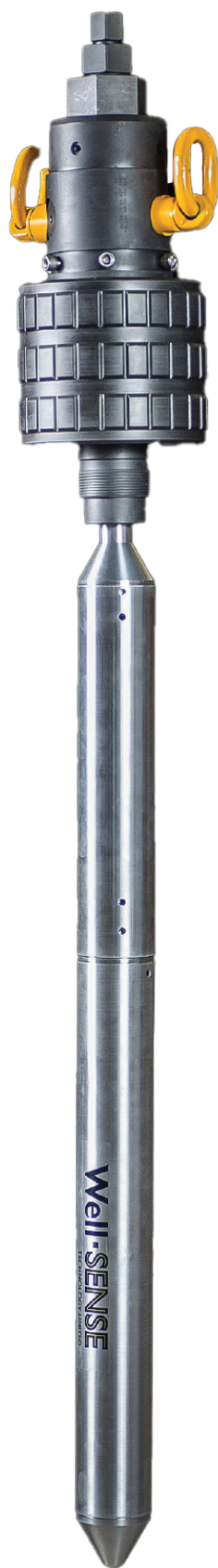




FLI DYNAMIC DE-SPOOL TECHNOLOGY

Fibre Optic Survey without Wireline



Continuous, Full Well 3D Coverage

If you want clearer, end-to-end insight across your well's entire lifecycle with efficiently deployed distributed fibre optic sensing then Fli from WellSense is the answer. With rapid data interpretation available on-site or remotely, our specialists - or your team - can quickly and confidently diagnose wellbore issues, including:

- Leak detection
- Injection profiling
- Cement assurance and integrity monitoring
- Vertical seismic profiling
- Well integrity and pre-abandonment surveys

The Answers You Need. Fast.

Fli Dynamic De-spool solutions are ready when you are. A simple, compact, self-contained solution with rapid mobilisation and deployment. Whether planned or reactive, you can acquire critical data on-demand – no waiting for wireline or slickline availability, no scheduling headaches.

Lightweight Operations

As a winchless, wireline-free solution, Fli has a minimal footprint – perfect for difficult to access wells, crowded facilities, and off-line intervention.



Our Solutions

Leak Detection

Fli fibre optic leak detection surveys offer rapid, full-well coverage that outperforms traditional multi-point methods. By continuously sensing along the entire fibre length, Fli surveys identify even small or intermittent leaks, often in just a few hours.

Well Pre-Abandonment Surveys

Fli well integrity surveys are ideal for pre-abandonment diagnostics, providing a complete well integrity check to locate the sources of sustained annulus pressure. From plug to cement to pressure barriers across multiple annuli, Fli surveys deliver the insight you need to reduce risk, avoid delays and plan abandonment operations with greater confidence.

Injectivity Profiling

Fli technology delivers continuous, full-well data to reveal exactly how fluids are entering the formation. Unlike conventional point measurements, Fli injection profiling uses distributed temperature monitoring across the reservoir section to determine the liquid or gas injection allocation and confirm reservoir containment. Injection of cold fluids into the reservoir causes cooling of the formation which will warm back towards the geothermal gradient once the well is shut-in.

We monitor the speed and magnitude of warm-back during this shut-in period and apply a temperature inversion analytical model to obtain the injection profile.

