



RELIABLE SMOKE DETECTION IN PRODUCTION FLOORS AND WAREHOUSES

RELIABLE SMOKE DETECTION FOR PRODUCTION FLOORS AND WAREHOUSES

Large, open spaces like those found in warehouses and production floors present many challenges for smoke detection. Many of these facilities are tall, operate 24 hours a day and seven days a week, making traditional spot or point smoke detection installation and maintenance difficult if not impossible to accomplish.

Various fire detection technologies have been deployed in these large, open spaces. Aspirating smoke detectors (ASDs) provide the fastest and most reliable detection but may not be cost-effective if very early warning is not the priority. While heat cable is false-alarm free, it only detects in the late stage of a flaming fire.

It is commonly believed that beam detectors provide an “acceptable compromise” for smoke detection in these spaces. Unfortunately, the walls of large structures flex under such environmental conditions as cold and heat, heavy wind, rain, etc., causing traditional beam detection to false alarm due to misalignment. Partially open facilities are exposed to insects, birds, rolling fog, etc., again risking beam detectors to false alarms or excessive faults.

In production floors and warehouses where the fire load is high, a fire will result in much more damage than just the cost of lost goods. Environmental damage also must be considered, as well as the cost of business interruption that could result in business reputation and customer losses.

“A large percentage of businesses do not survive a major fire. For example, a wine warehouse in California’s Napa Valley destroyed millions in rare vintages, and a warehouse fire in an industrial zone in Sharjan, United Arab Emirates, injured more than 80 people.”

FIRE DETECTION CHALLENGES

- Difficult access for detector installation, maintenance, testing and replacement
- Business and operation downtime
- Drafts through open doors diluting smoke
- Building movement caused by environmental factors
- Dust and dirt
- Rolling cranes and forklifts interrupting beams
- Insects and birds inside premises interrupting beams

OSID



OPEN-AREA SMOKE IMAGING DETECTION (OSID)

OSID provides superior, cost-effective performance in large, open spaces. In its simplest configuration, a system consists of one Emitter and one Imager placed on opposite walls, roughly aligned with one another.

OSID offers many advantages over traditional beam and spot smoke detectors, the primary one being the use of dual light frequencies. Ultraviolet (UV) and infrared (IR) wavelengths, which are outside the range visible to humans, assist in the identification of real smoke compared to larger objects, such as insects and dust, thus reducing false alarms.

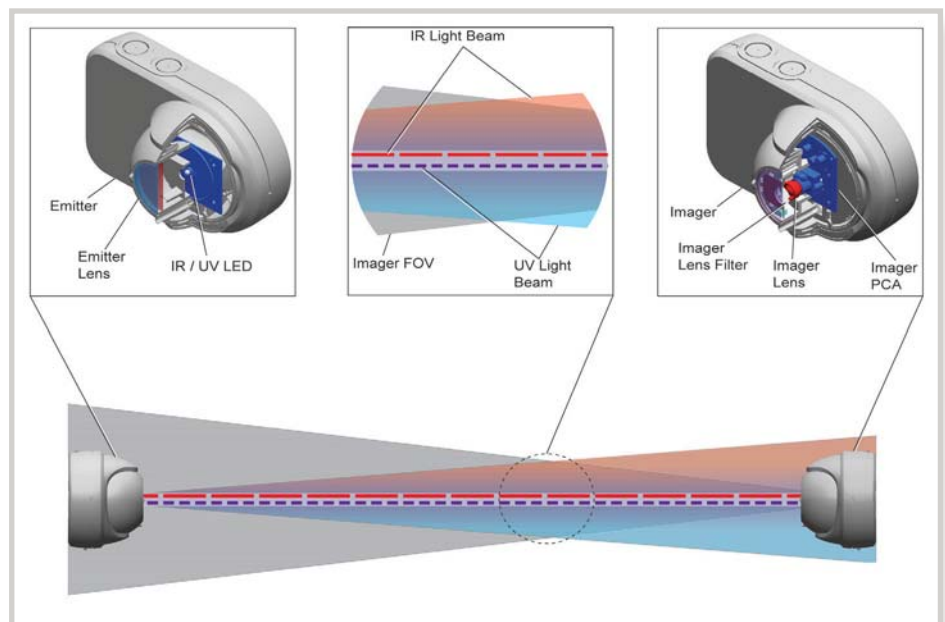
Furthermore, OSID is equipped with a CMOS imaging chip with many pixels rather than a single photo-diode. This concept allows the Imager to provide simple alignment as well as excellent tolerance to building movement and vibration, without the use of moving parts.

