Multi-channel Eddy Current Detector

Operation Manual

최신 비파괴 검사 장비 및 기재 전문

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1. Intelligent Digital Eddy Current Detector

MS-UN-D010X is an intelligent digital eddy current detector, it massively adopts imported Integrated Circuit, the most advanced eddy current technology photovoltaic technology and microprocessor technology. as the new generation of full-automatic eddy current detector, it's equipped with well-designed mechanical transmission devices, it leads the way of domestic NDT eddy current testing for it's exclusive mechanical-electrical integration with a complete automatic system. The adoption of the software processed by the Windows operating programs, makes it easier and more intelligent for operation. The instrument is featured with stable and reliable performance, full-automation and high testing speed, and is specially applied to the on-line eddy current flaw detecting of various metal tubes, bars and wires.

With high testing sensitivity, MS-UND010X intelligent on-line eddy current detector is frequently applied to various metal tubes,bars and wires flaw testing, such as the testing of surface crack, weld, hole, inclusion, etc.

The frequency ranges from 50Hz to 5MHz, to meet the requirements of various metal tubes. With multiple exclusive alarm modes, high-speed automatic digital electronic balance, it can is capable to set up standard testing programs for various sizes and materials workpiece testing

MS-UND010X can be equipped with through coils or other test coils with low requirement of couplant(the probes selection depends on the detailed testing requirements).Equipped with the fitting of high-accuracy delayed marking electronic module, saturation, and easy-operating marking machine, probe holders, it is capable to realize the on-line metal tubes eddy current automatic detecting.

Application：Edyy current testing for steel tube, steel bar, steel wire, metal parts and other metal material

Standards:

ASME GB/T YB EN JIG API-5L API-5CL MH/T

2. Characteristic

●Testing channel: 1-8, can be extended to 128 channels

● Frequency range: 50 Hz～10 MHz,to meet various metal material testing requirements.

● Gain: 0 dB ~ 99 dB, continuously adjustable, the work of each file 0.5dB step

●Phase: 0 ~ 359 °, continuously adjustable, continuously adjustable, precision 1 °

● Gain ratio: （X/Y）0.1～10.0

●Testing speed: >300/min

● Adjustable probe drive rank: 1～8, the real sense multi-function

●Fast digital / analog electronic balance

●non-amplitude, unsymmetrical phase alarm region setting

●Various display: impedance, time base display

● Digital Filtering: High-pass frequency (0Hz ~ 2000Hz), low-pass frequency (0Hz ~ 2000Hz)

●Delayed hardware output alarm, real-time hardware output alarm

●Sound-light alarm output

●Charging power supply: 110V ~ 220V

●Capable of delayed marking, fixed length marking, high accuracy up to 0.001S/1MM

● Automatic balance time: 1～1000 minute

● Inner or outside clock for choice

● Able to remove interfering signals from both ends of the tested workpiece.

● Mass storage of various test procedures and test data

- Eddy current testing signals playback, and the defects amplitude, phase and digital value measurement
- Automatically record and display the number and the position of defects.
- Display modes: solid line and blanking display
- Blanking display coefficient: 1～100
- English and Chinese operating languages, on-line help
- Rectangular coordinate system and polar coordinates background for choices
- Automatically display the date and time

3. Installation

3.1 Summary

Instrument adopt high-performance 32-bit microprocessors, large-screen high-brightness color LCD, the latest method of eddy current signal processing, user-friendly design, ensure that the instrument is high accuracy and high reliability intelligent eddy current flaw detector.

3.2 Installation

3.2.1 Unpack

①When collect the instruments, please confirm the number of goods and check the packaging.
②Unlock the box, according to the packing list to confirm equipment and accessories are complete or not.
③ Put the instrument in a right place

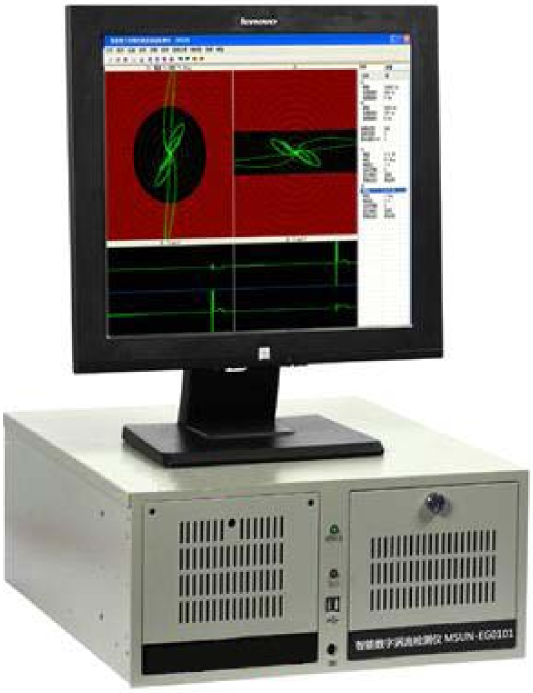
3.2.2 Instrument composition

Including mainframe/ equipment, screen , keyboard, mouse, hard disk, CD-ROM drive and so on, also can according to the customer’s need to dispose the “Eddy Current testing system software “

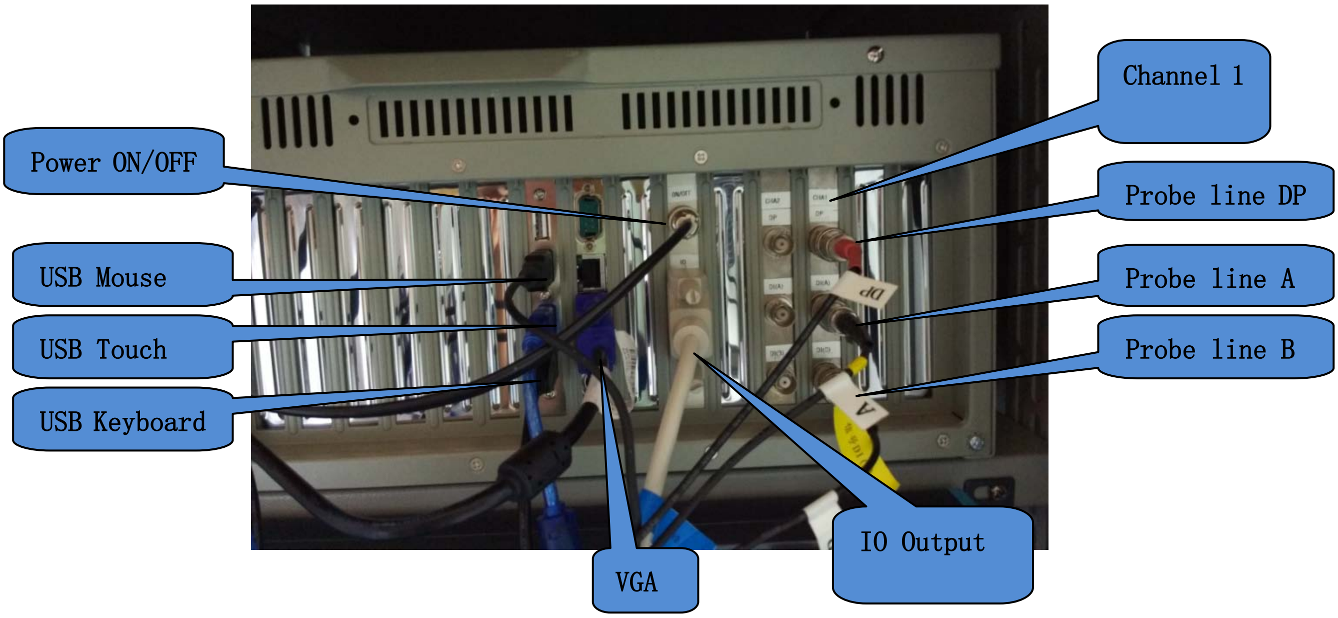
3.2.3 Equipment

Include the host computer processor, eddy current circuit and associated control modules.

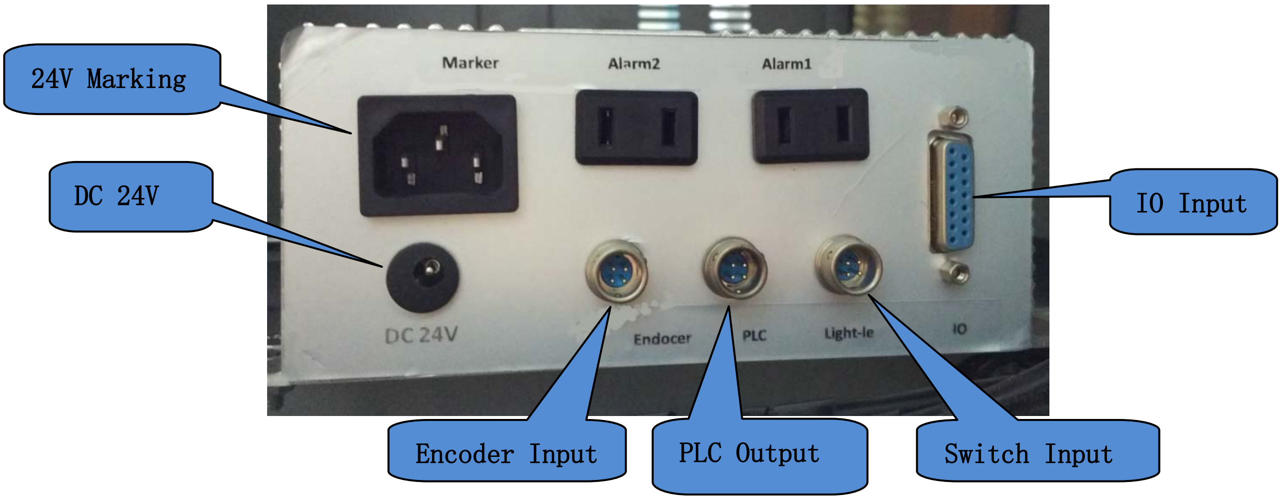
Instrument front panel

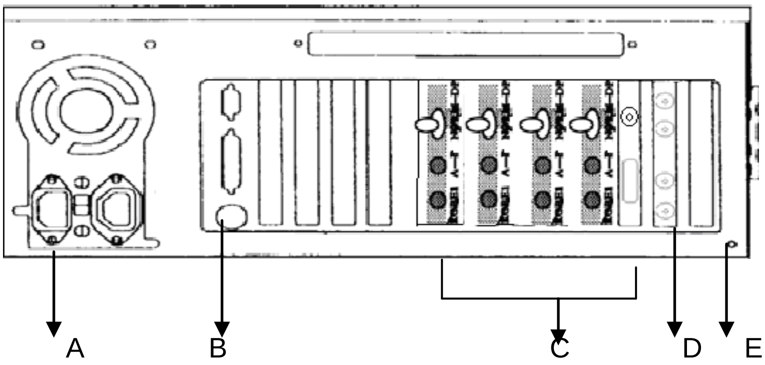


Instrument back panel


Power ON/OFF
USB Mouse
USB Touch
USB Keyboard
Channel 1
Probe line DP
Probe line A
Probe line B
IO Output
VGA

IO Box Interface


Marker
Alarm2
Alarm1
DC 24V
Endocer
PLC
Light-le
IO
24V Marking
DC 24V
IO Input
Encoder Input
PLC Output
Switch Input



A：Power supply（AC　220V）

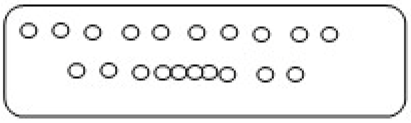
Note：power supply should be（AC　220V）.

B：Key Board、Mouse、Display Interface

C：Probe BNC plug and change-over switch

D：Integrated signal connection socket port

E：Alarm socket and the clock



Real-time alarm output

Alarm output delay

Out-Clock In

Measure Dist

Pick Up

Power : 12V

GND

4. Instrument operation

4.1 Introduction

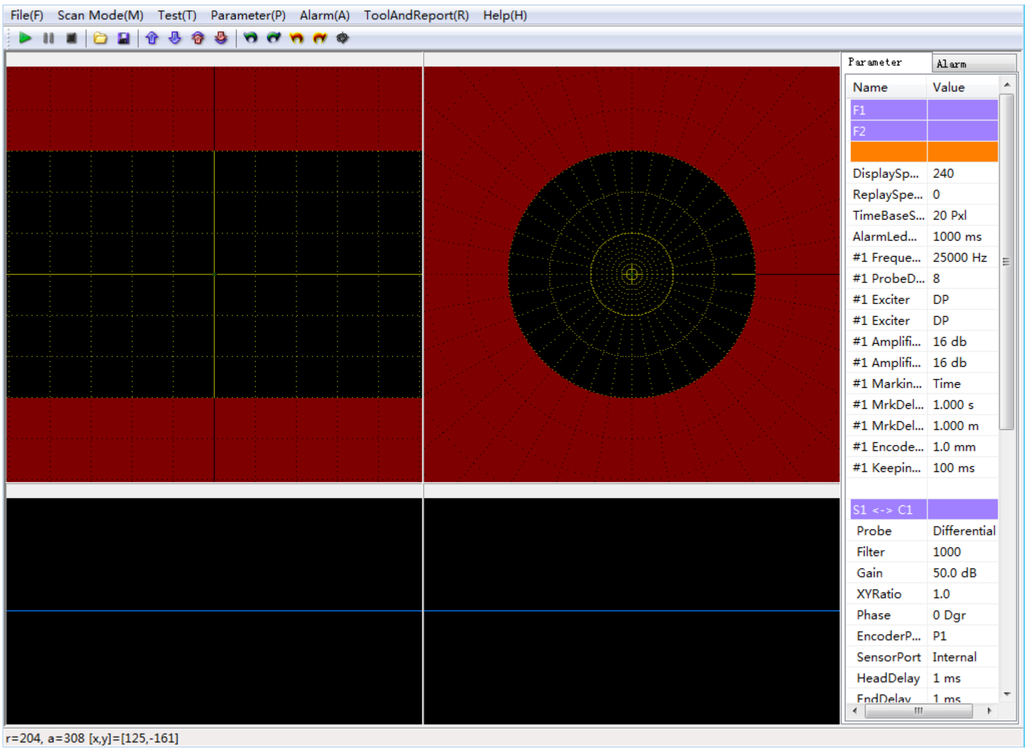
Adopting the full-digital technology and the keyboard operation rather than the complex configuration of control knob, dial switch and key switch, combined with the English and Chinese two operation versions, the equipment is easy to operate and the operators are free from tedious and time-consuming training.

4.2 Guideline of implementation and shutdown

4.2.1 System insertion

Turn on the power switch, the indicating lamp will be bright and the instrument begins to operate. After the start-up, it automatically operates the system

Double click the “ET-ISA” on desktop, the eddy current testing systems begins to operate.
The interface after the double click as follows:

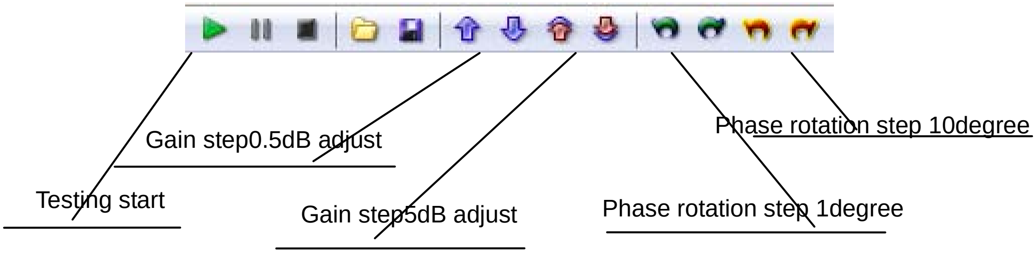

File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Parameter
Alarm

Name	Value
F1	
F2	
DisplaySp...	240
ReplaySpe...	0
TimeBaseS...	20 Pxl
AlarmLed...	1000 ms
#1 Freque...	25000 Hz
#1 ProbeD...	8
#1 Exciter	DP
#1 Exciter	DP
#1 Amplifi...	16 db
#1 Amplifi...	16 db
#1 Markin...	Time
#1 MrkDel...	1.000 s
#1 MrkDel...	1.000 m
#1 Encode...	1.0 mm
#1 Keepin...	100 ms
S1 <-> C1	
Probe	Differential
Filter	1000
Gain	50.0 dB
XYRatio	1.0
Phase	0 Dgr
EncoderP...	P1
SensorPort	Internal
HeadDelay	1 ms
EndDelay	1 ms

r=204, a=308 [x,y]=[125,-161]

4.3 Procedure options and operating procedures

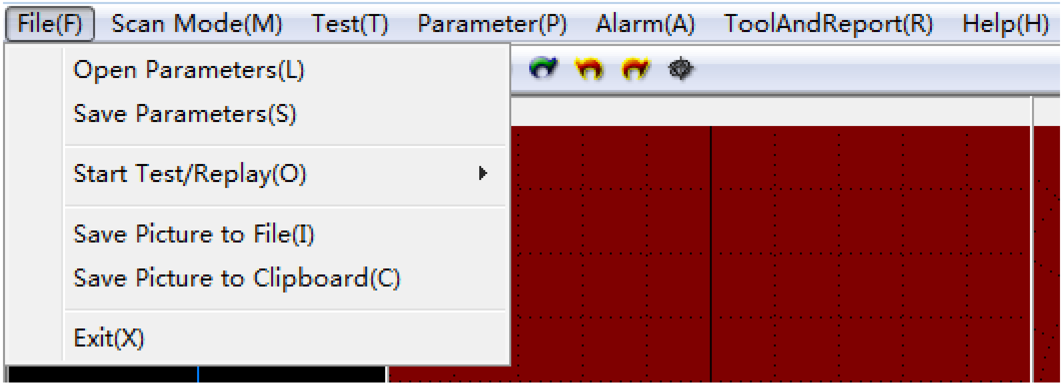
Entering into the testing systems, there appears the main menu at the top of the screen as follows:


Gain step0.5dB adjust
Phase rotation step 10degree
Testing start
Gain step5dB adjust
Phase rotation step 1degree

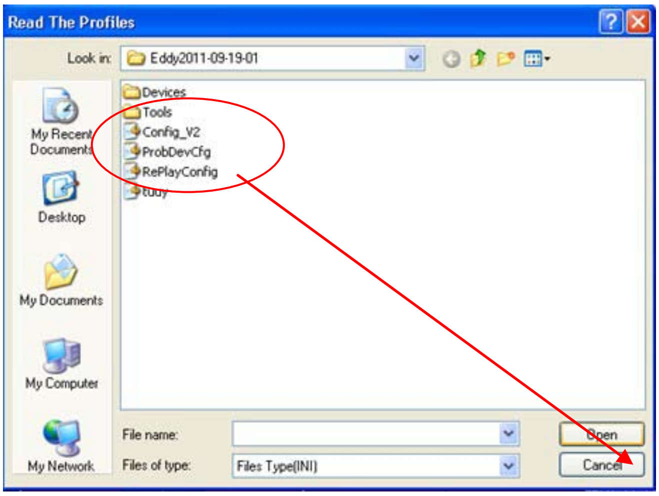
Via the mouse, you can choose the related submenu and check the setting of the parameters and the digital numbers; while the second rank menu is applied for the parameters resetting, say the adjustment of the gain, and phase, etc.

