

KAYO-A8L Automatic SMT P&P Machine



Operating Manual

KAYO Automation Technology Co., Ltd.

en.kayosmt.com



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Standards

This product implements product standard number: Q/KAYO. 012-2018.





Preface

Release Notes

This material corresponds to product model KAYO-A8L. This material is only applied to the standard configuration of corresponding product model, for special customized products, please carefully read the attached instructions. This material explains product principle, installation method, operation, troubleshooting, transportation, storage, maintenance, etc. If you use this product for the first time, please read this information carefully before installing and using it.

Please keep this information for future reference.

Symbol Description

In order to prevent the possible damage to the human body or equipment, the manual use the following safety signs to indicate how to use the equipment, please note the contents of the signs to ensure that you and the surrounding staff's safety.



General note. Failure to follow this operation, may result in equipment damage and malfunction!

A Danger

Electrical safety attention content. May cause risk of electric shock, resulting in personal injury!

Mwarning

Fire safety attention content. May cause a fire, pay attention to fire!

Explanation

Supplement and explain the description of operation content.



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Chapter 1 Preface

1.1 Greeting

Thanks for purchasing KAYO-A8L Automatic SMT Pick and Place Machine. If you use this product for the first time, please read this information carefully before installing and using it.

1.2 Company Introduction

Beijing KAYO Automation Technology Co., Ltd. is a professional manufacturer focusing in pick and place machine, reflow oven, screen printer, automatic feeder and other SMT equipment. Right now, we have integrated R&D, production and sales together.

We have 20-year experience in SMT machine, with unique understanding of SMT technology, we provide long-term professional services to domestic and foreign electronic company. It always lead SMT equipment technologies and trends in domestic market.

With good quality, competitive price, easy to operate and energy saving, our products are very popular in domestic and oversea market. And all of our machines are wildly used in electronic circuit, photovoltaic, LED industry, instruments and apparatuses.

Up to now, our products are already sold in many countries such as USA, Canada, Australia, Mexico, India, Japan and Southeast Asian area. We will continue to make great efforts to satisfy the customers' requirement.

SMT Pick and Place Machine: It is our primate product, the working teams have always been dedicated to the research and development of SMT machine, which has become a widely recognized brand by customers.

Reflow Oven: Now our reflow oven has eight series, and more than 20 models. We also accept customization for our customers to meet different customers' diverse needs.

Screen Printer: It is an indispensable equipment in the whole welding process. We provide a high-precision manual screen printers, semi-automatic screen printers and other equipment for your choice.



Chapter 2 Safety Guidelines and Precautions

2.1 Summary

Safety Guidelines is the safeguard of completing high quality products. During operating, main working mechanism of this product is among movement, may cause personal danger and goods damage. In order to prevent the possible damage to the human body or goods, please arrange qualified professionals for equipment operation and processing. Before operating, we recommend all the operators must read and understand this operating manual.

2.2 Safety Warnings and Instructions

Machine body safety warning labels explanation are shown in table 2-1 below

Warning Label	Explanation
警示CAUTION 机器运转中请不要 将手放入机器里 Do NOT PUT HANDS INTO THE MACHINE IS WORKING	Touch the machine in operation may cause serious personal injury and property damage.
ないで、 ないので、 で、 、 、 、 、 、 、 、 、 、 、 、 、 、	Internal high pressure, danger! All installation, use and maintenance, in principle, should be completed by qualified professionals only!

Table 2-1 Machine body safety warning labels explanation

2.3 Electrical Safety

a) Do not touch the high voltage terminals while the equipment is electrical working.Otherwise, it may cause personal injury, equipment damage or does not work properly.b) The emergency stop switch is located at the bottom of the front and rear monitors, two large red buttons, press the switch to start an emergency power off, making all the AC power in the device cut off (except industrial computer host).

c) The machine power outlet must have a bottom wire and the grounding resistance is less than 10 ohms.

d) After the machine is power off, please wait for 2 minutes before powering on to avoid continuous switching of the machine causing the impact current is too large.



2.4 General Precautions

The following general safety precautions should be observed at any time during operation, commissioning and maintenance of the equipment:

a) All motors must be closed before approaching the mounting head, X axis, Y axis,

transfer rails and other general electrical appliances;

b) When the equipment is running, it is forbidden to touch any moving parts by hand;

c) Hood must be installed at any time operating the equipment;

d) Unless an electrical maintenance task is performed, the electrical equipment must be disconnected before removing the side cover or opening the rear cover;

e) When handling and using chemical substances, observe the safety precautions

recommended by the manufacturer. Do not place flammable or explosive materials near the equipment;

f) Make sure fixation when using;

g) Do not hit this device;

h) Do not remold or dismount this device.



Chapter 3 Product Overview

3.1 Summary

KAYO-A8L automatic SMT pick and place machine is researched and developed by Beijing KAYO automation Technology Co., Ltd., used to SMD components placement.Users could conveniently set up and complete SMT operation via Software operation interface menu, operating tips, import PCB coordinates or mechanical adjustment.

3.2 Product Appearance

KAYO-A8L product appearance and the main module description:



3.3 Main Components and Functional Units

This device contains the following main components:

a) Mechanical System

Consist of X-Y working platform, Z axis, K axis, placement head, automatic feeder, automatic conveyor belt, etc.



b) Electronic Control System

Consist of Power module, IPC module, control system, motor, solenoid valve drive module, drive module, etc.

c) Image Recognition System

Consist of Lighting source, CCD optical system, image recognition processing software, etc. Mainly used to complete the component image recognition, correction and PCB board programming positioning

d) KAYO-A8L System Software

Special system software, provides the operating interface, to realize the user operating the machine.



Chapter 4 Installation and Commissioning

4.1 Delivery and Check

4.1.1 Unpacking Precautions

After opening the package, please confirm whether the goods are complete, if missing or damaged please contact us.

4.1.2 Check Content

- a) Whether the device is the same as the model you ordered;
- b) Whether the device is damaged during the transportation;
- c) Whether the manual is in the package;
- d) Whether the connecting wires are complete.

4.2 Installation Environment Requirements

Please install the device in a place that meets the following criteria:

- a) Indoor;
- b) Horizontal installation;
- c) There is no explosive gas, harmful gases and liquids;
- d) No radioactive material, strong electric, magnetic field interference;
- e) No continuous vibration and excessive impact;
- f) Avoid direct sunlight and air conditioning blowing up.

4.3 Installation Method and Precautions

Each functional parts have been assembled before delivery, don't need clients self-assembly. Please install the device in a place that meet 4.2 criteria.



Do not disassemble or modify inside parts and cables of the device, otherwise result in personal injury or equipment damage and failure to work properly.

4.4 Debugging Methods and Precautions

This device has been strictly debugged, in the best condition. If some parts need to adjust due to transportation or other reasons, please contact the after-sales technical support.



4.5 Electrical Connection and Inspection Items

After finishing installation, SMT machine's inspection items and technical parameters are shown in table 4-1 below:

Inspection Items	Inspection Content	Technical Requirements
Power Inspection	Total Power Supply	AC220x 〔1±10%〕 Frequency 47Hz~53Hz Supply Current≥10A
Air Inspection	Compressed Air Pressure and Storage Volume	①Air Pressure 0.55MPa~0.65MPa ②Air supply≥120L/min ③Air Tank≥100L
Machine Installation Test	Test of Stability of Installation of Machine Feet	 Whether the feet rise and support on the ground 2 feet are locked and screws are locked

Table 4-1 Inspection Items and Technical Parameters



Chapter 5 Usage and Operation

5.1 Summary

This chapter will introduce you how to operate the machine, please read carefully before using.

5.2 Prepare and Check before Starting

Please check the following before starting:

- a) Please check whether the power supply is connected;
- b) Please check whether the air supply is connected;
- c) Please check whether the mechanical modules are connected properly.

5.3 Machine Switch Operation Guide

5.3.1 Button Operation

a) Power On/ Off Knob: Turn on and off the power supply to make the device run or turn off;

b) Emergency Stop Button: In case of emergency, press this button to cut off the power to the device;

- c) Servo Button: Re-power the machine after offline;
- d) Start/Pause Button: Start/ pause;
- e) Reset Button: Clear up alarm/ error.

5.3.2 Equipment Start

Please follow these steps to start the device:

a) Connect the power cable (Before connecting, make sure whether the voltage matches the specified voltage of the device.);

b) Connect the pressed air tube and confirm the air pressure value (Please set the pressure value between 0.55Mpa and 0.65Mpa);

c) Turn on the total power supply, IPC into the Windows system;

d) Double-check SMT1808.exe on the desktop, into SMT machine running procedure;

e) Mouse click \bigcirc \rightarrow

start, machine is initializing;

f) Equipment initialization is complete, the device complete starting.



