

# Part 14

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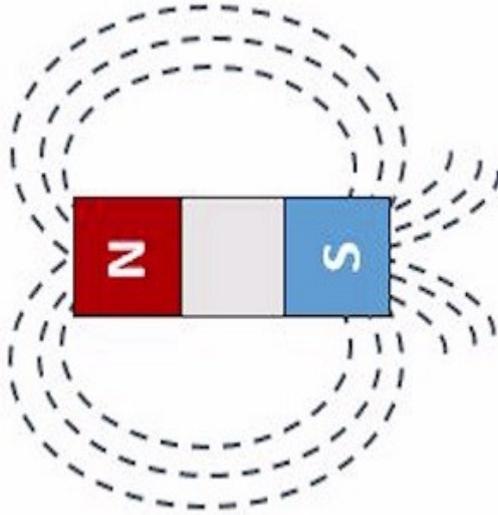
# Build-In Hall Sensor

## ESP32 Built-In Hall Effect Sensor

### The ESP32 Hall Effect Sensor

The ESP32 development board features a built-in hall effect sensor that detects changes in the magnetic field in its surroundings. It is located behind the metal lid of the ESP32 chip.

A hall effect sensor can detect variations in the magnetic field in its surroundings. The greater the magnetic field, the greater the sensor's output voltage.



# Hall effect sensor

The hall effect sensor can be combined with a threshold detection to act as a switch, for example. Additionally, hall effect sensors are mainly used to:

- Detect proximity
- Calculate positioning
- Count the number of revolutions of a wheel
- Detect a door closing
- And much more

## Read Hall Effect Sensor using Arduino IDE

Reading the hall effect sensor measurements with the ESP32 using the Arduino IDE is as simple as using the `hallRead()` function.

In your Arduino IDE, go to File > Examples > ESP32 > HallSensor sketch:

```
// Simple sketch to access the internal hall effect detector on the esp32.
// values can be quite low.
// Brian Degger / @sctv

int val = 0;

void setup()
{
  Serial.begin(115200);
}

// put your main code here, to run repeatedly
void loop()
{
  // read hall effect sensor value
  val = hallRead();
  // print the results to the serial monitor
  Serial.println(val);
  delay(1000);
}
```

This example simply reads the hall sensor measurements and displays them on the Serial monitor.

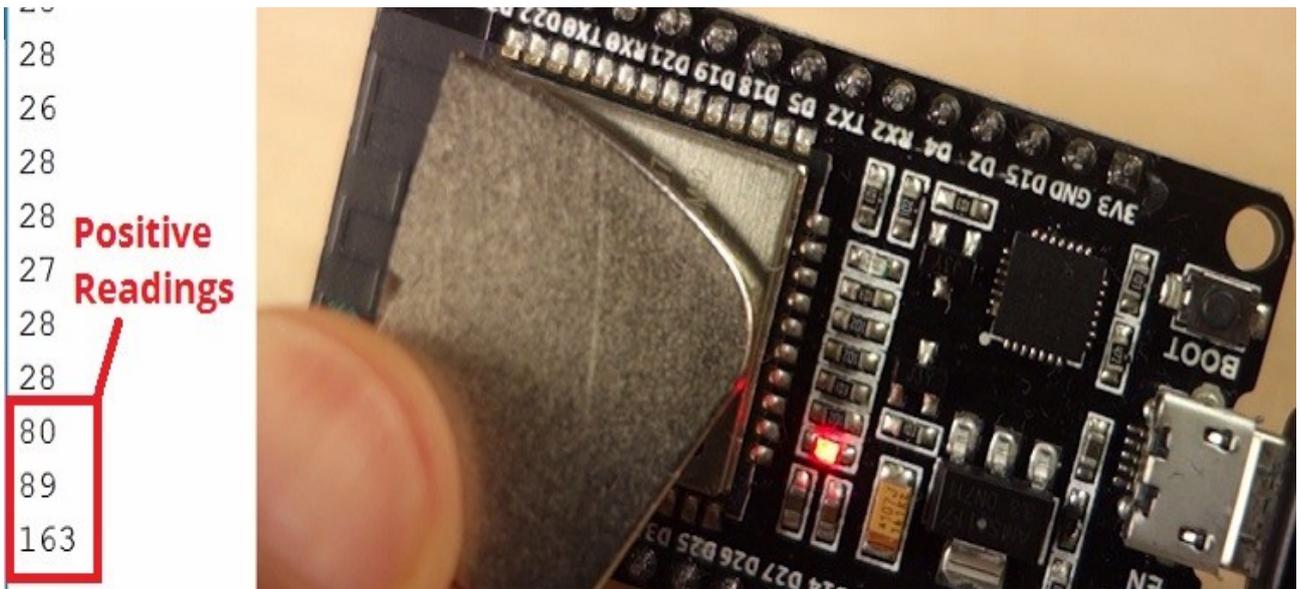
```
val = hallRead();
Serial.println(val);
```

Add a delay of one second in the loop, so that you can actually read the values.

