

Assembling the 1450XL Power and Mains Cables for the Mean Well RT65A power supply

Parts from the BOM:

Mean Well RT65A power supply

Multimeter

Qualtek 2 M AC power cord or similar

DC power cord 22AWG 1 M 8 conductor

DC power plug DIN 8pos Solder Cup

Spade Terminals M4 Plastic Insulated

Shrink Tubing

Crimper tool for spade terminals

You will also need a soldering iron/tweezer, solder, shrink tubing(appropriate diameter and length, third hand and hot air gun of some kind (blow dryer with a narrow opening)

This process is not hard for most people to do, but it's far better for your mental and physical health and the success of the build process if you have some degree of competency doing this type of soldering beforehand. If you are a complete noob, it's best to have a more experienced person make these cables. This involves AC and DC high current and voltage and can be **dangerous**.

1. Prepare the AC power cord

If you get the part called out in the BOM the internal three wires will already be exposed. Otherwise if you simply use a common AC power cord (w/three prong plug) you will need to cut off the end of the cable that does not plug into the wall. Cut/Strip off the external coating careful not to damage the internal three wires to a distance of at a little less than two inches. Then strip the external coating of each of the individual three wires, careful not to damage the internal metal wire/s to a distance of around $\frac{1}{2}$ an inch and tin each of the wires. If the internal wire is stranded instead of solid, then you will need to twist the strands together tightly, before tinning.

Now verify that all three wires connect to one and only one prong on the plug end of the cable. If they don't, don't use the cable, get another one. Some very cheap power cords will not connect to the gnd prong and are a disaster waiting to happen.

If you use non-insulated spades use appropriate diameter and length shrink tubing for each of the three wires and insert before crimping the spade terminals on. Once the spades are crimped then pull the shrink tubing over wire end of the terminal and heat shrink it to the exposed wiring.

[Here's a Youtube video on what to look out for](#)

Using three of the spade terminals, crimp each to a single wire. Check that the wires do not pull loose from the terminal. You may be able to solder tack the end of the wire to the point it barely comes out of the circular barrel of the spade to aide in holding the wire where it needs to be while crimping. But the crimp is the main method of holding the wire to the terminal.

2. Prepare the DC power cable- End 1

Now you will take one end of the DC power cable and cut/strip the external coating to expose the internal coated wires inside. Once again take care not to damage the internal wires. Use a distance of a little less than 2 inches. Then strip back the coating of each individual internal wire to expose the metal wire inside about 1/2 inch and tin the wire. If the internal wire is stranded instead of solid, then you will need to twist the strands together tightly, before tinning. Do not glob solder on to the wire. The tinning should be just enough to bind the individual strands together. This is crucial as the solder cups on the plug will not handle a bigger diameter of wire.

Now comes the real fun part. Essentially you will be soldering each individual wire into a solder cup on the back side of the plug. You may need to clamp the plug in place or use a third hand to hold things steady.

*Tip From Stephen on AtariAge: A trick I use is to tightly twist the wires, but do not tin them. Fill the cups on the connector with a decent flux. Then, while applying heat to the cup, apply solder to the top of the cup and the flux will pull the solder into the cup and the wires.

* Tip: Solder an internal wire in the bundle to an internal solder cup on the plug. The DC power cord will have a natural dispersion to the individual internal wires. You want to follow that as closely as possible. At this point don't worry about the wire coating color, the goal is to keep the diameter of the wire bundle at the solder cup to no more than the DC power cord itself.

Also plan to use shrink tubing of appropriate diameter and length to prevent internal shorting between the cups. They go onto the wire before

you solder the wire into the cup. Take note of the white shrink tubing in this Youtube short.

[Example of soldering wires to solder cup connectors](#)

Once you have all eight individual wires soldered in, test that the wire does not pull out and then pulled the shrink tubing over the solder cup junction and use a hot air gun to apply heat to shrink the tubing down around the solder junction.

