# SyncScan


## Minimize your cost for Phased Array & TOFD

SIUI

GSL
GLOBAL SUPPLY LOGISTIC E.I.R.L

# SyncScan

Latest ultrasonic flaw detector from SIUI, SyncScan incorporates the latest advancements in high-performance Phased Array and TOFD detection into one compact and durable 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 in two aspects:

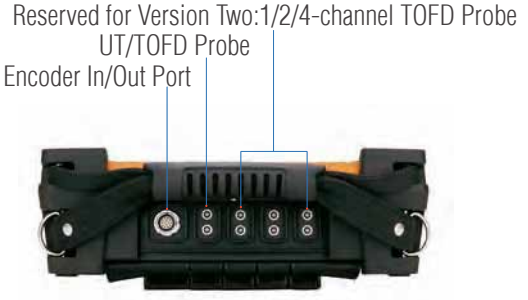
- Affordable price: SyncScan is a perfect choice for those who are looking for price-competitive products.
- Efficiency: For many people, Phased Array and TOFD inspection is very tricky and complicated. However, SyncScan smart wizard can make phased array and TOFD user-friendly. To facilitate new phased array or TOFD operators, SyncScan carries calibration wizard and scanning wizard with step-by-step menu to improve inpection speed.

## Superior Features

- IP rate: IP65
- Light Weight: 3.75 kg with battery
- Touch screen: 8.4" LCD with resolution 800×600 pixels
- Upgradeable from conventional UT to phased array or TOFD
- TOFD optional software: 1~4 channel TOFD for Selection
- Phased Array optional software: PA Groups (up to 6 groups)/ Flat Weld Groove/ C Scan In-Depth/ Corrosion Solution/Angle Weld/ Simultaneous Display of PAUT and TOFD Software

## Extendable connectors


Side View (Left)




Top View


Side View (Right)

## Compact and Durable

SyncScan is designed based on IP65 to work in the harshest industrial environment. The 8.4-inch touch screen can bring optimized effect for measurement and reading.

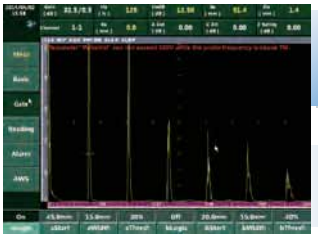
SyncScan is so compact (only 3.75kg, 90mm thickness) that it can be operated with only one hand for aloft and field work.


Touch Screen


*Specific functions are subject to final order.

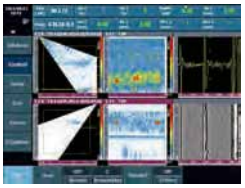
# Conventional UT

## Upgradeable from UT to Phased Array or TOFD

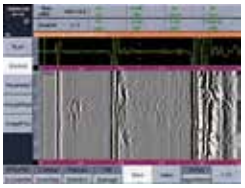


Conventional UT

**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.

| Inspection Basic Procedure | Before Inspection | During Inspection | After Inspection |
|---|---|---|---|
| | Assist testing process design | Assist flaw judgment | Assist flaw analysis |

Based on the on-site ultrasonic inspection basic procedure, SyncScan is designed to assist operators to better complete quality inspection.

## Conventional UT

- SyncScan carries many basic and advanced functions to make ultrasonic testing more convenient.

**Basic Functions:**

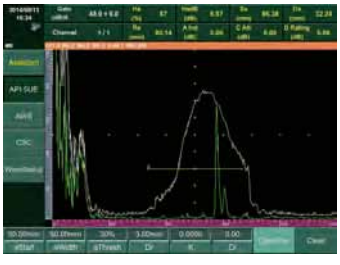
Velocity+Zero Calibration/ Angle Calibration/ DAC/ TCG/ AVG(DGS)/Full screen A scan/ Coordinates switch (sound path, depth, horizontal)/ Surface compensation(xx+xxdB)/ Auto freeze/ Second leg color/ Auto gain/ Wave compare/ Wave filling

**Advanced Functions:**

Most advanced UT functions including API, TCG, AWS, CSC, B Scan, Flat Weld Groove(RayTracing) are available as options.

