QUICK EA-A10

BGA/CSP Rework Station

Operation Manual

Thank you for purchasing our BGA/SMD Rework System. The system is exclusively designed for reworking and soldering SMD component. Please carefully read this manual before operating the system. Store this manual in a safe, easily accessible place for future reference.

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1. Summary

Thank you for using QUICK BGA EA-A10 Rework System. This system, have increase base heating power to original system , which adopts micro-processor control and infrared sensor technology to do soldering and de-soldering to surface mount components safely and accurately, increases bottom heating power based on the original one. It can also control the whole technical process and record all the information by means of the IR Software, thus meeting the higher technical demands of modern electronic industry. It becomes one of the most valued electronic equipments in this field.

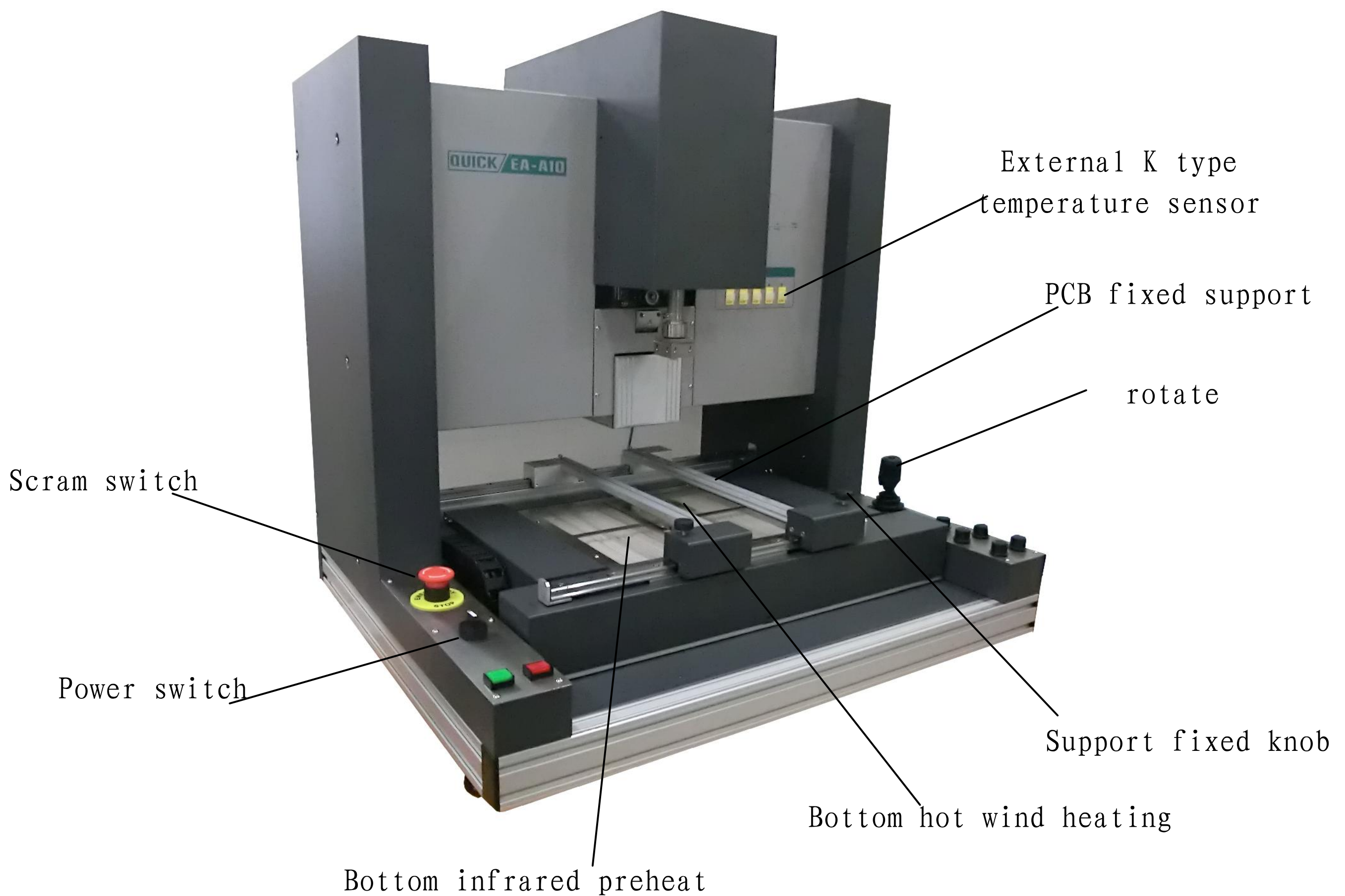
QUICKEA-A10 Rework System adopts hot airflow technology and closed–loop principle, integrating harmoniously the infrared preheater and the sirocco heater together. In order to control the soldering process optimally and get the nondestructive and reproductive PCB temperature, QUICKEA-A10's heating power is up to 4200W and the heating power can be adjustable.

With K-type sensor controls the surface temperature of the BGA. For more preciseness technics demands and effectual controlling the PCB temperature and the encapsulation temperature, the technology of re-flow soldering controlled by closed-loop ensures the precise and smaller technical window, even heat distribution and appropriate peak value of temperature for lead-free soldering. Besides, the infrared preheater is suitable for all applications, such as large or small PCB and lead-free solder, moving automatically in X-axis to heating the PCB evenly.

For reducing the manual effects, QUICK EA-A10 BGA rework system can automatically run the processes except adjusting X、Y、θ with hand, but with the precise motor for precise alignment. Besides, the chip sucking and pasting, lens moving, reflow controlling, heating moving and chip de-solder are all automatic controlled by the step motor. And the system has the controlling software with wide screen display of LCD to multi-control the processes unaided or by the outer computer.

The new BGA rework system has the advantages of the infrared heater and sirocco heater, satisfying the demands of reworking the BGA, especially in lead-free soldering.

2. Product Picture



3. The Unit is Supplied with

Please check whether the following parts are included and intact.

