SwitchDoc Labs

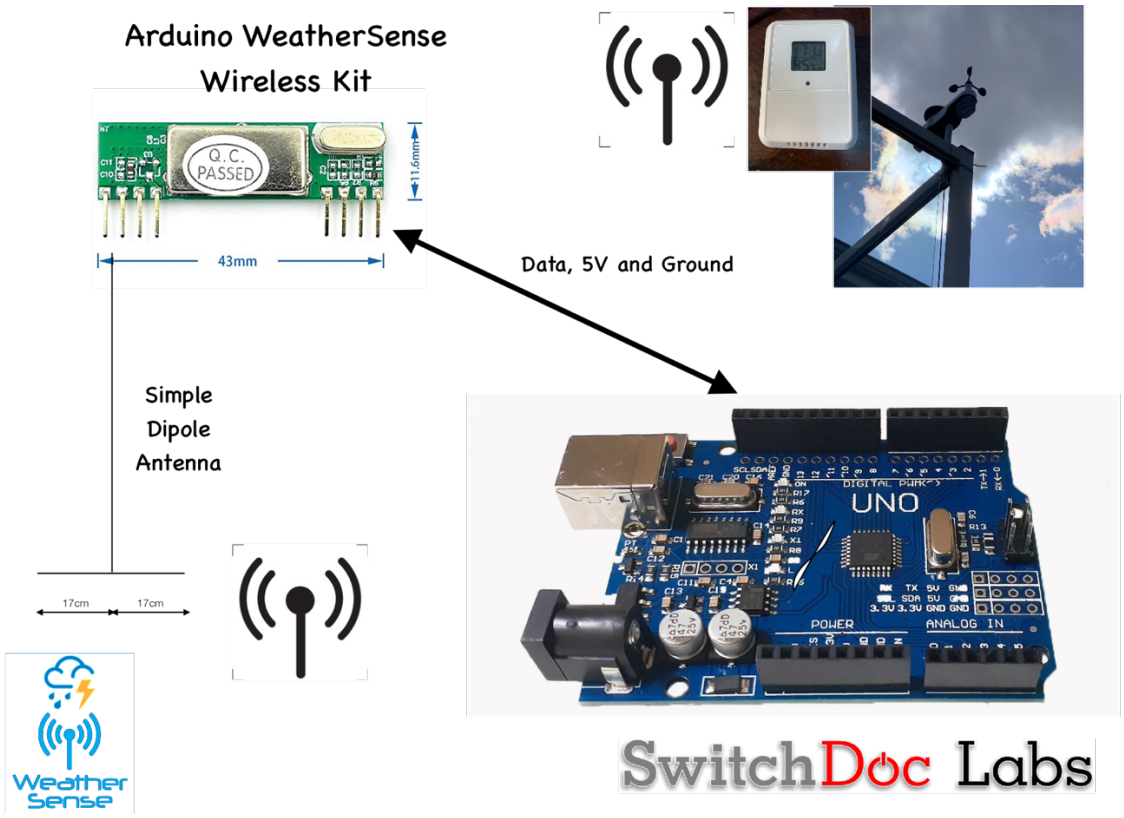
Arduino WeatherRack2 Kit

November 2020
Version 1.1

Table of Contents

Introduction

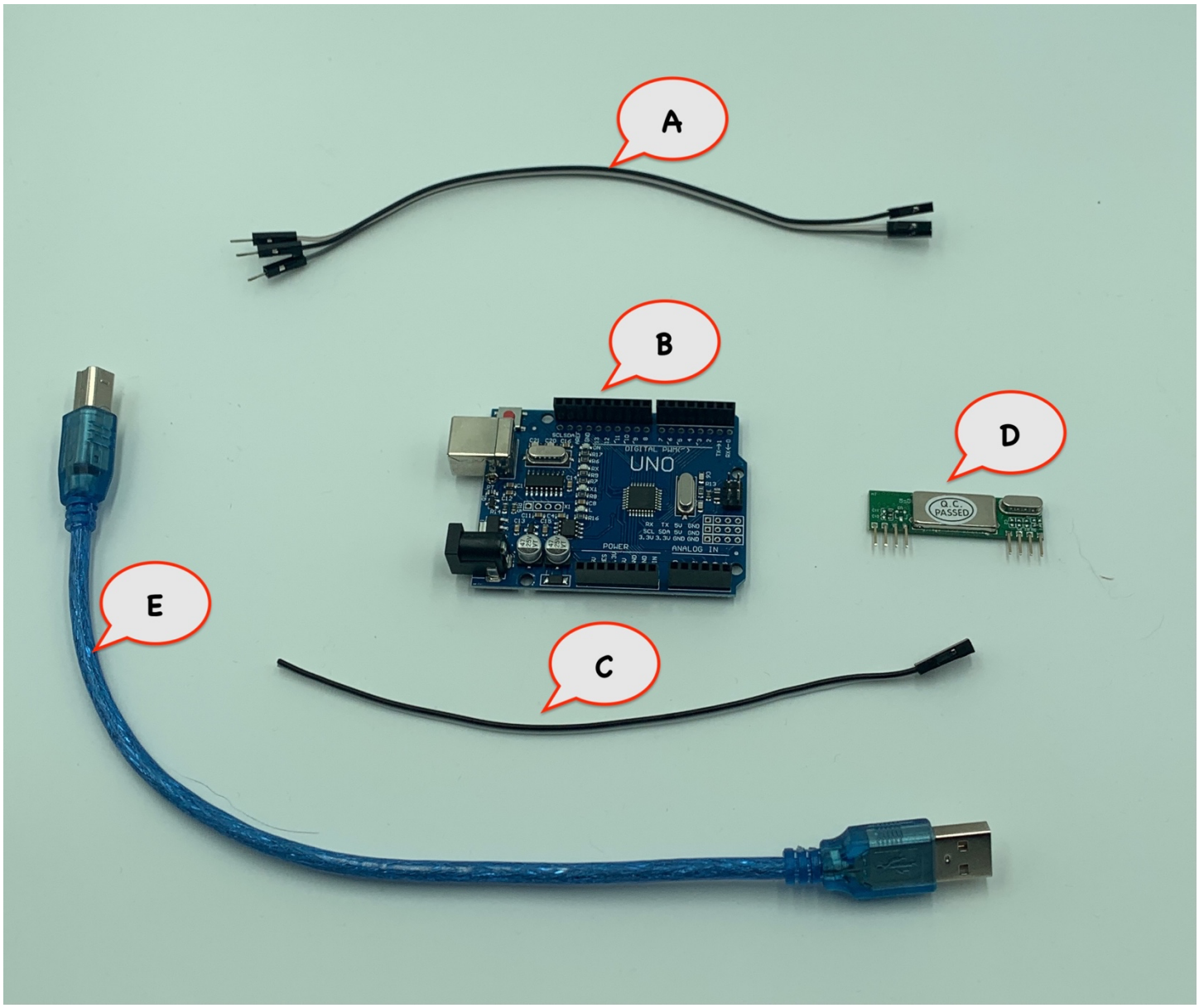
Thank you for your purchase of the SwitchDoc Labs Arduino Kit for the WeatherSense WeatherRack2. The following user guide provides step by step instructions for installation, operation and troubleshooting.



First Step

Assemble your WeatherRack2 and Indoor T/H Sensor and put batteries in the units. Follow the instructions in the WeatherRack2 Technical Specification and Assembly manual.

