MLINK X2 BGA Repair Workbench Introduction Manual

Catalogue

1. **Rework Station Installing**

a. Installation Location

In order to ensure the service life of rework station, the installation must meet the following conditions:

1. Away from flammable, explosive materials
2. Don't spilled by water and other liquid
3. Well-ventilated and Dry Place
4. Stable, Smooth, less vibrate place
5. Little dusty place
6. Don't put anything on control box
7. Away from the place affected by the direct flow of air condition, heater and fan
8. For upper part easy move and turn, More than 30cm Match at the back of rework station

b. Power supply requirements: use small fluctuant voltage power supply.
Voltage: 220V±10 Frequency: 50Hz±3

2. Rework Station Safety Precautions

1. Don't blow the rework station directly when it work, or will lead the negative differential of the surface of the heating plate, burned the parts

2. After starting up, high temperature heat area cannot contact anything directly, or may cause fire or explosion, PCB board should be put on the PCB board support
3. Don't shake rework station, move lightly.
4. After starting up, do not use flammable spray, liquid gas.
5. Don't try to redo the rework station, or will cause fire or electric shock.
6. There are high-voltage parts in electric box, don't take part or remove without permission
7. If there is metallic object or liquid fall into rework station, shut off the power immediately, unplug power line, completely remove the object and dirt after the station get cooling. If having residue, will emit odor after rework.
8. when rework station abnormal heating-up or smoke, shut off the power immediately, notify the technician repair, partly shut off power when move electric box or machine, hold the plug when unplug the wire, otherwise will cause poor contact, cannot work.
9. Shut off the power when stop use.

11. Rework station do not press or run over line or communication cable of other equipments power otherwise may cause equipment malfunction or cause fire or electric shock
12. Before operating the rework station, must read this introduction manual carefully.

3. Main Specification:

Total Power: 4400W
Top heating: 800W
Bottom heating: 800W
Bottom infrared preheat: 2400w
Current: AC220V 50/60HZ
Outer Dimension: L 600mm × W600mm × H610mm
Min PCB Dimension: 40mm × 40mm
MAX: PCB Dimension: 450mm × 500mm

Description:

1. This product adopt 7" HD touch screen Human–Machine Interaction(HMI), PLC Control, real-time display Five temperature curve, temperature precision be controlled in ± degree.
2. 6 section temperature controls, can further refine the temperature of each solder segment, to better ensure the welding effect.
3. Can save 0-49 group of temperature curve setting, analyze the curve and change the setting on touch screen anytime.
4. There are 3 THERMATICS to heating separately, can control multi-group, multi-section temperature in the 3 THERMATICS at same time, ensure achieve the best welding effect in different THERMATICS. Heating temperature, time, slope, cooling, vacuum, all can be set on HMI
5. Select high-precision K-Type thermocouple closed-loop control, detect temperature precisely through the external temperature testing interface
6. Have alarm function after finish unsolder, have over-temperature protection circuit around the whole machine, stop heating and alarm when abnormal over-temperature
7. Use High Cross-flow Fan cool PCB board promptly, incase the deformation of PCB board, ensure the welding effect.
8. Use V Shape groove address the PCB, Flexible removable have the function of protect PCB
9. For large thermal capacity PCB and other high temperature requirements, Both lead-free BGA/CSP and column BGA can deal with easily.
10. Hot air nozzles can 360 degree rotation, easy to replace. With a variety size of hot air nozzle, special requirements can be customized

5. Operate Steps

1. Pre-heating:

Pre-heat PCB and BGA before rework, in case of bursting while rework, temperature of constant temperature oven is generally set at 80 ℃ -100 ℃, time often be 12-24hours.

2. Disassembly

Put PCB on the position support of rework station, select the appropriate hot air reflow nozzle, set proper welding temperature curve, pull the start switch, when procedure run over, move the hot air manually, use vacuum suction pen remove BGA.

3. Clean the welding

Cleaning of PCB and BGA welding pad, one is use the suction tin line tow to same level, another is use soldering iron drag smooth directly. It is best remove soldering tin in a short time after remove BGA, while BGA not cooling totally, less damage of temperature difference to welding pad； Use soldering flux in the process of removing solder, can improve the solder activity, conducive to the removal of solder. Especially pay attention to do not damage the welding pad of PCB, for ensuring reliability of BGA welding, try to use some strong volatile solvent, washer, industrial alcohol during clean the remain solder paste on solder pad.

4. BGA REBALLING

Evenly coated solder paste on BGA pad with a brush, select the corresponding REBALLING steel mesh, use REBALLING STATION plant BGA tin sweat on corresponding BGA pad.

5. BGA Tin Sweat Welding

Heating the bottom of Tin sweat station and rework station heating zone, solder the tin sweat on BGA pad

6 Spread soldering flux

Spread a layer of solder flux on PCB pad with a brush, too much will cause soldering together, on the other hand, too less will cause missing soldering, thus for clean the dirt on BGA tin sweat, enhance soldering effect, solder paste must be spread appropriately,

7 Mount

Mount BGA on PCB, when counterpoint by hand, use silk screen print frame line helps counterpoint, confirming whether mount BGA in counterpoint by hand touch feeling of surface of Tim Sweat and soldering pad.

