SC-200

SC-100

SC-300

Resson®
Technologies
Easson®

SC-400

SC-500

Digital Readout System
- Digital Counter -
Operation Manual
(2D Measuring Option)

SC-500

SC-600

VERIFICATION

OF COMPLIANCE With Low Voltage Directive

CE

Verification No.: 16TW0856-LVD

Applicable Standard: IEC 61010-1:2010;

EN 61010-1:2010

This Verification of Compliance is hereby issued to the below named company.
The test results of this report relate only to the tested sample identified in this report.

General Information

Document holder :**Resson Technologies Co., Ltd.**
5F-3, No. 12, Lane 609, Section 5, Chongxin Road,
Sanchong District, New Taipei City, 24159
TAIWAN(R.O.C)

Product Description : **Digital Readout System - Digital Counter**

Model Number
SC-102, SC-103, SC-202, SC-203, SC-204, SC-302,
SC-303, SC-402, SC-502, SC-503, SC-603, SC-613

Trademark : Resson Technologies

This device has been tested and found to comply with the stated standard(s), which is(are) required by the Council Directive of 2006/95/EC. The test results are indicated in the test report and are applicable only to the tested sample identified in the report

Winnie Chiu

Winnie Chiu/ Reviewer

Date: Oct.28, 2016

Global Compliance Co., Ltd.
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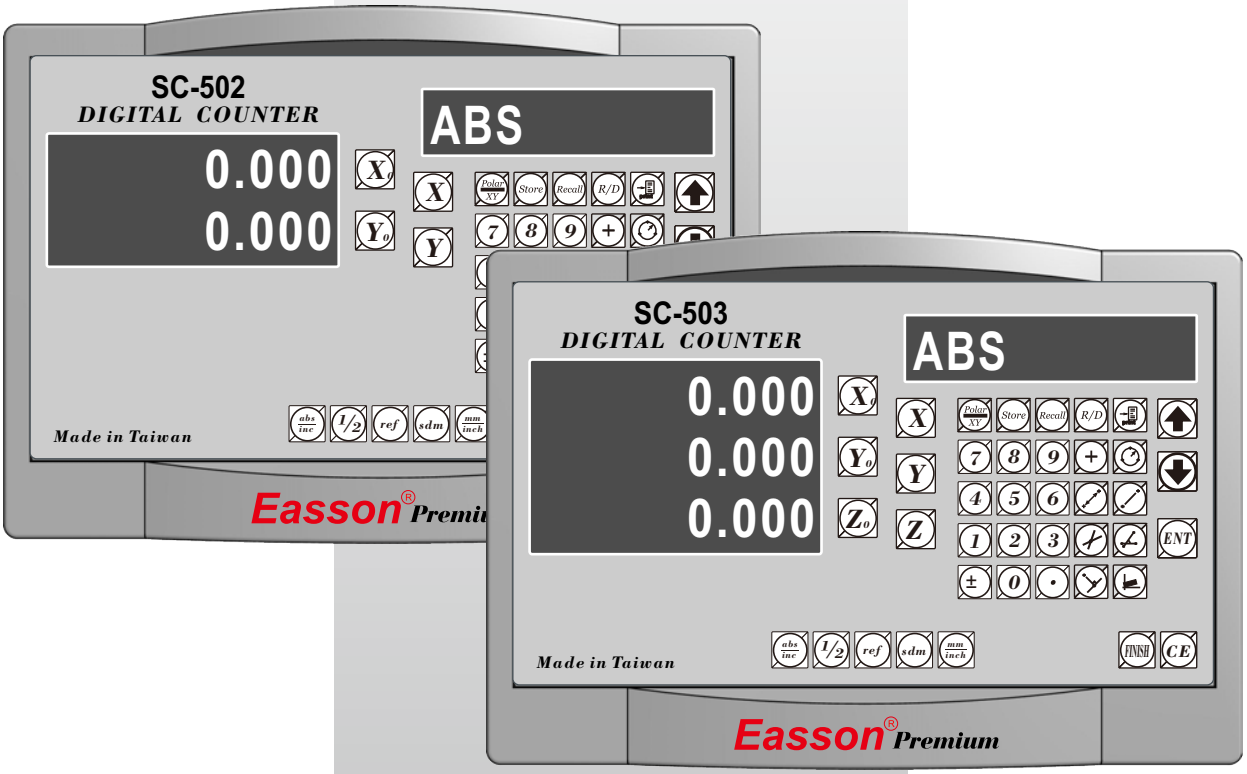
Easson® Premium

Made in Taiwan



SC-500

Digital Readout System
- Digital Counter -
Operation Manual
(2D Geomentric Measurement)

Resson Technologies Co., Ltd.

Note before using this display !

- Use the defined voltage

  The rated power voltage supplied to this display should be 100V~230V, select correct voltage supply and try best supplying the power from lighting power line!

  Since the power circuit would become unstable under frequent power on/off and cause instant strong interference or even power shutdown; take special note on it!

- Ground the display!

  To guaranty user safety and stable & reliable system work, we strongly request user connecting the attached ground line (3-m yellow-green cable packed in the packaged box to the FC terminal at back of display to make good grounding connection!

- Insert each axis optic rule into correct position before turning on display; if doing the turn inversely, it might burn out the electronic devices in the optic ruler!

- Do not operate this display in elevated ambient temperature or under high humidity!
- Do not operate this display in strong electric field, magnetic field or noisy environment, or by electric machine that would be the main reason making system act in error!
- Use dry, soft cloth to wipe cleaning display surface!
- For stain hard to remove, use soft cloth wet by neutral detergent to clean it up!
- Do not use gasoline, diesel fuel, kerosene or alcohol to wipe cleaning the display surface!
- Do not use compressing air gun to blow display and optic scale assembly since it would blow oil, moisture, dust or chips into them from seam and cause system unstable and damage!

Elaborate maintenance, correct operation;

Extend operation lifetime and stabilize work performed

Thanks for buying our product! To use it correctly, read this Operation Manual carefully and in details.

SC-500 Specification

SC-500 Specification :

Number of axes : 2Axes (SC-502)、3Axes (SC-503)

Reslution : 0.05/0.02/0.01/0.005/0.002/0.001/0.0005/0.0002/0.0001mm

Display function : 8-digit LED

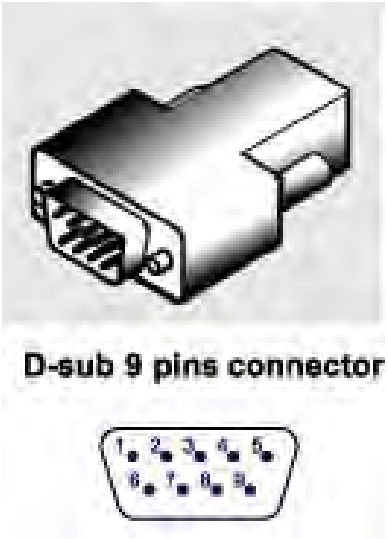
Response speed : 60m (198.6feet)/min

Quantizing error : ±1 count

Power source : AC100V～240V / 50～60Hz / 20VA

Temperature fange : Service:0～40℃ / Storage:-20～70℃

Linear Encoter (Scales) Electrical connector :



D-sub 9 pins connector

TTL

PIN	SIGNALS
1	N/C
2	0V
3	N/C
4	Inner shield
5	N/C
6	A
7	5V
8	B
9	R

N/C : No Connection

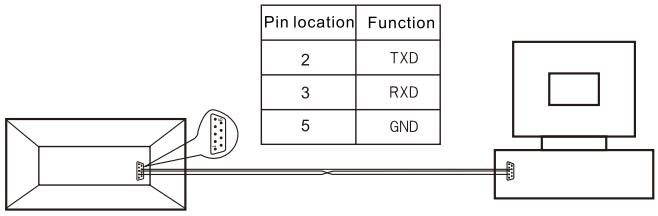
RS422

PIN	SIGNALS
1	A-
2	0V
3	B-
4	Inner shield
5	R-
6	A+
7	5V
8	B+
9	R+

RS-232C output Interface

RS232 output port

This display has RS232-C output port facilitating user to print out the measuring result or connect it to a computer; the port's picture is as below.



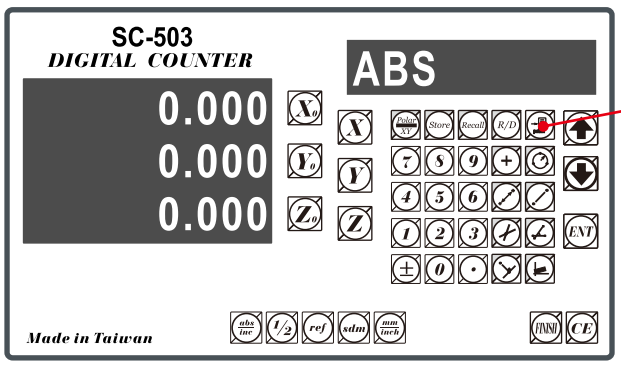
Pin location	Function
2	TXD
3	RXD
5	GND

The display's RS232 output port transmission parameters are:

RAUD RATE : 57600/19200/9600/4800/2400/1200bps
DATA : 8 data bits
STOP BITS : 1 stop bit

Through the display's RS232 output port, we can output display data to a computer or send the output or reset command to display from the computer; such as asking axis X to reset CX, axis Y to reset CY and axis Z to reset CZ.

RS232 output function

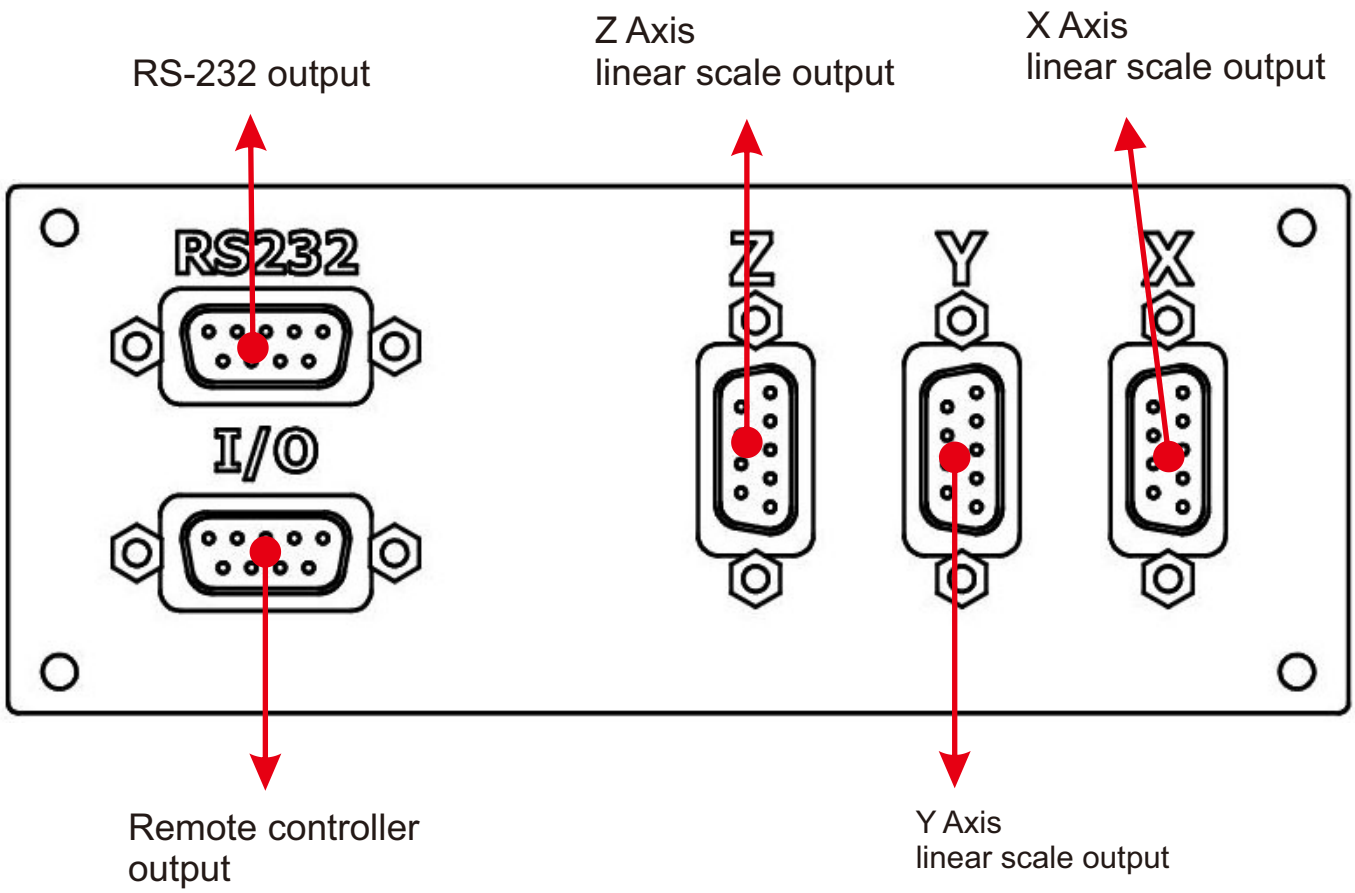


Press

to output display data; and set the “print” option to “on”; to apply two-way communication, set the “print” option to off.

User may select EPSON LQ-300+RS232 as the working printer; set speed to 19200bps and turn on the print to standby.

The back shell plug seat of DRO.



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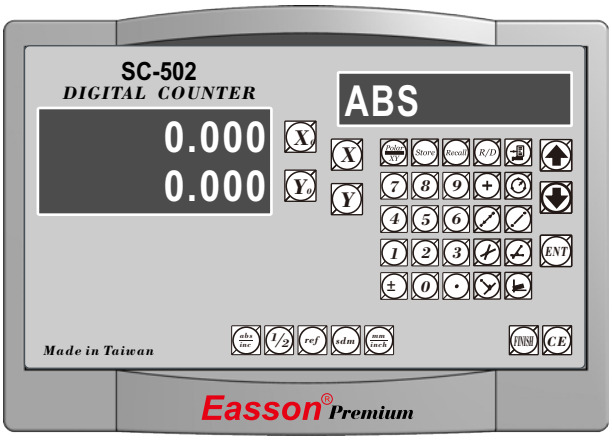
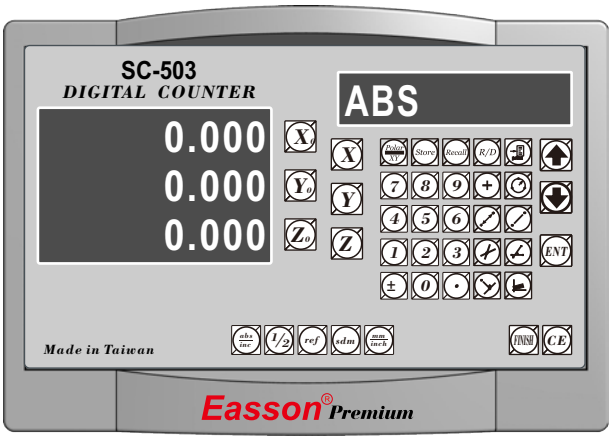
四. Parameters Setup Function 37

Basic Functions

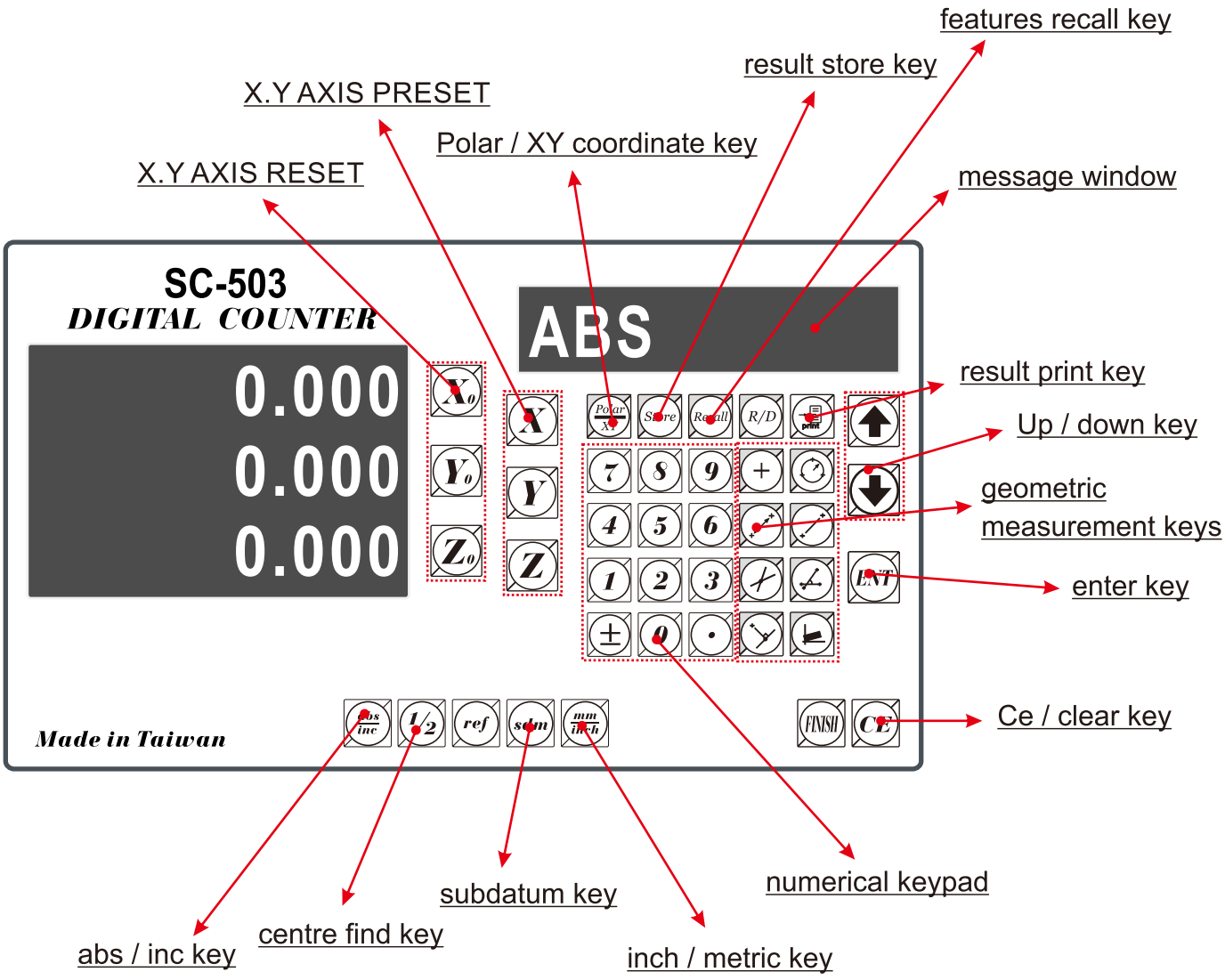




Basic Functions

SC-500 is specially designed for the use in Optical Profile Projector, 2D CCD Vision Measurement Machines, Tools Microscope & etc. It provides basic DRO functions as well as geometric calculation functions for data processing in 2D measurements.

