

# Mapstar UT

## Multi-channel weld inspection

Mapstar UT is a rugged, ultrasonic imaging device designed for weld inspection, replacing radiographic inspection of pressure vessels and other critical structures. Mapstar UT's machined aluminum housing is ideal for withstanding the harsh environments often encountered when inspecting critical industrial infrastructure. And with multi-channel performance, Mapstar UT provides pure productivity.

- Compliant with ASME Case 2235
- Packaged for rigorous testing environments.
- Five and ten ultrasonic channels available for multi-probe scans.
- Battery-powered for full shift operation on a single charge.
- Direct encoder input for scanner flexibility.
- Integrated TOFD software with multi-channel weld inspection capability.
- English, French, Spanish, German, Chinese, and Japanese operating languages capability.





## Productivity

Weld inspection can be a major time consumer during construction if the tested part must be segregated from the workflow for X-ray. With Mapstar UT, there is no need to disrupt production flow because welds can be inspected in-line with the manufacturing process saving significant time and valuable manufacturing capacity. The multi-channel Mapstar UT provides the ability to inspect the entire weld in one pass using a number of TOFD and pulse echo channels to concurrently look at weld fill, cap and root. There is no longer a need to inspect with multiple passes of different single channel setups.

## Portability

Deployment costs can be excessive with ultrasonic scanning systems. No need to bother with inverters, AC power sources or long UT cables with Mapstar UT. Its long battery life and Ethernet communications link allows Mapstar UT to be quickly setup at the site of the inspection.

All required inspection gear can also be easily carried and transport to the site by a single person.

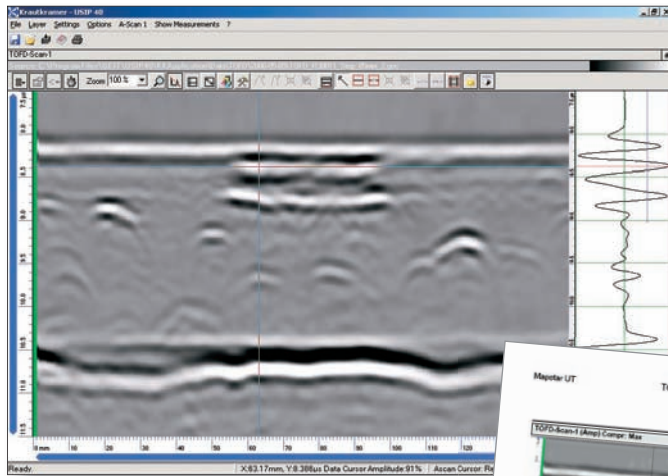


## Reliability

When called upon to work in harsh environments, you can rely on the robust Mapstar UT to perform. The solid construction features a machined billet aluminum chassis, high quality sealed connectors, and o-rings at every interface. The result is a durable instrument that is weatherproof to IP 65 and ready for any environment.

## Flexibility

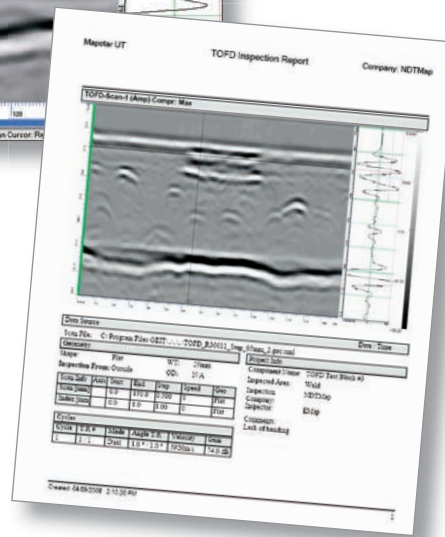
Because of its compatibility with a variety of existing probes and manual scanners, the cost of implementing Mapstar UT into an existing inspection is minimal. Mapstar UT employs direct encoder inputs that interface with most manual linear or two-axis scanners incorporating digital encoders. All instrumentation required for an inspection is contained within the Mapstar UT chassis and a simple Ethernet connection to a standard laptop computer is all that is needed for control and data acquisition. There is no need to invest in new scanners or special computing hardware.



