



Jovy Systems® Limited

# RE-8500 BGA Rework Station

User Manual

Ver1.0



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Thank you for purchasing our BGA/SMD Rework System. Please carefully read this manual before operating the system. Store this manual in a safe, easily accessible place for future reference.

**RE-800 BGA Rework Station (all you need in one machine)**

**RE-8500** is one of the most powerful machines in the BGA rework field as it has many important and advanced features which help the user to get the best performance in an easy way.

**RE-8500 Features:**

- Create an *IPC/JEDEC* standard profile (leaded or lead-free).
- Create a free mode profile (User defined profile).
- Manual control (drive **RE-8500** to get your own profile).
- Save up to 50 profiles in the machine memory.
- Process & profile analyser for process study and analysis.
- PID intelligent temperature control.
- Powerful heaters with long life time (3600 watt).
- Accurate temperature readings of +/- 2°C.
- Five channels thermocouple real time temperature reading.
- Password protection for data and settings lock.
- Alarm set point to increase the process safety and control.
- Safety set point for user safety and security.
- Optimum heating with 3 controlled heating zones.
- Equipped with different types of reflectors for focusing and spotting the heating image.
- High ramp preheating and reflow up to 2.5°C/sec, by using manual control.
- Ideal application cooling stage in two methods optionally direct and indirect air flow, adjustable airflow power fan.
- Very simple machine interface.
- All Windows multi lingual **Jovy® PC Suite** software interface via usb2.0.
- Wide lower heating area (500mmx 450mm).
- Serves all kinds of boards (small, medium and big).

**Field of Applications:**

- Laptop and mother boards rework and repair.
- Game consoles applications rework and repair.
- Small and medium size electronics assembly factories.
- Military sophisticated applications rework and repair.
- Medical equipment applications rework and repair.
- Automotive applications rework and repair.
- Light systems and LED applications.
- Home appliance and personal Gadgets applications rework and repair.
- Networking and communication applications rework, repair and assembly.
- Power supply and control PCB applications rework, repair and assembly.

**Components Types:**

- BGA on Flex printed circuit.
- PTH connectors, card slots and sockets.
- Metal components housing.
- Micro lead frame.
- PBGA with heat sink.
- Processor plastic sockets.
- Metal Shielding.
- CSP and fine pitches BGA.
- Plastic PLCC.
- Through hole sockets.
- Heavy Mass CCGA & CBGA.
- Under fill or epoxy coated components.
- QFN, VQFN and advanced design QFN.
- Package over package (POP).

**Jovy® PC Suite Interface Features:**

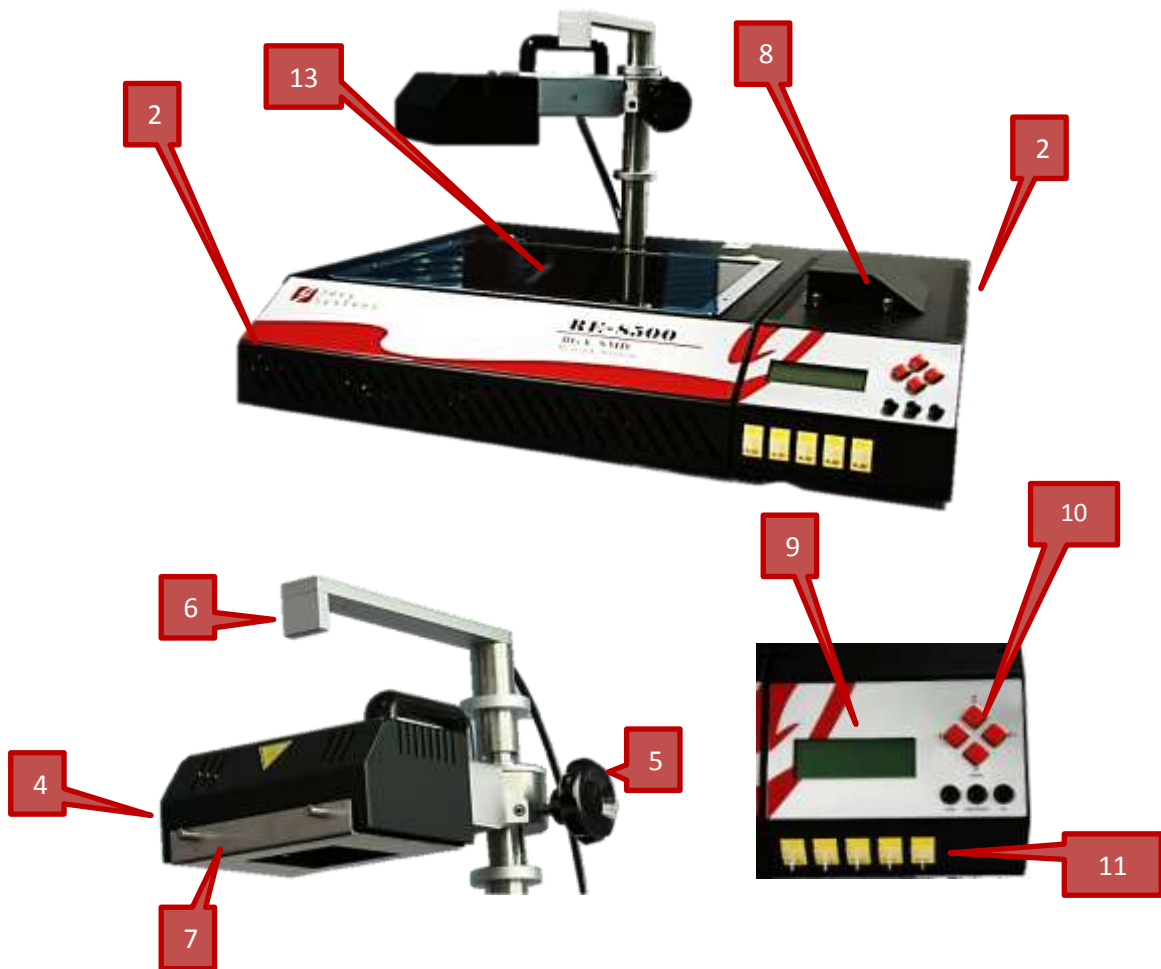
- Interactive and Easy to use Interface.
- Multi-languages interface.
- Fast USB 2.0 connection.
- Profiles:
  - Profiles Creation: where the user can create standard profiles or free mode profiles then download it to **RE-8500** memory or save it on PC.
  - Profiles Editing: user can load any saved profile on PC and edit its parameters.
  - Profile manager mode: where the user will be able to import, edit, delete and save the profiles saved on **RE-8500** memory could be re-download it to **RE-8500**.
- Processes:
  - Run manual processes or saved Profile process from the machine directly or through PC suite.
  - Monitoring heat distribution on PCB by drawing thermo-couples readings graph.
  - Analyze the heat distribution on PCB by monitoring thermo-couples reading on different five positions in a real time.
  - Do analysis on running process thermo-couples reading in real time.
  - Save unlimited number of running processes graphs and data (thermo-couples reading) files.
- Upgrade **RE-8500** firmware through **Jovy® PC Suite** through USB 2.0 connection.
- Full Control of all **RE-8500** peripherals like fan, pump and laser.
- Support Celsius and Fahrenheit temperature unit standards.
- Offline mode: Can create profiles and analyse process data files without connecting to **RE-8500**.

