

Operation Guide for Thickness Measured by Point Laser Products in Through-beam Method

-----V1.0



Manufacturer of World-Class Sensors

Version

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V1.0	2024/08/28	Draft	Yang Zhibin

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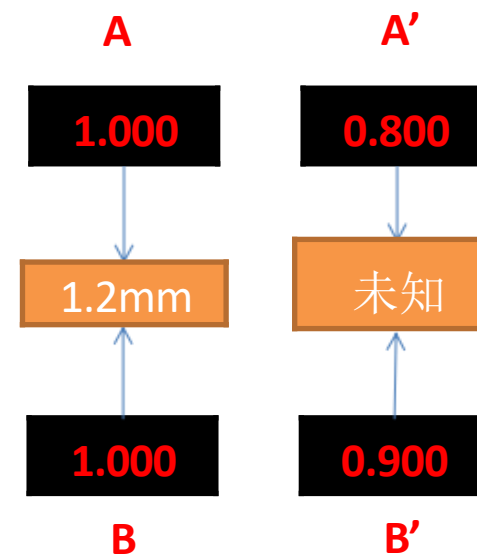
I. Computing Formula of Thickness Measured in Through-beam Method (This formula is applicable to SD33, SD22 and SC series products.)

Calculation method:

1. After aligning the light spots, place a gauge block with known thickness between the upper and lower sensor heads, and record the values of the upper and lower sensor heads. For example, the upper sensor head is 1 and the lower sensor head is 1 in the right picture.
2. Replace the gauge block with the actual measured object, and record the values of the upper and lower sensor heads. For example, the upper sensor head is 1.2 and the lower sensor head is 1 in the right picture.
3. Calculation formula:
$$= \{ - (A' \text{ sensor head value} - A \text{ sensor head value}) + [- (B' \text{ sensor head value} - B \text{ sensor head value})] \} + \text{gauge block thickness}$$

As shown in the right figure, $\{-(0.8-1)+[-(0.9-1)]\}+1.2=1.5$.

(SD33, SD22, SD-C, SGI series products need to export two sensor heads and then calculate according to the formula without the controller, and other series products can directly output the thickness value with the controller).



Note: The farther away SD33, SD22 and SC series are from the measured object, the greater the displayed value.

I. Computing Formula of Thickness Measured in Through-beam Method (This formula is applicable to SD-C, SGI, SG, and SCI series products.)

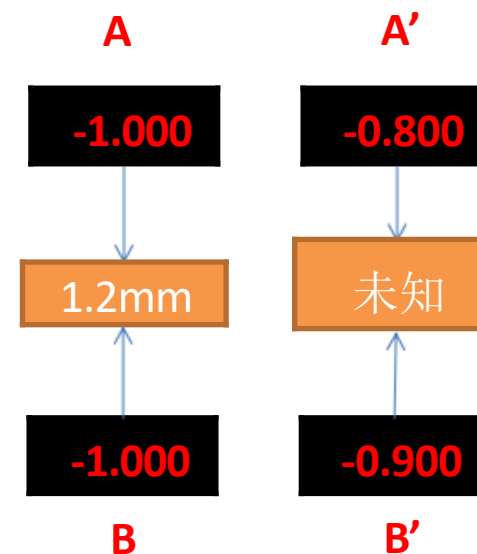
Calculation method:

1. After aligning the light spots, place a gauge block with known thickness between the upper and lower sensor heads, and record the values of the upper and lower sensor heads. For example, the upper sensor head is 1 and the lower sensor head is 1 in the right picture.
2. Replace the gauge block with the actual measured object, and record the values of the upper and lower sensor heads. For example, the upper sensor head is 1.2 and the lower sensor head is 1 in the right picture.
3. Calculation formula:

$$=(A' \text{ sensor head value} - A \text{ sensor head value}) + (B' \text{ sensor head value} - B \text{ sensor head value}) + \text{gauge block thickness}$$

As shown in the right figure, $(-0.8-1) + (-0.9-1) + 1.2 = 1.5$

(SD33, SD22, SD-C, SGI series products need to export two sensor heads and then calculate according to the formula without the controller, and other series products can directly output the thickness value with the controller).