* QUICK EA-A10 Main Unit	1 pcs
* PC（optional）	1 pcs
* QUICK EA-A10 Operation Manual	1 pcs
* top Sirocco nozzle (client provide size)	3 pcs
* Bottom Sirocco nozzle (50*50) 、(36*36)	2 pcs
* Video line	1 pcs
* USB line	1 pcs
* K-type sensors	5 pcs
* BGA Toolbox	1 pcs

Note:

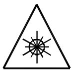
- The parts will be packed according to the packing list. If you don't purchase the optional part, it will not be in the package. If any part stated above is missed out, please contact with our company or agents immediately.

4. Safety Instructions

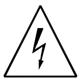
Note: For the safety of the system and operator, please read this manual carefully before operating the unit. Please note that the unit is suitable for soldering and de-soldering of electronic components.

Note: Top and bottom infrared heater and sirocco nozzle will be very hot during working, so explosive and combustible object or gas and solvent is strictly prohibited in working areas, also please don' touch the hot surface parts.

This equipment must be grounding when using.



Note: The laser alignment device includes a secondary laser device, so don't see the laser bean directly.



Note: When the system in trouble and needs maintenance, it should be maintained by an experienced and authorized technician or expert, or contact with service agent and factory.

The unit with dangerous voltage! The inexperienced maintenance is dangerous for the operators.

5. Specifications and Technical Parameters

5.1 Specifications

1. Power: 4200W（max）
2. Voltage: 220V/230V AC、 50/60HZ
3. Power of top Heater: 1200W
4. Power of Bottom infrared preheater:： 400W*4=1600W（infrared heat）
5. Power of Bottom Sirocco Heater： 1200W
6. Temperature of the Sirocco Heater: ≤3.5 m^3/min
7. Temperature of the infrared heater: 400℃（MAX）
8. Preheating temperature range: 400℃（MAX）
9. Size of the infrared heater: 290mm*3240mm
10. Maximal PCB size: 380mm*260mm
11. Chip size range: 2*2mm ~60*60mm
12. Placement precision ±0.02mm
13. Placement force 1.5N / zero pressure placement （two mode realize）
14. Camera： 12V/300mA；
    22*10 Horizontal resolution: 480 TV lines
    PAL format (composite)
15. LED light: White LED (lower side), Red LED (upper side) (with adjustable brightness)
16. communicate： USB （can connect to PC）
17. Bump： 12V/300mA, 0.05Mpa（max）
18. K-type sensor： 5 个

19. Dimension: 1200(L) mm×800(W) mm×940 (H)mm
20. net weight: about 60kg

5.2 Technical Parameter

T0: Valve temperature and T0≤TIR. Only when the temperature of the bottom infrared heater up to the T0, the top and bottom hot air heater comes to heat.

VT: The setting airflow of the top hot air

VB: The setting airflow of the bottom hot air

Top Sirocco: set top sirocco temperature of flow

Bottom sirocco: set bottom sirocco temperature of flow

Time: The setting time in the D1~D6&COOL zone

D1~D6: The six zone of one flow

COOL: The cooling zone

KT1~KT5: The testing temperature on the PCB with the outer K-type sensor 1~5

TC: The real temperature of the top sirocco heater

TB: The real temperature of the bottom sirocco heater

Tir: The setting temperature of bottom infrared heater

TIR: The real temperature of the bottom infrared heater

BUM: Pump is in working mode or not

FAN: The nearside cooling fan is in working mode or not

HED: the position of the top heater（UP-DOWN-UNKN）

ALG: the position of the contraposition arm（IN-OUT-UNKN）

6. Installing and Connecting of the Equipment

6. 1 Check the Package of the Equipment

- Check the package of the equipment is good or not.
- Take out the QUICK EA-A10 from the package and place it on the solid working desk.
- Check every unit is good or not according to the packing list. If not, please replace the unit from our company or agents in time.

6. 2 Connect Equipment

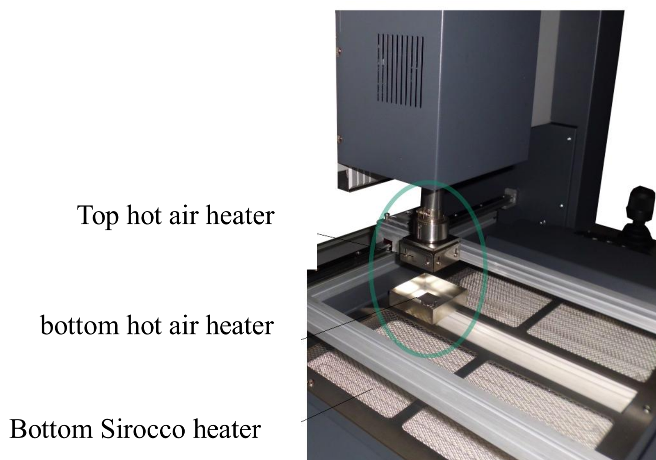
- Check the power supply whether is the same with the rating voltage value in the specification scutcheon.
- Check the switches of the entire units are turn off or not.
- Connect the power cord to the power socket.
- Connect the RS-232 cord to the RS-232 socket in PC if you use the BGA software.
- Connect the video line of the external LCD to the VIDEO-OUT socket.
- Connect the K type sensors (optional) to the external sensor’s socket in the front.

7. Parts Instruction

7. 1 Sensor

The system has five K-type sensors for checking the temperature on the PCB, such as the temperature of BGA surface, bottom temperature of the PCB, real temperature of the tin ball. And these values can show on the LCD. Besides, users can select the sensors during KT1-KT5.

7. 2 Heater System



* Main Heater

1. The main heater includes the top hot air heater and the bottom hot air heater.
2. The top and bottom hot air heater both provides 1200W-heating power. The temperature and the airflow both can be adjustable by the software, main zone of heating warming rapid, heat distribution uniformity, reduce vertical range of temperature between chip surface and welding spot， shorten craft carry out time.

* The Bottom Infrared Preheater

The maximal heating power of the bottom infrared heater is 1600W.

