SwitchDoc Labs

SkyWeather2 Assembly and Test Manual

> April 2021 Version 1.3



Table of Contents

Cautions when building and using SkyWeather2	2
Errata	6
What is The SkyWeather2 System?	7
Before You Build Your SkyWeather2 Weather Station	
Step by Step Assembly What are we doing here? Parts List Parts you need to buy separately from the kit Step by Step Assembly	
Testing SkyWeather2 What does the JSON from the Weather Sensors mean?	19 22
Installing your Optional Laser Air Quality Sensor Testing the Air Quality Sensor	22 24
Configuring your SkyWeather2 System Finding your SkyWeather2 Serial Number in your SkyWeather System What is WeatherSTEM? Empowering teachers to create STEM lessons, activities, and assessments from real-world weather Experience The Data How will SkyWeather2 Integrate with WeatherSTEM? Setting up your WeatherSTEM Account	25 27 29 29 30 30 30
Final Testing of SkyWeather2 Checking I2C Connections Starting SkyWeather2 Testing the Optional WeatherSTEM Connection Other WeatherSTEM Features	34 34 34 35 37
Disclaimer	37

Cautions when building and using SkyWeather2

- 1) Keep all water away from the electronics and power supply at all times!
- 2) This is not a toy! Keep it out of reach of young children and pets.
- 3) SwitchDoc Labs assumes no liabilities in the use of this kit, beyond the refund of the purchase price.

Errata

December 5, 2020 – Added WiFi Provisioning Information for SDL SD Card

What is The SkyWeather2 System?

Easy to build. Easy to learn about the IOT (Internet Of Things) and the Raspberry Pi.

The **heart** of the new SkyWeather2 project is our new custom made wireless Weather Sensor package called the WeatherRack2.



The **SkyWeather2** kit is so simple that even middle school children can build it with just a little adult help for configuration and installation.





Full Open Source Python3 Software that you can Modify.

We provide the Python3 software all open source with the kit. The Pure Python software can be modified to add new sensors, support new cloud software and connect up to your own projects and software.

Before You Build Your SkyWeather2 Weather Station

You must complete your assembly and testing of the WeatherRack2 before assembling the SkyWeather2 system.

Furthermore, you should build and test your SkyWeather2 system as below BEFORE you put it in the option 3D Printed case. Get it working first, then put it in the case. Believe us, it is always easier to debug the system before you close it up in the case! The manual for the case and weatherproofing is called the "SkyWeather2 Weatherproofing, Assembly and Test Manual". All manuals are available on the SkyWeather2 Product page on shop.switchdoc.com.

Step by Step Assembly

Cautions: Keep your static charge to a minimum during your assembly and operation. Touch metal before handling parts. Avoid shuffling your feet. Before starting assembly, layout all the parts above and familiarize yourself with the various parts.

What are we doing here?

We are assembling the SkyWeather2 System. You must complete your assembly and testing of the WeatherRack2 before assembling the SkyWeather2 system.

See the "WeatherRack2 Installation Manual" on the SkyWeather2 Product Page for assembly instructions.

In this manual, we are going to assemble the SkyWeather2 system and test all the functions. If you plan to put SkyWeather2 outside, and after you complete this manual, proceed to the "SkyWeather2 Weatherproofing, Assembly and Test Manual" on the SkyWeather2 Product Page.

Parts List











Part G Mounting Pole (Fits under Part A in Weather Sensor box)







Parts you need to buy separately from the kit

- 3 AA Batteries
- 2 AAA Batteries
- Raspberry Pi
- 16GB SD Card (unless you bought the SD Card from SwitchDoc Labs)

Step by Step Assembly

Step 1: Put <u>three</u> AA Batteries in the battery compartment of the Main Sensor Unit (Part A). Put the panel back on and screw them down if needed. You may have already done this.



Step 2: Put <u>two</u> AA batteries in the battery compartment of the Indoor Wireless Sensor (Part B). Set the dip switch inside to Channel 1 and then your choice of units of C or F. Put the panel back on and screw them down if needed. Note the channel setting. You may have already done this.



Step 3: Attach the Mounting Pole (Part G) to the base of the Weather Sensor Unit (Part A) using one of the supplied screws. It is up to you how to mount the Weather Sensor to your roof or deck. In general, the higher the better. Follow the tips in the WeatherRack2 Assembly Manual. You don't have to mount it now. You can



continue with this manual.

