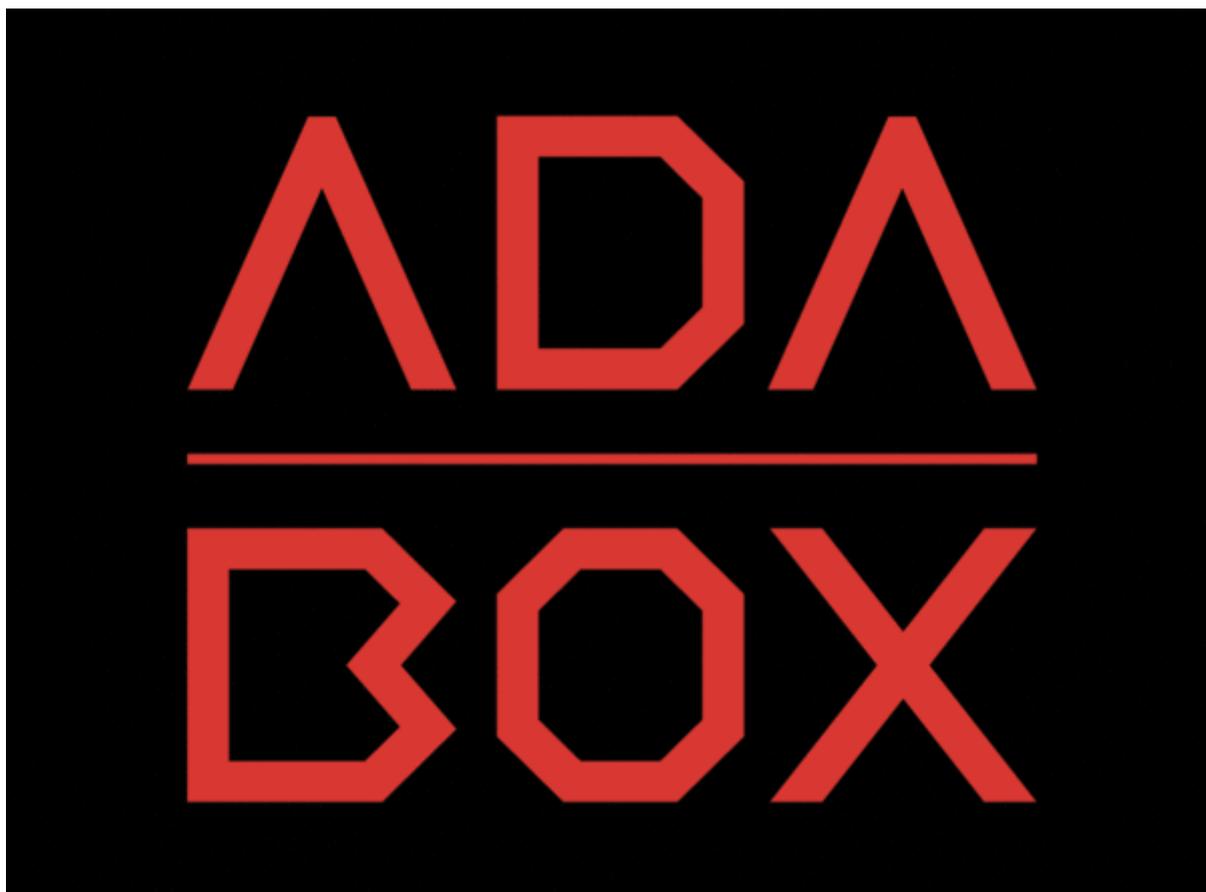




AdaBox 003

Created by Tyler Cooper



<https://learn.adafruit.com/adabox003>

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Introduction

Hi there!

[If you're looking to subscribe to AdaBox, click here! \(https://adafru.it/tNC\)](https://adafru.it/tNC)

If you're here, it's because you were given the gift of electronics with an AdaBox! You are a beginner who is getting started with your AdaBox or you just want to relive what it's like being a beginner at electronics again. But most of all, you want to learn how to build and make stuff with electronics! [If, rather than learn electronics, you'd like to look at pictures of cats instead, please check https://www.adafruit.com/galleries/cats-of-engineering \(https://adafru.it/oAd\)](https://www.adafruit.com/galleries/cats-of-engineering)

And, you're in luck: there's never been a better time.