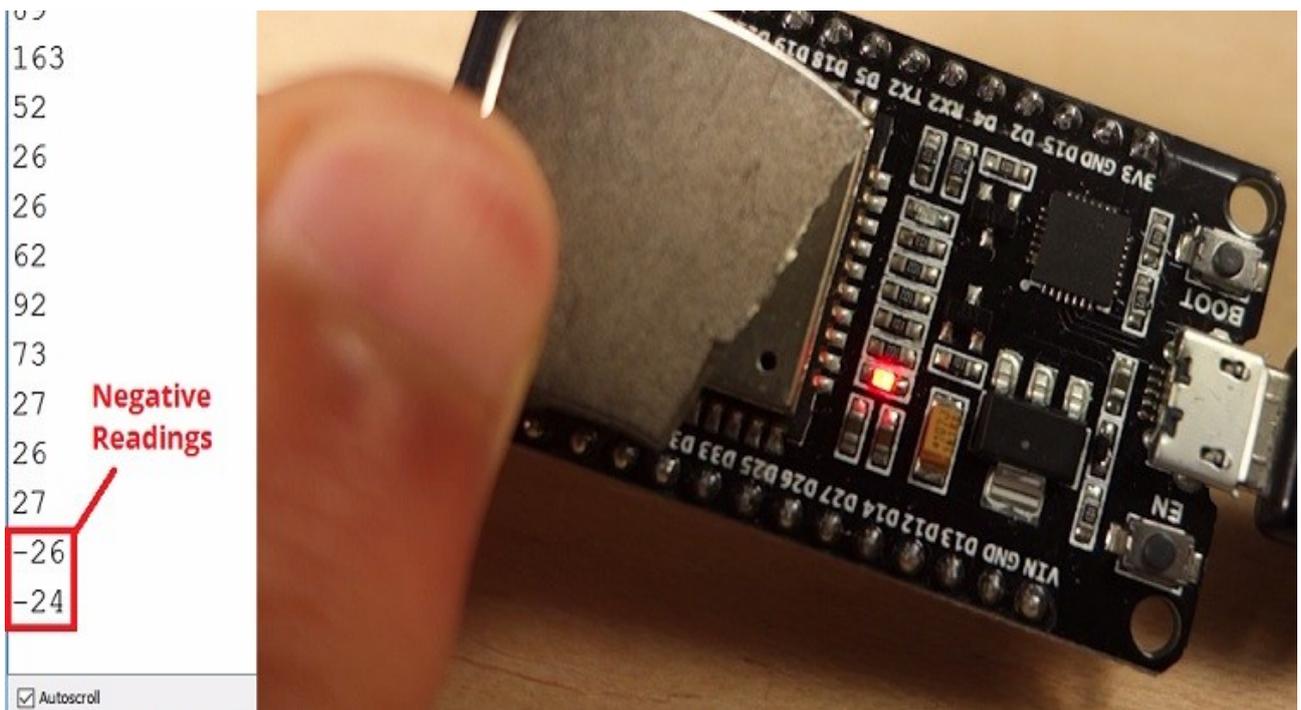
```
Delay(1000);
```

### Testing

Once the upload is finished, open the Serial Monitor. Approximate a magnet to the ESP32 hall sensor and see the values increasing...



Or decreasing depending on the magnet pole that is facing the sensor.



The closer the magnet is to the sensor, the greater the absolute values are.

## Read Hall Effect Sensor using MicroPython

To read the ESP32 hall effect sensor using MicroPython, you just need to use the following snippet of code:

```
import esp32
esp32.hall_sensor()
```

You need to import the `esp32` module. Then, use the `hall_sensor()` method.

If you want to print the readings on the shell, you just need to use the `print()` function:

```
print(esp32.hall_sensor())
```

If you're just getting started with MicroPython, you can read the following tutorial: