

INTPSU-12-4 Mini

Power 4 GSM

Dual Output Open Frame Switching Power Supply
Proven Solution for GSM Control & Alarm Systems
Patent Pending

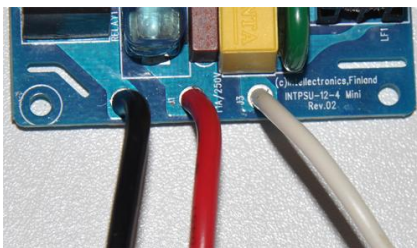
Application note for integrators

Before studying this document please read through the Specification (INTPSU-12-4-Mini_Specification.pdf)

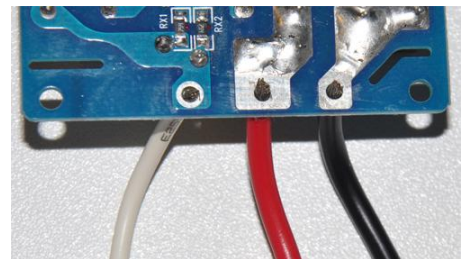
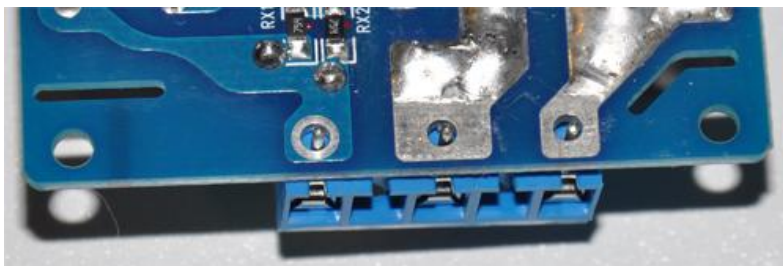
Main Input



There are two holes - Dia 2.2mm, pitch 10mm - on the input. This solution allows you to soldering wire directly to the PCB or you can install terminals and connectors with a 10mm pitch. For your convenience the PSU is supplied with terminals, which can be used if needed.



The diameter of the terminal pins is much less than that of the holes, that are designed for 2.5 mm² (AWG14) wires. You should therefore take this into consideration when soldering, and add more solder.



Power is supplied via pads J1/J3. Load switched by relay is powered via pad J2. Thus, J1 must be connected to the line (L, phase). Refer to the diagram in the specifications for connection. The neutral wire (N) to a switched load must be connected outside the PSU from the same source from which the neutral is supplied to pad J3 to power the PSU.

The PSU has a low input current (less than 1A). If you do not plan to install an output relay, you can use the terminals. But if you plan to install a powerful output relay we do not recommend that you use any connectors or terminals. The best option is to solder 2.5 mm² (AWG14) wires directly into the holes in this case.

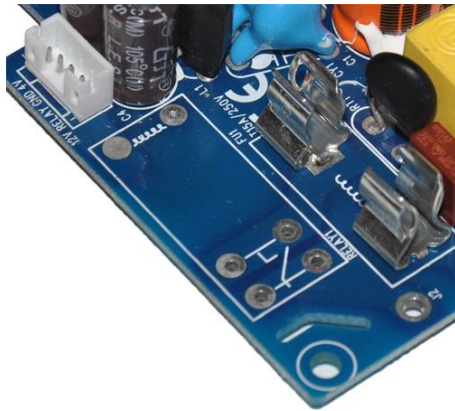
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Relay and fuse



There is place for an output relay with a 12VDC coil on the board. Layout for the most common types of relays is used. Refer to the table below, which lists of some of these relays. To carry the load 16A if it is necessary to add solder to the track as shown in the picture above. If you plan to use your own relay and the coil resistance does not correspond to the values, you can replace the resistor R2, thereby changing the resistance of the coil. Please refer to the warranty conditions when making modifications. Warranty information is available at the end of this document.

