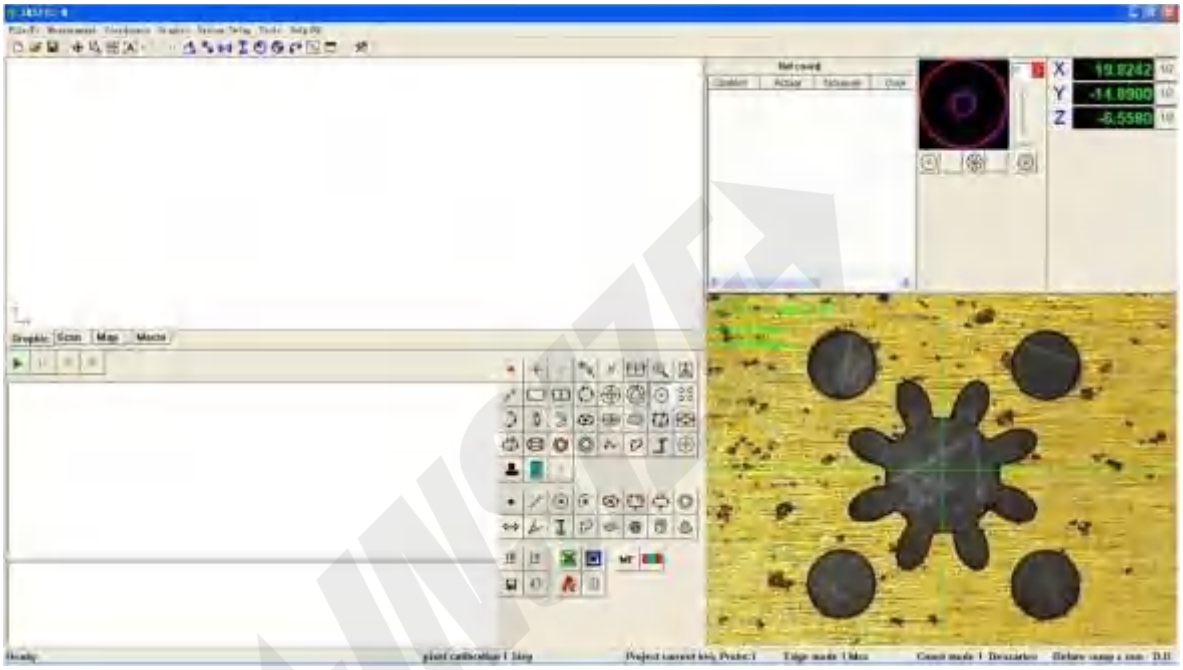
INSIZE



SOFTWARE MANUAL

Contents

CHAPTER I SUMMARY

Software developers combined with measurement of more than ten years working experience in industry and software, professional well-developed two-dimensional measurement software.

Software design principle is: Operation Simple, Powerful, Stable and reliable, Easy maintenance**.**

Main functions:

(1) Measuring element

Measuring 12 elements (point, line, circle, arc, ellipse, rectangular, slot, ring, distance, angle, the cloud line, closed cloud line).

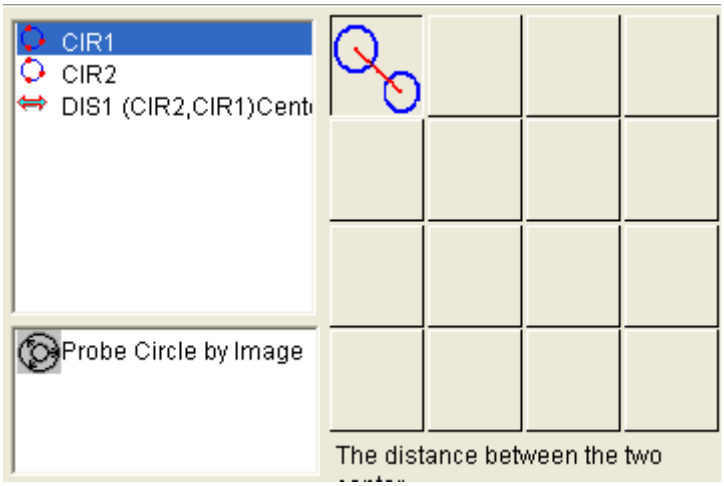
Features:

1) A variety of measure methods (Automatic identification, probe point, Compare, Comparison tolerance, preset) to meet the different needs of users, greatly improved ease of use and accuracy.
2) Single-point collection method: Mouse point, Cross line point, Zoom point.
3) To measure cloud line closed perimeter, area and center of gravity, the use of cubic interpolation algorithm, in order to present the most accurate method of measuring the cloud line.
4) Measurement can be more than a circle, rapid and accurate measurement of more than one circle.
5) Measurement data can be saved as DXF files, or. BMP images and user program format.

(2) Macro measurement function

Macro function is measured with some of the measurements, the command structure associated to a button. The click of a button, that is the beginning of the implementation of macro measurement function, measurement function macro will automatically complete the structure and measure, so moves the mouse to reduce the number of users and enhance efficiency. It should be noted that: macro measurement function is different from the user program, the macro does not record light measurements, such as measuring the state of the coordinates of the location. Run macros, it will not move table, lighting and so on. Software provides a measurement of 16 group macro function, users can edit macro button icon.

Interface:



(3) Automatic Identification

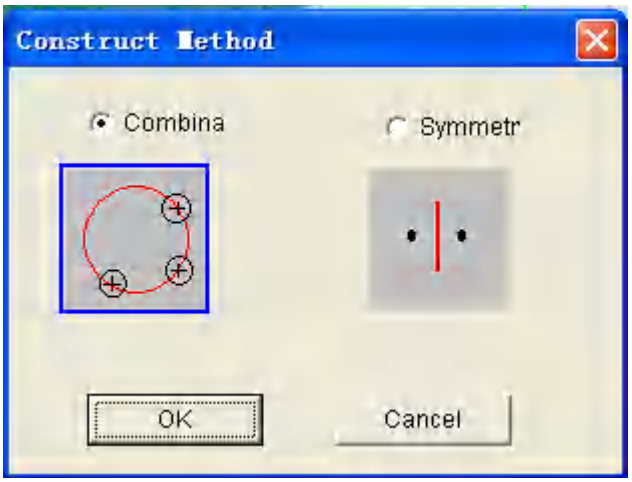
Click  ,and then the circle with the mouse trap to the edge of the work-piece can be automatically looking for edge line, circle or arc. The following: Automatically circle.

(4) Structural elements

Powerful element of structure: Structural elements to provide Construction Law 10 ([Shift], [rotation], [extraction], [portfolio], [parallel], [vertical], [mirror], [symmetry], [intersection], [tangent]) geometric structure elements. Structural elements allow users to easily cope with difficult to measure some of the elements, so as to enhance the work efficiency.

The results of a variety of structures to provide the results of the various structures for the user to choose. For example: two point's combline line, two points can be connected together to form a straight line, you can get a line of symmetry, so there are two constructors.

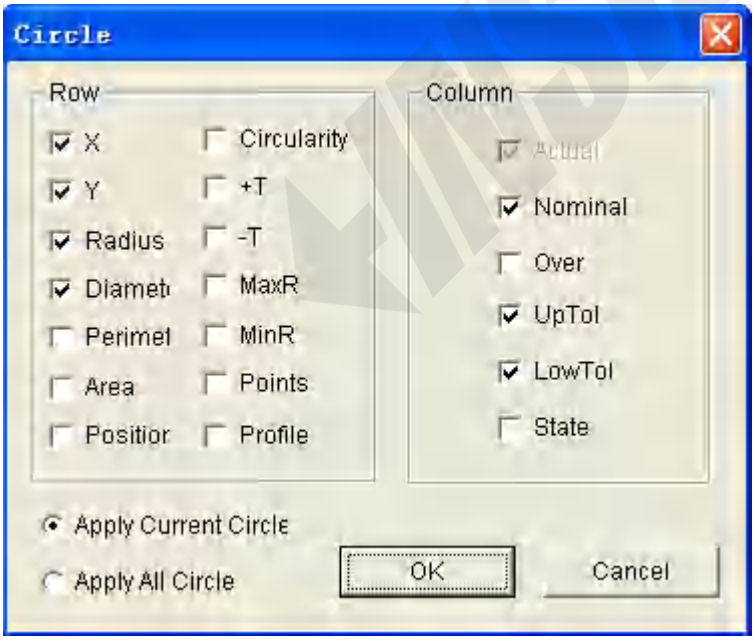
Interface:



- Combination method to choose, click **OK**, two points can be connected.
- Symmetric: symmetry line of two points.

(5) Measurement results

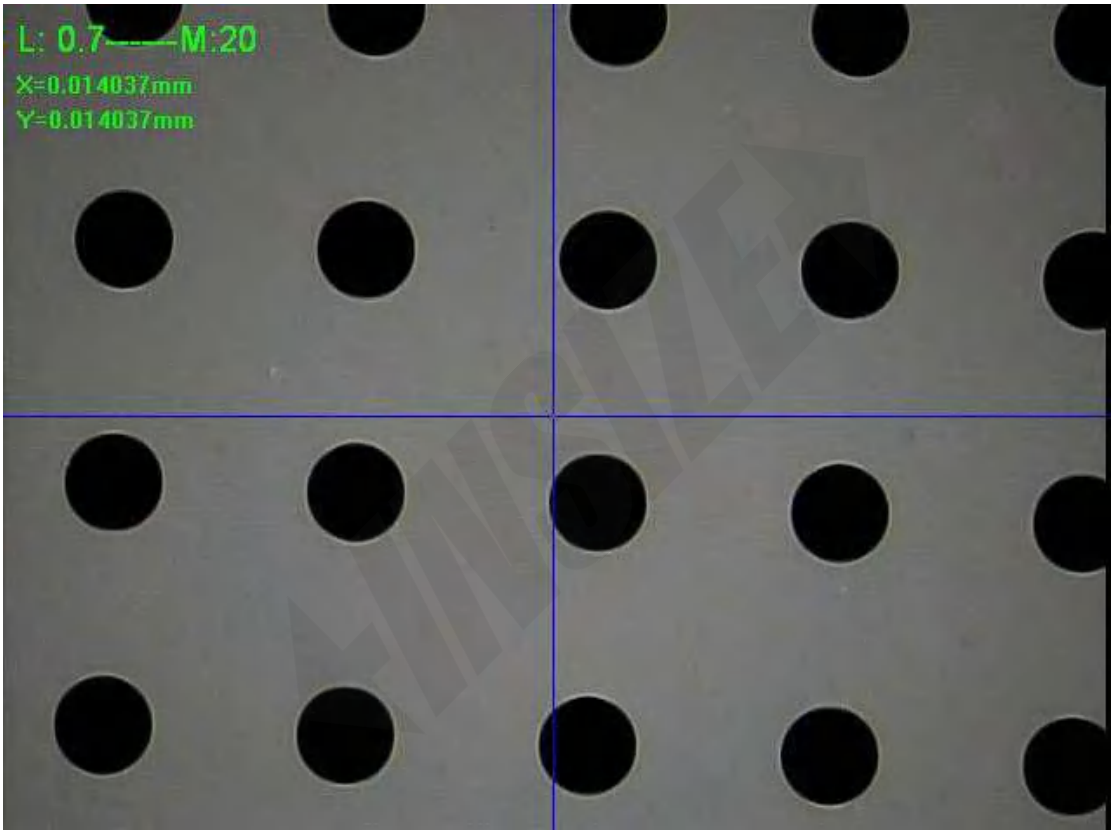
Various elements of the survey findings indicate that it is informative and can meet the needs of various customers. What are the content and settings, which does not show that individual elements can also set up a separate display of information? Similar elements can also be set on the next map element is circleround Settings dialog box to display information.



If the ultra-poor results, which will display the contents of the ultra-poor, and will appear as the **red**.

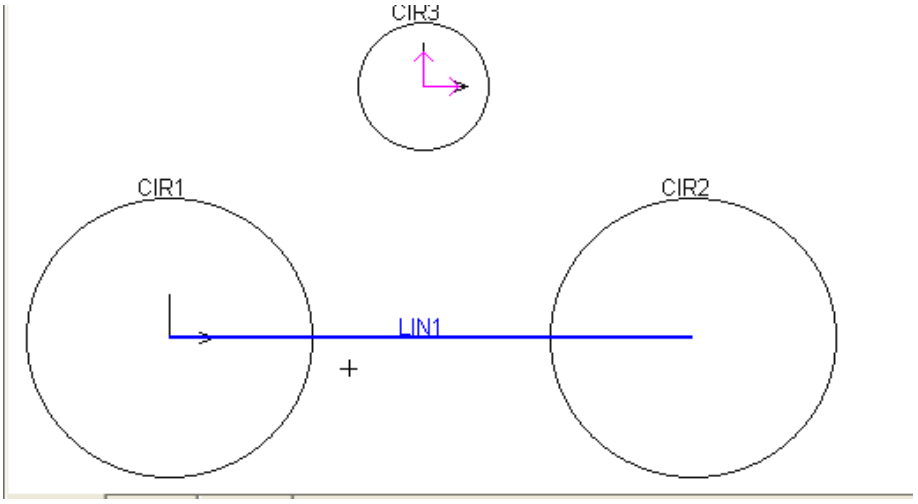
(6) Showing the optical magnification and screen magnification

The chart below shows the optical magnification and screen magnification, screen magnification software automatically calculates and display a pixel can be equal to the number of mm.



(7) Coordinate system

It can be set up in accordance with drawing multiple work-piece coordinate systems. The realization of the coordinates of the coordinate system transformation; can easily achieve the Cartesian coordinate system with polar coordinates conversion between; to achieve the work-piece coordinate system to store and call.



After the establishment of coordinate system, if you select a cross-line rotation, cross-line rotation will be instructing the direction of coordinate system rotation.

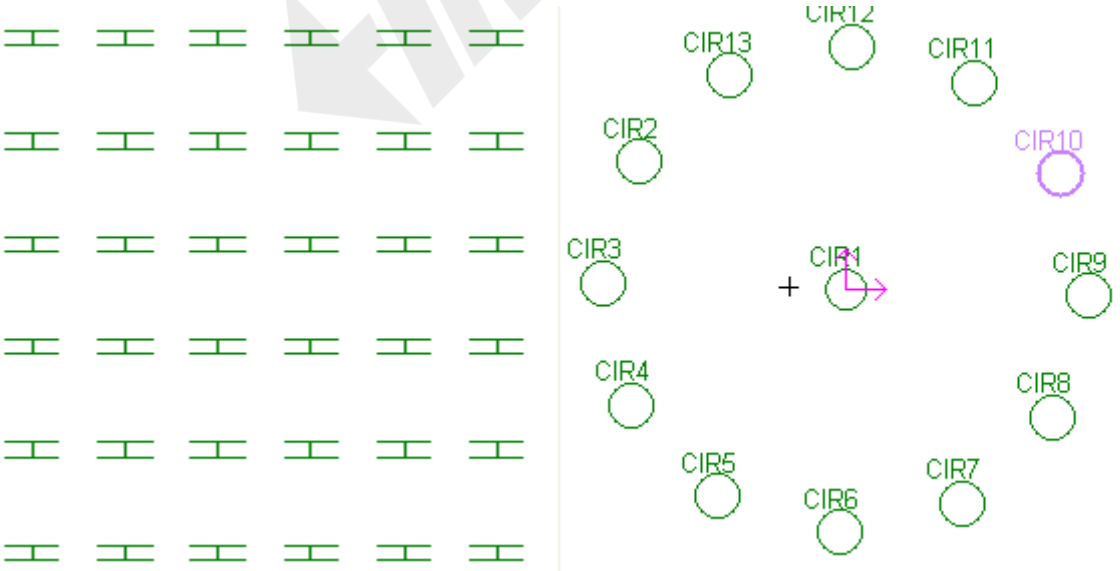
(8) User program

Unrestricted user program record, edit, save. Exhaled function. Users can edit all records of user actions, the realization of copy measurements, and a substantial increase in the efficiency measurement.

Can set the user program is running in the process of AF, in the automatic measurement process, can be measured manually.

Can be re-measurement of an element to change its measurement methods, but also can edit to change its measured rate, light source,etc.

The chart is set up through the translation and rotation of the two user programs:



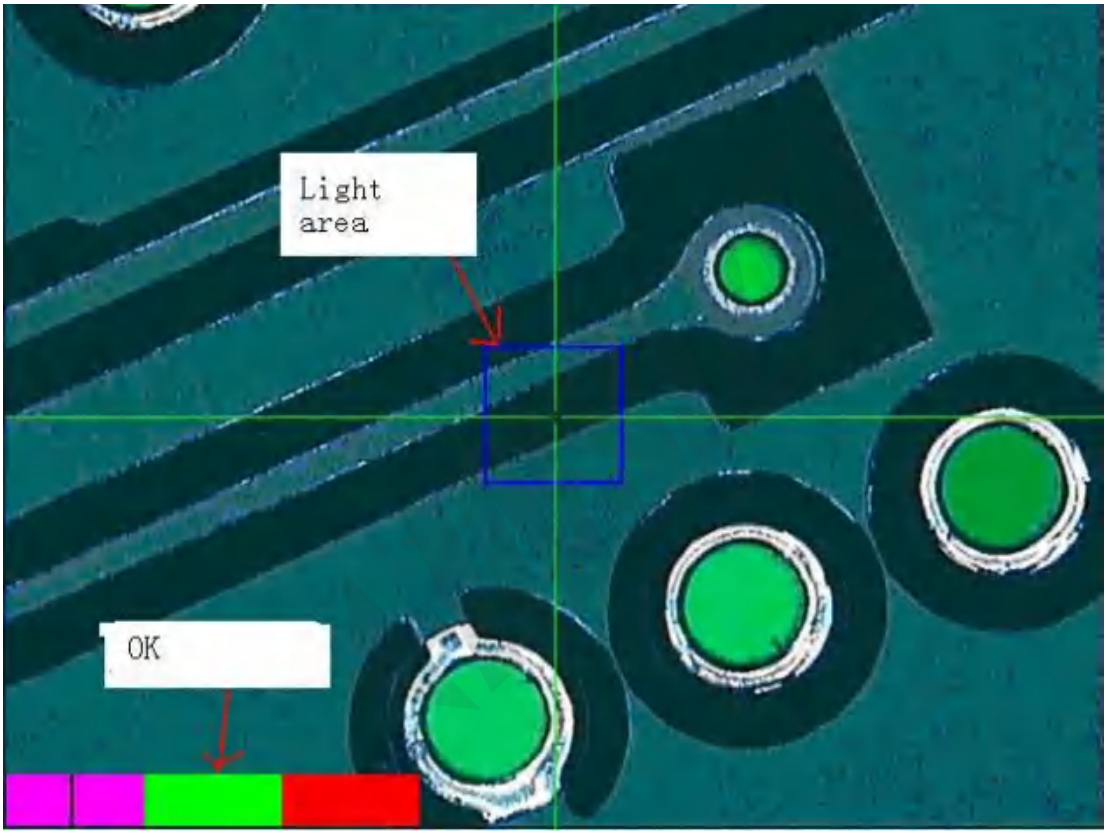
If the measurement of abnormal, the software can be smart to deal with, for example, if the work-piece move. The following dialog box will pop up to allow the user to choose.

(9) AF

Provide accurate and rapid Focus Focus function, measured by focusing a high degree of value, or through the AF point to be the current coordinates.

(10) Assist light

Indicator light will instruct the user when the best light, because of lighting to avoid measurement errors caused, and increased measurement accuracy and measurement efficiency.



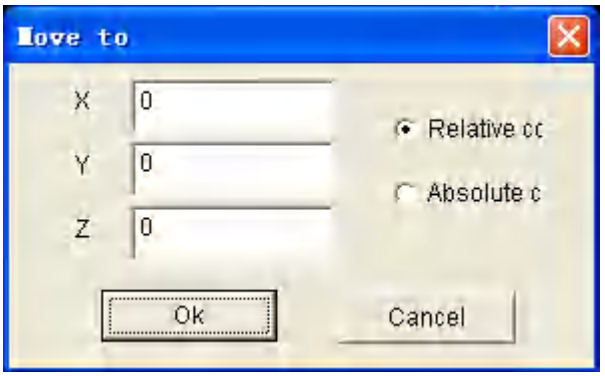
(11) Program-controlled light source

Support 1*5 to 1*8 program-controlled light sources, and support All, Track, Sector, Segment control mode.

(12) Motion control mode

Seven types of software to control movement mode, are as follows: in the image window click the middle mouse button, in the graphic window click the middle mouse button, in the motion control window area click of a mouse, enter the coordinates of the value of mobile.Right-catch in the video window, onto the window in the list of elements to choose move here.

The photo shows the value of input coordinates.

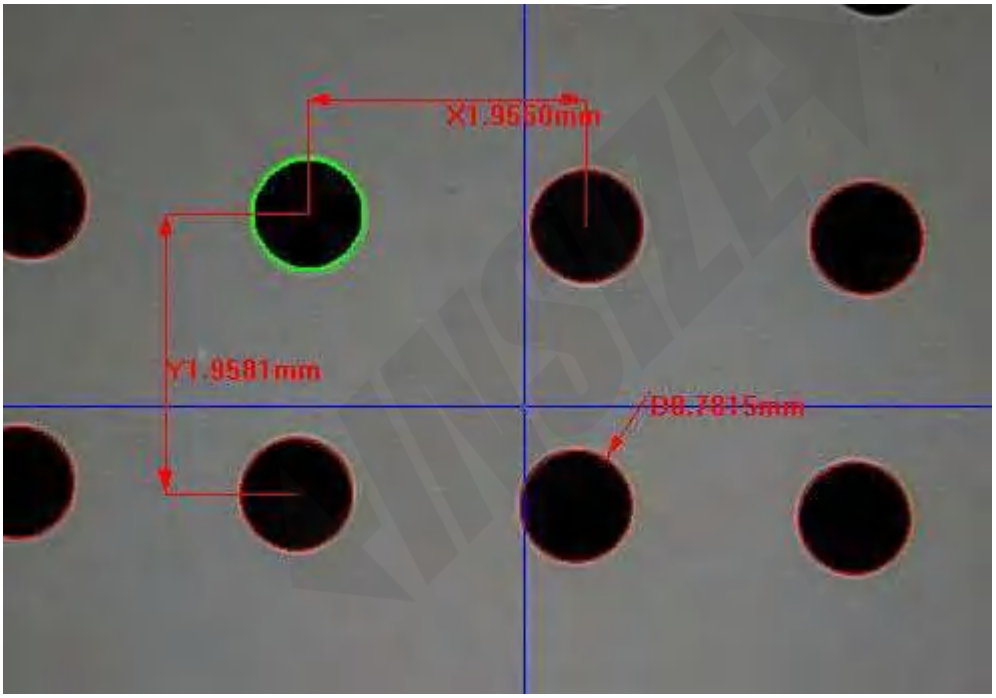


(13) Graphics

Have a well-developed graphics processing and display features (zoom, pan, window display, partial zoom, full screen display), so that the measurement results more intuitive, user-friendly. Scroll mouse button, zoom graphics, press and hold the key in moving the mouse, then moving graphics.

(14) Mark dimension

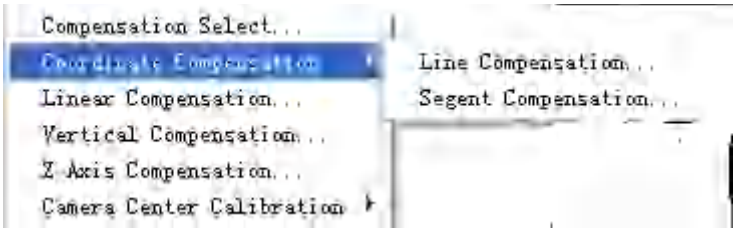
Mark dimension angle、distance、Delta X、Delta Y、Radius、Diameter、Arc length.



(15) System error compensation

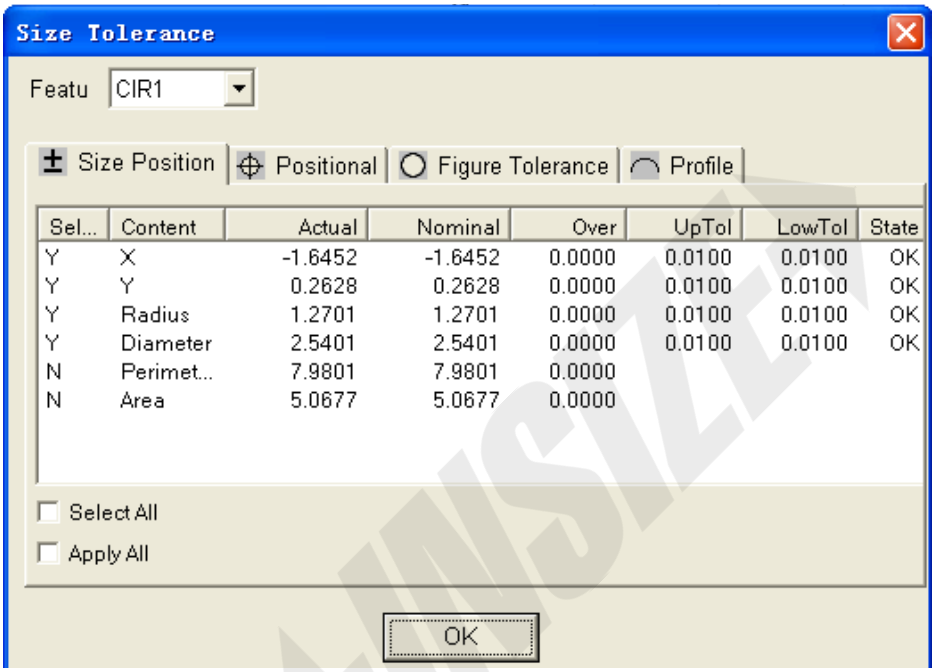
Currently available on the coordinates of the error, vertical error, Z-axis straightness error compensation, and offset lens center. Positioning System coordinates of the error of the compensation; there is a linear section of compensation and segment compensation methods.

<System compensation> menu



(16) Tolerance

Improve the computing power of the dimensional tolerances. Tolerance can be set with the default. In line with the GB / T calculation of the tolerance ability to calculate Straightness, Circularity. Calculation includes Position of tolerance,the parallesism, perpendicularity, and concentricity, symmetrical.



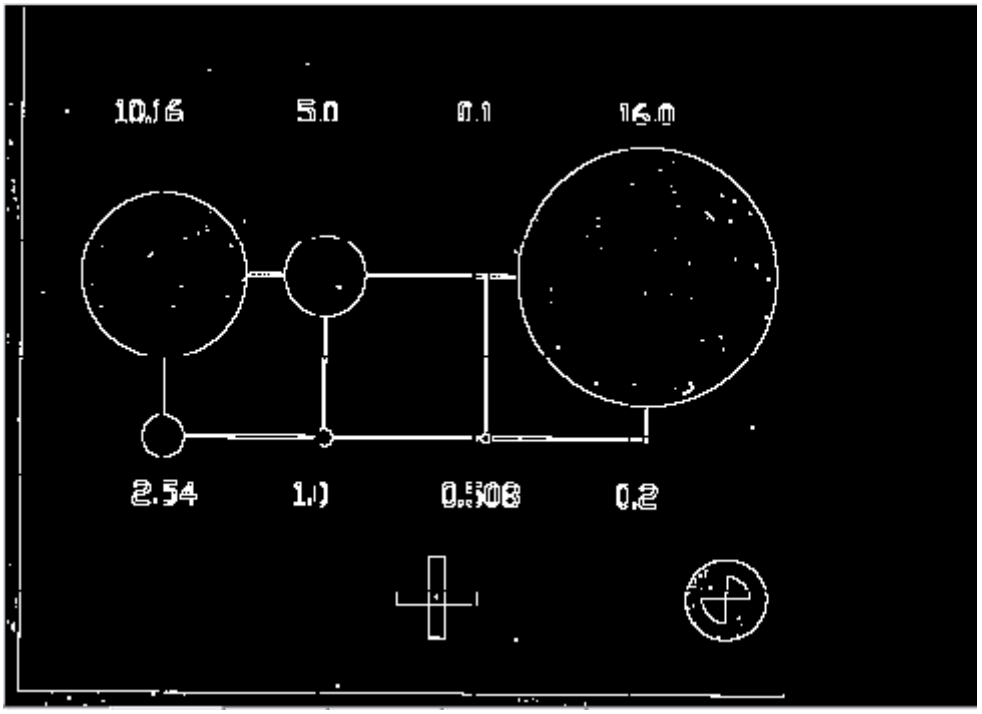
(17) Import DXF file

Import DXF files, the software prompts the user step-by-step operation, when the work-piece coordinate system set up after the good, the resulting DXF file into the user program completed. Software will automatically generate the nominal of the element.

