

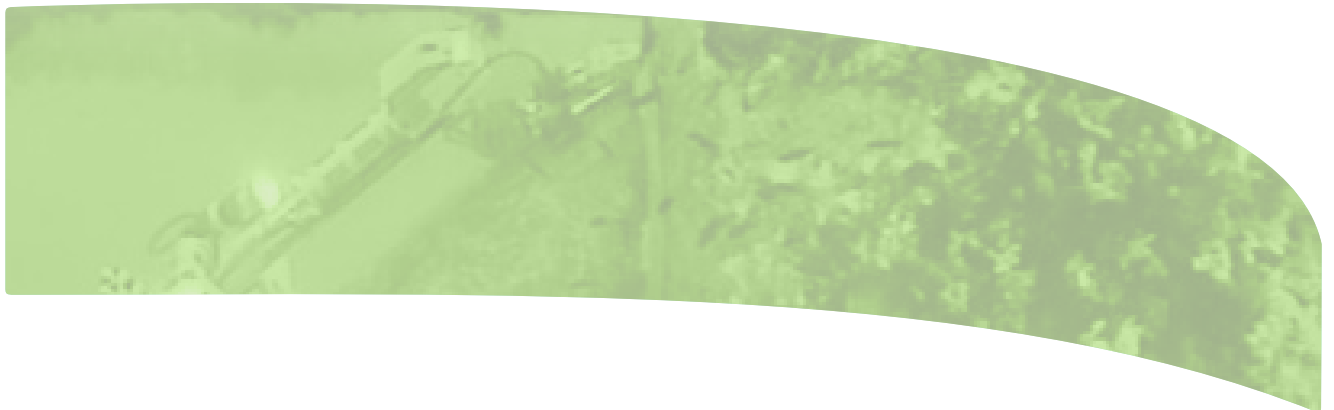


TSC

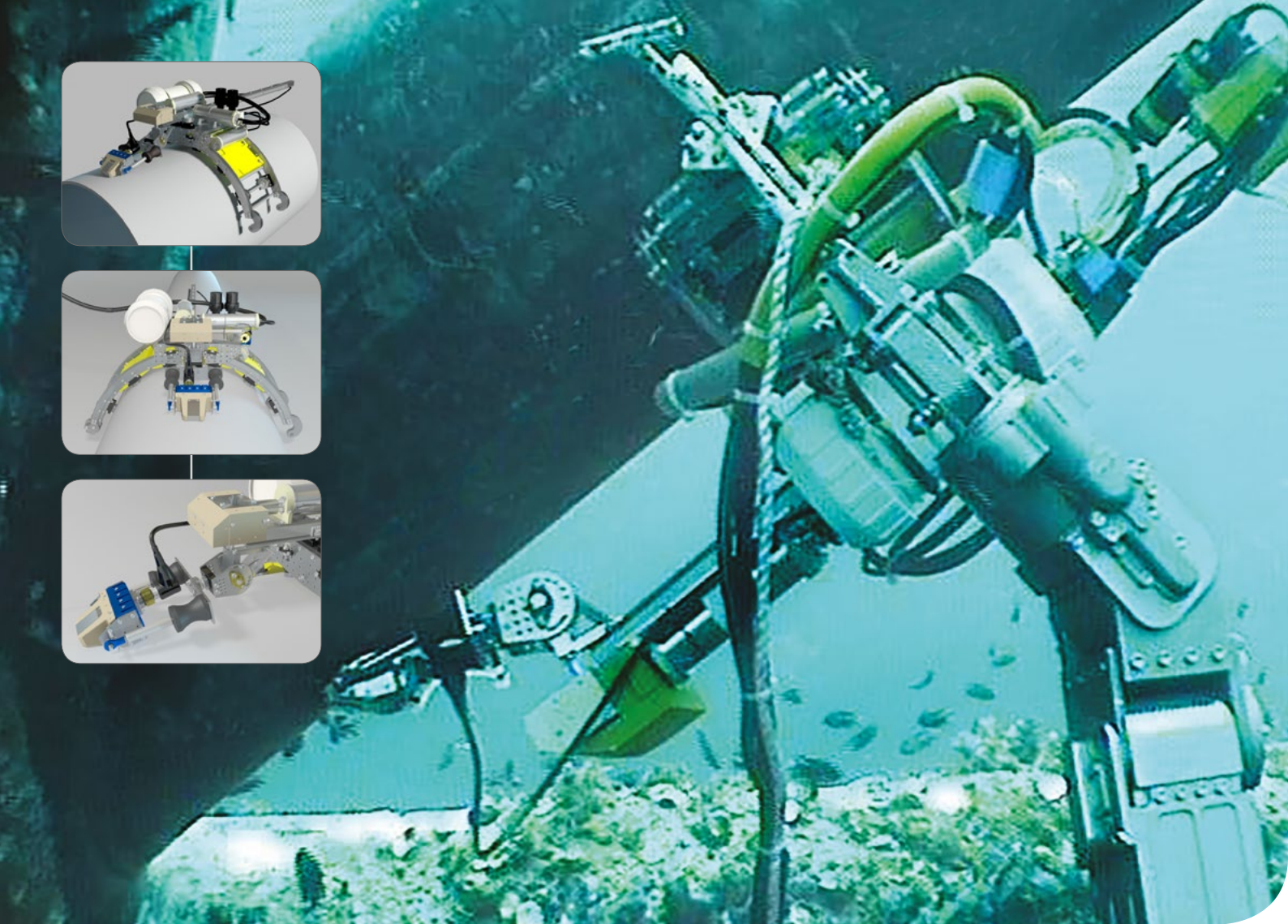
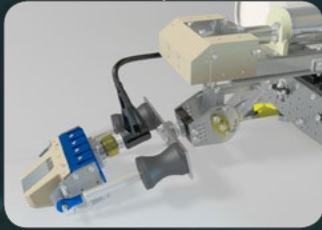
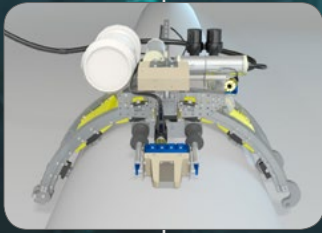
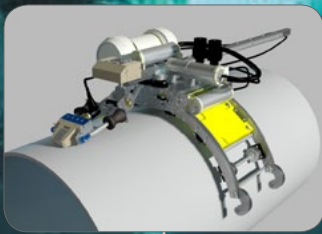
Part of Eddyfi Technologies

NodeScanner™

ACFM® Remote Subsea Inspection



Leaders in Advanced Non-Destructive Testing



The solution for diverless inspection of jacket structural nodes.

Subsea Scanning Solutions

The NodeScanner has been designed, developed and built by TSC engineers to work in tandem with ROV's, in the deployment of TSC's ACFM® Array Probes in order to inspect difficult to reach areas and complex geometries such as tubular welded node joints.

Strong magnetic feet enable the scanner to independently fixed in position without slipping or requiring constant positional adjustments. Once delivered the ROV detaches from the scanner and stands off, therefore avoiding the need to hold station accurately for long periods.

The scanner is powered and controlled through the ROV umbilical, requiring TCP-IP communication and 24V power. Cleaning of the surface needs to be to SA2 standard, where the scanner will be deployed, as well as the weld to be inspected.

Brace diameters greater than 450mm can be accommodated and the scanner can also be configured to operate on flat plate.

Probe Control/Deployment

The scanner has three motorised mechanisms which allow the probe to accurately follow the weld to be inspected. The probe is held in contact with the inspection surface using passive compliance, which ensures correct alignment with the inspection surface during inspection. Adjustments of position can be made in both parallel and transverse directions, allowing full coverage of the area to be inspected.



