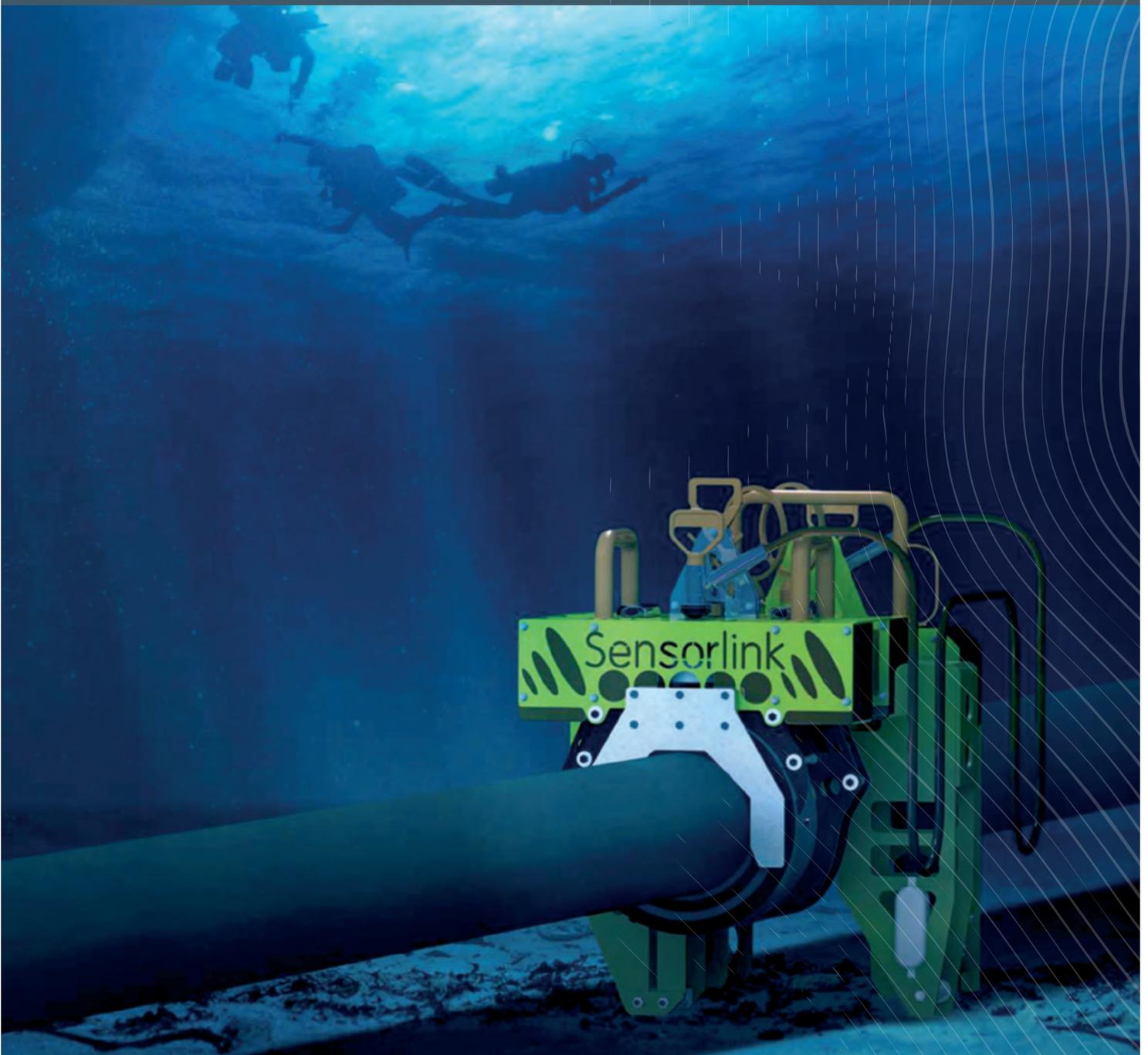




Sensorlink
PART OF AXESS

The Sensorlink UltraMonit[®] System

The wireless solution to accurate corrosion monitoring of pipelines, replacing the traditional internal inspection pig, at client discretion.



