Mikrosize®

UT-150
Ultrasonic Flaw Detector



Contact us

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Feature and Application

The UT-150 ultrasonic flaw detector is a portable industrial non-destructive testing device. Built on an ARM+FPGA hardware architecture, it features a 5.7-inch HD IPS color display, IP65 protection rating, a lightweight body of only 1.13 kg, and up to 12 hours of battery life. The instrument covers a detection range of 0–15 meters for steel components and is equipped with professional inspection modules including DAC/AVG curves, weld cross-section display, B-scan imaging, and crack height measurement. It has built-in national standards for multiple industries and AWS inspection standards. It supports automatic probe calibration and a wide gain adjustment range of 110 dB, and can store 500 channel setups and 1,000 PDF inspection reports, along with video recording and screenshot archiving functions. It is suitable for defect detection of workpieces in boilers, steel structures, rail transit, metallurgy, petrochemical and other industries, delivering stable accuracy and intelligent operation to meet multi-scenario non-destructive testing requirements in both laboratory and outdoor field environments.

Product Feature

- Ergonomic housing, water- and oil-resistant, IP65-rated; high-transparency, wear-resistant and scratch-resistant glass panel; rubber anti-slip protective boot; one-handed grip; net weight only 1.13 kg; dimensions 230 × 157 × 52 mm.
- Dual-damping swivel stand for multi-angle inspection indoors and outdoors; equipped with hand strap and anti-slip pad; portable and durable.
- 5.7-inch IPS full-color LCD, 640 × 480 resolution, 60 Hz refresh rate, wide viewing angle and visible under strong light; brightness continuously adjustable from 20% to 100%; 4 selectable UI color schemes.
- Waveform visualization: supports waveform fill, peak marking, echo coding (distinguishing 1st–9th reflection echoes), independent gate color change, and gate widening/zooming for detail display; provides two display modes: echo envelope and peak memory.
- Built-in high-capacity lithium battery, continuous operation ≥ 12 h; DC 9 V power supply; supports direct plug-in adapter for use while charging.
- Dual USB ports: USB storage (USB flash drive) and USB data communication, USB 2.0 high-speed transmission; supports BNC/LEMO dual-type probe sockets (separate T transmit / R receive).
- Built-in local storage: 500 inspection channels and 1,000 inspection reports; data retained after power failure.
- Video recording storage: internal memory stores up to 10 recordings, maximum 5 minutes each (30 fps); USB flash drive recording has no duration or quantity limit.







Feature and Application

Product Application

- Used for butt weld inspection in factory buildings and bridges; DAC curves are used to identify lack of penetration and cracks, and the weld diagram enables precise defect location.
- Compatible with JB/T 4730 standard; detects fatigue cracks in tank shell plates and nozzles; supports curved-surface correction for inspection of cylindrical shell workpieces.
- Rail transit inspection: detects rail parent metal and internal porosity and inclusions in rail welds; the portable body is suitable for outdoor field work, and long battery life supports all-day inspection tours.
- Detects white spots and laminations in castings, forgings and shafts; the AVG curve can automatically convert defect indications into equivalent aperture size.
- For oil and gas transmission pipelines: wall-thickness corrosion and girth weld defect screening; supports video recording and PDF reports for retaining inspection records for filing.

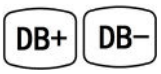
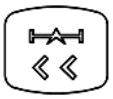
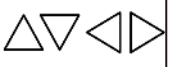