Step 4: Place the indoor temperature and humidity sensor (Part B) anywhere in your home (or outside), but away from water!



Step 5: Plug the SDR USB Dongle (Part C) into the Antenna (Part C). Then plug the USB Dongle into your Raspberry Pi as shown:



Step 6: Connect the 50cm Raspberry Pi Camera Cable (Part E) to the Raspberry Pi. Gently pull up on the black camera connector wings next to the HDMI connector.



Step 7: Insert the cable (Part E) into the cable slot on the Raspberry Pi. The cable slots into the connector situated between the Ethernet and HDMI ports, with the silver connectors facing the HDMI port. Push down the wings on the camera connector.



Step 8: To attach the SkyCamera (Part D), install one end of the 50cm Pi Camera Cable (Part E) into the SkyCamera connector by gently lifting the black wings, pushing in the cable and then pushing the black wings back down into the connector. Make sure the cable is in straight. You can remove the camera cap at this time.

Step 9: Take the SkyWeather2 Hat Board (Part H) and plug it into the 40 pin GPIO ports on your Raspberry Pi. Start at one end and gently work it onto the GPIO pins making SURE the pins are all aligned and not bent. Inspect the top pins on the SkyWeather2 Hat Board (Part H) to make sure they also are not bent.





Congratulations. You have now completed assembly of SkyWeather2 Kit.

WiFi Provisioning with the Optional SDL SD Card

There are many ways of provisioning the Wifi on the Raspberry Pi. For examples, please go to www.rasperrypi.org and search on WiFi.

The included provisioning system on the optional SDL SDCard is for those people that want to connect up to WiFi without editing their SDCard on a different computer or adding a monitor and keyboard (headless). You can find the SDL SDCard here on shop.switchdoc.com.

https://shop.switchdoc.com/products/16gb-sd-card-with-stretch-smart-garden-system-groveweatherpi

Step-By-Step Provisioning

Step 1: Turn on your Raspberry Pi (with the SD Card installed)

Step 2: On another computer, navigate to the WiFi hostpot called "RPiHostspot"

Step 3: If you want to use VNC, connect to 10.0.0.5:5900 from a VNC Server

Step 4: If you want to use SSH, type ssh <u>pi@10.0.0.5</u> 18 Page Version 1.3 April 2021 Step 5: In the terminal window type the following commands:

```
cd /etc/wpa_supplicant
sudo nano wpa_supplicant.conf
You will see the following:
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1
country=us
network={
ssid="gracie"
scan_ssid=1
psk="xxxxxxx"
}
Change the ssid to your network name and the psk to your password for your wifi network.
Step 6: Save, close and then type "sudo reboot"
```

Your Raspberry Pi will then come up on your network. Go to www.raspberrypi.org to see how to find your Raspberry Pi (Such as using Angry IP or another network scanner).

Now you are connected to your WiFi.

Testing SkyWeather2

If you have the SwitchDoc Labs SD Card, you can proceed to Step 4.

Step 1: Install the SDL modified version of rtl_433.

In a terminal window on your Pi at /home/pi type:

```
git clone <a href="https://github.com/switchdoclabs/rtl433.git">https://github.com/switchdoclabs/rtl433.git</a>
```

Then compile it on the Raspberry Pi:

cd rtl_433/ mkdir build cd build cmake .. make make install

Step 2: Install the SkyWeather2 Software using these commands:

```
cd
git clone https://github.com/switchdoclabs/SDL_Pi_SkyWeather2.git
19 Page
Version 1.3 April 2021
```

Step 3: Add needed python modules to your system (a list will be provided on forum.switchdoc.com in the near future). If you want to jump into it, run

sudo python3 skyweather2.py

And start adding in the missing libraries as they come up as missing imports.

Step 4: Note the IP Address of your Raspberry Pi. Type in the following commands to get your IP address:

hostname -I

You will get something like this:

```
pi@SwitchDocLabs:~/SDL_Pi_SkyWeather2 $ hostname -I
192.168.1.44
```

Step 5: Update SkyWeather2 to the latest version. Type the following commands into a terminal window.