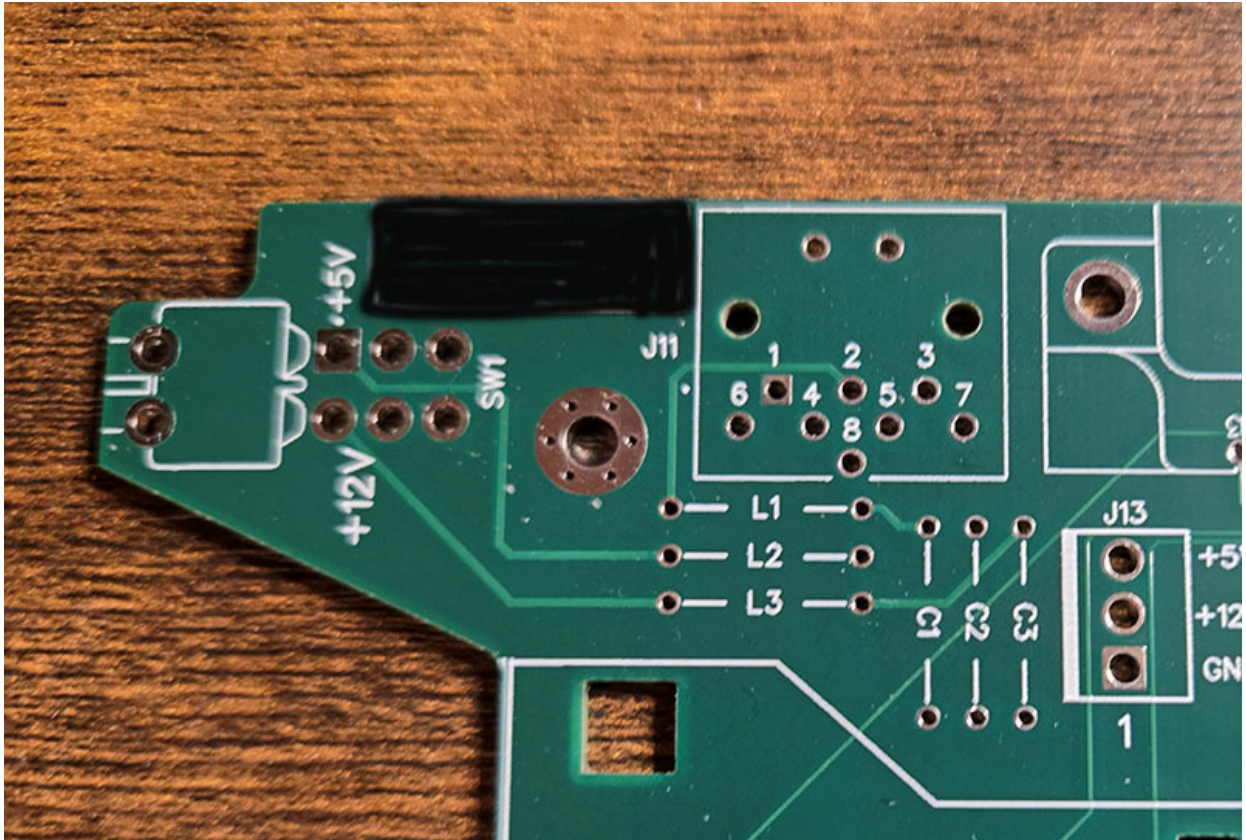
[Example of assembling DIN connector](#)

This should complete End 1 of the DC power cord.

3. Prepare the DC power cord--End 2

Remember how you did the AC power cord spade terminals in part 1. This will be very much the same method, just more wires with one additional step.

On the other end of the DC power cord from the DIN 8 plug, strip and tin each individual wire like before. Then connect the assembled DIN plug to the power input jack on the 1450XL. Now using the multimeter ohm each wire to these points on the assembled 1450XL to determine which wire connects through the power plug. Note the color of the wire that goes to each voltage and gnd. Ohm twice to be sure. The magic smoke will release from most of your chips and other circuitry in a sound extravaganza of exploding parts and intense smell of burnt plastic if you are wrong.