(18) Scan

Work-piece can be divided into multiple areas to be scanned

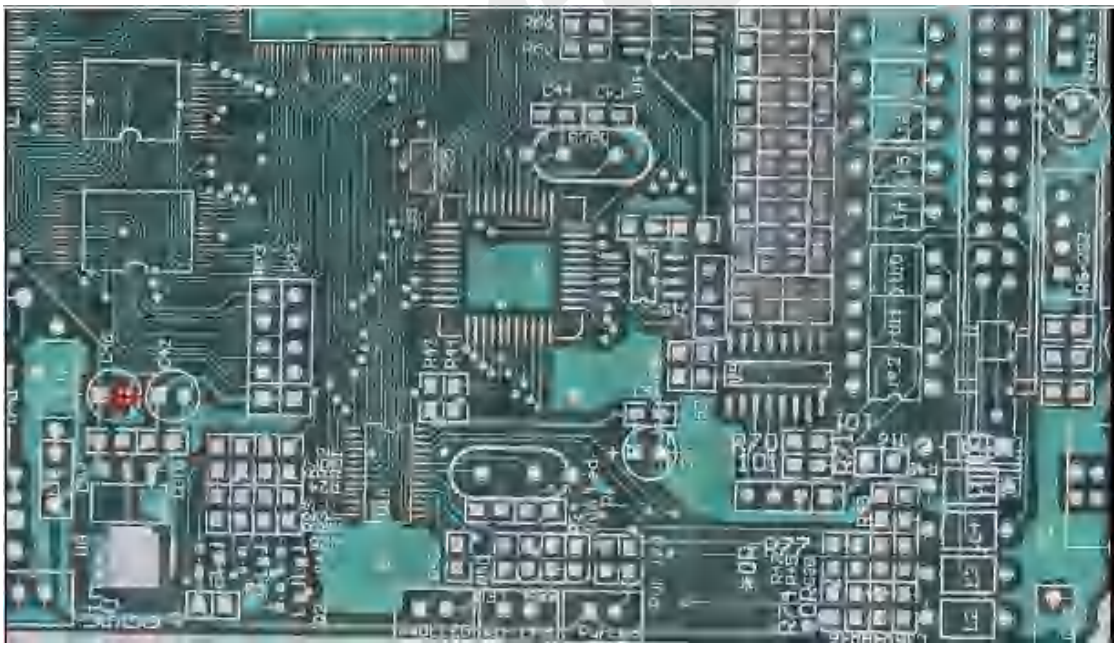
The point of scanning can be saved as dxf file.



(19) Map

Work-piece can be divided into a number of areas to take photographs，Generate large map，and dimension can be marked on the map.

Click the middle mouse button on the map, the machine will be moved here.



(20) Report

Measurement data can be exported to Excel, Word, AutoCAD, and TXT. User when program is running, the data can be derived by rows or columns to Excel.

Export to the report, the option to export the graphics and bitmaps.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Report Nu		111									
2	Part Name		222									
3	Part No. :		333									
4	Operator		444									
5	Company :		555									
6												
7	No.		Feature	Content	Nominal	UpTol	LowTol	1	2	3	4	5
8		1	CIR1	X	-4.128			-4.128	-4.128	-4.128	-4.128	-4.128
9		2		Y	0.845			0.845	0.845	0.845	0.845	0.845
10		3		Radius	0.599			0.599	0.599	0.599	0.599	0.599
11		4		Diameter	1.198			1.198	1.198	1.198	1.198	1.198
12		5	CIR2	X	-4.214			-4.214	-4.214	-4.214	-4.214	-4.214
13		6		Y	-1.917			-1.917	-1.917	-1.917	-1.917	-1.917
14		7		Radius	0.602			0.602	0.602	0.602	0.602	0.602
15		8		Diameter	1.203			1.203	1.203	1.203	1.203	1.203
16		9	CIR3	X	1.465			1.465	1.465	1.465	1.465	1.465
17		10		Y	-2.862			-2.862	-2.862	-2.862	-2.862	-2.862
18		11		Radius	0.6			0.6	0.6	0.6	0.6	0.6
19		12		Diameter	1.199			1.199	1.199	1.199	1.199	1.199
20		13	CIR4	X	1.53			1.53	1.53	1.53	1.53	1.53
21		14		Y	-0.111			-0.111	-0.111	-0.111	-0.111	-0.111
22		15		Radius	0.568			0.568	0.568	0.568	0.568	0.568
23		16		Diameter	1.136			1.136	1.136	1.136	1.136	1.136
24												

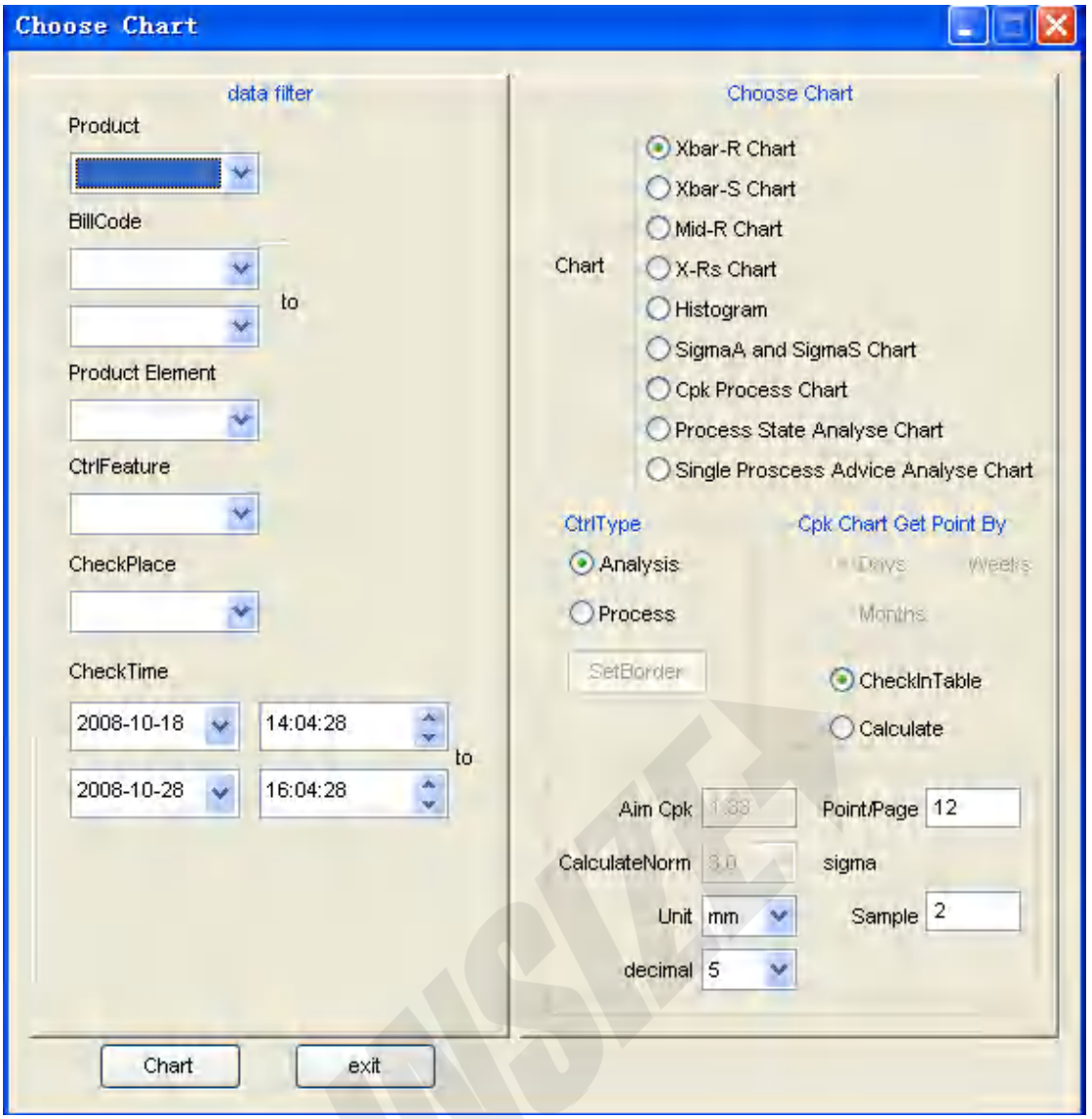
(21) Online SPC functions

Provide independent, professional SPC software, measurement data for re-processing

SPC software, measurement software and seamless connection, measurement after measurement software, automatic data into SPC database, do not need to manually re-enter, all settings of the control limits of all completed in the measurement of software, SPC software will no longer need to set up, thus greatly improve efficiency.

SPC Provide process control charts and analysis charts,

SPC Provide Xbar_R chart,Xbar_S chart,Mid_R chart, X-Rschart,Histogram,SigmaA and SigmaS chart,Cpk process chart,Process state analyse chart.



(23) Help

To provide a comprehensive help system, to help users quickly master the software.

CHAPTER II SETUP

Software installation requires four steps:

Step 1: Install security key driver

Step 2: Install video card driver

Step 3: Install controller driver

Step 4: Install software

Step 5: Set up parameters

Step 1: Install security key driver

Please insert the security key, then click on the setup.exe file. The following dialog box will pop up.

Click <Install>, start to install security key driver.

Step 2: Install video card driver

Please refer to the relevant installation manual for video card.

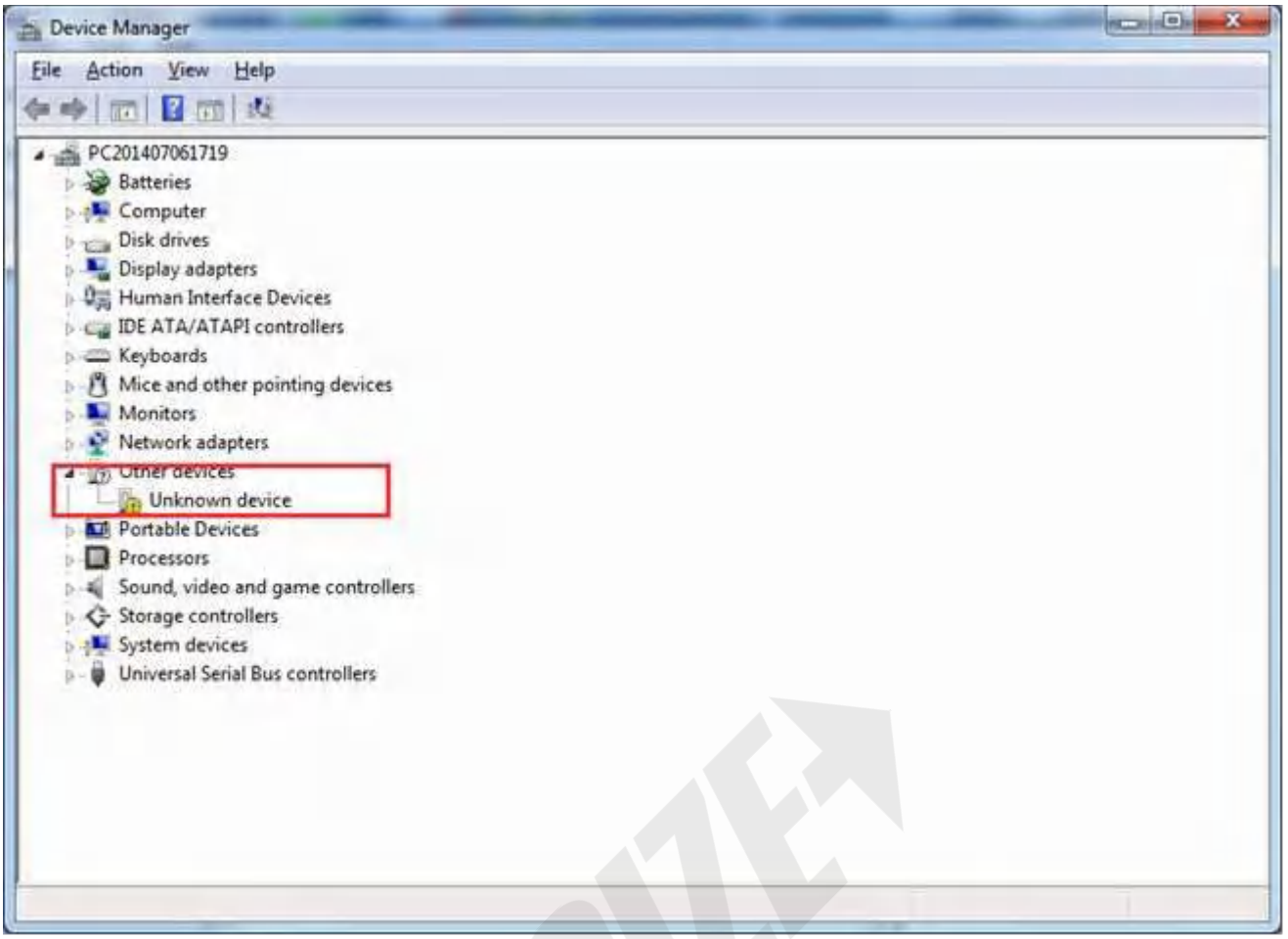
Step 3: Install controller driver

UWC3200 use USB interface to communicate with computer. The first time connect the controller to the computer, need to install the driver installation as following:

Turn on the controller power, after one second the red light up, indicating power is connected properly.

With a USB cable to connect computer to the controller, wait a moment, green light will light up once at a short time.

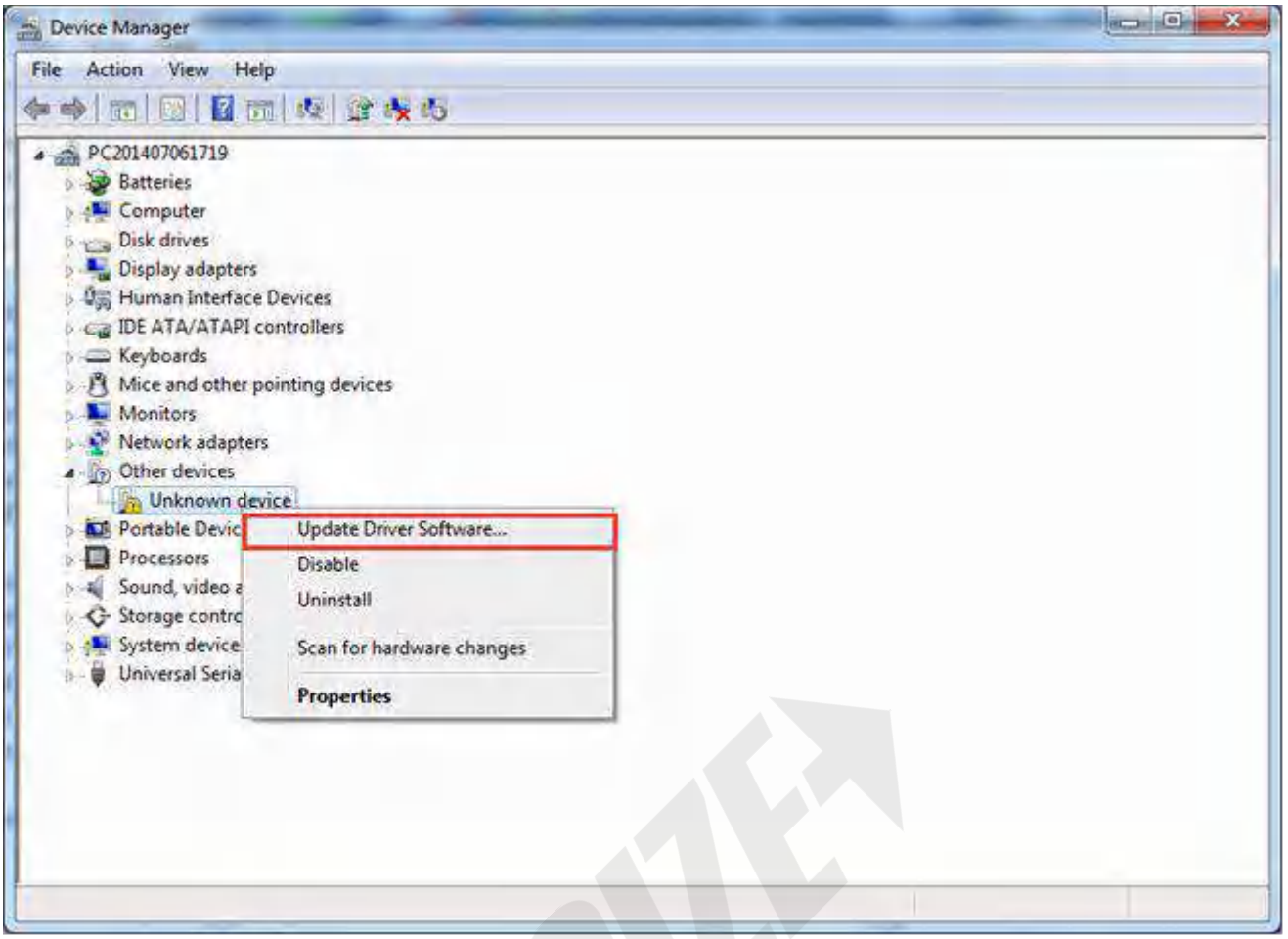
Then, the computer will prompt that has found new hardware, new hardware installation wizard pops up. The first step select "No, not this time", then select “Next”.



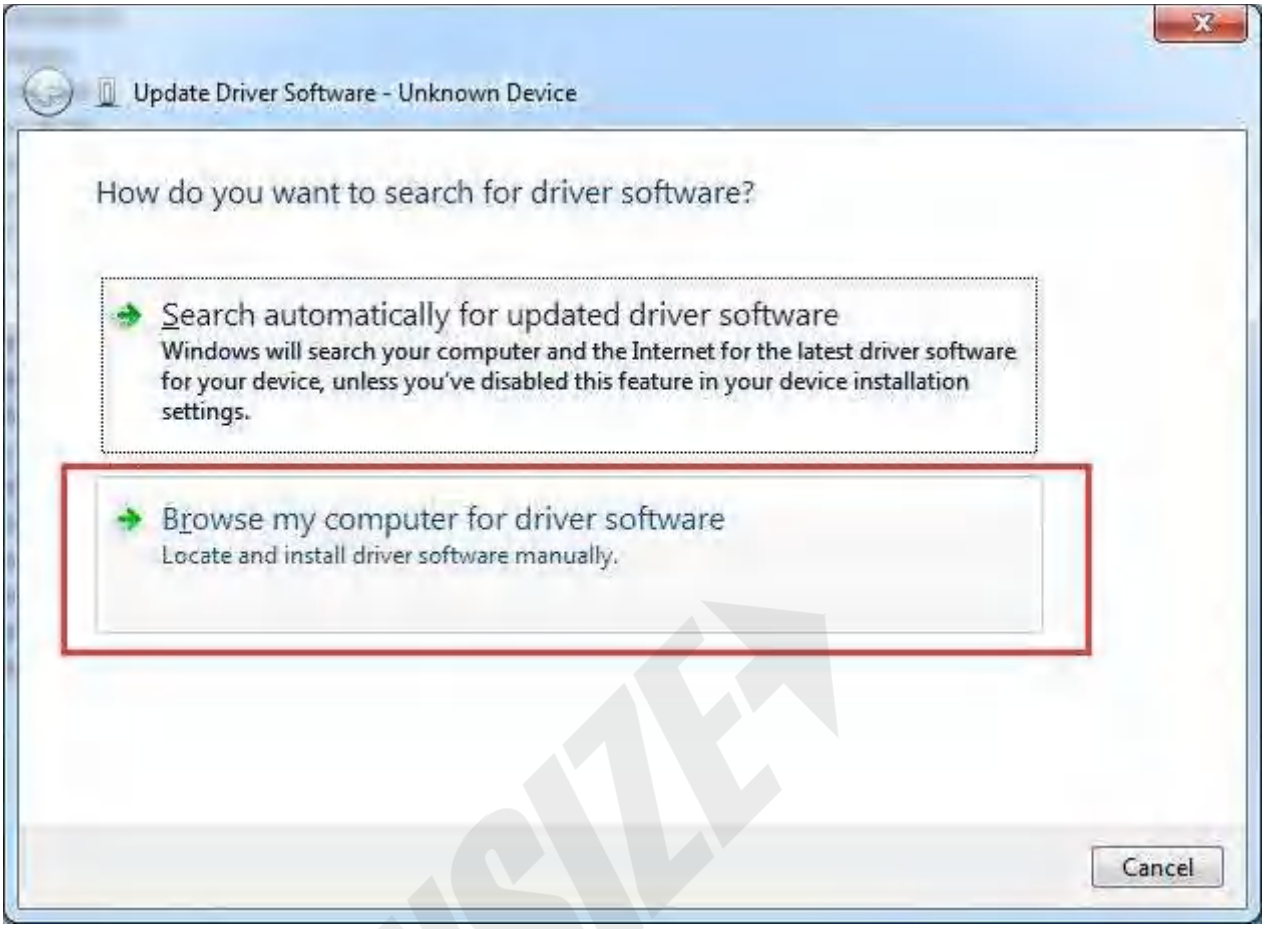
The second step select "Install from the list locations or specified location (Advanced)."

Note: Since USB device driver is according to the port, so that when the controller is connected to another USB port, PC will promote that has found new hardware. Because the driver has been previously installed, select "Install the software automatically (recommended) (I)".

In Windows XP, to avoid the users connect the USB to the port not installed driver after pull out the USB and re-connect it to the computer, we suggest install driver to all USB ports. But don't need this operation in Windows 7, because it has automatic installation function.



The third step, select "search in these locations for the best driver," the search path is UWC3200 data location, setup as following:

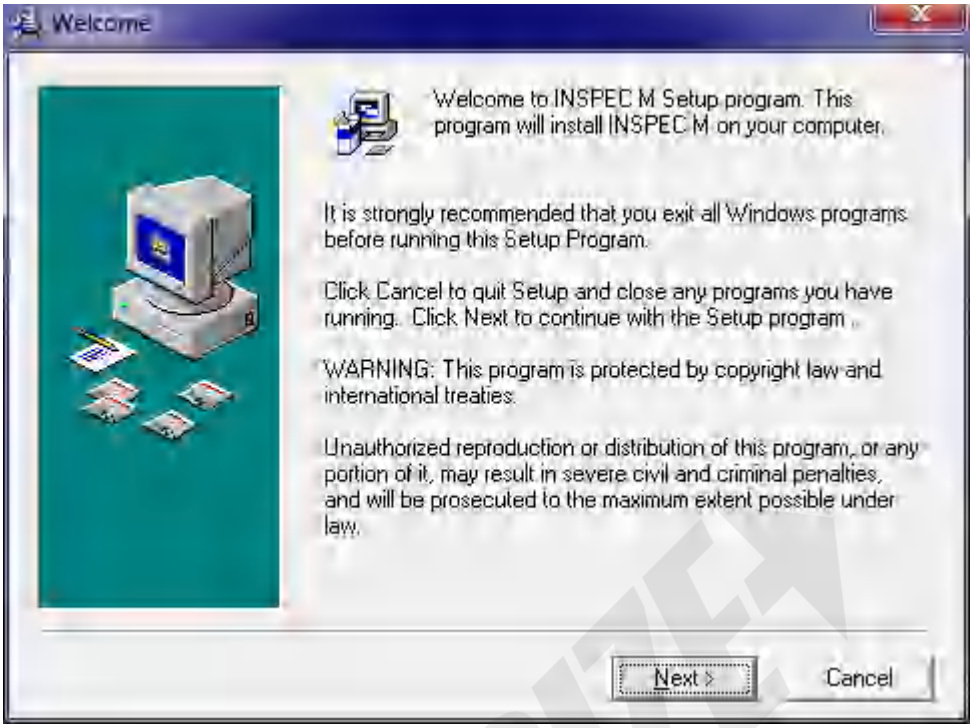


Click "Next", hardware Update Wizard will automatically search for the driver. If computer is first installed UWC3200, there will be a file copy video, then pops up the window below

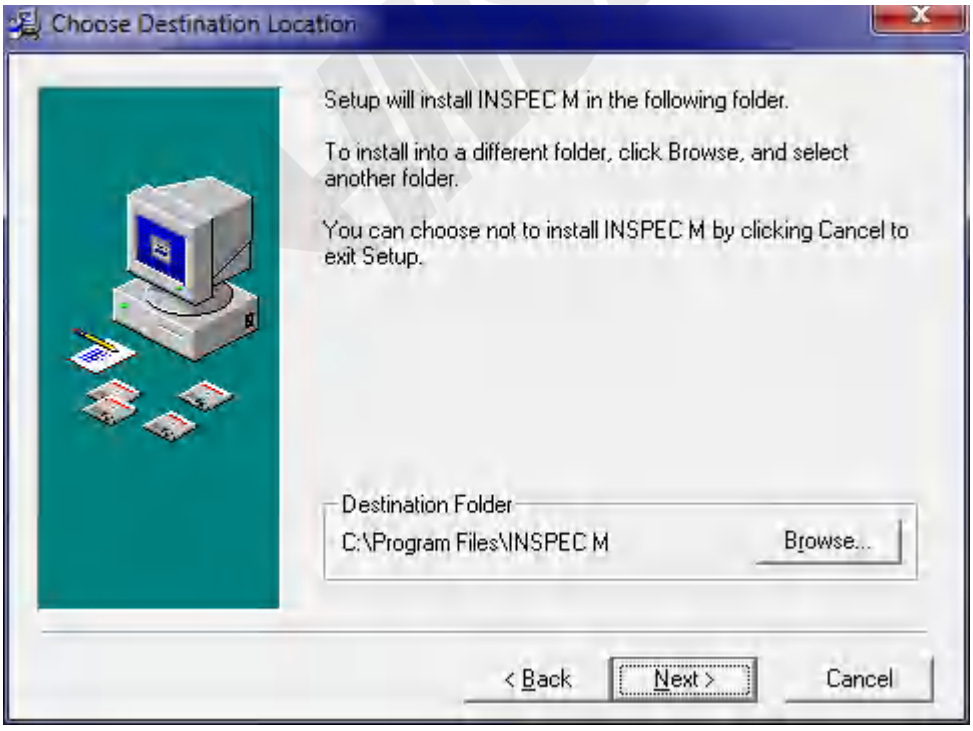
Now controller driver installation is completed. View the Device Manager "Universal Serial Bus controllers", you can find "Union Win Control UWC3200", the green LED on controller should light up .If the green LED is flasing after start the Setup Wizard software or UWC3200imeasurement software, it indicates data is exchanging.

Step 4: Install software

Double-click the setup.exe start the installation software.



Click <**Next**>



Users can change the installation path, and click <**Next**> button.
After installation is complete, the following dialog box will pop up.

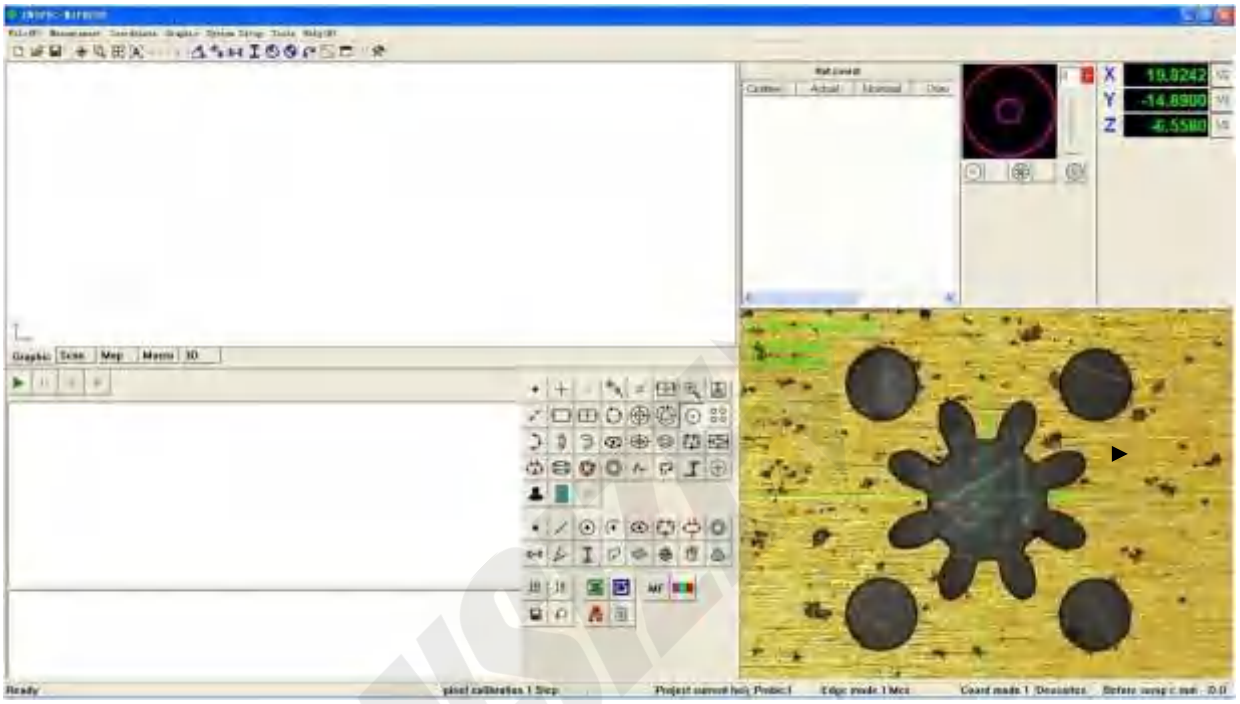
Click <**Finish**> to finish the software installation.

