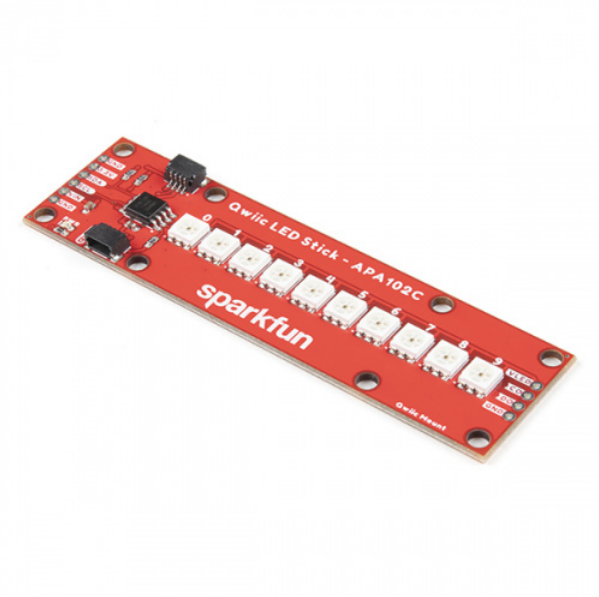
Qwiic LED Stick - APA102C Hookup Guide

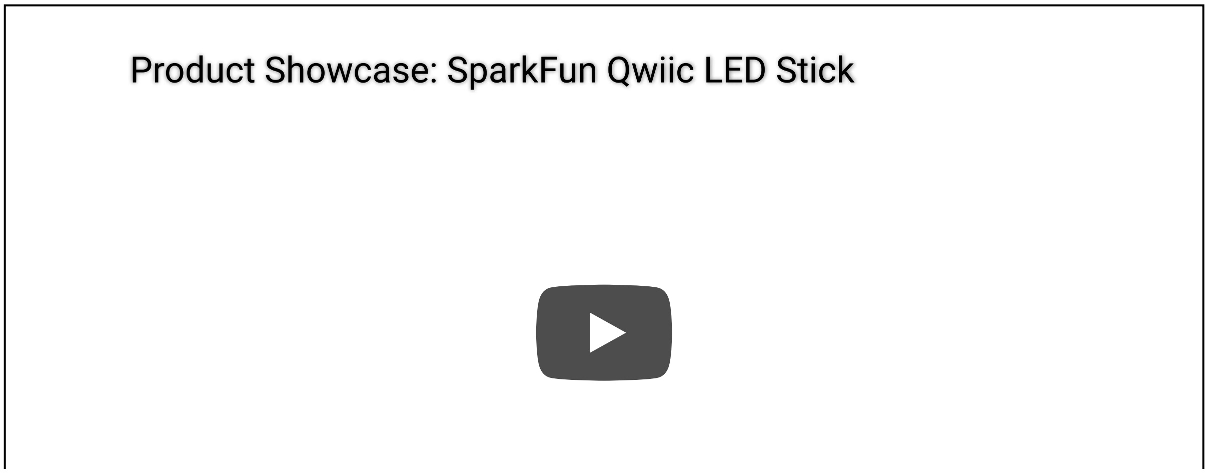
Introduction

The SparkFun Qwiic LED Stick - APA102C simplifies adding addressable LED control to any I^{2}C project using the SparkFun Qwiic System. The board includes 10 APA102 addressable LEDs controlled by an ATTiny85 on the board to work in tandem with either the SparkFun Qwiic LED Stick Arduino library or Python package..



SparkFun Qwiic LED Stick - APA102C

● COM-18354



Product Showcase: SparkFun Qwiic LED Stick

The Qwiic LED Stick was designed with making large chains of them in mind so with a quick software command, you can change the I^2C address of the ATTiny85 so you can control up to 100 LEDs (10 Qwiic LED Sticks) on a single bus! Now, having a hundred LEDs in a circuit significantly increases the required current to drive them and regulators on most development boards are limited to a few hundred mA so we've designed the Qwiic LED Stick to adjust the power input so a dedicated power supply can be used to drive the LED Sticks.

In this tutorial we'll cover the hardware present on the Qwiic LED Stick, how to assemble a basic circuit and to top it off we'll take a close look at the SparkFun Qwiic LED Stick Arduino library and Python package as well as a few of the examples included in them.