cd cd SDL_Pi_SkyWeather2 git pull

You will see something like this:

```
pi@SwitchDocLabs:~/SDL Pi SkyWeather2 $ git pull
remote: Enumerating objects: 19, done.
remote: Counting objects: 100% (19/19), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 12 (delta 10), reused 12 (delta 10), pack-reused 0
Unpacking objects: 100% (12/12), done.
From https://github.com/switchdoclabs/SDL Pi SkyWeather2
   f2193a0..c98a45c master -> origin/master
Updating f2193a0..c98a45c
Fast-forward
README.md
                          2 ++
SkyCamera.py
                          2 +-
SkyWeather2.py
                          2 +-
pclogging.py
                         12 ++++++-----
state.py
                          3 +++
testWirelessSensors.py | 18 +++++++-----
6 files changed, 22 insertions(+), 17 deletions(-)
```

Or, if your software is up to date:

pi@SwitchDocLabs:~/SDL_Pi_SkyWeather2 \$ git pull Already up to date.

Step 6: First we will test the reception of the wireless weather sensors. Test your SDR and wireless installation as follows. Note you must have completed the weather sensor assembly. Especially putting the batteries in the Main Weather Sensor and in the Indoor Temperature Humidity Sensor.

cd /home/pi/SDL_Pi_SkyWeather2

sudo python3 testWirelessSensors.py

You will then see something similar to this on your terminal window:

pi@SwitchDocLabs:~/SDL_Pi_SkyWeather2\$ sudo python3 testWirelessSensors.py Starting Wireless Read rtl_433 version -128-NOTFOUND branch master at 202007090750 inputs file rtl_tcp RTL-SDR Use -h for usage help and see https://triq.org/ for documentation. Trying conf file at "rtl_433.conf"... Trying conf file at "rtl_433.conf"... Trying conf file at "/root/.config/rtl_433/rtl_433.conf"... Trying conf file at "/usr/local/etc/rtl_433/rtl_433.conf"... Trying conf file at "/etc/rtl_433/rtl_433.conf"... quiet option (-q) is default and deprecated. See -v to increase verbosity

Consider using "-M newmodel" to transition to new model keys. This will become the default someday.

A table of changes and discussion is at https://github.com/merbanan/rtl 433/pull/986.

Registered 2 out of 147 device decoding protocols [146-147]

Found Rafael Micro R820T tuner

Exact sample rate is: 250000.000414 Hz

[R82XX] PLL not locked!

Sample rate set to 250000 S/s.

Tuner gain set to Auto.

Tuned to 433.920MHz.

Allocating 15 zero-copy buffers

{"time" : "2020-07-24 14:04:32", "model" : "SwitchDoc Labs F007TH Thermo-Hygrometer", "device" :
233, "modelnumber" : 5, "channel" : 3, "battery" : "OK", "temperature_F" : 71.000, "humidity" : 42,
"mic" : "CRC"}

This is the raw data: {"time" : "2020-07-24 14:04:32", "model" : "SwitchDoc Labs F007TH Thermo-Hygrometer", "device" : 233, "modelnumber" : 5, "channel" : 3, "battery" : "OK", "temperature_F" : 71.000, "humidity" : 42, "mic" : "CRC"}

{"time" : "2020-07-24 14:04:46", "model" : "SwitchDoc Labs FT0300 AIO", "device" : 12, "id" : 0, "batterylow" : 0, "avewindspeed" : 13, "gustwindspeed" : 20, "winddirection" : 245, "cumulativerain" : 1353, "temperature" : 1190, "humidity" : 27, "light" : 52649, "uv" : 33, "mic" : "CRC"}

This is the raw data: {"time" : "2020-07-24 14:04:46", "model" : "SwitchDoc Labs FT0300 AIO", "device" : 12, "id" : 0, "batterylow" : 0, "avewindspeed" : 13, "gustwindspeed" : 20, "winddirection" : 245, "cumulativerain" : 1353, "temperature" : 1190, "humidity" : 27, "light" : 52649, "uv" : 33, "mic" : "CRC"}

{"time" : "2020-07-24 14:04:46", "model" : "SwitchDoc Labs FT0300 AIO", "device" : 12, "id" : 0, "batterylow" : 0, "avewindspeed" : 13, "gustwindspeed" : 20, "winddirection" : 245,

"cumulativerain" : 1353, "temperature" : 1190, "humidity" : 27, "light" : 52649, "uv" : 33, "mic" : "CRC"}

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What does the JSON from the Weather Sensors mean?

The testWirelessSensors.py python3 program reads in the 433MHz signals into the Raspberry Pi, decodes them and formats the results as a JSON packet that will be provided to SkyWeather2 for processing.

