

FLOORMAP3Di

MFL Floor Scanner with STARS Top & Bottom Defect Discrimination
& MFLi Advanced Defect Analysis



FOR ALL YOUR INSPECTION NEEDS



- > COMPLETE TANK FLOOR MAPPING
- > ENHANCED PROBABILITY OF DETECTION
- > HIGH RESOLUTION SCANNING UP TO 1440 M²/DAY
- > FIELD PROVEN DURABILITY & RELIABILITY

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ADVANCED MFL TANK INSPECTION WITH STARS TOP & BOTTOM DEFECT DISCRIMINATION & MFLi ADVANCED DEFECT ANALYSIS



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Building on the success of the Floormap3D with STARS top and bottom defect discrimination, continuous research and development has resulted in the most advanced Magnetic Flux Leakage (MFL) storage tank bottom scanner the Floormap3Di.

The new system introduces:

- > MFLi (intensity) - advanced search and verification tool
- > Dynamic cursor - advanced defect sizing and classification tool

Together these innovative features achieve significant advances in corrosion measurement, with the potential to reduce inspection times and significantly enhance the quality of a tank inspection. This enables tank engineers to determine the optimum repair strategy and improve the outcome of Fitness For Service (FFS) assessments, Remaining Life Assessment (RLA), and Risk Based Inspection (RBI) programs.

KEY FEATURES

- > High Resolution 64 channel sensor arrays to maximise detection capability
- > 256 individual sensors for 4.6 x 2 mm scanning resolution
- > Advanced signal processing and defect classification tools
- > 20 years MFL development in over 60 global locations
- > Through coating inspection up to 6 mm including FRP, GRP and SS
- > Full tank floor data recording and mapping
- > USB based, simplified data transfer
- > Digital calibration for different plate thicknesses
- > Battery powered, no external cables required
- > Touch screen computer providing immediate plate view for defect assessment
- > Field proven durability & reliability
- > Motor driven, 0.5 m/s constant scanning speed

HIGH PRODUCTIVITY AND ACCURACY

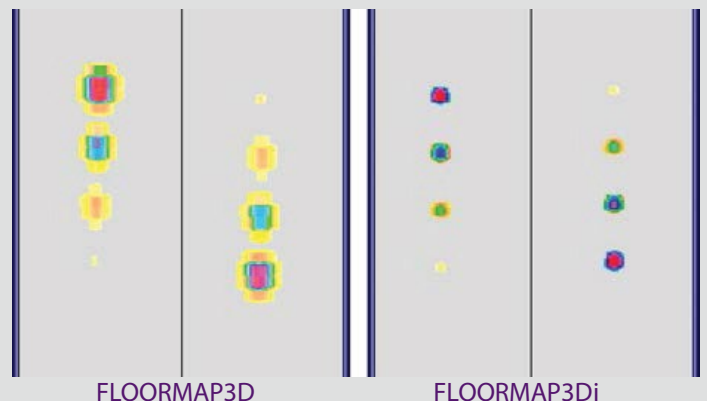
The Floormap3Di has a wider scan width than previous models capable of scanning up to 1440 m² per day, and unlike manual "stop on defect" systems, this is irrespective of the number of indications found. The software guided mapping process encourages the most efficient plate coverage, and helps ensure the maximum area is scanned reducing the chance of missed corrosion. The high resolution MFL sensor head coupled with advanced signal processing, and new defect classification tools significantly improves corrosion detection and sizing capability over previous generation systems.



DEFECT PRESENTATION

New signal processing algorithms developed for the Floormap3Di introduce greater accuracy for defect area presentation, and automatically separate and filter 'noise' indications from the displayed plate view.

The enhanced area representation and noise reduction filters further improve accuracy for top / bottom discrimination using STARS, whilst simultaneously reducing the requirement for 'prove up' and increasing inspection efficiency.



