Smartor

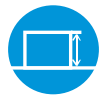## Ultrasonic Flaw Detector & Thickness Gauge

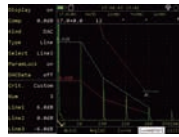One-hand Operation

Smart Test Wizard

Weld Simulation

Advanced Conventional UT & Thickness Measurement

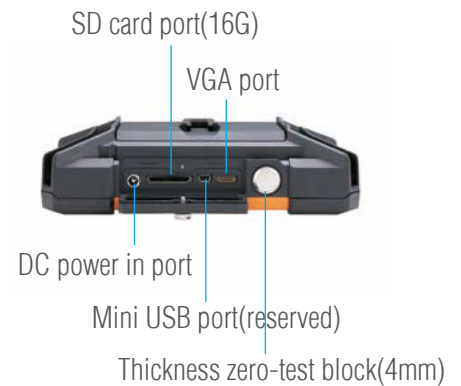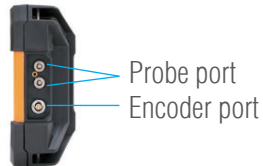**SIUI**

Smartor

SIUI's newly launched Smartor is a combination of ultrasonic testing and ultrasonic thickness measurement.

Version 1: UT

Version 2: TG

Software Upgrade

UT + TG

Probe port
Encoder port

SD card port(16G)
VGA port
DC power in port
Mini USB port(reserved)
Thickness zero-test block(4mm)

Superior Features

- High IP rate: IP 66
- Compact size: 198 (W)* 128 (H) *520 (D) mm
- Light weight: 0.9kg only, including battery
- 5.7" LCD with high resolution 640×480 pixels
- Adjustable pulse width, negative square wave transmission is up to 350V.
- Operating frequency range: 0.5~20MHz, multiple steps of wide broadband and narrow-band for selection.
- Easy operation: only a few buttons, well-defined intuitive interface, support right-hand and left-hand operation, outdoor mode.
- Multiple conventional UT functions
  - ✓ Weld, plate and forging test wizards are available, which can guide users to perform setup easily and improve inspection speed.
  - ✓ Peak memory, DAC curve, AGC (auto gain control), video record makes convenient and efficient flaw inspection.
  - ✓ Optional functions such as B-scan, TCG, probe spectral analysis, CSC (curved surface correction), weld simulation, crack height measurement are available.
  - ✓ Featured with AWS D1.1/D1.5 and API 5UE evaluation standards.
- Multiple thickness measurement functions
  - ✓ Standard A-scan thickness measurement(through coating measurement, echo to echo mode)
  - ✓ Auto-search, velocity measurement, alarm and dataset management are available.
  - ✓ Optional functions: coat thickness measurement, B-scan, multi-layer measurement, V-PATH, TDG and temperature compensation.
- System ports: encoder, VGA, standard SD card, USB

*EN12668-1: 2010(for UT) & EN15317-2007(for TG) compliant
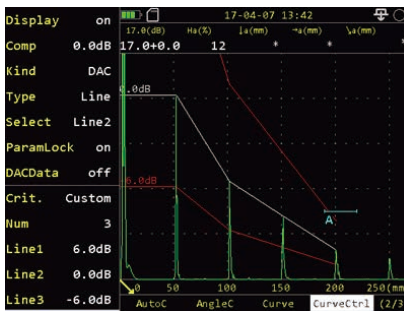
Test Wizard
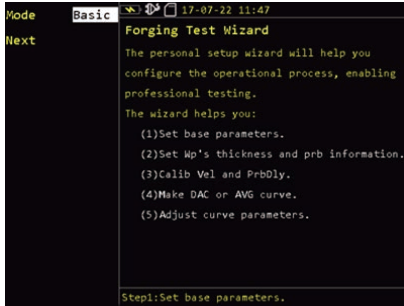
● Setup wizard will help users configure the professional operation process, enabling more professional testing.
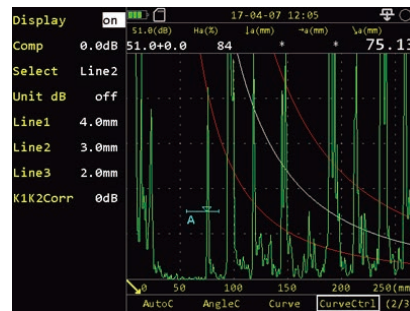
B-scan

