

ATG III

ULTRASONIC THICKNESS GAUGE

INTRODUCTION MANUAL



1. GENERAL INTRODUCTION

ATGII A-scan ultrasonic thickness gauge, Launch the ultrasonic through one side of the object, measure the digitized thickness real-timely, without cutting the object. As a subminiature measuring gauge, is researched and developed by our company according to the ultrasonic measuring theory. The features include fast response, non-destruction and precise measuring. In addition, A/B-scan waveform display is available by showing the echoes, which enables the more extensive measuring scope, more precise result and very little measurement error and finally makes the measuring processes more controllable.

ATGII A-scan ultrasonic thickness gauge, as the essential NDT instrument, can be widely applied in the detecting fields like manufacturing, metal processing, chemical industry, commercial inspecting and so on. It can not only precisely measures various kinds of panels and processing components, but also can monitor the thickness minus of tubes and pressure vessels in the manufacturing instruments after corrosion.

1.1 DESTRUCTION OF THE GAUGE



1.2 STANDARD PACKING

DESCRIPTION	Q'TY
ATG II THICKNESS GAGE	1
TS-510 PROBE AND CABLE	1
BATTERY	3
COUPLANT BOTTLE	1
CARRYING CASE	1
OPERATING MANUAL	1

1.3 OPTIONAL ACCESSORIES

HIGH-TEMPERATURE PROBE	CAST IRON PROBE
TS SERIES PROBE	STEP PIPE BLOCK
PROBE CABLE	STANDARD BLOCK

1.4 SPECIFICATIONS

SPECIFICATIONS	DESCRIPTION
SIZE (mm)	155×80×35
WEIGHT (g)	275(INCLUDING BATTERIES)
OPERATING TEMPERATURE (°C)	-20~45
POWER	THREE 1.5V ALKALINE BATTERIES
BATTERY LIFE	40 HOURS
DISPLAY	320×240 DOT-MATRIC TRUE COLOR SCREEN
PROBE	DUAL ELEMENT PROBE
MEASURING RANGE(mm)	0.65-650
DIGITAL RESOLUTION(mm)	0.01
VELOCITY RANGE (m/s)	500~9999
DISPLAY UNIT	Inch/mm
LANGUAGE	ENGLISH
WAVEFORM DISPLAY MODE	FULL WAVE, +RF, -RF
PULSER VOLTAGE	150 NEGITIVE SPIKE
dB GAIN SETTING	12-52 dB
V-PASS CORRECTION	AUTOMATIC CALIBRATION
DISPLY MODE	NORMAL, MIN/MAX CAPTURE, DIFF/PR%, DIGITAL, ASCAN, B-SCAN

MEASUREMENT POINT STORAGE	128,000 POINTS
LCD INTENSITY LIGHT CONTROL	8 STEP ADJUSTABLE
OUTPUT	USB PORT
REPORT SOFTWARE	DATA VIEW, WIN 7, WIN 8

1.5 MAIN FEATURES

1. Parameter configuration interface is simple and easy to operate
2. A-scan waveform display
3. B-scan record display
4. Coupling condition is different with different color digital to display the thickness
5. Min-Max values when measuring.
6. High-Low limited thickness set and alarm
7. Difference mode: getting the difference between the actual value and the normal value as well as the percentage.
8. Metric (mm) and Inch unit display both available.
10. Waveform: full wave and RF display
11. Optional rectification mode: full wave, +RF and -RF
12. Languages: English
13. Battery operation time: approx. 40 hours
14. Can store 128000 point and 250 A-scan trace or B-scan Trace
15. Echo-Echo measurement the thickness of the specimen through the coating
16. Air Calibration (Optional function)
17. AGC (Automatic Gain Control)

2. KEYPAD FUNCTIONS

Totally, there are 9 keys on the keyboard, including 3 virtual function keys (), four direction keys (), two specialized function keys (). See the following description (2.1)

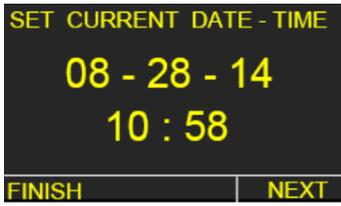


FIGURE 2.1 KEYBOARD FUNCTION DESCRIPTION

2.1 Powering On and Off

By pressing the power key  to power on the instrument, pressing the power key  to turn instrument power off.