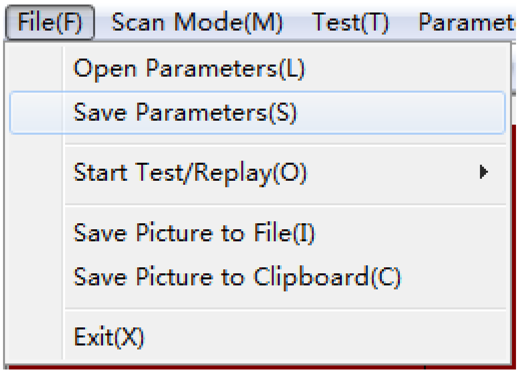
4.3.1 Files

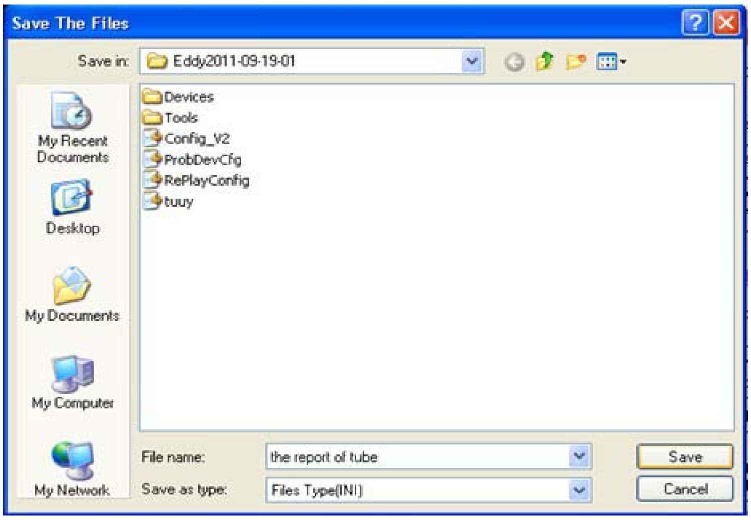
Click the file and there appears” parameters options” and “parameters archive” option. Since there is various testing material, it’s better to save their related testing parameters for future usage to avoid the parameters resetting within each testing. For better understanding, the detailed operation diagram as follows.


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Open Parameters(L)
Save Parameters(S)
Start Test/Replay(O)
Save Picture to File(I)
Save Picture to Clipboard(C)
Exit(X)

Click the “parameters option” or “parameters save”, there appears a file dialog and u can choose a name the path where u want to store the file for parameters save and u can chose the MS-UNI testing files for the parameters option


Read The Profiles
Look in:
Eddy2011-09-19-01
Devices
Tools
Config_V2
ProbDevCfg
RePlayConfig
Eddy
My Recent Documents
Desktop
My Documents
My Computer
My Network
File name:
Files of type:
Files Type(INI)
Open
Cancel


File(F)
Scan Mode(M)
Test(T)
Paramet
Open Parameters(L)
Save Parameters(S)
Start Test/Replay(O)
Save Picture to File(I)
Save Picture to Clipboard(C)
Exit(X)

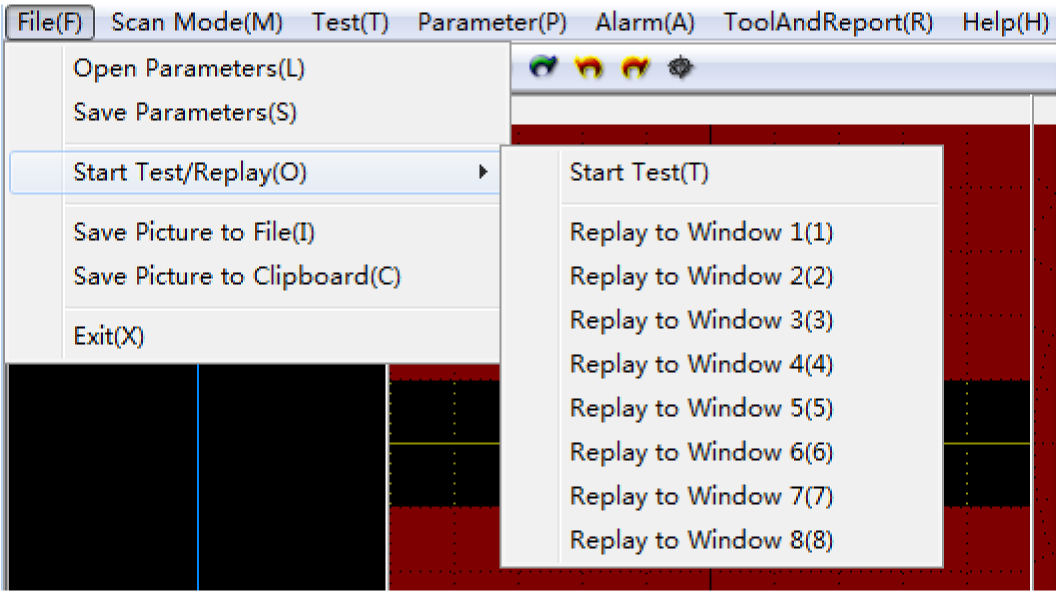

Save The Files
Devices
Tools
Config_V2
ProbDevCfg
RePlayConfig
tuuy
My Recent Documents
Desktop
My Documents
My Computer
My Network
Save
Cancel

Save in: Eddy2011-09-19-01

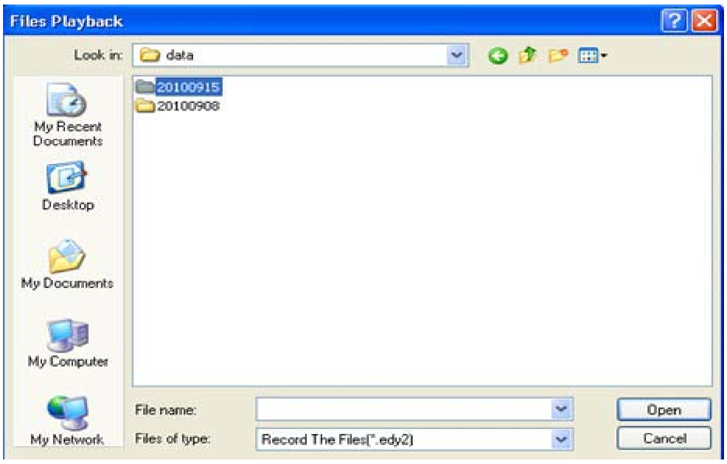
File name: the report of tube

Save as type: Files Type(INI)

Within the system menu, when we click the file option, and you'll get the submenu as follows:


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Open Parameters(L)
Save Parameters(S)
Start Test/Replay(O)
Save Picture to File(I)
Save Picture to Clipboard(C)
Exit(X)
Start Test(T)
Replay to Window 1(1)
Replay to Window 2(2)
Replay to Window 3(3)
Replay to Window 4(4)
Replay to Window 5(5)
Replay to Window 6(6)
Replay to Window 7(7)
Replay to Window 8(8)

Choose the testing data playback window, there enters the dialog as follows and choose the MS-UN file for testing procedure playback and data analysis.


Files Playback
20100915
20100908
My Recent Documents
Desktop
My Documents
My Computer
My Network
Open
Cancel

Look in: data

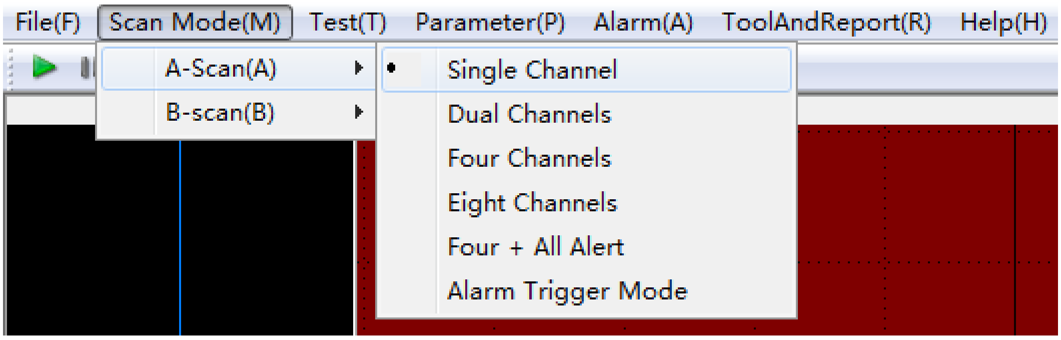
File name:

Files of type: Record The Files(*.edy2)

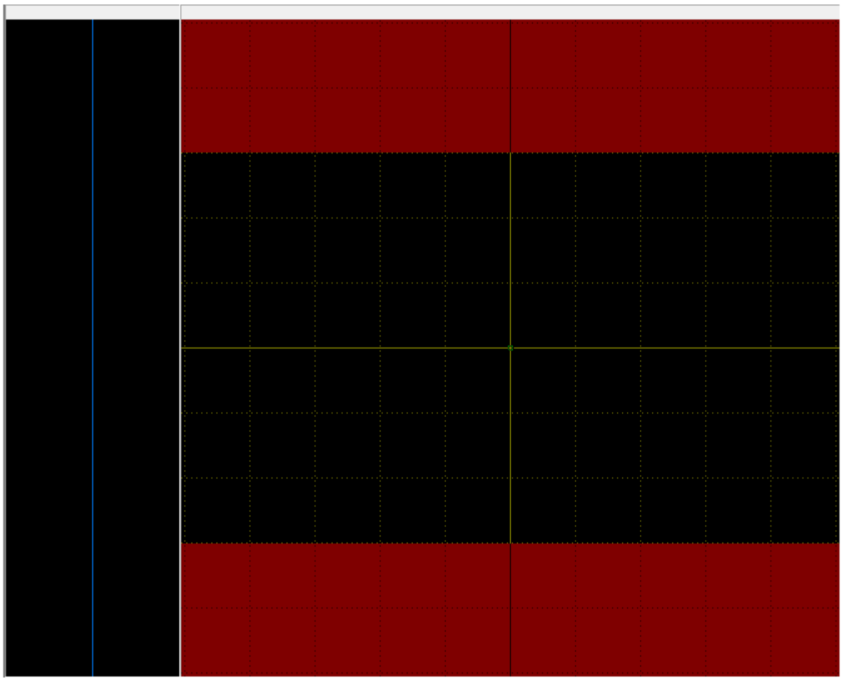
The testing procedures are usually saved in the DAT folder

4.3.2 Procedures

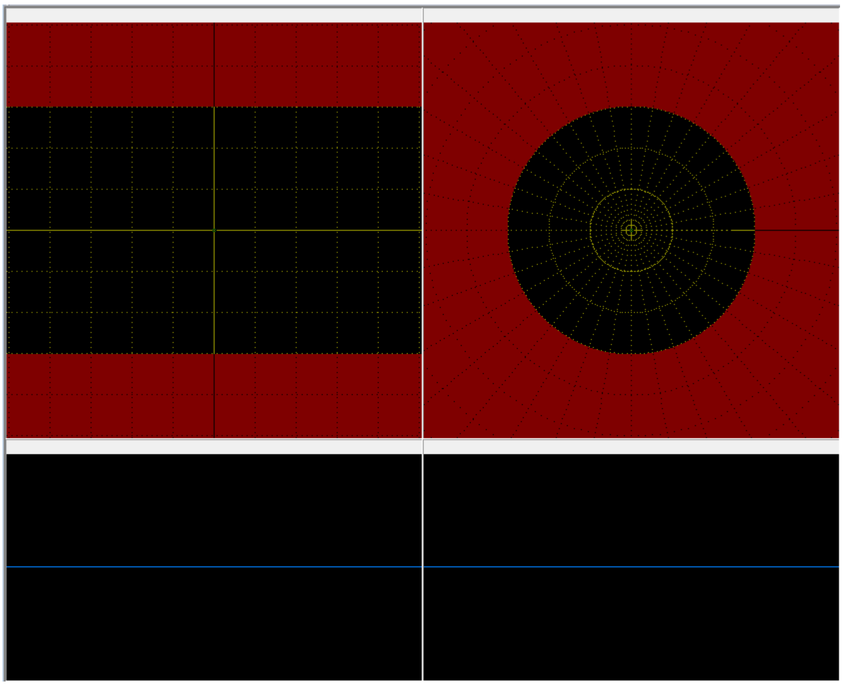
A scan


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
A-Scan(A)
B-scan(B)
Single Channel
Dual Channels
Four Channels
Eight Channels
Four + All Alert
Alarm Trigger Mode

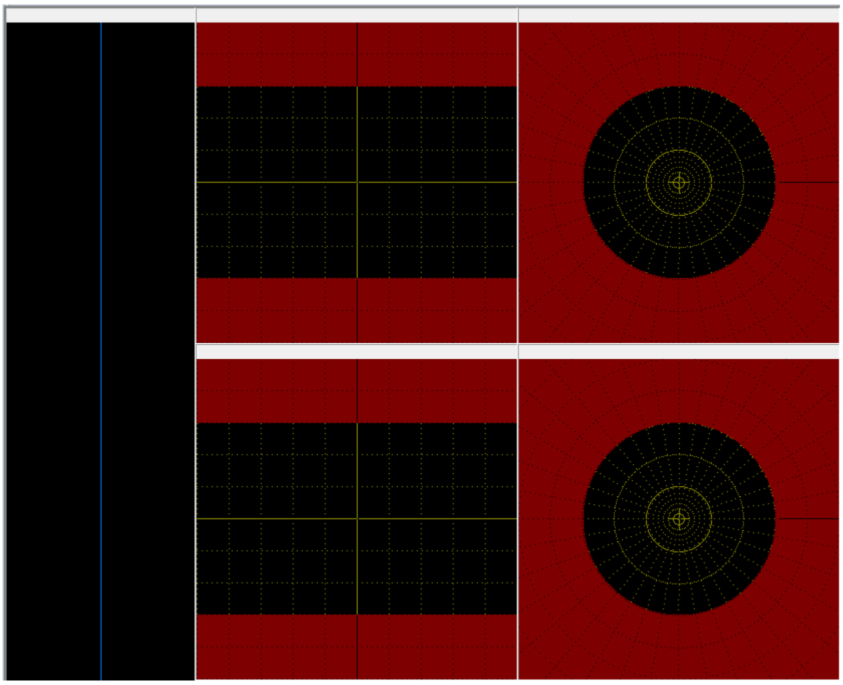
Via the mouse to select the related display mode, and each mode operate as follows:



