

## Off line / In line Laser marking machine



**SG300**

**SUV300**

### **G/UV PCB laser marking machine**

Wave length: G:532nm,UV:355nm

PCB size: **min 50\*50mm/max 400\*300mm**(Selectional)

Engraved size:**70 \*70 mm** (Selectional)

Board Thickness: **0.64mm**

Repeatability: **+ 0.02mm**

Min Laser Width: **< 0.005mm**

Code Compatible: Code128, code39, EAN8, UPCA

and other bar code Bar code, DataMatrix, QR etc.

Board Flow: left to right / right to left (Selectable)

Electrical Worktable: XY linear module

Positioning: **CCD Side Mounted Camera**

External Hardware: Vacuum Dirt & Dust Removal Unit

Power Protection: UPS, Standby Power Supply,10 min operation if power failure

Conveyor height:**900±20 mm**

Conveyor direction: **LR/RL** (optional)

Power Supply: **220V/50Hz/2KW**

Air Pressure: **0.6 Mpa**

Temperature: Temp **535°** , humidity**≤50%**

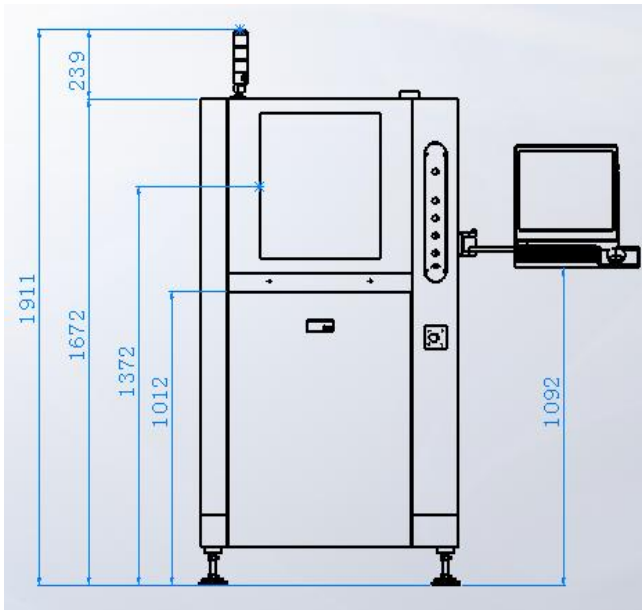
Communication: **SMEGA**

Dimensions: L\*W\*H **1050mm\*1150mm\*1700mm**

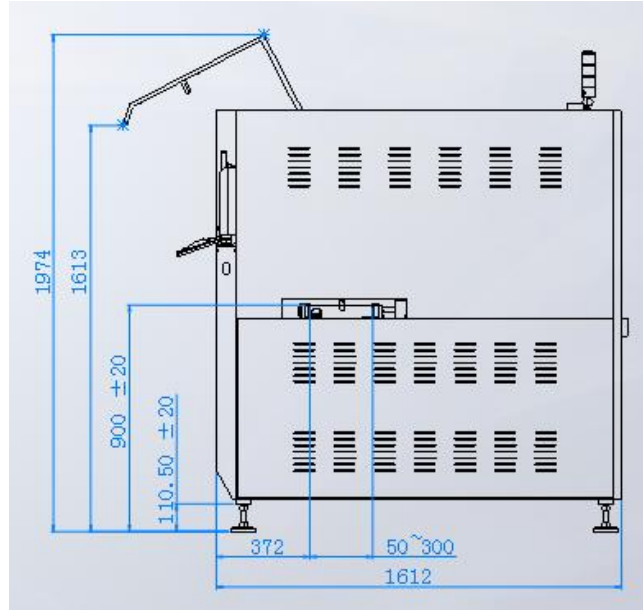
## ◎ 1、Machine Feature

- Ø Servo drive X, Y movement platform, industrial PC control, flexible modularized program design.
- Ø Standard configuration green laser (laser types other options), minimum carving surface of 1.5 mm x 1.5 mm, as many as 20 DM code characters.
- Ø CCD vision technology, precision positioning, read characters, qr code identification...
- Ø Switch between three color light source: 3 colors, easy to master the production status in time
- Ø Guide rail height to 900 + 30 mm, direct connection with other SMT assembly line. The custom to choose
- Ø Standard the SMEMA interface connected to the LAN, can free with upstream and downstream equipment and to communicate with the server;
- Ø matching dust filtering device, effectively remove the dirt and dust emissions, ensure clean indoor environment
- Ø Active mistake proofing function, the software automatically detect and prevent errors, omissions
- Ø In the process of carving, cannot artificially opened the door, in order to prevent bad product;