7. 3 PCB Fixture and Movement Controlling

∗ Bottom Preheater and the PCB Fixture

The adjustable infrared heater can provide even quantity of heat for the PCB and protect the PCB from distortion. The infrared heater

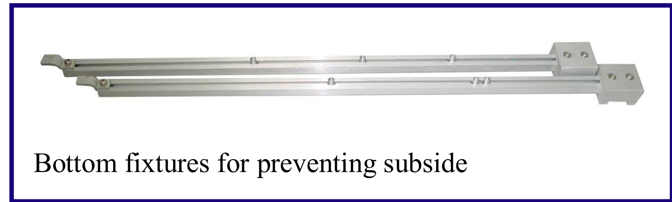
∗ Movement of the PCB Fixture

1. Movable PCB fixture is able to fix PCB with different size.
2. It has two lock knobs which are used for locking PCB Fixed Bar and to prevent it from moving the PCB.
3. Unscrew PCB Lock Knobs and push the Slide Block by hand to open the PCB Fixed Bar, make the distance accord with the PCB's size. Fix the PCB between them and screw the lock knobs. And then screw the fixture lock knob.
4. Before doing the precise alignment, please screw the *Fixture Lock Knob*. By "PCB MOVE CONTROL" to control the alignment from X, Y and θ.
5. Press the key on the top of the rocker "PCB MOVE CONTROL" and when swinging the rocker leftward or rightward, the PCB fixture will do the corresponding movement, leftward or rightward. When swinging the

rocker onward or backward, the PCB fixture will do the corresponding movement, onward or backward. If do not press the key on the top of the rocker and swing the rocker, the pad sucking the chip can do turn 360° .

6. Fix anomalistic PCB with anomalistic knightheads and bottom fixtures for preventing subside.

Anomalistic knightheads


Bottom fixtures for preventing subside

7. 4 Keys Instructions

Key name	function description
START	After set craft and select flow, press START key about 2S, auto start flow.
STOP	Click STOP key, auto stop flow
EMERGENCY STOP	When happen accident, press this key, X/Y/Z stop move ,hot air and sirocco stop; rotate clockwise remove emergency ,X/Y/Z rest.
POWER	Rotate clockwise, connect power; Rotate anticlockwise, cutoff power

1. Press rocker and move it left and right, then realize the PCB guide rail move left and right; move rocker front and back, then realize the PCB move front and back.
2. When proceed θ count point , not need press rocker, spin it direct , can realize chip 360° rotate , then finish counterpoint of chip.

Key name	Function description
Zoom	Control magnify and reduce of picture, 1~8 zoom ratio in all; Rotate clockwise (+), picture magnification, anticlockwise (-), reduction
Focus	Camera focus key Rotate clockwise (+), focus magnification,, anticlockwise (-), reduction
TOP-LIGHT	Top white light Rotate clockwise (+), blue white brighten, anticlockwise (-), darken
BOT-LIGHT	Bottom orange light Rotate clockwise (+), orange light brighten , anticlockwise (-), darken
Z	Rotate clockwise (+), downward movement, anticlockwise (-), upward movement Press Z rotate,(prism state is OUT), realize change "high speed mode" and "low speed mode" can see state of soft

7. 5 Aligning Arm Instruction

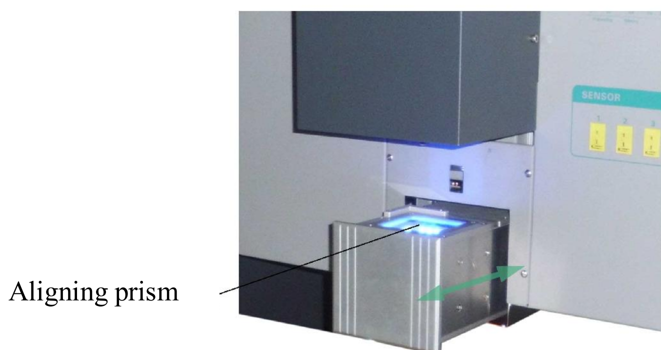
1、the movement of Aligning arm is control by software ; controlling by "aligning in/aligning out" in interface of software.

2、arm is used for the element alignment. In the aligning arm. Aligning arm contain camera, camera export video signal to monitor which produce from PCB and mouth, user can see the picture from monitor, can aligning by rocker and knob.

3、only when top heater reset, Aligning arm can movement.

4、when use camera, Aligning arm must be in out, light can adjust by BLUE、YELLOW knob, adjust picture by FOCUS)、(ZOOM) , can obtain clear picture , and micro-adjust, Aligning simpleness .

Aligning prism



7. 6 Nozzle Instruction

1. Software can realize auto place and suck chip.
2. Turn the rocker when optics alignment to make the sucked BGA by the nozzle turning until the stannum ballpoint in the BGA is superposable with the cuprum point in the PCB. During the process, make the rocker leftward and rightward, onward and backward for precise alignment.