-5V Should have continuity to either side of L1 or top inductor

With the power switch on:

+5V Should have continuity to either side of L2 or middle inductor

+12V Should have continuity to either side of L3 or bottom inductor

GND Should have continuity to any of the screw holes.

You should have four wires that ohm to GND. Combine two and crimp them together. Then do the same with the remaining two. You should have two wires that ohm out for +5V. Crimp those two together in one terminal. Put a single spade terminal on each one of the remaining 2 wires that ohm out to a voltage.

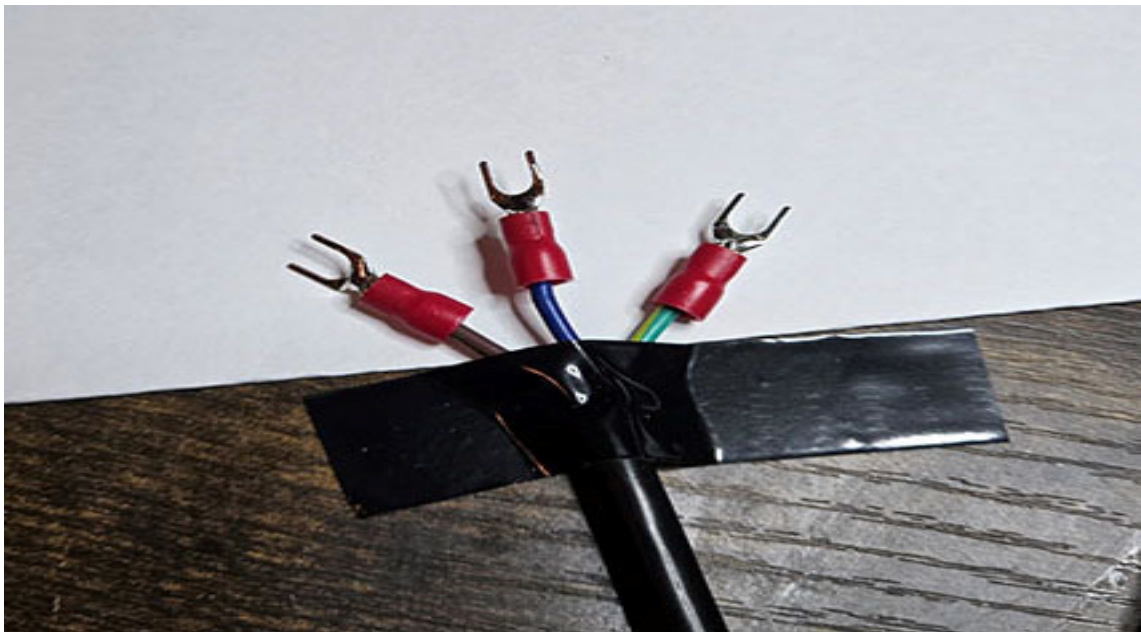
STOP: This is mains power and deadly. Never try connecting to the Meanwell RT65A power supply with an energized AC power cord. Always connect to the power supply first then plug in the AC power cord to the wall outlet when you need to.

4. Connecting the AC cable to the RT65A power supply

- A. Normally a standard 3 prong US AC power cord will have definitely defined colors for Hot, Neutral and GND to match a properly wired home AC outlet.

