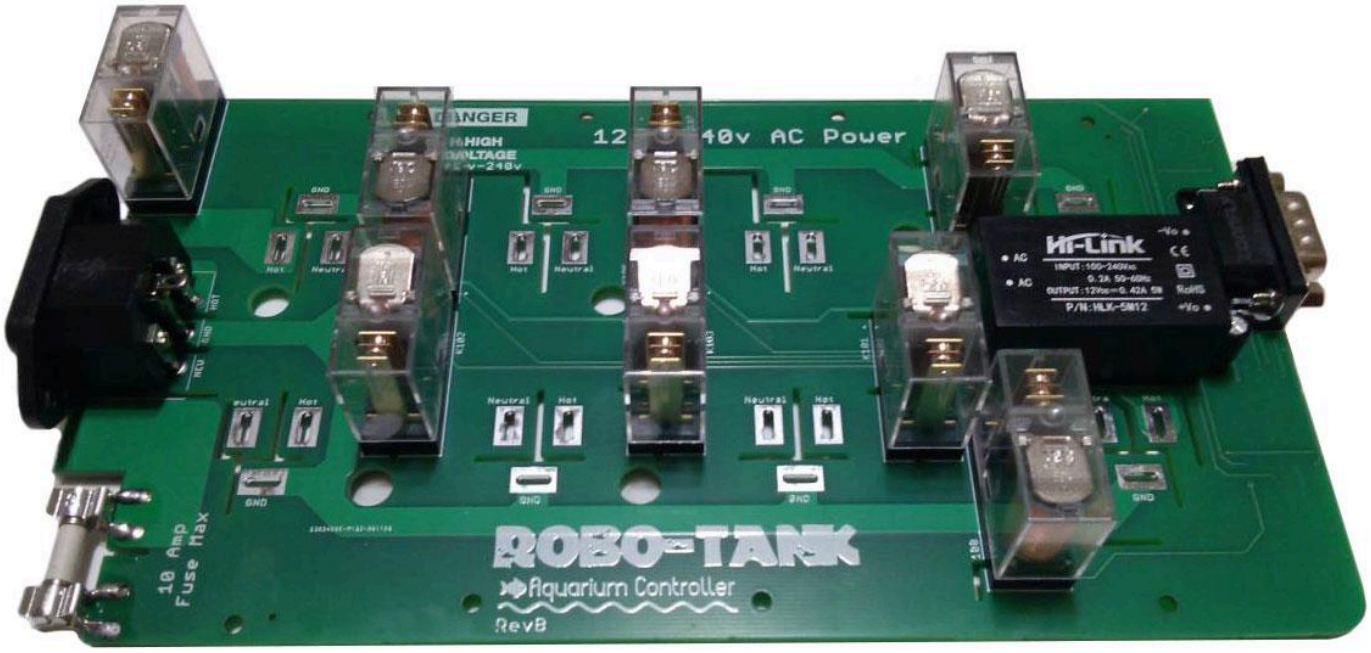
AC Power Bar DIY Assembly Manual

AC Power Bar Assembled



Safety Reminder

- **READ & FOLLOW ALL SAFETY INSTRUCTIONS**
- Always turn off the soldering iron on when you leave the room
- **DANGER -** Never handle electrical equipment with wet hands
    - This is all low voltage but you should still take care
    - Lighters cause fires
    - Sniffing glue is dangerous
    - Soldering irons can burn you
- Ensure all components (power adapters, power boards, controllers, wires, etc.) are properly set up according to manufacturer's recommendations, to prevent accidental damage

Table of Contents

Summary and Assembly Tips

Thank-you for your purchase of the Robo-Tank DIY Deluxe Controller.

In this manual I'll explain in detail how to assemble your controller, assembly is estimated to take 1-2 hours but remember to take your time so everything goes well.

You will need the following tools and supplies to assemble everything.

- Medium size Phillips screwdriver (star tip)
- Small flat head screwdriver (flat tip)
- Cutters
- Soldering Iron
- Solder

When soldering there are a few important things to remember such as

- Keep the tip of the soldering iron clean at all times, a damp sponge or cloth will work great.
- Never put solder on the tip and try to solder, instead heat the pin you are soldering first for about 1 second and using your other hand touch the tip with some solder and it will flow evenly.
- When mounting connectors and headers it's important they are sitting flat on the board and straight, the easiest way to achieve this is to solder one pin then position the board so you can align the connector and touch the pin you just soldered so you can move it around. Once you are happy proceed to solder the other pins. It's more difficult to remove things than solder them in place, so take your time to make sure you get everything correct before soldering things completely in place.
- Solder has flux within which cleans the contact but leaves a residue on the board. You'll see this on your board but it won't cause corrosion if it's a no clean flux, this is what I use, however if you have isopropyl alcohol you can use a Qtip to clean it off. You can also use a small flat screwdriver and it'll chip off without much trouble.

AC Power Bar DIY Parts List

In your package you'll find a zip lock bag with all the parts to assemble the power bar.