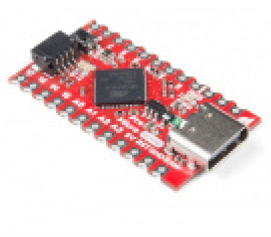
Required Materials

In order to follow along with this tutorial you'll need a few items along with the Qwiic LED Stick.

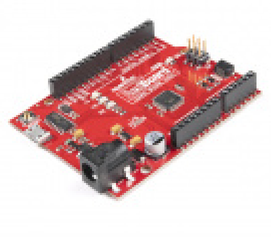
First off, the Qwiic LED Stick needs a controller like an Arduino development board or single-board computer (SBC) like a Raspberry Pi to communicate with the board. Click the button below to toggle to recommended Raspberry Pi and Qwiic Pi products.

RASPBERRY PI MATERIALS (TOGGLE)

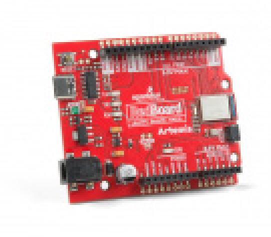
Below are a few Arduino development boards SparkFun carries that are Qwiic enabled out of the box:



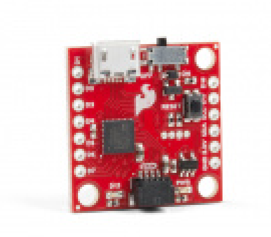
SparkFun Qwiic Pro Micro - USB-C (ATmega32U4)
◉ DEV-15795



SparkFun RedBoard Qwiic
◉ DEV-15123

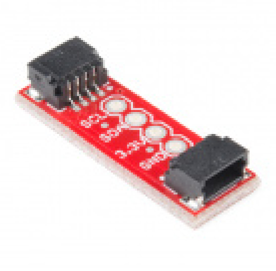


SparkFun RedBoard Artemis
◉ DEV-15444

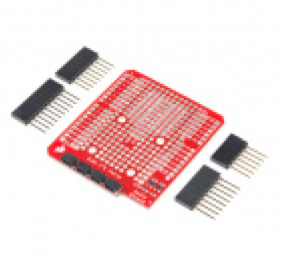


SparkFun Qwiic Micro - SAMD21 Development Board
◉ DEV-15423

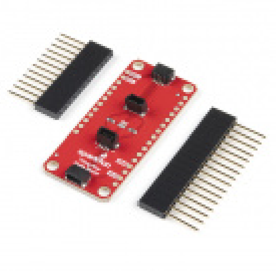
If your preferred microcontroller does not have a Qwiic connector, you can add one using one of the following products:



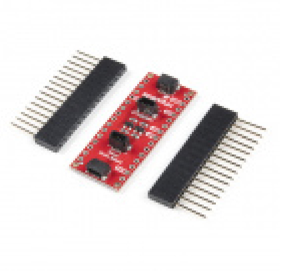
SparkFun Qwiic Adapter
◉ DEV-14495



SparkFun Qwiic Shield for Arduino
◉ DEV-14352

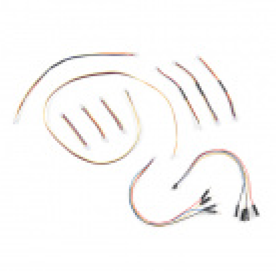


SparkFun Qwiic Shield for Thing Plus
◉ DEV-16790



SparkFun Qwiic Shield for Arduino Nano
○ DEV-16789

Along with a development board or SBC, you'll need at least one Qwiic cable. SparkFun carries a variety of lengths and types of Qwiic cables as seen here:



SparkFun Qwiic Cable Kit
◉ KIT-15081

Qwiic Cable - 100mm
◉ PRT-14427

Qwiic Cable - 200mm
◉ PRT-14428

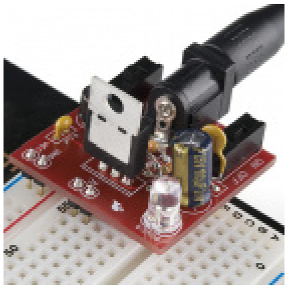
Flexible Qwiic Cable - 100mm
◉ PRT-17259

Recommended Tools

If you plan to use multiple Qwiic LED Sticks in your project, a few other tools and hardware are needed to assemble and drive your circuit. You may already have some of the products and tools suggested below so adjust your selections as needed.

