PETRO-BASE

SILVERWING
Part of Eddyfi Technologies

UT LITE

Corrosion Inspection & Analysis for Critical Assets

TANKS

PIPES

VESSELS

> COST EFFECTIVE & SCALABLE

> EASY INTUITIVE SOFTWARE

> B-SCAN, C-SCAN & TOFD INSPECTION

> RANGE OF PLUG & GO SCANNING HEADS

UT LITE FAMILY

MANUAL & AUTOMATED ULTRASONIC CORROSION PROFILING, MAPPING AND WELD FLAW DETECTION

The UT Lite is a portable, powerful, ultrasonic inspection system for corrosion profiling, mapping and weld inspection.

Using Silverwing's unique dry coupled scanning technology for corrosion profiling, mapping and standard TOFD probes for butt welds, it offers distinct advantages for inspection of storage tanks, pipework and pressure vessels.

The UT Lite is designed in line with Silverwing's philosophy of easy and fast measurement collection coupled with extensive analysis tools. This approach ensures technicians can focus on completing the job efficiently whilst capturing all the raw data to assist in reporting and Risk Based Inspection (RBI).

The system comes with three types of inspection capability, B-scan for fast encoded line scans, C-scan for detailed small area inspection and ToFD for weld inspection on tank shells and pipework. The user interface has ultrasonic controls similar to a standard flaw detector so a trained ultrasonic technician can quickly become familiar with all functions, including comprehensive data storage capability.

Scanning heads:

- R-Scan: Dry coupled manual B-scan scanner
- Thetascan: Dry coupled manual C-scan scanner
- ToFD: Single channel ToFD imaging system
- Scorpion: Dry coupled remote access tank shell crawler

KEY FEATURES

- Software designed for technicians by technicians
- Dry coupled wheel probe for B & C scan – no couplant requirement
- Outdoor viewable, ruggedised, touch screen
- Permanently stored data to assist with RLA & RBI trend forecasting
- Battery operated
- B-scan recording up to 33 foot (10 m) long
- C-scan recording up to 12 x 12 inches (300 mm x 300 mm)
- Use on material thickness up to 2 inch (50 mm)
- Import inspection data to Silverwing's CMAP analysis software
- Field proven durability & reliability

WHY UT LITE FAMILY

Traditionally wall thickness surveys would entail taking single Thickness Measurements at given locations (TML's). This means the statistical probability of finding the minimum thickness and then repeating over time is low. In addition, the collecting and reporting of these results can be significant.
Silverwing's approach to inspection is to record a large number of measurements covering as much of the asset as possible, as quickly as possible, and then analyse this with dedicated tools to deliver a complete picture of the assets condition.
The UT Lite family has been designed to increase the statistical probability whilst increasing efficiency by collecting more data in the same amount of time or less than a traditional approach. A single acquisition system coupled with a range of scanning heads gives the technician a complete cost effective solution to corrosion inspection.

R-SCAN LITE

The R-Scan is a manual, dry coupled B-scan ultrasonic scanner which can be used on a wide variety of assets ranging from 2 inch (50 mm) diameter pipe up to a flat surface.

> 360º In service corrosion profiling.
> Ideal for remote locations, (no couplant required).
> Inspect a variety of surfaces including pipes and elbows.

THETASCAN

The Thetascan is a manual, dry coupled C-scan ultrasonic system which can be used for corrosion mapping on assets ranging from 12 inch (300 mm) diameter pipe up to a flat surface.

> In service corrosion mapping.
> Detailed C-scan with adjustable resolution.
> Scan compensation for pipe diameter.

ToFD LITE

The ToFD Lite is a portable single channel system designed to inspect tank, pipe and vessel welds. The system includes H and A frames to cover a range of weld thickness and applications.

> 5 MHz and 10 MHz probes.
> 45, 60 and 70 degree angled wedges.
> H and A Frame configurations.

SCORPION

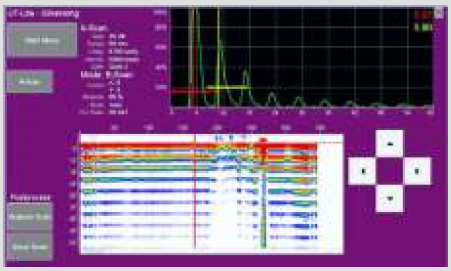
The Scorpion is a rugged remote access ultrasonic crawler designed for cost effective A and B-scan imaging on structures such as tanks, vessels and offshore installations.