There are two types of packets that are received. First are the radio packets from the Indoor Temperature and Humidity Sensors (SwitchDoc Labs F007TH). Remember that you can have up to 8 of these in your SkyWeather System (Garden Shed, in house, in basement, etc.)

```
{"time" : "2020-07-24 14:04:32", "model" : "SwitchDoc Labs F007TH Thermo-Hygrometer", "device" :
233, "modelnumber" : 5, "channel" : 3, "battery" : "OK", "temperature_F" : 71.000, "humidity" : 42,
"mic" : "CRC"}
```

This JSON package is self-explanatory. The temperature is always sent down as F, but SkyWeather2 will translate this to C if "metric" is selected in SkyWeatherConfigure.

The second packet is from the Main Weather Sensor (SwitchDoc Labs FT0300 AIO) and contains a lot of information:

```
{"time" : "2020-07-24 14:04:46", "model" : "SwitchDoc Labs FT0300 AIO", "device" : 12, "id" : 0,
"batterylow" : 0, "avewindspeed" : 13, "gustwindspeed" : 20, "winddirection" : 245,
"cumulativerain" : 1353, "temperature" : 1190, "humidity" : 27, "light" : 52649, "uv" : 33, "mic" :
"CRC"}
```

The values and units are:

- avewindspeed (to get m/s, divide by 10)
- gustwindspeed (to get m/s, divide by 10)
- windirection (degrees)
- temperature (to get F, subtract 400 and divide by 10)
- humidity (%)
- cumulativerain (to get mm, divide by 10)
- light (Lux)
- UV (UV Index)

Next we move to testing of the optional Laser Air Quality Sensor. Skip to the next section if you don't have the Laser Air Quality Sensor.

Installing your Optional Laser Air Quality Sensor

Step 1: Turn off your Raspberry Pi if you have it turned on.

Step 2: Plug in the Grove Cable (Part J) into the Grove connector on the Laser Air Quality Sensor (Part I).



Step 3: Plug the other end of the Grove Cable into the Grove Connector market "D20/D21 Dust Sensor" on the SkyWeather2 Hat Board (Part H).





You have completed the Assembly of the optional Laser Air Quality Sensor.

Testing the Air Quality Sensor

Step 1: Power up your Raspberry Pi and get a terminal window.

Step 2: Type the following into the terminal window:

cd cd SDL_Pi_SkyWeather2 sudo python3 testDustHM3301.py

You will see something like this on your terminal window.

```
pi@SwitchDocLabs:~/SDL_Pi_SkyWeather2 $ sudo python3 testDustHM3301.py
SkyWeather2.JSON File does not exist
b''
config.DustSensorSCL= 20
config.DustSensorSDA= 21
data= [4, 5, 7, 4, 5, 7]
PM1.0 Standard particulate matter concentration Unit:ug/m3 = 4
PM2.5 Standard particulate matter concentration Unit:ug/m3 = 5
PM10 Standard particulate matter concentration Unit:ug/m3 = 7
PM1.0 Atmospheric environment concentration ,unit:ug/m3 = 4
PM2.5 Atmospheric environment concentration ,unit:ug/m3 = 5
PM10 Atmospheric environment concentration ,unit:ug/m3 = 5
PM10 Atmospheric environment concentration ,unit:ug/m3 = 5
```

AQI= 21

The AQI number is shown at the bottom. If you see something like this, you are ready to go!

Configuring your SkyWeather2 System

Further information about these configuration screens are given in the "SkyWeather2 Configuration and Operations" Manual.

Step 1: Open up SkyWeatherConfigure by typing this:

sudo python3 SkyWeatherConfigure.py

You will see something like this:

```
pi@SwitchDocLabs:~/SDL_Pi_SkyWeather2 $ sudo python3 SkyWeatherConfigure.py
SkyWeatherConfigure.py:16: DeprecationWarning: AppURLopener style of invoking requests is
deprecated. Use newer urlopen functions/methods
    myURLOpener = AppURLopener()
remi.server INFO Started httpserver <u>http://0.0.0.0:8001/</u>
```

Now open up a browser window (either on the Raspberry Pi or on another computer on your local WiFi network) and enter this URL:

On your Raspberry Pi: http://127.0.0.1:8001/

On another computer type: <u>http://xxx.xxx.xxx.8001/</u>

Where "xxx.xxx.xxx" is the IP address of your Raspberry Pi that you wrote down above.

