

MOSES

Watering Controller

V 1.00



General Warning & Disclaimers

This is a prototype and did not undergo safety certifications, Installation of this component has to be performed by specialized personnel in a controlled environment.

This device is not designed nor intended for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage). No warranties either expressed or implicit is granted by the author of this prototype and shall be deemed void for any purpose not expressly declared. The author shall not be liable for any claims or damages arising out of products used in applications not expressly intended by this product. Unless otherwise agreed the product is intended ONLY for prototyping and NOT for public use, is to be realized and operated ONLY by competent and skillful personnel in a controlled and safe environment which must be able to tolerate any kind of failure.

Any other use is sole responsibility of the user. Beware that high voltage can be present and can be deadly, extreme care must be employed when dealing with this device. Prior to power the circuit a competent and certified within local regulation technician must assess the safety in compliance with all relevant laws, regulations and standards.

Read carefully the instruction manual. The controller's boards must never directly connected to mains, but only to low voltage DC (12V max) battery.

Every device connected has to be equipped with all the necessary protections against overvoltage/overpressure/overheat/fault, the reliability/security/capabilities of safety features embedded do not replace the electric/mechanical/hydraulically ones that have always to be in place and working and that must fit the plant where will eventually be used, moreover those devices, must allow a safe operation even in case of partial/total fault of SOLarin0.

Warning: some parts of the controller may become hot.

First Start

Connect the power to terminals, the device is protected from reverse voltage on the power line and can tolerate modest overvoltages.

The controller creates an autonomous WIFI AP, connect with a WIFI capable device equipped with a browser that fully supports HTML 5:

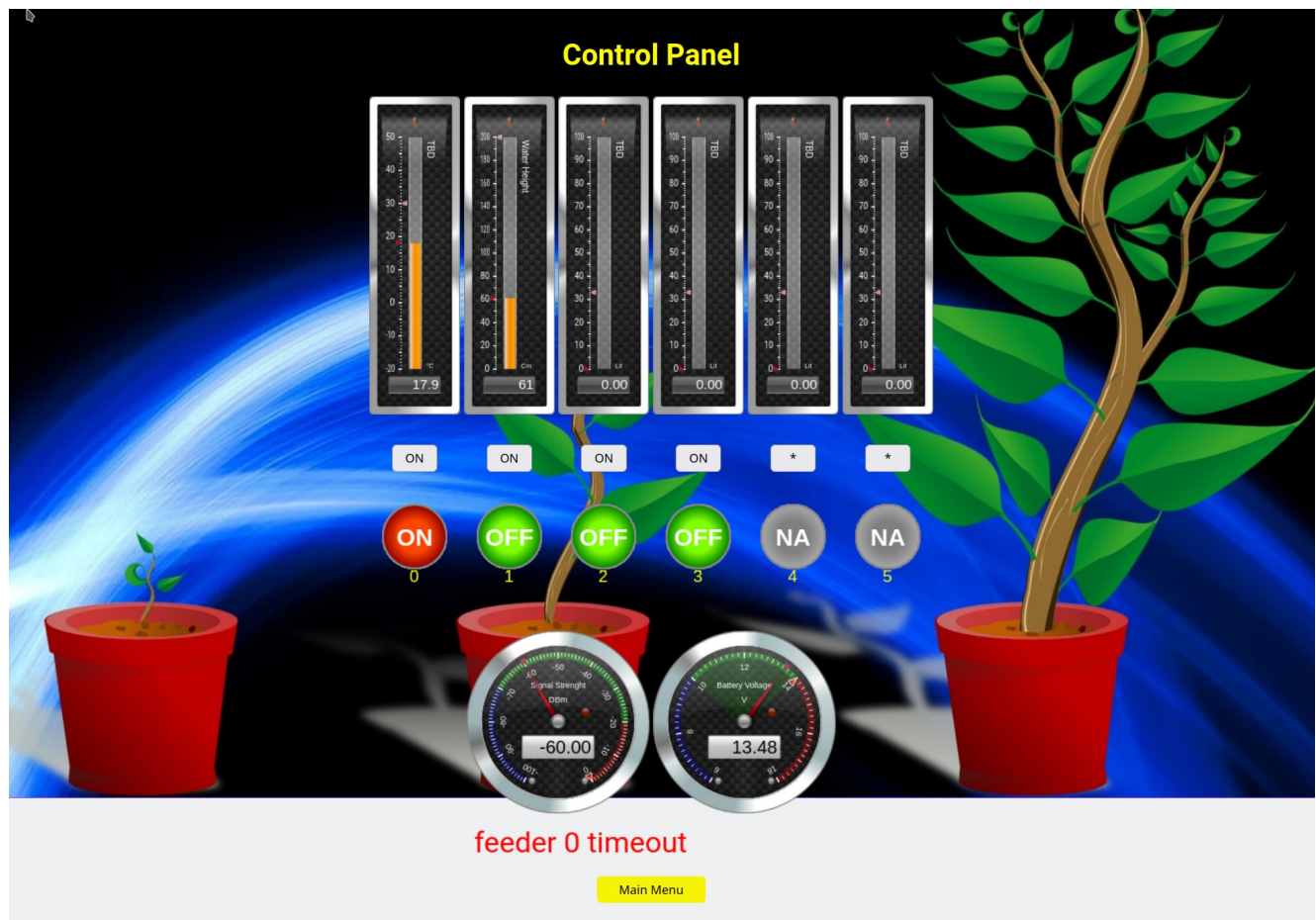


Search for new networks: connect to: **MOSES_<xxxx>**

Insert password: **12345678**

Note: <xxxx> is different for every device, password is the same.

After the connection start a browser on: 192.168.4.1



Meaning of instrument/links is (from left to right)

First Row:

Temperature, distance from water of the ultrasonic sensor, liters from counter 1,2,3,4

Second Row:

Turns on the specified valve

Third row:

Status of the valves

Fourth Row:

Signal strength, voltage

Fifth Row:

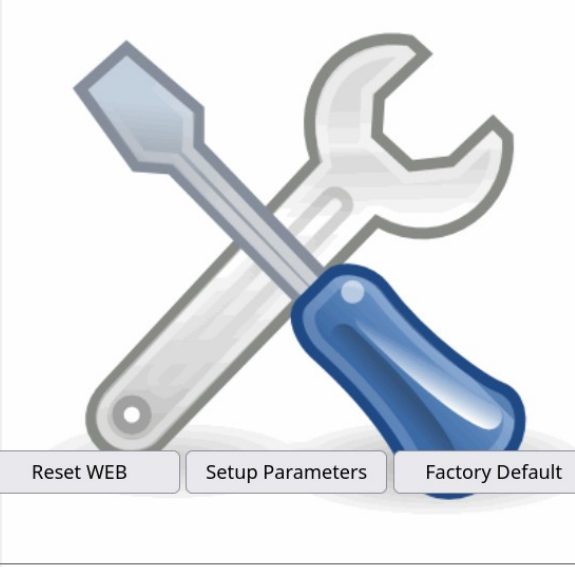
Status

Sixth row:

Goes to main menu

Main Menu

System configuration



[Dashboard](#) [Reset WEB](#) [Setup Parameters](#) [Factory Default](#) [Configure WIFI](#)

Serial: 15447478 v 1.20 esp32s2 Of Jan 22 2023 17:07:46 Uptime: 1290 STATION Mode

Your IP addresses:

Network WIFI MOSES WEB AP IP -> 192.168.4.1

WIRELESS CLIENT DHCP IP -> 192.168.2.59 Network WIFI :HOME

UTC Time: 2023.01.25 17:26:04 Timezone: -1

- Dashboard: Back to main menu
- Reset WEB: restarts the system
- Setup Parameters: Setup
- Factory Default: resets system to original values
- Configure WIFI: configures WIFI

You're advised about taking note of network and IP, this is the address to which you'll have to choose in browser when connected through your WIFI.