Product Detail



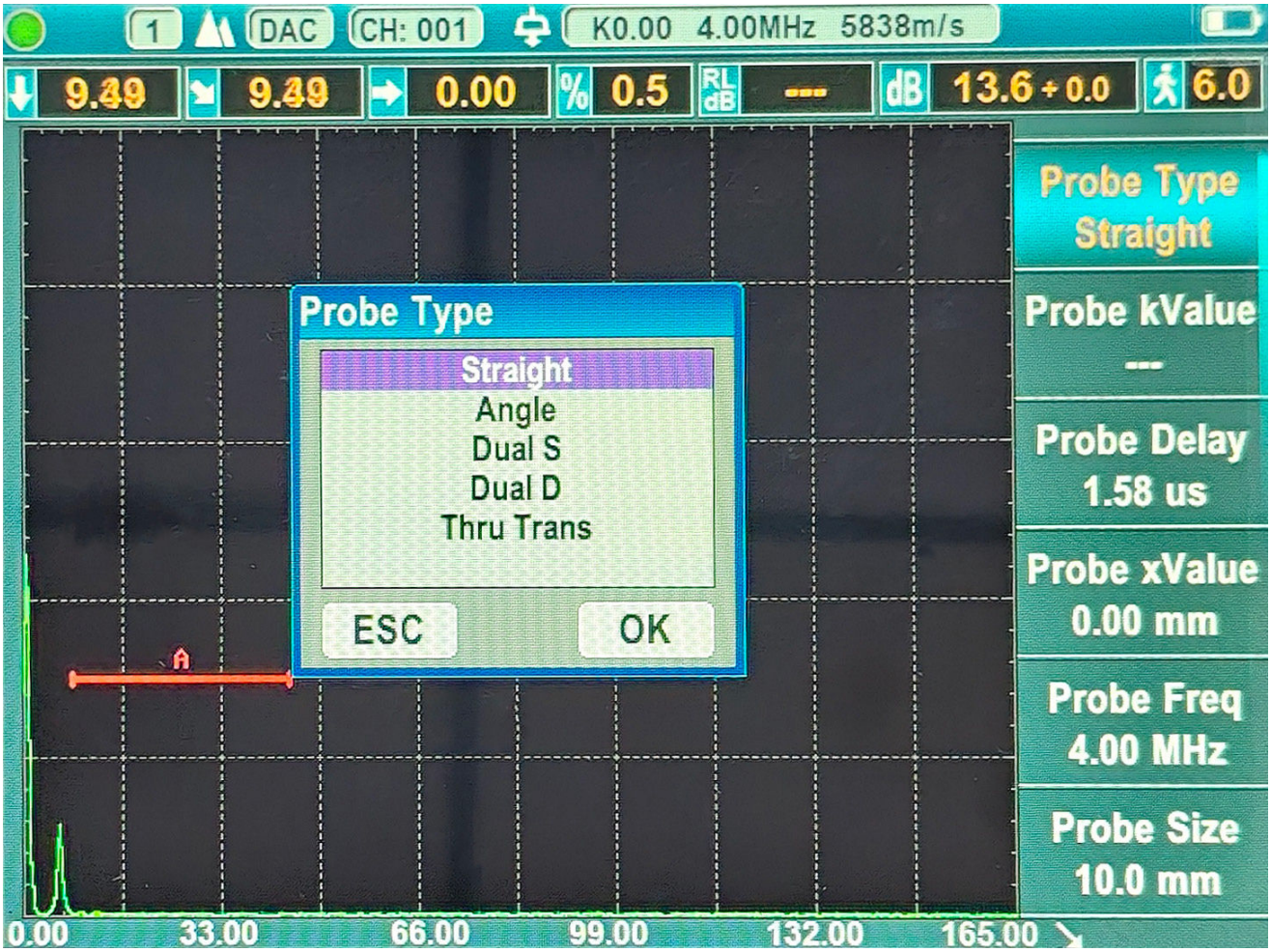
1. Hand Strap **2. Combination Keypad** **3. Swivel Stand**
4. 5.7-inch LCD Screen **5. Shortcut keys** **6. Digital rotary encoder knob**
7. Probe Connector **8. Power input connector** **9. USB storage Port**
10. USB Communication Socket **11. Reset Button**

Key Functions

	**Power**	Instrument power key; press and hold for 2 seconds to power on/off.		**Auto Gain**	Shortcut key: automatic gain control (AGC).
	**Basic Settings**	Shortcut key; enters the “Basic” function group.		**Step**	Shortcut key: minimum gain adjustment step/increment.
	**Probe Settings**	Shortcut key; enters the “Probe” function group.		**Freeze**	Shortcut key: screen freeze.
	**Screenshot /Recording**	Single press: take a screenshot; Fn + this key: enters the “Recording” function group.		**Freeze**	Shortcut key: enter the menu page. Long press to switch language.
	**DAC /AVG**	Single press: enters the “DAC” function group; press again to switch to the “AVG” function group.		**Gain**	Shortcut key: increase/decrease gain.
	**Gate Raise / Move Left**	Single gate: raise the gate. Dual gate: raise Gate A; Fn + this key: raise Gate B.		**Cancel**	Cancel key. On the main page, toggles full-screen display.
	**Gate Lower /Move Right**	Single gate: lower the gate. Dual gate: lower Gate A; Fn + this key: lower Gate B.		**OK / Confirm**	Confirm key.
	**Channel Save/ Recall**	Single press: save the channel; Fn + this key: recall the channel.		**Second Function (Fn)**	Second function key. The screen prompts “Fn”; Fn + Power key: firmware/program upgrade.
	**Report Save /View**	Single press: save the report; Fn + this key: view the report.		**Direction**	Up/Down/Left/Right arrow keys. On the main page, the Left/Right keys adjust gate width.
	**Gate Widening**	Shortcut key; widens the gate.		**Increment/ Decrement & Confirm**	Move gate position; modify parameters, etc.
	**Peak / Envelope**	Single press: displays the “Echo Envelope” function; press again to switch to the “Peak Memory” function.			