You will see something like this screen on your browser:



Step 2: Click on the WS-WU button:

You will see a screen similar to this:

SkyWeathe Version 00	er2 Configur 2 Your Wo	nation Tool	eat	he	r	Save F	Reset to Def	Cancel aults txit	
DMW	MTN	PSMax	WS-WU	в-тв	Pins	MQTTR	Camera		
WeatherS	TEM / Weat	therUnderG	round Config	guration Ta	ıb				
Weath	erSTEM	Confi	gurati	on					
Enable	WeatherST	EM							
Interval	l betwee	n pictur	es (seco	nds)					
60									
SkyWeather Station Key									
Month	owlindo		d Conf	i mumo	Lion				
weath	erunde	IGroun	u coni	rgura	CION				
Enable	WeatherUn	derground							
Station	ID								
KWXXXXX									
Station	Кеу								
YYYYYY									

Check the "Enable WeatherSTEM" check box and if you are going to use WeatherSTEM, then check the "Enable WeatherSTEM" box if you want to display your SkyCam on WeatherSTEM (see more information about WeatherSTEM below).

Put your SkyWeather2 Station Key (the SkyWeather Serial Number on your packing slip) in the "SkyWeather Station Key" box.

Continue with Step 3 below.

Finding your SkyWeather2 Serial Number in your SkyWeather System

When you buy a Weather SkyWeather Kit, you will receive an 8 character serial number that you will use to link your weather station with WeatherSTEM. This 8 character code (also known as the **device key**) will be entered into both the SkyWeather software and into the WeatherSTEM website. Your code will look

something like this: X7d3dkkk. Don't use this example code in your configuration file. It will not work. Do not use the serial number in the picture below. It will not work.

You will find your SkyWeather Serial Number on your packing slip (this one won't work).



Step 3: Click on the PSMax tab on the SGSConfigure browser window. Put the altitude of your station in meters in the "Station Height in Meters" to make your sea level barometric pressure more accurate.

Nervice Reset to Defaults Save and Exit Number of the cloud Num the cloud <
Source Save and Exit DMW MTN PSMax WS-WU B-TB Pins MQTTR Camera Pixel / NeoPixel / SolarMAX Configuration Tab Pixel / NeoPixel LED Support _Enable Pixel/NeoPixel Solar Max Configuration _solarMAX Present
DMW MTN PSMax WS-WU B-TB Pins MQTTR Camera Pixel / NeoPixel / SolarMAX Configuration Tab
Pixel / NeoPixel / SolarMAX Configuration Tab Pixel/NeoPixel LED Support Enable Pixel/NeoPixel Solar Max Configuration SolarMAX Present LEAD
Pixel/NeoPixel LED Support Enable Pixel/NeoPixel Solar Max Configuration SolarMAX Present LEAD
Enable Pixel/NeoPixel Solar Max Configuration SolarMAX Present LEAD
Solar Max Configuration SolarMAX Present LEAD ~
SolarMAX Present
LEAD 🗸
Station Height in Meters
626.0
Sunlight Gain
Low ~

Step 4: Now click on "Save and Exit" button. Your JSON configuration file is now in your directory. Restarting the configuration program will read this file in to begin, if it is there. Delete it if you want to start over. If you want to look at the configuration file, type the following command:

more SkyWeather2.JSON

You will see something similar to this:

```
pi@SwitchDocLabs:~/SDL_Pi_SkyWeather2 $ more SkyWeather2.JSON
{"key": "value", "ProgramName": "SkyWeather2", "ConfigVersion": "001", "SWDEBUG"
: false, "enable_MySQL_Logging": false, "MySQL_Password": "password", "enable_WL
AN_Detection": false, "PingableRouterAddress": "192.168.1.1", "mailUser": "youru
sername", "mailPassword": "yourmailpassword", "notifyAddress": "you@example.com"
, "fromAddress": "yourfromaddress@example.com", "enableText": false, "textnotify
Address": "yournumber@yourprovider", "runLEDs": false, "SolarMAX_Present": false
, "SolarMAX_Type": "LEAD", "BMP280_Altitude_Meters": "626.0", "Sunlight_Gain": "
Low", "USEWEATHERSTEM": false, "INTERVAL_CAM_PICS_SECONDS": "60", "STATIONKEY":
    "", "WeatherUnderground_Present": false, "WeatherUnderground_StationID": "KWXXX
XX", "WeatherUnderground_StationKey": "YYYYY", "USEBLYNK": false, "BLYNK_AUTH":
    ", "AS3935_Lightning_Config": "[2,1,3,0,3,3]", "DustSensorSCL": "20", "DustSen
sorSDA": "21", "DustSensorPowerPin": "12", "GPIO_Pin_PowerDrive_Sig1": "4", "GPI
O_Pin_PowerDrive_Sig2": "4", "WATCHDOGTRIGGER": "6", "REST_Enable": false, "Came
ra_Night_Enable": false, "Camera_Rotation": 0, "MQTT_Enable": false, "MQTT_Serve
r_URL": "", "MQTT_Port_Number": "5900", "MQTT_Send_Seconds": "500", "English_Met
ric": false}
```

