OurWeather V2 and WeatherPlusV2 Advanced Usage Manual

January 2020

Revisions

Version 3.0 - January 2018 - Added Alexa to OurWeather Interface Information

Using the REST Interface built into OurWeather

Set up your OurWeather system as shown in the OurWeather Assembly Manual.

Testing the REST Interface

Now that you have OurWeather setup and working, it’s time to test the first REST command.

Open a browser (Chrome, Safari, Internet Explorer or Edge - if your browser doesn’t work, download and install Chrome) and type in the following (substitute your OurWeather IP address for 192.x.x.x):

http://192.168.1.118/FullDataString

returns:

```
{"FullDataString":
"22.08,30.01,27.68,103266.00,493.28,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0,1969
-12-31 17:17:50,,752,4,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,V:,WXLMB
,0,,,0,,,0", "id": "1", "name": "OurWeather", "hardware": "esp32", "Controllerboard": "V2",
"connected": true}
```

Which contains a bunch of weather information from the OurWeather station.   Note: Your FullDataString will have more information in it if you are using software version 019 or later.

After doing that, you now have access to all of these REST commands.

The supported REST commands are:

REST Variables

For example, to access the OurWeather REST variables type into a browser:

http://192.168.1.118/FullDataString

returns:

```
{"FullDataString":
"21.30,36.70,25.63,101714.00,620.44,0.00,0.00,0.00,0.70,0.00,0.00,0.00,0.00,0.00,0.00,0,04/2
4/2016 11:56:10,SwitchDoc Labs", "id": "1", "name": "OurWeather", "connected": true}
```

REST Variables

Variable	Return	Example
OurWeatherTime	OurWeather Time and Date	`{"OurWeatherTime": "05/21/2016 10:09:59", "id": "1", "name": "OurWeather", "connected": true}`
FullDataString	String of Weather Data	See description of the FullDataString after this table
FirmwareVersion	Which software version is OurWeather running	`{"FirmwareVersion": "016", "id": "1", "name": "OurWeather", "connected": true}`
IndoorTemperature	Temperature sensor on BMP280 on the WeatherPlus board. Always reports in degrees C.	`{"IndoorTemperature": 27.47, "id": "1", "name": "OurWeather", "connected": true}`
BarometricPressure	Barometric Pressure sensor on BMP280 on the WeatherPlus board. Always reports in Pascals.	`{"BarometricPressure": 100958.00, "id": "1", "name": "OurWeather", "connected": true}`

REST Variables

Altitude	Altitude calculated from BMP280. Always reports in meters.	{"Altitude": 682.52, "id": "1", "name": "OurWeather", "connected": true}
OutdoorTemperature	Outdoor Temperature from the AM2315. Always reports in degrees C.	{"OutdoorTemperature": 23.60, "id": "1", "name": "OurWeather", "connected": true}
OutdoorHumidity	Outdoor Relative Humidity from the AM2315. Always reports in % RH.	{"OutdoorHumidity": 35.70, "id": "1", "name": "OurWeather", "connected": true}
CurrentWindSpeed	Current Wind Speed from the WeatherRack - Always reports in kph (kilometer per hour).	{"CurrentWindSpeed": 0.00, "id": "1", "name": "OurWeather", "connected": true}
CurrentWindGust	Current Wind Speed from the WeatherRack - Always reports in kph (kilometer per hour).	{"CurrentWindGust": 18.00, "id": "1", "name": "OurWeather", "connected": true}

REST Variables

CurrentWindDirection	Current Wind Direction from the WeatherRack - Always reports in degrees. 0 = due North.	{"CurrentWindDirection": 90.00, "id": "1", "name": "OurWeather", "connected": true}
EnglishOrMetric	Is the Weather DISPLAY set to English or Metric units. 0 means English units, 1 means Metric units. The REST interface always sends Metric unit.	{"EnglishOrMetric": 0, "id": "1", "name": "OurWeather", "connected": true}
RainTotal	Current Rain Total since last reboot of WeatherPlus. Always reports in mm.	{"RainTotal": 0.28, "id": "1", "name": "OurWeather", "connected": true}
WindSpeedMin	Wind Speed Minimum as calculated by WeatherPlus over the past 50 seconds. Always reports in kph.	{"WindSpeedMin": 0.00, "id": "1", "name": "OurWeather", "connected": true}
WindSpeedMax	Wind Speed Maximum as calculated by WeatherPlus over the past 50 seconds. Always reports in kph.	{"WindSpeedMax": 2.50, "id": "1", "name": "OurWeather", "connected": true}