As mentioned above, using many Qwiic LED Sticks draws a significant amount of current that your microcontroller may not be able to provide. We recommend using a dedicated power supply for the APA102 LEDs on the LED Stick. Select your power supply based on the estimated total current draw of the LEDs in your circuit. Below are a few options that can work with the APA102 LEDs:

Power Supply - 5V, 4A
◉ TOL-15352



SparkFun Breadboard Power Supply 5V/3.3V
◉ PRT-00114

Power Supply - 12V/5V (2A)
◉ TOL-15664

Mean Well LED Switching Power Supply - 5VDC, 5A
◉ TOL-14601

Along with a dedicated power supply, you may need some tools to solder with. If you need a soldering iron or soldering supplies, take a look at the tools and supplies below:

Soldering Iron - 60W (Adjustable Temperature)

◉ TOL-14456

Solder - 1/4lb Spool (0.020") Special Blend

◉ TOL-10242

Solder Lead Free - 100-gram Spool

◉ TOL-09325

Weller WLC100 Soldering Station

○ TOL-14228

Recommended Reading

In case you are not familiar with the Qwiic System, we recommend reading here for an overview:

We also recommend taking a look at the following tutorials if you aren't familiar with the concepts covered in them:

How to Power a Project

Logic Levels

A tutorial to help figure out the power requirements of your project.

Learn the difference between 3.3V and 5V devices and logic levels.

I2C

An introduction to I2C, one of the main embedded communications protocols in use today.

Serial Terminal Basics

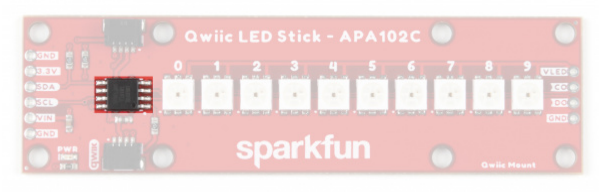
This tutorial will show you how to communicate with your serial devices using a variety of terminal emulator applications.

Hardware Overview

The Qwiic LED Stick is a fairly straightforward ATTiny85-based Qwiic board that you may be familiar with already. In this section we'll cover the hardware present on the board in detail.

ATTiny85

The brains of the Qwiic LED Stick is one of our favorite microcontrollers, the ATTiny85. This IC comes pre-programmed with custom firmware designed to interact with the Arduino library and Python package we've written to use with this board. The ATTiny85 accepts I^{2}C reads and writes, interprets them and outputs the appropriate strings to control any APA102 LEDs attached to it.

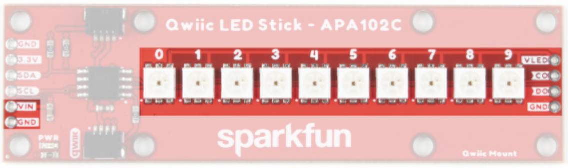


The default I^{2}C address of the ATTiny85 is **0x23**. Adjust the address either through the ADR jumper or via software. Read on for more information regarding changing the address in both manners.

Just like our other Qwiic breakouts using the ATTiny85, users can update or change the firmware using the 2x3 pin header on the back of the board. The firmware can be found in the Hardware GitHub Repository. For tips and tricks on how to re-program an ATTiny IC, check out this tutorial.

APA102C LEDs

The LED Stick includes 10 APA102C LEDs controlled by the aforementioned ATTiny85. APA102C LEDs operate just like most addressable LEDs over a two-wire interface. The board ties that interface to the ATTiny85 and operates both the IC and LEDs at **3.3V** logic. For specific information regarding the LEDs, take a look at the APA102C Datasheet.

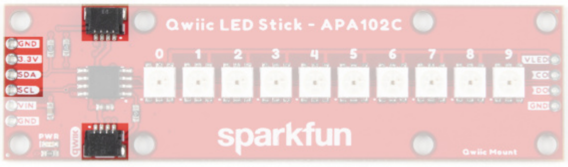


The board includes a dedicated power PTH pin labeled **VIN** (along with a spare Ground PTH) to power the LEDs directly for longer chains of Qwiic LED Sticks or circuits with an extra LED strip that require more power than a typical microcontroller can provide. Enable this power input by adjusting the **VLED** jumper. The APA102C LED accepts a supply voltage between **3.0V** and **5.5V**.

We've also routed the LED control signals out to a dedicated 0.1"-spaced PTH header on the edge of the board in case you would like to add another APA102 LED strip to the end of the LED stick. This PTH header has signal labels as well as silk labels on the bottom of the board for the coordinating wire colors (Red, Blue, Green and Yellow) to make it easy to match the wires for standard APA102 LED strips.