5.3.3 Equipment Stop

Please follow these steps to stop the device:

- a) Click , exit the running program;
- b) Close IPC Windows system;
- c) Close SMT machine power supply;
- d) Close SMT machine air supply.

5.4 Software Operation Introduction

5.4.1 Software Main Interface

When you open the software, you will see the screen shown in Figure 5-1:



Figure 5-1 KAYO-A8L SMT Machine Software Main Interface

The software main interface includes the following elements:

a) Main Menu Area

Software system menu, for set the basic parameters, machine parameters, editing procedures.

b) Image Display Area

Real-time display images of MARK camera, high-speed camera, precision camera.

c) Production setting

Set each camera's tolerance value, SMT speed, the starting and ending position, the action after opening the safety door, etc.

d) System Status

Used to display the normal operation or fault status of the SMT machine.

e) Production Mode



SMT machine's running mode under normal operation.

5.4.2 Produce Menu

- a) "Open": Open the PCB program;
- b) "Create": Re-create a PCB program;

5.4.3 Project Menu



Figure 5-2 Project Menu

- a) "Board": Includes the length, width, and make-up PCB information;
- b) :Mount": The placement coordinate information on each PCB board;
- c) :Import": Generates pick and place files, import coordinate files;
- d) "Part": Basic information of Material stand components.

5.4.4 Offline Menu

"Offline": Power off X-axis and Y-axis, to make sure the security of manual operation.

5.4.5 Monitor Menu

"Monitor": During normal operation, could view the recognition of high-speed and precision cameras.

5.4.6 Configuration Menu

"Configuration": Set up and debug the factory parameters of the machine.



5.5 Illustrating PCB Programming

5.5.1 PCB Illustration

make-up is three rows and four columns, shown as Figure 5-3-1:



Figure 5-3-1 Imposition

Each small board has 9 points and 8 kinds of components, shown as Figure 5-3-2:



Figure 5-3-2 single board

The programming steps are as following:

5.5.2 Create a New Project

I) Produce \rightarrow Create \rightarrow name Show as Figure 5-4 This name can be PCB's name, also can be a date.



READY	FLIE NAME.KY X: 0	Y: 0 Z: 0 Manual Semim-automatic Fully-automatic Produce
Login	Select the file to save the incettee!	
Project	Computer Viscone	Alty Animgs by Folder - Date modified Type 18/02/2007 200 FM We faile 8/02/2007 1.12 FM File faile 9/02/2007 1.23 FM File faile 9/02/2007 1.23 FM File faile 9/02/2007 1.23 FM File faile
Produce Int Produce Int VY Inst 21 2 Angia Error 0.13 2 No. 20 2 Start Bit: 1 2	Site 2 MARK Parameter MARK P	

Figure 5-4

II) Click "save", interface will automatically jump to the "project" interface, shown as Figure 5-5:



Figure 5-5

5.5.3 Fill Board Information

In the "Board" interface, need to fill in the length and width of the PCB substrate, then click "adjust track". Put a PCB on the board importing place, and then click "Input board",



making the PCB into SMT machine and top board fixed.

5.5.4 Create New Part Information

Click "Part" button into the edit, add components interface, shown as Figure 5-6-1:



Figure 5-6-1

① Click "New Part"button, then into components setting interface, shown as Figure 5-6-2: Items need to set:

Part Name: Need to set the name of the components;

Type: Total 3 kinds (Tape, pipe, tray);

NO: Feeder Station No. (This material corresponds to the feeder's station number);

Visual Algorithm: Component Recognition Method (Resistor-tolerance Algorithm, Compatible Algorithm)

Visual: Recognition Camera's recognizing method after picking the materials (High speed camera, precision camera, fast precision, no);

Pick Office: Synchronous pickup tolerance. KAYO-A8L has the function of 4 nozzles synchronous pickup, that time needs choose it.

The size of the value is the synchronous pickup deviation value. It judges whether can be synchronous pickup.

If 0, this feeder station does not perform the synchronous pickup operation.

The larger the value, the more they will be picked up together. Normally 0603 sets to 20, 0805 sets to 40, 1206 sets to 60, components above 3528 set to 100.

Feeder's XY coordinates: This material's picking position.



1#-8# Suction nozzle's pickup/ paste height, pickup/ paste speed, pickup/ paste delay;

⁽²⁾ After inputting the part's name, choosing material's type, NO and visual, click "MARK camera", Mark camera will move close to selected material, shown as Figure 5-6-2:



Figure 5-6-2

③ Click the "Open Feeder", move XY coordinates, make the red cross scale aiming to the first material from feeder, click "record coordinate". At this point, all the coordinates record of 1#-8# suction nozzle corresponding to this feeder has been saved. Shown as Figure 5-6-3:



Figure 5-6-3

④ Click "Nozzle", at this time, 1# suction nozzle could move right above to the red cross

scale, click "DOWN" button to make 1# suction nozzle down to just touch the material, shown as Figure 5-6-4:



Figure 5-6-4

Click "Record Height" in the pickup material column, after height saved, 1# suction automatically rising back to zero.

(5) Move 1# suction nozzle on the top of PCB board, click butto nozzle just touch the PCB board. Shown as Figure 5-6-5:

button, make 1# suction



Figure 5-6-5



⁽⁶⁾ Click "Record Height" in the paste column, after pick and placement height saved, 1# suction automatically rising back to zero.

⑦ Pickup/ paste speed set:

Tape: 7~9 Tube: 5~8

Tray: 1~4

(8) Pickup/ paste delay set:

Tape: 1~5

Tube: 5~10

Tray: ≥20

Now the feeder's (corresponding to 1# suction nozzle) parameter have been set, click

to check whether it could pick material normally.

9 Continue to set the feeder's parameter corresponding to 2# suction nozzle (XY

coordinates need not to set again), click **22**, the tooltip will appear, then click "Yes (Y)", the setting way is the same as 1# suction nozzle's.

⁽¹⁾ After setting all of the suction nozzles which need to pick the feeder's materials, click

 \checkmark . Then create next new component, the operating method is the same as 1-9.

① Until all the components types which PCB required have been finished, click

button on the upper right corner of the interface. Shown as Figure 5-6-6:





 ${f t}$ As different materials have different packages, so the ranges of vision recognition are



different, which need to set. Click

and will appear high speed vision recognition

setting interface, shown as 5-6-7:



Figure 5-6-7

Eight frames separately present 8 suction nozzles.

Firstly choose components each nozzle need to pick and recognize select test components, then select "visual range" to 201, after all selected, click Pickup material to camera. It is time nozzles will pick selected components to recognize in the high speed camera. It is best to adjust the light source brightness contrast significantly. Note: For the components have larger package, make sure the components within the recognition range (yellow circle), and with much margin, otherwise it will cause error recognition!

After setting Throw, then click

(1) For the components have larger volume, precise pin, need to use precise vision to inspect, the setting method is the same as above, interface shown as **5-6-8**:





READY	DBQ.KY	X: 0 Y: 0	Z: 0 Manual	Semim-automatic	Fully-automatic
Reset	1105-01	Board	Mount O Import	Part	<u>\$</u>
States States		Particular de la Marke pen Anna Marke	(二冊は年)	114: 14 T RE 200 S RESULT 14438 V 4 2448: 10 S 2444: 10 S 2444: 10 S 2445: 10 S 2445: 10 S	Notice States pre-erables Visad
	Reset is complete!			7/17/2	018 1:33:06 PM

Figure 5-6-8

Normally, only need to choose the part that you want to test, set the angle, nozzle, visual range, LED1 and delay.

PART: choose the component that you want to test.

Angle: Refer to component angle, can be understood as the placement angle. Rotate according to this angle after picking.

Nozzle: choose the correct nozzle to pick up the component.

Visual Range: Diameter of the detection area, be sure to include the entire component. If the visual range is 0, it is the maximum visual range. If it is greater than 0, it is considered to be the set visual range.

LED: Light source brightness, only set LED1, no need to set LED2.

Delay: Refers to recognition time, cannot be lower than 100.

Area: Pixel area of each component. The default value is 0. When the area is greater than 800, it is considered that something has been recognized.

If it is not 0, it is the currently set value, plus the set tolerance range.

Tolerance: The difference between the actual area and the saved area. The default value is 0. If there is value in Area, normally set Tolerance 10~20%. If Area is 0, the Tolerance setting does not work.

Example: If the area of 0805 resistor sets to 32145, the tolerance is 20%, then the area of this resistor will change if stands up when picked up. If it exceeds 20%, it will be considered unqualified and thrown.

