Smart Farming
Training Kit
for developing world

Joy Institute of Technology
&
Postech

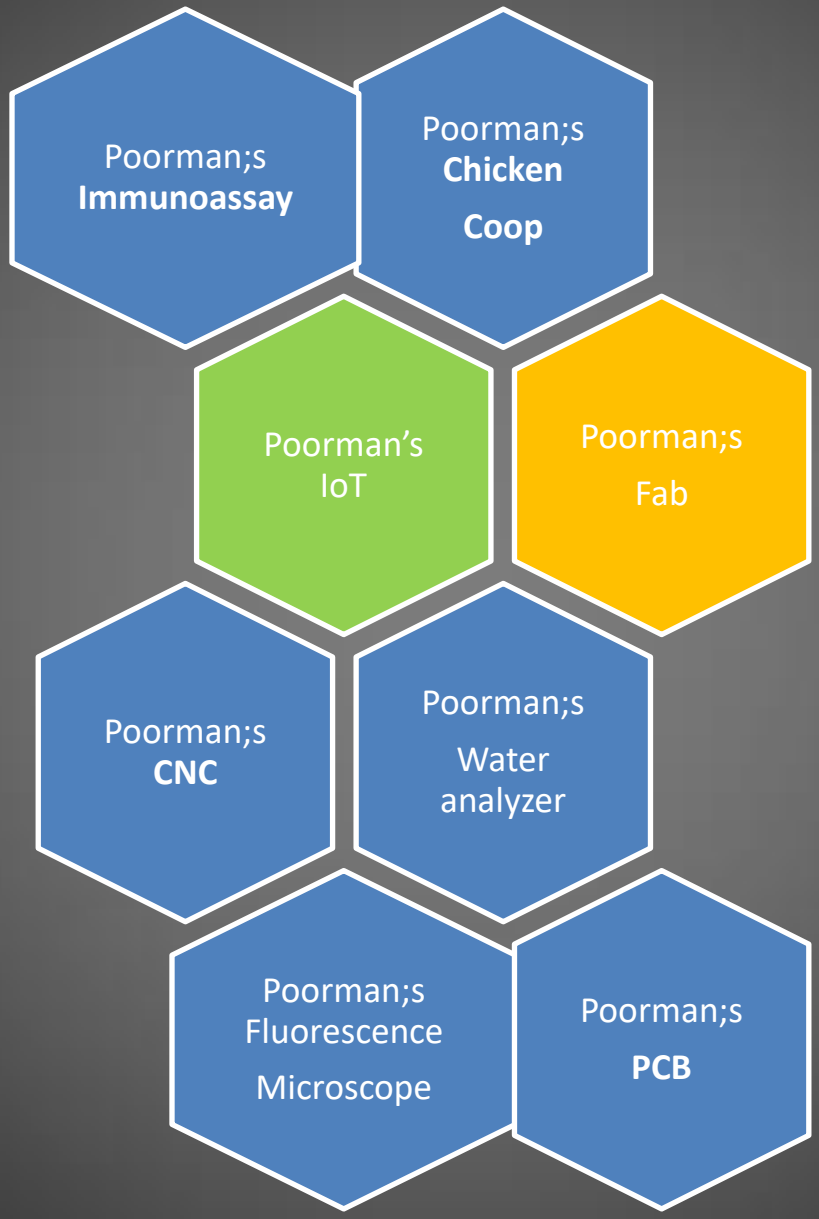
Fighting poverty through education





JIT

Joy Institute of Technology


Poorman;s
Immunoassay
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Chicken
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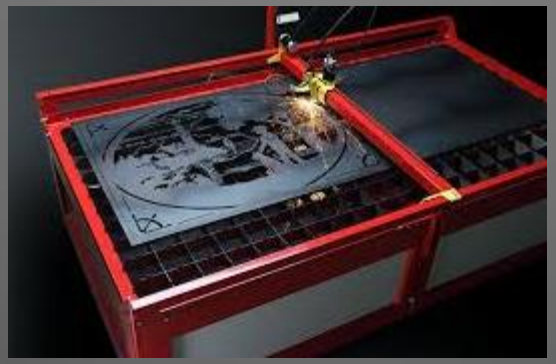
analyzer
Poorman;s
Fluorescence
Microscope
Poorman;s
PCB