Qwiic and I^{2}C Interface

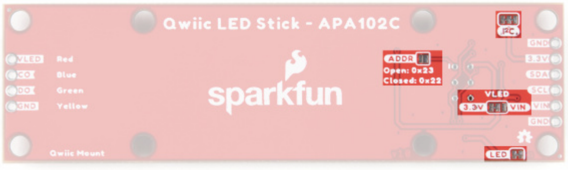
As the product name suggests, the LED Stick routes the I^{2}C interface on this board to a pair of Qwiic connectors for easy assembly using the Qwiic system. Those who prefer a a traditional soldered connection for the circuit can use the I^{2}C pins routed to a standard 0.1"-spaced PTH header.



3.3V and GND are also provided via the Qwiic interface to power both the ATTiny85 as well as the APA102C LEDs in the default configuration.

Solder Jumpers

The Qwiic LED Stick has four solder jumpers labeled **I2C**, **VLED**, **ADR** and **LED**. Let's take a closer look at them and their functionality. If you've never worked with solder jumpers before or would like a refresher, take a look at our How to Work with Jumper Pads and PCB Traces tutorial.



The I^{2}C jumper pulls the SDA/SCL lines on the ATTiny85 to **3.3V** via a pair of **4.7kΩ** resistors. Disable these pull up resistors by severing the trace between the three pads. Recommended practice is to only have a *single* pair of pull up resistors enabled on an I^{2}C bus to avoid communication errors caused by too strong of a parallel resistance. If you are using multiple Qwiic LED Sticks or other I^{2}C devices in a long chain, we recommend disabling all but one of these resistor pairs.

The VLED jumper controls the input voltage for the APA102C LEDs. By default, this two-way jumper ties the APA102C VCC to **3.3V** provided either over the Qwiic connector or the labeled PTH pin. For long chains of Qwiic LED Sticks, switch this jumper to the **VCC** side by severing the trace between the center and **3.3V** pad and adding a blob of solder to connect the center pad with the **VCC** side. Once this is adjusted, connect a separate voltage between **3.0V** and **5.5V** to the **VIN** PTH pin to power the circuit. When in the **VIN** position, the board connects a **4.7µF** decoupling capacitor to help smooth out power supplied to the LEDs.

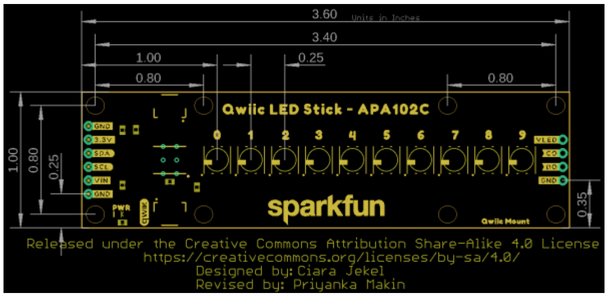
> **Note:** The VLED jumper isolates the voltage input from the **3.3V** used to power the ATTiny85. When using the **VIN** PTH pin to power the LEDs, make sure to provide power to the ATTiny85 either via the Qwiic interface or over the **3.3V** PTH pin.

The ADR jumper sets the I^{2}C address of the ATTiny85 via a hardware adjustment and is **OPEN** by default. While open, the ATTiny85's address is set to **0x23**. Closing this jumper adjusts the address to **0x22**.

The LED jumper controls the board's power LED by tying the anode to **3.3V** via a **1kΩ** resistor. The jumper is **CLOSED** by default. Sever the trace between the two pads to disable the power LED if needed.

Board Dimensions

The Qwiic LED Stick measures 1.00in x 3.60in (25.4mm x 91.44mm) with four mounting holes that fit a 4-40 screw.