Area and Tolerance are used to make sure that there is no wrong component is picked up. Step 1:



Choose the component that you want to test, set the parameters and choose the correct camera mode.

Step 2:

Click "Pickup Recognition", the nozzle will pickup the component and move above the camera.

Step 3:

Click "Recognition", the camera will recognize the component.

Step 4:

Adjust the parameters according to the Recognition Result.

Step 5:

Click "Save Para" to save parameters.

Step 6:

Click "Recognition", if recognize successfully, click "throw", then exit the settings interface.

At this point, all of the items in "Part" have been set up.

© Extension: The function of mouse right click of "Part" include, shown as Figure 5-6-9: Change: Enter the selected component settings interface (Figure 5-6-2), can modify all of the parameters.

MARK Camera Positioning: Position to the XY coordinate of the selected component. Delete: Delete selected components.

Uniform Parameters: In the single or multiple selecting case, rapidly set the nozzle (corresponding to the component) pickup height, paste height, pickup/ paste speed, pickup / paste delay, visual mode.



Figure 5-6-9



"Uniform Parameters" shown as Figure 5-6-10:



Figure 5-6-10

Ticking before the modified items presents modifying this item, if not, presents do not modify this item even there is value.

Note: When using "Uniform Parameters", please note suction nozzles switch 1 , to ensure nozzles' corresponding relation.



5.5.5 Create Mount Information

Click "Board", and enter board setting interface, show as Figure 5-7-1:



Figure 5-7-1

(1) Move the red cross line to the middle of the MARK point

via moving XY

coordinates, then click Mark 1 or Mark 2 to set the two MARK points on the PCB board (the distance between these two Mark points are the largest). Mark points can be adjusted to avoid screen printing. Shown as 5-7-2:





Click "Mount", and enter mount setting interface, show as Figure 5-7-3:



E-mail: sales@kayosmt.com

READY	DBQ.KY	X: () Y:) Z:	0 M	Ianual	Semim-au	tomatic	Fully-a	utomatic
C			🔲 Board	O Moun	t 🗿 Iı	mport	Part			保存
Reset	-		Position:	Angle:	0.00	Add compor	en Update coordinate	Correct coordinate	Add Array	Correct verificatio
Login			Part Name	Nozzle:	14022101	Insert	Modify componen	Next	Specialsha ped board	Open MarkLED
Produce			NO Position	Norm	Part S	Station X		Angle No	ZZIe Arrav	Mount
Project										
Offine										
Monitor										
Config										
Exit										
	 Mark Camera High Speed Camera Pre 	cision Camera								
	Image: Control of the second secon	Roard Clip Roard								
Prodeuce Set										
Precision Camera XY Error : 2.1 Angle Error: 0.1 NO.: 20	MARK Premeter MARK Premeter MARK Pasing Rate: 30 de Non: 10 de Non: 10 de	mt Speed								
Start Bit:	Set the Input Board Output Composition of Open Auto	Mark stage								
	Reset is complete!							7/17/2	018 1-44	•23 PM

Figure 5-7-3

① Move XY coordinate to the first component (R1) of the single board in the upper left corner, the middle of this component pad.

Position: Input position name, normally is screen position No.-(R1).

Specification: The components' package.

Part Name: Choose the component corresponding to this point-(1K).

Shelf NO.: will automatically update-(1).

Angle: Input the component angle-(0).

Nozzle: Select the suction nozzle which the component required-(1).

Click "Add coordinate _____", shown as 5-7-4:

Add

Position:	a	Angle: 00	00 🛨	Add componen	Update coordinate	Correct coordinate	Add Annay	Correct verification
Part Name	b 📩		u	Insert componen	Modify componen	Next	Specialsha ped board	Open MarkLEI



② Move XY axis to look for the next component, the method is the same as ①, successively find the remaining components of this small board, the order is not unique,



as long as no more or no less.

Correct verification ③ Then click "Correct verification need to change.

" to check whether there is errors, if there is, it

For example, 5# nozzle cannot pickup the 1# feeder's materials, shown as Figure 5-7-5:

Posit	ion:	Ang	le: 0.00	de 1 🔻	Add componen	Update coordinate	Correc coordin	ate A	Add umy	Correct verification
Part ?	Name	•			Insert componen	Modify	Next	Spe	cialsha I board	Open MarkLEI
NO.	Position	Norm	Part	Station	x	Y	Angle	Nozzie	Anay	Mount
3			16	编:16	33612	44407	0	3	1	
4			16	编:16	SMT606			4	1	V
5			1	编:1				5	1	
6			16	编:16	Please modify	y the color label li	ne,	6	1	V
7			16	编·16				7	1	V

Figure 5-7-5

④ After correct verification, select all of the components, mouse right click to select "Sorting", shown as 5-7-6:





⑤ Enter sorting interface, click "Nozzle order", then "Bomlist" shown as Figure 5-7-7, will



pop up a dialog box, click "Yes (Y)", After sorted, click Ito close nozzle sorting interface.

u	rent Da	la							12	irger Da	ıa						
	No.	Position	Part	Station	х	Y	Angle	Nozzle		No.	Position	Part	Sation	Х	Y	Angle	No
	1	Rl	1K	7	24576	13868	0	1	Manual sorting								
	2	R5	10K	8	24576	13868	0	2									
	3	R2	1K	7	2 <mark>45</mark> 76	13868	0	3									
	4	C\$1	1R80	6	24576	13868	0	4									
	5	CS2	1R80	6	24576	13868	0	5	>>>								
	6	Ul	10nf	2	24576	13868	0	6	Detat								
	7	R3	100nf	1	24576	13868	0	1	Moving								
									Feeder frequency Mount position BomList								
									Determine the sequence								

Figure 5-7-7

⁽⁶⁾ Due to make-up, after nozzle sorting, still need to array the rest boards, array set in the "Board: interface. Firstly input XY quantity of make-up, shown as Figure 5-7-8:





 \bigcirc Then set array mark points. Please note corresponding relationship, shown as 5-7-9:





Figure 5-7-9

Through moving XY coordinates to find 4 corresponding points and separately "record",

click ,could check recorded coordinates.

8 Return to "Mount" interface, select all of components, and click "Add array"



shown as Figure 5-7-10:

Posit	tion:	Ang	tle: 0.00	zle 1 💌	Add componen	Update coordinate	Correc	ate A	Add uray	Correct verification
Part	Name	•	. j		Insert componen	Modify componen	Next	Spe	cialsha I board	Open MarkLEI
NO.	Position	Norm	Part	Station	x	Y	Angle	Nozzle	Array	Mount
1			16	编:16	33615	42416	0	1	1	
2			16	编:16	33616	43410	0	2	1	N
3			16	编:16	33612	44407	0	3	1	9
4			16	编:16	33616	45409	0	4	1	V
5			16	编:16	33615	46409	90.00	5	1	
6			16	编:16	33615	47409	90.00	6	1	V
7			16	编:16	33613	48411	90.00	7	1	2
8			16	编:16	33615	49405	90.00	8	1	N
9			16	编:16	31617	42423	0	1	1	V
10			16	编:16	31617	43414	0	2	1	5
11			16	编:16	31617	44414	0	3	1	V
12			16	编:16	31617	45417	0	4	1	V
13			16	编:16	31612	46412	90.00	5	1	N
14			16	编:16	31616	47410	90.00	6	1	•
15			16	编:16	31615	48410	90.00	7	1	V
16			16	编:16	31615	49414	90.00	8	1	2

Figure 5-7-10

After adding, click "save """ "button. At this point, one complete program has been compiled.

© Extension: The function of "Mount" mouse right click includes:

Locate: Mark camera positions to the currently selected component.

Move: Modify X, Y coordinate (can be single, multiple choice).

Test: Test picked material to the current coordinate point.

Select All: Select All.

Anti-election: reverse selection.

Delete: Deletes the selected component.

Nozzle Sorting: Specify or change the nozzle for the selected component.

Specify the Components: Specify or change parts for selected components.

Unified Angle: Specifies or changes the angle of the selected component.

Cancel the Placement: Cancel selected component mount status

Set the Placement: set selected component mounted state

Package Angle Change: Change the angle of the selected component in the component station.

Search for Component Location: Fill in the component "mount location" name, can overall change the filled components.

Sorting: Sort the mount method.



Marked as the start bit: Place the first point of the mount from the selected component.

Correct coordinates

: Manually enter the board, click "verify mount coordinates", could modify the program again.

5.5.6 Running

In the "Produce" interface, click "output board" \rightarrow "Fully Automatic" \rightarrow "Start", shown as 5-8:



Figure 5-8

Set the Springboard

: If there is bad boards in the make-up, could click "set the springboard"to

jump this bad board.