## Technical Data

### RE-8500 BGA Rework Station

**RE-8500** has three lower heaters and one upper heater, the upper heater and the lower heaters heat directly towards the BGA chip to make sure the chip get enough heat, so that it can reach its melting point and be soldered well.

**Description of the main parts:**



<b>Part Number</b>	<b>Part Name</b>
<b>1</b>	<b>Power switch</b>
<b>2</b>	<b>Basic unit</b>
<b>3</b>	<b>Control box</b>
<b>4</b>	<b>Upper heater</b>
<b>5</b>	<b>knob for adjusting the height of upper heater</b>
<b>6</b>	<b>laser</b>
<b>7</b>	<b>Upper heater reflector</b>
<b>8</b>	<b>Cooling fan</b>
<b>9</b>	<b>LCD</b>
<b>10</b>	<b>Keypad</b>
<b>11</b>	<b>Thermo-Couple connectors</b>
<b>12</b>	<b>X-Y table</b>
<b>13</b>	<b>Guard Glass</b>
<b>14</b>	<b>Control box cable</b>



## **RE-8500 Specifications**

<b>Dimension: L x W x H</b>	<b>520mm x 600mm x 310mm</b>
<b>Working depth</b>	<b>220 mm</b>
<b>Power supply</b>	<b>230 V AC, 50/60 Hz,16 A</b>
<b>Installed heating power</b>	<b>Total 3600 Watt. Upper heater power is 600W &amp; Lower heaters total power is 3000W</b>
<b>Upper heater size</b>	<b>60mm x 120 mm one zone</b>
<b>Lower heater size</b>	<b>340mm x 280mm ,2 separate heating zones</b>
<b>Distance of Upper heater to PCB</b>	<b>range from 30mm to 60mm</b>
<b>Distance of Lower heater to PCB</b>	<b>35 mm</b>
<b>Temperature sensor channels</b>	<b>5 x k-type thermocouples (potential free) 2 main and 3 optional</b>
<b>Maximum component size PL</b>	<b>120mm x 60 mm</b>
<b>Control</b>	<b>via USB 2.0 with Jovy® PC Suite</b>
<b>Operating Systems</b>	<b>Windows XP® or Windows Vista® or Windows7®</b>



## **Operating Precautions**

- Please carefully read the relevant information provided by the manual before starting using this machine.
- Make sure that the power cord has been properly connected before using the machine.
- Install the rework station at a location free from splashing of water or other liquids.
- Install the rework station at a dry location.
- Install the rework station at a location free from excessive dust.
- Install the rework station at a location away from inflammables.
- Before starting any process, install the rework station at a location free from the direct airflow impact from air Conditioner, heater or ventilator.
- Regularly clean the surface of the machine especially the guard glass.
- For more safety, please wear heat-proof gloves and never touch the high-temperature zone.

For further information or technical inquiries please write to [support@jovy-sys.com](mailto:support@jovy-sys.com)

## **Power Supply**

Power and voltage should meet the following requirements according to country standard

- 230 V AC,16 A
- 60/50Hz

## **Power Consumption**

- 3.6 KW MAX

## **Safety instructions**

### **General safety instructions**

- Fire and explosion hazard:

The upper heating element and the lower heating element become very hot during operation. Flammable objects, liquids, and gases, must be removed from the work area of the device!

- Do not use the system to heat any liquids, or containers under pressure. Batteries and electrolyte capacitors can explode if heated excessively.
- Attention burn hazard:

Hot housing elements should not be brought into contact with the skin or materials that are sensitive to heat. The housing parts of the IR system remain hot for several minutes after a rework process.

- caution laser

A Class II semi-conductor laser is used as a positioning aid. Do not look directly into the laser beam.

- Attention:

The device contains voltage-conducting parts. There is a risk of fatal injury if inexperienced personnel work on the unit.

Only experienced and qualified electricians may perform repair work.

### **Electrical safety**

- Choose the supply power voltage standard. (220V-250V/50Hz or 60Hz) before installing.
- To avoid possible electric shock caused serious damage, please disconnect the power cord from the outlet temporary before moving machines.
- Pull out the power if don't use the machine for a long time.