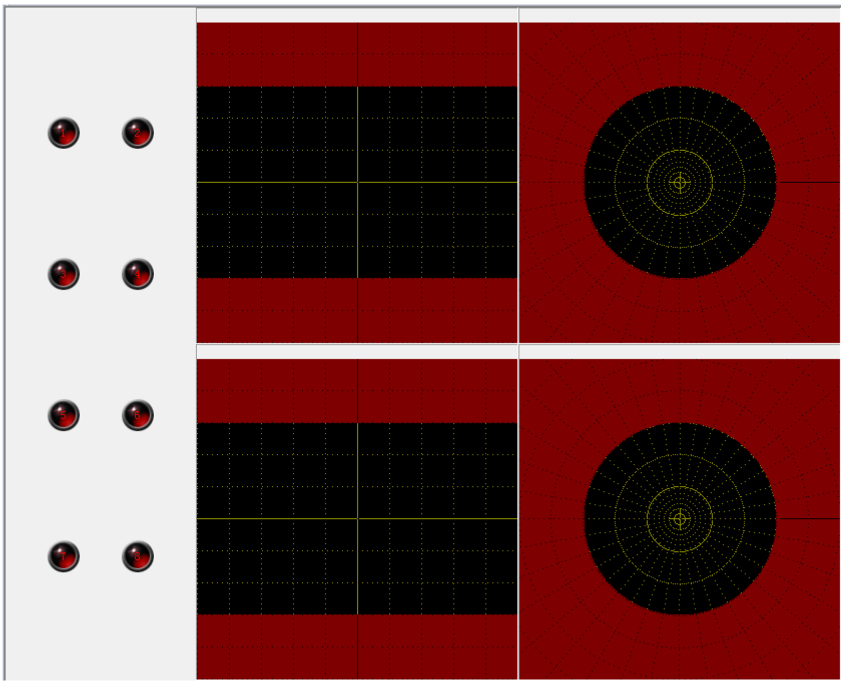
Single impedance display



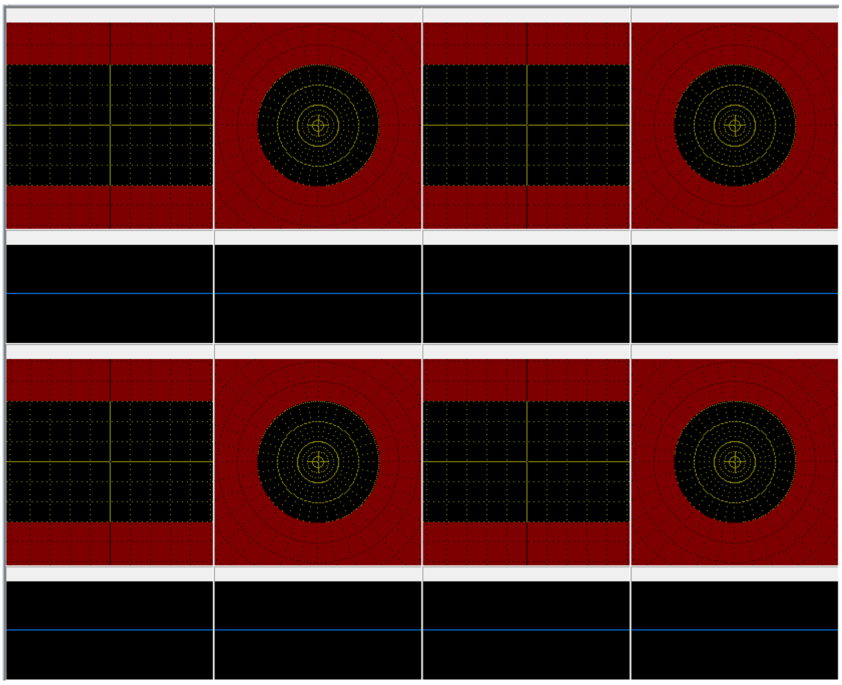
Double impedance display



Four impedance display

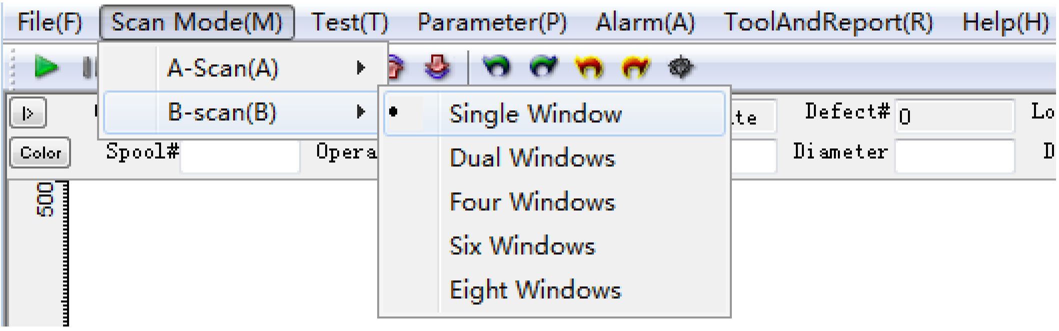


4 + full display / alarm

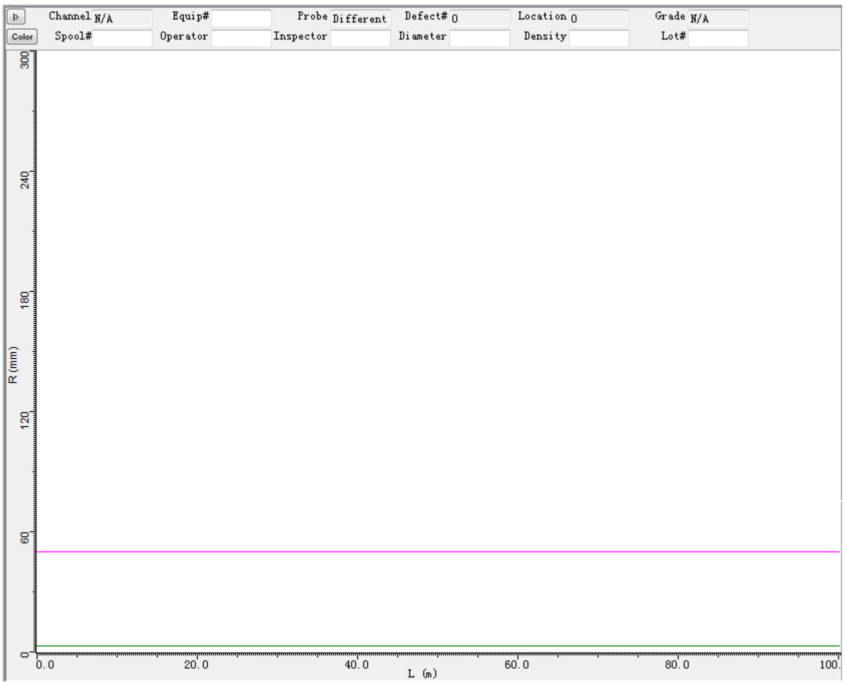


Eight impedance display

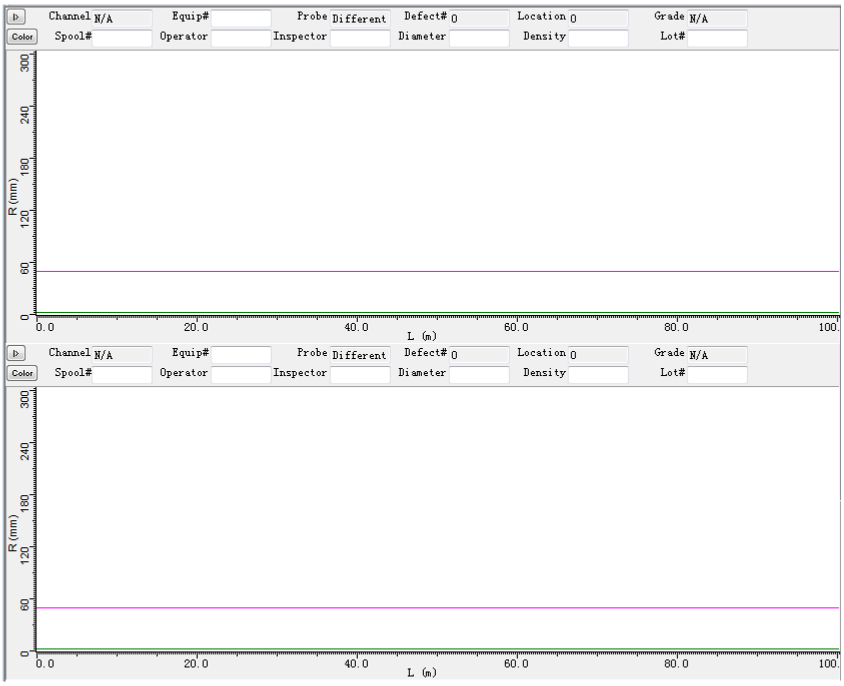
B scan:


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
A-Scan(A)
B-scan(B)
● Single Window
Dual Windows
Four Windows
Six Windows
Eight Windows
Color
Spool#
Opera
Defect# 0
Diameter
500

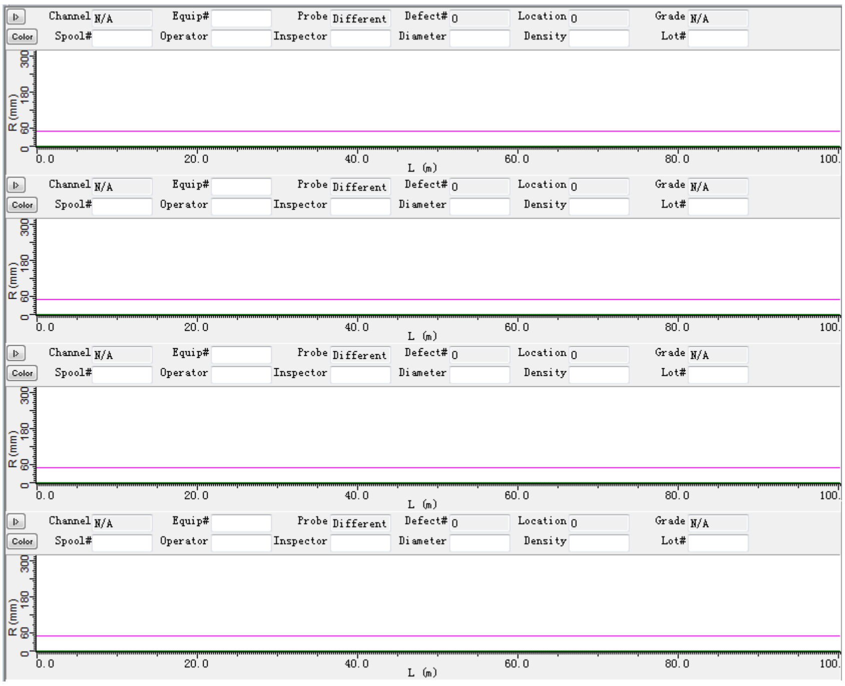
Via the mouse to select the related display mode, and each mode operate as follows:


Channel N/A
Equip#
Probe Different
Defect# 0
Location 0
Grade N/A
Color
Spool#
Operator
Inspector
Diameter
Density
Lot#
300
240
180
120
60
0
R (mm)
0.0
20.0
40.0
60.0
80.0
100.
L (m)

One window display


Channel N/A
Equip#
Probe Different
Defect# 0
Location 0
Grade N/A
Color
Spool#
Operator
Inspector
Diameter
Density
Lot#
300
240
180
120
60
0
R (mm)
0.0
20.0
40.0
60.0
80.0
100.
L (m)

Two window display



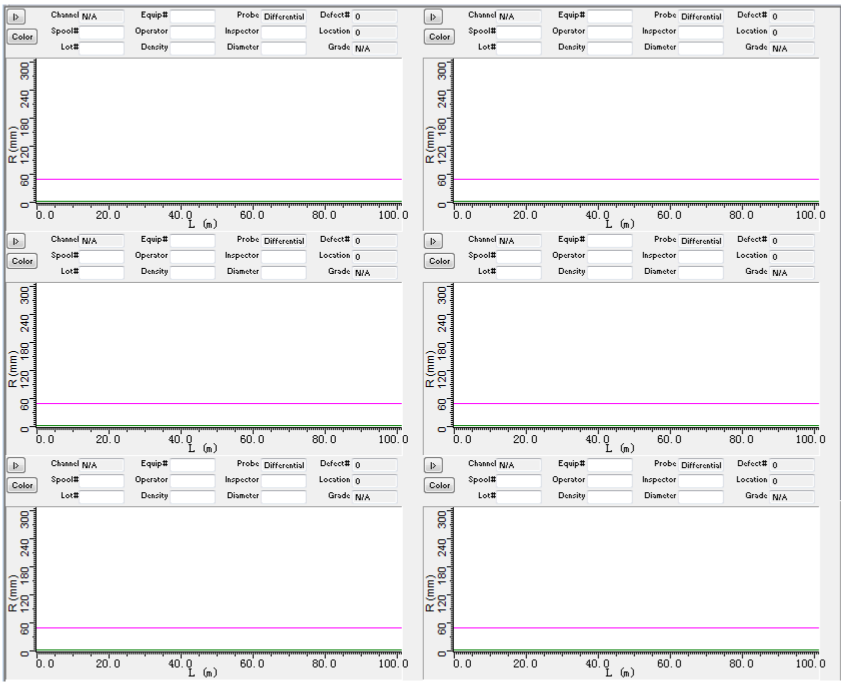
Channel N/A Equip# Probe Different Defect# 0 Location 0 Grade N/A
Spool# Operator Inspector Diameter Density Lot#

Channel N/A Equip# Probe Different Defect# 0 Location 0 Grade N/A
Spool# Operator Inspector Diameter Density Lot#

Channel N/A Equip# Probe Different Defect# 0 Location 0 Grade N/A
Spool# Operator Inspector Diameter Density Lot#

Channel N/A Equip# Probe Different Defect# 0 Location 0 Grade N/A
Spool# Operator Inspector Diameter Density Lot#

Four window display



Channel N/A Equip# Probe Differential Defect# 0
Spool# Operator Inspector Location 0
Lot# Density Diameter Grade N/A

Channel N/A Equip# Probe Differential Defect# 0
Spool# Operator Inspector Location 0
Lot# Density Diameter Grade N/A

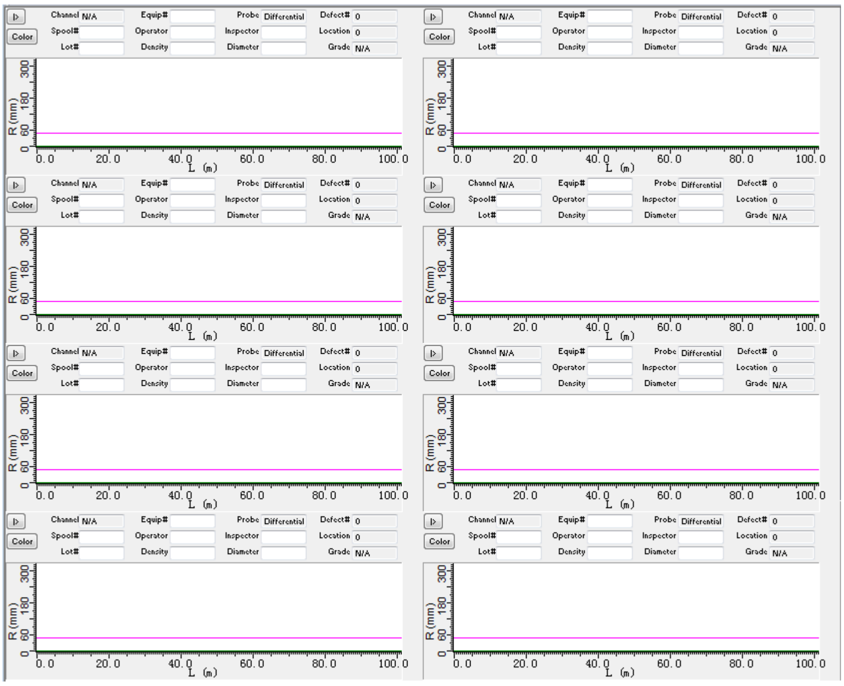
Channel N/A Equip# Probe Differential Defect# 0
Spool# Operator Inspector Location 0
Lot# Density Diameter Grade N/A

Channel N/A Equip# Probe Differential Defect# 0
Spool# Operator Inspector Location 0
Lot# Density Diameter Grade N/A

Channel N/A Equip# Probe Differential Defect# 0
Spool# Operator Inspector Location 0
Lot# Density Diameter Grade N/A

Channel N/A Equip# Probe Differential Defect# 0
Spool# Operator Inspector Location 0
Lot# Density Diameter Grade N/A

Six window display

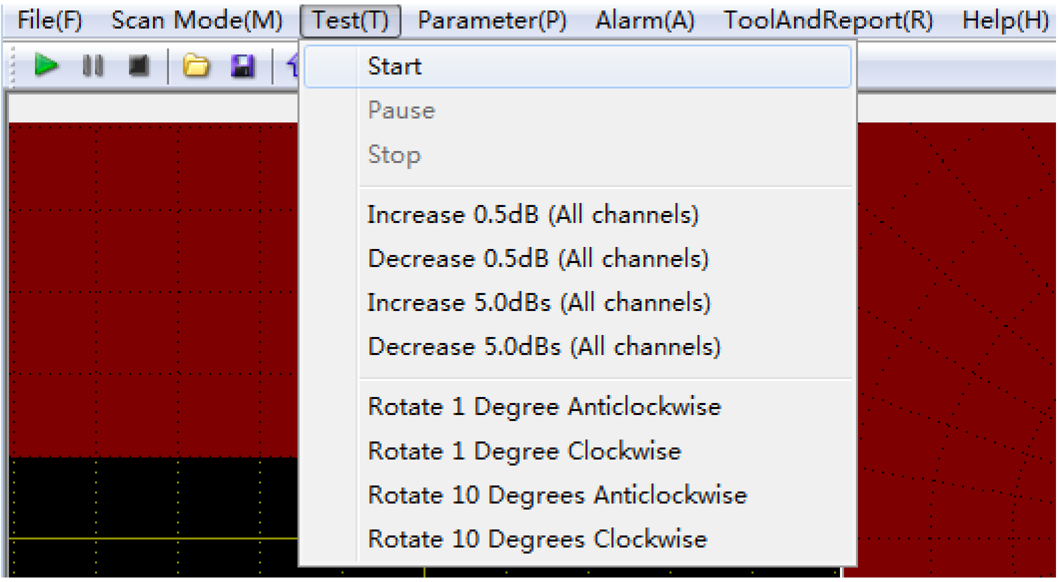

Channel N/A
Equip#
Probe Differential
Defect# 0
Color
Spool#
Operator
Inspector
Location 0
Lot#
Density
Diameter
Grade N/A
R (mm)
0
60
180
300
0.0
20.0
40.0
60.0
80.0
100.0
L (m)

Eight window display

Note: when you choose the A scan or B scan , please stop testing first

4.3.3 Testing

It'll enter into different testing screen display and submenus according to the different testing procedures and different channel numbers. While the mouse moves to the testing option menu, there appears the submenus as the follow diagrams and click the start-up menu.


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Start
Pause
Stop
Increase 0.5dB (All channels)
Decrease 0.5dB (All channels)
Increase 5.0dBs (All channels)
Decrease 5.0dBs (All channels)
Rotate 1 Degree Anticlockwise
Rotate 1 Degree Clockwise
Rotate 10 Degrees Anticlockwise
Rotate 10 Degrees Clockwise

Testing

Within the single impedance interface, enter into the testing submenu, and the whole testing system will enter into the impedance graphic display mode. At the upper center, it's the impedance graphic, the left band part with built-in time base scan , the right part is the main testing parameters while the below is the operating instruction of each button and the main menus.

the current definition of each button：

[A]：to achieve new balance

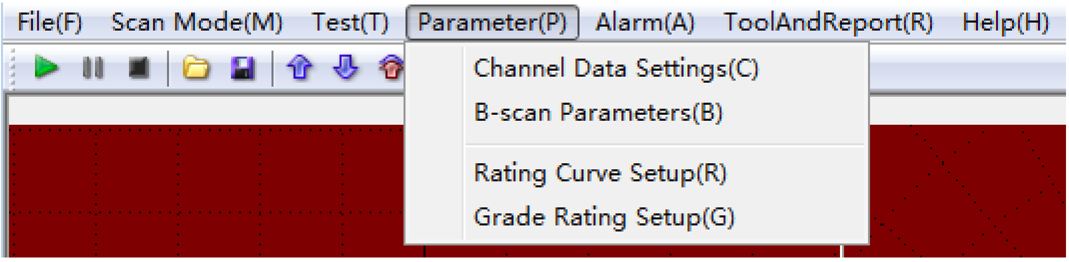
[B]：to remove the impedance graphic

[space]：to achieve new balance at the same time to remove the impedance graphic

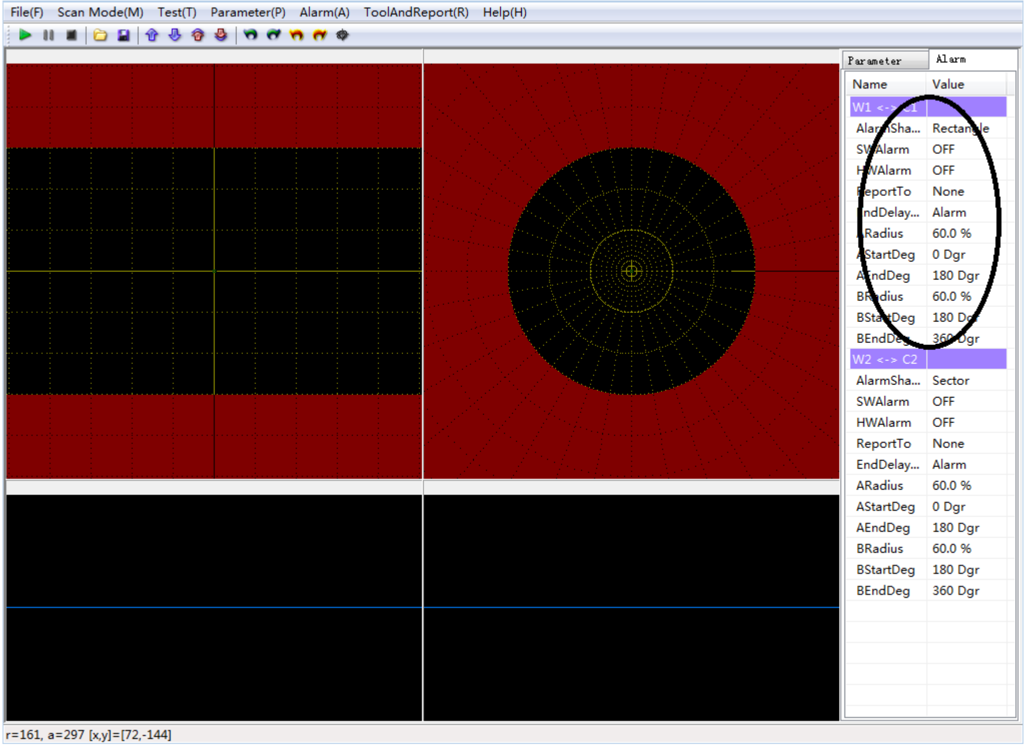
[↑] / [↓]：Via removing the blue cursor within the parameters area to select the parameters to me adjusted.