8 Welding

Put PCB on the position support of rework station, select the appropriate hot air reflow nozzle, set proper welding temperature curve, start heating inching switch, run soldering procedure, stop running, front BGA cooling fan start cool BGA, improve hot air point, make hot air nozzle above on surface of BGA 8-10mm. and keep cooling 30-40 seconds, or after the start switch light power off, move hot air head, and then take away the PCB board from bottom heating area position stably.

a. Missing Solder; because of manually counterpoint will make deviation between chips and solder pad, Tension of tin sweat surface will make a process of correct the place between BGA chips and pad automatically. Because of uneven heating, leading the chip fall unevenly, if stopping reflowing now, the chip will not fall normally, resulting in non-coplanarity phenomenon and then cause missing solder and cold solder, so need extend the time of temperature of third and forth section THERMATICS, our enhance the pre-heating temperature at bottom, melt tin sweat and fall evenly.
b. Short Circuit: The tin sweat is liquid when get melting point, the extension and support function of tin sweat support will be damaged when suffer over-time, over heat temperature

or over press, and then lead short circuit because of chip fall on the PCB pad completely while reflowing, Hence, we need decrease temperature and time of the third and forth heating section, or decrease the preheating temperature at bottom.

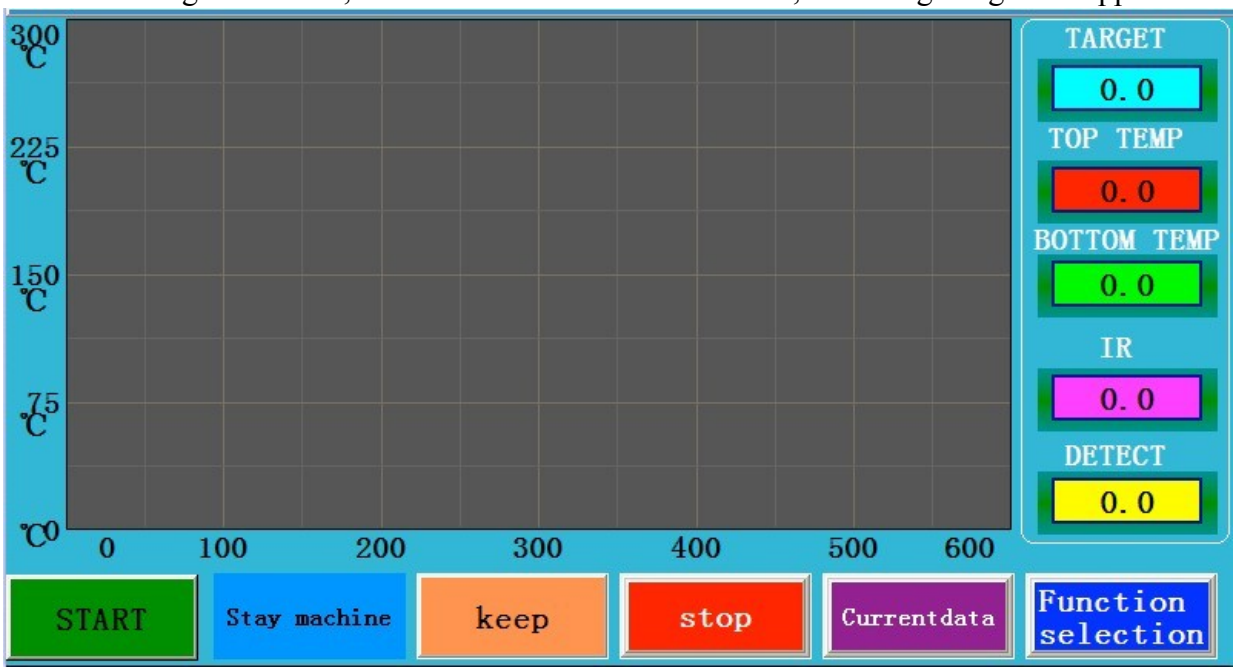
Note: Will appear small quantity ozone when reword station using, in order to ensure a comfortable, healthy and safe operating environment, please keep good air circulation.

6. Touch Screen

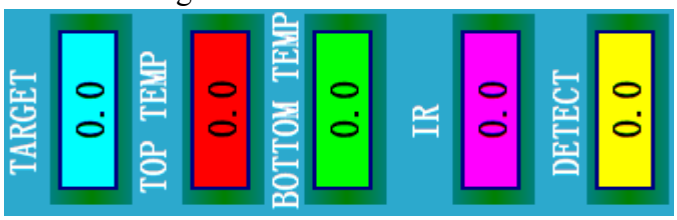
Operation Introduction:

a. Open the control power supply, rework station be powered. Home page Chinese- English select interface appears on the touch screen, select the language interface you want.

b.If selecting ENGLISH, enter into the main work interface, following image will appear:



And then will appear top target temperature, top actual temperate, bottom actual temperature, actual thermostatic temperature of the third THERMATIC (preheating temperature at bottom), outer actual temperature from up to down at the right side of the touch screen.