Step 5: Setup Parameters

Set up hardware connection, compensation data etc.
Please check with Yihui for detail.

CHAPTER III INTERFACE

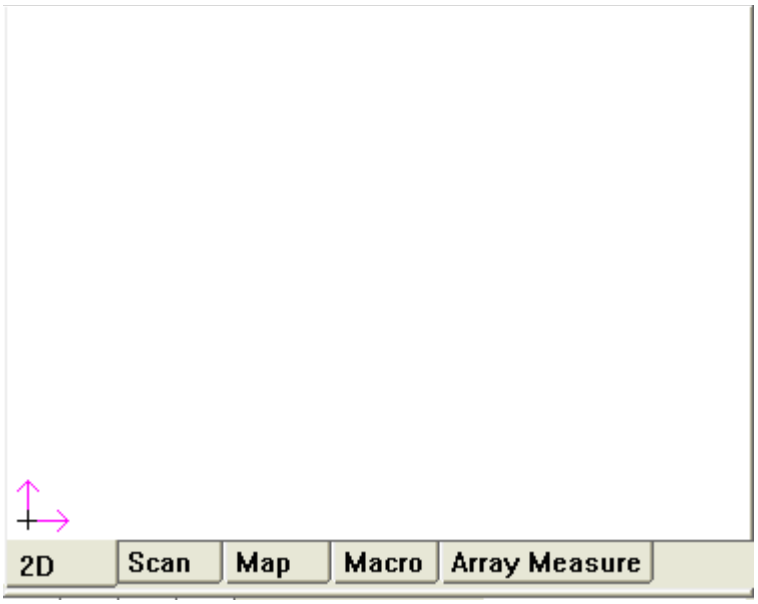
Following is a software interface:



Software interface will be set up with the display resolution, and in different resolution, the window will be slightly different arrangement, the map is 1024 * 768 in the result will be displayed.

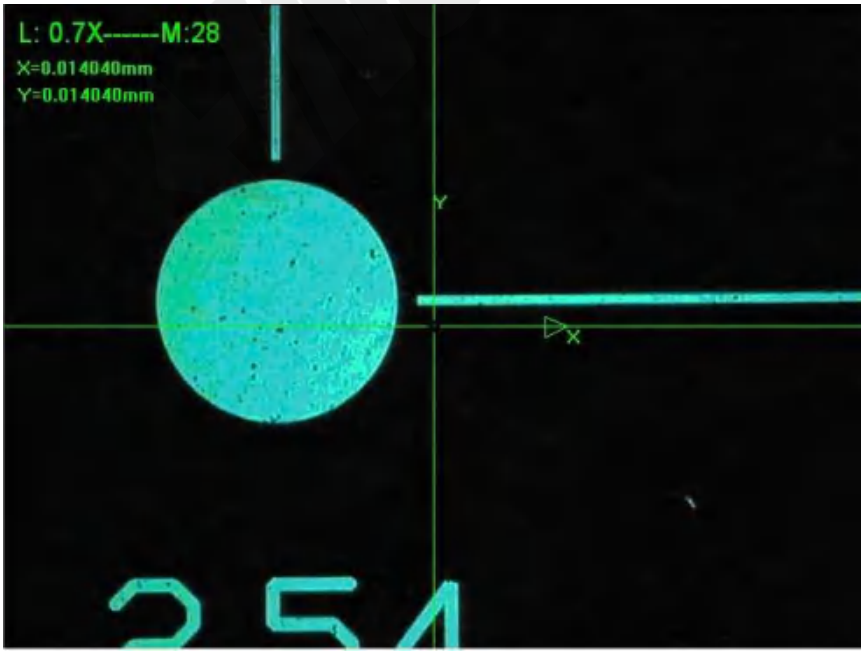
The following for each sub-window for a brief introduction:

1) 2D window



There are several Pages, a 2D window, a scan window, a map window, a macro measurement window, a measurement window for array. In the 2D window, it displays 2D graphics. In the scanning window shows data from the scan, in the map window, showing that splicing of the map, in the macro window, show macro button about the macro measurement issues related to will be detailed later.

2) Video window



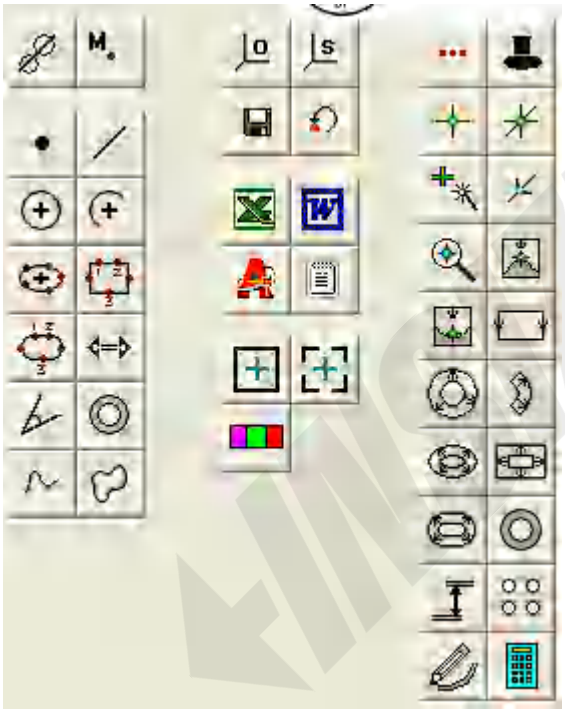
This window is used to measure the main window.

3) DRO Window

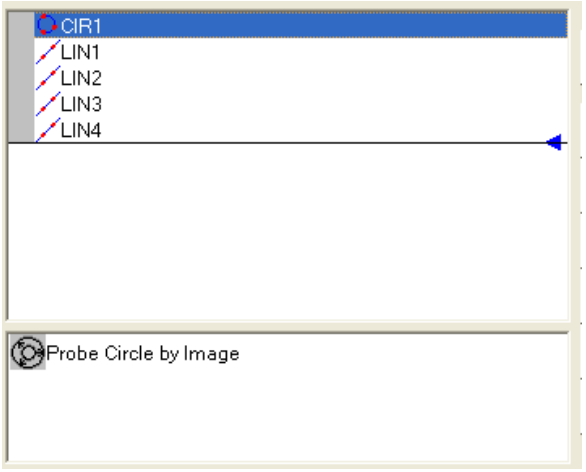
4) Toolbar

Run program toolbar

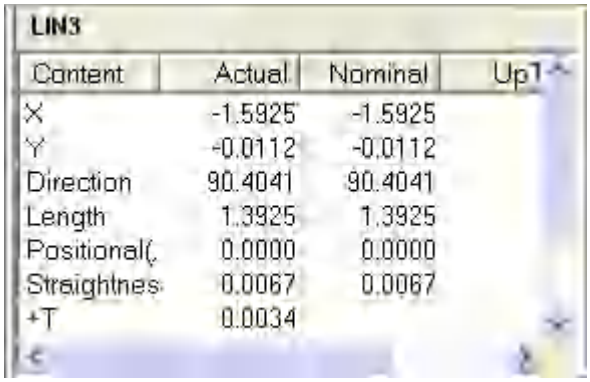
Measure and construct toolbar



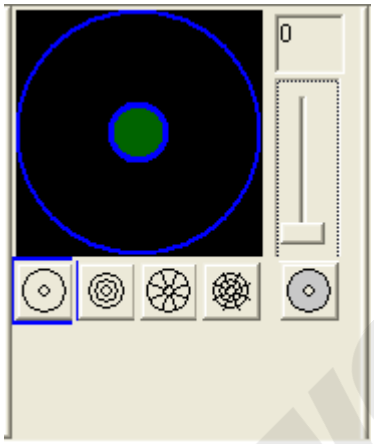
5) Feature list window



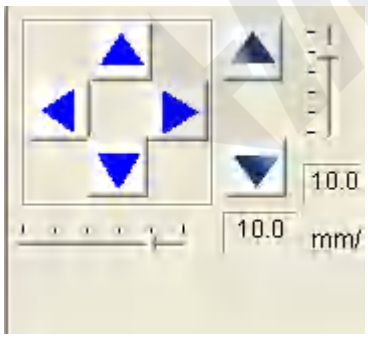
6) Result window



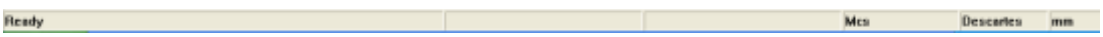
7) Light control



8) Motion control window



9) Status Bar



Double-click the status bar at the corresponding position, to switch their status.

CHAPTER IV MEASUREMENT

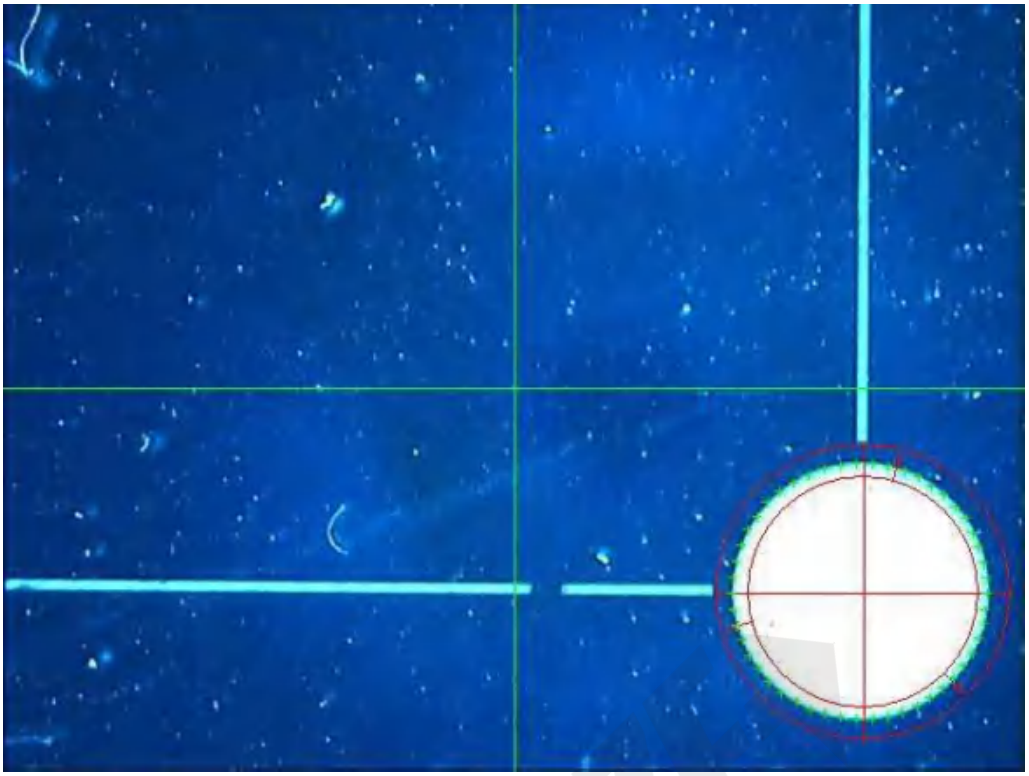
4.1 Pixel calibration

The first measurement, or changes in lens magnification, the pixel must be calibrated.Pixel calibration is designed to allow a more accurate measurement results.

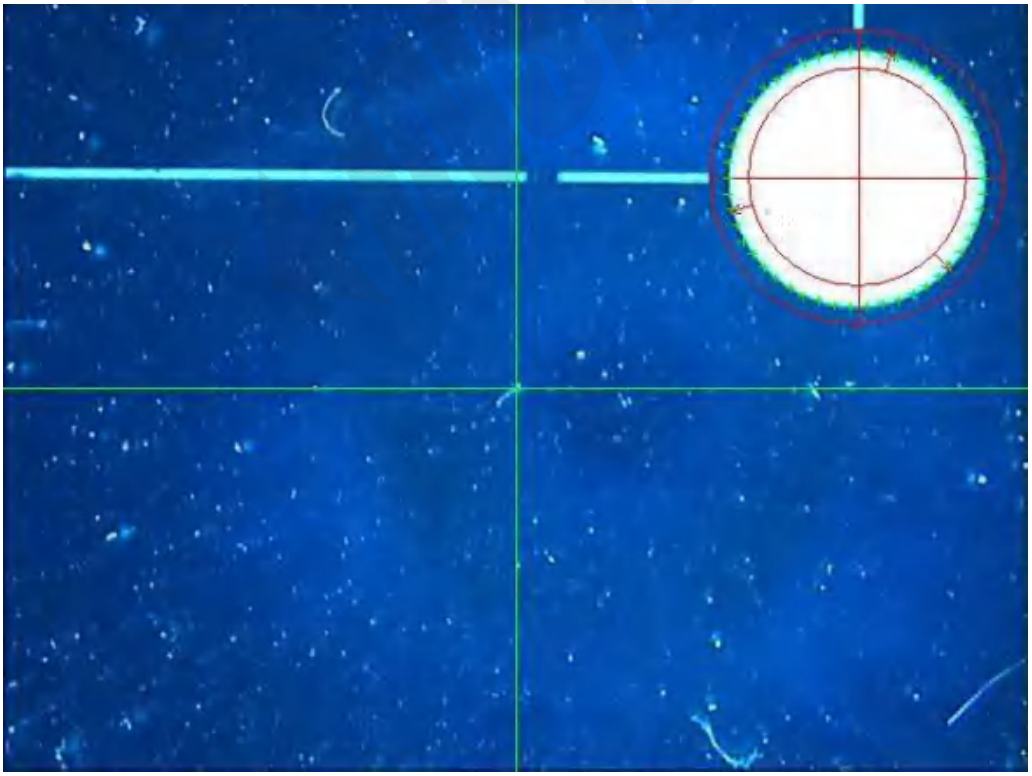
1) Pixel calibration must meet the following conditions:
2) The same magnification lens
3) Circle measurement tools must be used
4) Calibration sequence must be: along the four corners of the image areas, clockwise or counterclockwise.
5) Circle can not be too large nor too small, accounting for the screen 1 / 8 of the best.

Pixel calibration steps are as follows: (calibration sequence to rightbottom,righttop, lefttop,leftbottom).

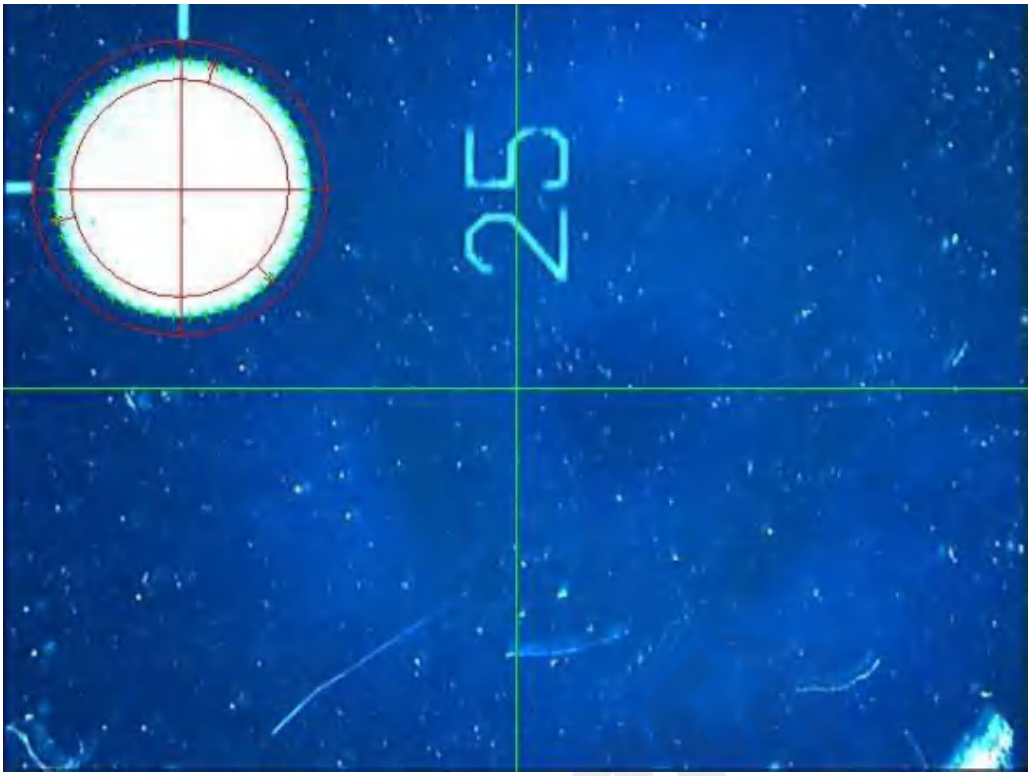
1. Right-click in the image window, the pop-up menu, select "pixel calibration ", and start measuring circle.



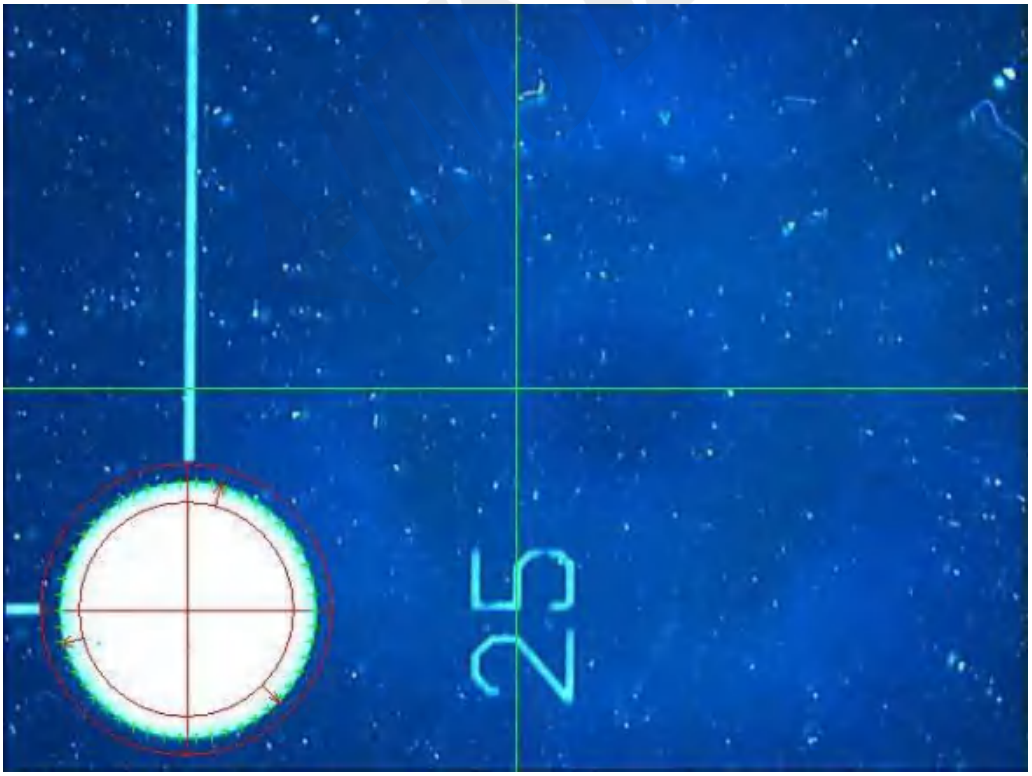
2. Status bar will display "pixel calibration, Step 2", moving Y-axis, this circle display to the top right of the image area, and then, accordance with steps 1 to complete the measurement.



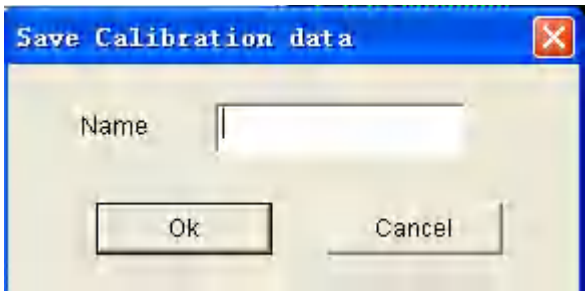
3. Status bars will display "pixel calibration, Step 3", mobile X-axis, this circle display to the upper left image window, and then, in accordance with steps 1 to complete the measurement.



4. The status bar will display "pixel calibration, Step 4", move Y-axis, this circle display to the lower left video window, and then, In accordance with steps 1 to complete the measurement.



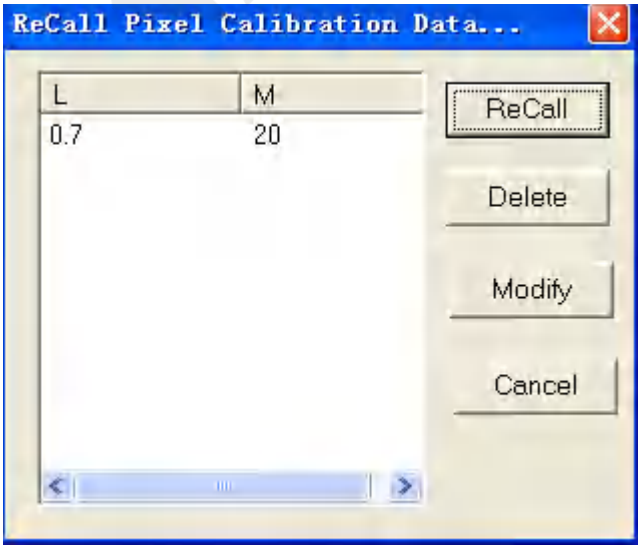
The following dialog box will pop up, save pixel calibration data.



Enter the name, please note that we must enter a number, such as: 0.7,1.0.2.0,2.5 and so on, can not enter such characters, such as A0.7x, and so on, because the software based on this data to calculate the screen magnification.

After input, presses **OK**, the software will automatically calculate the screen magnification, and save the results of calibration pixels.

X, Y on the screen of the value for X, Y direction of a pixel is equivalent to the number of mm, M for screen magnification. Screen magnification is for calculating with the computer monitor and the size of the CCD sensor, so the software provides a setting where these two parameters. In the parameter setting -- User Preferences -- set up in magnification set parameters. Save the pixel calibration data can also call again. Right mouse in the video window, the pop-up menu, select <Recall pixel calibration data>, the following dialog box will pop up.



4.2 Measuring element

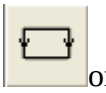
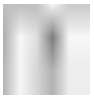
A variety of measure methods (Automatic identification, probe point, Compare, Comparison tolerance, preset) can meet the different needs of users, greatly improved ease of use and accuracy.

Introduced below:

4.2.1 Image find edge

Note: during the measurement (including find edge, Compare、Comparison tolerance, probe point) have been carried out to-pixel calibration, or data error.

 Sub-measurement. Measured over the screen line, arc, will use this function.

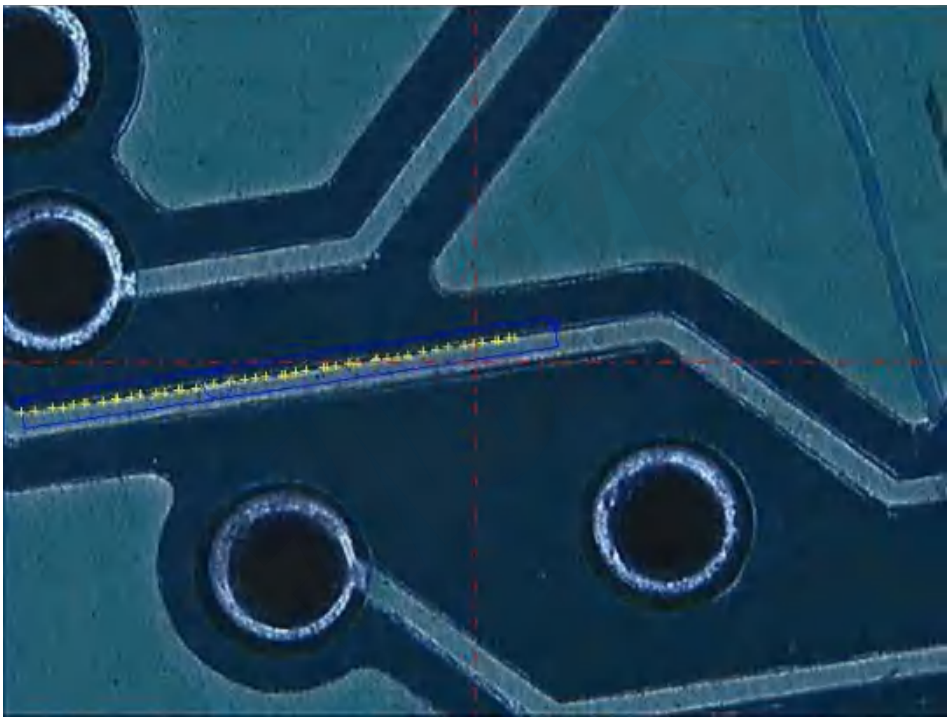
Methods of operation: Click the button, and click  or  or  , start measure line, circle, arc.When the probe is completed, please click  the calculation button, the calculation results.

1  Automatic Identification of measurement

This function can automatically identify the line, circle, arc elements, without the need for people to click.

Methods of operation: Click the button, in the image window will be a circle, move the mouse to the edge of the element to be measured, and then the mouse does not move about to stay around 0.5 seconds, the software will automatically identify the element, then you need to do is to press SPACE key measurement.

For example, the following bmp:



2  Mouse probe point button.

Methods of operation: Click the button, and then in the image window click the left mouse button, you can collect one point.

3  AF,get a focus point

This feature be used, will get the current coordinates after AF.

4  Automatic collection point tool:

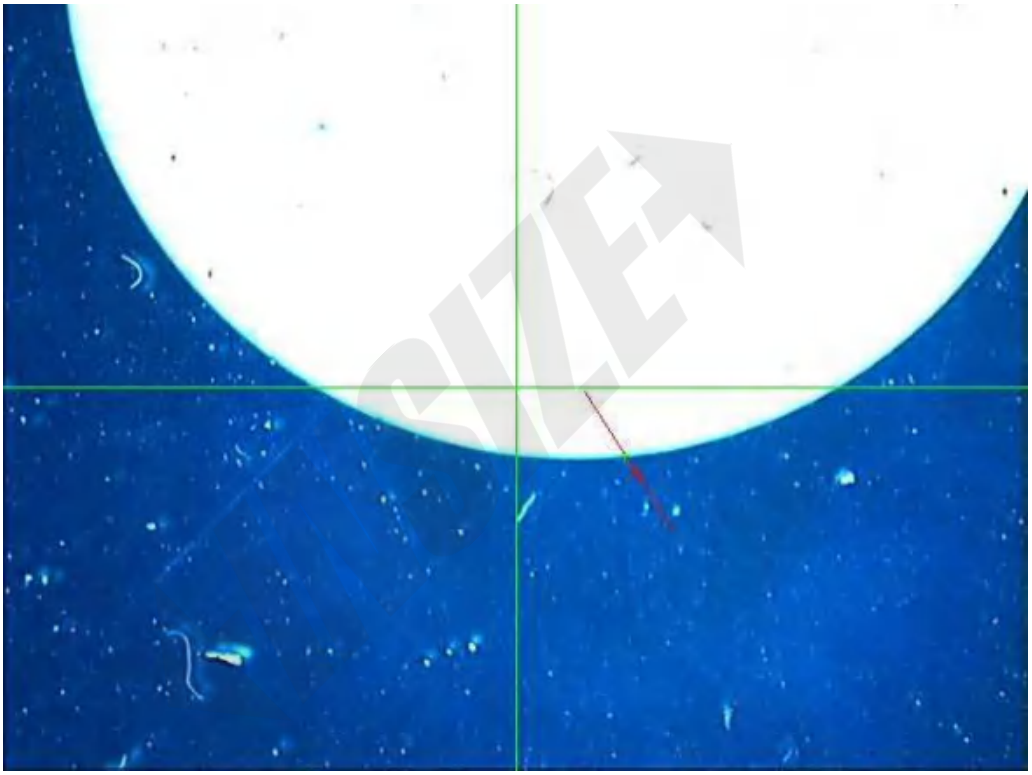
This feature is through the sub-pixel analysis, the mouse has been near the edge of the

point, click the left button to confirm the point.

5  Collection point button using a straight-line.

Methods of operation: Click the button, and then in the video window by holding down the left mouse button, move the mouse, dragged out of a straight line across the border. And then double-click the mouse or presses the SPACE key, will get points, the arrow direction while the direction of search.