[C]：Clear the screen

4.3.4 Parameter


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Channel Data Settings(C)
B-scan Parameters(B)
Rating Curve Setup(R)
Grade Rating Setup(G)

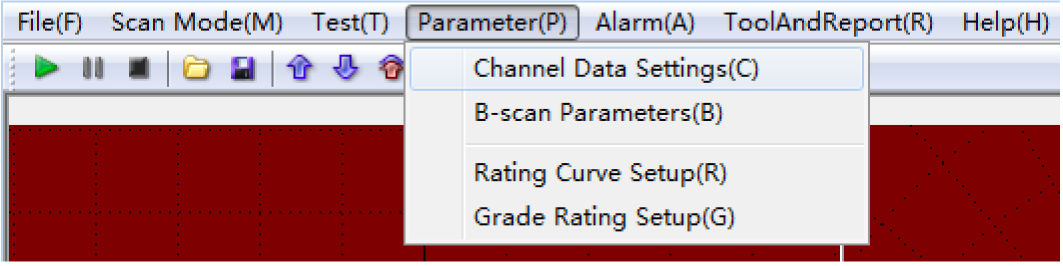
While entering the testing system, there are parameter menu within the main menus at the top of the screen as follow picture. Via the [↑]、[↓] to select the related parameter while the [←]、[→] buttons are applied to the parameter adjustment.


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Parameter
Alarm

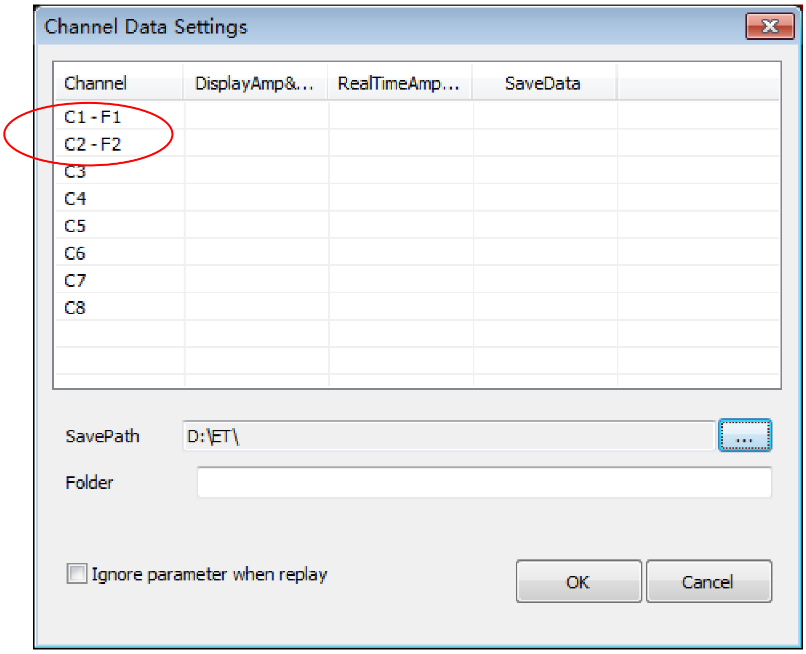
Name	Value
W1 <-> C1	
AlarmSha...	Rectangle
SWAlarm	OFF
HWAlarm	OFF
ReportTo	None
EndDelay...	Alarm
ARadius	60.0 %
AStartDeg	0 Dgr
AEndDeg	180 Dgr
BRadius	60.0 %
BStartDeg	180 Dgr
BEndDeg	360 Dgr
W2 <-> C2	
AlarmSha...	Sector
SWAlarm	OFF
HWAlarm	OFF
ReportTo	None
EndDelay...	Alarm
ARadius	60.0 %
AStartDeg	0 Dgr
AEndDeg	180 Dgr
BRadius	60.0 %
BStartDeg	180 Dgr
BEndDeg	360 Dgr

r=161, a=297 [x,y]=[72,-144]

The above is the single impedance graphic display and we can select the channel numbers according to the testing requirements. Except the above parameters setting as the pictures display, we can also achieve the adjustment via the parameter menu at the top of the screen.


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Channel Data Settings(C)
B-scan Parameters(B)
Rating Curve Setup(R)
Grade Rating Setup(G)

Click the Channel option, then input F1 ~ Fn to bind channels, as below:


Channel Data Settings
OK
Cancel

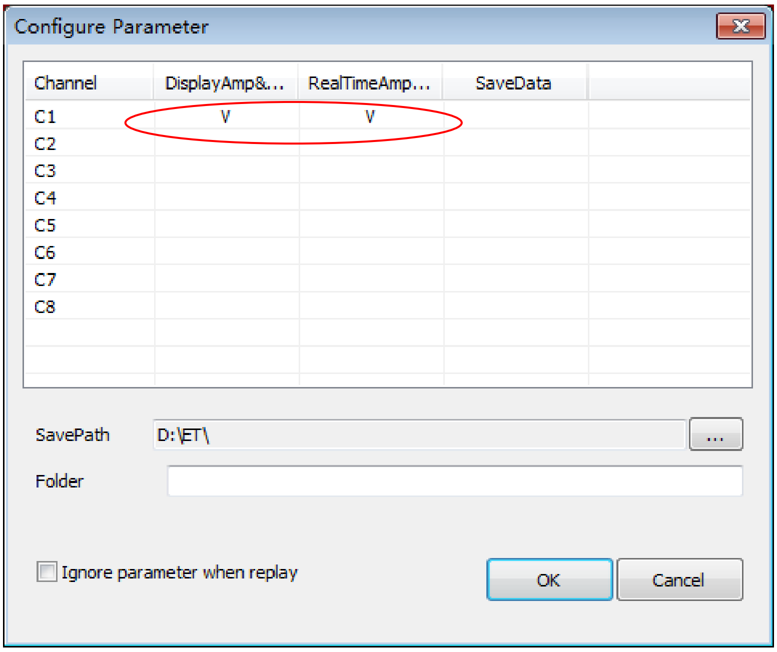
Channel	DisplayAmp&...	RealTimeAmp...	SaveData
C1 - F1			
C2 - F2			
C3			
C4			
C5			
C6			
C7			
C8			

SavePath D:\ET\

Folder

☐ Ignore parameter when replay

Click the DisplayAmp RealTimeAmp option, and it'll automatically display the data and phase of the flaw signals on the upper part of the display window with setting diagram as below. Select the windows u'd like to check and it'll automatically display the corresponding test data



Configure Parameter

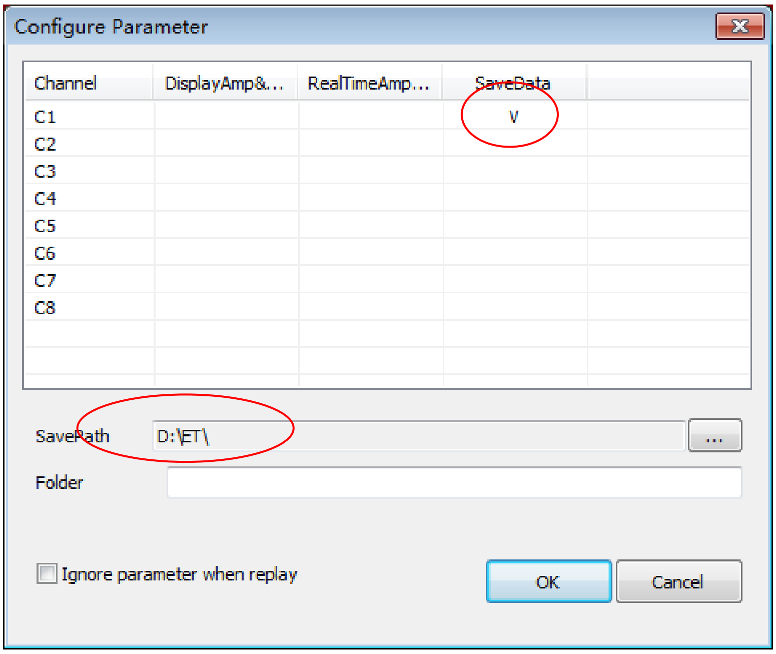
Channel	DisplayAmp&...	RealTimeAmp...	SaveData
C1	V	V	
C2			
C3			
C4			
C5			
C6			
C7			
C8			

SavePath D:\ET\

Folder

☐ Ignore parameter when replay

Select the channels for the testing procedures storage via the eddy current test data archive function from the parameter option.



Configure Parameter

Channel	DisplayAmp&...	RealTimeAmp...	SaveData
C1			V
C2			
C3			
C4			
C5			
C6			
C7			
C8			

SavePath D:\ET\

Folder

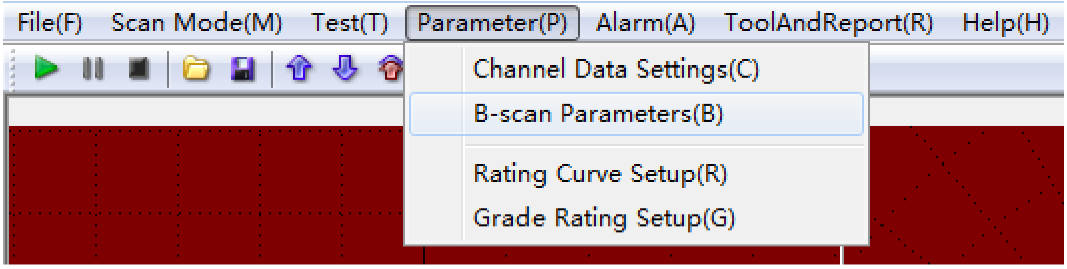
☐ Ignore parameter when replay

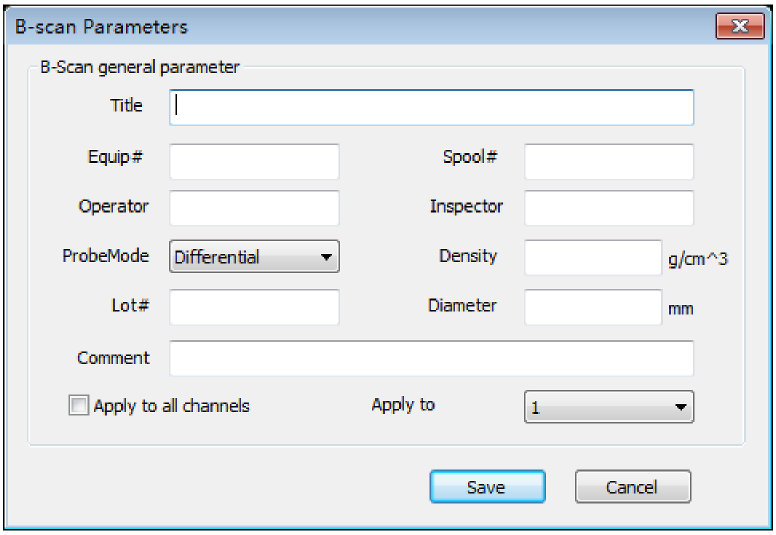
Click the channel data selection option and check the testing data of each probe. the two windows display of one probe testing data is also accepted. And we can preset display modes according to the practical testing requirements

The C1、C2……in the above windows remarks the window number while F1、F2…indicates the testing channels. Click the eddy current test data storage option, there appears the dialog as below. Select the corresponding options and save the test data of each testing channels.

As shown, four channels are separately set to one channel display.

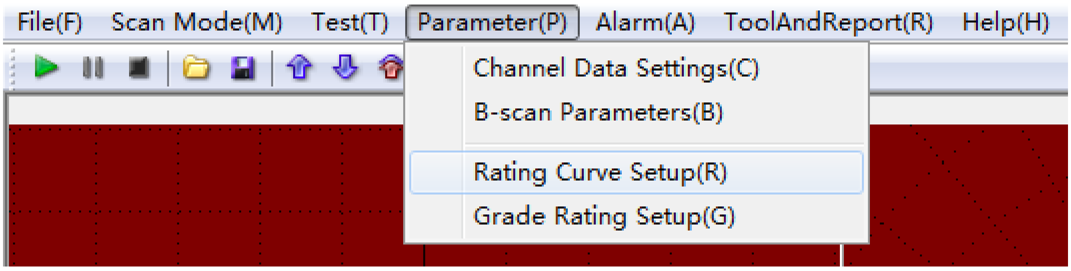
Set up the Parameter of B scan

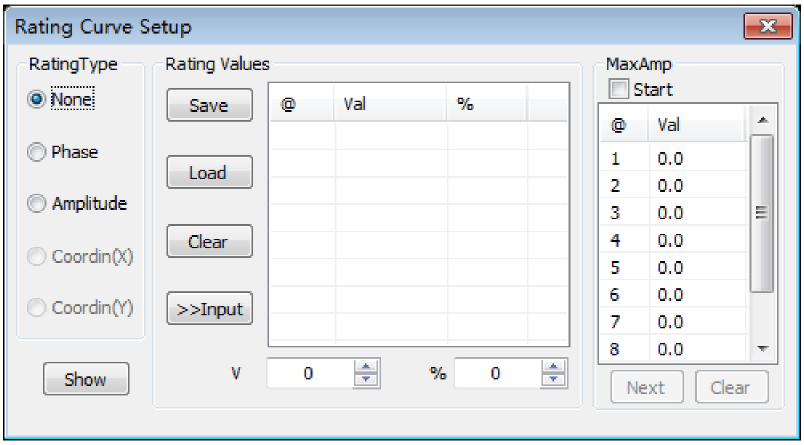

File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Channel Data Settings(C)
B-scan Parameters(B)
Rating Curve Setup(R)
Grade Rating Setup(G)


B-scan Parameters
B-Scan general parameter
Save
Cancel

Title:
Equip#:
Spool#:
Operator:
Inspector:
ProbeMode: Differential
Density: g/cm^3
Lot#:
Diameter: mm
Comment:
☐ Apply to all channels
Apply to: 1

Via the calibration curve making option, we can make the curve according to the different artificial defect testing standard thus we can get the related flaw information via the curve condition


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Channel Data Settings(C)
B-scan Parameters(B)
Rating Curve Setup(R)
Grade Rating Setup(G)


Rating Curve Setup
Rating Values
Save
Load
Clear
>>Input
Show
Next
Clear

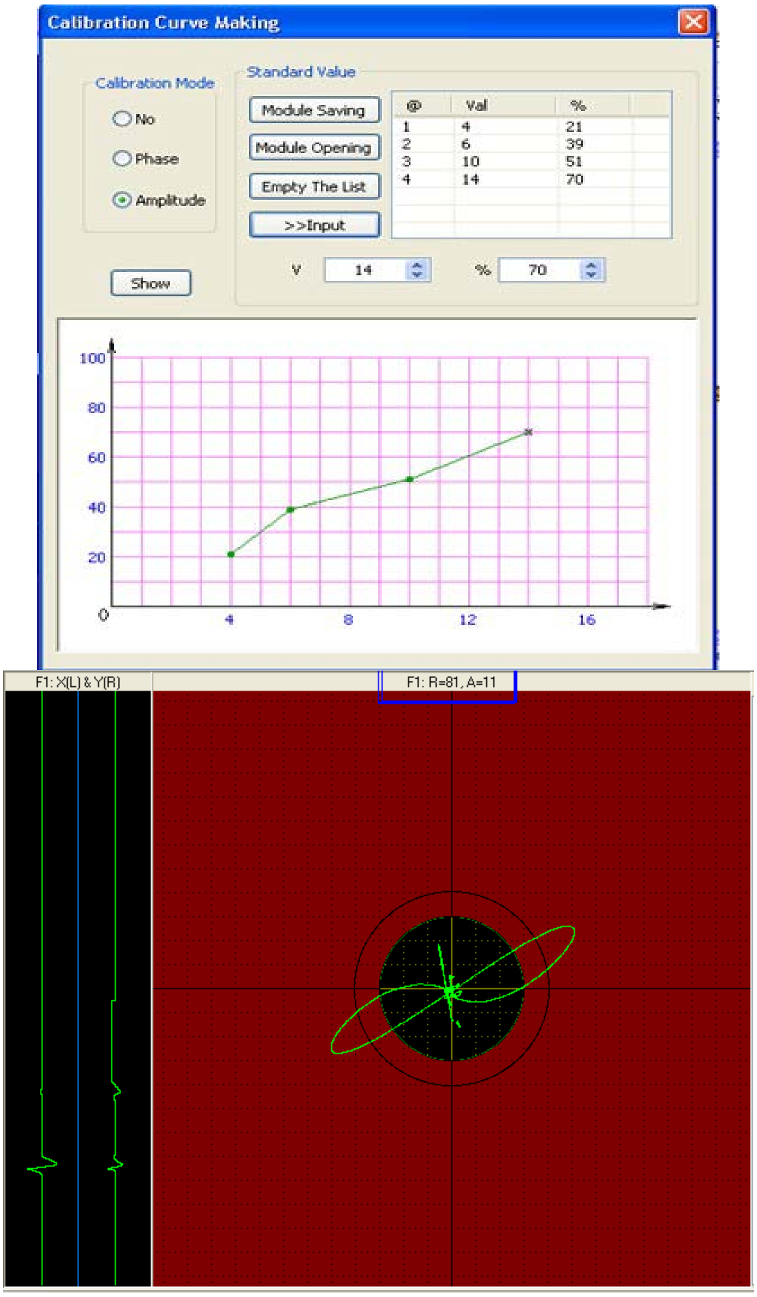
RatingType:
● None
○ Phase
○ Amplitude
○ Coordin(X)
○ Coordin(Y)