Curves on image are: Tope target temperature (blue), top target actual temperature (red), bottom actual temperature (green), infrared actual temperature (purple), out tested actual temperature

1. Click 

enter into each asked specification of running after start heating

These specifications are the target temperature, holding temperature time, heating-up speed

Second is the unit of heating-up speed, three THERMATIC of Top, infrared can set 6 section heating-up, 6section temperature-holding curve model, at this interface, also can modify the specifications, but this specification will not be saved in inner of procedure, only be used in the heating curve after start at this specification. **To save, please read formula setting content!**

Click QUIT, return to curve interface

Click START, the whole machine get into start heating, the running heating curve is specification as above described specification, meantime clean out last curve show on screen.

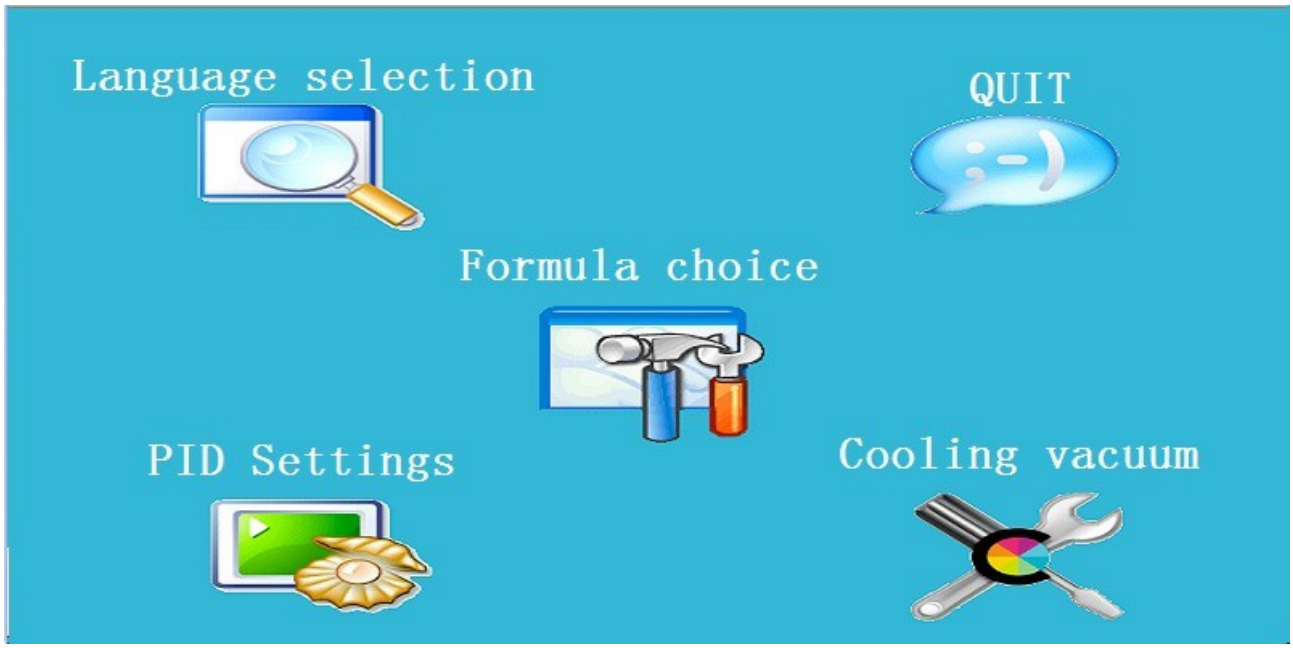
Under normal operation, when top target temperature and heating speed is zero, the whole process finished, machine stop work, hear Roar sound., if have set cooling and vacuum state in cooling vacuum interface, the output of cooling and vacuum will run. Click stop, when running, the whole machine will stop.

Stay machine is the current state

Click keep, when running, this button will shine, notify that the whole machine go into temperature-holding state, the three group of heating temperature output will remain at present temperature, running in constant temperature, till to re-click

keep, return to normal heating state.

