

Laser-Based Open Path Gas Detectors Frequently Asked Questions



Terminology

What is ELDS™?

The MSA Senscient ELDS™ employs Tuneable Diode Lasers within its range of open path gas detectors. Tuneable Laser Diode Spectroscopy (TLDS) is a proven method of rapid gas diagnostics. The Senscient ELDS uses Enhanced Laser Diode Spectroscopy (ELDS), an advanced detection technology which provides greater resilience to false positives that may occur from environmental interference on the monitoring path.

What is SimuGas™?

SimuGas is an electronically-simulated gas function featured on all MSA Senscient ELDS systems. This patented facility enables daily, 'end-to-end' verification of the systems and eliminates the need for employees to enter hazardous areas for gas checks or manual interventions. Test results are retrievable from the detector's internal event log.

Detectable Gases

What flammable gases can ELDS detect?

Senscient ELDS detectors are target gas specific and can be supplied for Methane or Ethylene.

What toxic gases can ELDS detect?

Senscient ELDS detectors are target gas specific and can be supplied for Ammonia, Carbon Dioxide, Hydrogen Sulfide, or Hydrogen Chloride.

Is there a two-gas combination available with ELDS?

Senscient ELDS detectors are available for the two-gas combination of Methane with Hydrogen Sulfide entrainment (i.e. sour gas) only.

Where is ELDS used?

ELDS systems are used by plant operators who wish to monitor for fugitive emissions of flammable or toxic gases to protect plant and personnel. ELDS applications range from large, ventilated spaces to open, outdoor areas. A product variant is also available for monitoring methane ingress at mechanical ventilation air inlets. This variant has a response time of less than one second and a higher detection sensitivity.

WE KNOW WHAT'S AT STAKE.

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Principle of Operation

How does ELDS work?

The transmitter's laser generates light at a specific absorption wavelength of the target gas. This light beam is aimed at the detector's receiver over the open area to be monitored. The target gas within the beam distorts the light signal. The receiver analyzes the distorted light signals' harmonics and calculates the gas concentration. The amplitude of these harmonics correlates to gas concentration.

What advantages does ELDS have over conventional flammable infrared open path gas detection?

Laser-based gas detection is target gas specific, removing any cross interference and unwanted alarms. In addition, it provides higher detection sensitivity enabling faster initiation of executive actions. ELDS also operates at different IR wavelengths that are less prone to fog or rain interference, effectively increasing uptime availability in adverse weather conditions.

Testing Requirements

How does the Daily auto-test (SimuGas) facility work?

Every 24 hours, the transmitter drives the laser to generate a signal that is identical to a known concentration of the target gas. The transmitter also generates a marker to inform the receiver that the signal it is seeing is a test and not a gas release. The receiver analyzes the signal and compares the result with expected values to declare a pass or fail. The mA output is held at the pre-test value during the test to avoid unwanted plant shutdown. SimuGas may remove the need for routine manual testing.

Are optical test filters available?

Unlike conventional IR open path gas detectors that respond to a wide range of hydrocarbons, laser-based open path gas detectors are target gas specific. Therefore, laser-based gas detectors will not respond to any other hydrocarbon gas other than the target gas and this includes hydrocarbon (plastic) optical filters.

Are external gas test cells available for ELDS?

Yes, ELDS external gas test cells are available. They are gas dependent and can be used for Methane, Ethylene, Hydrogen Sulfide, and Carbon Dioxide systems. The use of an external gas test cell for Ammonia and Hydrogen Chloride is not recommended due to the instable nature of these gases under normal conditions. For these unstable gases, we recommend using the integral SimuGas test facility.

What additional equipment do I need to commission a system?

All Senscient ELDS systems require the use of an alignment scope and an MSA-configured PC or tablet (purchased separately).

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