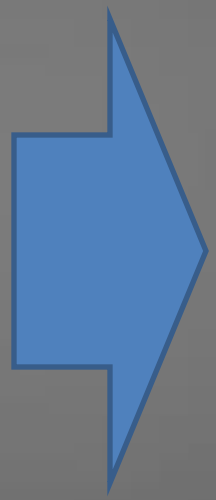





HITACHI
BAND SAW
CB 75F

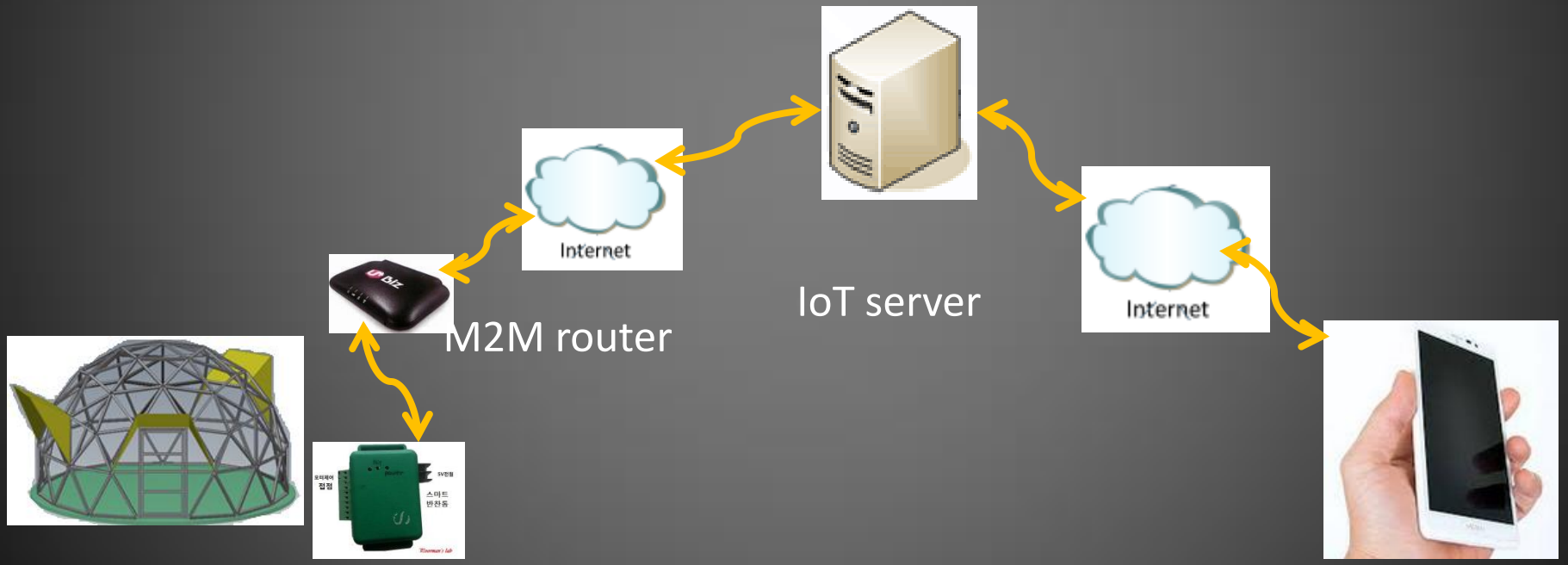
PLANT

- Place
- Light
- Automation
- Nutrients
- Temperature



Smart farm Education

Educational Smart farm









1. Dome kit









Automation Kit



2. Tablet kit

- Wireless chargers for all tablets
- Foldable solar charger included







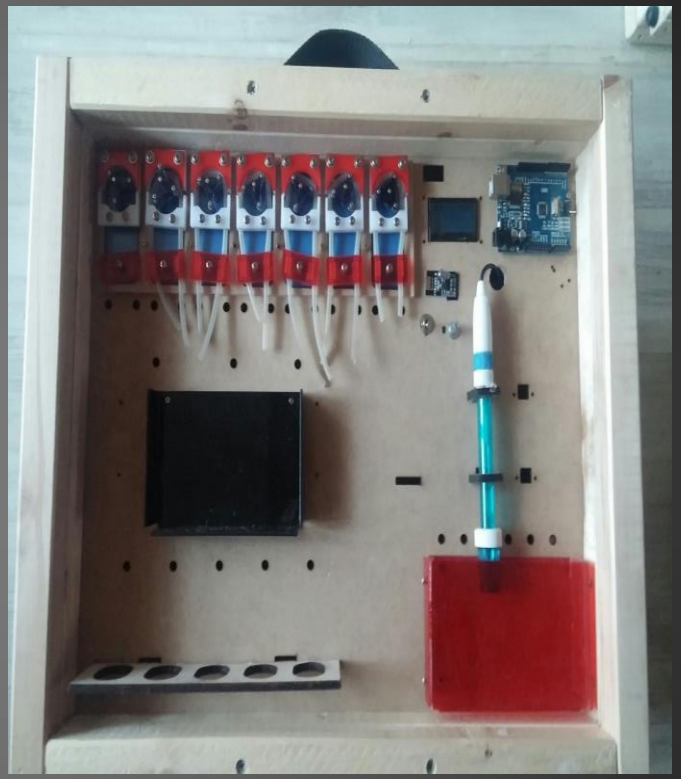
3. IoT kit

- Wireless soil moisture sensor
- Wireless temp/humid/light sensor
- Wireless wind speed sensor
- Irrigation controller
- …
- …



4. Experiment kit

-Automatic nutrients dosing
-Water level controller
-Hydroponics controller
-pH analyzer
-electric conductivity analyzer
…



5. Indoor farm kit

- Smart phone control
- Cloud data logging
- LED lighting
- Irrigation control





6. Data collection using Google Sheets

DataCollector

File Edit View Insert Format Data Tools Add-ons Help Last edit was 12 days ago

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4	3	12/10/2016	undefined	undefined						
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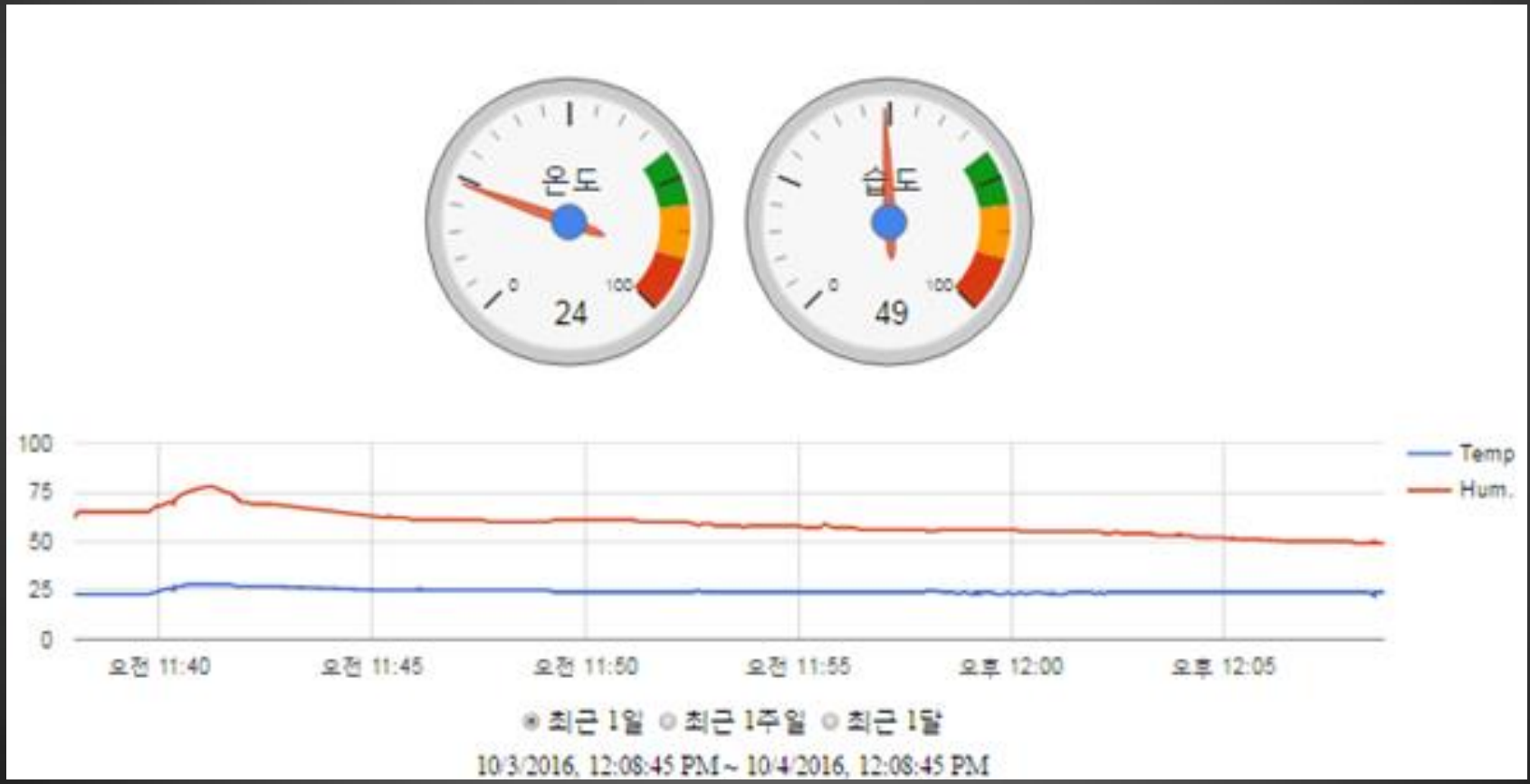
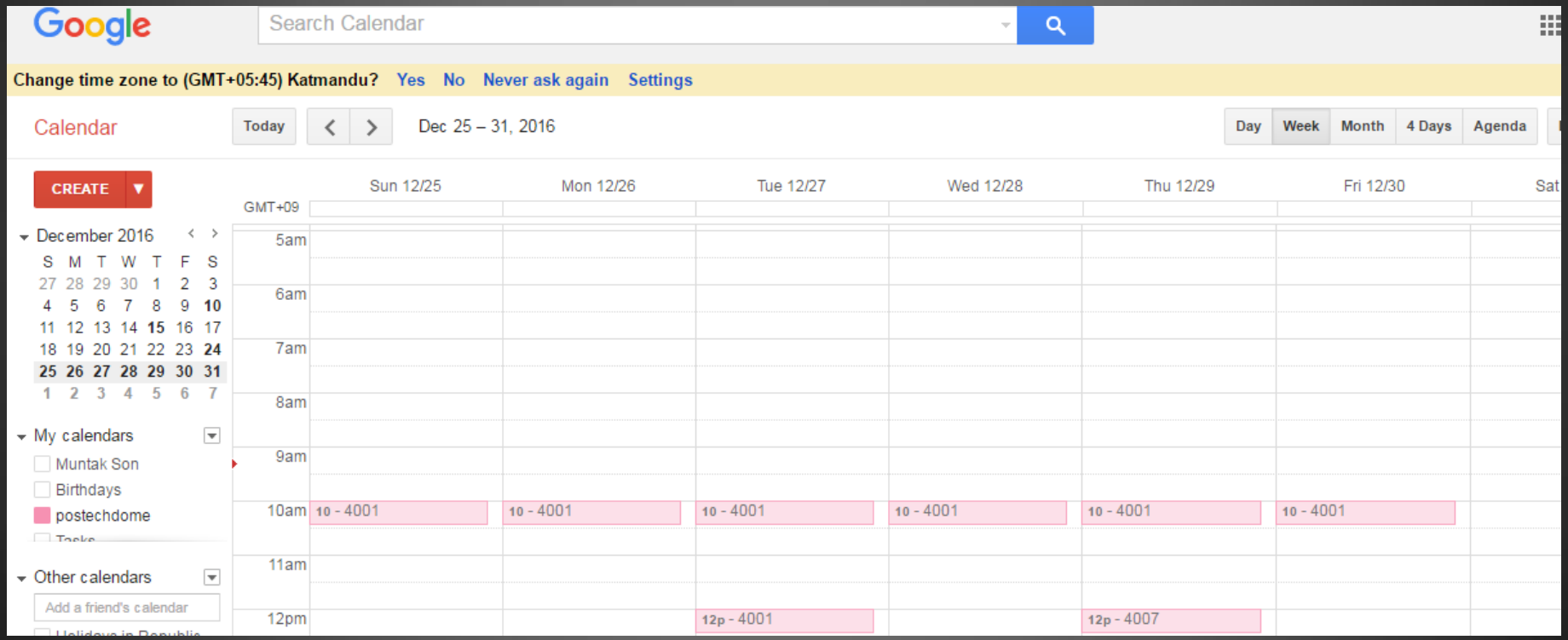
18	17	12/10/2016	SoilMoisture	869						
19	18	12/10/2016	SoilMoisture	874						
20	19	12/10/2016	SoilMoisture	869						