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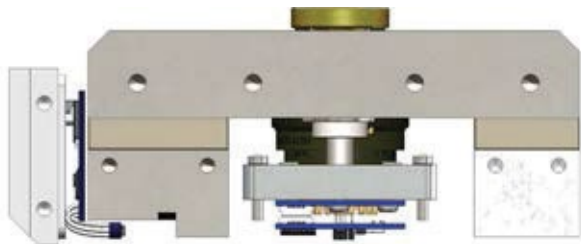
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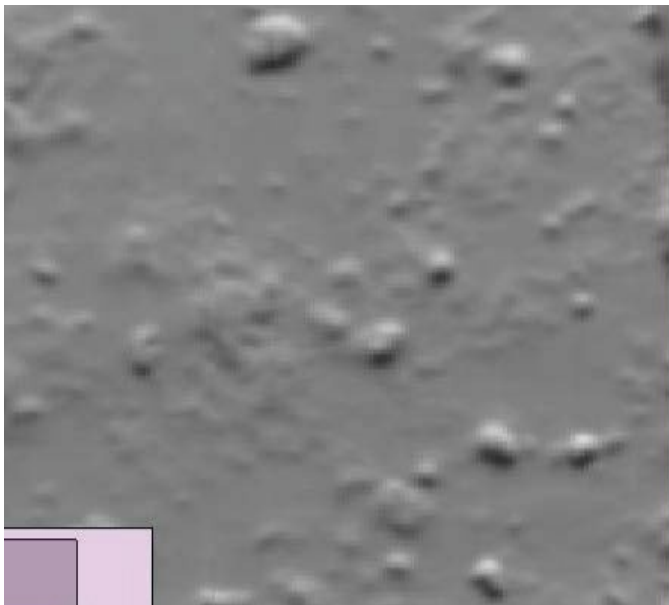
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SURFACE PROFILE WITH STARS TECHNOLOGY

The innovative STARS technology adds an additional 64 channel sensor array to detect variations in magnetic field strength caused by top side defects. STARS and MFL signals are combined and processed within software to distinguish top side defects from bottom side defects.



STARS works effectively through up to 6 mm (1/4") of coating, enabling efficient defect surface discrimination without coating removal.



STARS VIEW

High resolution Stars sensor view detailing top side defects

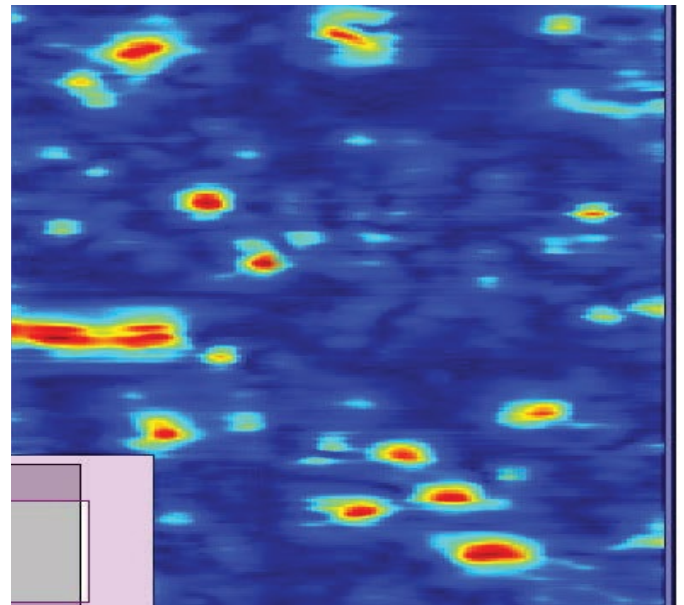
MFLi VIEW

The Floormap3Di introduces a new high contrast plate view based on the intensity of MFL signal response.

The MFLi defect map uses multiple colour palettes to highlight areas of corrosion, reduce the effect of spurious indications, and most importantly to help classify defect type.

This powerful detection and classification tool can reveal the presence of small diameter pitting, SRB attack, erosion patterns and other features that require further verification.

MFLi has been made possible by the industry's highest resolution sensor array and advanced signal processing capabilities of the Floormap3Di.

