HORIZON DAS

This FAQ guide is designed to help with specific questions our customers may have with regards to the Horizon DAS product range. Bandweaver also provides Technology Overview guides for Distributed Acoustic Sensing (DAS), Distributed Temperature Sensing (DTS) and Artificial Intelligence technologies. Please refers to these if you have any questions regarding the underlying technology principles.

What technology principle does the Horizon DAS use?

The Horizon DAS is a fully distributed fiber optic acoustic system based on Coherent Rayleigh Optical Time Domain Reflectometry (COTDR). Using standard single mode telecoms based fiber optics, the system can measure up to 50km per channel, at frequencies up to 20kHz with measurement points from every 1m .

What is the difference between the Horizon DAS and FenceSentry DAS?

Both systems are based on CODR technology but have quite different capabilities. The Horizon DAS can measure up to 50km per channel, whereas FenceSentry is designed for shorter perimeters up to 5km per channel.

The Horizon DAS can measure both buried cables, overhead cables and wall/fence mounted cables whereas the Fence Sentry is designed to monitor Fence/wall mounted cables only.

Both systems use advanced algorithms to maximise probability of detection while minimising nuisance alerts. Bandweaver has a standard library of classification algorithms and in both systems the detection algorithms can be tuned according to the conditions of the specific zone.

Finally, the Horizon DAS can classify specific events according to the type of intrusion (e.g. personnel digging, vehicle movement) whereas for the FenceSentry it detects events but does not classify different types of intrusions.

What kind of detection rates should I expect and what about nuisance alarms?

Typically, we aim for a probability of detection rate (PoD) of greater than 95% and nuisance alarms at less than 1 per km per week. Both parameters are greatly affected by environmental conditions and the specific condition and configuration of the sensing cable and so these are targets as opposed to performance guarantees.

Do I need any additional hardware when I buy a Horizon DAS?

No, for most applications the Horizon DAS is a fully standalone system. The Horizon DAS system consists of a Detection Unit (DU) and a Processing Unit (PU).
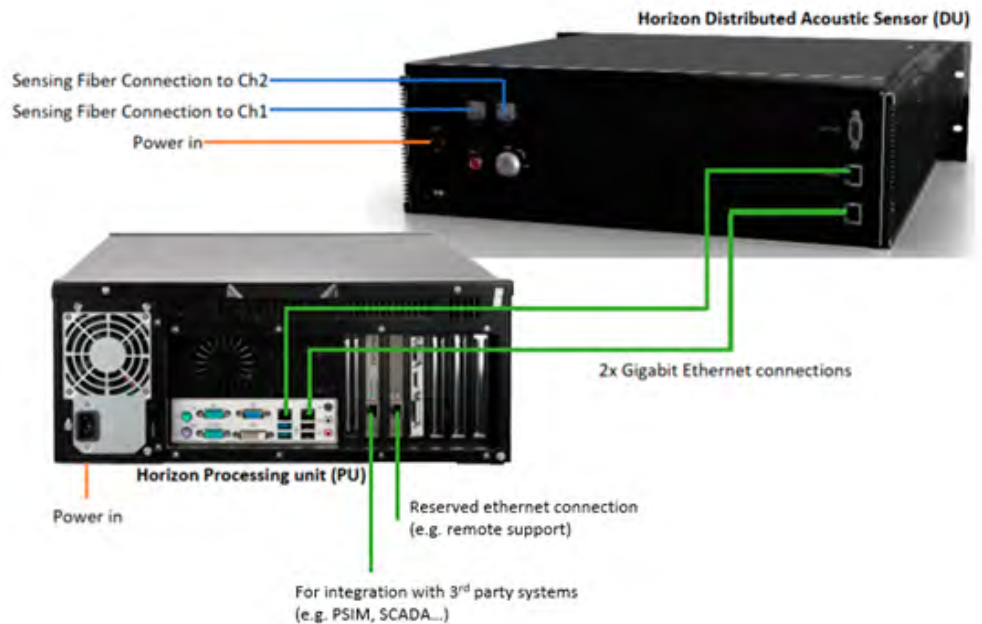
The DU connects to the fiber optic sensing elements and contains all the optoelectronics to interrogate the fiber optic and data acquisition components to acquire the data. The PU is based on a high-performance industrial PC and carries out the classification algorithms (including the DNN machine learning) as well as the user interface.

## How does the 2-channel version of the Horizon DAS work?

The Horizon DAS is a true dual channel** system, which can simultaneously and continuously monitor 2 fiber optic sensors. This capability opens a number of potential opportunities, including doubling the range of the system or cut resilience. It is important to emphasise the aspect of simultaneous measurement, as some systems on the market utilise multiplexers that consecutively switch between the fibers, thus reducing the coverage time to less than 50% on either fiber (including switching time and algorithm interruption).

Some other systems also claim to have 2-channel capability but in fact are 2 units housed in a single enclosure, thus greatly increasing the costs. Bandweaver has the unique optical arrangement which allows the monitoring of both fibers continuously without significantly increasing components costs.

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Do I need any additional software when I buy a Horizon DAS?