Software Function

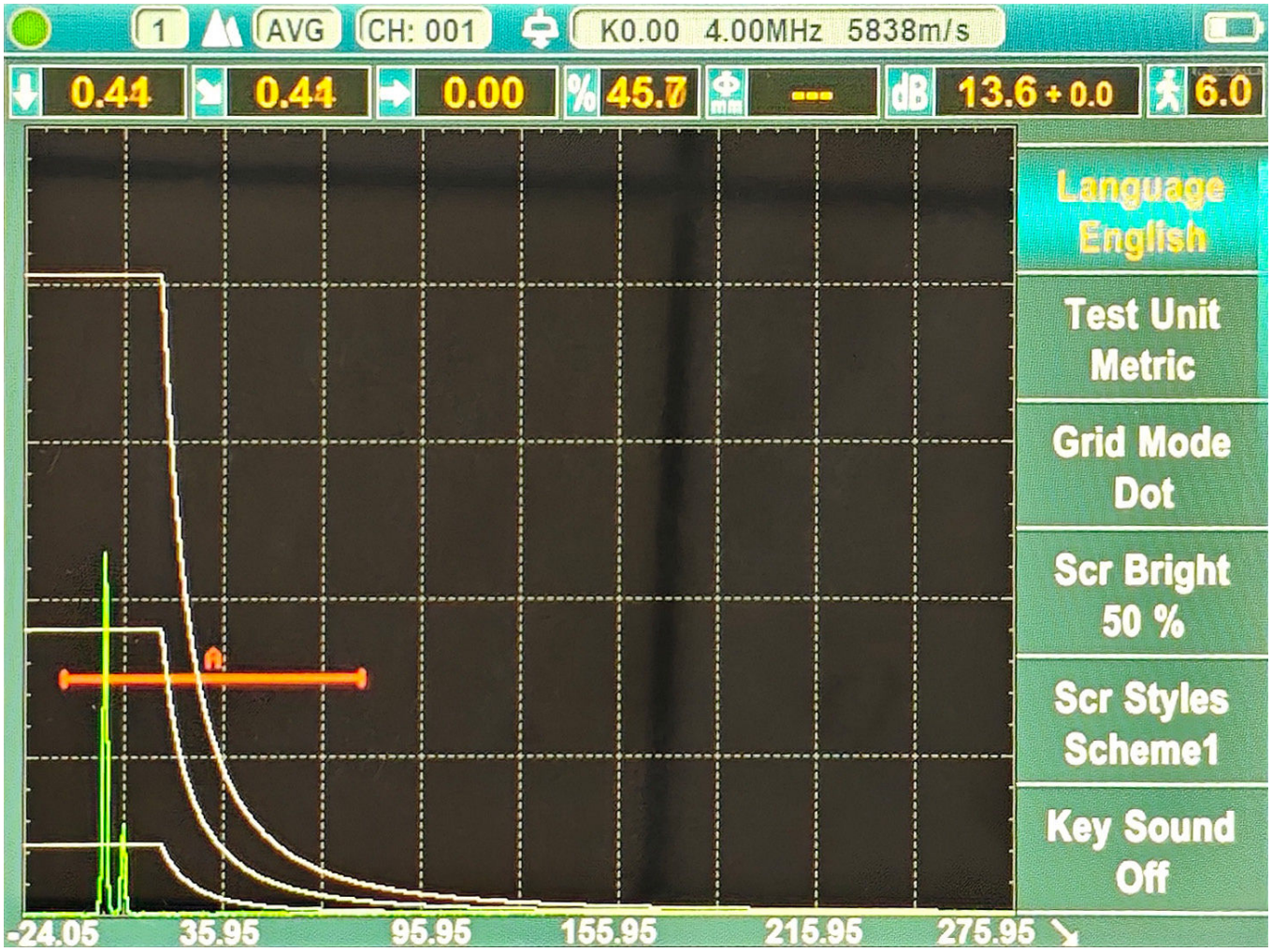
DAC (Distance–Amplitude Curve)