Click Function selection popup function select interface

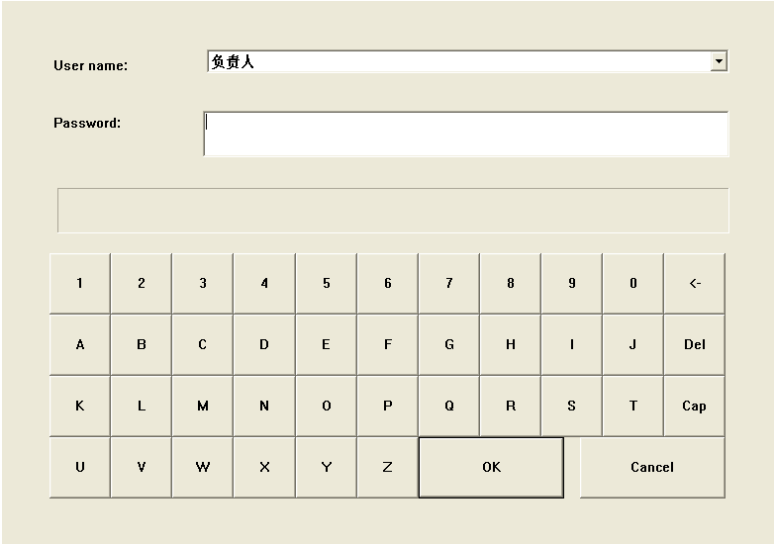


1. Click 

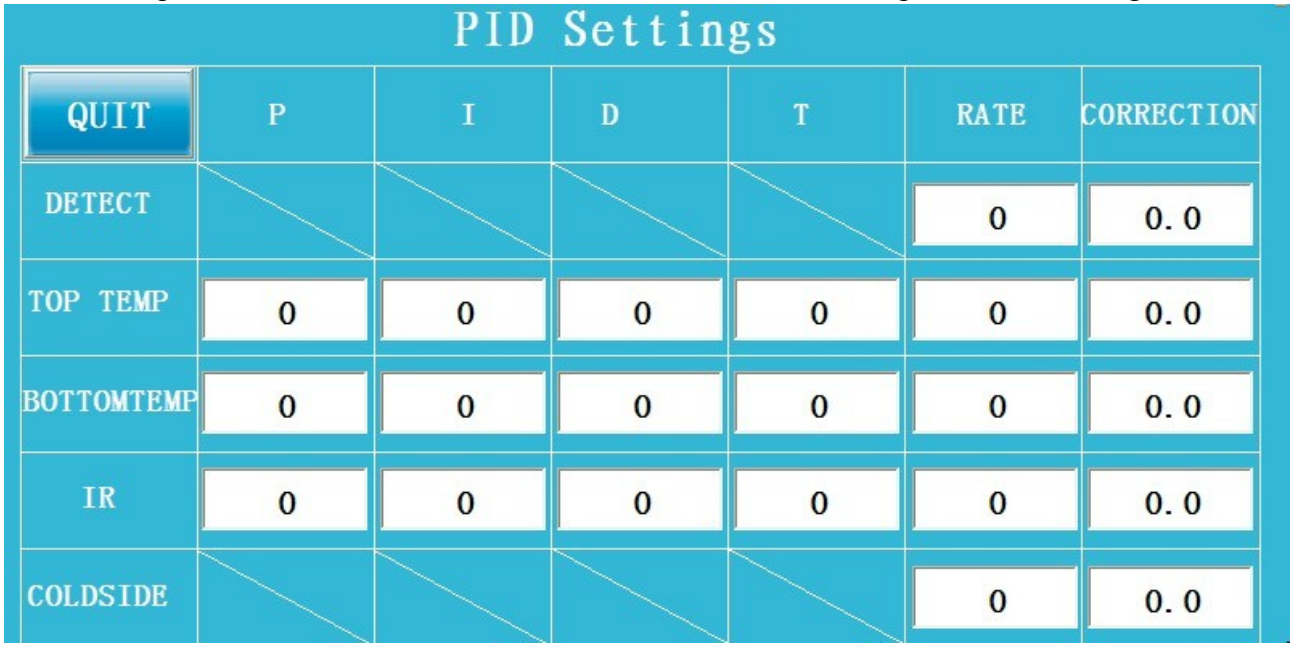
return to Chinese-English interface

2. Clock 

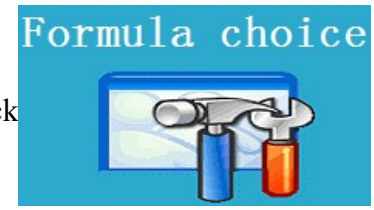
popup “enter code “ window



The default pass word is 123456, after enter the code, enter into PID specification setting;



All specifications have been set before leave factory, no need change

3. Click 

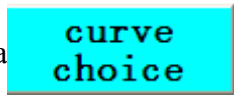
will appear follow image:

QUIT	PREHEAT1	PREHEAT2	PREHEAT3	PREHEAT4	PREHEAT5	PREHEAT6
TOP TEMP	0.0	0.0	0.0	0.0	0.0	0.0
TIME	0	0	0	0	0	0
HEATINGSPEED	0.0	0.0	0.0	0.0	0.0	0.0
BOTTOMTEMP	0.0	0.0	0.0	0.0	0.0	0.0
TIME	0	0	0	0	0	0
HEATINGSPEED	0.0	0.0	0.0	0.0	0.0	0.0
IR	0.0	0.0	0.0	0.0	0.0	0.0
TIME	0	0	0	0	0	0
HEATINGSPEED	0.0	0.0	0.0	0.0	0.0	0.0