## Initial set up

### Package contents

Please check whether the following parts are included and intact.

- Basic unit ----- 1 pc.
- Control box ----- 1 pc.
- Operation Manual----- 1 pc.
- K-type thermo-couple----- 2 pcs.
- X-Y table----- 1 pc.
- USB cable-----1 pc.
- 4 upper heater reflectors -----4 pcs.
- CD -----1 pc.
  - **Jovy® PC Suite.**
  - **RE-8500 Driver.**
  - Microsoft .NET Framework 3.5 Redistributable Package.
  - Microsoft Visual C++ Runtime Redistributable.
  - Softcopy of the User's Manual.
  - Adobe Acrobat Reader.

### Install the machine and adjust parts

- Unwrap the packing of the machine.
- Make sure whether the machine and parts are in good conditions.
- Take out **RE-8500** Basic Unit and put it on the horizontal worktable.
- Take out **RE-8500** control box and put it at the **right** side of the basic unit.
- Connect the power cable of the control box.
- Adjust the parts of the XY table and put it above the basic unit and the control box.

## **Install XY table**

- 1- un-pack the XY table components from the cartoon
- 2- Insert the main two rail bars to the X and Y holder sliding block.
- 3- Connect the bars with the left and right fixtures.
- 4- Install the four legs to the fixture.
- 5- Insert the limit control rod as a final step.

## **System installation**

- Please make sure that the supply voltage accords with the rated voltage on the system nameplate then connect the power cord.
- Check whether all switches are turned off.
- Connect the two thermocouples in the first and second thermocouple female sockets ( 1 & 2 from right to left)
- Insert the vacuum tube into suction pump nozzle

## **Software installation**

- Insert **Jovy®** software to CD/DVD reader.
- Install Microsoft .NET Framework 3.5 Redistributable Package.
  - Run CD drive then RSW\_PKGS folder.
  - Run dotnetfx.exe file then follow the install instructions appeared on your screen.
- Install Microsoft Visual C++ Runtime Redistributable.
  - Run CD drive then RSW\_PKGS folder.
  - Run runtimec.exe file and follow the install instructions appeared on your screen.
- Install **Jovy® PC Suite**.
  - Run CD drive.
  - Run *Jovy®\_PC Suite\_v1.00\_Installer.exe* file and follow the install instructions appeared on your screen.
- Install **Jovy** USB Driver.
  - Run **Jovy® PC Suite** installation Directory.  
Default directory (C:\Program Files\Jovy® PC Suite ver1.00)
  - Open Drivers folder.
  - Run *JovyUSBInstaller.exe* and follow the install instructions appeared on your screen.

**NOTE:** **Jovy® PC Suite** software should be run as an administrator in windows 7 and vista platforms.

**NOTE:** for software download and license activation please visit [www.jovy-systems.com](http://www.jovy-systems.com).

## **Accessories**

- **X-Y table** (L :750mm x W:345mm x H:144mm)
  - Suitable for holding different sizes of printed circuit boards
  - Easy in use fixture in dynamic design for using with **RE-8500 & RE-7500** or with any stations for rework and hand soldering
  - Made of advanced material – high thermal dissipation – to keep the user safe from any thermal effects during the reworking process.



- **IR shatters**
  - Reflectors are designed to control the heating image emitted from the upper heater, by allow the IR wave to travel in straight line through specified window space, to reflect the extra wave away from the spotted area.
  - Reflectors are available four different windows size, square shape pattern 20mm x 20mm, 40mm x 40mm, 60mm x 60mm and 70mm x 70mm. It could be customized according to the customer requirements. In any window size or pattern, Should not exceed the upper heater dimension (60mm X 120mm).

## Operating instructions

### a) Machine Manual Control

Use the up and down keys to scroll menu items, and +/- to change the settings and values.

The main menu of machine interface contains four submenus

- 1- Profile manager.
- 2- Manual control.
- 3- Settings.

```
**** Main Menu ****
1-Profile Manager
2-Manual Control
3-Settings
```

### Profile Manager

This menu has four options as follows:

- 1- Create profile.
- 2- Choose Profile.
- 3- Delete profile.
- 4- Delete all profiles.

```
***Profiles Menu***
1-Create Profile
2-Choose Profile
3-Delete Profile
4-Del.All Profiles
```



## Create profile

To create new profile first chose one of the following types:

- 1- Standard profile.
- 2- Free mode profile.

```
***Profile options**  
1-Standard Profile  
2-Free mode profile
```

Standard profile is according to the IPC/JEDEC directions, while the free mode profile is according to the user experiences.

- 1- Standard profile:

Standard profile parameters starts with setting the type of the board (leaded or lead-free) and the peak time desired.

```
*Profile Type?  
  Leaded/Leadfree  
*Time on T-peak?  
  0 Minutes
```

After setting the board type and the peak time press **ok key**, to enter the profile parameters:

- Preheat temperature value.
- Soak temperature value.
- Peak temperature value.
- Alarm temperature value.

```
*T-Preheat = 150 C
*T-Soakine = 200 C
*T-Peak     = 250 C
*T-alarm    = 240 C
```

Press Enter key after entering these parameters, new message will appear asking if user would like to save this profile or not.

```
** PROCESS INPUTS **
Save as Profile? YES
```

Choose **YES** or **NO** by pressing +/- keys.

1- **YES**, the profile number will be shown and by pressing Enter **ok** user will be asked to enter the profile name.

If user chooses **NO**, the profile will run without saving.

<pre>** PROCESS INPUTS ** Profile No. :2</pre>	<pre>PROFILE NAME : Xbox</pre>
------------------------------------------------	--------------------------------

User can enter the profile name easily as follows:

- Choose character or number by pressing **UP** and **DOWN** Keys.
- Go to the next space by pressing +/- Keys.