@	Val	%

V: 0
%: 0

MaxAmp
☐ Start

@	Val
1	0.0
2	0.0
3	0.0
4	0.0
5	0.0
6	0.0
7	0.0
8	0.0


Calibration Curve Making
Calibration Mode
Standard Value
Module Saving
Module Opening
Empty The List
>>Input
Show
100
80
60
40
20
0
4
8
12
16
F1: X(L) & Y(R)
F1: R=81, A=11

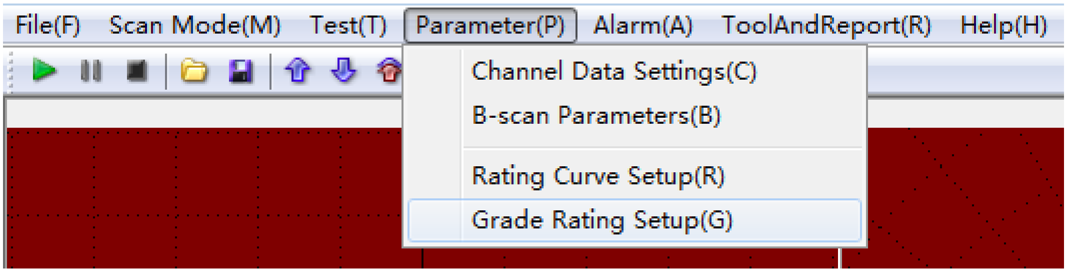
Calibration Mode: ○ No ○ Phase ● Amplitude

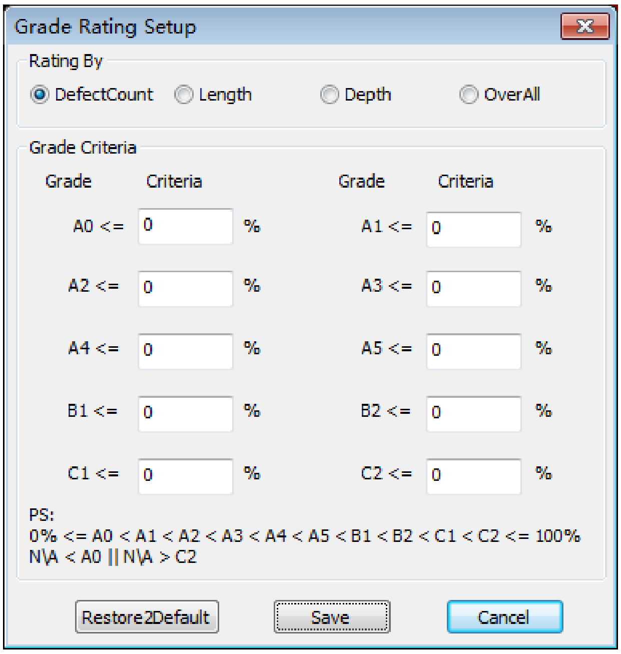
@	Val	%
1	4	21
2	6	39
3	10	51
4	14	70

V 14 % 70

As shown in the figure, the flaw thickness is 39% of the wall thickness.

“Grade Assessment Setting”


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Channel Data Settings(C)
B-scan Parameters(B)
Rating Curve Setup(R)
Grade Rating Setup(G)



Grade Rating Setup

Rating By

● DefectCount ○ Length ○ Depth ○ OverAll

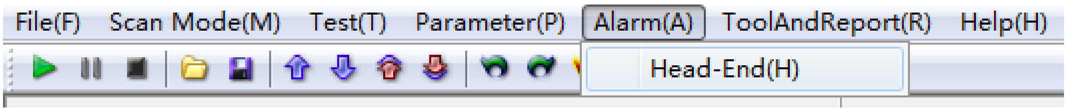
Grade Criteria

Grade	Criteria		Grade	Criteria	
A0 <=	0	%	A1 <=	0	%
A2 <=	0	%	A3 <=	0	%
A4 <=	0	%	A5 <=	0	%
B1 <=	0	%	B2 <=	0	%
C1 <=	0	%	C2 <=	0	%

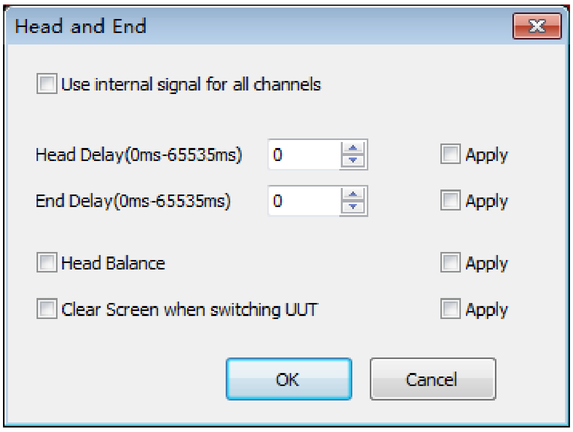
PS:
0% <= A0 < A1 < A2 < A3 < A4 < A5 < B1 < B2 < C1 < C2 <= 100%
N\A < A0 || N\A > C2

4.3.5 Alarm

Move the mouse to the alarm option, there will appear the submenu as follows



The fixed time and length marking setting as follows：



Head and End

☐ Use internal signal for all channels

Head Delay(0ms-65535ms) 0 ☐ Apply

End Delay(0ms-65535ms) 0 ☐ Apply

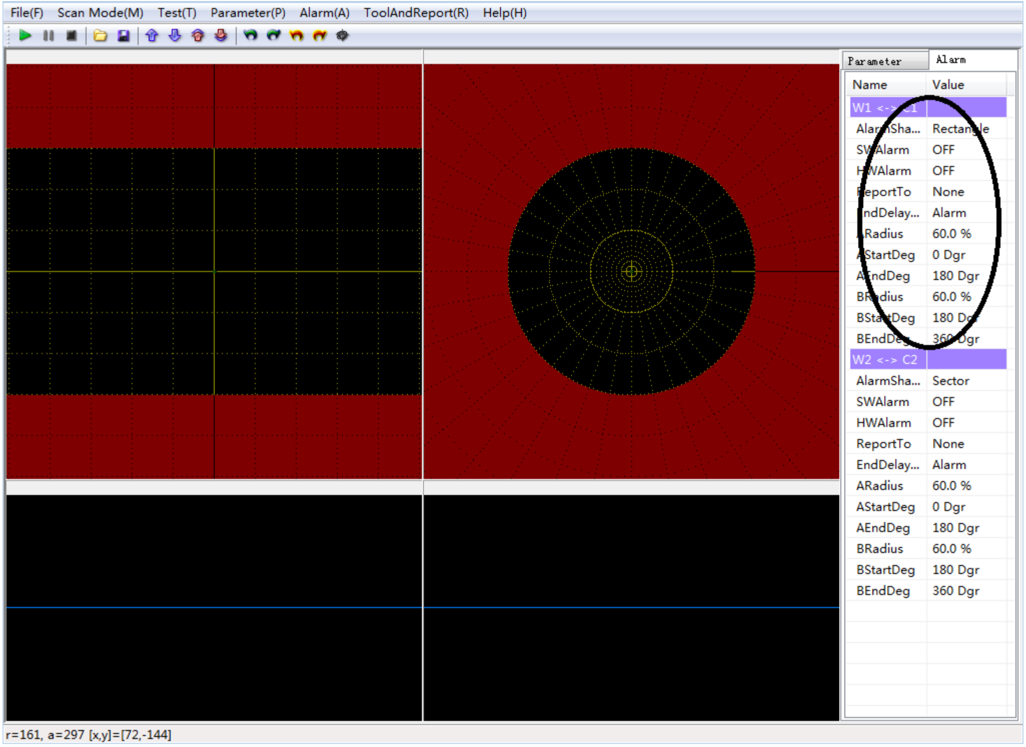
☐ Head Balance ☐ Apply

☐ Clear Screen when switching UUT ☐ Apply

Once select the automatic mechanical clock, we should reset the delay time of both ends (as above figure), thus we can remove the jamming signals of the both ends to ensure more accurate testing(or we can choose the detector clock)

Besides, via the “ends balance”, we can achieve automatic balance of the testing signals to avoid the false alarm; via the both end signals clearness to remove the jamming signals to assure no interference signals of the next workpiece detecting.

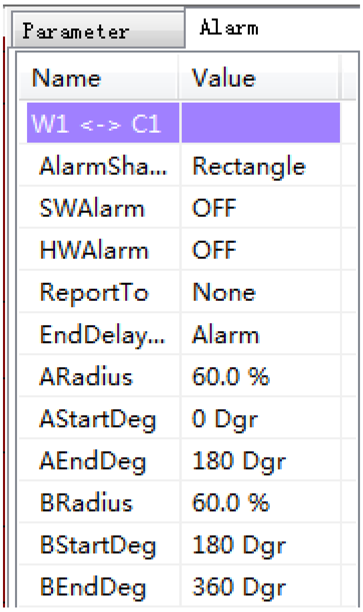
click the alarm window and we can reset the alarm parameters according to your detailed requirements.(as below figure)


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Parameter
Alarm

Name	Value
W1 <-> C1	
AlarmSha...	Rectangle
SWAlarm	OFF
HWAlarm	OFF
ReportTo	None
EndDelay...	Alarm
ARadius	60.0 %
AStartDeg	0 Dgr
AEndDeg	180 Dgr
BRadius	60.0 %
BStartDeg	180 Dgr
BEndDeg	360 Dgr
W2 <-> C2	
AlarmSha...	Sector
SWAlarm	OFF
HWAlarm	OFF
ReportTo	None
EndDelay...	Alarm
ARadius	60.0 %
AStartDeg	0 Dgr
AEndDeg	180 Dgr
BRadius	60.0 %
BStartDeg	180 Dgr
BEndDeg	360 Dgr

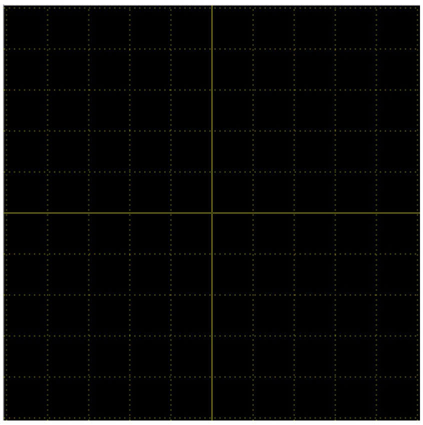
r=161, a=297 [x,y]=[72,-144]

Turn to the alarm option, and check the parameters at the right side of the interface. Via the [↑][↓] button to choose the one u interested and via the [←][→] to adjust the parameter figures

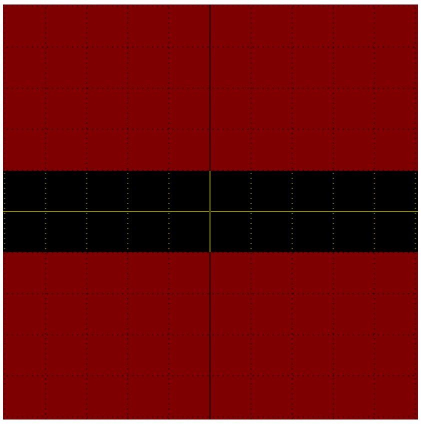

Parameter
Alarm

Name	Value
W1 <-> C1	
AlarmSha...	Rectangle
SWAlarm	OFF
HWAlarm	OFF
ReportTo	None
EndDelay...	Alarm
ARadius	60.0 %
AStartDeg	0 Dgr
AEndDeg	180 Dgr
BRadius	60.0 %
BStartDeg	180 Dgr
BEndDeg	360 Dgr

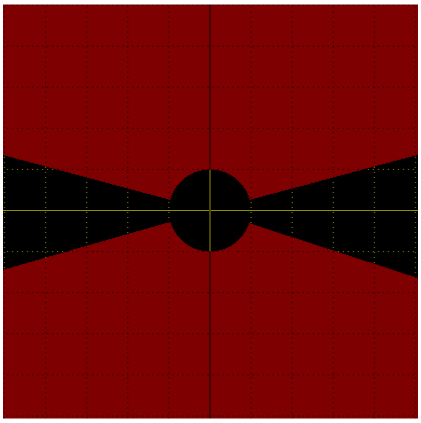
(1) AlarmShap: None/Rectangle/Sector



None



Rectangle



Sector

definition of each button：

[↑] / [↓]： The shifting button [↑] / [↓] to select the MS-UNI menu or submenu .

Alarm setting procedure:

Firstly, focus to the alarm region option, and set the alarm mode, alarm domain mode and sound and light alarm mode, etc; secondly, set the size of the alarm window. Via the[→] or [←] button to adjust the amplitude value and the phase value to achieve the alarm window adjustion(or what we called the alarm domain size adjustion).

Fig2. Software alarm setting mode**:**on/off

Software alarm	Alarm setting	Specification

setting mode	mode	
on	on	System and hardware alarm at the same time
	off	System alarm,hardwarre do not alarm
on	on	System do not alarm, hardware alarm
	off	System and hardware both do not alarm

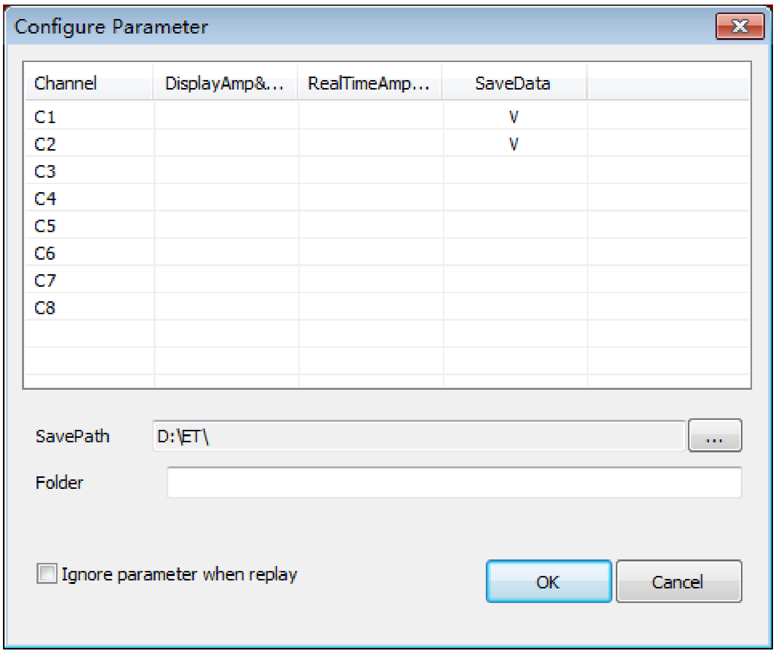
Notes: generally, we keep the software alarm function open.

⑵ **Hardware alarm: P1/P2/P3/P4**

Normally, the hardware alarm is fixed with the corresponding testing channel. That is to say, P1 means the channel 1(W1) alarm, P2(W2) means the channel 2 alarm. And if we mix match the hardware alarm to other testing channel, the testing result will be misleading

⑶**/ #A1/ #A2/ #A3/ #A4 report storage**

Options: no record, #A1、#A2、#A3、#A4 which separately represents the channel one, channel two, channel three and channel four. In this case, after the testing, it'll automatically generate the corresponding testing report of each channel(detailed information as the flaw length, phase, amplitude, etc) and the users can check the report according to their own requirements. If for each channel, we choose the uniform setting of #1(can be #2, #3 or #4). It'll generate only one report sheet with the complete testing data of all the channels. While if we choose no record, there'll be no report sheet at all.



Configure Parameter

Channel	DisplayAmp&...	RealTimeAmp...	SaveData
C1			V
C2			V
C3			
C4			
C5			
C6			
C7			
C8			

SavePath D:\ET\

Folder

☐ Ignore parameter when replay

⑷Alarm deviation

Since the distance between each probe and the starting position is not all the same, thus we need to check the deviation distance of each probe to assure more accurate testing report.

Eg, if the value number is 10mm, it means 10mm back of the standard probe position.

Eg. If the value number is -10mm, it means 10mm ahead of the standard probe position.

⑸Ending testing

The alarm function of the ending testing is used for the automatic alarm when the whole testing is finished.

⑹Interference signals amplitude: the same function as the “parameters/interference signals amplitude”. For more details just refer to 5.3.4

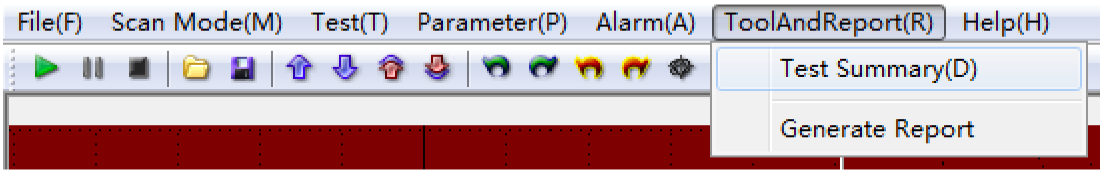
⑺Amplitude and phase clear: the same function as the “parameters/interference signals amplitude”. More details, just refer to the 5.3.4

A radius：>15pix
A start：0~180
A end：0~180
B radius：>15pix
B start：180~360
B end：180~360

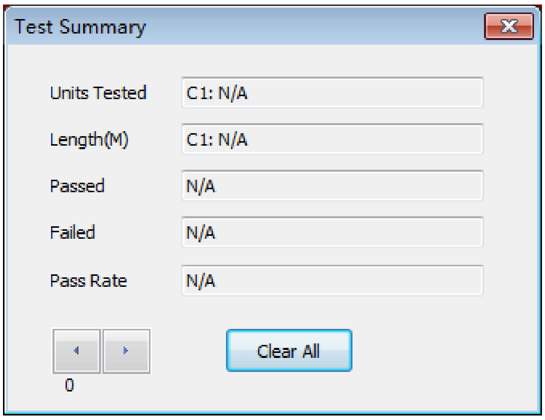
4.3.6 Toolbar and report

Testing summarization

Select the testing summarization submenu, it will appear a dialog with some corresponding parameter values for users to check the test number, evaluate the testing efficiency, and the analyze the product quality. The operating interface as below figure.



testing summarization dialog as follows:



Units Tested C1: N/A

Length(M) C1: N/A

Passed N/A

Failed N/A

Pass Rate N/A

Select the outside clock (within the automatic mechanical device rather then inserted in the detector device), and set the two end signals values, the testing system will automatically generate the test number, the qualified number, the unqualified number, the passing rate, and other information.