2.2 Date and Time Setting up



MONTH

By pressing the green arrow key  under “NEXT” to switch between date and time, by pressing the yellow arrow keys  to adjust date and time, then press the green arrow key  under “FINISH” to completely settings.

Set the date time. Need go back to A-scan mode and store one A-scan

After save one A-scan, when turn off and turn on, the new set date and time will display.

3. OPERATION

3.1 PRESET OTHER SPECIFICATIONS

Press MODE key to enter the configure interface, which including many specification adjusting options like

FILE	F001	
PROBE	TS510	
UNITS	mm	
VELOCITY	5920 m/s	
RECTIFICATE	RF	
BRIGHTNESS	—	
THICKNESS	255	
MAX-ALARM	255	
MIN-ALARM	000	
BSCAN MAX	025	
BSCAN MIN	000	
BSCAN FILE	NULL	
A-SCAN	BSCAN	NEXT

Use M Key enter
 Configue File Manaul
 Press right Arrow Key



Move the cursor to select
 parameter

Use 4 direction key
 to set the correct value



3.2 SPECIFICATION ADJUSTING STEPS

FILE - Set the file name of the current measured value or waveform stored.

PROBE – Select using probe, 7 different probes insert

UNITS: Metric (mm) or Inch

VELOCITY: Enter correct specimen velocity

RECTIFICATE: RF, full wave

BRIGHTNESS: 8 steps LCD brightness adjustment

THICKNESS: Set specimen thickness set the normal thickness. The real concrete application will be introduced in the DIFFERENCE MODE.

MAX. ALARM: Set the maximum thickness alarm value. The

- result will be displayed in red if the actual thickness is more than the maximum value preset.
- MIN. ALARM:** Set the maximum thickness alarm value. The result will be displayed in red if the actual thickness is more than the maximum value preset.
- BSCAN MAX.:** Set the maximum of the thickness of the B scan.
- BSCAN MIN.:** Set the minimum of the thickness of the B scan.
- BSCAN FILE:** Storage of B-scan map with file no.

3.2 PRESET THE MATERIAL'S VELOCITY

1. With the unknown material velocity, calibration before testing is necessary.

The velocity ranges from 500m/s to 9999m/s.

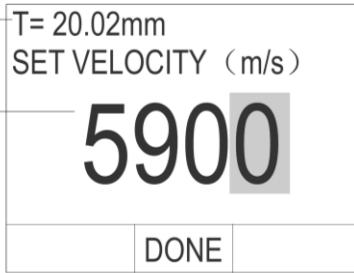
Steps as follow:

- (1) Prepare a testing block of the same component with the testing object. Make the surface suitable for testing.
- (2) Measure the thickness of the block with a precision slide caliper.
- (3) Put some couplant on the surface of the testing block.
- (4) Measure the thickness of the testing block with the probe and keep coupling.
- (5) Press the direction keys to adjust the velocity to make the actual thickness value be same with the known value.

2. Adjust the velocity directly if the material velocity is known. See 3.1:

the present thickness

set velocity



1. press **CAL ON** to enter the calibration interface
2. press the relevant **▲** to adjust the velocity
4. press the DONE relevant **▲** to save the velocity and return to the measuring interface



3. press the direction keys to adjust the velocity value

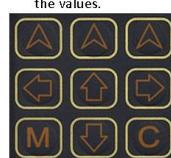
Enter Specimen Velocity



Press Mode key enter
Configure File Manual

Press arrow function key
under NEXT to do selection

Press same key four times to
move the cursor to VELOCITY
to use 4 direction keys set up
the values.



Increase or decrease,
100 each step



Increase or decrease,
10 each step.

3.3 CALIBRATION

Before measuring the thickness with ATG II, calibrating the gage with probe is necessary.

Calibration mode incl. 4 function

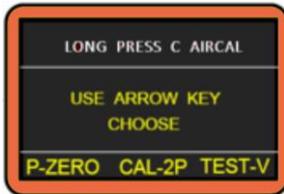
- Automatic probe recognized calibration without test block (air-calibration)
- Single point calibration (CAL-1P)
- 2 point calibration (CAL-2P)
- Velocity calibration TEST-V

3.4 AIR-CALIBRATION

ATG II Incl. very good calibration method called “Air-Calibration”. Air-Calibration means the gauge will recognized the probe and calibrate automatically



By pressing  key to do Air-Calibration in configure manual, press green arrow key  under Next to select probe type, for example TS510, then wait for few seconds until it complete.