Key advantages

- Wireless communication
- High absolute wall thickness accuracy (0.15 mm)
- High sensitivity (0.01 mm)
- Easily installed, moved and retrofitted
- Can be used on coated pipes, 0-10 mm homogenous plastic coatings
- Non-intrusive, no infringement of pipeline integrity
- Direct access to results via web interface
- Fast feedback on the effectiveness of corrosion inhibitors
- Remote operation with real-time data
- Automated measurement, logging and analysis
- Ideal for monitoring unpiggable pipelines



The wireless UltraMonit® system effectively monitors internal corrosion and erosion rates in pipelines using ultrasound technology to provide highly accurate measurements. The system is a “clamp-on” tool installation, and operation of the equipment does not interfere with the operation of the pipeline in any way. It is ideal for new and existing pipelines, as well as unpiggable lines. In many situations the UltraMonit® system can replace or complement intelligent pigging inspection tools, reducing the need for frequent cost-intensive pigging. Aside from the use of UltraMonit® in place of pigging inspection tools, a principal advantage is that customers can optimize their use of corrosion inhibitors or can predict the remaining service life of a pipeline.

The UltraMonit® system for subsea pipelines consists of an instrumented clamp which can be installed on pipelines by diver or ROV. As the tool can be retrofitted, it can be moved to new locations at any time.

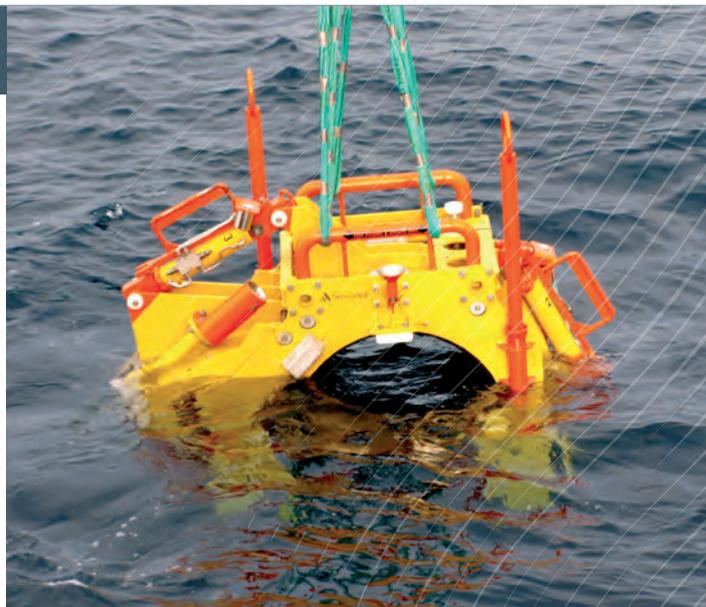
The UltraMonit® system is based on the well-established ultrasonic pulse-echo method, where special processing methods have been developed enabling high resolution and accurate wall loss measurements.

The Sensorlink UltraMonit® technology is among the best on the market with respect to precision, accuracy and speed of detection for non-intrusive wall thickness monitoring, corrosion rate estimation and corrosion profile estimation.

Case 1

Monitoring the effectiveness of corrosion inhibitors

A subsea UltraMonit® installation included a 34-inch subsea UltraMonit® system. The system was installed approximately 10 kilometers downstream from the export platform to monitor the effectiveness of the corrosion inhibitor regime. The entire system was installed by ROV, without diver intervention. In this application, UltraMonit® enabled the operator to optimize the corrosion inhibitor regime. A fundamental requirement in this application was the sensitivity of the system and the resultant ability to discover changes in corrosion rate.



Case 2

Monitoring for riser liner verification

An UltraMonit® system was installed on a subsea water injection riser carrying produced water. Because the produced water had an aggressive corrosive effect on the riser, the riser was lined with a plastic material to prevent further corrosion. The UltraMonit® tool was installed to provide the operator with online corrosion monitoring of the annulus between pipe and liner. UltraMonit® confirmed the effectiveness and reliability of the new liner concept to be verified. A fundamental requirement in this application was the ROV installable feature and the wireless communication.