● Display A-scan echo in imaging mode, so as to achieve more intuitive test result for easy observation and analysis.
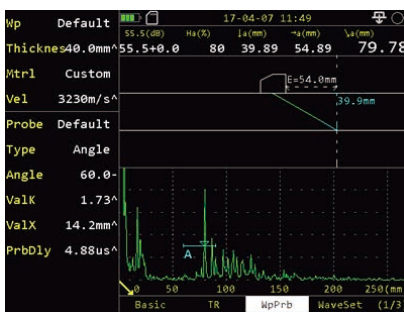
DAC Curve

● Bring easier and more convenient flaw evaluation.

AVG/DGS Curve

● Auto created by taking a known flat-bottom hole or large flat-bottom echo for reference.
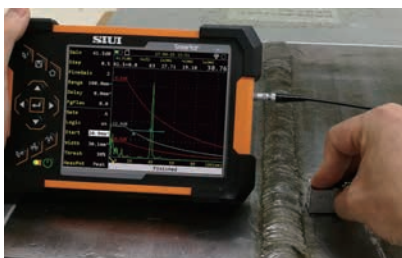
Weld Simulation

● Simulate the weld shape and use the dynamic beam tracking function to assist the user to quickly determine the location of flaws in the weld.

Probe Spectral Analysis

● The probe waveform, spectrum and center frequency of the probe can be measured precisely by capturing echoes.

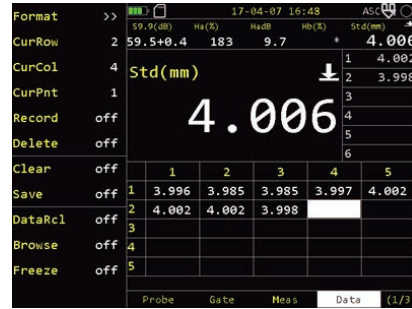● Flat weld testing

● Angle weld testing
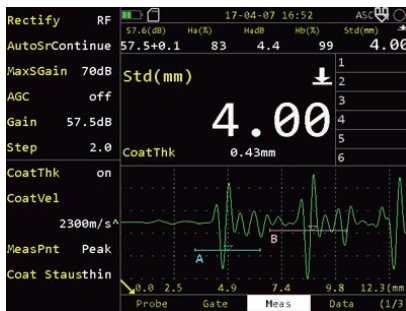
Thickness Measurement

B Scan

● Based on time interal or encoder, display the measurement readings in B-mode image.

Data Set Management

● Measurements recorded and displayed in grids.

Through-coating Management

● After setting the coating velocity, through-coating thickness and coating-thickness can be displayed at the same time.

TDG (Time Distance Gain Curve)
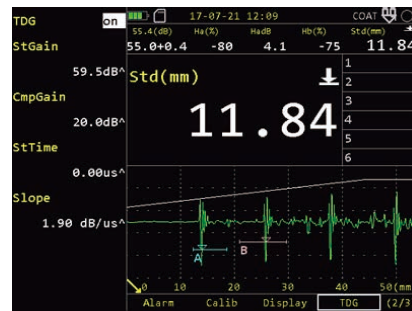
● It can be used for compensating the loss of echo amplitude due to propagation of sound path.

TempComp Function
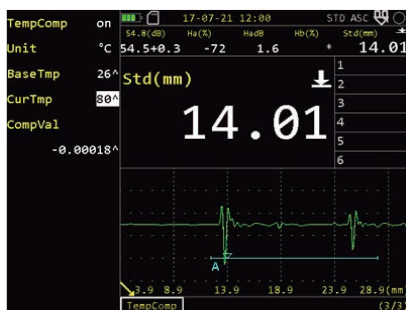
● When there is temperature difference between the calibration block and the detected workpiece, it can be used for temperature compensation.