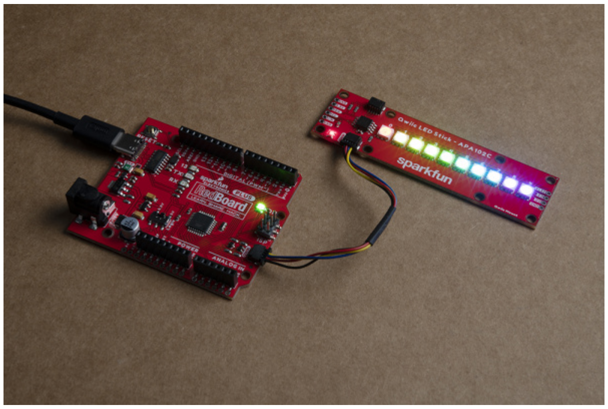

3.60
Units in Inches
3.40
1.00
0.25
0.80
0.80
1.00
0.80
0.25
0.35
Qwiic LED Stick - APA102C
0
1
2
3
4
5
6
7
8
9
GND
3.3V
SDA
SCL
VIN
GND
VLED
CO
DO
GND
PWR
QWIIC
sparkfun
Qwiic Mount
Released under the Creative Commons Attribution Share-Alike 4.0 License
https://creativecommons.org/licenses/by-sa/4.0/
Designed by: Ciara Jekel
Revised by: Priyanka Makin

Hardware Assembly

Assembling a basic Qwiic LED Stick circuit is easy with the Qwiic system so we'll cover that assembly as well as a few things to be aware of when assembling a larger string of Qwiic LED Sticks or when using other APA102Cs on the end of the stick.

Basic Qwiic/I^{2}C Assembly

For a basic Qwiic LED Stick circuit with a board like the SparkFun RedBoard Qwiic Plus all you need to do is plug the two boards together with a Qwiic cable.



Multiple Qwiic LED Sticks and APA102C Extensions

Users who wish to use multiple Qwiic LED Sticks chained together or even with an external APA102C LED Strip connected to the LED PTH header on the side of the board will need to do some minor soldering assembly as well as adjusting solder jumpers.

First, take into account the max current draw the LED Stick chain will pull. At full power, each APA102C can draw as much as **40mA** when set to white (full Red, Green and Blue) at full brightness so we recommend testing the current draw of your LED chain prior to wiring up long chains of LED Sticks (or adding an extra LED strip) to avoid damaging your controller. In our testing, while running all 10 LEDs at full brightness and White color, the strip only pulled **~65mA@3.3V** so you should be safe powering a few of these from your microcontroller but note that most Qwiic development boards use a **3.3V/600mA** regulator to power devices connected to the Qwiic connector.

For detailed assembly instructions and tips for building APA102 LED circuits, take a look at our APA102 Addressable LED Hookup Guide:

APA102 ADDRESSABLE LED HOOKUP GUIDE - HARDWARE ASSEMBLY

If using a separate power supply to power the LEDs, adjust the **VLED** jumper to the **VIN** side and connect a supply voltage between **3.0** to **5.5** to the **VIN** and **GND** pins capable of supplying enough current to power the LED chain. After making your power supply connections, plug the Qwiic LED Stick to the controller using a Qwiic cable or the I^{2}C PTH pins.

Now that our Qwiic LED Stick circuit is assembled, let's take a look at the software packages we use to control them over I^{2}C.

Qwiic LED Stick Arduino Library

Note: This library assumes you are using the latest version of the Arduino IDE on your desktop. If this is your first time using Arduino, please review our tutorial on installing the Arduino IDE. If you have not previously installed an Arduino library, please check out our installation guide.

The SparkFun Qwiic LED Stick Arduino Library makes controlling the LED stick as easy as sending the command `setLEDColor()` with three RGB values to set the color along with a host of other functions to control the LED Stick. Install the library by searching for **"SparkFun Qwiic LED Stick"** in the Arduino Library manager. Users who prefer to manually install it can get the library from the GitHub Repository or download the ZIP by clicking the button below:

SPARKFUN QWIIC LED STICK ARDUINO LIBRARY (ZIP)

Library Functions

The list below outlines all the functions available in the Qwiic LED Stick library along with quick descriptions of what they do.

Class

Construct the `LED` object in the global scope. The examples use `LEDStick` as the Qwiic LED Stick object.

- `LED LEDStick;`

Device Setup and Settings

- `bool begin(uint8_t address, TwoWire &wirePort);` - Initialize the LED Stick at a specified address on a chosen port. If left empty, default address will be used and Wire is used.
- `bool isConnected();` - Check if the LED Stick is connected to the port at the specified address.
-