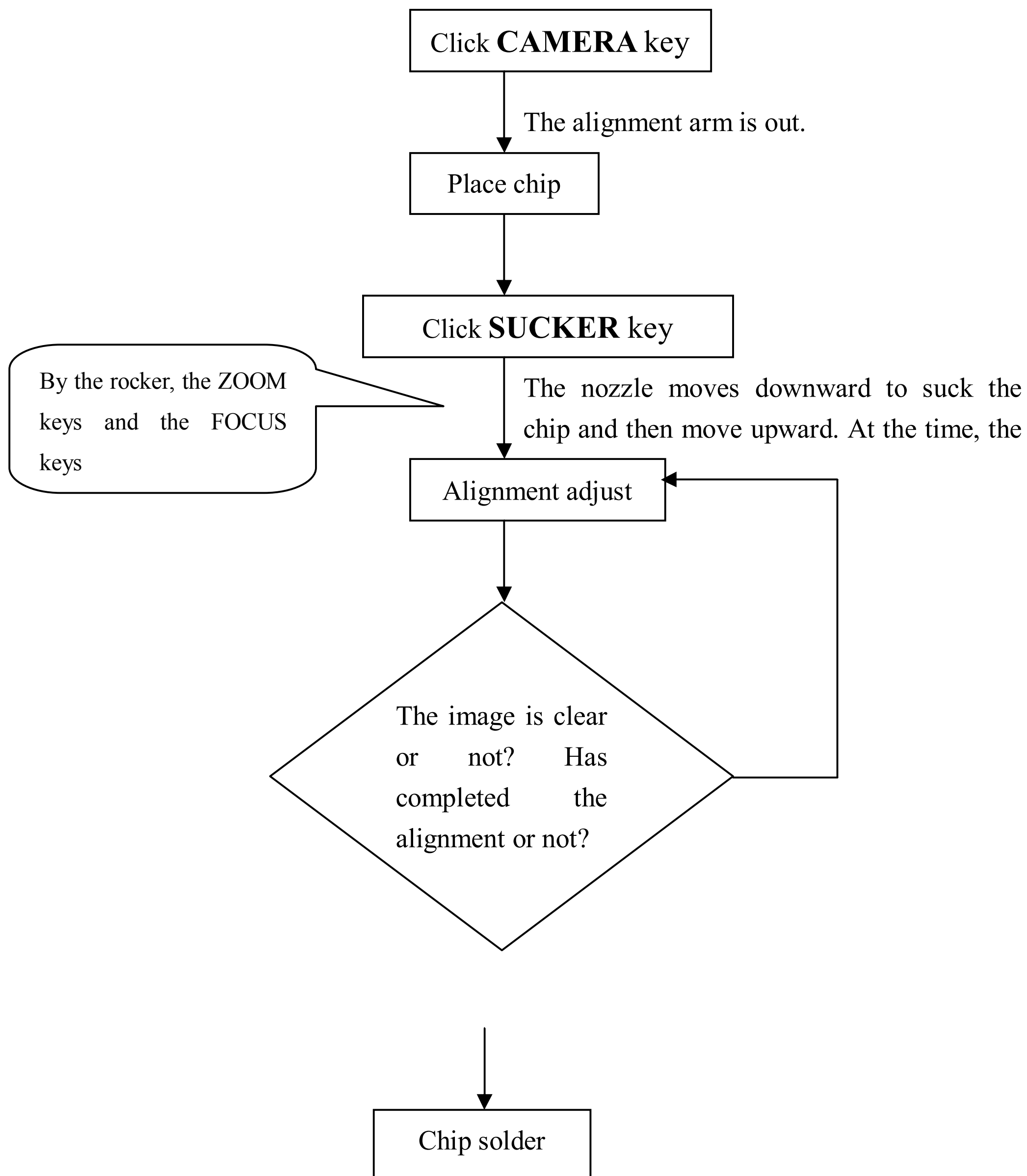
8、Technology Process

Technology Process contain: solder and desolder.

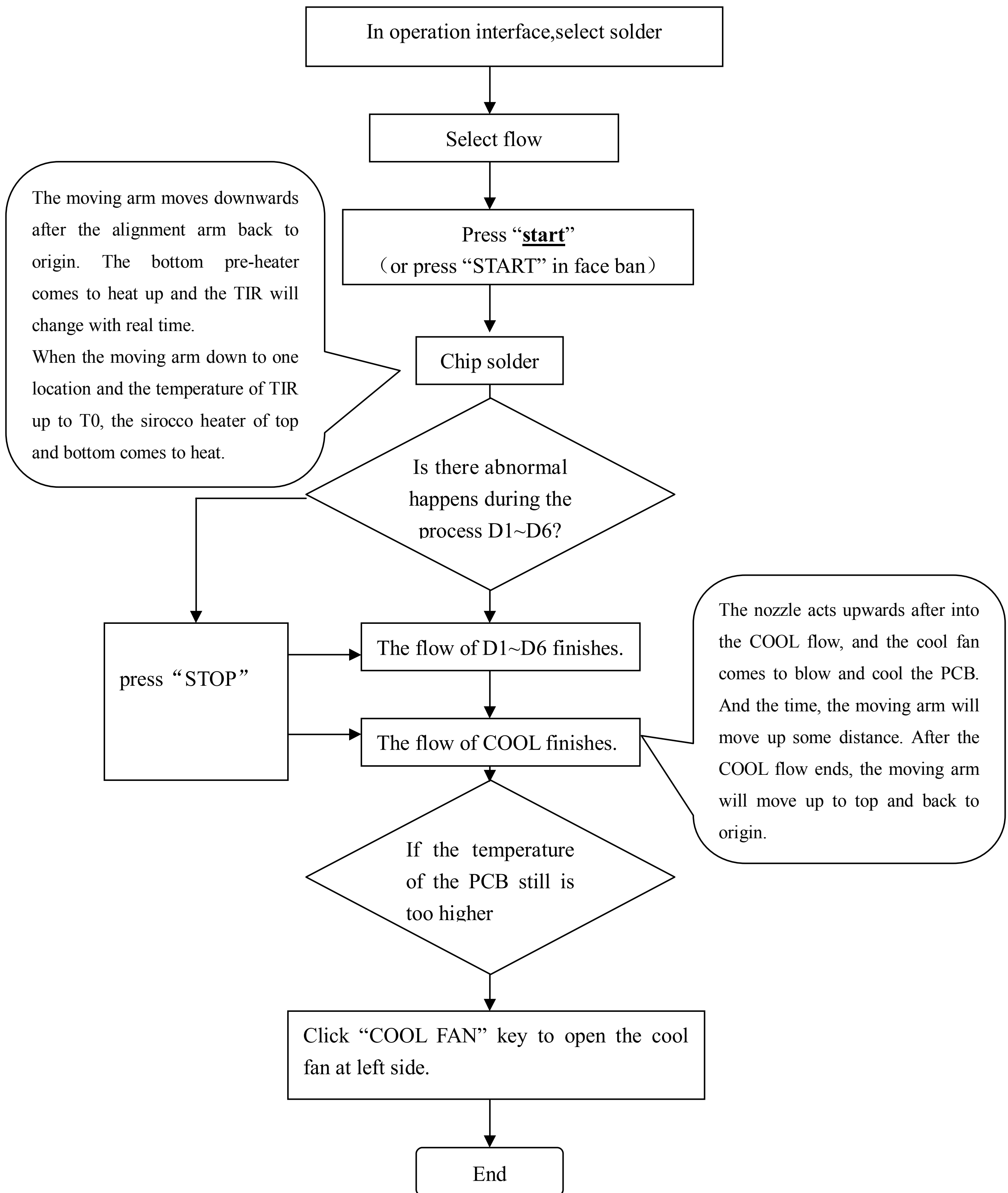
The soldering process includes suck, alignment and soldering.

The de-soldering process includes laser alignment and de-soldering.

