Case Power Manual

Thank you for purchasing a Synthrotek's Case Power! It is very important to read through the entire manual before making any connections or powering it on.

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General Info

Case Power is a marriage of the 5A Power Supply System (now further regulating the +12V rail) and the Noise Filtering Distribution board, resulting in a love child called Case Power. It is safe, clean, quiet, and will power small and large Eurorack systems. Connecting Case Power to your current bus board system is easy with molex or spade connectors. We have 3U or 1U power entry panels available, but Case power does not have to take up valuable HP space; you can wire a jack, LED and switch into your case and easily attach them to the board.

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Features:

- Advanced low-noise, fully regulated voltage converters on each rail
- Over-current protection: shuts off each power rail automatically if modules use too much current on that rail
- Noise filtering capacitors are placed in two sections on the board to help minimize module to module noise
- Eighteen 16-pin Eurorack power connections, keyed for safety
- Molex connector for daisy chaining Synthrotek distribution/bus boards
- Spade connectors for connecting other manufacturers' bus boards
- Screw clamp headers for power entry wiring and daisy-chaining an additional Case Power
- Multiple power options to fit your needs and budget:
    - +12V @ 3A, -12V @ 2.5A, +5V @ 1.5A
    - +12V @ 3A, -12V @ 1.3A, +5V @ 1.5A
    - +12V @ 2A, -12V @ 500mA, +5V @ 1.5A
- LED status indicator for each rail (+12V, -12V, +5V)
- Protective cover over converters
- Eight mounting holes for screwing into your case (spacers and screws included)
- Optional 1U or 3U backlit Eurorack panels with on/off switch
- Screw clamp headers for power entry wiring and daisy-chaining an additional Case Power
- Fits an 84HP case or larger
- Dimensions: 14⅞ x 1⅜ (37.8 x 3.5cm) height: 22mm (spacers add 3mm)
- Requires a 16-19V 90W center-positive power brick (sold separately). The brick does not plug directly into Case Power; you will either need to wire the board into your case or use a Power Panel.

Case Power / Super Power Output Options			
Converter Combinations	3A Recom, 2.5A MuRata	3A Recom, 1.3A MuRata	2A Recom, 500mA TDK
Maximum current draw per rail	+12V @ 3A -12V @ 2.5A +5V @ 1.5A	+12V @ 3A -12V @ 1.3A +5V @ 1.5A	+12V @ 2A -12V @ 500mA +5V @ 1.5A

Important Links

Assembly Instructions
Bill of Materials

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Estimating your power consumption

If you are wondering how much power your modules will need, check out http://www.modulargrid.net. ModularGrid lets you create a virtual “case” with all your modules in it and will add up the power consumption of your modules. Bear in mind that since there is no standardized system for calculating the current draw of modules, some modules may draw more power than modular manufacturers and contributors specify. This power supply has been thoroughly tested to provide the full amount of power described.

Common sense precautions

- Do not use a screwdriver on the terminal blocks or screw your power into a case while it is turned on.
- Do not drop screws, resistor leads or any other bits of metal into the power supply.
- Do not mount Case Power directly onto a metal case without using spacers.
- Do not plug in modules while your Case Power is turned on (“hot swapping”). This can damage a module.
- Two Case Powers can be daisy-chained together via the terminal blocks at the end of the PCB, but they ***must not*** be connected together using Molex connectors, spade connectors or 16 pin connectors. This will backfeed the converters and destroy them.