LED Control

- `bool setLEDColor(uint8_t number, uint8_t red, uint8_t green, uint8_t blue);` - Sets the color of the selected LED using RGB values between 0 and 255. If no LED is selected, all LEDs are set to the specified color. For example, to set the fourth LED to yellow the command would be `LEDStick.setLEDColor(4, 0, 255, 255);`.
- `bool setLEDBrightness(uint8_t number, uint8_t brightness);` - Sets the brightness of the selected LED. If no LED is selected, all LEDs are adjusted. Acceptable values are 0 to 31. Setting an LED to `0` will turn it off but saves the stored color value.
- `bool LEDOff(void);` - Sets all LEDs in the Qwiic LED Stick to off.
- `bool changeAddress(uint8_t newAddress);` - Change the I^2C address of the ATTiny85. Enter a valid address. Note once the address is changed, the LED Stick must be initialized with the new address. For example, initialize a Qwiic LED Stick with the address 0x70 using `LEDStick.begin(0x70);`.
- `bool changeLength(uint8_t newLengths);` - Change the number of LEDs in the chain. Used when adding another Qwiic LED Stick or other addressable LED strip to the circuit. Default value is 10. Max value is 100.

Arduino Examples

The Qwiic LED Stick Arduino Library includes eleven examples to get you started with the basics of the board along with some nifty lighting demos. In this section we'll look at a few of the examples and explore how they work.

Before we get into the examples, let's take a closer look at the setup used for all the examples. The code initializes both the serial and wire ports as well as starts communication with the LED Stick over I^2C:

```
Wire.begin();
Serial.begin(115200);

if (LEDStick.begin() == false){
    Serial.println("Qwiic LED Stick failed to begin. Please check wiring and try again!);
    while(1);
}
```

You can open the Arduino serial monitor with the baud set to **115200** to view any serial printouts from the code. If the Qwiic LED Stick fails to initialize on the bus at the default address, the code freezes. The two most common causes of this is a bad connection between the device and controller or the Qwiic LED Stick's I^2C address does not match the default value.

Example 1 - Blink

This basic example shows how to initialize the LED Stick along with controlling the LEDs on it all at once. Open the example by navigating to **File > Examples > SparkFun Qwiic LED Stick Arduino Library > Example01_Blink**. After opening the example, select the correct Board (in our case the SparkFun RedBoard) and Port it enumerated on. Next, click upload and barring any errors, you should see all ten LEDs set to the same color (white) and turn on and off every second.

Try adjusting the values in this line to change the color:

```
LEDStick.setLEDColor(50, 50, 50);
```

Example 3 - Single Pixels2

The third creates three arrays to set the Red, Green and Blue values for each LED. In the global class, the code creates an array for Red, Blue and Green and sets arbitrary values for each pixel.

```
//           Pixel#     1    2    3    4    5    6    7    8    9   10
byte redArray[10]   = {214,  78, 183, 198,  59, 134,  15, 209, 219, 186}; //r
byte greenArray[10] = { 59, 216, 170,  21, 114,  63, 226,  92, 155, 175}; //g
byte blueArray[10]  = {214, 147,  25, 124, 153, 163, 188,  33, 175, 221}; //b
```

After setting up the three arrays and initializing the LED Stick, the code sets the pixels to the color values to the corresponding entry in the array.

```
LEDStick.setLEDColor(redArray, greenArray, blueArray, 10);
```

For example, the fourth LED should match the color (pink/magenta) of the RGB values in the fourth entry in the array.

Example 4 - Set Brightness

The fourth example steps through all the valid brightness settings for the `setLEDBrightness();` function with each LED set to a different color rainbow color (plus white) so you can get a quick idea of how each color looks at each brightness level.

Just like Example 3, the code creates three arrays for Red, Blue and Green and assigns values for each LED. After initializing the LED Stick, the main loop steps through each brightness value every second and prints out the brightness value over serial:

```
for (byte i = 0; i < 32; i++) {
    LEDStick.setLEDBrightness(i);
    Serial.print("Brightness level: ");
    Serial.println(i);
    delay(1000);
}
```

These examples round out most of the basics of the Qwiic LED Stick Library. The others include a few demos of cool effects you can do with the Qwiic LED Stick along with changing the I^{2}C address and length of LEDs controlled when using a command not pointed at a specific LED pixel. Take a look at them either in the Arduino IDE or the Library GitHub Repository.

Qwiic LED Stick Python Package

Note: This package and the included examples assume you are using the latest version of Python 3. If this is your first time using Python or I^{2}C hardware on a Raspberry Pi, these tutorial can help you get started:

- Python Programming with the Raspberry Pi
- Raspberry Pi SPI and I2C Tutorial

The Qwiic LED Python package is a port of the Arduino library for users who prefer to use this board with a Raspberry Pi. The Python port includes the same eleven examples as the Arduino library to get you started from simply turning on the LEDs to creating some nifty light displays.

