

## 1. Pull Up and Pull Down Concept

Using CPX + Crickit + Python

### Introduction

Digital input pins should always have a stable HIGH or LOW value. If the pin is left unconnected, it becomes floating and gives random values. To solve this problem, we use Pull Up and Pull Down connections.

### 1. Pull Up Concept

Default State: HIGH / True

Button Pressed State: LOW / False

#### Pull Up Connection

Signal Pin 1 → Push Button

Other side of Push Button → GND

Internal resistor connects pin to 3.3V

Connection Diagram:

3.3V

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[Internal Pull Up]

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Signal Pin ---- Push Button ---- GND

#### Pull Up Python Code

```
from adafruit_crickit import crickit
import time

crickit.seesaw.pin_mode(1, crickit.seesaw.INPUT_PULLUP)

while True:

    state = crickit.seesaw.digital_read(1)

    print(state)

    time.sleep(0.5)
```

### 2. Pull Down Concept

Default State: LOW / False

Button Pressed State: HIGH / True

#### Pull Down Connection

Signal Pin 1 → Push Button

Other side of Push Button → 3.3V

Internal resistor connects pin to GND

Connection Diagram:

3.3V ---- Push Button ---- Signal Pin

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[Internal Pull Down]

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GND

#### Pull Down Python Code

```
from adafruit_crickit import crickit
import time

crickit.seesaw.pin_mode(1, crickit.seesaw.INPUT_PULLDOWN)

while True:

    state = crickit.seesaw.digital_read(1)

    print(state)

    time.sleep(0.5)
```

### 3. State Code Concept

This is called State Code because the program continuously checks the state of the button or sensor.

```
if state == False:
    print("Button Pressed")

else:
    print("Button Released")
```

### 4. Pull Up vs Pull Down

| Feature       | Pull Up | Pull Down |
|---------------|---------|-----------|
| Default State | HIGH    | LOW       |
| Pressed State | LOW     | HIGH      |
| Connected To  | 3.3V    | GND       |

## 5. Applications

Push Buttons

IR Sensors

Limit Switches

Touch Sensors

Robotics Projects

Home Automation

## Conclusion

Pull Up and Pull Down connections help microcontrollers read stable digital values from sensors and switches. They are very important in CPX and Crickit projects.