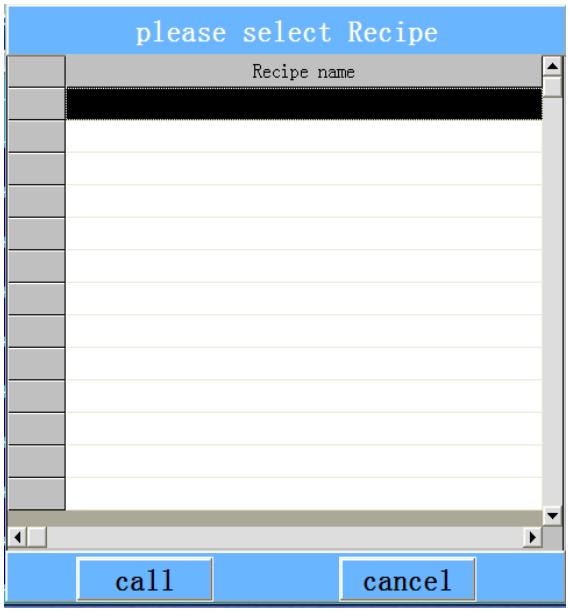
Recipe name
0
Saverecipe
Previous
Next
Use
Read
curve choice
0

Modify and save temperature curve often used

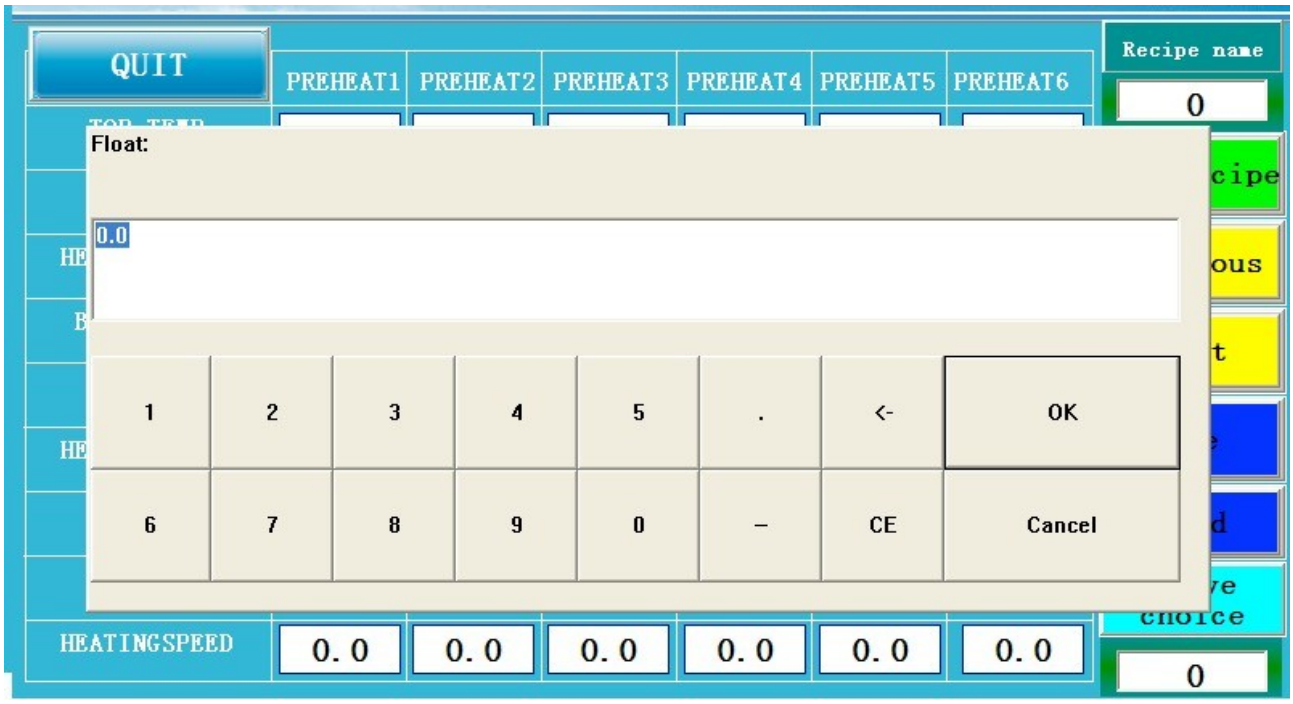
Set the heating temperature, constant temperature time, heating speed required by production craft, this product can store the temperature curve up to 50 groups. Save various production craft specifications in system, call it directly when meet different production craft.
Means the Formula stored in system, because the heating temperature is different while different products using. We could save different specification in different formula. When change the product, do not modify the specification much, just click call the corresponding formula