Notes: for the “all to clear” operating, we have to stop the testing procedure firstly

After the testing of each part or the whole part of the workpiece, the memory of test length should be cleared to avoid the false flaw position of the following testing.

Testing data playback

Via the “record playback” option, we can check the test data. But during the testing processing, we can only check the former test data via the” file/open the equipment or file” option

Fig1. Via the”file/open the equipment or file” option, we can check the testing data of any channel you like

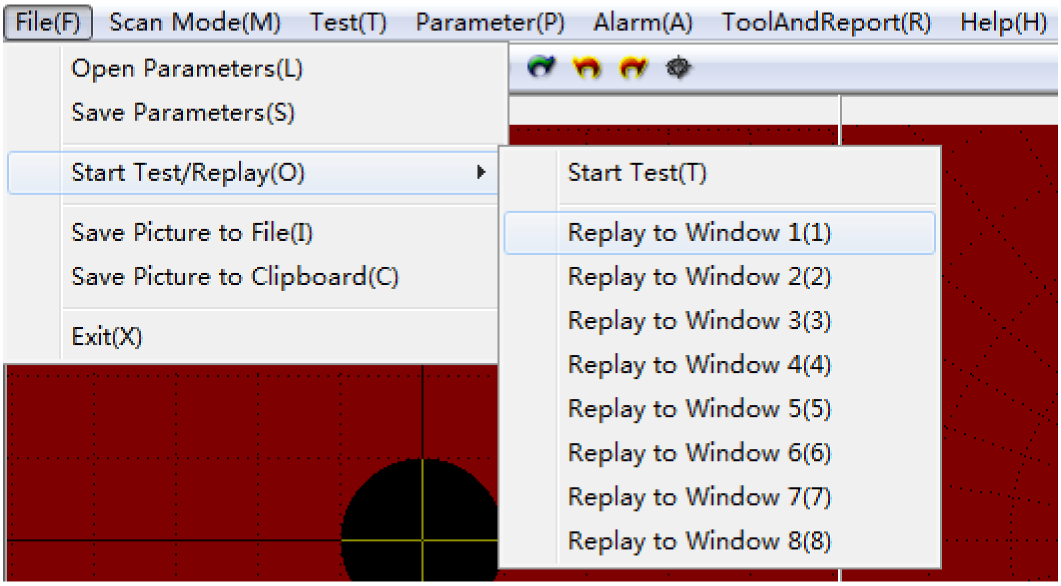
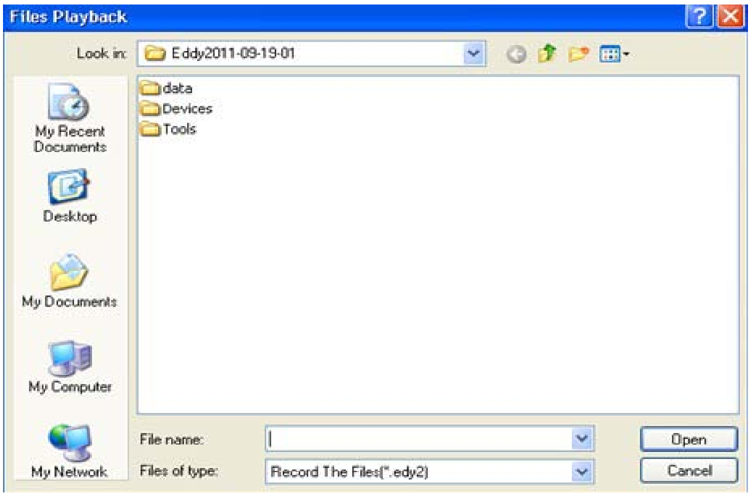

File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Open Parameters(L)
Save Parameters(S)
Start Test/Replay(O)
Save Picture to File(I)
Save Picture to Clipboard(C)
Exit(X)
Start Test(T)
Replay to Window 1(1)
Replay to Window 2(2)
Replay to Window 3(3)
Replay to Window 4(4)
Replay to Window 5(5)
Replay to Window 6(6)
Replay to Window 7(7)
Replay to Window 8(8)

Fig2. click the “dat”

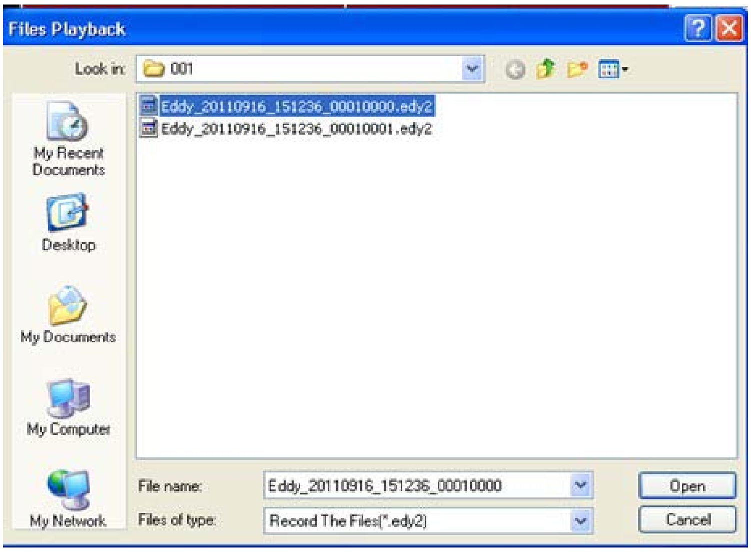

Files Playback
data
Devices
Tools
My Recent Documents
Desktop
My Documents
My Computer
My Network
Open
Cancel

Look in: Eddy2011-09-19-01

File name:

Files of type: Record The Files(*.edy2)

Fig3. select the testing file for playback


Files Playback
Eddy_20110916_151236_00010000.edy2
Eddy_20110916_151236_00010001.edy2
My Recent Documents
Desktop
My Documents
My Computer
My Network
Open
Cancel

Look in: 001

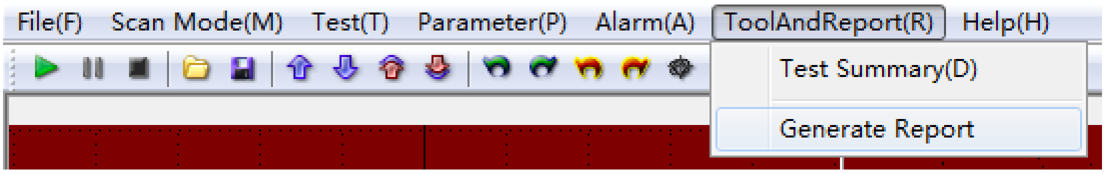
File name: Eddy_20110916_151236_00010000

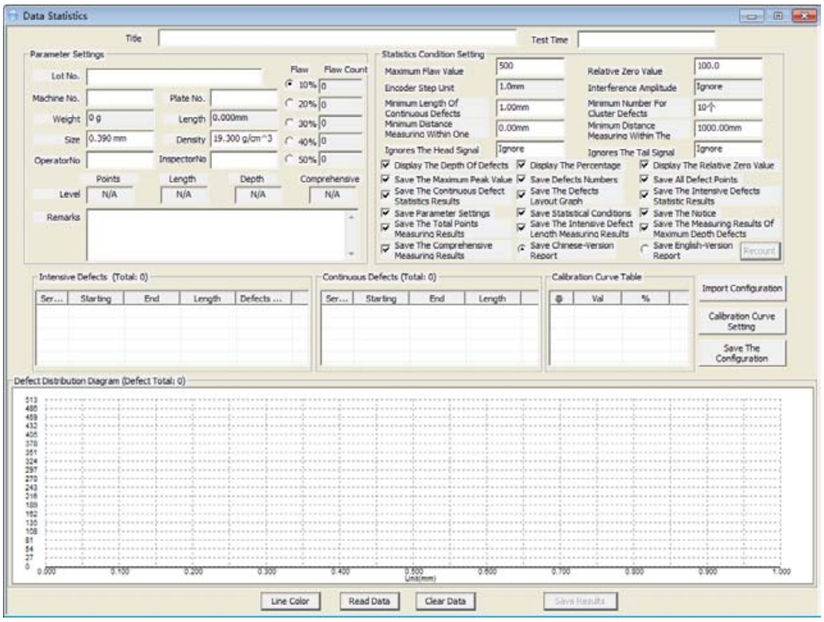
Files of type: Record The Files(*.edy2)

Playback parameter option: with the function of playback speed control.
Say, if the number is larger, the faster while smaller, the slower

The record setting and the diagram generating

After the testing, we can get the testing report diagram via the following operating procedures.


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Test Summary(D)
Generate Report


Data Statistics
Parameter Settings
Statistics Condition Setting
Intensive Defects (Total: 0)
Continuous Defects (Total: 0)
Calibration Curve Table
Ser...
Starting
End
Length
Defects ...
@
Val
%
Import Configuration
Calibration Curve Setting
Save The Configuration
Recount
Defect Distribution Diagram (Defect Total: 0)
Unit(mm)
Line Color
Read Data
Clear Data
Save Results

Title:
Test Time:
Lot No.:
Machine No.:
Plate No.:
Weight: 0 g
Length: 0.000mm
Size: 0.390 mm
Density: 19.300 g/cm^3
OperatorNo:
InspectorNo:

Flaw	Flaw Count
● 10%	0
○ 20%	0
○ 30%	0
○ 40%	0
○ 50%	0

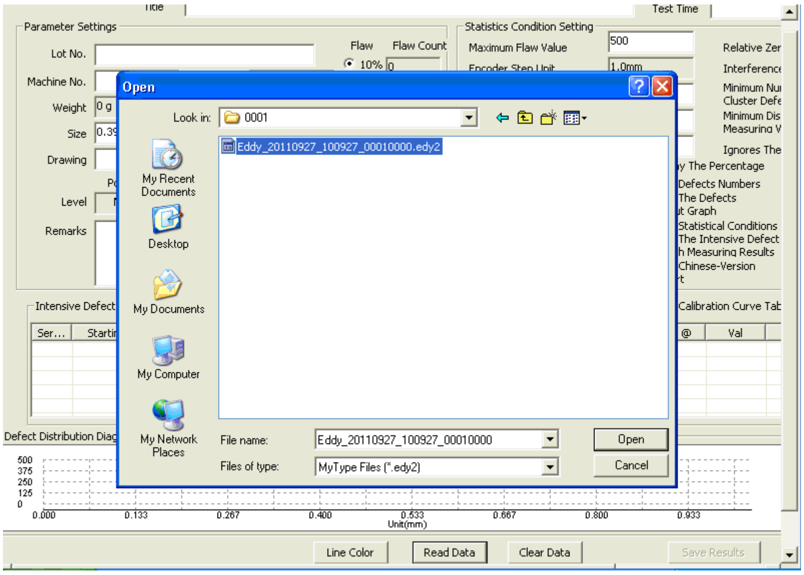
	Points	Length	Depth	Comprehensive
Level	N/A	N/A	N/A	N/A

Remarks:

Maximum Flaw Value: 500
Encoder Step Unit: 1.0mm
Minimum Length Of Continuous Defects: 1.00mm
Minimum Distance Measuring Within One: 0.00mm
Ignores The Head Signal: Ignore
Relative Zero Value: 100.0
Interference Amplitude: Ignore
Minimum Number For Cluster Defects: 10个
Minimum Distance Measuring Within The: 1000.00mm
Ignores The Tail Signal: Ignore

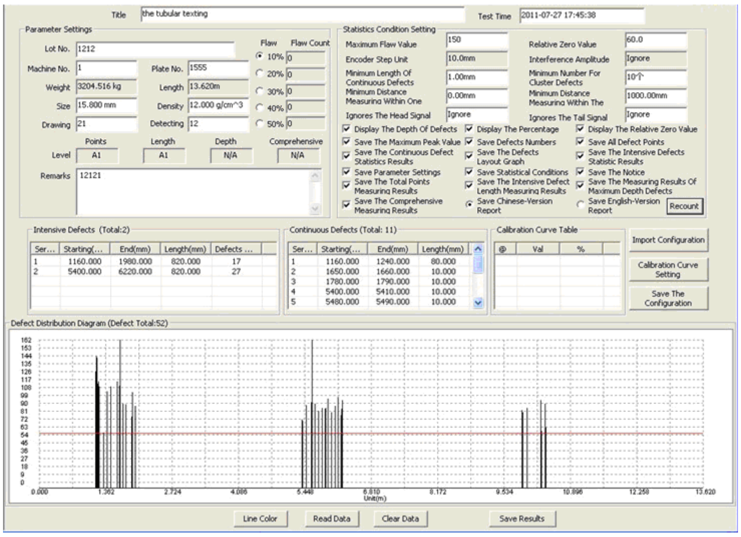
☑ Display The Depth Of Defects
☑ Save The Maximum Peak Value
☑ Save The Continuous Defect Statistics Results
☑ Save Parameter Settings
☑ Save The Total Points Measuring Results
☑ Save The Comprehensive Measuring Results
☑ Display The Percentage
☑ Save Defects Numbers
☑ Save The Defects Layout Graph
☑ Save Statistical Conditions
☑ Save The Intensive Defect Length Measuring Results
● Save Chinese-Version Report
☑ Display The Relative Zero Value
☑ Save All Defect Points
☑ Save The Intensive Defects Statistic Results
☑ Save The Notice
☑ Save The Measuring Results Of Maximum Depth Defects
○ Save English-Version Report

After testing, can save the report, as follow:


Open
Look in:
My Recent Documents
Desktop
My Documents
My Computer
My Network Places
Open
Cancel
Line Color
Read Data
Clear Data
Save Results

Look in: 0001
Eddy_20110927_100927_00010000.edy2
File name: Eddy_20110927_100927_00010000
Files of type: MyType Files (*.edy2)

Then can see as follow:



Title: the tubular texting
Test Time: 2011-07-27 17:45:38

Parameter Settings

Lot No.: 1212
Machine No.: 1
Plate No.: 1555
Weight: 3204.516 kg
Length: 13.620m
Size: 15.800 mm
Density: 12.000 g/cm^3
Drawing: 21
Detecting: 12

Flaw	Flaw Count
● 10%	0
○ 20%	0
○ 30%	0
○ 40%	0
○ 50%	0

	Points	Length	Depth	Comprehensive
Level	A1	A1	N/A	N/A

Remarks: 12121

Statistics Condition Setting

Maximum Flaw Value: 150
Encoder Step Unit: 10.0mm
Minimum Length Of Continuous Defects: 1.00mm
Minimum Distance Measuring Within One: 0.00mm
Ignores The Head Signal: Ignore
Relative Zero Value: 60.0
Interference Amplitude: Ignore
Minimum Number For Cluster Defects: 10个
Minimum Distance Measuring Within The: 1000.00mm
Ignores The Tail Signal: Ignore

☑ Display The Depth Of Defects
☑ Save The Maximum Peak Value
☑ Save The Continuous Defect Statistics Results
☑ Save Parameter Settings
☑ Save The Total Points Measuring Results
☑ Save The Comprehensive Measuring Results
☑ Display The Percentage
☑ Save Defects Numbers
☑ Save The Defects Layout Graph
☑ Save Statistical Conditions
☑ Save The Intensive Defect Length Measuring Results
● Save Chinese-Version Report
☑ Display The Relative Zero Value
☑ Save All Defect Points
☑ Save The Intensive Defects Statistic Results
☑ Save The Notice
☑ Save The Measuring Results Of Maximum Depth Defects
○ Save English-Version Report

Intensive Defects (Total:2)

Ser...	Starting(...	End(mm)	Length(mm)	Defects ...
1	1160.000	1980.000	820.000	17
2	5400.000	6220.000	820.000	27

Continuous Defects (Total: 11)

Ser...	Starting(...	End(mm)	Length(mm)
1	1160.000	1240.000	80.000
2	1650.000	1660.000	10.000
3	1780.000	1790.000	10.000
4	5400.000	5410.000	10.000
5	5480.000	5490.000	10.000

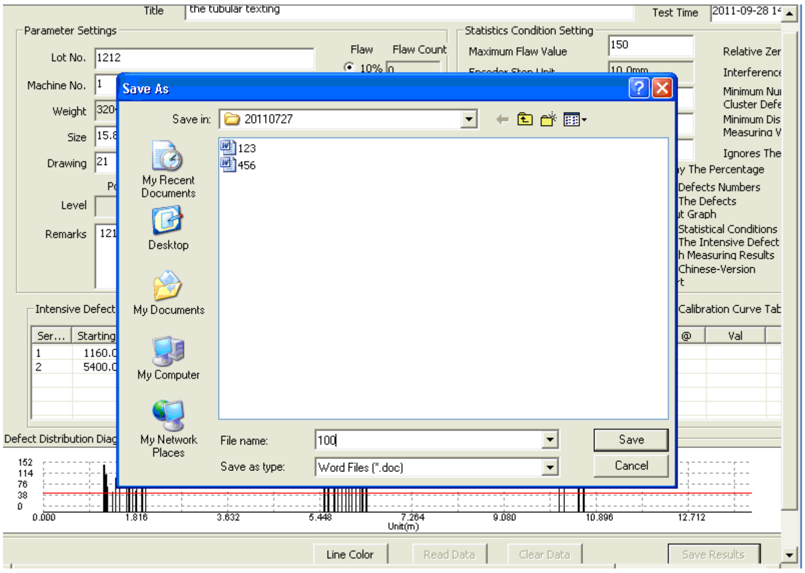
Calibration Curve Table

@	Val	%

Defect Distribution Diagram (Defect Total:52)