Start Bit:

: Set to start mount from which order.

MARK Param	eter
MARK Error:	100 🚔
Passing Rate :	60 🌲
No.:	20 🚔

: "MARK Error" general is 20-60; "Passing rate" general is 60-80. "No."

Mark recognizes times.

x	YN	Ιoι	int	Spe	ed
-	40:08	- 17	-0	1 10:01	1

: X,Y coordinates' moving speed during mount.

Angle Mount Spee

:The speed of the angle during placement



Precision Carr	iera	
XY Error :	2.0	*
Angle Error:	0.06	* *
NO.:	20	*

: "XY Error" placement allows the error unit of XY to be pulse; "Angle Error"

Placement Allowed Error; "No." Precision Camera Repeated Corrections number.

5.6 Programming Method with "Import" Function

① Firstly export the Generates pick and place files from PCB drawing software, and copy it into the machine's IPC, (The imported file must be in .csv format)

② Click "Import ^OImport [™] → click "Open import file ^{Open import file}", click the file which has been copied into the IPC, and click "Open". (shown as Figure 5-9-1)

READY	TECH.KY	X: 0	Y :	0 2	Z: 0	M	anual	Semi	i-auton	natic	Fully-automatic
C			Board	O Moi	unt 🤇	Impo	ort	🕂 Pa:	rt		Save as Save
			Designator	Footprint	Mid X	Mid Y	Ref X	Ref Y	Pad X	Pad Y	
			R18	0805R	116.524mm	117.191mm	116.4mm	117.2mm	116.524mm	116.048m	Open import file
Login			R17	0805R	118.624mm	117.191mm	118.5mm	117. 2mm	118.624mm	116.048m	
			R16	0805R	123. 476mm	117. 209mm	123. 6mm	117.2mm	123. 476mm	118.352m	Rectore the
		and the second	K	K	107.55mm	126. 4mm	109.8mm	128. 4mm	109.8mm	128. 4mm	initial title
Produce		and the second	C1	x0603x	96. 9mm	126.8mm	96. 9mm	126.8mm	96. 9mm	127. 5mm	
			C2	x0603x	91. 3mm	115.8mm	91.3mm	115.8mm	91. 3mm	116.5mm	Minus
Project	The Present of the Present	I THE REAL	C3	电解	82.05mm	123. 9mm	82.05mm	122.65mm	82.05mm	122.65mm	WIND
			C4	x0603x	91. 3mm	112. 3mm	91. 3mm	112. 3mm	91. 3mm	113mm	
			C5	电解	82.05mm	117.15mm	82.05mm	115.9mm	82.05mm	115.9mm	Info:
Offine			C6	x0603x	109.1mm	115.5mm	109. 1mm	115.5mm	108. 4mm	115.5mm	1. In the EDA
	·		C7	x0603x	109.1mm	118.3mm	109. 1mm	118.3mm	108.4mm	118.3mm	software, record
		and the second se	CB	电解	118.75mm	123. 1mm	120mm	123.1mm	120mm	123. 1mm	two diagonally
Monitor	and the second		D1	M7	67.6mm	116.25mm	67. 3mm	116.15mm	69.7mm	116.25mm	the two marks.
			HT7130-1#	SOT89	113. 8mm	124.75mm	113.8mm	125. 2mm	112.3mm	123. 3mm	2. Fill in the
/ <i>/</i>	and the second		PIR	TO-52xxx	93. 3mm	124.77mm	93. 3mm	123.5mm	90. 76mm	123. 5mm	recorded 2 sets
Config			Ql	S0T23	113mm	112.4mm	113mm	112. 4mm	111.925mm	113. 35mm	the lower
			QZ	S0T23	64. 8mm	122.9mm	64.8mm	122. 9mm	63.85mm	121.825m	MARK1,
Exit			Q3	SOT23	69.8mm	123.15mm	69.8mm	123.15mm	68.85mm	122.075m	coordinates.
	Mark Camera O High Spee	d Camera 🔘 Precision Camera	R1	x0603x	98. 7mm	125. 1mm	98.7mm	125.1mm	98. 7mm	124. 4mm	3. If there is no
XY Axis	Z Axis	Transport	R2	x0603x	94.55mm	120. 9mm	94.55mm	120. 9mm	94. 55mm	120. 2mm	board on the no
			R4	x0603x	91. 3mm	120. 5mm	91. 3mm	120. 5mm	91. 3mm	121. 2mm	
N 1	left • Z1 © Z5	Up Board	R5	x0603x	94. 5mm	115.8mm	94. 5mm	115.8mm	94. 5mm	115. 1mm	Manually: MARK
			R6	x0603x	SSmm	117.6mm	88mm	117.6mm	88mm	118. 3mm	• Iviandaliy ivirtick
	Cente red Z	iero 📃 📃	R7	x0603x	94. 5mm	112. 3mm	94. 5mm	112. 3mm	94. 5mm	111. 6mm	System MARK
			RS	x0603x	SSmm	113.8mm	88mm	113.8mm	88mm	114.5mm	
	Right O Z4 O Z8	Nown Clip Board	R9	x0603x	105.1mm	118. 3mm	105.1mm	118. 3mm	105. 1mm	119mm	MARK 1 Coordinate
			RIU	x0603x	105.1mm	114.8mm	105.188	114.8mm	105.1mm	114.100	X:
Production Setting	rs l		R11	x0603x	64 Smc	112.6500	109.05mm	112.65mm	100.35mm	112. 6588	Y:
Precision Came	ra MARK Parameter		R12	x0003x	60 Sec.	119. 400	60 Ser.	119. will	69 lmc	119. 400	MARK 2 Coordinate
XY Error:	2.0 - MARK Error: 50 - XV Mount Spe	ed Angle Mount Speed	R13	ABOSE	120 724mm	117.101mm	120 6mm	117 2mm	03. 1ml	115. 400	X:
Angle Error:	0.10 Passing Rate : 60	cu ingli incluit opecu	RIS	08058	125 676	117 209-	125 Sm	117 2mm	125 676~~	118 352	
NO.:	20 NO: 20 🗘		111	Biss0001	99 7mm	115 geres	99.700	115.9m	101 65mm	111 455~	r
				51330001	00. Luff	.10. ouffi	55. 2aff	-10. outi	101.000	111. 4000	
Start Bit	Set the Input Output	en Auto Mark									Generate
1	 Springboard Board Board Op 	en three-stage			III		_			•	
	Reset is complete!										

Figure 5-9-1

③ Set the column: Click the right mouse button at the top name of each column to associate and match different names.

 $Designator {\rightarrow} Position;$

 $Footprint {\rightarrow} Footprint;$

Mid $X \rightarrow X$ Coordinate;

Mid $Y \rightarrow Y$ Coordinate;

Rotation \rightarrow Angle;

TB→Top/Bottom;

Comment→Comment Name;