All of the other values and configuration screens are shown in the "SkyWeather2 Configuration and Operations Manual".

Continue your configuration below if you want to use WeatherSTEM and if not, skip to the Testing SkyWeather2 section below.

What is WeatherSTEM?

Empowering teachers to create STEM lessons, activities, and assessments from real-world weather

EDUCATORS: WeatherSTEM.com has a tremendous amount of curriculum material available about using WeatherSTEM in your classroom.

More than ever in our history, schools across the United States face the challenge of better preparing students to enter careers where competency in STEM-related subject areas (Science, Technology, Engineering, and Mathematics) is a requirement.

We believe weather provides an excellent foundation for STEM education. It also provides myriad opportunities for exposing students to topics from a plethora of disciplines in the scope of a single activity. Any weather situation, from the most benign scenario where a few cumulus humilus clouds dot the sky to the most intense Category 5 hurricane, can turn into a discussion covering everything from algebra to zoology.

WeatherSTEM is a platform built by Ucompass CEO Edward Mansouri who has a Bachelors degree (Penn State) and Masters degree (Florida State) in Meteorology. Fascinated by weather since childhood, Mansouri

created the WeatherSTEM platform to infuse K-12 STEM curriculum with live data collected by weather instruments, cloud cameras, agricultural probes, and other sensors.

Experience The Data

The WeatherSTEM platform consumes live information to create and deliver interactive activities and assessments. The platform combines data from weather instruments, agricultural probes, Web cameras and other sensors to create immersive science education experiences and an introduction to "Big Data" and computer programming.

How will SkyWeather2 Integrate with WeatherSTEM?

Each SkyWeather2 System station will:

- Publish data and images to its own WeatherSTEM website once per minute
- Store data and images permanently that are accessible via the WeatherSTEM Data Mining Tool
- Integrate data and images into WeatherSTEM's education repository that you and your stakeholders will have access to
- Publish data and images to the WeatherSTEM SkyWeather social media platform integrated with Twitter, Facebook, and YouTube
- Create daily time-lapse "sky movies"
- Integrate data into WeatherSTEM's Safety Platform featuring lightning alerts and other important situational awareness notifications
- Offer the capability for real-time, moment by moment data streaming
- Enable real-time access to the data via WeatherSTEM's API
- So much more!

Setting up your WeatherSTEM Account

Your WeatherSTEM account is where you register your SkyWeather2 station for the WeatherSTEM cloud data storage and display.

Go to "skyweather.weatherstem.com" and you will see the screen below:

SkyWeather								
customerservice@s	witchdoc.com							
••••••	1~							
Lo	g in							
C Remember me	Forgot Password?							
Register a SkyWeather Device								

Click on "Register a SkyWeather Device" Fill out the form, paying special attention to the SkyWeather device key (your serial number from the SkyWeather sticker on your SkyWeather2 packing slip above.

Register Your	SkyWeather Device with 🛷 /!
First Name	
Enter First I	Name
_ast Name	
Enter Last N	Name
E-Mail Address	
Enter E-Ma	il Address
Password	
Enter Pass	word
Repeat Passwo	rd
Repeat Pas	sword
SkyWeather De	vice Key
Enter SkyW	leather Device Key
Agree to th	e terms and conditions

Return to Login Screen

Respond to the email from <u>skyweather@weatherstem.com</u> to complete linking your account.

Click on the link in the email and then login to your account.

Add the name of your station (Xandau, Palm Springs, CA – Paris, France or something like that) and then the handle of the station. The handle is what your station is called in URLs.

Select your location on the map on the right.





You can add additional SkyWeather2 stations from the add station links if you want to have more than one SkyWeather2 station on your account

Now to the final set of tests.

