



**PN 82135 PowerSwitch Tail IIU-120 Kit
 PN 82235 PowerSwitch Tail IIU-240 Kit
 Version 1.0**

- **120vac (PST IIU-120) and 240vac (PST IIU-240) versions customizable for global applications.**
- **User provides power cords to match country of use.**
- **3 to 24v dc input range via resistor selection.**
- **Drive directly from microcontroller pin with as little as 3v dc @ 3ma.**
- **20 amp switching capacity; 5300Vrms isolation.**
- **Two wire signal connection; no separate dc power source required.**
- **No exposed ac wiring when used with case.**
- **LED status indicator.**
- **This is a parts kit; assembly is required.**

CAUTION: Please make sure you have or have access to the skills necessary to assemble and use this product. Always secure the case with the included screws before applying electrical power to the power cord. Please read this entire document before starting assembly. Our liability is limited to the purchase price of this product only. By using this product you agree that PowerSwitchTail.com, LLC can not be held liable for any damages or injuries resulting from use or repairs.

The PST IIU-xxx kit allows you to customize the PowerSwitch Tail product to meet your application needs. There are two kit models. The PST IIU-120 is designed to operate with 100-120v ac devices and power sources. The PST IIU-240 is for use with 200-240v ac devices and power sources. Both products provide single pole switching at 20amps max.

Before You Start:

For proper operation, the power source must be connected to the PCB pads or terminal block labeled "LINE." This is because power to operate relay K1 is derived from the "LINE" side power cord. The PST-IIU will not operate if the source of power is connected to the "LOAD" side of the PCB. The plug or "male" power cord should always be connected to the "LINE" side of the printed circuit board (PCB).

You can optimize the input signal voltage requirement by selecting and installing different resistor values for R1 and R2. In general, the resistor values are set to provide a total input current between 5-10ma across the voltage range shown below. R2 can be left out altogether if the LED status indicator is not needed. You can experiment with different values if controller power is limited. We have tested units that operate as low as 3v dc @ 3ma.

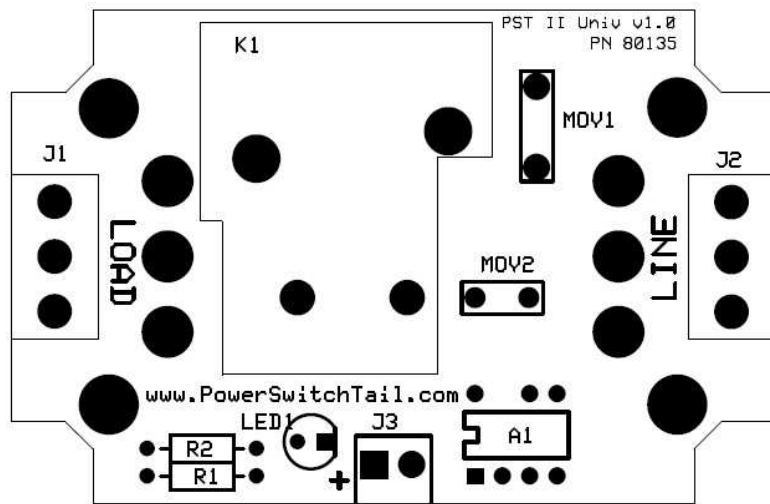
Input Voltage	R1	R2
3 – 5 volts dc	1K ohm	510 ohm
5 – 12 volts dc	1.5K ohm	1.5K ohm
15 – 24 volts dc	4.7K ohm	4.7K ohm

Note to advance users: Since the input is an opto-isolator, input current is the key parameter. For any input voltage, the value of R1 should be selected for 5-10ma and not to exceed 20ma.

The power cords are soldered directly to the pads on the PCB. Optional 3-position terminal blocks J1 and J2 are available for applications for which the case is not used and the PCB is mounted in a larger enclosure. If using the terminal blocks, install them with the wire slots facing toward the edge of the board. The maximum size wire for the PCB pads and the terminal blocks is #14 AWG.