Here is a list of all the parts that should be included in your kit.

- 1 – AC power bar printed circuit board
- 2 – Fuse holder clamps
- 1 – 10 amp fuse
- 1 – IEC-320 AC power socket
- 24 – m2.5 x 6mm screws
- 2 - m2.1 x 16mm screws

Assembling the Power Bar

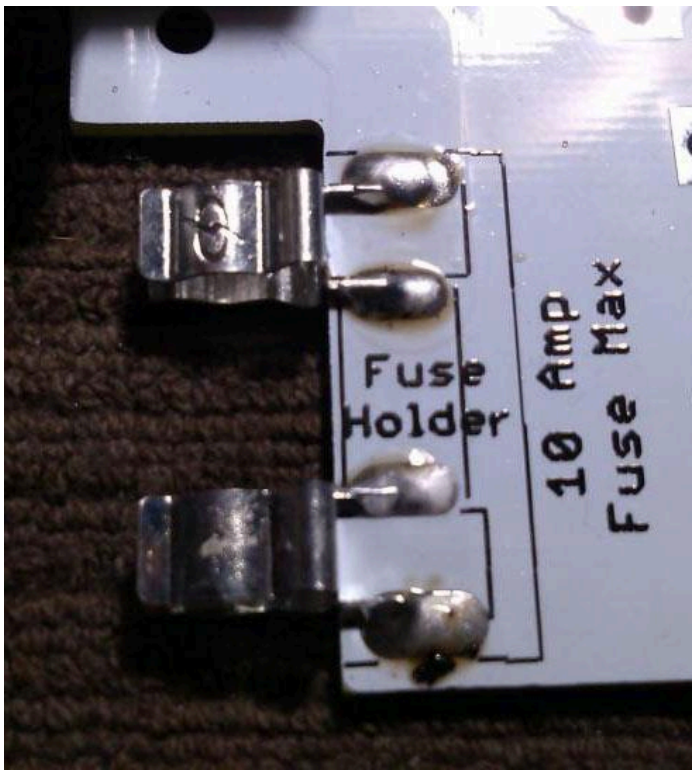
The assembly process is laid out in steps, it's recommended to go through the following steps. The board has drawings so you know what goes where, everything is mounted on the side shown in the image below. The images throughout the manual are for the North American board but the others are very similar.

Step 1 – Mounting the Fuse Holder

To keep the power bar as thin as possible the fuse holder is mounted flat on the board. When it's in the case you use tweezer or needle nose pliers to hold it and with a flat screwdriver or blunt object push it in on each side. Don't push on the glass, only the metal sides of the fuse.

When you look closely at the fuse holder clamps you see one side has a tab sticking up, make sure you put that end on the outside otherwise the fuse won't go in.

1. Add solder to one mounting pad for each clamp.
2. Using small pylers or cutters hold the clamp and reheat the pad on the board. You want to make sure it's sitting flat and bumped up against the board.
3. Now do the same to the other clamp.
4. Once both are in place verify they are sitting straight, then solder the other tab on each clamp.



Step 2 – Mounting the AC Power Socket

Now you can mount the IEC-320 AC power socket.

1. Place the socket on the PCB and solder the middle terminal while pulling the socket away from the board.
2. Hold the board and verify the socket is straight in all directions. The edge of the socket rests on the board so there's a space between the socket and board, make sure the space is the same all the way through.
3. Once you're happy, solder the other remaining terminals.

Mounting the Power Bar Board in Case

Now you can mount the power bar in a 3D printed case if you so desire.

It's important to assemble the case in the order outlined below as this ensures everything gets lined up properly and there's no flexes in the case. Once it's installed you can remove the screws and it'll come out easy.

You should have 3 pieces.

