

### Product Description

The Xtralis VESDA ASD Suppression Actuation Threshold (ASAT) Calculator is a simple to use software tool for the calculation of Xtralis VESDA detector fire alarm thresholds. Determination of the appropriate fire alarm settings for suppression actuation is anticipated as the most common use for this tool, however, it could also be used as a guide to setting suitable thresholds for evacuation annunciation, Fire Brigade notification, automated equipment shutdown, HVAC or smoke management system control.

The calculations, performed by the tool, account for the particular environmental conditions within an area and are based on validated models.\*

### Xtralis VESDA ASAT Calculator

#### Suppression Release At The Right Time

In mission critical environments such as telecommunications facilities and computer server rooms, smoke and fire damage must be minimized to avoid the costs associated with the loss of business continuity, essential services and assets. Although the very early warning capabilities of Xtralis VESDA detectors will most often ensure adequate time for investigation and action, making suppression release unnecessary, there are situations where reliable suppression release is essential, in unmanned facilities for example. Timely suppression release, with an appropriate Xtralis VESDA alarm threshold, will not only ensure cost minimization via damage reduction but also by safeguarding against expensive and unnecessary suppression dumps.

The air movement within mission critical environments creates detection difficulties by rapidly diluting the smoke and diverting it away from ceiling mounted detectors. Delayed detection means late suppression and more damage. The active, cumulative, air sampling performed by Xtralis VESDA detectors throughout the protected area overcomes this problem, enabling earlier and more reliable detection. The ASAT Calculator factors in the airflow and room geometry when calculating Xtralis VESDA alarm thresholds so untimely suppression release, either too early or too late, is prevented.

#### Simple Design of Coincidence Detection Schemes

Coincidence detection is a common design practice which is stipulated in many local codes when a detection system is used for suppression system actuation. There are several configuration schemes for coincidence detection with a Xtralis VESDA system:

- Two Xtralis VESDA detectors with their sampling pipes alternated.
- One Xtralis VESDA detector sampling the exhausts of up to four other Xtralis VESDA detectors.
- A combination of Xtralis VESDA detectors and spot-type heat or smoke detectors.
- Two Xtralis VESDA detectors, one on the ceiling or in the floor void and the other across the return air vent of the HVAC system.
- One Xtralis VESDA VLS using two adjacent sampling pipes.
- One Xtralis VESDA detector with two alarm thresholds.

#### Optimized Fire Protection Solution

Xtralis VESDA detector multiple alarm levels can be set over a wide range of sensitivities; high for very early warning, lower for suppression system actuation. With the ASAT Calculator to provide spot-type detector equivalent Xtralis VESDA suppression actuation alarm thresholds, the same technology can now be used for very early warning smoke detection and suppression actuation, hence drastically optimizing the overall detection system design and cost of the fire safety system.

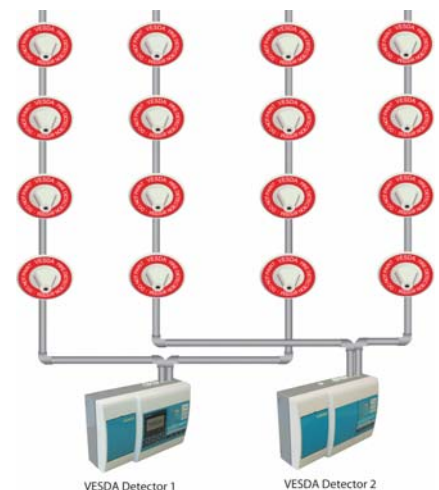
For all fire safety system designs, we strongly recommend the use of appropriately qualified persons and adherence to any local code requirements.

### Features

- Computational Fluid Dynamics (CFD) modeling based.
- Industry first multi-purpose method for calculating ASD alarm thresholds.
- Provides equivalence to industry-standard spot-type smoke detector nominal sensitivities with improved performance.
- Easy to use.
- Consideration of environmental parameters.
- Printable log of calculations.
- Metric or imperial inputs/outputs.
- Verifiable alarm settings during commissioning.

### Approvals

- Factory Mutual (FM)\*\*



An example of an alternating Xtralis VESDA sampling pipe coincidence detection scheme.

\*The development of the ASAT Calculator was based on extensive computer simulation studies using Computational Fluid Dynamics (CFD) modeling. The accuracy and validity of the results has been validated by independent empirical testing.

\*\*The ASAT Calculator is now listed in the Factory Mutual (FM) Approval Guide under Fire Protection Chapter 14, Fire Detection, Smoke Actuated.

### Application of the Tool

#### Inputs:

- Units (metric or imperial)
- Detection method (ceiling or floor void)
- Air Change Rate
- Total Area to be Protected
- Average Ceiling Height
- Nominal Sensitivity of Spot-type Detector for Equivalency
- Xtralis VESDA Sampling Hole Spacing
- Type of Air Circulation

#### Outputs:

- The appropriate Xtralis VESDA alarm threshold, based on the parameters input.
- The maximum permissible number of sampling holes.

Note: The ASAT Calculator will keep a printable log of all calculations.

### Specifications

#### Software Requirements:

Microsoft Windows 2000 or XP  
Microsoft Office 2000 or 2003 (Excel)

#### ASAT Calculator Outputs

Appropriate Xtralis VESDA alarm threshold  
Maximum permissible number of sampling holes

#### Application Assumptions

The following input parameter limitations apply:

- Air change rate  $\geq 5$ /hour
- Room area  $\geq 10$  m<sup>2</sup> (108 sq.ft)
- Ceiling height 2 - 6 m (6.5 - 20 ft)
- Floor void height 0.1 - 2 m (0.3 - 6.5 ft)
- Required sampling hole spacing 2.5 - 10 m (8 - 30 ft)
- Spot detector sensitivity equivalence  $\geq 0.05\%$ Obs/m (0.015 %Obs/ft)
- Type of air circulation employed – CRAC or Upflow/ Downflow HVAC systems

#### Xtralis VESDA Detectors Supported

All currently available Xtralis VESDA detectors are supported in the ASAT Calculator.

### Ordering Information

A copy of the ASAT Calculator software (Part No. VSW-088) can be provided upon request from Xtralis regional offices. The accompanying Product Guide (Doc. No. 12748) and the Verification and Commissioning Test Procedure (Doc. No. 12746) can all be downloaded from the Xtralis web site, free of charge, by those with the appropriate access.

Contact your local Xtralis Office for details on obtaining access to the software and companion documentation.