Time-based A&B-scan

Professional Thickness Measurement Tool

If ordinary ultrasonic thickness gauges cannot meet your needs, please choose our UM-5 series, which can solve various thickness measurement problems with cost-effective solutions.

Principle Elaboration

Ordinary ultrasonic thickness gauges adopting the principle of pulse-echo method need to meet the following conditions in order to measure successfully:

1. The first bottom echo must be higher than the gate (the gate level is fixed and cannot be adjusted).
2. There is no other clutter higher than the gate before the first bottom surface echo (otherwise the thickness of the clutter will be measured).

Sometimes, there are many conditions that cannot meet the above requirements, such as severe near-surface corrosion, coarse-grained materials (such as cast iron), aluminum materials, small diameter tubes, ultra-thin plates, ultra-thick plates, rough surfaces, unevenness in the material, internal defects, the laminated structure, etc., ordinary ultrasonic thickness gauges will be powerless.

UM-5 can easily solve the above problems:

1. The height of gain and gate can be adjusted to make the first bottom surface echo higher than the gate.
2. The blanking function can invalidate other clutter before the first bottom surface echo.

Main Functions

Real-time color A-scan

The user can directly see the color ultrasonic signal wave pattern on the screen, which is essential for verifying whether the measured thickness reading is correct or not. In many cases, erroneous thickness readings or even no readings can be caused, the user can easily find the problem according to the waveform. the only thing he need to do is adjusting the three parameters: gain (GAIN), blanking (BLANKING), and gate (GATE), then an correct measured value will be gotten.

Adjustable Gate Height

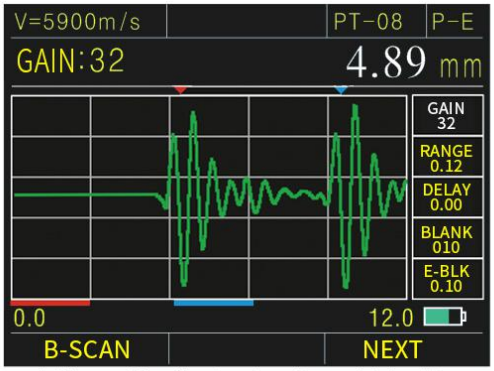
Only when the echo is higher than the gate, the instrument can recognize and receive the echo, and will have a measured value. This shows the importance of adjustable gate height, especially in low-echo signal applications (such as ultra-thin plate, ultra-thick plate measurement).

Red Arrow

There is a red arrow in the A-scan mode to indicate the measuring point, and the thickness reading is the abscissa of this point. It can help judge whether the thickness reading is correct. When measuring correctly, the red arrow should point to the front end of the first bottom surface echo.

Gain Adjustment

Adjust the magnification of the echo signal by the instrument， manually increase or decrease in units of 1dB. This function is very effective for the measurement of sound attenuating materials (such as metal castings).



Filter out the front noise through blanking

Blanking Function

Invalidate the waveform in the range of the red blanking bar, and filter out harmful clutter that affects the measurement, such as the noise caused by the rough surface of the material or the internal unevenness.

Range

Adjust the range of the waveform displayed on the screen, the waveform is visually compressed or expanded. If the display range is not set correctly, the echo waveform may appear in an invisible area, but the measured value can still be displayed correctly.

Delay

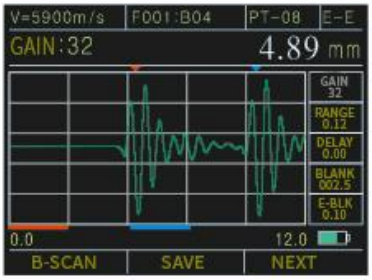
Adjust the starting position of the waveform displayed on the screen, the waveform is visually moved horizontally. If the translation is not set correctly, the echo waveform may be out of the display area and cannot be seen, but the measured value can still be displayed correctly. The range and pan function can magnify any part of the waveform and display it on the screen.

With the function of through coating, without removing the coating

We were the first in China to launch the UM-1D thickness gauge with penetration coating technology,UM-5D and UM-5DL also have this widely acclaimed function.This function is achieved by measuring two successive bottom echoes of the substrate.

There are more advantages in this mode:

1. No zero point calibration;
2.High stability, the measured value is not subject to probe pressure, coupling layer thickness and the influence of dust stains on the surface of workpiece;
3.Zero drift.



Penetrating Coating Mode
(echo - echo method)

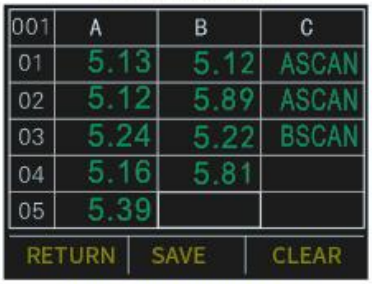
Live Color B-scan

UM-5 series thickness gauge with live B scan function. Show the cross-sectional view of the workpiece along the movement track of the probe, use for observe the underside contour of the workpiece.And automatically capture the minimum value on a B-scan image,the position of the minimum value is indicated by a red triangle.The thickness value of any point in the B-scan image can also be viewed by moving the pointer.