> Dry coupled wheel probe.
> Complete UT crawler system.
> Remote access upto 164 foot (50 m) distance.

B-SCAN - INSPECTION PROCESS

B-scans have been used for some time to show wall thickness profiles affected by corrosion. Whilst the images produced have always been useful, the slow method of manual data collection using couplant, has limited effective use on site. Silverwing's unique dry coupled, dual element ultrasonic wheel probe transforms inspection speeds by removing the need for couplant. It is now cost effective for inspection programmes to require complete B-scan profiles, and use this extensive information to improve asset management.

The system is easy to use, and with the R-scan effectively operating as a simple thickness measurement probe any certified technician will feel comfortable in using the system. With reduced need for couplant application and live B-scan views giving easy visual feedback, the operator can focus on interpretation of results, improving inspection quality.



B-SCAN SOFTWARE

The R-scan and Scorpion software has been designed to make life easier for the operator. The touch screen intuitive layout, with large buttons makes it ideal for site conditions, allowing the operator to conduct and analyse an inspection more efficiently.

A nominal thickness line and an adjustable reporting threshold line can be displayed over any of the B-scan views (amplitude, profile and line) to identify reportable defects at a glance and allow rapid evaluation of the complete scan. Data can be stored in pre-defined formats to make grid and tank wall scanning patterns, with direct import into CMAP. All these features are designed to make data analysis and reporting easier for the operator.

C-SCAN SOFTWARE

Used as a follow-up inspection in conjunction with B-scan, or stand alone for C-scan mapping of small areas the system provides an easy to use 2D scan of an area. During a scan the software displays a real-time A-scan trace, C-scan image and a digital thickness measurements. The easy to use defect sizing tools make it simple for the operator to scan, analyse and highlight any areas of concern.

ToFD SOFTWARE

ToFD is now an established method for weld inspection, especially root corrosion. The simplified UT Lite system is easy to use for pipe and tank shell welds. The software features several easy to use measurement tools.

REPORTING TOOLS

All inspection and thickness measurements can be simply exported to a USB for transfer to a PC for further analysis and reporting. The exported data can be viewed in the desktop version of the software or thickness readings can be viewed in Excel.

B-scan Inspection data taken from the R-scan or Scorpion can be imported to Silverwing's CMAP reporting software along with C-scan and D-scan images taken from the Thetascan or ToFD.

TYPICAL INSPECTION APPLICATIONS

PIPELINES

> Full data recording with easy to interpret B-scan corrosion profile at the 12, 3, 6 and 9 o'clock positions.
> Rapid thickness measurements and B-scan inspection of internal / external elbows, bends and straight pipe.
> Small area C-scan corrosion mapping of pipes and flat plate.
> ToFD weld inspection of butt welds.

PRESSURE VESSELS / HORIZONTAL TANKS / TANK TRUCKS

> Rapid thickness measurements and B-scan inspection with full data recording. Each scan can be easily saved in a grid pattern chosen by the operator and imported in to CMAP.
> ToFD weld inspection of shell welds.

VERTICAL STORAGE TANKS

> Rapid thickness measurements and B-scan inspection with full data recording of shell plates. Scans can be easily saved in a shell grid pattern and automatically positioned in CMAP.
> ToFD weld inspection of shell welds.

ROPE ACCESS

> Corrosion inspection in inaccessible area can be very difficult; the combination of the UT Lite's carry harness and dry coupled wheel probe makes the system ideal for rope access inspection.

WATER AND FIRE BOILER TUBES

> Rapid wall thickness measurements and B-scan inspection of bends and straights greater than 2 inch (50 mm) diameter.

BRIDGE GUSSET PLATE CORROSION ASSESSMENT

> Rapid thickness measurements, B-scan inspection and corrosion mapping with full data recording of gusset plates.

