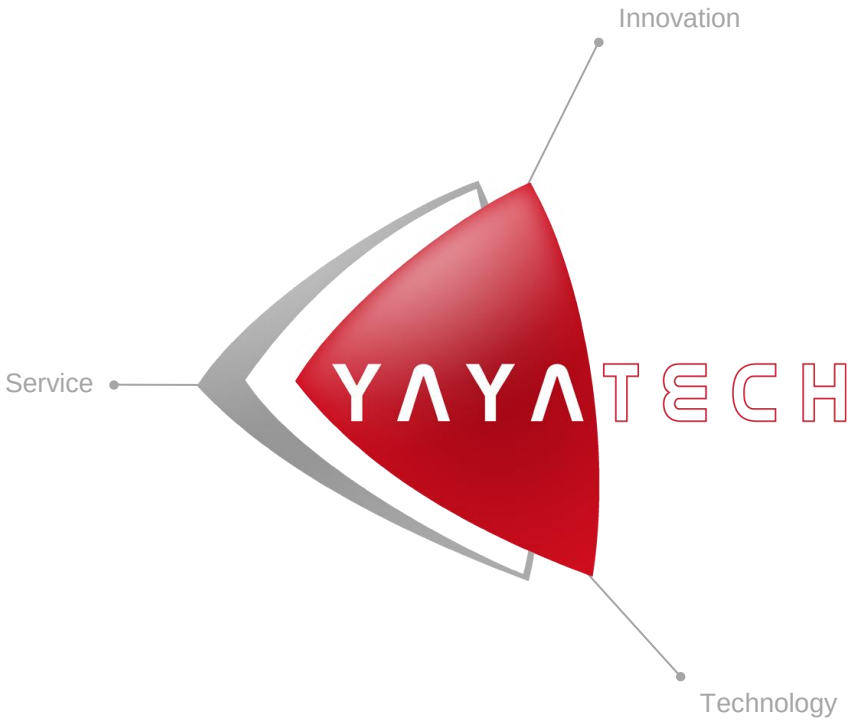


3D-Dimple Inspector

Filling Inspector

The YAYA 3D-Dimple inspector can check the holes depth profile after plating; since it can measure the dimple value of each hole, we are confident this machine will be able to meet customer's future requirements for high quality of fill-holes.