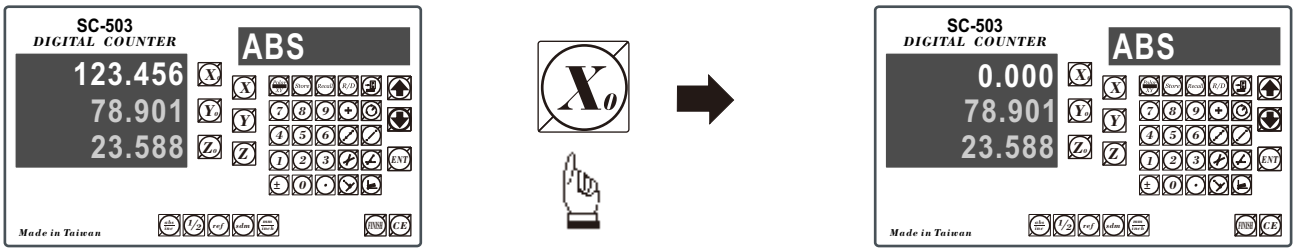
Key layout in front Panel



Set Display to Zero

Purpose : Set the current position for that axis to zero

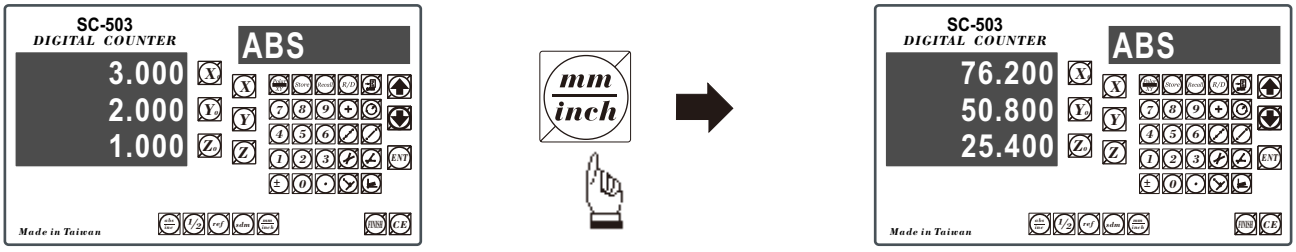
Example : To set the current **X Axis** position to **zero**



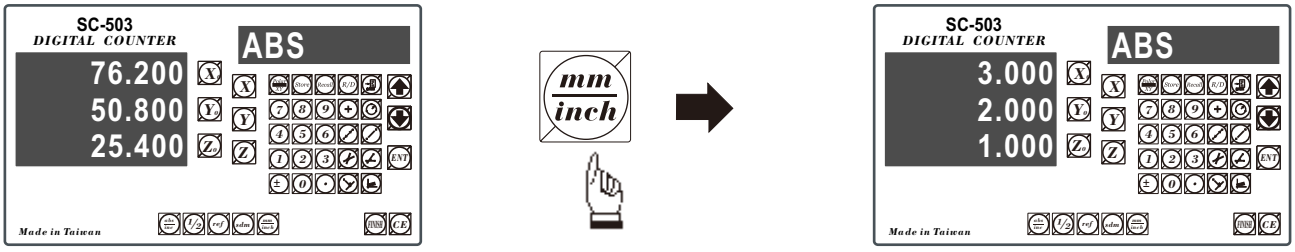
Inch / Metric Display Conversion

Purpose : Switches between inch and metric display

Example 1 : Currently in **inch** display, to switch to **metric** display



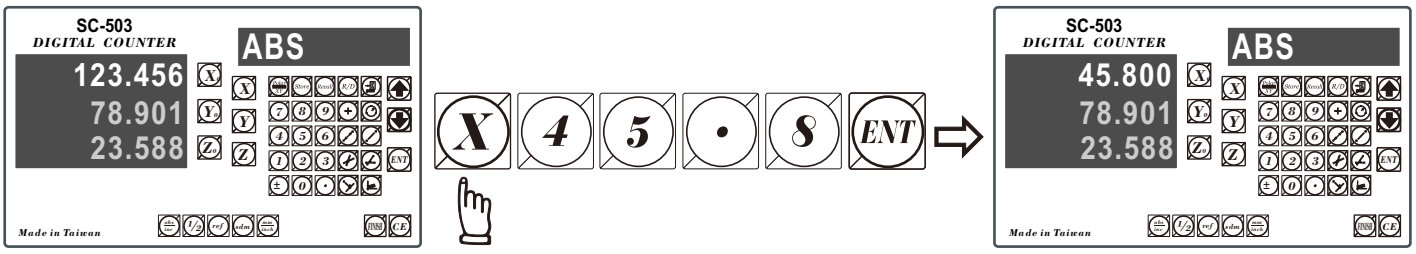
Example 2 : Currently in **metric** display, to switch to **inch** display



Enter Dimensions

Purpose : Set the current position for that axis to an entered Dimension

Example : To set the current **X Axis** position to **45.800 mm**



ABS / INC Coordinates display switches

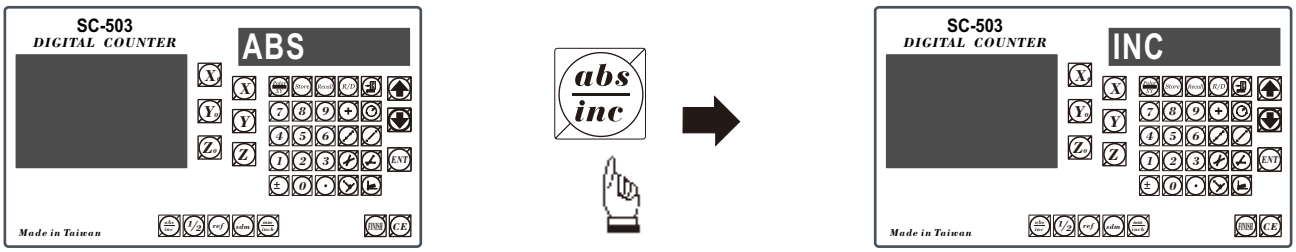
Purpose : **SC-500** provides two sets of basic coordinate display, they are **ABS** (absolute) and **INC** (incremental) displays.

During machining operations, the operator can *store the work piece datum (zero position) in **ABS** coordinate, then switch to **INC** coordinate to continue machining operations.*

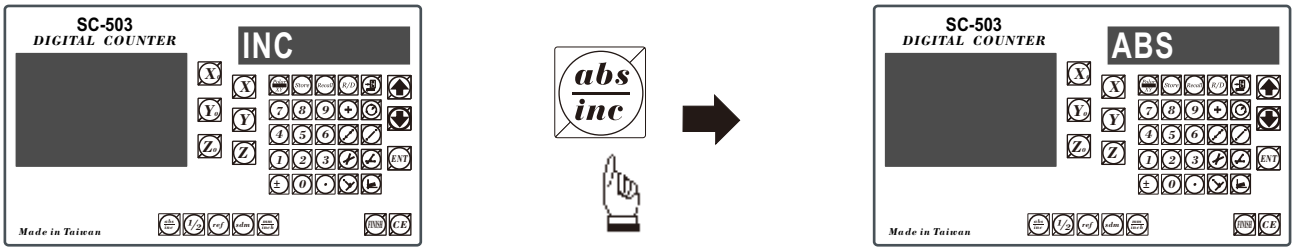
The operator is then free to zero the axes or preset any dimensions into any axis in **INC** coordinate for relative position machining. The work piece datum (work piece zero position) is still retained in **ABS** coordinate by the **SC-500**.

Operator can then toggle between **ABS** (absolute) and **INC** (incremental) coordinates without losing the work piece datum (work piece zero position).

Example 1 : Currently in **ABS** display coordinate, to switch to **INC** display coordinate



Example 2 : Currently in **INC** display coordinate, to switch to **ABS** display coordinate

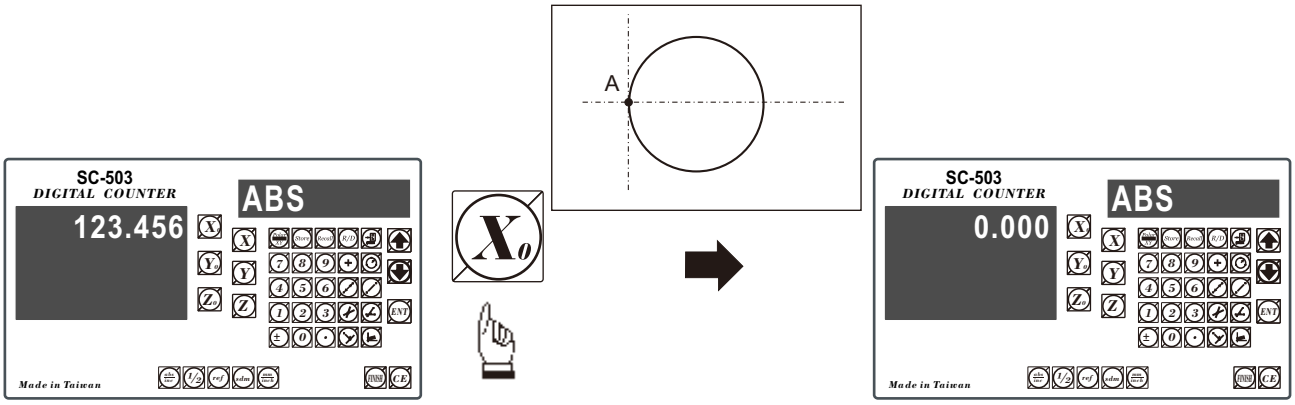


Centre-find

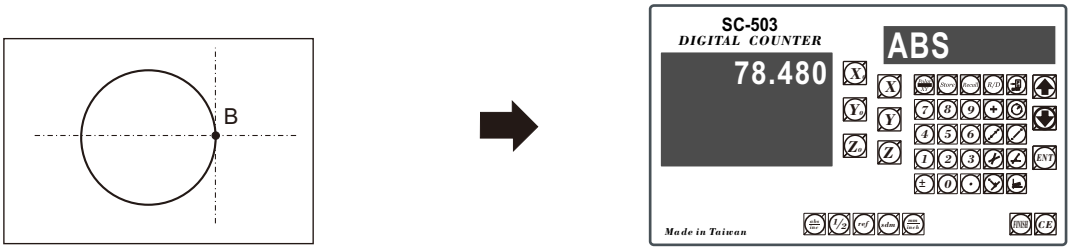
Purpose : **SC-500** provides the centre-find function by halving the current display coordinate, so that the zero point of the work piece is located at the centre of the work piece.

Example : To set the X Axis zero point at the centre of the work piece.

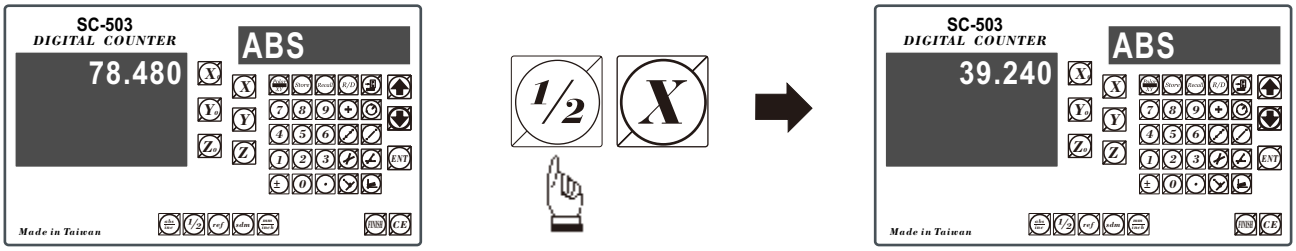
Step 1 : Locate the edge finder at one end of the work piece, then zero the X Axis.



Step 2 : Locate the edge finder at the opposite end of the work piece.

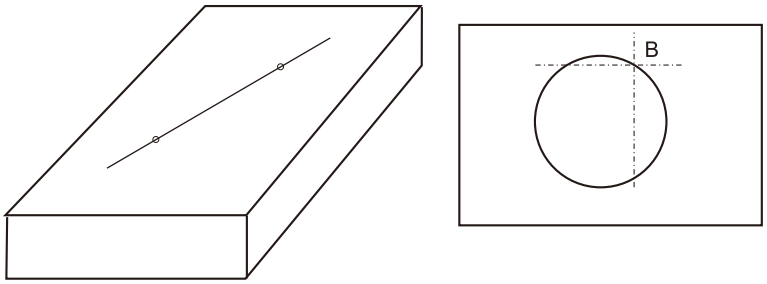


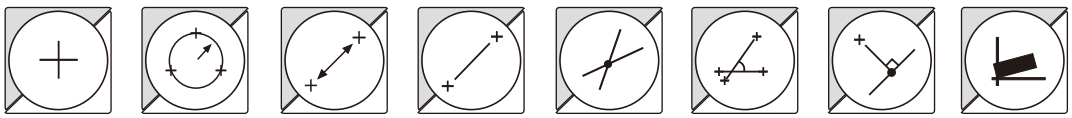
Step 3 : Then half the display coordinate using centre-find function as per follows:



Now the X Axis zero point (0.000) is located at the X centre of the work piece.

2D Geometric Measurement functions

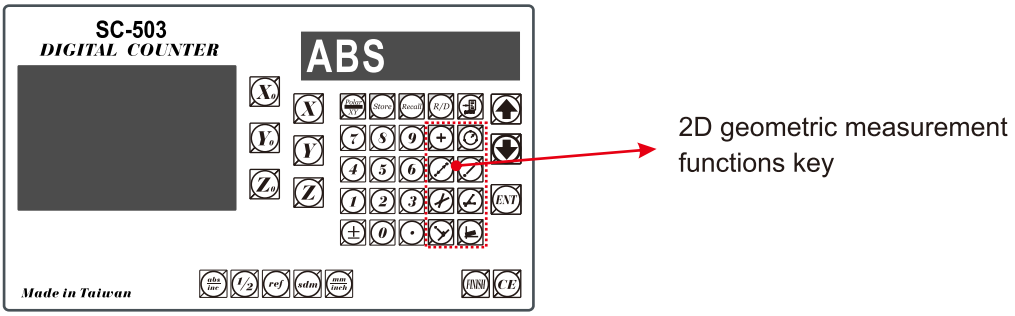




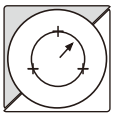
Geometric measurement functions

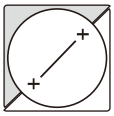
SC-500 counter provides various 2D geometric measurement calculation function for the ease of 2D measurements in Optical Profile Projector, 2D CCD vision measurement machine, tool maker microscope and etc..

Key panel layout for geometric measurement functions



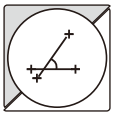
2D geometric measurement functions keys :


3 points to construct a circle (from 3 up to 9 points)


two points to construct a line (from 2 up to 9 points)

point measurement

two points distance calculation


four points to construct intersection point and angle

two lines intersection point and angle

point-line perpendicular projection point

Inclined compensation

All measurement results can be exported out via the RS-232 interface port of SC-500, a small line printer is built in the DRO holding arm of the RP1 projector, all measurement result can be printed out in that line printer for record purpose..

Geometric Measurement functions & concept of features

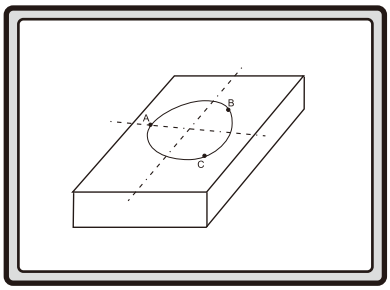
- all geometric elements in SC-500 are called **feature**, such as point, line, circle. and etc. SC-500 can store totally 100 features in the non-volatile memory, all features are labeled by feature no, they are feature 0 to feature 99. In SC-500's calculation, the point feature and the circle feature are the same, the centre of the circle in circle feature are treated as a point feature. **Please notice all features memory are reference to the ABS coordinate.** Therefore, all geometric features are in same work piece plane no matter they are measured under different sub-datums.

- The are 10 set of work coordinates in SC-500, they are ABS, Sd.1 to Sd.9. The ABS is the main coordinate, the Sd.1 to Sd.9 are sub-datums for ease of measurement and temporary reference. Since all features memory are reference to ABS coordinate, if the measured features is stored in the SC-500's feature memory, all measurements are in same reference datum no matter they are measured in different sub-datums. It is also very import that the ABS coordinate cannot be reset during the measurement of one work piece.

- The INC coordinate in SC-500 is a very special coordinate, this coordinate are a temporary coordinate used by many geometric calculation functions in SC-500. For example, it is preset to the centre position for 3 point circle measurement function after calculation, it is also preset to all point calculated position for the function such as four point angle, two lines intersection, point-line perpendicular projection point. Therefore, it should never be used as sub-datum point coordinate of the work piece.

3 points to construct a circle funcion

1) 3 points to construct a circle function



Purpose: To pick three point from the circle or arc feature in the work piece, SC-500 then calculate the centre position and Diameter(D) / Radius(R)
(from 3 up to 9 points)

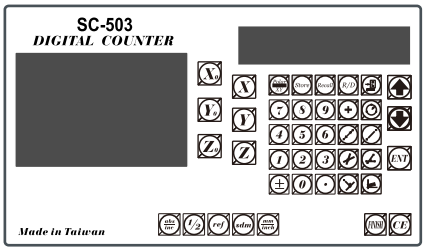
Operation procedure

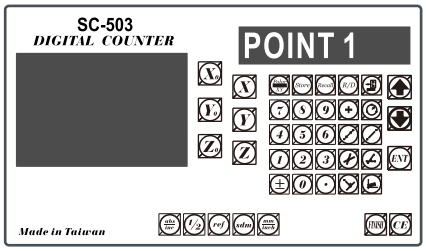
Under the ABS coordinate, there are two method of construct a circle feature:
a) Pick three points in the circle or arc directly from work piece ;
b) Recall three points features or circle features from memory ;

a) Pick three points in the circle or arc directly from work piece ;

1. Press the key to enter into 3 point circle function

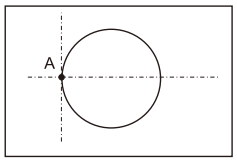
message window displays ENT PT.1
requesting enter the point no. 1

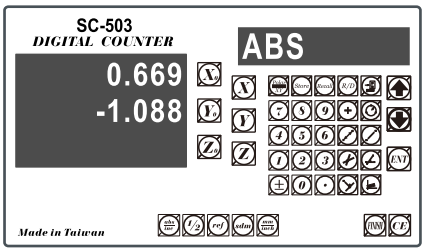




3 points to construct a circle function

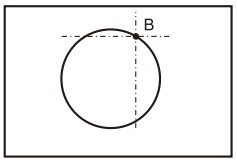
2. locate the cross hair center at the first point on the circle, press ENT to enter the point no. 1

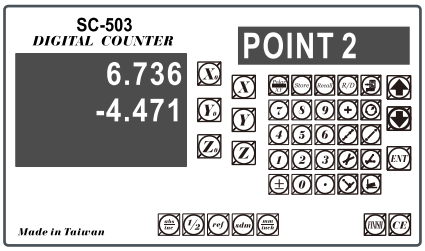




3. locate the cross hair center at the second point on the circle, press ENT to enter the point no. 2

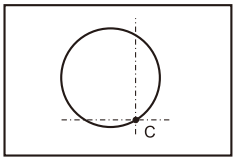
message window displays ENT PT.2
requesting enter the point no. 2

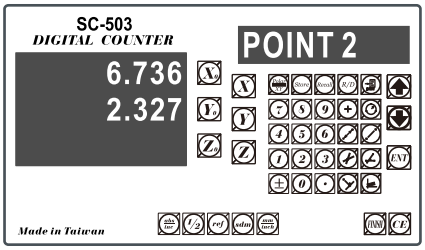




4. locate the cross hair center at the third point on the circle, press ENT to enter the point no. 3

message window displays ENT PT.3
requesting enter the point no. 3



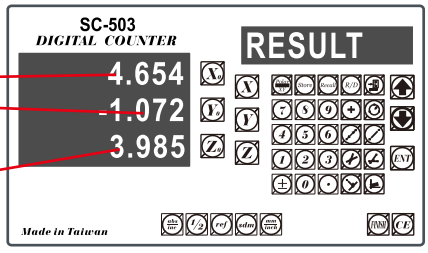


User can select up to 9 points associating the datum line; if less than nine points picked, press FINISH to close the calculation during the measuring process.