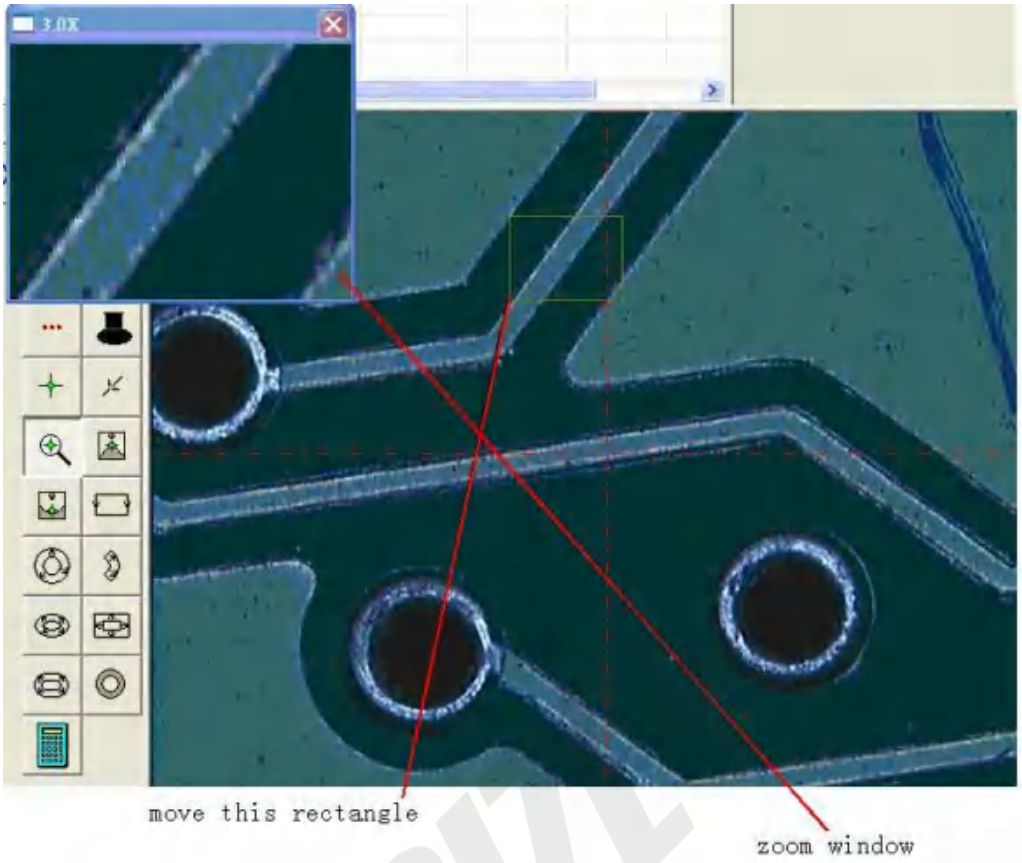
For example:



6  collection point by zoom

Partial image to enlarge, then use the left mouse button click in enlarge the window, and get a point.

For example:



7  Collected the highest points: collection highest point in rectangular

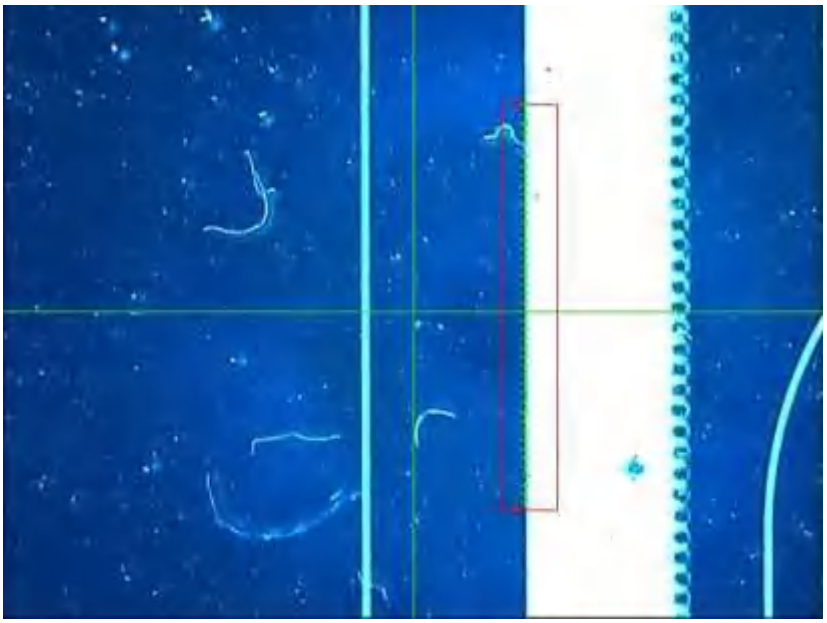
Methods of operation: Click the button, and then in different places Image window, click the left mouse button three times, will form a rectangle, and then press SPACE key or change the mouse double-click, will be within the scope of the rectangle the highest point.

8  Collected the lowest points: collection lowest point in rectangular.

Collection operation is the same as the highest point

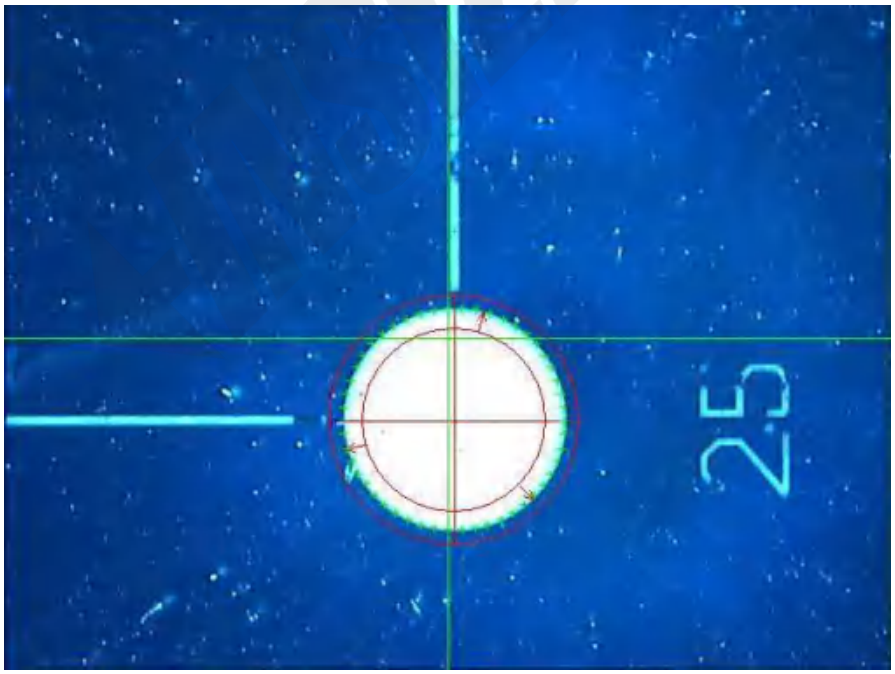
9  Line button:

Methods of operation: Click the button, and then to be measured in the vicinity of one end of the line click the left mouse button, move the mouse to the other side of the line side, and then click the left mouse button, and then move the mouse to the other side of the line, the clicking of the mouse left, you can draw a rectangle, double-click or press the SPACE key, get a straight line.



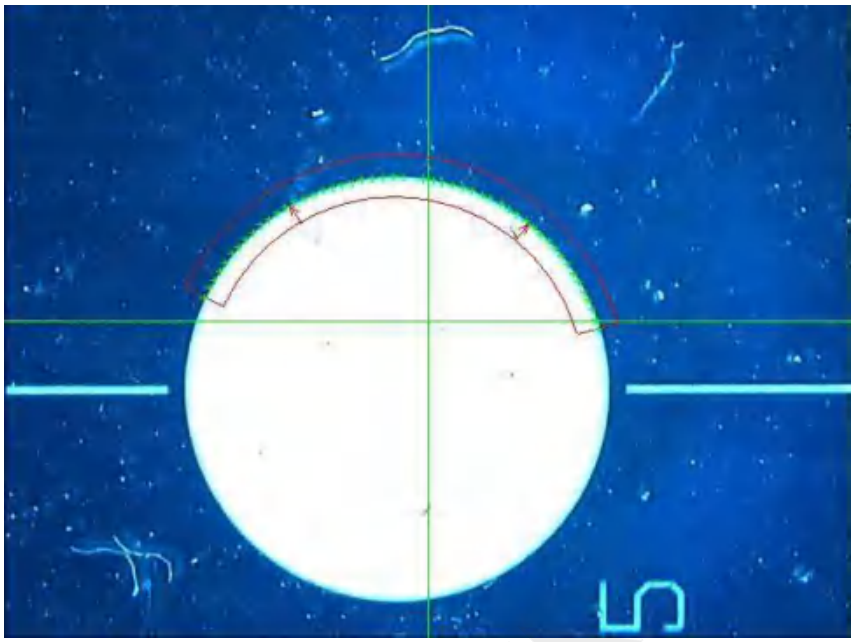
10  Circle button

Methods of operation: Click the button, and then on the edge of circle, the left mouse button click three times, and then double-click or press the SPACE key, you can get an circle.



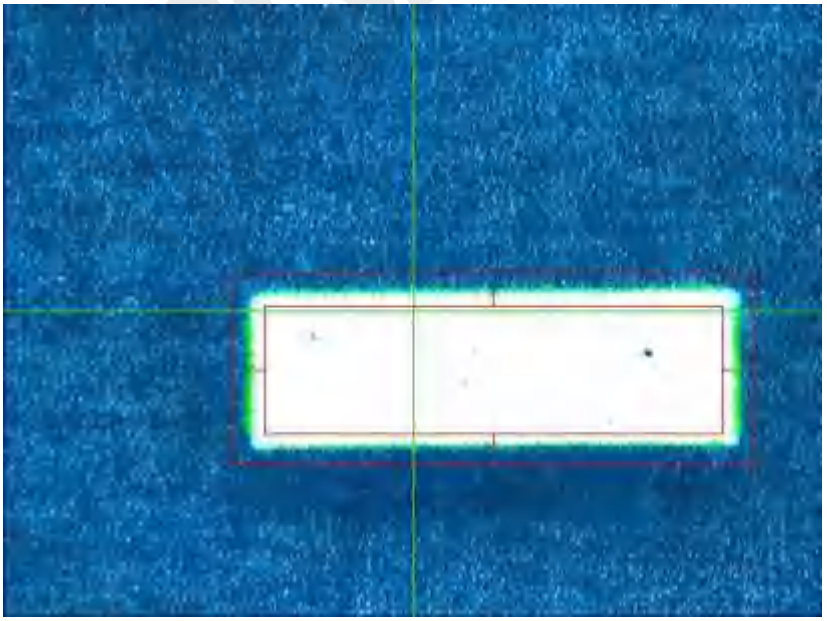
11  Arc button

Methods of operation: Click the button, and then on the edge of arc, the left mouse button click three times, and then double-click or press the SPACE key, you can get an arc.



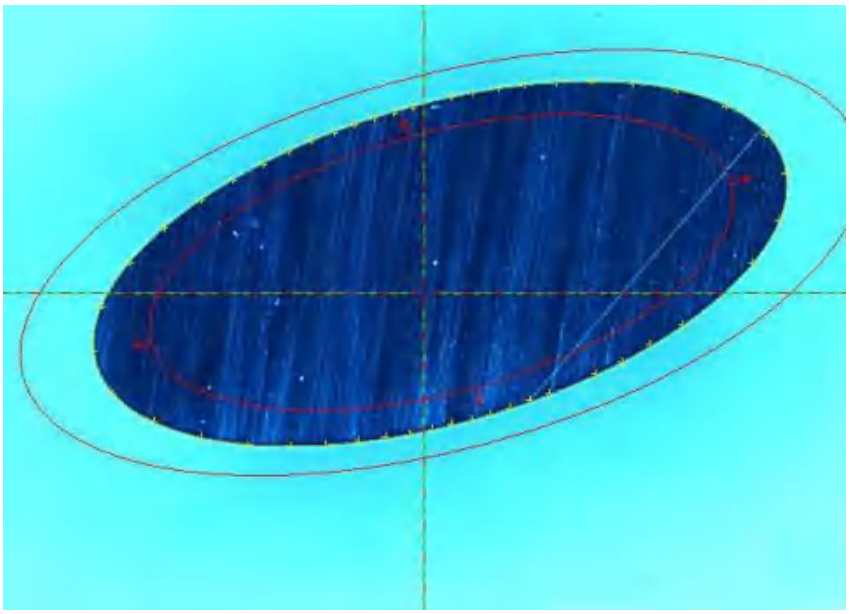
12  Rectangle button

Methods of operation: in the rectangular side of the clicking of the mouse twice, and then click the mouse one time in the the rectangular other side. And then double-click or press the SPACE key, you can get a rectangle.



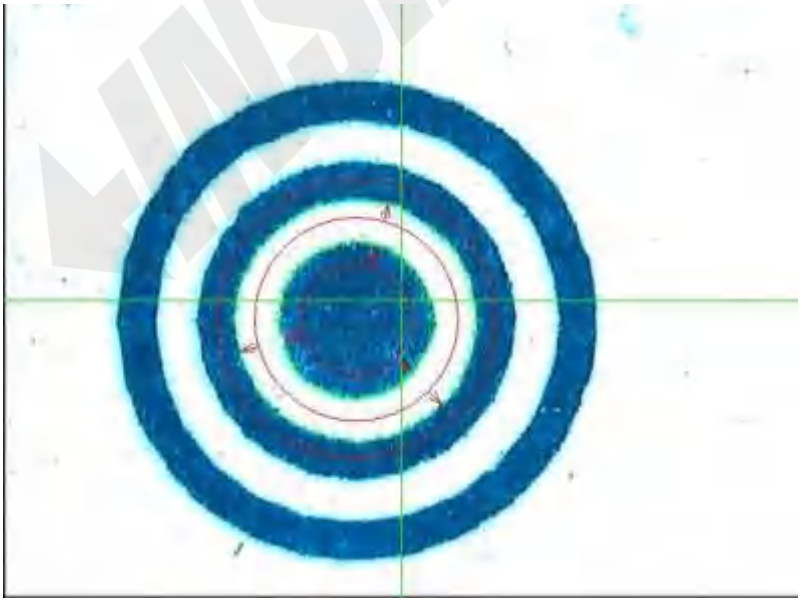
13  Ellipse button

Methods of operation: Click the button, and then the edge of the ellipse five times the clicking of the mouse. And then double-click or press the SPACE key, you can get an ellipse.



14  Ring button

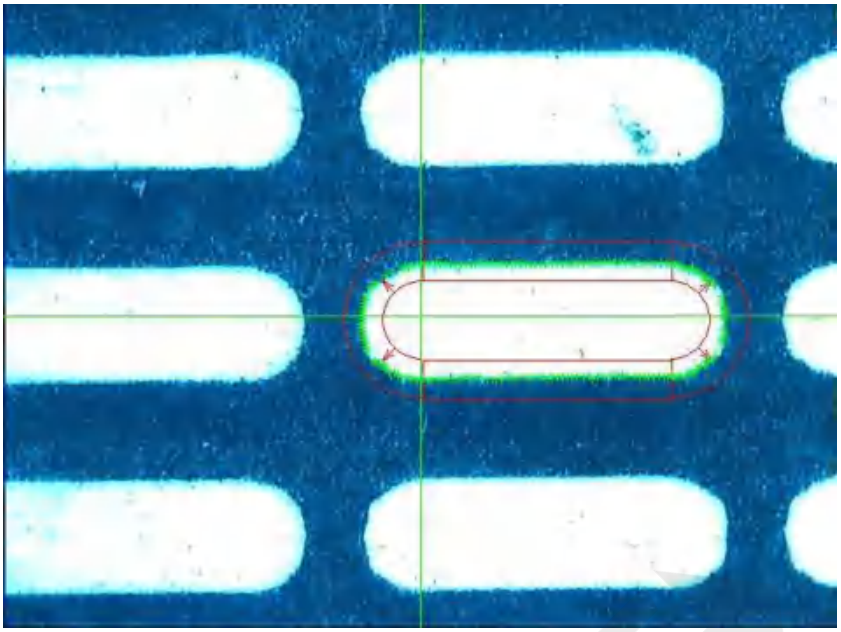
Methods of operation: Click the button and then press and hold the left mouse button in the video window, move the mouse, which will be three concentric circles. And then double-click or press the SPACE key, you can get a ring.



15  Slot button

Methods of operation: Click the button, and then press and hold the left mouse button, move the mouse to the arc center, which will be a period of arc, and then release the left mouse button, move the mouse, when surrounded the slot and then you can click the left mouse button. and

then double-click or press the SPACE key, you can get a slot.



16  Height measurement

Click the button, the software prompts the user for collecting the first face, when after the completion of the first Focus; the software prompts the user for collecting the second face, when after the completion of the second focus, and get a high value of the two surface.

17  Measurement of multi-circle

Click the button, pulled out a rectangular in video window, and then release the mouse, it has get all circles within the rectangular.

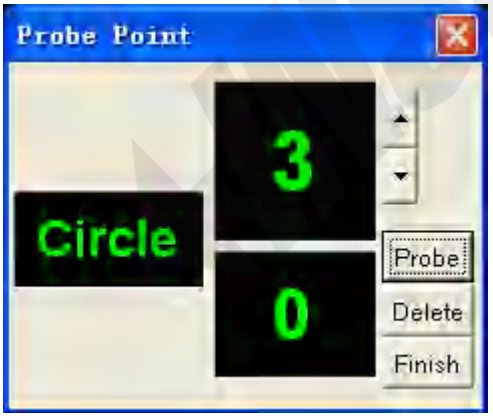
18  Calculation button

This feature is specifically used in the measurement of the screen over the line, circle, arc, when the sub-collection is complete, click on the button to calculate the results.

4.2.2 Probe point measurement

 Click this button, to enter the probe point of measuring. Then click on the point, line, circle button, etc.

To measure the circle as an example to show how to take point measurements. Click the circle measurement button, pop-up dialog box

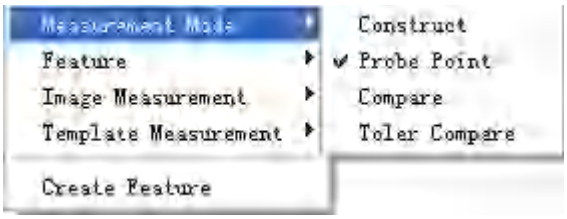


There are many methods of probe point: You can take the mouse, the mouse Intelligent , the cross line, etc.

Probe point toolbar: 

4.2.3 Compare measurement

Compare measurement: draw the corresponding graph in the image window, then the size of graphics, which is to be measured by the size of graphics.



Select Measurement menu -> measurement mode-> compare.

Gray button can not be compared to measurements, bright buttons that can be compared with measurements.

An example for a circle:

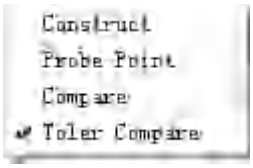
Operation:

 Click the circle button, and then on the edge of the circle, click the left mouse button three times, will draw a circle. Users can move the circle, or pull the circle. And then double-click the mouse or press the SPACE key, then get the measurement results.

4.2.4 Tolerence compare measurement

Compare the so-called tolerance measurement, the tolerance zone is a useful set of graphics to the circle to be measured to see the circle to be measured by whether or not to draw within the tolerance zone, this feature is mainly visual

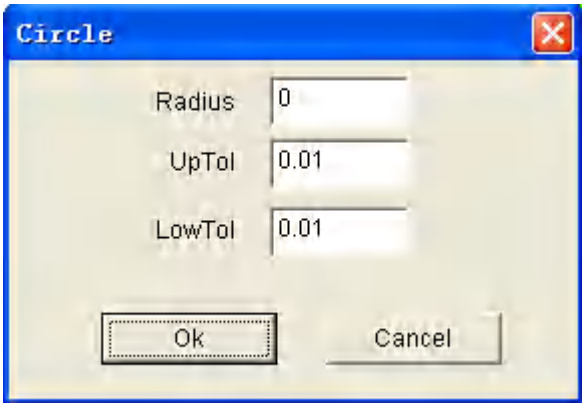
Measurement menu-→measurement mode-→Toler compares



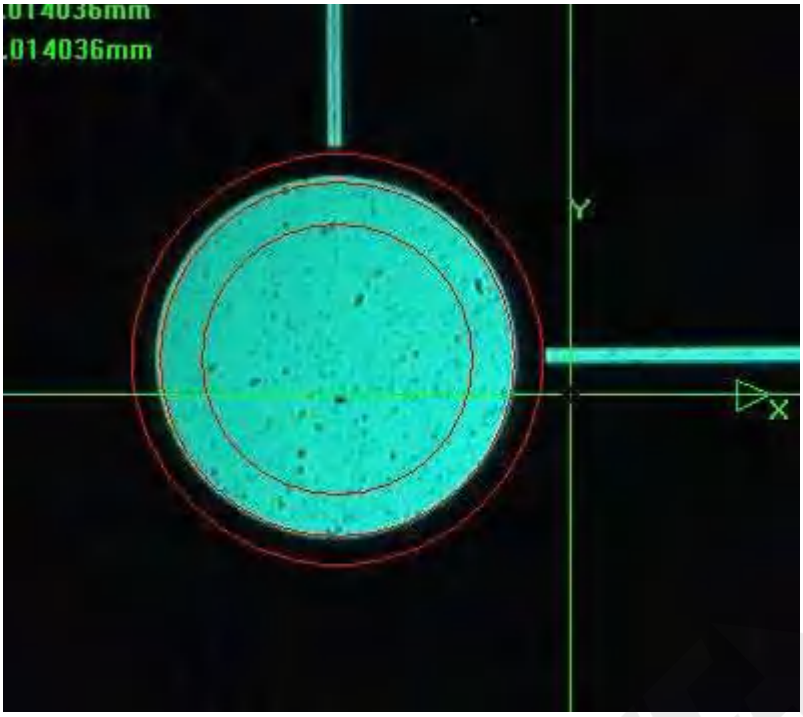
Measure toolbar:

To a round as an example to show tolerance of the measurement method

 Click this button, Pop-up dialog box.



Enter the nominal radius of a circle, and upper and lower tolerances, and press "**OK**";



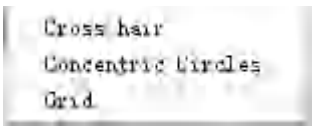
If you want to reset the upper and lower tolerances, double-click the mouse in the image area, in the pop-up dialog box to enter value.

4.2.5 Template measurements

Template method, but also a visual approach, mainly through the eyes visual users to see if qualified projector-type to be used in the standard specification plate.

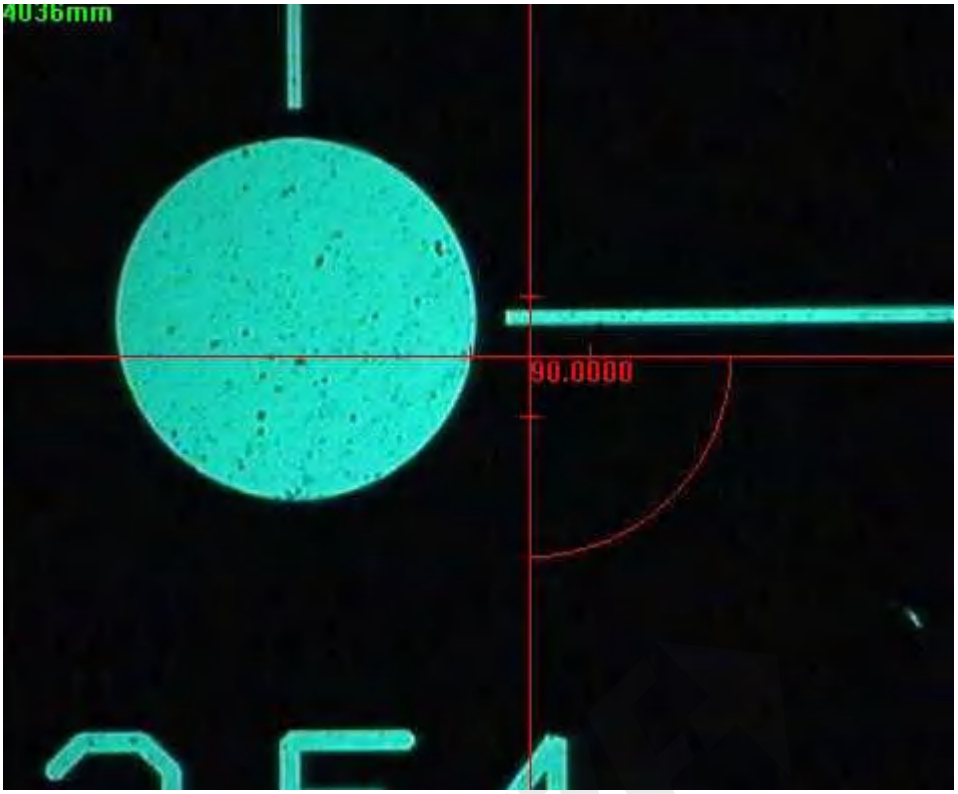
Template measurements, cross-line templates, box templates and a concentric circles template. Cross lines to measure the angle, grid template is used to measure the distance, concentric circle is used to measure radius.

Template measurements menu:



Cross-line templates**:**

Operation: <Measurement>-→<Template measurement>--< Cross lines >

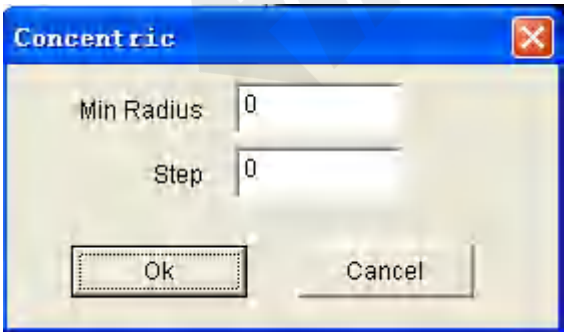


Users can rotate and pan the cross line, in order to get angle.

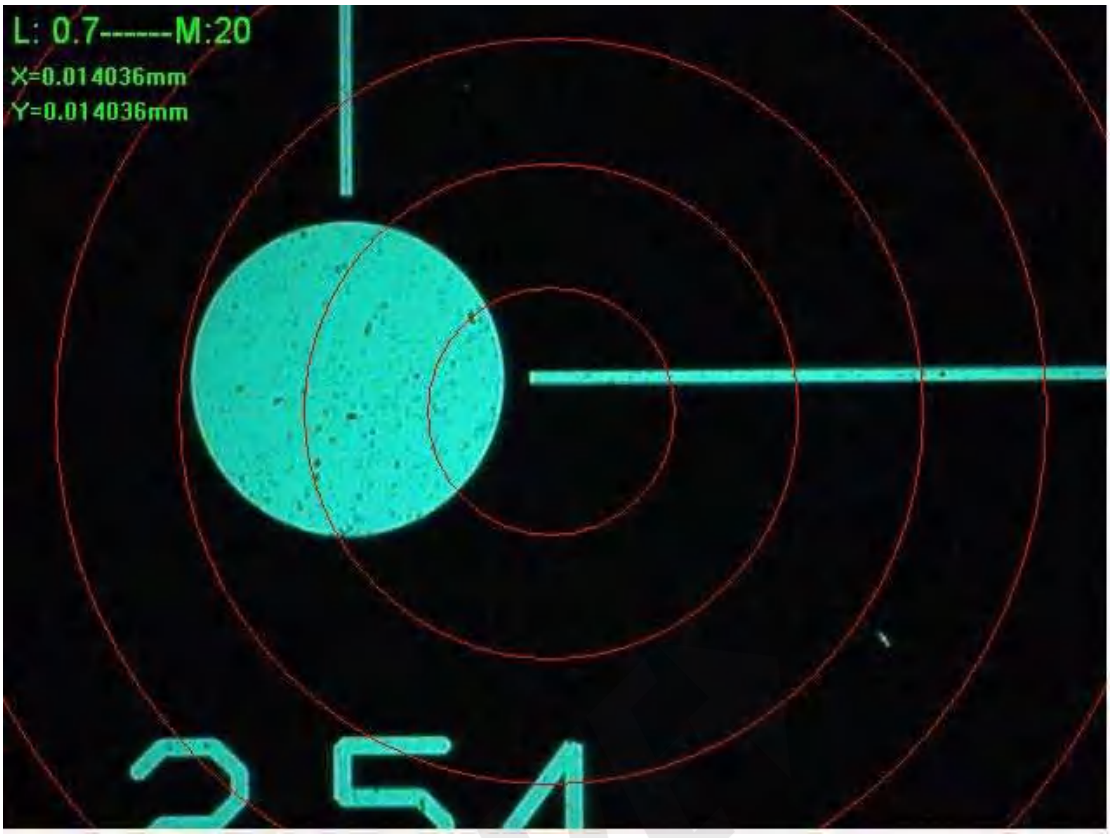
Concentric circle templates

Operation: <measurement>-→< Template measurement>→<concentric circles>

Pop-up dialog box:

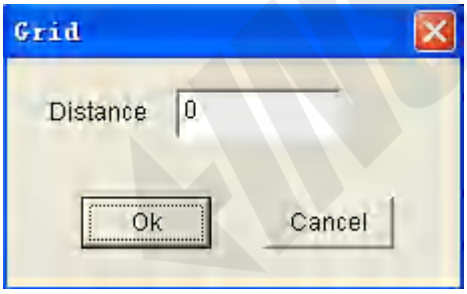


Enter the minimum radius and step, the click OK:

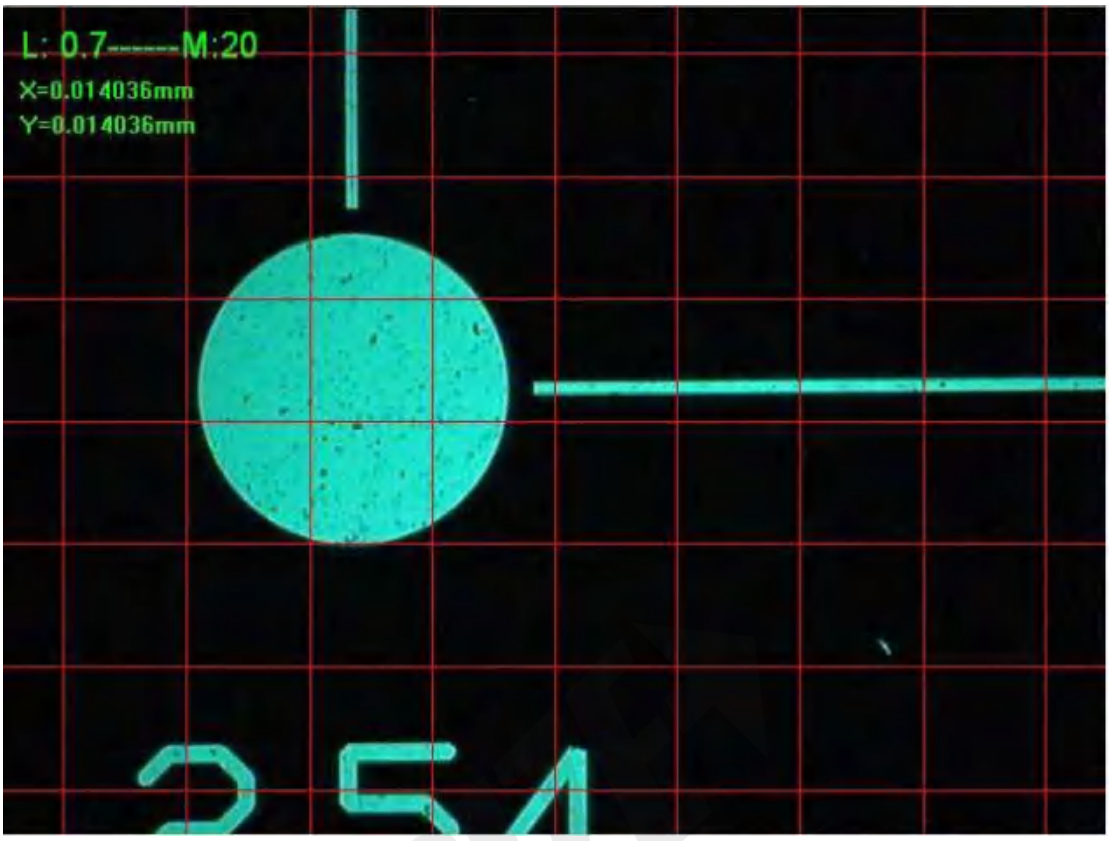


Grid template:

Operation: <measurement>-→<template measurement>--<Grid>



Enter distance value.