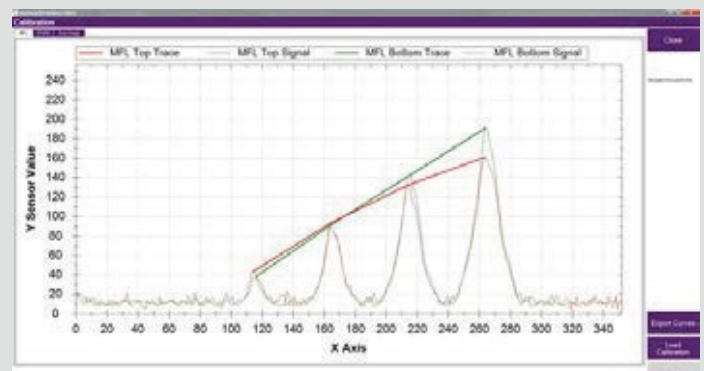


MFLi VIEW

High resolution MFLi view detailing top and bottom defects

CALIBRATION ROUTINE

The Floormap3Di system incorporates a novel calibration routine that creates separate calibration curves for top side and bottom side corrosion. During the inspection, the software first identifies if a signal is generated from the top side or bottom side, and then automatically applies the most relevant calibration curve for more accurate defect depth estimates. The simplified calibration routine applies automatic gain and magnet compensation curves.



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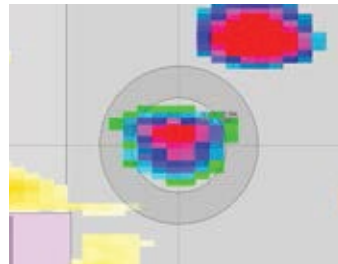
DYNAMIC CURSOR

The unique Dynamic Cursor (DC) sizing and verification tool assists in identifying difficult to size defects such as deep pits, bacterial attack and through holes.

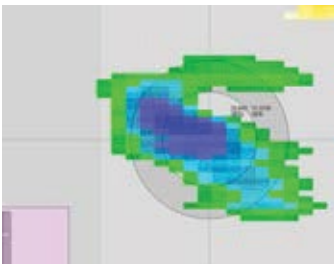
Dynamic Cursor is based on the expected volume loss and diameter of 'known depth' reference defects. The screen cursor forms a ring when moved over an indication which dynamically changes to show the expected diameter of the defect.

By using the DC, prove-up inspections such as pit gauging and ultrasonic measurements can be targeted towards the most relevant defects, reducing overall inspection time and improving inspection accuracy.

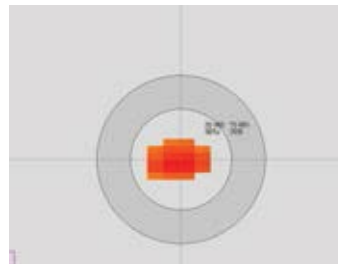
At a glance, the operator is able to determine which indications are likely to have been sized within expected accuracy levels, and which defects may have been oversized or undersized due to volumes being significantly different to the reference defects.



CORRECTLY SIZED
Indication within Dynamic Cursor



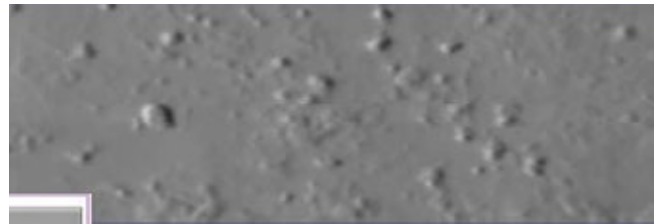
OVERSIZED
Indication outside Dynamic Cursor



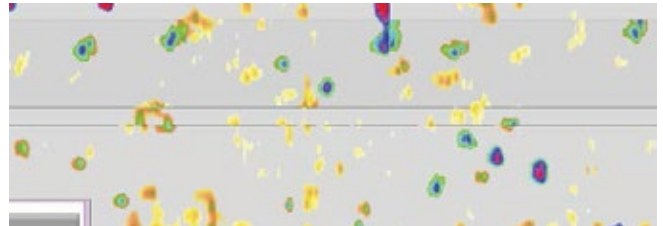
UNDERSIZED
Indication inside Dynamic Cursor