Then enter a personal message to be displayed after each stage (pre-heat, soak or peak).

Saved profiles could be **run**

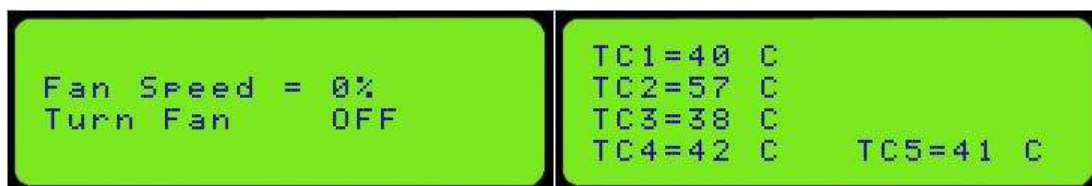


To stop the process press **CANCEL** Key, to run it again press **ENTER** Key.



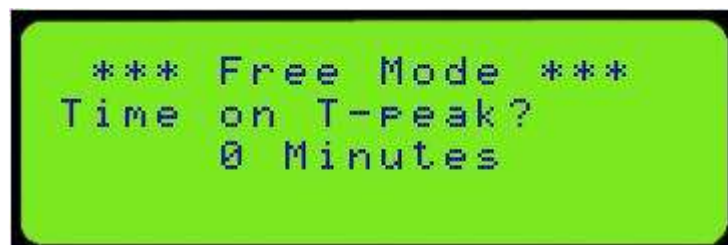
Press the CANCEL key twice to go the main Menu.

When pressing **UP** or **DOWN** keys during the process, two windows will appear. First one is to run the cooling fan and the other shows the temperature readings.



## 2- Free mode profile.

The same procedure as standard profile but user will be asked to enter the heaters power in each stage (preheat, soak and peak) which gives the user full control of the machine.



Then, enter the end temperature value for each stage.

```
*T-Preheat = 150 C
*T-Soakine = 200 C
*T-Peak    = 250 C
*T-alarm   = 240 C
```

Then, enter the heaters power for each stage:

```
Preheat Stage:
Upper Heater = 100%
Middle Heater = 100%
Side Heater  = 100%
```

```
Soak Stage:
Upper Heater = 100%
Middle Heater = 100%
Side Heater  = 100%
```

```
Reflow Stage:
Upper Heater = 100%
Middle Heater = 100%
Side Heater  = 100%
```

Then, to save the created profile on the machine memory; follow these steps:

```
** PROCESS INPUTS **
Save as Profile? YES
```

```
** PROCESS INPUTS **
Profile No. :2
```

```
PROFILE NAME :
Xbox
```

After entering the profile name, user will be asked to enter preheat, soak and reflow messages. (Optional)

### **Choose profile**

The second option in profile manager menu is choose profile. When choosing this option, a new window will appear contains all saved profiles to select the profile to run or edit it.

```
** CHOOSE PROFILE **  
2  
XBOX
```

After selecting the profile, it will be loaded and all its parameters will be shown.

```
LOADING....
```

```
*Board Type?  
Leadfree  
  
*Peak Time = 0sec
```

```
*T-Preheat = 150 C  
*T-Soakins = 200 C  
*T-Peak = 250 C  
*T-alarm = 240 C
```

Press **OK KEY** to run the selected saved profile.

```
STATUS:Preheating  
Xbox  
  
Process Time 00:30
```

### Delete profile

Delete profile option will lead to another window to select the profile to be deleted from the list of profiles saved on **RE-8500** memory, a message will appear to make sure of deleting the chosen profile.

```
***Delete profile***  
3  
PS3
```

```
** DELETE PROFILE **  
Are You Sure? YES
```

### Delete all profiles

Delete all profiles option is the same like delete profile but it will lead to deleting all the saved profiles on **RE-8500** memory.

```
*Delete All Profile*  
Yes/No?
```

## Manual Control

Manual control is another option in the main menu which leads to run process manually without any control of the machine.

When choosing manual control option, three windows will appear. The first one to run the process or adjust the heaters power and the second is to enter manual process inputs and the third window is showing the temperature readings.

```
HEATERS POWER : Stop  
UPPER ZONE = 100%  
Middle ZONE = 100%  
Side ZONE = 100%
```

```
Enter manual inputs  
T-alarm = 230 C  
Fan Speed = 0%  
Turn Fan OFF
```

```
TC1=40 C  
TC2=57 C  
TC3=38 C  
TC4=42 C TC5=41 C
```

## Settings

Machine settings are the last option in the main menu. In this Menu user can adjust the following settings:

- 1- Safety set point.
- 2- Temperature unit.
- 3- Activate password.
- 4- Change password.
- 5- Keypad tone.
- 6- Backlight timer.

```
*** Settines ***  
1-Safety S.P= 400  
2-Temp.unit = C/F
```

```
3- Activate Password  
4- Change Password
```

```
5-Keypad Tone ON  
6-Backlight Timer  
2 minutes
```

### Note:

- Pressing **CANCEL KEY** in any window will lead to go back to the previous window.
- Pressing **CANCEL KEY** in the main menu will lead to run the cooling fan.



## b) Machine Software Control “Jovy® PC Suite”

As noticed in the last section that **RE-8500** has very simple machine interface, it also has user friendly software interface “**Jovy® PC Suite**”. It is a multi-language, interactive, and easy to use Interface. With **Jovy® PC Suite** user can easily monitor heat distribution on PCB by drawing thermocouples reading on different five positions in a real time. User can also create or edit and save profiles in addition to process and profile analyser for complete process study and control.