Black for Line(Hot) White for neutral Green for GND

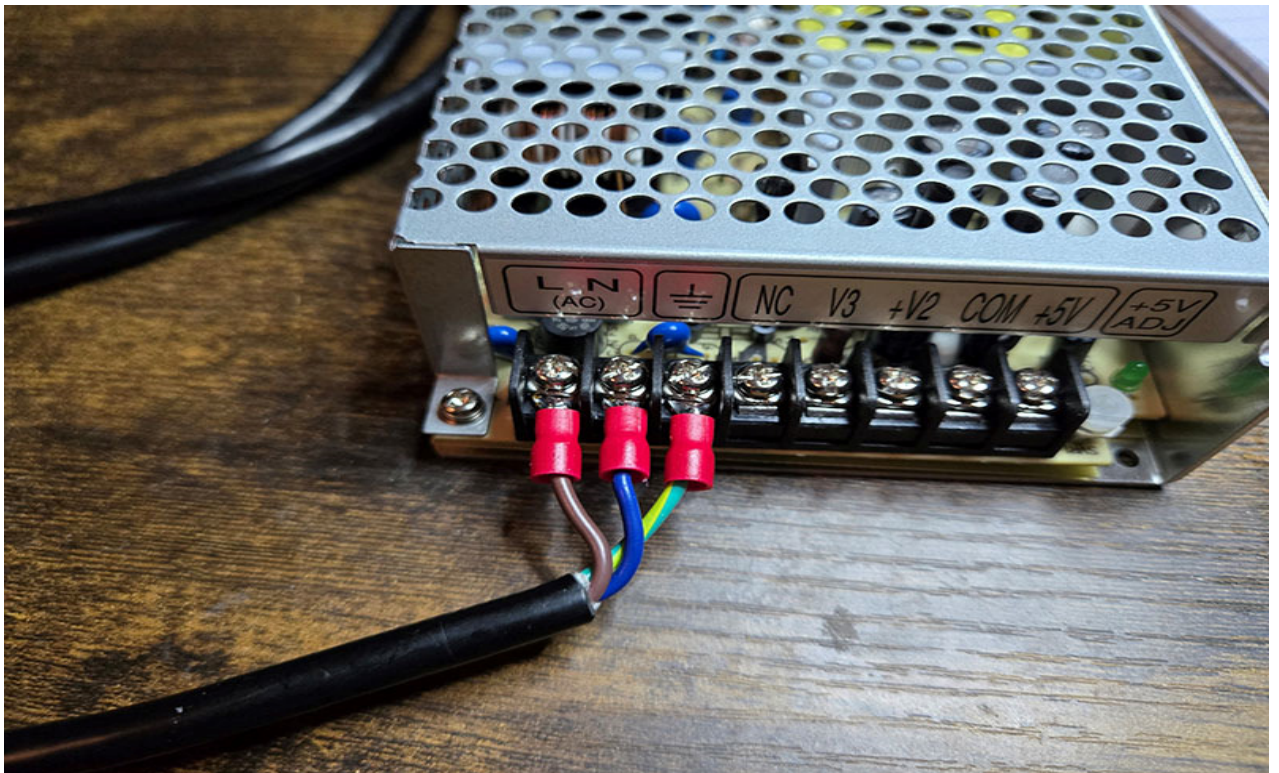
But sometimes the colors don't match, or you are unsure which is Line(Hot) and which is Neutral. In my case the colors did not match. I was able to verify the green wire did ohm to the round grounding plug at the other end. So I replicated the test in this linked [youtube video](#) and discovered that the blue wire was neutral and the brown wire was hot.



Just like in the video take extra care that all three wires are separated and you tape them down like in the picture above, then plug in the power cord to a wall outlet or surge suppressor. Set your multimeter to AC Volts and very carefully measure the two unknown wires. Make a note, it should be ~ 120 V AC. Then measure one of the unknown wires to your known GND wire. It will either equal the previous voltage or hardly have any voltage at all. If the voltage equals the previous value then that wire is the hot. That leaves the other unknown wire being the neutral.

Unplug the power cord at the wall outlet or surge suppressor and then connect the other end wires to the RT65A like so. Remember to screw the terminal screws down snugly.

This should finish the AC cable connection to the RT65A.



B. DC cable connection to the RT65A. Your wire colors may vary depending on what you ohmed out earlier.

RT-65A Terminals

DC cable wires

NC:

Not connected to any wire.