5. Measurement input complete, SC-500 will display centre position and the Diameter/Radius of the circle.

X, Y centre coordinate

press R/D Diameter/Radius display



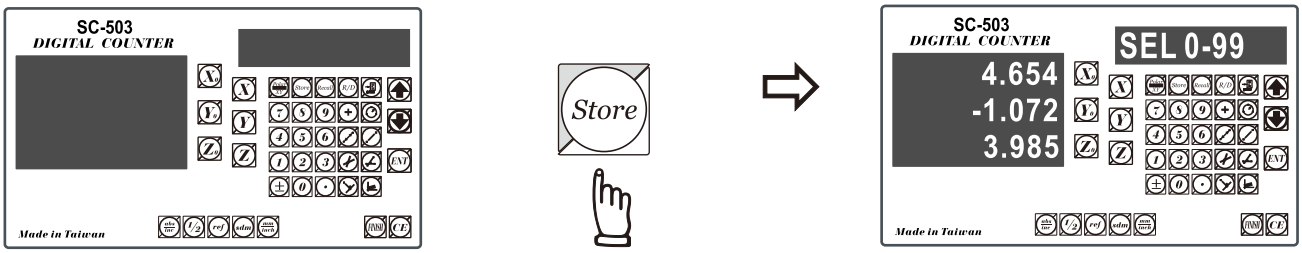
press ▲ ▼ to scroll between center position and Diameter/Radius displays

In the Dia/Rad display mode, press R/D to swap between Diameter/Radius

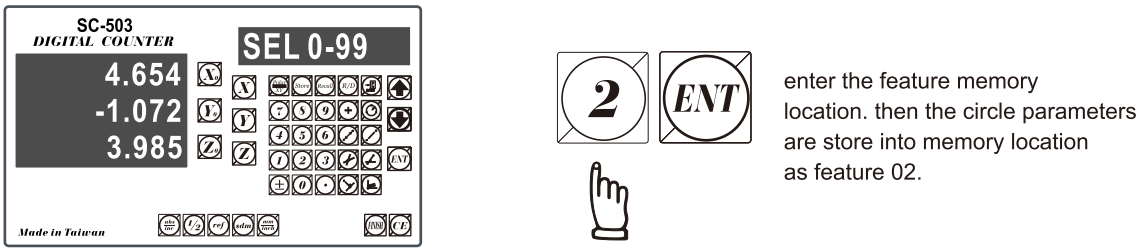
3 points to construct a circle function

6. After operator viewed the circle feature's parameters (centre and Dia/Rad), operator can store this circle feature into the memory of SC-500 as per following procedure.
   press Store key to store the feature into the memory

SC-500 asking the feature memory location to be stored.



There are 100 feature memory available in SC-500, they are feature 0-99 respectively, in this example, we are going to store this circle parameters as feature 02, procedure are as follows



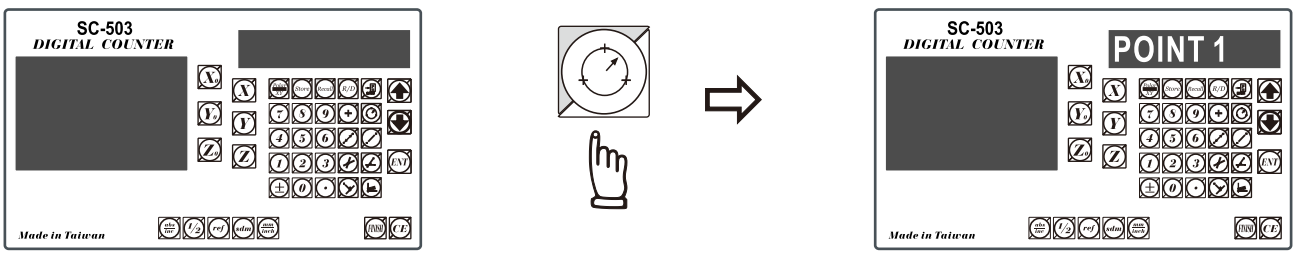
enter the feature memory location. then the circle parameters are store into memory location as feature 02.

After the 3 point circle measurement, the INC coordinate of the SC-500 will be preset to the centre coordinate of the circle to be measured. operator move to 0.000 in INC coordinate, then this is the centre of the circle to be measured.

b) Recall three points features or circle features from memory to construct a circle

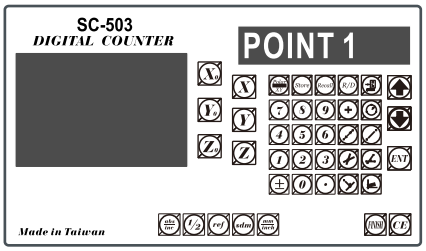
1. Press the key to enter into 3 point circle function

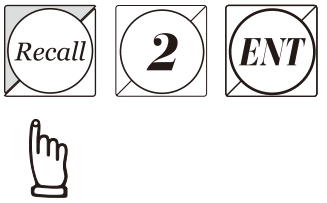
message window displays ENT PT.1
requesting enter the point no. 1



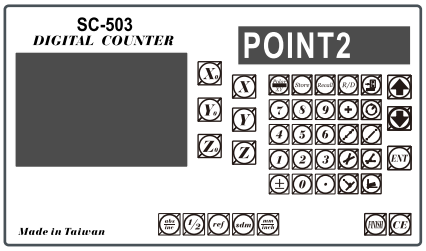
3 points to construct a circle function

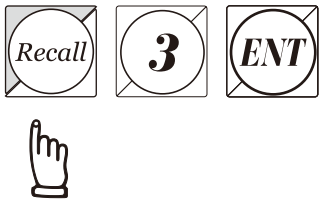
2. We have already stored three point features or circle features in SC-500's memory, we can use the Recall key to recall the stored feature for circle calculation. In the example below, we already have feature 02, feature 03 & feature 04 stored in the SC-500 memory.



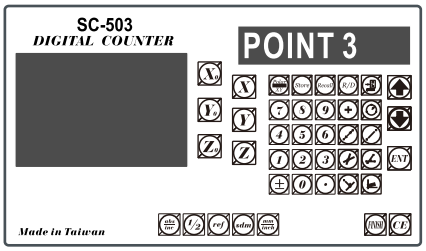


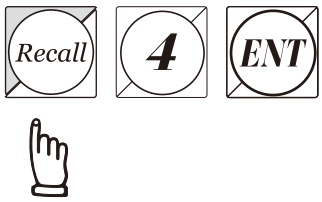
recall the feature 02 as the first point on the circle.





recall the feature 03 as the second point on the circle.



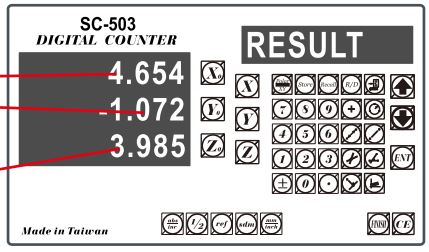


recall the feature 04 as the third point on the circle.

3. Features input completed, SC-500 will display centre position and the Diameter/Radius of the circle.

X, Y centre coordinate

press R/D Diameter/Radius display

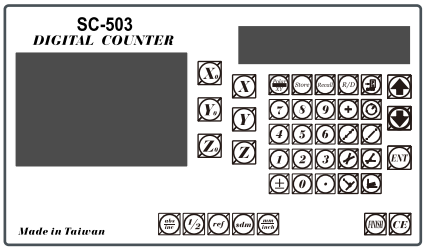


press ▲ ▼ to scroll between center position and Diameter/Radius displays

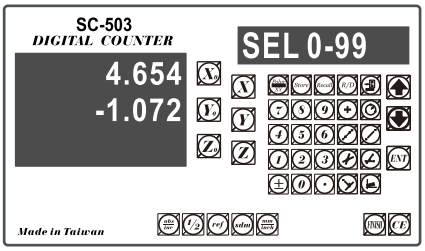
In the Dia/Rad display mode, press R/D to swap between Diameter/Radius

4. After operator viewed the circle feature's parameters (centre and Dia/Rad), operator can store this circle feature into the memory of SC-500 as per following procedure.

press Store key to store the feature into the memory

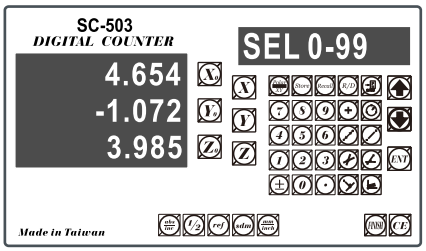


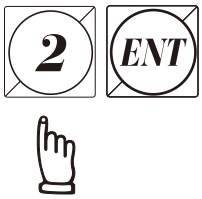
SC-500 asking the feature memory location to be stored.



3 points to construct a circle function

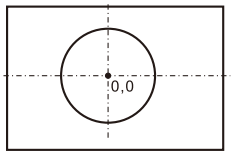
5. There are 100 feature memory available in SC-500, they are feature 0-99 respectively, in this example, we are going to store this circle parameters as feature 05, procedure are as follows

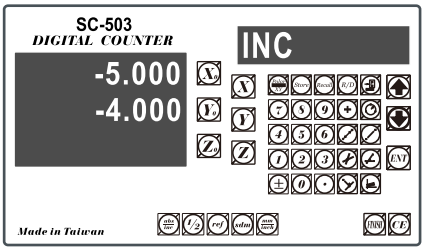




enter the feature memory location. then the circle parameters are store into memory location as feature 05.

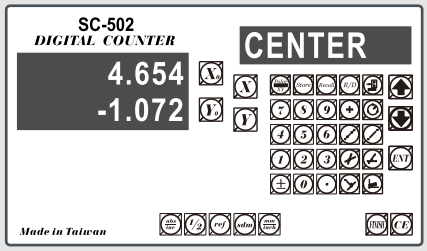
After the 3 point circle measurement, the INC coordinate of the SC-500 will be preset to the centre coordinate of the circle to be measured. operator move to 0.000 in INC coordinate, then this is the centre of the circle to be measured.

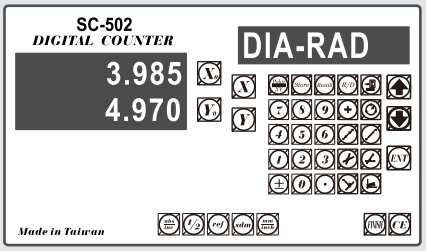




2-axes display

X, Y
centre coordinate

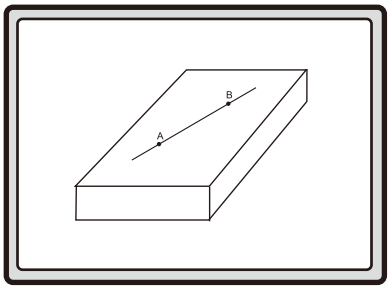




Diameter/
Radius display

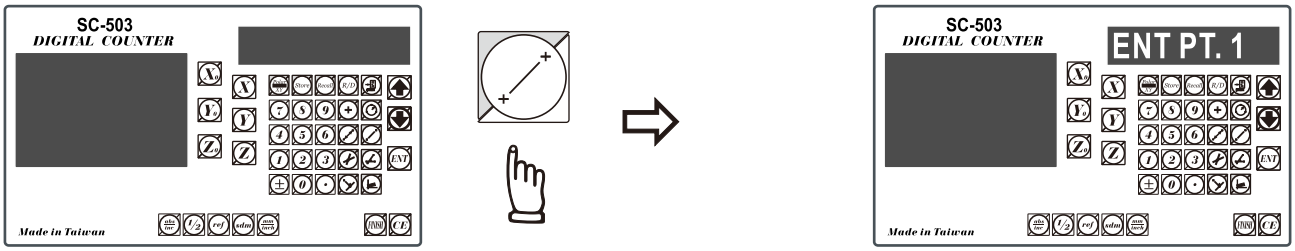
2) Two points to construct a line function

Purpose: On the instrument, pick up points (from 2 up to 9 points) from the edge of work piece to associate a line.

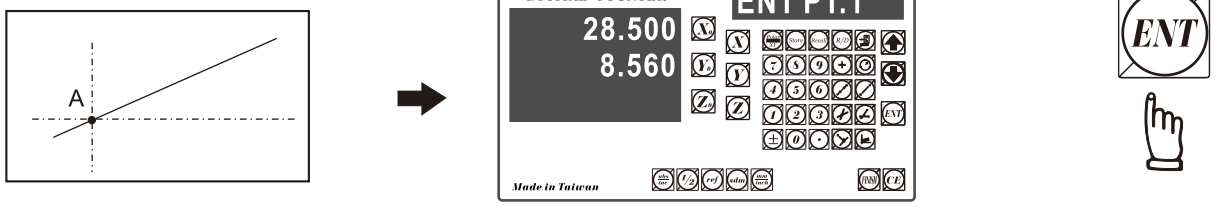


1. Press the key to enter into two points to construct a line function

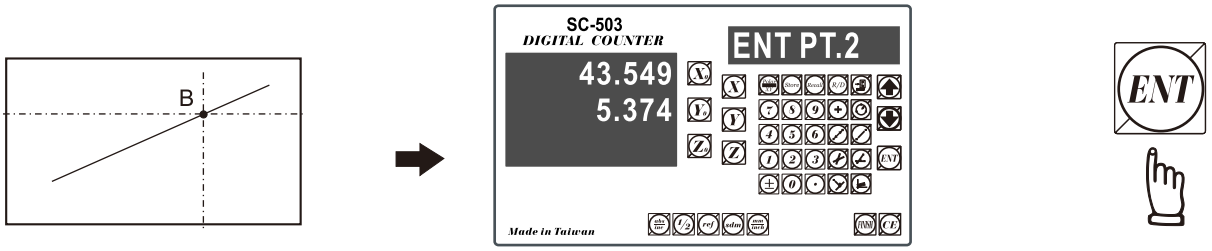
message window displays ENT PT.1
requesting enter the point no. 1



2. locate the cross hair center at the first point on the circle, press to enter the point no. 1



3. locate the cross hair center at the second point on the circle, press to enter the point no. 2

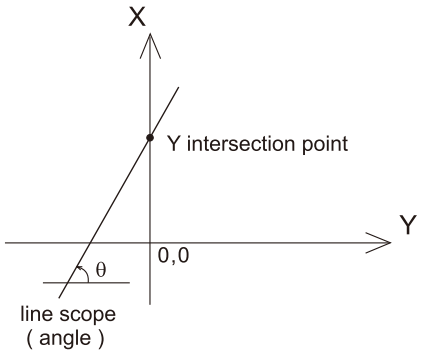


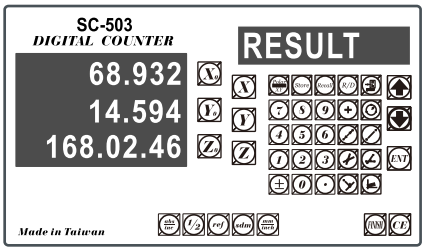
message window displays ENT PT.2
requesting enter the point no. 2

User can select up to 9 points associating the datum line; if less than nine points picked, press to close the calculation during the measuring process.

2 points to construct a line function

4. then press ENT key, line measurement completed, SC-500 will display the line scope (angle) and Y intersection point to show line feature have been constructed.

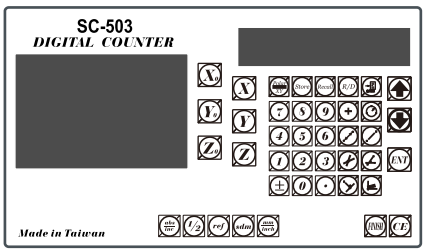




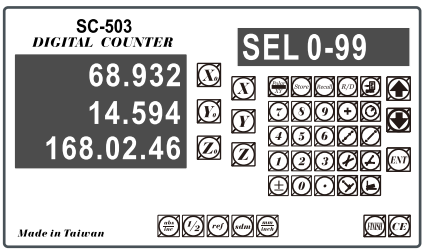
angle display:

X X X · X X · X X
degree minute second

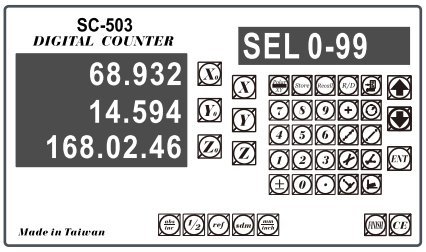
5. After operator viewed the line feature's parameters, operator can store this line feature into the memory of SC-500 as per following procedure.
press Store key to store the feature into the memory

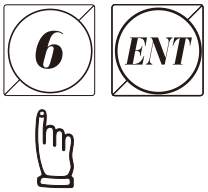


SC-500 asking the feature memory location to be stored.



There are 100 feature memory available in SC-500, they are feature 0-99 respectively, in this example, we are going to store this line parameters as feature 06, procedure are as follows

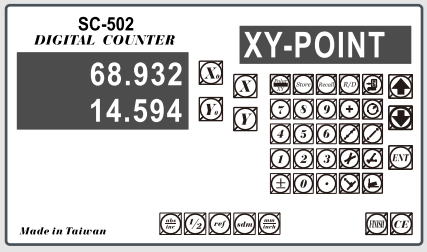


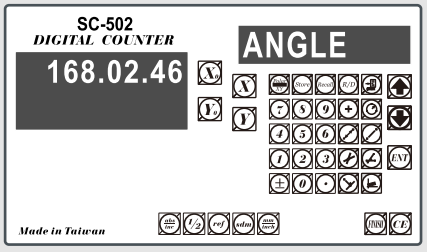


enter the feature memory location. then the line parameters are store into memory location as feature 06.

2-axes display

X,Y intersection point

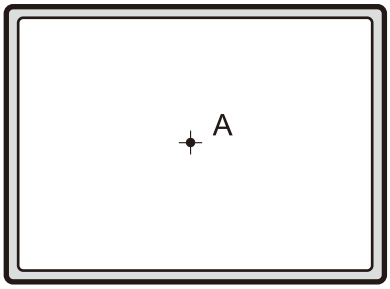




angle

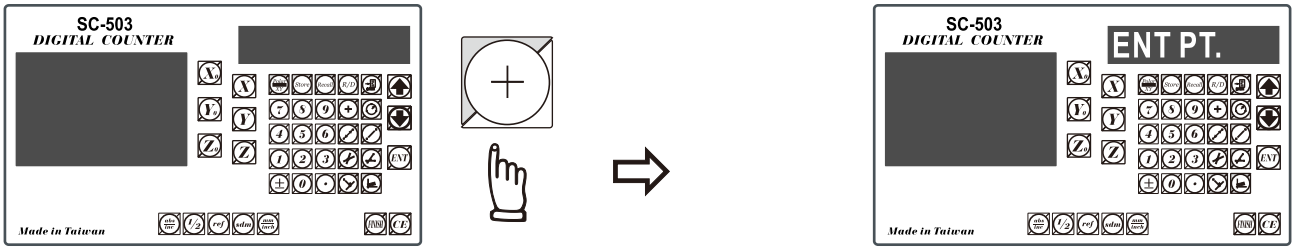
3) point measurement function

purpose: to measurement a point and store the measured point into the SC-500's memory.