By Pressing  key to do Air-Calibration, Long press  key

to complete calibration.

Calibration Procedure as following

1. Select the Gauge probe and plug with IMG-4B PLUS
2. Press power on switch turn on the instrument
3. Set the date and time, after set correctly, press arrow key under finish entry A-scan display screen
4. Press  key to configure manual
5. Press the green arrow key  to select probe type, after select the probe, press  key, then Long press  key, at this stage screen display AIRCAL and wait it for few seconds, the gauge will calibration automatically without test block.

Note: To do the air-calibration, please make sure the probe front head are clean without any couplant. Otherwise couplant might be caused probe calibration wrong. After did the Air-Calibration, put the probe on the test block check the step. If values are correct, that you can start to do the thickness inspection. If not correct, do the air-calibration again.

3.5 Single Point Calibration

3.5.1 Use A-scan wave for calibration with AGC

1. Adjust the velocity to 5920m/s according to the method in chapter 3.1.
2. Long pressing the  key. Select P-Zero to do the single point calibration. The screen shows *CALIBRATION: YES*
3. Press green arrow key  under “YES” into calibration mode.
4. Add the couplant on the zero block and put the probe make it

coupled completely Press arrow key until the screen echo waveform move and display into 4.00, the gain will automatically be adjusted by software as well.

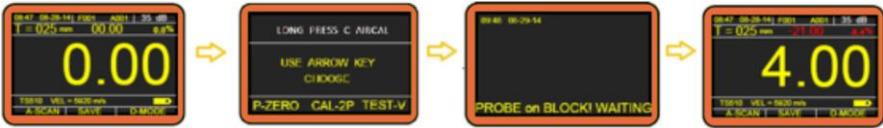
5. After the wave form move and display 4.00, the calibration was done and ready inspection.
6. During the calibration, press the C key again to stop calibrating any time and restart to calibration again.

3.5.2 P-ZERO Single Point Calibration



1. Adjust the velocity to 5920m/s according to the method in chapter 3.1.
2. Press  key enter the calibration.
3. Press green arrow key  under “P-ZERO” to progress calibration
4. Add the couplant on the zero block (4mm) and put the probe on, until the screen display into 4.00, the gain will automatically be adjusted by software as well.
5. After the wave form move and display 4.00, the calibration was done and ready inspection.
6. During the calibration, press  key again to stop calibrating anytime and restart to calibration again.

3.6 Use Digital Calibration



1. Press green arrow key  under “DIGITS” enter digital mode
2. Press  key enter the calibration.
3. Press green arrow key  under “P-ZERO” to progress calibration
4. Add the couplant on the zero block (4mm) and put the probe on, until the screen display into 4.00, the gain will automatically be adjusted by software as well.
5. After that, screen display 4.00, the calibration was done and ready inspection.
6. During the calibration, press  key again to stop calibrating anytime and restart to calibration again.

3.7 Two Point Calibration

Press Calibration key  key in A-scan mode to enter calibration manual, press  key under “CAL-2P” enter two point calibration mode.



Firstly add some couplant and put probe on lower step, for example 2.5mm thickness, set LOW-P =2.5mm. use yellow arrow     to set up thickness of step block, after display digital stable press green arrow key  under NEXT, then move to next step to do the second point calibration.

Secondly, put probe on thick step for example 20mm thickness. The gauge software set HIGH-P =20.00 mm. If the step thickness different with this, use yellow arrow keys     adjust it into 20.00 mm, Then press next, the display will show the actual step of thickness and velocity.

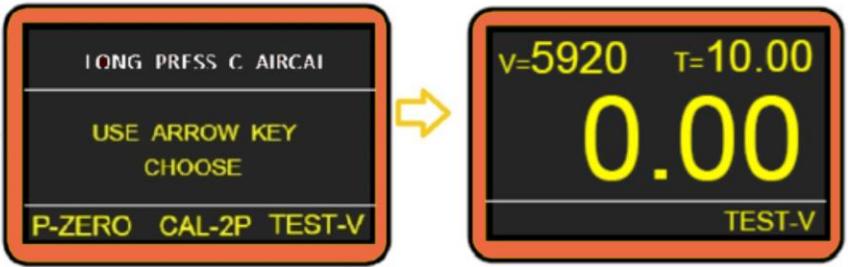
The gauge now ready for 2-point calibration and go back to A-scan mode.

