Makersplayce Machine Manual

Soldering Station

Weller WR300M



Introduction

This is the user guide of the WELLER WR3000M soldering station in Makersplayce. This device has a soldering iron, desoldering iron, and the hot air iron.

The user can refer to the information given in this document to properly use, handle, and care for the soldering iron. Reading through the whole manual first is strongly encouraged before using this soldering station as it can easily become a safety hazard, especially if the user does not have experience.

Overview

Figure 1 below gives an overview of the soldering power unit. Each button and switch will be explained with the help of the figure below.



Figuur 1: Overview of the soldering power unit

Channels: These are connected to the iron heads via two cables. 1st channel is the hot air gun, 2nd is the desoldering iron, and the 3rd one is the soldering iron.

On/Off switch: This switch is used to turn on and off the iron heads. **When they are not in use, turn off the power unit.**

Channel Buttons: - Buttons 1, 2, and 3 are used to select the channel for which the temperature needs to be adjusted.
- Air button can be used to adjust the airflow for the hot air gun, this is standard at 50%.
- The 1-2-3 button can also be used to change between channels, just like the separate 1, 2 and 3 buttons.
- Lastly, the Pick Up button will activate the suction function of the desoldering iron, but there is also a buttons on the iron head itself to do that.

Up/Down Buttons: These can be used to adjust the temperature or the airflow, depending on the selected channel and the function.

Starting Up

To start using the machine, follow the next steps:

1- Make sure all the iron heads are in the proper holders. If any of them are on the table, place them back into the holders.
2- Plug the device in and press the power button.
3- Wait until the desired temperature is displayed on the screen for the iron head that's going to be used.
4- Clean the tip and start using the iron needed. The temperature can be adjusted with the help of the up and down buttons. The standard temperatures for each iron head are:
    a. Soldering iron head: 350
    b. Desoldering iron head: 180 at stand by – 400 while desoldering
    c. Hot air iron head: 100 at stand by – 400 while blowing hot air

Shutting Down

To turn the machine off, follow the next steps:

1- If the soldering iron specifically was used, put some tin on the tip of it. This action is called 'dripping the tip' and it prevents the tip of the soldering iron from oxidizing and increases its longevity.
2- Place the iron heads and the appliances used back in their stands and their place.
3- **Turn the power off** by clicking the power button.

WHAT NOT TO DO!!

You may **NOT:**

- Use the soldering iron to melt or solder with any other material than tin, like plastic.
- Use the soldering iron to heat up and move some parts, like inserting a nozzle into your 3d printed part. If you choose to do this, the tip of the iron will get severely damaged.

Soldering Iron

This iron head can be used to solder through hole components to PCB's, to solder two cables together, and many other soldering applications needed, **except for soldering SMD** components. If you want to solder SMD with a normal soldering iron with a small tip, go to the SMD lab in ER0.64. If you're working with solder paste or want to desolder SMD's you can skip to the Hot Air Gun section.

If this is your first time soldering, watching an online tutorial first is recommended. To solder with the soldering iron, follow the next steps after you're done with the starting up section:

1- Take some tin from the roll, it should easy to rip it apart. Hold the tin in your non-dominant hand.
2- With your dominant hand, take the soldering iron and carefully put a little bit of tin on it.
   a. If you're soldering through hole components:
      - Place the soldering iron diagonally on the pad of the PCB and wait for the pad to heat up for a few seconds.
      - Slowly touch the tip of the tin to the pad, and pull it away when the pad is covered with tin.
   b. If you're soldering two cables together:
      - Before you start, place a heat shrink tube on one of the wires so that it easily slides on top of the soldering joint once the connection is done. See section Hot air gun to read about what you can do with this heat shrink tube.
      - Clip the wires in place with use of one of the stands available.
      - Bring the tip of them you want to solder close to each other.
      - Place the tip of the iron to their connection point, and carefully put more tin on the tip. You will see that the tin will start flowing into the connection point of the cables.
      - When there is enough tin to keep the cables together, you can pull out the tin away from the iron. With the iron you can smooth out any big lumps of tin on the cable by going over them slowly.
   c. For any other application, you can consult the worker present or follow a tutorial on the internet.

Desoldering Iron

This iron head can be specifically used to remove any solder from through hole components to disconnect them from the PCB. This iron head works by creating a hot environment around the pad to melt the solder. After the solder has become liquid, the iron head can suck away the solder. Working quickly but carefully is the key for this application. Feel free to consult one of our workers or an online tutorial if the following explanation isn't clear enough.

Before using this iron head, fist check if the solder you're going to remove is old or new – to ensure the solder will melt when you place actual desoldering iron head on the pad. You can do this by touching the heated tip of the soldering iron head to the connection joint and wait for a while for the connection joint to melt, this can take a long time. If the solder melts easily, you can skip to the numbered steps.

If you can't get the solder to melt, add a bit of tin to the tip of the soldering iron and touch the tip of the soldering iron to the connection joint again. If you still can't get the solder to melt, we recommend waiting and adding a tiny bit more solder and waiting longer each time.

To actually desolder using the desoldering iron, follow the next steps:

1- Ensure the desoldering iron is heated to the desired temperature and that the suction mechanism is working properly by pressing the button on the iron head. Check that the suction nozzle is clean and free of blockages.
2- Place the heated tip of the desoldering iron on the connection joint or solder pad you want to remove solder from. Let the tip heat the solder for a few seconds.
3- Once the solder has melted, press the suction trigger to draw the molten solder into the nozzle and remove the iron head after max. 3 seconds.
4- Check the connection joint to ensure that most or all the solder has been removed. If necessary, repeat steps 2–3 until the joint is clear.

Tips for better results:

- **Avoid pressing too long**: Let the heat and suction do the work for shorter periods of time to prevent damaging the pad or the components.
- **Work quickly but carefully**: Minimize the time the heated tip is in contact with the PCB to avoid overheating, or in the worst case scenario, melting the pad itself.
- **Consult a worker or online resources**: If you're unsure or encounter difficulties, feel free to consult the worker present or look up tutorials online.

Hot Air Iron

This hot air iron head can be used for heating and reflowing solder, to work with **Surface Mount Devices (SMDs)**. The iron head blows extremely hot air that can be used for various purposes such as: soldering or desoldering SMD components by reflowing solder paste. It can also be used to apply heat to heat shrink tubing around wires, to protect and isolate the connection joint.

If you're new to using a hot air iron, it's recommended to consult a worker or watch a tutorial online before use.

To use the hot air iron, follow the next steps after you're done with the starting up section:

1- Adjust the airflow and the temperature with the help of the buttons. Check online which settings apply best to your situation.
If you're soldering through hole components:
   a. If you're soldering/desoldering SMD with solder paste:
   - Hold the hot air iron a few centimeters above the component or solder joint with solder paste on it.
   - After a few seconds, you can place or remove the component with help of tweezers.
   b. If you're trying to seal the heatshiirnk on top of the connection joint of two wires soldered together:
   - Slide the heat shirnk over the connection joint until all of the exposed wire is covered and no metal parts of the wires are visible.
   - Hold the wires at a point far from the connection joint in order to avoid burning, and slowly bring the hot air iron closer to the connection joint. Once you start the heat shrink reform, turn the wire so that all parts are completely sealed.