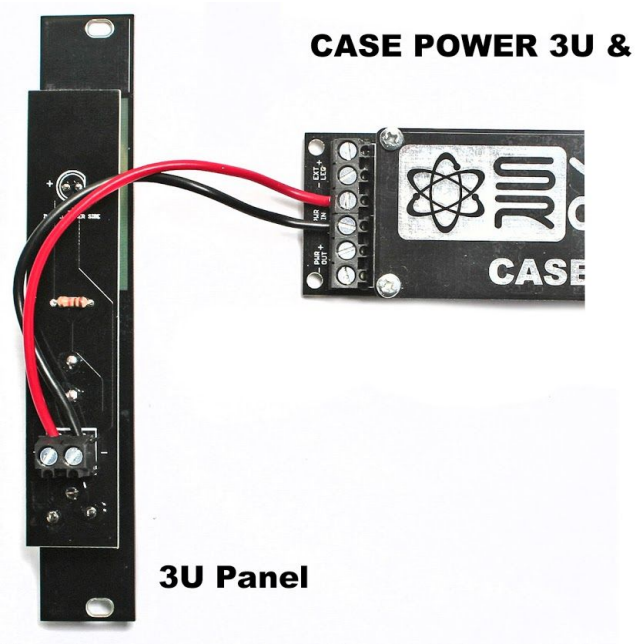
Setting up your Case Power

Note: Unplug your power brick before connecting any wiring or distribution/bus boards.

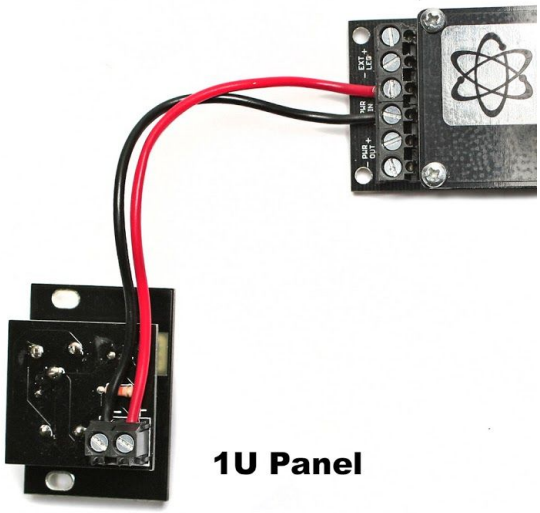
Attention: The molex connector and spade connectors on the Case Power are only for connecting to a distribution board(s). DO NOT connect a Case Power to another Case Power, Deluxe Power or Super Power via the molex connector or spade connectors. This WILL damage the power converters and void your warranty.

For instructions on Power Panel wiring and wiring your Case Power into your case, please see the Assembly Instructions.