Parts List



Part A – 3 male to female jumpers (colors will vary)

Part B – Arduino UNO

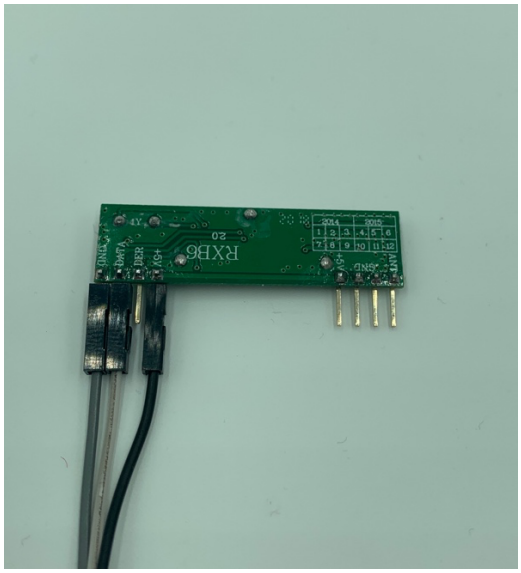
Part C – 2 female 17cm dipole antenna cable (colors will vary)

Part D – RXB6 433Mhz Receiver

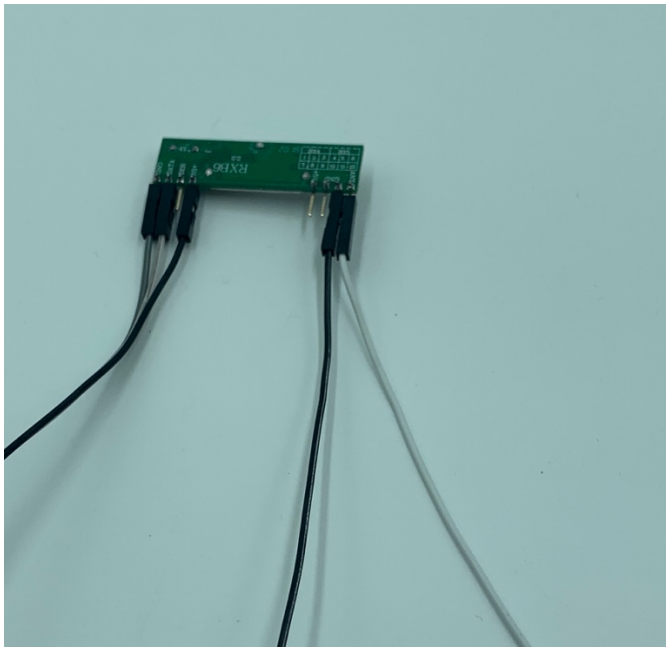
Part E – USB Cable for Arduino to Computer Connection

Step-By-Step Assembly

Step 1 – Plug the 3 male to female jumpers (Part A) into the GND, Data and +5V pins of the RXB6 receiver (Part D) . Carefully note the colors that you have on each pin (your colors will vary).

