1. Connecting mySQMWEB to mySQMPROESP device, and serving trough Apache

Here is how to setup mySQMWEB on a device running debian Linux, anything from a Raspberry Pi 3/4 to PC will work.

This section assumes you have the basic Apache installation up.
Here are some Apache2 basics on help.ubuntu HTTPD - Apache2 (https://help.ubuntu.com/lts/serverguide/httpd.html)
You do not need any ssl, as there is no login on the mySQMWEB page.

I will also assume that you are on a distro with python installed.

To get mySQMWEB up from here, then.

1.1. Install dependencies

`sudo apt update`

`sudo apt install python-rrdtool python-simplejson python-utidylib`

.2. Extract the mySQMWEB folder, and copy to your home directory.

`cp -r path/to/your-download/mySQMWEB ~/`

Now set all .py and .sh files as executable:

```
chmod +x ~/mySQMWEB/*.py
chmod +x ~/mySQMWEB/*.sh
```

1.3. Create CHART folder and set permissions and owner

```
mkdir ~/mySQMWEB/html/CHART
chmod -R 775 ~/mySQMWEB/html
chown -R [your_username]:www-data ~/mySQMWEB/html
```

1.4. Create symlink to html directory.

This assumes default apache root directory = /var/www/html, it could also be /var/www

```
# Do not use ~/mySQMWEB or $HOME/mySQMWEB, the symlink needs fullpath
sudo ln -s /home/[your_username]/mySQMWEB/html /var/www/html/sqm
```

1.5. Reload apache

```
sudo systemctl reload apache2.service
```

You should now edit the file ~/mySQMWEB/SQMconfigDN.py and set your defaults and connection options.
Edit only the parts in square brackets.

1.6. Connection

The name and IP-address of the mySQMPROESP device are set in:

The IP-address needs to be defined like 'DEVICEPORT = "http://192.168.4.1/"

you_username is the user which was used to install mySQMWEB.

```
DEVICE="mySQMPROESP"
DEVICEPORT="http://[your_device_ipaddress]"        #i.e. "http://192.168.4.1"
#PATH TO GRAPHs
CHARTPATH="/home/[your_username]/mySQMWEB/html/CHART/"
RRDFILE="/home/[your_username]/mySQMWEB/SQM.rrd"
```

1.7. Defaults

1). You should at least set the site related defaults.

The ALTITUDE and TIMEZONEOFFSET need be defined as a value, not a string, so no quotes.

```
##### SITE RELATED ####
OWNERNAME="[your_name]"
SITENAME="[your_observatory_name]"
ALTITUDE=[your_elevation]
```

2). Sun rise/set info
Site Lat/Long is used to get the sunrise/sunset times from https://sunrise-sunset.org/ via their API.
Use DD with 6 decimal places or the API won't work. (W longitudes as negative).

```
##### SITE RELATED ####
SITELAT = "[your_latitude]"
SITELONG = "[your_longitude]"
TIMEZONEOFFSET = [your_elevation]
```

3). The External Data Related options is for the 'Satellite and SKEW' tab, to get expanded weather information for your area.