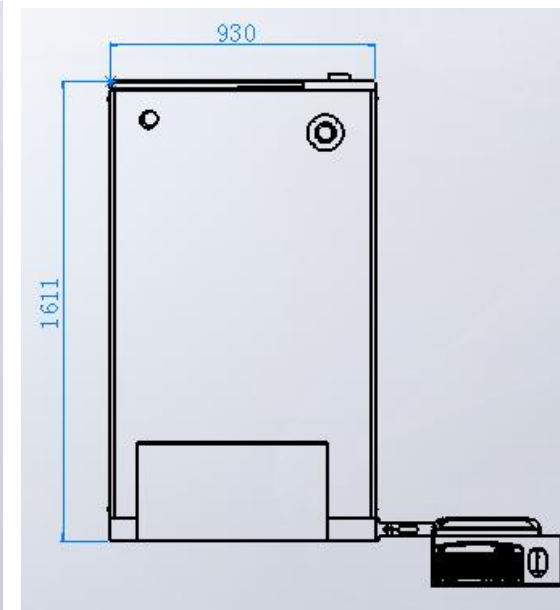
## ◎ 2、The External Size



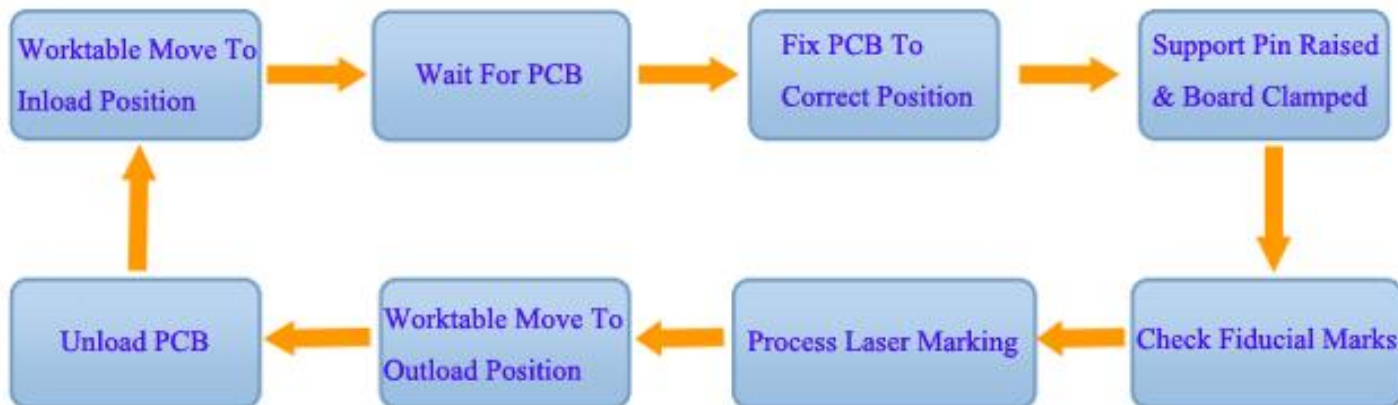
Positive



ON the side

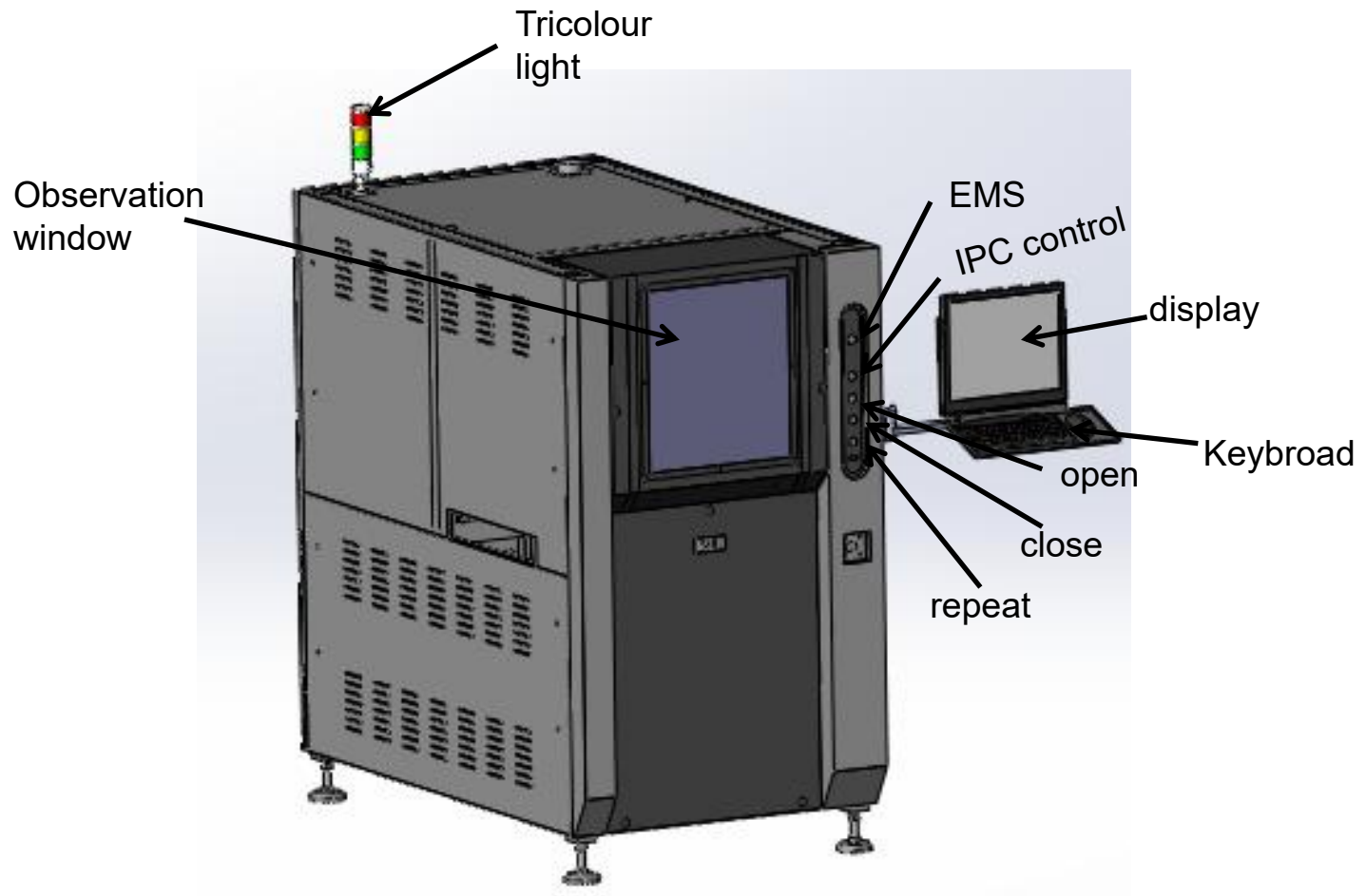


Back