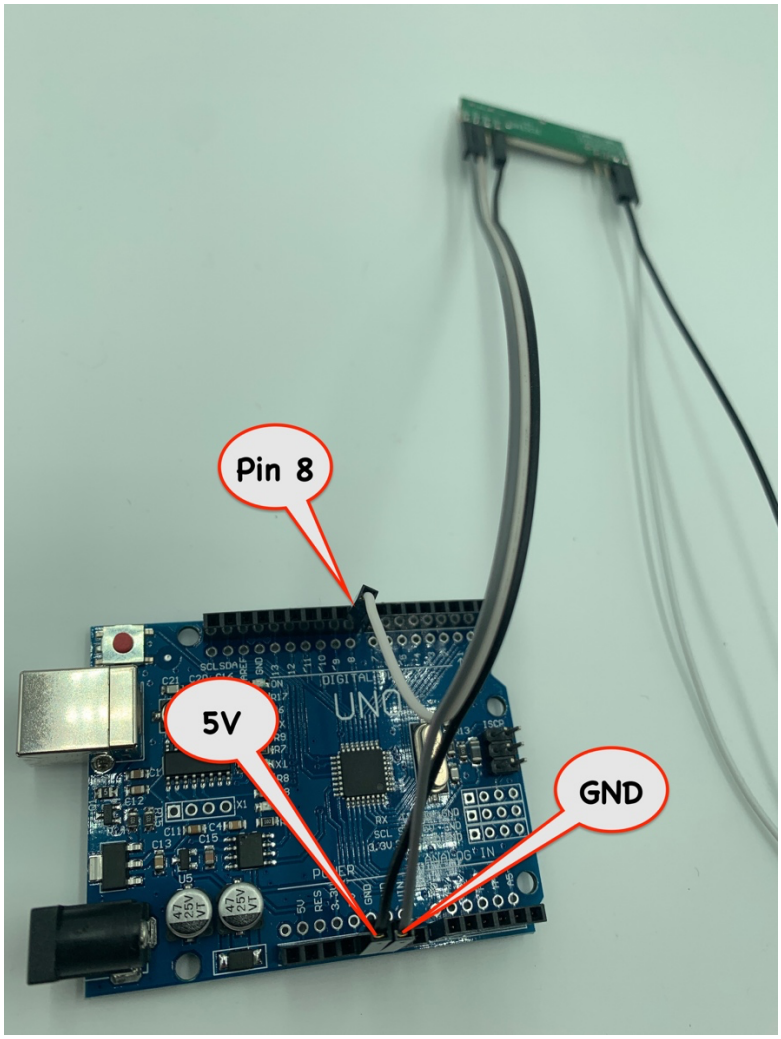


Step 2 – Plug the Two Lead Female Dipole antenna (Part C) into the RXB8 (Part D) pins ANT and GND as shown. Separate the wires.



Step 3 – Plug the male end of the 3 male to female jumpers (Part A) into the Arduino Uno (Part B) pins as follows:

RXB8 (Part D) Pins	Arduino UNO (Part B) Pins
GND	GND
DATA	Pin 8
+5V	5V



Check your work! DO NOT MIX UP THESE WIRES! YOU MAY DAMAGE YOUR HARDWARE!

Step 4 – Plug the square end of the USB Cable (Part E) in the Arduino UNO (Part B) and then the other end of the USB Cable into an USB Port on your computer.

Installing The Software

The Arduino UNO (Part B) is supplied unprogrammed. To program the Arduino, you must install the Arduino IDE, download the software and program the Arduino. Before you proceed, make sure you have assembled your WeatherRack2 and have batteries in both the WeatherRack2 and the Indoor T/H Sensor (F016TH).

Step 1 – Install the Arduino IDE on your computer. This process will vary according to your computer. Go to

https://www.arduino.cc/en/Guide

and follow the instructions for your computer.

Step 2 – Download the SDL_Arduino_WeatherRack2 drivers.

Go to:

https://github.com/switchdoclabs/SDL_Arduino_WeatherRack2

and download the zip file (under the green Code tab).

Step 3 – Unzip the downloaded file

Step 4 – Remove the "-master" from the name of the unzipped directory

Step 5 – Move the whole program directory to your "arduino" directory. The location of this will vary by computer type.