There are 3 options for satellite images, choose the one best suited for your location.
Europe, MiddleEast and Western Asia: EUMETSAT,
Eastern Asia, Australia, New Zealand: JMASAT
and for the Americas GOESSAT.

```
##### External Data RELATED ####

#Visit http://weather.uwyo.edu/upperair/sounding.html
#look up the sounding location closest to your site
SOUNDINGSTATION="[your_sounding_station]"
#SATSYSTEM="EUMETSAT"
#SATSYSTEM="JMASAT"
SATSYSTEM="GOESSAT"
#SATSYSTEM="GOESSATANIMATED"
#IMAGETYPE="GEOCOLOR"
```

```
External Data RELATED #####

#EUMETSAT latest image. Choose from:
#https://eumetview.eumetsat.int/static-images/latestImages/
#You can use different images for day and night.
#This is nice but only works at daylight time:
#EUMETSAT_LAST="https://eumetview.eumetsat.int/static-images/latestImages/EUMETSAT_MSG_VIS006Color_CentralEurope.jpg"
#This show rain and ice clouds
#EUMETSAT_LAST="https://eumetview.eumetsat.int/static-images/latestImages/EUMETSAT_MSG_RGBNatColour_CentralEurope.jpg"
#and this cloud cover at IR 39. Works also at night
#EUMETSAT_LAST="https://eumetview.eumetsat.int/static-images/latestImages/EUMETSAT_MSG_IR039Color_CentralEurope.jpg"

# Set your chosen images in EUMETSAT_LAST_DAY= and EUMETSAT_LAST_NIGHT=.
#EUMETSAT_LAST= is a failsafe and should also be set.
EUMETSAT_LAST="https://eumetview.eumetsat.int/static-images/latestImages/EUMETSAT_MSG_RGBNatColour_WesternEurope.jpg"
EUMETSAT_LAST_DAY="https://eumetview.eumetsat.int/static-images/latestImages/EUMETSAT_MSG_RGBNatColour_WesternEurope.jpg"
EUMETSAT_LAST_NIGHT="https://eumetview.eumetsat.int/static-images/latestImages/EUMETSAT_MSG_IR039Color_WesternEurope.jpg"
#EUMETSAT_LAST="http://meteocentre.com/satellite/europe/fr_ir.gif"
```

```
External Data RELATED #####

##JMASAT lastimage: Click the filelist link for your location from:
#https://www.data.jma.go.jp/mscweb/data/himawari/index.html
#Choose your preferred image from one in the first row (00:00 UTC) and copy the URL
#i.e. https://www.data.jma.go.jp/mscweb/data/himawari/img/nzl/nzl_b13_0000.jpg
#For the define use the URL without the last part (0000.jpg): "
#-> https://www.data.jma.go.jp/mscweb/data/himawari/img/nzl/nzl_b13_

JMASAT_LAST="https://www.data.jma.go.jp/mscweb/data/himawari/img/nzl/nzl_dnc_""
JMASAT_LAST_DAY="https://www.data.jma.go.jp/mscweb/data/himawari/img/nzl/nzl_dnc_"
JMASAT_LAST_NIGHT="https://www.data.jma.go.jp/mscweb/data/himawari/img/nzl/nzl_b13_"
```

```
External Data RELATED #####

#All GOES sat images may be found here. https://www.nhc.noaa.gov/satellite.php
#Select GOES-E or W Full Disk and Composite Images under general images.
#Then select your desired coverage and image.
#Click the desired image, it opens in a windows, on the bottom there is a download image link, right-click and copy link address.
#This address needs to be split into two parts, part one is the part before the date/timecode, part two the part after the date/time c
ode.
#The updater script will fill in the middle part.
#Paste this address between the qoutes for you desired day or night image. (and also one for LAST.)
#NOTE: you could also select smaller images than 1200x1200, the links are there ;-)

GOESSAT_LAST_p1="https://cdn.star.nesdis.noaa.gov/GOES16/ABI/SECTOR/se/GEOCOLOR/"
GOESSAT_LAST_p2="_GOES16-ABI-se-GEOCOLOR-1200x1200.jpg"
GOESSAT_LAST_DAY_p1="https://cdn.star.nesdis.noaa.gov/GOES16/ABI/SECTOR/se/GEOCOLOR/"
GOESSAT_LAST_DAY_p2="_GOES16-ABI-se-GEOCOLOR-1200x1200.jpg"
GOESSAT_LAST_NIGHT_p1="https://cdn.star.nesdis.noaa.gov/GOES16/ABI/SECTOR/se/05/"
GOESSAT_LAST_NIGHT_p2="_GOES16-ABI-se-05-1200x1200.jpg"
```

```
External Data RELATED #####

#GOESSATANIMATED displayes an animated gif.
If you want to use another type, change IMAGETYPE define to the desired type.
Visit https://www.star.nesdis.noaa.gov/GOES/fulldisk.php?sat=G16 and choose an image type.
The types can be found in the download link for the image, i.e 'GEOCOLOR' 'AirMass' or '03' for Band 3

GOESSAT_LAST_p1="https://cdn.star.nesdis.noaa.gov/GOES16/ABI/SECTOR/se/GEOCOLOR/"
GOESSAT_LAST_p2="_GOES16-ABI-se-GEOCOLOR-1200x1200.jpg"
GOESSAT_LAST_DAY_p1="https://cdn.star.nesdis.noaa.gov/GOES16/ABI/SECTOR/se/GEOCOLOR/"
GOESSAT_LAST_DAY_p2="_GOES16-ABI-se-GEOCOLOR-1200x1200.jpg"
GOESSAT_LAST_NIGHT_p1="https://cdn.star.nesdis.noaa.gov/GOES16/ABI/SECTOR/se/05/"
GOESSAT_LAST_NIGHT_p2="_GOES16-ABI-se-05-1200x1200.jpg"
```

```
External Data RELATED #####
In 'external.html', configure the 'ClearOutside' forecast with your location's coordinates (Decimal Degrees, 2 decimals).


"http://clearoutside.com/forecast/[your_lat]/[your_long]"
```