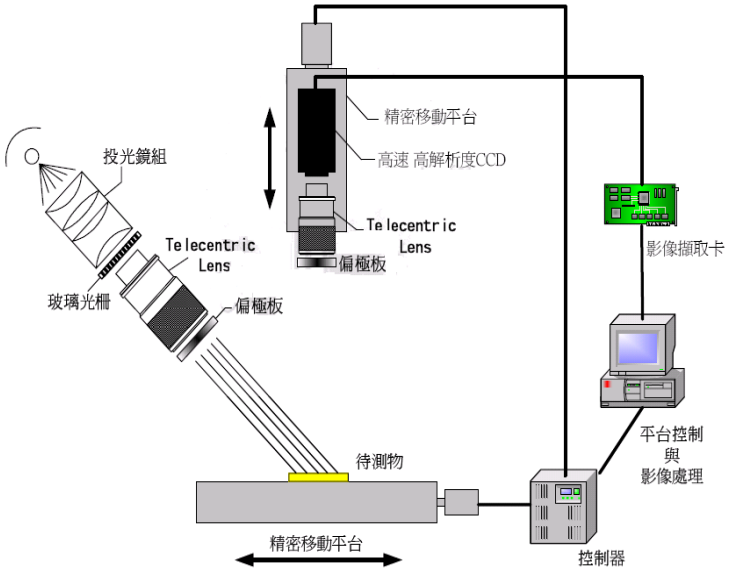
The principle

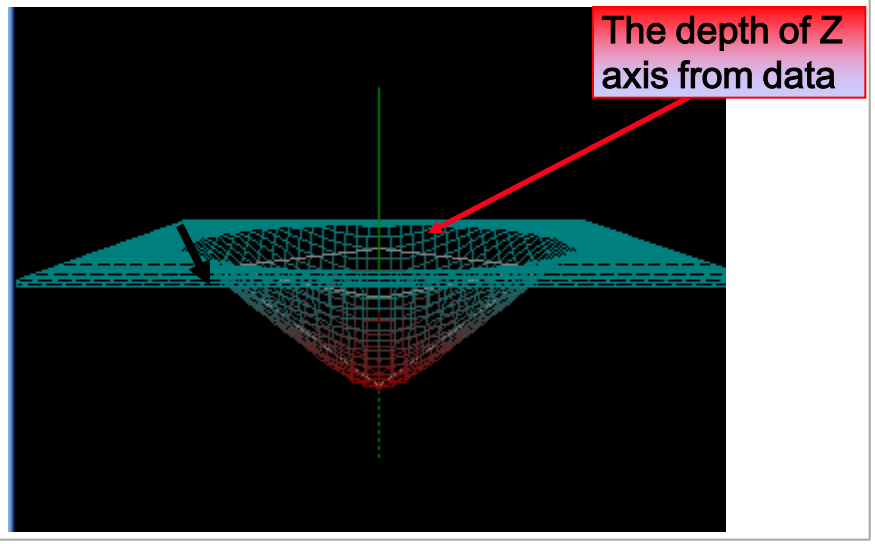
Light System : Light with big angle.

Inspect technology : Use the image and data was took by deferent phase of light, to rebuild the 3D image of panel. You may check the surface situation of the panel.

Statistic : Use the data from Z axis during scanning to calculate.

Vertical resolution : the minimum unit is 0.1um

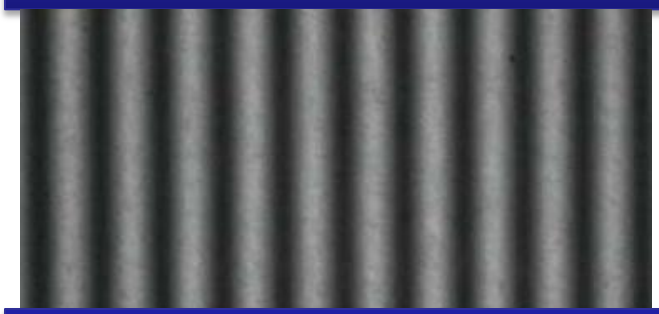




The principle

1. Send parallel sin straight stripe to panel surface.
2. Make raster change its shape on the panel.
3. Move the Panel with high precision stage, and scan the panel three times by high speed, high resolution CCD camera and linear motor to get the image information that we need.
4. After combining all data, we use images that took by CCD camera and phase shift interfere technology to calculate the height of the filling hole.

Send the stripe to the surface



The image of sin raster map

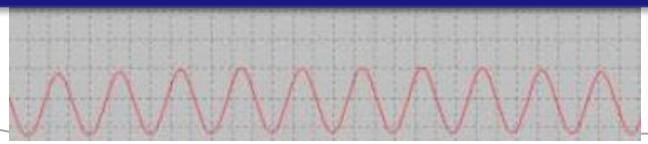
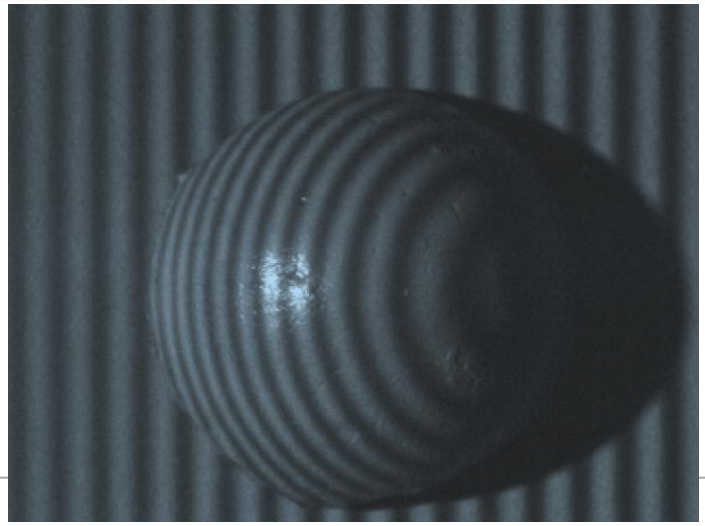


Image chanced when stripe sent to the surface



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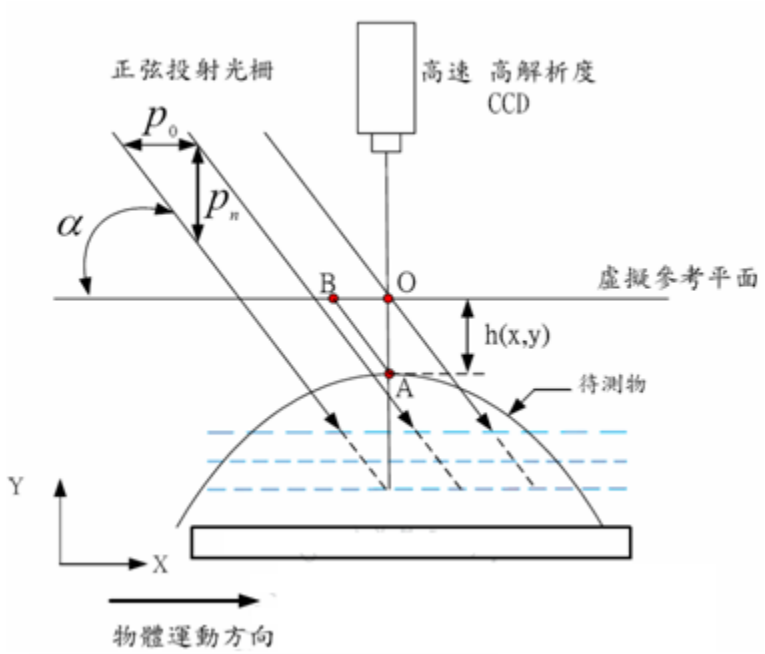
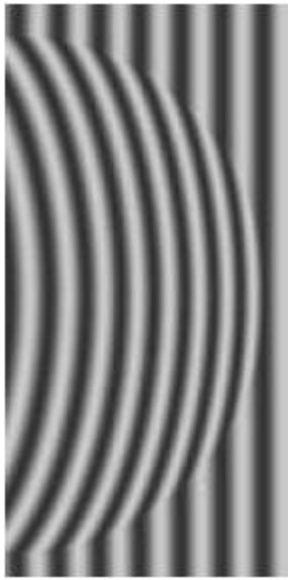
The principle



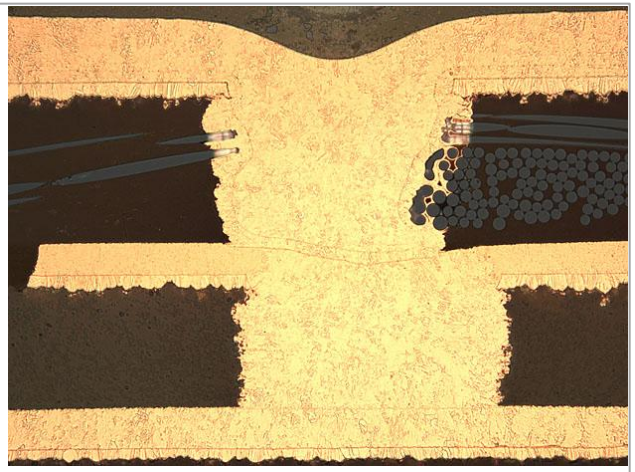


$$h(x,y)=\overline{OA}=\frac{\overline{OB}}{\tan\alpha}=\frac{NP_0}{\tan\alpha}=NP_n$$

$$\tan\alpha=\frac{\overline{OB}}{\overline{OA}}=\frac{P_0}{P_n}$$

$$\phi(x,y)=\tan^{-1}\left[\frac{I_4(x,y)-I_2(x,y)}{I_1(x,y)-I_3(x,y)}\right]$$

Why we use YAYA's inspector



- To reduce operator require.
- To increase inspect speed and 100%sorting.

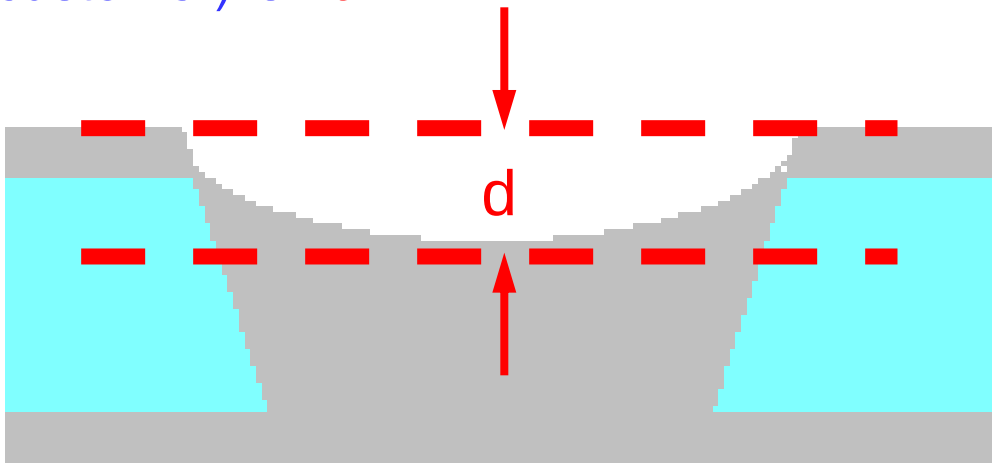
operator takes 2~3hr for one panel, but
FV-68 takes 120secs for one side.

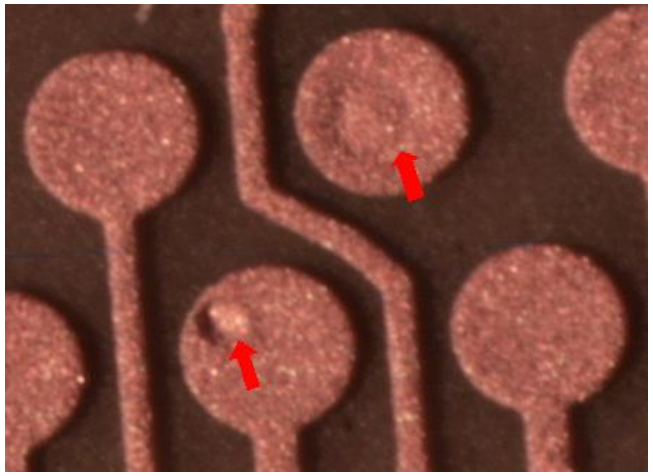
- Inspect all panels with one STANDARD.
- To reduce defect panels to next process to make lower cost.
- Monitoring plating quality.

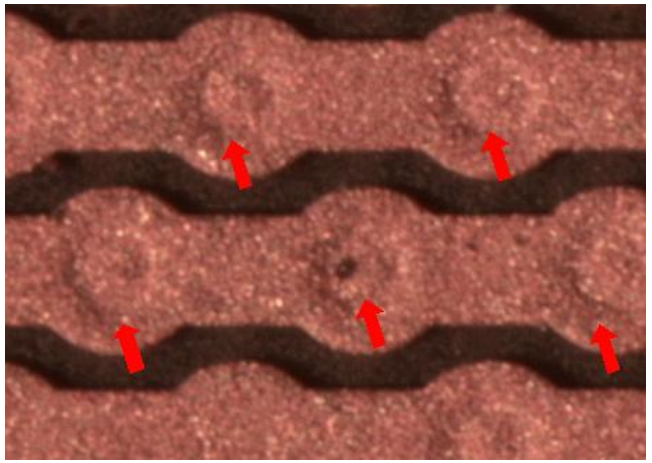
➢ To reduce cost, lost, and waste.

Define Defect

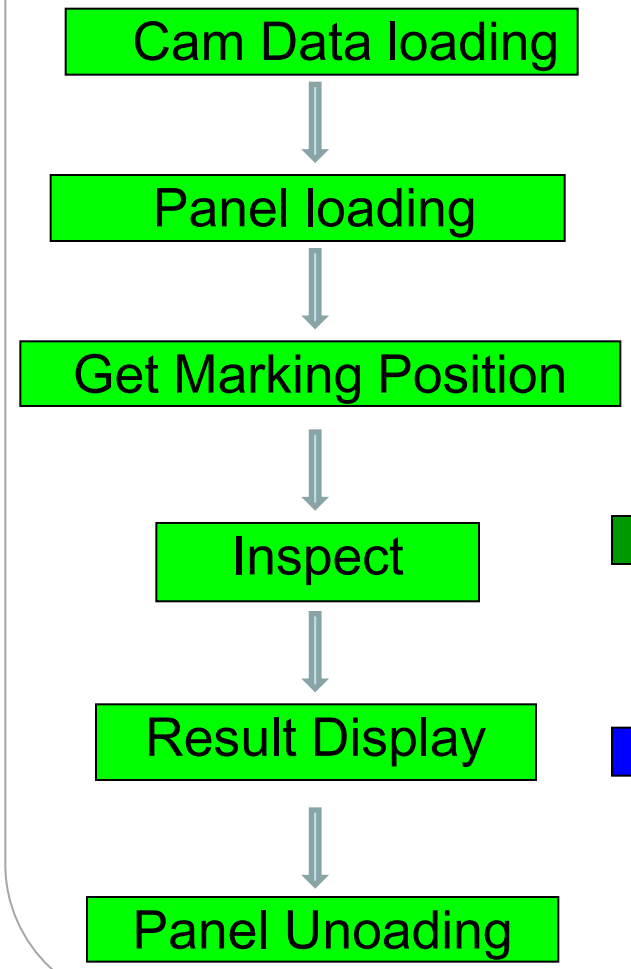
Measure the depth (d) after via filling. If the depth (d) is more than spec(setup by customer) is Fail.