Gone are the days where you need thousands of dollars of equipment and lots physics/math background. Nowadays, if you want to learn to work with electronics, you can jump right in for \$100 or less, and any sort of computer. And we're talking about learning a lot of electronics - from the basics of analog to the complexities of firmware. With a good pack of parts, you can build a base of knowledge that will take you from your first blinking LED to someone who can start prototyping and inventing custom products.

Who is this for?

Anyone with a computer they can install software on, an Arduino or compatible and the ability to type and click a mouse. That's pretty much the minimum. Remember, this guide is specifically for people who have purchased or received an AdaBox subscription!

You don't need to know a lot of physics or math, and just like an Art Degree isn't required for making art and being creative, **you don't need to have a computer science degree**. It helps if you're comfortable using computers but that's a skill most people pick up through life.

If you know how to program already - great! If not, don't worry, we'll teach you enough to be dangerous.

Who isn't this for?

While you can follow along without an AdaBox, it will not make as much sense unless you have all of the components and more which either came as a gift or purchased yourself - remember, the goal is helping beginners!

If you're an expert, please visit our hundreds other tutorials and jump right in at [learn.adafruit.com](https://adafruit.com/learn) (<https://adafruit.com/learn>)

Who are you?

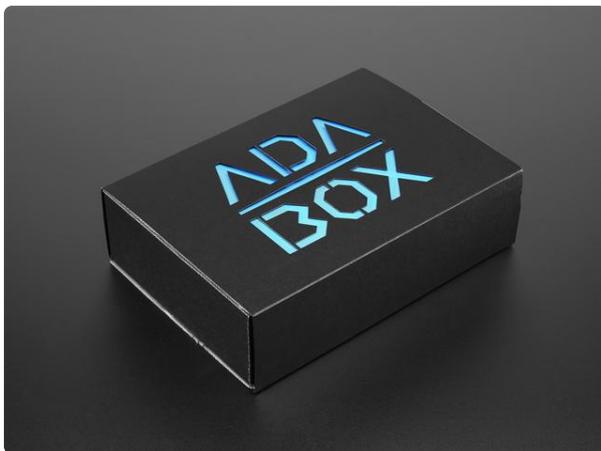
Great question. This is me:

I'm Ladyada, and I love to teach people how to build stuff and how they can be creative with technology.

So, are you ready?

Let's do this thing!

Want to buy past AdaBoxes?



[AdaBox001 - Welcome to the Feather Ecosystem](#)

Please note! This is NOT the subscription version of AdaBox! This is ONLY AdaBox001 that shipped out to AdaBox subscribers in September of 2016. This...

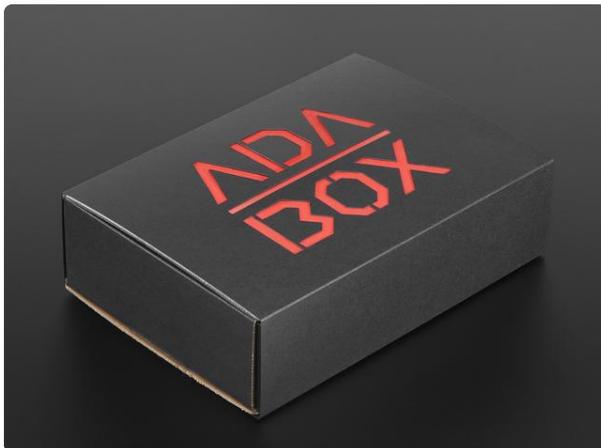
<https://www.adafruit.com/product/3193>



[AdaBox002 – Making Things Move](#)

AdaBox002 - Making Things Move with our Feather Bluetooth LE Mini Robot Rover is the perfect gift for folks who are just getting started in the...