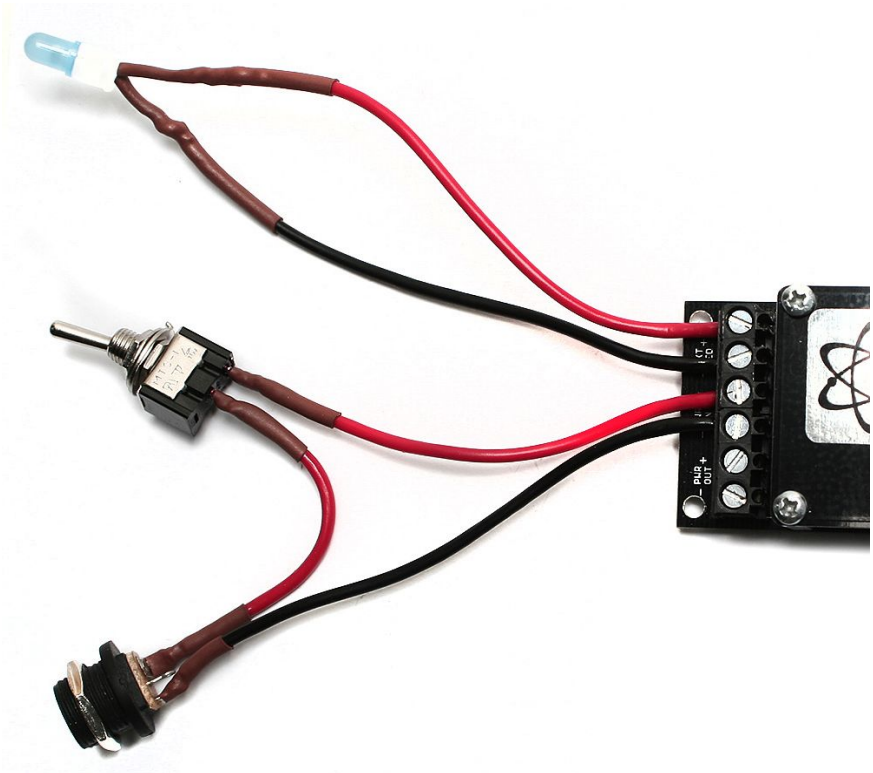
CASE POWER 3U & 1U Panel Wiring



3U Panel



1U Panel



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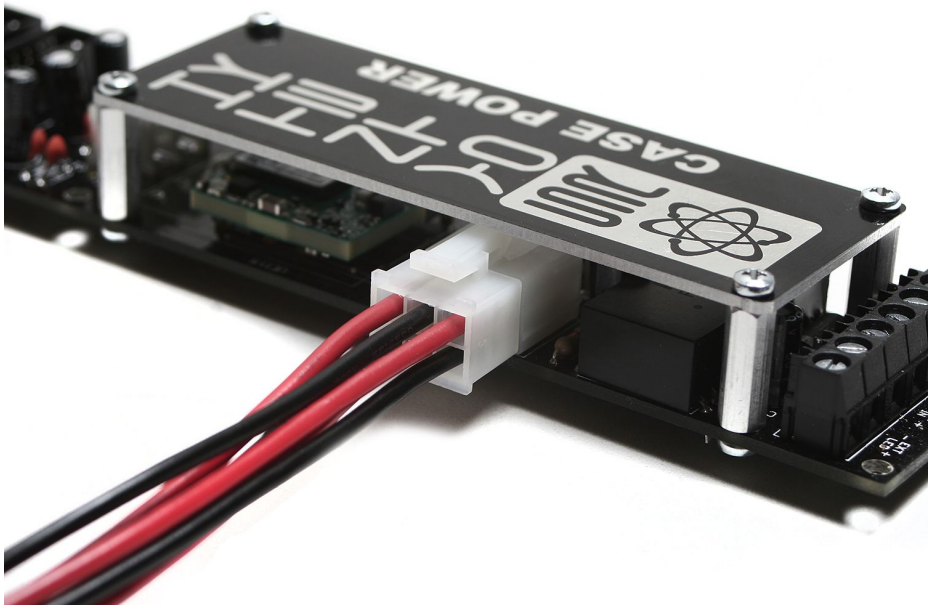
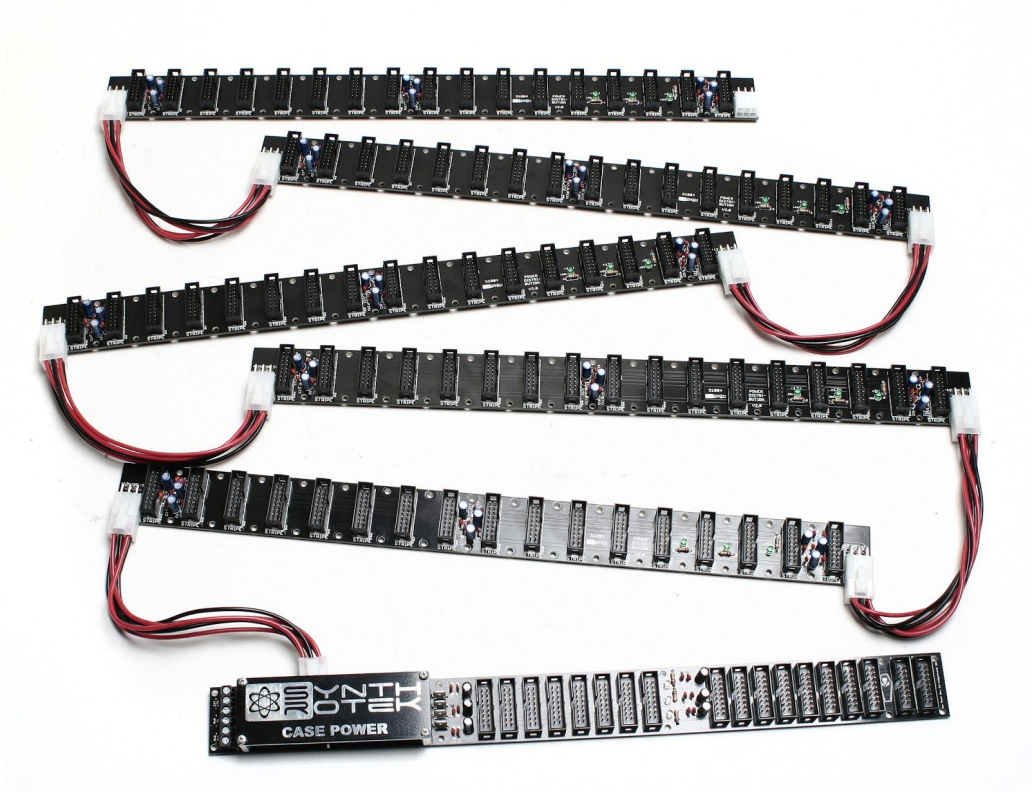
Connecting your Case Power to Noise Filtering Power Distribution Boards:





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Turning on your Case Power for the first time

It's important to check whether your wiring is correct before plugging any modules into your Case Power, so first plug it in and turn it on by itself. If all 3 LEDs light up on the board, you're ok to start plugging modules in. If not, double check your wiring against the diagram shown here in the manual and in the assembly instructions.

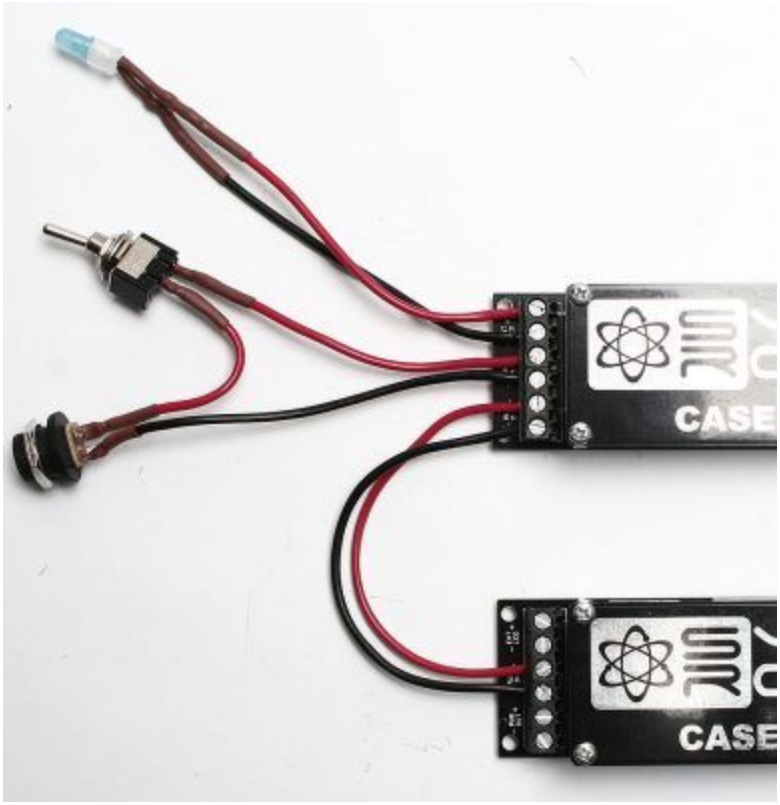
Plugging in your modules

Please note: Do not plug in modules while your Case Power is turned on ("hot swapping"). This can damage a module.

Case Power uses keyed shrouded connections, making it simple and safe to plug in your modules. The "key" on a power cable is a little bump on the plastic end. "Shrouded" connections have walls around the connection pins but an opening on one side of the wall for the key. If you are using a keyed power cable, you won't be able to plug in your module backwards, you won't accidentally miss pins and you it's significantly less likely that you will bend any pins. This is especially useful when you have to reach inside your case and can't easily see which way you should plug your module in.