Setup Parameters

Parameters management

#1 Water every	30	#2 Water every	9999	#3 Water every	9999	#4 Water every	9999
#1 Liters	1	#2 Liters	10	#3 Liters	10	#4 Liters	10
Multiplier 1	120	Multiplier 2	1200	Multiplier 3	10	Multiplier 4	10
Timezone	-1	Watering every Minute/Second	☒ M ☐ S	Temp. Corr. Liters to Temp	4	Language	English
Channel name 0	TBD	Channel name 1	Water Height	Channel name 2	TBD		
Channel name 3	TBD	Channel name 4	TBD	Channel name 5	TBD		

Store Parameters

Back to menu

#X Water every (minutes or seconds depending on radio button M/S): time cycle

Liters: how many liters should be delivered

Multiplier: how many ticks do you need to a liter (1200)

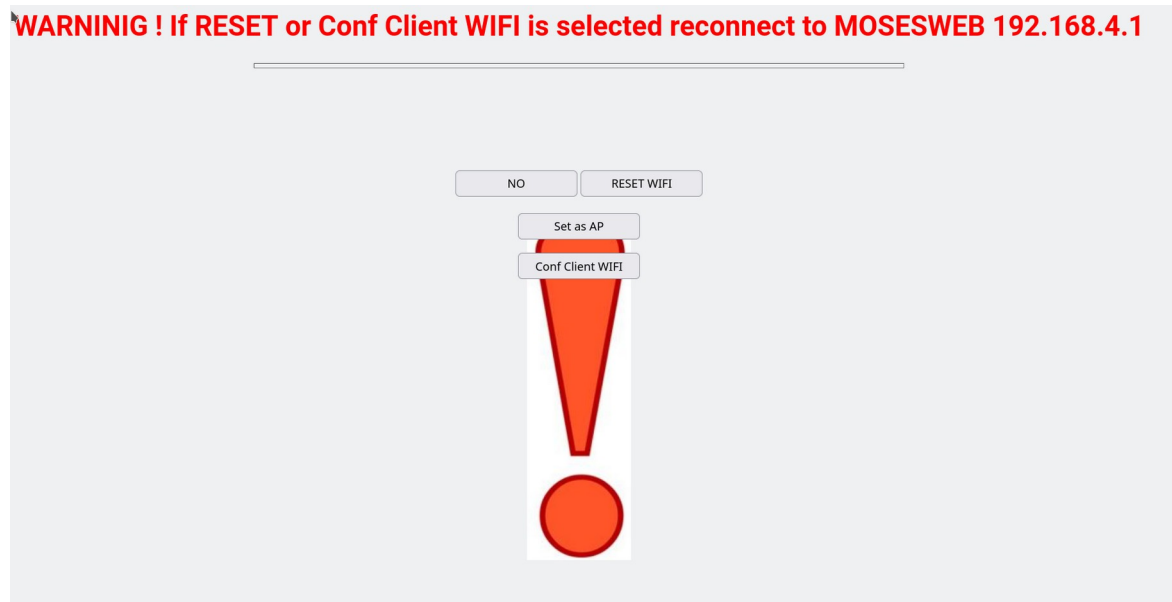
Timezone (for timesync if used)

Temperature correction: how much water in % will be feed for every degree above 25 C

Language

Channel name: what appears in main screen description of instruments

Configuration of WIFI



You can choose:

- NO: aborts operation, any other operation needs a reboot .
- RESET WIFI
- SET as AP: becomes Access point only, no connection to local WIFI
- Conf. Client Wifi: here enter your network name and password

If Conf Wifi is chosen you'll get to the page below where networks are listed. Choose the wanted local network filling **SSID** and **PASS** fields, if "**ACCESSPOINT**" keyword is left in SSID then device will default to AP and will not connect to any existing WIFI.

