QUICK BGA 2100

1. Summary

Thank you for using QUICK BGA2100 Rework System. This system, which adopts microprocessor control to solder and de-solder the surface mount components safely and accurately. It also can control the whole technical process and record all the information by means of the BGA Software, thus satisfying the higher technical demands of modern electronic industry. It is one of the most valued electronic equipments in electronic field.

QUICK BGA2100 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, QUICK BGA2100's heating power is up to 5000W 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.

QUICK BGA2100 Rework System with 60*60mm optics aligning prism, big BGA alignment can see clearly and the aligning lens are controlled by the step motor and the chip slave is above the lens. The PCB fixture is square and the maximum size is 550*450mm, the width of the left and right arms can be adjusted and the abnormity knightheads can be fixed on the arms. And the bottom knighthead is connecting with the arm to keep identical placing position of PCB.

For reducing the manual effects, QUICK2025 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. Specifications and Technical Parameters

2.1 Specifications

1. power: 5000W（max）
2. Voltage: 220V/230V AC   50/60HZ
3. Power of top Heater: 800W
4. Power of Bottom infrared preheater: 400W*8=3200W
5. Power of Bottom Sirocco Heater   800W
6. airflow speed of the left side cooling fan：   ≤3.5 m^3/min
7. temperature of the Sirocco Heater: 500℃（MAX）
8. temperature of the infrared heater: 500℃（MAX）
9. size of the infrared heater：   550mm*450mm
10. Maximal PCB size: 600mm*500mm
11. chip size range：   2*2mm ~60*60mm

12. paste precision   ±0.025mm
13. Paste force   1.5N
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. LCD：   Size: 100*75 (mm)   16×2 character
17. COM port：   RS-232C
18. bump：   12V/300mA,   0.05Mpa（max）
19. K-type sensor：   5
20. weight：   120kg
21. dimension：   1150(L) mm×800(W) mm×800 (H)mm

Note: the nozzle can be ordered.

2.2 Technical Parameter

MAIN INTERFACE：

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

TY： Select solder flow or de-solder flow (sold or desold)

Top： The setting sirocco temperature of the top in the D1~D6&COOL zone

Bot： The setting sirocco temperature of the bottom in the D1~D6&COOL zone

Tim： 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

KTC: The real temperature of the top sirocco heater

KTB：   The real temperature of the bottom sirocco heater

TIR：   The setting temperature of bottom infrared heater

KIR：   The real temperature of the bottom infrared heater

TOH：   Top sirocco heater is in working mode or not

BOH：   Bottom sirocco heater in working mode or not

IRH：   The infrared heaters are in working mode or not.

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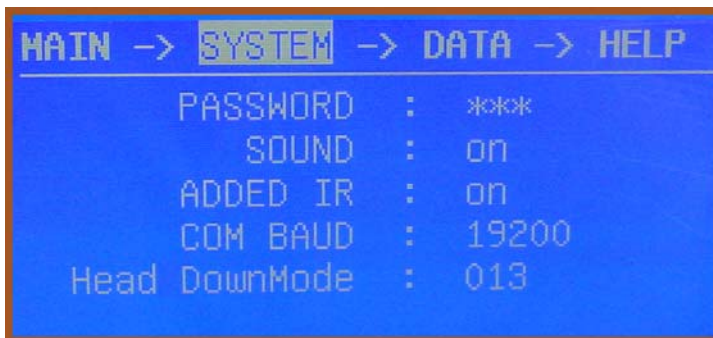
FAN：   The nearside cooling fan is in working mode or not

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

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

SUC：   the position of the nozzle（UP-DOWN-UNKN）

SYSTEM INTERFACE:

PASSWORD：	Set password for protecting the parameter setting.
SOUND：	Alarming or not (ON: with alarming when happening abnormal.
	OFF: without alarming when happening abnormal.)
COM BAUD：	Set the communication baud rate and the default value is 19200.
HEAD DOWN MODE:	When the value is "0", the heater head adjusts automatically the distance between it and the chip when touching the chip. When the value is not "0", the value is the downward moving distance of the heater head.