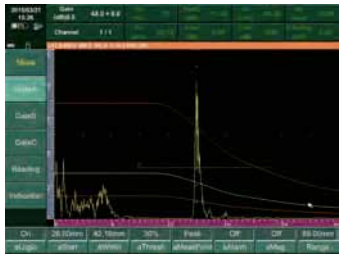
**Cineloop:** Up to 2 GB data A scan files can be saved and can be reviewed on SuporUp software.

### API 5UE

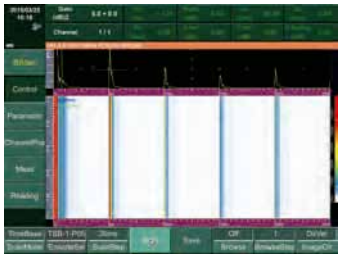


### AWS

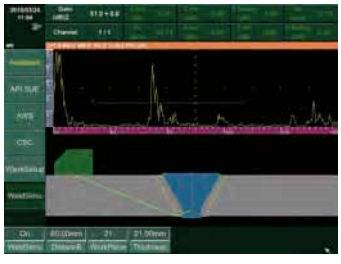
### DAC



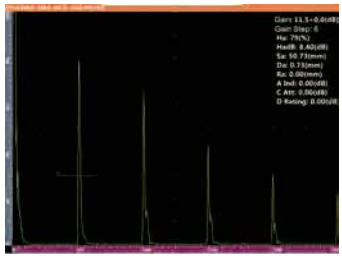
### B Scan



### Flat Weld Groove(RayTracing)



### Full Screen A Scan



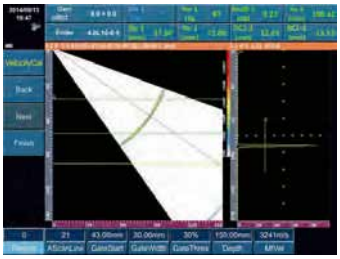
# Thickness Measurement

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

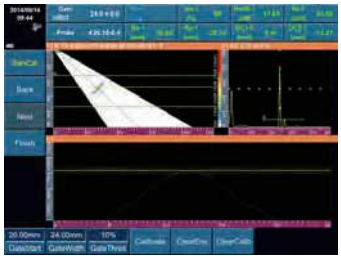
# Phased Array

## Calibration Wizard

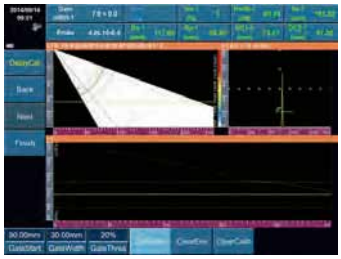
● To facilitate phased array operators, SyncScan carries calibration wizard with step-by-step menu to improve inpection speed.



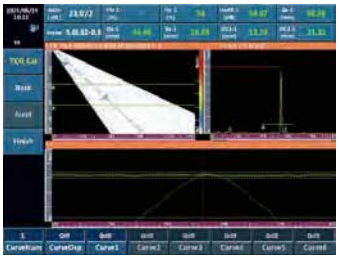
Velocity Calibration



Sensitivity Calibration



Delay Calibration



TCG Calibration

■ Calibration wizard is to calibrate key performance parameters of phased-array, including velocity, delay, sensitivity and TCG.

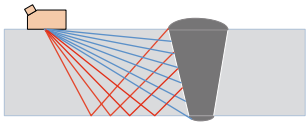
■ Step-by-step menu guides operators to calibrate velocity, delay, sensitivity and TCG.

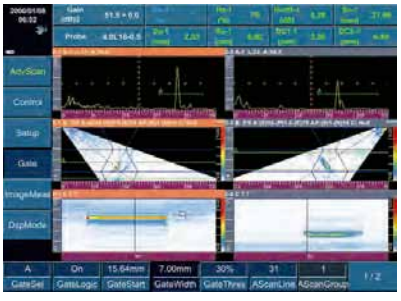
■ Smart wizard, which can guide operators to finish imaging setup easily and improve inspection speed.