Press green arrow key  under NEXT to adjust the screen display range into 30 mm. Move the probe to check different step thickness and make sure the calibration was correct. If it's ok, it will be ready to start inspection



Velocity calibration TEST-V

First single calibration, calibrate the gauge. After execute single point calibration, Under the Ascan display, press C key. Enter calibrate Mode. Press TEST-V under green arrow key. Enter TEST-V display



Put the block on already know standard thickness step (we use 20 mm thick for example).

Use 4 yellow arrow key adjust the T=20.00, then press green Key under TEST-V, The material Velocity will display.

The block material is 5914 m/s. This calibrate velocity will automatic entry the setting



3.8 DISPLAY MODES

There are five measuring display modes: normal mode, difference mode, limits value mode and A-scan mode. The thickness value, unit, velocity, and battery power indicator are all showed in these modes.

3.8.1 NORMAL MODE/DIGITAL THICKNESS VALUE MODE:



3.8.2 D-MODE

Press green arrow key  under "D_MODE", when entered D-mode, it shows large digital display. It has showing Max. and Min. values of the inspection thickness measurement. This mode allows the customer to catch the real-time maximum and minimum thicknesses of material when test constantly. It shows the minimum and maximum values during the tests as well as the present thickness. Press Mode again, back to the Normal Digital Mode.



3.6 DIFFERENCE MODE INTERFACE

3.9 TURN ON/OFF AUTOMATIC GAIN CONTROL (AGC)



By long pressing the upper left corner green arrow key  for few seconds to turn AGC on, the AGC will show on upper left corner of the screen.

And by long press the upper left corner green arrow key  for few seconds to turn AGC off, after that AGC will disappear.

3.10 DESCRIPTION AND ADJUST OF A-SCAN DISPLAY MODE

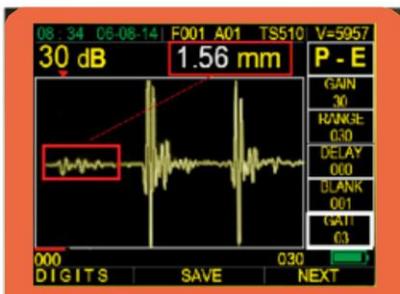
In the A-scan display model, press the bottom right corner NEXT relevant green  to select the specification that needs to be adjusted. Then press the direction keys to adjust the values. Up and down keys are used for small steps, while left and right for big steps increase or decrease.

GAIN	adjusting the magnification factor of the echo signal,
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	which allowing the manual adjust by unit 1db. This function is very useful for the testing of attenuation materials (like metal cast).
RANGE	adjusting the range of waveform on the screen. The waveform can be compressed or spread visually and it's invisible if the display range is set incorrectly and the echo waveform is beyond the display area, however, the testing value can also be read correctly.
DELAY	adjusting the beginning location of the waveform on the screen. The waveform can be moved horizontally visually and it's invisible if the delay is set incorrectly and the echo waveform is beyond the display area, however, the testing value can also be read correctly.
BLANK	making the waveform within the red blank line invalid, so that the influential harmful clutter can be blanked. In the real testing, wrong measurement due to the material may exist, such as near surface serious corrosion, AL material, inside defects, uneven component, lamination structure and so on. While adjusting the gain or gate can solve part of the problem, but only blank function can avoid the mistake when those clutter echoes are higher than the bottom echoes.

For example, if the gate set to low, the noise echo will be calculated by the software with wrong display. This is 10 mm test block but the display only show 1.56 mm

If we extend the black, the echo into the blank will not calculated and the display was correct value.



E-BALNK

E-blank was use to del. the interface echo between echo to echo. It most use only in echo-echo through coating measurement. Due to the layer thickness of coating material. It will generate different type of interface echo.

E-blank settings

When under E-E mode. Use green arrow key move high light to gate, Press Gren arrow key again. It will show blue e-blank. Use yellow arrow key can adjust the blank length



For example

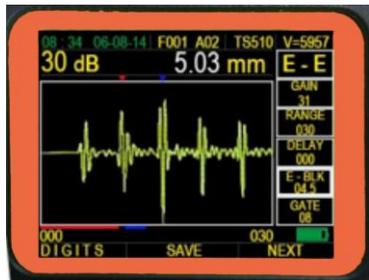
The measurement with 0.5 mm coating layer

The echo display on mm coating layar



We use blank red bar del.. noise echo from first echo. Use blue bar E-black del. the noise echo between first and second echo.