The parameters in the data interface can be set in the *advanced interface of the BGA software*. The *PASSWORD*'s function is same with *"protected parameter"* of the software and *COM BAUD* also can be set in the *"communication option"* of the software. The *Head DownMode* can be set in the "*the mode of heater head running down*".

DATA INTERFACE：

2100 has ten working modes in which parameter can be changed according to demands.

In data interface, all the parameters of the ten working modes can be changed according to demands.

Flow0~Flow9: which means the different working modes.

T0: Valve temperature and $T0 \leq TIR$.

TD1~TD7: which means the heating temperature in the different zone (D1~D6&COOL) of the top hot air.

BD1~BD7: which means the heating temperature in the different zone (D1~D6&COOL) of the bottom hot air.

SD1~SD7: which means the work time in the different zone (D1~D6&COOL).

All the above parameters can be set in the *parameter adjustment* interface of the software.

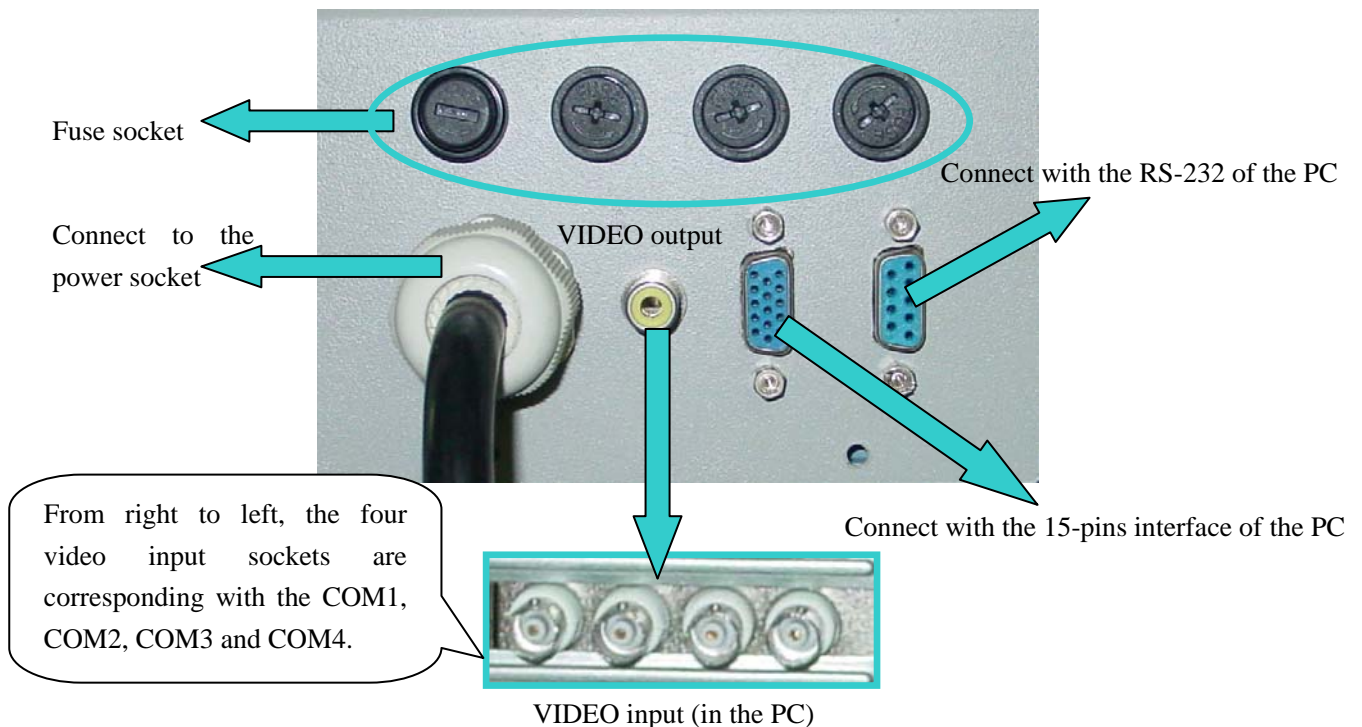***Note:** Time unit："S"   Temperature unit：" "

3、Install and Connecting of the Equipment

3.1 check the package of the equipment

* Check the package of the equipment is good or not.