Personal styling to the appearance can be done in the CSS stylesheet:
To give the appearance a personal touch, various style settings are available
in the 'style.css' file located in 'mySQMWEB/html/css'

Most of the colors are set with HEX color. See www.color-hex.com (https://www.color-hex.com/216-web-safe-colors/) for inspiration.

Line
1: Background color a set with RGB
2-5: Style 'a' is for the links to the tabs.
6: Style b is used for the 'Time' display. Color and size can be set here.
7: Font setings for style 'a' and 'b'.
8: Style 'c' is for the Title.
9: Style 'd' is for the 'Raining' text.

style.css:

```
1  body {background-color:rgb(20,20,20);}
2  a:link {color:#ccc;}      /* unvisited link */
3  a:visited {color:#ccc;}  /* visited link */
4  a:hover {color:#ccc;}  /* mouse over link */
5  a:active {color:#ccc;}  /* selected link */
6  b {color:#aaa; font-size: 125%;}
7  b,a {font-family: Arial, Helvetica, sans-serif; font-size:large;}
8  c {font-family: Arial, Helvetica, sans-serif; font-size:200%; color: #ccc}
9  d {font-family: Arial, Helvetica, sans-serif; font-size:150%; color: #ccc; text-decoration:none}
10 table, th, td
11 {
12 border: 5px solid transparent;
13 }
```

1.8. Configuring the start script

Before the first run the suntimes json needs to be generated:

```
./getSuntimes.py
```

For the collection of the Satellite image and sounding, an internet connection is needed.
In situations where there is no internet connection available, to prevent errors, the sounding script should be commented out in startSQM.sh:

```
#./sounding.py $EXECNOOUTPUT &
```

