

Intro to the Raspberry Pi (RPi) & The Internet of Things (IoT)

Class 5 – 2018 / 04 / 08

Projects - Level 1 Difficulty

- Light mixer
 - Use 3 Buttons and RGB LED to „mix“ 7 colors
- Sound board
 - Use 3 Buttons for different sound effects
 - Have LEDs, too
- Binary Counter
 - Use 3 or 4 LEDs and one button to show binary numbers
 - number += 1 per button press
 - You will need to DEBOUNCE the button

Projects - Level 2 Difficulty

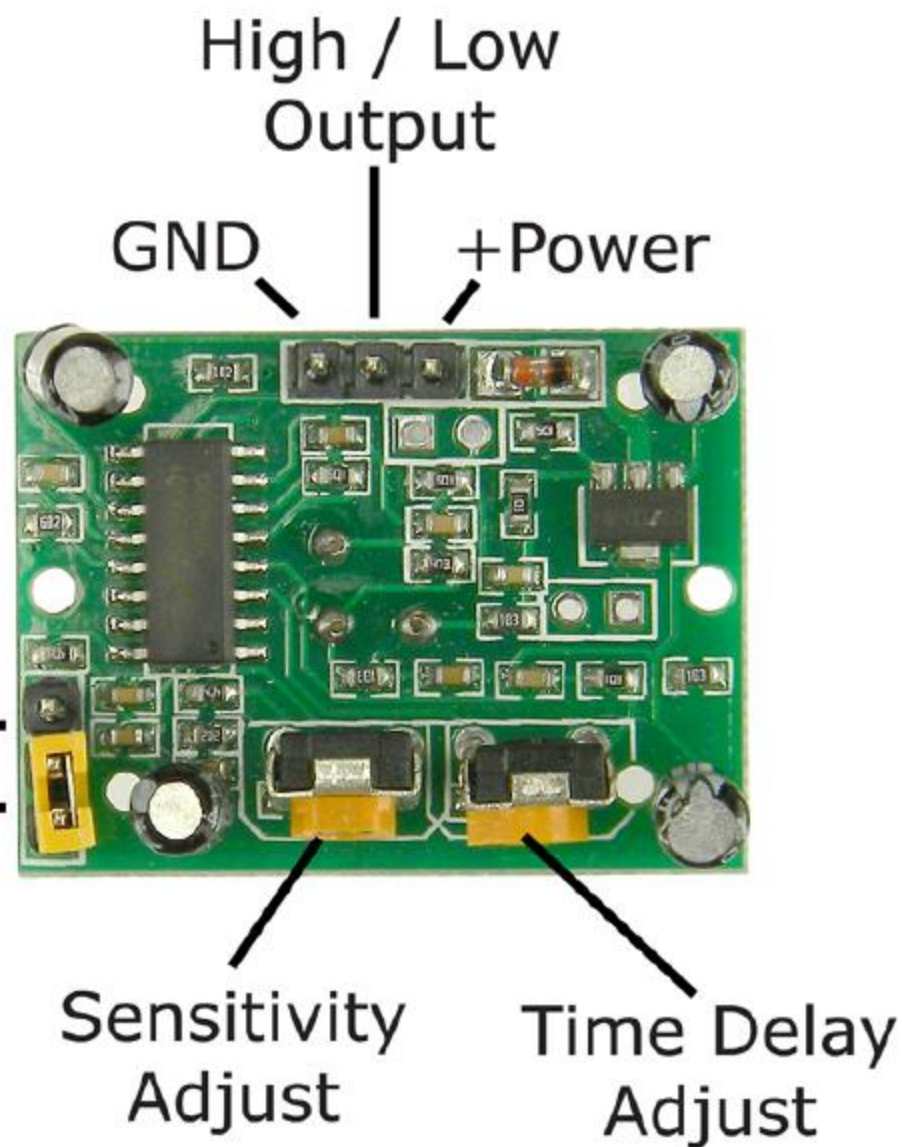
- IR Alarm
 - Get a **PIR sensor** from me (I have 10) and figure out how to use it to make an alarm system!
 - Add alarm sound
 - Add button to cancel alarm
 - Add button to arm / disarm
 - Add LEDs for armed / disarmed stat
 - Blink LEDs when alarm