---

● SyncScan is compatible with phased array groups function for weld inspection, corrosion solution for corrosion mapping and composite inspection, angle weld software for the angle weld of ocean platform and oil & gas steel structure, flat weld groove function. Furthermore, simultaneous inspection of phased array and TOFD can increase productivity in various inspection situations.

## PA Groups Function





Two Groups of A+B+C Scans

With SyncScan, one phased array probe can be designated up to six groups for different inspection.
For one phased array probe, multi groups of element and different angles can be applied for scanning at the same time, fully covering weld area and enhancing inspection efficiency.

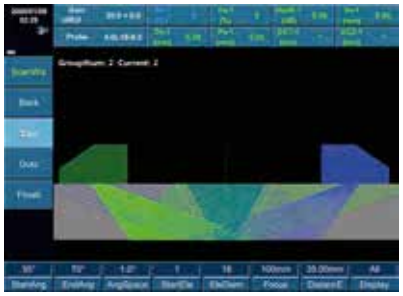
Y Splitter for
two phased array probes

Two phased array probes can work simultaneously with phased array groups function to inspect both sides of the weld, therefore enhancing the inspection efficiency and speed.

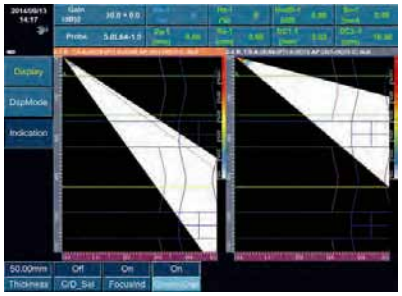
# Phased Array

## Flat Weld Groove Function

Beam Coverage Simulation(Single Probe)



Beam Coverage Simulation (Grouping)



Flat Weld Groove

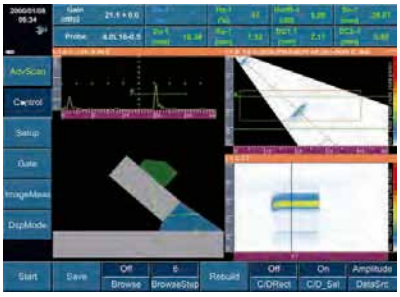
This function is to complete testing process design for the specific testing of work pieces, including the beam coverage simulation and phased-array imaging parameter settings. With this function, operators will find it easy to analyze, locate flaw signals and make sure each part of the test pieces meet the industrial welding standards.

## Angle Weld Solution

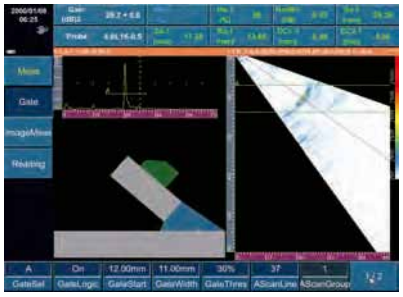
Angle Weld software is suitable for the angle weld of ocean platform and oil & gas steel structure.

Angle Weld

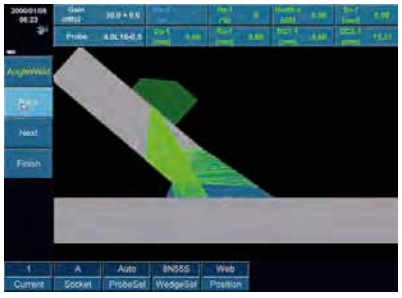
- This software can automatically simulate the real angle weld shape based on few parameters input.
- User-friendly angle weld wizard can simulate sound beam coverage in six different probe positions to satisfy various onsite applications.
- When RayTracing testing function is on, the software can auto analyze and judge the workpiece flaw situation, record flaw image and measurement result, and then generate the report.



RayTracing (A+B+C+R scan)

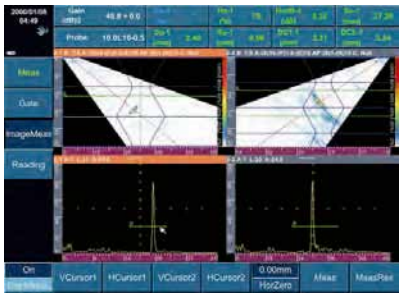


RayTracing (A+B+R scan)



Web Simulation

## Image Measurement & Report Generation



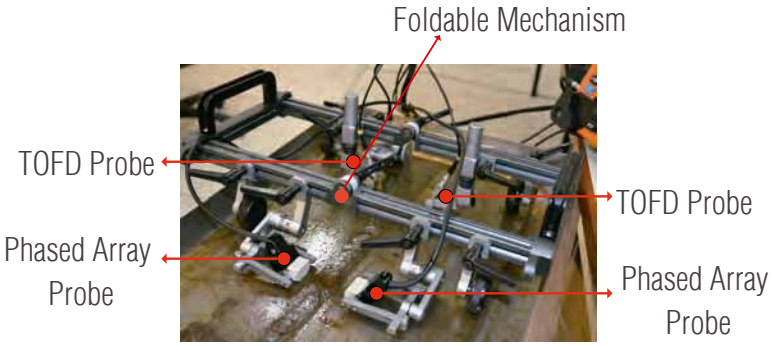
Two Groups Measurement

Two Groups Measurement Result

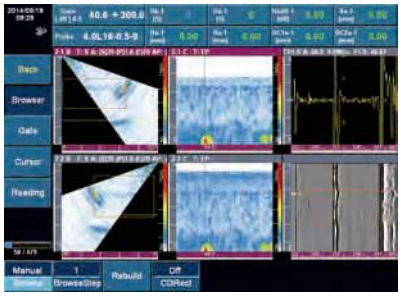
- Flaws can be measured and analyzed;
- A PDF file type report can be generated on the SyncScan main unit.

# Phased Array

## Simultaneous Inspection of PA & TOFD




Foldable phased array and TOFD crawler



Simultaneous display of phased array and TOFD

Simultaneous display of phased array and TOFD function can expand scanning coverage, decrease undetected rate and provide multiple detection methods.

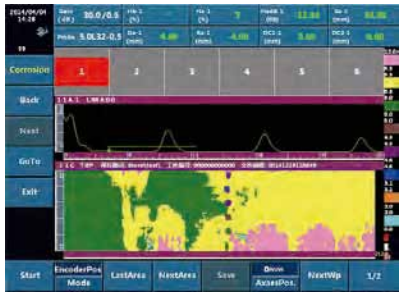
## Data Source


C Scan In-Amplitude, showing acho amplitude


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

## Corrosion Solution

Chain Phased Array Crawler (XY axis)

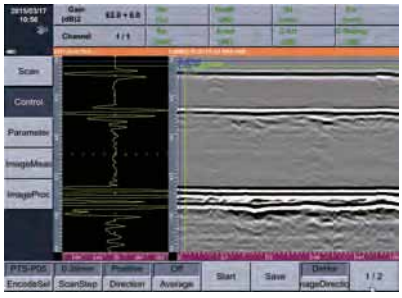


Corrosion Solution Image

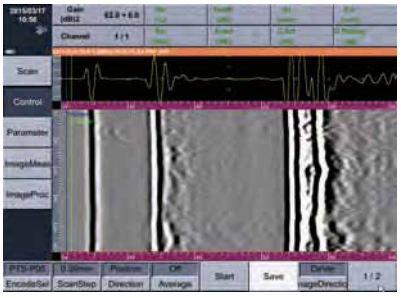
- Easy to work out scan plan for pipeline corrosion inspection.
- Step-by-step wizard can guide operators to finish setup easily and improve inspection speed.
- Different thickness will be displayed in different colors, making it easier to determine corrosion situation for pipe.
- Data analysis is available,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