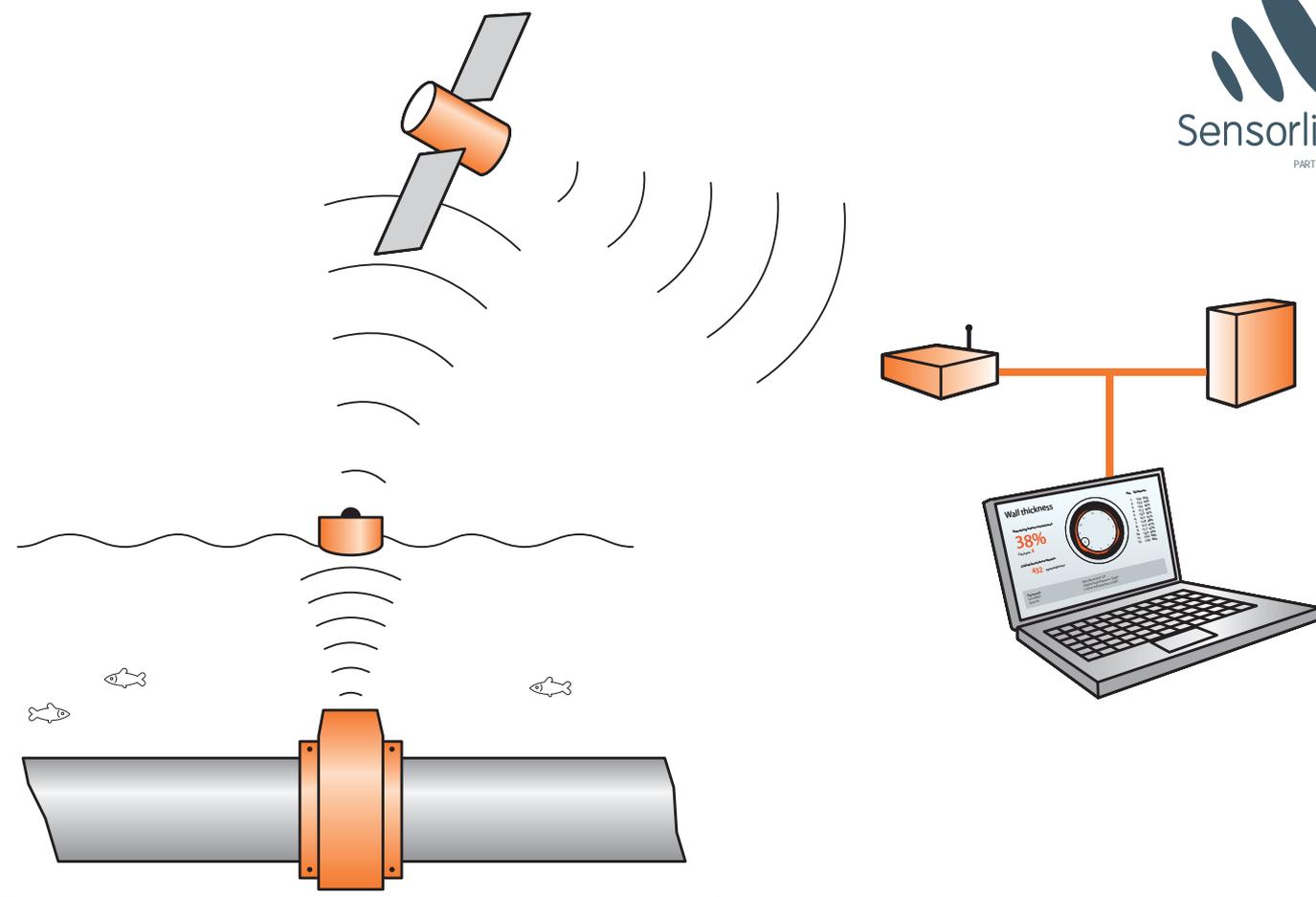
Case 3

Monitoring of hydro transport erosion

An UltraMonit® system for monitoring hydro transport erosion was installed for an oil sands operator in Alberta Canada. The installation includes 20 measurement locations with dual 24 or 28 inch UltraMonit® land belts. Each dual belt set carries 24 ultrasonic transducers monitoring the erosion rates. The UltraMonit® tools are hooked up to the cell phone network, and communicates with the Sensorlink server. The system is powered by solar cell panels, which makes it completely wireless, and thereby easy to move to different locations on the pipeline network. The erosion data is distributed to the customer via a web interface.

(The UltraMonit® system is often promoted as PipeMonit for land and topside applications)





Data communication

The UltraMonit® system communicates wirelessly via acoustic modem or alternatively via cable or optical link, as well as satellite or radio link from surface to the UltraMonit® server.

Alternatively, a cable to a surface communication buoy or platform can be installed, and if not viable, data stored in the UltraMonit® controller can be retrieved by an ROV or diver. The controller is designed for long-term data storage due to its internal long-life battery.

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