* Take out the QUICK 2100 rework system from the package and place it on the solid working desk.

* Check every unit is good or not. If not, please replace the unit from our company or agents in time.

3.2 Connect the 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. There are four VIDEO-OUT sockets in the PC and each socket to the different communication port.

* Connect the K type sensors (optional) to the external sensor's socket in the front.

Fuse socket

Connect with the RS-232 of the PC

Connect to the power socket

VIDEO output

Connect with the 15-pins interface of the PC

From right to left, the four video input sockets are corresponding with the COM1, COM2, COM3 and COM4.

VIDEO input (in the PC)

⚠ **Note: there are four video input sockets and each socket is corresponding to different communication port. If connect with the un-corresponding communication port, the unit will not transfer the video information.**

4、Parts Instruction

4.1 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.

Small LCD

K-type sensor
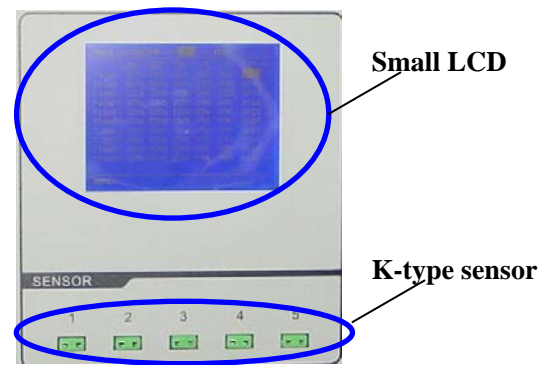
6.2 Heater System

＊ 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 800W-heating power. The temperature and the airflow both can be adjustable on the software or on the small LCD (refer to MIAN INTERFACE).

Top hot air heater

Bottom hot air heater
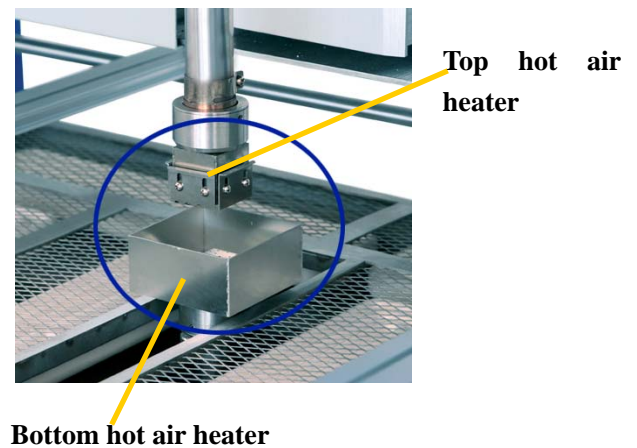
＊ The bottom preheater

1. The maximal heating power of the bottom infrared heater is 3200W and the maximal temperature is 500℃.
2. The middle two heaters are kept on and the other six heaters can be controlled by the switches.

5．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.

＊ Movement about 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 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

# 6．keys instructions

* Keys on the left side
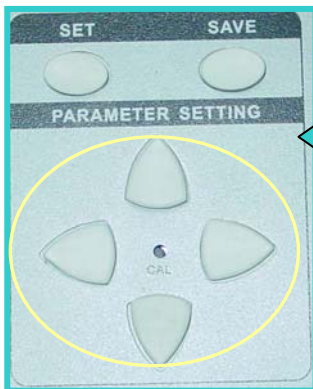
The six keys can control the parameters setting of the "MAIN" interface.

SET: click it into the setting mode.

SAVE: click it to save the changed parameters and exit to set.

CAL: calibrate the temperature about KT1~KT5, KTB, KTC and KIR.