If you have an unkeyed power cable, align the red or blue stripe on your power cable with the STRIPE callout on the Case Power.

Daisy-chaining two Case Powers together



Putting together a massive system? Case Power was designed so that two of them can be daisy-chained to each other with only one power input.

Synthrotek does not supply the parts for this. Whichever components you select, make sure that they are rated for and can handle the maximum current draw.

For example, if you have two Case Powers with +12V @ 3A, -12V @ 2.5A, and +5V @ 1.5A, you should use a 180W power supply brick. You will need a power brick, wire, and a jack that can handle 180W. The jack and LED are not necessary to power the circuit, but if you chose to use these, they would also need to handle 180W.

Synthrotek does not recommend or supply any of the parts you will need to daisy chain two Case Powers.

Important: Do not use Synthrotek's No-Panel Kit when daisy-chaining power together. The parts are rated only for use with a single Case Power. Powering two Case Powers with these components could start a fire.

Frequently Asked Questions

Q: Will Case Power work internationally with a 240V input?

A: Yes. You will need a power brick that can convert 240V. The 90W Power Supply that Synthrotek offers will work fine, but you may need an adapter to plug it into the wall. Just make sure that the power brick you use is center positive and provides 90W at 16 to 19V.

Q: I think I may be having an inrush current problem. Is there a way to know for sure?

A: When modules are initially powered on, they may draw considerably more current than they normally do for a split second. This is called inrush current draw or startup current draw. Module manufacturers list the maximum *operating* current draw, but not inrush current draw. If you are not currently using your full power output but your power shuts off automatically when you turn it on, you may have a module with an high inrush current.

Any module can potentially do this: oscillators, touchables, even output mixers. To figure out which module is the culprit, you will need to turn off your power supply, unplug a module (one at a time), then turn it back on. Keep doing this until you have found the troublesome module.

If you are having trouble with inrush current, you are already on the verge of using the full amount of power that the power supply can handle and may need to add an additional power supply.

Q: I hear electrical interference/unwanted noise coming through my modular setup. How can I reduce this?

A: Unwanted noise can come from a number of sources, such as a noisy module or your building's electrical system.

Check for line noise:

- Are you using a 3-prong power brick? Is it plugged into a 3-prong power outlet?
- Is your wall outlet properly grounded? (Don't test with a multimeter! Use a wall tester like this one.)
- Are you using an amplifier or other gear that is not part of your modular system? Sometimes this can cause ground loop noise. Try plugging headphones directly into your modular (with nothing external connected to it); if the noise is gone then you may have a ground loop issue. See if any of the following make a difference:
    - Try plugging the modular and the other audio gear into the same outlet.

    - Try using a ground-lift adapter to disconnect the ground pin on your modular power supply (not recommended, but good for troubleshooting).
    - Try using a ground-lift adapter to disconnect the ground pin on your amplifier/mixer/etc. (not recommended, but good for troubleshooting).
    - Put a DI between your modular and your amplifier.
- What kinds of lights are running on the same circuit breaker as your modular? Lights, especially dimmers, can introduce noise into your electrical system.
- What kind of appliances are running on the same circuit breaker as your modular? Some appliances, such as built-in house vacuum systems, microwaves or appliances with motors, can introduce noise as well.
- Do you live near a radio tower or high voltage power lines? If you do, or if you think your house may have a grounding issue, you could try plugging your modular in at a different building.
- If you still have noise coming through your power outlet, you could try a wall mount power filter like this one.

Check for module noise:

- Noise can travel through bus boards and flying bus cables. Try unplugging the power from your modules one by one to see if one of them is causing the noise.
- Do you have a decent power bus board? "Flying" bus boards are made from ribbon cable with connectors crimped to it; they sometimes encourage noise. Try using a bus board. We highly recommend our Noise Filtering Power Distribution Board, which has noise filtration in three places on the board.

More questions? Get a hold of us here:
503-417-1130
store@synthrotek.com

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CASE POWER TEMPLATE
CUTOUT BOTH TEMPLATES AND TAPE 1&2 TOGETHER

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