- Case
- Lid
- Outlet plate

Step 1 – Secure Outlets in Plate

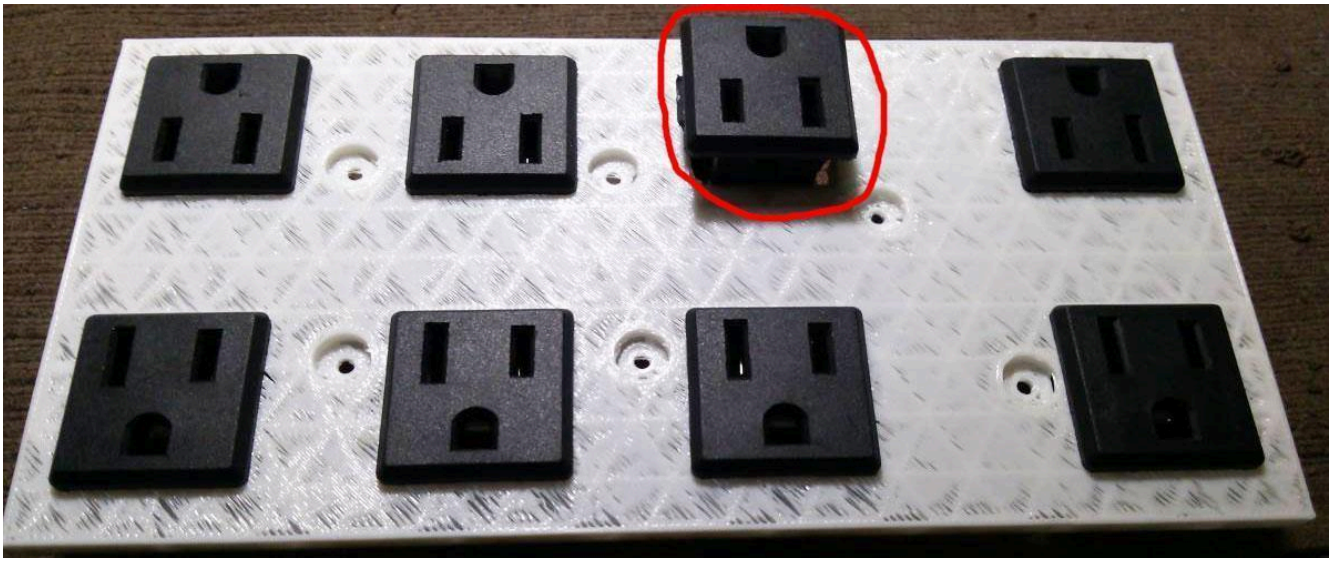
Before pushing the outlets through the faceplate you need to cut the plastic tab between the outlet contacts that push through the PCB. If this isn't done the outlet contacts won't push through the PCB far enough.

Now you push all the outlets through the plate that holds them in place.

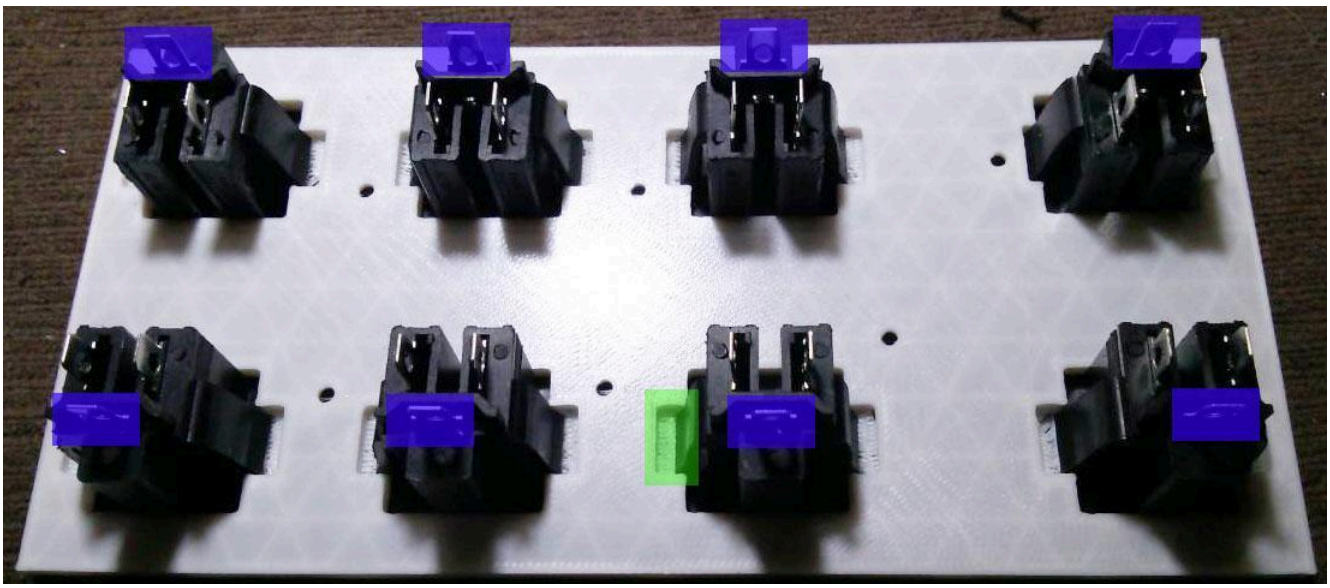
When you have the outlet half in as the circled one, hold the plate on the bottom on each side of the outlet, with your thumb push the outlet in, it'll be tight but the plate won't break if you secure it on each side of the outlet.

You should have heard the outlet snap into place, that usually happens but not always. If you turn the board over like the 2nd image, green mark, you can see if the plastic went under the outlet snap, verify they all did.

If not, use a flat screwdriver to push on the plastic that's bulged and stopping the tab. When you do this make sure you are pushing the outlet in place, the tab will go over the plastic on its own when it can.