Or we can extend blank gate de. First echo and use second and third echo measurement. See below



GATE	adjusting the height of the gate. Only when the waveform is higher than the gate, can the gage take the echo and show the value, and only when the GATE specification is
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highlighted, can the gate show out. The first intersection point between the waveform and gate is pointed by a red arrow, which can help judging whether the thickness value is correct (the red arrow should point the front of the first bottom echo if correctly tested).

Gate threshold 06, The noise over the gate, Increase the gate threshold, the noise not over

The measurement data was wrong

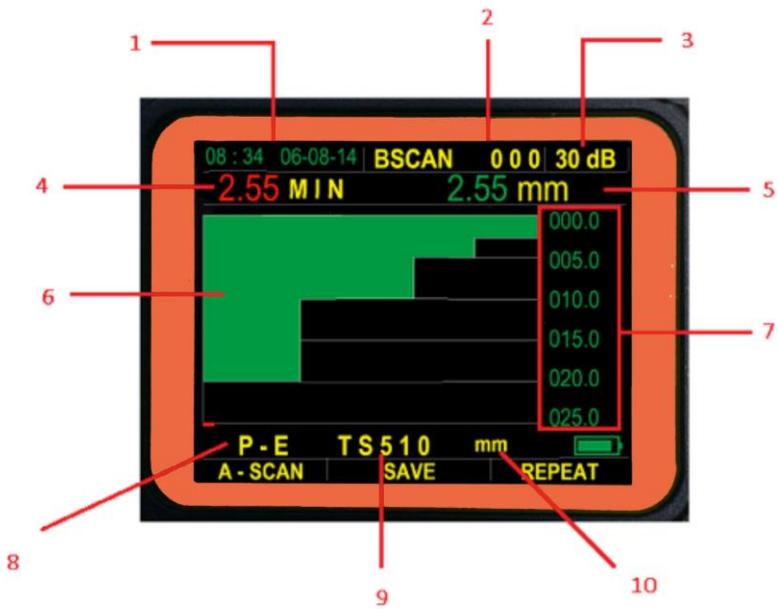


The gate. The display will be correct



3.11 Operate of B Scan

3.11.1 B-scan Mode



BSCAN MAP DESCRIPTION

- | | |
|----------------------------------|--|
| 1. Date | 6. B-scan display map |
| 2. File name | 7. Min to max. thickness of B-scan map scale |
| 3. Gain | 8. P-E (pulse echo mode) |
| 4. Min.thickness measurement | 9. Probe type |
| 5. Thickness of last measurement | 10. Unit display |

3.11.2 Introduce B-Scan

ATGII thickness gauge has time-base B-scan function. Move the

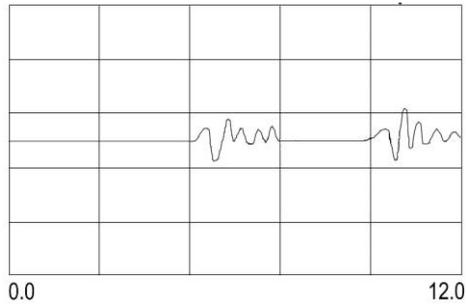
probe along the work piece surface, then the profile of the work piece will display on the screen, observe the underside of the work piece. Very good for corrosion inspection

When remove the probe from work piece, it could be automatically capture a minimum value of the B-scan image, and indicate the position of the minimum by a red value display. You can see any point thickness value of the B-scan image by moving the pointer.

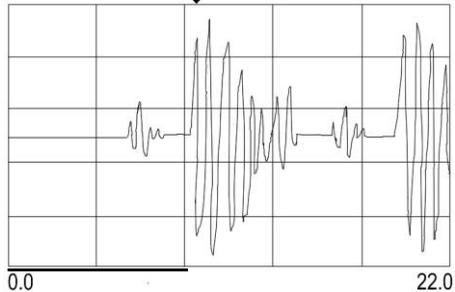
The B-scan display will stop if lost contact or couplant during inspection. If not capture the good B-scan image, just press green arrow key  under repeat

3.12 REAL CASES ANALYSIS

1. When measuring the thickness, there always happens that over small gains prevent the precise results. As showed in the following figure, the thickness of the testing object is about 5mm, but as for the over small gain, the measuring result is 10.77mm as the first echo has not broken the gate and the gate locates the second echo automatically. This is obviously an incorrect result, and customers can pull up the echo by enhance the gain to make the first echo broke the gate and finally realize the right measurement.
2. There are some defects in the testing object, and the gate locks the defect echoes. As showed in the following figure, the thickness of the testing object is about 10mm, but as there are obvious defects (the defect echoes are showed on the screen) and the gate locks the defect echoes which have broken the gate, thus, the testing result showed is the thickness of the defect area. The right measurement can be realized by making the gate above the defect echoes.