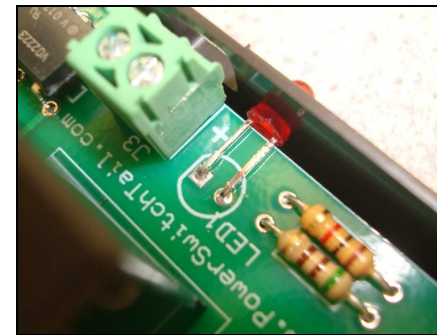
Assembly:

Make sure all components are inserted from the component side (side with the white lettering) of the PCB. The circuit board is labeled with the outlines and IDs of all components. Certain parts are polarity sensitive and must be installed correctly. Solder all parts and trim off the excess lead lengths before moving to the next step.



We suggest assembling the kit in the following sequence:

1. Install LED1. The short (cathode) lead on the LED goes in the hole with square pad. Using a set of long nose pliers, bend the leads on the LED at a right angle so that when inserted, the LED sits on the edge of the PCB and into the hole in the side of the case as shown. It may be easier to solder the pads from the top side of the PCB instead of the solder side.



2. Install resistors R1 and R2. Refer to table above for typical values. Omit R1 if you are not using the LED.
3. Install the 2-position terminal block J3. Make sure the wire insert slots are facing away from the board so that they are accessible through the cutout in the enclosure.
4. If you are using the two 3-position terminal blocks J1 and J2, install them with the wire slots facing outward toward the edge of the PCB.
5. There are two MOV (Metal Oxide Varistors). Install the larger (14mm) diameter one at location MOV1 and the smaller (7mm) one at location MOV2.
6. Install SSR chip A1. The chip can only be inserted one way.

7. Install relay K1.
8. If you are using the case, slip the optional rubber grommets over the power cords.

Position the PCB so that the three large pads labeled "LOAD" are to the left and three large pads labeled "LINE" are to the right. These pads are also connected to the terminal blocks J1 and J2 respectively.

The bottom pads and the bottom wire slot on the terminal blocks on are the ground conductor (green or green/yellow wire). The middle pads and the middle wire slot on the terminal blocks are the neutral conductor (white or blue wire). The top pads and the top wire slot on the terminal blocks are the "live" conductor (black or brown wire). This is the conductor that is switched by the relay. The ground and neutral conductors are not affected by the relay and simply pass through the PCB. See Figures 1 and 2 for examples of typical wiring.

9. Attach the plug side or "male" power cord to the PCB pads labeled "LINE" or terminal block J2. This is the power cord that normally connects to the source of electrical power. Refer to step 8 for color code standards.
10. Attach the receptacle, outlet, or "female" power cord to the PCB pads labeled "LOAD" or terminal block J1. This is the power cord that normally connects to the device or appliance that uses the electrical power. Refer to step 8 for color code standards.
11. Visually inspect your work and double check your solder connections. Be sure all joints on relay K1 and the power cords are full. Retouch any joints if necessary.
12. Inspect the power cord wiring on the top side of the PCB and at the entry points of the terminal blocks. If you are using stranded wires,

look for possible shorts between adjacent wire connections caused by stray wire strands that do not enter the holes or wire slots completely.

13. Install the PCB into the bottom of the case by aligning the LED on the PCB with the hole in the case wall. Secure the board with the 4 short screws. Attach the actuating signal wires to the 2-position terminal block J3. Observe polarity (+ lead to wire slot next to the LED, - lead to the other). At this point, you can test the actuating signal wiring by applying the actuating signal and observing the LED. The LED should go on when the signal applied. At this time, relay K1 will not operate.