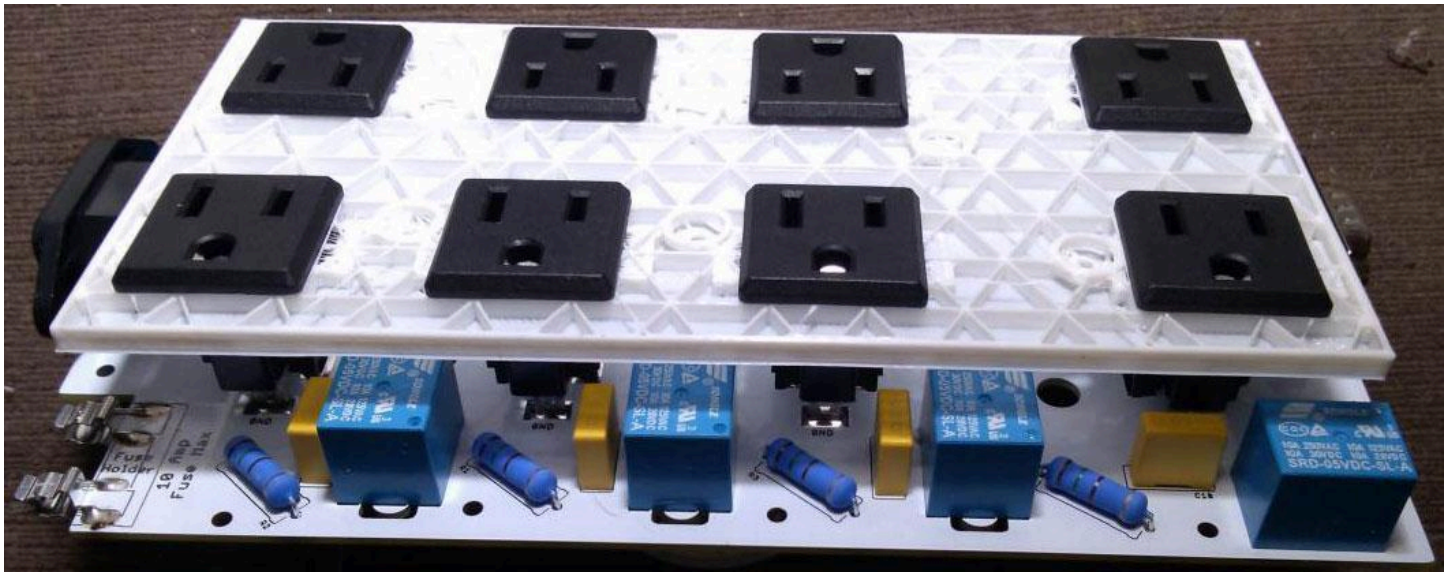


Once the outlets are secured, bend the ground tabs (marked in blue) away from the center about 1/8th of an inch so they will line up with the board.



Step 2 – Test Fit the Outlets

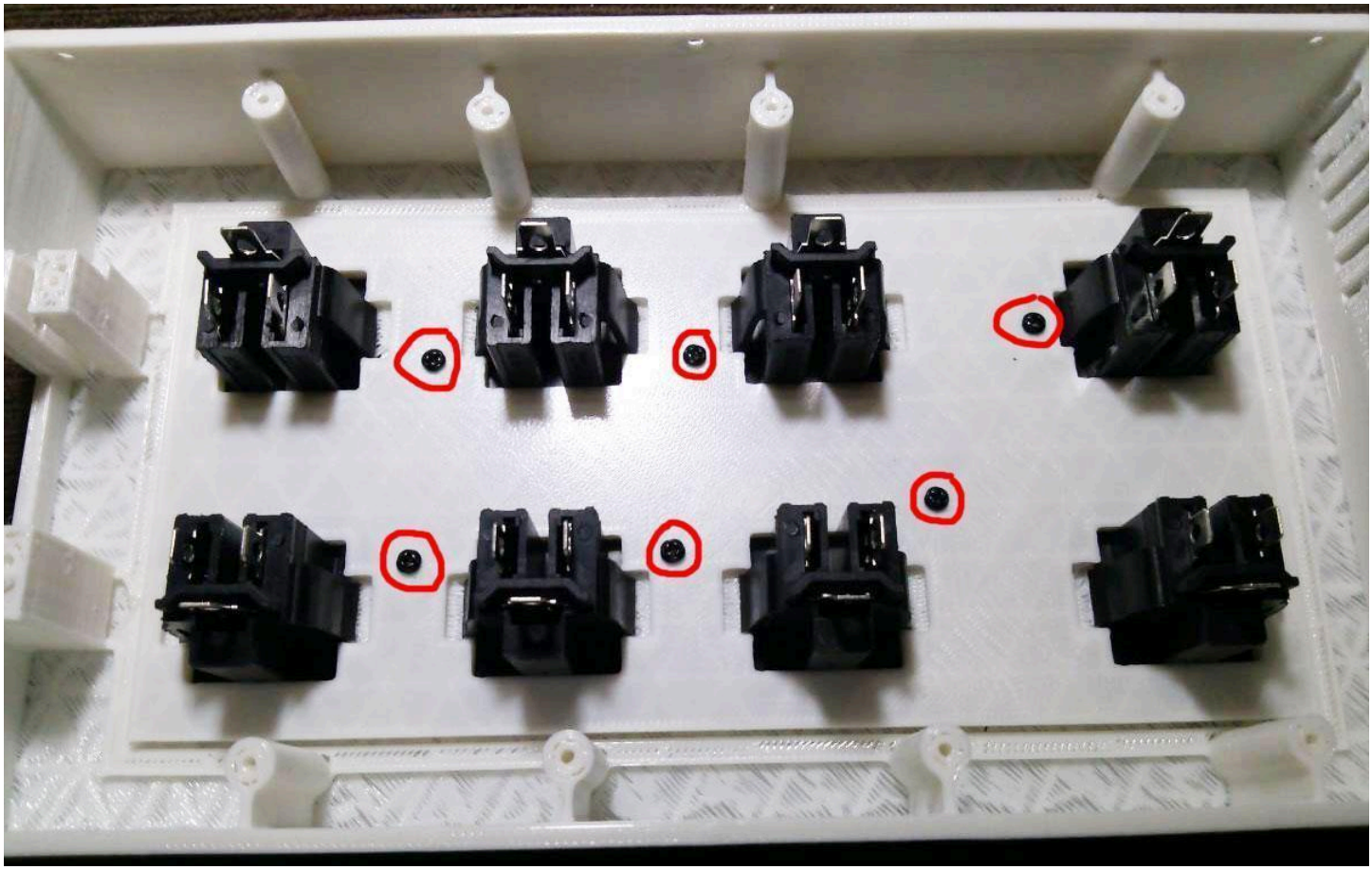
Place the outlets on the board and make sure the tabs are aligned, the Ground tabs shown in red will need adjusting, once you're able to place it on without trouble you can remove it and move on.