Introduce of sequence Inspect



- Auto alignment by machine, without operator
- High precision alignment
- Takes less than 3 min for setting
- easy to operate

*Measure time<2.0min/pnl(Full pattern)
(Panel size is 16”* 18”,450 thousand hole,
(including alignment and show result.)

*It will show the result of inspection, and analyze graphic on the screen.

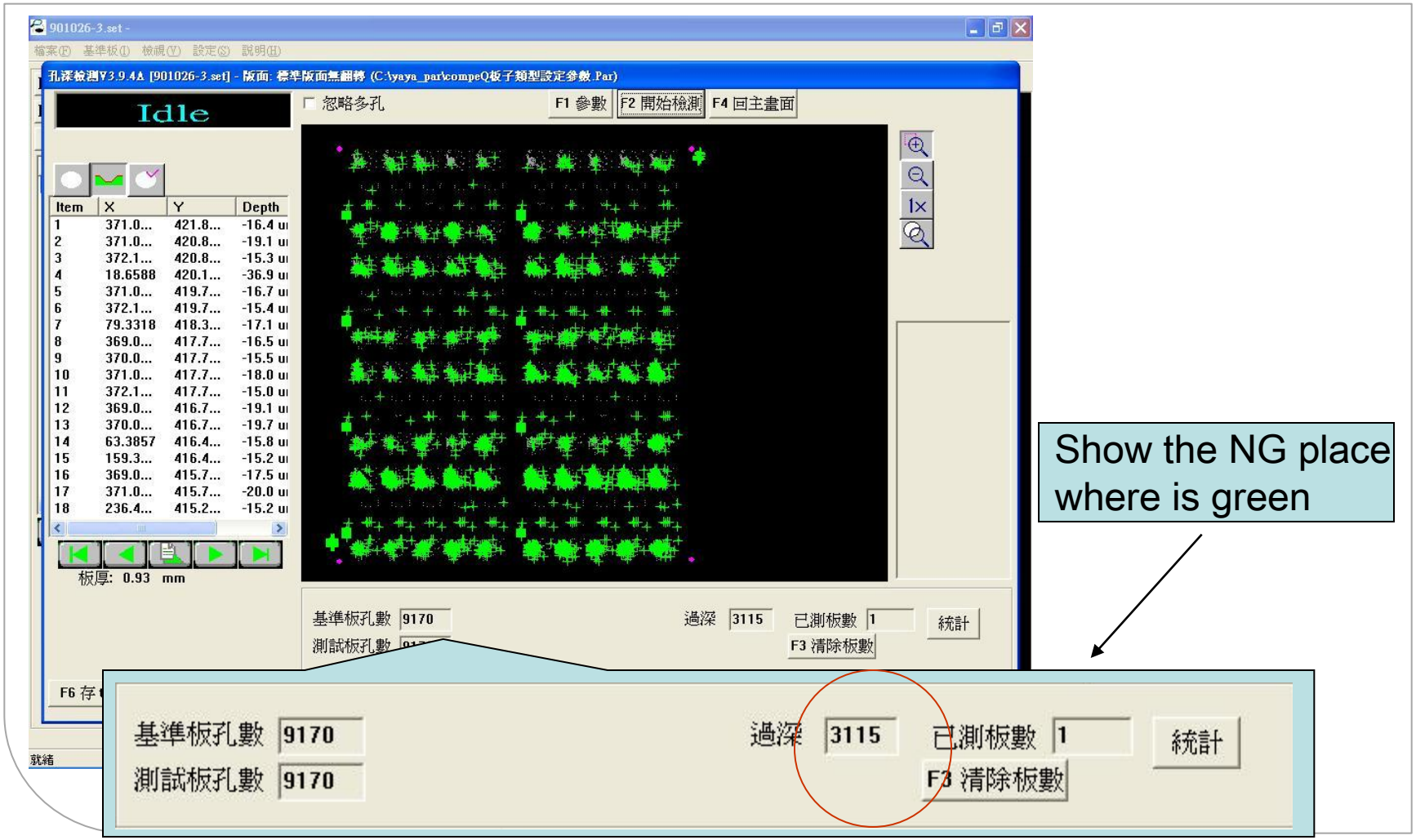
Introduce of precision

Dimple depth	measure precision
0 ~20μm	precision is ≦ ±2μm
over than 20μm	precision is ≦ ±10%μm