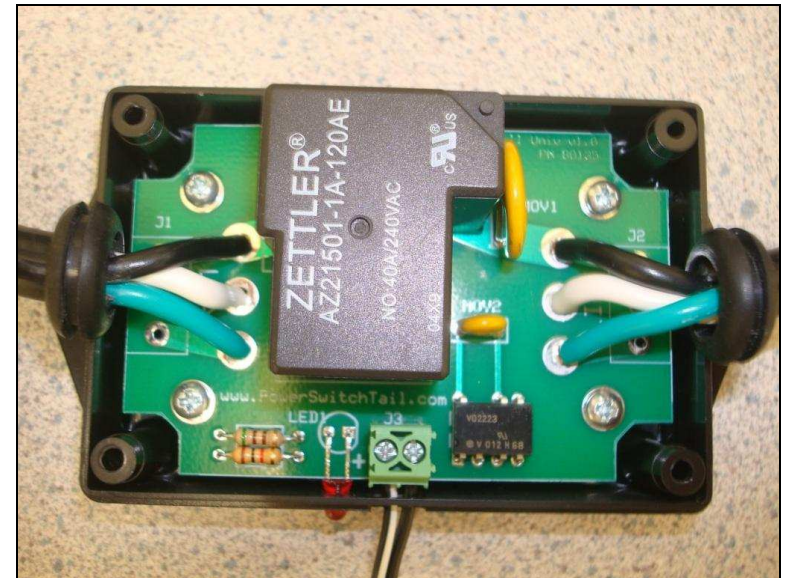


Figure 1 PST IJU-120 with US/Canada power cords.

14. Install the case cover by aligning the case to over the grommets and into the "U" shape cutouts. Secure the case halves using the 4 long screws.

15. Plug the line side power cord into the source of power. The relay should now respond (hear the click) when the actuating signal is applied. Turn off the actuating signal and attach your ac powered device or appliance to the load side power cord. Apply the actuating signal to turn on power to your device or appliance.

Notes:

1. Relay K1 and the PST IIU case gets warm during normal usage.
2. No “phantom” power is drawn when the PST IIU is off.
3. The PST IIU is not intended for use in outdoor environments.
4. Always disconnect power to the LINE side power cord before opening the case.
5. The relay is capable of switching 20 amps. However, certain power cords make limit carrying capacity to a lower value.

For assistance, please contact us at support@powerswitchtail.com.

Soft copy of this and related documents can be found at www.powerswitchtail.com.

Our liability is limited to the purchase price of this product only. By using this product you agree that PowerSwitchTail.com, LLC can not be held liable for any damages or injuries resulting from use or repairs.

Parts List

Product: PN 82135 PST IIU-120 and PN 82235 PST IIU-240
 Revision: v1.0
 Date: 3/30/2011

ID	Description
J1	Terminal Block, 5.08mm, 3 position (Not included with kit.)
J2	Terminal Block, 5.08mm, 3 position (Not included with kit.)
J3	Terminal Block, 3.5mm, 2 position
LED1	LED, 3mm, Hi-eff Red Diffused
MOV1	Metal Oxide Varistor, 14mm 130V (XXE201K IRUI)
MOV2	Metal Oxide Varistor, 7mm 130V (XX201K IRPH)
R1a	Resistor, 1.0K ohm, 5%, 1/4w (Brn-Blk-Red-Gold)
R1b	Resistor, 1.5K ohm, 5%, 1/4w (Brn-Grn-Red-Gold)
R1c	Resistor, 4.7K ohm, 5%, 1/4w (Yel-Vio-Red-Gold)
R2a	Resistor, 510 ohm, 5%, 1/4w (Grn-Brn-Brn-Gold)
R2b	Resistor, 1.5K ohm, 5%, 1/4w (Brn-Grn-Red-Gold)
R2c	Resistor, 4.7K ohm, 5%, 1/4w (Yel-Vio-Red-Gold)
K1	Relay, Power 40A 120VAC coil
A1	SSR, Opto-isolated, 600V
PCB	Circuit Board, PN 82135 Case, ABS, with 4 screws PCB screws (4 each) Grommets (2 each)
	Substitute the following for the PST IIU-240
MOV1	Metal Oxide Varistor, 14mm 250V (XX391K RYOH)
MOV2	Metal Oxide Varistor, 7mm 250V (XX391K SLPH)
K1	Relay, Power 40A 240VAC coil