mySQMWEB is started by executing the startup script:

```
./startSQM.sh
```

mySQMWEB is stopped by executing the stop script:

```
./stopSQM.sh
```

To start the scripts at boot, edit crontab:

```
crontab -e
```

Append at the end:

```
@reboot cd /home/pi/mySQMWEB && ./startSQM.sh
```

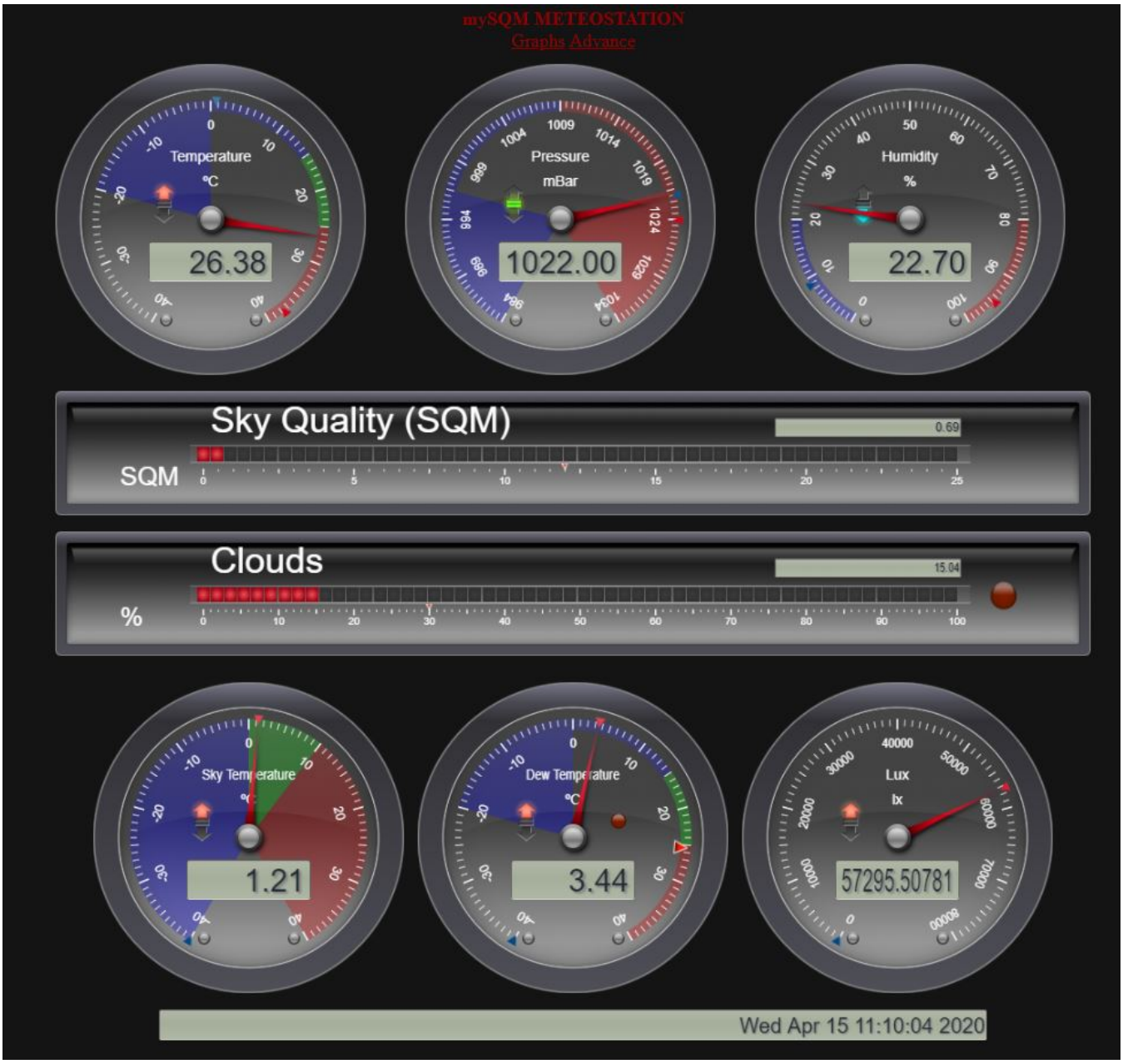
Press CTRL-s (save) and CTRL-x (exit).

On the first run you'll get FAIL notifications for the MaxMinAvg script.
This is normal, the script stores Max, Min and Average values for a period up to 24h.
The FAIL will disappear as soon as there is enough data collected in the RRD file.

