University of British Columbia
Electrical and Computer Engineering
EECE 281/EECE282

Solid State Relay (SSR) Box User Guide

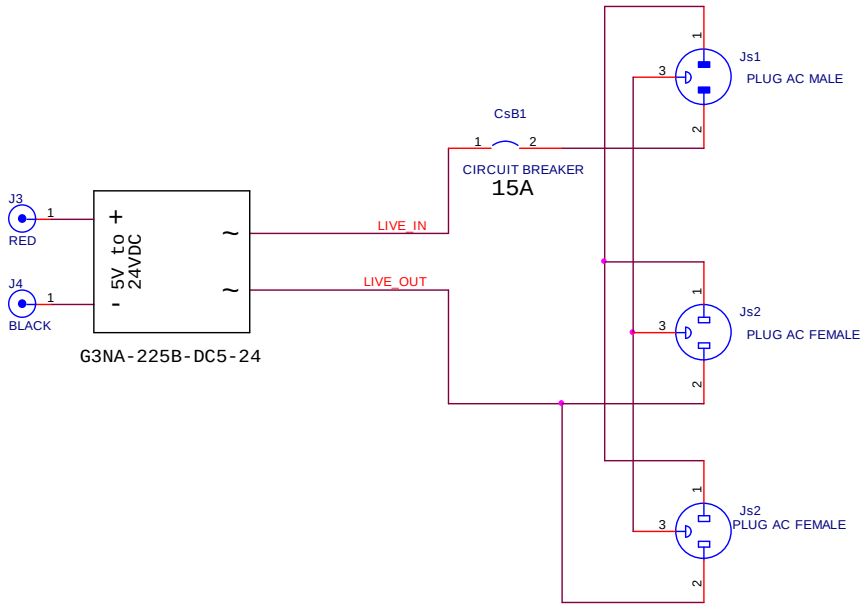
Introduction

One way of controlling the power of an alternate current (AC) load is by using a solid state relay (SSR). A solid state relay is usually built using an opto-coupler and a triac. This circuit configuration is available pre-packed in a small box often referred as a hockey puck relay. The SSR box available in the labs is built around one of such devices, the G3NA-225B-DC5-24 from Omron. The datasheet of the G3NA-225B-DC5-24 can be downloaded from:

http://www.digikey.ca/product-detail/en/G3NA-225B%20DC5-24/Z921-ND/206392

Block Diagram

The figure below shows the block diagram of the SSR box. It consists of a G3NA-225B-DC5-24 SSR, a 15A circuit breaker, connectors for the DC control signal, and AC plug connectors for the main AC power.



Usage

To use the SSR box to control an AC load follow these steps:

a) Connect a power cord cable to the male AC connector. The power cord cable must be rated for the type of load to be connected. If the SSR box would be used to power a 1500W toaster oven, the power cord cable must be rated for at least 13A.

b) Connect the AC load to one of the available AC plugs.
c) Apply a DC voltage from 5V to 24V to the control banana plugs.

Precautions

In order for the SSR box to operate safely, comply with the following conditions:

a) Do not operate the SSR box for more than 30 minutes at the maximum rated current of 15A.
b) The SSR box is designed for resistive loads only. Do not plug inductive loads (such as motors) to the SSR box.
c) Do not operate the SSR box if the ambient temperature is above 40C.
d) The SSR box may become warm to the touch after using it for several minutes at maximum rated capacity. If you suspect that the case temperature is over 40C discontinue using the SSR box immediately.
e) Only apply a DC voltage from 5V to 24V to the control pins. Do not apply negative DC voltages of ANY magnitude.
f) Do not disassemble the SSR box.
g) If the protection breaker is tripped, find and correct the cause of the fault before resetting the breaker to normal operating mode.