Features

- Designed for use with the ACFM® U31R™ and ACFM® Array probe technology.
- ACFM® probe easily deployed to follow complex node weld profile.
- Versatile design for axial and circumferential measurements.
- Rated for 100m water depth.
- Designed for deployment on small and large brace diameters.
- Instant data capture for audit and comparison purposes.
- Produces high resolution and detailed images for reporting.
- Dedicated control software to follow complex weld geometries.
- Inspects through paint and other coatings.
- Tolerant of residual marine growth.
- Buoyancy blocks fitted to reduce submerged weight for improved ROV manipulation.
- Robust design aids ease of handling on deck.



U31R™

The U31R™ Underwater ACFM® Crack Microgauge Instrument has been specifically modified for remote subsea deployment using ROVs.

Different ACFM® probes are available depending on the inspection task and the type of delivery system employed. There are three types: Static Arrays, Swept Arrays and simple Single Element probes. Bespoke probe solutions are also available.

The U31R™ ACFM® system comprises of a subsea instrumentation bottle, designed to be fitted to an ROV, a sensor probe, a topside communication control box and a PC. The probe is mounted onto an ROV manipulator and is deployed at the inspection site. An umbilical is routed from the probe along the manipulator arm to the U31R™ subsea unit. The subsea unit takes its power from the ROV and communications to and from the topside control box are via the ROV umbilical. This control box is then connected to a standard PC running TSC's ASSIST™ software.



Advantages of ACFM®

Feature	ACFM®	MPI	Conventional Eddy Current
Reduced dependance on operator competence <ul style="list-style-type: none"> • Detection reliability and repeatability • Confidence in integrity data 	✓	✗	✗
Detection through coatings. <ul style="list-style-type: none"> • Avoids cost & disruption of coating removal & reinstatement 	✓	✗	✓
Detection in normal ambient light. No pollutants used	✓	✗	✓
Detection in Duplex and non-magnetic materials	✓	✗	✓
Can be remotely deployed. <ul style="list-style-type: none"> • Enables deep water or hazardous zone deployment • Reduced cost of dive support vessels and systems 	✓	✗	✗
Provides accurate and auditable inspection records. <ul style="list-style-type: none"> • Enables effective integrity and risk management • Supports regulator verification and audits 	✓	✗	✗
Determines crack length and depth without calibration. <ul style="list-style-type: none"> • Allows crack criticality assessment 	✓	✗	✗
High POD and low false call rate. <ul style="list-style-type: none"> • Avoids cost of unnecessary repairs and rework 	✓	✗	✗

ACFM® NodeScanner™ System Specifications		
Unit Mass	35.0kg	Cameras & other tooling excluded
Unit Weight in Water	16.0kg	Adjustments to buoyancy can be made
Unit Length	950mm	Other lengths available at approx. 4 week lead time
Unit Width	1.29m	Other lengths available at approx. 4 week lead time
Unit Height	270mm	Excludes buoyancy
Brace Diameter Range	457mm upwards (to flat surface)	Nodes with a wide range brace and legs diameters can be accommodated. Scope of work specification is required. Some sizes require non stock components, typical 4 week lead time.
Minimum Brace Angle	40°	
Pull Force	500N	
Surface Travel Speed	0-150mm/s	Intelligent controller assists the operator following complex welds geometries.
Power Requirement	24V at 5A	Other variations available on request
Communications	Ethernet 100Mb/s RS232, 115k Baud	TCP-IP protocol. RS232 required for ACFM® instrument. Other options available.
U31R™ Instrument	Array capable. 32 channels standard.	U31R™ is mounted on the ROV
Operating Temperature	0° to 45° C	
Environment Protection	IP68 depth rated to 100m sea water	



The NodeScanner™ is rated to 100m depth, however the standard U31R™ enclosure is rated to 300m water depth and utilises a waisted cylindrical stainless steel bottle with stainless steel end caps. The deepwater enclosure is not waisted and is rated to 2000m.

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