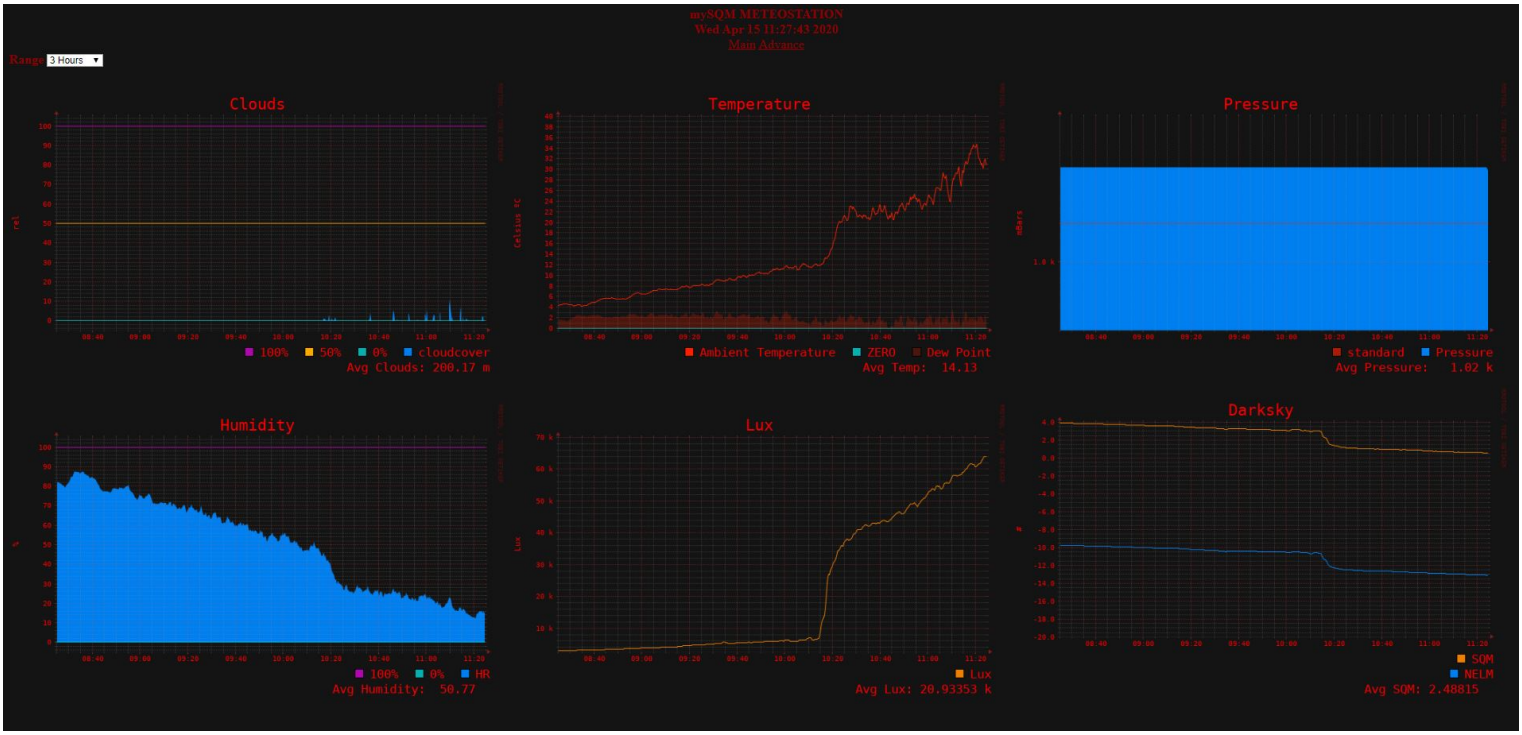
If the scripts don't work.
Check if the .py and .sh files have the 'Executable' property set.
If not set it!