3. If there are some defaces in the testing object and the gate locks the defect echoes, the measuring result will be the thickness of the defect area. In this condition, customer can use the BLANK function to get a right testing result. As showed in the following figure, the line on the bottom of the screen, which we use to shield the defect echoes, indicates the blank confines and makes the gate not catch the echoes within the blank confines, thus, the right thickness value is acquired.



3.13 HOW TO SAVE THE LAST SETTING

When turn on the gauge. The display will show the last save date and time. Press green arrow key  to move cursor and use 4 yellow arrow keys     to modify the correct date and time. After completed it, press left green arrow key  enter to A-scan display.

Put the probe on 4 mm block get one a-scan display. Remove the probe. Press middle

Green arrow key  to save the setting. When turn off the gauge or run out the battery, it will start with this current setting when next time you turn on.



4. SAVE AND RECALL

4.1 SAVE DIGITAL DATA

Press power key turn on the gauge. First setup the right date and time.

Press finish to enter the Ascan display

Add block some couplant and put the probe on the test block. Press

 key, enter calibration display. Press green arrow key  under "CAL-1P", wait and calibrate the gauge. After calibration, press

green arrow key  under "DIGITAL", enter to digital display mode. Put probe on step black 1=20 mm, after display stable, press green

arrow key  under "SAVE", now the F001A01 saved data

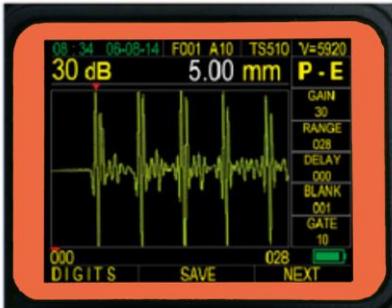
Move probe to 2=10.00 mm, after display stable, press save, now the F001A02 saved data. Move the probe to 3=5.00, after display stable,

press save, now the F001A03 save data. Move the probe to 4=2.50, after display stable, press save, now the F001A04 save data.



Now the F001 total save 4 point (A01,A02,A03,A04).

4.2 SAVE A-SCAN PULSE

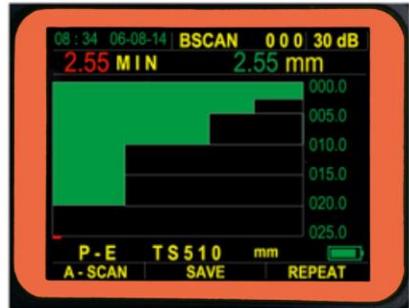
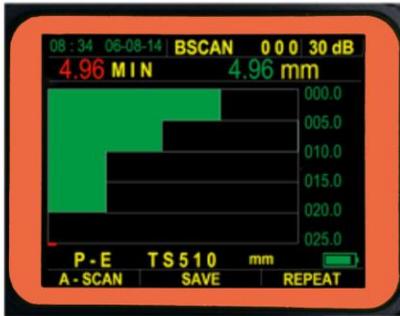


For example put probe on step block 10 mm thick, after display stable to remove the probe from test block, then press green arrow

key  under “SAVE”, move to step block 5 mm thick to do measurement, after display stable to remove the probe from test

block, then press green arrow key  under “SAVE” and so on.

4.3 SAVE B-SCAN VALUES



Put probe on object block, for example to do measurement from thicker move to thin, that we did measurement from 20mm to 2.5mm to capture the value, then press green arrow key  under “SAVE” to save it.

4.4 RECALL DATA

By pressing  key to enter configure manual, press green arrow key  under “NEXT”, to move cursor as shown on F001. Use 4 yellow arrow keys     to choose the File no. to review. After select the File no. to review, press green arrow key  under “OPEN” The display will change and show all F001 storage data. Use 4 yellow arrow keys to move square cursor to view the data.