# TOFD

## TOFD Image Direction

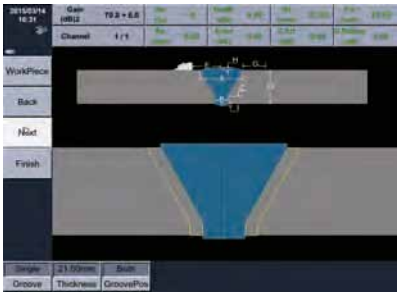


Horizontal TOFD image



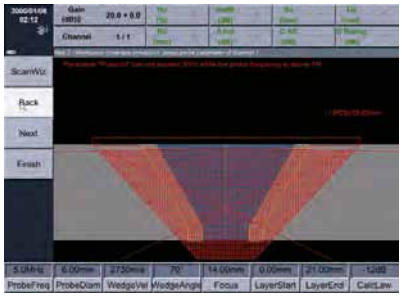
Longitudinal TOFD image

## Workpiece Setup

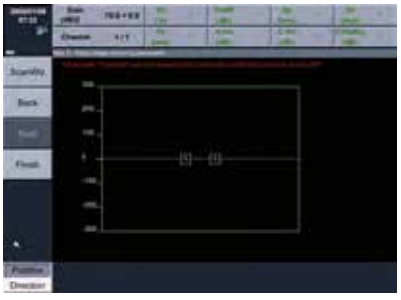


Input weld parameters to set up the workpiece.

## TOFD Wizard



Beam Coverage Simulation

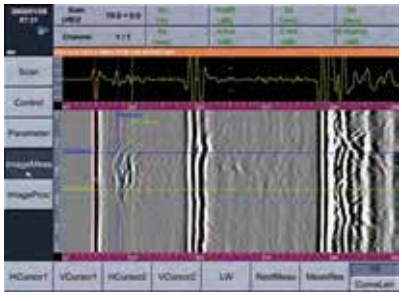


Scanning Parameter Setting

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

Step 1: Setup channel num 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

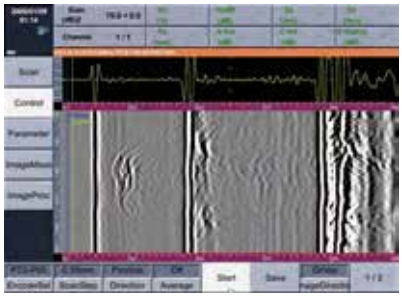


TOFD Measurement

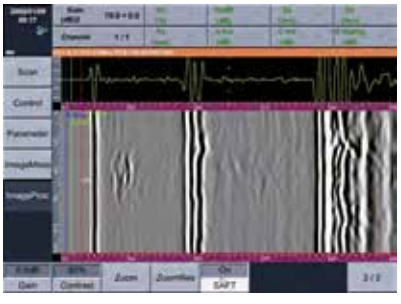
TOFD Measurement Result

SyncScan TOFD measurement is easy and useful, only moving the reference line can measure the flaw height and length. The measurement result is clearly shown in the data table.