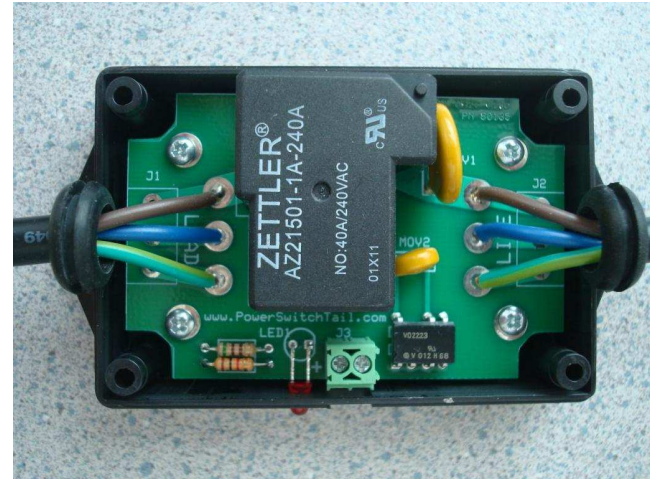
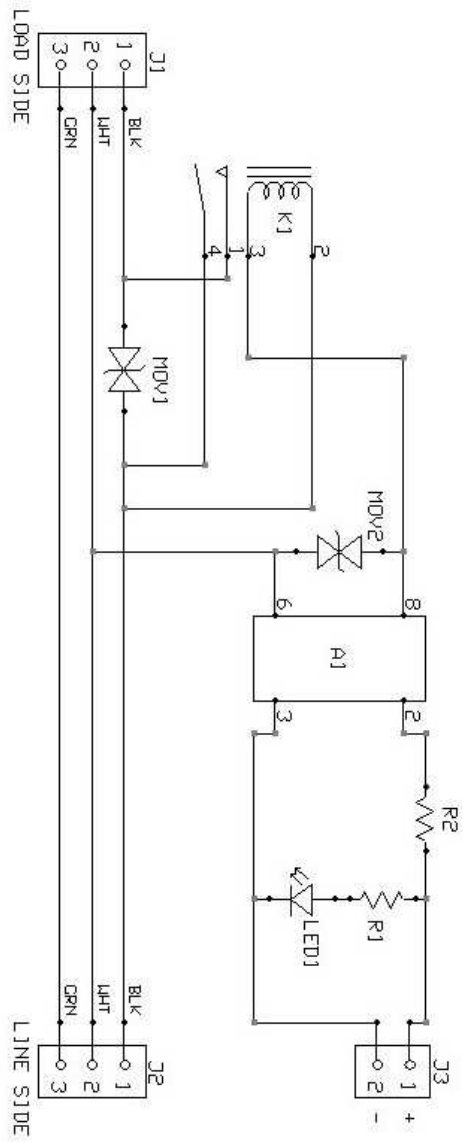


Figure 2: PST IIU-240 with international power cords.

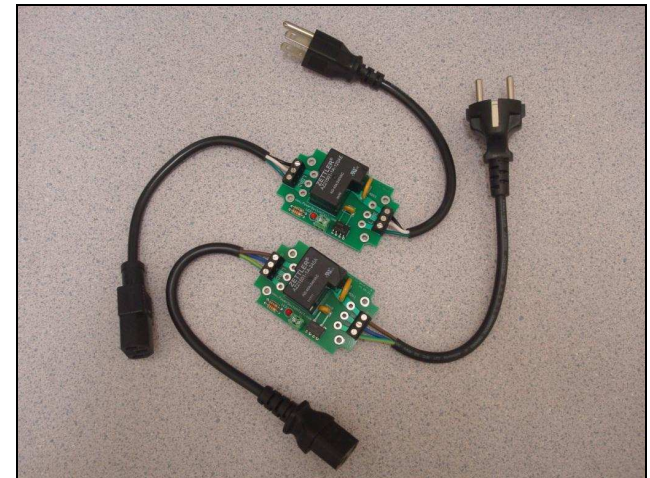


Figure 3: PST IIUs with optional terminal blocks.