Click data 

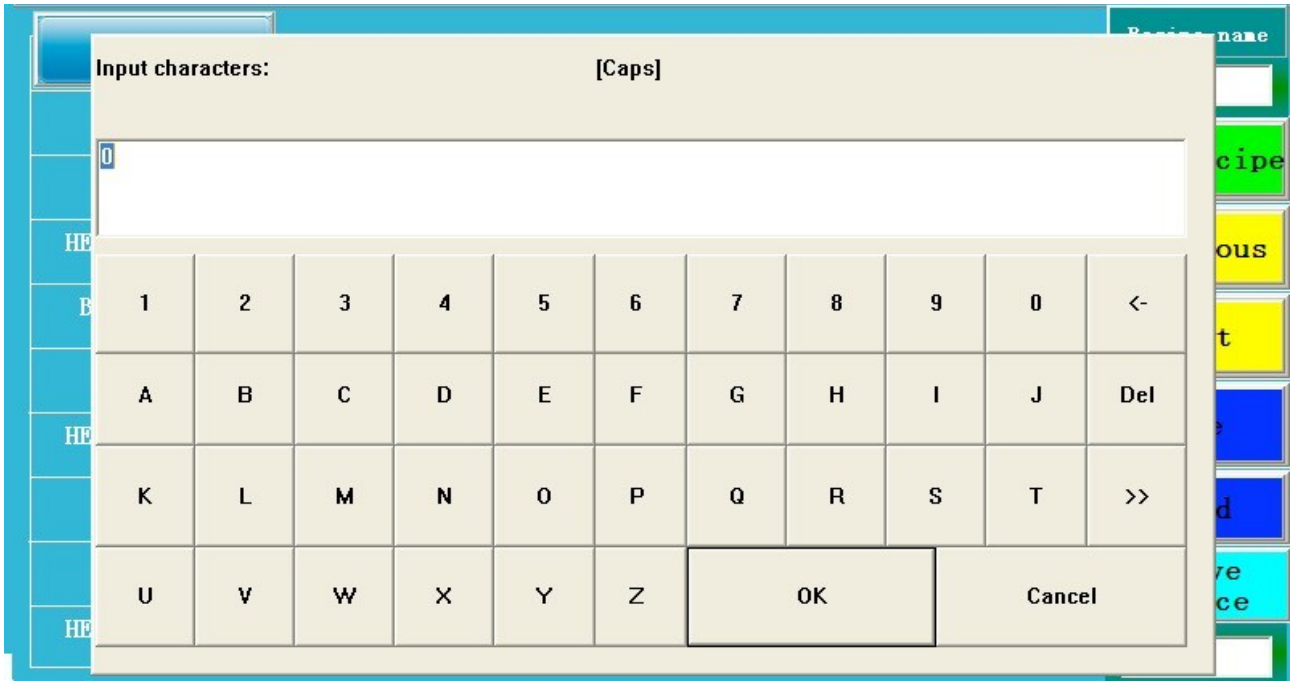
pop up the entry key of data

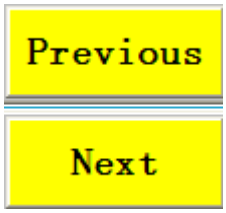


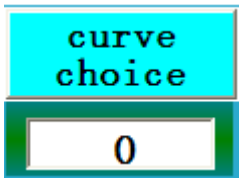
Click the Enter key numerical value at the pop-up



Enter the modified data, press OK, Finished setting Temperature specification of Three THERMATICS, click Saverecipe then all specification set just now have stored under the name(serial number) of present formula. Click Recipe name 0 Popup dialog box



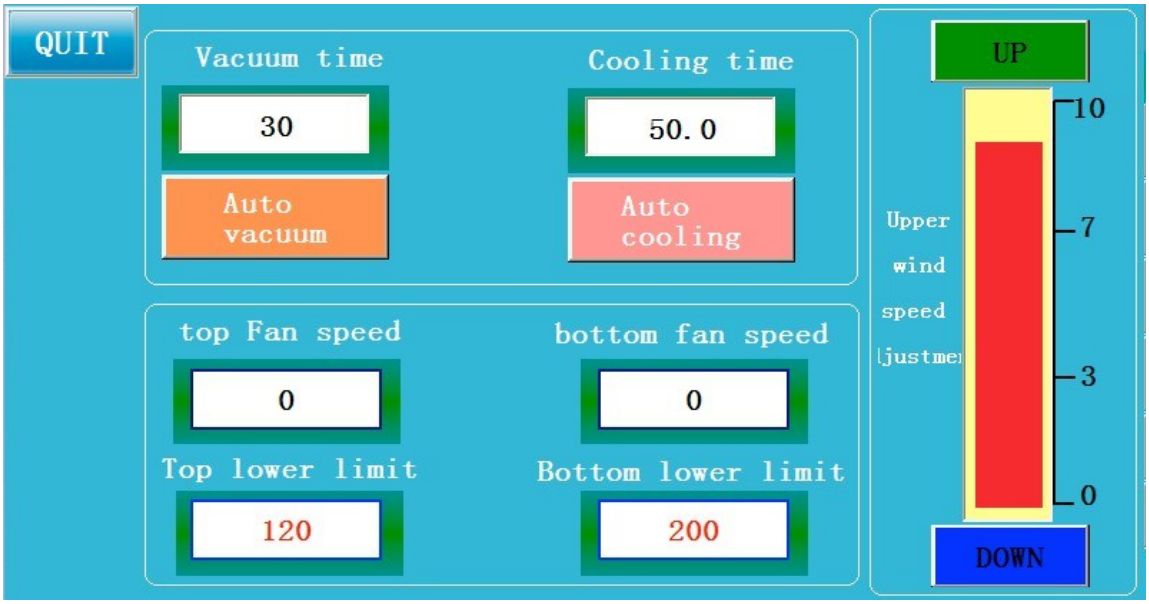
name this curve, select Chinese or other name convenient for remembering. Also can get the asked temperature curve directly through  two buttons. (the formula noted)