8.1 Process of Sucking the Chip

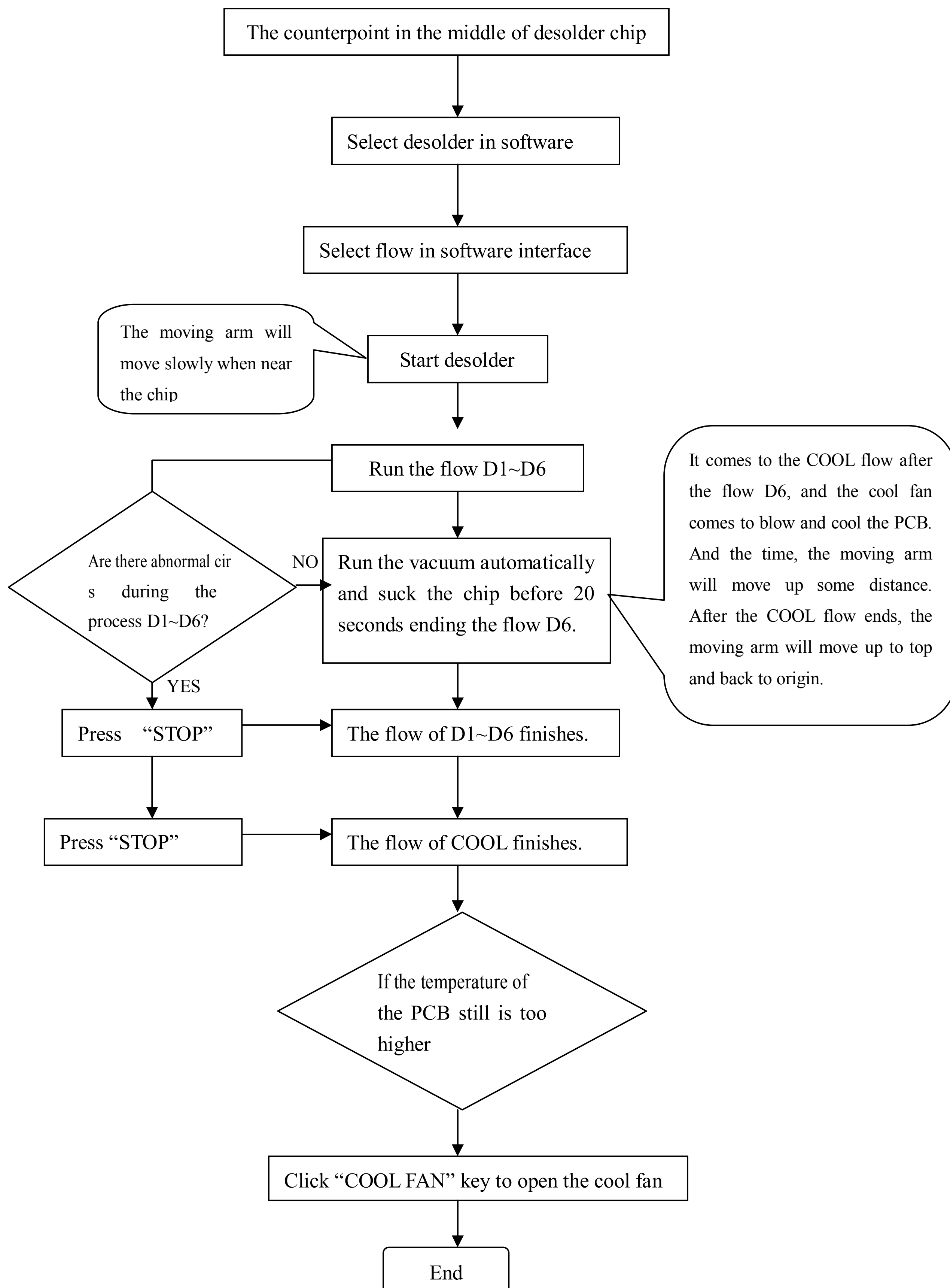


8. 2 solder flow of chip



8. 3 De-soldering Process

Note: please check the flow type "deso" before running the de-soldering process.



9、Description of the process

Note: The top and bottom heater will be very hot during working, so please don' touch the hot surface of the parts.

9.1 place height and suck height

1. **Place height:** after setting one time, place height be save and memory, Do not adjust focus every times for the same BGA chip.(the next time effect which parameter save to current flow)

   Place height： after setting once, no pressure place height be save and memory, to the same specification BGA chip, when solder, do not setting place height every time can realize no pressure place..(the next time effect which parameter save to current flow)

2. **Aligning height setting:**

   （1）、after PCB focus right, suck chip, enter aligning operation interface, rotate "YELLOW" knob, turn off yellow light, rotate BLUE, open blue light.

   （2）、rotate "Z" knob adjust the height of chip, make the picture of chip the best distinct.

   （3、) now, can click "aligning height" , and then enter parameter setting interface, save to appoint parameter, setting complete.

3. **Place height setting:**

   （1）、after suck chip , rotate "Z" knob, make chip approach PCB, when chip achieve the best place height, click software "aligning operation" "place height", this place height be memory . and then enter parameter setting interface, save to appoint parameter, setting complete.

   （2）、when place, reach the place height then auto stop vacuum pump, place BGA chip on the surface of PCB.

note：under common condition, aligning height according to just contact PCB.

9.2 soldering technology

1. Place need solder PCB to PCB studdle（If PCB irregular, can use dysmorphism support）.
2. Screw fixed knob of PCB holder.
3. Shake the rocker, move PCB ban, make laser shine in the middle of BGA pad.
4. Put the waiting soldering BGA chip on suck mouth, attention the direction of chip.
5. Photology aligning. Detail see "9.1".
6. Click "operation interface", select goal flow, then select "solder", and then click "start", auto place chip, start solder.
7. After solder finish , must cool PCB ban , please do next solder flow after cool down.
8. And then again one to six step as follow.

9.3 Desolder technology

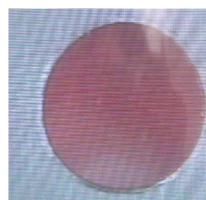
Note: desolder technology flow the same as solder technology flow, only select desolder in BGA software.

1. Place need solder PCB to PCB studdle（If PCB irregular, can use dysmorphism support）.
2. Screw fixed knob of PCB holder.
3. Shake the rocker, move PCB ban, make laser shine in the middle of BGA pad. Open prism, make picture corresponding to chip.
4. Click “operation interface”, select goal flow, then select “desolder”, and then click “start”, auto place chip, start desolder.
5. Flow finish, auto suck chip, take down chip.
6. And then again above step .