- Built-in more than ten sets of national standards, including GB/T 11345, NB/T 47013, SY/T 4109, etc., and supports user-defined Custom standards.
- No limit on the number of calibration points; automatically generates the reference/base curve plus the Evaluation Line (EL), Quantitative/Sizing Line (SL), and Rejection Line (RL); the curves automatically update/link with gain and sound path.
- Supports adding/deleting/moving calibration points and surface compensation settings; defects are displayed directly as relative equivalent dB values.

Software Function

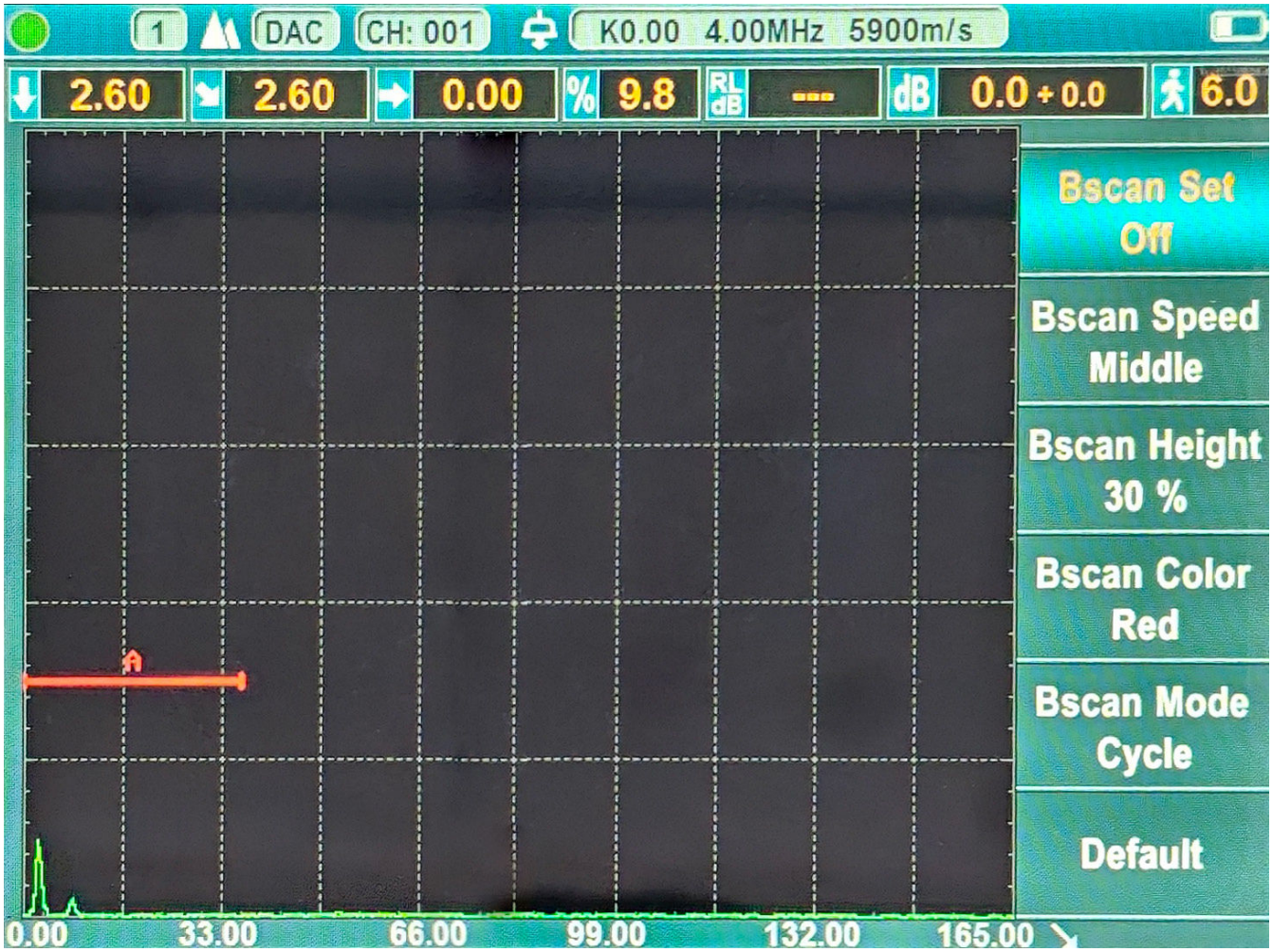
AVG (Distance–Gain–Size) Equivalent Curves



- Compatible with three types of reflectors — flat-bottom hole (FBH), large flat bottom, and short transverse hole — and automatically generates three AVG equivalent curves: upper, middle, and lower.
- Displays the defect equivalent aperture diameter Φ in mm in real time on screen; automatic theoretical correction at three times the near-field distance; supports curve editing and compensation gain.