$\triangleleft$ $\triangle$ $\triangledown$ $\triangleright$: Controlling the cursor moving from one parameter to the other parameter and then click "SET" key to the parameter setting mode. Press $\triangle$ or $\triangledown$ key to change the parameter and click "SAVE" key to exit the setting.
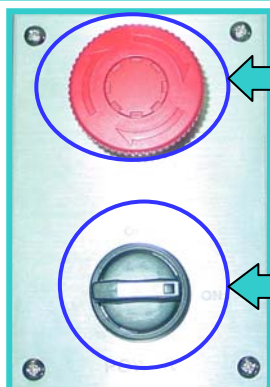
Emergency switch: when happening suddenness, pressing this switch and cutting off the power supply

Power switch: turn on or turn off the power supply.

*Keys on the right side

Infrared heater switch: controlling the corresponding heater is on or off. The middle two heaters (red mark) are on.

1. 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.
2. 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°.

1. Only when the aligning arm is out, the boons "RED"& "WHITE" and the keys "ZOOM" & "FOCUS" can work.
2. The "WHITE" knob adjusts the brightness of the bottom white light.
3. The "RED" knob adjusts the brightness of the top red light.
4. "ZOOM+"&"ZOOM-" keys zoom the image.
5. "FOCUS+" & "FOCUS-" for camera focusing.
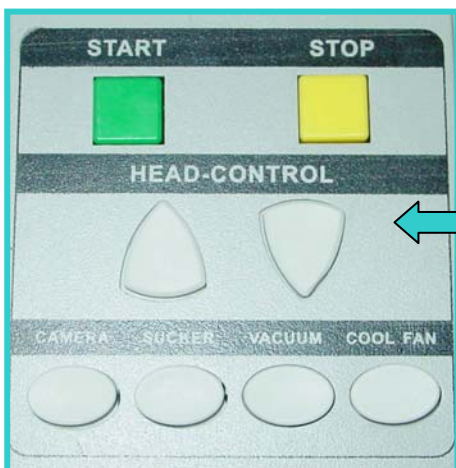
1. **START**: in standby mode, click it into the soldering or de-soldering process.
2. **STOP**: in the soldering or de-soldering process, click it to exit the current process and the heating arm will move upwards.
3. **HEAD-CONTROL** $\triangle \triangledown$: Control the movement of the top sirocco-heating arm, upward or downward.
4. **CAMERA**: Click it to make the aligning arm moving out and open the camera. It can do the alignment.
5. **SUCKER**: Make the sucking pad suck the chip.
6. **VACUUM**: Click it to open the vacuum bump.

* Note: In the flow of soldering or de-soldering, the keys (CAMERA, SUCKER, VACUUM and COOL FAN) cannot work.

7.   Aligning Arm Instruction

Aligning arm is used for the element alignment. In the aligning arm, there is a camera which transmitting the information by video cord and then displaying the image about the soldering point in the PCB and element pins below the nozzle. Users can observe element alignment by adjusting function keys.
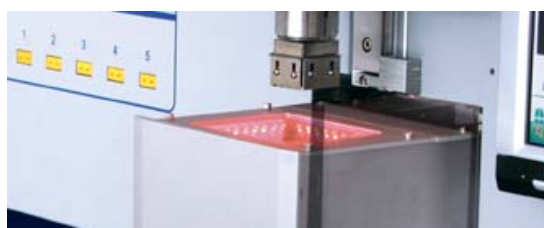
- Aligning arm is controlled by the "CAMERA" key. Pressing "CAMERA" key, when the aligning arm is in side, it will move automatically from inner to outer and stop in one line with the top heater, and when the aligning arm is outside, it will do the opposite action to the initial state. But the aligning arm does not act when pressing it until the top heater up to the top.
- Aligning arm is outside when the camera in using state and the light of the camera is adjustable. User can get a clear image by lighting, focusing and zooming and the aligning operation is easy and convenient by micro adjusting.

8. Nozzle Instruction

- The nozzle will act during the process of placing and sucking the chip and the SUCKER key and the rocker can control the nozzle's movement.
- Press "SUCKER" key to the state of the chip sucking and the nozzle will suck the chip automatically.
- Press "START" key to the state of the chip pasting and the nozzle will paste the chip automatically.
- Turn the rocker when optics alignment to make the BGA sucked 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.