Step 6 – Open up the Arduino IDE

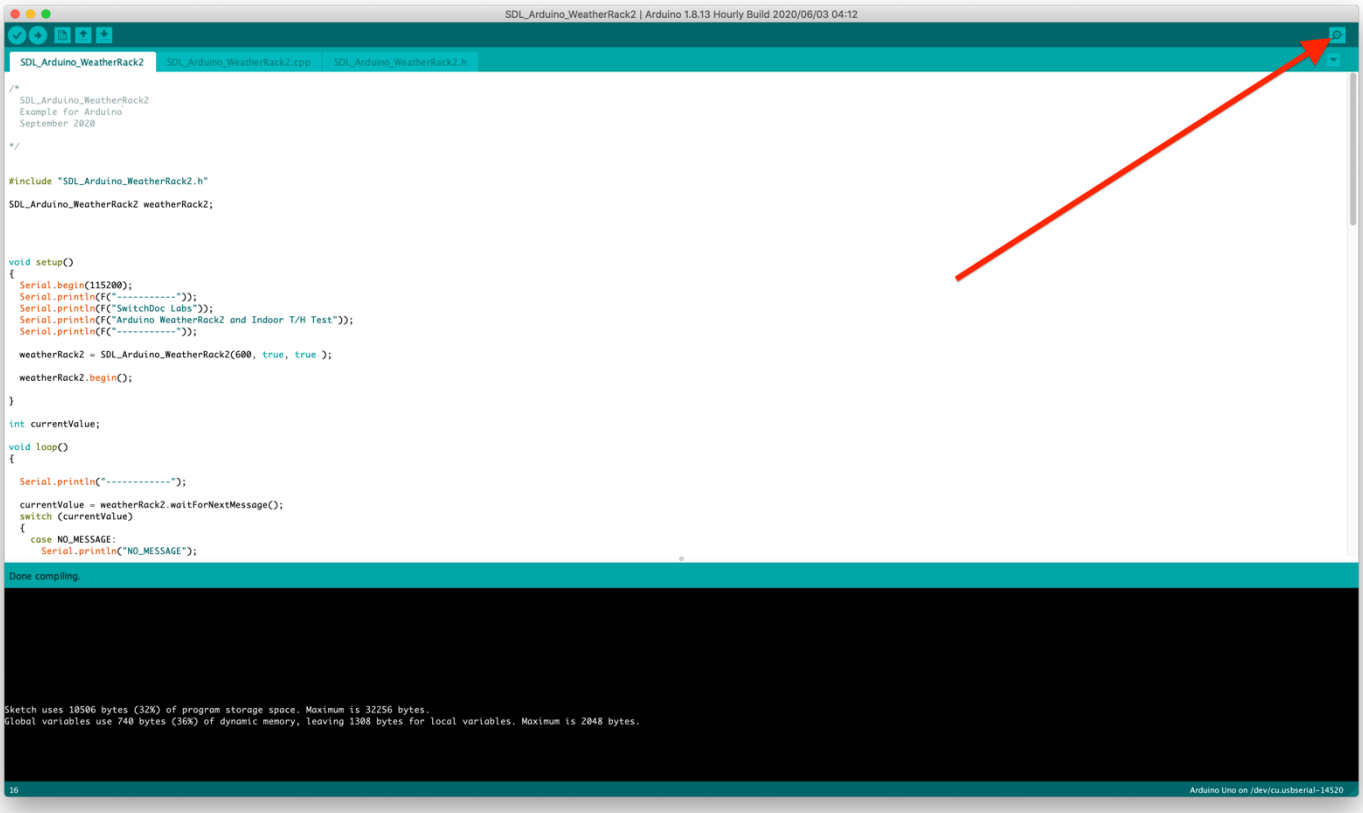
Step 7 – Select the Arduino Board you have. Go to Tools->Board->Arduino AVR Boards->Arduino UNO

Step 8 – Select the USB Serial port in which you have plugged the Arduino. Go to Tools->Port->(select your UNO). The port number and name will vary by computer type.