9.4 Aligning Technology

1. Unscrew the fixing screws of the PCB fixture and adjust the distance between the PCB fixing bars. Insert the PCB and screw down the fixing screws.
2. Press “CAMERA” key and the alignment arm moves out. The lights of up and down both are on.
3. Place the component on the prism of the alignment arm.
4. It will suck the chip automatically and come back to aligning position after pressing “SUCKER” key. Manual operation is also convenient.
5. Unscrew the fixing screws of the PCB fixture and adjust the distance between the PCB fixing bars. Insert the PCB and screw down the fixing screws and adjust PCB’s position to the below of the aligning arm by the rocket.
6. Make the images of soldering point and component in the same center point. After roughly adjusting, screw the Fixture Fixing Knob to lock PCB Fixture to prevent it from sliding right and left.
7. Check whether the image displayed on LCD fitting user’s demand. Use the rocker to adjust it. Adjusting refers to “Keys Instructions”.
8. Make the images of the component soldering pins and the soldering point on PCB overlap. The image can be observed on the monitor. Aligning adjustment refers to “Adjustment knobs” and “PCB Fixture”.
9. **Observe the images:** the alignment is precise if the two images (Circle) in the LCD superpose, otherwise not and it needs to be adjusted.

Imprecise



Precise

11. After alignment, click the “CAMERA” key, the aligning arm exits to the origin.
12. Click “START” key, the unit runs the soldering flow automatically.

10. Equipment Maintenance

Remark:

- For ensuring reliable function and maintenance of equipment, please use parts provided by original factory.
- Please turn off power switch at each part and pull out the power plug when not in use.

Caution: After cutting off the power supply, please do clean after the surface of the equipment is still very hot and don't use any dangerous or combustible solvent to clean it.

10.1 Clean parts

1. Clean the dust on system with clean towel.
2. Suggest using dry or wet towel to clean the equipment. Solder on the glass of Bottom Radiator can be cleaned out with hard object. Please be careful not to break down the glass.
3. Clean the prism of camera with pledget and be careful not to scrape it.
4. Use the towel with cleaning oil to clean PCB fixture and orbit.

10.2 Replace Suction Pad

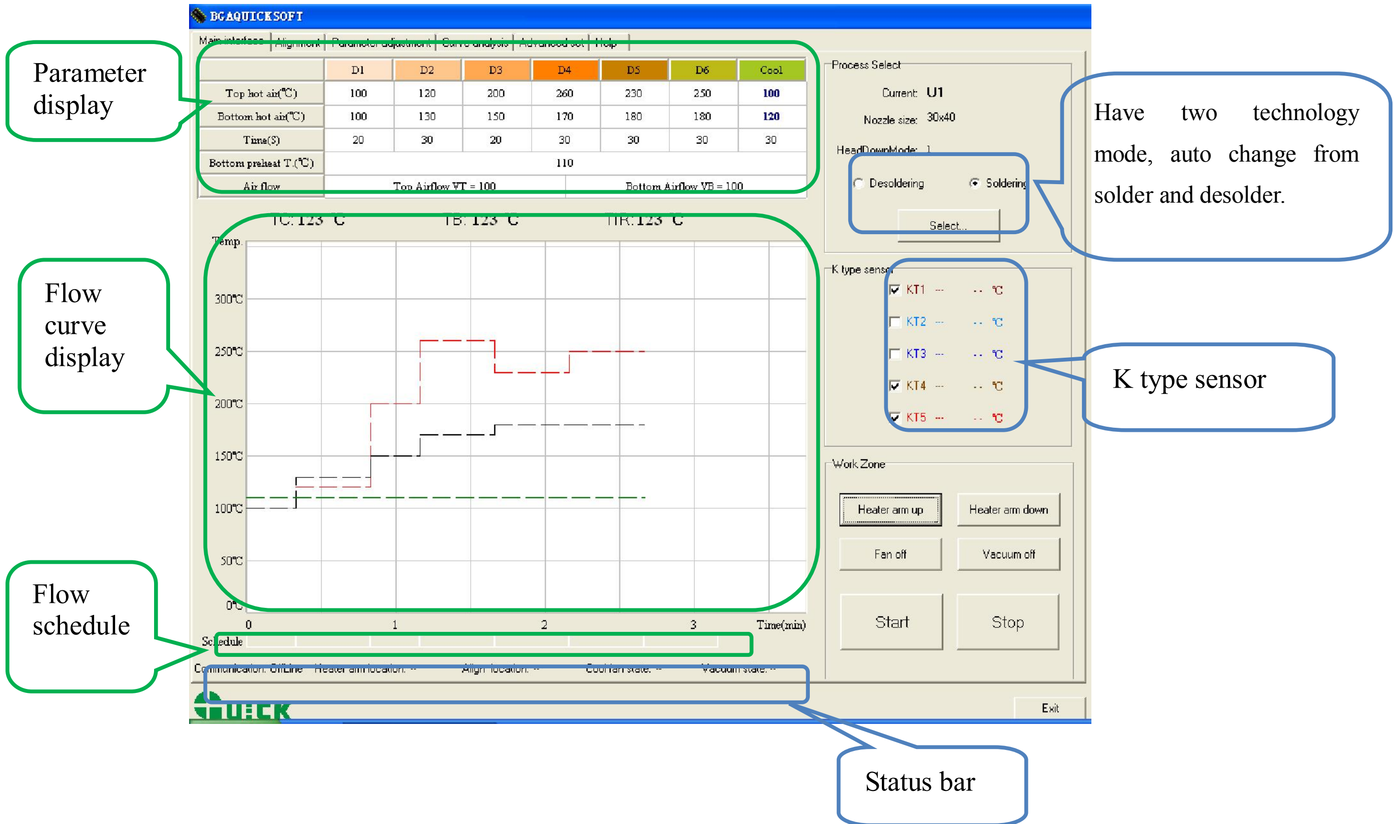
1. If you want to replace the suction pad, please turn off power, and replace it after the vacuum suction nozzle and top heater cooling down.
2. Take the suction pad out of suction nozzle downwards, and install a new one in opposite direction.

