Documentation Plantomation V1.0

Automatic Plant Watering System

Made with LaTeX
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PLANTOMATION

Synthron

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1. Prelude

Plantomation is a project started by a friend of mine who had the idea of a self-watering flower pot. After some deliberation and initial drafts he pulled out of it for personal reasons.

I now restart the project because I always forget to water my house plants and eventually they all die. This will be a thing of the past thanks to this small project!

2. Introduction

Plantomation is an automatic plant watering system based on ESP32. It can handle up to four different plants simultaneously and is fully configurable via a simple web interface.

It uses capacitive soil moisture sensors to detect the humidity of the soil in the flower pot. Via a pump and valves, water can be delivered to the plants that need it.

By applying a threshold, the amount of water used for plants can be customized to the plants specific needs.

The module is supplied by external 12V DC. Pumps and Valves are driven off 12V directly, moisture sensors are driven by 5V, the spillage sensor is connected to 3.3V.

Config and Log files are saved on the SD card.

3. SD Card

The SD card is connected via SPI and is necessary for normal operation. If no SD-Card is present, no channels can be activated for control.

File Tree:

```
/
├── config/
│   ├── control.xml
│   │   ├── name <1-4>
│   │   ├── humidity threshold <1-4>
│   │   ├── state <1-4>
│   │   └── log_enable <1-4>
│   └── wifi.xml
│       ├── Op-Mode <station/AP>
│       ├── SSID
│       ├── PassWD
│       └── IP static <optional>
└── log/
    ├── plant1.log
    ├── plant2.log
    ├── plant3.log
    ├── plant4.log
    └── error.log
```

control.xml

Contains information about the channels and their oepration. Names, humidity thresholds and the states (enabled/disabled) are stored here for the ESP to act upon and to display in the web interface. The log_enable keys can be used to enable or disable logging for this channel.
Default is enabled, errors will always be logged.

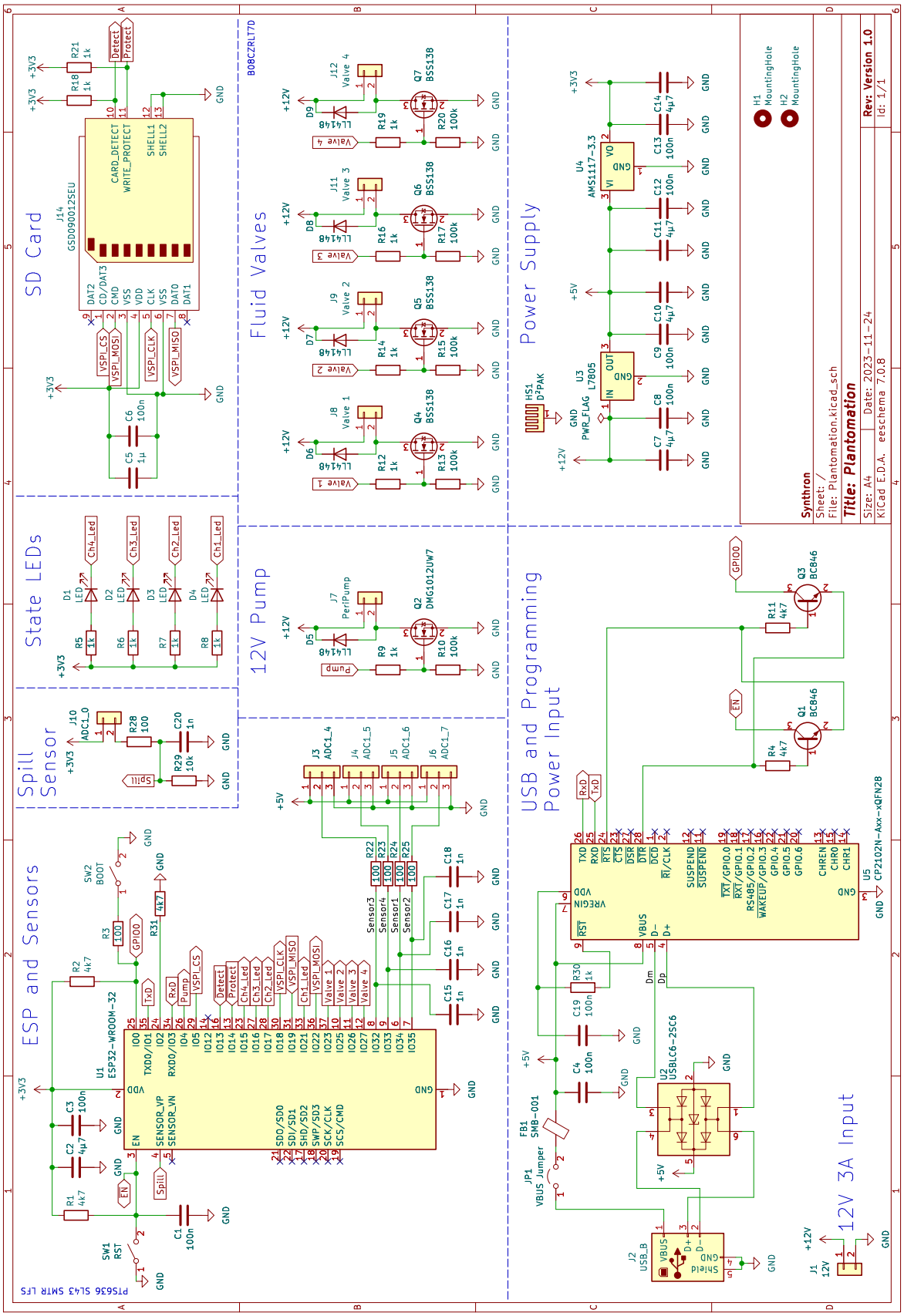
wifi.xml

Contains all necessary information for wifi-usage, like SSID, password and if the ESP should be in station mode (client inside existing network), or in AccessPoint-Mode (creating its own network). Default is AP-Mode.

Logfiles

If logging is enabled, the ADC-values (hourly) and watering-events will be logged. This way long-term data about the moisture and water usage can be obtained for further fine-tuning.

A. Schematic


SD Card
Fluid Valves
Power Supply
State LEDs
12V Pump
Spill Sensor
ESP and Sensors
USB and Programming
Power Input
12V 3A Input
Synthron
Title: Plantomation
Rev: Version 1.0
Date: 2023-11-24
Size: A4
KiCad E.D.A. eeschema 7.0.8
File: Plantomation.kicad_sch
Sheet: /
ESP32-WROOM-32
CP2102N-Axx-xQFN28
AMS1117-3.3
L7805
BSS138
BC846
USBLC6-2SC6
SMB-001
GSD090012SEU
B08CZRLT7D
PTS636 SL43 SMTR LFS