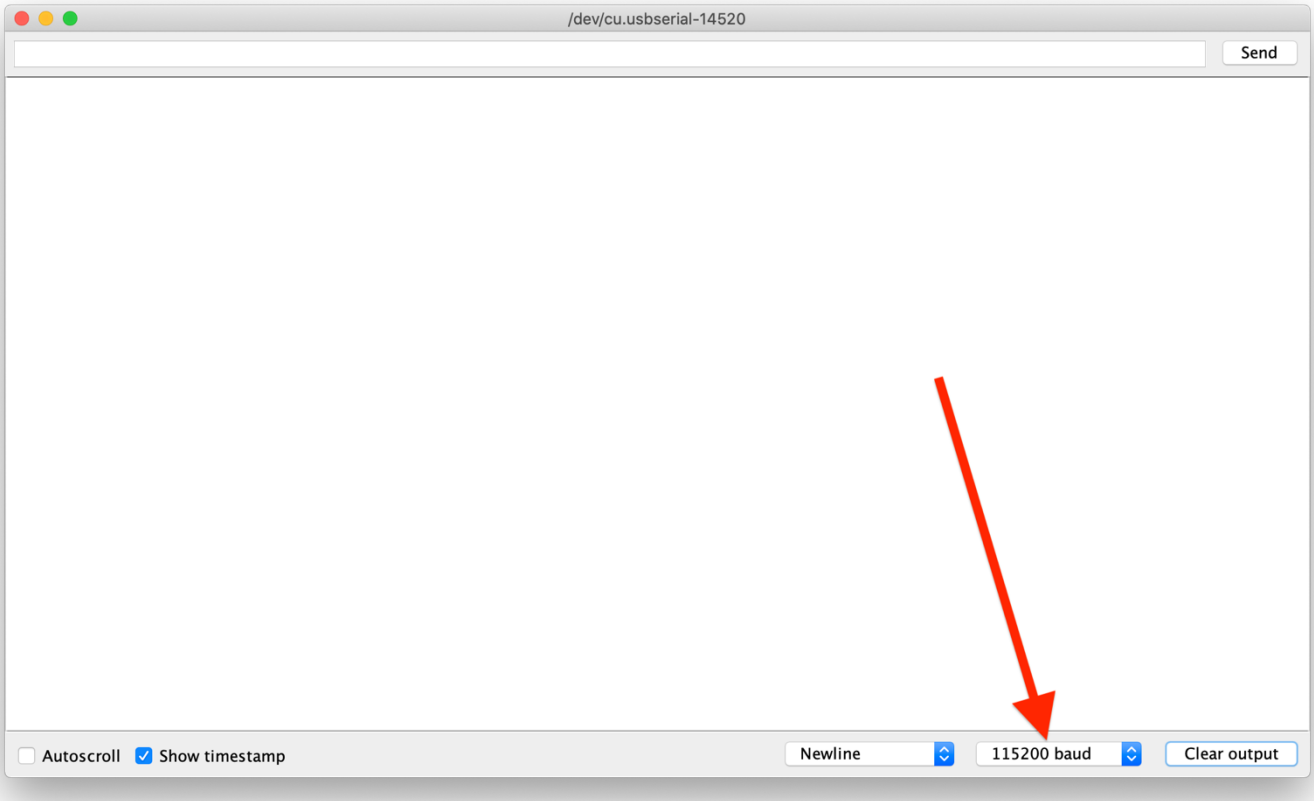
Step 9 – Open the downloaded SDL_Arduino_WeatherRack2.ino file. Go to Open->SDL_Arduino_WeatherRack2 and select the SDL_Arduino_WeatherRack2.ino file.

Step 10 – Now you will see three tabs containing the WeatherRack2 software.