In the next pages a full description of how to use this tool but first it is very important to know that this tool has 2 modes:

- 1- Online mode (**RE-8500** is connected).
- 2- Offline mode (**RE-8500** is not connected).

## Offline Mode

In offline mode user can create profiles and analyse process data files without connecting **RE-8500**.



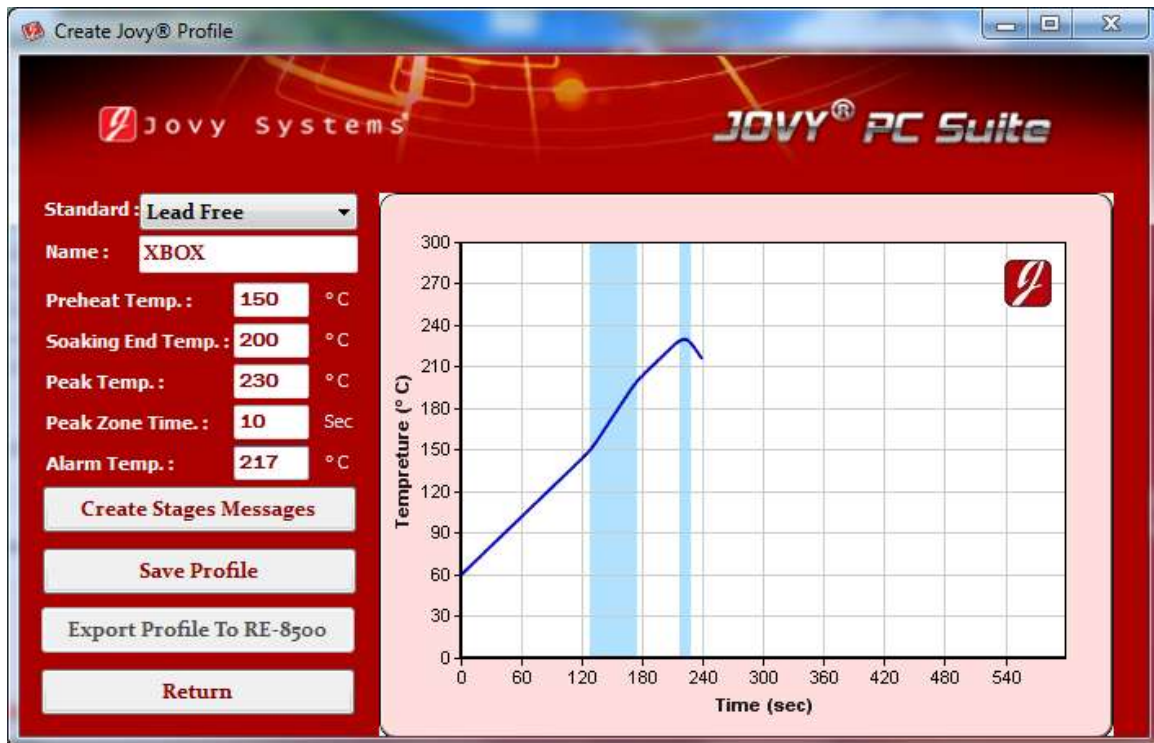
Click work offline and enjoy creating profiles and full process analysis.

To create profile, click on **Jovy®** profiles then create **Jovy®** profiles and choose standard profile or free profile.



If standard profile is chosen, a new window will appear asking about type of board (leaded or lead-free) and profile parameters.

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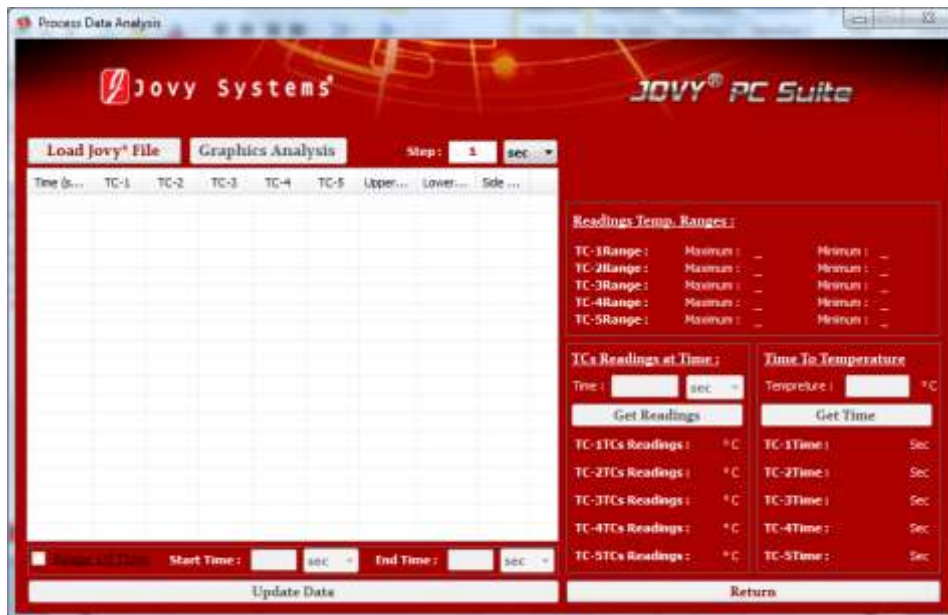
User can easily save the profile by clicking save profile button.

Also user can edit the profile by clicking edit profile and choose it from the saved profiles.



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Another advantage of offline mode is the process & profile analyser for complete process study and control. User can do this by clicking tools then process analysis. A new window will appear “process data analysis”.



User can easily load a **Jovy**® file and enjoy the full study of the process & profile.

Graphical analysis is also a fantastic option which makes the study of the process & profile more interesting.