Recount
Import Configuration
Calibration Curve Setting
Save The Configuration
162
153
144
135
126
117
108
99
90
81
72
63
54
45
36
27
18
9
0
0.000
1.362
2.724
4.086
5.448
6.810
8.172
9.534
10.896
12.258
13.620
Unit(m)
Line Color
Read Data
Clear Data
Save Results

Then click to Save dates:



Save As

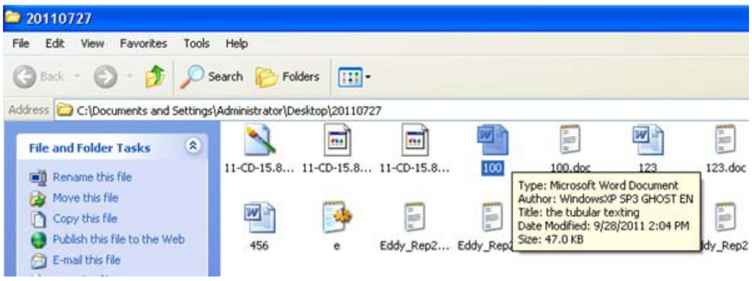
Save in: 20110727

123
456

File name: 100
Save as type: Word Files (*.doc)

My Recent Documents
Desktop
My Documents
My Computer
My Network Places
Save
Cancel
Title
the tubular texting
Test Time
2011-09-28 1
Parameter Settings
Statistics Condition Setting
Lot No.
1212
Machine No.
Weight
Size
Drawing
Level
Remarks
Flaw
Flaw Count
10%
Maximum Flaw Value
150
Intensive Defect
Calibration Curve Tab
Defect Distribution Diag
152
114
76
38
0
0.000
1.816
3.632
5.448
7.264
9.080
10.896
12.712
Unit(m)
Line Color
Read Data
Clear Data
Save Results

Find the .doc file. Open it , can fine the test report in word :



20110727

Address: C:\Documents and Settings\Administrator\Desktop\20110727

Type: Microsoft Word Document
Author: WindowsXP SP3 GHOST EN
Title: the tubular texting
Date Modified: 9/28/2011 2:04 PM
Size: 47.0 KB

File
Edit
View
Favorites
Tools
Help
Back
Search
Folders
File and Folder Tasks
Rename this file
Move this file
Copy this file
Publish this file to the Web
E-mail this file
11-CD-15.8...
11-CD-15.8...
11-CD-15.8...
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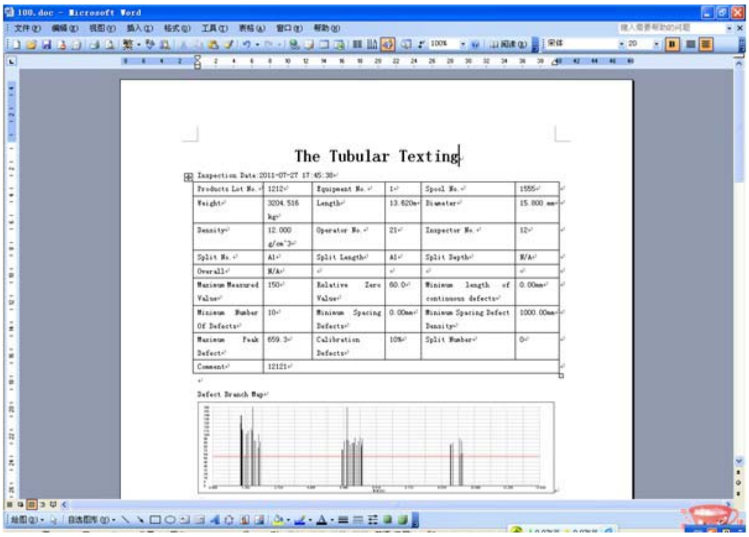
Eddy_Rep2...
Eddy_Rep2
dy_Rep2

Open "100.doc" document, can see:



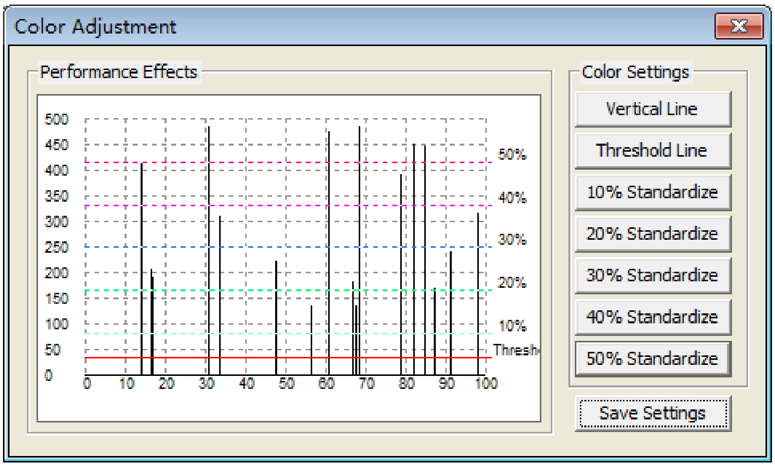
The Tubular Texting

Inspection Date:2011-07-27 17:45:30

Products Lot No.	1212	Equipment No.	1	Spool No.	1555
Weight	3204.516 kg	Length	13.620m	Diameter	15.800 mm
Density	12.000 g/cm^3	Operator No.	21	Inspector No.	12
Split No.	A1	Split Length	A1	Split Depth	N/A
Overall	N/A				
Maximum Measured Value	150	Relative Zero Value	60.0	Minimum length of continuous defects	0.00mm
Minimum Number Of Defects	10	Minimum Spacing Defects	0.00mm	Minimum Spacing Defect Density	1000.00mm
Maximum Peak Defect	659.3	Calibration Defects	10%	Split Number	0
Comment	12121				

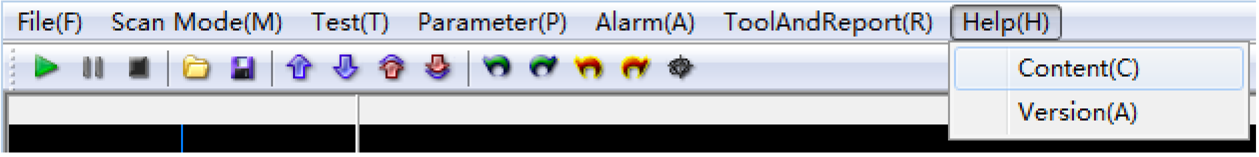
Defect Branch Map

Through the test report, can know the details of the work piece defect information. Click line color button，can choose the background color as you like ,as follow：


Color Adjustment
Performance Effects
500
450
400
350
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
50%
40%
30%
20%
10%
Thresh
Color Settings
Vertical Line
Threshold Line
10% Standardize
20% Standardize
30% Standardize
40% Standardize
50% Standardize
Save Settings

help/aid/assistant

1. Check the system instruction file and the detailed position as below.


File(F)
Scan Mode(M)
Test(T)
Parameter(P)
Alarm(A)
ToolAndReport(R)
Help(H)
Content(C)
Version(A)

2. On-line help

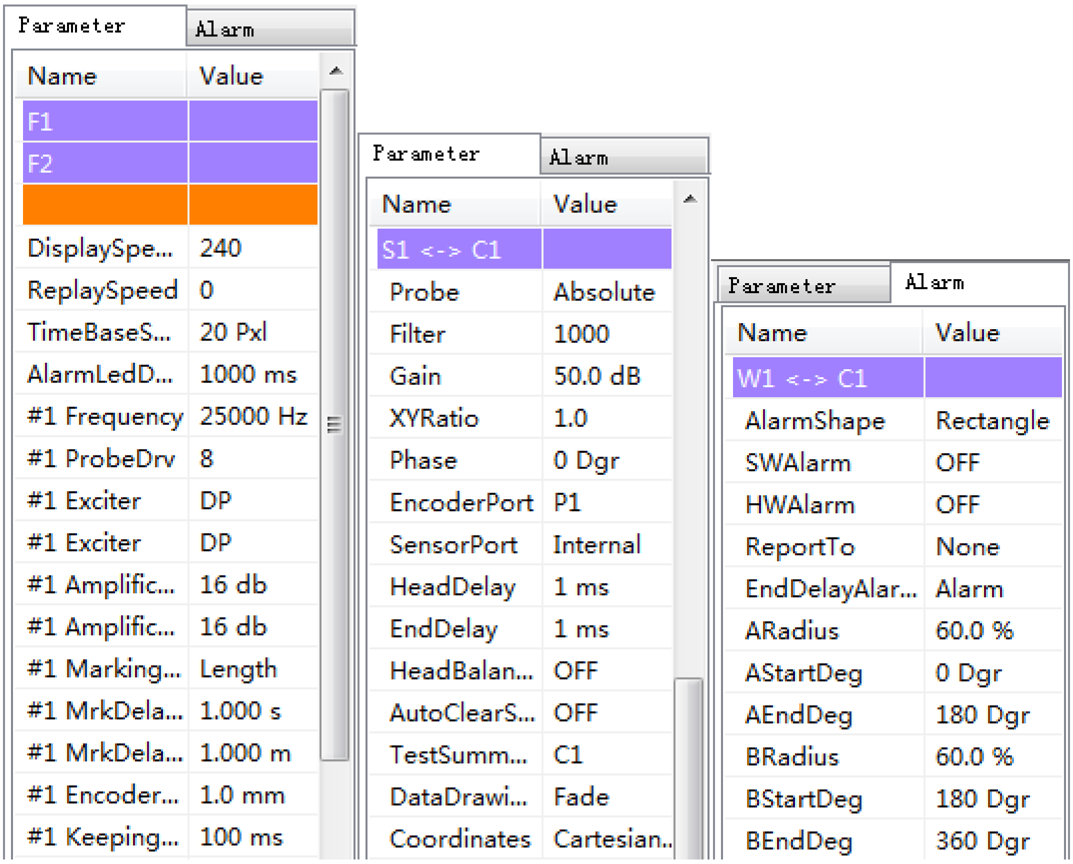
3. Telephone help

4.4 Operating menus and function buttons

4.4.1 Diagram of the operating menus and function buttons

Touch keys	Function
B	Balance command
PgUp	Previous Page

PgDn	next page
Insert	real line / blanking
C	clear
Space	clear + balance
ENTER	enter
↑	selection menu：up
↓	selection menu：down
←	minus
→	plus



Name	Value
F1	
F2	
DisplaySpe...	240
ReplaySpeed	0
TimeBaseS...	20 Pxl
AlarmLedD...	1000 ms
#1 Frequency	25000 Hz
#1 ProbeDrv	8
#1 Exciter	DP
#1 Exciter	DP
#1 Amplific...	16 db
#1 Amplific...	16 db
#1 Marking...	Length
#1 MrkDela...	1.000 s
#1 MrkDela...	1.000 m
#1 Encoder...	1.0 mm
#1 Keeping...	100 ms

Name	Value
S1 <-> C1	
Probe	Absolute
Filter	1000
Gain	50.0 dB
XYRatio	1.0
Phase	0 Dgr
EncoderPort	P1
SensorPort	Internal
HeadDelay	1 ms
EndDelay	1 ms
HeadBalan...	OFF
AutoClearS...	OFF
TestSumm...	C1
DataDrawi...	Fade
Coordinates	Cartesian..

Name	Value
W1 <-> C1	
AlarmShape	Rectangle
SWAlarm	OFF
HWAlarm	OFF
ReportTo	None
EndDelayAlar...	Alarm
ARadius	60.0 %
AStartDeg	0 Dgr
AEndDeg	180 Dgr
BRadius	60.0 %
BStartDeg	180 Dgr
BEndDeg	360 Dgr

Parameter	**Range**	**Mark**
Board parameters（#1~#4 means board number） Modify before stop test		
DisplaySpeed	**1~400**	**Draw signal speed.**
ReplaySpeed	**-300~300**	**Replay signal speed.**

TimeBaseSpeed	**1~16384Pxl**	**Time base line move speed.**
AlarmLedDelay	**10~60000ms**	**Alarm output last time.**
Frequency	**10Hz~10MHz**	**Probe frequency.**
ProbeDrv	**1 ~ 16**	**The bigger the value, the bigger the signal.**
Exciter	**DP/DI**	**According to different probe selection.**
Amplification	**1~32 db**	**Hardware to amplify the signal, that is, the hardware gain.**
MarkingBy	**Length/Time**	**Marking by length or time.**
MrkDelayT	**0.001ms~120s**	**Delay a specific time before the start marking.**
MrkDelayL	**0.1m~49.9m**	**Delay a specific length before the start marking.**
EncoderStep	**0.01mm~1000mm**	**The length of each pulse of the encoder.**
KeepingTime	**1~10000ms**	**Marking last time.**
Channel parameters（2 channel per board） **Modify any time**		
Probe	**Absolute/Differential**	**Probe type.**
Filter	**0~30000**	**Is inversely proportional to the speed, different speeds have different optimal values, Advice from gradual adjustment.**
Gain	**0~99.0dB**	**Hardware gain.**
XYRatio	**0.1~10**	**X/Y enlarge scale.**
Phase	**0~359Drg**	**Associated rotation.**
EncoderPort	**P1/P2…P8**	**Encoder port, a board has two, you can use any one of the board.**
SensorPort	**Internal/P1/P2…P8**	**Sensor port, a board has two, you can use any one of the board.**
HeadDelay	**0~65535ms**	**Delay a specific time before the start workpiece.**
EndDelay	**0~65535ms**	**Delay a specific time after the end workpiece.**
HeadBalance	**ON/OFF**	**Whether the end head of each work piece is to re calculate the position value of the origin.**
AutoClearScr	**ON/OFF**	**The screen switch.**
TestSummary	**C1~Cx**	**Cx = Maximum number of virtual channels**
DataDrawing	**Fade/Keeping**	**Whether keep the signal on screen.**
Coordinates	**None/Cartesian/Polor**	**Select the coordinate on background.**
Alarm parameters（AScan&BScan are difference）		
AlarmShape	**None/Rectangle/Sector**	**Select the alarm shape on background.**
SWAlarm	**ON/OFF**	**Beep on / off.**
HWAlarm	**OFF/P1~Px**	**P1~Px**
ReportTo	**None/#A1~#Ax**	**#A1~#Ax**
EndDelayAlarm	**None/Alarm**	**See 5.4.2**
ARadius	**1~450 Pxl**	**Upper parm alarm radius.**
AStartDeg	**0~179Dgr**	**The maximum value is limited by AEndDeg.**
AEndDeg	**1~180Dgr**	**The minimum value is limited by AStartDeg.**
BRadius	**1~450 Pxl**	**Lower part alarm radius.**

BStartDeg	**180~359 Dgr**	**The maximum value is limited by BEndDeg.**
BEndDeg	**181~360Dgr**	**The minimum value is limited by BStartDeg.**
DataSource	**AmpR/AmpX/AmpY**	**Data sources.**
AlarmAmp	**0~600**	**The maximum value is limited by MaxAmp.**
XLength	**1~100000m**	**BScan X coordinate length.**
MaxAmp	**10~100000**	**The minimum value is limited by AlarmAmp.**
Coordinates	**ON/OFF**	**Whether to display the coordinates.**
GradeCriteria	**Overall/ByDefectCnt/ByLength/ByDepth**	**Criterion of judgment.**
[←][→][↑][↓]Modify Parameter		

4.4.2 Parameters

Board Parameters:

(1) DisplaySpeed: means if we activate this function, the former testing display will blank within the time u set towards the blanking coefficient

(2) ReplaySpeed: once we select the testing data function, we are required to set the playback coefficient to achieve faster or slower playback. The larger of the coefficient value, the faster, vice versa.

(3) TimeBaseSpeed: via the time base scan speed to control the amplified flaw signal display speed.

(4) AlarmLedDelay: the sound and light alarm delayed setting is to separate their alarm time, thus it’s easier for the testers to get informed of the flaw information.

(5) Frequency: the testing system frequency is 50Hz～10MHz, continuously adjustable. The testers can adjust the frequency according to the material characteristics(say the conductivity, the magnetic permeability, etc) and the frequency range of the eddy current transducer (probe). While as to the on-line testing, the shape, thickness, coupling distance and other factors will also be taken into consideration. Below are some frequency ranges of some material for your reference.

Pipe （Diameter×thickness）	**Reference frequency**
25×0.5 Titanium tube	60KHz～100KHz
25×0.7 Titanium tube	40KHz～80KHz
25×1 yellow copper tube	8KHz～30KHz
25×1 nickel copper tube(B10)	20KHz～35KHz
25×1 nickel copper tube (B30)	15KHz～35KHz

(6) ProbeDrv: the probe drive of each channel can be separately adjusted without any interference of each others. And the drive strength is to influence the magnetic field strength. There are 1-8 grades of the driver strength and the larger of the value, the more powerful of the probe driver.

Notes: there’ll appear saturation if the driver strength is too powerful. That means we should set the driver value according to the test material and some other factors.

(7) Exciter: DI/DP Probe.

(8) Amplification:Hardware Gain.

(9) MarkingBy: preset the value number of the marking time and marking length. And since there are some distance between the marking machine and the probe, we can select the fixed time marking or fixed length marking for more accurate flaw marking.

(10) MrkDelayT. Since there are some distance between the probe and the marking machine, the marking time is delayed. To test the delayed marking time, the relationship is as follows:

T=S/V (T: delayed marking T; S: the distance between the probe and the marking machine; V: the testing speed)

(this parameter relationship is only applicable to the fixed time marking mode)

(11) MrkDelayL: via the setting of the marking length to ensure more accurate flaw marking

(12) EncoderStep: the wheel circumference of the encoder divide the pulse number is the number of the step unit value. E.g. suppose the diameter of the encoder is 30mm, then the circumference is 94.2mm, and if the pulse number of the encoder is 50, then the step unit is 94.2/5=19mm

(13) KeepingTime: via the marking time setting, we can avoid the missing marking. Generally, the continuously marking time is 100ms, the longer of the marking time, the longer of the marking scope.

Channel Parameters:

(1) Probe: AbsoluteProbe/DifferentialProbe.

(2) Filter: Balance filter, keeping points in center.