Note: The farther away SD-C, SGI, SG, and SCI series are from the measured object, the greater the displayed value.

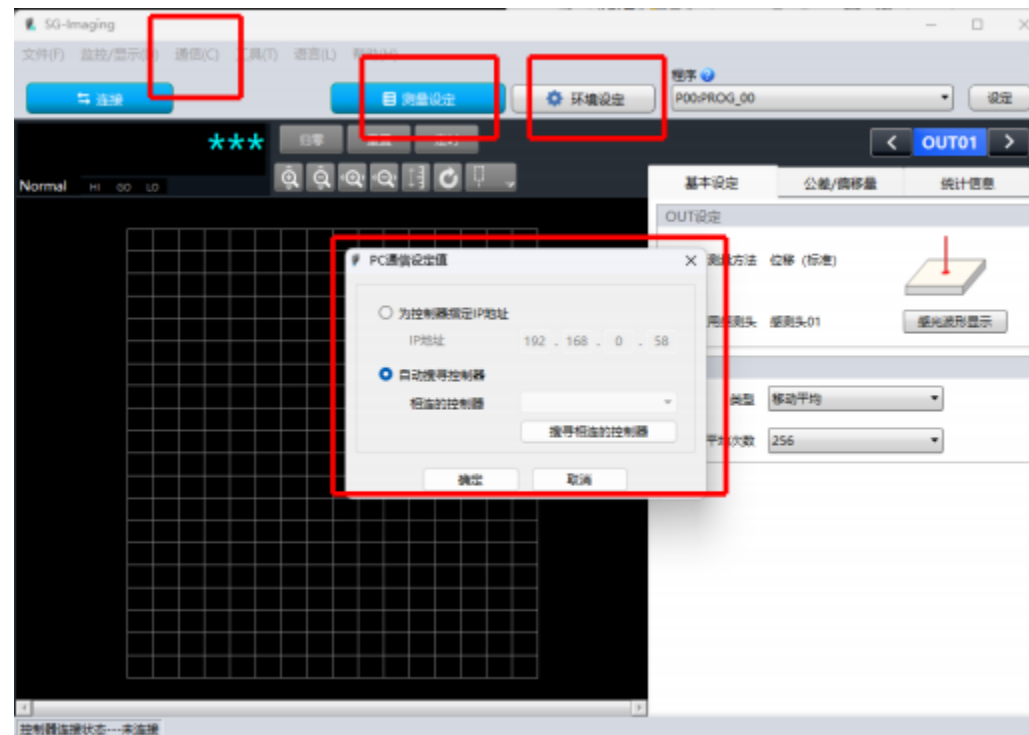
II. Settings of SG-Imaging Software

Commonly used for SG, SC, SCI

Steps:

1. Start up the software - pop up the **PC communication settings box** (if not, click on the **menu bar - Communication - PC Communication Settings**)
2. Click **Search Connected Controller - Confirm** (if unsuccessful, change the **first three digits** of the host IP address to be the same as the first three digits of the controller.

For example, if the red box IP in the right figure is **192.168.0.58**, change the host IP address to **192.168.0.xxx**. xxx is any value from **0 to 255**. Note: do not set the same IP address with other devices).



II. Settings of SG-Imaging Software

Commonly used for SG, SC, SCI

Steps:

1. Click **Environment Settings**, where you can modify the baud rate, and check the **Port Number**, **IP address**, etc.
2. Click **Measurement Settings - Synchronous Settings**, check all of **OUT01**, **OUT02** and **OUT03**, and press OK (the sampling frequency can be changed by synchronously setting the **Sampling Settings** above).



II. Settings of SG-Imaging Software

Commonly used for SG, SC, SCI

Steps:

1. Click the **Measurement Setting - Measurement Method** - **Option** to adjust the minimum display unit to 0.0001mm (the unit can be adjusted as required).
2. Click **Basic**, and click **OUT01: Displacement (standard)**, and select the **Sensor Head 01**; Click **OUT02: Displacement (standard)** and select the **Sensor Head 02**; Click **OUT03: Displacement (standard)**, click **Edit**, select **Calculate**, and select **X+Y** as the operation formula, the equation will be **OUT03=OUT01+OUT02**.