REST Variables		
WindGustMin	Wind Gust Minimum as calculated by WeatherPlus over the past 50 seconds. Always reports in kph.	`{"WindGustMin": 0.00, "id": "1", "name": "OurWeather", "connected": true}`
WindGustMax	Wind Gust Maximum as calculated by WeatherPlus over the past 50 seconds. Always reports in kph.	`{"WindGustMax": 6.50, "id": "1", "name": "OurWeather", "connected": true}`
WindDirectionMin	Wind Direction Minimum as calculated by WeatherPlus over the past 50 seconds. Always reports in degrees - 0 is due north.	`{"WindDirectionMin":  0.00, "id": "1", "name": "OurWeather", "connected": true}`
WindDirectionMax	Wind Direction Minimum as calculated by WeatherPlus over the past 50 seconds. Always reports in degrees - 0 is due north.	`{"WindDirectionMax":  275.00, "id": "1", "name": "OurWeather", "connected": true}`
AirQualitySensor	Instantaneous Air Quality. Reports a value from 0 (very clean) to ~32000 (very dirty). See the Our Weather Air Quality Extender Manual on www.switchdoc.com on the store.	`{"AirQualitySensor": 1400, "id": "1", "name": "OurWeather", "connected": true}`

REST Variables		
ThunderBoardLast	Returns all the current lightning information from OurWeather	`{"ThunderBoardLast": "20 km,03/31/2018 14:37:54,20,Lightning detected,03/31/2018 14:37:54,1", "id": "1", "name": "OurWeather", "connected": true}`
ThunderBoardParams	Returns the current ThunderBoard Parameters	`{"ThunderBoardParams": "2,1,7,0,2,2", "id": "1", "name": "OurWeather", "connected": true}`

Format of the specialized JSON for the ThunderBoardLast response:

as3935_LastLightning - Distance of the last lightning strike (e.g. 7km)
as3935_LastLightningTimeStamp - Time of the last lightning strike
as3935_LastLightningDistance - integer distance (e.g. 7)
as3935_LastEvent - The last event recorded by the ThunderBoard (see below)
as3935_LastEventTimeStamp - Time Stamp of last event
as3835_LightningCountSinceBootup - Number of lightning strikes since bootup

Format of the specialized JSON for the ThunderBoardParms response:

as3935_NoiseFloor - Current Noise Floor (0-7)
as3935_Indoor - Indoor (0) Outdoor (1)

as3935_TuneCap - Current Tune Cap value for the AS3935 (0-15)
as3935_DisturberDetection - 0 - detect and report disturbers 1 - do not report
as3935_WatchdogThreshold - WatchDog Threshold (0-15)
as3935_SpikeDetection - Spike Rejection Value (0-15)

Structure of the FullDataString Return Value

```
{"FullDataString":
"21.30,36.70,25.63,101714.00,620.44,0.00,0.00,0.00,0.70,0.00,0.00,0.00,0.00,0.00,0.00,0,04/2
4/2016 11:56:10,SwitchDoc
Labs,0,4,3.62,35.20,2.78,0.00,4.96,25.20,0.00,0.00,0.00,0.00,0.00,0.00,V:0,WXLMB ,", ", "id":
"1", "name": "OurWeather", "connected": true}
```

The values in the FullDataString are all in metric.   See metric units in the above table.