## Data Integrity

Mapstar UT captures the scan image and the A-scan for each shot in an inspection. Once saved, all data associated with an inspection can be recalled off-line for future processing and additional archiving.

Real time reporting of an inspection is made possible by Mapstar UT's report generation module. Using this module, an operator can create inspection reports using standard templates, or create a custom report.



ASME Case 2235 States:

- The ultrasonic examination shall be performed using a device employing automatic computer enhanced data acquisition.
- A complete data set with no gating, filtering, or thresholding for response... shall be included in the data record.

# Specifications

## Number of channels

5, or 10 in max. 20 multiplexed cycles

## Pulse Repetition frequency

4 to 20,000 Hz, proportionally for each cycle, e.g. max. 5,000 Hz when using four cycles

## Pulser

Spike pulse 100 V, 400 V  
Charging capacitor 1 nF, 220 pF,  
Rise time < 10 ns

## Wide-band filter (-3 dB)

0.2 - 30 MHz / 10 - 30 MHz / 1 - 10 MHz

## Narrow-band filter

1 / 2 (2.25) / 4 (5) / 10 / 15 MHz

## Gain

0 - 110 dB, variable in steps of 0.5 dB

## Fine setting of gain

1 dB, continuously variable in 10 steps

## Rectifier

Full-wave, negative and positive half-wave,  
RF mode

## Reject

Linear, 0 - 80% screen height, variable in steps

## DAC/TCG

Distance-amplitude curve (DAC) or TCG  
line with up to 16 reference echoes per  
cycle, multiple DAC mode with up to four  
additional curves at variable spacings from  
the reference curve, individual curve for each  
cycle possible

## Sound velocity

500 - 15,000 m/s, manually variable or  
selectable from table

## Digital upsampling

At 400 MHz in real time, 9 bits

## Display

A-scan with 1024 pixels, range 1 mm to 15 m  
in steps of 0.1 mm, pulse delay-10 mm to  
15 m in steps of 0.1 mm, display start with  
initial pulse or interface echo

## A-scan memory

Saved and currently active A-scan can  
be superimposed

## Traces

Several A-scan windows can be opened from  
different or identical cycles having different  
display ranges.

## Evaluation gates

Variable bar-type representation modes  
for each cycle independent of one another,  
showing start, width, and threshold of gate.  
Four evaluation gates can be used, of which  
1 as echo start gate, one threshold per gate  
(coincidence or anticoincidence selectable),  
flaw suppression per counter (1 - 16), trigger:  
initial pulse or interface echo, width 0.1 mm to  
15 m in steps of 0.1 mm, start 0 mm to 15 m in  
steps of 0.1 mm

## Amplitude resolution

0.5% of display range

## Thickness measurement resolution

2.5 ns corresponding to 0.007 mm at a sound  
velocity of 5,920 m/s

## Thickness measurement modes

Measurement between initial pulse or  
interface echo and gates A, B or C, or between  
gates A and B, start/stop at zero crossing  
(selection of phase independently for start  
and stop), flank or echo peak, tolerance  
monitor with 4 thickness values min. and max.  
per cycle

## Encoder inputs

3, for quadrature or pulse/direction,  
compression of ultrasonic data on path grid

## Setup parameters for each cycle

Gain / frequency filter / gate start / gate  
width / gate threshold / gate IF start / rectify  
reject / display delay / display range / flaw  
suppression counter / TCG / DAC / thickness  
measurement mode, sound velocity, UT mode

## Units

mm, inch or  $\mu$ s

## Dialog languages

English, German, French, Spanish, Chinese,  
and Japanese. The user is able to configure  
his own language.

## Connections

Probes Lemo 00, encoder - Lemo 3k  
Ethernet - RJ45

## Mains operation

Via external power supply (85 - 265 VAC);  
power consumption max. 20 W

## Operating temperature

-10 to +50 °C

## Sealing

IP65

## Input voltage

12VDC

## Battery operation

Two Li Ion battery packs, 10.8 V, Operating  
time 8h with two 7.2 Ah packs.



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