Hello MOSES @ 192.168.4.1

Network(s) found:

- 1: HOME_2 (-42 DBm) Encrypted
- 2: TEST_NET (-43 DBm) Encrypted
- 3: GstH_1AFE34D233CB (-57 DBm)
- 4: HOME (-62 DBm) Encrypted

Leave ACCESSPOINT in SSID press GO! and cycle power to activate AP

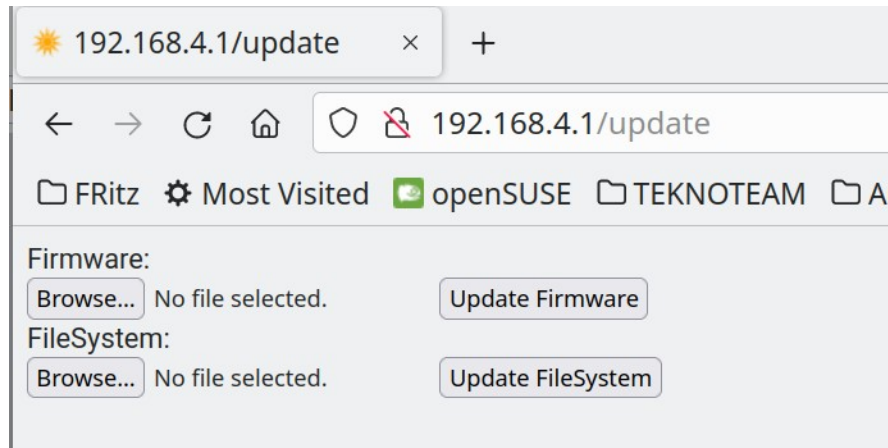
SSID:

PASS:

TEST SSID & Password, After pressing button reconnect to MOSESWEB

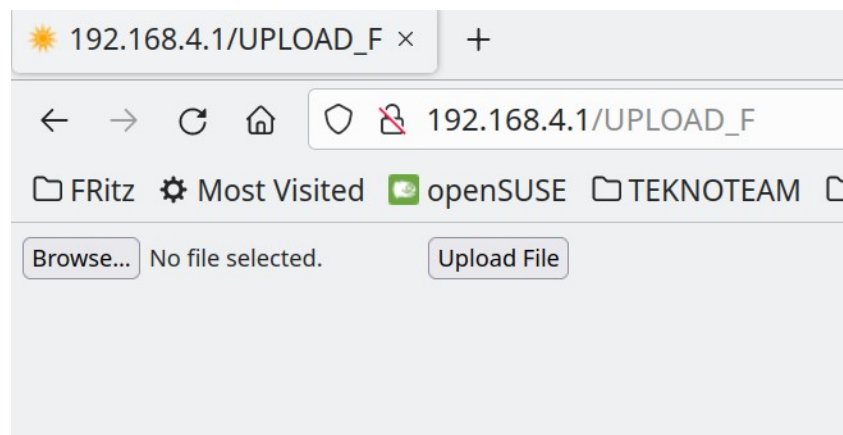
UPDATE/UPGRADE

Is possible to update the firmware manually selecting the page:



And then the corresponding file, after choosing the file press “Update Firmware”

To update the filesystem choose:



Beware ! The filesystem is limited in size, is not possible to remove a file: only an upload with a file of IE, one byte, can free space.

Note

Power usage

About 5W @ 12V DC

Security

If AP only is used there's no connection to the Internet, however the device itself is reachable within his own AP range, so take all the cautionary steps.

DHCP

IP Address may change in case of reboot, in this case to know the address connect to the default.

NTP server

An active NTP server is not mandatory.

Default

In case of fault connect with a WIFI device. Standing next to the controller look for the network, inser password, browse to 192.168.4.1.

