SCORPION2

Battery-powered remote access ultrasonic crawler with dry-coupled wheel probe and SWIFT-UT rugged data acquisition instrument

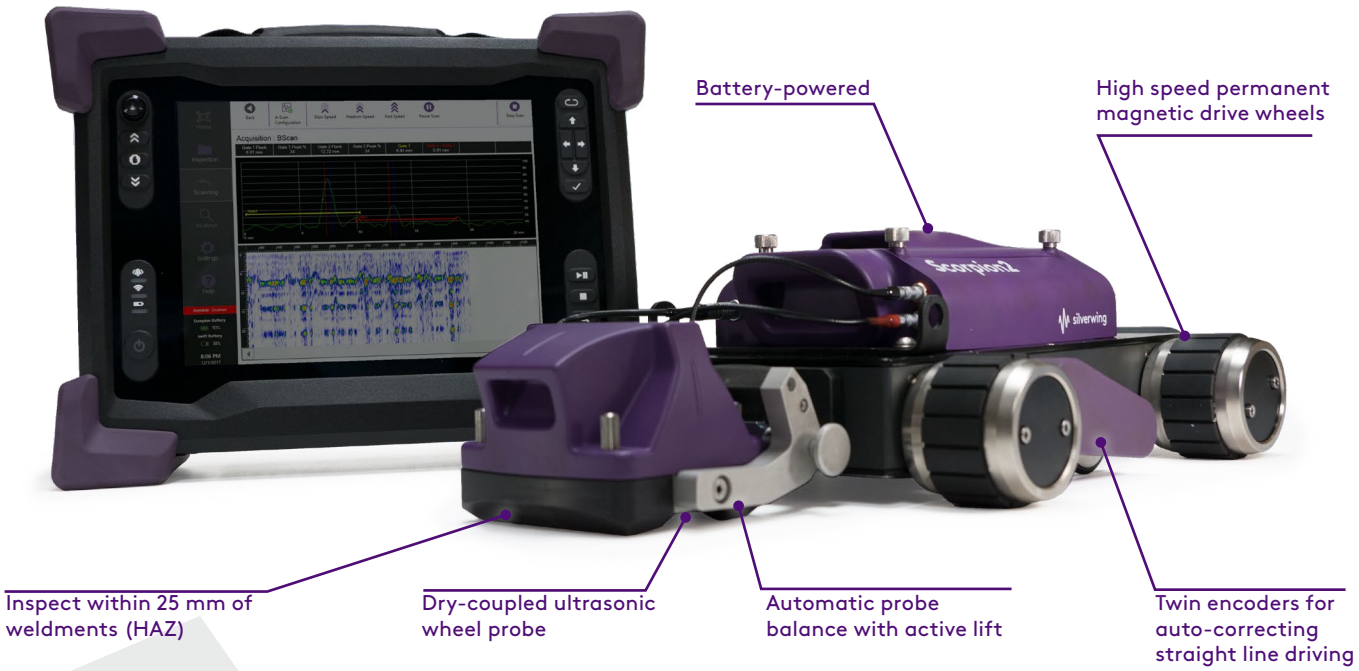
- Inspection speed up to 180 mm/sec (7 in/sec)
- Floating and tracking ultrasonic gates
- Dry-coupled probe, no couplant required

Eddyfi Technologies

silverwing

EFFICIENT REMOTE ACCESS INSPECTION
A PROVEN SUCCESS. MADE BETTER.

Scorpion2 dry-coupled remote access ultrasonic crawler system brings major efficiency and data improvements to the inspection of structures such as storage tanks, vessels and offshore installations.



ULTRASONIC PERFORMANCE

Scorpion2 is equipped with the best ultrasonic electronics and software the industry has to offer. With its advanced filtering, the system can inspect materials ranging from 5 to 100 mm (0.2 to 4 in) faster and more accurately. The software allows for unique UT gate processing, such as floating and tracking gates, ensuring correct wall thickness measurements under most circumstances.

SCORPION2 CRAWLER

The battery-power crawler is designed to go where no man can go. Crawler handling is minimized with simple controls and long umbilical, when combined with a speed of up to 180 mm/sec (7 in/sec), allow the completions of inspections faster and more efficiently.

PROBE DESIGN

Silverwing's unique dry-coupled ultrasonic wheel probe eliminates the need for couplant or a constant water supply. The probe is designed as a twin crystal ultrasonic probe with a unique rolling probe face.

PROBE CARRIAGE

The probe carriage allows the system to record thickness measurements within 25 mm (1 in) of a weld cap to inspect the critical heat affected zone (HAZ). The four independently-powered magnetic drive wheels with treaded tires give Scorpion2 the advantage of being able to easily drive over 12 mm (0.47 in) and provide grip under any conditions.

ACTIVE PROBE LIFT AND BALANCE

Unique feature to Scorpion2, the active probe lift raises the wheel probe when measurements are not being recorded, extending the life span of the probe's tire. Probe balance makes it easier to setup the probe pre-inspection, reducing time whilst increasing inspection repeatability.

BATTERY-POWERED

Scorpion2 comes with two lithium-ion batteries, allowing for continuous on-site operation. The battery is mounted on board the crawler, removing the need for a separate battery pack on the ground, thus reducing umbilical and overall system weight.

A TRUE ALL-IN-ONE SOLUTION
RUGGED, PORTABLE, BATTERY OPERATED

Field proven, robust ultrasonic data acquisition instrument, when you combine Swift with Scorpion2 you unleash the most advanced fully featured B-scan inspection system.