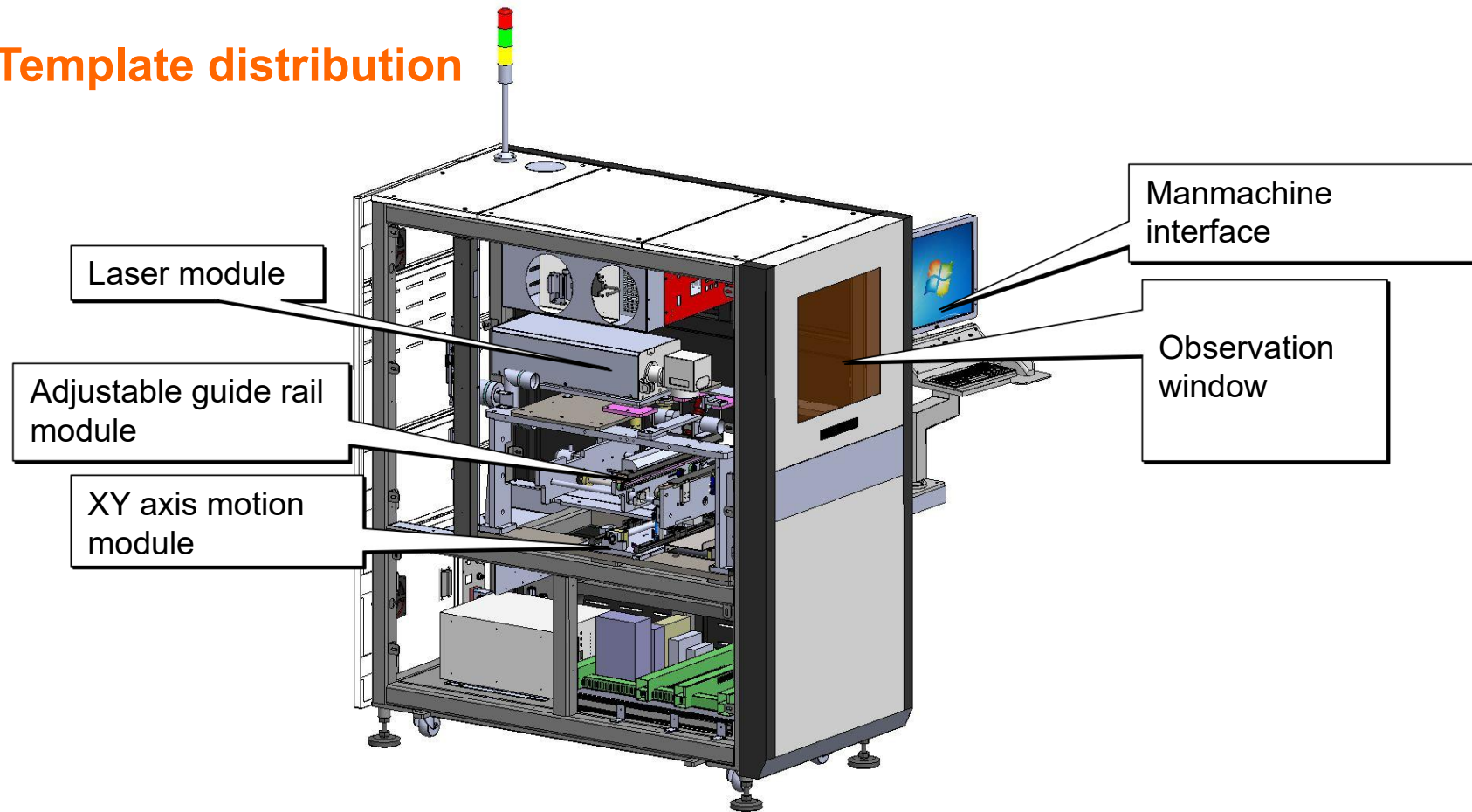


Operation process

## 2.1、 Operation Panel

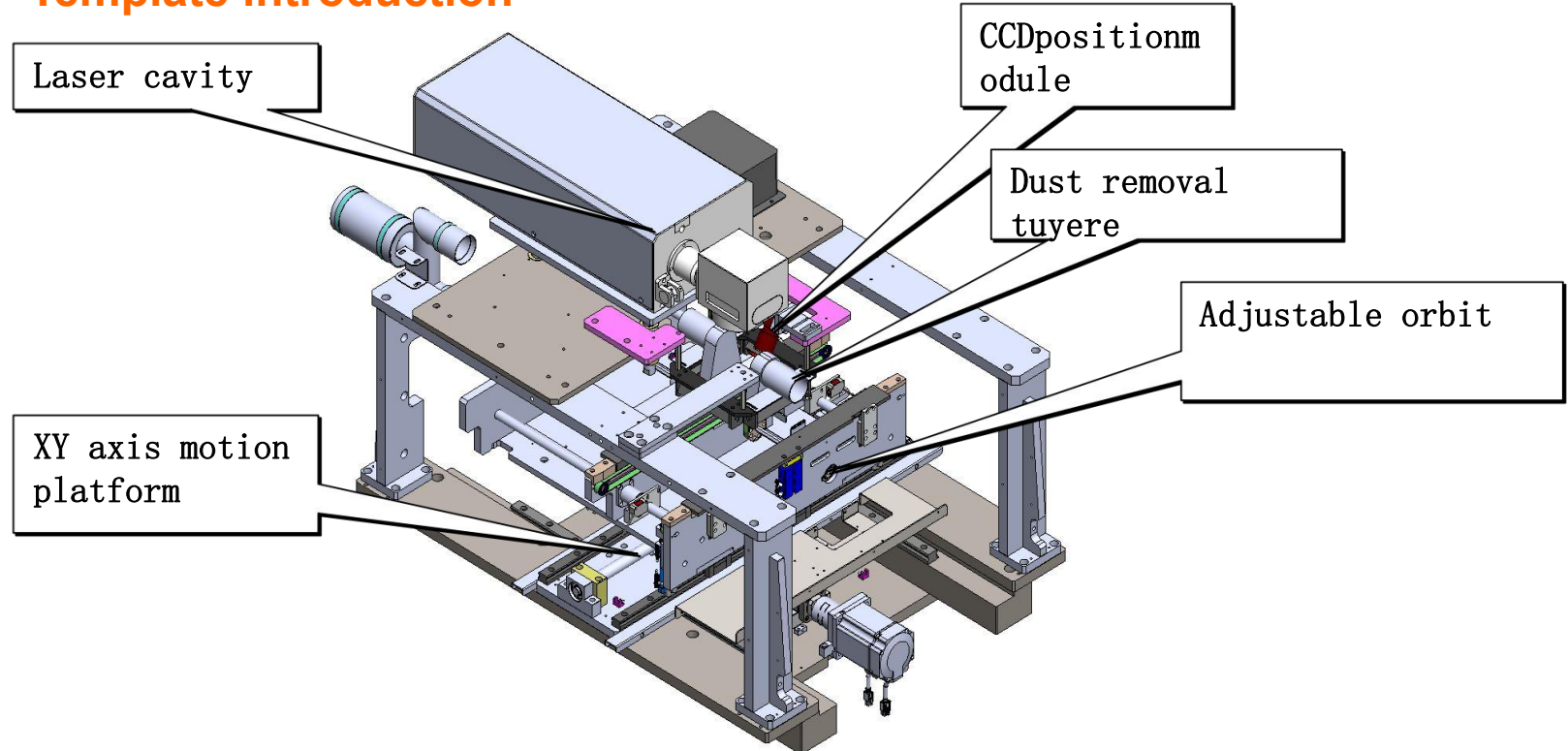


### © 3、 Template distribution



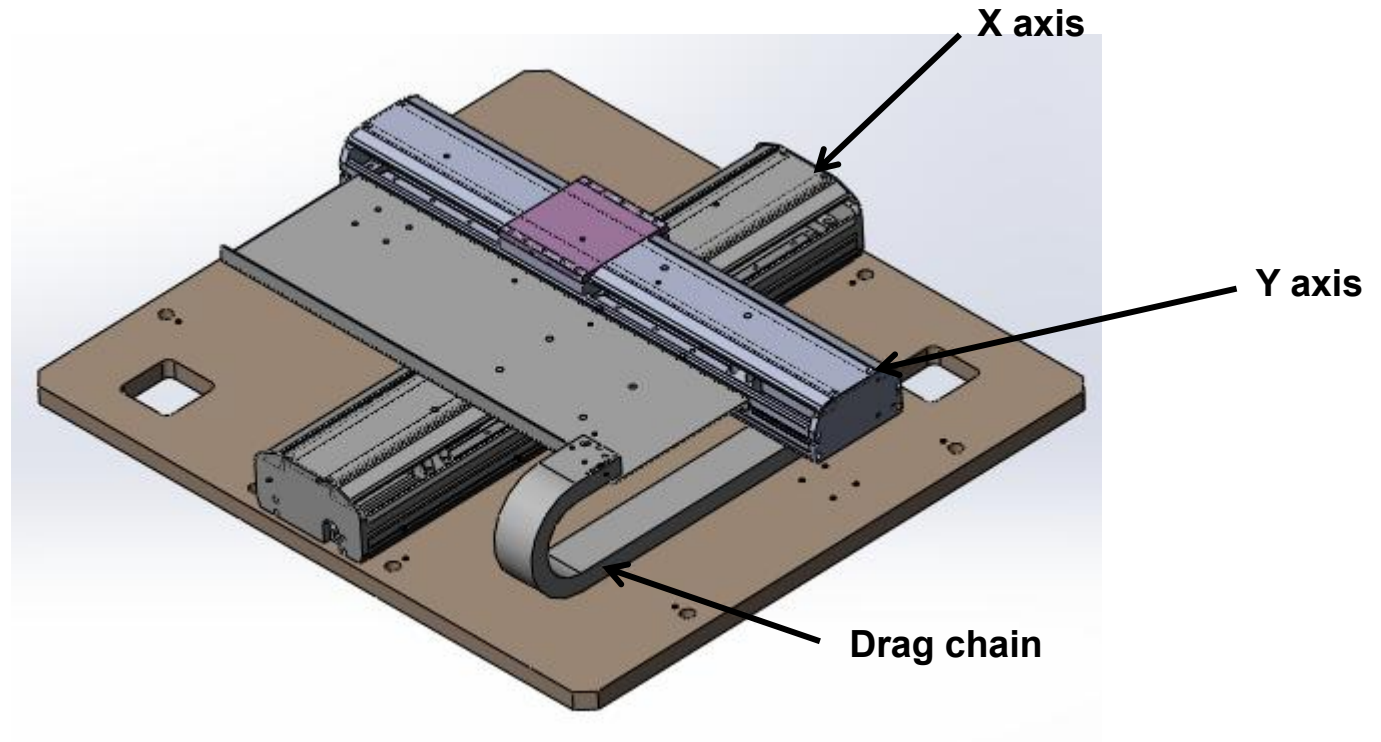
PCB marking machine mainly laser module, XY platform module, adjustable width of the orbital module, Z axis tunable laser module, CCD positioning module, dust removal system and other parts;