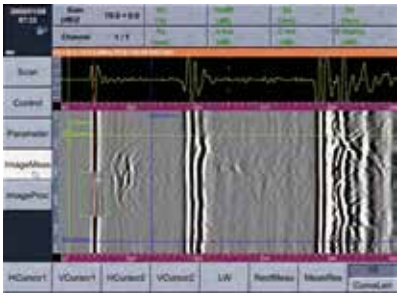
## TOFD Image Processing



Raw TOFD Image



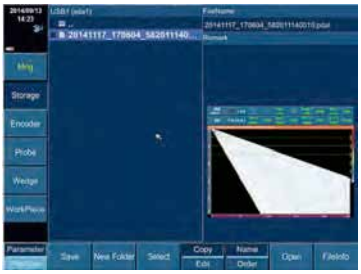
After SAFT function



After Remove function

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

## Management

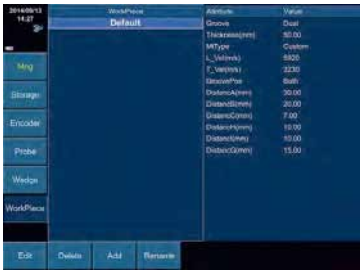


Storage Management

Encoder Management

Probe Management

Wedge Management

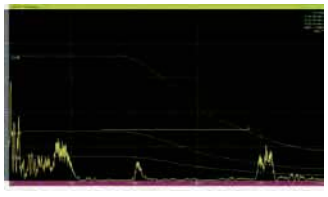


Work Piece Management

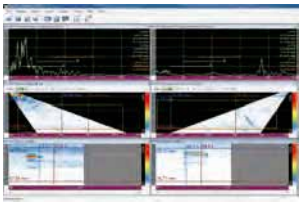
- Easy-to-use interface to make work piece, probe, wedge, encoder and storage managements more convenient.
- In the work piece management, the shape of the work piece is simulated and detailed parameters are listed for reference.
- The operators may manage probe and wedge parameters via probe and wedge 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-based Software

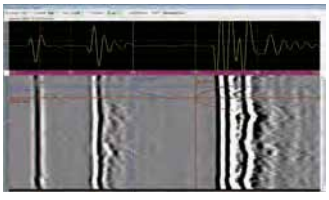
Main functions: Checking data file, Screen capture, Measuring data analysis. Generating measurement reports. Several files from corrosion solution can be opened and combined.  Abundant report samples are available.



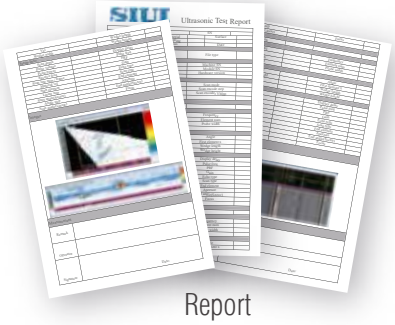
UT File Measurement



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...

# General Technical Specification

| General Technical Specification | |
|---|---|
| Display Screen | 8.4" high brightness TFT LCD, 800×600 |
| Dimension (W×H×D) | 284 mm×220 mm×90 mm |
| Weight | 3.75 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 | AC 100-240V 50Hz/60Hz |
| Adaptor Output | 15V DC |
| Power | 20VA |
| 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) |
| WIFI | 1pc, Build-in |
| **Environment Tests** | |
| Operation Temperature | -10℃-45℃ |
| Storage Temperature | -20℃-60℃ |
| IP Code | IP65 |

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

| | Conventional UT | Phased Array | TOFD |
|---|---|---|---|
| **System** | | | |
| No. of Channel | 1 | 16 | 1/2/4 |
| Probe Connector | LEMO 00, 2 pcs | Tyco, 1 pc | LEMO 00 (same connector as conventional UT) |
| Max. Supporting Elements | 2 | 64 | 2-8 |
| Pulser | Negative square | Bi-polar square | Negative square |
| PRF | Adjustable 20-2000Hz, step: 20Hz | 100Hz-20KHz, step:100Hz | Adjustable 20-2000Hz, step: 20Hz |
| Pulse Voltage | 50V~500V, min. step 1V | 10-110V, min step 2V | 50V~500V, min. step 1V |
| Pulse Frequency | —— | 2-10MHz, step 0.5MHz | —— |
| Pulse Energy | —— | 4 levels | —— |
| Pulse Width | 30-1000ns, step:10ns | —— | 30-1000ns, step:10ns |
| Damping | 25/75/200/1000 Ω ,4 levels | —— | 25/75/200/1000 Ω ,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 |
| Bandwidth | 0.5-20MHz（-3dB） | 0.7-20MHz (-3dB) | 0.5-20MHz（-3dB） |
| A/D Sampling Rate | 170MHz | 100MHz | 170MHz |
| Rectification | Positive/ Negative/ Full/ RF | Positive/ Negative/ Full/ Filter | RF |
| Receiver Delay | —— | 0-20μs, resolution 2.5ns | —— |
| Receiver Focusing | —— | Max. range: 1008 foci per scan line | —— |
| Filter | Digital: 10 levels 1-4/0.5-10/2-20/1/2.5/4/5/10/13/15MHz Analog: 4 levels 3/5/10/Full MHz | 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% | —— | —— |

