Weather Station



Project	Meteorological station aka weather station
Description	A tool to measure things like temperature, humidity and the wind
Status	on hold
Trac	Weatherstation
Contact	fantawams
Participants:	fantawams

Detailed status of the prototypes	
Temperature	Running
Humidity	Running
Wind-force	Planning
Wind direction	Planning
UV radiation	Running
Green energy power source	Planning
Solarpower per day/month/year	Planning
Windpower per day/month/year	Planning
Waterpower per day/month year	Planning
Powerusage	Planning
Communication	RF running unidirectional
Radioactivity	Planning
Aires quality	Planning
Flame detection	Planning
Barometric pressure	Running (over SPI)
Rain quantity	Planning
Lightning detection	Planning
Weather forecast	Planning
E-Ink Display integration	Planning
Status of measurements and whole station	Planning
Status over email by danger	Planning
SpaceApi integration	Planning
Encryption	If possible
Radiostation	Thinking about it
Links for the Docu	Planning

Detailed Description

The weather station is a multiple purpose tool for measuring everything meteorological you want. Be it normal things like temperature and humidity or special and much fancier things like UV-radiation and radioactivity.

Measuring things is already pretty cool, but we also need to have something, where we can look at what we measure. So we are going to need some kind of display. For that purpose we are going to integrate an E-Ink Display with some fancy images, our actual status of our measurements and of course an forecast for the weather itself. The advantage of an E-Ink display is, it only needs an power source if it changes the page and you have always an good view on it no madder how bright the light may be.

Like for everything electrical, we need a good power source for our station. Naturally for the indoor part we use our regular 230V electricity network, but what about our outdoor part. There we probably don't have any electricity. For that purpose we are going to use solar, wind and water power in the day and batteries for the night which are recharged with our green energy in the day.

All that's left now. is a way to get our informations from our measure point to our station. The easiest way to solve this, is to use an cable, but who knows if that's always possible, perhaps the two locations are far away or you just don't have the space for it. So we are going to use wireless communication. For indoors it's the best option to use a 2,4GHz tool, so you may use it with you wifi at home. For outdoors, there is a major problem with the temperature because there might be -20°C at night in winter and most purchasable 2,4GHz tools, stop working probably at 0°C. In this case it's best to use an RF communication, they don't have an really big bandwidth but they work until -20°C and their bandwidth is more than big enough for our purpose.

Now, if all our prototypes work, you can built your own fancy weather station for your own purpose. I hope you will enjoy building it and have success.

Notes

I know there are a tons of ways to get to the mark and i am not saying, my way is the best, but it works for me. If you want an documentation, just click on the the links. In these documentations, you will find the code for the specific modules, an detailed explanation of the code, an list of which parts were used to build the station, schematics for building an PCB and much more. If you really like this project and use the documentation for your own project, it would be nice to make a small Donations to the C3L. So have fun with your own weather station or building something total new.

Software

- http://www.weewx.com/docs/usersguide.htm#fousb
- https://github.com/chubin/wttr.in
- https://www.arduino.cc/
- http://kicad-pcb.org/

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