7. Data visualization using Google Chart



8. Irrigation control using Google Calendar



Development history

Rooftop smart farm at Postech

- Hopefully typhoon safe
- Easy access
- Full sun
- WiFi access



Tanzania



Korea, Laos, Mozambique









open innovation community of Arduino, Android, Raspberry





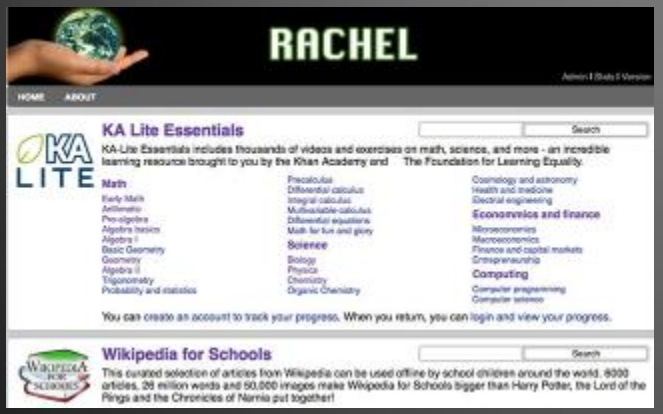








Offline educational server using Rachel & Raspberry Pi 3





IoT server

- UPS
- Battery backup
- OLED display



Contents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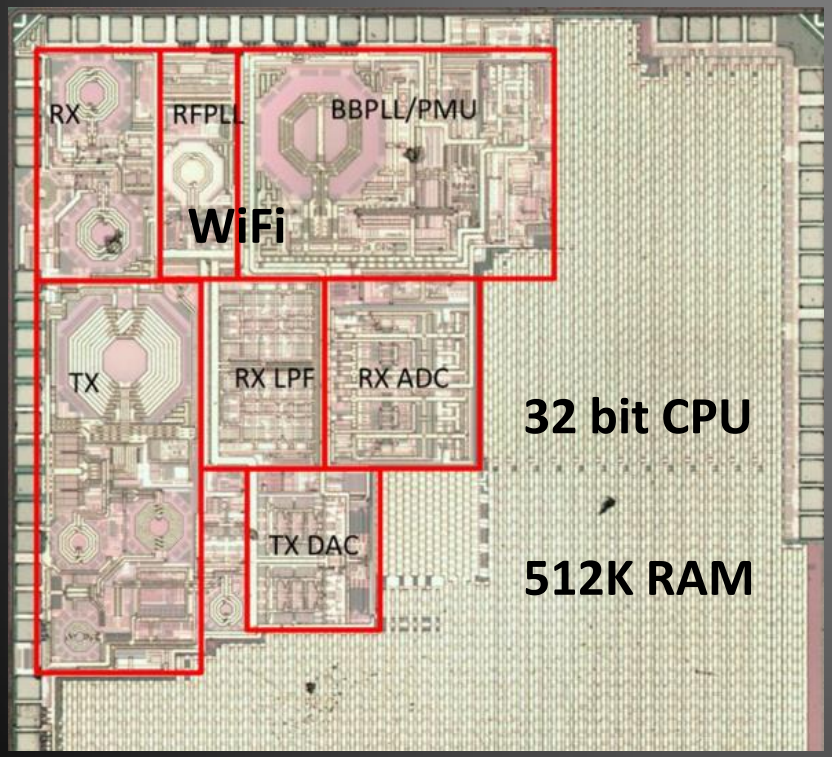
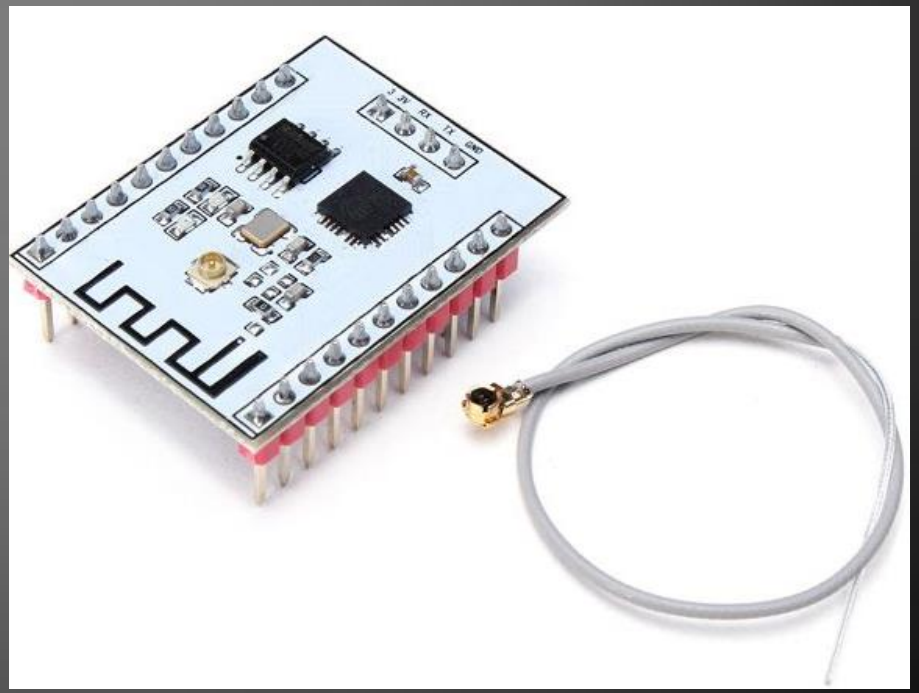
African Storybook.org
GCF
LearnFree.org
CK-12
RADIOLAB
KHAN
ACADEMY
PRACTICAL ACTION
SCRATCH
hesperian
health guides
KA LITE

IoT - WiFi Arduino ESP8266







Anadura kit for smart farm education



Internet

RF - Relay

RF - Sensor

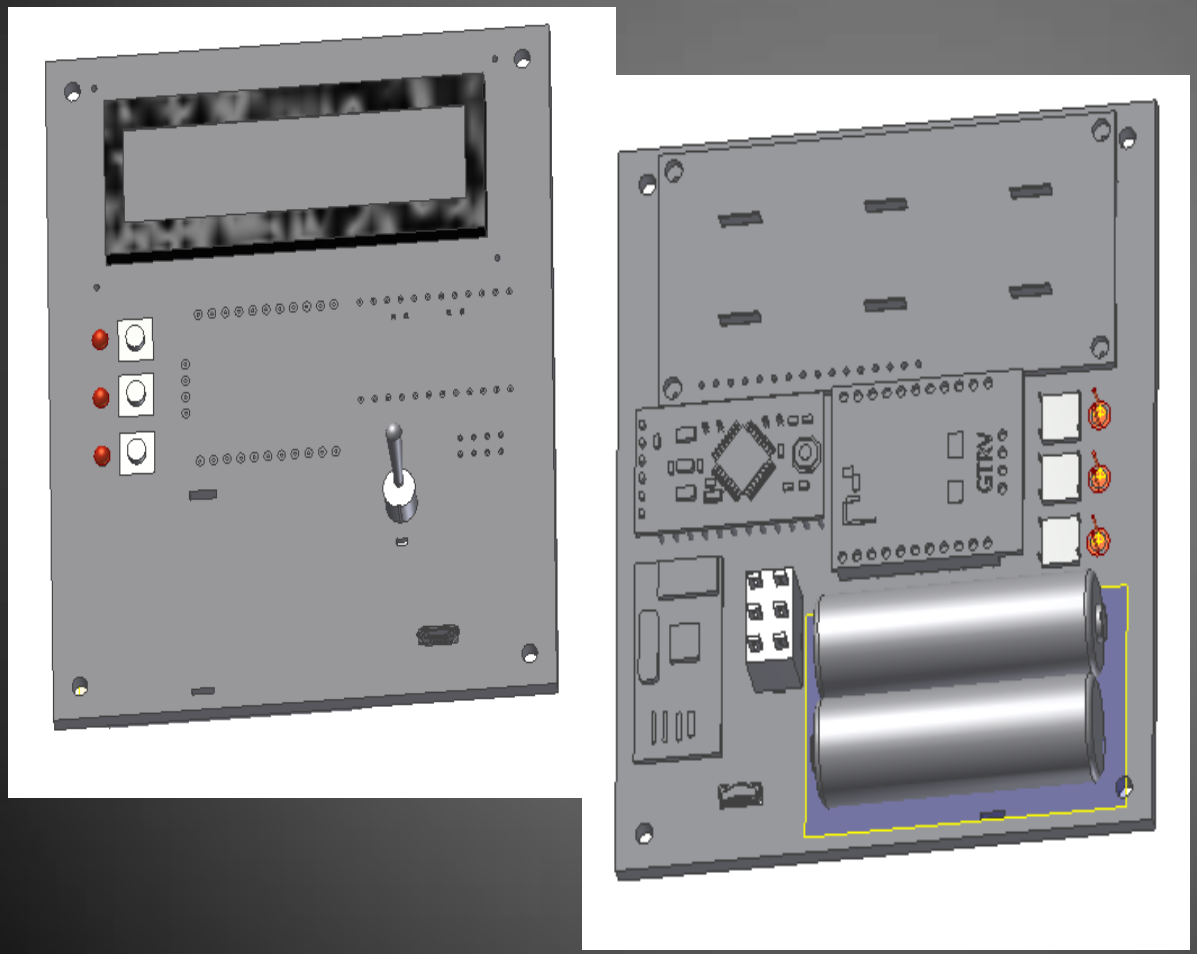
RF-WiFi gateway

WiFi router

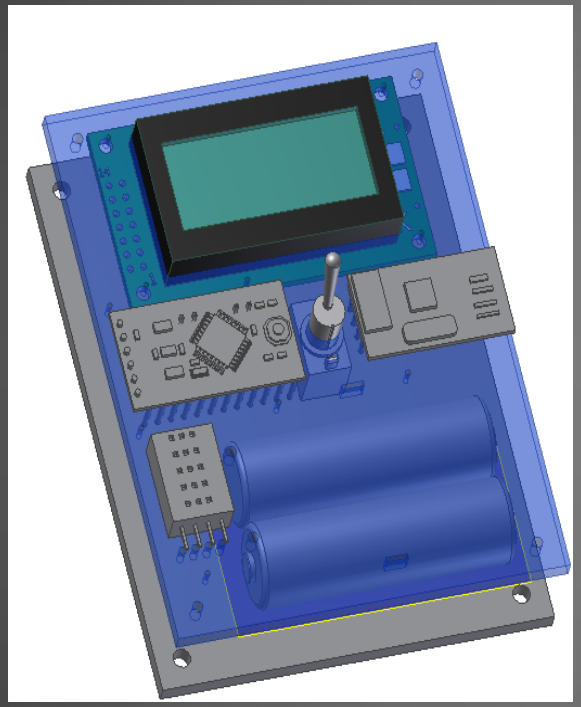
RF-Bluetooth gateway

Raspberry Pi

RF-WiFI gateway



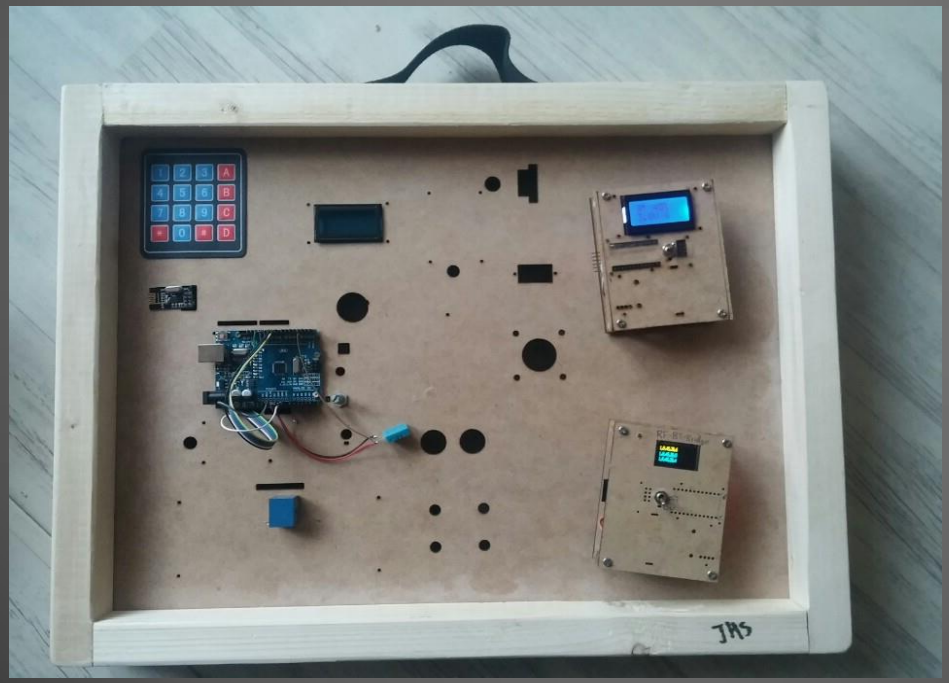
RF-sensor



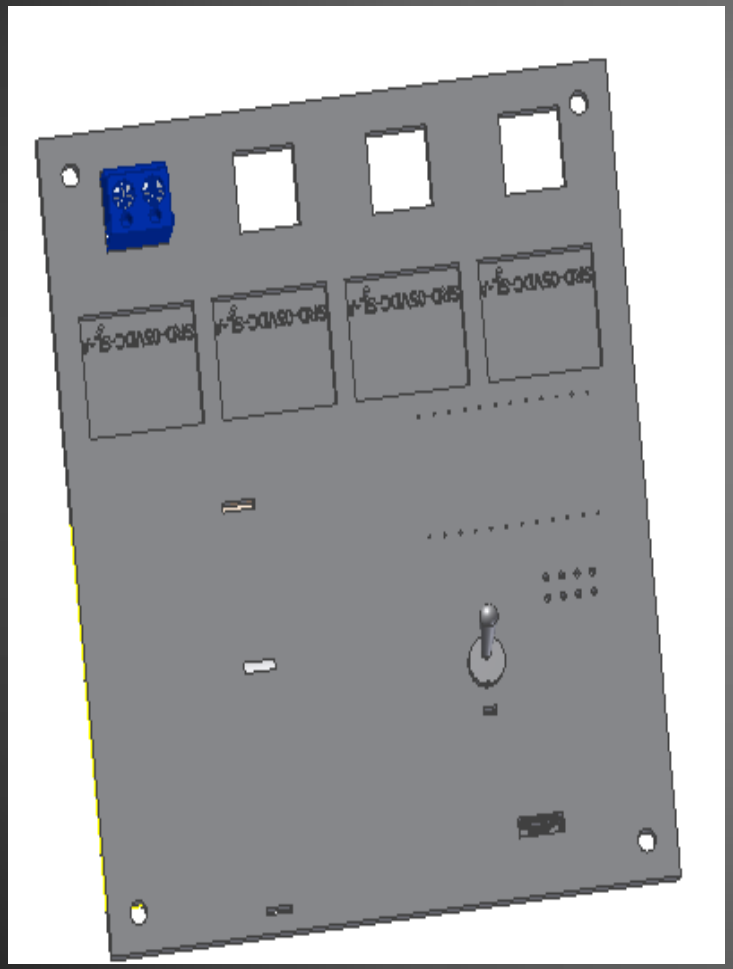


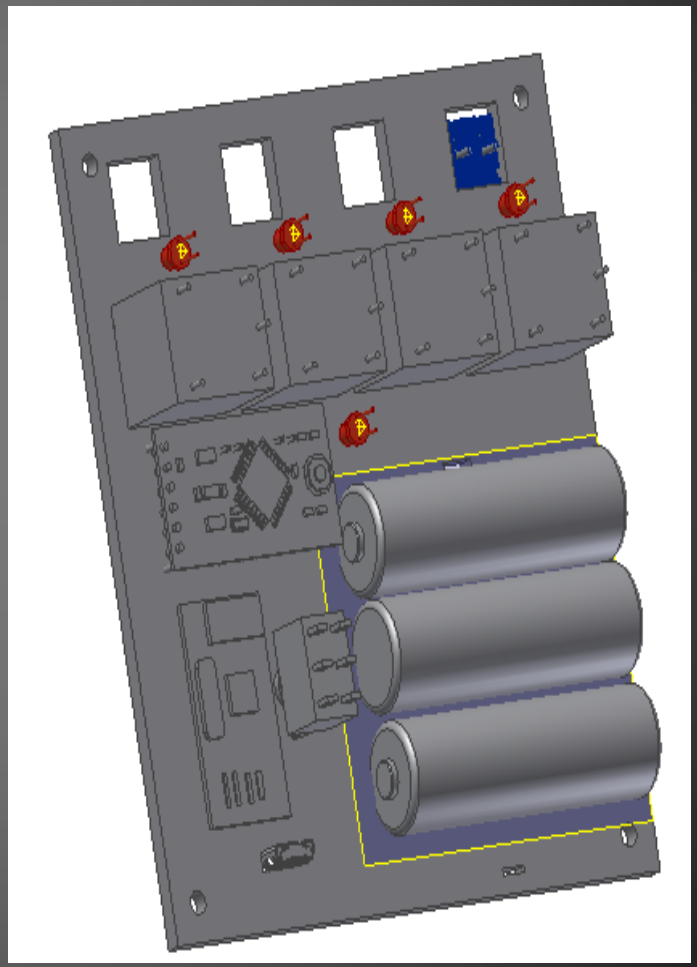
RF-Bluetooth gateway



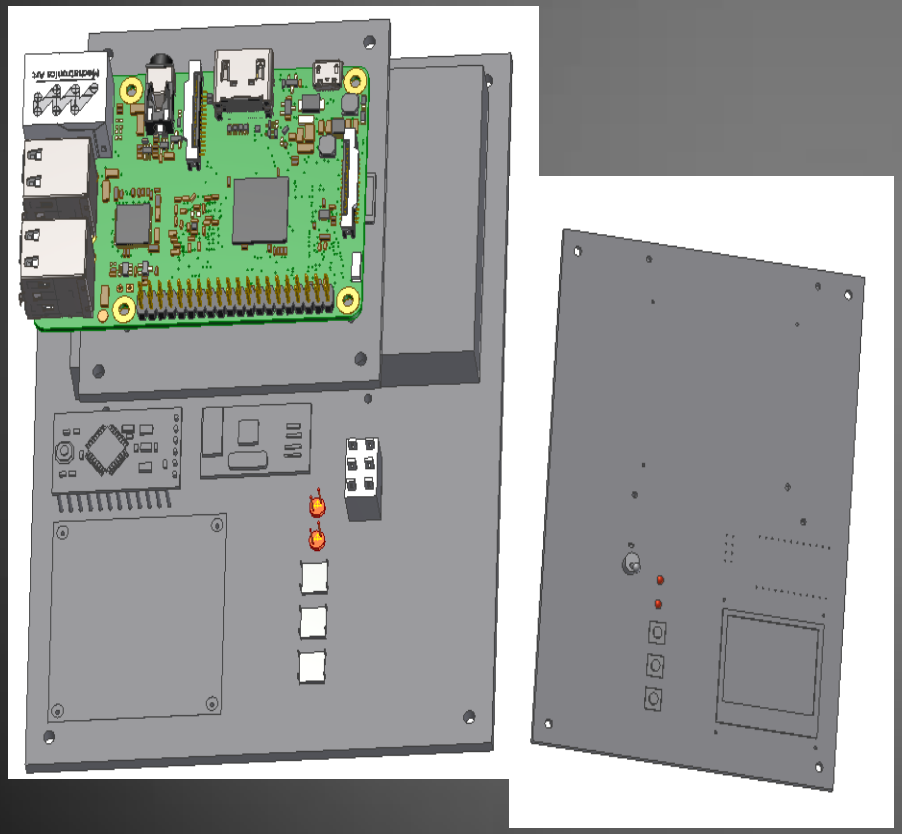

1 2 3 A
4 5 6 B
7 8 9 C
* 0 # D
JHS

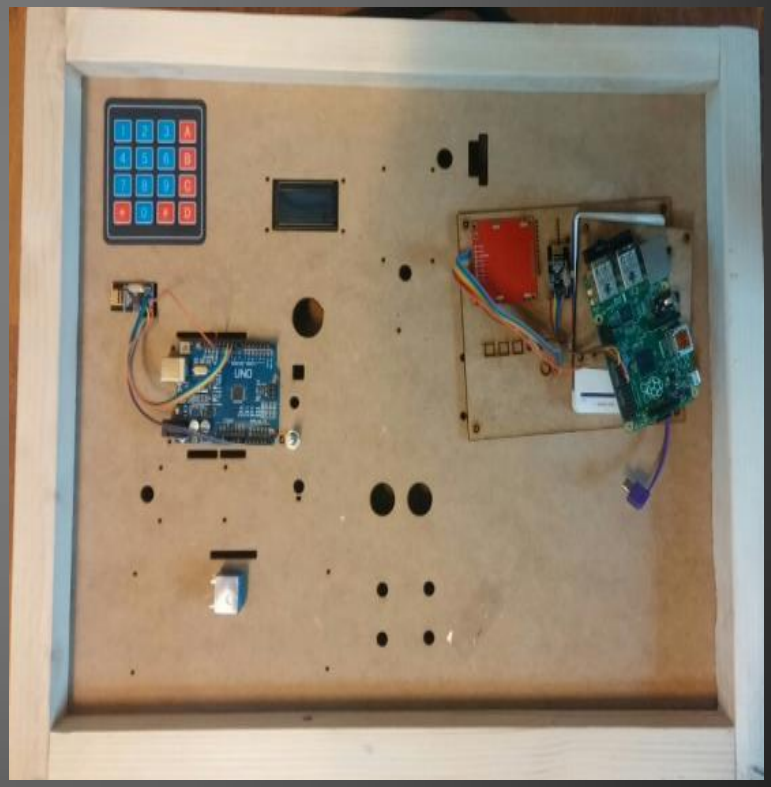
RF-Relay



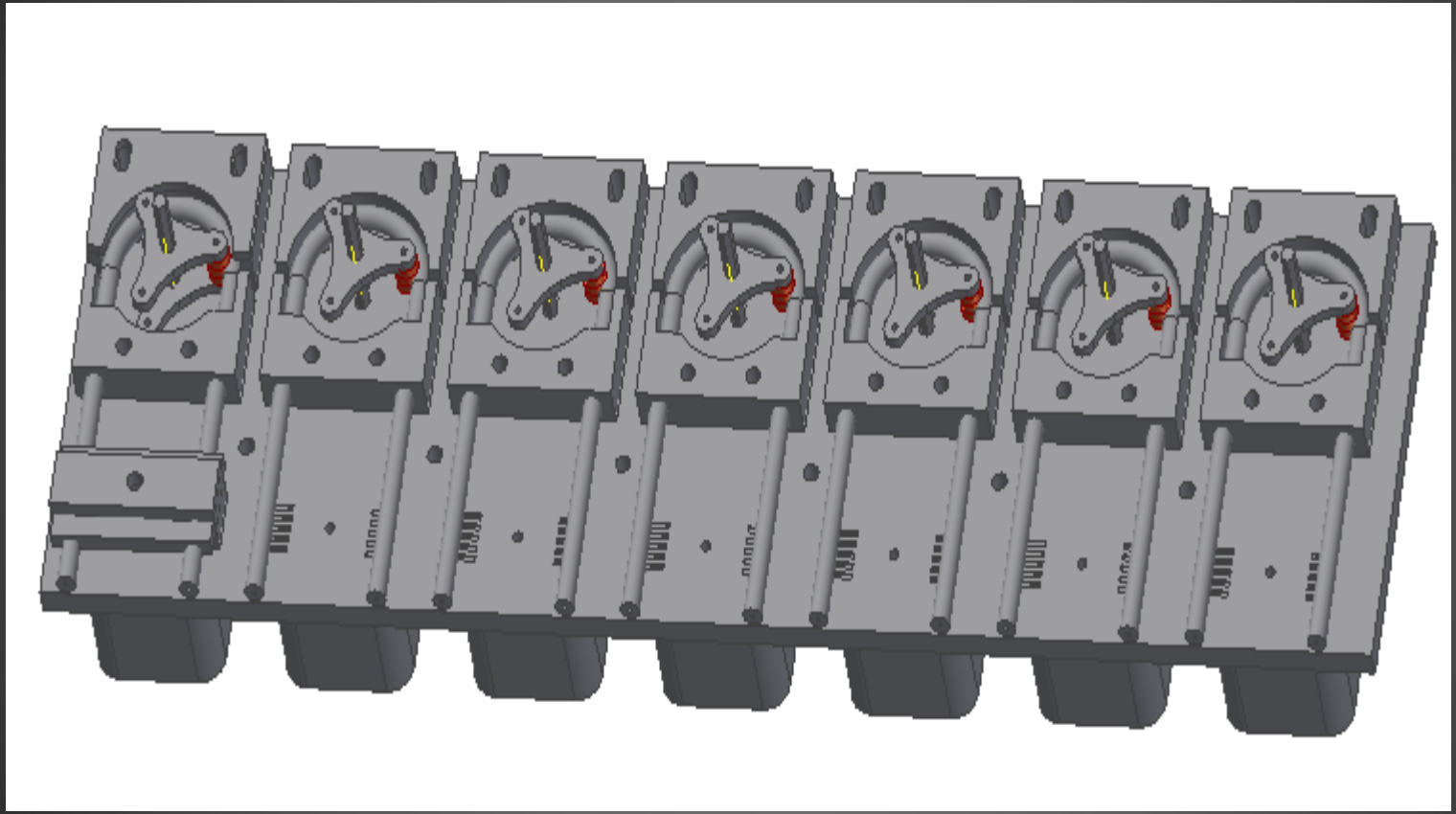


Raspberry Pi server

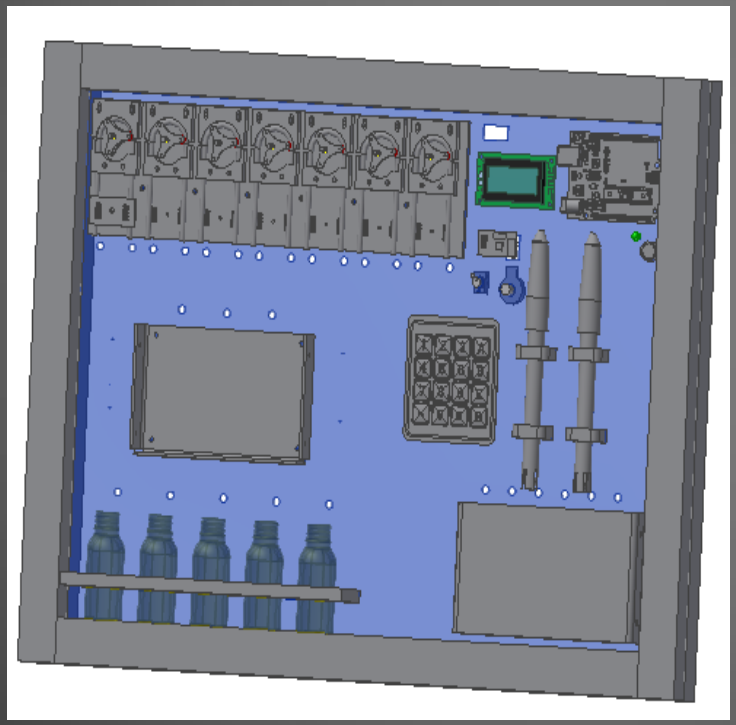




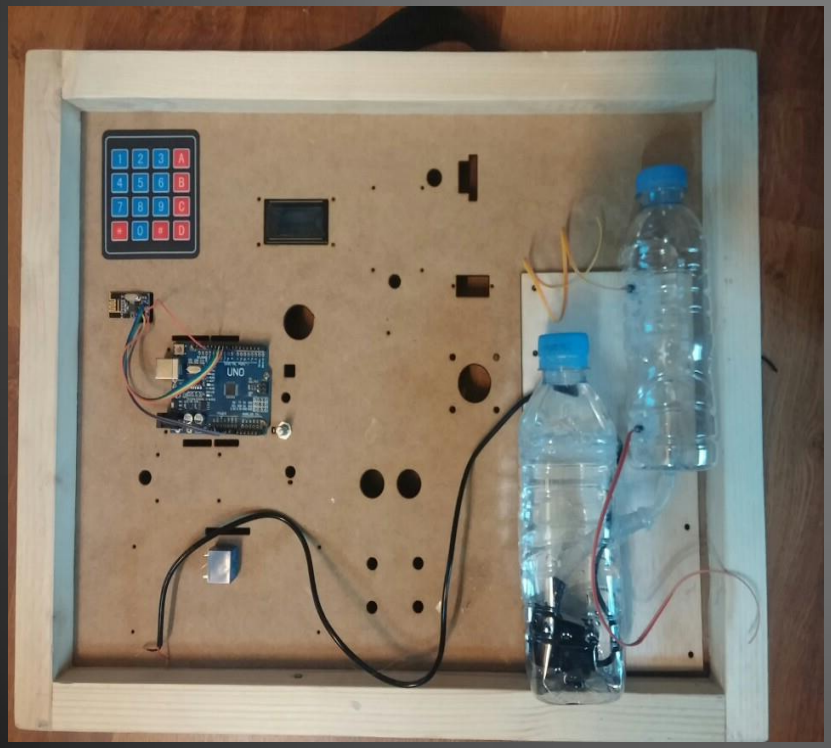
Peristaltic pump

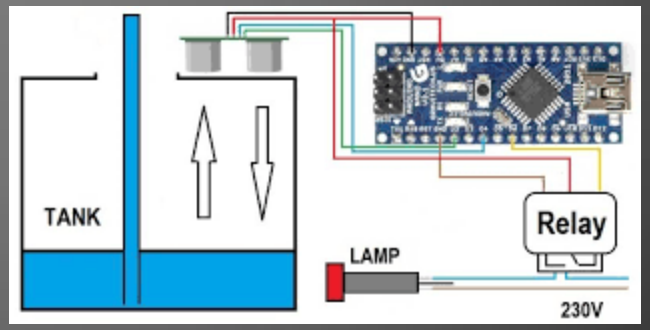


Nurients controller dosing controller

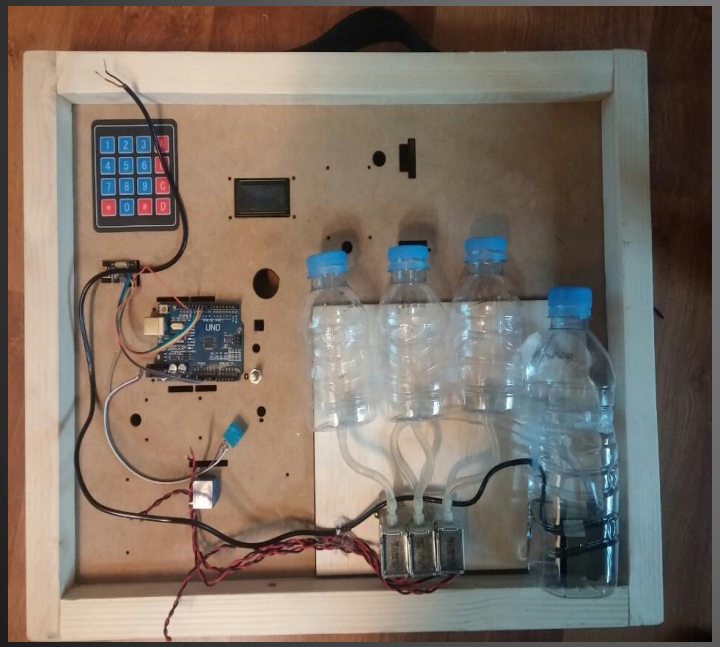


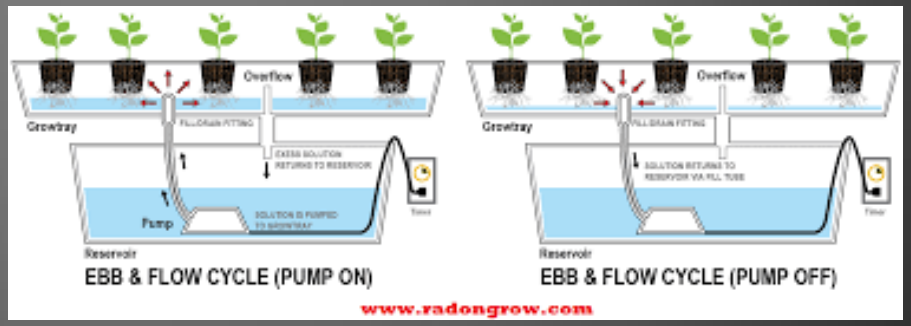
Water level controller kit



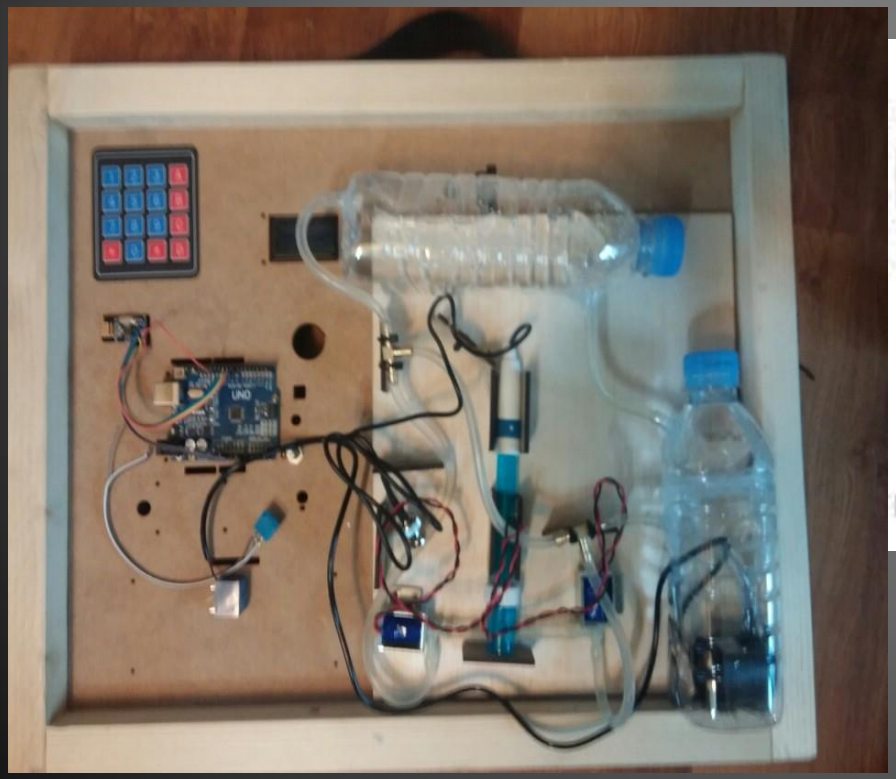


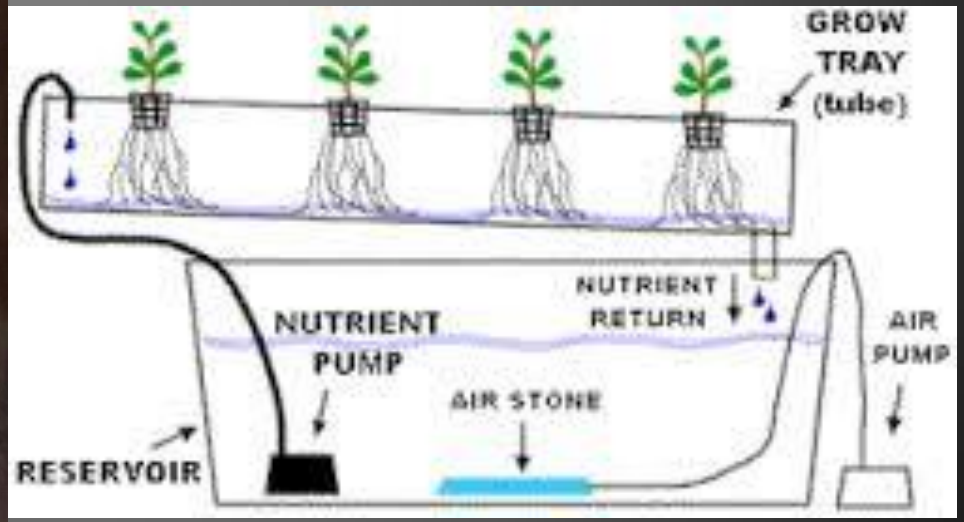
Ebb-flow hydroponics kit