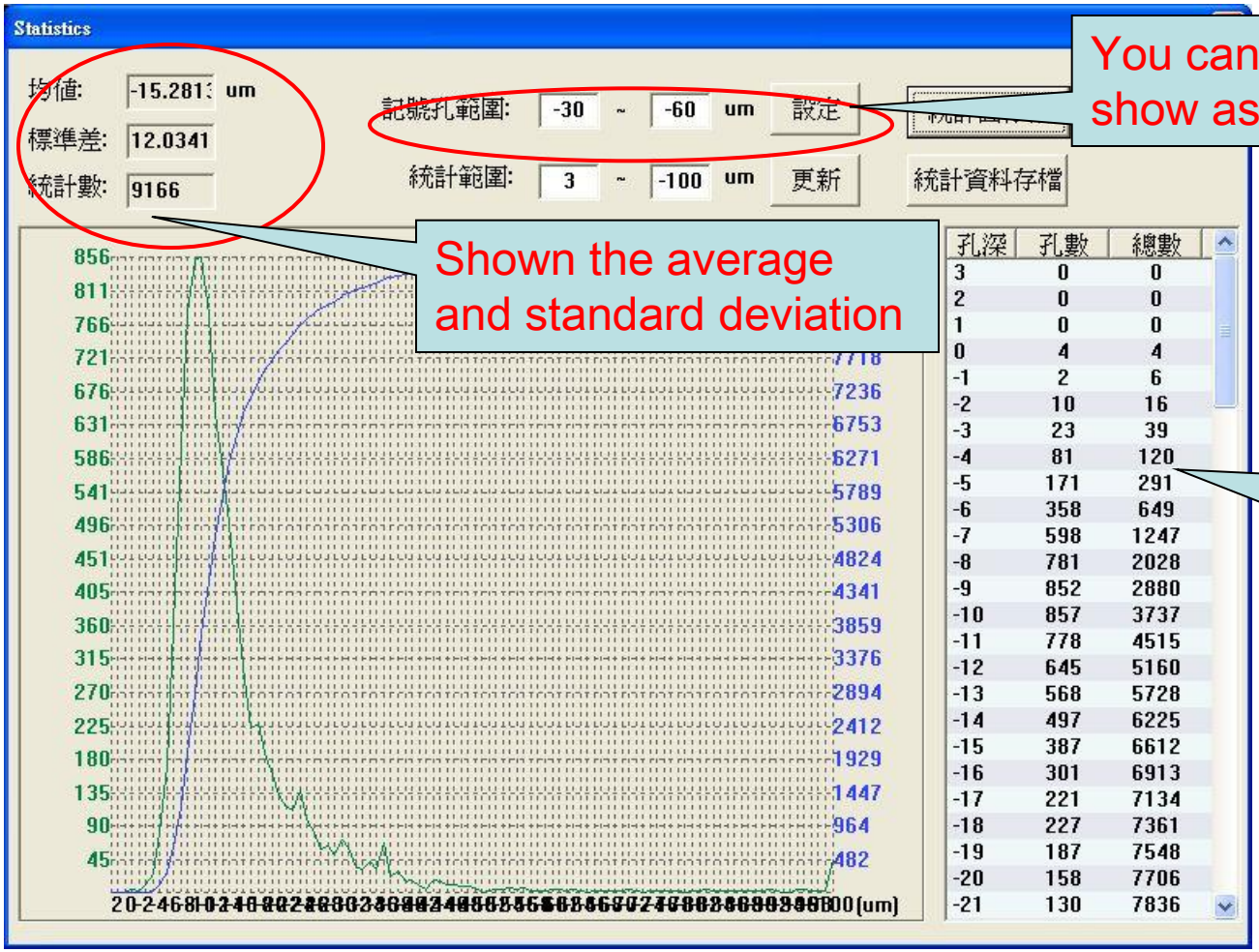
We inspect the depth of dimple by FV-68 first, and measure the same holes by WYKO machine. We can evaluate the precision of FV-68 as WYKO is standard.

(the precision of Wyko is ±3nm【nanometer】,measure area is ≦100μm, we will take the deepest place by the result of WYKO's measurement.)