No, as standard it will operate as a standalone system with no additional requirements. The Horizon PU comes with the SSOS operating software pre-installed. The SSOS software is used to configure and operate the Horizon DAS. This includes advanced visualisation such as waterfall analytics, fully re-scalable mapping function and some integration of CCTV cameras.

Sample Screenshot
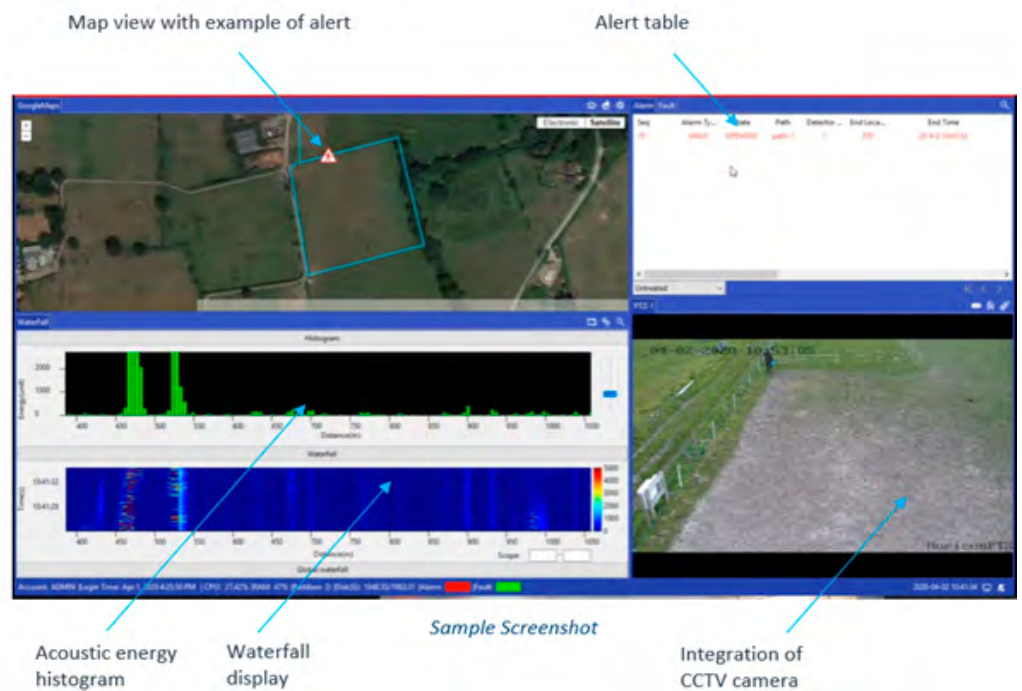
In the event that more advanced integration is required (e.g with PSIM, VMS or SCADA systems) there are additional software modules that can be added.

Does the Horizon DAS use artificial intelligence?

Yes, the Horizon DAS algorithms have Deep Neural Network (DNN) based machine learning built into some of the classification algorithms. DNN-based AI has led to advances in detection rates, reduction in false alarms and improved installation and commissioning timing.

How is the range of the Horizon DAS system defined?

There are a number of ways of defining the range of the Horizon DAS, depending on the specific application. Below are the definitions:

Radial Range

Radial range is equivalent to the maximum distance per channel for the unit. This matches the naming convention of the specific model (e.g. a Horizon 50 DAS has a 50km radial range).
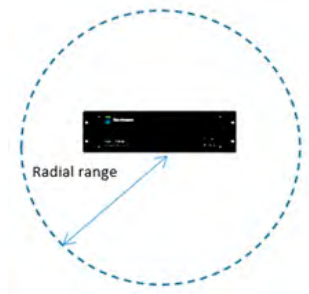
Radial range

Linear Range

Linear range applies to linear assets (i.e. assets which extend over a long distance). Examples include pipelines, borders, and power cables.


Linear range

For a 2-channel unit the linear range is twice the distance of the radial range (e.g. a 2 channel Horizon DAS 50 has a linear range of 100km).

Loop Range

Loop range is applicable to Perimeter Intrusion Detections Systems (PIDS).

For a 2-channel unit the loop range is twice the distance of the radial range (e.g. a 2 channel Horizon DAS 5 has a loop range of 10km).

Loop range = 2 x radial range
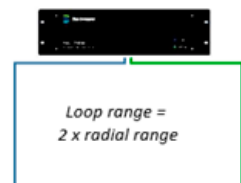
Cut Resilient Loop Range

For PIDs applications (and other loop-based systems) with a 2-channel unit this offers the potential to have a cut resilient configuration. This means the system will continue with full functionality even in the event of a cable cut.

Cut resilient loop range = radial range
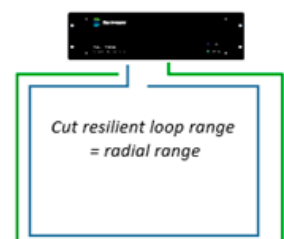
We hope this FAQ helps you to better understand the capabilities and configuration of the Horizon DAS so that you can specify accordingly. If you have any other questions, please contact your local Bandweaver representative.