SyncScan

Minimize your cost for Phased Array and TOFD

SIUI

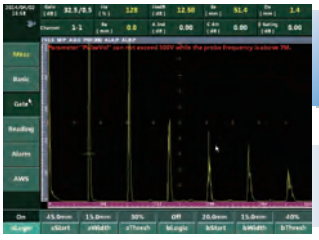
SyncScan

Third-generation Phased Array flaw detector from SIUI, SyncScan incorporates the latest advancements in high-performance Phased Array and TOFD detection into one compact unit. SyncScan can be upgraded with Phased Array and TOFD to satisfy various inspection requirements. SyncScan can **minimize your cost** for Phased Array and TOFD inspection.

Superior Features

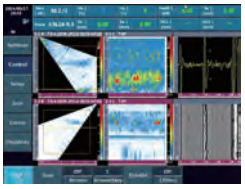
- High IP rate: IP65
- Light Weight: 3.75 kg with battery
- Large touch screen: 8.4" LCD with resolution 800×600 pixels
- Upgradeable from conventional UT to phased array or TOFD, with powerful & complete optional software functions.

Upgradeable from Conventional UT to Phased Array or TOFD

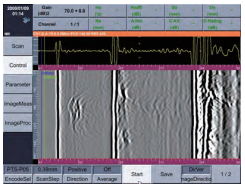


Conventional UT

Version One
upgradeable to 16:64 PAUT + 1-ch TOFD/ UT



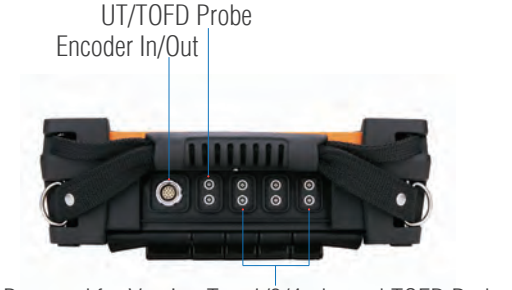
Version Two
upgradeable to 1/2/4-ch TOFD/ UT



* Please define your preferred version before purchase.

Extendable connectors

Side View (Left)



Reserved for Version Two:1/2/4-channel TOFD Probe

Top View

Side View (Right)

Compact and Durable

SyncScan is designed based on IP65 to suit the harshest industrial environment. Extra-large 8.4-inch touch screen can bring optimized experience for measurement and reading. SyncScan is so compact (3.75kg, 90mm thickness) that it can be operated with only one hand for aloft and field work.

Touch Screen

*EN-12668-1 compliant

*Specific functions are subject to final order.

Conventional UT

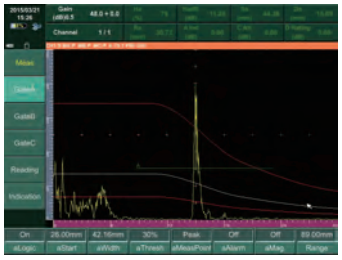
Conventional UT

Basic Functions:

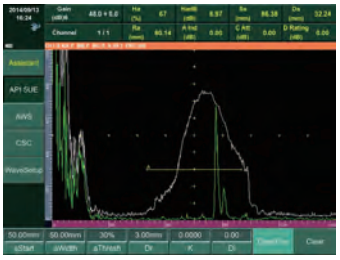
Velocity+Zero Calibration/ Angle Calibration/ DAC/ AVG(DGS)/Full screen A scan/ Coordinates switch (sound path, depth, horizontal)/ Surface compensation(xx+xxdB)/ Auto freeze/ Second leg color/ Auto gain/ Wave compare/ Wave filling/ Peak Envelope/ Screenshot

Advanced Functions:

API/ TCG/ AWS/ CSC/ B Scan/ Flat Weld Groove(RayTracing)/ Crack Height Measurement/ Probe Spectrum Analysis/ Cineloop

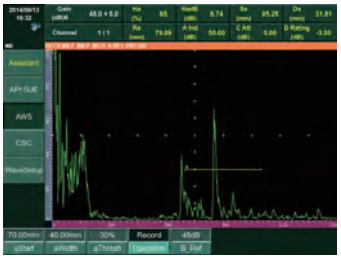


DAC

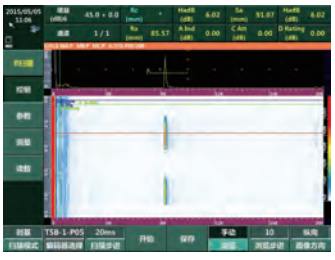


API 5UE

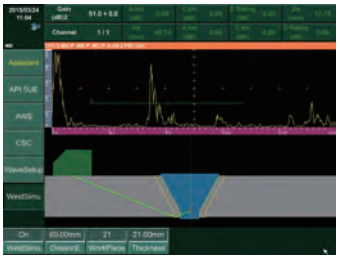
TCG



AWS

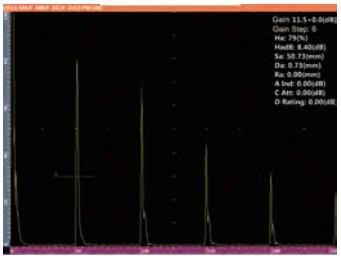


B Scan



Flat Weld Groove(RayTracing)