Final Testing of SkyWeather2

Checking I2C Connections

Open a terminal window and type the following:

sudo i2cdetect -y 1

You will see something very similar to this:

pi@S	Swit	chI	DocI	Lab	s:~,	/SDI	L Pi	i sl	ky₩e	eatl	ner2	2\$	suc	do :	i2co	detect	: -y	1
	0	1	2	3	4	5	6	7	8	9	a	b	С	d	е	f		
00:																		
10:																		
20:																		
30:																		
40:																		
50 :																		
60 :																		
70:								77										

That is our friendly barometer on the SkyWeather2 Hat Board hanging out at I2C address 0x77.

Starting SkyWeather2

Open a terminal window and type the following:

```
cd
cd SDL_Pi_SkyWeather2
sudo python3 SkyWeather2.py
```

You will see something very similar on your terminal window as below:

```
pi@SwitchDocLabs:~/SDL_Pi_SkyWeather2 $ sudo python3 SkyWeather2.py
./SkyWeather2.JSON File exists
```

```
b''

b''

BMP280: Present

SkyCam: Present

AS3935: Not Present

OLED: Not Present

SunAirPlus/SunControl: Not Present

SolarMAX: Not Present

DustSensor: Present

UseBlynk: Not Present

UseBlynk: Not Present

UseMySQL: Not Present

UseMyTT: Not Present

Check WLAN: Not Present

34 Page

Version 1.3 April 2021
```

WeatherUnderground: UseWeatherStem:	Not Present Not Present		
Scheduled Jobs			
######			
Jobstore default: patTheDog (trigger: readWiredSensors (t tick (trigger: inter read_AQI (trigger: barometricTrend (tr writeWeatherRecord writeITWeatherRecord rebootPi (trigger: PST)	<pre>interval[0:00:10], nex rigger: interval[0:00:3 rval[0:01:00], next run interval[0:02:00], next rigger: interval[0:15:00 (trigger: interval[0:15 d (trigger: interval[0:15 cron[day='5-30/5', hour</pre>	t run at: 2020-12-04 08:30:3 a), next run at: 2020-12-04 a at: 2020-12-04 08:31:24 PST c run at: 2020-12-04 08:32:24 b), next run at: 2020-12-04 0 c:00], next run at: 2020-12-0 c:15:00], next run at: 2020-12 c='0', minute='4'], next run	4 PST) 08:30:54 PST)) PST) 8:45:24 PST) 4 08:45:24 PST) -04 08:45:24 PST) at: 2020-12-05 00:04:00
starting 433MHz scannin ###### Main Weather Sensors Fo Indoor Weather Sensors Tick! The time is: 2020	.g vund Found 0-12-04 08:31:24.846078		

A few things to note. SkyWeather2 goes through a series of equipment detection routines that pick up the default and optional weather instruments. With this initial kit, you should see the BMP280 and SkyCam as Present, and nothing else. If you don't see these two devices, go back and check all your connections, especially make sure you have the SkyWeather2 Hat Board properly aligned (missing BMP280) or the Camera cables properly plugged in (missing SkyCam).

You have now completed testing and initial configuration. Proceed to the SkyWeather2 Configuration and Operations Manual for a full explanation of all the available options. If you are planning on putting the Raspberry Pi outside, proceed to the "SkyWeather2 Weatherproofing, Assembly and Test Manual" on the SkyWeather2 Product Page. Your SkyWeather2 Station is running!

Testing the Optional WeatherSTEM Connection.

If you have configured your WeatherSTEM connection, after your SkyWeather2 station has been running for about 10 minutes, you will see your data appear.

You are now connected to WeatherSTEM!

Go to the link shown on your control page (see below – yours will be a different link) and you are now connected to WeatherSTEM.

Handle Solutions to the station at https://skyweather.weatherstem.com/test Location Solutions Solutions State At the link you will see a display like this:



Oh and one more exciting thing. After you station has been up for more than one day, click on the SkyVideo item and you will see time lapse videos that are generated on a daily basis and archived for a week.

Other WeatherSTEM Features

WeatherSTEM has a number of different features. It keeps historical information, generates graphs, generates a daily time lapse and has a complete API (Application Programming Interface) for more advanced programmers. Explore the WeatherSTEM system!

EDUCATORS: WeatherSTEM.com has a tremendous amount of curriculum material available about using WeatherSTEM (and SkyWeather) in your classroom.

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.