Jumper Set:

H: Repeat Trigger—

L: Single Trigger—

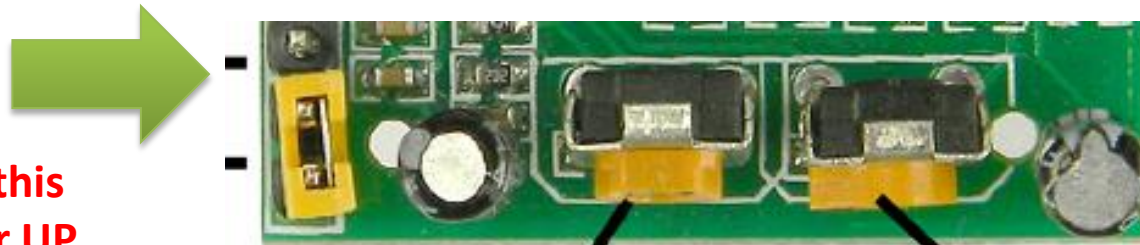


Setup Rpi Cables

- GND -> Minus / BLUE
- +Power -> 5 V (not 3.3 V!)
- High Low Output ->
Any RPI pin configured as input
- Jumper Set: H position (Retrigger)
Move Jumper to H Position

Sensitivity & Delay – Settings

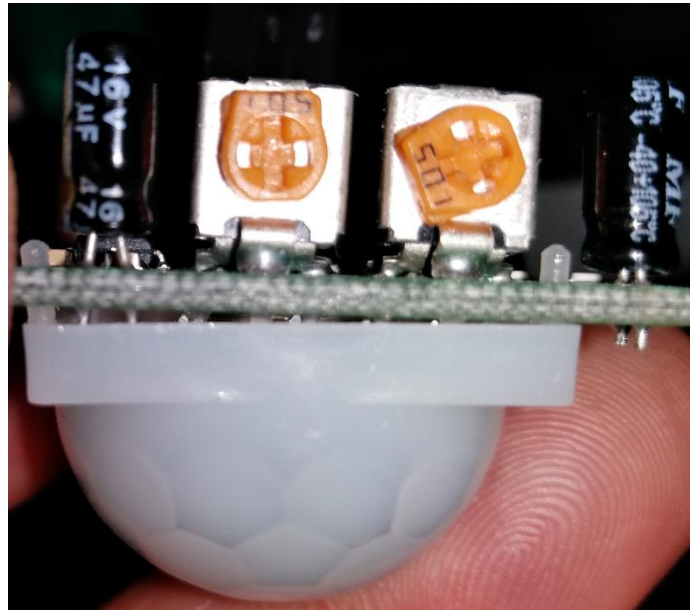
Move this
jumper UP



Sensitivity
Adjust

Time Delay
Adjust

Sensitivity –
half way
in the middle



Delay –
all the way
to the left

Projects - Level 2 Difficulty

- „Catch the LED“ Game
 - A reaction game with 3 LEDs and 3 buttons
 - There is one button per LED
 - After a random time between 0.2 and 5 seconds, a random LED lights up
 - Use has to push the corresponding button *fast* (0.2 seconds?) to get a point
 - Don't allow to cheat!
- After 20 attempts, report points
- Game could accelerate

Projects – Level 3 Difficulty

- Make a „Simon“ game
 - 3 LEDs
 - 3 buttons
 - 3 sounds
 - ... or better, 4 😊



Some Code Fragments

<https://www.michael-wessel.info/class5>

- Loops – for and while loops
- Random – random generator
- Time – measure time differences
- Make a sound – sample playing
- Booleans-list-conditions
 - Conditions, loops, input, output, ...
- Leds-with-buttons-debounced – from last class