

SILVERWING RMS PA

High resolution imaging without speed compromise.



Robotic corrosion mapping system
incorporating M2M Gekko or Mantis
phased-array instruments

NON-INTRUSIVE INSPECTIONS (NII) FASTER, EASIER AND SAFER

Silverwing RMS PA inspection solution leads the way for a 100% corrosion mapping coverage of critical assets. The solution can inspect 10 times faster at a higher resolution compared to conventional UT.

Phased-Array Corrosion Mapping

Automated corrosion mapping has become an integral part of NDT inspection campaigns and is widely accepted within integrity management programmes and written schemes of examination. To optimise productivity with resolution, historically corrosion mapping systems have been set to 3-5 mm resolution steps.

Incorporating phased-array technology into an automated corrosion mapping system can help increase productivity, without sacrificing resolution and probability of detection (PoD).

Phased-array probes have a wide electronic footprint and with a 1 mm resolution across the width of the beam, the required scanning coverage is achieved with significant time reduction. The ability to collect high resolution and increased scanning speeds, will improve probability of detection, enhance imaging and improve defect characterisation.

The phased-array configuration utilises a specially designed water box which produces a controlled and stable water-column that eliminates the need for a wedge, thus providing the benefits of improved signal consistency, accuracy and limited dead zone. This concept offers enhanced surface conformance and improved coupling.

Non-Intrusive Inspection (NII)

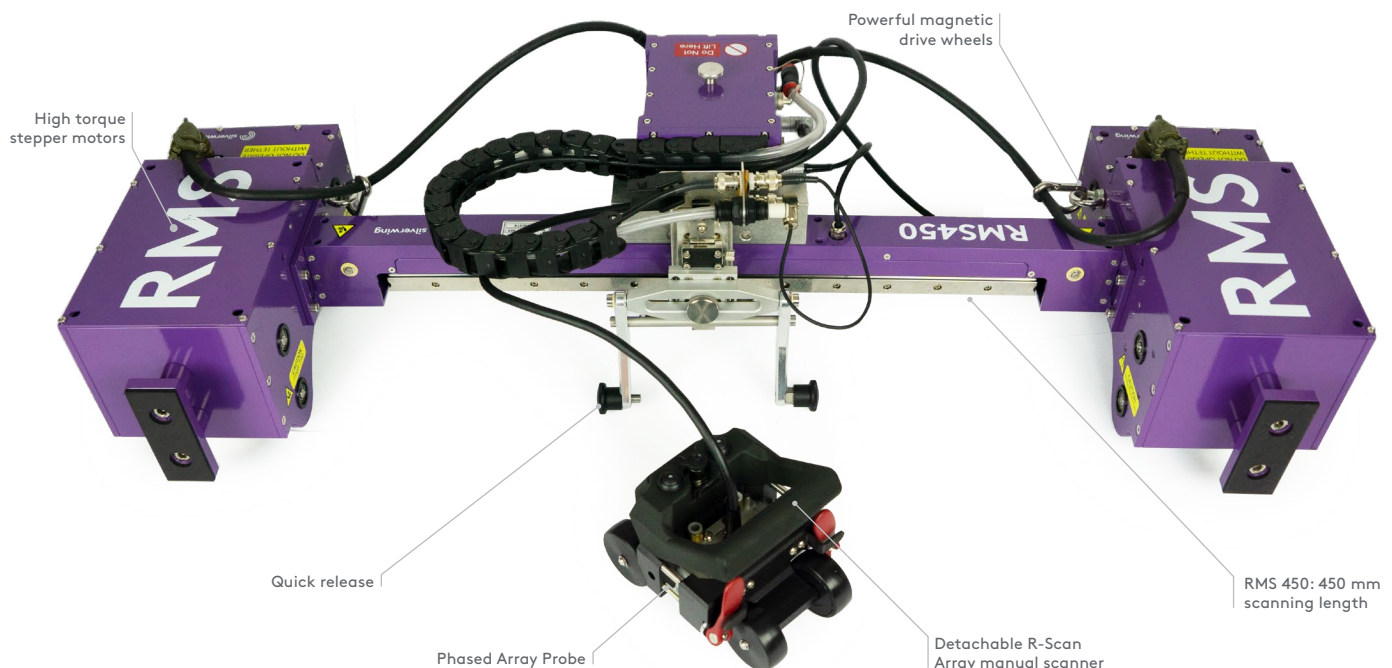
This unique technology combination allows inspection versatility when performing non-intrusive inspections of pressure vessels and associated pipework.

To complete a thorough NII inspection, there are requirements to perform numerous advanced Ultrasonic Testing (UT) methods. In addition to corrosion mapping of the shell, the industry recommended practice is to perform Time of Flight Diffraction (ToFD) on welds, and manual phased-array for flange face and nozzle welds.

With a RMS phased-array system, operators are now able to perform the full NII inspection by a simple change of probe.

Applications

- Pressure vessels
- Pipelines
- Horizontal storage tanks
- Tank shells and roofs
- Spheres
- Ship hulls
- Marine vessels
- Slug catchers
- Other critical ferrous assets



HIGH-RESOLUTION PHASED-ARRAY FLAW DETECTORS

The only portable Phased-array Ultrasonic Testing (PAUT) instrumentation offering intuitive phased-array (PA) features and Real-Time Total Focusing Method (TFM)

An Eddyfi Technologies Solution

Eddyfi Technologies integrated two market leading solutions, Silverwing's RMS and M2M's phased-array instruments to provide a high-speed, remote access phased-array inspection system.

The robust, field-proven RMS robotic scanning head has been successfully deployed on various assets such as pressure vessels, pipelines, storage tanks and other critical structures in harsh environments including oil and gas, offshore, marine, dry docks and mining.

The cutting-edge M2M Gekko and Mantis phased-array systems have a growing reputation for being the most advanced phased-array instruments on the market. M2M is the first brand to deliver portable phased-array flaw detectors capable of driving matrix arrays and perform TFM in real time.

Benefits

- Up to 10 times faster than conventional corrosion mapping
- High resolution imaging with standard 1 x 1 mm resolution
- Detachable R-Scan Array manual scanner
- Increased Probability of Detection (PoD)
- Increased accuracy with enhanced defect characterisation

Integrated Software

The user interface is developed to ease the workflow. The RMS control software is embedded into the M2M instruments and functions seamlessly with the phased-array data capture and analysis software.

Real-Time Total Focusing Method (TFM)

As a complimentary solution for NII campaigns, real-time TFM imaging can be incorporated into schemes of examination. The high-resolution and enhanced focusing capabilities will assist detailed defect characterization for the following damage mechanisms

- High-Temperature Hydrogen Attack (HTHA);
- Flange face corrosion;
- Fatigue cracking;
- Microbiological-Induced Corrosion (MIC);
- Hydrogen blistering (HB);
- General corrosion and erosion;
- Laminations;
- Internal coating failures or disbonding.