4.2.6 Macro measurement

Macro function is measured with some of the measurements, the command structure associated to a button. The click of a button, that is the beginning of the implementation of macro measurement function, measurement function macro will automatically complete the structure and measure, so moves the mouse to reduce the number of users and enhance efficiency. It should be noted that: macro measurement function is different from the user program, the macro does not record light measurements, such as measuring the state of the coordinates of the location. Run macros, it will not move table, lighting and so on. Software provides a measurement of 16 group macro function, users can edit macro button icon.

Operation**:**

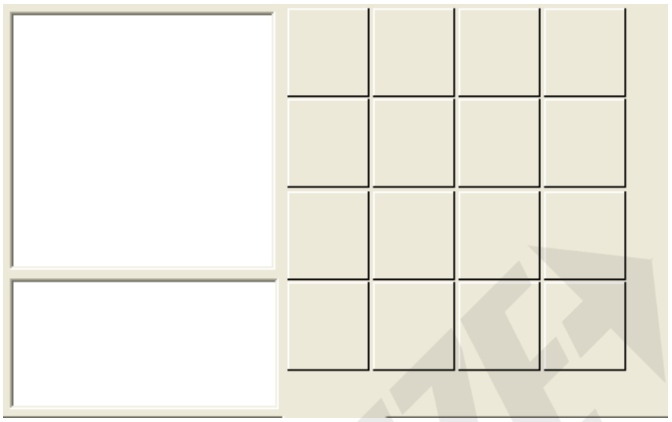
Step 1: First measurement and structural

Setp 2: Save for the macro file (. Mc)

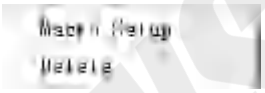
Click toolbar  , and click  button.then save *.mc file.

Step 3: Link to macro file

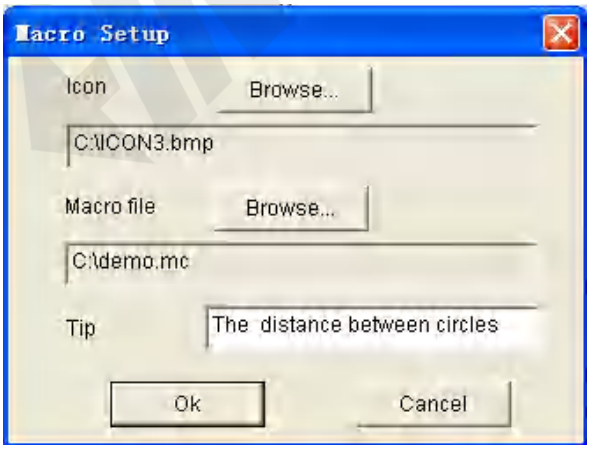
Macro measurements interface are as follows:



Right-click on the button will pop-up menu as follows:



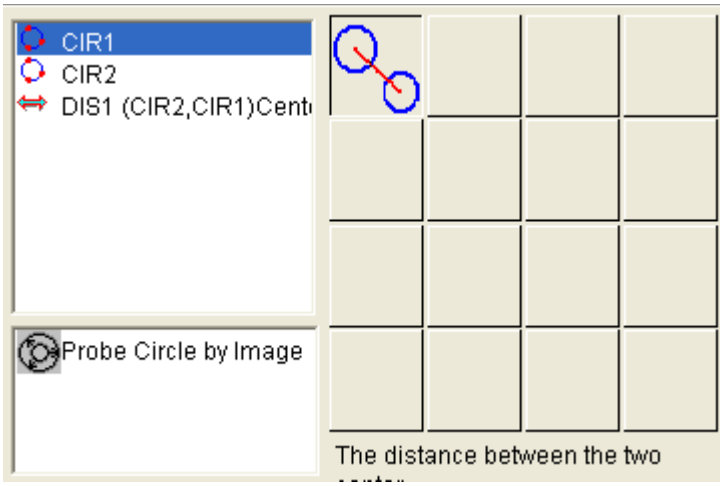
Select [macro setup...], the following pop-up dialog box



You can select the measurement macro icon and save the macro file (*. mc) file. And enter tip message.

Step 4: Run macro measurement

Click the button. For example:

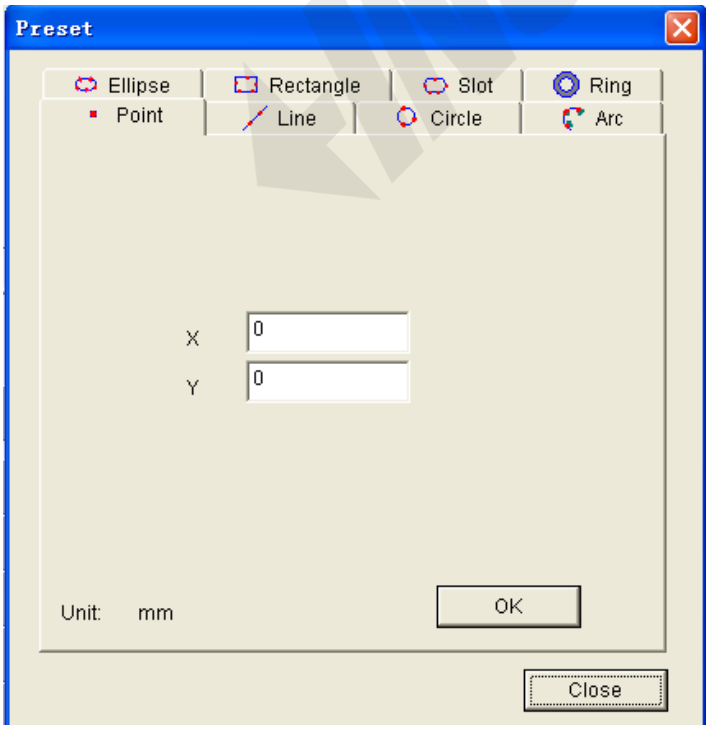


Notice: This feature is mainly used in the same measurement and construct, but not the law of the location of elements.

4.2.7 Preset

Preset data through the keyboard input, to be elements

Operation :< Measurement>-→Preset



Can be preset point, line, circle, arc, ellipse, rectangle, slot, and ring.

CHAPTER V ARRAY MEASUREMENTS

The software provides an array measurement. The so-called array of features, is more than the same work-piece with the work-piece placed in the units, the completion of all one-time measurement of the work-piece, called array measurement.

There are rectangular arrays and annular arrays. Rectangular array refers to the horizontal direction between the work-piece and the fixed distance between the vertical direction. Annular array means: circular distribution of the work-piece. That is, the difference between two adjacent parts of a fixed angle.

Array of measurement methods:

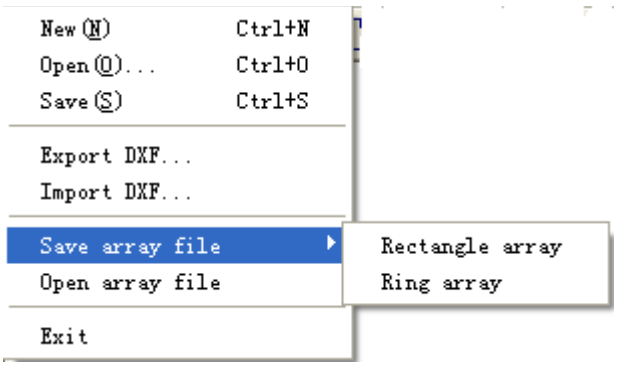
Step 1: Users put the part and fixtures in the work-piece.

Step 2: The beginning of measurement。First measurement feature on fixtures,and create coordinate,and save the coordinate.

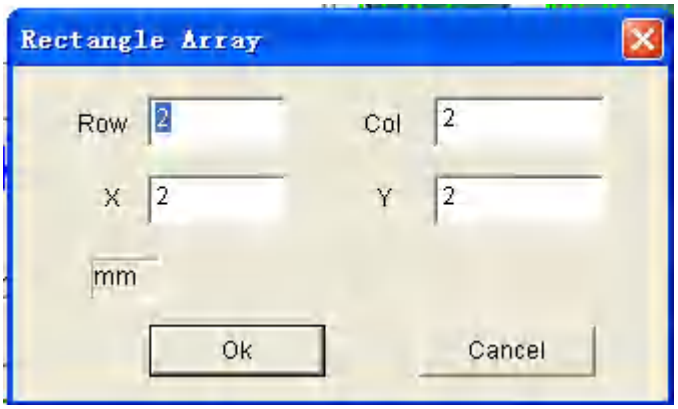
Step 3: The beginning of the work-piece measurement. Work-piece coordinate system can be created,it may not be created.

Step 4: Save array.

Click <file>menu--→<save array file>:

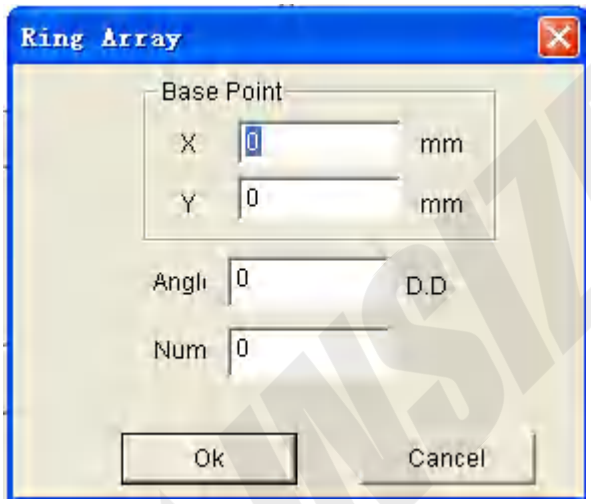


If you choose to save it as a rectangular array, then the following pop-up dialog box.



Enter the number of rows and columns, but also X, Y of the distance.and press “OK”.Enter file name, and save.

If you choose to save it as a circular array. The following dialog box will pop up.



Set up the center of the annular array and the angle and the number of work-piece,and press “OK”,enter file name,save.

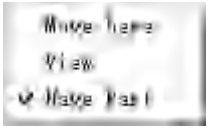
Step 5: Run

Array measurement operation procedures and operation of an ordinary user program is the same. Measured after the completion of a work-piece, in the following chart will automatically display the work-piece is "OK" or "NG".

The chart is a 5 * 5 Schematic diagram of the rectangular array

21	22	23	24	25
16	17	18	19	20
11	12	13	14	15
6	7	8	9	10
1	2	3	4	5

The right mouse button on the button will pop-up menu as follows.



[Move here]: When all measurements of the work-piece are finished, click the menu, the machine will be automatically moved to the location by clicking the work-piece.

[View]: When measured after the completion of the work-piece, the work-piece can view the measurement data specified. For example, if the work-piece tolerance, you can view the work-piece through the measurement data.

[Have part]: Can set the location of the existence of a work-piece, if the location does not work-piece, the measurement will be skipped

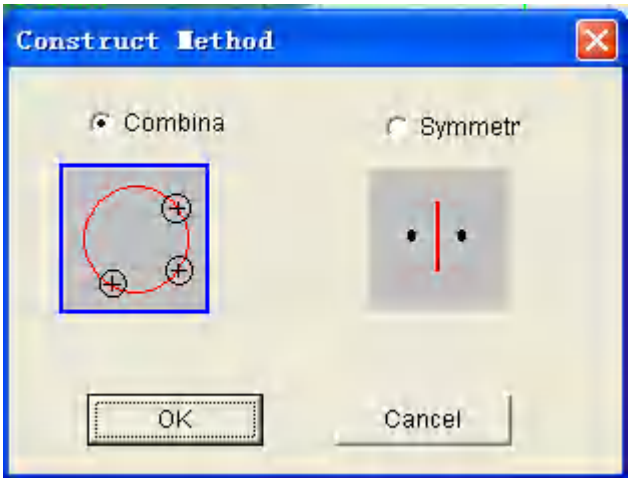
CHAPTER VI CONSTRUCTION

Powerful element of structure: Structural elements to provide Construction Law 10 ([Shift], [rotation], [extraction], [portfolio], [parallel], [vertical], [mirror], [symmetry], [intersection], [tangent]) geometric structure elements.

Operation：  Click the button, as follow:

Then, in the graphics window or image window, click the element with the mouse, select after, and then click the button to structural elements.

For example: two-point element of choice, and then constructed a line,please click 



Method of constructing the user to choose different methods of structure, which will be different results.

CHAPTER VII COORDINATE SYSTEM

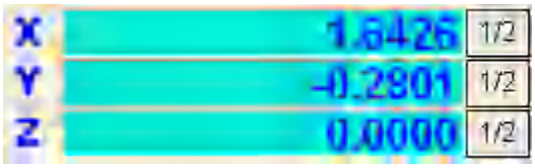
Coordinate type：ABS Coordinate, Inc Coordinate；

(1). ABS Coordinate

(2). Inc Coordinate

Work-piece coordinate system is based on the measured, through the coordinate transle and rotate, get a new coordinate system.

Coordinate toolbar =



7.1 Origin shift

(1). Function

"Origin shift": Coordinates of the origin is moved to a specified point。

(2). Operation

Selected elements of a point or points can be generated elements (circle, arc, ellipse,rectangle,slot,ring), and then select menu "→coordinate"→"Origin"

* select **"Auto"**: (or toobar button )

  Translational coordinates of the origin coincide with the point.

* Select **"X"**:

  Shift the origin X: Translational coordinates of the origin of the X value of point X with the same value

* Select"**Y"**:

  Shift the origin X: Translational coordinates of the origin of the Y value of point Y with the same value

7.2 Axis skew

(1). Function

"Axis skew" Axis of a coordinate system, rotation to coincide with a specified element.

(2). Operation

Selected line elements or other elements of the point, and then select the "coordinate"→ "Axis skew":

* Select**"Auto"**

Put shaft (Automatic): If the rotation axis and the X-axis angle less than 45 degrees, will be X-axis rotation to coincide with the axis, on the contrary, will be Y-axis rotation to coincide with the axis.

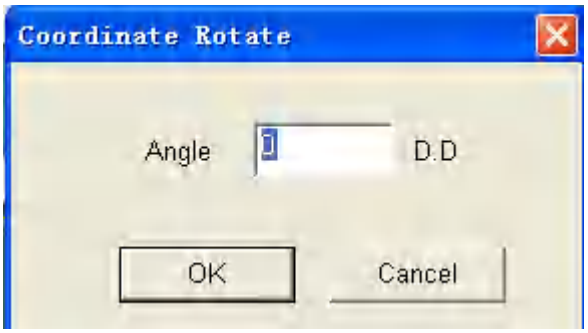
* Select "**X**"

Skew X: The X-axis rotation to coincide with the axis.

* Select "**Y**"

Skew Y: The Y-axis rotation to coincide with the axis.

7.3 Coordinate rotate



(1). Function

"Coordinate Rotate": that is anti-clockwise rotation angle.

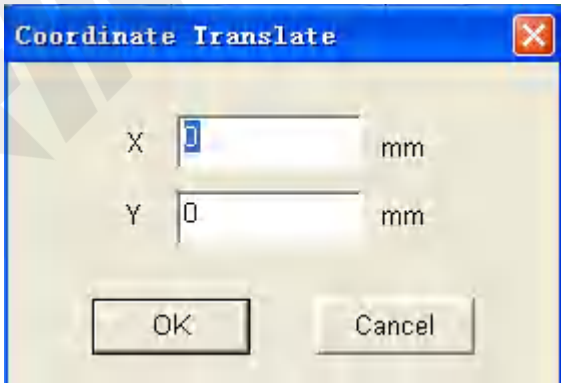
(2). Operation

Select“Coordinate →coordinate rotate”， and enter angle, and click “OK”button.

7.4 Coordinate Translation

Operation:

Select <Coordinate>--→Coordinate translation



Enter the X, Y values， and click “OK”button.

7.5 Save coordinate

(1). Funcition:

"Save coordinate": Must save the coordinate system, otherwise the coordinates is temporary, as a temporary coordinate system has not been recorded,so the user program is running, it was not established as a work-piece coordinate system.

(2). Operation:

Click  ,and save.

7.6 Recall coordinate

(1). Function：

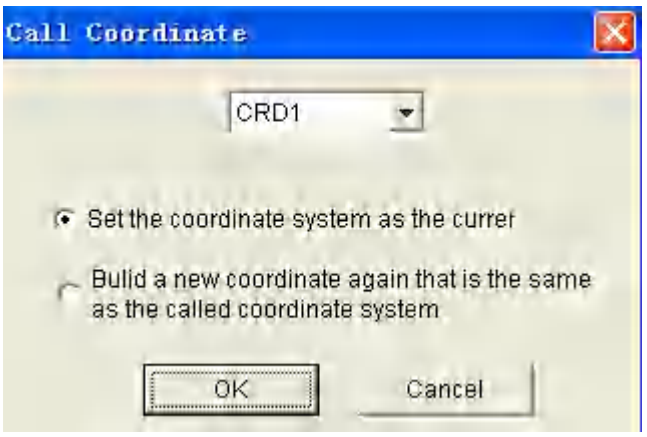
"Recall coordinate": call old coordinate.

(2). Operation：

Click  button，

If you choose the first one: the coordinate system as the current coordinate system, the measurement data will be displayed in the coordinate system

If you choose the second: to re-create a new coordinate system, the new coordinate system with the breath like the coordinate system.



7.7 Coordinate switch

(1). Function:

"Coordinate switch": "mechanical coordinate " and "work-piece coordinate" to switch between.

(2). Operation:

Select <coordinate>-→coordinate switch, or double-click the status bar of the sub-column coordinate system, you can switch to coordinate system.

7.8 Coordinate transition

(1). Funciton:

"Coordinate transition": "Cartesian coordinate" and "polar coordinates" conversion between.

(2). Operation:

Select <coordinate>--→coordinate transition-→descartes or polar.double-click the status bar

CHAPTER VIII DIMENSION

Dimesion toolbar:

Methods of operation: first click the mark button on the toolbar, and then in the video window or click on the drawing window to mark the elements, move the mouse, mouse, and then up, then mark the completion.

 Angle. Select two lines or an angle.

 Distance.Select any two elements or distance elements.

 X distance.Select any two elements(no two lines) or distance elements

 Y distance. Select any two elements(no two lines) or distance elements

 Radius .only circle or arc.

 Diameter.Only circle or arc.

 Arc length.Only arc.

CHAPTER IX GRAPHIC OPERATOR

Toolbars:

 Pan.click the button, hold down the left mouse button, move the mouse in the graphics window, the graphics that follow mouse.

 Zoom window.In the graphics window with the left mouse button out of a dashed border, and then release the left mouse button.

 Full screen.All graphics will be displayed in the graphics area

 Display name.display or no display feature name.

 Undo.

 Redo.

CHAPTER X USER PROGRAM

User program toolbar:

The software features are: the process of measuring the work-piece, that is, the process of recording user program. When measured after the end of a work-piece, the user program is automatically generated, you can re-run.

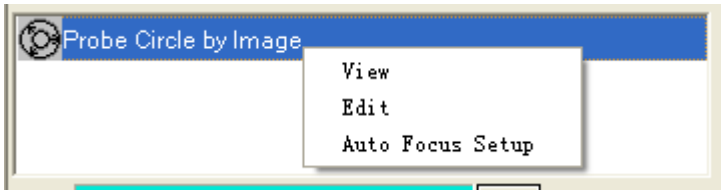
1.  Run program.
2.  Pause program.
3.  Continue
4.  Stop program.

Notice：Before running to ensure that the machine will not be misled into collision barrier, so as not to damage the machine.

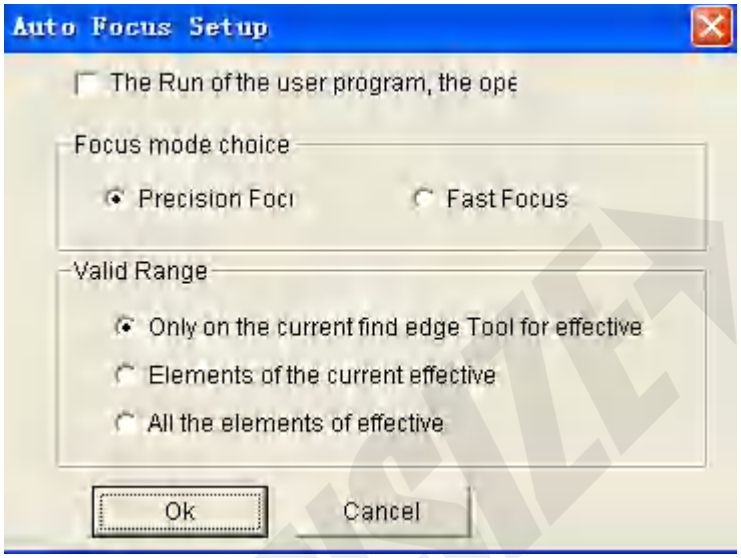
10.1 When users run the program, how to AF

Before running the user program, the user can set whether to auto-focus, single element can be set to auto-focus can also be set up all the elements of the AF. Running the user program, automatic focus, it would affect the measurement of efficiency, but the uneven thickness of the work-piece, can improve the measurement accuracy of repeatability.

Click the right mouse button in the following window; select <Auto focus settings>.



The following dialog box will pop up.



In this dialog, the user can choose whether or not the user running the program, to start focusing function, can also choose to focus mode and choose which elements of the AF.

10.2 When running the program, how to deal with abnormal

When running a user program, if there is an abnormality, such as the work-piece has been moved, or measure results error, the machine will stop and wait for users to deal with. Dialog box will pop up the following:

[Manual measurement]: the meaning of manual measurement is: the user manually to measure an element, not auto-complete measurement. Can change the light source, platforms can also be moveed.

[**Next step**]: If an element is divided into a few paragraphs to measure, when one after the failure of the section of measurement, you can measure the next step, and skip current step.

[**Accept**]: forced to accept the current measurement data.

[**Next elemen**t]: ignore elements of the current measurement, measure the next element.

[Next work-piece]: ignore work-piece of the current measurement, measure the next work-piece.

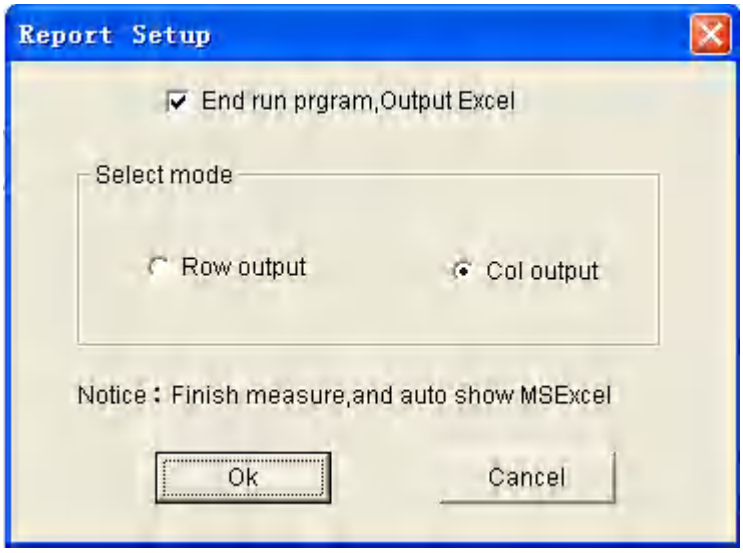
[**Stop**]: User program termination.

10.3 When running the program, how to report processing

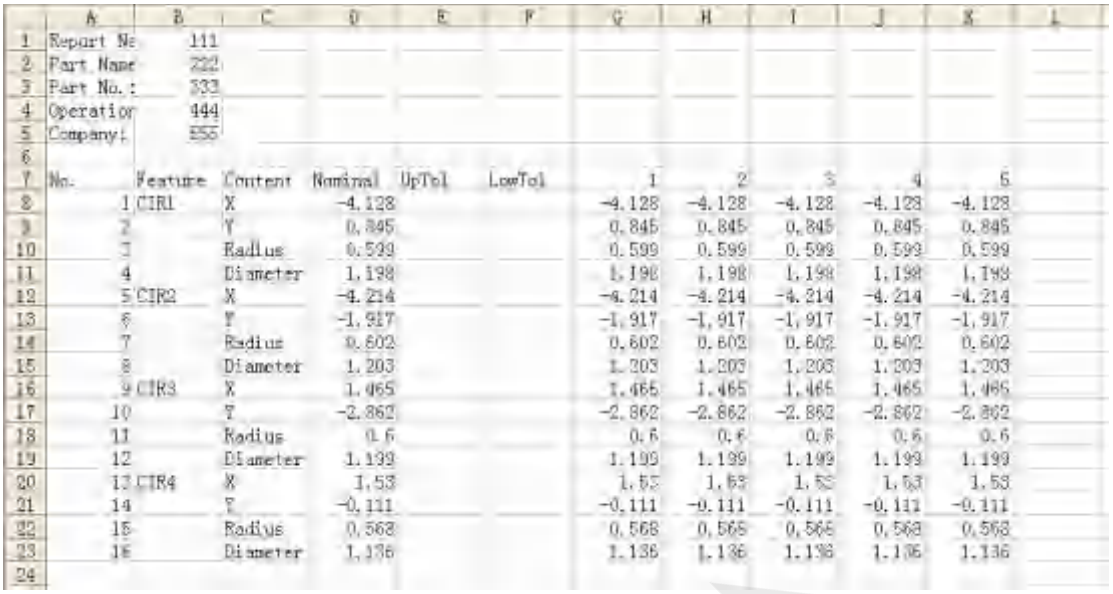
User program is running, when measured after a work-piece, the data can be automatically exported to Excel and SPC software, the whole process is done automatically, the user does not need any operation.

Of course, users can choose whether to export data to Excel and SPC.

EXCEL Report: **Operation** :< System setup>-→<user paramter>→<Program setup>-→<Auto output report setup>:



You can choose whether or not to import into Excel, and import it into Excel format.