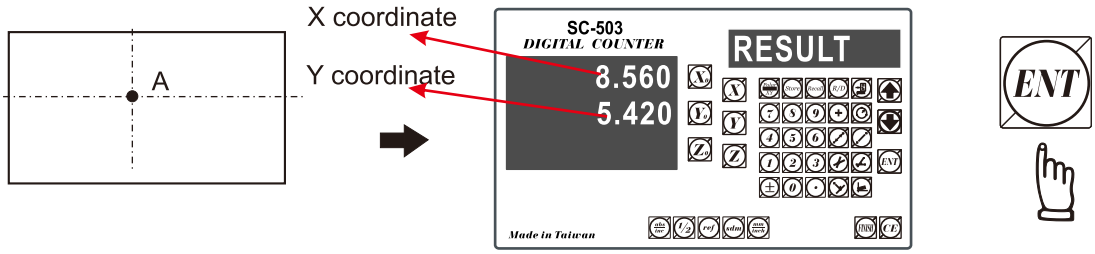


1. Press the [+] key to enter into two points to construct a line function

message window displays ENT PT requesting enter the point

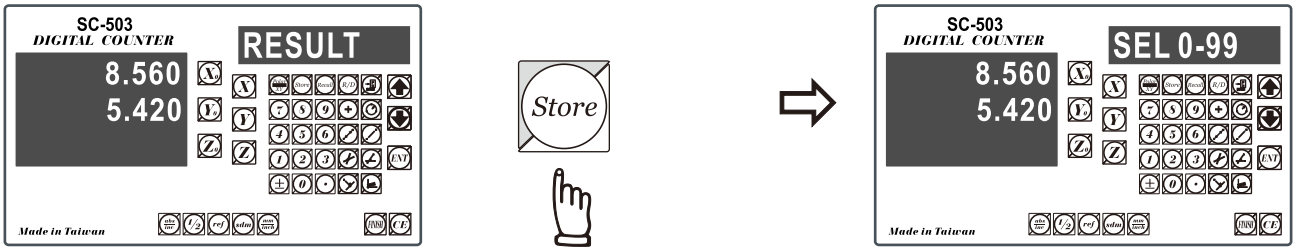


2. located the cross hair center to the measured point, press [ENT] to enter the point.

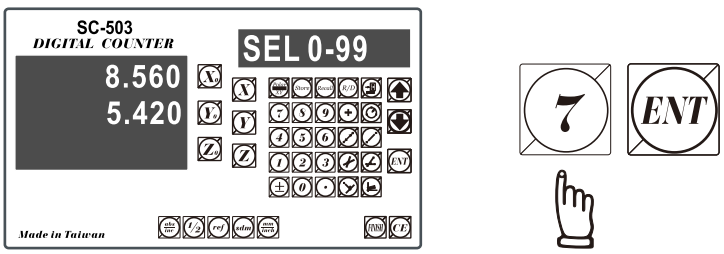


3. After operator viewed the point feature's parameters, operator can store this point feature into the memory of SC-500 as per following procedure.
press [Store] key to store the feature into the memory

SC-500 asking the feature memory location to be stored.

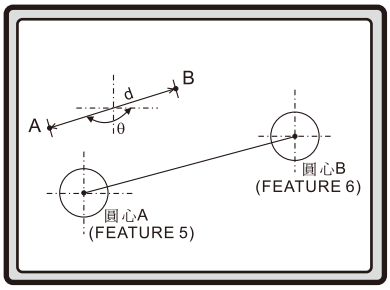


There are 100 feature memory available in SC-500, they are feature 0-99 respectively, in this example, we are going to store this point parameters as feature 07, procedure are as follows



enter the feature memory location. then the point parameters are store into memory location as feature 07.

4) two points distance calculation function

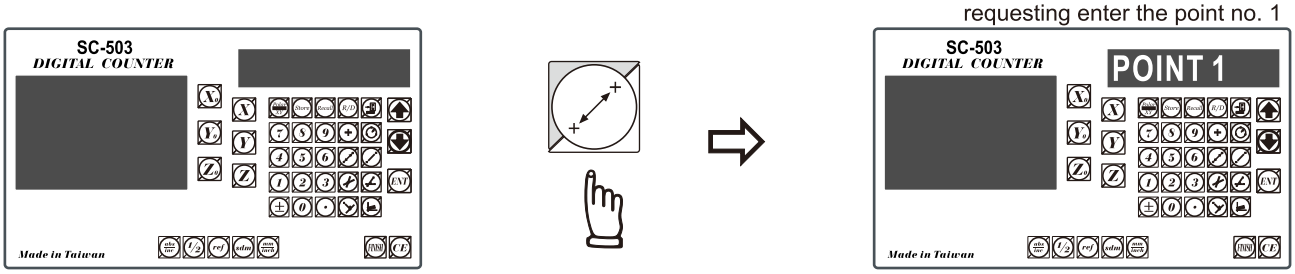


Purpose: to calculate the distance between two points or two circle. please notice that the point or circle features must be stored in the SC-500 memory in prior to this calculation function.

Example: To calculate the distance between two circle features, circle A (feature 05) & circle B (feature 06) which have been constructed and stored in the SC-500 memory.

1. Press the key to enter into 3 point circle function

message window displays ENT PT.1 requesting enter the point no. 1

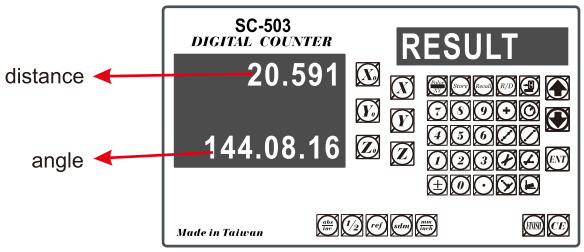


Recall 5 ENT — recall the feature 05 as the first circle feature.

Recall 6 ENT — recall the feature 06 as the second circle feature.

2. If ENT pressed to confirm the distance calculation, then SC-500 will displays

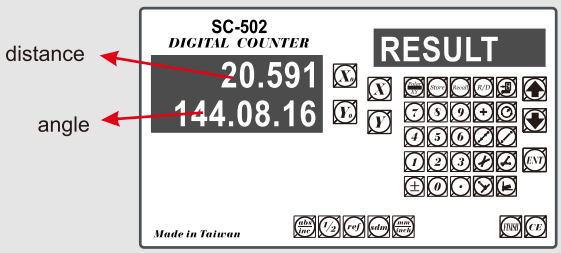
3-axes display



angle display:

X X X · X X · X X
degree minute second

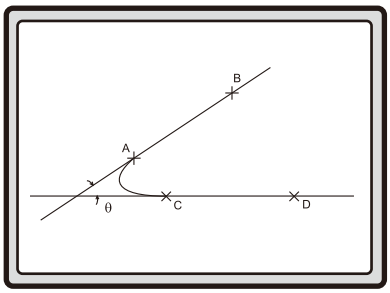
2-axes display



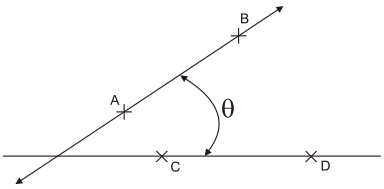
5) four points to construct intersection point and angle

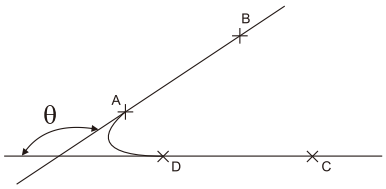
Purpose: to measure four points from two lines to construct the intersection point and the intersection angle of the two lines.

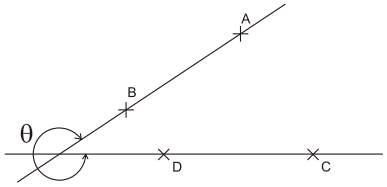
Example: the point A and B in the line 1 ;
the point C and D in the line 2 ;
to construct the intersection point and
the intersection angle of the line 1 & 2



Different coordinate point selecting order will result in varied angle in response.

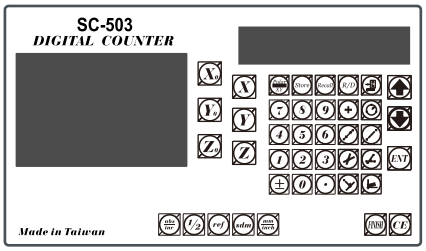


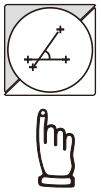


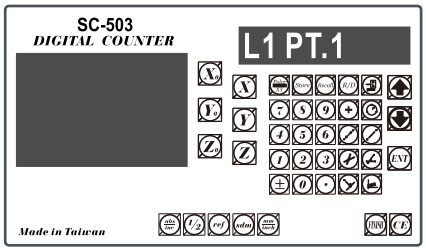


1. Press the key to enter into four points to construct the intersection point and the intersection angle function

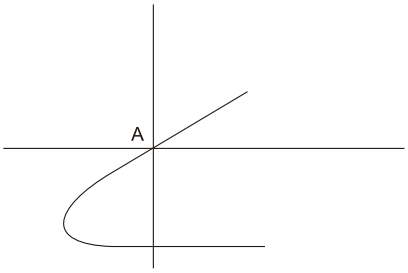
message window displays L1 PT.1
requesting enter the point no. 1 of line 1

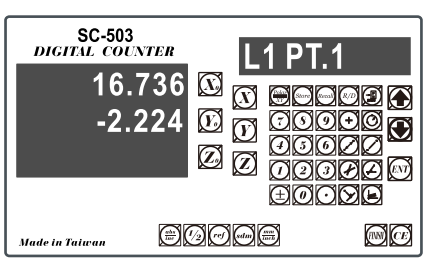






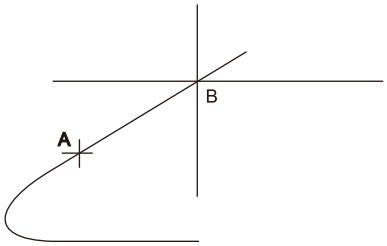
2. located the cross hair centre to the position A of line 1, press to enter the point.

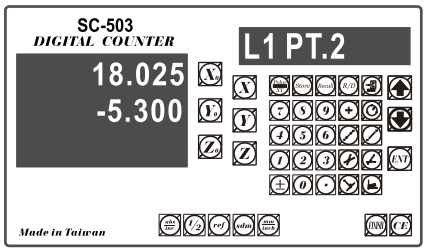




four points to construct intersection point and angle

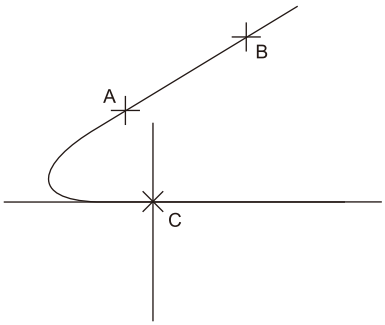
3. located the cross hair centre to the position B of line 1, press ENT to enter the point.

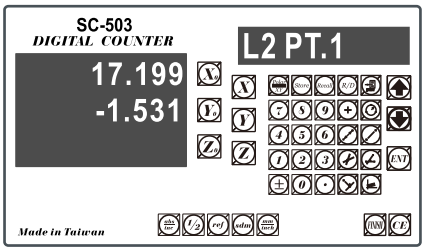




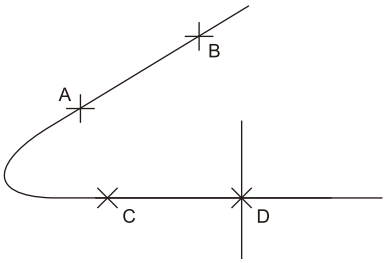
then point A & B will construct the line 1 in the SC-500 memory

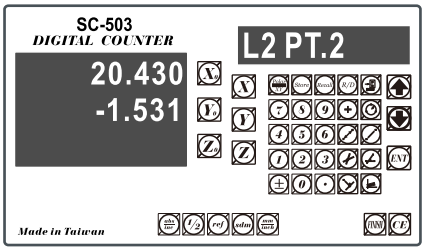
4. located the cross hair centre to the position C of line 2, press ENT to enter the point.





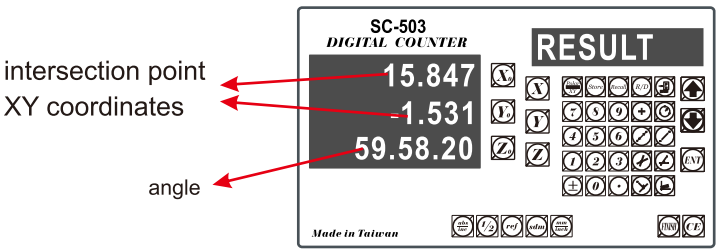
5. located the cross hair centre to the position D of line 2, press ENT to enter the point.





6. press ENT key to condirm the measurements, then SC-500 will displays the intersection point and angle

3-axes display

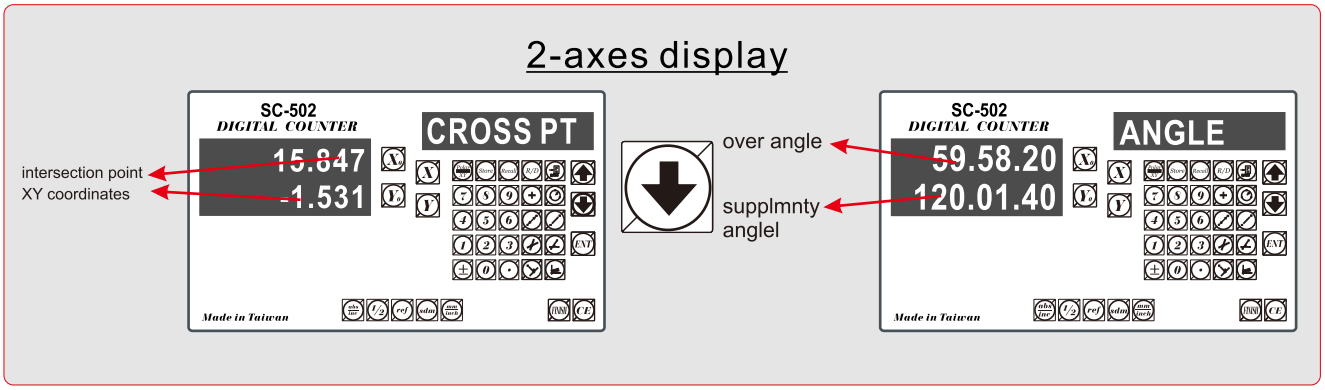


angle display:

X X X · X X · X X
degree minute second

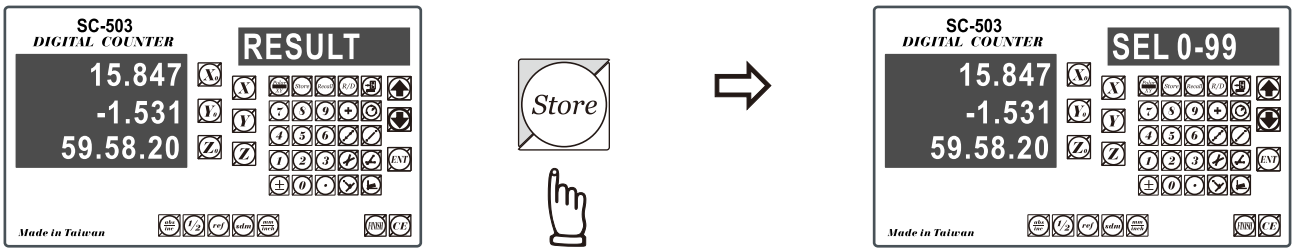
Press R/D to switch over angle/supplementary angle.

four points to construct intersection point and angle

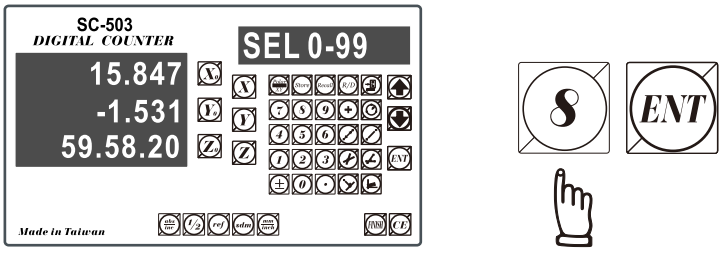


7. After operator viewed the intersection point parameters (coordinate and angle), operator can store this point feature into the memory of SC-500 as per following procedure.
   press Store key to store the feature into the memory

SC-500 asking the feature memory location to be stored.



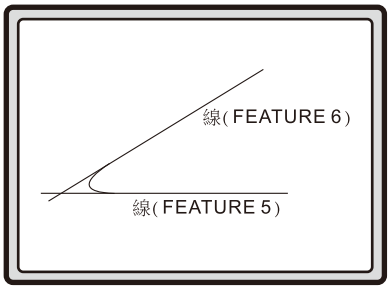
There are 100 feature memory available in SC-500, they are feature 0-99 respectively, in this example, we are going to store this point parameters as feature 08, procedure are as follows



enter the feature memory location. then the point parameters are store into memory location as feature 08.

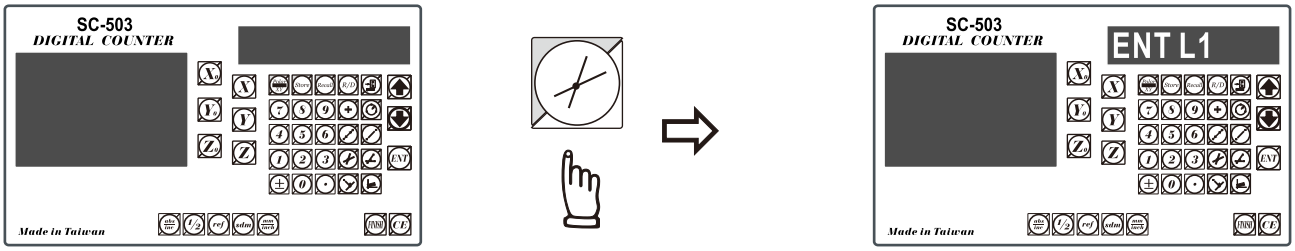
After the four points to construct intersection point and angle measurement, the INC coordinate of the SC-500 will be preset to the intersection point of line 1 & 2, operator move to 0.000 in INC coordinate, then this is the intersection point of the line 1 & 2..

6) two lines intersection point and angle



Purpose: To recall two line features from SC-500's memory, calculate their intersection point and angle.

1. Press the ⁄ key to enter into two lines intersection point and angle function



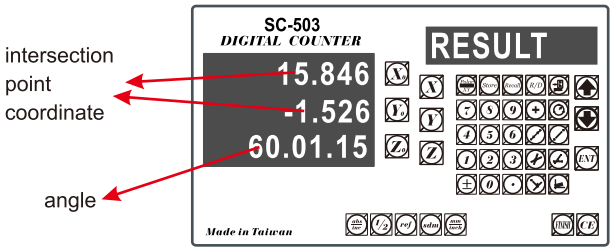
message window displays ENT LI1
requesting enter line 1 feature no.

Recall 5 ENT — recall the feature 05 as the line 1 feature.

Recall 6 ENT — recall the feature 06 as the line 2 feature.