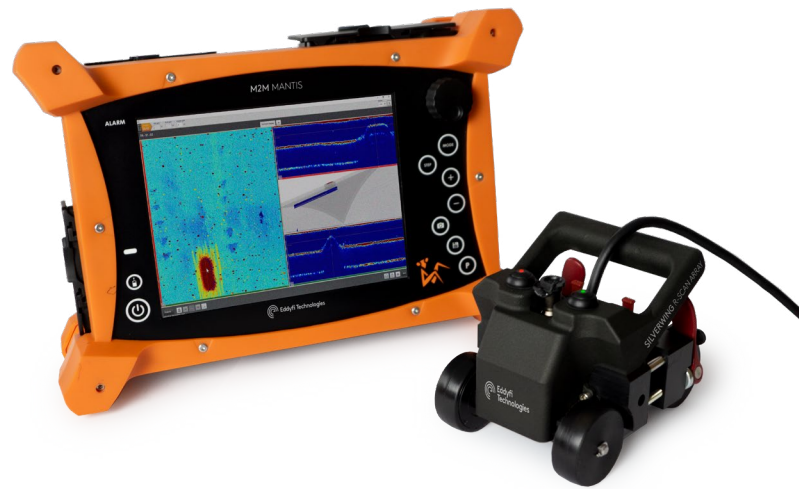


Detachable R-Scan Array Scanner

The RMS integrates a detachable hand-held manual scanner for the inspection of smaller areas and assets ranging from 4 inch (100 mm) to flat plate.

The R-Scan Array can be purchased as an independent scanner, simply connect the scanner to a M2M Gekko or Mantis and you have a semi-automated phased-array corrosion mapping system with on-board data collection capabilities.

Ideal for complex geometry components and restricted access areas the R-Scan Array offers improved inspection dexterity and total battery operated portability.



SPECIFICATIONS

SILVERWING RMS

SCANNER COMPARISON

RMS Model	Circumferential		Longitudinal		Flat Plate
	Min Internal	Min External	Min Internal	Min External	
600	2 m (79 in)	0.65 m (26 in)	5.6 m (221 in)	5.5 m (217 in)	Yes
450	1 m (40 in)	0.15 m (6 in)	N/A	N/A	Yes
300	2 m (79 in)	0.65 m (26 in)	1.65 m (65 in)	1.4 m (56 in)	Yes
ARC 24-36	N/A	N/A	N/A	0.6 - 0.9m (24-36 in)	N/A
ARC 36-48	N/A	N/A	N/A	0.9 - 1.2m (36-48 in)	N/A
R-Scan Array	1.3 m (4.2 ft)	100 mm (4 in)	500 mm (20 in)	150 mm (6 in)	Yes

COMMON SCANNER SPECIFICATION

Scan grid	Configurable from 1 × 1 mm (0.04 × 0.04 in)	
Coverage per hour	7.8 m ² /h (22.5 ft ² /h)	
Scanner Auto-position	To origin or selected point	
Scanner control	Joystick and/or M2M software	
Umbilical cable	5 m (16 ft) standard. 7.5 m (24 ft), 15 m (49 ft) and 30 m (98 ft) optional	
Max Material thickness range	15 mm (0.6 in) water box	60 mm (2.4 in)
	30 mm (1.2 in) water box	120 mm (4.7 in) optional
Max surface	Phased-array	80°C (176°F)
Temperature	Single crystal	200°C (392°F)
Power requirements	100 to 240 VAC - 50-60Hz	

M2M Gekko and Mantis

GENERAL

Dimensions (L × W × H)	Gekko	410 × 284 × 126 mm (16 × 11 × 5 in)
	Mantis	320 × 220 × 100 mm (13 × 7 × 4 in)
Weight	Gekko	6kg (13 lb) without battery
	Mantis	4kg (8.8 lb) without battery
Screen	Gekko	0.4" high contrast resistive screen Resolution 1024 × 768 px
	Mantis	8.4" high contrast resistive screen Resolution 1024 × 768 px
Operating temperature range:	-10°C to 45°C (14°F to 113°F)	
Operating time:	4h (hot swappable battery)	
IP Rating	Designed for IP66	

RECEIVERS

Phased array channels:	Input impedance: 50 Ω
	Frequency range: 0.4 to 20MHz
	Max. input signal: 1.2Vpp
	Gain: up to 120dB (0.1dB step)
	Cross-talk between two channels < 50 dB

PULSERS

Phased array channels:	Negative square pulse, width: 35ns to 1250ns
	HT voltage: from 12V to 100V (with 1V step)
	Max. PRF: up to 20kHz

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www.eddyfitechnologies.com

sales-sw@eddyfi.com