B-Scan Interface

Larger memory, more convenient storage function

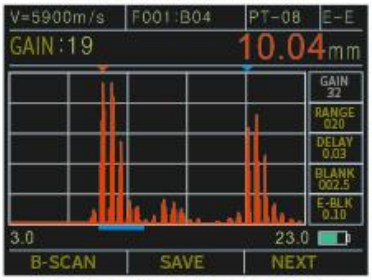
It can save one hundred thousand thickness values and one thousand A/B-scan waveforms, waveform and thickness value can be mixed stored in the same file. Adopt the storage mode of grid format,one screen can display 15 thickness values,and simultaneously display the position in the grid,convenient for users to view the stored thickness data; USB 2.0 Full Speed interface, powerful DataView data statistics and management software.



Store Grid Format Files

Rectification Mode

Optional RF+, RF-, half +,half -, full wave
RF describes the complete echo waveform;
RF- indicates the phase waveform of RF+;
half + means putting off the half － echo and only left the half + echo;
half － means putting off the half + echo and turn the half － over to +;
full wave indicates the half + echo and the overturned half - echo.



Negative Half Wave Rectified Waveform

More Practical Features

Difference/reduction rate:The difference mode shows the difference between the measured and the preset thickness. Reduction rate is to calculate and display the percentage of thickness loss as the material is thinned,The typical application is to measure metal materials that have been thinned by bending.

Max/Min value capture: Current thickness value, Min and Max thickness values are displayed on the screen at the same time.

Alarm mode:Dynamically change the color of the thickness reading when alarming.

Adjustable update rate 4Hz, 8Hz, 16Hz : select 4Hz for common applications, and select a higher update rate for rapid scanning, such as high temperature measurement.

White numbers indicate coupling

Difference/Reduction rate mode

Max./Min. Mode
Red numbers indicate alarm

UM-5 Series Technical Specifications

Feature	UM-5	UM-5D	UM-5DL	Data Logger Option
Color Display	✓	✓	✓	
Time-based A-scan	✓	✓	✓	
Time-based B-scan	✓	✓	✓	
Control of Gain and Gate	✓	✓	✓	
Blanking	✓	✓	✓	
Thru-paint&coatings)	X	✓	✓	
Data Logger	X	X	✓	✓
DataView Software	X	X	✓	✓
Technical parameter				
Display Type	2.4 inch (320×240 dot matrix) color display LCD screen.			
Operating Principle	P-E (pulse-echo) , E-E (echo-echo) with dual elements transducer			
Measuring Range	0.50mm to 508mm(0.025" to 20.00"), depending on material, probe and surface condition.			
Measuring Resolution	Selectable 0.01mm, 0.1mm(0.001", 0.01")			
Units	Inch or Millimeter			
Gain	Adjustable			
Display Mode	Value mode, Minimum / Maximum capture, DIFF/RR%			
Calibration Method	Zero calibration,Two-point calibration			
V-path compensation	Automatic			
Update Rate	Selectable 4Hz, 8Hz, 16Hz			
Material Velocity Range	500 to 9999m/s (0.0197 to 0.3937in/us)			
Alarm Settings	Minimum and Maximum alarms. Dynamic waveform color change on alarm			
Languages	Selectable Chinese, English, German，French，Japanese			
Power supply	Two 1.5V AA batteries, 24 hours standby time			
Instrument Shut-off	Selectable ALWAYS ON or AUTO OFF after 5, 10, 20 minutes of no activity			
Operating Temperature	-10° C to +50° C , -20° C in special requirements			
Dimensions	153mm X 76mm X 37mm(H X W X D)			
Weight	280g including batteries			
Data Logger Features				
Capacity	100,000 readings, 1000 waveforms, 400 files			
File Structure	Grid file			
Rows X Columns	21 X 12			
Communication Port	USB 2.0			
Software	DataView PC software			

Transducer Specifications

Model	PT08	TC510	TC550	ZT12	PT06	PT04	GT12
Type	Standard	Standard Configuration	Composite Elements	Cast Iron	Small Tube	Fingertip	High Temperature
Frequency	5MHz	5MHz	5MHz	2MHz	7.5MHz	10MHz	5MHz
Contact Diameter	11mm	13. 5mm	13. 5mm	17mm	8. 7mm	7. 0mm	15mm
Measurement Range	0.8-100.0mm	1.2-200.0mm	1.0-200.0mm	4.0-508.0mm	0.8-30.0mm	0.7-12.0mm	4.0-80.0mm
Temperature Range	-10～60℃	-10～70℃	-10～70℃	-10～70℃	-10～70℃	-10～70℃	-20～480℃