V-PATH Function
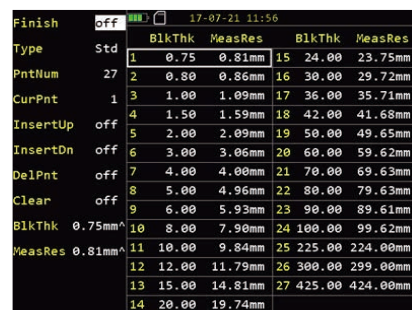
● All the original dual element probes have a set of default V-PATH calibration curves. Users can make a set of UserVpath curves for a specific probe.

● Thickness measurement on pipe

● Thickness measurement on step block

Technical Specification Conventional UT & Thickness Measurement

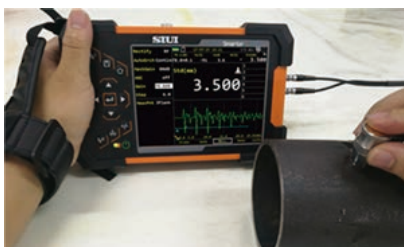| General Technical Specification	
Display Screen	5.7" high brightness TFT LCD, 640×480 pixels
Measure Unit	Inch / mm
Peripheral port	USB, SD card(16G) and VGA ports(Sharing with same mini HDMI with I/O signal port)
Language	English/German/Russian/Polish/Hungarian
Power Supply	DC 12V (external power supply); 7.4V (battery)
Battery Operating Time	≥8h (under factory default mode)
Operation Temperature	-10℃~ +45℃
Storage Temperature	-20℃~ +60℃
IP Code	IP66
Weight	Approx. 0.9kg (including a 0.24kg battery)
Dimension (W×H×L)	198mm ×128mm × 520mm
Encoder Connector	1pc(4-core)

	Conventional UT	Thickness Measurement
No. of Channel	1	
Probe Connector Type	LEMO 00	
No. of Probe Connector	2	
Max. Supporting Elements	2	
Work Mode	——	Standard (R-B1, measurement from transmit pulse to the first bottom wave). All measurement using Zero Crossing. Echo to Echo(B1-B2, measurement by auto-tracking the second bottom wave according to the first bottom wave). Through coating measurement.
Pulse	Negative square, Negative spike pulse	Negative square, Negative spike pulse(auto fits the probe)
Transmitting Voltage	50~350V, step 50V	50~350V(auto fits the probe)
Pulse Width	Negative square: 50~500ns, step 10ns Negative spike pulse: ≤40ns	Negative square: 50~500ns (auto fits the probe) Negative spike pulse: ≤40ns (auto fits the probe)
PRF	Negative square: 10~1000Hz adjustable, step 10Hz Negative spike pulse: 10~2000Hz adjustable, step 10Hz	200Hz
Damping	50/1000Ω , 2 levels	50/1000Ω , 2 levels (auto fits the probe)
A/D Sampling Rate	240MHz/10bit	
Sampling Point	1024 points, 16bit/point	——
Gain	0~110dB, step: 0.5/2/6/12dB	0~110dB Manually adjustable, step: 0.5/2/6/12dB Auto adjustable(auto-search or auto-gain)
Fine Gain	-4~+4	——
Surface Compensation	Full gain range	——
Bandwidth	0.5~20MHz(-3dB)	
Operation Frequency	1~4MHz/ 0.5~10MHz/ 2~20MHz/ 1MHz/ 2.5MHz/ 4MHz/ 5MHz/ 10MHz/ 13MHz/ 15MHz/ 20MHz, 11 levels	
Rectify	Negative/ Positive/ Full/ RF/ Filter	Negative/ Positive/ Full/ RF
Reject	0~80%, step 1%	——
Detection Range	0~15000mm, min. display range 2.5mm	0.5~600mm(subject to probe, material, temperature and selected configuration)
Indication Resolution	——	0.001/0.01/0.1 mm(0.0001/0.001/0.01 inch)
Indication Precision Error	——	0.80~9.99mm ± 0.05mm 10.00~99.99mm ± (1‰H + 0.04)mm 100.0~400.0mm ± 3‰H mm Tested with TGM5-10L probe; H is the measured thickness.
Tube Wall Thickness Measurement	——	With TGM5-10L probe, it can measure steel tube with diameter no less than 20mm and wall thickness no less than 2mm.
Material Velocity	100~20000m/s, min. step 1m/s	100~20000 m/s
Display Range		5~1000mm
Pulse Shift Range	-10~1000mm, min. step 0.1mm	-10~500mm