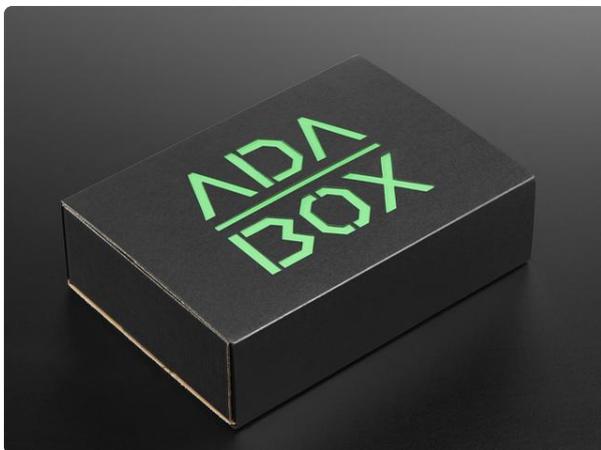
<https://www.adafruit.com/product/3235>



[AdaBox003 – The World of IoT – Curated by Digi-Key](#)

AdaBox003 – The World of IoT (Curated by Digi-Key) is the perfect gift for folks who are just getting started in the world of DIY electronics. It's an...

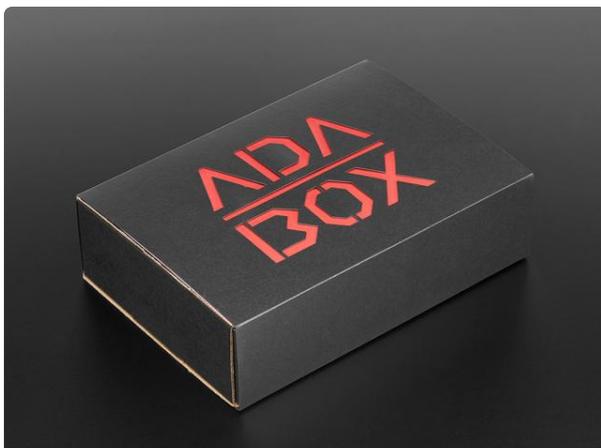
<https://www.adafruit.com/product/3268>



[AdaBox004 – Making Things Dance](#)

AdaBox004 – Making Things Dance is the perfect gift for folks who are just getting started in the world of DIY electronics. It's an excellent...

<https://www.adafruit.com/product/3370>



[AdaBox005 – Break for Pi](#)

AdaBox005 – Break for Pi is the perfect gift for folks who are just getting started in the world of DIY electronics. It's an excellent...

<https://www.adafruit.com/product/3644>

Unboxing AdaBox 003



ADABOX003 is designed to introduce a new person the joys of making electronics and specifically the world of IoT. With our friends at Digi-Key, we decided to come up with a fun pack of parts that:

- Could introduce a beginner to making
- Does not require any additional tools or paid software
- Teaches electronics and programming skills
- Does not assume any prior experience
- Comes with enough fun parts that could be combined and adapted for months or years
- Introduce beginners to the growing world of the Internet of Things



Kit Contents

After lots of thinking here's what we came up with:

- [Feather HUZZAH with ESP8266 WiFi chip - pre-soldered with Feather Stacking Headers](http://adafru.it/3213) (<http://adafru.it/3213>) - Our take on an 'all-in-one' ESP8266 WiFi development board with built in USB and battery charging. Its an ESP8266 WiFi module with all the extras you need, ready to rock! Perfect for connecting your projects to the wide world of the internet.
- [Featherwing OLED - 128x32 OLED Add-on - pre-soldered](http://adafru.it/2900) (<http://adafru.it/2900>) - adds a 128x32 monochrome OLED plus 3 user buttons to your main Feather board.
- [DHT22 Temperature-Humidity Sensor](http://adafru.it/393) (<http://adafru.it/393>) - This is a basic, low-cost digital temperature and humidity sensor. It uses a capacitive humidity

sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin.