The package is hosted on PyPi to make installation quick and painless using simple commands in the command interface. If you prefer to manually install the package, you can find it on the GitHub repository or click the button below to download the ZIP of it:

DOWNLOAD THE SPARKFUN QWIIC LED STICK PYTHON PACKAGE (ZIP)

(**Please be aware this package depends on the Qwiic I2C Driver. You can also check out the repository documentation page, hosted on Read the Docs.*)

Qwiic LED Stick Py Installation

Let's go over both installation methods for the Qwiic LED Stick Python package.

> **Note:** Don't forget to double check that the hardware I^{2}C connection is enabled on your Raspberry Pi or other single board computer. The Raspberry Pi tutorials linked in the note above cover how to enable the Pi's I^{2}C bus.

PyPi Installation

Hosting the package on PyPi makes installation simple on systems that support PyPi installation via `pip3` (use `pip` for Python 2). Open a command interface and enter the following commands:

For **all users** (The user must have **sudo** privileges) privileges):

```
sudo pip3 install sparkfun-qwiic-led-stick
```

For the **current user**:

```
pip3 install sparkfun-qwiic-led-stick
```

Local Installation

Follow these instructions for a local installation. Make sure to install the `setuptools` package prior to installing the Qwiic LED Stick package.

Use this command for direct installation at the command line (use `python` for Python 2):

```
python3 setup.py install
```

Build a package for use with `pip3` :

```
language:
python setup.py sdist
```

This command builds and places a subdirectory called "dist". Change to the new subdirectory and install the Qwiic LED Stick package using `pip3` with these commands (make sure to fill in the correct version number):

```
cd dist
pip3 install sparkfun_qwiic_led_stick-<version>.targ.gz
```

Qwiic LED Stick Python Package Operation

A complete overview of all the functions included in the Qwiic LED Stick Py is hosted on the ReadtheDocs. You can also take a look at the source code.

Upgrading the Qwiic LED Stick Python Package

In case the package is updated in the future, you may need to upgrade it. Use these commands to upgrade the package:

For **all users** (The user must have **sudo** privileges):

```
sudo pip3 install --upgrade sparkfun-qwiic-led-stick
```

For the **current user**:

```
pip3 install --upgrade sparkfun-qwiic-led-stick
```

Python Examples

The Qwiic LED Stick Python package includes eleven examples ranging from basics to get you started with the board to some some nifty demos. In this section we'll take a closer look at a few of the examples and what they do.

Just like in the Arduino library, each example creates the `my_stick` object and includes a begin statement that initializes the Qwiic LED Stick on the I^{2}C bus and freezes the code if that fails:

```
my_stick = qwiic_led_stick.QwiicLEDStick()

if my_stick.begin() == False:
    print("\nThe Qwiic LED Stick isn't connected to the sytsem. Please check your connection", \
        file=sys.stderr)
    return
print("\nLED Stick ready!")
```

If your code freezes here, double check the I^{2}C bus is enabled on your Pi and your Qwiic LED Stick is connected properly. Adjusting the address either via the ADR jumper or changing it via Example 10 - Change Address requires entering the new address in the begin statement:

```
if my_stick.begin(I2C Address Here) == False:
```

Example 1 - Blink

The first example demonstrates a standard "Blink" for all ten LEDs. After initializing the LED Stick on the bus, the code sets the brightness to ~50% so we don't burn our retinas looking at super-bright white LEDs.

After that, the code sets the color of the LEDs to all white and blinks them on and off every second:

```
my_stick.set_all_LED_color(50, 50, 50)
time.sleep(1)
my_stick.LED_off()
time.sleep(1)
```

Example 3 - Single Pixel 2

This example creates three lists of ten to set the Red, Green and Blue values for each LED on the stick and then uses the `set_all_LED_unique_color()` function to set the color of each individual LED.

Try playing around with the values in each list to switch the colors of the LEDs:

```
red_list = [214, 78, 183, 198, 59, 134, 15, 209, 219, 186]
green_list = [59, 216, 170, 21, 114, 63, 226, 92, 155, 175]
blue_list = [214, 147, 25, 124, 153, 163, 188, 33, 175, 221]
```

Example 4 - Set Brightness

The last example we'll cover here demonstrates how to set the brightness of the LED Stick. The first example uses the function in its basic form so you may be familiar with it already. This example sets the LEDs to a rainbow and steps through each valid brightness setting to give you a good idea of what each color looks like at each brightness level to figure out what works best for your project.

```
for i in range(0, 32):
    my_stick.set_all_LED_brightness(i)

    print("\nBrightness level: " + str(i))
    time.sleep(1)
```

The other examples demonstrate some neat lighting displays along with demonstrations of how to change the I^{2}C address, adjust the total number of LEDs controlled to add other LED Sticks or LED strips.

