Weather Station WS-2-Plus

by DJ0ABR

Overview

Most of us have purchased several weather stations. My experiences with these devices are, shall we say, mixed. Often beautiful optics is paired with mediocre function. Especially the range of the sensors could definitely be better. In addition, I always lacked (at least with affordable devices) network capability. This led to the desire to have something really nice, powerful with extensive network connectivity. Of course it has to be affordable and should be buildable for normal hobbyists without SMD soldering station. Finally it is done, the whole thing was not developed overnight, it took its time, but every second of work was a lot of fun and finally the goal was reached. Of course, the system is open for extensions and anyone can add own ideas, but the current state is already fully operational..

the main points:
* easy to build up
* only well obtainable standard components
* few and simple soldering
* high precision of the measured values
* clear user interface in the browser
* full network integration.

modules

The weather station consists of a server and any number (currently max. 63) of sensors, where each sensor can provide several weather data (so a sensor with temperature, air pressure, humidity etc. counts as "one" sensor).

Server:

- Raspberry PI (low power requirement, e.g. RPI-3, PRI-Zero-2W, or others).
- Power supply and network connection

Sensors:

- ESP32 or ESP8266 controller
- Sensors for temperature, air pressure, humidity, wind, rain, battery measurement
- Battery and housing (e.g. 3D printed)
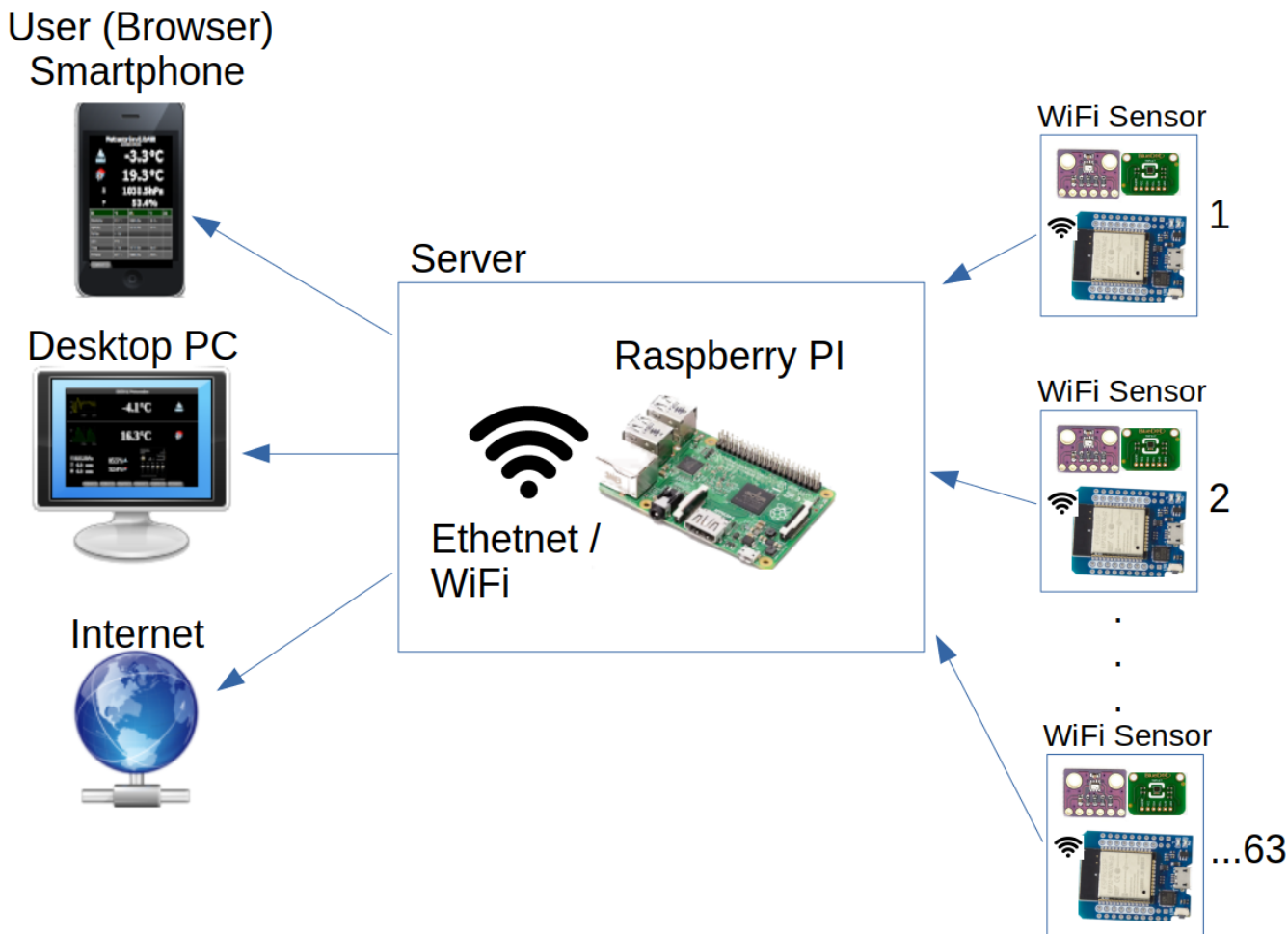
DIY: Do it Yourself, DIY

especially important is that everyone can build and assemble the necessary parts themselves. This way, one is not dependent on any special components.

The assembly of the individual boards is very simple and can be done even by less experienced hobbyists. The boards are standard parts which are available in large quantities on the Internet.

Software

The most important part of this weather station is the software. This is completely open and can be downloaded and used by anyone, of course customizations are possible if anyone wants to do that.

The system consists of two software packages

1. Weather server with web server
2. Firmware of the sensors

Configuration

The weather station is completely configured with a file on the weather server, most texts are entered

there, so that any languages can be used. It is also possible to calibrate the pressure sensors, so that all sensors show comprehensible values. The conversion from absolute to relative air pressure is done automatically based on the entered altitude of the location.

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