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shown as Figure 5-9-2

KAYO-A8L SMT P&P Machine Manual

Sum Image: Sum of the sum of th	READY	TECH.KY	X: 0	Y:	0 2	Z: 0	м	anual	Semi	i- <mark>auton</mark>	natic	Fully-automatic
Image: Description 1 14 1 14 1 14 1 14 1 14 1 1 14 1 1 14 1 1 14 1 1 14 1 1 14 1 1 14 1 1 14 1 1 14 1	C			Board	🖸 Moi	unt 🤇	Imp	ort	🕂 Pa:	rt		Save Save
Land Product	T.ese:			Hidden	Column	x e	Mid Y	Ref X	Ref Y	Pad X	Pad Y	Open
V Ati Example 111 abs	Login			Position		24.00	117, 191mm	116.4mm	117.2mm	116. 524nm	116.048m	import file
X V				Footprin	nt	24mm	117. 191mm	118. 5mm	117. 2mm	118.624nm	116.048m	
Voise V A <td></td> <td></td> <td>and the second second</td> <td>х</td> <td></td> <td>55mm</td> <td>175 dem</td> <td>100 Smm</td> <td>117. 200</td> <td>123. 470mm</td> <td>178 dem</td> <td>Restore the</td>			and the second second	х		55mm	175 dem	100 Smm	117. 200	123. 470mm	178 dem	Restore the
With the set of the set	Produce			Y		Prom	126.8mm	96.9mm	126.8mm	96.9mm	127.500	
Very etc. Image: Im				Angle		Bann	115, 8mm	91. 3mm	115. Smm	91. 3mm	116.5mm	
Inter to react the field based from the f				Compo Tan (D	nent Name	5mm	123.9mm	82.05mm	122.65mm	82.05mm	122. 65m	Mirror
Vision Cis 48/R 62, 05m 117, 15m 52, 05m 118, 5m 42, 05m 118, 5m 108, 5m <t< td=""><td>Project</td><td></td><td></td><td>C4</td><td>x0603x</td><td>91. 3mm</td><td>112.3mm</td><td>91. 3mm</td><td>112. 3mm</td><td>91. 3mm</td><td>113mm</td><td></td></t<>	Project			C4	x0603x	91. 3mm	112.3mm	91. 3mm	112. 3mm	91. 3mm	113mm	
Vision C6 x08001 109.1m 118.5m 108.4m 118.5m 108.5m 128.5m 128.5m 128.5m 128.5m 118.5m 108.5m			Section 1	C5	电解	82.05mm	117.15mm	82. 05mm	115.9mm	82.05mm	115.9mm	Info
Visite 2 0 10 <	Offine		and the second second	C6	x0603x	109. 1mm	115.5mm	109.1mm	115.5mm	108.4mm	115.5mm	I In the EDA
Nenter Nenter 123 m 120 m 120 m 123 m 120 m <				C7	x0603x	109.1mm	118. 3mm	109. 1mm	118. 3mm	108. 4mm	118.3mm	software, record
Viewer 0 110 17 67. 6m 116. 25m 67. 3m 116. 15m 69. 7m 116. 15m 69. 7m<				C8	电解	118.75mm	123. 1mm	120mm	123. 1mm	120mm	123. 1mm	two diagonally
Viewing 0 Mark Parameter Viewing 0	Monitor		and the second se	Dl	M7	67.6mm	116. 25mm	67. 3mm	116.15mm	69. 7mm	116.25mm	coordinates of the two marks
VAris ZAris Tansport Varis ZAris Tansport Varis Zaris <				HT7130-1#	SOT89	113.8mm	124.75mm	113.8mm	125. 2mm	112. 3mm	123. 3mm	2. Fill in the
Config 01 90723 113 mm 112. 4mm 111. 22mm 13. 3 mm Of Confinition is in the longer Config 0 Mark Camera High Speed Camera Precision Camera 6 5. 50723 64. 5mm 122. 5mm 65. 5mm 113. 5mm 108 mm 65. 5mm 113. 5mm 108 mm MARK I, MAR	/ <i>/</i>		and an and a second	PIR	TO-52xxx	93. 3mm	124. 77mm	93. 3mm	123.5mm	90, 76mm	123. 5mm	recorded 2 sets
VANS ZAVS Tansport VI AVS ZAVS Tansport VI AVS ZAVS Tansport VI AVS ZAVS Tansport VI AVS ZAVS VI AVS VI AVS<	Config			Q1	S0T23	113mm	112. 4mm	113mm	112. 4mm	111.925mm	113. 35m	the lower
Bat • Makk Camer • High Speed Camer • Precision Camer • Makk Camer • High Speed Camer • Precision Camer • VY Axis • Z Axis • Z Axis • Transport • Z Axis				Q2	SOT23	64.8mm	122.9mm	64. 8mm	122. 9mm	63.85mm	121. 825m	MARK1,
Ext • Mark Cuerer • High Speed Cuerer • High Speed Cuerer • High Speed Cuerer • Precision Cuerer • Zaxis • Transport • Zaxis		2		Q3	SOT23	69.8mm	123.15mm	69.8mm	123.15mm	68.85mm	122. 075m	MARK2
XY Axis Z Axis Transport Image: Construction of the	Exit	Mark Camera O High Speed Camera O Pr	ecision Camera	Rl	x0603x	98.7mm	125.1mm	98.7mm	125.1mm	98. 7mm	124. 4mm	3. If there is no
111 com 120 cm	XV A vis	Z ávis Tra	insport	R2	x0603x	94.55mm	120. 9mm	94.55mm	120. 9mm	94. 55mm	120. 2mm	board on the no
1 1			insport	R4	x0603x	91.3mm	120.5mm	91.3mm	120. 5mm	91. 3mm	121. 2mm	
	N 1	left Z1 Z5 Up	Board	R5	x0603x	94.5mm	115. 8mm	94. 5mm	115.8mm	94. 5mm	115. 1mm	A family & fADY
Image: Start Bit: Start Bit: Springbadd Springbadd Open three-stage Image: Start Bit: Open three-stage Image: Start Bit: Open three-stage Image: Start Bit: Image: Start Bit: Open three-stage Image: Start Bit:				R6	x0603x	88mm	117.6mm	88mm	117.6mm	88am	118.3mm	 Manually MARK
		Cente Zero		R7	x0603x	94.5mm	112. 3mm	94. 5mm	112. 3mm	94. 5mm	111.6mm	System MARK
Image: Start Bit: Open three-stage Image: Start Bit:				RS	x0603x	SSam	113. Sam	88mm	113.8mm	88mm	114.5mm	
R10 x 40003x 105 im 114 fem 106 im 116 fem 116 fem 106 im 116 fem		Right O Z4 O Z8 Down	Clip Board	R9	x0603x	105.1mm	118. 3mm	105. 1mm	118.3mm	105.1mm	119mm	MARK 1 Coordinate
Presidention Settings NARK Parameter N N NO 109 Gen 112 Gen 105 Gen 112 Gen 115 Gen 113 Gen				R10	x0603x	105.1mm	114.8mm	105.1mm	114.8mm	105.1mm	114.1mm	X:
Kitz Watzk Farameter XY Mount Speed Angle Mount Speed Angle Mount Speed Angle Mount Speed Mark Farameter MARk Coordinate MARk Coordinate <t< td=""><td>Production Satting</td><td>7</td><td></td><td>R11</td><td>x0603x</td><td>109.05mm</td><td>112.65mm</td><td>109.05mm</td><td>112.65mm</td><td>108.35mm</td><td>112.65m</td><td>Y:</td></t<>	Production Satting	7		R11	x0603x	109.05mm	112.65mm	109.05mm	112.65mm	108.35mm	112.65m	Y:
XY Error 2.0 5.1 XXXXE Error 50 50 XY Mount Speed Angle Mount Speed Angle Error 0.10 6.1 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10 60 10	- Precision Camer	a MARK Parameter		R12	x0603x	09. 5mm	119.4mm	09.8mm	119.4mm	09. 1mm	119.400	MARK 2 Coordinate
Augle Error 0.10 No: 20 No: 20 Start Bit: Set the Input Set Output Open Auto Mark Open three-stage Open three-stage Control 10, cell 11, 20 Open Auto Mark Open three-stage Control 11, 20 Control 11, 2	XY Error: 2	.0 - MARK Error: 50 - XV Mount Speed Angle Mo	unt Speed	R13	x0603x	69.8mm	119.4mm	09.8mm	119. 9mm	09. 1mm	119. 400	X:
No. 20 30 20 30 20 30 20 30 30 7 Start Bit: Set find Input Output Open Auto Mark I Input Output Open three-stage III 30 99. 2m 115. 5m 101. 65m 111. 45m	Angle Error: 0	10 - Proving Parts - 60 -	Juntopeed	R14	OFOER	120. 724mm	117, 191mm	120. 6mm	117. 2mm	120, 724nm	110.048m	
Start Bit: Start Bit: Set the Springboard Springboard Springboard Start Bit: Set the Set the	NO.: 2	0 NO: 20		n15	Rice0001	120.0/6mm	117.209mm	120.800	117. 2mm	120.076mm	110.3520	Y:
Start Bit: Set the Input Output Open Auto Mark 1 * Springboard Board Open three-stage			Contraction of Contra	U1	51550001	99. 2mm	110.900	89. ZIII	110. 900	101.0000	111. 4050	
Springbourd Board Board Open three-stage	Start Bit	Set the Input Output Open Auto Ma	ark									Generate
	1	Springboard Board Board Open three-sta	age		_	m		_			+	
	1											

Figure 5-9-2

④ Delete the bottom layer and the rows that do not need to be mounted.

The right mouse button can quickly select the top/bottom layer. Shown as Figure 5-9-3



Figure 5-9-3



(5) Appoint MARK1, MARK2 with two type: 'manually appoint MARK',' systematically appoint MARK'. (Generally, "System MARK" will be used)

A) **Manually appoint MARK**: According to the PCB layout, find the two coordinate lines with the longest distance, click the right mouse button, and select "Set Mark1" and "Set Mark2" respectively (At this time, the coordinate value will be filled in the box on the right), then click "Generate"

Move the MARK camera, find the mounting position of the MARK1 component just selected on the PCB, align the center of the component mounting position with the center of the crosshair, and then click "Set Mark1"

Move the MARK camera again, find the mounting position of the MARK2 component just selected on the PCB, align the center of the component mounting position with the center of the crosshair, and then click "Set Mark2", after clicking "Set Mark2", it will automatically jump to the "Mount" interface.