## © 4、Template introduction



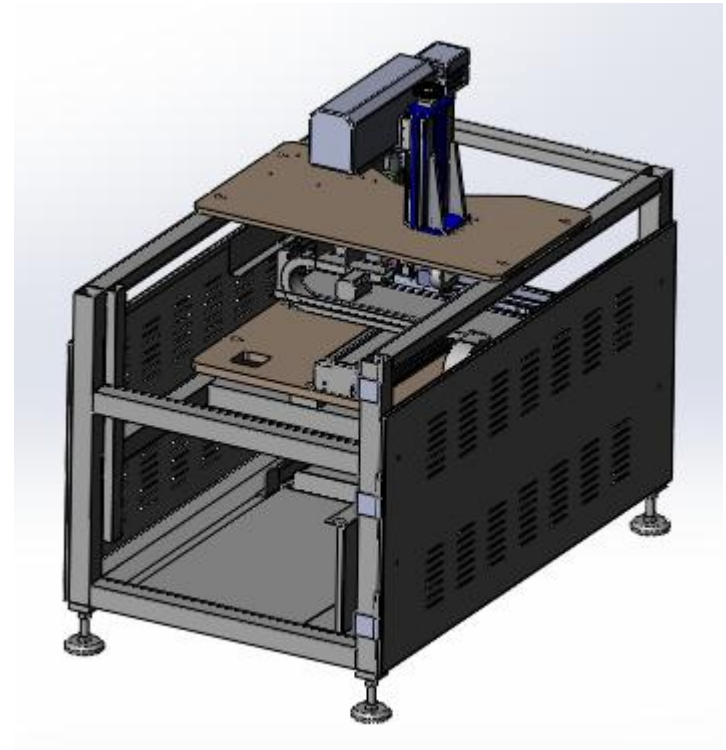
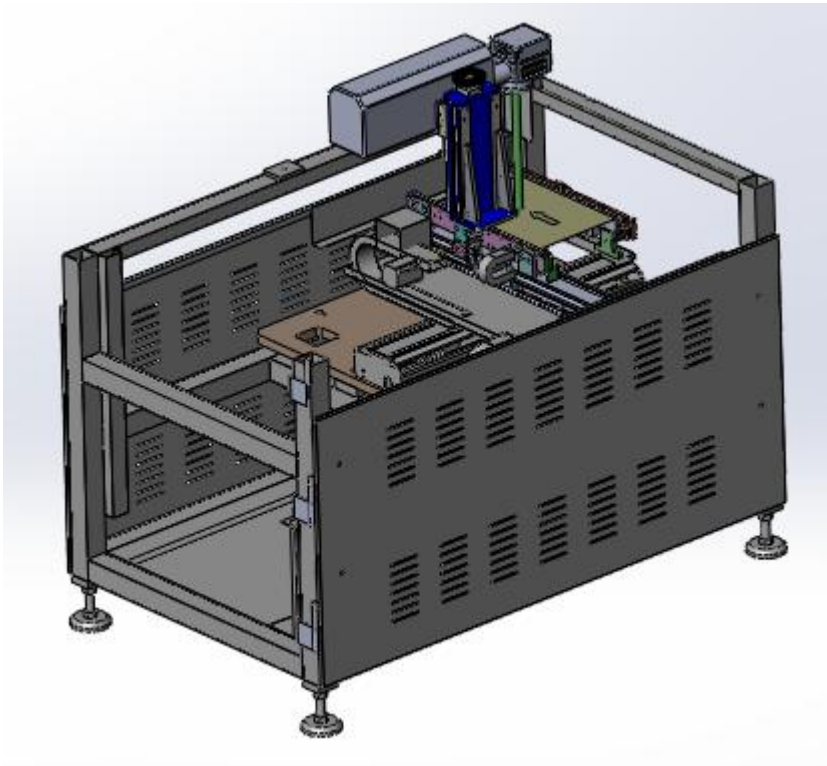
1. XY sports platform: drive the delivery track to meet the size requirements of the product
2. CCD positioning module: camera positioning ensures the accuracy of the PCB's location.
3. Dust removal vents: ensure that the radium carvings are produced with dust smoke removed to ensure the safety of the environment;
4. Adjustable wide track: ADAPTS to a certain size range of PCB board, through software control, can be adjusted automatically

#### 4.1、 Template introduction cross sliding device



The cross sliding platform is customized with precision guide rail, the grinding level guide and servo motor drive, the accuracy is controlled within 0.02 mm.