4.6 RECALL B-SCAN VALUES



By pressing **M** enter to manual, then press green arrow key under “OPEN” to open B-SCAN files.

4.7 DELETE A-SCAN FILES



By pressing green arrow key under “SAVE” to recall A-scan files, then press **C** the display will show “CLEAR ALL ASCAN?”, press green arrow key under YES, all A-scan files will be cleared out.

4.8 DELETE DIGITAL FILES



By pressing MODE key **M** to enter configure manual, press function key **A** under NEXT, then press function key **A** under CLEAR. The display will ask “Yes” or “No”, Press function key **A** under “Yes” to clean all of data. The file F001 will empty and waiting entry new data.

5. RESTORING THE INSTRUMENT



Long press the middle of green arrow key  then press power key  and hold green arrow key  for a while to restore the instrument, the settings and all stored files will be cleared out.

6. ATOMATIC GAIN CONTROL (AGC)



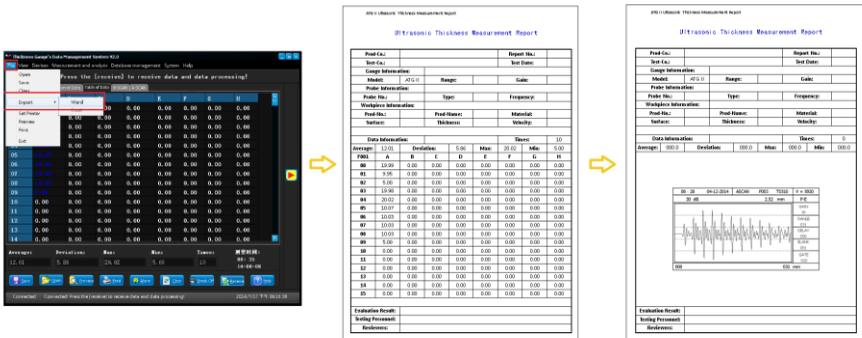
Long press the upper left corner green arrow key  for few seconds to turn AGC on, when AGC is on the gain will increase and decrease automatically by software, then long press the upper left corner green arrow key  for few seconds to turn AGC off.

4. COMMUNICATING B-SCAN VALUES



By pressing  key twice, enter to manual to press green arrow key  under “OPEN”, to open stored B-scan files, then press green arrow key  under “COPY” on instrument, meanwhile click “Receive” button on PC for receiving data, all data will be shared to PC.

7.3 EXPORTING MEASUREMENT REPORTS



To select from manual, click File → Export → Word on PC, to generate thickness measurement report in WORD format, and so on whatever A-scan, B-scan or digital data.

8. MEASUREMENT APPLYING SKILLS

8.1 MEASURING ERROR PREVENTION

1. MATERIAL INFLUENCE

In many materials like nonmetal or plastic, the change of velocity is obvious, thus, the accuracy of measuring is influenced. If the material of the object is not isotropic, the velocity varies in different directions. In this condition, the preset velocity should be the average value among the testing range, which can be acquired through testing a block with the same velocity as the object average velocity value.

2. ULTRA-THIN MATERIAL

When the thickness of the testing object is below the minimum value of the probe limit, the result may be incorrect, and the thickness can be acquired by contracting the blocks when necessary.

When testing ultra-thin materials, sometimes DUAL-ECHO happens, which is a kind of incorrect result and the result is twice of the real one. Another incorrect result called PULSE ENVELOPE AND CIRCULATORY JUMPING, which means that the testing result is higher than the real one. In order to prevent this kind of error, when testing the object with the appropriate thickness as the minimum limit and judgment is available, customer should pay attention to the waveform displayed and adjust the gain or use blank function.

3. ROUGHNESS INFLUENCE

The extremely rough surface may arouse measuring error or even reading lost, therefore, the surface of the material should be smooth before measuring through polishing, filing, grinding or using high-viscosity couplant.

4. SURFACE OF THE ROUGH MACHINE PROCESSING

The regular slugs after rough machine processing (such as lathing or planing) on the surface of the work-piece may also arouse measuring errors. Except for the compensation methods mentioned above in 4, adjusting the angle between and sound insulating wall (the metal film through the center of the probe bottom) of the probe and the slugs of the material and making them perpendicular or parallel with each other to get the minimum reading as the thickness value is also efficient.