Scan Panel


Idle
忽略多孔
F1 參數
F2 開始檢測
F4 回主畫面
Item X Y Depth
板厚: 0.93 mm
基準板孔數 9170
測試板孔數 9170
過深 3115
已測板數 1
統計
F3 清除板數
Show the NG place where is green

Statistics & Analyze

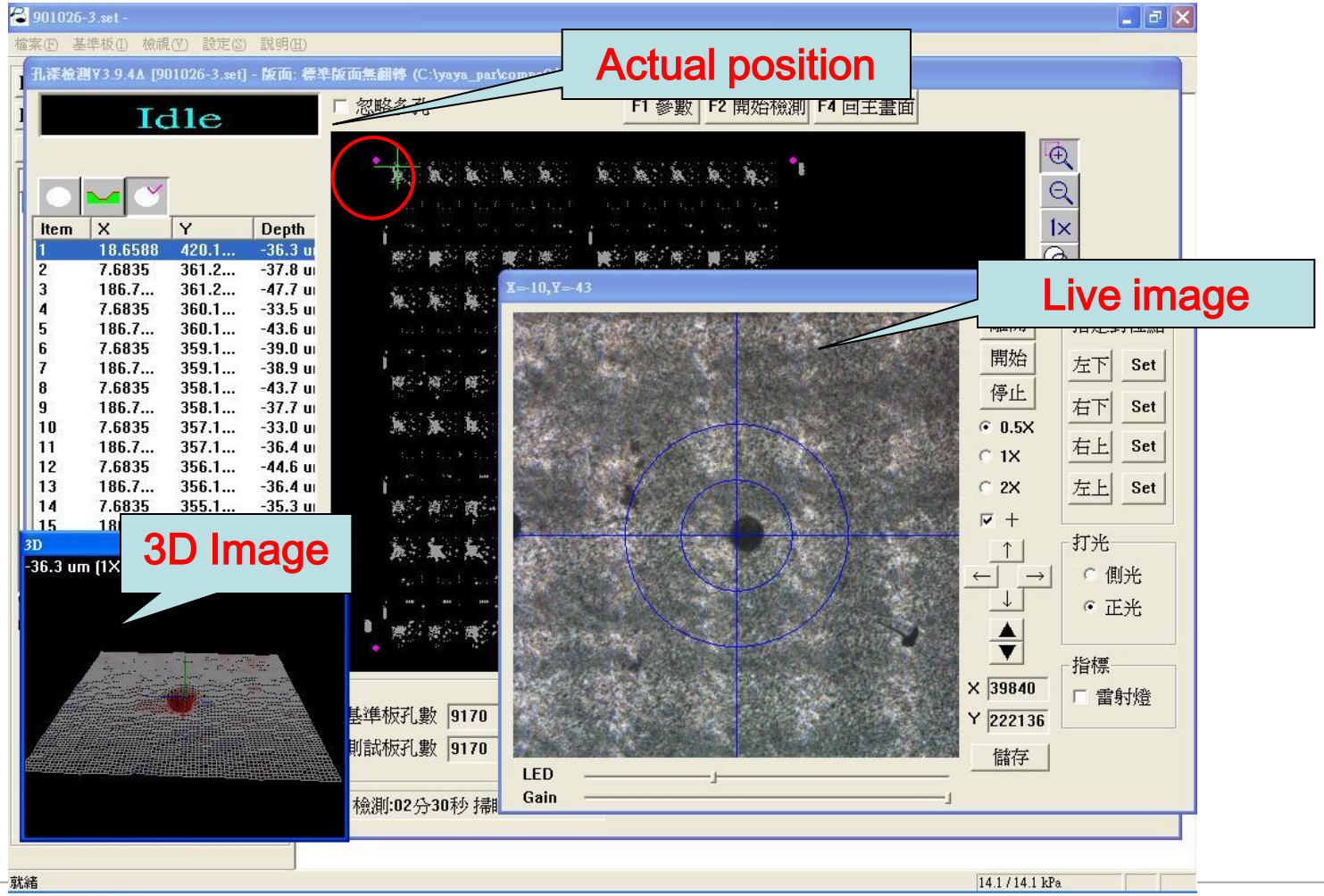


You can set the area to show as you need.