⚠**Note:** **the communication is unilateral, and the saving data in the small LCD cannot transfer to the PC, but the data saved in the PC can transfer to the small LCD.**

9. Functions and use of the software

a) Installation

Before use the "BGAQuickSoft" software, it must be installed in the computer. Double click the icon of the "BGAQuickSoft" in the CD, and then install the software as the program.

b) Login

1. After install successfully, it will pop up an interface of inputting password as following:

2. If you click the "cancel" button, it will run into the Main interface directly.

3. If you want to set the password, input the numeric values from 1 to 999 by the keyboard. The password in the "password input" and the "password confirmation" must be the same each other. And then click "hanged login password" to save the setting password. The system pops-up the following dialog box.

⚠️**Note:**   **the password can protect the MCU's parameters from change by un-authorizing person.**

c) **Main interface Tab**

1.   The main interface's function is to operate the software. The data cannot be changed at the screen.

2.   It can select "soldering" or "desoldering" process and select one flow saving in the PC.

3.   At the bottom of the screen, it will display the running flow's state, a real-time changing schedule with different colors and other information.
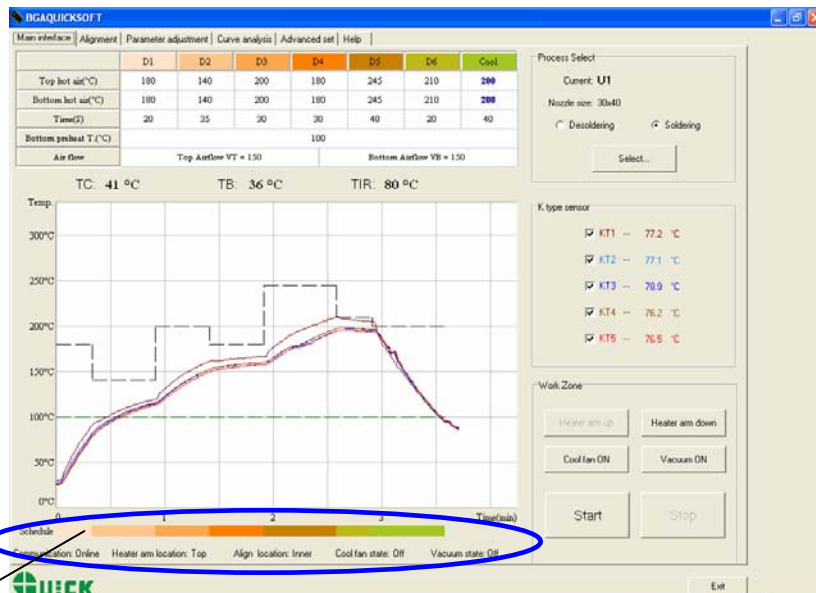

Flow's state

d) **Align Tab**

1. Click "alignment" tab, it will display the alignment interface and the alignment arm will move out.
2. For getting a clear image, it can adjust the light and focus the image by clicking the button at the right side or by the keys or rocker on the unit.
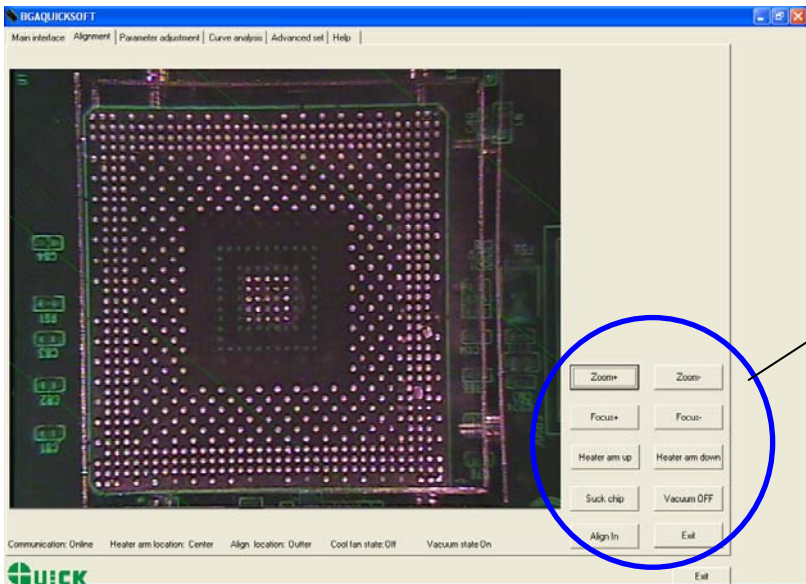
The aligning function buttons for getting a clearer image.