## Online Mode

When **RE-8500** is connected, user will go to the online mode.



After clicking on Online Mode button, a message “*USB IS CONNECTED*” will appear on LCD and user will be able to control **RE-8500** from PC.



If **RE-8500** was protected with password a window will appear asking about password before starting Online Mode.



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In online mode, user can run standard process, free mode process and manual process. User can also create profile, save it on PC and export any profile to **RE-8500** to run it.

In this mode, user can control all **RE-8500** peripherals like fan, pump and laser.

### Create Profile

Create a profile in the online mode is the same like create a profile in offline mode, click on **Jovy® profiles** then *create Jovy® profile* and choose either it is a *standard profile* or *free profile*. In the same way user can edit profile.

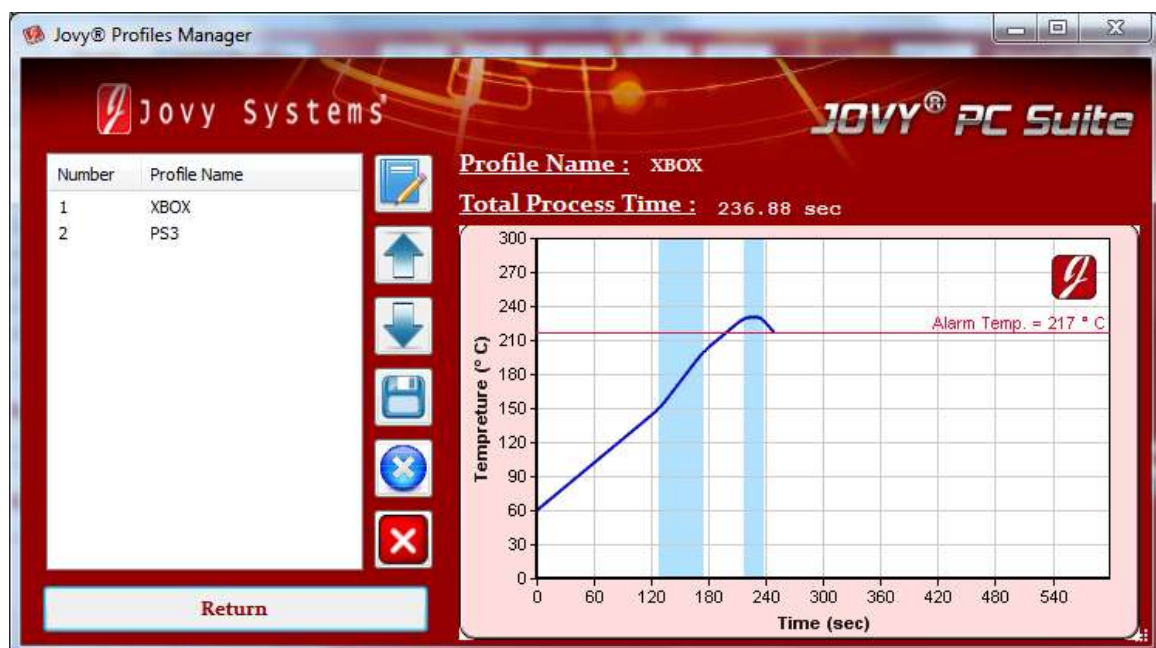


**Jovy® Profiles Manager** is an option which makes user manages profiles in an easy way.

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By clicking on **Jovy®** Profiles Manager, another window will appear showing a list of the saved profiles on **RE-8500** and edit them in easy way.



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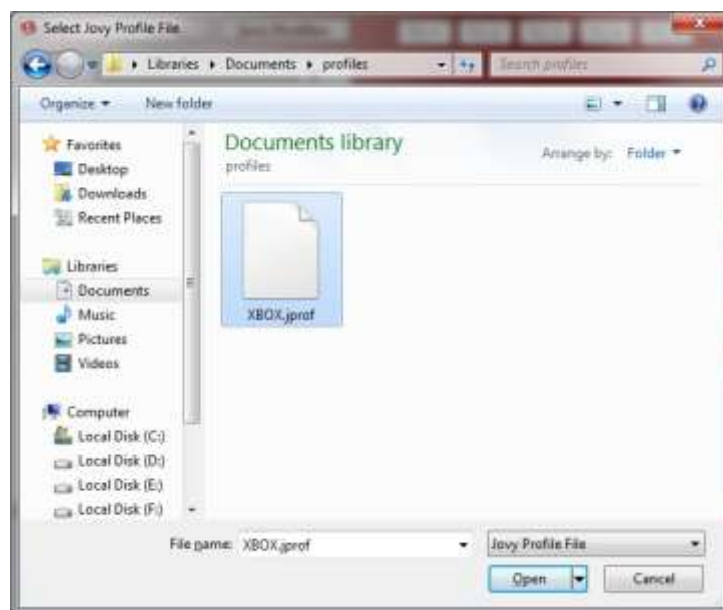
User can Export any saved profile to **RE-8500** simply by clicking on **Jovy®** profiles then Export Profile to **RE-8500**.



### Run Profile Process

As we mentioned above, in online mode user will be able to run profile process and manual control process.

--*Running profile process*: After clicking Run Profile Process, another window will appear asking to select the profile user would like to run.