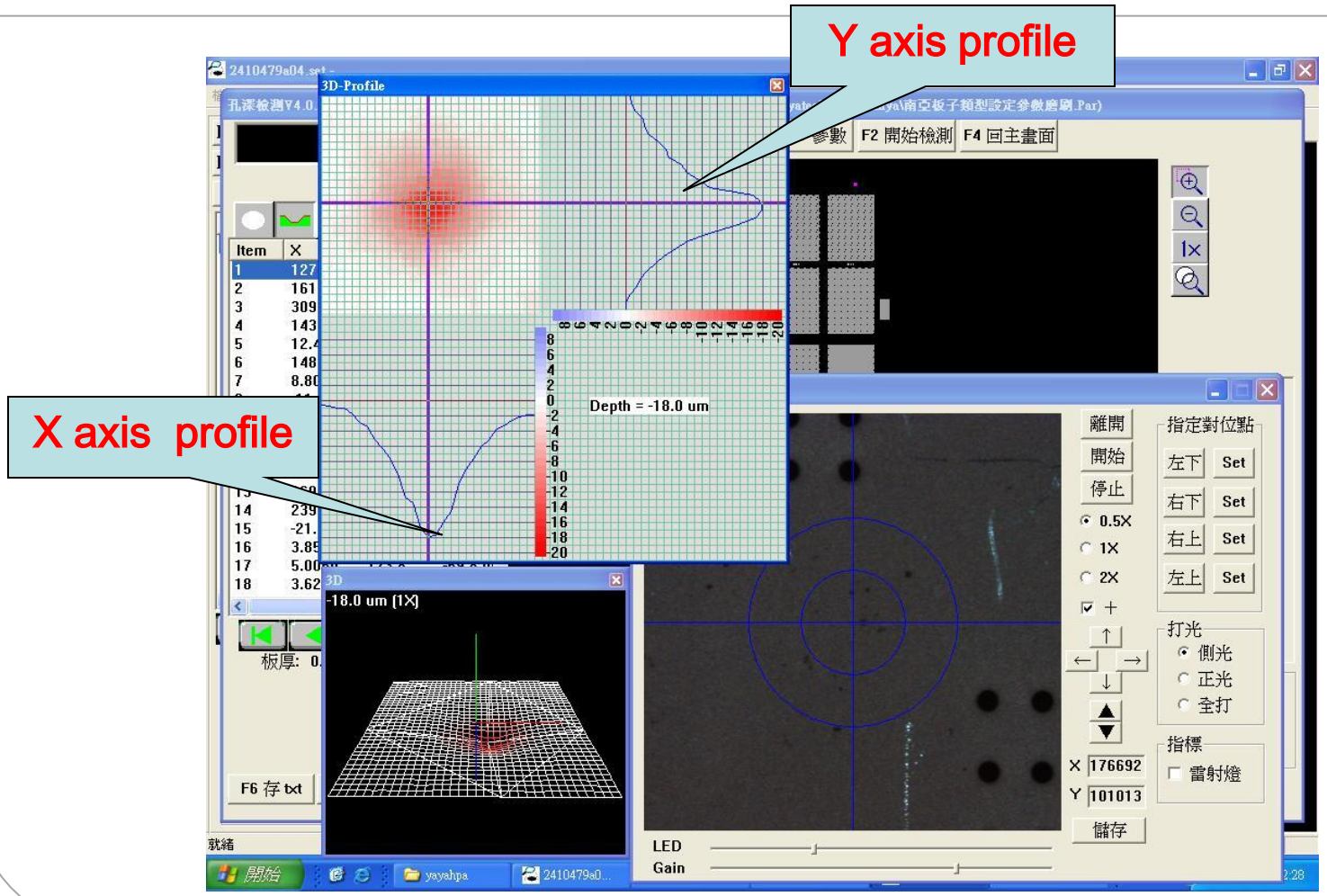
Shown the average and standard deviation

Statistics of data.

Live image


Actual position
Live image
3D Image
Idle
Item
X
Y
Depth
F1 參數
F2 開始檢測
F4 回主畫面
開始
停止
0.5X
1X
2X
左下
右下
右上
左上
Set
打光
側光
正光
指標
雷射燈
LED
Gain
儲存
基準板孔數
9170
測試板孔數
9170
檢測:02分30秒
就緒

Analyze single hole



Specification

Item	Spec List	Machine Spec
1	Thickness	<4.0mm
2	Fixed	Vacuum stage
3	Alignment	Automatically alignment
4	Movement	X and Z axis by camera, Y axis by stage
5	X ,Y axis	Linear motor with 1um optical scale
6	Z axis	Step Motor
7	Hole size	Aspect Ratio < 3:1 (After Plating)
8	Panel size	X : 24”, Y : 24” (610mm*610mm)
9	Amount of holes	2 million holes
10	Precision	0~20um: ±2 um,20um以上: ±10% Dimple's depth
11	Minimum figure	±0.1um

Specification

12	Operate system	Microsoft Windows system
13	File form	Excellon II Laser drill program
14	Password manage	Multi Password manage system
15	Statistics report	Made by customer require
16	SPC Soft	Made by customer require
17	Soft interface	Traditional Chinese/English interface
18	Temperature	20℃~28℃
19	humidity	50%~75%
20	Power Supply	220V(single phase), 50/60Hz

Q&A