V3 =

-5V should be connected to the -5V wire

V2 =

+12V should be connected to the +12V wire

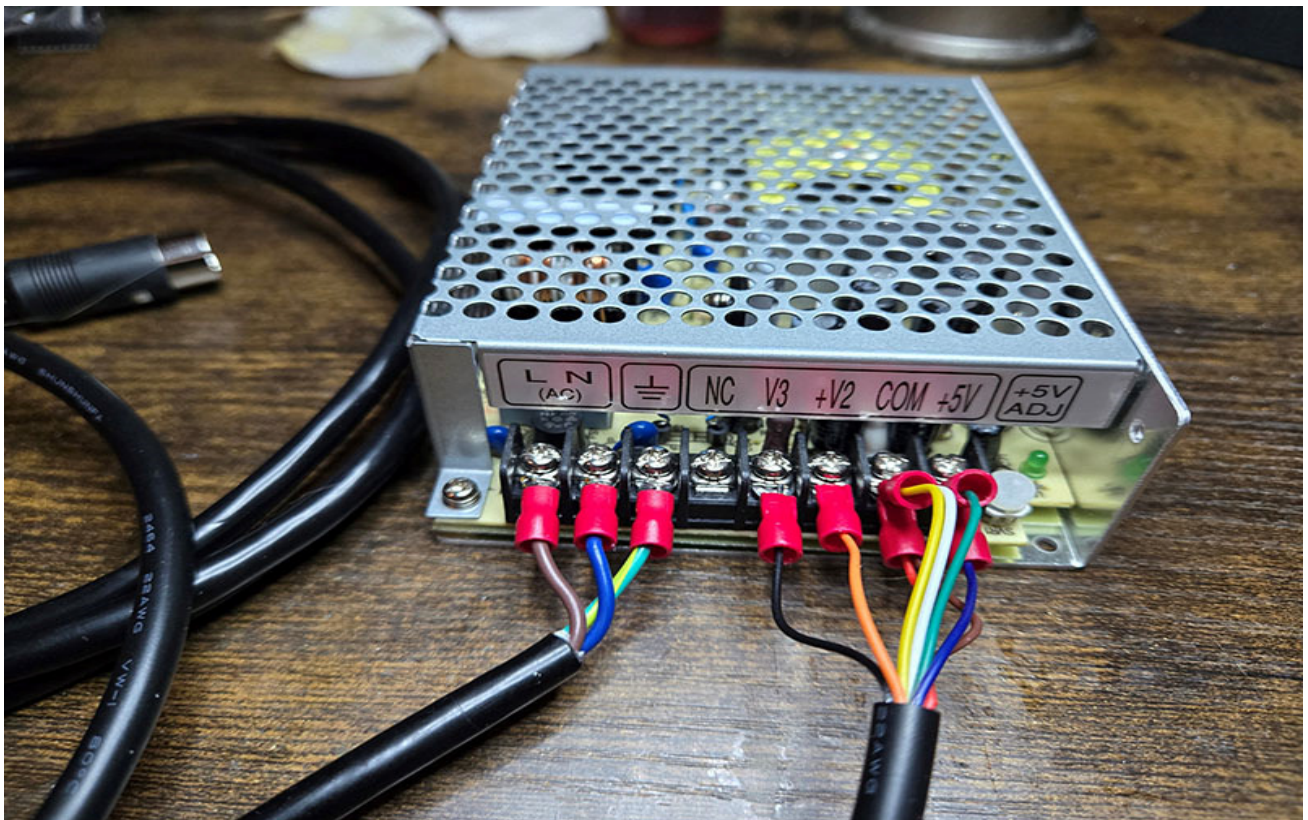
COM =

GND should be connected to both GND wires

+5V =

+5V should be connected to the double +5V wires

Screw all four terminals down snug for the DC connections. It should look like this.



C. +5V Pot adjustment

Disconnect the DIN plug from the 1450XL.

Then plug the RT65A AC cable into an AC power outlet. You should see the power indicator on the RT65A come on. Then **CAREFULLY** across COM and the +5V terminal on the RT65A measure the +5V voltage output, it should be no more than + .2 V and no less than -.1 V. If not then use a plastic/wood flat tool to turn the +5V adjustment pot very slowly in whatever direction will get it within specs.

Unplug the AC power cord from the wall outlet or surge suppressor. Wait for about an hour for the power supply charge to discharge some.

D. Final check

One final time to double check the DC power wires to the RT65A. This time you will ohm the connection between the RT65A DC voltage terminals and test points on the 1450XL motherboard to verify continuity to the proper place.