Relay part number	Manufacturer	UL	VDE
FTR-K1AK012T	Fujitsu Component Ltd.	YES	YES
ALZ22F12(T), ALZ21B12(T), ALZ22B12(T), ALZ21F12(T)	Panasonic Electric Works Co., Ltd.	YES	YES
ALZ51B12(T), ALZ52B12(T), ALZ51F12(T), ALZ52F12(T)	Panasonic Electric Works Co., Ltd.	YES	YES
JQX-115F-012-1HS3A	Xiamen Hongfa Electroacoustic Co., Ltd	YES	YES
NRP14T-A12D	NCR Industrial Clion Relay Co., Ltd.	YES	NO
NRP14-A12D, NRP14-A12DH	NCR Industrial Clion Relay Co., Ltd.	YES	NO
G2RL-1A-E-DC12	Omron Electronics	YES	YES
G5RL-1A-E-LN-DC12, G5RL-1A-E-HR-DC12	Omron Electronics	YES	YES
RT334012, RT334012WG, RTD34012	Tyco Electronics	YES	YES
RP330012, RP730012	Tyco Electronics	YES	YES

Because the relay is an expensive item, the board provides space for a fuse to protect the relay from burnout. This fuse can also help prevent other undesirable effects, such as burnt out wires. The fuse is a critical component in terms of safety standards. Use only certified fuses! The wires for switching output load, connector and fuse must match the rating of the relay. The fuse must have a lower rate than the relay. The fuse type is 5x20 T15AL/250V.

If you need a PSU with installed relay and fuse, contact your dealer.

The input is also fused with a 1A (T1A/250V) fuse.

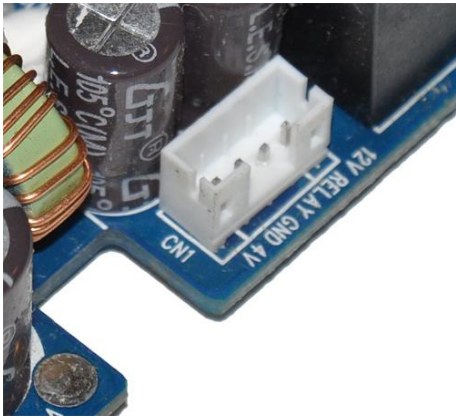
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Outputs

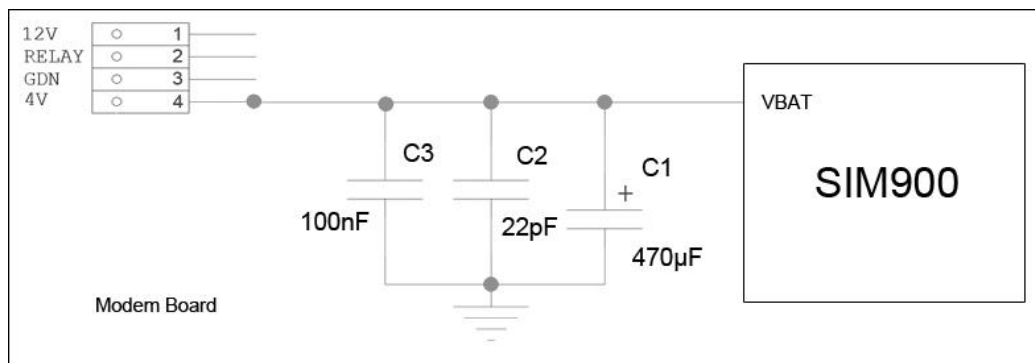
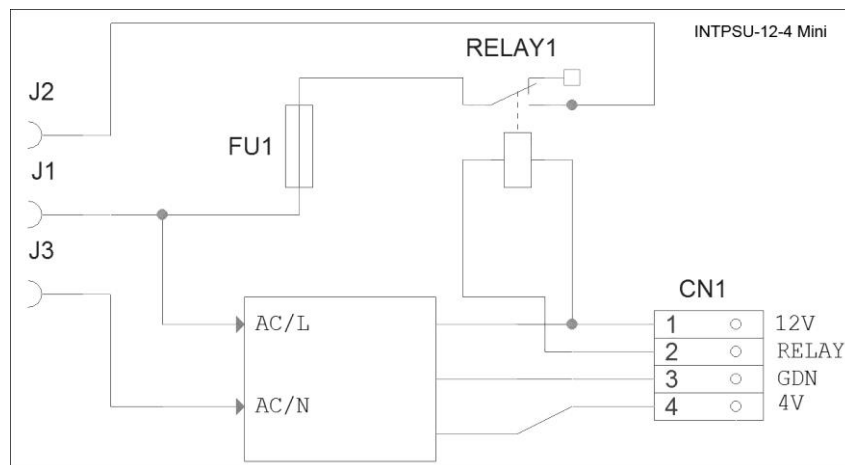