Crack Height Measurement

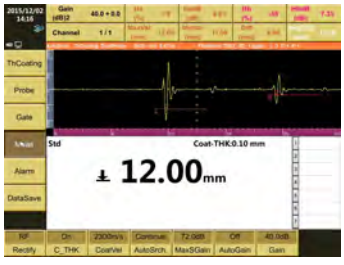


Full Screen A Scan

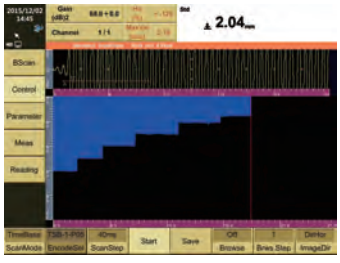
Thickness Measurement

Thickness Measurement

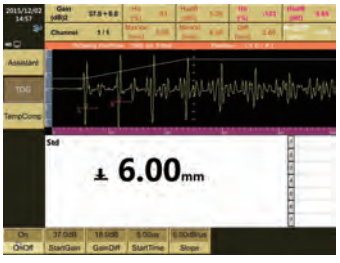
Advanced function to achieve CoatTHK, Echo to Echo, B-scan, V PATH, TDG, TEMP and MULTI-Layers Measurement.



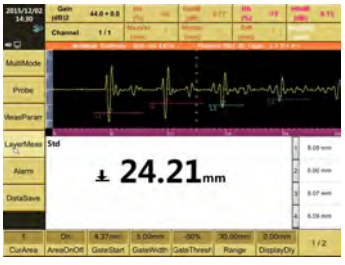
CoatTHK



B-scan



TDG

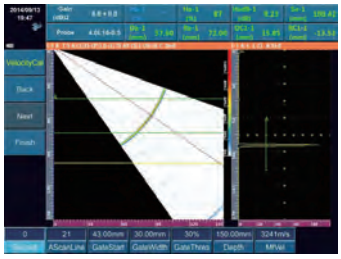


MULTI-Layers Measurement

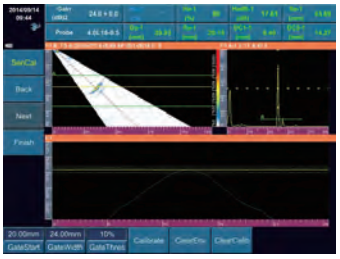
Phased Array

Calibration Wizard

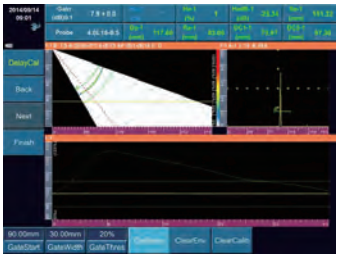
● To facilitate phased array operators, SyncScan carries calibration wizard with step-by-step guide to maximize inpection speed.



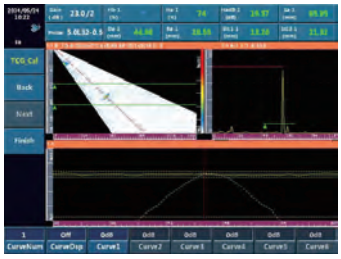
Velocity Calibration



Sensitivity Calibration

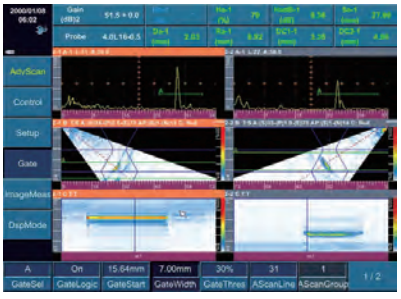


Delay Calibration



TCG Calibration

PA Groups Function



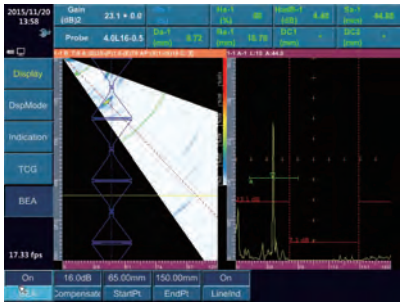
Two Groups of A+B+C Scans

Y Splitter for
two phased array probes

One phased array probe can be designated up to six groups for different inspection.
Multi groups of element and different angles can be applied for scanning at the same time, fully covering weld area and enhancing inspection efficiency.
Two phased array probes can work simultaneously with phased array groups function to inspect both sides of the weld, enhancing the inspection efficiency and speed.