	Conventional UT	Thickness Measurement
Probe Zero	0~200us, min. step 0.01us	0~200 us
Probe Flank	0~100mm, step 0.1mm	——
Wizard	For weld, plate and forging testing	——
Test Point	Peak/ Flank/ J Frank	
Measurement	Gate: amplitude, amplitude dB difference, sound path, horizontal distance, vertical distance, south path difference between Gate A and B; Cursor: 2 cross cursors, measuring horizontal and vertical positions on B scan image, and distance between cursors(activated for optional B scan)	——
Gate Mode	Standard	Gate A is selected in standard measurement mode.
No. of Gate	2	——
Gate Start	Full range	Gate A start: -10~1000mm, min. step 0.1mm
Gate Width	Full range	Gate A width: 1~1000mm, min. step 0.1mm
Gate Thresh	10~90%, step 1%	Gate A thresh: 10~90% or -10~-90%(for RF), step 1%
Auto Search	——	off/on; If enabled, auto adjusts to the proper display range, gain and gate position based on the measured wave signals, so as to improve measurement efficiency.
Velocity Measurement	——	Velocity dynamic measurement
Calibration	zero point, zero point + velocity, probe angle	Measure the known reference block for fast zero point calibration Custom calibration (zero point / zero point + velocity calibration)
Measurement Reading Mode	——	Std / MinVal / MaxVal / Avg / Diff
Alarm	Audible and visual alarm: positive/ negative	Upper and lower limit alarm(sound, indicator light)
Screen Display Combination	Normal, full screen	A/BVa, A/Ba/SVa, Ba/BVa (AScan+big value/ AScan+data grid+ small value/ data grid + big value)
Refresh rate of measurement		4/8/16/32Hz
Curve Function	Up to 6 DAC (curve/ line), up to 10 reference points for each curve/line AVG/DGS	——
Auxiliary Function	Full screen, coordinates switch(sound path/ depth/ horizontal), single/continuous auto gain (10~100%, step:10%), SecColor, WaveComp, WaveFill, PeakEnv, PeakEcho, FastScan, Outdoor, gate magnify, CineRec, PrintScreen Auto freeze(Gate: A, B,A and B, A or B)	Freeze, auto gain, history reading column, last reading maintained, mm/inch switch, outdoor mode.
Storage Function	Save, recall and delete the parameter, data files, record files, printscreens, depends on the SD card capacity.	Save, recall and delete the parameter, data sets, printscreens, depends on the SD card capacity.
Dataset File	——	1D/2D/3D file format Measurements recorded and displayed in grids; record length customizable. Each record point data includes measured values, basic parameter settings and A-scan waveform data.
Data Post Processing	Playback, analysis, reports of parameters, record files, printscreen files in SuporUp software.	Playback, analysis, reports of parameters, data sets, printscreen files in SuporUp software.
Time Base linearity	≤0.5%	——
Vertical Linearity	≤3%	——
Amplitude Linearity	≤±2%	——
Attenuator Precision	20dB±1dB	——
Dynamic Range	≥32dB	——
Optional Software	AWS, API, CSC(Curved Surface Correction), TCG, B Scan, Flat weld simulation, Crack height measurement, Probe Spectrum Analysis.	CoatTHK, V path, TDG, Temperature compensation, Multi-layers measurement, B scan.

SIUI