8.2 MEASURING METHODS

1. SINGLE-POINT MEASUREMENT

Using the probe to measure a random point on the surface of the object, the reading displayed is the thickness value.

2. 2-POINT MEASUREMENT

Measuring twice at the same spot on the object, and making the probe inclines 90° in the second measurement, the thinner reading is the thickness value.

3. MULTIPLE-POINT MEASUREMENT

When the reading is unstable, measuring several times within a circle with a certain point as center and 30mm as diameter, the thinnest reading is the thickness value.

4. CONTINUOUS MEASUREMENT

Taking continuous measurements along a specified path at intervals of 5mm or less according to the single measurement method, the thinnest reading is the thickness value.

8.3 PIPE WALL MEASUREMENT

The reading will change regularly when the split plane of the probe is along with or perpendicular to the pipe axis and the thinnest measuring reading is the thickness value.

When the diameter is big, the split plane of the probe should be perpendicular to the pipe axis, while the diameter is small, the respective measurements should be both along with and perpendicular to the pipe axis and the thinner reading is the thickness value.

8.4 CAST MEASUREMENT

It's difficult to measure cast work-piece because there are some special features of the cast measurement: the rough grain of cast material, the loose structure, and the rough surface measuring status. So there are some tips to follow:

- 1.** Use low frequency probe like TS210 or TS112 in our company.
- 2.** When measuring the non-processing surface of some cast work-piece, high viscosity couplant such as machine oil, grease or water glass is needed.
- 3.** Calibrate the sound velocity with the standard block that shares the same material and same measuring direction with the testing object.

9. SELF EASY MAINTENANCES

9.1 POWER SOURCE INSPECTION

If the gage cannot be turned on, please check and change the batteries first.

The steps of changing batteries are as follow:

1. Turn off the gage.
2. Loose the screws and open the battery cassette.
3. Take out the batteries and put in new ones. Take care of the polarity.

Attention: as even when the gage is turned off, there is still weak power consume, please take the batteries out when sparing the gage for long, or the gage can be power off and cannot be turn on.

9.2 CONSIDERATIONS

1. Please be cautious of the zero block's getting rust as couplant will be spread on the surface of it when calibrating the gage. After using, clean the zero block. Avoid dripping sweat on the gage in high temperature. Some grease spreading on the surface of zero block is useful to avoid rusting if the gage will be spared for long. Wipe the grease out when reusing.
2. As caustic liquid such as alcohol and diluents is corrosive to the cover and
3. the window, so wipe them with little amount of clean water.
4. Avoid heavy scratch on the surface of the probe and make the measurement lightly. With a worn probe, the indicating value will be unstable. Please change probe in that case.

9.3 MAINTENANCES

Contact with the maintaining department of our company if the following problems appears:

1. Components damage and the gage fail to measure.
2. The display of the screen is disordered.
3. The measuring error is abnormally big in normal situation.
4. Keyboard operating is disordered or keyboard doesn't work.

As the ATG II ultrasonic thickness gage is high-tech product, the maintaining work should be made by professional operator and please avoid self-acting operations.

APPENDIX: SOUND VELOCITIES OF COMMON MATERIALS

Material	Sound Velocity	
	in/ μ s	m/s
Aluminum	0.250	6350
Bismuth	0.086	2184
Brass	0.173	4394
Cadmium	0.109	2769
Cast Iron	0.180(apprx)	4572
Constantan	0.206	5232
Copper	0.184	4674
Epoxy Resin	0.100(apprx)	2540
German Silver	0.187	4750
Glass, Crown	0.223	5664
Glass, Flint	0.168	4267
Gold	0.128	3251
Ice	0.157	3988
Iron	0.232	5893
Lead	0.085	2519
Magnesium	0.228	5791
Mercury	0.057	1448
Nickel	0.222	5639
Nylon	0.102(apprx)	2591
Paraffin	0.087	2210
Platinum	0.156	3962
Plexiglass	0.106	2692
Polystyrene	0.092	2337
Porcelain	0.230(apprx)	5842
PVC	0.094	2388
Quartz Glass	0.222	5639
Rubber, vulcanized	0.091	2311
Silver	0.142	3607

Steel, common	0.233	5918
Steel, stainless	0.223	5664
Stellite	0.275(apprx)	6985
Teflon	0.056	1422
Tin	0.131	3327
Titanium	0.240	6096
Tungsten	0.210	5334
Zinc	0.166	4216
Water	0.058	1473