List of current files

```
-rwxrwxr-x 1 root users 209251 22 gen 16.52 background.jpg
-rwxrwxr-x 1 root users 1851 22 gen 16.52 british-flag-small.jpg
-rwxrwxr-x 1 root users 6096 22 gen 16.52 ex.jpg
-rwxrwxr-x 1 root users 1150 22 gen 16.52 favicon.ico
-rwxrwxr-x 1 root users 99090 22 gen 16.52 flotr2.min.js
-rwxrwxr-x 1 root users 1765 22 gen 16.52 fra.txt
-rwxrwxr-x 1 root users 1040 22 gen 16.52 french-flag-small.jpg
-rwxrwxr-x 1 root users 12396 22 gen 16.52 gauge.js
-rwxrwxr-x 1 root users 905 22 gen 16.52 german-flag-small.jpg
-rwxrwxr-x 1 root users 1642 22 gen 16.52 ger.txt
-rwxrwxr-x 1 root users 15755 22 gen 16.52 home_background.jpg
-rwxrwxr-x 1 root users 5216 22 gen 16.52 index_DE.htm
-rwxrwxr-x 1 root users 5209 22 gen 16.52 index_FR.htm
-rwxrwxr-x 1 root users 5091 22 gen 16.52 index_GBF.htm
-rwxrwxr-x 1 root users 12926 22 gen 16.52 index_GB.htm
-rwxrwxr-x 1 root users 12225 22 gen 16.52 index.htm
-rwxrwxr-x 1 root users 12926 22 gen 16.52 index_IT.htm
-rwxrwxr-x 1 root users 229 22 gen 16.52 index_OUT.htm
-rwxrwxr-x 1 root users 1523 22 gen 16.52 index_startup.htm
-rwxrwxr-x 1 root users 1513 22 gen 16.52 index_startup.htm~
-rwxrwxr-x 1 root users 1037 22 gen 16.52 italian-flag-small.jpg
-rwxrwxr-x 1 root users 1702 22 gen 16.52 ita.txt
-rwxrwxr-x 1 root users 1889 22 gen 16.52 my.txt
-rwxrwxr-x 1 root users 69 22 gen 16.52 owners
-rwxrwxr-x 1 root users 6568 22 gen 16.52 penci.jpg
-rwxrwxr-x 1 root users 1417 22 gen 16.52 standalone6.html
-rwxrwxr-x 1 root users 219512 22 gen 16.52 steelseries-min.js
-rwxrwxr-x 1 root users 5438 22 gen 16.52 thermometer.jpg
-rwxrwxr-x 1 root users 37330 22 gen 16.52 Tool_animated.gif
-rwxrwxr-x 1 root users 5354 22 gen 16.52 tween-min.js
-rwxrwxr-x 1 root users 569 22 gen 16.52 usa.htm
-rwxrwxr-x 1 root users 1596 22 gen 16.52 usa.txt
-rwxrwxr-x 1 root users 1624 22 gen 16.52 usa.txt~
-rwxrwxr-x 1 root users 14099 22 gen 16.52 Wrench.jpg
-rwxrwxr-x 1 root users 11513 22 gen 16.52 xindex_GB.htm
-rwxrwxr-x 1 root users 12712 22 gen 16.52 xml.js
```

Schematics & connections

Connections.