- [Micro Servo \(http://adafru.it/169\)](http://adafru.it/169) - Tiny little servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds you're used to but smaller.
- [PIR Motion Sensor \(http://adafru.it/189\)](http://adafru.it/189) - PIR sensors are used to detect motion from pets/humanoids from about 20 feet away (possibly works on zombies, not guaranteed). This one has an adjustable delay before firing (approx 2-4 seconds), adjustable sensitivity **and** we include a 1 foot (30 cm) cable with a socket so you can easily reposition the sensor or mount it using the two drills on either side
- [Premium Male/Male Jumper Wires- 40" x 6" \(http://adafru.it/758\)](http://adafru.it/758) - Handy for making wire harnesses or jumpering between headers. Essential for most electronics projects.
- [Half Size Breadboard \(http://adafru.it/64\)](http://adafru.it/64) - This is a cute half size breadboard, good for small projects. Also essential for most electronics projects.
- [Magnetic Contact Switch \(door sensor\) \(http://adafru.it/375\)](http://adafru.it/375) - Tell who walks in (and out) of your room! Also potentially excellent for zombies - though we have not tested.
- [Medium Vibration Sensor Switch \(http://adafru.it/2384\)](http://adafru.it/2384) - The "poor man's" accelerometer/motion sensor! These spring-vibration switches are **medium sensitivity** non-directional vibration induced trigger switches.
- AdaBox003 Component Bag - Includes:
 - Photo Cell
 - Diffused RG LED
 - 10k Potentiometer
 - Piezo Buzzer
 - 10K 5% 1/4W Resistors
 - 560ohm 5% 1/4W Resistors
 - Diffused 10mm Red LED
 - Diffused 10mm Green LED

- 12mm Tactile Switches
- SPDT Switch

What's not included

- [Micro USB Cable \(http://adafru.it/592\)](http://adafru.it/592)- We figure most of you have these already and wanted to use the space in the box for some more goodies. If you don't have a USB cable, you can always pick one up [here \(http://adafru.it/592\)](http://adafru.it/592).

Bonus parts (for subscribers only!)

- [Lithium Ion Polymer Battery - 3.7v 500mAh \(http://adafru.it/1578\)](http://adafru.it/1578)- Lithium ion polymer (also known as 'lipo' or 'lipoly') batteries are thin, light and powerful. The output ranges from 4.2V when completely charged to 3.7V. This battery has a capacity of 500mAh for a total of about 1.9 Wh. Great for taking your project on the go!
- PCB Ruler - Digi-Key Edition - Our friends at Digi-Key tossed in their always handy version of the [Adafruit PCB ruler \(http://adafru.it/1554\)](http://adafru.it/1554) - the PCB to ruler them all.
- AdaBox Collectible Pin - Nimbus the Friendly Cloud Entity is our Internet of Things mascot. It floats above and around your connected devices with a mischievous and ethereal glow. Nimbus is always happy when makers build devices to join it. Whether they be trash cans, sinks, lamps, or toasters, Nimbus is always present and will never judge.

Adafruit IO Basics & AdaBox



Here at Adafruit, we sell all of these amazing components, but we couldn't find a good way to interact with them over the internet. There are certainly a lot of great services out there for datalogging, or communicating with your microcontroller over the web, but these services are either too complicated to get started, or they aren't particularly fun to use. So, we decided to experiment with our own system, and that is how Adafruit IO got started.

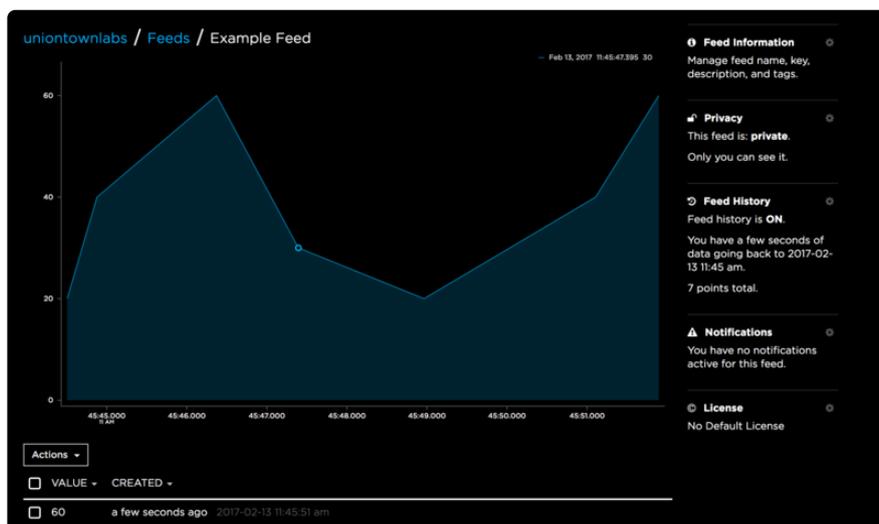
The API is the core of the system, but with only an API, it's not that fun to use. We've built a few basic client libraries to simplify working with the API. We also have a dashboard with a few widgets that allow easy 2-way interaction with your devices. We plan on adding many more features, such as mapping and location awareness for your devices, triggers based on custom parameters, email alerts and more.