## 4.2、 The Internal Structure



Functional distinction between each unit, modular, visual design, easy installation and maintenance.



### 4.3、 The Characteristics Of the Green Laser

- 1、 narrow pulse width green laser, the whole machine adopts air cooling, do not need other external cooling way;
- 2、 with a peak power and narrow pulse width, marking the font more clear;
- 3、 The beam quality of 1.2 or less.
- 4、 Narrow pulse width:  $< 4 \text{ ns @ } 30 \text{ KHZ}$
- 5、 compared with CO2, green light, UV laser, more suitable for all kinds of PCB material.
- 6、 generate heat effect is small, do not harm the underlying material, reduce the risk of product;



## 4.4、 The Characteristics Of MOPA Laser

M6 + series is a kind of new MOPA laser fiber laser.

Except possesses the advantages of traditional tuning Q laser MOPA fiber laser has the advantages of narrow pulse laser, the wider the pulse width of the adjustment, has faster response speed, and so on.

MOPA laser can not only make a mark line fine, but also makes the edge smooth and not rough, for precision machining and other applications provide the ideal laser light source.

Using unique technology as the core, MOPA fiber laser through modulation seeds can be flexible to control the output waveform signal source, from 2 ns 250 ns pulse width adjusting range, as well as a wider frequency range 11000 KHZ, the application scope of M6 series laser is the use of very large space;Faster and higher peak power, the first pulse rise time, means having a higher machining efficiency of damage energy and more efficient, is one of the processing industry of choice in the highend laser light source..

◦ ◦



## 4.5、 The characteristics of the laser

we imported jd1105 high speed mirror form German. The galvanometer system has the characteristics of zero drift, fast speed, small volume, low temperature and reliable operation. The comprehensive performance index reached the international advanced level and obtained many national patents 。

Scan motor parameters:

Operating temperature: 045 °C

Linearity: 99.9%

Fine pitch response time: 0.3 ms or less

Drift rate: < 40 PPM / °C

The origin drift: < 15 mu Rad / °C

The input voltage: plus or minus 15 VDC

Drift for a long time work 8 hours (continuous) : < 0.5 mrad. COM ports: digital (xy2100)

The average working current: 2.0 A position signal input resistance: 1 kΩ plus or minus 1%

Peak current: 15 A position signal input scaling factor: v / 0.33 °

Biggest sweep Angle code: plus or minus 15 ° position signal output scaling factor: 0.33 v / °

repeatability: 8 microns.