- Outdoor Temperature
- Outdoor Humidity
- Indoor Temperature
- Barometric Pressure
- Altitude
- Current Wind Speed
- Current Wind Gust
- Current Wind Direction
- Rain Total
- Wind Speed Minimum
- Wind Speed Maximum
- Window Gust Minimum
- Window Gust Maximum
- Wind Direction Minimum
- Wind Direction Maximum
- Is Display English (1) Or Metric (0)
- Current Date/Time on OurWeather
- OurWeather Station Name
- Current Air Quality Sensor Reading
- Current Air Quality Qualitative Reading
- SunAIrPlus Battery Voltage
- SunAIrPlus Battery Current
- SunAirPlus Solar Panel Voltage
- SunAirPlus Solar Panel Current
- Load Voltage (into OurWeather)
- Load Current (into OurWeather)
- WXLink Battery Voltage
- WXLink Battery Current

- WXLink Solar Panel Voltage
- WXLink Solar Panel Current
- Always 0.00
- WXLink Load Current
- WXLink AM2315 Temperature Validation IVF: Means Invalid Temperature Found, V: Means Valid found
- WXLink Message Status: WXLMG - WXLink Last Message Good, WXLMB - WXLink Last Message Bad
- MQTT Enabled (1) or Not (0)
- as3935_LastLightning - Distance of the last lightning strike (e.g. 7km)
- as3935_LastLightningTimeStamp - Time of the last lightning strike
- as3935_LastLightningDistance - integer distance (e.g. 7)
- as3935_LastEvent - The last event recorded by the ThunderBoard (see below)
- as3935_LastEventTimeStamp - Time Stamp of last event
- as3835_LightningCountSinceBootup - Number of lightning strikes since bootup
- Controllerboard - Not present for V1, V2 for Version 2 (V2 - V050)
- HDC1080 Humidity (V2 -V050 - if 0.0 if not present)
- Current RSSI on Wifi (V2 - V053)
- SolarMAX Lead Acid Present (1) or (0) if not (V2 - V053)
- SolarMAX LiPo Present (1) or (0) if not (V2 - V053)

Note: As more devices are added and supported by OurWeather, this string will continue to increase beyond these values, but only at the end of the string.

REST Commands

REST Commands			
Variable	**Function**	**Parameters**	**Returns**
arduino	For ArduinoiConnect	Not Implemented	
	External commands		

REST Commands

led	Controls red LED connected to GPIO0 on the WeatherPlus Board	http://192.168.1.118:/LED?params=1 1 means on, 0 means off	`{"return_value": 1, "id": "1", "name": "OurWeather", "connected": true}`
setID	sets the ID of the OurWeather at the IP address. Returned in “id” field	http://192.168.1.118/setID?params=2 Parameter is the new ID. Alphanumeric allowed	`{"return_value": 1, "id": "2", "name": "OurWeather", "connected": true} - Note new ID#`
resetOurWeather	Restarts OurWeather to default. Works most of the time on the ESP8266.	http://192.168.1.118/resetOurWeather?params=adminpassword Paramater is administration password	return_value will be 1 if reset command was accepted, 0 if not (as in password failure)
setAdminPassword	reset Administration Password	http://192.168.1.118/setAdminPassword?params=oldpassword,newpassword Parameters are old and new password, separated by a “,”	return_value will be 1 if the command succeeded and 0 if it did not (such as invalid password)

REST Commands			
setDateTime	sets Data and Time on the DS321 Real Time Clock on WeatherPlus	http://192.168.1.118/setDateTime?params=password,Jan 31 2016,14:03:00 Admin password is first parameter. Note the exact non-tolerant format of the data time. Spaces are important.	As of OurWeather software version 017, return_value will be 0 if password fails, 2 if the date or time is bad and 1 if the set date/time succeeds
resetToDefaults	reset Our Weather to default values	Not Implemented	Not Implemented
resetWiFiAccessPoint	resets OurWeather Access Point values to initial values. OurWeather will be at 192.168.1.4 and act as an access point. See OurWeather Assembly Manual to set up.	http://192.168.1.118/resetWiFiAccessPoint?params=adminpassword Parameter is administration password	return_value is 1 if it succeeds (and you will never receive it if it does) or 0 if the password fails.
updateOurWeather	Does an Over-The-Air (OTA) on OurWeather from the latest software located at www.switchdoc.com	http://192.168.1.118/?params=adminpassword Parameter is administration password	return_value is 0 if the password fails, 1 if the update failed, 2 if there are no updates, 3 if it succeeds. You generally will not receive 3 as the ESP8266 will be rebooting.
	External Interfaces		
enableCWOP	Enables the CWOP interface for OurWeather	Not Implemented	Not Implemented

