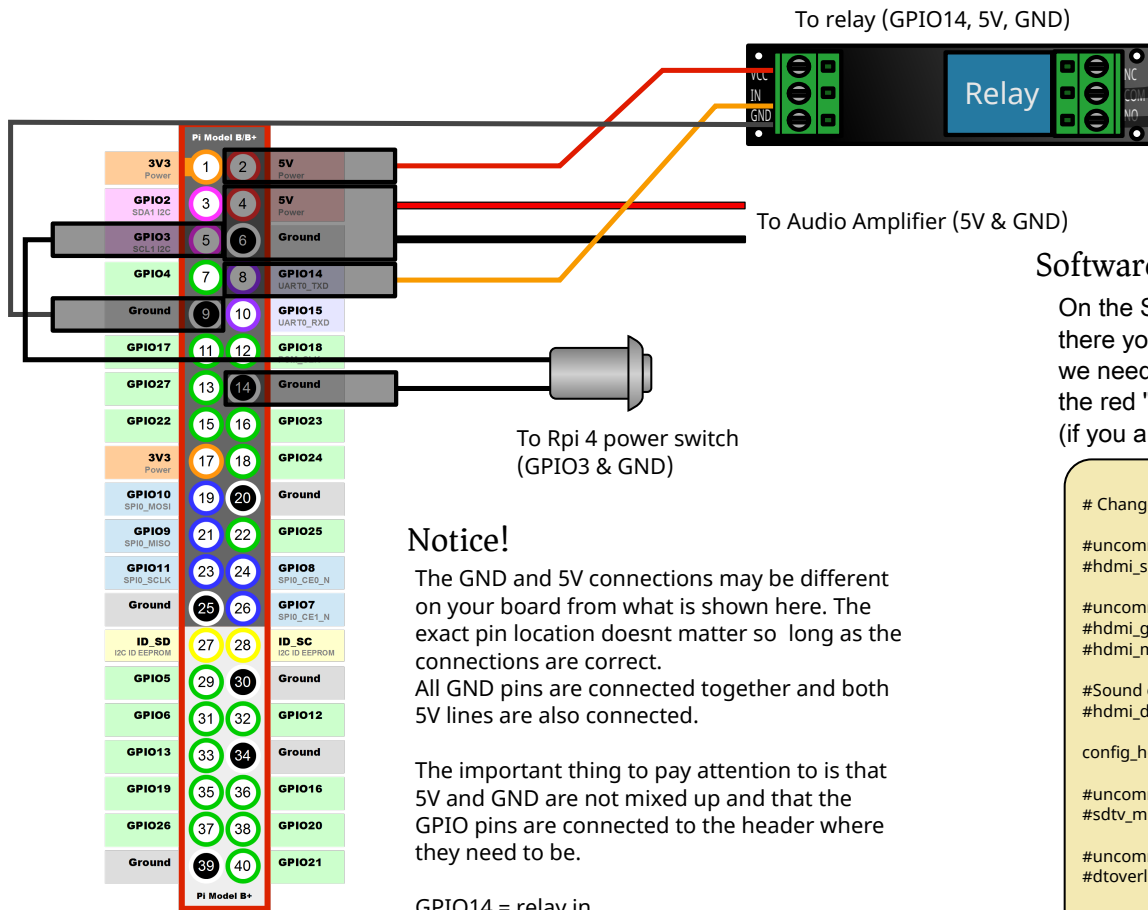# What is a relay?

A relay is an electro magnetic switch that can handle a larger load than the raspberry pi can power by itself.

In this case that is a high voltage AC load (alternating current) Connecting this to the Pi would certainly fry it.. In fact, connecting this to us could fry us also!

Be careful and unplug your machine before wiring and have an adult present to double check your connections before testing.

This setup is using the GPIO serial port pin on the raspberry pi as a signal to turn on the relay causing the light to turn on. Once the Raspberry Pi turns off the serial port is also shutdown causing the light to turn off.