Adafruit IO Basics & AdaBox

Over the last couple months we have been publishing guides to teach people the basics of Adafruit IO. The sneaky part is that we have been using only AdaBox 003 parts on the guide examples! This means that you can open up your AdaBox and follow all of the Adafruit IO Basics guides. By the end of the guides you will be an Adafruit IO Pro and will be able to take your new knowledge and create amazing projects that you can interact with.

Be sure to check back to this guide as more Adafruit IO guides will be published over time using your AdaBox 003 parts.

Feeds



Feeds are the core of the Adafruit IO system. The feed holds **metadata** about the data you push to Adafruit IO. This includes settings for whether the data is public or

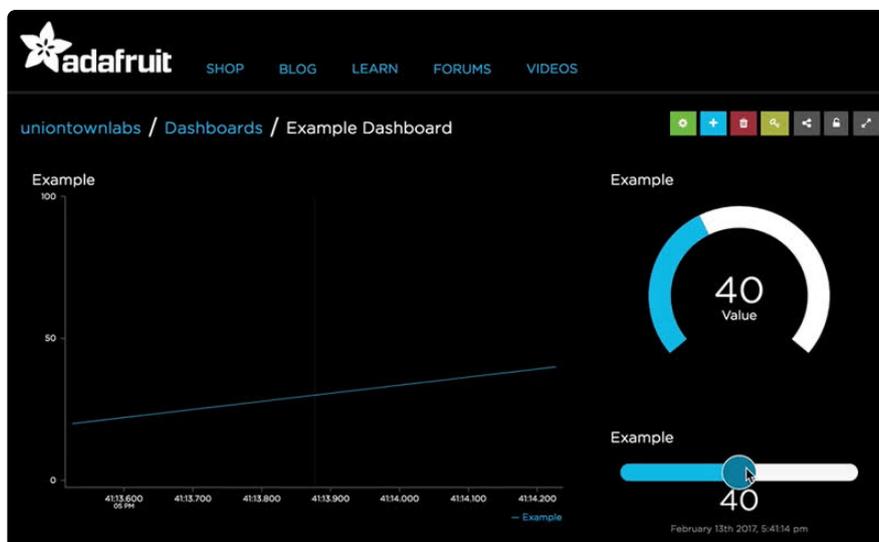
private, what license the stored sensor data falls under, and a general description of the data. The feed also contains the sensor **data** values that get pushed to Adafruit IO from your device.

You will need to create one feed for each unique source of data you send to the system. For example, if you have a project with one temperature sensor and two humidity sensors, you would need to create three feeds. One feed for the temperature sensor, and one feed for each humidity sensor.

Adafruit IO Basics: Feeds

<https://adafru.it/ioA>

Dashboards



Dashboards allow you to visualize data and control Adafruit IO connected projects from any modern web browser. Widgets such as charts, sliders, and buttons are available to help you quickly get your IoT project up and running without the need for any custom code.

If you are new to Adafruit IO, you may want to start with the [Adafruit IO Feeds guide](https://adafru.it/ioA) (<https://adafru.it/ioA>) before you continue with this guide. If you are comfortable with feeds, then you are ready to create your first dashboard.