SWIFT-UT INSTRUMENT

With a large 26.4 cm (10.4 in) non-reflective, touchscreen display, Swift-UT provides clear views under any lighting conditions.

It has a powerful integrated ultrasonic card and seamlessly works with the dedicated B-scan software. Setting up ultrasonic and inspection details has never been this easy.

Swift-UT is sealed and designed for IP65. Its magnesium alloy casing is tough, and is water and dust resistant. Combined with a 3mm (1/8 in) strengthened glass, it's the perfect instrument for harsh environmental conditions.

Swift-UT comes with two lithium-ion, hot-swappable batteries, allowing for a full day's work.

Swift-UT has an optional harness to support the use of the system for longer period of time. The adjustable stand, the top handle, and four corner anchor points make it practical for on-site inspections.

DATA ACQUISITION SOFTWARE

Swift-UT B-scan data acquisition software features several powerful data review, reporting and printing tools. Saved data can be reviewed at any time with active A-scan and B-scan displays. Placing the cursor over any part of the B-scan profile shows the A-scan trace for that specific section of the scan.

An adjustable reporting threshold indicator can be displayed over the B-scan profile, helping to identify reportable defects at a glance and allowing rapid analysis of the complete scan. The full amplitude B-scan mode helps to characterize wall loss which in turn allows for a more detailed post-inspection analysis and accurate corrosion assessment.

Inspection data can simply be exported as CSV, A-scan and B-scan images or as CMX files which can be imported into CMAP inspection management software. When importing into CMAP, all scans are automatically positioned based on X, Y coordinates, providing a complete overview of the inspection.

EEMUA & API RECOMMENDATIONS

Traditional techniques of random tank shell thickness measurements can be very misleading due to the low Probability of Detection (POD) and may lead to incomplete corrosion rate calculations. As recommended by EEMUA, Scorpion2 records thickness measurements along a vertical line even in the critical Heat Affected Zone (HAZ), meaning a higher POD resulting in a more accurate corrosion assessment.

EEMUA states that walking on tank roofs can be hazardous if the condition is unknown. The condition and thickness of the roof plates should be confirmed before access is permitted. Scorpion2 can remotely record thickness measurements reducing the need for roof access.

SCORPION2 DIAMETER CAPABILITIES	
External longitudinal	3.0 m (10 ft)
External circumferential	3.0 m (10 ft)
Internal longitudinal	5.0m (17 ft)
Internal circumferential	3.0 m (10 ft)
Minimum material thickness	4.7 mm (3/16 in)
Maximum material thickness	100 mm (4 in)
Maximum paint thickness	1 mm (3/64 in)
Maximum step weld	12 mm (0.45 in)

SPECIFICATIONS

SCORPION2		
Dimensions (W×H×D)		494 x 294 x 130 mm (19.5 x 11.6 x 5.1 in)
Weight	With batteries	10.5 kg (23lb)
	Without batteries	10 kg (22lb)
Umbilical cable length and weight		50 metres (164 feet), 4.25 Kg (9.4 lb)
Power requirements		Lithium-ion, rechargeable, DOT compliant
Power supply		Onboard battery
Batteries	Type	Li-ion, rechargeable, DOT compliant
	Typical life	4 hours
Max scan speed		180 mm/sec (7 in/sec)
Drive		Active Steer 4 independent 12V DC motor drive
Adhesion		4 x Neodymium iron boron magnetic wheels
Transducer		5Mhz twin element Dry-coupled
Near-surface resolution		2.5 mm (0.1 in)
Probe normalisation		Self-normalising probe
IP rating		Designed for IP62, use in light rain
Operating temperature		0–40 °C (32–104 °F)

SWIFT		
Dimensions (W×H×D)		355×288×127 mm (14.0×11.3×5.0 in)
Weight	With batteries	6.6 kg (14.5 lb)
	Without batteries	5.7 kg (12.5 lb)
Volume		13 L (791 in^3)
Power requirements		100–240 VAC, 50–60 Hz
Power supply		Direct VAC or onboard batteries
Batteries	Type	Li-ion, rechargeable, DOT compliant
	Typical life	6–8 hours
Display		26.4 cm (10.4 in) Non-reflective (AR coating) Anti-fingerprint (oleophobic coating) 3 mm (1/8 in), strengthened glass cover Optically bonded LCD and touchscreen
Storage		SSD, 100 GB
Connectivity		Gigabit Ethernet, Wi-Fi, Bluetooth®, USB 2.0 (×3)
IP rating		Designed for IP65
Operating temperature		0–40 °C (32–104 °F)
Operating humidity		95 %, non-condensing

SWIFT-UT ULTRASONIC			
Internal pulser/receiver	1 x Tx/Rx, 1 x Tx (for pitch and catch)	Filter, Waveform	FIR filter, Full rectify
Transducer frequency	2.25–20 MHz	Sampling Rate	100 MHz
Max. pulsing rate	Application dependant capable up to 20 kHz	Resolution	16 bits
Pulse Voltage	-75 to -200 in step of 25 volts	Waveform Length	up to 16328
Pulse Width	25 ns to 225 ns in 2.5 ns increment	Trigger Source	Internal or Encoder-based
Damping	50Ω	Transducer Range	2.25–20 MHz
Receiver Gain	8 to 70 dB, 40 dB TCG Range	Post trigger delay	8 to 141006540 samples in 1 sample step

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