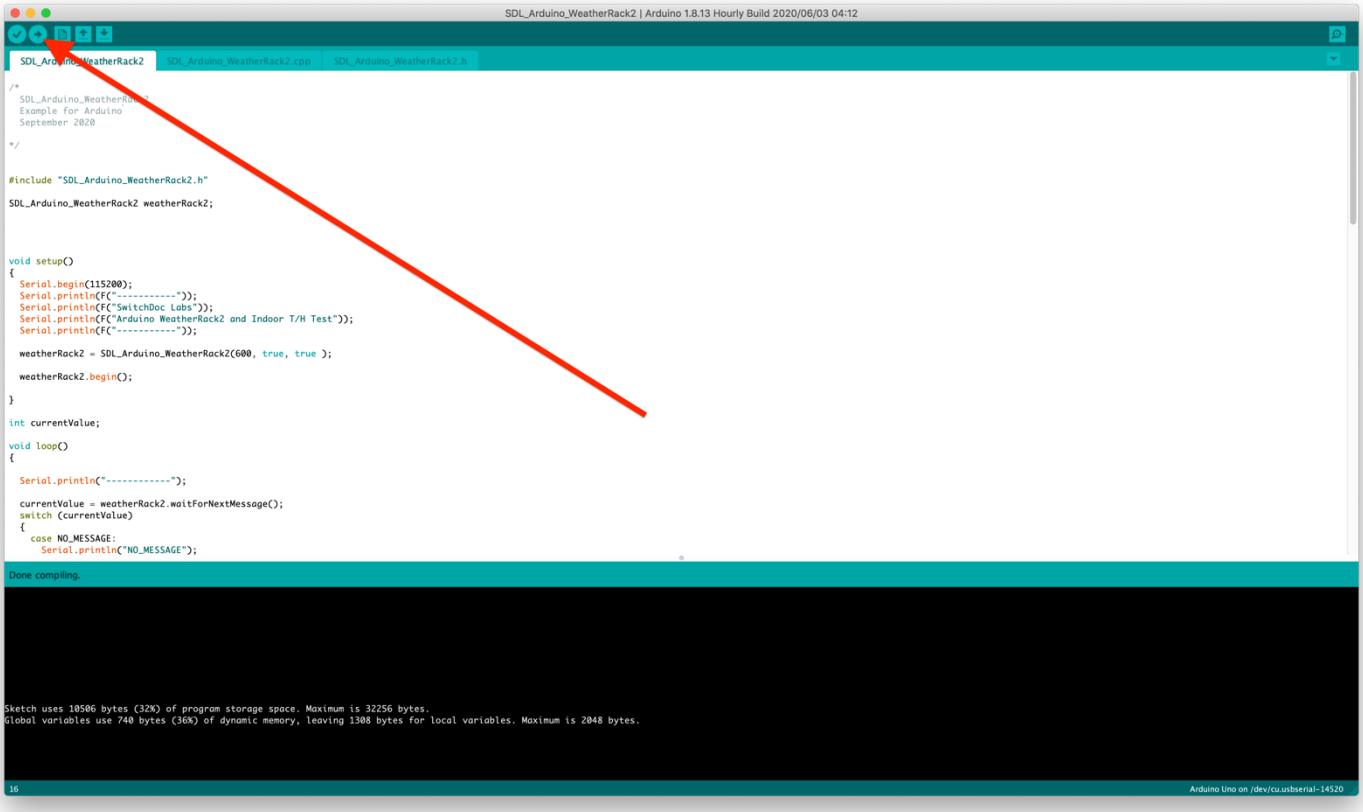
Step 11 – Click on the magnifying glass on the upper right of the Arduino IDE to see the Serial output from the Arduino.



Next set your Serial Window Baud Rate to 115200


/dev/cu.usbserial-14520
Send
Autoscroll
Show timestamp
Newline
115200 baud
Clear output

Step 12 – Compile and download the code to your Arduino by hitting the green right facing arrow button on the upper left of the Arduino IDE screen.



You will see lights flashing on your Arduino UNO and you should see text starting up in your Serial port.

```
12:58:59.684 -> ------------
12:59:01.646 -> -----------
12:59:01.646 -> SwitchDoc Labs
12:59:01.646 -> Arduino WeatherRack2 and Indoor T/H Test
12:59:01.646 -> -----------
12:59:01.646 -> ------------
```