B) **System appoint MARK**: After selecting "System MARK", the software will automatically generate the coordinate values of MARK1 and MARK2, and the data on the left will also be marked with different colors for MARK1 and MARK2 (the green is MARK1, the blue is MARK2) Then click "Generate"

Move the MARK camera, find the mounting position of the MARK1 component on the PCB board, align the center of the component mounting position with the center of the crosshair, and then click "Set Mark1";

Move the MARK camera again, find the placement position of the MARK2 component on the PCB board, align the center of the component placement position with the center of the crosshair, and then click "Set Mark2", After clicking "Set Mark2", it will automatically jump to the "Mount" interface. As shown Figure 5-9-4



Reset is complete!



Figure 5-9-4

6 In "Mounting", first check whether the mounting position and angle are correct or not.

Checking Method: Right click on each line, select "Locate", or click "^{Next}" to check and verify

 \bigcirc If everything is correct after checking, click" $\begin{tabular}{c} \end{tabular} \end{tabular}$, the software will automatically

generate "Part", and the page will automatically jump to "Part" as shown Figure 5-9-5

48	3 Y:	51682 Z	: 0 Ma	nual S	emi-au	tomatic	Fu	lly-ai	itomati	c)092	Y: 54	336 Z: (N	Ianual	Ser	ni-au	tom	atic	Ful	ly-au
כ	Board	🚺 Mou	nt 🧿 Impo	rt 🕂	Part			Save	Save		Board	🖸 Mount 🕻) Imp	ort	+ P	art				Save
Posi	tion: Q1	Angl	le: 89.98	Add componen	Update coordinate	Correct coordinat	A	dd ray	Correct verificatio	Part N Footp	ame: 150R int: 0805F	2		1	Add Part]		Sa	ve	F
ootj	nint: SOT	23	ic. ▼	Insert componen	Modify componen	Next	Spec	ialsha board	Open MarkLED	Ty Pick of	pe: Tape&F	Ree ▼ NO.: Feeder				J		Chi	inge	Pre
	Position	Part	Footprint Statio	on X	Y	Angle	Nozzle	Array	Valid	Feed	r	/	1							Sc
1	R15	150R	0805R	19973	48243	-0.02	0	1	V		X: 621	0 Mark Camera		Test	F	High Spee	ed Camer	ra Test		
2	Q2	A1SHB	SOT23	20544	54334	179.98	0	1					_							
3	R18	3R	0805R	19971	49158	179.98	0	1	V		Y: 6666	73 Record		Open Fee	der	Precision	a Camera	Test		
4	R17	3R	0805R	19971	48948	179.98	0	1				TNI								
5	R16	150R	0805R	19973	48463	-0.02	0	1				//								Co
6	C1	0.01uF	x0603x	20933	51121	-0.02	0	1		Pick	p Height:	Nozzle	Pa	iste Height:	0		Nozzle			
7	C2	0.01uF	x0603x	19833	51682	-0.02	0	1	V	Pick	in Sped			uta Connd	1	- P.	and Uni	a hat		Co
8	C4	0.01uF	Locate		12	-0.02	0	1		1 IVA	//=	Kecord Heigh	t 11	iste opeeu.	_		coru nei	igne		-
9	D1	SS14	Displacement		14	89.98	0	1		Pick	p L'day:	0	Pa	iste Delay:	10					
10	HT71	ZD	Test		30	179.98	0	1			0									1
11	Q1	A2SHB	Select All		1	89.98	0	1	V	1 Ac	Part	Footprint Feeder	X	Y	Pickup	Pickup	Pickup	Paste	Paste	Past
12	Q3	P MOS	Reverse Electio	n	13	179.98	0	1				Troopian Troop			Height	Speed	Delay	Height	Speed	Della
13	R1	47K	Delete		1	179.98	0	1		1	150R	0805R			0	1	10	0	1	10
14	R2	4.7M	Selected		• [7	179.98	0	1	11	2	A1SHB	SOT23			0	1	10	0	1	10
15	R4	750K	Sort		2	-0.02	0	1	1	3	3R	0805R			0	1	10	0	1	10
16	R5	1.2M	Nozzle Sort		2	179.98	0	1		4	0.011	x0603x			0	1	10	0	1	10
1/	R6	15K	Associate Com	ponent	2	-0.02	0	//		5	5514				0	1	10	0	1	10
18	K7 DO	10	Unify Angle		2	179.98	1	1		0	4DCAD	00109			0	1	10	0	1	10
19	K8	10K	Cancel Placem	ient	2	-0.02	//	1			AZOND R MOR	20123			0	1	10	0	1	10
20	R11 010	101	Setup Placeme	ent	6	00.98	1	1		0	478	206022			0	1	10	0	1	10
21	R14	11	Package Angle	Change	4	07.0	0	1		10	4.71	x0603x			0	1	10	0	1	10
22	RIS D14	20	Search for Plac	ement Position	n lo	17 00	0	1		11	750K	x0603x			0	1	10	0	1	10
23	R14 II1	on Ricc0001	Mark as Start P	osition	8	-90.02	0	1		12	1 21	x0603x			0	1	10	0	1	10
24	01	B1880001	BOM Import			-90.02	0	1		12	1. ZM	x0603x			0	1	10	0	1	10
			Create Part							14	11	x0603x			0	1	10	0	1	10
			-							15	1.0K	x0603x			0	1	10	0	1	10
										16	Ricc0001	Ric			0	1	10	0	1	10
										10	D12220001	D15			V	1	10	0	T	10

Figure 5-9-5

(8) In the "Part" interface, set the parameters of each Part (including: "Type", "NO.", coordinates, speed, delay) The setting method is the same as 5.5.4.

synchronize the data to " Mount "As shown Figure 5-9-6



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Figure 5-9-6

(1) Appoint the nozzle number for different position associations.

Method: Click the right mouse button on the row to be associated, select "Nozzle Sorting", and specify the nozzle number for the placement position. (The placement position and nozzle number can be selected multiple times) as shown Figure 5-9-7



READY	TECH.KY	X: 20	106	Y: 5	4338 Z	Z: 0	Mar	ual S	emi-aut	tomatic	Fu	lly-au	itomati
C			Ē	Board	Мот	int 🤇	Impor	t 日	Part			Save	Save
Reset	- 2 (8	÷.	Positi	on: Q2	Ang	gle: -179.	96	Add	Update coordinate	Correct	A	idd rray	Correct verificatio
Login		I	art Nai Footpri	int: SOT2	3 • Noz: 13	zle:	•	Insert componen	Modify componen	Next	Spec	cialsha board	Open MarkLED
Produce		5		Position	Part	Footpris	at Station	x	Y	Angle	Nozzle	Array	Valid
	C. G. G. MAR		1	R15	150R	08055	T&R:6	19528	48250	0.04	0	1	
Project			2	Q2	A1SHB	SOT23	3 T&R:7	20092	54337	-17	0	1	V
			3	R18	ЗR	08055	T&R:8	19525	49165	-17	0	1	
Offine		100	4	R17	ЗR	08055	T&R:8	19525	48955	-17	0	1	
			5	R16	150R	08055	: T&R:6	19527	48469	0.04	0	1	
			6	C1	0.01uF	x0603	x T&R:9	20485	51127	0.04	0	1	
Monitor			7	C2	0.01uF	x0603	x T&R:9	19384	51686	0.04	0	1	
6		/	8	C4	0.01uF	x0603	x T&R:9	19034	51686	0.04	0	1	
Confir			10				Locate						
			11	01	12SHB		Displacement			90.04	0	1	
X			12	03	P MOS	-	lest			-17	0	1	
Exit			13	R1	47K	Y	Select All		ł	-17	0	1	
	 Mark Camera High Speed Camera Pre 	ecision Camera	14	R2	4.71	x	Reverse Election	n		-17	0	1	
XY Axis	Z Axis Tra	nsport	15	R4	750K	x	Selected			0.04	0	1	V
	Top Z1 OZ5 Up	Loose	16	R5	1.2M	x	Sort			-17	0	1	
		board	17	R6	15K	x	Nemle Cest			0.04	0	1	V
	Cente © Z2 © Zo Zero		18	R7	11	x	Associate Con	nonent		-17	0	1	
			19	R8	15K	x	Unify Angle	ponene		0.04	0	1	
	Right 74 78 Down	Clip	20	R11	10K	x	Cancel Placen	ent		90.04	0	1	
		DIROG	21	R12	1M	x	Setup Placem	ent		90.04	0	1	
	1		22	R13	1M	x	Package Angl	Change		90.04	0	1	
Production Settings	MARK Dynameter		23	R14	ЗR	<u> </u>	Search for Pla	ement Posi	tion	-17	0	1	
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Angle Error: 0.	10 The Proving	unt speed					BOM Import						
NO.: 20	NO: 20						Create Part						
Start Bit:	Set the Springboard Board Output Board Open Auto Ma	nrk nge											
4	Open the file successfully!	e: 488.8KB								1	100% /-		