Software Function

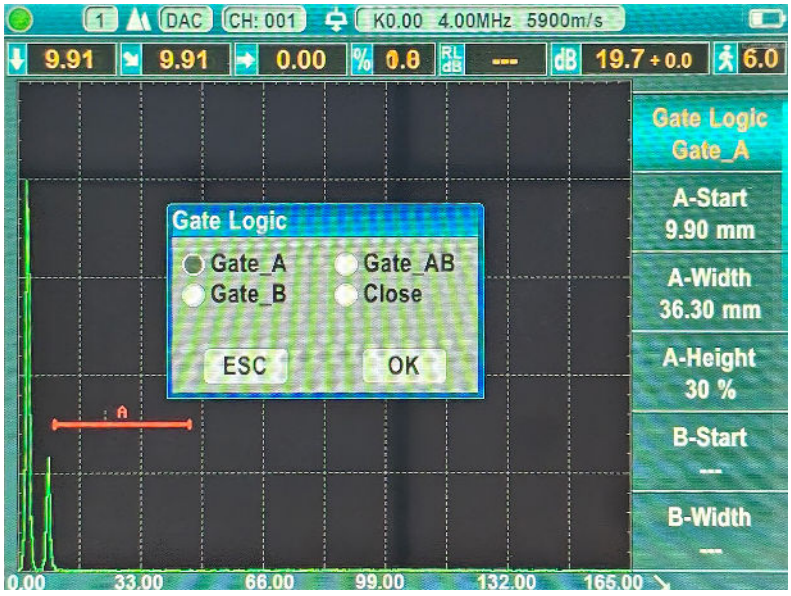
Professional Weld Inspection Support Functions

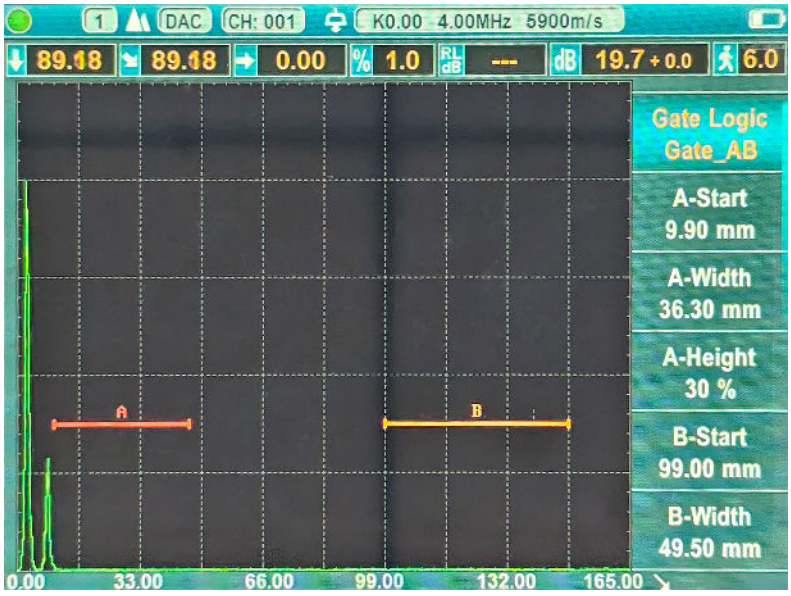


- Weld cross-section diagram: allows user-defined V-groove and other groove types, work-piece thickness, and probe offset distance; visually displays the defect position in the weld cross-section in 2D; supports pan and zoom viewing.
- AWS D1.1 (US standard) automatic rating — no manual conversion required; tip diffraction method for automatic crack height measurement.
- B-scan color tomographic imaging: visually displays defect morphology in the workpiece cross-section; adjustable scan speed, height, and color; supports single and continuous scanning.

