LivePIPE® II
Enhancing the world’s most reliable real-time pipeline protection technology
About Fotech

With real-world experience in the energy, security and transport sectors Fotech continues to provide unrivalled sensory data to its customers to help them solve business-critical challenges. Our industry leading DAS technology and services are changing expectations, optimising traditional processes and creating new opportunities.

Established in 2008 to develop Distributed Acoustic Sensor (DAS) solutions for the energy, security and transport markets Fotech combines talent from across the globe with leading edge industrial photonics and technology expertise.
Harness the power of fibre optics to locate intrusions and leaks on your pipelines with LivePIPE® II

World leading DAS technology from Fotech Solutions
LivePIPE® II

Protect your pipelines and their products against damage, theft and the consequences of leaks.

LivePIPE II delivers a fully integrated and networked sensing solution based on the world’s most advanced fibre optic Distributed Acoustic Sensor.

- Detect, locate and isolate leaks early to maximise the protection of the environment
- Detect, locate and target unwanted third-party interference (TPI) on your pipeline
- Prevent the theft of product
- Protect against accidental damage by maintenance crews
- Be confident knowing that your pipeline is protected by a robust, reliable and proven technology

Pipeline Intrusion Detection Systems (PIDS) are recognised across the globe as a proven technology for the protection of pipeline, with thousands of kilometres of pipeline being protected every day in harsh, densely populated and remote locations.

The LivePIPE II dual channel technology delivers up to 100km* of continuous monitoring from each individual module enabling operators to monitor their network with fewer DAS units compared with competitor solutions, delivering a significant economic saving.
LivePIPE® II represents the next generation in LivePIPE technology, harnessing the enhanced capability and functionality of the Helios X3 Distributed Acoustic Sensor (DAS) and EDAM (Enhanced Data and Acoustic Management) system to deliver smarter and more intuitive detection at industry leading range.

LivePIPE II delivers unrivalled detection of leak events and pipeline threat activities, including excavation and drilling. With its dynamic Alarm system operators are armed with the information they need to quickly and proportionately respond to any incident to prevent damage or theft and to minimise the environmental impact at the earliest possible opportunity.

The Helios X3 dual-channel technology monitors two fibres along the pipeline up to 50 km* in length to deliver **100 km** of pipeline monitoring from a single DAS unit.

The significant technical enhancements in LivePIPE II are making it easier for operators to protect their assets than ever before, with a substantial economic saving compared with leading competitors.

*50 km of fibre optic cable with a one-way optical loss of up to 12.5 dB. Range is dependent upon quality of fibre, local environment, and the specific detection streams required.*
A Modular Solution

LivePIPE® II is a modular Distributed Fibre Optic (DFO) sensing solution based on the world's most advanced Distributed Acoustic Sensing technology. Using the Helios X3 dual-channel technology to connect into an operator's new or existing pipeline fibre optic network, LivePIPE II modules can be rapidly deployed and networked together to deliver continuous and real-time monitoring along the entire length of a pipeline.

The LivePIPE II solution can be configured and deployed using three types of LivePIPE module:

- Monitoring and Sensing Module
- Sensing Module
- Monitoring Module

The robust modular design is not only readily configurable to deliver a best fit solution for your pipeline but also enables you to easily extend its protection as you expand your pipeline network.

LivePIPE II Alarm server, Panoptes, delivering an immediate pipeline leak notification to operator, with Map view and accurate GPS coordinates.
**LivePIPE® II Features**

- Modular design delivers a simple and flexible solution to fit any pipeline architecture and to adapt to an expanding pipeline network

- Fully integrated and networked sensing solution with simple installation, high reliability and low maintenance delivers a low total cost of ownership

- Continuous monitoring of up to 100 km† of a pipeline from a single module, using Fotech’s dual-channel technology

- A sensitive and resilient sensing solution that provides industry leading monitoring to protect critical pipelines and detect leaks

- Discrimination between threats, including mechanical excavation, manual digging, personnel and vehicle movements

- Specific alarms for pipeline maintenance activities, including leak detection and PIG tracking

**Key Benefits**

- Extended range from one Helios DAS interrogator

- Cost reduction for identical length of asset

- Listen to a section of the fibre sensor with headphones*

- Play back and analyse data files to interpret new threats*

- Options for system redundancy

* Requires EDAM module

† 50 km of fibre optic cable with a one-way optical loss of up to 12.5dB. Range is dependent upon quality of fibre, local environment, and the specific detection streams required.
EDAM (Enhanced Data and Acoustic Management) works with the Helios DAS (inside a LivePIPE module) to identify and record segments of data that may be stored, replayed, listened to and used to write, or improve event detection algorithms.