Cement Integrity and Assurance Surveys

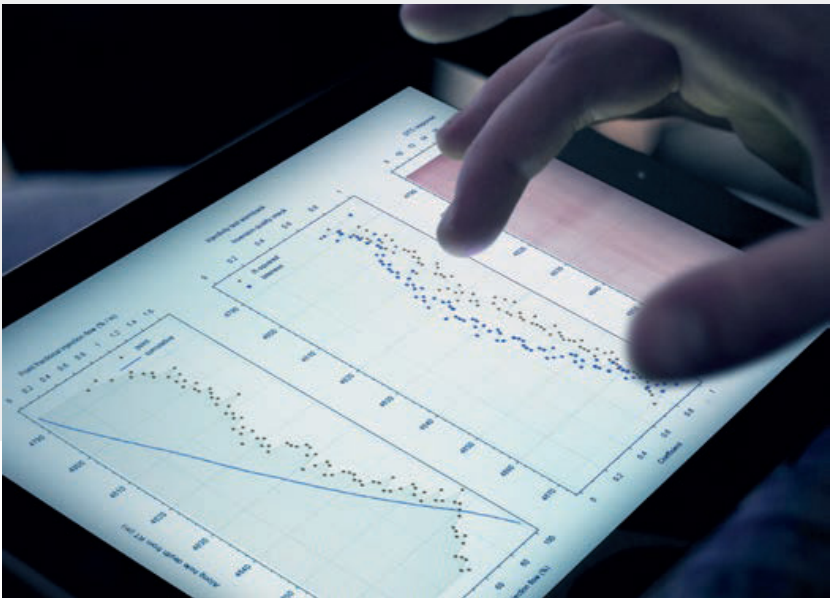
Conventional cement bond logs (CBLs) provide isolated snapshots of cement quality – not the full picture of integrity. Throughout the well lifecycle, you can supplement cement quality logs with through tubing Fli cement integrity surveys. This enables you to acquire data continuously during pressure cycles to characterise behind pipe flow with confidence.

Fli cement integrity surveys are ideal for integrity assurance and leak path identification during well construction, operations and diagnostic support for plug and abandonment, delivering dynamic insight across the entire well lifecycle, including multi-annuli integrity profiling, leakage and microannulus detection, and continuous monitoring during casing pressure cycles.

Monitor cement in real time – before integrity issues arise. Fli fibre optic cement assurance surveys provides continuous thermal and acoustic data during the cement curing process – with no disruption to your critical path. You gain insight into top of cement, cement-to-fluid interfaces, density variations and cement cure time.

Vertical Seismic Profiling

Fli surveys enable faster, more cost-effective vertical seismic profiling (VSP), providing comparable results to conventional geophones but with higher spatial sampling interval and rapid data acquisition. Historically, VSPs have used conventional, wireline deployed geophones or specialist fibre optic equipped cables. However, these techniques are expensive, risky, and time-consuming, requiring substantial equipment and personnel. As a result, they are only used occasionally. Fli VSP surveys provide data in minutes, delivering seismic images containing both compressional and shear direct and reflected waves. Multiple VSPs can be acquired in multiple boreholes in just a few hours including set up – a fraction of the time it would normally take for a traditional geophone VSP survey.



The Science Behind Fli Dynamic De-Spool

Fli has three core elements that work together seamlessly to answer the need for fast, reliable, and cost-effective data acquisition. They allow the fibre to be dynamically de-spooled, rather than from a static surface spool, minimising the footprint, avoiding drag and enabling the use of highly sensitive bare fibre for a clearer picture of your well.

Fli Dynamic De-Spool Probe

A compact, single-use probe that free-falls or is pumped into the well that deploys bare optical fibre as it descends quickly and safely.

- Low-friction nose cone stabilises descent
- Controlled-tension bobbins protect the fibre during release
- Fluid-activated release triggers unspooling automatically
- Dispenses via gravity - no winch, no retrieval

Fli Optical Fibres

The Fli Dynamic De-spool probe serves as the conveyance method, deploying bare optical fibre that functions as the sensing medium, with options to include one or two strands per deployment.

- Single fibre configuration supports DTS or DAS
- Dual fibre configuration enables both DTS and DAS
- Up to 30,000 ft (9,150 m) range
- 1m spatial resolution and 20,000 datasets/sec
- Fibre is non-electrical and passive

Fli Data Acquisition System

The surface system is designed for rapid setup, real-time data acquisition and minimal operational footprint.

- Optical fibre connects to high-performance interrogators
- Interrogators interface with a laptop or tablet running our proprietary FliDAS software
- Enables real-time visualisation, data recording and remote streaming
- No wellhead modification required – fibre exits via standard lubricator or valve
- The entire surface kit is transportable in hand-carry cases





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