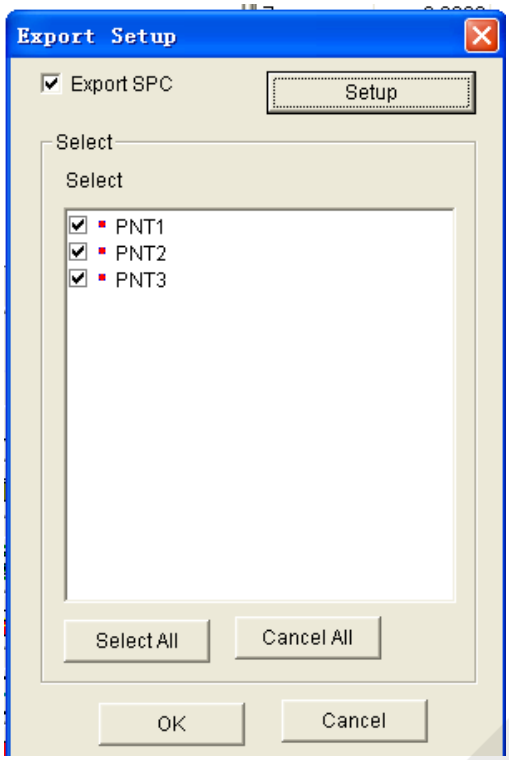


	A	B	C	D	E	F	G	H	I	J	K	L
1	Report Nu		111									
2	Part Name		222									
3	Part No.:		333									
4	Operator		444									
5	Company:		555									
6												
7	No.	Feature	Content	Nominal	UpTol	LowTol	1	2	3	4	5	
8	1	CIR1	X	-4.128			-4.128	-4.128	-4.128	-4.128	-4.128	
9	2		Y	0.845			0.845	0.845	0.845	0.845	0.845	
10	3		Radius	0.599			0.599	0.599	0.599	0.599	0.599	
11	4		Diameter	1.198			1.198	1.198	1.198	1.198	1.198	
12	5	CIR2	X	-4.214			-4.214	-4.214	-4.214	-4.214	-4.214	
13	6		Y	-1.917			-1.917	-1.917	-1.917	-1.917	-1.917	
14	7		Radius	0.602			0.602	0.602	0.602	0.602	0.602	
15	8		Diameter	1.203			1.203	1.203	1.203	1.203	1.203	
16	9	CIR3	X	1.465			1.465	1.465	1.465	1.465	1.465	
17	10		Y	-2.862			-2.862	-2.862	-2.862	-2.862	-2.862	
18	11		Radius	0.6			0.6	0.6	0.6	0.6	0.6	
19	12		Diameter	1.199			1.199	1.199	1.199	1.199	1.199	
20	13	CIR4	X	1.53			1.53	1.53	1.53	1.53	1.53	
21	14		Y	-0.111			-0.111	-0.111	-0.111	-0.111	-0.111	
22	15		Radius	0.568			0.568	0.568	0.568	0.568	0.568	
23	16		Diameter	1.136			1.136	1.136	1.136	1.136	1.136	
24												

10.4 Export to SPC software

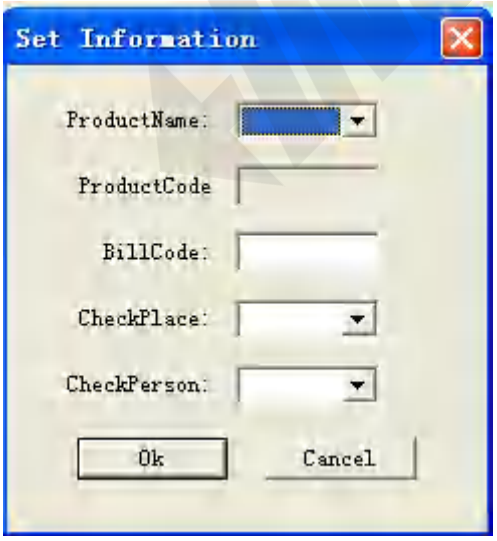
Export to SPC software: When measured after the end of a work-piece, you can set whether to export to the SPC software. In the export of data to SPC software before, but also set up some relevant information with the work-piece to complete the settings, to automatically export data to SPC software.

Operation :< Tools>-→<SPC >--→<SPC Setup>:



In this dialog box, you can set whether to export to the SPC software, if the check, then [**Setup**] button to brighten.

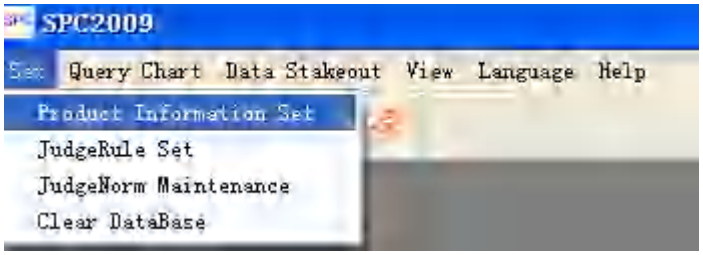
Click [**Setup**] button, the following dialog box will pop up to allow users to select information corresponding to the work-piece.



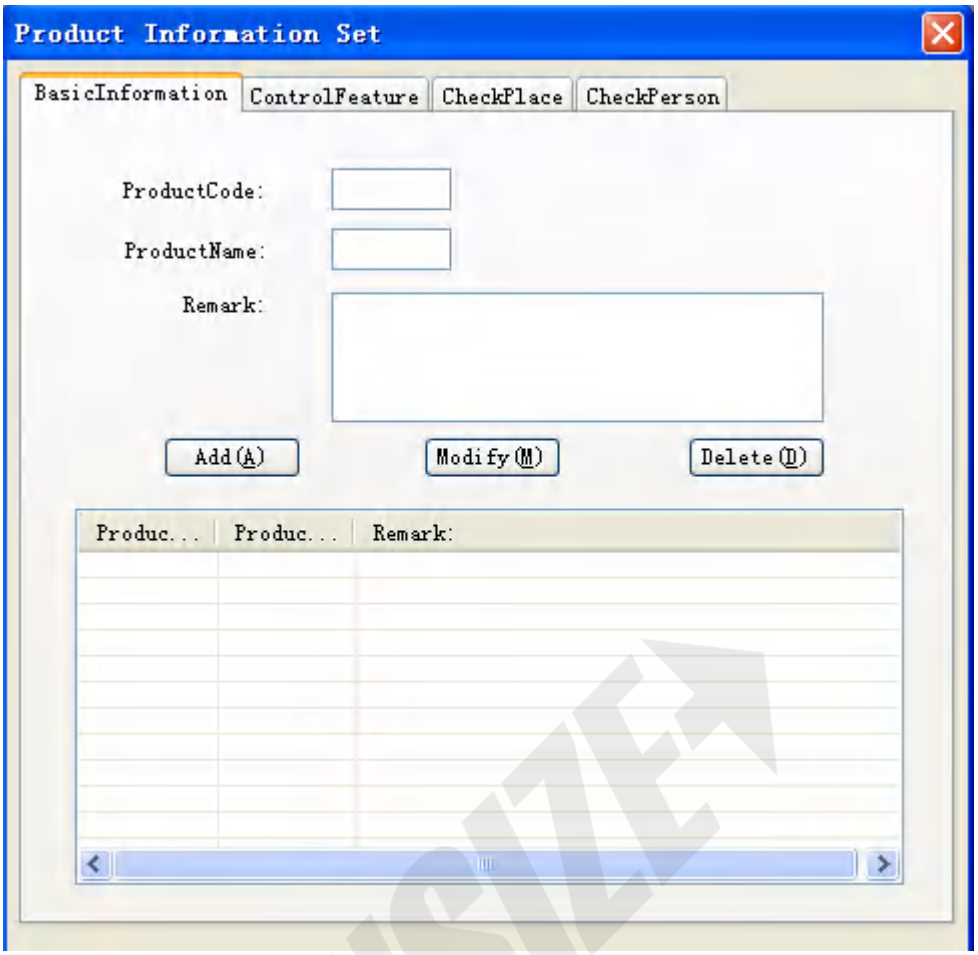
The user can choose the work-related information, selection, will be recorded in the user program, the next time you open the user program, no need to set up.

Then, as above, the information in the dialog box where settings do? Such as product name, product number, site inspection, inspection personnel, where it set up? This must be set in the SPC software.

Select<Tools>-→<SPC >-→Open SPC



Select <Product Information Set>, the dialog box will pop up as follows:



<BasicInformation>: Enter a product number and product name.

<ControlFeature>: Enter the relevant information.

<CheckPlace>， Enter the relevant information.

All the information stored in the database

Set up after the completion of product information, we can carry out the measurement software options.

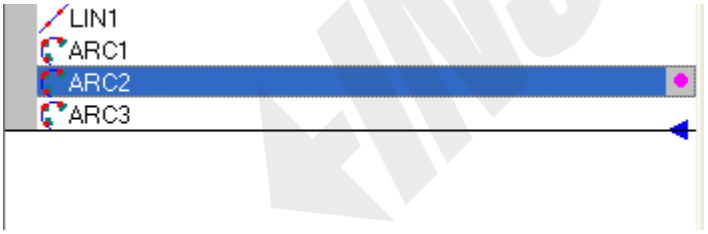
10.5 Run program, you can manually measured

Sometimes, an element difficult to accuracy measure through the automatic measurement, so that users need to manual measurement.

Operation: Select the element, and then the right mouse button pop-up menu in the pop-up menu, select

<<Breakpoint >>. That run to the elements, the machine will be suspended, waiting for user manual measurement of the elements. Of course, we can abolish the breakpoint.

After setting a breakpoint, the following chart will show that there is a breakpoint set.



CHAPTER XI EDIT USER PROGRAM

11.1 Edit element

The so-called editors, is to add, delete, insert measuring element, or translation, rotation in order to obtain a new element, or re-measurement of an element to change the ratio of their measurements, the light source and so on. Or hope that a certain element in the measurement, the machine was suspended, and by manually measuring the elements.

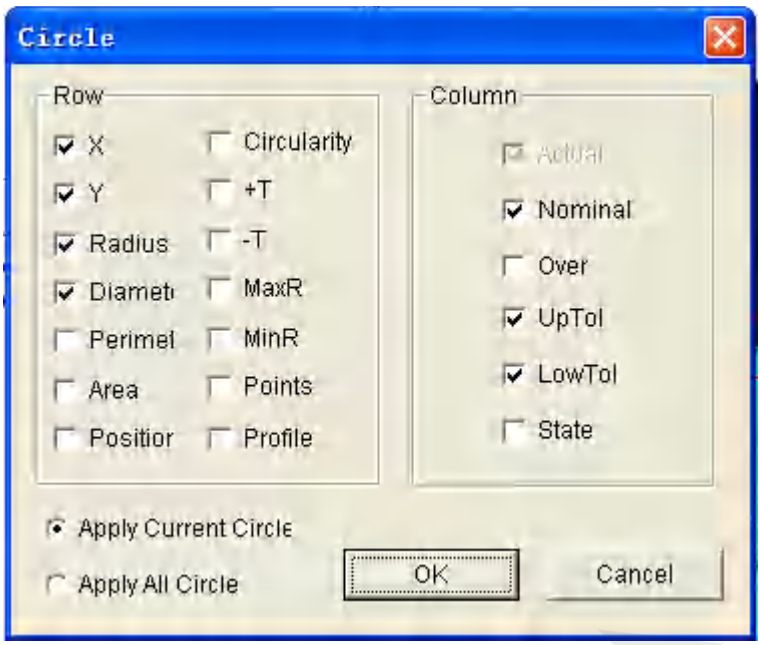
Click the right mouse button in the result window, or click the right mouse button in graphics window, which will be the following menu:

1. [Move here]: Click on the menu, the machine will be moved to the center of the selected element.

2. [Tolerance]:<Tolerance> introduced in the back.

3. [Display setup…]: Is used to set the selected elements, which displays the contents of which do not show content.

Elements in an circle as an example, the following dialog box will pop up.



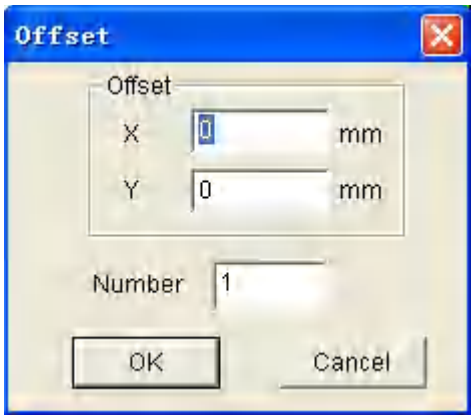
Selected are to be displayed. After setting, click OK button, and change the content of shows. The same element can show the same content; you can set up individual elements of the content of its shows.

4. [Remeasure]: Re-measurement of the selected element, including changes in measurement of light source, magnification measurements and other conditions. A major role in re-survey is that, when the measurement of an element is not satisfied with it can be re-measured. Re-measurement operation by the user to measure, rather than automatic measurement machine.

5. [Rename]: Modify feature name。

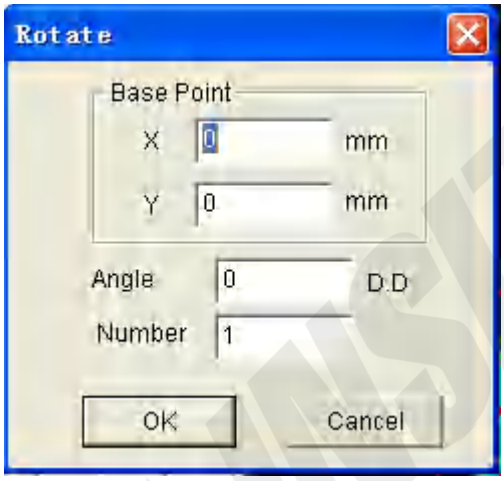
6. [Find]: Input element's name will automatically find the element, and the machine moved to that location. This element in the measurement of many cases, very useful.

7. [Translate]: Translation of the selected element,get a new elemen. Of a work-piece, there are many elements of the same, but different positions, and the location of changes in the law, this reactive power is very useful there.

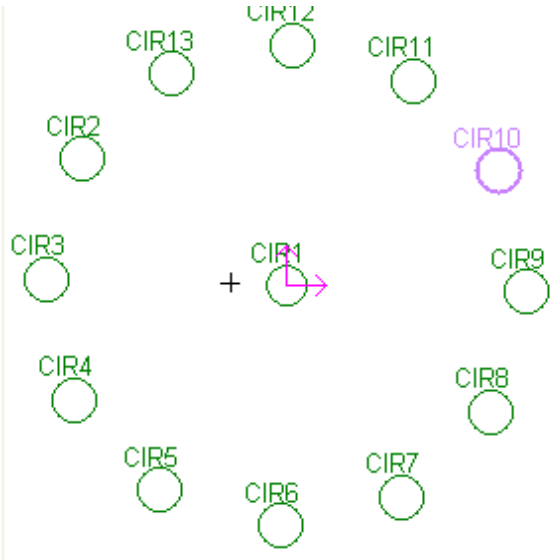


Enter the X, Y translation of the volume, and then enter the number of replication. And then click OK button to complete the translation.

8. [Rotate]: Rotating the selected element, and get a new element.



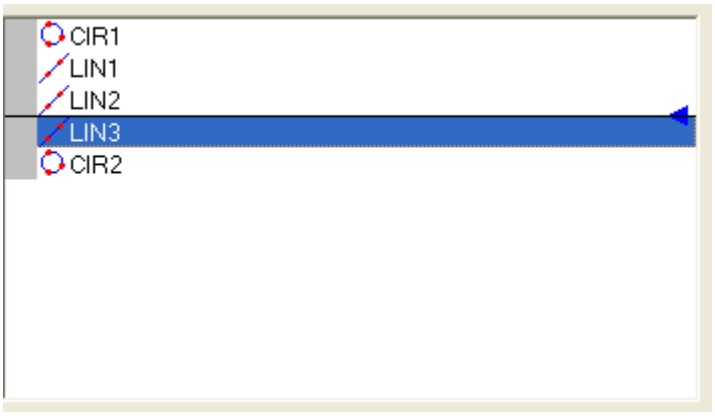
Enter the reference point, and then enter the rotation angle of input copy number, click OK. For example, under the map:



9. [Select all]: Select all features.

10. [Delete]: Delete select feature.

11. [Insert]: The elements inserted before the selected element.



The chart above, the figure is inserted before the element LIN3. Now, if after an element of measurement, will increase before LIN3.

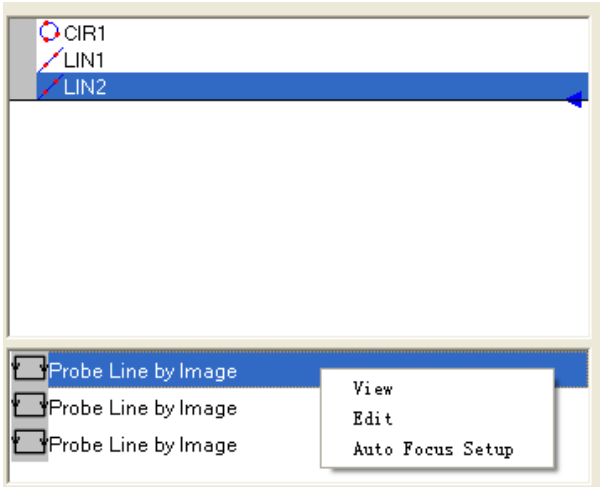
12. [Cancel Insert]: Cancel insert, the new measurements will be added to the final element.

13. [Breakpoint]: When running to the elements, the machine will stop. Wait for the user manual measurement of the elements.

14. [Cancel breakpoint]: Unset breakpoints.

11.2 Editor Probe tool

The software can edit a single element; the software can also be used for measuring the elements of sampling tools for editing.



[View]: Click on the menu, the machine will be moved to the probing tool, and it shows that the point of probing.

[Edit]: Sampling tool can be modified, including the light source, magnification, and the location and size, double-click the mouse to complete modifications.

[Auto Focus Setup]: AF settings, in Chapter IX, introduced in the user program. Introduced here are no longer.

CHAPTER XII TOLERANCE

There are three types of tolerance: size tolerances, position tolerances, Form tolerance.

Size tolerances：

Changes in the volume of the size allowed. Size limit of tolerance zone is the largest and the smallest size range between the limits of size, that is, (the name of the tolerance value of +) and (in nominal terms - under the tolerance) between the range (upper and lower tolerance in the software are positive). Measured values fall in the size tolerance zone, the size of qualified; measured values fall outside the tolerance zone size, measured the size of failure. Another argument, the more margin = measured value - nominal value, if the ultra-margin between the upper and lower tolerances, the size of qualified (not worse); otherwise the size of standard (ultra poor).

Position tolerances:

Refers to the geometric elements associated location of the base elements of the changes to allow the entire volume. Tolerance, including the location of two-dimensional orientation tolerance, positioning tolerances. Software to provide a temporary parallel, the vertical angle of inclination, concentricity, symmetry.

Orientation tolerance:

He refers to elements related to the direction of the base to allow changes in total. Including parallelism, perpendicularity and inclination.

Positioning Tolerance:

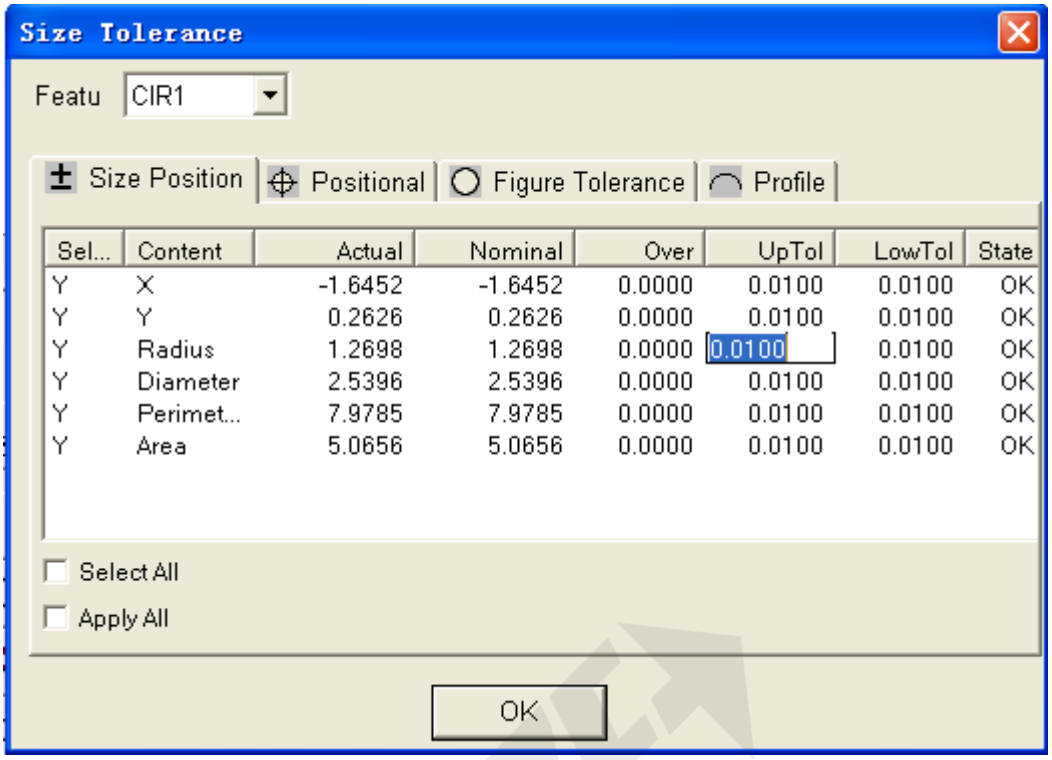
Refers to the geometric elements associated to the base in place to allow changes in the whole volume. Including the location, the concentricity and symmetry.

Form tolerance:

Include straightness, circularity.

12.1 Size tolerances

Methods of operation: select an element in the display element window or graphics window, click the right mouse button, select "Tolerance - Tolerance" in the pop-up menu or double-click the selected elements in display elements window.



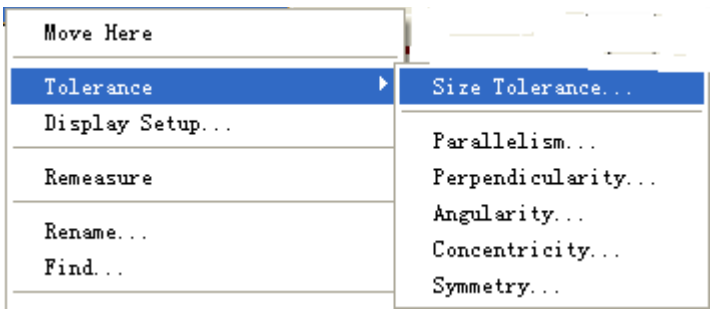
"**Select**":Double-click the status bar to change the properties, if "Y", the expressed support for upper and lower tolerances, if "N", does not support, as indicated in Fig. Click "select all", the contents of all of the elements have to use upper and lower tolerances.

The default value is 0.01mm, but users can "System setup "-->" User paramter"-->"default tolerance",and set the default value.

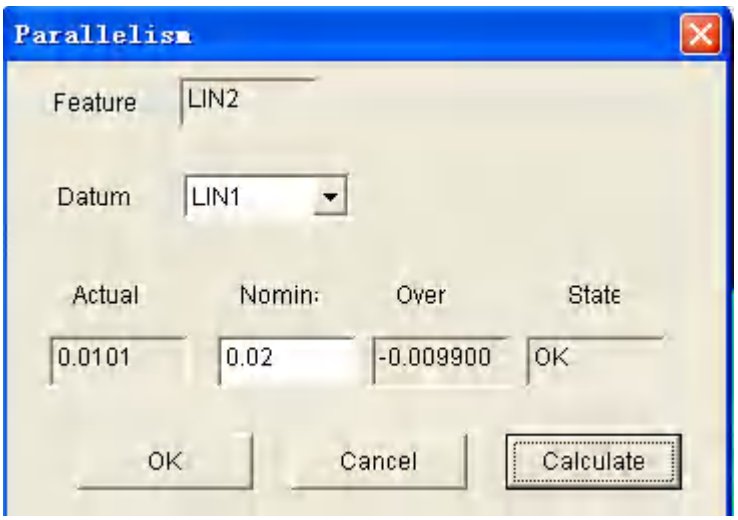
12.2 position tolerance

The software provides a parallelism, perpendicularity, angularity, concentricity, symmetry.

Position Tolerances menu:

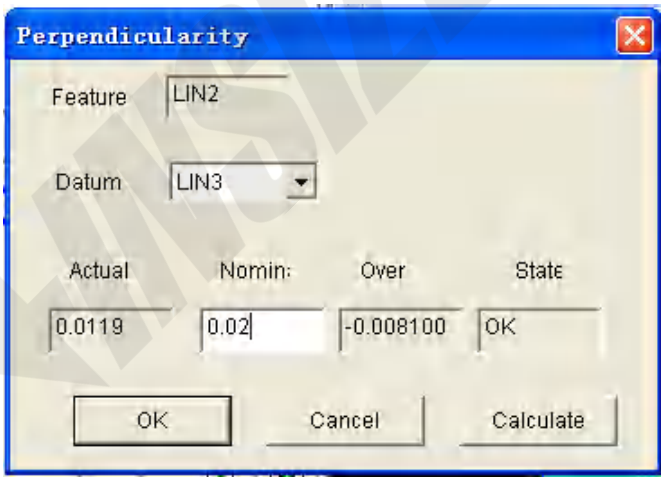


Parallelism:

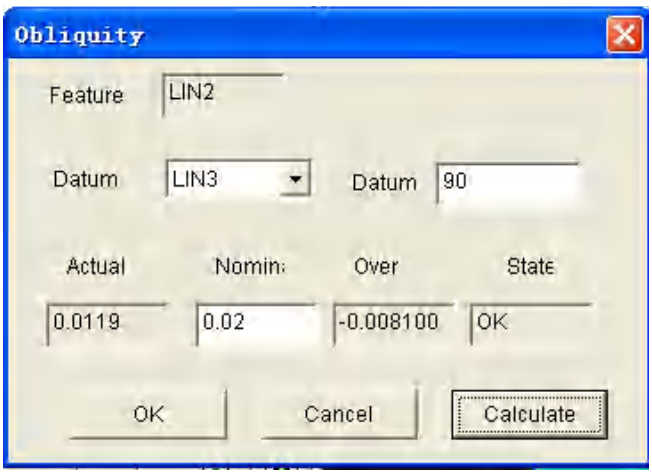


Choose a baseline line, enter nominal, and then click the calculation button, the margin will be calculated super, and display status.click “OK” button, and accept this Parallelism.