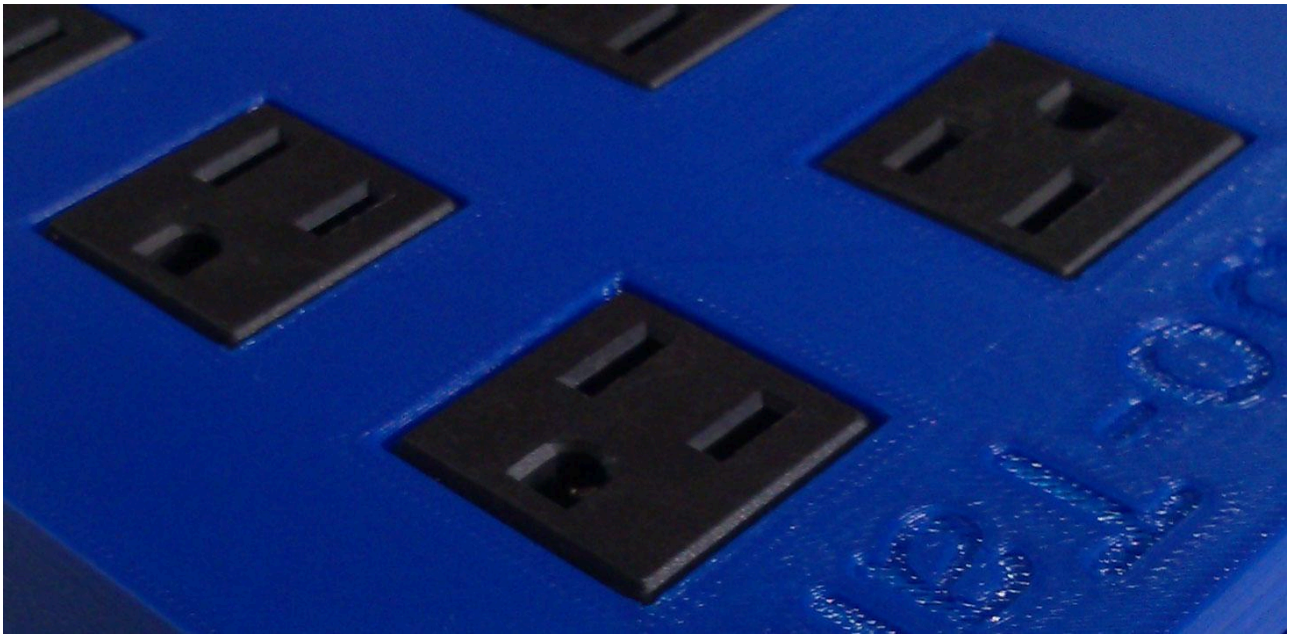


Step 3 – Mount Outlets to Case

Take the outlets and place it in the case, turn it over and see how they line up, you may need to shift them horizontally, vertically they will be ok.

Once you have them looking good on the top add the six screws to hold it in place.