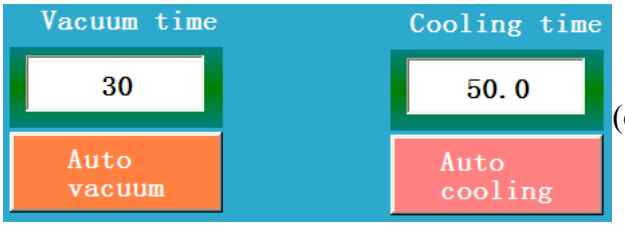
(0-49) enter corresponding serial NO. Click  restart the running temperature curve of heating

Or save the modified temperature specification in present interface through  .

4. Click  op following interface:

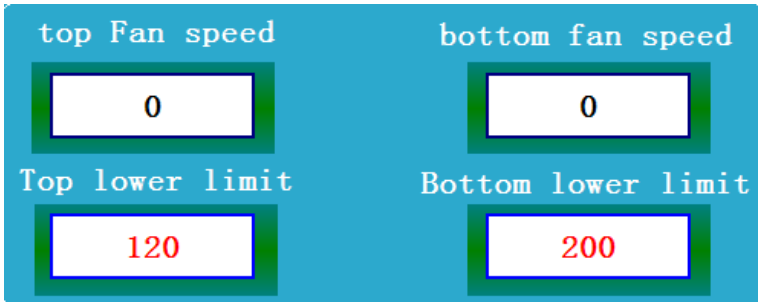


Heating finished, System will run cooling and vacuum as



(counting by second), or manually control cooling and vacuum state by

, after went into manual, whether heating or not, vacuum suction always worked, click cooling manual button, only stop heating, then output, heating start, output stop, for having enough time take away the suction pen, suggest that when remove chip, set the cooling to zero,

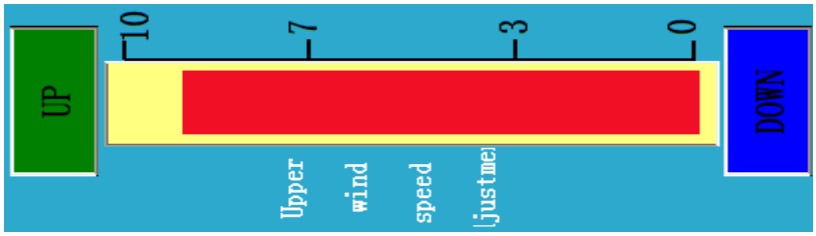


This machine can real-time monitor the rotating speed of cooling fan of up-down hot air, also can set the min rotating speed. Fan stop work or rotating speed less than set data during heating, and up-down hot air data high than 300 degree, system will stop heating immediately, alarm at same time, whole machine turn to cooling state, will show where is the trouble on main interface, can help worker find the trouble in a short time.

Caution!

While alarm due to trouble, all functional button will be locked! It cannot work still after deal with the trouble, power off.

New Type Mlink X1 top wind speed modifies has been optimized to show on status bar on touch screen, more easily show the current speed through the column image!



Modify top wind speed by accelerating and decelerating! Avoid over-slow
Temperature specification often used ad following:

Lead solder temperature curve

41*41 BGA Solder temperature setting：

	Preheating section	**Temperature-holding section**	**Heating-up section**	**Solder section 1**	**Solder section 2**	**Temperature-drop section**
Top Heating	160	185	210	220	225	0
Constant Temperature Time	30	30	35	40	20	0
Bottom Heating	165	190	215	225	230	0
Constant Temperature Time	30	30	35	40	70	0
Infrared Time	110	120	130	140	150	0
Constant Temperature Time	30	30	35	40	70	0
Slope	2	2	2	2	2	0

38*38 BGA Solder Temperature Setting

	Preheating section	Temperature-holding section	Heating-up section	Solder section 1	Solder section 2	Temperature-drop section
Top Heating	160	185	210	215	220	0
Constant Temperature Time	30	30	35	40	20	0
Bottom Heating	160	185	215	220	225	0
Constant Temperature Time	30	30	35	40	40	0
Infrared Time	110	120	130	140	150	0
Constant Temperature Time	30	30	35	40	70	0
Slope	2	2	2	2	2	0