e) Parameter adjustment Tab

1. Click "Parameter adjustment" tab, it will display the Parameter adjustment interface.
2. At this interface, it can change the parameter values in the all flows and save them.
3. First, click "process select…" and then pop up a interface saving flow. Select a flow, such as "U1.medl" and then change this flow's parameter values.
4. After change the values, click the "parameter's save" to save the parameter values and click the "save curve" to save the flow's curve into the PC. And the values cannot be loss after turn off the power supply.
5. The saved parameter values will be transmitted to the **Main interface** and the small LCD on the left side of the unit.
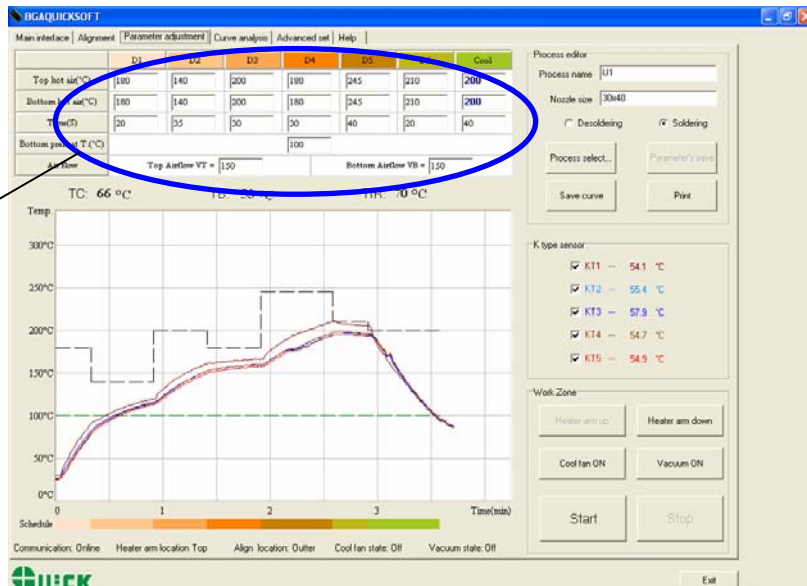
These parameter values can be set.

Note: only when you have set the password and login with the correct password, the parameter values can be set.

f) Curve analysis Tab

1. Click "curve analysis" tab, it will display the Parameter analysis interface.
2. Moving the mouse to the curve, it will show the real-time temperature and time of the point.
3. Click the "print" button to print the current flow's information and curve.
4. Click the "delete" button to delete the file showing.
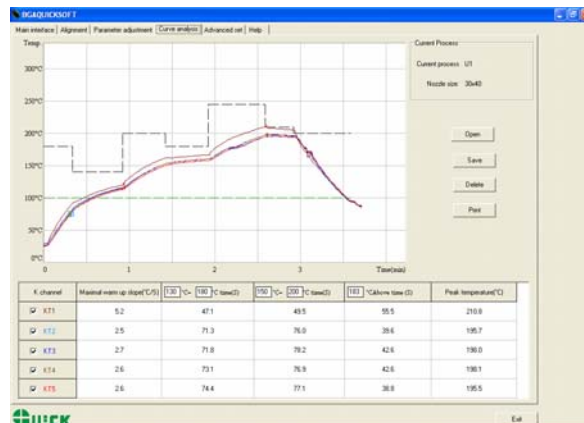
g) Advanced set Tab

