

Exercise 6: RGB LED strip

In this exercise you are going to program a LED-strip. To get you started there is an example code at the course [page](#). The aim of this exercise is to learn how to install an external code library to control the LED's and creating your own RGB-effects.

Hardware Required

Arduino UNO R3

LED-strip

Breadboard

Cables

Circuit

Connect the LED-strip to your breadboard. From previous exercises you should have an idea of how the LED-strip should be connected. The LED-strip is marked with VDC for power, DIN for the signal and GND for ground. Make sure the arduino is powered off when making all connections.

Installing the library

A library is a collection of functions you may use for different applications. For this application, you are going to need to download and install the Neopixel library which is used to control the type of LED's that we're using. In Arduino IDE go to *Sketch/Include -> library/Manage Libraries*. Search for Adafruit Neopixel and select the library named "Adafruit NeoPixel. Make sure it's the version description is "*arduino library for controlling single-wire-based LED pixels and strip*". Once installed you should restart your Arduino IDE after installation.

Test your installation: Example code

If the installation was successful you should now be able to load the example sketch "strandtest". You will find it under *File/Examples/Adafruit Neopixel*. Select it and upload it to your board. If you have connected the wires correctly (Check your data pin) the LED's should light up.

What is RGB anyway?

RGB refers to the color channels used by the LED's to create all combinations of colors using only 3 primary colors - Red, Green and Blue. It is basically your digital color palette where you can mix and match to get whatever color you like.

Remember the analog write value 255 we used in previous exercises? If you look in the example code you should see something like:

```
strip.Color(255, 0, 0)
```

The LED's are controlled by setting the intensity of each color channel. A value of 0 means the channel is off, a value of 255 means the channel is at it's max intensity. The small code block above represents the color red, as the red channel is set to max intensity and the green and blue channels are set to off.

(0,255,0) = Green

(0,0,255) = Blue

Experiment with the example code

Look around in the example codes and try and figure out the different functions, rainbow, sweep etc. Change some color values and try to make your own special effect.

TIP: make sure you set the number of LED's in the code is the same as your connected LED-strip.