Software Function

Gate Alarm and Measurement System

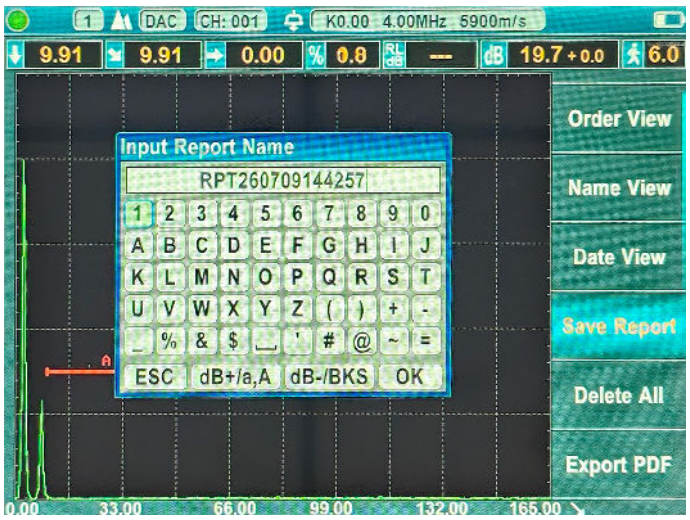




- Dual independent gates A/B, supporting single-gate and dual-gate reading modes; gate start/width/height are fully adjustable (gate height 5%–90%).
- Two trigger modes: peak trigger (peak echo reading) and edge trigger (leading-edge reading); echo-entry and loss-of-echo dual alarms with synchronized red LED and buzzer indication.
- Real-time automatic calculation of defect parameters: sound path, vertical depth, horizontal distance, echo amplitude, and equivalent dB/aperture size; peak memory locks the maximum defect echo.

Software Function

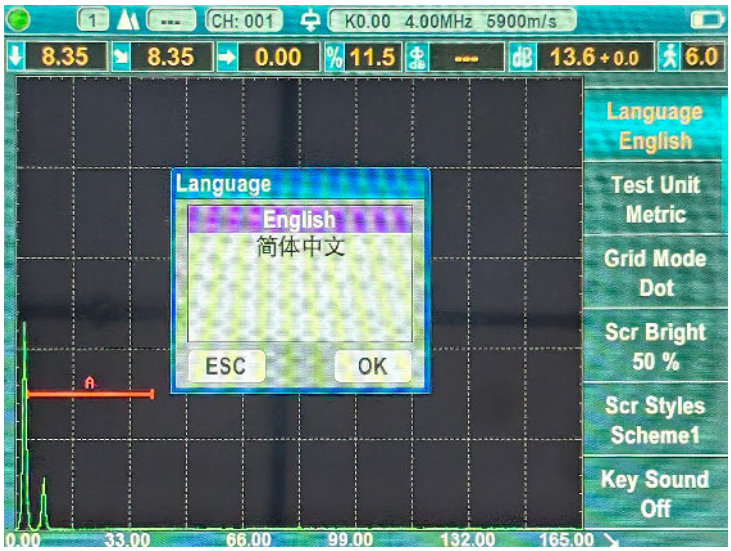
Data Recording, Export and Output Functions

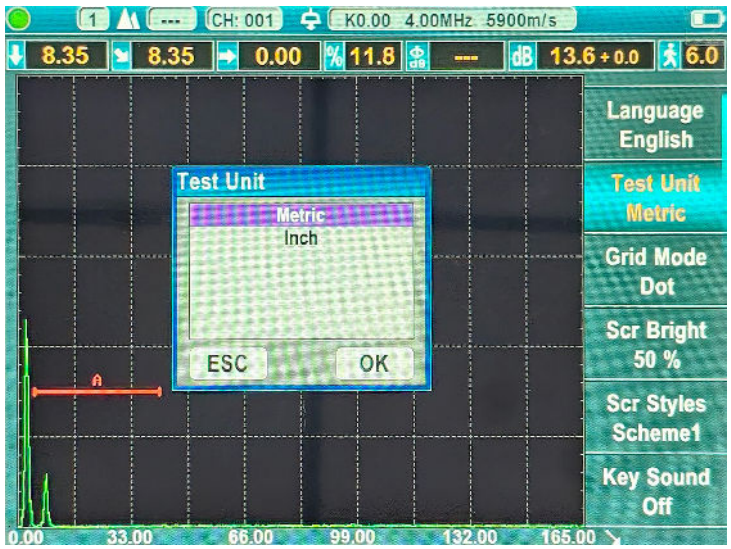


- Real-time screenshot: saves color/grayscale BMP images to a USB flash drive, with one-touch capture of the flaw detection waveform display.
- PDF inspection report: standardized PDF reports are generated directly on the instrument and exported via USB flash drive; they can be opened and printed directly on a computer or mobile phone, and report contents are customizable.
- Video recording: records the flaw detection waveform throughout the entire inspection process; supports pause, fast-forward, and fast-rewind playback, enabling post-inspection defect review and training/teaching purposes.
  Batch management of channels/reports: single/all import and export, renaming, and deletion; flaw detection procedure parameters can be copied between instruments via USB flash drive, eliminating repeated calibration on site.
- Real-time clock (RTC): precise inspection timestamps are automatically attached to all reports, recordings, and screen captures.

Software Function

Auxiliary Features

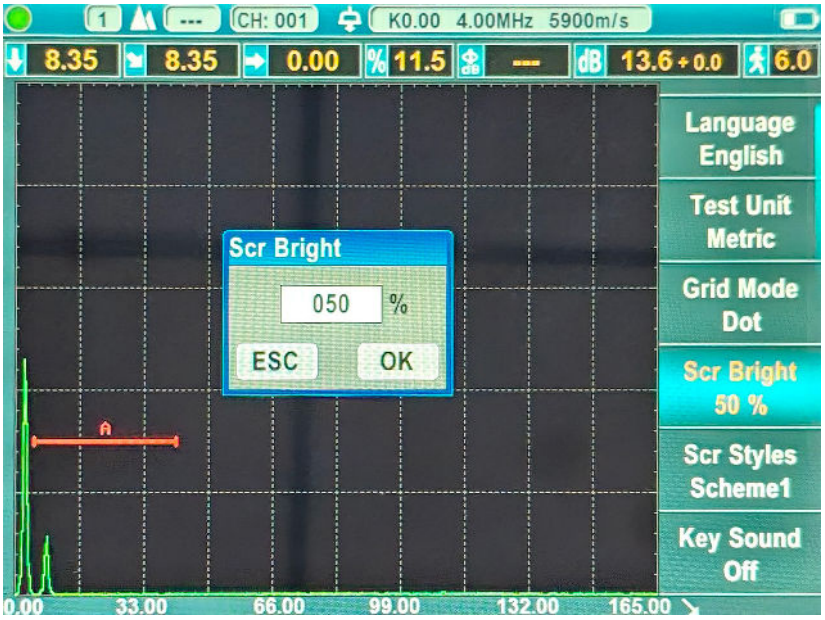


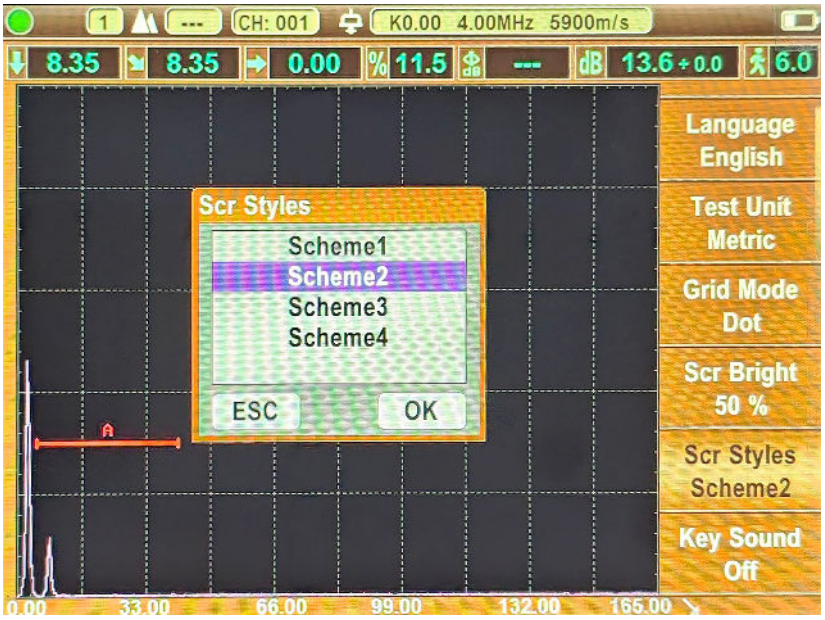




Software Function

Auxiliary Features





- Curved-surface correction: automatically corrects the circumferential positioning dimension of defects during circumferential scanning of internal and external cylindrical workpieces.
- Waveform freeze and in-gate expansion: magnifies local echo details for clear discrimination of minor defects.
- Firmware self-upgrade: two-step firmware update via USB flash drive; no parameter loss or equipment damage during the upgrade.
- Multiple languages and metric/imperial unit switching; key press/alarm sound on/off; customizable grid display mode; multiple theme colors available.

Technical Specification

Detection Range	0–15 m (longitudinal wave in steel); 30 min through-transmission mode	
Velocity Range	100–20,000 m/s	
Operating Stability	Signal amplitude variation ≤ ±2%; time-base drift ≤ ±0.5%	
Working Disc Diameter	Narrowband	Wideband
	1.0M(0.41-2.1) 2.5M(1.4-3.6) 5.0M(3.7-6.3) 10M(8.2-11.8) 15M(13-17)	1.0M(0.43-2.3) 2.5M(1.0-4.0) 5.0M(3.0-7.0) 10M(7.5-12.5) 15M(12.5-17.5)
Dead Zone After Transmitting Pulse	≤9μs	
Usable Dynamic Range	≥100dB	
Attenuator Error	≤±1.0dB(20dB span)	≤±2.0dB(60dB span)
Vertical Amplitude Linearity Error	≤2%	
Horizontal Time-Base Linearity Error	≤0.5%	
Repetition Pulse Frequency And Accuracy	≤±5%(20~2000Hz)	
Equivalent Input Noise	≤30nV√Hz	

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Technical Specification

Number Of Inspection Channels	500
Number Of Defect Reports	1000
Inspection Report Types	PDF inspection report
Display And Resolution	5.7-inch IPS high-brightness wide-viewing-angle display; 60 Hz refresh rate; 640 × 480 resolution
Digital Rejection	0–80%, without affecting linearity or gain
Probe Types	Straight beam probe, angle beam probe, dual-element probe, through-transmission probe
Gates	Initial (echo) gate, lost-echo gate; single-gate reading, dual-gate reading
Trigger Mode	Peak trigger, edge trigger
Alarm	Echo alarm, lost-echo alarm, buzzer alarm, LED alarm
Power Supply	DC 9 V; lithium battery for over 12 hours of continuous operation
Auxiliary Functions	Screen capture, video recording and playback, B-scan, automatic DAC/AVG curve generation, AWS intelligent acceptance rating, data analysis software
Advanced Functions	Weld diagram; probe frequency measurement (optional)
Number Of Video Files	10 video files stored internally, each up to 5 minutes; real-time waveform at 30 frames per second; no limit on the number and duration of recordings on an external USB flash drive
Dimensions And Weight	230x157x52 mm (WxHxD); weight: 1.13 kg

Technical Specification

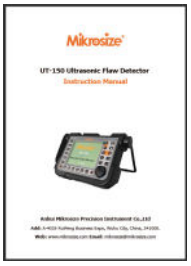
Operating Environment	Temperature: -25 to 55 °C; relative humidity: 20–95% RH
Protection Rating	IP65
Inspection Standards	EN 12668-1; complies with JB/T 10061 and other industry
Pulse Type	Negative pulse; transmitter pulse voltage: selectable in steps from 100 V to 500 V
Pulse Width	Continuously adjustable from 30 ns to 510 ns to match probes of different frequencies
Pulse Shift	-20 μs to 10,000 μs
Probe Damping	50 Ω, 150 Ω, 300 Ω, 400 Ω selectable, meeting different requirements for sensitivity and resolution
Probe Zero Offset	0 μs to 99.99 μs
Sampling	12-bit A/D sampling, high-fidelity waveform
Rectification Mode	Positive half-wave; negative half-wave; full wave; RF wave
Max Gain	110 dB (step selectable: 0.1 dB, 1 dB, 2 dB, 6 dB)
Communication Interface	USB / RS232
Probe Connector	BNC / LEMO

Note: The above specifications were measured with a 2.5 MHz probe and full-wave rectification

Standard Delivery

Name	Qty	Photo
Main Unit	1pc	
Straight Beam Probe	1pc	
Angle Beam Probe	1pc	
Power Adapter	1pc	
Lemo/Bnc Probe Cable	2pcs	
Usb Flash Drive	1pc	

Standard Delivery

Name	Qty	Photo
Couplant	1pc	
User Manual	1copy	
Certificate Of Conformity	1copy	
Warranty Card	1copy	
Test Report	1copy	
Instrument Carrying Case	1pc	