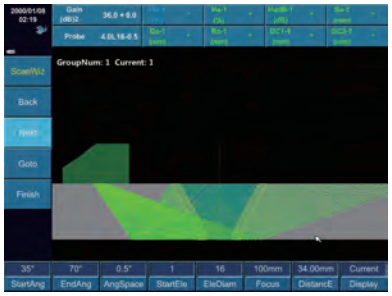
BEA Function(Backwall Echo Attenuator)

This function is to help set a gate over an area and adjust the gain for this area regardless of the global gain. It is very useful for inspection of Forgings and Castings with allowing independent gain control of the area under the gate with the BEA for backwall echo monitoring.

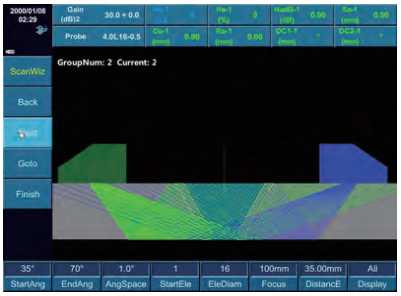


Phased Array

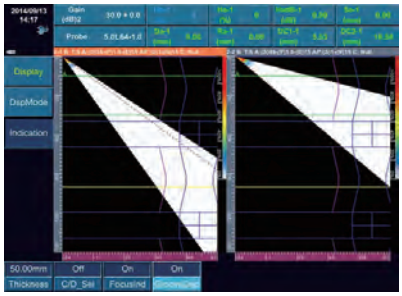
Flat Weld Groove(Flat Plate)



Beam Coverage Simulation(Single Probe)



Beam Coverage Simulation (Grouping)



Flat Weld Groove

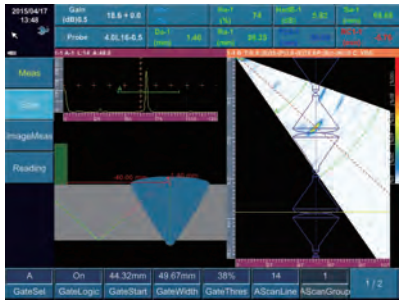
This function is to simulate flat plate work pieces geometry, including the beam coverage simulation and imaging parameter settings. With this function, it will be easy to analyze, locate flaw signals.

Flat Weld Solution

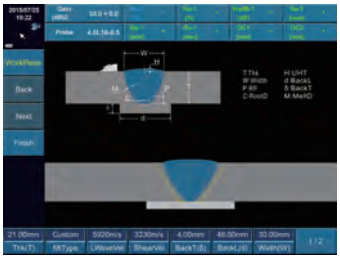
This solution is suitable for flat butt weld and pipe girth weld inspection.

- Automatically simulate various welds with different groove types to make simulation closer to the on-site weld shape.
- Professional wizard operation mode facilitates operators finish phased array setup
- Assisted positioning (RayTracing) flaw measurement and report generation functions are available.

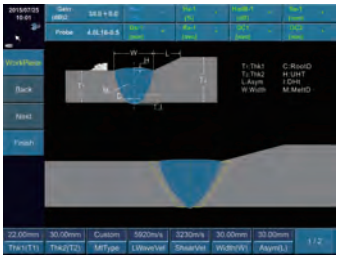
New Weld Type Selection



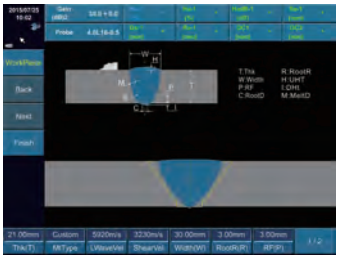
RayTracing (A+B+R scan)



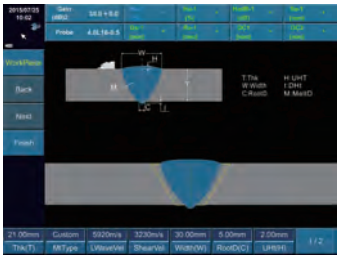
Y-weld with backing



Asymmetric Weld



U-Weld



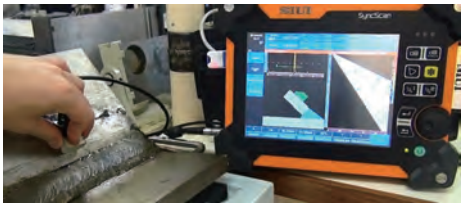
Single V-Weld

- Eight types of weld groove: V, Half V, Y, X, U, I, Y with backing, Asymmetric Welds.
- Quick setup of weld parameters: thickness, material type, groove width, root clearance, up/down reinforcement, fusion simulation, heat-affected zone, as well as workpiece edit, delete, add and rename.

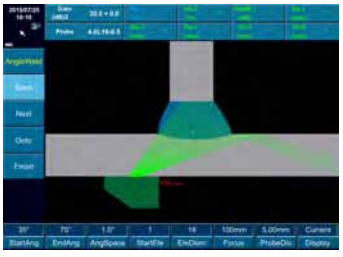
Phased Array

Angle Weld Solution

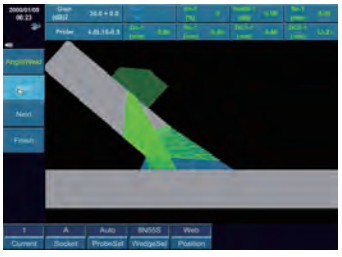
Suitable for angle welds in ocean platform and oil & gas steel structure.