Blue arrow: turbine orange=signal, Blue=negative Red=Positive

Red Arrow: Valve, no polarization

Green Arrow: Power supply White+positive, Black=Negative

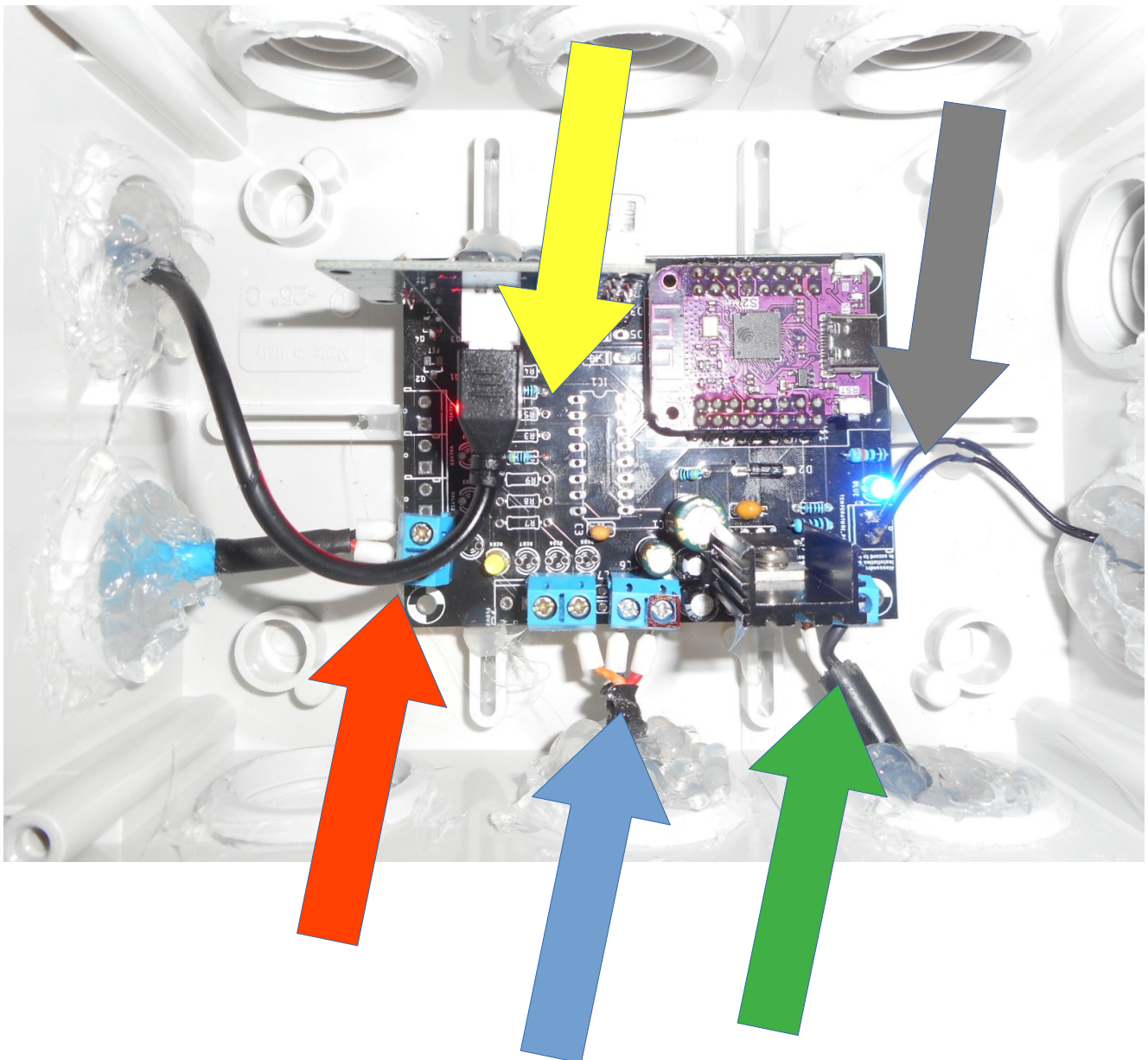
Yellow Arrow: ultrasonic sensor connector

