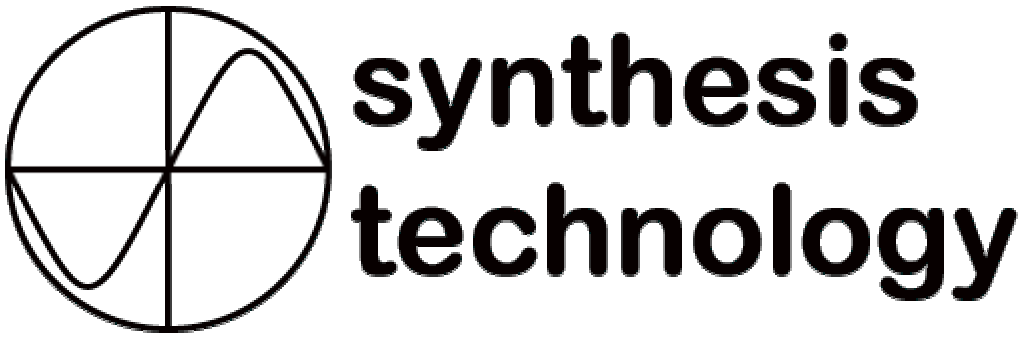

MOTM-900 Power Supply
Assembly Instructions & Owner's Manual

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SYNTHESIS TECHNOLOGY
MOTM-900 POWER SUPPLY

BILL OF MATERIALS

Please check off each item as you verify the contents.

- ❒ 1ea Power One linear supply
- ❒ 1ea MOTM-900 front panel
- ❒ 1ea AC Input connector & fuse (EC version will include a jumper wire).
- ❒ 1ea Power distribution pc board
- ❒ 1ea Power switch
- ❒ 1ea No-clean solder
- ❒ 1ea Wire set, including:
  1ea green wire with #6 ring terminal & 0.250 FASTON, 600V
  1ea black wire with 0.187 uninsulated and 0.250 FASTONs, 600V
  1ea white wire with 0.187 uninsulated and 0.250 FASTONs, 600V
  1ea white wire with 0.250 FASTON and stripped end, 600V
  1ea black wire with 0.250 FASTON and stripped end, 600V
  1ea white wire with 0.250 FASTON and stripped end, 300V
  1ea red wire with 0.250 FASTON and stripped end, 300V
  1ea black wire with 0.250 FASTON and stripped end, 300V

  The 600V wire has thicker insulation. The voltage rating may be printed on the wire itself.

- ❒ 1ea Hardware set, including:
  2ea larger diameter heat-shrink tubing
  6ea small diameter heat-shrink tubing
  1ea #6 KEPS nut
  2ea #8 KEPS nut
  2ea 4-40 x ½ screw
  2ea #4 KEPS nut
  6ea #6-32 x ¼ screw
  1ea small tie-wrap
  6ea #8-32 x 3/8 black screw (4 are for mounting the module)

The MOTM-900 Power Supply is a UL/CSA/CE approved linear regulator for powering up to 22 MOTM modules. Input voltages from 100VAC to 240VAC can be used with the proper wiring. Power to each module is by a 4-conductor 18ga. jumper cable, that plugs into the power distribution board.

This kit requires very little soldering (only 5-7 wires), and can be assembled in about 1 hour.

PARTS LIST

Please carefully check that you have received all of the parts on the Parts List. If you have a shortage, please notify us at once.

TOOLS REQUIRED

The following tools are needed in order to build your kit.

- #1 Phillips screwdriver
- soldering iron (special no-clean solder is provided)
- chain nose or needle-nose pliers
- a set of nut drivers
- diagonal wire cutters
- a heat-gun is ***highly recommended***. Try the Alpha FitGun 3.
- DVM is handy to check the output voltages

HOW THE INSTRUCTIONS ARE FOLLOWED

There is a check box ❒ by each instruction. After completing the step, check the box. This is useful if you have to stop in the middle and need to remember where you are in the process. Please read the instruction BEFORE you start: there may be info at the end that's important.

Remember: this is NOT a speed contest. It is an accuracy contest.

PHASE 1: Power input switch and fuseholder.

1) ❒ Locate the power switch. It is a 'press fit' into the front panel. It goes in the small rectangular hole. **IMPORTANT**: the '0' (off position) MUST be oriented to the top. The '1' (on position) is the bottom of the switch. Firmly press the switch into the hole. You may hear a slight 'snap'.
2) ❒ Locate the AC input connector. Check to see that the proper fuse is installed. It is located in a little slide-out drawer: get a fingernail on the small lip and pull out. For North America & Japan versions, this is a 800ma fuse. For all others, it is a 400ma fuse. Replace the drawer.

Attach the AC connector to the front panel, with the fuse drawer on the bottom side. Locate the 2 #4-40 x ½ flat head screws and the 2 #4-40 KEPS nuts in the hardware bag. Put the screws in the 2 holes on the connector, put the connector through the front panel and put on the lock nuts. Tighten the AC connector to the panel.

3) ❒ Locate the bag of 8 wires.