Figure 5-9-7

(1) After setting the nozzle number, click the right mouse button and select "Sorting" to sort the placement position again. Generally only use the "Nozzle Order" function, click and select "Determine the sequence", a system dialog box pops up, select "Yes". As shown Figure 5-9-8



KAYO-A8L SMT P&P Machine Manual





Figure 5-9-8





1 Click

If you need array, the method is same as (a), (b) in 5.5.5

13 Running: like 5.5.6

◎ Extension: If the "Comment Name" is missing from the imported file data, that is, the "Part Name" is missing, you can use the "BOM Import" function. As shown Figure 5-9-9

C	and the second s	🗖 B	loard	🖸 Mou	int 🧿]	[mport 🗧	Part			as	Sav	e
[Aeset	e cot	Positio	n:	Ang	le: 0.00	Add	Update	Correct		Add	Correct verificatio	1
Login		Part Nam	ie: 150R	 Nozz 	ie: Nozzle1							
		Footprin	nt: Biss00	01		Insert	Modify componen	Next	Spe ped	cialsha I board	Open MarkLED	
Produce												2
			Position	Part	Footprint	Station X	Ŷ	Angle	Nozzle	Array	Valid	
Project		▶ 1	R15	-	Locate	109	40047	-0.03	0	1		
		2	Q2		Displace	ement	86	179.97	0	1		
		3	R17		Test		02	179.97	0	1		
Offine		5	R10 P16		Select A	di l	67	-0.03	0	1		
		6	KIO		Reverse	Election	59	-90.03	0	1		
Monitor		7	Cl	1 <u>-</u> 9	Delete		24	-0.03	0	1		
		8	C2	-	Selecter	1	× 85	-0.03	0	1		
1	+	9	C3	-	Sort		10	179.97	0	1		
Config		10	C4		Nozzle	Sort	85	-0.03	0	1		
		11	C5	-	Associa	te Component	10	179.97	0	1		
×		12	C6	(1 7)	Unify A	ngle	05	89.97	0	1	7	
Exit	Mark Camera High Speed Camera Precision Camera	13	C7	121	Cancel	Placement	05	89.97	0	1	V :	-
WW Anda	7 4	14	C8		Setup P	lacement	89	-90.03	0	1		
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				1 <mark>-</mark>	Search	Start Desition	34 B4	179.97	0	1		
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T C					_	195	0 51565	-0.03	0	1		
				-	_	102	0 52015	-0.03	0	1		
				-	-	188	50 51365	179.97	0	1		
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				-	-	194	50 50305	-0.03	0	1		
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					-	195	71 54336	89, 97	Û	1		-
								1	100% (-		U	(+

Figure 5-9-9

The steps to import BOM (Bill of Material must be in .CSV format) are as follows:

1. In the pop-up dialog box, click "Select File", after selecting the BOM, click "Open"

2. Edit the column of the table, and appoint the corresponding names according to the types of different columns, "Component name", "Position", "Footprint Type", and hide the other columns (specify with the right mouse button)



3. Click "Finish Edit", after confirming that it is correct, click "Yes"

4. Click "Match BOM", after the prompt is successful, click "OK" to complete the BOM import. As shown Figure 5-9-10



Figure 5-9-10



5.7 Factory Parameter Setting

Note: Non-professionals do not operate.

Factory parameters of this device In the "Configuration" menu, click "Configuration" to enter the factory parameter settings.

5.7.1 Fling Materials Location Setting

Throw 10000 15000 Record

After moving the XY axis to the desired position, click "Record".

5.7.2 High Speed Camera Parameter Setting

① Replace the 8 suction nozzles with a black solid nozzle.

② Move the nozzles above the high-speed camera by moving the XY axis, make sure each nozzle is as close as possible to the vision center crosshair location, then click

"record" to save it Record
3 Choose "High Speed [•] High Speed "
④ Click "move to camera work to Camera", adjust the light source brightness to make the

white point of the solid nozzle head bright, highlight. And then click "Visual

parameters Visual Parameters "

Precision Camera

Automatically calculate and click the Exit button.

5.7.3 Precision Camera Parameter Setting

(1) Replace the 8 suction nozzles with a black solid nozzle.

② Move the #1 nozzle to the visual center of precision camera by moving the XY axis,

22452 1261 Record then click "record" to save it. Switch Z axis **C Z2**, move to the visual center as well, then "record". In this way save the visual coordinates of the eight nozzles.

③ Choose "Precision "→click "Measuring " into precision camera parameter setting interface.

(4) Click "Automatic Set Auto Set ", at the same time to adjust the light source brightness to make the white point of the solid nozzle head bright, highlight.

⑤ If appearing "Recognition Complete" dialog box, it indicates that the recognition is

successful and exit after confirming.

5.7.4 Open the Cover Working Mode and Alarm Parameter

Open the door work mode

There are two working modes after opening the cover, speed

deceleration and stop. The alarm parameters are alarming after not taking components for several times.

5.7.5 Corresponding Setting



wide init value: the width of the track after resetting;

Stop spacing: mainly to adjust the stopped boards are centered; Output delay: adjust the output time according to the size of different board;

Stop board Y: stop PCB board position.

5.7.6 Nozzle Relationship Setting

① Prepare inkpad, 8 small-caliber nozzles (502 best), one PCB board with white paper (size> 200x80mm).

2 Click "Nozzle Relationship ^{Nozzle} Relationship "into nozzle relationship setting interface.

③ Move the XY coordinates so that the nozzle is on the upper edge of PCB board with white paper and the 8 nozzles could within the white paper when decline. Shown as Figure 5-10:



Figure 5-10



Record

④ Select "Z1 \rightarrow click "down", making 1 # nozzle drop to white paper and also with much force,

Then click "record height Hight " below the No. 1 nozzle's offset; record the remaining 7 nozzles' height according to the same method separately.

(5) After setting 8 nozzles' height, click "Start ", appearing the prompt box, click "yes (y)" after reading.

⁽⁶⁾ Appearing the prompt box again, after painting the 8 nozzles inkpad, click "Confirming" (Note: Do not click "Confirming" before painting the inkpad), shown as Figure 5-11. 8 nozzles will dot on the white paper successively. Ready to paint the inkpad again, total 4 times, total dot four rows. be careful when operating.



Figure 5-11

⑦ After dotting 4 rows, MARK camera will automatically move close to the first point., Moving the XY axis, red cross line of MARK camera will find the center of the first point,

click "Save nozzle No. 1 ", appearing the prompted box, click "Confirming" after verifying the information. Then MARK camera will automatically move close to the



second point location, moving the XY axis, red cross line of MARK camera will find the center of the second point, click "Save nozzle No. 2", appearing the prompted box, click "Confirming" after verifying the information. So do the third point.

[®]After saving 8 points of the first row, click "ok ^{ok} "on the lower right corner,

MARK camera will automatically move to the next row, and continue to set the second row, setting method same as above.

When all points of the four rows saved, click "ok "on the lower right"

corner, at this point, all of the suction nozzle relationship have been set up, click exit.

5.7.7 Camera angle compensation setting



Camera angle compensation is used to correct the angular misalignment due to mechanical installation. This parameter has been adjusted when the device is shipped from the factory.

5.7.8 Synchronous Pickup Tolerance Setting



Take tolerance: This parameter is used to calculate whether the components can be picked up at the same time. The parameters are determined according to different packaged components. The greater tolerance, The higher the probability of pickup at the same time. The suction components may not be in the center position, resulting in the components can't picked up. The smaller the tolerance value, the smaller the probability of pickup at the same time, and the better the stability of the suction components, this parameter needs the user to adjust according to the components used in the actual mounting process.



5.8 Component Library

According to the component name, collect the pick speed, place speed, pick delay, place delay, etc. of the component together, can quickly match and call when editing the program again.

5.8.1 Component matching

Component + Part matching In interface, click , the software will automatically index the names in the component library, and perform parameter matching for components with the same name in the component. As shown Figure 5-8-1



Figure 5-8-1

5.8.2 Update to Component Library

Synchronize the components in



• Part to the component library.