Note: QUICK BGA EA-A10 is precise equipment. Please don't make any changes on it. Otherwise the precision of this equipment will be affected.

11、QUICKSOFT brief instruction

11.1 operation interface

1. Operation interface: this interface reaction executive condition of flow , we can real-time operate by this interface.
2. parameter of operation interface, be setting from “parameter testing interface”, in operation interface do not need setting.



Parameter display: the parameter of this area do not be setting in “operation interface”, it can be setting in parameter debug interface.

Flow select: click “start” auto enter flow, in before , must select technology way and flow file.

K type sensor: KT1~KT5, only connect K type temperature sensor, can display temperature .

Flow curve display window: temperature curve of KT1－KT5, easy to real-time watch and curve analysis.

Flow status bar: this bar display flow status by colour, colour is corresponding to working colour .

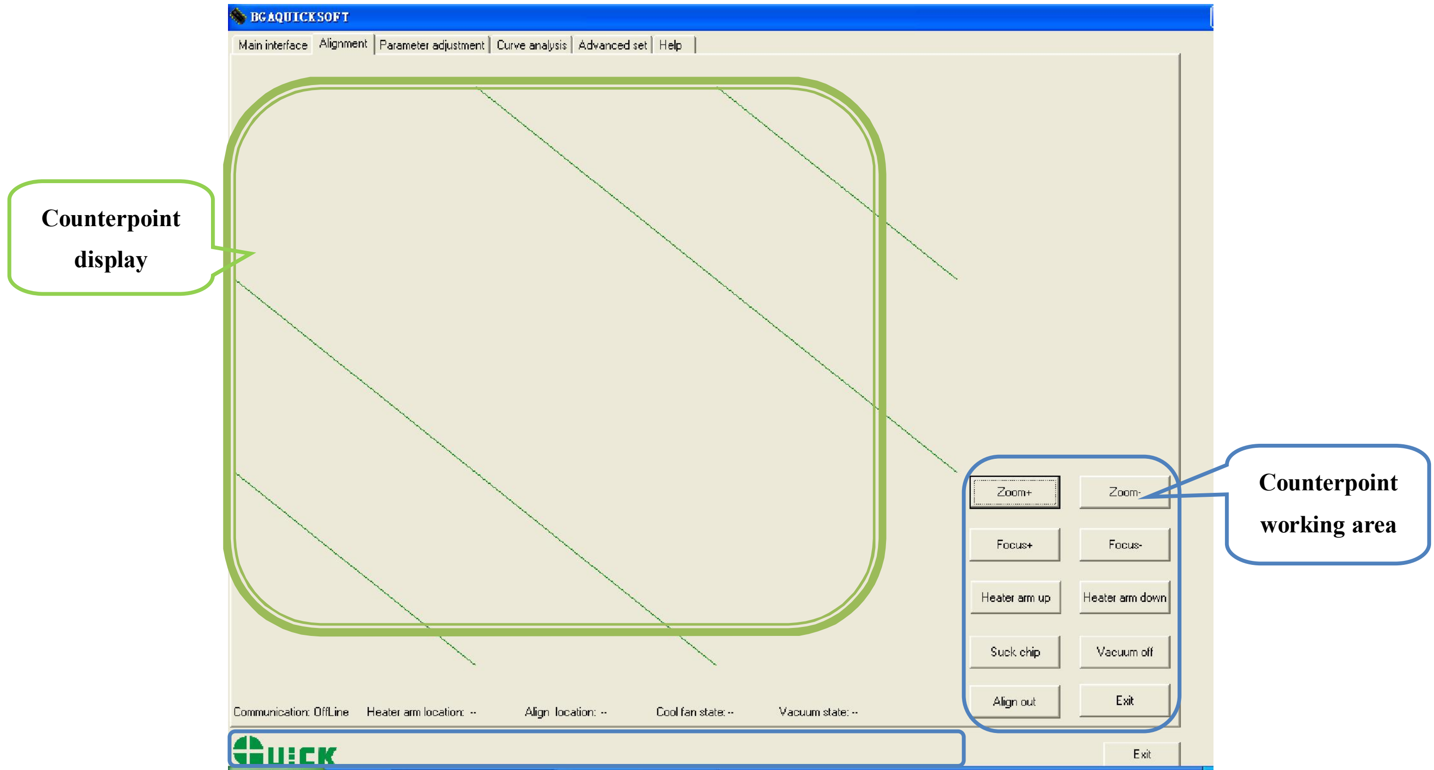
Status bar: real-time display current state, contain communicate state （online/offline）, the location of heat head(up/middle/down）, aligning arm location（external/middle/interior）, head dissipation（open/close）,vacuum state（open/close）.

Only when communicate state is online, we can control equipment auto carry out flow by software.

Working area: contain every working button "heat arm up", "heat arm down"、"dissipation open/dissipation close"、"place component "、"start"、"stop"。

11.2 counterpoint operation interface

We can complete total counterpoint operation by counterpoint operation interface , contain focus, magnify reduce, suck component, etc.



Up light close/up light open: click close or open top blue light.
Down light close/down light open: click close or open top yellow light.

Amplification: amplify picture of display window.
Reduction: reduce picture of display window.

focus+：magnify picture focus.
focus-：reduce picture focus.

Heat arm up: click, heat arm move up; press on continuous, heat arm move up continuous.
Heat arm down: click, heat arm down; press on continuous, heat arm move down continuous.

Suck component /place component: click , then suck component.; after suck, show "place component", and then click this button, place component, button display change to "suck component".

Vacuum open/vacuum close: open or close vacuum pump.

Aligning arm in / out: click, can make aligning arm which in external retraction , the location state change to

"interior"; again click aligning arm, it will move to external ,the location state change to "external".

Exit : exit "counterpoint operation "interface, enter "operation interface", current state have no change.
When working area display aligning arm in ,then status bar location of aligning arm: external;
When working area display vacuum open, then vacuum state in status : "close".

When status bar display "high speed mode", express move speed is high, When status bar display "low speed mode", express move speed is low. This function effect in counterpoint interface.

11.3 parameter testing interface

Parameter testing interface: when solder or desolder new chip, by this display ,we can do solder or desolder testing.