2. If ENT pressed to confirm the distance calculation, then SC-500 will displays

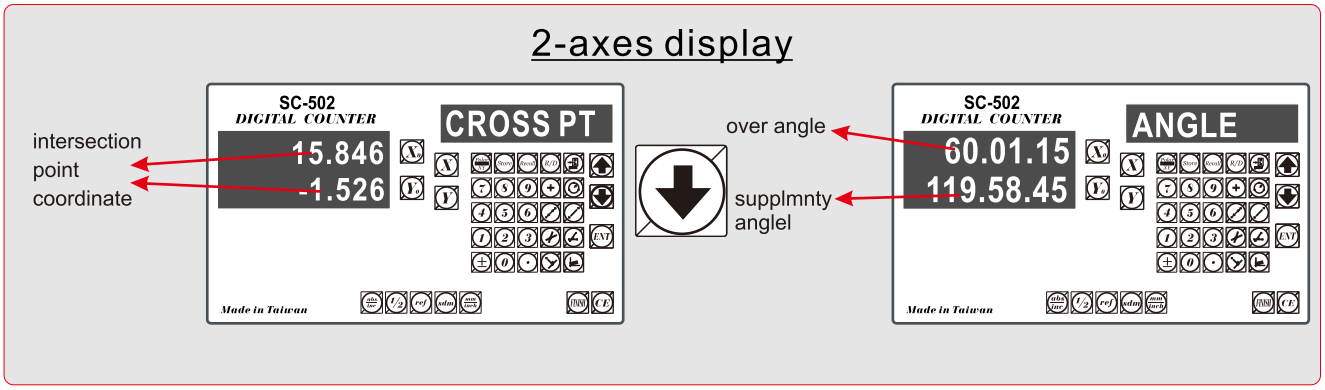
3-axes display



angle display:

X X X · X X · X X
degree minute second

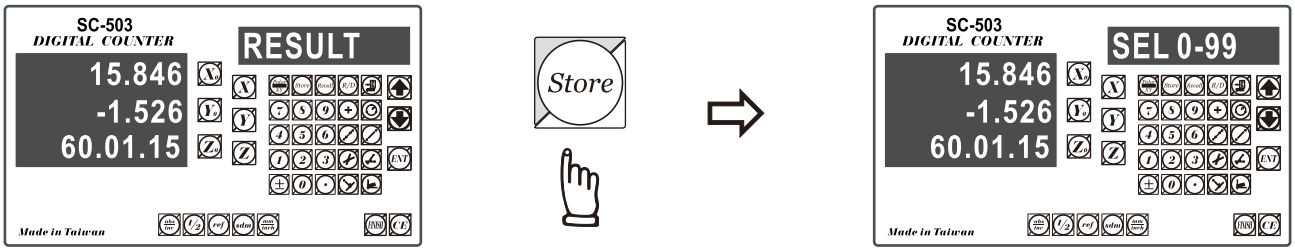
two lines intersection point and angle



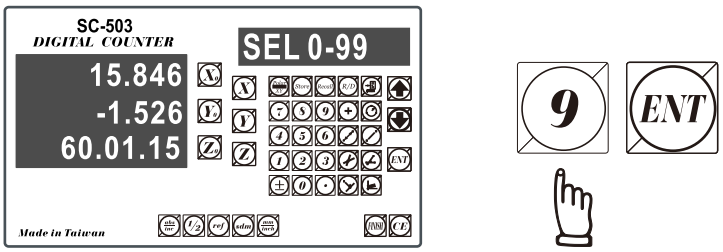
After the two lines intersection point and angle calculation, the INC coordinate of the SC-500 will be preset to the intersection point of line 1 & 2, operator move to 0.000 in INC coordinate, then this is the intersection point of the line 1 & 2..

3. After operator viewed the intersection point feature's parameters, operator can store this point feature into the memory of SC-500 as per following procedure.
press Store key to store the feature into the memory

SC-500 asking the feature memory location to be stored.

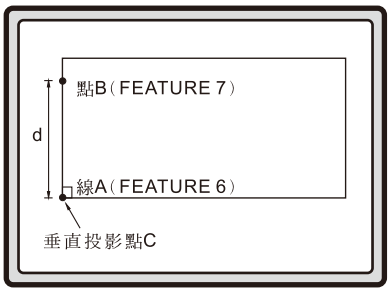


There are 100 feature memory available in SC-500, they are feature 0-99 respectively, in this example, we are going to store this point parameters as feature 09, procedure are as follows



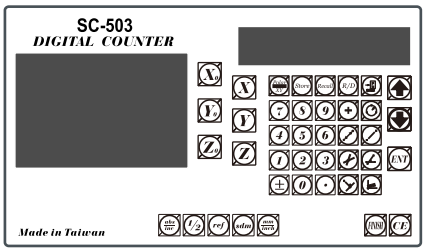
enter the feature memory location. then the point parameters are store into memory location as feature 09.

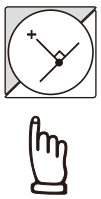
7) point-line perpendicular projection point function



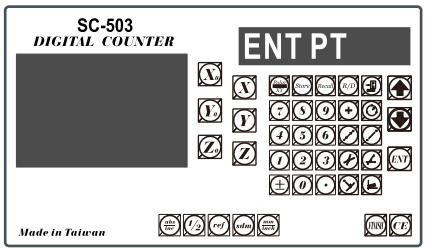
Purpose: to recall a line feature **A** and a point feature **B** from SC-500 memory, then calculate the perpendicular projection point **C** and the distance **d**.

1. Press the key to enter into two point-line perpendicular projection point function

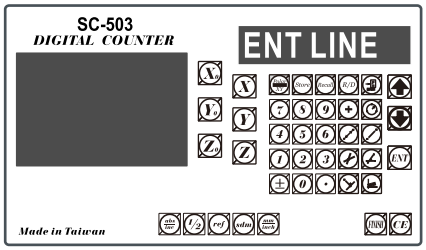




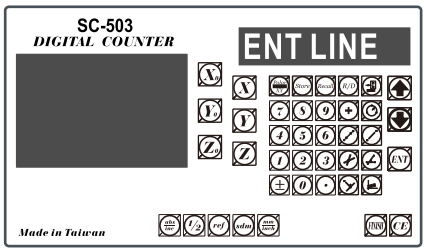
message window displays ENT LI requesting enter line feature no.



recall the feature 06 as the line **A** feature.

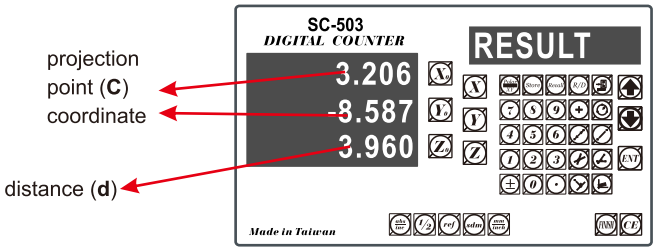


recall the feature 07 as the point **B** feature.

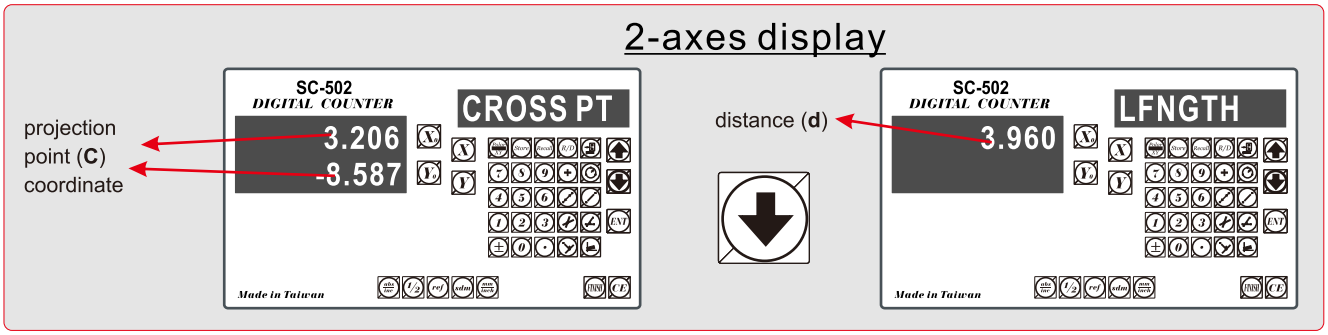


2. If pressed to confirm the projection pont calculation, then SC-500 will displays

3-axes display



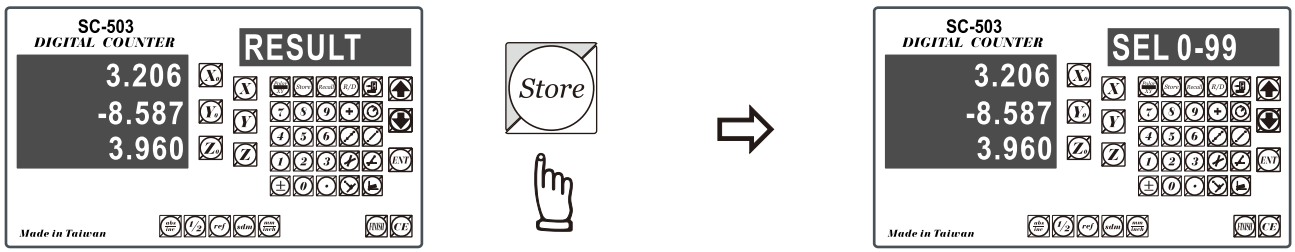
point-line perpendicular projection point



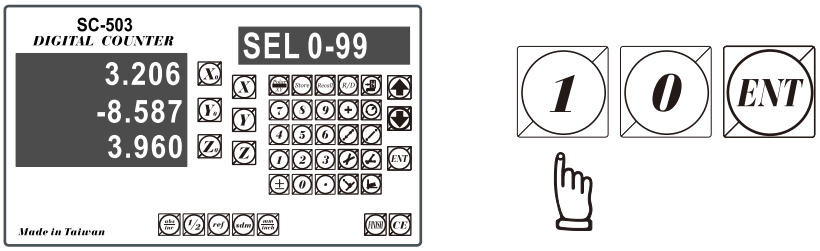
After the point-line perpendicular projection point calculation, the INC coordinate of the SC-500 will be preset to the projection point of line **A** & point **B**, operator move to 0.000 in INC coordinate, then this is the projection point **C.**

3. After operator viewed the projection point feature's parameters, operator can store this point feature into the memory of SC-500 as per following procedure.
   press Store key to store the feature into the memory

SC-500 asking the feature memory location to be stored.



There are 100 feature memory available in SC-500, they are feature 0-99 respectively, in this example, we are going to store this point parameters as feature 10, procedure are as follows



enter the feature memory location. then the point parameters are store into memory location as feature 10.

8) Inclined compensation

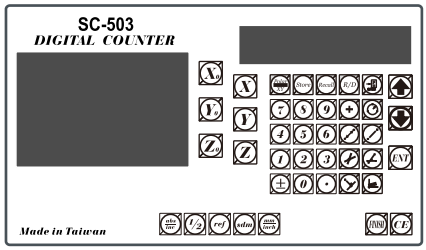
operation procedure.

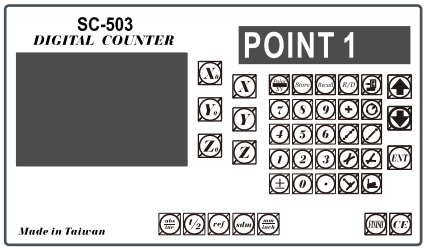
it should use this inclined compensation function in priority facilitating to the followed coordinate into specimen's working coordinate. Before measuring a new work piece, purpose to overlap certain edge line with x- or y-axis, and convert the instrument function allows operator to rotate the coordinate system to a specific angle in the contour or not right angle between x- & y-axis, the display's coordinate compensation and improve the measuring speed and accuracy. When the specimen has irregular major function of this compensation is to help operator set up the specimen quickly specimen; this process is called the coordinate inclined compensation. The Rotate the x-axis or y-axis and move the coordinate to overlap one side of the

Operation steps: select up point A & B (can increase up to 9 points) at any one straight line of work specimen to make the datum line.

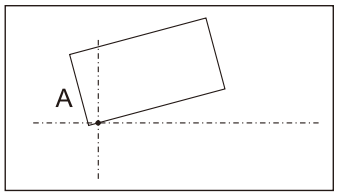
a) Press in th edisplay.

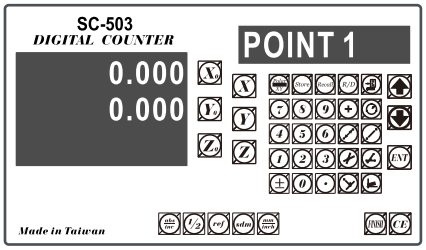
Display will show POINT 1 &request to input the line feature.



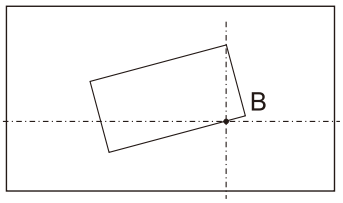


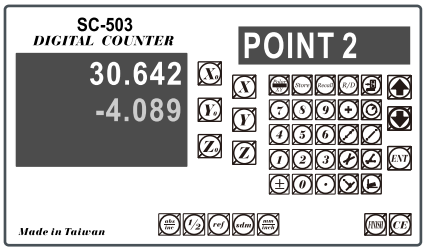
b) Move center line to point A and press ENT .





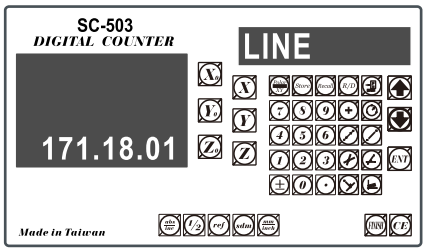
c) Move center line to point B and press ENT .



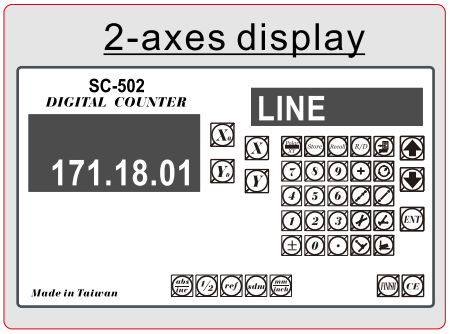


d) When the points are selected, DRO will show the angle of line associated from the points.

3-axes display



2-axes display



e) After the procedure is complete, press ENT to enter the inclined compensation.

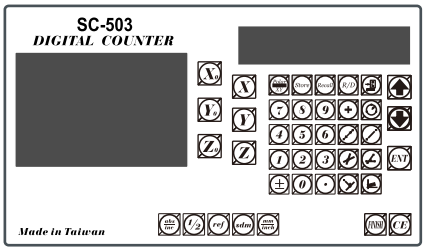
f) To switch over between the inclined compensation mode and normal mode, press to do so.

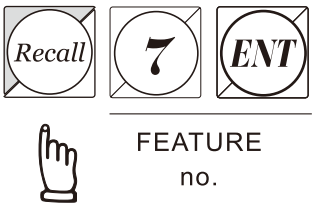
PS. To cancer or abort the inclined compensation mode, press 8 to end it up. If rebooting the display, it needs to set up the datum line once again.

9) feature recall function

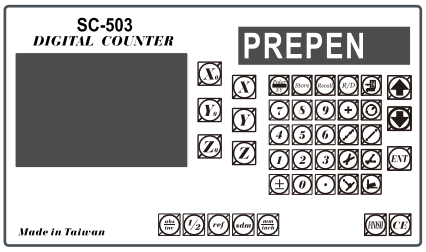
- SC-500 provides 100 features memory to store all measured or constructed result of basic geometric elements such as point, line and circle. To recall those features from memory, so that we can view or print out those features in line printer. procedure are as follows.

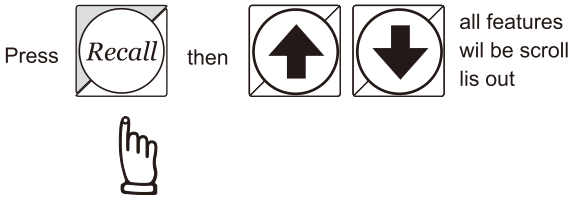
a) **recall feature from memory**, for example, recall the feature 07 from memory.



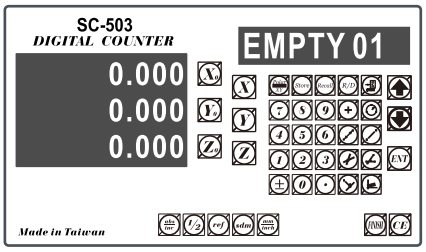


b) **browse features list in the memory**, for example, recall the feature list in the memory



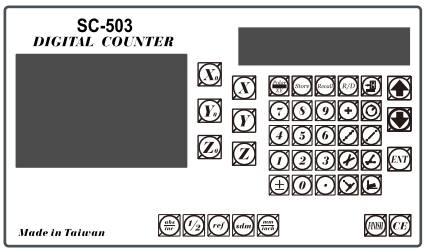


In case, the memeory loctaion is without any feature stored, SC-500 will displays

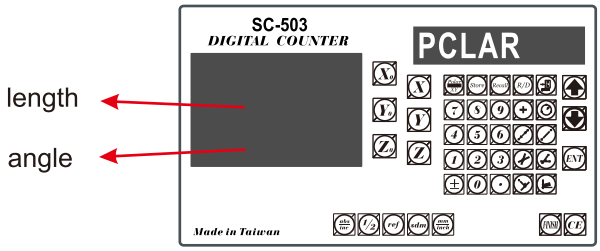


10) polar display

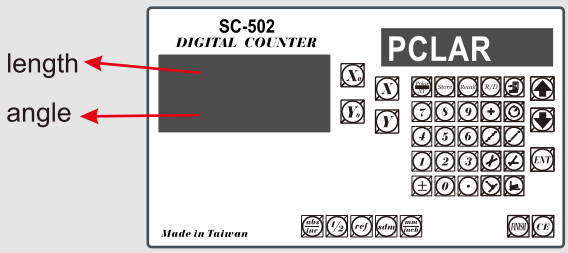
In 2D measurements, in some situation, operator may found that polar display can give a straight forward representation of geometric feature. SC-500 provide XY coordinate / polar display swap for ease of 2D measurement.



swap key for
XY / polar display



3 Axes polar display mode

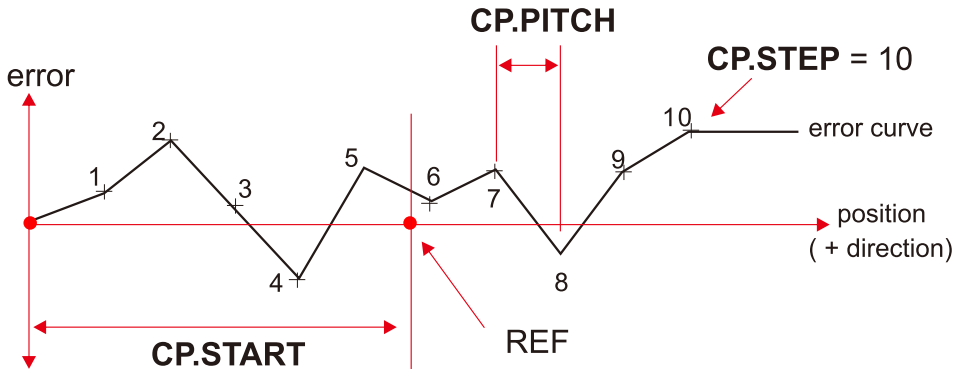


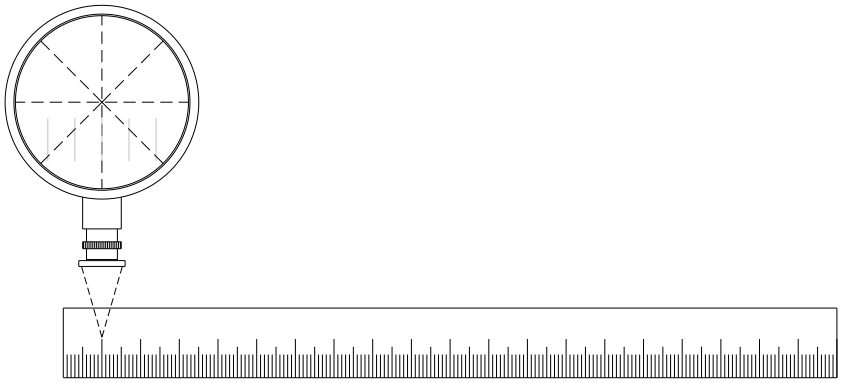
2 Axes polar display mode

During the polar display mode, press

to reset the display coordinate

Non linear error compensations



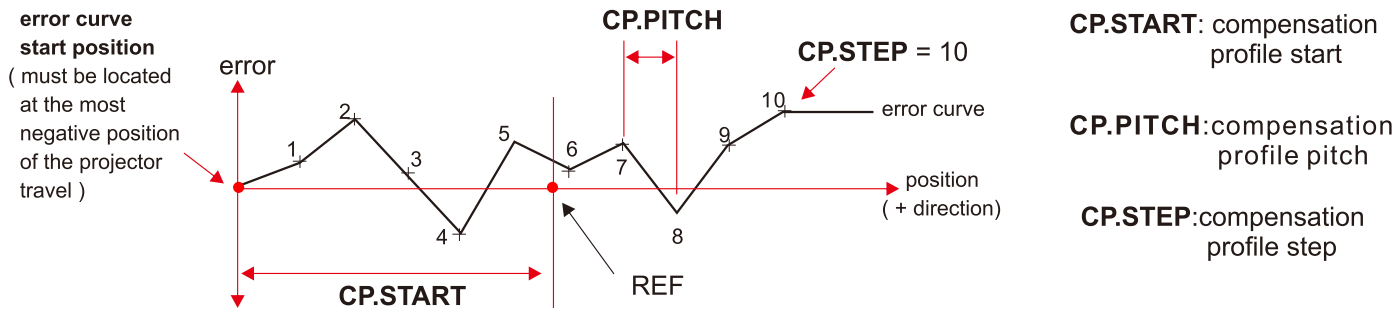


Non-linear error compensation

Because of the structural design of profile projector, the over-hang problem of table is inevitable and the Abbe error is exist. To achieve maximum possible accuracy for measurement, error compensation is commonly used. SC-500 provides non-linear error compensation to improve measurement accuracy to maximum possible limit .