REST Commands

enableTwitter	Enables the Twitter Interface for OurWeather	Not Implemented	Not Implemented
	Weather Display Functions		
WeatherSmall	Sets the OurWeather OLED display to small characters	http://192.168.1.118/WeatherSmall	return_value is 1
WeatherMedium	Sets the OurWeather OLED display to medium characters	http://192.168.1.118/WeatherMedium	return_value is 1
WeatherLarge	Sets the OurWeather OLED display to large characters	http://192.168.1.118/WeatherLarge	return_value is 1

REST Commands			
WeatherDemo	Sets the OurWeather OLED display to Demo mode. Senses and moves fast showing values that people can quickly change like outside temperature/ humidty, wind speed, direction and rain. Used in classroom demonstrations where the instruments are located for people to change and turn.	http://192.168.1.118/ WeatherDemo	return_value is 1
EnglishUnits	Sets the OurWeather OLED display to show English Units	http://192.168.1.118/ EnglishUnits	return_value is 1
MetricUnits	Sets the OurWeather OLED display to show Metric	http://192.168.1.118/ MetricUnits	return_value is 1

REST Commands			
~~EnablePubNub~~ (obsoleted as of V053 - V2)	Enable/disable PubNub (Alexa) on OurWeather - sets the Pub and Sub keys	http://http://192.168.1.102/EnablePubNub?params=admin,1,pub-c-cc4d6662-190a-42af-a14d-3be4e6040ff6,sub-c-47725a16-f0e7-11e7-9869-a6bd95f83dd1 Admin password is first parameter. Second parameter is Enable (1) or Disable (0) Alexa. Third Parameter is the MQTT PubNub Publish Key and the Fourth Parameter is the MQTT PubNub Subscribe Key	As of OurWeather software version 026, return_value will be 0 if password fails, 1 if the set pub/sub key succeeds
~~SendPubNubState~~ (obsoleted as of V053 - V2)	Sends an MQTT Message to the PubNub site. Great to start things out.	http://192.168.1.102/SendPubNubState?params=admin First Parameter is the Admin password	return value is 1

setThunderBoardParams		http://192.168.1.146/setThunderBoardParams?params=admin,2,1,7,0,2,2
		The numbers after the password contain the parameters to be set. Some order as reported in the ThunberBoardParm variable above
			return value 0 if fails password
			return value of 1 if successful
			return value of 2 means illegal parameter value

REST Commands			
EnableMQTT (V053, V2)	Enable / Disable MQTT and set User specifications	http://192.168.1.31/EnableMQTT?params=admin,1,192.168.1.24,1883,500 First Parameter is the admin password. Second is URL (can be an external domain name). Third is the MQTT port number. Fourth is how often to send an MQTT message in seconds. Internally limited to a maximum of every 60 seconds	Reboots OurWeather if successful, no return. Return value 0 if fails password, Return value 2 if illegal parameter value.
SendMQTTState	Send an MQTT message	http://192.168.1.31/SendMQTTState?params=admin First parameter is admin password. Note: If MQTT is not enabled, this command has no effect.	Return value 0 if fails password, Returns value 1 if successful Return value 2 if illegal parameter value.

How to Program Your OurWeather

Download the Arduino IDE 1.6.9 (or higher) to start from arduino.cc

Installation of the IDE

With the new 1.6.9+ releases of the Arduino IDE, it is much simpler to add and manage new boards. In the case of the ESP32, it a simple process. Rather than repeat the tutorial here, we would suggest following the Adafruit tutorial.