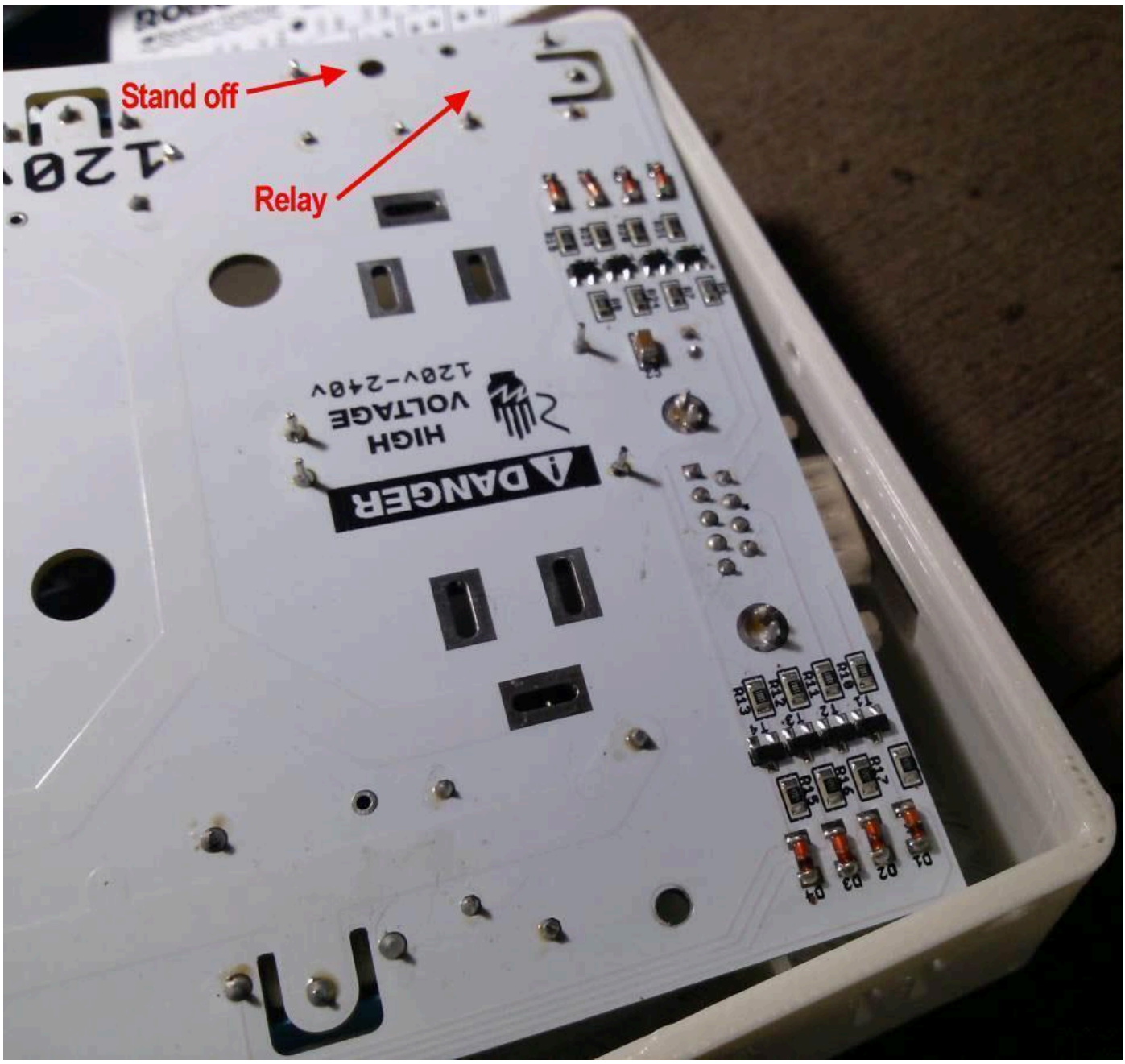
Step 4 – Mounting the PCB

Now that you have the outlets in place and mounted to the case you can place the PCB on them.

At the top of the image you can see there's a relay and stand off that are close to each other, because of this you have to put the board in at an angle.

Once you have it at the correct angle, you'll feel it, straighten then board with the other end still sticking out so it's hovering with just the DB9 socket in the case.