Then the profile will be loaded and its parameters will be showed. See photo

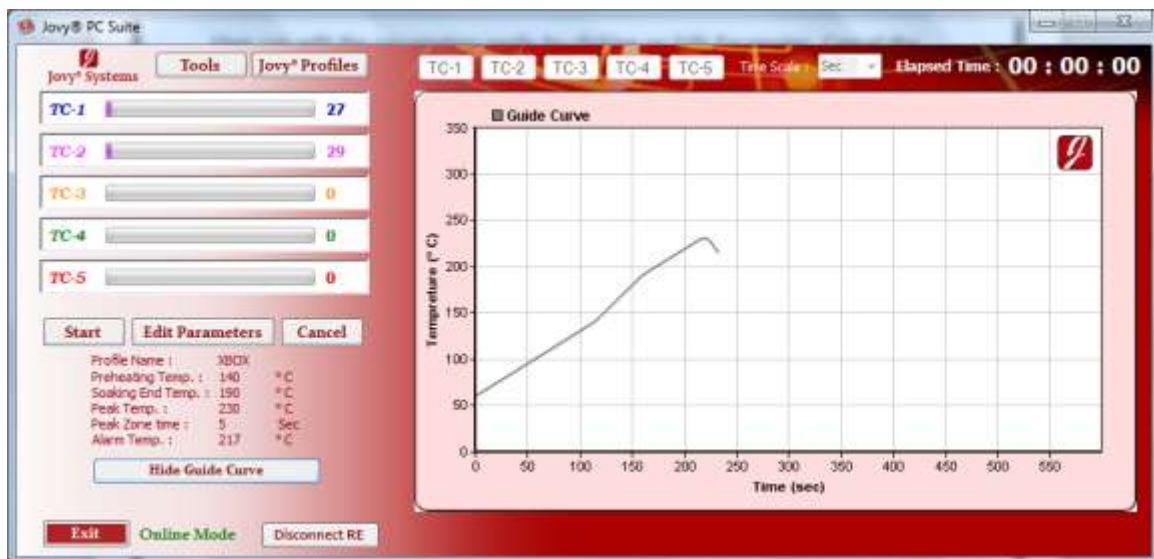


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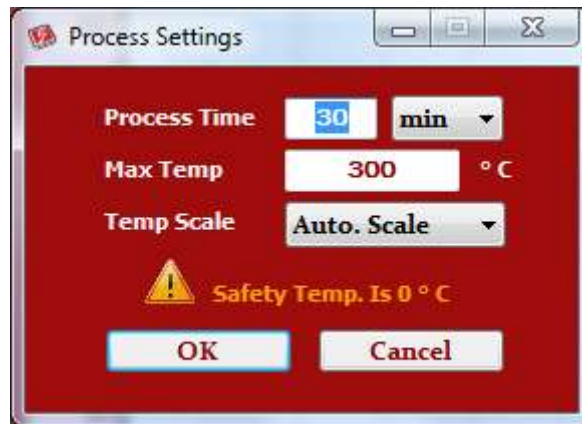


User can edit the parameters easily by clicking on Edit Parameters, Cancel the selected profile by clicking cancel button and start the process of the selected profile by clicking on Start button.

To draw a guide curve of the selected profile click on Draw Profile Guide Curve



Clicking Start button will lead to another window asking about process time, Max temperature, the graph scale type and a warning about safety temp.



Click OK button to start the process.

When process is running, user will be able to:

- Monitor heat distribution on PCB by drawing thermo-couples reading on different five positions in real time.
- Do analysis on run process thermo-couples reading in real time.
- Activate or deactivate any Thermo-couple reading by clicking on the TC-N button. (N: thermo-couple number)

When temperature on the target IC reaches the Peak temperature, a window will appear asking if the user wants to run the cooling fan and the speed of it.



When the process is completed, user will be able to save the data file or save graph by clicking on Tools then Save File or Save Graph.

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### Run Manual Control Process

Manual Control is another feature in the online mode which helps the user to drive **RE-8500** manually. User can run a manual control process by clicking the button Run Manual Control Process.



Click change button to adjust heaters power.



Then click apply button and click Start to run the process.



User can change heaters power in real time during the running process, to do so, click change button then apply.



When the process is completed, user will be able to save the data file or save graph by clicking on Tools then Save File or Save Graph.

Note:

- Also in online mode, user can do full analysis on the process by clicking on Tools then Last Process analysis.
- Also user can easily run the Fan or the Pump from Tools button.

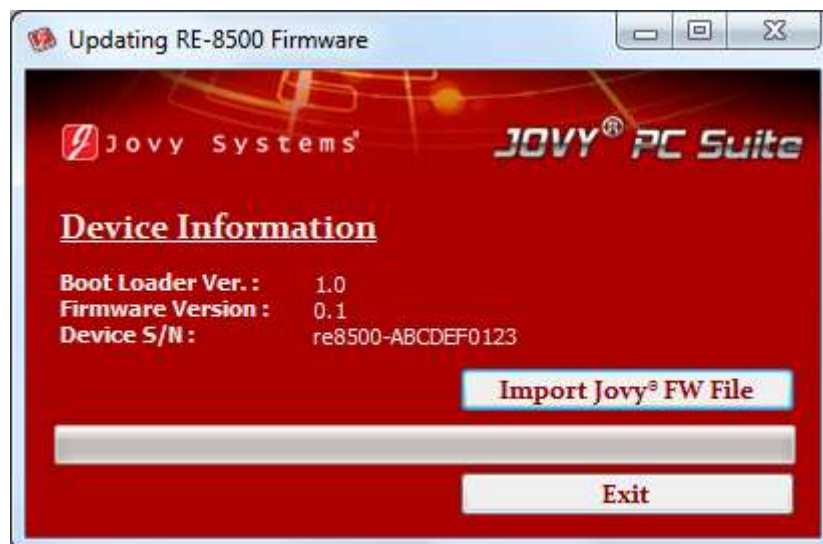
## **Firmware update**

With **Jovy® PC Suite** user will be able to keep **RE-8500** up-to-date by updating its firmware through the USB connection.