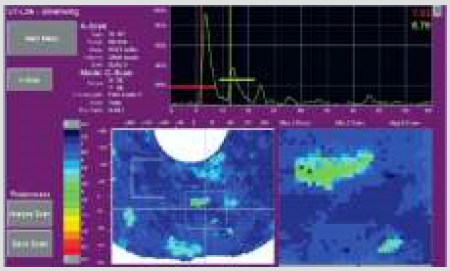
For more information on any of our products please contact our sales team at sales@silverwingndt.com or visit our web site:

www.silverwingndt.com

C-SCAN - INSPECTION PROCESS

If the operator discovers an area of concern requiring a more detailed inspection they can simply switch to the Thetascan which will allow them to perform a more detailed C-scan inspection. Ultrasonic C-scan is a well proven method for imaging of defects.

The UT Lite uses the Thetascan dry-coupled scanner to quickly map an area for detailed inspection. This is particularly useful to follow up any corrosion areas identified by B-scan, giving a greater probability of detection and more accurate map of the corrosion. The same ultrasonic wheel probe is used, again removing the need for couplant and giving consistent results with the R-scan.



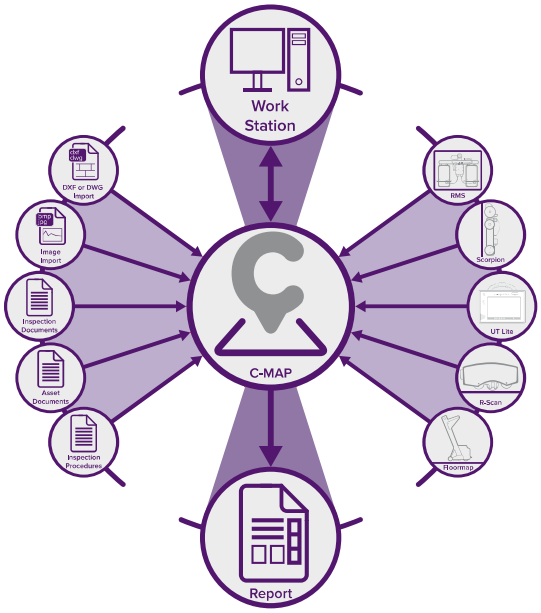
CMAP - INSPECTION MANAGEMENT SUITE

Silverwing's CMAP software is an innovative solution to managing today's complex inspections, delivering a powerful and efficient data management environment.

CMAP's unique approach enables inspection results from multiple disciplines and historical inspections to be easily viewed, analysed and shared.

Developed as an inspection data hub, CMAP gives you control over valuable inspection data to create a complete view of an assets condition.

CMAP also solves the problem of managing the vast amount of data that can be collected from the latest Silverwing inspection systems, giving easy access to detailed results or large scale overviews.



CENTRAL LOCATION OF INSPECTION RESULTS

CMAP's powerful inspection database is user configurable to reflect the asset structure within an organisation, or the client base for an inspection company.

Users can create multiple "sites" each with their own "assets" such as tanks, pipes and vessels then simply import all the associated corrosion inspection results, CAD drawings, images and work flow documents such as inspection procedures, technician qualifications and asset related information.

EASY DATA STITCHING AND PLACEMENT

CMAP can import data from Silverwing's range of inspection systems building up an overall view of an inspection. This significantly reduces time in analysing inspection data.

Once scans are "stitched" it is easy to investigate defects that may be present over 2 or more physical scans, CMAP automatically showing the minimum data when scans are overlapped to ensure nothing is missed.

ADVANCED PALETTE TOOL

CMAP has an advanced palette tool with real time image updating irrespective of the size of scans. Using this feature it is easy to highlight different depths which, for example, can be used to reveal clear images of back wall pitting, or set simple acceptance thresholds to highlight areas outside of desired specification.

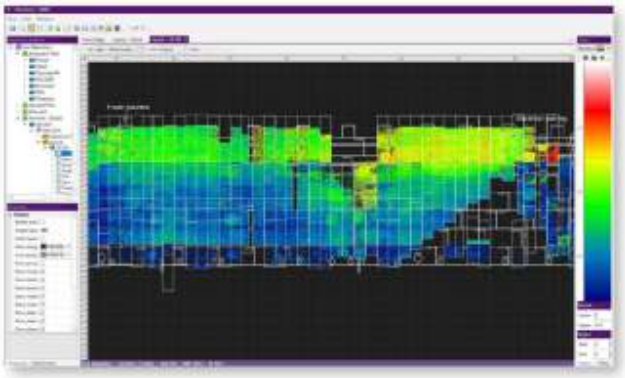
MEASUREMENT TOOLS

CMAP contains dimension tools to annotate defect areas. These dimension markers can overlap different scans and be used for defect sizing, or adding positional information.