The PSU has two outputs: 4V and 12V. For the output connector, a common wafer-socket (Wire-to-Board Header) is mounted. This wafer-socket has a 2mm (.079 ") pitch and has a rating of at least 2A. An example of such a wafer-socket is the Molex 89400-0420. A ready-made cable and a wafer-socket ("through-hole" type) for your second board (for e.g. a modem board) are included in the package. If you need an SMT type socket, contact your supplier.

If you use your own cable for some reason (e.g. 70mm length is not long enough), make sure to avoid voltage drops below an acceptable level. A long cable will increase the voltage drop and it might be critical for burst-mode of GSM-modules. For your own cable assembly you can use Molex 87369-0400 2.00mm (.079 ") Pitch Crimp Housing.

The output socket also has a "Relay" pin for connecting the control circuit switches from your modem board.

Power connection for SIMCom GSM-modules



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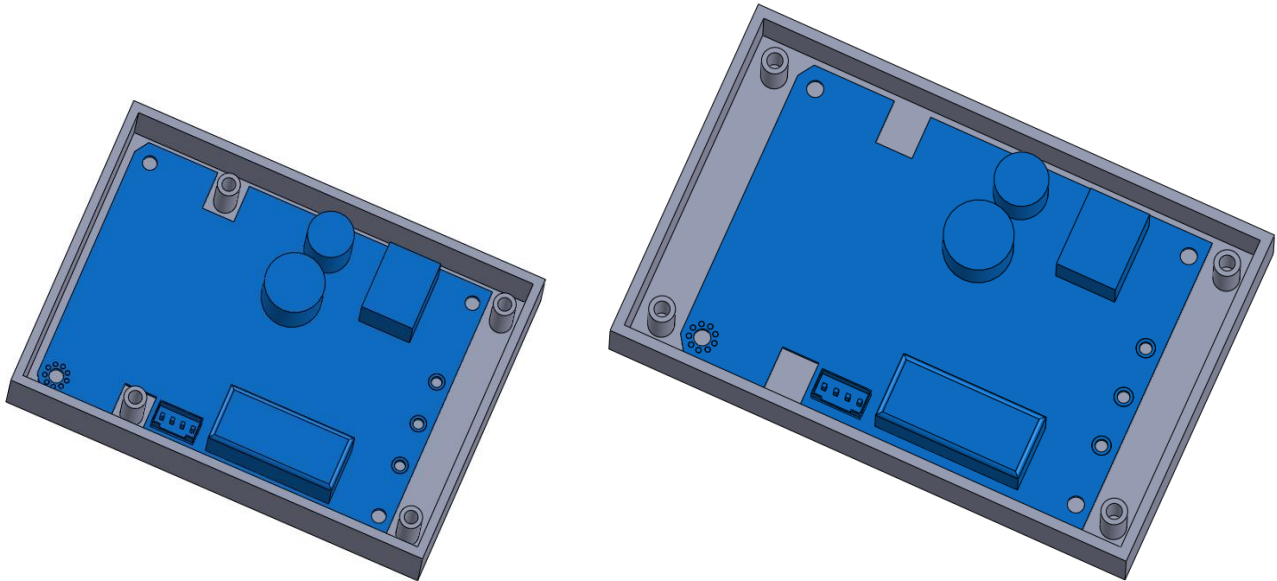
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The PSU has an output of 4V for direct connection to the VBAT of GSM-modules SIM900/SIM300 or other modules, which have a typical voltage rating of 4V. However, we strongly recommend you use an additional VBAT bypass capacitor on your modem board as close to the VBAT of the module as possible, especially if you use long wires from the PSU to your second board. The recommended connection diagram is shown in the picture above. Also keep in mind the power tracing requirements mentioned in SIMCom's reference documentation. An important requirement is that the route should be as short as possible and designed for a current of 2A. If the module is switched off during operation, then measure the voltage drop at various points in your design and identify "bottlenecks".