II. Settings of SG-Imaging Software

It needs to be set separately only for SC. Skip this page directly for SG and SCI !!!

Steps:

1. Click **Measurement Settings - Measurement Method** to set **OUT01: Displacement (Standard) - Scaling, Offset, Tolerance**, and change the displayed value from 2 to -1. Click **OUT02: Displacement (standard) - Scaling, Offset, Tolerance**, and change the displayed value from 2 to -1.

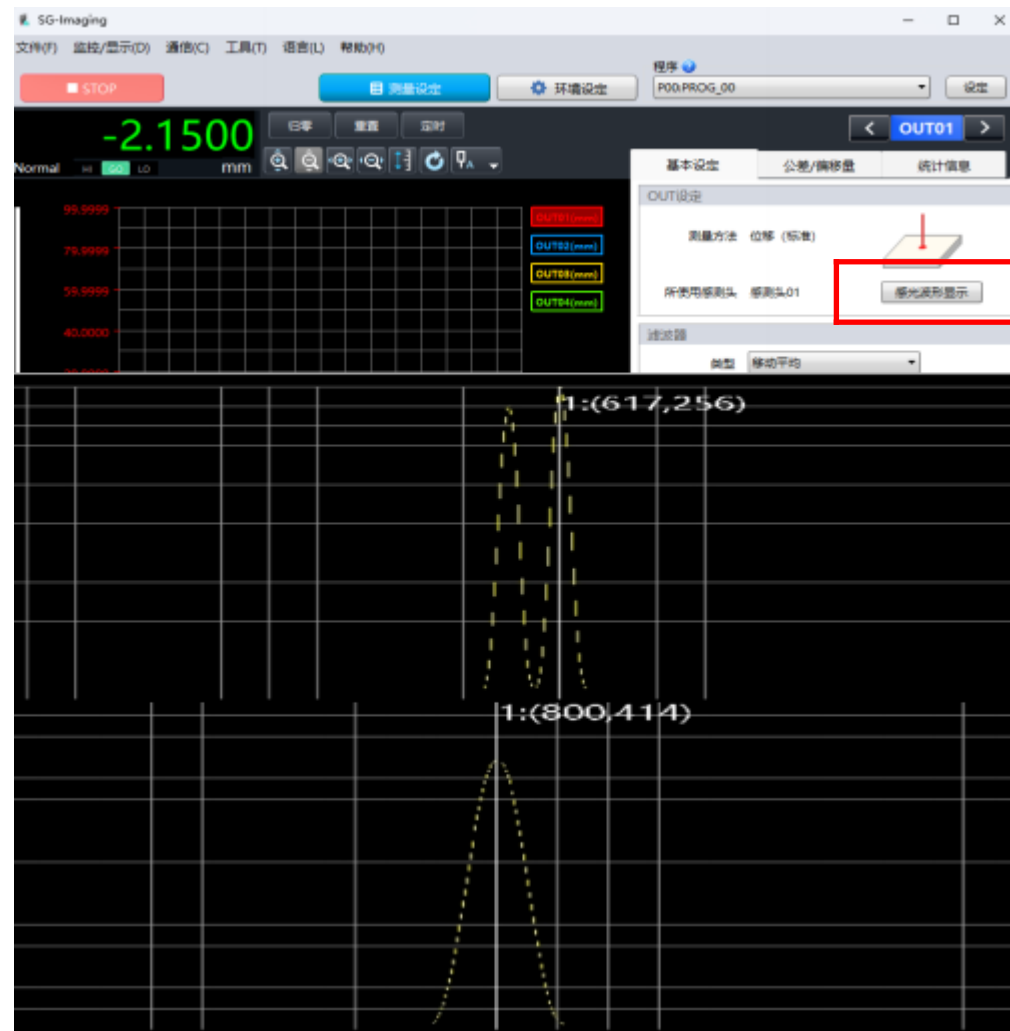


II. Settings of SG-Imaging Software

Keep the upper and lower sensor heads coaxial.