Adafruit IO Basics: Dashboards

<https://adafru.it/f5m>

Digital Input

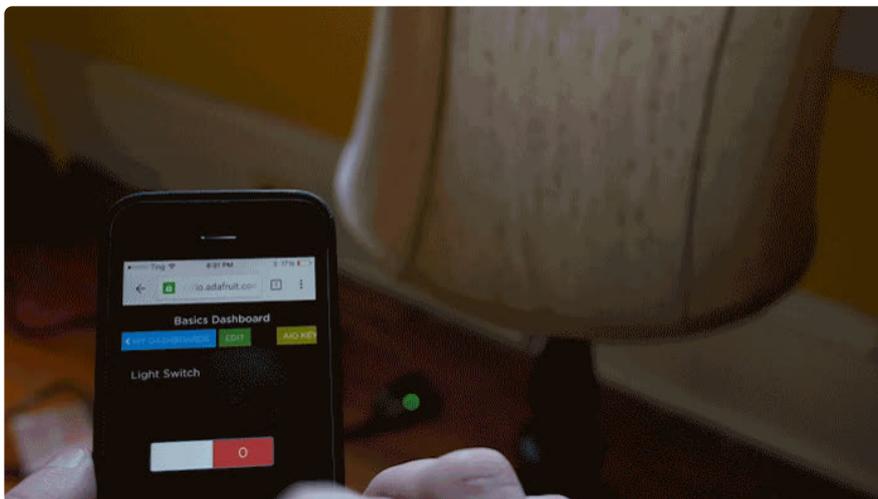


The third guide in the series will show you how to send momentary button press data to Adafruit IO.

Adafruit IO Basics: Digital Input

<https://adafru.it/m9f>

Digital Output

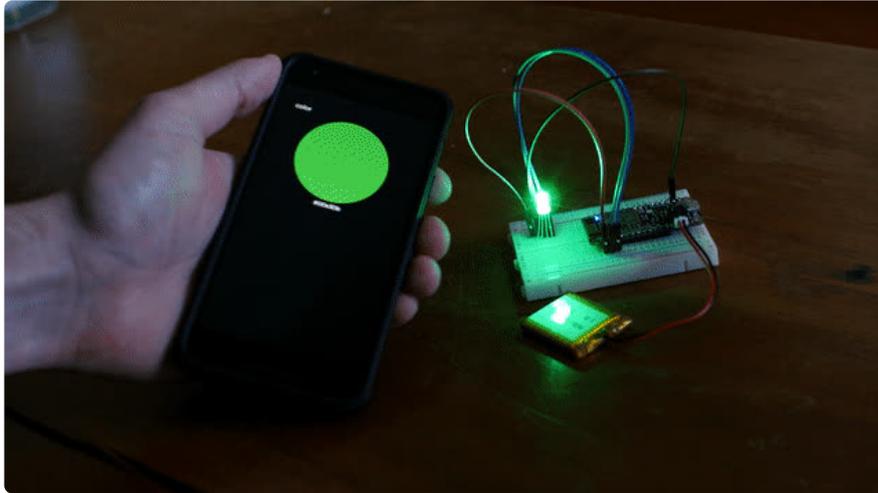


The fourth guide in the series will show you how to turn a LED on and off from Adafruit IO using any modern web browser.

Adafruit IO Basics: Digital Output

<https://adafru.it/iRe>

Color

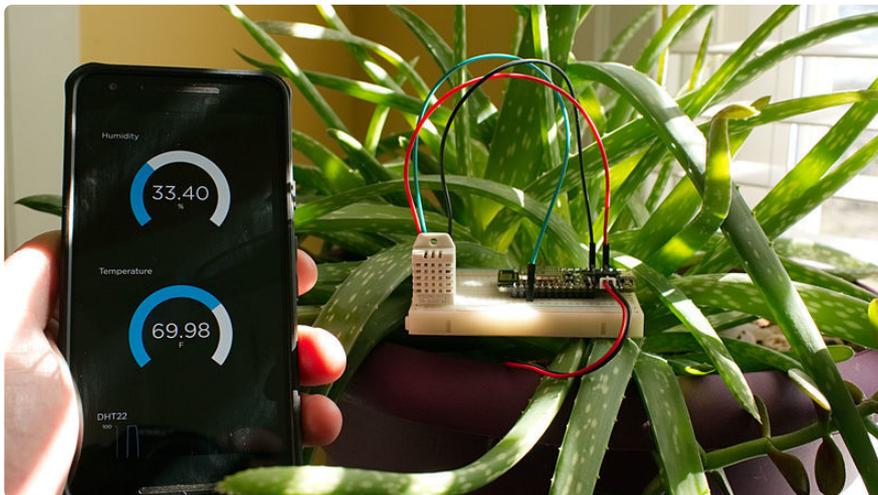


The fifth guide in the series will show you how to send color data from Adafruit IO to a RGB LED.