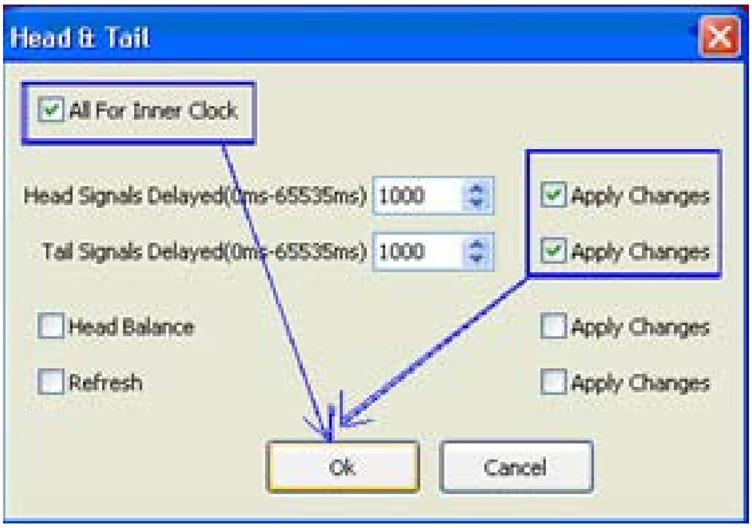
(3) Gain: the gain range of this testing system is 0～99dB, continuously adjustable with 0.1dB for each step. For more accurate testing data, we can adjust the gain value according to the various characteristics of the test material (say the conductivity, the magnetic conductivity, etc) and the features of each type eddy current probe.

Notes: The gain adjusting button at the back of the detector is designed for urgent usage.

(4) XYRatio: the default is 1.0, which represents the relative amplification and scale down of the ratio between the eddy current signals on the X-coordinate and the time base signals on the Y coordinate. And in this case, it can automatically adjust the phase of the eddy current signals to achieve the amplification and sale down function of the phase gap.

(5) Phase: it ranges from 0-359, continuously adjustable with the precision 1°.via the phase adjustion, we are capable to separate various testing signals

(6) EncoderPort: If the system is of multi-channel eddy current testing while there is only one port for the connection of the encoder and the hardware, the users is required to reset the port. Generally we choose to connect the hardware with the PI port.


Head & Tail

☑ All For Inner Clock

Head Signals Delayed(0ms-65535ms) 1000 ☑ Apply Changes

Tail Signals Delayed(0ms-65535ms) 1000 ☑ Apply Changes

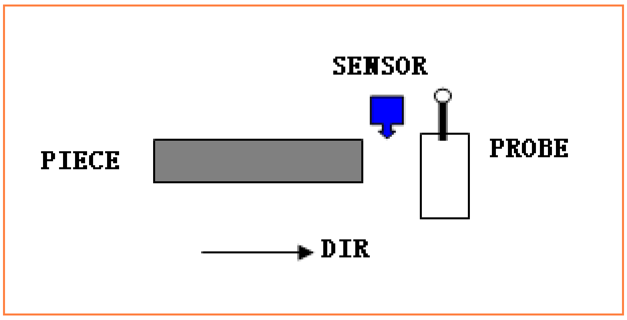
☐ Head Balance ☐ Apply Changes

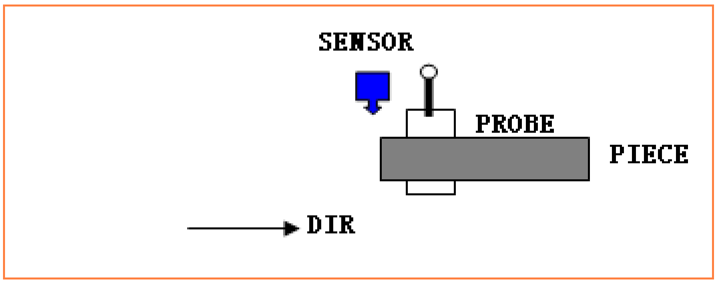
☐ Refresh ☐ Apply Changes

(7) SensorPort: detector clock/ mechanical device clock for choice. They are applied to control of the delayed trigger signals of two ends.

(8) HeadDelay: with the head signal delay, we can avoid the false alarm of the head signal as that of flaw ones.

(9) EndDelay: while testing, it can avoid the end jamming signals which will lead to the false alarm.





(10). HeadBalance: Via the setting of the head balance to avoid the false alarm of the jamming signals of the head part.

(11). AutoClearScr: when it comes to the next testing, the former testing signals will be blanked for more accurate on-screen evaluation.

(12) TestSummary: With the help of the mechanical device clock, the detector is capable to figure out the qualified and the unqualified workpieces. And via the automatic data analysis, we can get a intuitive testing results for better evaluation of the products.

(13) DataDrawing: that is just the testing storage rather than the real-time on screen display

(14) Coordinates: rectangular coordinate system and polar coordinates background for choices

5.Equipment maintenance

5.1 Equipment maintenance

In order to ensure safe working for the equipment and to avoid the interference of power supply noise, we suggest access the exchange purification between the instrument and the power .

Disk drive is a precision mechanical , when use and transport ,please be gently to avoid shock. Environment for using the instruments should be kept clean, dry, to prevent dust and moisture into the gas string instruments, so as not to affect the instrument performance.

After use the equipment, need to cover with the dust cover. In the rainy season, the instrument should always be open 1-2 hours to disperse the moisture.

When the instrument is in the open state, not allowed to open the shell, stretching hands or tools inside equipment to avoid personal injury or equipment being damaged.

Equipment installation site should be avoided around the existence of strong electromagnetic interference, good earthing and shielding facilities can be very effective in preventing the interference signal into the string

If find the equipment is not working properly, not allow to dismantle the equipment to maintain by yourself , you should first carefully read the instruction manual, check the operation method is correct or not , also can ask the dealer or manufacturer to exclude methods. Unauthorized withdrawal of opening to blind repair, often will expand the result of the fault .

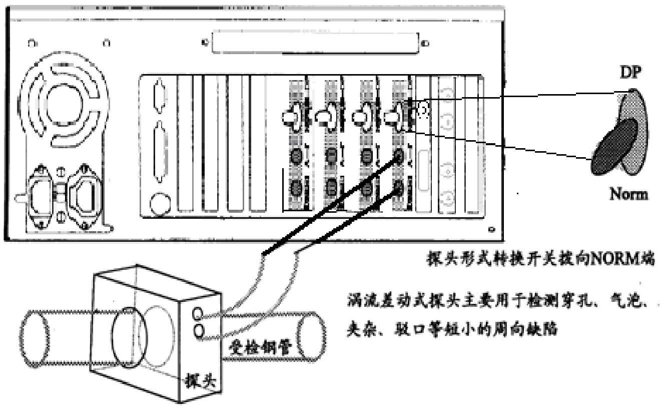
Users can not rule out the fault, it is recommended to send the instrument back to factory for repairing. We will provide one-year warranty period. The instrument is on the right storage, usage conditions,if it still has the fault, we will be responsible for the maintenance for free, if it is over the warranty period ,we will continue to provide maintenance services.

If you have any questions , please give us email or call , we will reply you as soon as possible .

5.2 Instrument switch settings and the connection method of the probe

During the testing , when you choose different type probes, the settings of the switch will different ,too.

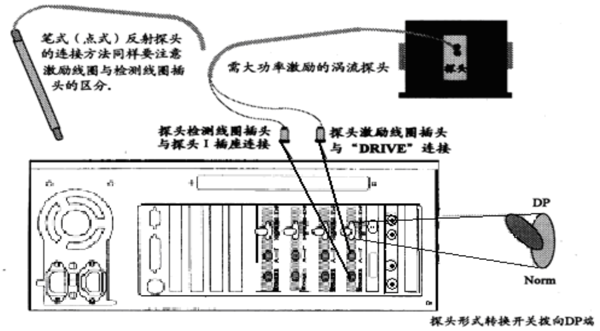
（1）Eddy current differential probe



探头形式转换开关拨向NORM端

涡流差动式探头主要用于检测穿孔、气泡、夹杂、驳口等短小的周向缺陷

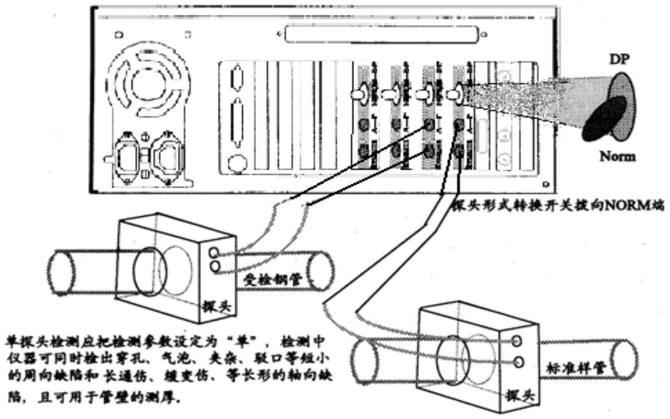
（2）Eddy current absolute probe


笔式（点式）反射探头的连接方法同样要注意激励线圈与检测线圈插头的区分.
需大功率激励的涡流探头
探头
探头检测线圈插头与探头 I 插座连接
探头激励线圈插头与"DRIVE"连接
DP
Norm
探头形式转换开关拨向DP端

通常配备磁饱和器检测时，应选用反射式探头

仪器使用中，请注意参数的设定，
设置相应的开关，连接好探头

（3）Eddy current Reflection probe（D-P probe）



单探头检测应把检测参数设定为"单"，检测中仪器可同时检出穿孔、气泡、夹杂、驳口等短小的周向缺陷和长通伤、缝变伤、等长形的轴向缺陷，且可用于管壁的测厚.

单探头检测的连接方法示意图

5.3 Common Faults and troubleshooting（Flat Probe ）

(1). The middle part of the flat type probe need to be aligned in the welding

(2). During the off-line testing, the probe is preferably coated with paper ,so it not only can avoid the probe wear, but also has a certain lift-off function.

(3). The probe need to be aligned in the welding, general the distance should be less than 2mm, but if high speed, the distance can be less than 3mm. The closer the probe away from the weld, the higher the sensitivity, so it is better to minimize the distance under guaranteed not to wear the probe.

Magnetic saturation operation method

Magnetic saturation is the essential device of eddy current testing for ferromagnetic metal pipe, during the on-line or off-line testing for the high-quality ferromagnetic metal pipe, in order to check a variety of internal defects, such as the hole flaws, bubbles and inclusions ,it should be accompanied the magnetic saturator.

1 Installation method

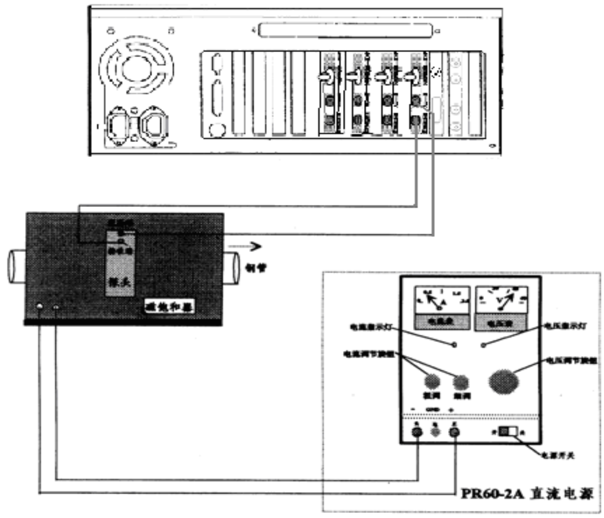
1. Choose the suitable probe for the workpiece (such as probe model is MS-UNA03XX, i.e. D-P probe). Probe must be installed two BNC probe socket outwards.

2. Choose the suitable guide bush and install and fix up it in the magnetic saturator.

3. Probe line is double wired conductor, one wired conductor is exciting coil, both sides have red color, partly connected to the eddy current output BNC socket（equipment mark is "**DRIVE**"）and probe input

socket（probe mark is **Drive**）; Another wired conductor is connected to eddy current **PROBE-2 A BNC** socket and probe BNC socket which is near the middle of the probe .

4. Connect the magnetic saturator and electric power (As follow :)



磁饱和钢管探伤系统连接图

2 Operation method

(1).After the above steps and methods to connect securely ,then keep the eddy current instrument and the DC power switch is on the connected state.

(2).Choose “Dual time base scan + impedance display” testing program,and enter into testing. Steel pipe should be uniform through the magnetic saturation.

(3).Adjust the magnetic saturation DC power, the voltage adjustment knob to the maximum, the current emphasis on the about 1.0A, the magnetizing current should be adjusted in the highest sensitivity, interference with the smallest .

(4).If use the power amplifier can increase the power of incentives and signal strength, If the detection signal is too small, can right-handed power amplifier knob, to increase the incentive power and make the signal enhancement, but without appear the signal saturation.

(5).Before pull out of the pipe from the magnetic saturator, please turn off the DC power first .

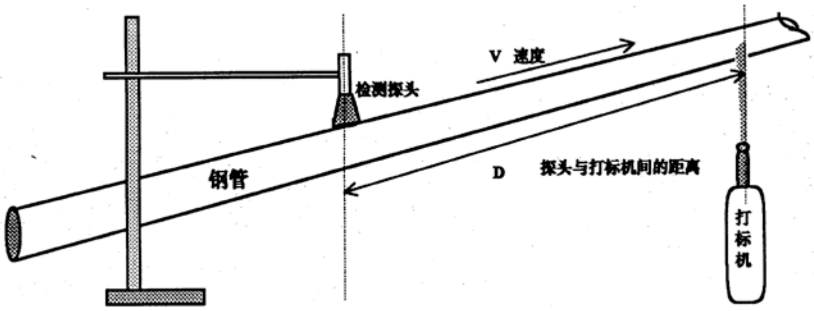
High-precision delay marking unit

（Optional 1）

During the testing , if want to make a mark for the defects, as there is a distance between the probe and marking system, so the marking will a little time delay after alarm. What is more, when find a defect, but the defect still do not reach the marking equipment, and maybe appear another defect, then the delay marking unit has the memory function.

The delay time is from 0 to 20 seconds continuously adjustable and with a resolution of 0.001 seconds.

High-precision delay marking unit adjustable


V 速度
检测探头
钢管
D 探头与打标机间的距离
打标机

Can set the delay time according to different applications. Such as: the testing speed is 1m/s, distance from probe to marking machine is 3m, then delay time T:

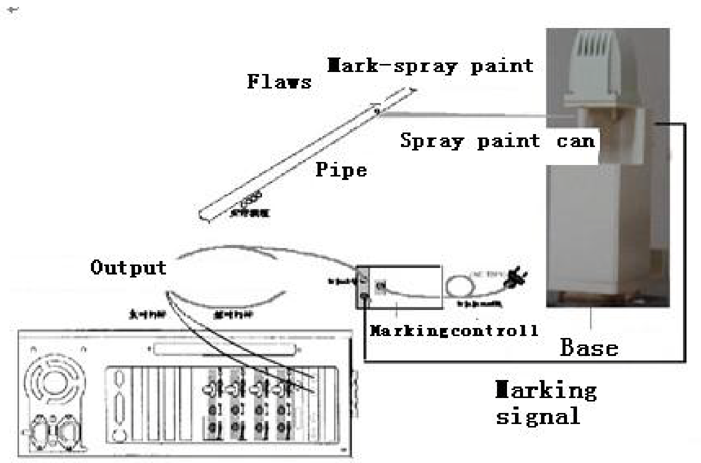
T＝D/V＝3/1＝3（s）

Marking machine instructions

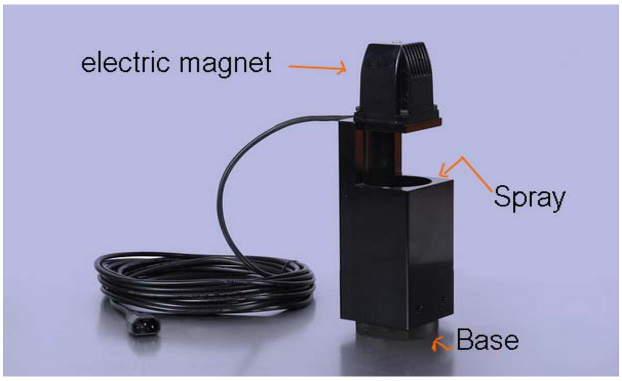
1 Function

When find the flaws , then will make a mark on the workpiece.

2 Circuit connection（As follow）


Mark-spray paint
Flaws
Spray paint can
Pipe
Output
Markingcontroll
Base
Marking signal

3 Installation


electric magnet
Spray
Base

1)Installation of the spray paint cans, unscrew the base and put into the paint cans, and then tighten the base.

2)Set up the electric magnet.

3)Set up the base.

4. Operation

First open the power of the detector , then turn on the power of the marking system ,and marking system can start to work.

5.Parameter

Working voltage：AC　220V±10％

Signal voltage：＋5V，<2mA

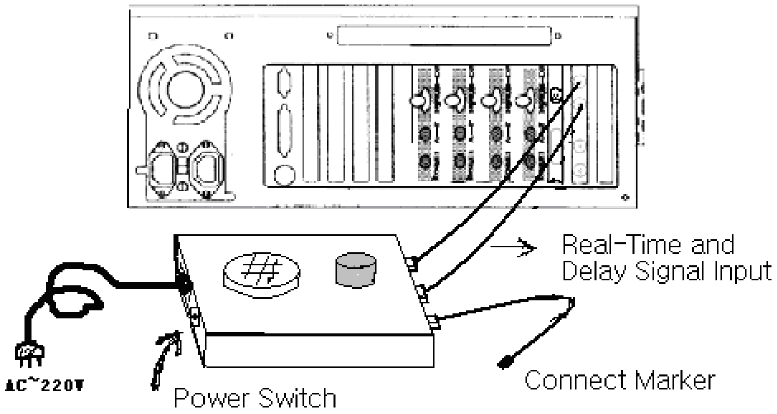
Acousto-optic alarm

（Optional 2）

Function

Acousto-optic alarm detector can receive the alarm signal output, real-time measurement of materials defects in docking signals synchronized sound and light alarm.

Installation of electrical connections



Operating methods

The alarm system installed in a suitable location to facilitate your work. First open the detector power, when the detector into a normal testing state, switch on the sound and light alarm power, alarm system is on work. If you switch on the alarm power before the detector into the normal testing state , as the initialized state of the detector and the output port with high potential, which leads to the alarm sound as interference signal.

Parameter

Working voltage：AC　220V±10％

Signal voltage：＋5V，<2A

5.4　Technical Support

In the course of using this product abnormal, please contact the manufacturer of this product for technical support.

The manufacturer of this product is

Xiamen MS-UN Electronic Technology Co.,Ltd

Website : http://www.MS-UN.com