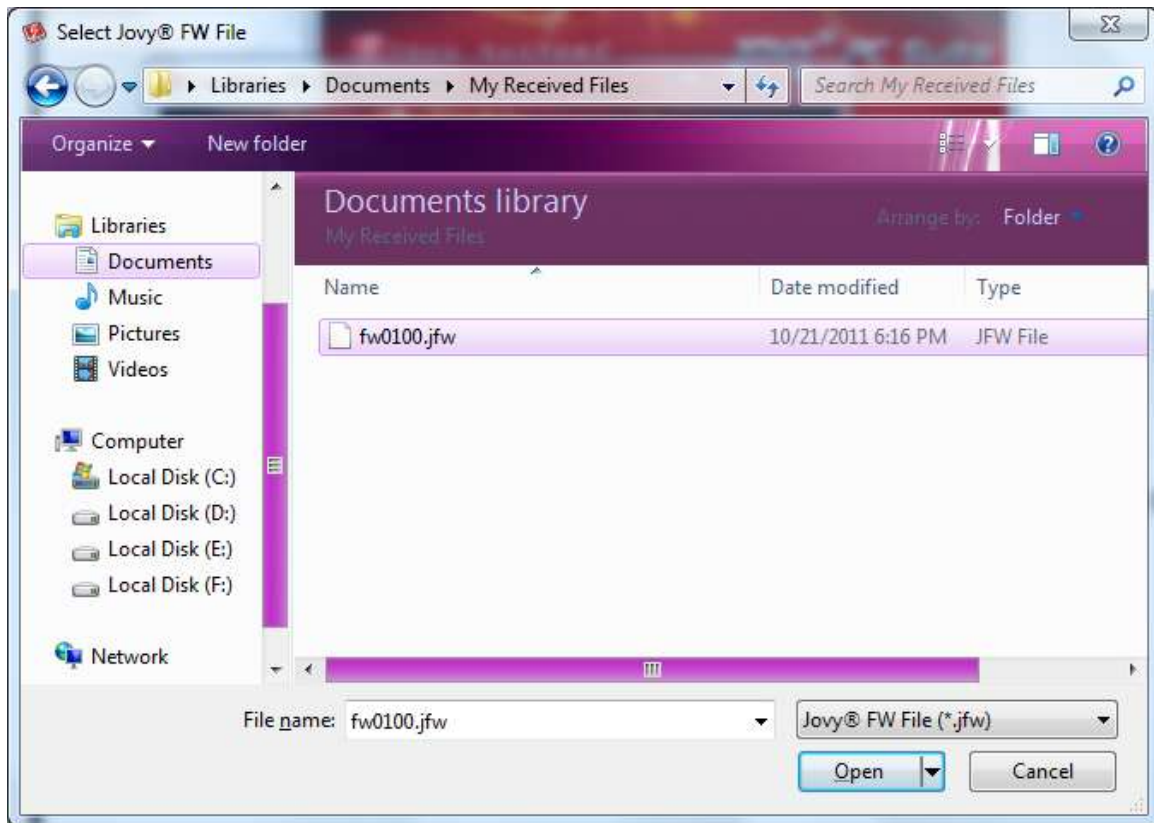
To install a new **RE-8500** firmware version to the **RE-8500**, only very simple steps should be followed.

First run the **RE-8500** machine on Boot load mode by keep pushing Enter/Ok button while turning on The **RE-8500**.

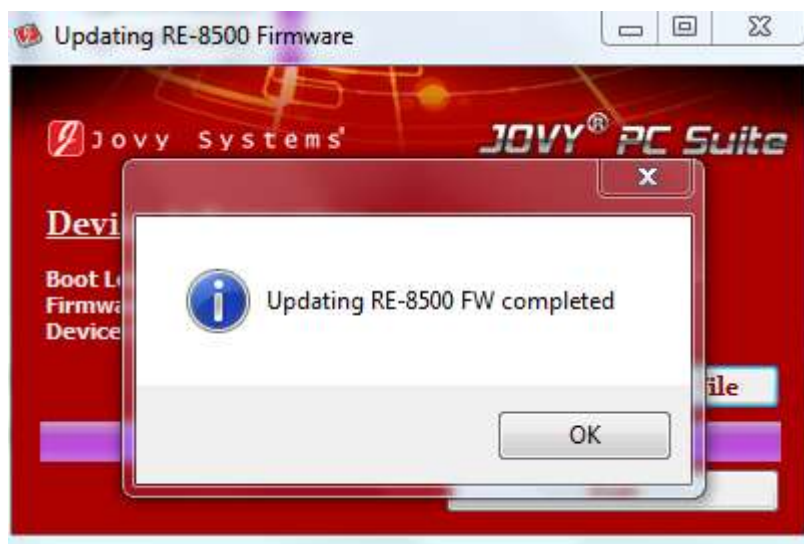
Then open **Jovy® PC Suite** and click connect, **Jovy® PC Suite** will automatically open update FW window where the **RE-8500** information like S/N, FW version and Boot loader version will be appeared.



The user can easily import **Jovy®** FW file from PC and install it to **RE-8500** by clicking on Import **Jovy®** FW file button and browsing the desired **Jovy®** FW file.



Finally, after installing a new firmware version to **RE-8500** the user should restart the **RE-8500** to start using the latest updated firmware for **RE-8500**.



## **Warranty policy**

The complete machine has a warranty period of 1 year from the time of purchase.

We provide online troubleshooting support and technical advice service through the web site [www.jovy-sys.com](http://www.jovy-sys.com).

## **Getting Technical support**

As we always care about user satisfaction, we have many support ways in the following points:

- Many profiles for the common applications.
- White papers.
- Videos.
- Live support through SKYPE.

We also support software and drivers for the any updates.

Visit [www.jovy-systems.com](http://www.jovy-systems.com) and enjoy our helpful support.