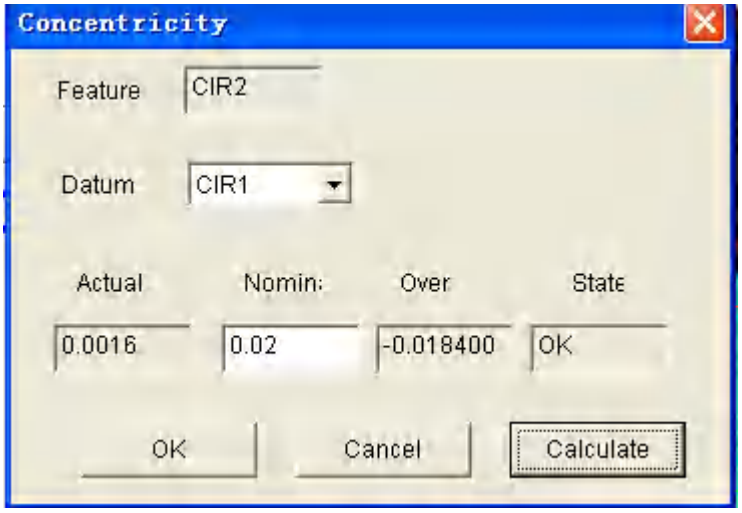
Perpendicularity:



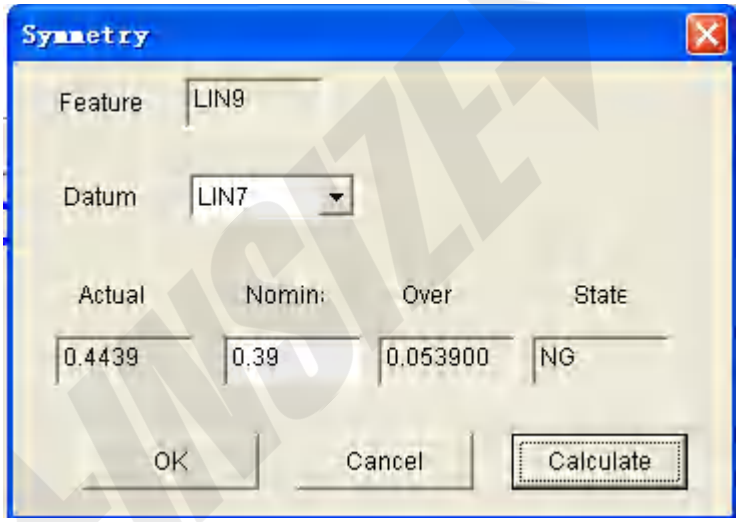
Angularity:



Concentricity:



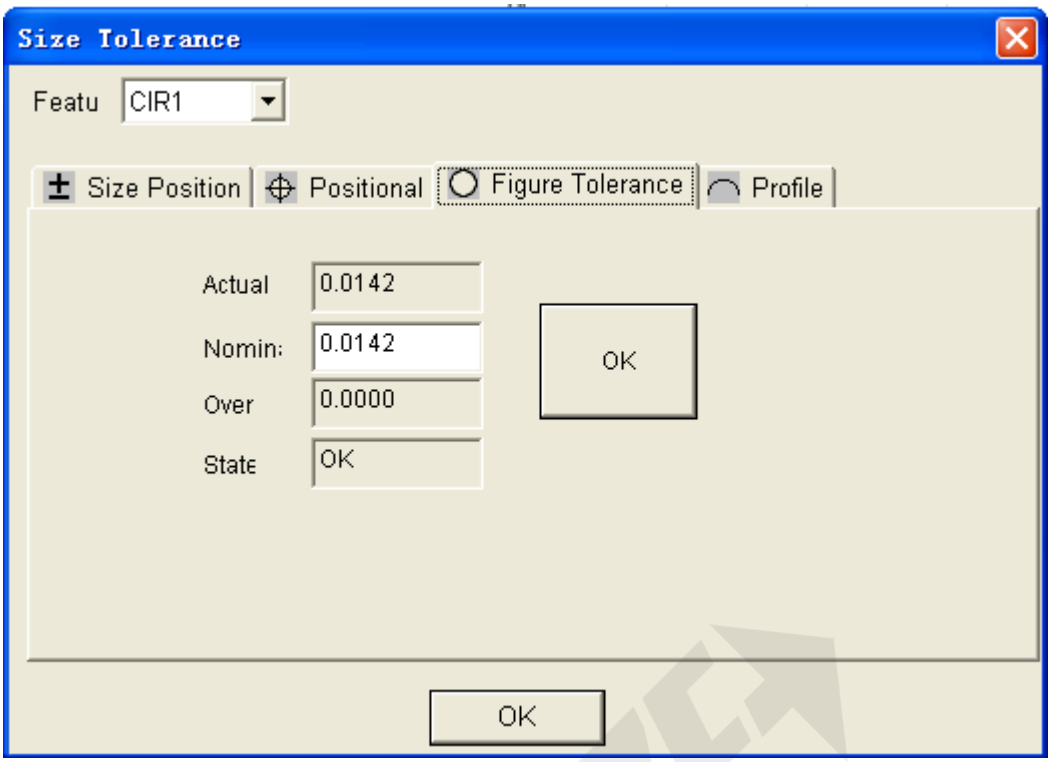
Symmetry:



12.3 Form tolerance

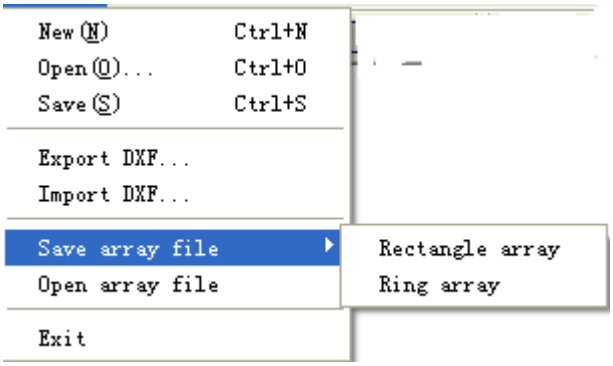
Measurement line, circle, arc, when the three elements of the measurement points, when more than 2,3,3, will have the form tolerance. That is straightness, circularity.

Form tolerance of the page are as follows:



Enter nominal, and click the calculation button.

CHAPTER XIII FILE



13.1 Save,Open user program

New: Create a new user program.

Open: Open an old user program.

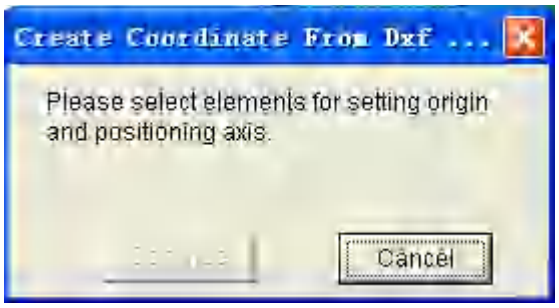
Save: Save user program，There are three save format:QV,bmp,mc.QV for the user program file, bmp as bitmap. Mc for the macro measurement file.

13.2 DXF file export and import

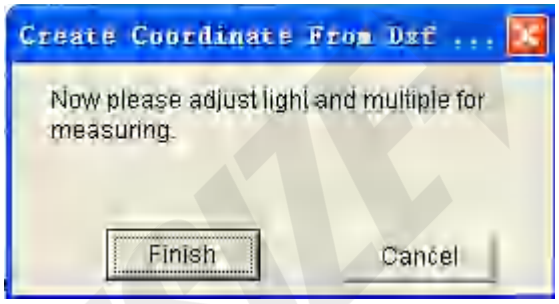
Export DXF file: save DXF file.

Import DXF files: Open DXF files.

When open the DXF file, DXF file displayed in the graphics window and display the following dialog box.



The dialog box prompts the user to set up the work-piece coordinate system, first select an element, and then click  button to set origin, and then choose one element, then click  button. Then and click <<continue>> button. The following dialog box will pop up.



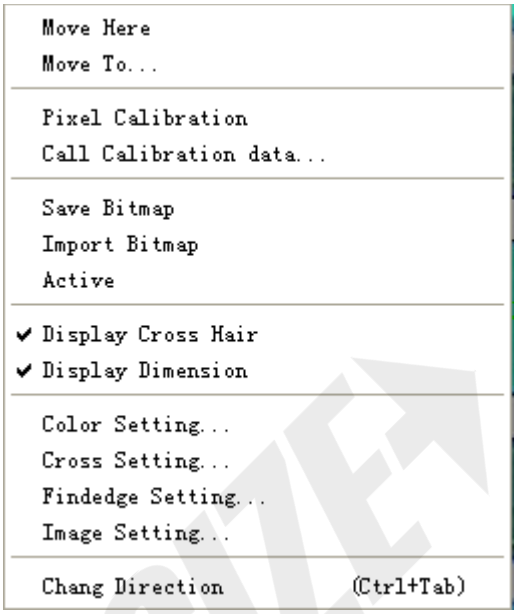
The above dialog box prompts the user to adjust magnification and good light source, mainly used in CNC machines.

13.3 Save,Open Array file

Please refer to Chapter V array measurements

CHAPTER XIV IMAGE PROCESSING

Right-click in the image window will pop-up menu as follows:



1. [Pixel Calibration]: In <Measurement> Chapter Introduction

2. [Call Calibration data]: In Chapter IV Introduction

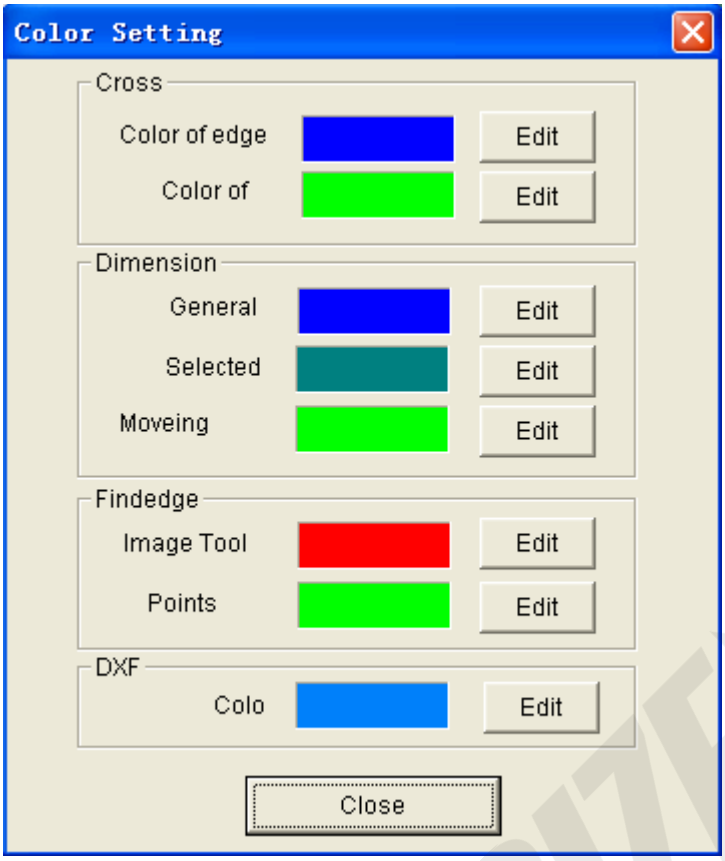
3. [Save bitmap]: Click <<Save bitmap>>, enter file name, and save bitmap.

4. [Import bitmap]: Open an existing bitmap file.When open bitmap file, if in order to restore, click < activate > menu.

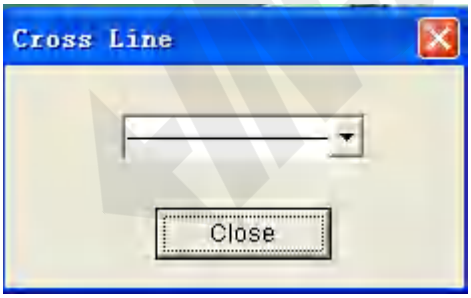
5. [Display cross hair]: Can show or not show the cross-line

6. [Display dimension]: Can show or not show dimension.

7.[Color setting]: Select the menu will pop up the following dialog.

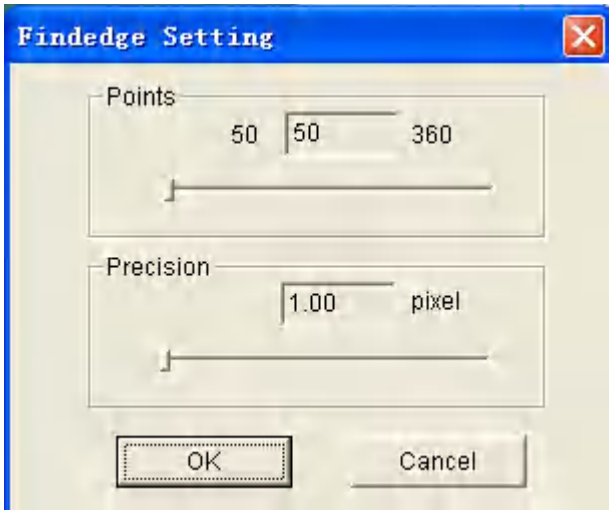


8.[Cross setting]:



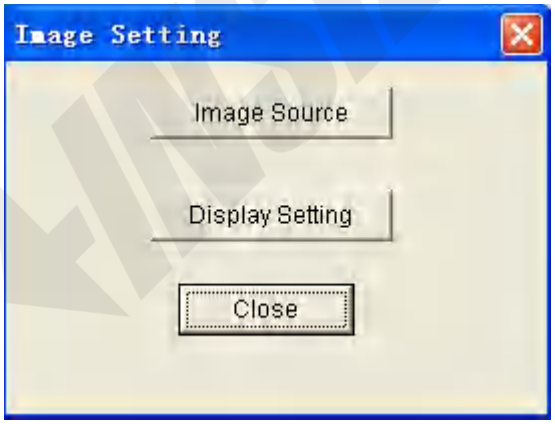
Cross-line style can be set

9.[Findedge setting]:



Find edge points can be set up, and look for edge accuracy. When the work-piece when the burr more, please look for edge-based high precision.

10.[Image setting]:

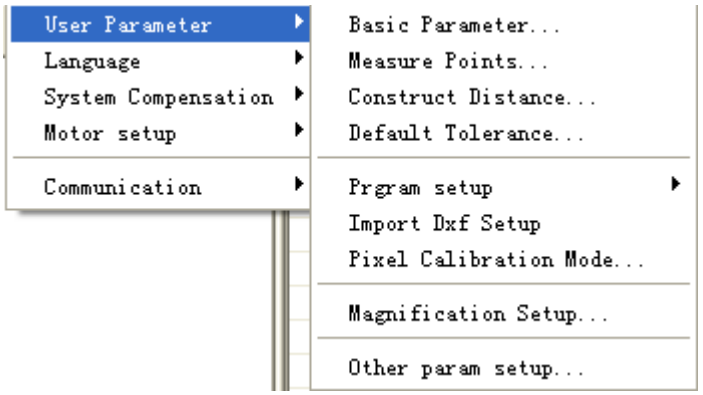


To set the image source and display settings, display settings contained in the contrast and brightness settings.

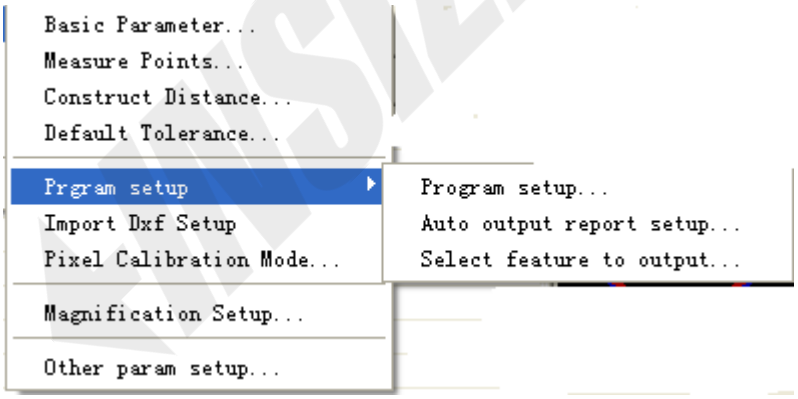
11. [Chang direction]: Ctrl + Tab can change the direction of find edge.

Click delete button to delete the selected element.

Chapter XV System setup

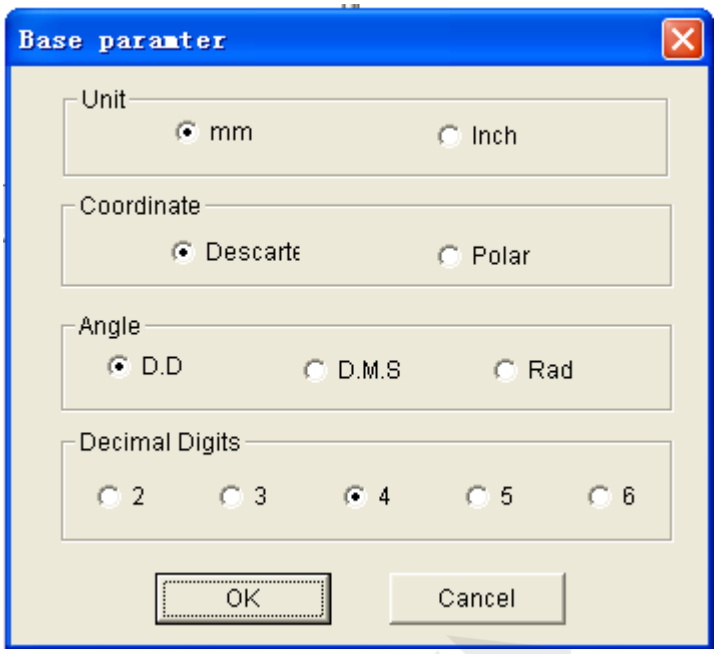


15.1 User parameter



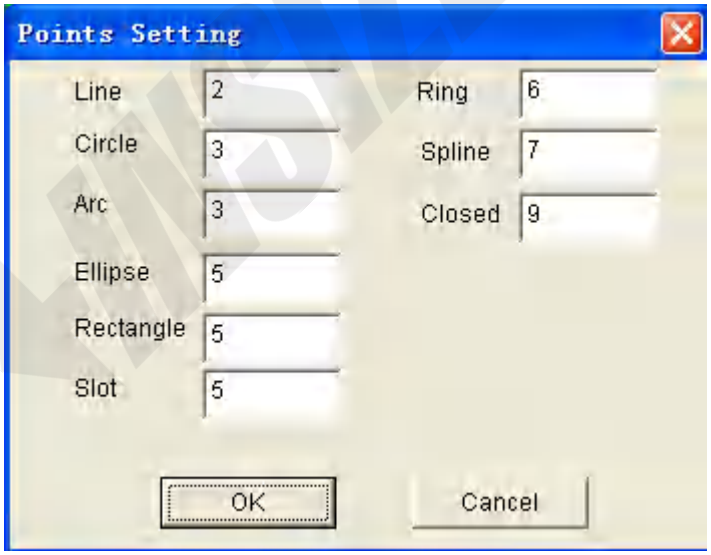
(1) Basic parameter

1. Coordinate display(Descartes/Polar)
2. The length unit(mm/ inch)
3. Angle units(D.D/Rad/D.M.S)
4. Decimal digits(3/4/5/6)



(2) Measurement Points

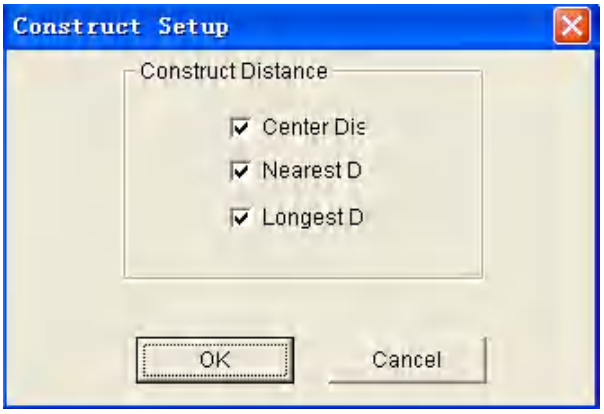
Probe point of measuring element, the measurement points required.



There are the smallest limit points.

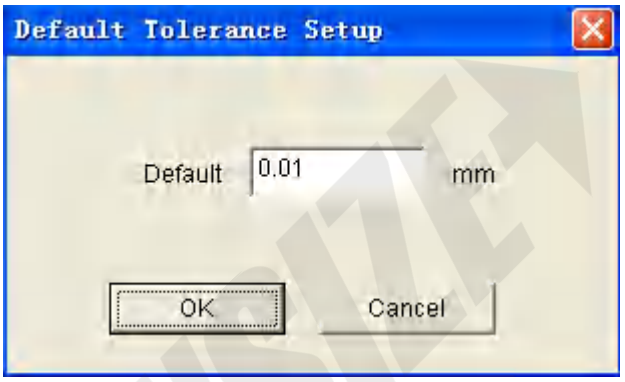
point	line	circle	arc	ellipse	rectangle	slot	ring	spline	Closed spline
1	2	3	3	5	5	5	6	3	3

(3) Set constructs distance



Can set the number of one-time structural distance.

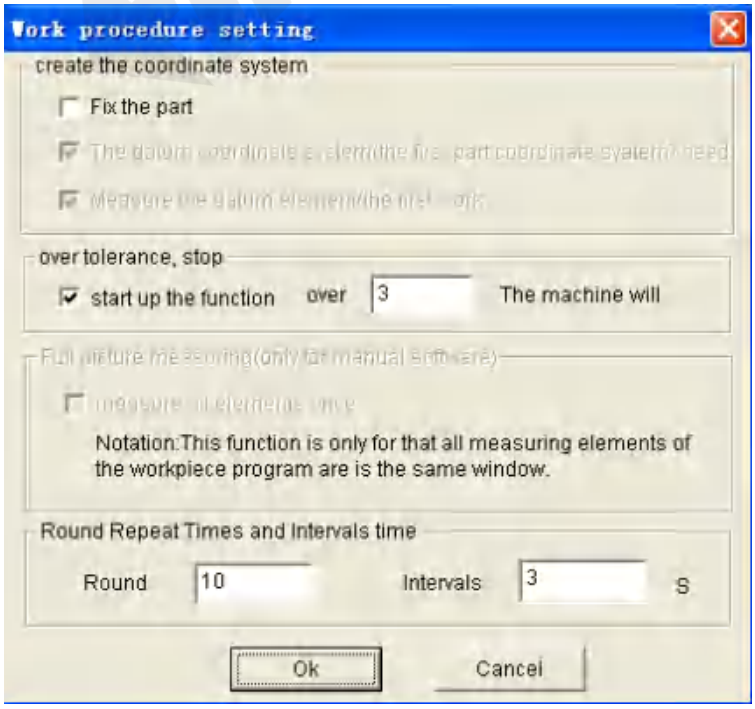
(4) Default Tolerance



Set under tolerance and up tolerance of the default values.

(5) Program setup

[Program]: Click on the menu, the following dialog box will pop up.



1 Create Coordinate

User program is running, there were two situations: one is the work-piece on the table is always a fixed location (if any rule fixture). Another is to place the work-piece at random. In the above dialog box, if checked, fixed work-piece, it is the first case, otherwise, it is the second case.

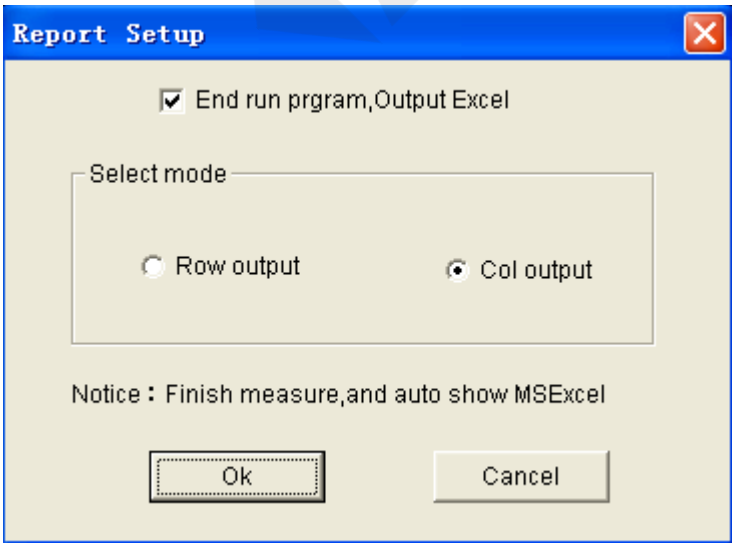
The first case: fixed work-piece. If the user would like to manually set up each time the work-piece coordinate system, then seduce the second. (If you do not check this, the automatic measurement software elements of the establishment of coordinate system and the establishment of the work-piece coordinate system, find the location of edge tools are fixed, the user can not be changed) if the user would like to establish a baseline measurement of each Block S Department of elements, the third check (If you do not check this, it will not be measured to establish the element coordinate system, the direct use of previously established coordinate system)

2 Ultra-poor, and to suspend the machine

3 full-screen measurement.(only manual software)

User program is running, the video window after the first measurement of all the elements, not man-made mining point. A prerequisite for this function is: Do you work on the measurement of elements that can display a screen of all. Otherwise, would not apply.

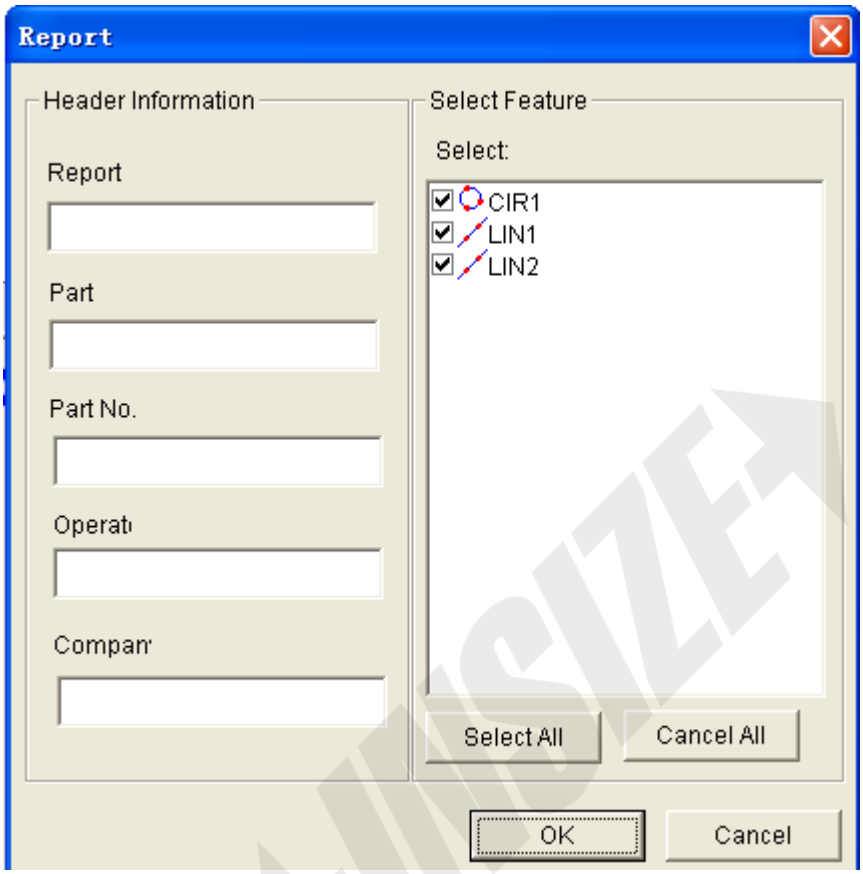
[Auto output report setup]



Set whether to export the data to Excel, and horizontal or vertical.

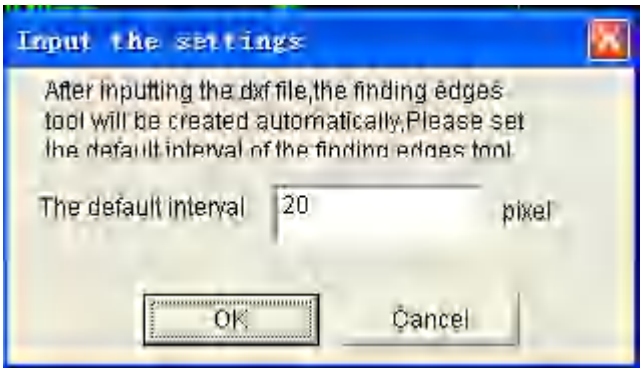
[Select feature to report…]

Select the menu, the following dialog box will pop up, the user can choose which elements in the Export to Excel.

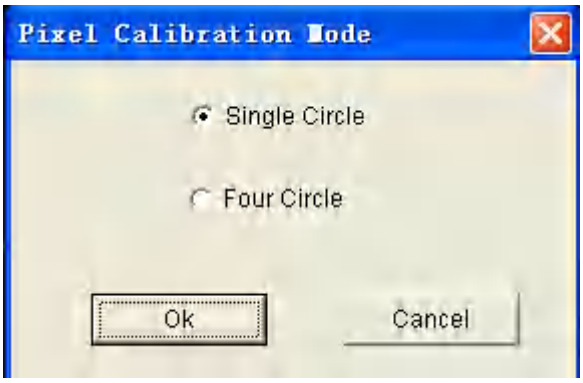


(6) Import dxf setup

After inputting the dxf file, the finding edges tool will be created automatically,Please set the default interval of the finding edges tool.



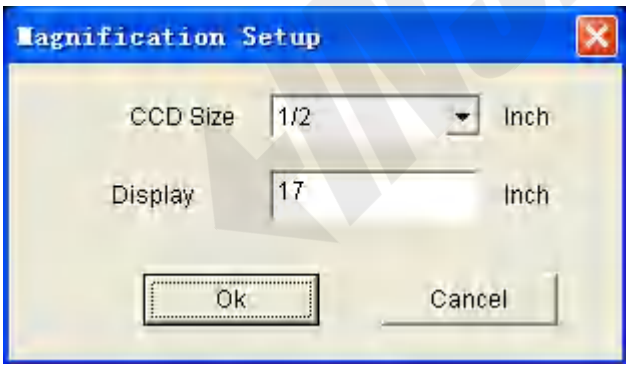
(7) Pixel Calibration mode



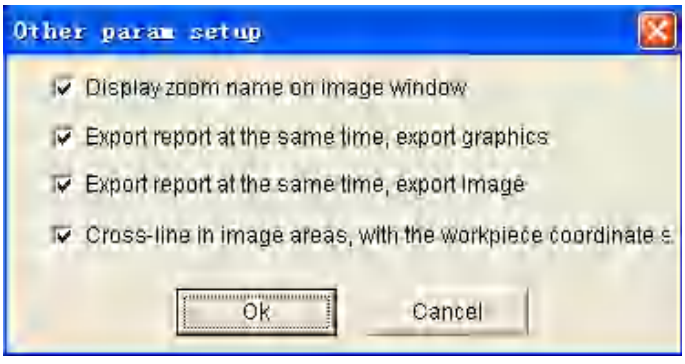
Software provides a single circle and four-circle calibration correction function, if the installation of a grating scale, by four-circle calibration accuracy is much higher than single-round correction.