input hole diameter: 7 mm

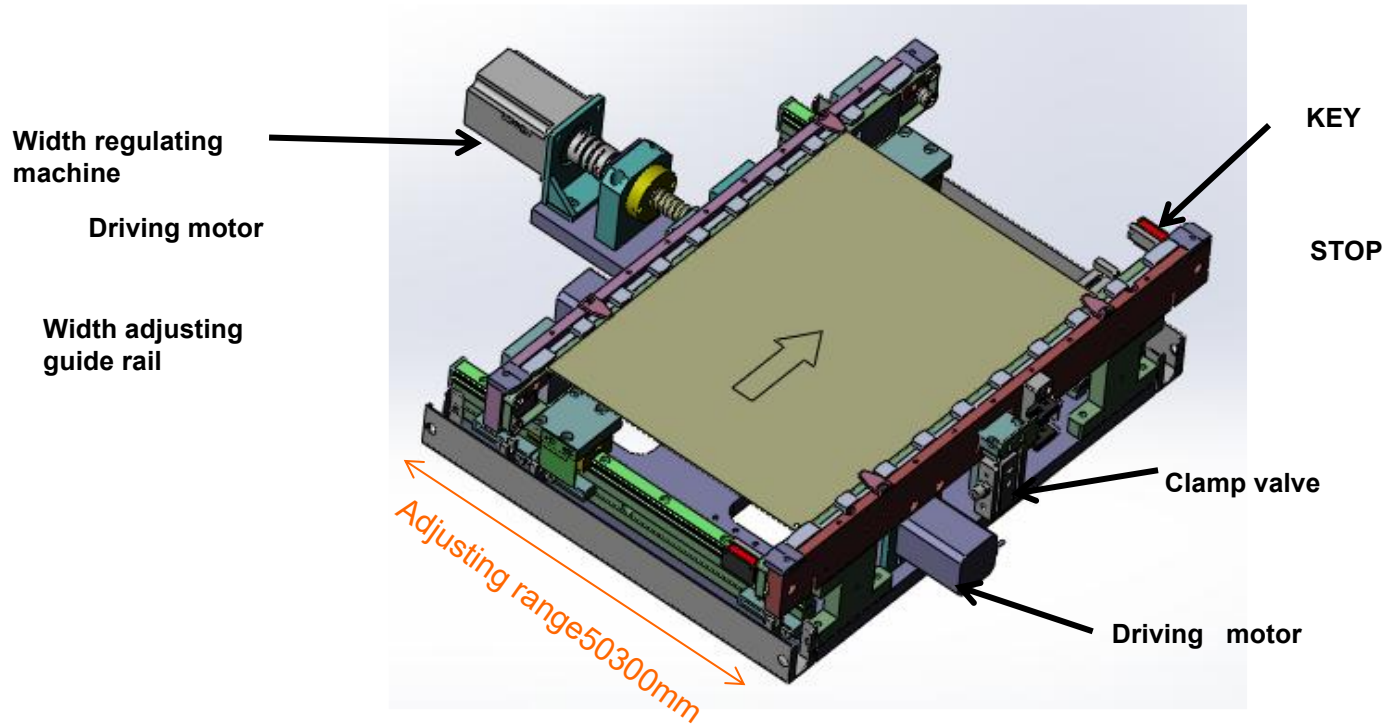
beam: 9.5 mm

weight: 45 g

frequency: 1200 hz or less



## © 5、 Movement Introduction



- 1、 The width regulating motor can adjust the guide width automatically according to the requirement ;
- 2、 With dual drive motor, the transmission is more stable
- 3、 Stop the gear, give the product initial positioning, improve the visual efficiency
- 4、 The clamping cylinder is clamped down to ensure that the focus of the plate laser is the same

## ◎ 6、 Effect analysis

### ● Labelling Barcode Samples

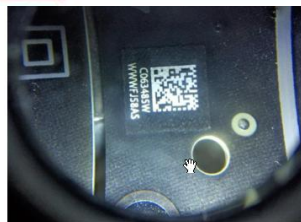
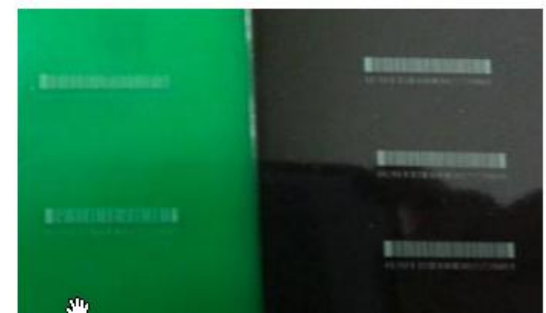


### Traditional label



### ● Laser Marking 2D Code Samples Including Red/Green/Black?Yellow PCB

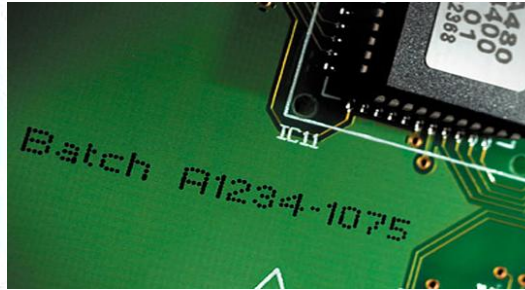
### Laser marking



## 6.1、 Conclusion of comparison



Labeling samples



Code sample



laser samples

1. Traditional labelling capacity is low, the mark is easy to fall off, not durable, total investment is high 。
2. Traditional inkjet code is low precision, poor effect, no lasting, high pollution and late investment 。
3. Laser tag technology, with clear and long mark, high efficiency, environmental protection, no consumables, Low input, high return characteristics, is replacing the traditional printing industry step by step.

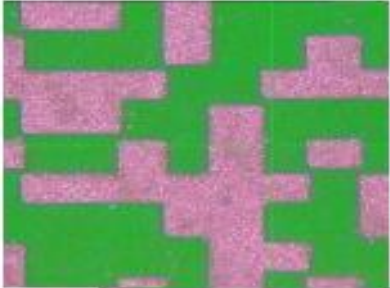
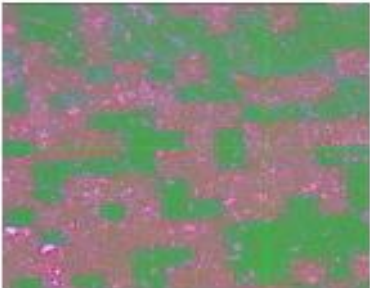