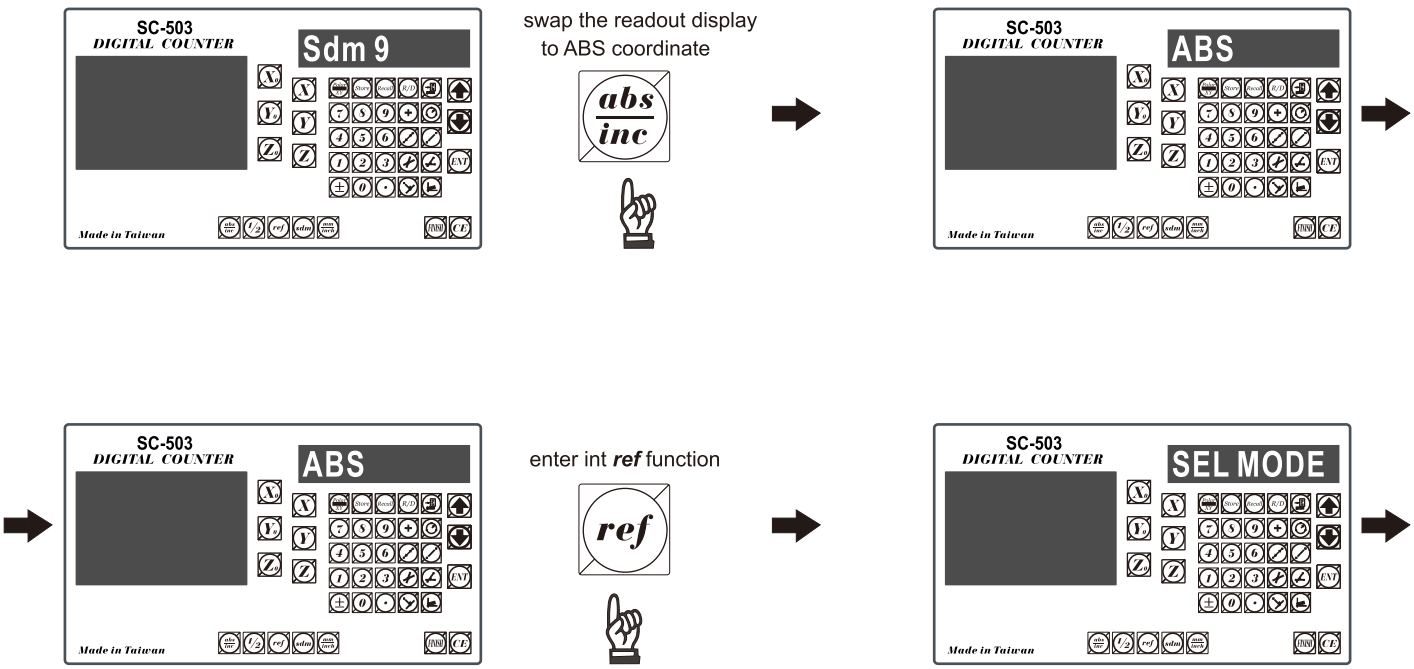
Principle of operation :

Non linear error compensation make use of the REF (reference mark) position of linear scale to locate the absolute position of the projector. The readout's CPU then compensate the readout readings according to the error table that built in during the set up process. The compensation always started from the CP. START position and only compensate towards the positive direction. In other words, it is vital to have the CP. START position located at the most negative position of projector travel. SC-500 offers a maximum of 303 non-linear compensation step, linear compensations is effect between the compensation steps.



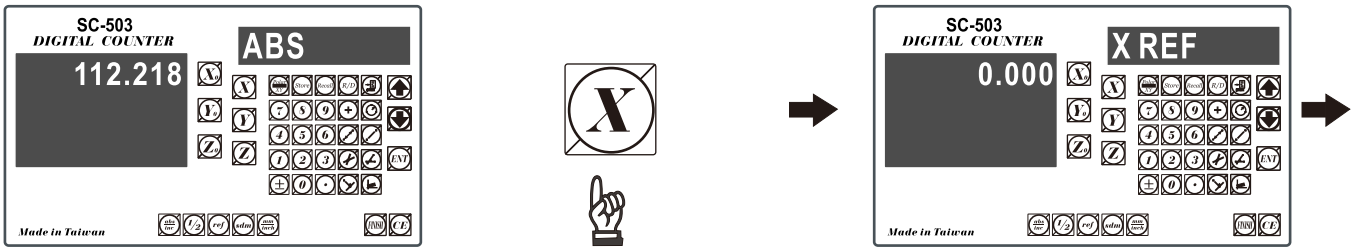
Operation procedure

1) Locate the REF zero at ABS coordinate

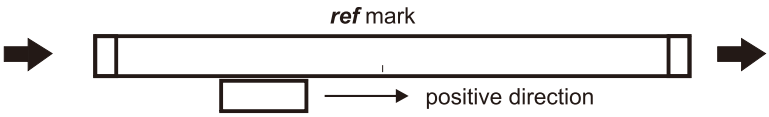


Non-linear error compensation

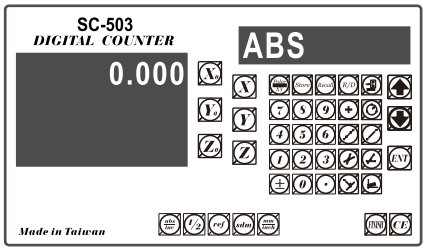
Let's say take X axis an example



move the projector across the ref mark of the scale until the digits display start run. **Please remember the movement of scale must towards the positive direction.**



after the display digits start rum, move the projector to X=0.000, it is the ref mark position



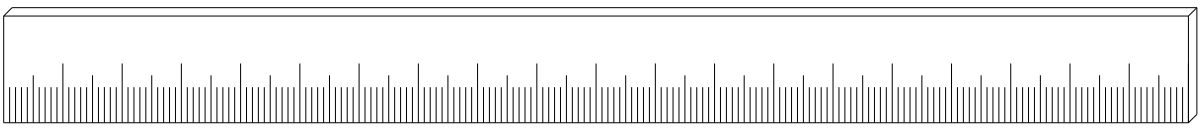
2) Locate the CP. START position

The CP. START position is the absolute reference for the internal error compensation calculation of the readout, it is the start point of the error curve, to make fast, real time calculation possible, the readout assume all internal error compensation calculations are only in positive direction. Therefore, the CP. START position should be located in the most negative position of the projector travel, so that all measured position in the error curve are located in positive position.

i.e. In the example below, we are using a standard glass scale as our measurement standard, the total measurement travel of the projector 200mm. The glass scale marking pitch is 1mm, we take 10mm as one measurement step.

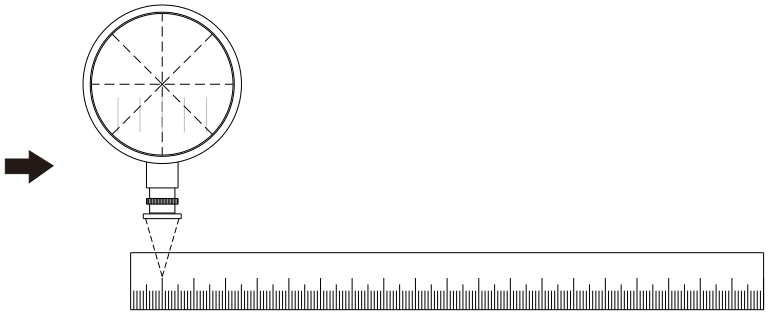
CP.PITCH=10mm

CP.STEP=(total travel : 200mm) / CP.PITCH =20

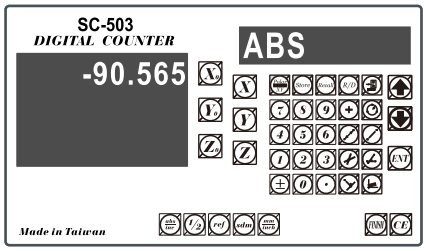


Non-linear error compensation

Using a high magnification lens (50X or 100X) to locate the most negative position of the glass scale, positive the cross hair of the screen to the first line of the glass scale, record down this position as the CP. START position.



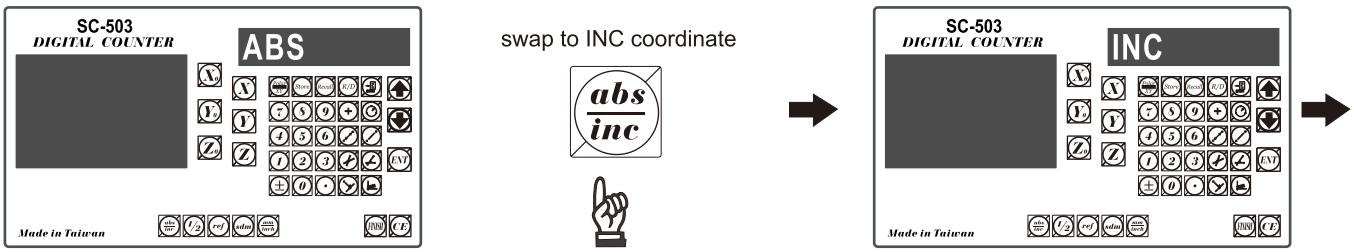
Because the CP. START position always in the most negative position of the projector trave, therefore, it should always be negative value



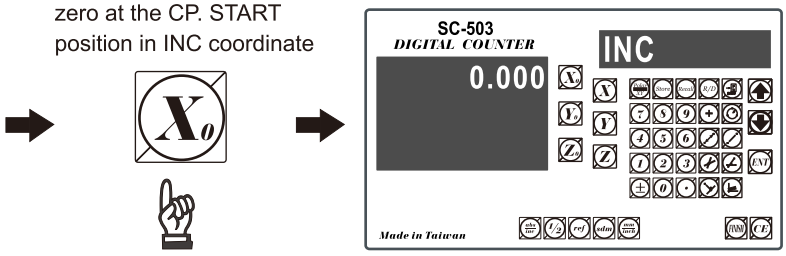
record down this position by pen, i.e., the CP.START= -90.565

3) Start measure the errors to build up an error curve

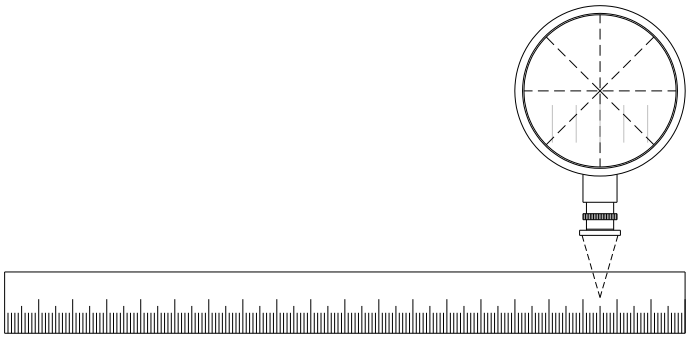
To make the error measurement more easy, swap to INC coordinate and zero at the CP. START position



zero at the CP. START position in INC coordinate



start measure the error by positioning the cross hair of screen on the glass scale. Take down the display value shown at the readout and compare it with the glass scale grating.



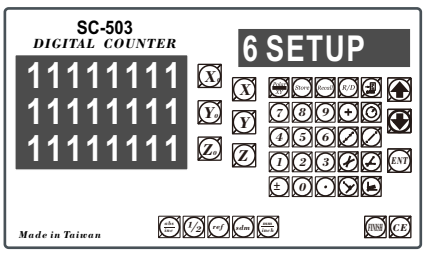
- record down the measured value from the readout and fill up following table

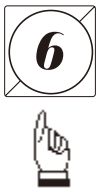
standard position	measured result
10.000	10.003
20.000	20.007
30.000	30.005
40.000	40.010
50.000	50.007
.....	.....
.....	.....
180.000	180.009
190.000	190.090
200.000	200.050

CP.START=-90.565
CP.PITCH=10
CP.STEP=20

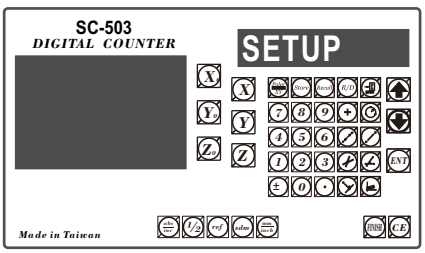
4) Enter the error curve data into the SC-500 readout

switch off the readout and
then switch it on again to enter
into the "SETUP" function



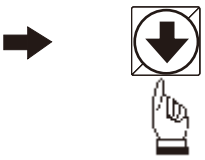


during the start up of readout,
when the readout displays
the software version number,
press "6" once to enter
int the "SETUP" function

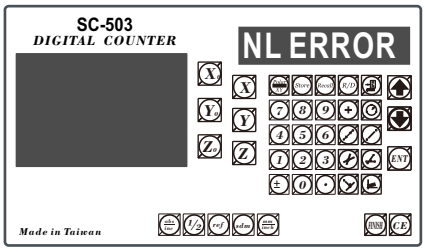


Non-linear error compensation

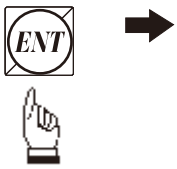
after entered into the "SETUP" function, press the "down" key until display "NL Error" appear in message window



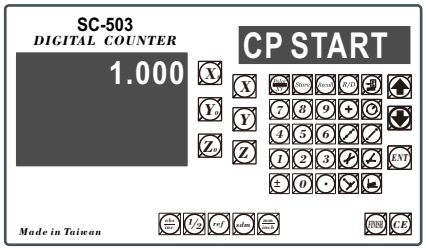
NL Error is Non-Linear Error
(Non Linear Error Compensation)



press ENT to enter into NL error function



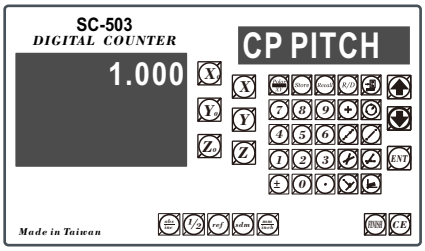
enter the CP. START



X ± 9 0 • 5 6 5 ENT

next step

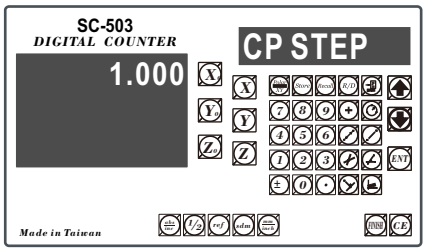
enter the CP. PITCH



X 1 0 ENT

next step

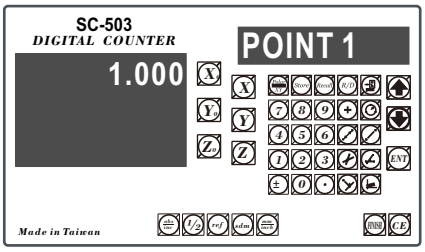
enter the CP. STEP



X 2 0 ENT

After entering the “Point 1” status, press the up/down key to select the measuring result at the point selected.

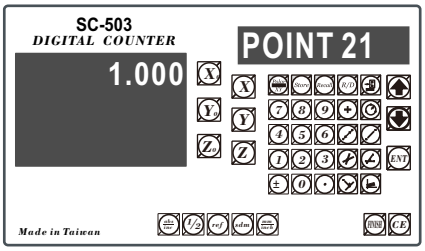
Input the measuring result.



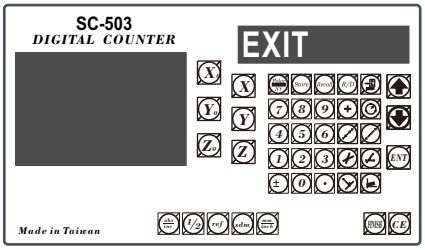
- - - - - The measuring result - - - ENT

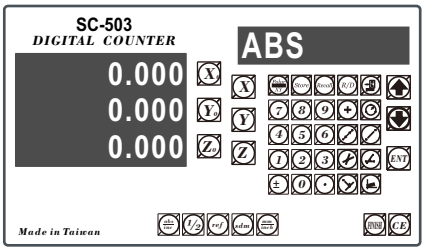
Non-linear error compensation

After all data inputs are done, press CE to exit.

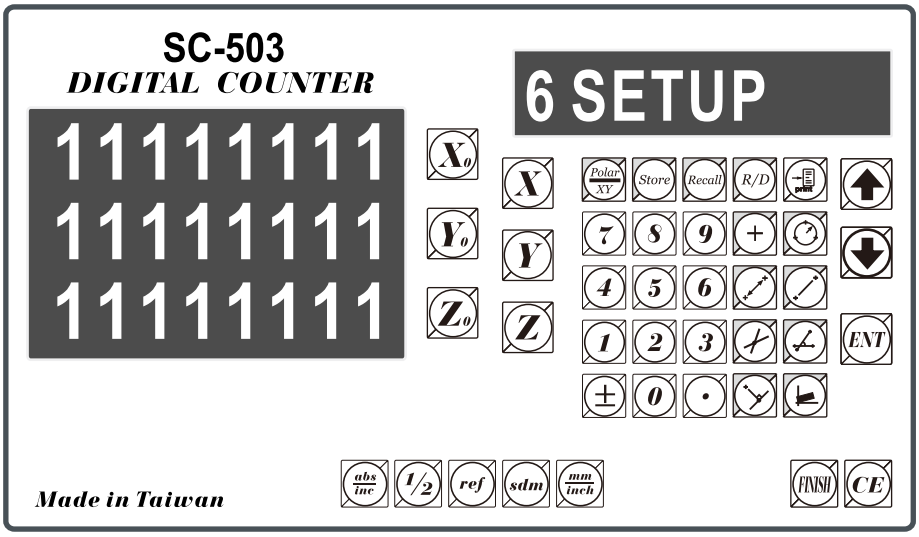


Press up/down key till EXIT appears.