Counterpoint height: memory setting height. After setting, auto memory this height, the same specification chip counterpoint, call save flow, do not need adjust counterpoint height.
Counterpoint height cancel: cancel saved counterpoint height.
Suck height: memory sucking height which have be set. After setting, auto memory this height, when suck the same chip next time, we can call the saved flow, not need adjust counterpoint height.
Cancel suck height: cancel suck height which have be saved.
In flow edit display, show goal flow name and technology type (desolder/solder)、nozzle size、down distance and heat dissipation air quantity etc.
Down distance: adjust heat head height range, setting range 0~255mm; heat dissipation air quantity setting range 35~100. (can adjust on the basis of PCB adjust)

After edit parameter in parameter setting display, in "flow edit display" input flow name, appropriate nozzle size, select flow technology curve is "desolder"、or "solder". And then click "parameter save"、 "save curve", can save current parameter and flow curve.

In parameter setting display, can set parameter, setting range refer to 5.1.

T0: only satisfy "TIR≥T0", hot air system can start working. No special purpose, please set Tir＞T0.

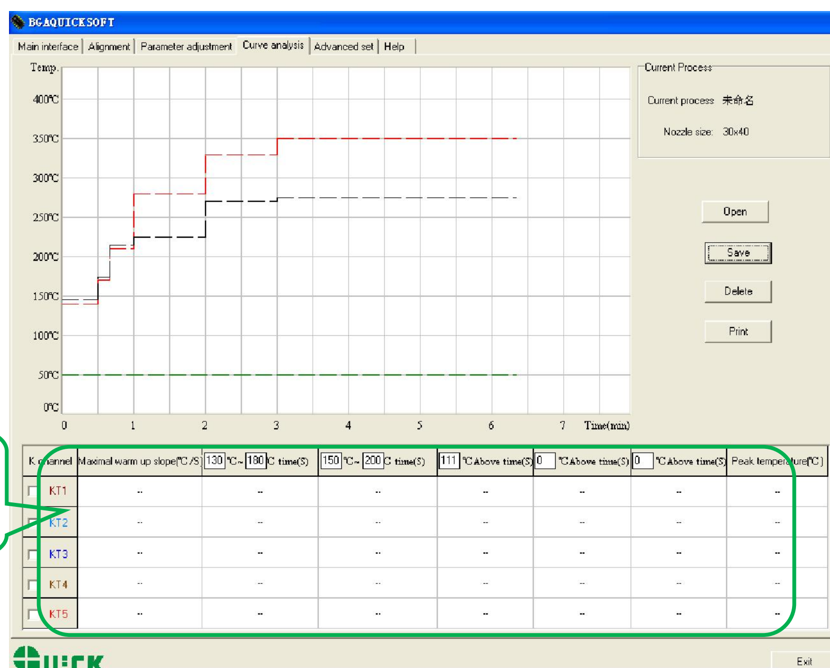
Can also click "flow select" in "edit flow display", call saved parameter and modify it. heat dissipation air quantity : 35～100.

Note: parameter setting please refer to technology require.

11. 4 curve analysis display

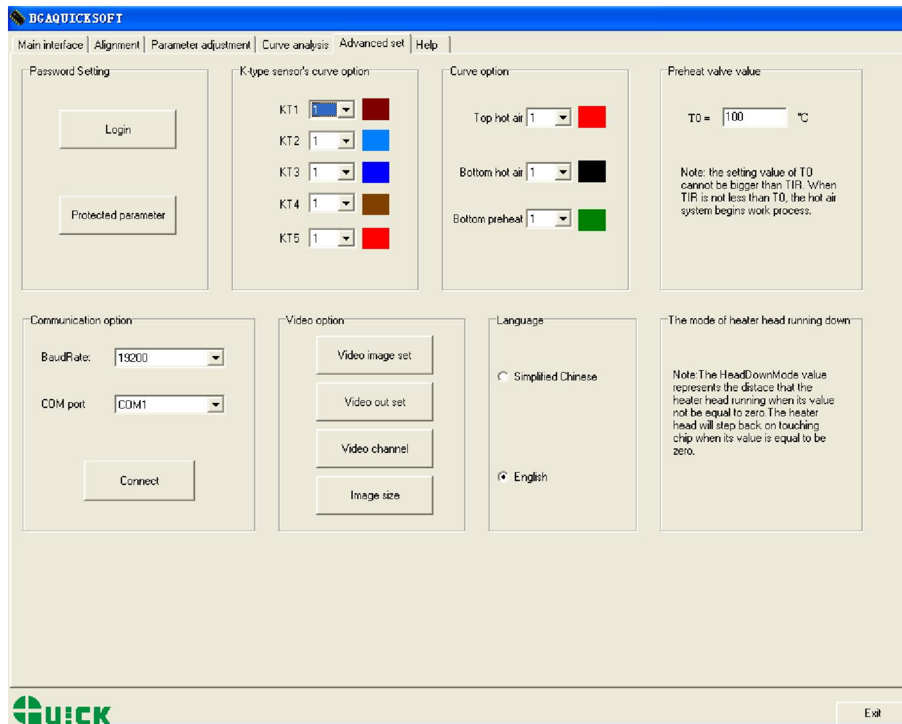
1. Curve analysis display: this display can analysis KT1－KT5 flow curve, know peak temperature of this flow, temperature rise slope, temperature change of every heat process and time, thus judge if correspond technology flow.
2. In curve analysis interface, can save or delete current curve, or call saved curve analysis, and also print current curve file.
3. After open flow file , flow curve interface auto display flow curve; if flow file contain external K type temperature test data, then display temperature arise time, maximum temperature rise slope, peak temperature.

Data analysis interface



11. 3 advanced setting interface

Advanced setting: in this interface, we can set operation limits of authority, communicate video etc. and also can set T0, temperature curve colour and wire wide, and can select china and English.



Password setting: can set "enter password" and "parameter protect" two type password.
The people who obtain enter password can operation this software, but no parameter modify power.
The people who obtain parameter protect can operation this software, and modify parameter.
If not set parameter protect password, people who obtain enter password also modify parameter.

Language version select: can select language china or English.
Select Chinese, then software interface is Chinese.
Select English, then software interface is English.

Colour of K type temperature curve setting: provide different colour and curve wide. In technology interface, temperature display by curve, different colour express different K type temperature sensor.