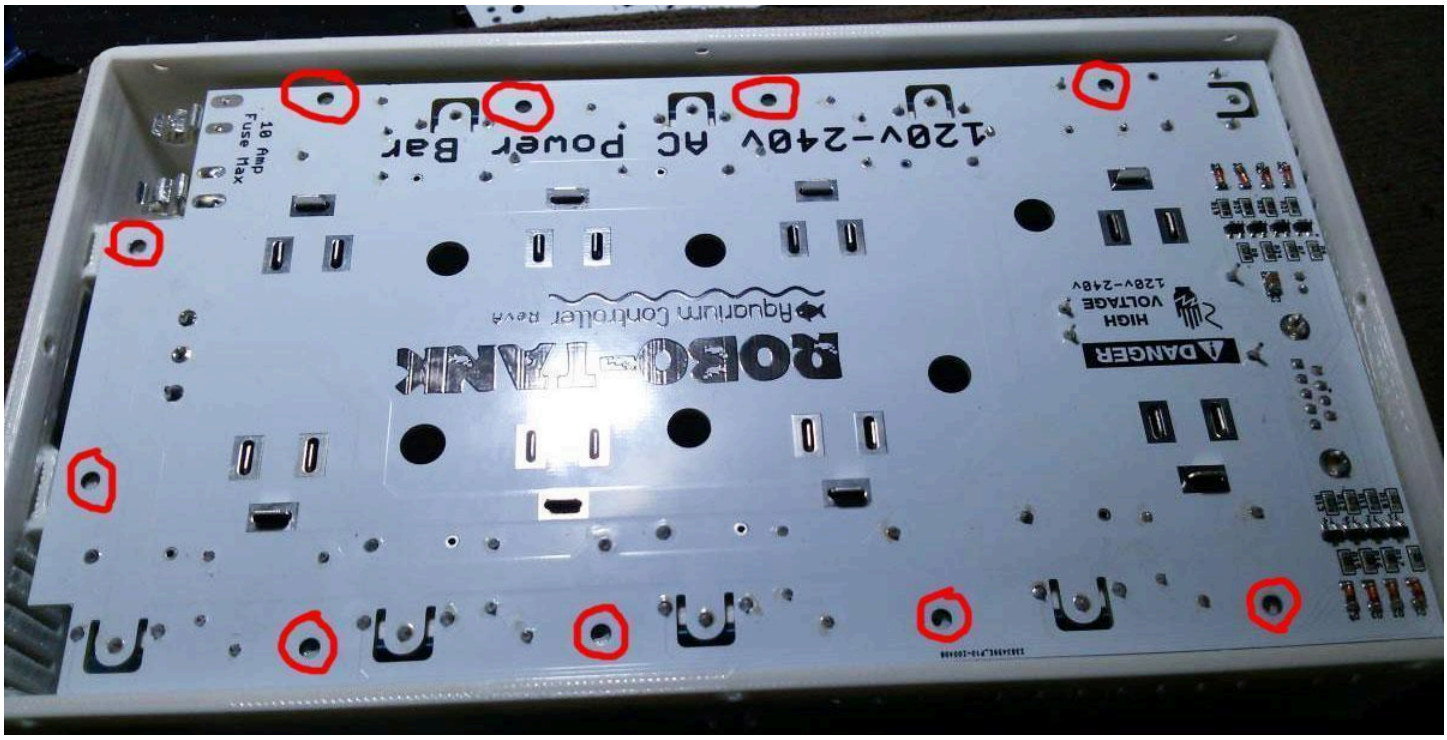
Now slowly drop the board straight down, at first there will be some resistance as the outlets closest to the DB9 won't be quite lined up with holes so push the board towards the DB9 and you should see them appear. At that point you'll feel you can push it down more until the terminals hit the 2nd outlet. These are spaced far enough that it's usually straight down but if there's any resistance you might have to lift the board slightly and adjust one of the terminals.



Step 5 – Screw the PCB in Place

Now that you have the circuit board in place you need to mount it to the case with the screws in your kit. **Do not solder the outlets until you've done this.**

Start with a screw in each corner, don't tighten them until you have one in each corner.



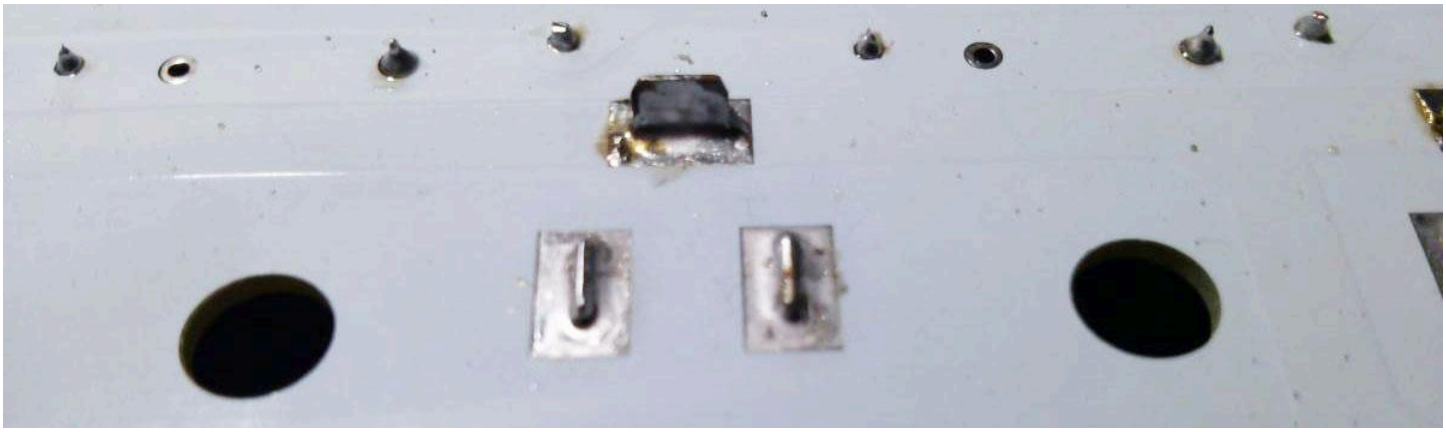
Step 6 – Solder Outlets to PCB

Now that everything is firmly secured you can solder the outlets to the board. Make sure you look at the front and verify the outlets still look straight, if one is off to the side you can use the holes on the PCB with a small screwdriver to push the outlet to either side. When you're happy, solder one terminal on each outlet in rotation.