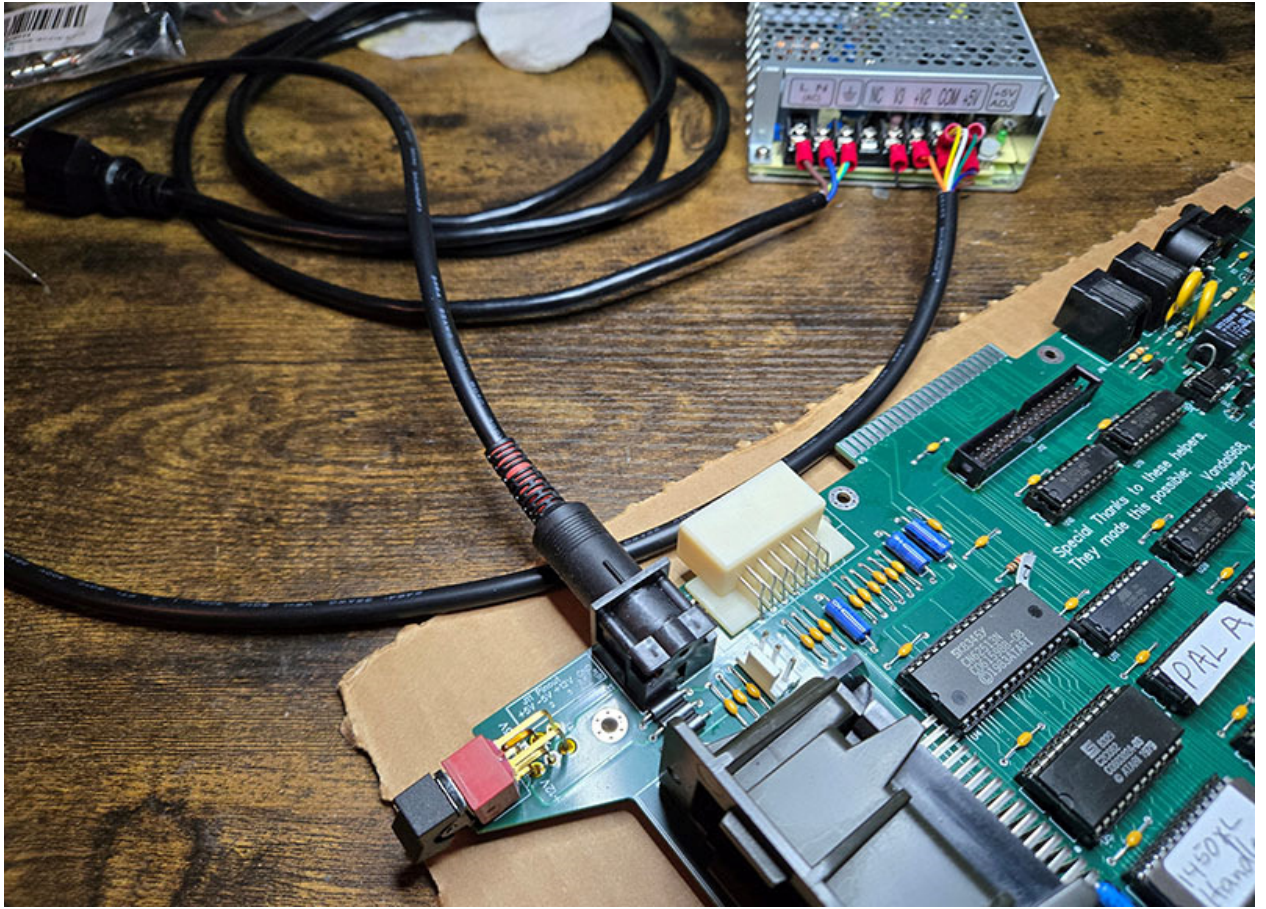
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5. Case enclosure for the Meanwell RT65A

At the current time there is no enclosure for the power supply. If you are good with 3d design to be printed by a 3D printer please share your ps case design.