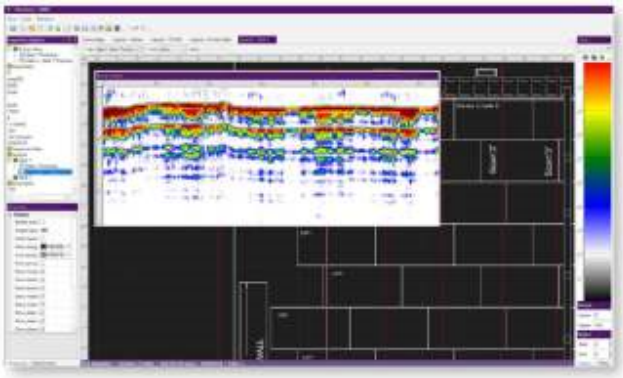
REPORTING TOOLS

CMAP automatically creates inspection reports using a powerful configurator to place highlighted scans, CAD drawings, and layouts into a document that can then be edited with additional notes.

Reports are created using a wizard which guides the user through a simple process of selecting layouts, scans, Inspection Areas and layers such as peak, surface and amplitude reference gates.



TANK SHELL OVERVIEW
Simple layout of inspection data with CAD overlay



B-SCAN ANALYSIS
Tank Shell B-scan Inspection

TECHNICAL SPECIFICATION

R-SCAN LITE	
Dimensions	Length 4.8" (122 mm) x Width 2.5" (65 mm) x Height 2.1" (54 mm)
Probe	TWP25 - 5 MHz dual element Dry Coupled wheel probe
Umbilical Cable	6.5 feet (2 metre)

THETASCAN	
Dimensions	Length 4.3" (110 mm) x Width 3.4" x (87 mm) x Height 2" (50 mm)
Probe	TWP25 - 5 MHz dual element Dry Coupled wheel probe
Max Scan Area	21.7" (550 mm) radius 180° swing

ToFD LITE	
Dimensions	H-Frame: Length 10.2" (260 mm) x Width 3" (80 mm) x Height 2" (50 mm)
	A-Frame: Length 1.7" (45.5 mm) x Width 0.7" (20 mm) x Height 3.5" (90 mm)
Probe	5 MHz and 10 MHz non composite crystal probe
Wedges	Supplied with 45, 60 and 70 degree angled wedges
Weld Plate Thickness	Min 0.25" (6 mm) Max 2.5" (63 mm)

SCORPION	
Dimensions	Length 15.2" (385 mm) x Width 8.7" (222 mm) x Height 4" (102 mm)
Probe	TWP40 - 5 MHz dual element Dry Coupled wheel probe
	Optional 5 MHz bubbler probe
Speed	1" /second (25 mm/second)
Umbilical Cable Length	164 foot (50 metres)

UT LITE SPECIFICATION	
Pulse Voltage	-400V
Pulse Shape	Spike
Receiver Gain	0 – 80 dB in 1 dB steps
Filters	Wideband (0.5 – 2 MHz), 1.5 – 3.5 MHz, 3.5 – 7.0 MHz, 6.5 – 12 MHz
Sample Rate	50 MHz
Range	Maximum of 500 mm in steel with a velocity of 5920 m/s
Probe Range	1.0 MHz – 15 MHz
Probe Mode	Single or dual
Measurement Mode	Peak, flank, 1st echo & echo to echo
Dimensions	Length 14.2" (360 mm) x Width 12.2" (310 mm) x Height 9.5" (240mm)
Weight	4.75 Kg
Battery	8 hours operation from fully charged
Display	10.1" high brightness with 1920 x 1200 resolution, Capacitive 10 finger multi-touchscreen & digitizer
Ambient Temperature Range	-5°C to +60°C