It helps to lay the soldering tip on an angle so you can heat more of the pad. While your tip is on the pad continue to add solder until it's full, then quickly move your tip to the other side of the tap and add more solder.

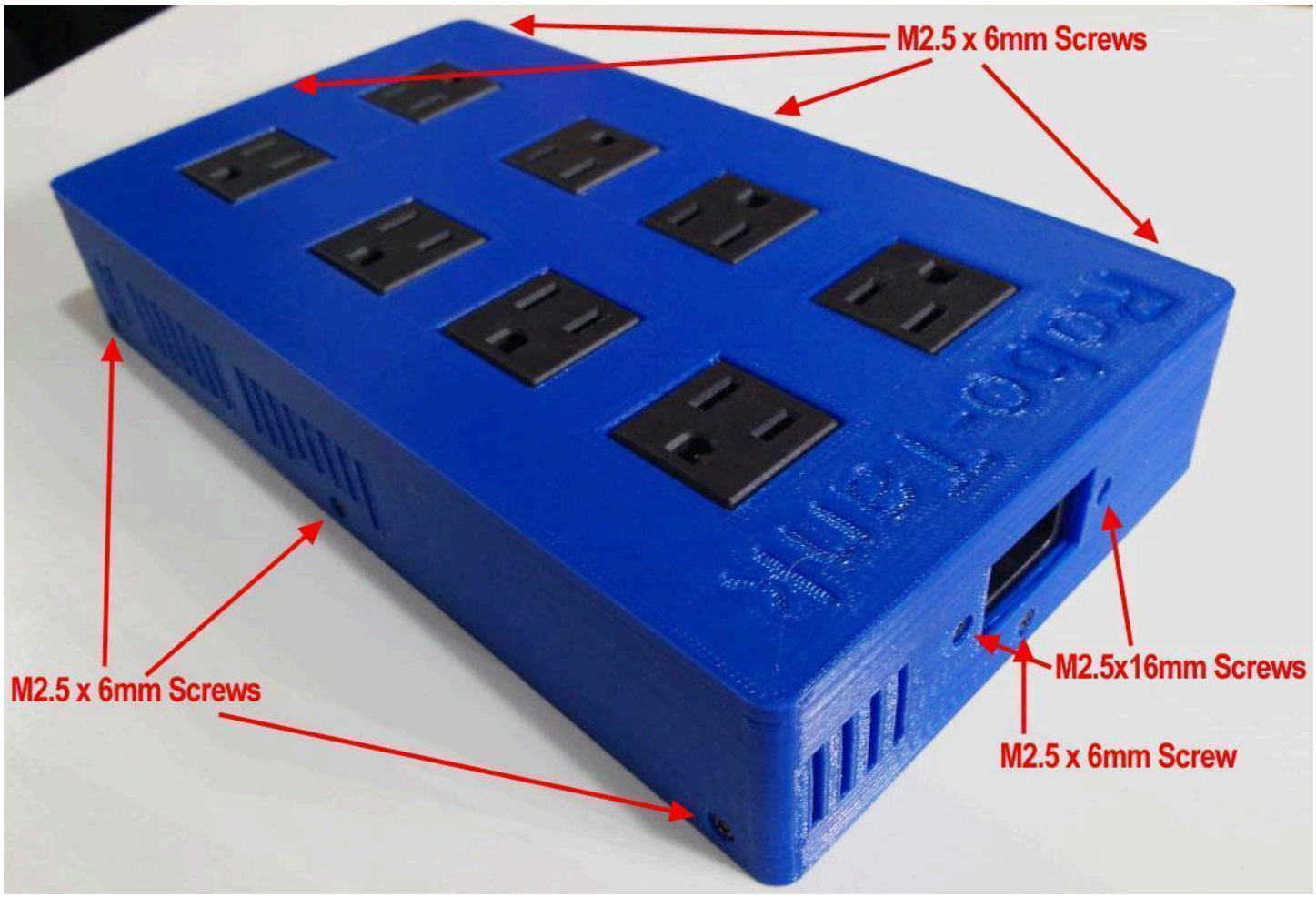
While you have your soldering iron pressed on the pad use it to rub the side of the terminal, you'll hear a squeak as it cleans and the solder will stick better and quicker.

Make sure you give the outlet time to cool before soldering the next terminal, the time you do a terminal on the other outlets it'll be ok to solder the next.



Step 7 – Secure Lid

The only thing left is to mount the lid on the case. It's recommended to add the lid before using it for safety reasons but the standoffs on the lid also transfers a lot of the pressure put on the outlets.



Note: The two screws that secure the AC power socket are long.

Thank-you again for your purchase and I hope you enjoy your Robo-Tank controller.

Questions or comments contact me, Rob Fowler at info@robo-tank.ca