(8) Magnification setup

This feature is the calculation of the screen magnification. Pixel calibration is completed, will automatically calculate the screen magnification. Screen magnification calculation requires two parameters; the parameters can be set up. Settings dialog box as follows:



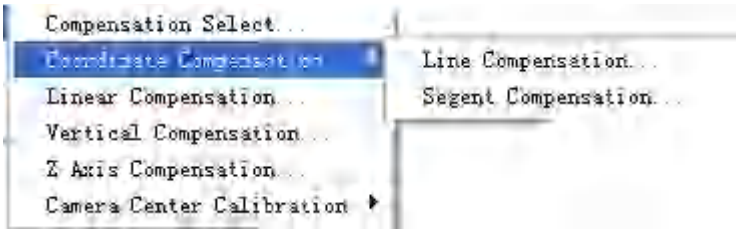
(9) Other param setup



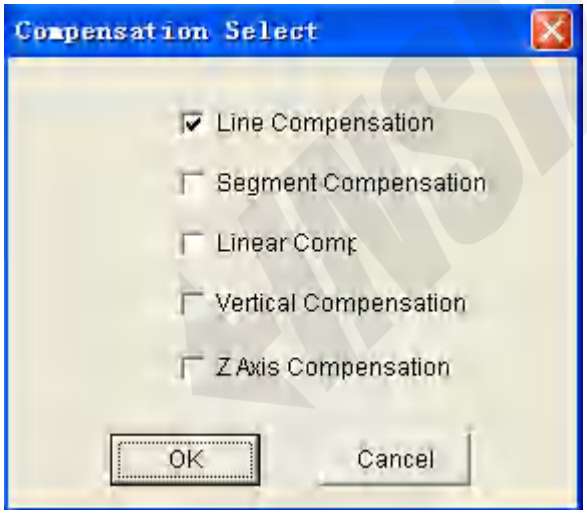
15.2 Language

After choosing the language, it is necessary to restart the software, to take effect.

15.3 System compensation



Compensation options to enable certain compensation effective, some compensation is invalid Compensation of the dialog box options are as follows:

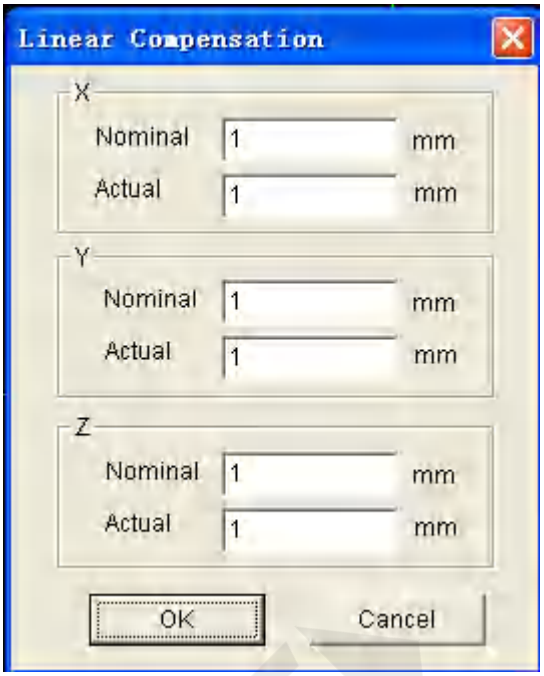


Check the items can be compensated.

1. Coordinate compensation:

1) Line compensation

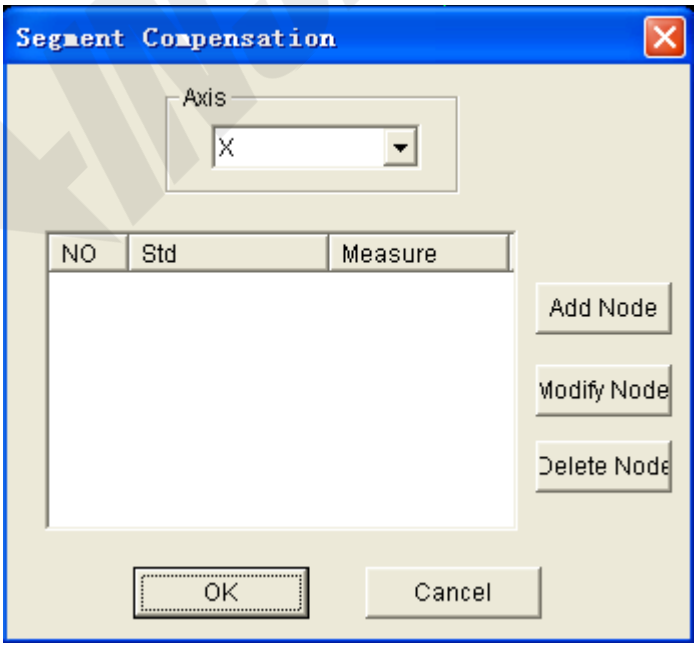
Operation: Select<System setup>→System compensation-→Coodinate compensation→Line compensation", dialog box below:



Enter X, Y, Z axis nominal and actual value, Click OK to save.

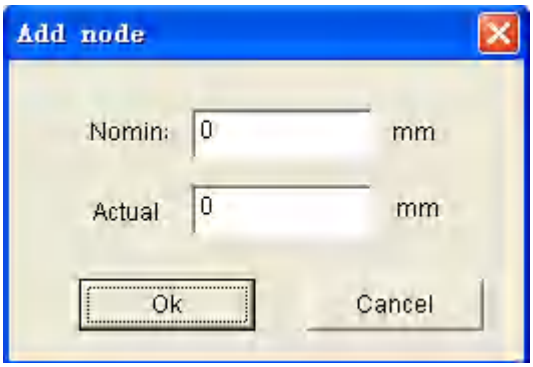
2) Segment compensation

Operation: Select“System setup-→System compensation-Coordinate compensation-Segment compensation”.



（1） Add node

Click [add node] button



（2） Modify node

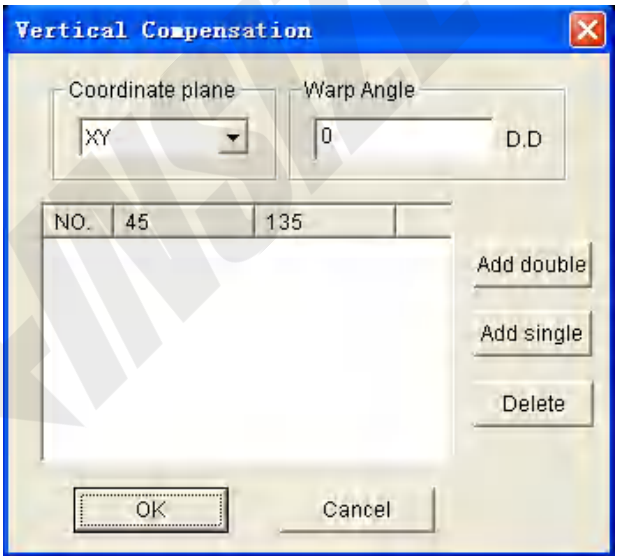
Modify nominal value and actual value.

（3） Delete node

Delete a selected node.

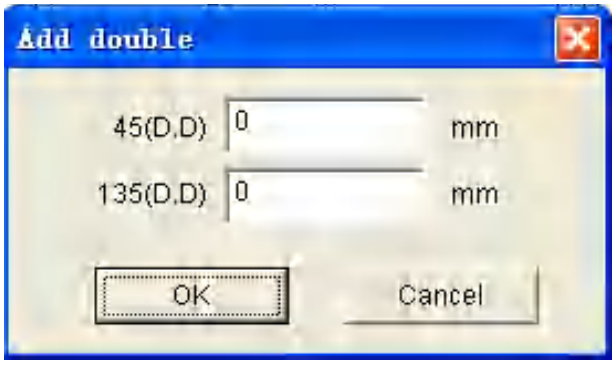
2. Vertical compensation

Operation: Select“System setup-System compensation-Vertical compensation”



（1） Add double

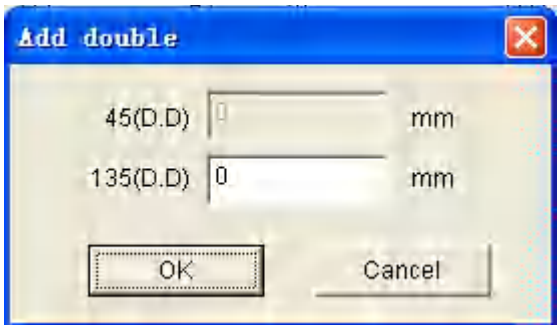
Click [add double] button.



Enter 45 degrees and 135 degrees, the measurement of gauge block length.

（2） Add single

Click [Add single]，Enter the 135 degrees of the measured value.

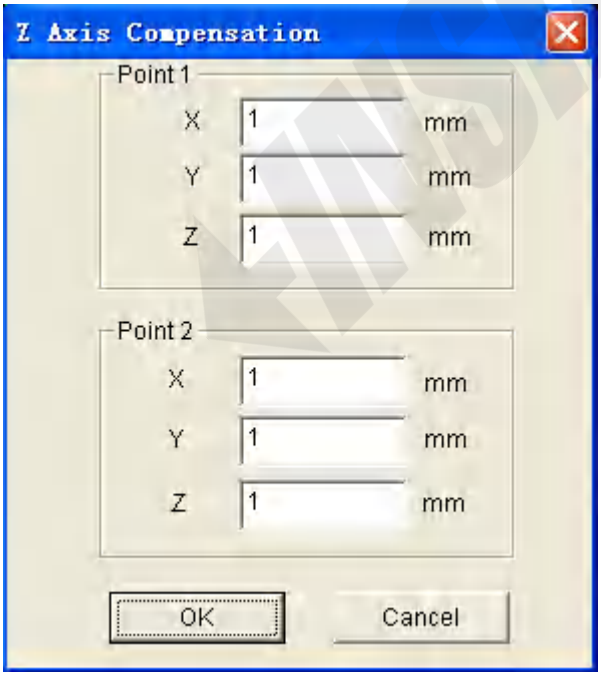


（3） Delete

Delete the last data in Verticality compensation table;

1. Z Axis compensation

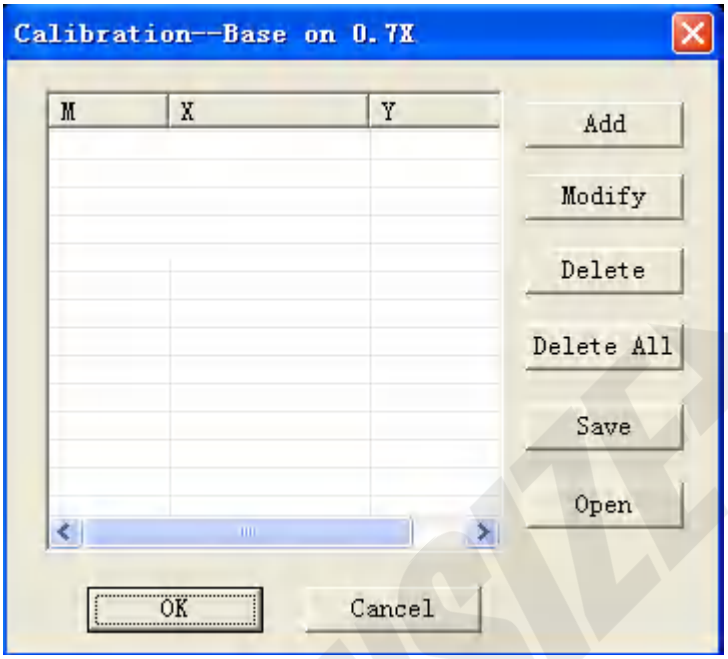
Z Axis up and down movement as a result, the error will cause a straight line, it will take X, Y of the measurement error. Z-axis compensation is to compensate for straightness error.



Enter the high point and low point in the Z-axis.

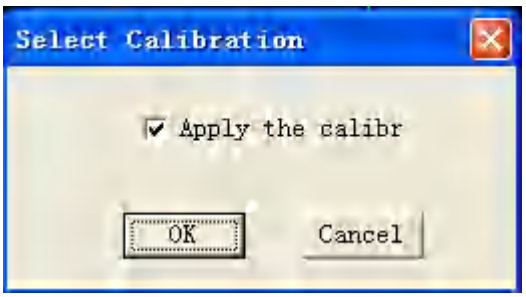
2. Camera center Calibration

In different ratio, the measurement of the same work-piece, the center will offset the inevitable errors in different magnification lens. Center software provides a compensation function, a very good solution to this problem.



In different ratio, the measurement with a circle, and then the center of a circle under a different magnification value into the dialog box.

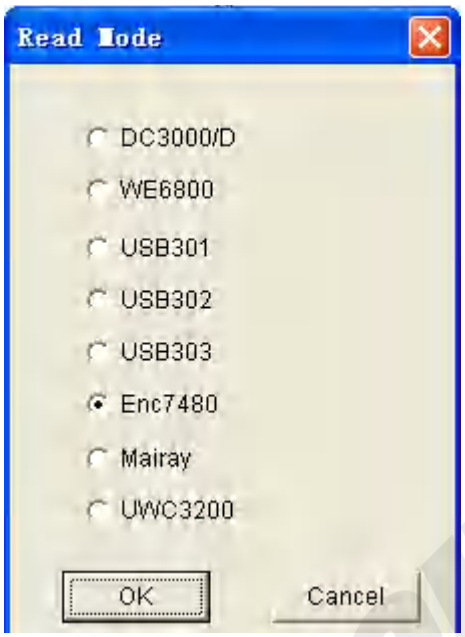
Start camera center Calibration.



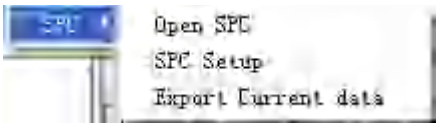
15.4 Communication

This feature is mainly used in the software manually. To choose a different counter.

Select <system setup>--<communication>--mode.



CHAPTER XVI SPC



SPC Statistical Analysis

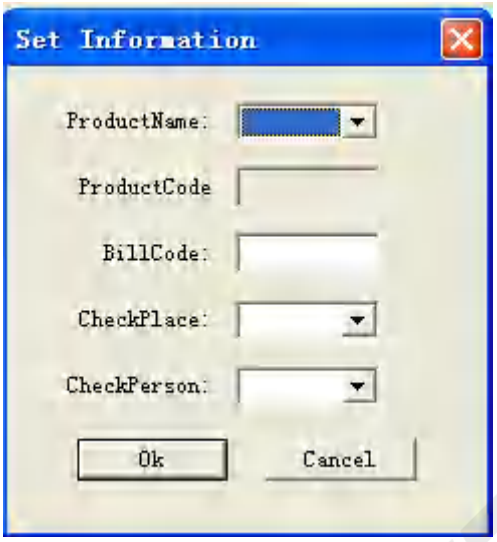
1) SPC（Statistical Process Control:is to raise the standard of an effective quality management methods. It uses the principle of mathematical statistics, by detecting the data collection and analysis; you can achieve "prevention" effect, which effectively control the production process, the continuous improvement of quality.
2) SPC Provide process control charts and analysis charts,
3) SPC Provide Xbar_R chart, Xbar_S chart, Mid_R chart, X-Rs chart, Histogram, SigmaA and SigmaS chart, Cpk process chart, Process state analyse chart.

Operation:

<Tools>-→<SPC >--→<SPC Setup>::

In this dialog box, you can set whether to export to the SPC software, if the check, then [SETUP] button to brighten.

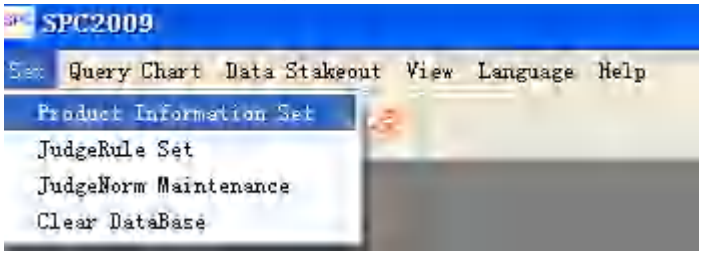
Click [Setup] button, the following dialog box will pop up to allow users to select information corresponding to the work-piece.



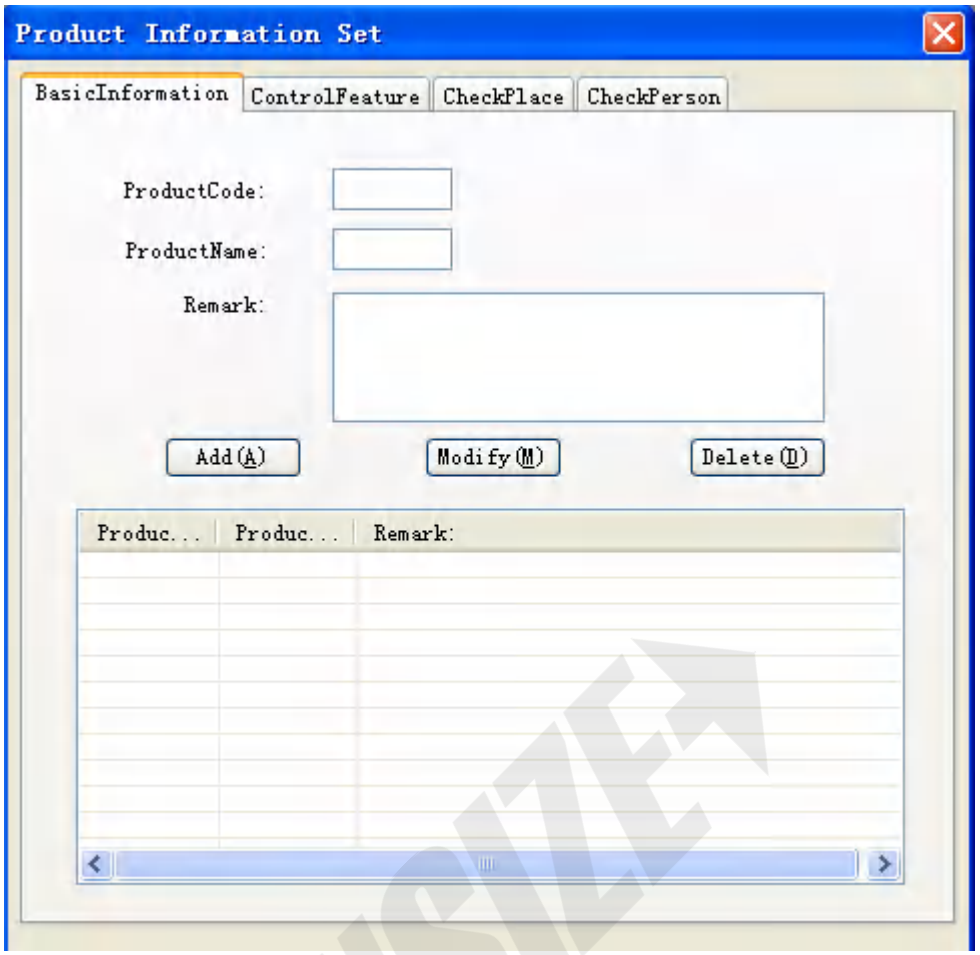
The user can choose the work-related information, selection, will be recorded in the user program, the next time you open the user program, no need to set up.

Then, as above, the information in the dialog box where settings do? Such as product name, product number, site inspection, inspection personnel, where it set up? This must be set in the SPC software.

Select<Tools>-→<SPC >-→Open SPC



Select <Product Information Set>, the dialog box will pop up as follows:



<BasicInformation>: Enter a product number and product name.

<ControlFeature>: Enter the relevant information.

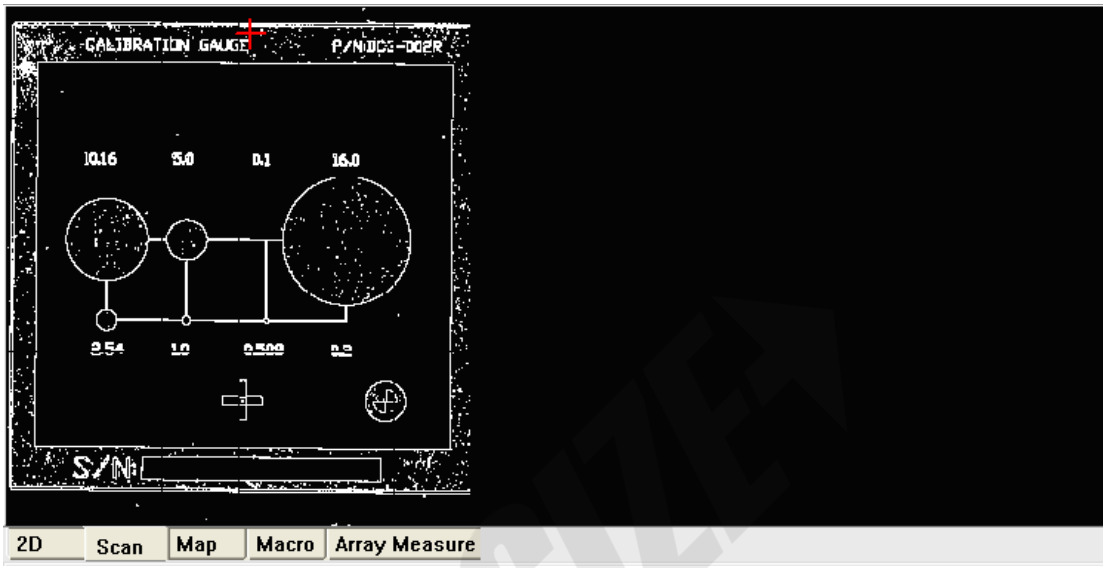
<CheckPlace>: Enter the relevant information.

All the information stored in the database

Set up after the completion of product information, we can carry out the measurement software options.

CHAPTER XVII SCAN

Scan window:

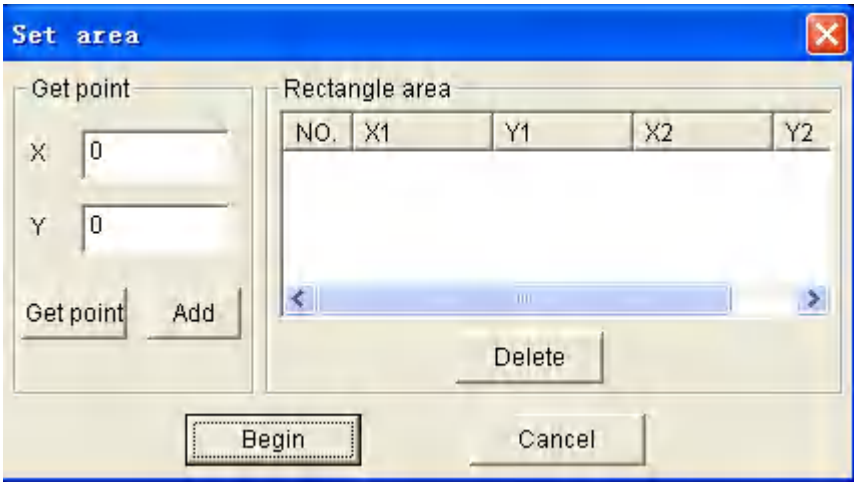


The operation for manually machine:

The window in the focus state, the user presses the ENTER key, you can scan。Click the right mouse button in the window, int the pop-up menu, you can clean and save the scan data.

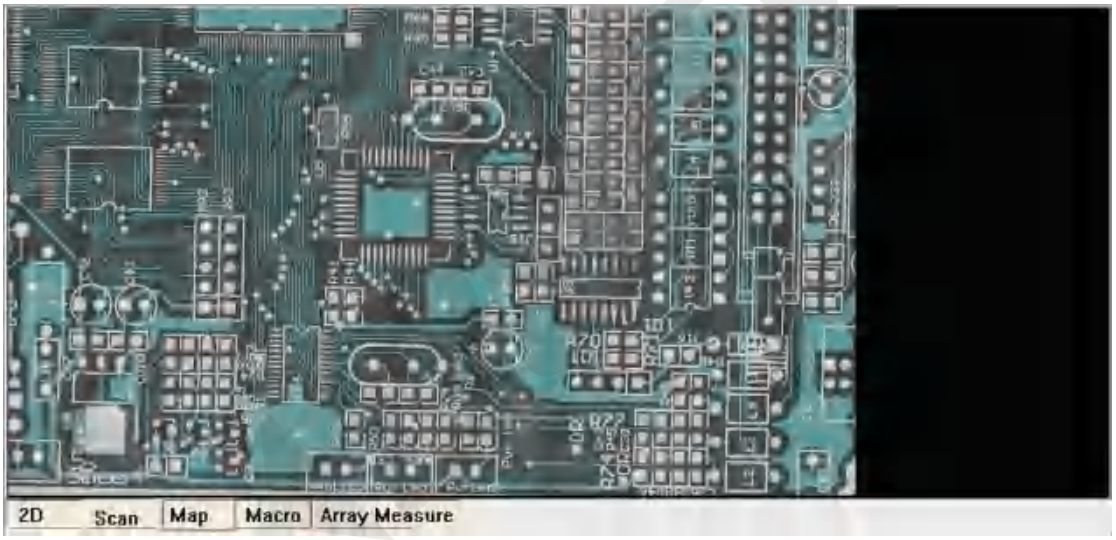
The operation for CNC machine:

In the right pop-up menu, select <setup> menu, the following dialog box will pop up to set the scan area.



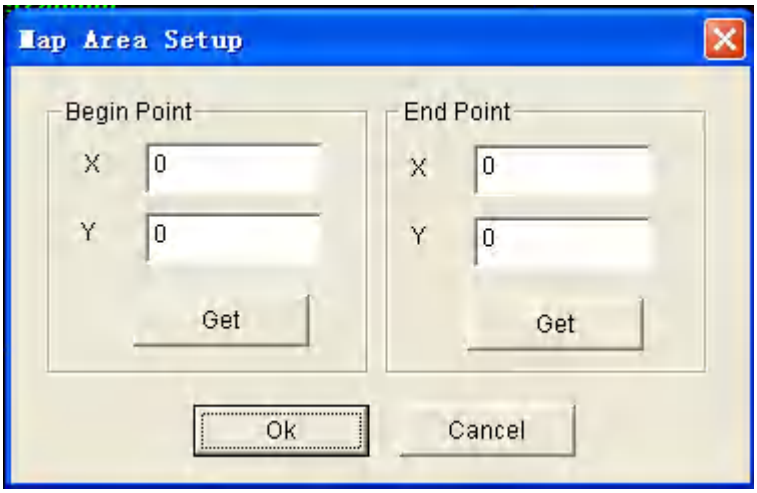
Can scan a number of areas, this dialog box is used to set scanning area. Scanning the region are shaped into a rectangle by the diagonal consisting of two points. On the map [Get point]: that it will obtain the current coordinates of points. [Add]: that is, accept the point as to scan a region corner. Set is complete; click [Begin] button can be automatically scanned.

CHAPTER XVIII BIG MAP



The operation for manually machine:

Methods: Right-click in the window and select <<Map Area setup>> menu item in the pop-up menu, the following dialog box will pop up



Move table, two points to be diagonal, and then click the ok button to start scanning

The operation for CNC machine:

Mosaic map of the method and the method of scanning the same as the previous chapter.

The map can be used for the following operation:

1 Can be marked on the map, and save the map.

2 Shows the map, it may not show the map. <See right Menu>

3 Mark can show, or do not show。<See right Menu>

4 Red Cross Line, said the current location。

5 Double-click the mouse on the map, in the image display window will show the picture the mouse Department and in the above measurement.

CHAPTER XIX CONTOUR TRACKING

Contour Scanning: Scan only specified work-piece contour, whether it is open or closed contour profile can be scanned. Including the rules of graphics such as round, arc, line, oval, etc. can be scanned, that is, irregular lines and closed Kaiyun cloud line can be scanned. Received data. This feature is in the larger outline of the work-piece to the work-piece when the scan is very useful through the CNC machine can quickly scan the outline of the work-piece. After intelligent processing software can automatically identify to the work-piece contour to track the outline of the work-piece to complete the outline of the work-piece scan.

Methods of operation: click on the outline of the tracking button  , and then in the image window, use the left mouse button, click the first point (the start of scan point), and then click the second point (the first point to the second point for the scanning direction), and then click The third point (the end point of scanning), when clicking the mouse up the third point, the machine started automatically track along the edge contour, until the scan to the end point, the machine stopped scanning. The results showed that the scanning window.

NOTE:

- Can only be compared to the contour of the work-piece a clear track scanning. For more miscellaneous points may be unable to complete a scan, to several times before.
- If the scanning process repeated scanning in one place, or suddenly in the opposite direction of the scan, and the edge of the work-piece may be unclear, or there are multiple edge, when the user can press ESC key from the scan profile, and then re - scanning direction and set the starting point.
- Users can press ESC key to exit contour tracking.

SOFTWARE NOTE

- **Set linear scale direction**

If the table movement, the direction should be counted as follows:

The left table movement, including value should be increased.

If the table forward movement, the total value should be increased.

The table does not move, by the sliding movement of the bridge frame machine , when the sliding movement to the right aircraft, the total value increased backward movement when the sliding frame, the total value increased.

If the measurements are not accurate, there may be no pixel calibration. Please re-calibration pixels.

- **Auxiliary focus and dimming**

Secondary focus and dimming can improve the repeatability of the measurement accuracy.

- **Create coordinate**

In the establishment of coordinate system, the user must keep in mind that must be preserved, otherwise, the establishment of the coordinate system is invalid.

- **The use of SPC**

Prior to the use of SPC software, we must remember that in the control SPC software to set up the characteristics of the project. Measurement software and then choose, data will be sent to the SPC.