GPIO Header location

⚡HIGH VOLTAGE POWER⚡
UNPLUG BEFORE WIRING!!
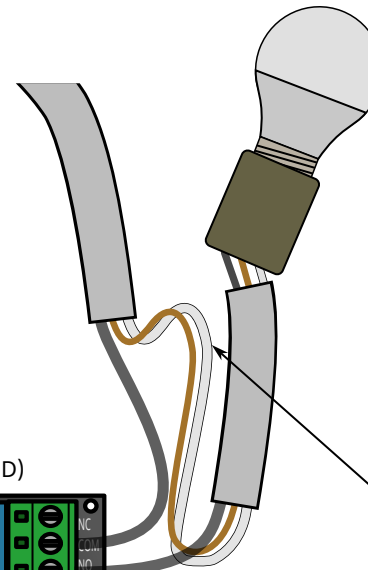
Wiring:

Cut open insulation around romex wire to get to black wire inside. connect one side of the black wire you cut to the COM terminal and the other side to the NO terminal. NO is short for "normally open" which means that by default the connection is not closed until a signal is present to tell the relay to turn on.

Only the black wire needs to be cut but if you cut the others use wire nuts to put them back together (tighten the nuts well and make sure there are no extra wires hanging out!)

(Wire Nut if needed)

To relay (GPIO14, 5V, GND)

Relay

To Audio Amplifier (5V & GND)

Software Configuration:

On the SD card in the raspberry pi there is a partition named boot. there you will find a file named: recalbox-user-config.txt we need to add the "enable_uart=1" to the bottom of the file. the red "dtoverlay" command is only for the raspberry pi 4's power switches (if you are using a raspberry pi 5 then disregard this line)

To Rpi 4 power switch (GPIO3 & GND)

Notice!

The GND and 5V connections may be different on your board from what is shown here. The exact pin location doesnt matter so long as the connections are correct.
All GND pins are connected together and both 5V lines are also connected.

The important thing to pay attention to is that 5V and GND are not mixed up and that the GPIO pins are connected to the header where they need to be.
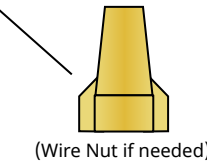
GPIO14 = relay in
GPIO3 = power switch (rpi 4 only)

```
/boot/recalbox-user-config.txt

# Change to your needs

#uncomment if you get no picture on HDMI for a default "safe" mode
#hdmi_safe=1

#uncomment to force a specific HDMI mode (this will force VGA)
#hdmi_group=1
#hdmi_mode=1

#Sound output. Set to 0 or comment for autodetect, 1 for DVI, 2 to force HDMI.
#hdmi_drive=2

config_hdmi_boost=0

#uncomment for composite PAL
#sdtv_mode=2

#uncomment for lirc-rpi
#dtoverlay=lirc-rpi

#uncomment if you have chinese TV display and display is garbled or slow
#hdmi_ignore_edid=0xa5000080
overscan_scale=0
gpio=14=op,dh
dtoverlay=gpio-shutdown,gpio_pin=3,active_low=1,debounce=1500
enable_uart=1
```

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Pi Model B/B+

3V3 Power	1	2	5V Power
GPIO2 SDA1 I2C	3	4	5V Power
GPIO3 SCL1 I2C	5	6	Ground
GPIO4	7	8	GPIO14 UART0_TXD
Ground	9	10	GPIO15 UART0_RXD
GPIO17	11	12	GPIO18
GPIO27	13	14	Ground
GPIO22	15	16	GPIO23
3V3 Power	17	18	GPIO24
GPIO10 SPI0_MOSI	19	20	Ground
GPIO9 SPI0_MISO	21	22	GPIO25
GPIO11 SPI0_SCLK	23	24	GPIO8 SPI0_CE0_N
Ground	25	26	GPIO7 SPI0_CE1_N
ID_SD I2C ID EEPROM	27	28	ID_SC I2C ID EEPROM
GPIO5	29	30	Ground
GPIO6	31	32	GPIO12
GPIO13	33	34	Ground
GPIO19	35	36	GPIO16
GPIO26	37	38	GPIO20
Ground	39	40	GPIO21

Pi Model B+