Steps:

1. Install the upper and lower sensor heads on the bracket and make sure that they are **coaxial**. You may put the paper between them to align the laser spot at the same point (try to keep the upper and lower sensor heads in the middle field of view).
2. Click on the **photosensitive waveform display**. If it is close to the coaxial line, two peaks will appear. At this time, adjust slightly according to the peaks, and finally let the two peaks merge into one peak.

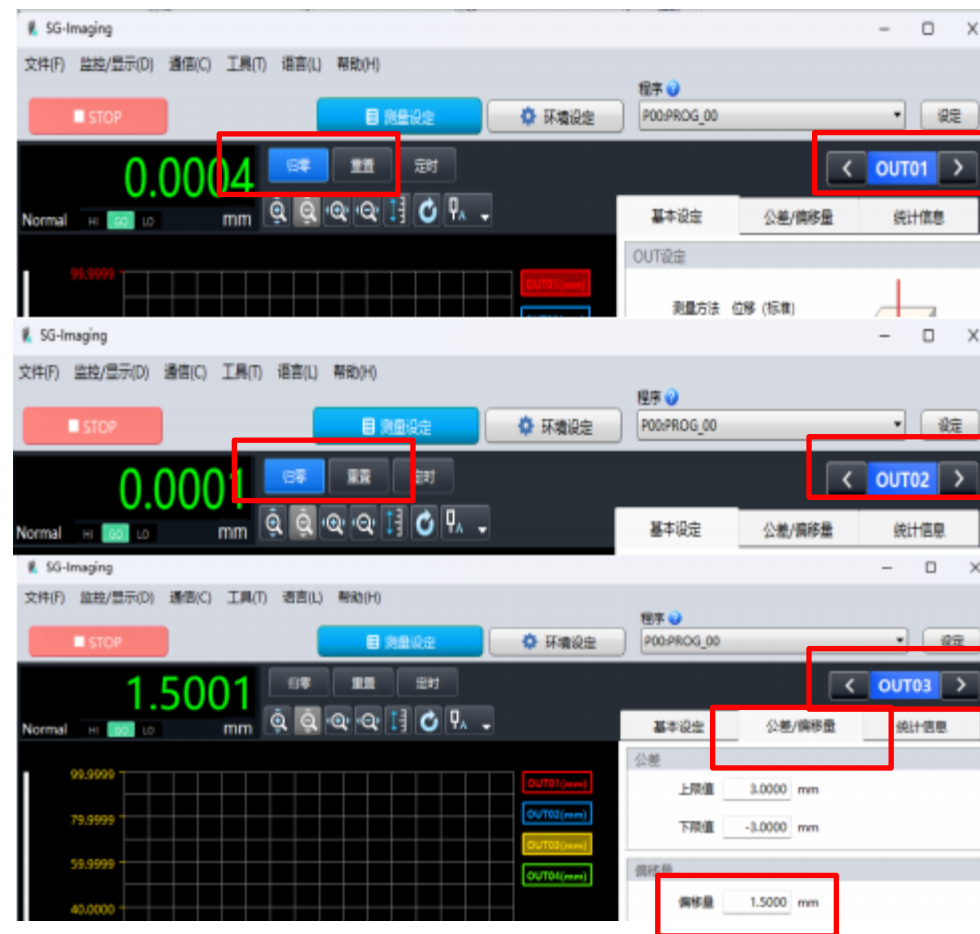


II. Settings of SG-Imaging Software

Commonly used for SG, SC, SCI

Steps:

1. Place a gauge block with a known thickness between the upper and lower sensor heads, for example, the thickness of the gauge block is 1.5 mm.
2. Click OUT01 and click Zero; Click OUT02 and click Zero; Click OUT03, click the Tolerance Offset, and input 1.5 as the Offset. Then remove the gauge block, place the actual measurement sample, and check that the value of OUT03 is the measured thickness.





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