First select the components to be synchronized (multiple selections are possible), then click the right mouse button and select " Update to Component Library" as shown Figure 5-8-2



READY	TECH.KY	X: 1992	Y: 54	335 Z	Z: 🚺 (Aanua	I Se	mi-a	uton	atic	Ful	ly-au	tomatic
C			Board	🚺 Mou	unt 🕻	🗩 Imj	port	🚹 F	Part				Save	Save
Keset		Part	Name: SS14										F	ügh
		CO Foot	arint: M7			-		Add Part			Sa	ive	Sp	reed
Login			1417		-						Ch	ange	Pre	cision
		I	ype: Tape&R	tee - NO	.: Feeder	-20 -							Ca	mera
Produce		Pick o	ffice: 0	Vist	al: HighSj	peed 👻								
		Feed	ler										So	rting
			X: 2892	0 Ma	urk Camera	1	Test		High Sp	eed Cam	era Test			
Project						_								
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		Picl	cup Speed:	÷ R	ecord Heigh	it P	aste Speed:	5	Ē	Record H	leight		ma	tching
1 🥜 🛛		Pid	cup Delay:	0		P	aste Delay:	10	\$				N	ozzle
Config	ter and an and the second s												1	÷
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Exit		-	150P	09050	TADC	52020	66672	1 EGO	o	Delay	1 590	o	Dellay	u
	Mark Camera O High Speed Camera O Preci	sion Camera	A1 SHB	SOT23	T&R7	52277	66673	1560	8	10	1580	8	10	H
XY Axis	Z Axis Trans	port 3	3R	0805R	T&R8	50585	66673	1560	8	10	1580	8	10	Н
	- Top left ⊛ Z1 ⊙ Z5 Up Bo	ose 4	0.01uF	x0603x	T&R9	48921	66673	1580	8	10	1560	8	10	Н
		5	SS14	117	T&R20	28920	66673	1590	D	elete				
	Cente red Zero Zero	6	ZD	SOT89	T&R22	25672	66673	1590	G	amera P	ositionin	9		
		7	#2SHB	SOT23	T&R10	45591	66673	1580	Ta	ake the	material t	est		
	Right 0 Z4 0 Z8 Down Ro	lip 8	P MOS	SOT23	T&R11	43976	66673	1580	U	nified P	arameter			· · · ·
		9	47K	x0603x	T&R12	42267	66673	1580	Sy	nc to n	nount			
		10	4.71	x0603x	T&R13	32460	66920	1580	M	latch co	mponent	t library		
Production Settings	3 MARV December	11	750K	x0603x	T&R14	38933	66673	1580	U	pdate to	compor	nent libr	ary	···
XY Error: 2	MARK Error: 50 A	12	1.2M	x0603x	T&R15	37311	66673	1580	8	10	1380	8	10	n
Angle Error 0	XY Mount Speed Angle Mount	it Speed 13	15K	x0603x	T&R16	35715	66673	1580	8	10	1560	8	10	Н
NO	Passing Rate : 00	14	11	x0603x	T&R17	33948	66673	1580	8	10	1560	8	10	Н
		15	10K	x0603x	T&R18	32311	66673	1580	8	10	1560	8	10	н
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1	Springboard Board Board Open three-stag	;e												
	Open the file successfully!													

Figure 5-8-2

5.8.3 Component Library

Component In Part interface, click Library pop-up component library interface. as shown Figure 5-8-3 New : Create new component Edit : Modify various parameters of a component. As shown Figure 5-8-4 > to Move the component to the right operation box to modify it (press move to the right) Project Import : Read component information from other edited projects for using Export to :Export from component library to 🛛 🔁 Part Part



READY	TECH.KY	X:	19921 Y:	54335	Z: 0	Manua	l Sem	i-auton	atic	Fully	-automat
READ	TECH.KY	X:	Part Name Footprint: Type: Pick office Part	rd Mori 0.01uF 0.0603x 1aph&Ree + NO 10 trained Footp	Z: 0 unt 0 : Feeder9 ut Hightcoad rint Feed	Manua Import	Sem Pa	I-auton	era Test era Test ra Test b Paste Height 1580 1580	Fully e e e e e e e e e e e e e	-automati své Bal Speed Freciso Component Component Component Lickary Nozzle 1 © Nozzle 1 © Nozzle 1 ©
	Delete From Com	ponent	lew Ed	it Delet	le Proje Impo	ect Exp ort F	ort to art	10 10 10 10 10 10 10 10	1560 1500 1500 1560 1560 1560	8 5 5 8 8 8 8 8 8	10 H 10 H
Precision Camera	MARK Parameter				-		1500	10	1560	8	10 H
XY Error: 2.0 🚔	MARK Error: 50 + XV Mount S	and Angle Mount Sneed	12 1.	Zn X0603X	Tep16 25	511 66673	1580	8 10	1560	0	10 H
Angle Error: 0.10	Pauline Pate: 50	peeu angre arount speeu	13 1	M #0600	TAD17 00	110 00073	1580	0 10	1560	0	10 n
NO: 20	NO: 20		14 1	x0603x	TAD10 200	211 00073	1580	0 10	1560	0	10 H
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Оре	n the file successfully!	px 🔛 Size: 490.8KB							100	% (=) -	

Figure 5-8-3



Figure 5-8-4



-LED: Brightness of the LEDs

-Threshold:Visual recognition threshold, the default is 127. Don't change it casually, it's prepared for some special components.

-Area: Pixel area of each component. Can be set to 0, during the placement process, the software will automatically calculate according to the software's built-in threshold.

-Shape Error: Area tolerance. Can be set to 0, the software will proceed according to the default setting.

-Range: Diameter of the detection area. Can be set to 0 by default, which is the maximum recognition range.



Chapter 6 Maintenance

6.1 Summary

regular maintenance could make the equipment smoothly run, extend the service life and improve production efficiency.

6.2 Daily Maintenance

6.2.1 Daily Check and Clean

A) Often clean the machine desktop, check whether there is a foreign matter, especially the feeder base, and timely clean up. When cleaning, please make sure not let the foreign matter fall into the pores.

B) Often check high-speed camera cover, precision camera cover. No foreign matter, oil, dust, and when wipe, shall not use corrosive solvent.

C) Often check whether there are debris in the track and synchronous belt, if there is necessary to clear with the air gun, prohibit hard objects scratching the track.D) Often check whether the screws, tracheal joints are loose.

6.2.2 Electrical Check

All electrical parts are forbidden to privately disassemble. As the chassis internal has much lines is complex, if foreign matter or dust accesses, completely eradicate using wet cloth to wipe. After power off, can use vacuum cleaner to absorb.

6.3 Rails Maintenance

The rails belong to moving parts, and the movement is frequent, must ensure that monthly replacement of new special lubricants.

Rails Maintenance:

Before all the rails refueled, remove the old grease with a non-dust cloth and insert the oil gun into the grease nipple of rail slide, and then put the lubricant into the slider after fixed, until the oil overflowed from the slider, and then move the slider several times along the rails. Shown as Figure 6-1, 6-2:





The oil gun's nozzle inserts into the slider's nozzle and fully integrate

Figure 6-1



Figure 6-2



Chapter 7 Fault Analysis and Troubleshooting

During production process, due to parameter settings and production material variation and other reasons, the software or related error of SMT machine, need operators to deal with. Common faults and troubleshooting methods are shown in Table 7-1

Fault	Reason Analysis	Solution
	PCB board revered	Click "Stop", and adjust the board after exported
Can not recognize Mark point	Mark point tolerance is set too small	Increase Mark point tolerance (Range 50-100)
	Mark point oxidation or batch causes on PCB board make the difference of saved Mark point is too large	Re-save Mark point
	Check whether the air pressure is	Make sure the air pressure
Feeder cannot normally work	Check whether feeder blocks material	Clean up the waste material
	Check whether feeder is broken	Replace or repair feeder
	Check whether the air pressure is too low	Make sure the air pressure between 0.55Mp and 0.65Mp
Disking motorials shoermally	Check whether the nozzle is clogged or damaged	Clean up or replace nozzle
	Check whether vacuum generator is abnormal	Replace the intake / bleed pipe or vacuum generator
	Parameter setting is wrong	Re-set the coordinate and height of picking material $(3-1)$ of 5.5.4
	Whether there is deviation in the placement position of specific points	Import board again, After "Correct placement coordinate", find this point and modify it.
There is a deviation in the placement position	Whether there is deviation in the whole placement position	Modify the Mark points again
	The first make-up is normal, there is deviation in the placement position of rest make-up and deviation is regular	Reset the array point (⑧ of 5.5.5)
Can not put the board after adjusting the rail	Whether there is debris on the rail	After cleaning up the debris, click "rail reset" to adjust the rail again



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