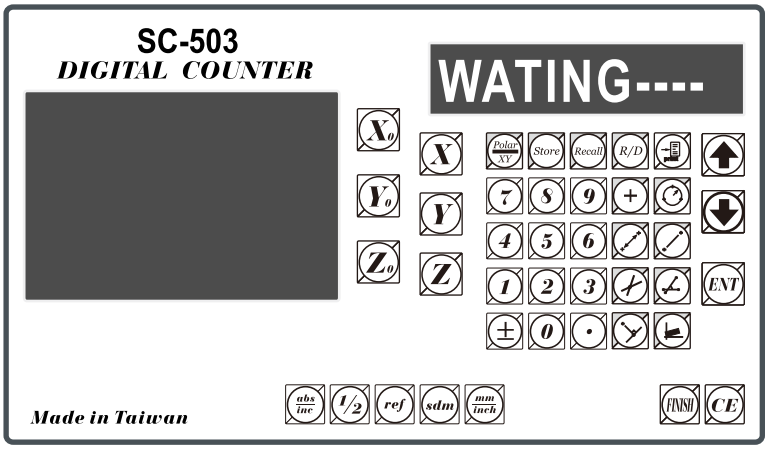


Parameters Setup



BAUD SET ..... set up RS232 transmission baud.
PRT ON/OFF ..... turn on/off printer.
BEEP ON/OFF ..... turn on/off beeper.
RESOLUTE ..... set up Linear scale resolution.
CP ERROR ..... compensate Linear scale error
LINEAR P ..... compensate linear error.
NL ERROR ..... compensate nonlinear error (point compensation)
DIRECT ..... set up direction.
EXIT ..... end and exit.

Reset display's original parameter (RESET)



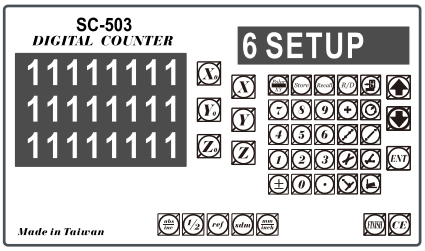
When the DRO is under the impact of abnormal voltage, or user's improper operation that cause parameter setting in error, it needs to default simple working parameters by resetting them to default value from memory. Yet, before parameter reset, check if there is any parameter value set in already; if so, write down the setting data and set it up after reset.

Operation steps:

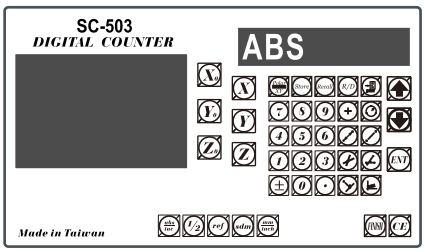
1) . Turn off the DRO power.

2) . Turn on the DRO; when "11111111" test signal is shown in the display window, press "0" and the display start performing "reset".

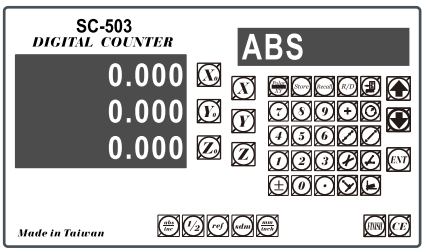
While turning on the display, it will perform self diagnosis and test; press 0



3). 1.When parameters reset, "WATING" will show on the display.



"WAITING --" is shown as parameter reset is underway.

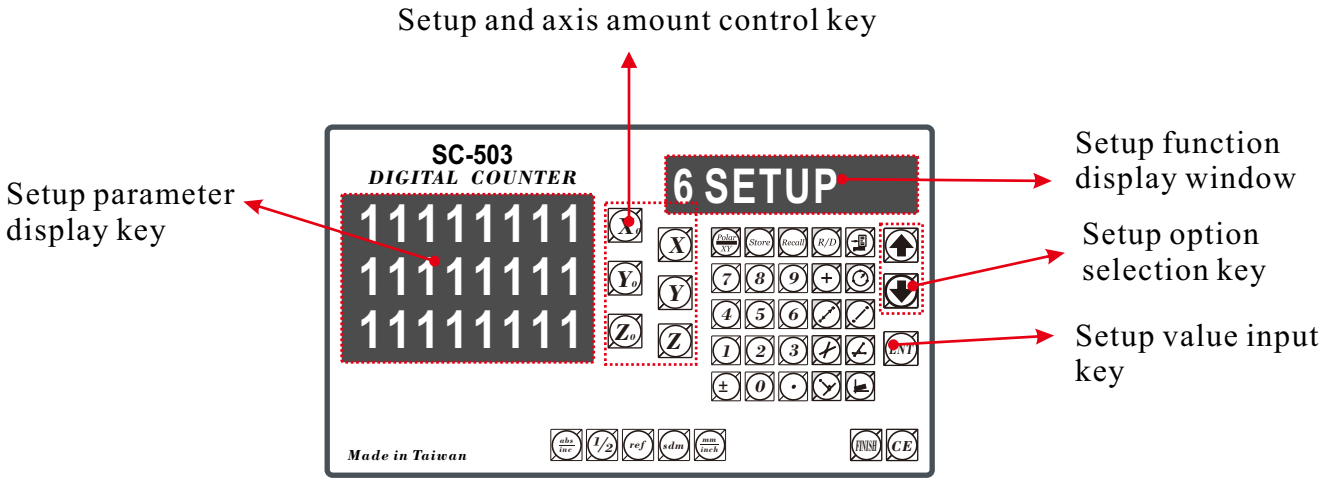


After coming backing to normal mode, the parameter reset process is complete.

Set up new parameters in display (SETUP)

When DRO-change IC is under the impact of abnormal voltage or improper operation, which cause the default disturbed; or user wants to change production process and needs to modify the default value, it needs to set up DRO and reset function values in memory.

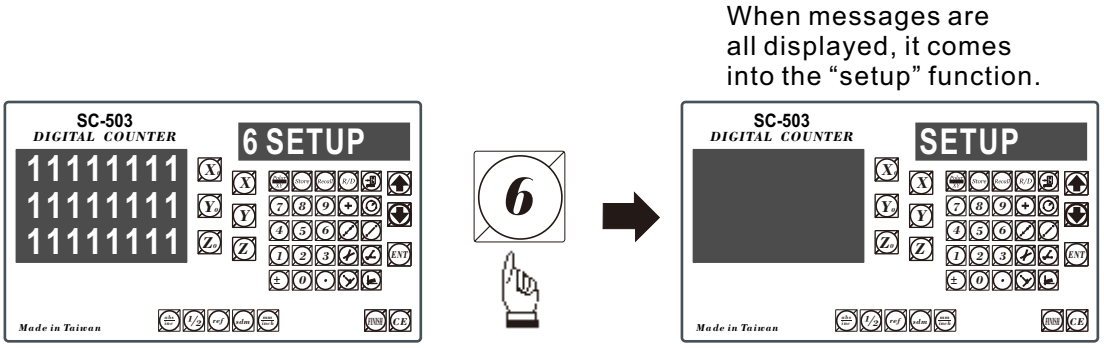
DRO in the display and related key locations in the SETUP process:



Operation steps:

1). 1.Turn off the DRO power.

2). Turn on the DRO; when self-diagnosis test signal is shown in the display window, press 6 and the display start performing "setup"

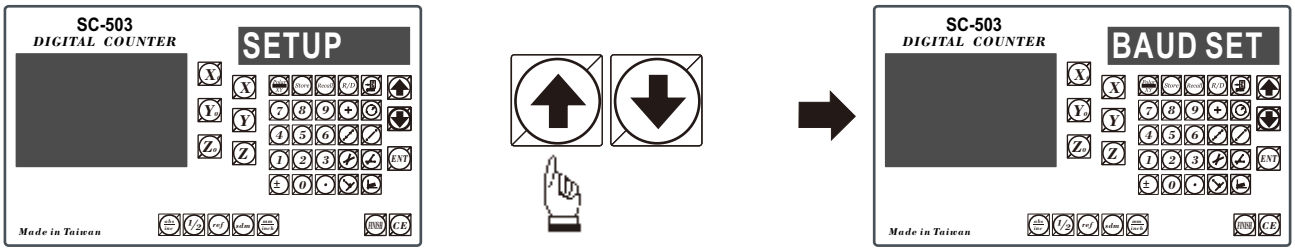


The setup procedure is designed to option menu mode; the Definition List facilitates user to apply the following options.

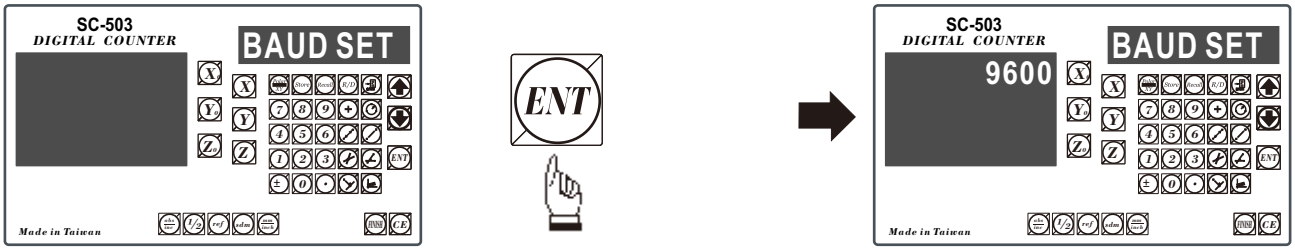
The first layer functions are, in turn, defined as below:

BAUD SET ..... set up RS232 transmission baud.
PRT ON/OFF ..... turn on/off printer.
BEEP ON/OFF ..... turn on/off beeper.
RESOLUTE ..... set up Linear scale resolution.
CP ERROR ..... compensate Linear scale error
LINEAR P ..... compensate linear error.
NL ERROR ..... compensate nonlinear error (point compensation)
DIRECT ..... set up direction.
EXIT ..... end and exit.

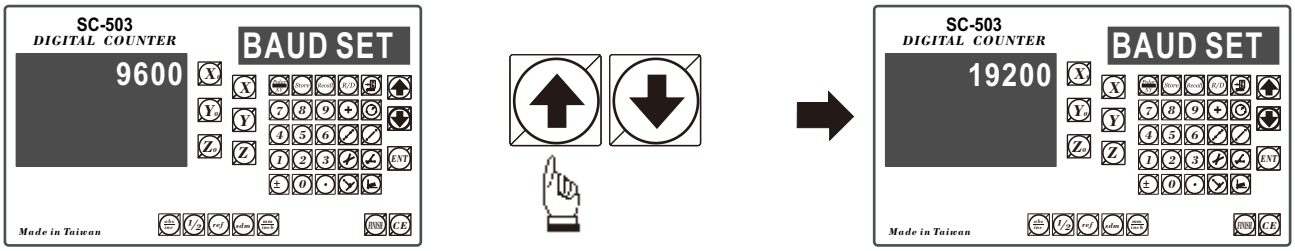
3) Press to "BAUD SET".



Press to enter the setting of RS232 transmission baud.

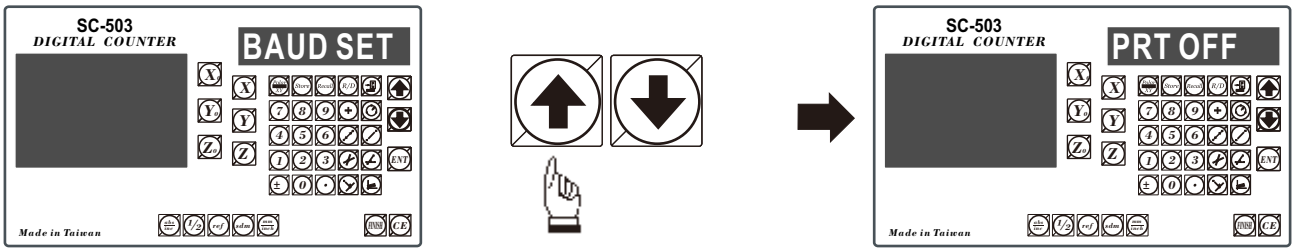


Press or to select the correct baud speed from 1200/2400/4800/9600/19200/57600.

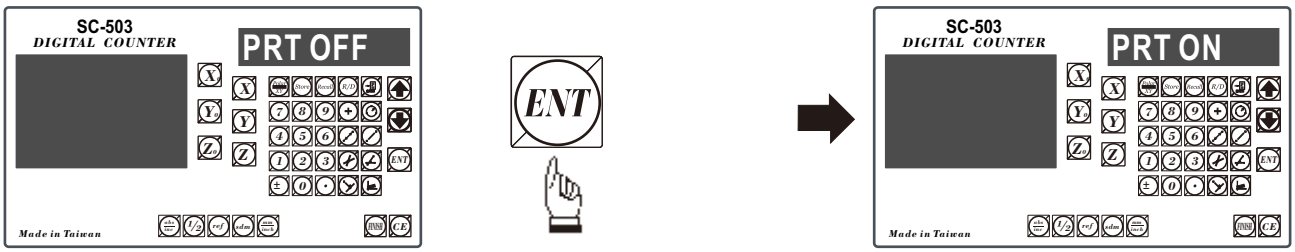


After baud speed is selected, press to end up this setting function.

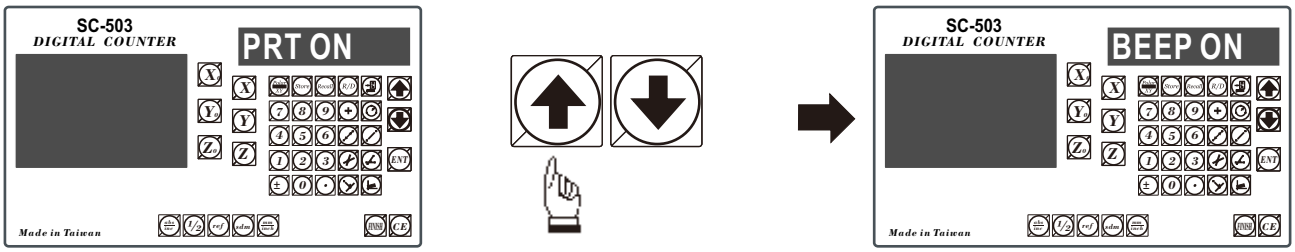
4) Press ▲ or ▼ and move to "PRT ON/OFF".



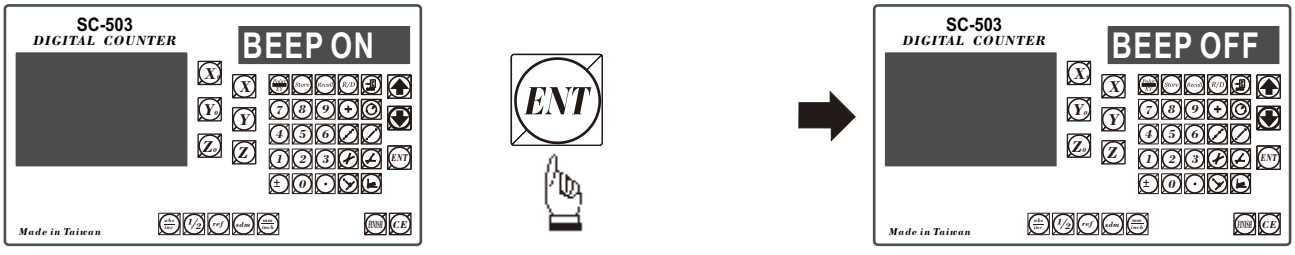
Directly press ENT to change over OFF & ON.



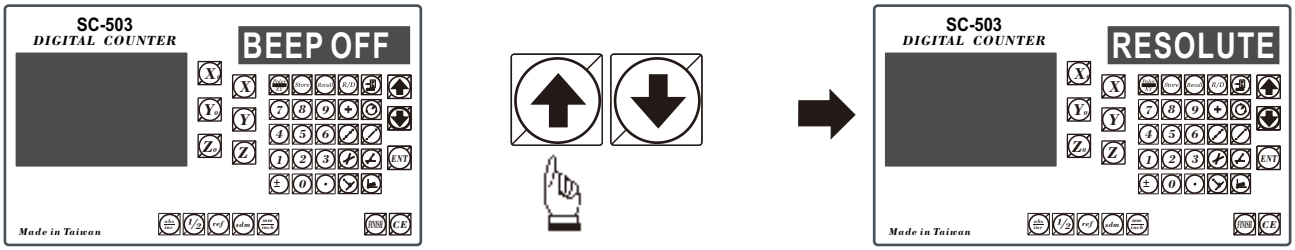
5) Press ▲ or ▼ and move to "BEEP ON/OFF".



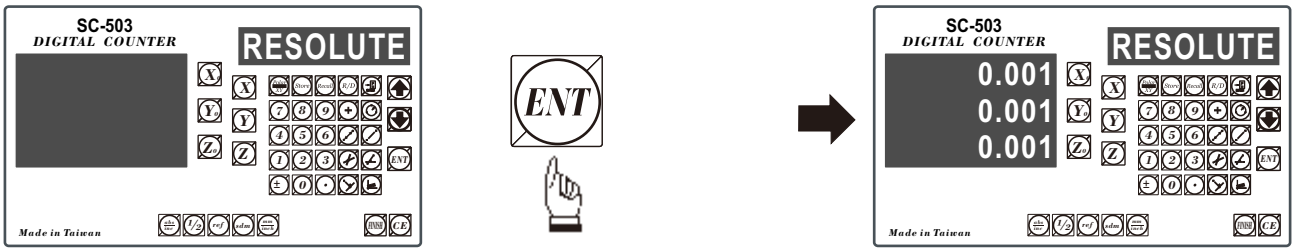
Directly press ENT to change over OFF or ON.



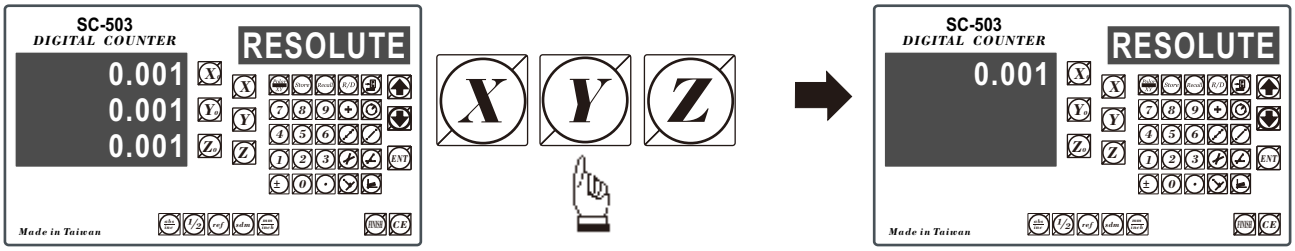
6) Press ▲ or ▼ and move to "RESOLUTE".



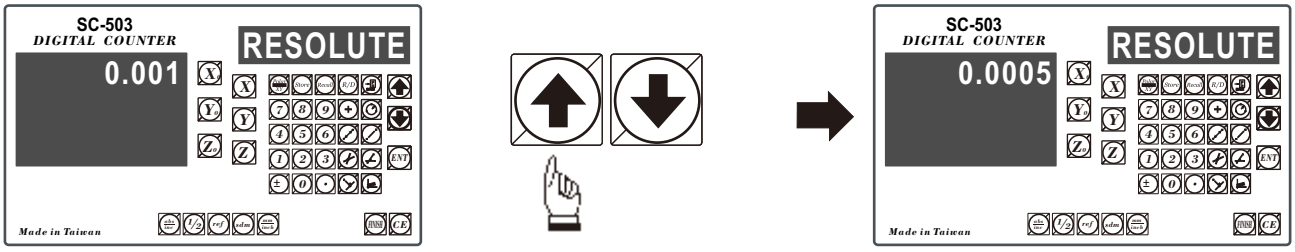
Press ENT to enter the linear scale resolute setup.