1.9. The mySQMWEB user interface

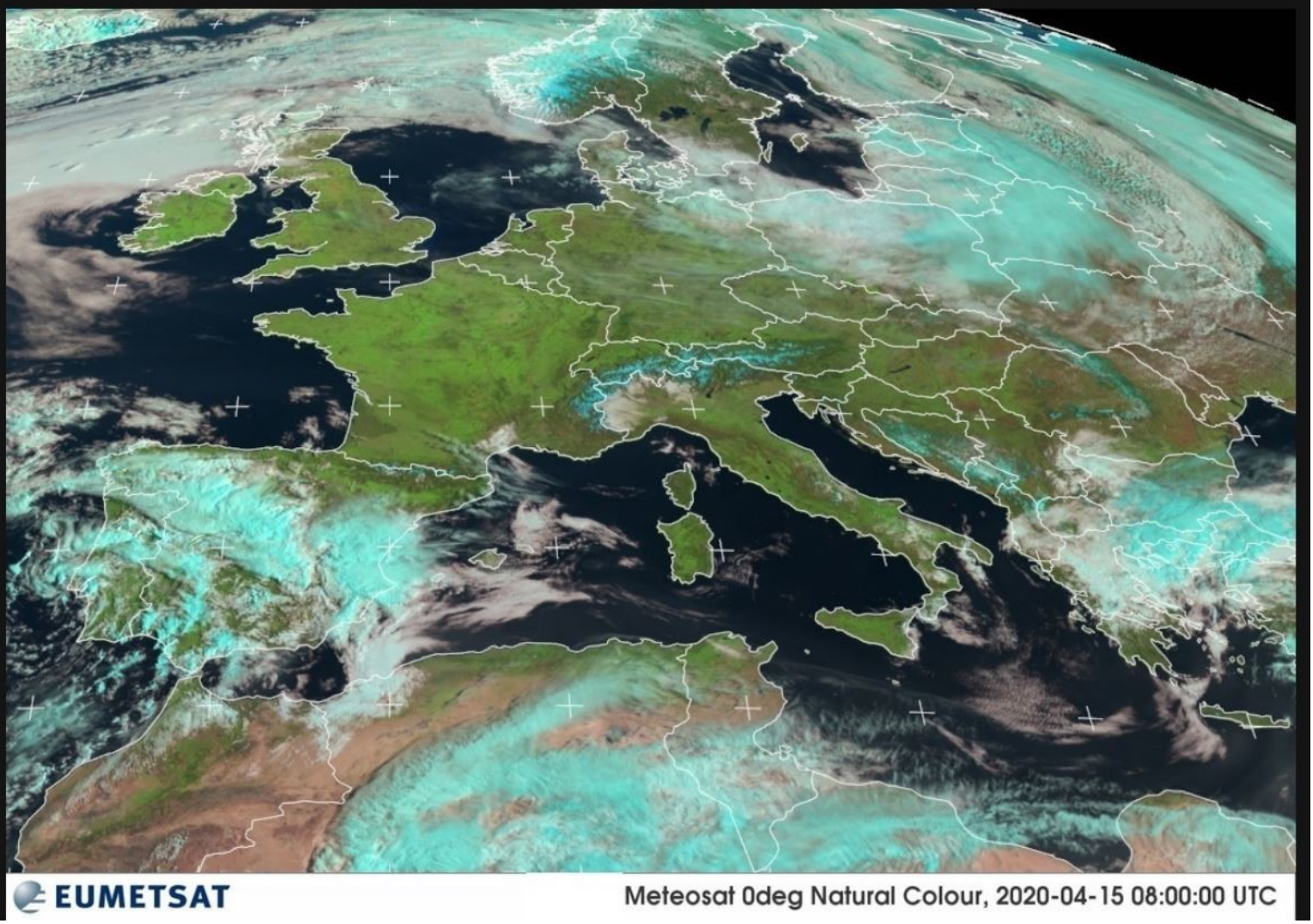
The index shows the current readings and status.



Graps of METEO data, ranging from 3 hours to 1 month back.



EU MET SAT images for your sounding station


EUMETSAT
Meteosat 0deg Natural Colour, 2020-04-15 08:00:00 UTC