# General Technical Specification

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

| | Conventional UT | Phased Array | TOFD |
|---|---|---|---|
| **Scan** | | | |
| Scan Type | A/B | A/S/L/C/D | A/ TOFD |
| Trigger Mode | —— | Time-based/ Encoder | Encoder |
| Scan Length | —— | Max.3m<br>(encoder precision:0.5mm) | Max.90m<br>(encoder precision:0.5mm, 4-ch TOFD working simultaneously) |
| Scan Line Number | —— | Max.512 lines | —— |
| 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 | —— |
| **Calibration** | | | |
| Range | 0-15000mm, min. display range is 5mm. | 0-1000mm, min. step: 0.01mm | 0-15000mm, min. step:0.1mm |
| Material Velocity | 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 |
| Probe Delay | 0-200us, min. step: 0.01us | —— | 0-200us, min. step: 0.01us |
| Probe Flank | 0-100mm, step: 0.01mm | —— | 0-100mm, step: 0.01mm |
| Wizard | DAC, AVG/ DGS, Angle calibration, auto calibration | Scan wizard,<br>velocity/ delay/<br>sensitivity/ TCG calibration | TOFD |
| Auto Calibration | Zero, Velocity | Zero, Velocity, Delay, Sensitivity, TCG | —— |
| Test Point Selection | Peak/ Flank/ J Flank | Peak/ Flank/ J Flank | —— |
| Measurement | Three gates: to measure echo amplitude, amplitude dB difference, sound path, horizontal distance, vertical distance | Three gates: to measure echo amplitude, sound path, horizontal distance, vertical distance.<br>Two measurement cursors: to measure horizontal & vertical position and distance between cursors. | Flaw height and length measurement. |
| Gate Start | Full range | Full range | —— |
| Gate Width | Full range | Full range | —— |
| Gate Thresh | 10-90%, step: 1% | 10-90%, step: 1% | —— |

# General Technical Specification

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

| | Conventional UT | Phased Array | TOFD |
|---|---|---|---|
| **Measurement** | | | |
| Curve Function | DAC: Max. 6 lines;<br>AVG/DGS | TCG: Max. 6 lines; | —— |
| Auxiliary Function | Coordinates switch (sound path/ depth/ horizontal), auto gain(Single and Multiple 40~100%, step:10%), second leg color, wave compare, gate expansion, wave filling, auto freeze. | Auto gain | —— |
| Alarm Signal | Signal and sound alarm: positive/ negative | Signal and sound alarm: positive/ negative | —— |
| Display Measure Value | —— | 8 positions can be user-defined. | —— |
| Data Analysis | —— | Image mode switch and image gate dynamic reconstruction | LW/BW straightening, LW/BW removal, contrast adjust, gain adjust, zoom |
| **Testing Index** | | | |
| Time Base Linearity | ≤0.5% | —— | —— |
| Vertical Linearity | ≤3% | —— | —— |
| Amplitude Linearity | ≤±2% | —— | —— |
| Attenuator Precision | 20dB±1dB | —— | —— |
| Dynamic Range | ⩾32dB | —— | —— |
| **Software** | | | |
| Optional Software | API | PA Groups | Can be upgraded to 2-ch TOFD |
| | AWS | Flat Weld Groove | Can be upgraded to 4-ch TOFD |
| | TCG | Angle Weld Solution | Can be upgraded to 4-ch TOFD |
| | B scan | Simultaneous Display of PAUT and TOFD | SAFT |
| | Flat Weld Groove | C Scan In-Depth | —— |
| | CSC(Curved Surface Correction) | Corrosion Solution | —— |