Gray Arrow: temperature probe

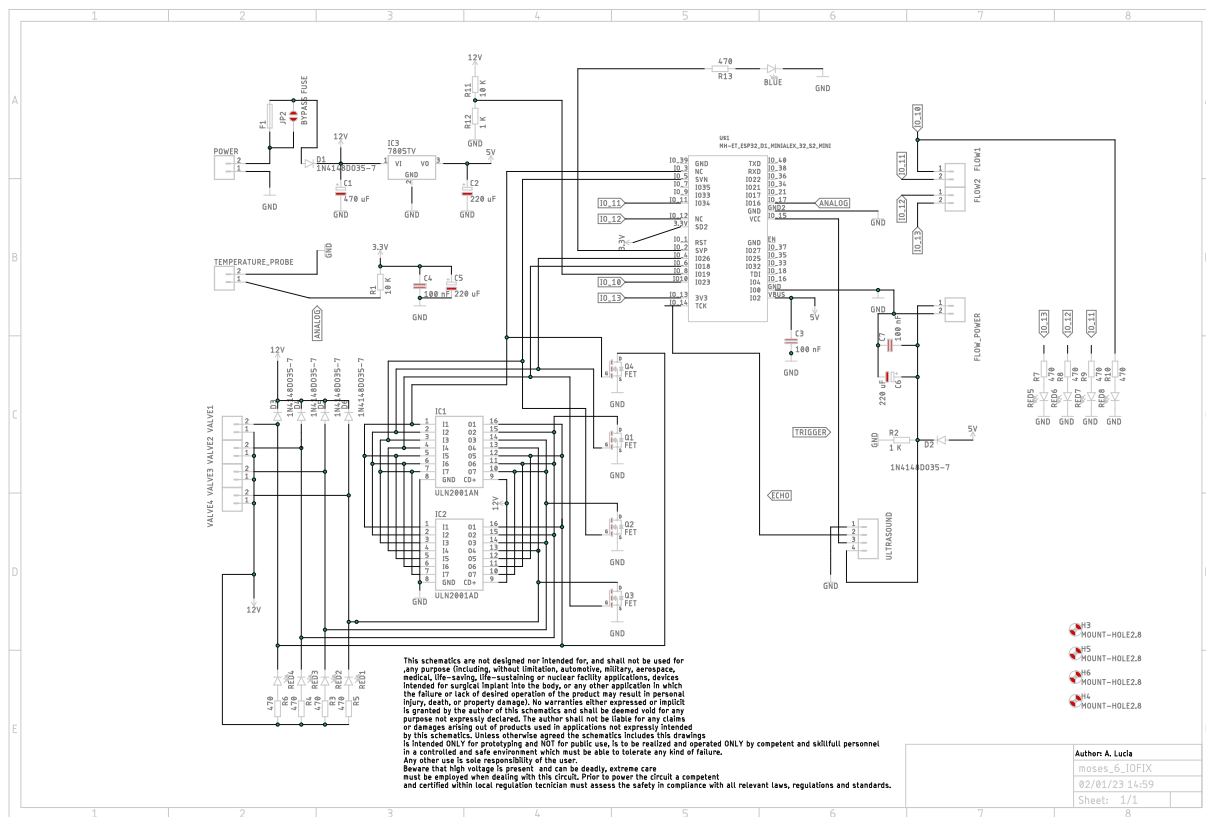
Blue LED: blinks when circuit works

Yellow LED: Blinks when water flows

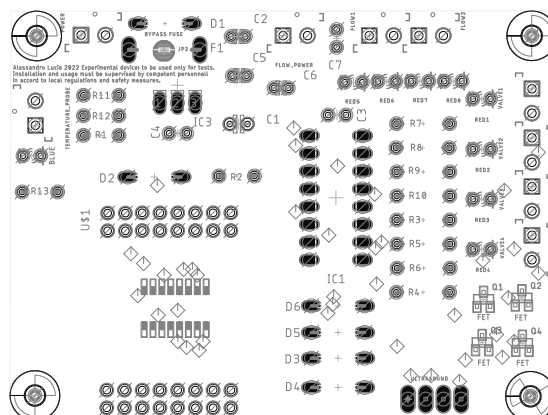
Red LED: on when valve is open



Electric schema



PCB



Acknowledgements

Some Icon made by from www.flaticon.com
Graphics: <http://www.humblesoftware.com/flotr2/>
ARDUINO community

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