31*31 BGA Solder Temperature Setting

	Preheating section	Temperature-holding section	Heating-up section	Solder section 1	Solder section 2	Temperature-drop section
Top Heating	160	180	200	210	215	0
Constant Temperature Time	30	30	35	45	20	0
Bottom Heating	160	180	200	215	225	0
Constant Temperature Time	30	30	35	45	60	0
Infrared Time	110	120	130	140	150	0
Constant Temperature Time	30	30	35	40	70	0
Slope	2	2	2	2	2	0

Above is reference for lead BGA temperature Curve

Lead-free temperature curve solder

41*41 BGA Solder temperature setting：

	Preheating section	Temperature-holding section	Heating-up section	Solder section 1	Solder section 2	Temperature-drop section
Top Heating	165	190	225	245	255	240
Constant Temperature Time	30	30	35	55	25	15
Bottom Heating	165	190	225	245	255	240
Constant Temperature Time	30	30	35	55	25	15
Infrared Time	110	120	130	140	150	160
Constant Temperature Time	30	30	35	40	40	70
Slope	2	2	2	2	2	2

38*38 BGA Solder temperature setting：

	Preheating section	Temperature-holding section	Heating-up section	Solder section 1	Solder section 2	Temperature-drop section
Top Heating	165	190	225	245	250	235
Constant Temperature Time	30	30	35	45	25	15
Bottom Heating	165	190	225	245	250	235
Constant Temperature Time	30	30	35	45	25	15
Infrared Time	110	120	130	140	150	160
Constant Temperature Time	30	30	35	40	40	70
Slope	2	2	2	2	2	2

31*31 BGA Solder Temperature Setting

	Preheating section	Temperature-holding section	Heating-up section	Solder section 1	Solder section 2	Temperature-drop section
Top Heating	165	190	220	240	245	235
Constant Temperature Time	30	30	35	40	20	15
Bottom Heating	165	190	220	240	245	235
Constant Temperature Time	30	30	35	40	20	15
Infrared Time	110	120	130	140	150	160
Constant Temperature Time	30	30	35	40	40	70
Slope	2	2	2	2	2	2

Above is reference for lead-free BGA temperature Curve

If you want to dismantle BGA, it is enough to set the value of temperature-drop section as 0.

7. **Rework Station Handling Precautions**

1. Open repair station power switch, first check whether there is cold wind blowing in the upper hot lips and lower hot lips. If no wind blowing out, don't use the start switch, otherwise it will burn the up and bottom main heater; the bottom of the all infrared heating area is controlled with the switch. You can choose the bottom of the infrared heating area according to the size of PCB board.
2. Rework different BGA, it needs to set different temperature curve, the maximum temperature of each segment setting cannot exceed 300 ℃. When rework with lead-free, one can set according to welding temperature curve reference of BGA solder beads.
3. When dismantle BGA, first transfer cooling fan and vacuum gear to the automatic gear, when the temperature curve operation is end, the buzzer alarms automatically, at this time quickly suck away BGA from the PCB board with vacuum suction pen, and then remove PCB board holder from the location grid.
4. While soldering the BGA, first transfer cooling fan is to the manual gear, turn off the vacuum. When the temperature curve operation is end, buzzer alarms automatically, the cooling fan starts to cool the heating area BGA and the down heating zone. Hot air chills cold wind at the same time. Then upgrade the main heater at the top, so that the bottom of hot air nozzle is 3 ~ 5MM up to the upper surface of BGA, and keep cool for 30 to 40 seconds, or remove the main heater after turning off the start switch lights, , then remove the PCB board from the rack pan.
5. Before BGA installation, you must check whether the PCB board by chip and BGA solder ball pad is good; BGA chip must be carried out by visual inspection after soldering. If something is

unusual, one should stop the installation of BGA and test the temperature, one cannot weld it before it is adjusted properly, otherwise it may damage the BGA or the PCB board.
6. The surface of the machine should be cleaned regularly; in particular, keep the clean of Infrared heating board to prevent dirt accumulating in the top which will affect the normal heat radiation, resulting in poor welding quality, and shortening the life of infrared heater.
If the heating unit is burned due to this reason, the Company will not be responsible for free replacement!

Concluding Remarks

In production areas of electronic products, especially computer and communications electronics products, the component is developing to the miniaturization, multi-function, green orientation, various packaging technologies continue to emerge, BGA / CSP is the mainstream of packaging technology nowadays.

To meet the rapidly growing demand of circuit assembly of BGA devices, manufacturers need to choose safer, more convenient and more efficient assembly and rework equipment technology.

Enclose Packing List：

No.	Name	Specification and Model	Quantity	Unit price	Remark
1	Main engine of BGA rework station	Mlink X1	1		
3	vacuum nozzle		1	/	
4	Vacuum sucker		3	/	
5	Manual	Mlink X1	1	/	
6	Hot air nozzle		4+1		
7	heterosexual Clamp		6	/	
8	plum knob sticks		6	/	
9	supporting screws		8	/	
10	Infrared bottom big		1		
11	Infrared bottom small		1		
12	Hot air element		1		
13	Delta fan		1		
14	Extra nut		1		