXPECTED PERFORMANCE SPECIFICATIONS

Detection Range:	3 km
Range Resolution:	10 m
Concentration Limit of Detection:	5 ppm
Size:	< 2.75 m3
Weight:	< 500 lbs
Power Requirement:	< 2kW

DIAL CONCEPT



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