Alignment of the Emitter is simple, achieved by using a low-cost laser alignment tool to rotate the optical spheres until the laser beam from the alignment tool is within proximity to the Imager. No further alignment is required, resulting in extremely fast installation and set-up, which is a major benefit in large, open spaces where access for installation is often limited because of space and time.

HOW OSID WORKS

Building movement is the primary cause of false alarms for beam detectors used in large structures. Temperature changes and heavy winds cause building structures to flex. Because OSID uses an optical imaging chip with a wide-angle view, its software can compensate for vibrations and building movement. With this unique feature, the OSID Imager is able to track the signal from an Emitter even when the wall to which it is fixed flexes by up to 2 degrees in any direction, without generating a fault or false alarm. Further, even movements beyond this range will not normally generate false Fire alarms, but will merely indicate a fault.

If the light path is interrupted due to the presence of genuine smoke particles, the Imager will go into alarm. The novel use of dual light frequencies enables OSID to discriminate between real smoke and intruding objects, thus drastically reducing false alarms. That's because smoke reduces UV light more than IR light, whereas dust and solid objects affect both frequencies equally.



OSID Operational Diagram

OSID



OSID also has a high resistance to steam and water droplets. Steam will not generally cause false alarms. If water concentration in the air becomes excessive, a fault will be raised but false alarms are very unlikely.

In addition, OSID requires only limited space (15 - 20 cm or 6 - 8 in.) in its line of view. Therefore, the solution can be deployed safely between ceilings and supporting structures, moving cranes, etc.

OSID DIAGNOSTIC SOFTWARE

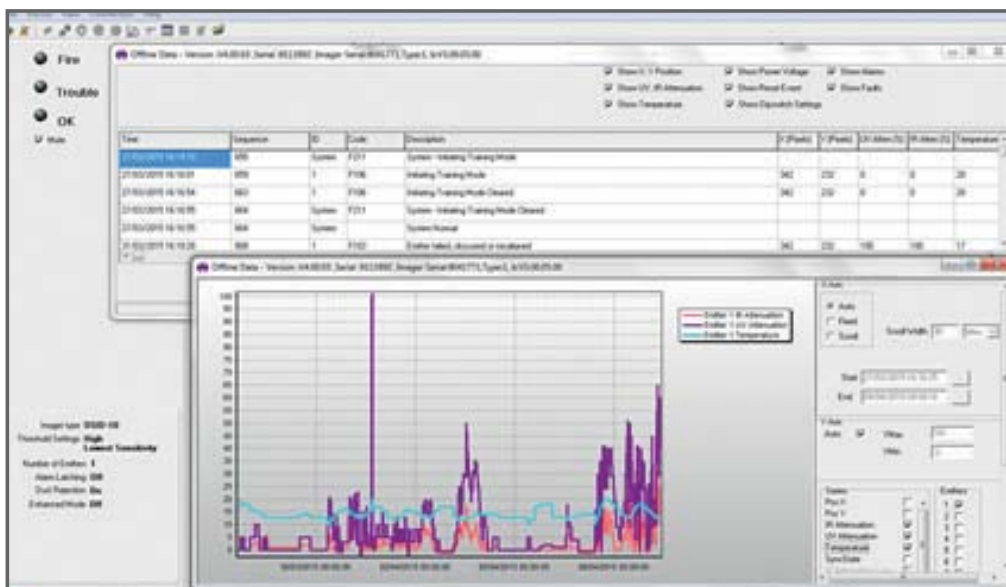
OSID Diagnostic is a unique tool in the industry that allows for live and off-line diagnostic information about the system and environment.

The tool operates under Windows on a standard laptop PC and offers, when connected in the field to the Imager, real time live visualisation of the normalised UV and IR values (0-100% obscuration), the UV and IR grey levels, the X-Y positioning of the 1-7 Emitters on the imager, reference levels and temperature.

The tools also allows for live and off-line evaluation of the imager's log files and reconstruct, with time and date stamp, any significant changes in the system. Log files can also be exported to an Excel file for quick analysis and review.