And eventually (after a minute or so) you should start to see data coming in.

```
13:12:38.612 -> ------------
13:12:44.963 -> -----------
13:12:44.963 -> SwitchDoc Labs
13:12:44.963 -> Arduino WeatherRack2 and Indoor T/H Test
13:12:44.963 -> -----------
13:12:44.963 -> ------------
13:12:51.786 ->
13:12:51.893 -> MESSAGE_WEATHERRACK2_GOOD
13:12:51.893 ->
13:12:51.893 -> currentWR2.messageid=1
13:12:51.893 -> currentWR2.time=
13:12:51.893 -> currentWR2.device=12
13:12:51.893 -> currentWR2.modelnumber=0
13:12:51.893 -> weatherRack2.currentWR2.battery=0
13:12:51.893 -> currentWR2.avewindspeed=12.00
13:12:51.893 -> currentWR2.gustwindspeed=26.00
```

```
13:12:51.893 -> currentWR2.winddirection=259
13:12:51.893 -> currentWR2.cumulativerain=1920
13:12:51.893 -> currentWR2.temperature=0.50
13:12:51.893 -> currentWR2.humidity=79
13:12:51.926 -> currentWR2.light=3705
13:12:51.926 -> currentWR2.uv=0
13:12:51.926 -> currentWR2.CRC=0x20
13:12:51.926 ->
13:12:51.926 -> Headers Found=1
13:12:51.926 -> WeatherRack2 Sensors Found=1
13:12:51.926 -> Indoor T/H Found=0
13:12:51.926 ->
13:12:56.910 -> ------------
13:13:00.697 ->
13:13:00.732 -> MESSAGE_INDOORTH_GOOD
13:13:00.732 ->
13:13:00.732 -> IndoorTHMessage.messageid=2
13:13:00.732 -> IndoorTHMessage.time=
13:13:00.732 -> IndoorTHMessage.device=249
13:13:00.732 -> IndoorTHMessage.modelnumber=5
13:13:00.732 -> IndoorTHMessage.channel=3
13:13:00.732 -> IndoorTHMessage.battery=0
13:13:00.732 -> IndoorTHMessage.temperature=21.00
13:13:00.768 -> IndoorTHMessage.humidity=32
13:13:00.768 -> IndoorTHMessage.CRC=0x44
13:13:00.768 ->
13:13:00.768 -> Headers Found=2
13:13:00.768 -> WeatherRack2 Sensors Found=1
13:13:00.768 -> Indoor T/H Found=1
13:13:00.768 ->
13:13:05.748 -> ------------
```

Congratulations. You are connected to the WeatherRack2 Sensors!

Here is a video of the unit working:
https://youtu.be/aQ4r3p-qI3w

Notes on Radio Reception

Your computer, monitors, cell phone can generate interference for your Arduino Kit.

Wireless communication is susceptible to interference, distance, walls and metal barriers. We recommend the following best practices for trouble free wireless communication.

1. **Electro-Magnetic Interference (EMI)**. Keep the sensors several feet away from computer monitors and TVs.

2. **Radio Frequency Interference (RFI).** If you have other 433 MHz devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.

3. **Line of Sight Rating.** This device is rated at 100 m line of sight (no interference, barriers or walls) but typically you will get 30 m maximum under most real-world installations, which include passing through barriers or walls.

4. **Metal Barriers.** Radio frequency will not pass through metal barriers such as aluminum siding. If you have metal siding, align the remote and receiver through a window to get a clear line of sight.

The following is a table of reception loss vs. the transmission medium. Each “wall”or obstruction decreases the transmission range by the factor shown below.

Medium	**RF Signal Strength Reduction**
Glass (untreated)	5-15%
Plastics	10-15%
Wood	10-40%
Brick	10-40%
Concrete	40-80%
Metal	90-100%

Disclaimer

SwitchDoc Labs, LLC takes no responsibility for any physical injuries and possession loss caused by those reasons which are not related to product quality, such as operating without following the operating manual and cautions, natural disasters, or force majeure.

SwitchDoc Labs, LLC has compiled and published this manual which covers the latest product description and specification. The contents of this manual are subject to change without notice.