4) ❒ Locate the short white wire with 2 red terminals. Note that one terminal is slightly smaller, and is not fully insulated. All of the following references are from the point of the back of the panel.

Firmly slide the larger terminal (it is a snug fit!) on the lower left terminal of the AC connector. BE SURE IT IS ALL OF THE WAY ON. Slide the smaller terminal on the lower left power switch connector.

5) ❒ Locate the short black wire. It also has 1 large red terminal and 1 smaller red un-insulated terminal. Slide the large red terminal on the middle terminal of the AC connector. Slide the smaller terminal on the lower right power switch connector.

PHASE 2: Wiring to the power supply

1) ❒ The MOTM-900 uses a pre-assembled, pre-tested Power One linear supply. It attaches to the front panel using 2 #8-32 x 3/8 black screws and 2 #8 KEPS nuts.

Using the screws and nuts, secure the power supply to the panel. NOTE: the supply is oriented so that the transformer (that big heavy black box thing) is towards the bottom.

Attaching the one nut under the transformer is tricky: what I suggest is to loosely attach the top screw and nut first. Then, using a pair of needle-nosed pliers, grab the nut and slide it under the transformer. Use a screwdriver to turn the screw into the nut as you hold it with the pliers. If you have small fingers, you can hold the nut with one finger as you tighten with the other hand. Tighten both screws.

2) ❒ Locate the green wire with the 'ring terminal' on one end. This is the grounding wire for the AC line. Press the red terminal on the top connector on the AC connector.

3) ❒ Locate the #6 KEPS nut. This nut secures the ring terminal to the frame of the Power One supply. Look at the supply: see that the transformer has 4 screws securing it to the frame. Also note that the screws are slightly longer than needed: we will use this to our advantage!

Locate the transformer screw nearest the bottom, closest to the AC connector. Slip the ring terminal over the protruding threads. Secure the ring terminal with the #6 KEPS nut.

4) ❒ Locate the long (7") white wire, with the thicker insulation and large red terminal. Push it firmly on the top left power switch connector.

5) ❒ Locate the long black wire, with the thicker insulation and large red terminal. Push it firmly on the top right power switch connector.

PHASE 3: Wiring the AC input wires to the transformer

IMPORTANT NOTE!!!

The Power One transformer is shipped as configured for 100V or 110V operation (Japan & North America). If you have a 220V or 240V system, then you MUST RECONFIGURE THE TRANSFORMER.

Look carefully at the transformer. Note that there are 5 terminals. Each terminal is numbered (but not in order). For the North America 110VAC input, the 1&3 terminals and the 2&4 terminals are connected. The AC voltage (the white and black wires in the 2 preceding steps) attaches to the #1 and #4 terminals.

If you will use the supply with other AC input voltages, the pre-soldered wires on the terminals must be cut, and new wire (supplied) is used to jumper the terminals differently.

Here is a chart that shows the different jumper settings. Note that the supply does not care if your AC line frequency is 50Hz or 60Hz. Please note this chart is printed on the side of the Power One supply.

AC INPUT VOLTAGE	100	110/120	220	230 & 240
JUMPER	1&3 2&4	1&3 2&4	2&3 ONLY	2&3 ONLY
BLACK WIRE	1	1	1	1
WHITE WIRE	5	4	5	4

After the terminals are properly jumpered, the AC wires from the power switch are connected. Note that for 220-240V, the two existing jumpers are cut off, and one jumper is added, using the supplied wire.

DANGER! THE AC INPUT TERMINALS CARRY LETHAL VOLTAGES WHEN POWER IS ON. NEVER WORK ON THE POWER SUPPLY WITH THE AC LINE CORD PLUGGED IN.

❒ Locate a piece of the large heat-shrink tubing. Slip a piece on the white wire that is attached to the power switch. Using the pliers, put the stripped end of the wire into the terminal hole (you may need to heat the wire first with the soldering iron to melt the solder on the wire) ***as shown in the chart***. Wrap the excess wire around the terminal tightly. Solder the wire using the supplied solder. Make sure the connection is secure. Don't use too much force or you could loosen the terminal from the transformer.

2) ❒ Do the same for the black AC wire. Be sure to put the large heat-shrink tubing on first! ***Solder to the #1 terminal ONLY!***
3) ❒ Slip the heat shrink tubing over the soldered transformer terminal down as far as you can. Using a heat gun, or other heat source (you can hold the soldering iron ***close to but not touching*** the heat-shrink and it will work) shrink the tubing to the transformer terminals.
4) ❒ Locate 3 pieces of small tubing. Slide them over the 3 unused, exposed transformer terminals. Shrink the tubing on these terminals. This is to prevent contact with the transformer terminals.

DANGER: HIGH VOLTAGE CAN BE PRESENT ON THE UNUSED TRANSFORMER TERMINALS WHEN IN USE. THESE TERMINALS MUST BE COVERED!