Benefits of OSID

- **Simple and quick installation**
- **High tolerance to vibrations, building movement and high airflow**
- **Reliable discrimination between real smoke and other intruding objects such as dust, steam, birds, insects and forklifts**
- **Requires only 20 cm (8 in.) free space**
- **3-D coverage**



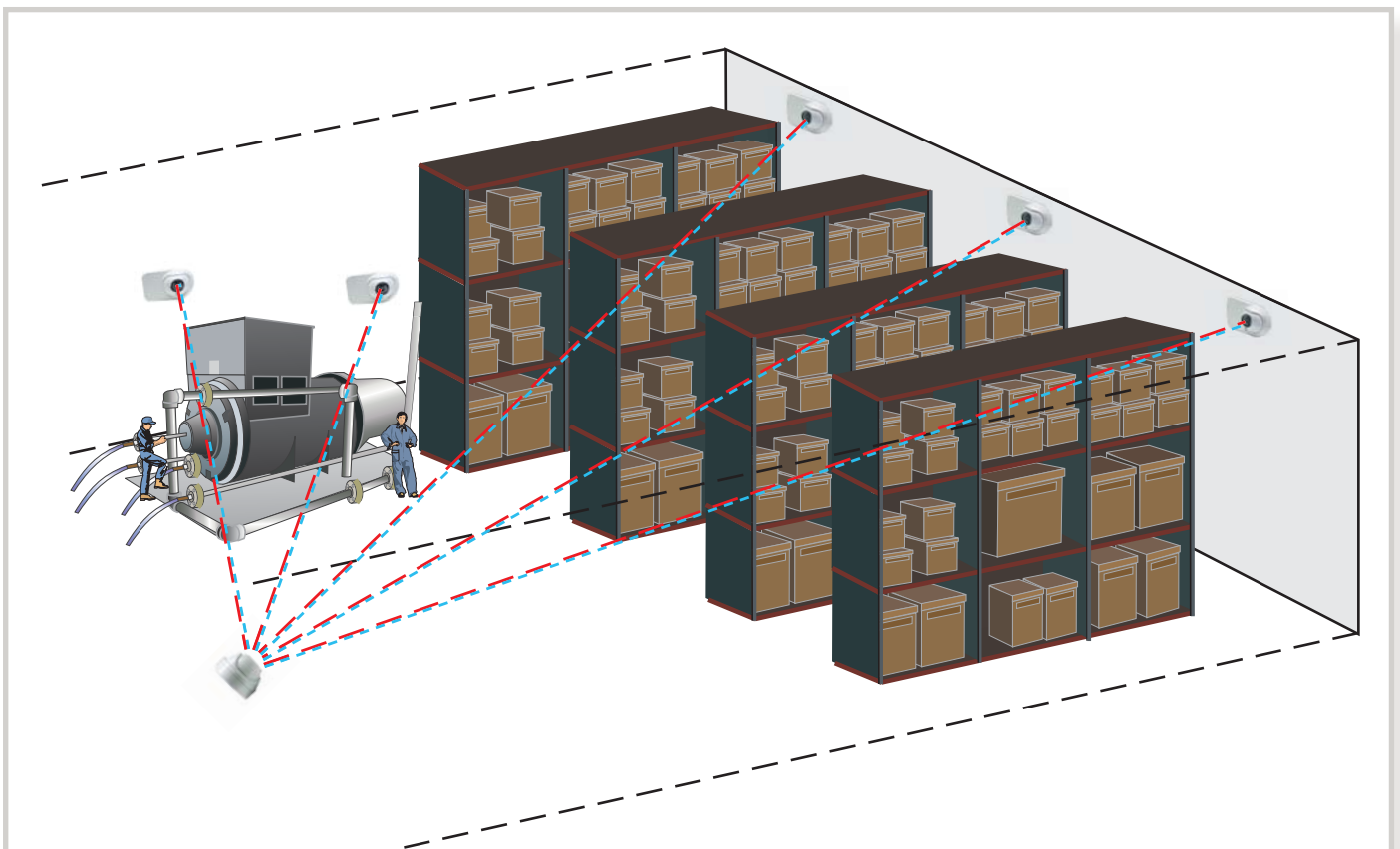
OSID



VOLUMETRIC COVERAGE

In Imagers with viewing angles of 80 degrees, the imaging chip also allows for the deployment of up to seven Emitters per Imager. Only the Imager has to be wired versus every receiver as is the case with traditional beam detectors. Various Emitters also can be placed at different heights for optimum coverage and easy adaption to obstacles along walls.

The beam lengths for the 80 degree Imagers range from 6 to 68 meters (20 to 223 ft). The Imagers' large viewing angle, both horizontal and vertical, enable three-dimensional area coverage.



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