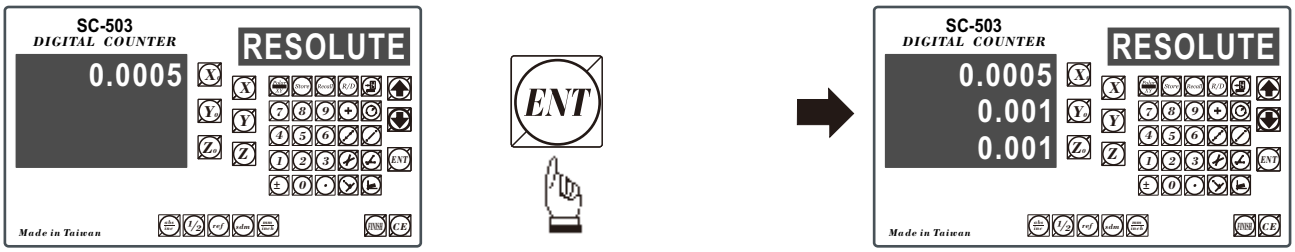
Press the axis going to be changed: X 、 Y 、 Z



Press ▲ or ▼ to switch to the correct resolution value from 0.01/0.005/0.002/ 0.001/0.0005/0.0002/0.0001

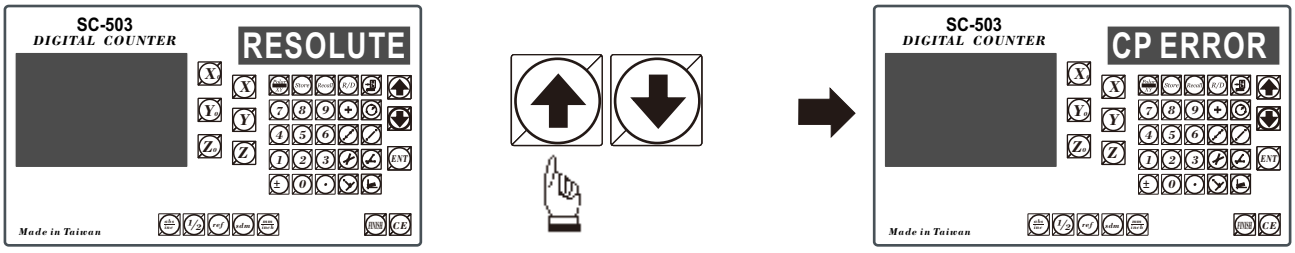


Press ENT to end up this axis's setup

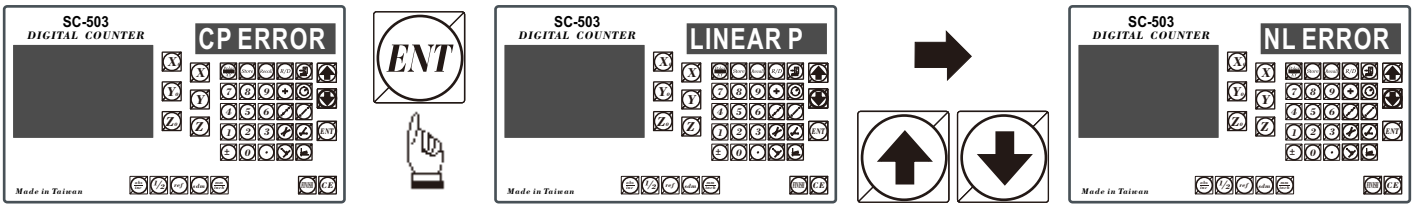


Then, press ENT to end up the linear scale resolute setup procedure.

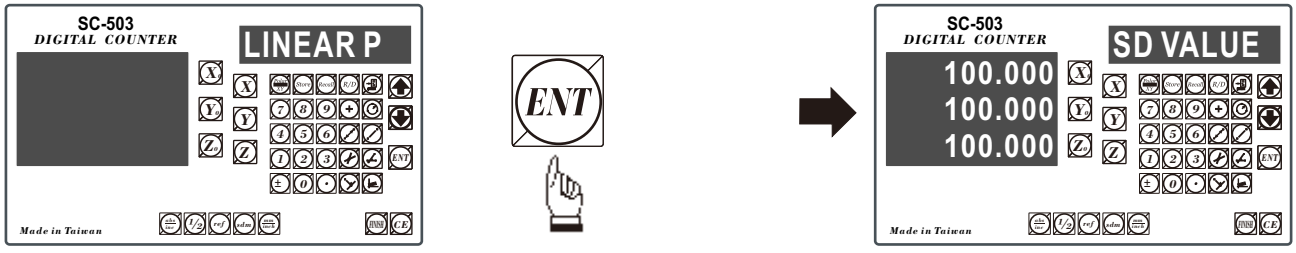
7) Press ▲ or ▼ to "CP ERROR" (error compensation).



Press ENT to enter the compensation setup; you can press ▲ or ▼ to switch between the "LINEAR P" (linear compensation) mode and "NL ERROR" (nonlinear compensation) mode; choose one alternatively.

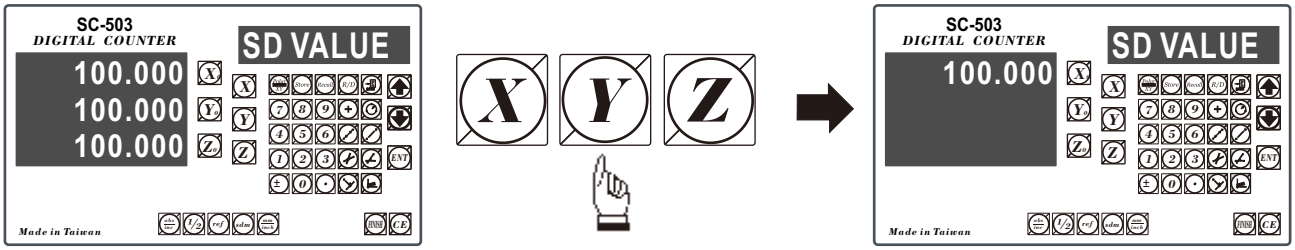


While selecting "LINEAR P", press ENT to enter the linear compensation process.

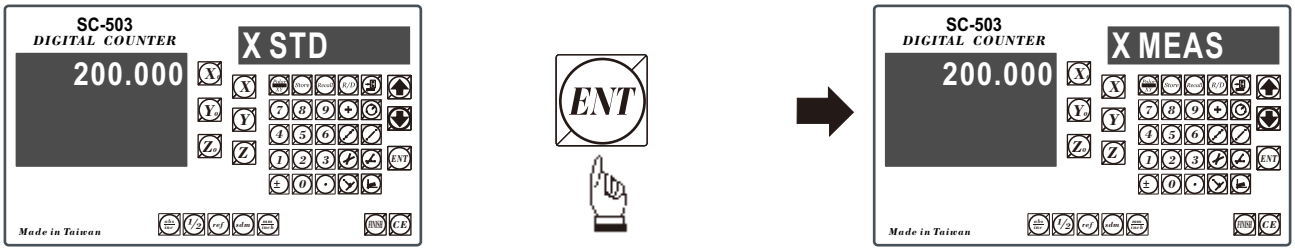


Parameters Setup

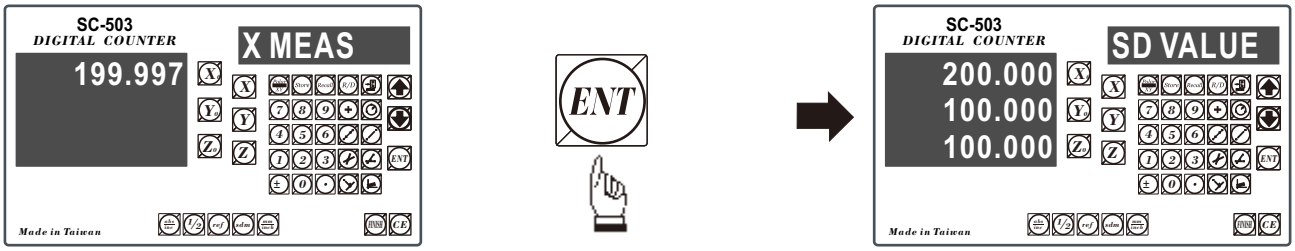
Press the axis X , Y or Z under compensation.



Input the length measured and press ENT .



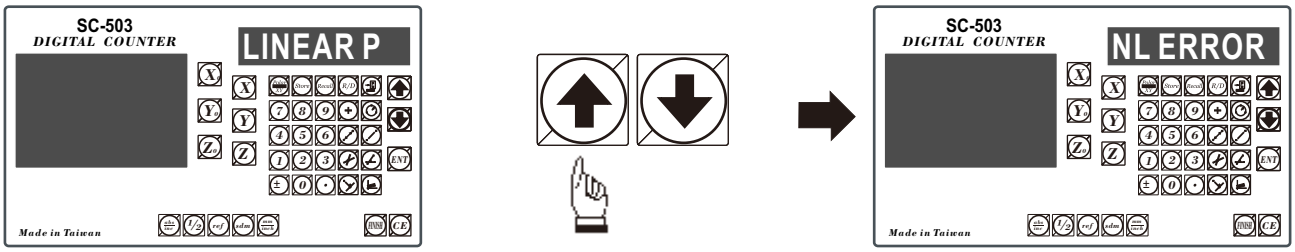
Input the actual length and press ENT .



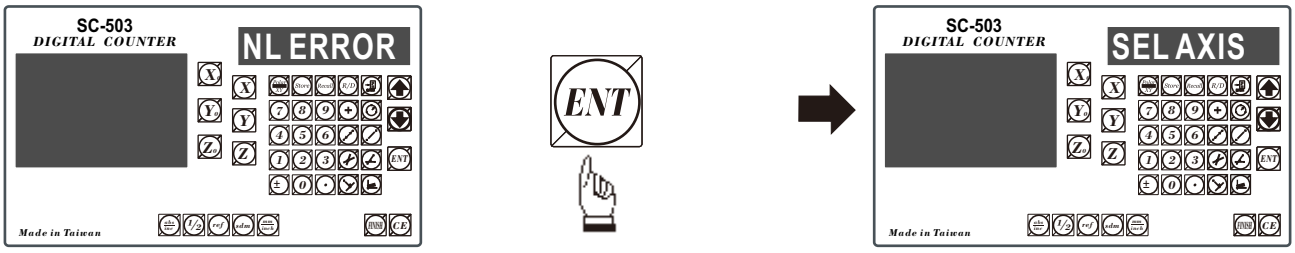
Press other axis Y or Z under change and follow the above procedure to operate;
after the compensation procedure is done, press ENT to end up the compensation of linear scale.

Parameters Setup

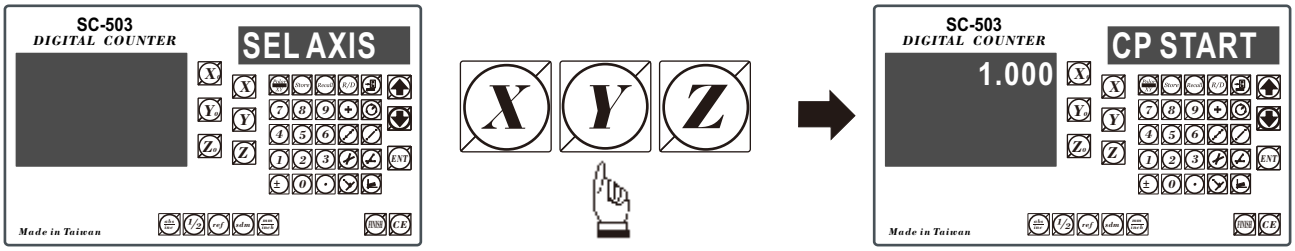
Press ↑ or ↓ to switch to "NL ERROR" (nonlinear compensation).



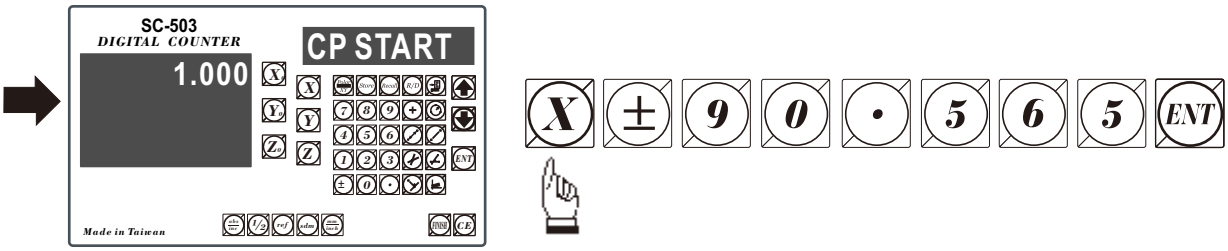
Press ENT to enter the nonlinear compensation setup.



Press the axis X , Y or Z under compensation.



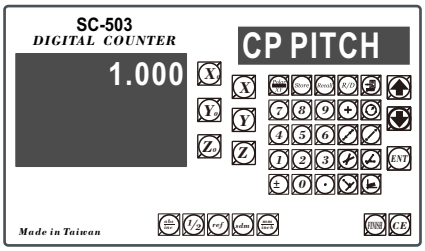
Input CP START

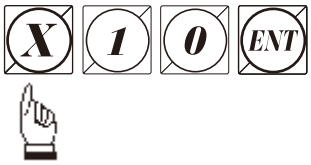


Parameters Setup

Input CP PITCH

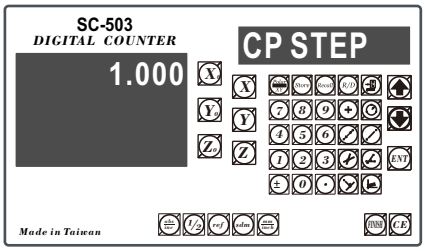
Next step

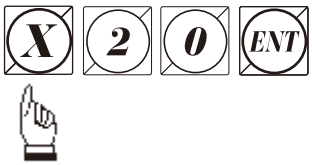




Input CP STEP

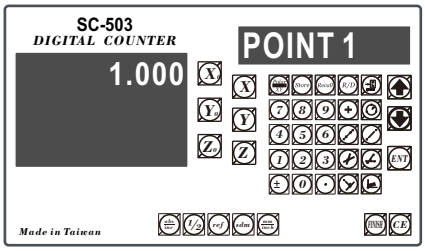
Next step





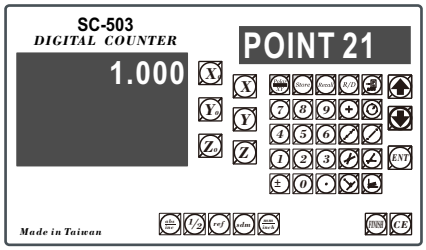
After entering the "Point 1" status, press the up/down key to select the measuring result at the point selected.

Input the measuring result.

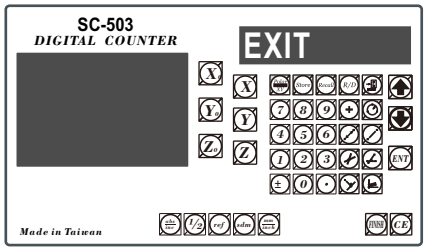


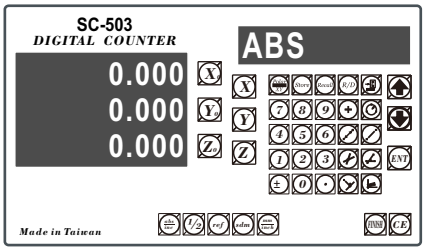
- - - - - The measuring result - - - - -

After all data inputs are done, press CE to exit.



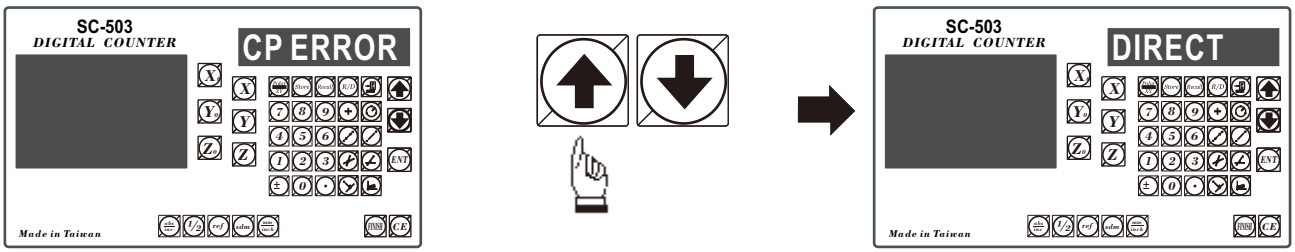
Press up/down key till EXIT appears.



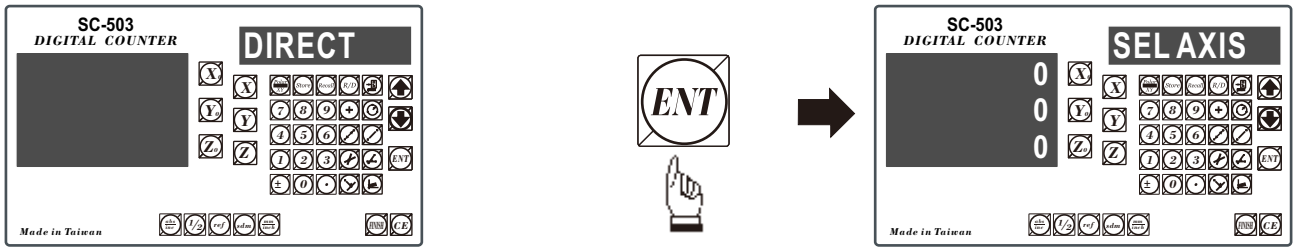


If use the error compensation function, you must turn off the DRO then power on the DRO again, otherwise your compensated value will invalid.

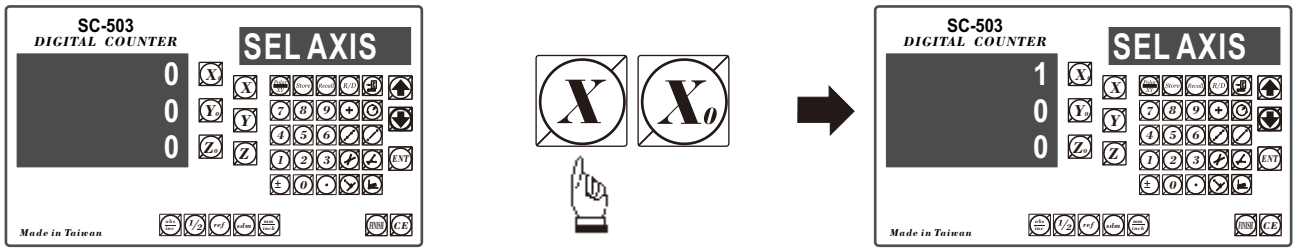
8) Press ▲ or ▼ to move the "DIRECT" (direction setup).



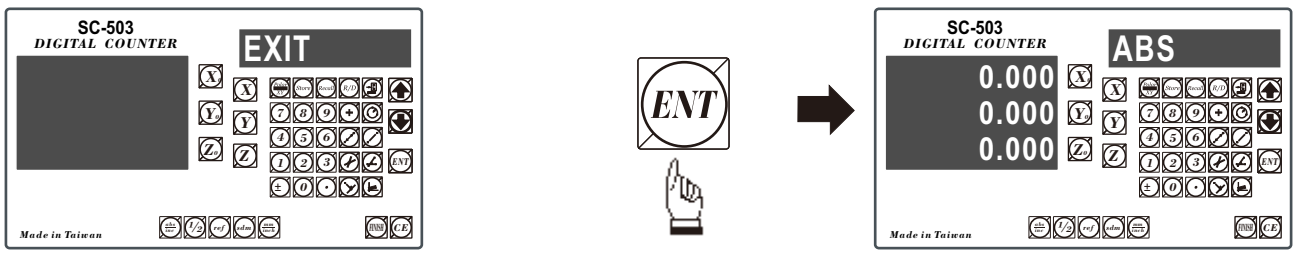
Press ENT to enter direction setup mode. "0" means in positive direction whereas "1" means the negative direction.



Press X or X_0 to set up X-axis to "1" (negative direction); and do it to Y- & Z-axis similarly.



9) Press ENT to exit; and ▲ or ▼ to "EXIT" and end up the parameter setup.



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