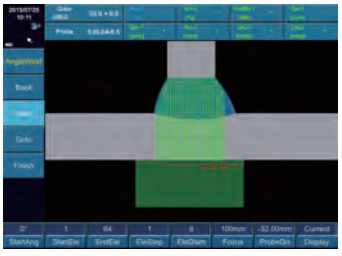
- Automatically simulate real angle weld shape based on parameters input.
- Simulate sound beam coverage in six different probe positions.
- When RayTracing function is on, the software can auto analyze and judge the workpiece flaw situation, record flaw image and measurement result, and generate test report.



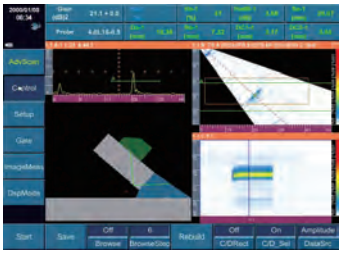
Flange Simulation



Web Simulation



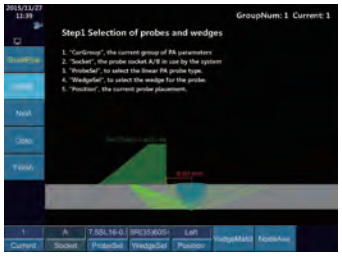
T-weld Simulation



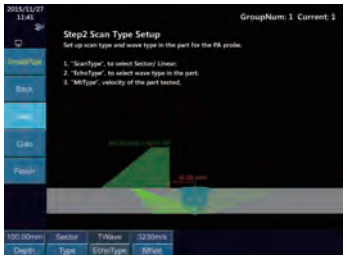
RayTracing (A+B+C+R scan)

Small Pipe Girth Weld Solution

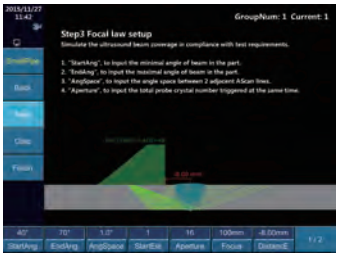
- This solution is suitable for testing welds of small diameter pipes with outside diameters ranging from 21-115mm (0.83-4.52 inch).
- By offering features of V-groove and Y-groove weld making, beam coverage simulation, as well as inserted wedge and link assembly guide table, the solution helps users to finish testing of small diameter pipes quickly.



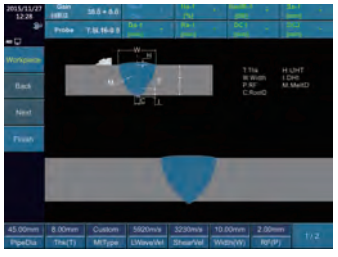
Selection of Probes and Wedges



Scan Type Setup

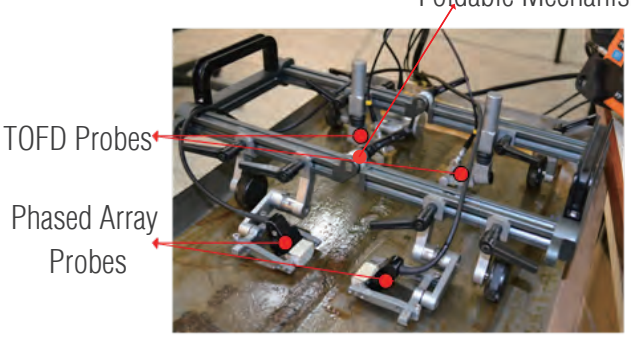


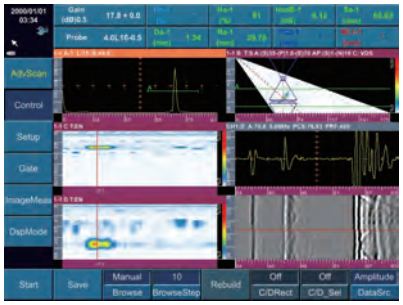
Focal Law Setup



Workpiece Setup

Simultaneous Inspection of PA & TOFD





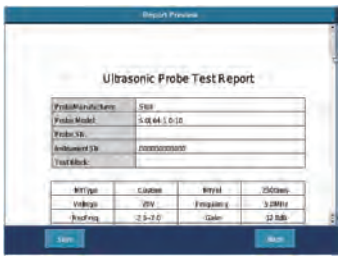
Simultaneous phased array and TOFD inspection can expand scanning coverage, decrease undetected rate.

Phased Array

PA Probe Element Testing

Probe Test Interface

Probe Test Result



Probe Test Report

Conforming to ASTM E2491 code, this solution achieves auto testing of phased array equipment for its element activity, so as to measure activity of all elements and acoustic energy uniformity of the phased array probe.