Adafruit IO Basics: Color

<https://adafru.it/uFC>

Temperature & Humidity

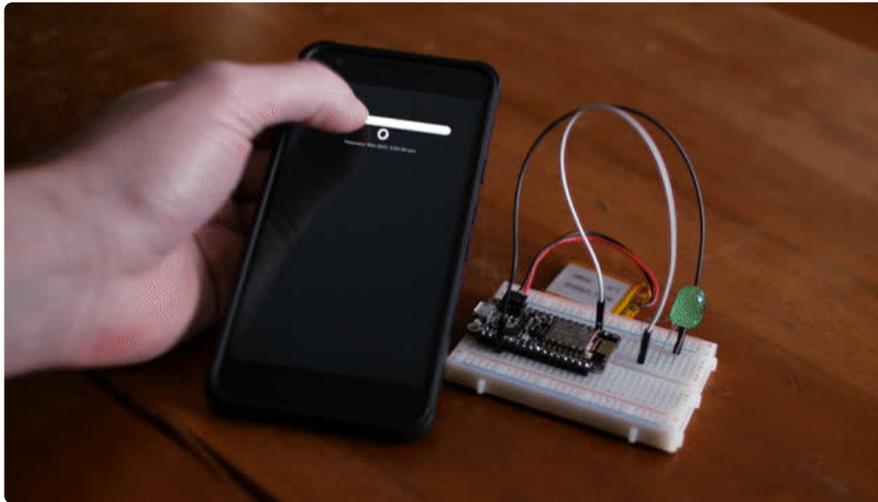


The sixth guide in the series will show you how to send temperature and humidity values wirelessly to Adafruit IO from a DHT22 sensor.

Adafruit IO Basics: Temperature & Humidity

<https://adafru.it/uFD>

Analog Output



The seventh guide in the series will show you how to dim a LED from Adafruit IO using any modern web browser.

Adafruit IO Basics: Analog Output

<https://adafru.it/uFE>

Analog Input

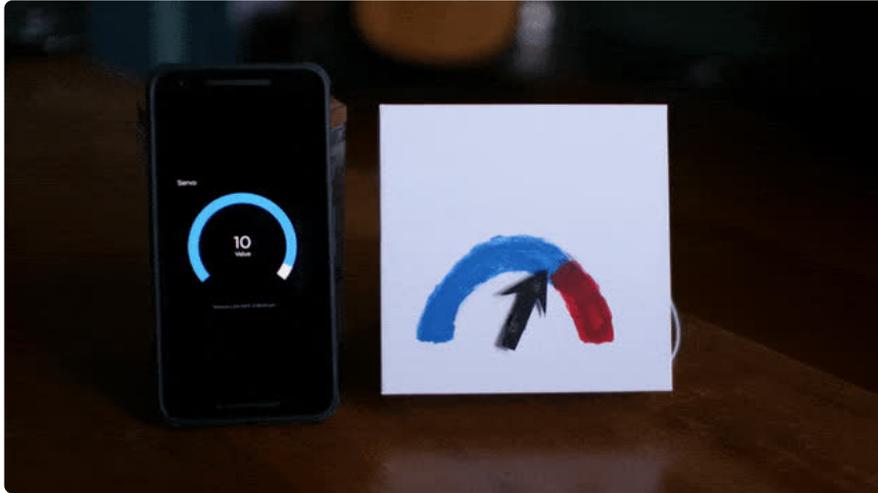


The eighth guide in the series will show you how to send analog values to Adafruit IO from a photocell.

Adafruit IO Basics: Analog Input

<https://adafru.it/uFF>

Servos



The ninth guide in the series will show you how to wirelessly control a servo from Adafruit IO.

Adafruit IO Basics: Servos

<https://adafru.it/uFG>

Using the Featherwing OLED Display

[Using the Featherwing OLED Display \(https://adafru.it/nek\)](https://adafru.it/nek)

Need Help? Questions?

[Need Help? Questions? \(https://adafru.it/uZD\)](https://adafru.it/uZD)