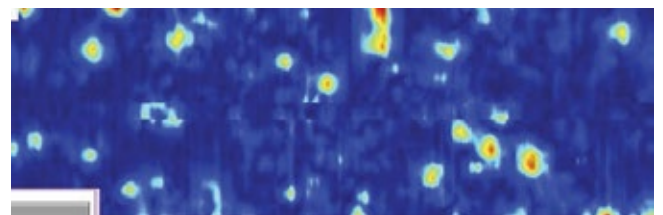
CORRODED PLATE SAMPLE
Extensive top side corrosion pitting.



STARS RAW DATA VIEW
View of STARS sensor output. Accurate representation of top surface profile.



CALIBRATED MFL VIEW
View of processed and filtered MFL data, colour coded to represent estimated percentage loss.



MFLi VIEW
'Intensity' view of MFL data. Used to classify and evaluate defects.

REPORTING SOFTWARE

The Floormap3Di is supported by the SIMS reporting suite which automatically builds a CAD layout of the tank floor from the data file. SIMS provides the most powerful and efficient means to create high quality reports on tank condition, and archiving of inspection results for traceability.

Additional data from visual, ultrasonic, vacuum box, magnetic particle inspection or even PDF's can be added to the report, generating a full fingerprint of the tank floor including the annular plates. An innovative feature of the software allows subsequent inspection data to be overlaid and corrosion growth assessed as part of RLA/ RBI programme. See separate brochure for full details.



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TECHNICAL SPECIFICATION

Patent Pending (EU: GB105193.5, GB1110889.1, GB1109371.3 and USA: 13175440)

Principle of operation:	Magnetic Flux Leakage & Magnetic Field Reluctance
Method of detection:	256 Hall Effect sensors, 64 channels
Top and bottom discrimination:	Yes, using ST ARS technology
Test through coatings:	Yes, if non magnetic
Speed:	500 mm / second (19.7" / second)
Scan width:	300 mm (12")
Maximum single scan length:	32 metres (1,260")
Scan coverage:	9 m ² / minute (354 in ² / minute)
Positional accuracy:	± 0.04% (± 3 mm over 8 metres) (± 3/32" over 315")
Method of propulsion:	DC motor, anti-static drive wheels
Rollers:	Heavy duty, multi compound rollers
Dimensions:	Height: 980.5 mm (38.7") - Width: 510 mm (20") - Length: 690 mm (27.1")
Weight:	57.5 kg (126 lbs)
Minimum man-way size:	500 mm
Transit case:	Meets IATA requirements for transporting magnetisable material
Power requirements:	1 x 12V, 25 amp-hour sealed lead acid batteries
Batteries supplied:	4 supplied and 3 chargers for continuous use
Typical battery operational time:	Up to 2 hours
Operating temperature:	-30°C to 55°C (-22°F to 131°F)
Storage temperature:	-35°C to 75°C (-31°F to 167°F)
Humidity:	10 - 95% RH
Minimum defect detection sensitivity:	2 mm (0.08") diameter pipe type 50% deep
Minimum defect sizing sensitivity:	20% material loss (ball type) under floor and top surface **
Maximum coating thickness for accurate sizing:	6 mm (1/4") coating on 6 mm (1/4") plate 5 mm (3/16") coating on 8 mm (5/16") plate 3 mm (3/32") coating on 10 mm (3/8") plate 1 mm (5/64") coating on 12 mm (15/32") plate
Supported plate types:	Rectangle, annular and sketched
Scan overlap:	0 to 250 mm (9.8") with transparent tracks to show all defects
Un-scanned area:	10 mm (3/8") from plate weld, 160 x 160 mm (6.3 x 6.3") corner dead zone
Real time analysis:	Defect size, x / y position, plate view, top/bottom, MFL, MFLi, STARS
SIMS Reporting Suite:	Full version – 3 user license included. Read only version – unlimited Operating system requirement – Windows XP, Vista, 7 or 8
Training:	4 days Silverwing based training and examination included.