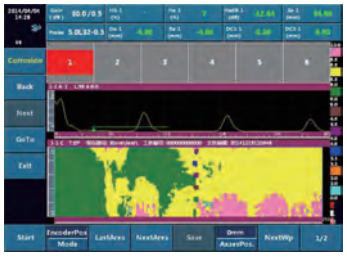
Data Source

C Scan In-Amplitude, showing echo amplitude

C Scan In-Depth, showing echo depth,
can be used for simple corrosion inspection.

Corrosion Solution

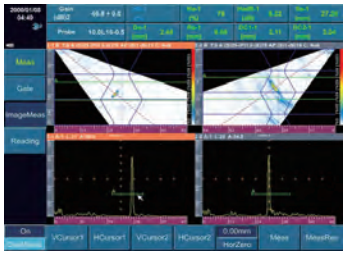
Chain Phased Array Crawler (XY axis)



Corrosion Solution

- Easy to work out scan plan for pipeline corrosion inspection.
- Step-by-step wizard can guide operators to finish setup easily and improve inspection speed.
- Different thickness will be displayed in different colors, making
- it easier to determine corrosion situation for pipe.
  Data analysis is available, for better understand the corrosion.

Image Measurement & Report Generation



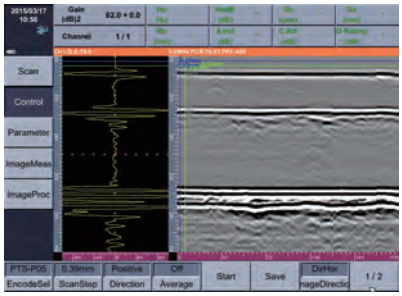
Flaws can be measured and analyzed

PDF test report can be generated on the SyncScan instrument.

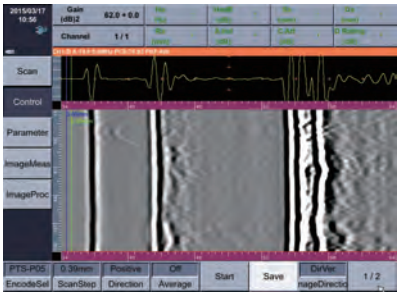
A-scan signal waveform and info (angle, south path, amplitude and depth) for any position on the scan figure can be displayed real time, and the operators may use two cross cursors to measure flaw length and height on the B/C/D scans.
The measurement result and flaw images can be saved for generating test report automatically.

TOFD

TOFD Image Direction

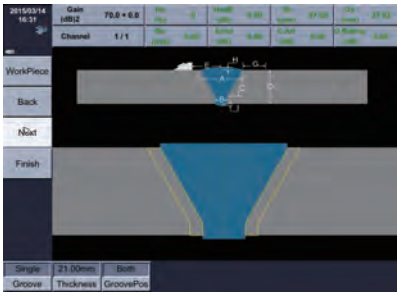


Horizontal TOFD image



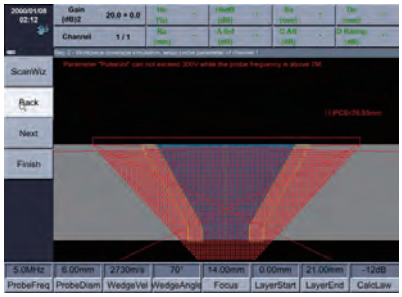
Longitudinal TOFD image

Workpiece Setup



Input weld parameters to set up the workpiece.

TOFD Wizard



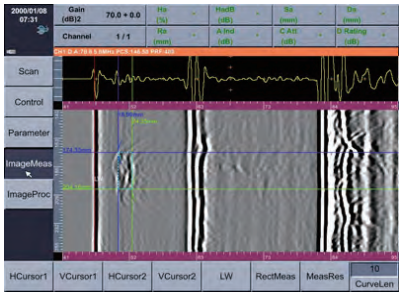
Beam Coverage Simulation

Scanning Parameter Setting

With step-by-step menu to guide operators to finish TOFD scanning process easily and improve inspection speed.

Step 1: Setup channel number for inspection.
Step 2: Workpiece coverage simulation.
Step 3: Setup wave parameter.
Step 4: Setup encoder parameter.
Step 5: Setup image scanning parameter.

TOFD Measurement

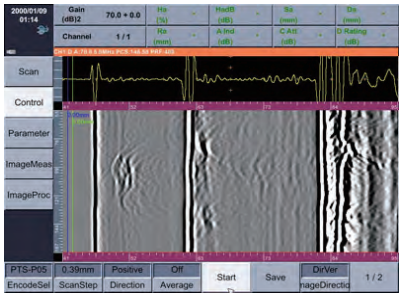


TOFD Measurement

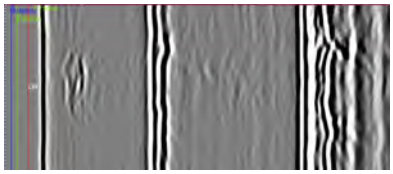
TOFD Measurement Result

SyncScan TOFD measurement is easy and useful. The flaw height and length can be measured by moving the reference line. The measurement result is clearly shown in the data table.