Use Version 1.6.9+ of the Arduino IDE for better results.

https://learn.adafruit.com/adafruit-huzzah32-esp32-feather

Make sure you have selected Adafruit ESP32 Feather as the board under the tools menu.

Download the WeatherPlus Software for OurWeather

Move to where you wish to store your Arduino program and use the command line to clone the OurWeather/WeatherPlus software

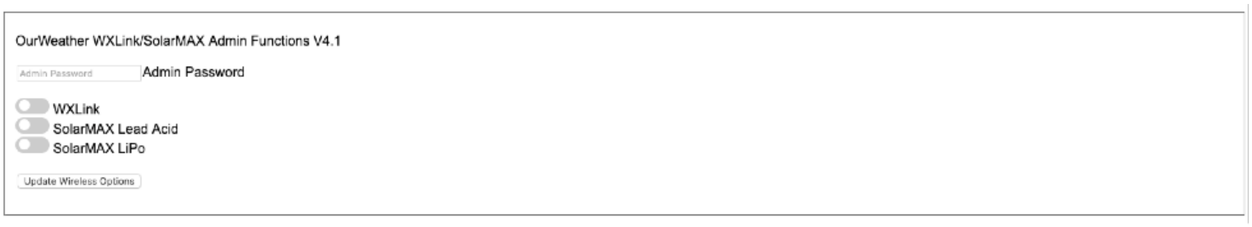
```
git clone https://github.com/switchdoclabs/SDL_ESP32_OurWeather.git
```

This will create a directory called SDL_ESP32_OurWeather.

Now use the Arduino File menu to open the program then Compile and download the program to the WeatherPlusV2 Board .

Make sure you have selected the “Adafruit ESP32 Feather” board under the tools menu.

Settings for WXLink / Solar WXLink



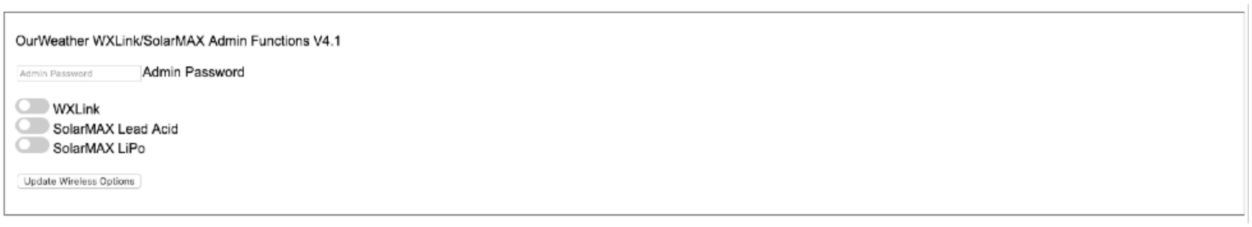
OurWeather WXLink/SolarMAX Admin Functions V4.1

Admin Password

○ WXLink
○ SolarMAX Lead Acid
○ SolarMAX LiPo

On the http://switchdoc.com/OurWeatherAdmin.html link (put in your IP number at the top!) select WXLink, enter your admin password and then hit update wireless options.
See the OurWeather WXLink / Solar WXLink Manual for setup.

Settings for SolarMAX Lipo / SolarMAX Lead Acid



OurWeather WXLink/SolarMAX Admin Functions V4.1

Admin Password Admin Password

○ WXLink
○ SolarMAX Lead Acid
○ SolarMAX LiPo

On the http://switchdoc.com/OurWeatherAdmin.html link (put in your IP number at the top!) select your SolarMAX system (if you have WXLink, you need to enable that again too), enter your admin password and then hit update wireless options.

Setting up the OurWeather Twitter Interface

Not Implemented as of OurWeather Software Version 053

Setting up the OurWeather CWOP Interface

Not Implemented as of OurWeather Software Version 053

Setting up the OurWeather WeatherUnderground Interface

See the OurWeather WeatherUnderground Manual