Mounting in enclosure



The PSU has a low profile and is suitable for installation in the 1U housing. But above all the INTPSU-12-4 Mini is compact. This is the smallest power supply in its class available on the market! This unique feature of this PSU can be used in GSM systems where reliability in a compact housing is important. The PSU has special cut-outs to accommodate the elements. In addition to the standard mounting outside of PSU's dimensions, you can apply the compact method of installation. This saves additional space. The diagrams above show two ways mounting the PSU in the enclosure. The PSU is connected to the enclosure via 3.1mm diameter holes.



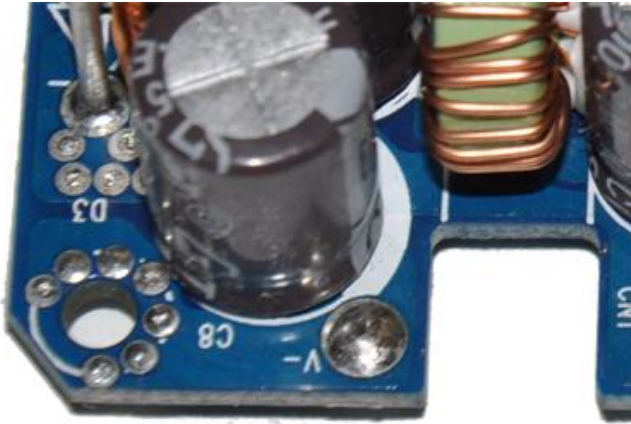
It is strictly forbidden to fasten the unit through the special slots in the PCB! Glue (see picture) is used to prevent heavy components from moving. Do not remove this glue.

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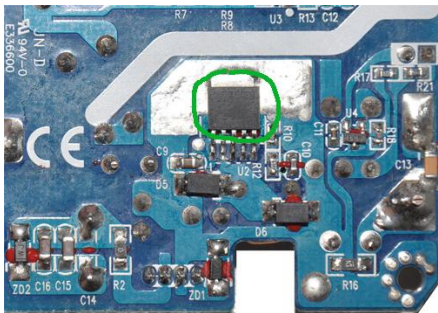
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Earthing



One of the mounting holes has an earth pad. You can connect this to a metal base (for ex., to enclosure or metal plate). This will improve EMC immunity. However, the PSU is designed to meet the necessary standards of electromagnetic compatibility without earthing. Thus, the PSU can be installed not only in a metal casing, but also in a non-metallic housing, such as plastic, with no negative impact on EMC. To solve this problem some additional components are installed on PCB. Compliance with all requirements is confirmed by an independent accredited laboratory and the PSU has all the necessary certificates.

Cooling



The PSU is cooled by free convection. No additional supplementary devices are needed. There are no strict requirements on the free space around the PSU, but there must be sufficient space to allow natural cooling. Make sure that the PSU will work within the temperature range specified in the specification. Rising temperatures have a negative impact on the power parameters of PSU. If the housing allows, you can stick a heatsink onto the chip U2 (circled on the figure) or install a fan to blow cooling air through. These measures are only needed if you wish to use the PSU outside the nominal load current constantly, e.g. to supply something other than the GSM-module (4V output) and sensors (12V output), as the rated power consumption of these will not overheat the PSU.

Suggestions

If you have any suggestions for improving this product, we would welcome your e-mail or letter. Contact information is provided at the end of each page.

Warranty

The company Intellectronics offers 2 year warranty on the PSU. This warranty does not apply to components installed by the integrator, such as relays and fuses. By integrator, here and below, we mean any person who is a buyer / user of the product. The guarantee is void if the integrator modifies the product itself. Such modifications do not include the installation of the relay and fuse. However, if the failure of other components of the PSU is caused by the improper selection or installation of the relay and/or fuses the guarantee is void. Intellectronics recommends using only relays listed in the table in this document or the relay ordered with the product. At the discretion of Intellectronics, the guarantee can be achieved by repair or replacement. However, if the integrator installs the relay itself, the guarantee shall always be by repair of the product. The integrator can return the product for repair without un-installing the relay. Relays from the table fit the parameters, but Intellectronics does not guarantee that such relays have all the necessary certificates. If the integrator installs the relay himself, the device may no longer meet safety standards for some countries. Please contact the vendor for additional information.

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