1. Click "Advanced set" tab, it will display the advanced setting interface.
2. All the functions of the software can be set in this interface, including:
   1) Password setting
   2) K-type sensor's curve option
   3) Curve option
   4) Preheater valve value

5) Communication option
6) Video option
7) Language (simplified Chinese or English can be selected.)
8) The mode of heater head running down (0 or other digit).
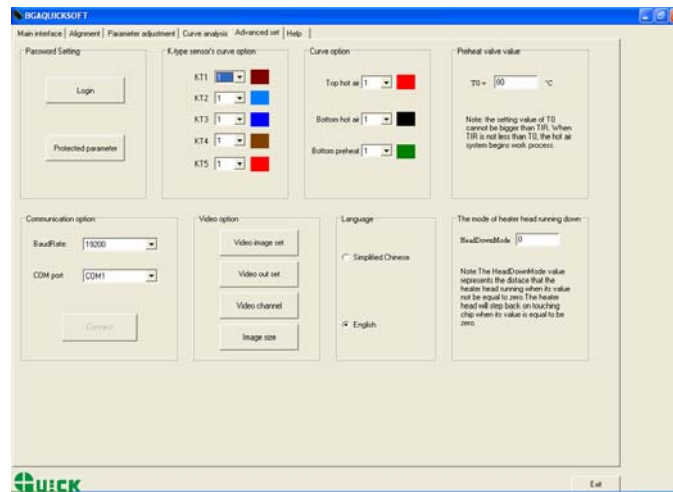
10、 Operating Technics Instruction

Note: Top and Bottom Heater will be very hot during working, so please don' touch the hot surface of the parts.

10.1 Soldering Technics (System's power supply is on)

1．Turn on power switch of each part.
2．Move PCB Fixture bracket with PCB above the Bottom heater and make the soldered component on the PCB between Top heater and Bottom heater (the soldered elements have been placed on the PCB board). The position of the soldered BGA must be corresponding with the position of the sirocco nozzles.
3．Select parameters or set the parameters with keys.
    A．Select the required flow, if need to modify the parameter, input the password before performing relevant operation.
    B．Select "solder" working mode.
    C．No change in communication speed, and press "SAVE" button to save and exit to MAIN surface.
    D．System starts working after pressing "START", running the select flow
4．LCD will display series of setting temperatures and the current temperature during working. and user can know about the setting value clearly.
5．The system can perform a series action during the flow.
    A．After press START key, the top heater move downward near to bottom.
    B．When the flow from D1 to D6 is over, the top heater arm moves upwards and the flow runs the **cool zone**. The top nozzle blows cooling air and bottom sirocco nozzle stop blowing warm air to blow cooling air,

besides, the left cooling fan blows the cold air at the same time until up to the time. The effect of cooling is better when blowing cooling air simultaneously.

Note: The process of the De-soldering technics is same with the soldering technics besides selecting "DESO" when setting the process parameter.

10.2 Aligning Technics

1．Turn on power switch of each part.
2．Press "CAMERA" key and move the alignment arm to aligning position (out). The lights of up and down both are on.
3．Place the component on the prism of the alignment arm.
4．Suck the chip automatically and back to aligning position after pressing "SUCKER" key. Manual operation is also convenient.
5．Check whether the image displayed on LCD fitting user's demand. Use the rocker to adjust it. Adjusting refers to "Keys Instructions".
6．Unscrew the PCB Fixing Knobs on the PCB Fixture to open PCB Clamp Bar. Fix the soldered PCB on the PCB Fixture and adjust PCB's position to the below of the aligning arm. Make the LCD display the image of soldering point, and make the images of soldering point and component in the same center point. It is convenient for adjusting. After roughly adjusting, screw the Fixture Fixing Knob to lock PCB Fixture to prevent it from sliding right and left.
7．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".
8．Observe the images: the system is precise if the two images (Circle) in the LCD superpose, otherwise not. The system needs to be adjusted.

| Imprecise | Precise |

9．After alignment, click the CAMERA key, the aligning arm exit to the origin.
10. Click "START" key, the unit comes to the soldering flow.