## 6.2、 The actual effect analysis of radium carvings on the actual effect of PCB radium

### Types of laser

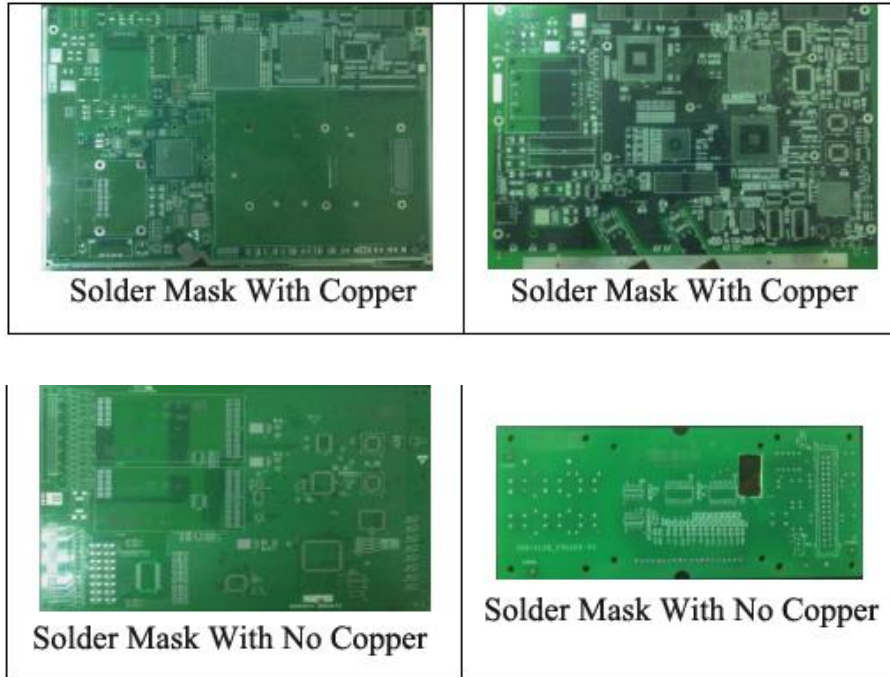
The industrial laser has three main types of light source: semiconductor laser (green light, ultraviolet), fiber laser, CO2 laser.

Different types of lasers produce different marks on the surface of the product due to the difference in wavelength.

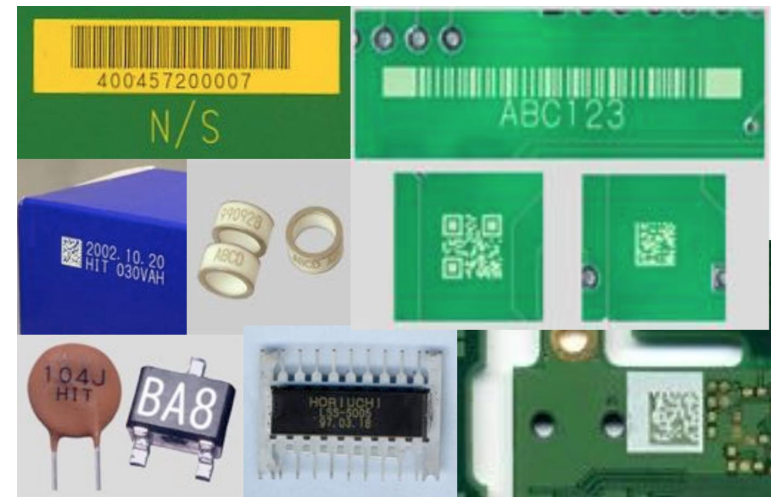
**contrast**

Green Laser	IR Laser	CO2 Laser
		
<p><b>Performance Comparison:</b></p> <ol style="list-style-type: none"> <li>1) CO2 laser having thick lines, yellow or black phenomenon</li> <li>2) Fiber Optic laser may have rough and unevenness interior texture</li> <li>3) Green laser having better and clearly visible lines</li> </ol>		

### 6.3、 Suitable for PCB type



**Code also can be printed on different kinds of product.**



The green, ultraviolet and CO2 laser are suitable for all PCB board ink layers that do not use the substrate. The fiber is only partially available, and the sample test is required.






Green light mark with high precision, strong adhesion, good effect. The uv light is slightly less than the green light. CO2 application and product requirements not high (yellowing, blackening), large size PCB board



## ◎ 7、 Specification

Laser specifications				
	CO2	FAYB	GR	UV
Wavelength	10.6μm	1064nm	535nm	355nm
Laser power	10W/20W/30W	10W/20W/30W	10W/8W/5W	8W/5W/3W
Service Life(just for refer)	2000040000 hours	100 thousand hours	100 thousand hours	100 thousand hours
Printing Angle	0360°	0360°	0360°	0360°
Focal length	70mm/110mm/190mm			
Corresponding linear velocity	<120m/min			
Bar code type	Data Matrix/CODE39/CODE128/ITF/NW7/JAN(EAN)/UPC/RSS14 (GS1 DataBar)			
Cooling method	Strong cold wind			
Environment temperature	535°C, must no dew,no ice			
Environment humidity	3585%RH ,must no dew,no ice			

### bar code , 2D code sample

Name	PDF417	Data Matrix (ECC200)	Maxi Code	QR Code	Veri Code
Sample					

## ◎ 8、 Answer your confusion

1

**Q:Bar code according to the requirements of the process need to wash flux immersion, and wave soldering high temperature operation, whether it is not fuzzy, still easy to read in?**

A: For the bar code of laser engraving, we have done tests according to the actual production situation of the production line. Such as: silk printing network problems cause need to wash the plate, fingerprint pollution and high temperature furnace, etc., quality and read no larger effect on the bar code.

2

**Q:Bar code needs to be resistant to DI water ultrasonic cleaning process, and the handwriting is clear to facilitate the barcode gun cleaning can meet?**

A: For the bar code of laser engraving, we have done tests according to the actual production situation of the production line. Such as: silk printing network problems cause need to wash the plate, fingerprint pollution and high temperature furnace, etc., quality and read no larger effect on the bar code.

3

**Q:What's the UPH per hour?**

A: It need to be based on the size of the board and each board required to imprint the number of bar code to determine. For example: PCB is 330\*250mm, if each board need to engrave 1 2D code,  
Then input is :34s FDMARK:1s,  
Engraved time:0.5s Check: 1s  
Total: 57s/pcs About: 600pcs/hurs

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