Troubleshooting

In this section we'll outline a few troubleshooting tips for common issues you may run into using the Qwiic LED Stick.

Software Tips

Make sure when using multiple Qwiic LED Sticks to set each board to a unique I^{2}C address. Adjust the address either by opening the ADR jumper or using the Address Examples from the Arduino library or Python package.

Also, update to the new number of LEDs in your chain using the Change Length examples in the Arduino library and Python package. Note, the default firmware limits the maximum number of LEDs to 100.

Power Supply Tips

When using many LEDs (either multiple Qwiic LED Sticks or an additional LED strip), make sure to take into account the total current draw of your LED chain. If the total current draw is outside of the limits of your chosen controller's **3.3V** regulator capacity (most SparkFun Qwiic boards have a max out of **600mA@3.3V**), adjust the **VLED** jumper to isolate the LEDs from the rest of the circuit and use a separate voltage input via the **VIN** PTH pin. Connect **3.3V** to **5.5V** power supply capable of sourcing enough current to drive the APA102 LEDs in your string.

There is no need to add a decoupling capacitor when using an external power supply connected to **VIN** as the board includes a **4.7µF** capacitor parallel to **VIN** and Ground when the **VLED** jumper is adjusted to use that pin to power the LEDs.

General Troubleshooting

If you need technical assistance and more information on the Qwiic LED Stick or another SparkFun product that is not working as you expected, we recommend heading on over to the SparkFun Technical Assistance page for some initial troubleshooting.

SPARKFUN TECHNICAL ASSISTANCE PAGE

If you don't find what you need there, the SparkFun Forums are a great place to find and ask for help. If this is your first visit, you'll need to create a Forum Account to search product forums and post questions.

CREATE NEW FORUM ACCOUNT **LOG INTO SPARKFUN FORUMS**

Resources and Going Further

That wraps up this tutorial for the Qwiic LED Stick. For more information on the board, take a look at the following resources:

- Schematic (PDF)
- Eagle Files (ZIP)
- Dimensional Drawing (PNG)
- Datasheet - APA102C (PDF)
- Hardware GitHub Repository
- Qwiic LED Stick Arduino Library
- Qwiic LED Stick Python Package
- Qwiic Information Page

For some inspiration on an LED project with the Qwiic LED Stick, take a look at these tutorials:

Das Blinken Top Hat

A top hat decked out with LED strips makes for a heck of a wedding gift.

Interactive LED Music Visualizer

Use an Arduino and the SparkFun Sound Detector to create visualizations on Addressable RGB LED strips.

LED Cloud-Connected Cloud

Make an RGB colored cloud light! You can also control it from your phone, or hook up to the weather!

LED Crystal Goddess Crown

Follow this tutorial to make your own Crystal Goddess Crown with LEDs!

LuMini Ring Hookup Guide

The LuMini Rings (APA102-2020) are the highest resolution LED rings available.

LuMini 8x8 Matrix Hookup Guide

The LuMini 8x8 Matrix (APA102-2020) are the highest resolution LED matrix available.

LumiDrive Hookup Guide

The LumiDrive LED Driver is SparkFun’s foray into all things Python on micro-controllers. With the SparkFun LumiDrive you will be able to control and personalize a whole strand of APA102s directly from the board itself.

Or check out some of these blog posts for ideas:

Pierce the Veil This Halloween With a Glowing Talking Skull

DIY Sunrise Alarm

MARCH 26, 2018

OCTOBER 10, 2017

Wedginursday: Frame Rates and Funky Colors
MAY 23, 2018

Fan-Out Capability of the APA102C
JUNE 18, 2018

ATP: Circuit Design with LEDs
JULY 2, 2018

Save Your Buffer
SEPTEMBER 6, 2018

Underlit Crystal Display
DECEMBER 19, 2018

Python and the SparkFun LumiDrive
JANUARY 22, 2019

DIY Camera Lens Light Ring
FEBRUARY 5, 2019

Enginursday: DIY Capacitive Touch Night Light
JUNE 6, 2019

Enginursday: Ten Years of Testbeds
OCTOBER 10, 2019