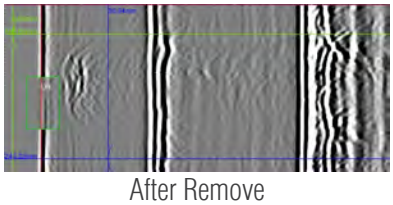
TOFD Image Processing



Raw TOFD Image



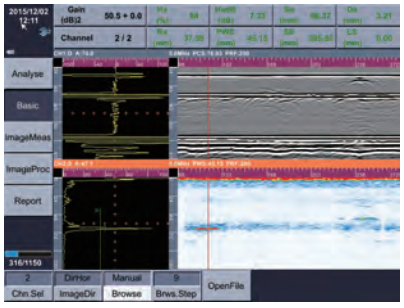
After SAFT



After Remove

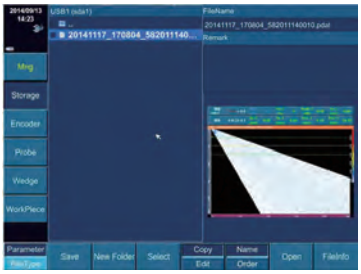
Perform straightening, filter, local zoom, contrast adjustment, gain post processing and SAFT on the TOFD image.

Blind Zone Inspection



TOFD+Conventional UT to inspect the blind zone area

Management

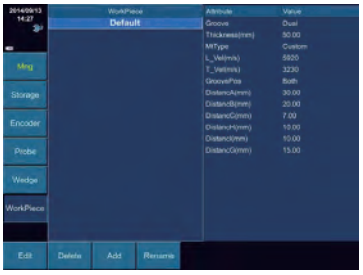


Storage Management

Encoder Management

Probe Management

Wedge Management

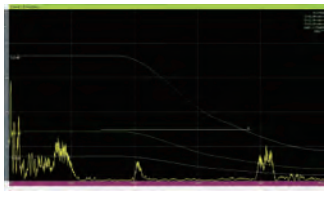


Work Piece Management

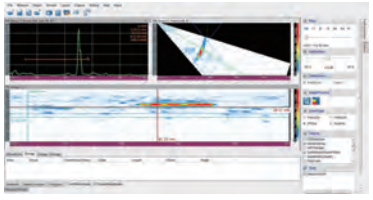
- Easy-to-use interface to make work piece, probe, wedge, encoder and storage managements more convenient.
- In the work piece management, the shape of the work piece is simulated and detailed parameters are listed for reference.
- The operators may manage probe and wedge parameters via probe and wedge management.
- Follow the wizard, the operators can finish encoder simple operation, calibration and test quickly.
- Parameters, screenshot and data can be easily managed in the storage management to enhance the inspection efficiency.

PC Software

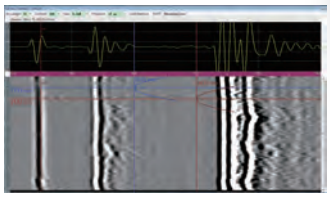
Main functions: Checking data file, Screen capture, Measuring data analysis. Generating test reports in word or excel format. Several files from corrosion solution can be opened and combined. Abundant report samples are available.



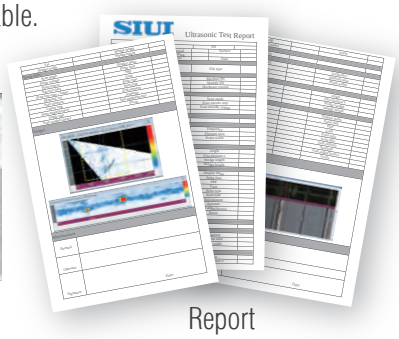
UT File Measurement



Phased Array File Measurement



TOFD File Measurement



Report

Application

SyncScan is designed to increase productivity in less demanding applications. It is suitable for inspection flaw position and size, which can be widely used for various detection demands, such as PA weld inspection, TOFD weld inspection, corrosion mapping, composite inspection, gas pressure welding on rail, pressure vessel inspection, stainless steel and PE pipe inspection...

Technical Specification for 16:64 PAUT and TOFD to achieve simultaneous inspection of PA & TOFD

	Conventional UT	Phased Array	TOFD	Thickness Measurement
System				
No. of Channel	1	16	1/2/4	——
Probe Connector	LEMO 00, 2 pcs	Tyco, 1 pc	LEMO 00, 2/4/8 pcs	——
Max. Supporting Elements	2	64	2-8	——
Pulser	Negative square	Bi-polar square	Negative square	Negative square
PRF	Adjustable 10-2000Hz, step: 20Hz	100Hz-10KHz, step:100Hz	Adjustable 10-2000Hz, step: 20Hz	200Hz
Pulse Voltage	50V~400V, min. step 1V	10-110V, min step 2V	50V~400V, min. step 1V	50-400V
Pulse Frequency	——	2-10MHz, step 0.5MHz	——	——
Pulse Energy	——	4 levels	——	——
Pulse Width	30-1000ns, step:10ns	——	30-1000ns, step:10ns	30-1000ns
Damping	25/75/200/1000Ω,4 levels	——	25/75/200/1000Ω,4 levels	——
Pulser Delay	——	0-20μs, resolution 5ns	——	——
Pulser Focusing	——	Single point focusing	——	——
Receiver				
Gain	0-110dB, step:0.5/2/6/12dB	0-80dB, step:0.1/0.5/2/6/12dB	0-110dB, step: 0.5/2/6/12dB	0-110dB, manually adjustable(0.5/2/6/12dB)/ auto(for auto-search or auto-gain)
Bandwidth	0.5-20MHz（-3dB）	0.7-20MHz (-3dB)	0.5-20MHz（-3dB）	0.5-20MHz
A/D Sampling Rate	170MHz/12bits	100MHz/12bits	170MHz/12bits	——
Sampling Point	1024, 16bit/ point	Adjustable 256/512/1024, 16bit/point	1024, 16bit/ point	——
Rectification	Positive/ Negative/ Full/ RF	Positive/ Negative/ Full/ Filter/ RF	RF	RF/ Full/ Positive/ Negative
Receiver Delay	——	0-20μs, resolution 2.5ns	——	——
Receiver Focusing	——	Max. range: 1008 foci per scan line	——	——
Filter	10 levels: 1-4/0.5-10/2-20/ 1/2.5/4/5/10/13/15MHz	6 levels: 0.7-4/2.5-7/4-8.5/7-10/ 9-15/0.7-20 MHz	6 levels: 0.5-5/0.5-10/ 3.5-10/0.5-15/ 5-15/0.5-20MHz	——
Reject	0-80%, step:1%	——	——	——
Scan				
Scan Type	A/B	A/S/L/C/D	A/B/D	——
Trigger Mode	——	Time-based/ Encoder	Encoder	——
Scan Length	——	⩾3m (with 16G SD card, encoder precision:0.5mm)	⩾90m (with 16G SD card, encoder precision:0.5mm, 4-ch TOFD simultaneously)	——
Focal Laws	——	512	——	——
Scan Angle Range	——	-89°~+89°, step 1°	——	——
Angle Spacing	——	0.1°-5°, step 0.1°	——	——
Line Average	——	——	4 levels, 1/2/4/8	——
Focus Position	——	6-500mm, step1mm	——	——
Focal Mode	——	Depth, Sound Path	——	——
Basic				
Range	0-15000mm, min. display range 5mm	0-1000mm, min. step: 0.01mm, min display range 3mm	0-15000mm, min. step:0.1mm	0.5-600mm (subject to probe, material, temperature and selected configuration), display range 5-1000mm
Material Velocity	500-15000m/s, min. step:1m/s	500-15000m/s, min. step:1m/s	500-15000m/s, min. step:1m/s	500-15000m/s, min.step:1m/s
Display Delay	0-1000mm, min. step: 0.01mm	0-1000mm, min. step: 0.01mm	0-1000mm, min. step: 0.01mm	0-1000mm, min. step: 0.01mm
Probe Zero	0-200us, min. step: 0.01us	——	0-200us, min. step: 0.01us	0-200us
Probe Flank	0-100mm, step: 0.01mm	——	0-100mm, step: 0.01mm	——
Wizard	DAC, AVG/ DGS, Angle calibration, Auto calibration (velocity, zero)	Scan wizard, velocity/ delay/sensitivity/ TCG calibration	PCS Calculation, Probe Zero Calibration, Ultrasound Parameter, Scan Wizard, Time Window	——
Calibration	Zero, Velocity, Angle	Zero, Velocity, Delay, Sensitivity, TCG	PCS, Wedge Delay, PCS/Depth, Time Window, Probe Zero	a. Fast zero point calibration with the built-in test block. b. User-defined calibration(zero point calibration/ zero point+ velocity calibration)

	Conventional UT	Phased Array	TOFD	Thickness Measurement
Basic				
Test Point Selection	Peak/ Flank/ J Flank/G Flank/ G Peak	Peak/ Flank/ J Flank/ G Flank/ G Peak	——	——
Measurement	Three gates: to measure echo amplitude, amplitude dB difference, sound path, Ra/ Da	Three gates for each A scan, max. 18 gates: to measure echo amplitude, sound path, Ra/ Da	Flaw height and length measurement.	Measurement Mode: Standard (R-B1, transmit pulse to the first echo.) All Measurements using Zero Crossing.
	Cursor: two cursors to measure horizontal and vertical position of B scan and distance between cursors (active when optional B scan function is available.).	Cursor: two cursors to measure horizontal and vertical position of B scan and distance between cursors on B/C/D scan.	Cursor: two cursors to measure horizontal and vertical position of B scan and distance between cursors (active when optional B scan function is available.).	Measurement Function: Standard/ minimum/ maximum/ average/ difference
Gate Mode	Normal, Tracing	Sound Path, Depth		Gate A is selected in standard measurement mode
Gate Start	Full range	Full range	——	0-1000mm, step is adjustable
Gate Width	Full range	Full range	——	1-1000mm, step is adjustable
Gate Thresh	10`90%, step: 1%	10`90%, step: 1%	——	10`90% or -10`-90%, step: 1%
Display Resolution	——	——	——	0.001/0.01/0.1 mm (0.0001/0.001/0.01 inch)
Display Error	——	——	——	0.80～9.99mm ± 0.05mm 10.00～99.99mm ± (1‰H + 0.04)mm 100.0～400.0mm ± 3‰H mm With TG5-10L probe, H is thickness of the detected material
Storage	——	——	——	Measurement files, data file, screen shot storage, recall and delete function and the storage is up to the SD card.
Display Mode	——	A, B, C, D, A+B, B+C, A+B+R, A+B+C+R...	——	A scan+ big reading/A scan+ data grid+ small reading/data grid+ big reading
Data Files	——	——	——	1D/2D/3D file format, measured value is recorded and displayed in grid table: record length and conversion mode is user-defined. Each data package includes measured value, basic parameter setup and A scan wave data.
Measurement				
Curve Function	DAC: Max. 6 lines&16 points for each line AVG/DGS	TCG: Max. 6 lines, max. 16 points for each line	——	——
Auxiliary Function	Coordinates switch (sound path/ depth/ horizontal), auto gain (single/ continuous), second leg color, wave compare, gate expansion, wave filling, peak envelope, auto freeze, Cineloop, screenshot	Auto gain: Single/ Continuous Auto Search: Search the highest echo amplitude scan line within gate range in B scan. BEA(Backwall Echo Attenuator)	——	Auto search (Off/On-Proper display range, gain and gate position can be adjusted automatically based on the measured waveform echo, which improves measurement efficiency.)/ freeze/ auto gain/ history reading bar/ last reading maintain
Alarm Signal	Signal and sound alarm: positive/ negative	Signal and sound alarm: positive/ negative	——	Upper and lower limit alarm (sound, signal and data color).
Display Measure Value	——	8 positions can be user-defined.	——	——
Data Analysis	——	Image mode switch, image gate dynamic reconstruction and report generation	LW/BW straightening/ removal, contrast adjust, gain adjust, zoom, color scale adjustment, test report generation,	Data file, measurement file, screenshot file can be played, analyzed and report generated on SuporUp software.

	Conventional UT	Phased Array	TOFD	Thickness Measurement
Measurement				
Tube Wall Thickness Measurement	——	——	——	With a TG5-10L probe, it can measure steel tube with diameter not less than 20mm and wall thickness not less than 2.0mm.
Measurement Times	——	——	——	4/8/16/32
Testing Index				
Time Base Linearity	≤0.5%	——	——	——
Vertical Linearity	≤3%	——	——	——
Amplitude Linearity	≤±2%	——	——	——
Attenuator Precision	20dB±1dB	——	——	——
Dynamic Range	⩾32dB	——	——	——
Software				
Optional Software	API AWS TCG B scan Flat Weld Groove CSC(Curved Surface Correction) Crack Height Measurement UT Probe Spectrum Analysis	PA Groups Flat Weld Groove Flat Weld Solution Angle Weld Solution Simultaneous Display of PAUT and TOFD Software C Scan In-Depth Corrosion Solution Small Pipe Girth Weld Solution Probe Element Testing	Can be upgraded to 2-ch TOFD Can be upgraded to 4-ch TOFD SAFT	CoatTHK Echo to Echo MULTI-Layers Measurement B Scan V PATH TDG TEMP

General Technical Specification	
Display Screen	8.4" high brightness TFT LCD, 800×600 pixels
Dimension (W×H×D)	284×220×90(mm)
Weight	3.65 kg with battery
Battery	Smart lithium battery, 1 pc (0.55kg)
Battery Capacity	7.5 Ah/pc, operation time more than 4 hours for PAUT, 5 hours for UT/TOFD.
External Power Supply for Adaptor	AC 100-240V 50Hz/60Hz
Adaptor Output	15V DC
Power	26VA for PAUT, 20VA for UT/TOFD
Data Storage	Standard SD card (16G)

General Technical Specification	
Input/Output	
USB Connector	2 pcs
Ethernet Connector	1 pc
Video Output	VGA port
Encoder Connector	1 pc (14-core)
Environment Tests	
Operation Temperature	-10℃-45℃
Storage Temperature	-20℃-60℃
IP Code	IP65

SIUI

Shantou Institute of Ultrasonic Instruments Co., Ltd.

Add: #77, Jinsha Road, Shantou 515041, Guangdong, China
Tel: +86-754-88250150 Fax: +86-754-88251499
E-mail: siui@siui.com Website: http://www.siui.com

CE

DCY2.781.EN.SyncScan CY/6C07