It provides:
- The ability to listen into any activity happening anywhere along the pipeline.
- The ability to instantly listen to and view the sound field and spectral content of the noises leading up to and causing an alarm.
- The automatic capturing of DAS data for an Area Of Interest (AOI) around an alarming activity.
- The ability to access audio, spectral content and sound field information of any historical Alarm up to three months from occurrence.
- The ability to manually create an AOI on the pipeline route and access acoustic, spectral content and listen to the optical fibre, even if no alarm has been raised.
Leak Detection

When product leaks from a pipeline it creates an acoustic, or vibrational signature. LivePIPE® II uses dynamic detection algorithms to detect and locate the leak, differentiating it from background noises to readily raise an alarm. In some cases, other leak signatures may also be detected, such as a change in temperature, but the acoustic signal detected with DAS is the most prevalent.

LivePIPE’s leak detection capability has been proven at independent test facilities, successfully demonstrated in the field on operating pipelines, and continues to monitor and protect established pipeline networks across the globe.

The LivePIPE II technology employs advanced algorithms to extract and separate out the vibrations generated by a leak from all other background noises.

Soundfield display after spectral filtering and de-noising is applied, in real-time, to isolate and detect the acoustic energy of the leak, rejecting background noise.
How LivePIPE® II works

LivePIPE II uses the Helios DAS technology, which is an advanced variant of an Optical Time Domain Reflectometer (OTDR). Every second it sends thousands of pulses of light along an optical fibre cable and monitors the finely structured Rayleigh backscatter pattern in the reflected light. This reflected light pattern changes when acoustic or vibrational energy creates a strain on the optical fibre.

By using advanced algorithms and processing techniques the Helios DAS analyses these changes to identify and categorise the disturbance event, whether digging next to the pipeline or product leaking from an orifice. By detecting disturbance events simultaneously along the entire fibre in real-time the Helios DAS is able to build a comprehensive image of your pipeline, detailing the type of disturbance event, its location and its evolution through time.
LivePIPE® II Module Specifications

LivePIPE Modules are fully integrated and networked solutions, built and tested in the factory, ready for rapid onsite deployment.

The modules can be configured with multiple Helios DAS units and Panoptes Alarm handling servers to facilitate the continuous monitoring of multiple sections of an asset.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Operation</td>
<td>Temperature Humidity</td>
<td>+5 to +40°C (41 to 104°F) 80% RH for temperatures up to 31°C (87.8°F) non-condensing</td>
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<tr>
<td>Energy Consumption</td>
<td>Power Consumption</td>
<td>Sensing &amp; Monitoring Module 960W (Typ)/1240W (Max)</td>
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<tr>
<td></td>
<td></td>
<td>Sensing Module 720W (Typ)/980W (Max)</td>
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<td></td>
<td>Monitoring Module 510W (Typ)/770W (Max)</td>
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<td></td>
<td></td>
<td>EDAM Module 350W (Typ)/500W (Max)</td>
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<tr>
<td></td>
<td>Voltage, Frequency</td>
<td>110-240 VAC / 50-60Hz</td>
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<tr>
<td>Rack Size</td>
<td>Meters</td>
<td>0.6 x 1.01 x 1.41</td>
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<tr>
<td>Network Capabilities</td>
<td>MODBUS, HTTP &amp; email notification SCADA via third party vendors</td>
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<tr>
<td>Fibre Type</td>
<td>Single Mode ITU G652 Series (Other types can be considered)</td>
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<tr>
<td>Service &amp; Warranty</td>
<td>24/7 Global Service &amp; Technical Support 12 month warranty</td>
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IEC60825-1, UL60950-1, CDRH-21CFR1040, FCC, RoHS certified

Note: Specifications are subject to change without notice. For further technical information please contact your local Fotech representative.
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