PHASE 4: Wiring to the power distribution board

1) ❒ Locate the small pc board with the white connectors. This is where each power cable plugs into from the modules.
2) ❒ Locate the 6ea #6-32 x ¼ screws. The pc board attaches to the front panel. Note that there are 6 standoffs on the panel: the pc board sits on top of them and the 6 screws go in the standoffs.

Look at the pc board. You will see 3 little connectors like on the AC connector. These are called FASTONS. They are labeled +15VDC, GROUND, and -15VDC.

The pc board sits on the standoffs, with the 3 FASTONs towards the Power One supply. Use the 6 screws to secure the pc board.

3) ❒ The 3 remaining wires are red, white, and black. Each one has a large red terminal. Locate the white wire. Press it on the FASTON +15VDC.
4) ❒ Press the black wire on the FASTON Ground.
5) ❒ Press the red wire on the FASTON -15VDC.
6) ❒ Look at the Power One supply's pc board. It has 7 terminals. You will only need 3 of them: -OUT, COM, and +OUT.

Now comes the hardest (and most critical!) part of the kit: soldering the 3 wires from the power distribution board to the Power One terminals. Why? Because if these connections are not secure, all of the modules will loose power.

The secret to getting a good connection on these terminals is applying enough heat to get the solder to flow evenly around the wire and terminal. This is probably the only time you will be encouraged to apply lots of heat! Again, not too much solder.

There are two methods to attach the wires to the terminals. If you have a heat-shrink gun, we suggest method #1. Otherwise, use method #2.

METHOD #1 - if you have a heat-shrink gun

Look at the terminals on the Power One pc board. Notice each one has a small hole in the top of the terminal. We will insert the wire into the hole and solder.

a) ❒ Cut half of the exposed end of the red wire off (when the wire is in the hole, only about 1/16th of an inch [1.5mm] is exposed).

b) ❒ Slide a piece of the small heat-shrink tubing on the wire.

c) ❒ Insert the wire into the hole in the -OUT terminal.

d) ❒ Apply heat to the top of the terminal for 3 full seconds before applying solder. Use enough solder so the hole is filled, but resist the urge to goop more on.

e) ❒ Wait about 10 full seconds for the solder and terminal to cool. Slide the heat-shrink tubing over the wire so the entire terminal is covered. Shrink the tubing. If you don't wait, the tubing will partially shrink around the wire, and you will not be able to slide it over the terminal (not that I ever did this....<grin>)

f) ❒ Repeat the procedure with the white wire, in the +OUT terminal.

g) ❒ Repeat the procedure with the black wire in the COM terminal.

METHOD #2 - wrapping and soldering.

Look carefully at the terminal. Notice it has a ring in the middle. You will wrap the wire around the top section and solder. NOTE: the wire is rather stiff, and will take some practice to wrap it around the terminal. Apply heat to the wire/terminal for 3 seconds before applying solder.

a) ❒ Wrap the white wire around the +OUT terminal. Apply heat and solder.

b) ❒ Wrap the black wire around the COM terminal. Apply heat and solder.

c) ❒ Wrap the red wire around the -OUT terminal. Apply heat and solder.

Carefully inspect each joint. Make sure the solder is on all sides of the terminal. Don't put so much solder on that it looks like a pyramid.

7) ❒ Put a nylon tie-wrap around the 3 wires about in the middle.

Congratulations! You have just completed the MOTM-900 Power Supply!!

POWER SUPPLY CHECK-OUT

The first step is a visual check-out. Please check the following connections:

1) The red wire from the -OUT terminal goes to the distribution board -15VDC.

2) The black wire from the COM terminal goes to the distribution board GROUND.

3) The white wire from the +OUT terminal goes to the distribution board +15VDC.

4) Look at the chart for the transformer wiring. Carefully verify that the transformer is properly jumpered for your country.

If you have a DVM or voltmeter, you can check to see if the MOTM-900 is outputting the correct voltage: + and -15VDC.

ATTACHING POWER CABLES TO THE MODULES

The 4-conductor power cables plug onto the pc board, with the wires extending out from the left side (as looking from the back of the unit). Notice there is a 'locking tab' on the connectors on the pc board, and an angled 'lip' on the cable's connector. The cables/connector plug together so that they interlock together.

CAUTION: BE *VERY CAREFUL* WHEN TESTING THE SUPPLY!

1) With the power switch in the off position (0), attach an AC line cord. Apply power.
2) Put the DVM on the 20VDC scale. Put the black DVM lead on the COM terminal. There should be +15VDC on the +OUT, and –15VDC on the –OUT terminals. The actual voltage can be + or – 0.20 volts. The 2 trim pots on the Power One pc board can be adjusted to exactly +-15.0VDC if desired.

If not, check the following:

a) Remove the AC line cord and check to be sure the fuse is properly installed.
b) Check the wiring from the AC input connector to the switch. Check the transformer jumpers.
c) Be sure you had the power switch ON (the '1' is pressed).
d) If the output voltage is +-12VDC instead of +-15VDC, look on the Power One's pc board. Jumpers VW1 and VW2 should be missing. If they are still there, use a pair of cutters and cut them out. Send a nasty email, and the proper person will be beaten.