

Open-area Smoke Imaging Detector

Engineering Specification

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1. Scope

This document provides specification details of the Open-area Smoke Imaging Detector (OSID) product to assist in their installation and commissioning.

2. System Information

2.1 General

An open-area smoke imaging detector will be installed for the protection of nominated areas in the building plans.

The system will actively measure the attenuation in these areas and be able to distinguish between smoke, intruding objects (e.g. obstructions, insects), and non-smoke particles (e.g. dust).

The detector will have at least two beams with different wavelengths.

The system will have high alignment tolerances that enable it to compensate for natural shifts in the building structure, and be easily installed and maintained.

2.2 Approvals

The Open-area Smoke Imaging Detector must be of a type submitted to, tested, approved, and/or listed by a Nationally Recognized Testing Laboratory (NRTL) as follows:

- CPD
- VdS
- UL (Underwriters Laboratories Inc), USA
- ULC (Underwriters Laboratories Canada), Canada
- FM (Factory Mutual)
- ActivFire, Australia
- AFNOR, France

2.3 Codes, Standards or Regulations

The Open-area Smoke Imaging Detector (OSID) shall be installed to comply with all local codes and standards for beam detectors such as:

- AS 1670.1, AUS
- BS5839.1, UK
- NFPA72, US
- GB50166, China

The design of the system, including all spacing and mounting locations of components, shall fulfil all protection goals and local requirements.

2.4 System Description

The system shall consist of a receiving (Imager) and emitting (Emitters) components for installation along the perimeter of the protected space.

It shall use dual wavelength imaging principles to determine the smoke obscuration at known locations, while providing a high resistance to false alarms and obstructions.

Intruding objects that sufficiently reduce the ability of the system to measure smoke obscuration will be identified as a Trouble (Fault).

2.4.1 The Imager (receiving component)

1. The system will be primarily configured through DIP switches located on the Imager that allow for a number of settings to provide the best possible parameters for the particular site in which it will be installed.

The parameters will be least:

- 3 sensitivity settings for fire alarm threshold
 - Selection for particle size discrimination (dust rejection on or off)
 - Alarm latching or non-latching.
2. Different Imagers will be available covering different horizontal viewing angles.
 3. There will be at least Imagers for 7°, 38° and 80°.
 4. The vertical viewing angle shall be at least 50% of the horizontal one.
 5. Depending on the angles chosen, the respectively covered distances will vary from 150 m/492 ft to 34 m/110 ft.
 6. For the 38° and 80° viewing angles, the system will allow a configuration of 1 up to 7 Emitters on a single Imager so the system designer can project the most cost-effective, yet complying area coverage.
 7. This set-up will allow installing Emitters on different heights and as such providing an optimum 3D coverage of the area.
 8. The Imager shall be powered from an external power supply at a nominal value of 24 VDC

2.4.2 The Emitters (emitting component)

1. The Emitters may be powered from an external power supply, or by an internal battery.
2. When choosing the external power supply, the nominal value will be 24 VDC.
3. The system designer shall have a choice between Emitters with two intensities, for long range or short range coverage.
4. A battery-powered component shall indicate when its battery power is low.
5. The Emitters shall activate automatically once aligned and their position fixed and secured

3. Product

3.1 Manufacturer

Open-area Smoke Imaging Detector: Acceptable Manufacturer:

Xtralis

4 North Drive, Virginia Park

236 – 262 East Boundary Road

East Bentleigh VIC 3165

Australia

Telephone: +61 3 9936 7000

Fax: +61 3 9936 7200

3.2 Product Specific

The housing will be constructed of a robust plastic material meeting all relevant flammability requirements.

3.3 Signal Annunciation, Inputs and Outputs

1. Locations of alarms and troubles (faults) shall be identified through the user interface.
2. It will be possible to remotely reset the unit by applying 24 VDC to a dedicated input.
3. There will be a choice between automatic reset and manual reset. Faults are always reset automatically when the fault has disappeared.
4. There will be an initiating device circuit (IDC) interface, C/O contacts, to report Alarms and Trouble (Fault) to connected four-wire control panels.
5. A connection to a remote indicator (remote LED) shall be provided, which will activate when a Fire alarm is initiated.
6. An internal heater shall be provided to prevent condensation build-up in the detector when installed in low temperatures.
7. Optional equipment may be installed to provide addressability to a third-party control panel. Such installations must comply with the control panel manufacturer's specifications.

4. Installation

4.1 The Detection system

The contractor shall install the system in accordance with the manufacturer's Product Guide.

4.2 Environmental

The units will have an IP44 rating for the Electronics and IP66 rating for the optics enclosure. The system will be able to operate at an ambient temperature range of at least -10°C to 55°C (14°F to 131°F) at a maximum relative humidity 90% (non-condensing).

4.3 Alignment

1. Both Imager and Emitter will be constructed in such that they can be simply rotated left, right, up and down and easily aligned and secured by the use of a simple tool, i.e. a laser screwdriver. The adjustment angles will be at a minimum $\pm 60^\circ$ horizontal and $\pm 15^\circ$ vertical.
2. It will possible to install and align Imagers and Emitters by a single person.

4.4 Building Flex

The system will tolerate building flex up to at least 2° in all directions.

4.5 Commissioning

1. After installation and power up, the system will automatically learn the locations of the Emitters and initialise itself. The installation engineer shall not be required to remain at the detector while the initiation is going on.
2. The user interface will indicate when the learning phase is over. At the end of this phase the detector shall be active without any further required action or programming except for a test.
3. The whole initiation phase will not take longer than 10 minutes for a detector with 7 Emitters.

4.6 Maintenance

1. The system shall be highly resistant to dirt and dust and auto-adjust.
2. Maintenance will be limited to clean the Imager and Emitter front by wiping the optical surface with a dry cloth.

4.7 Testing

Optical filters shall be available from acceptable manufacturers that enable a calibrated test to be performed.

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