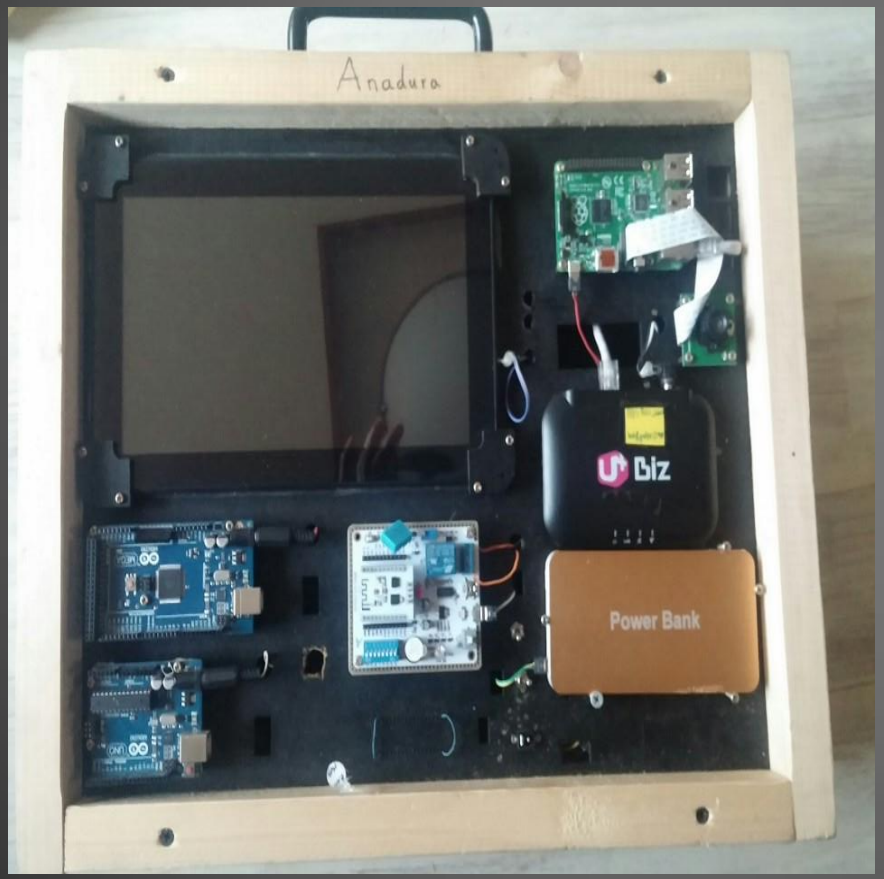


Nutrient-film hydroponics kit



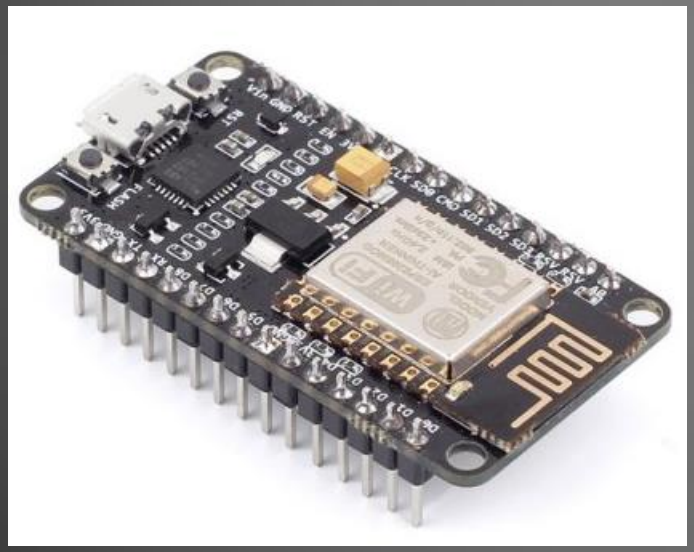


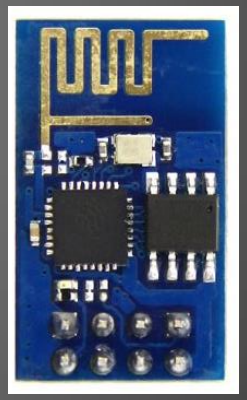
machine vision training kit



IoT Technology

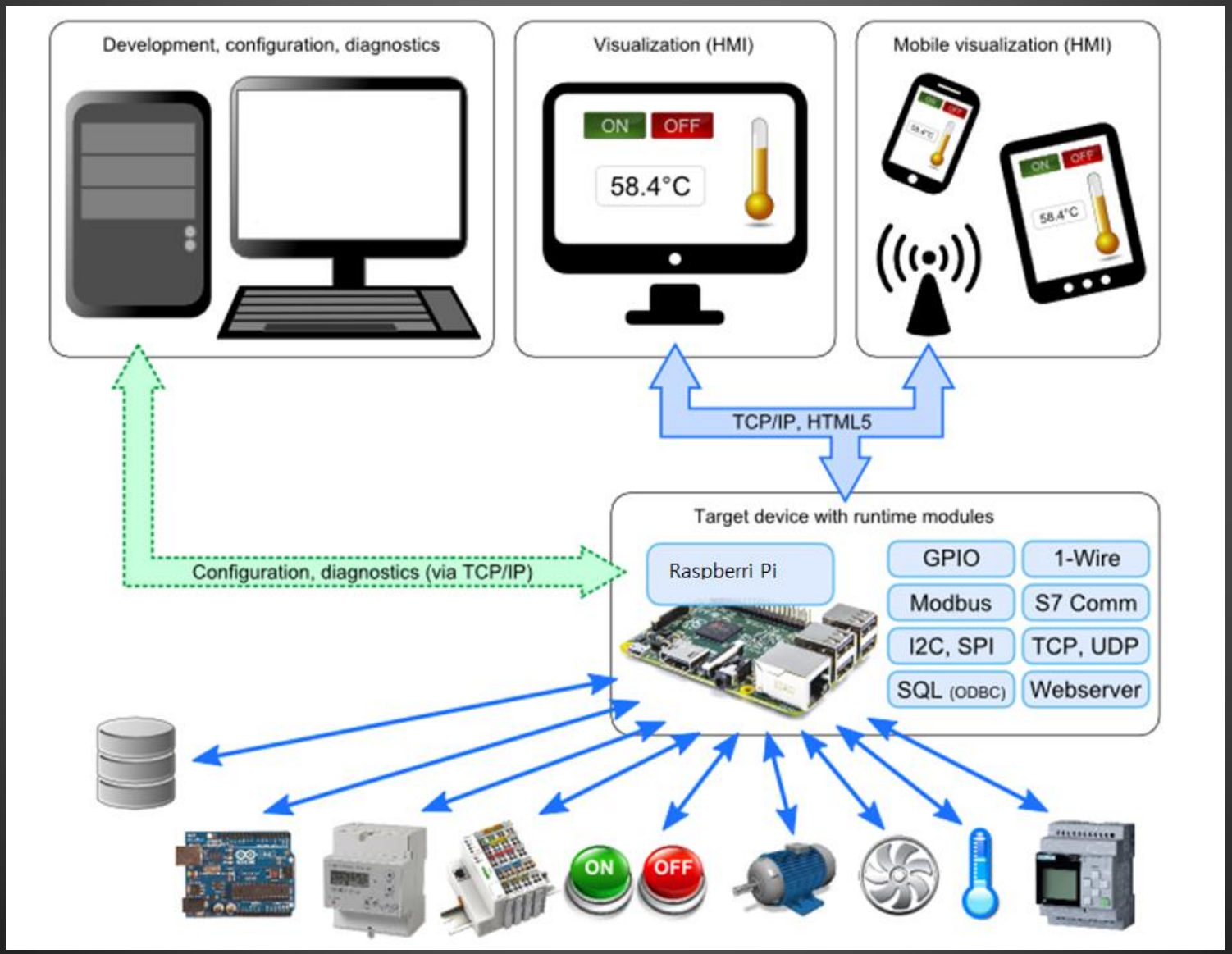
ESP8266



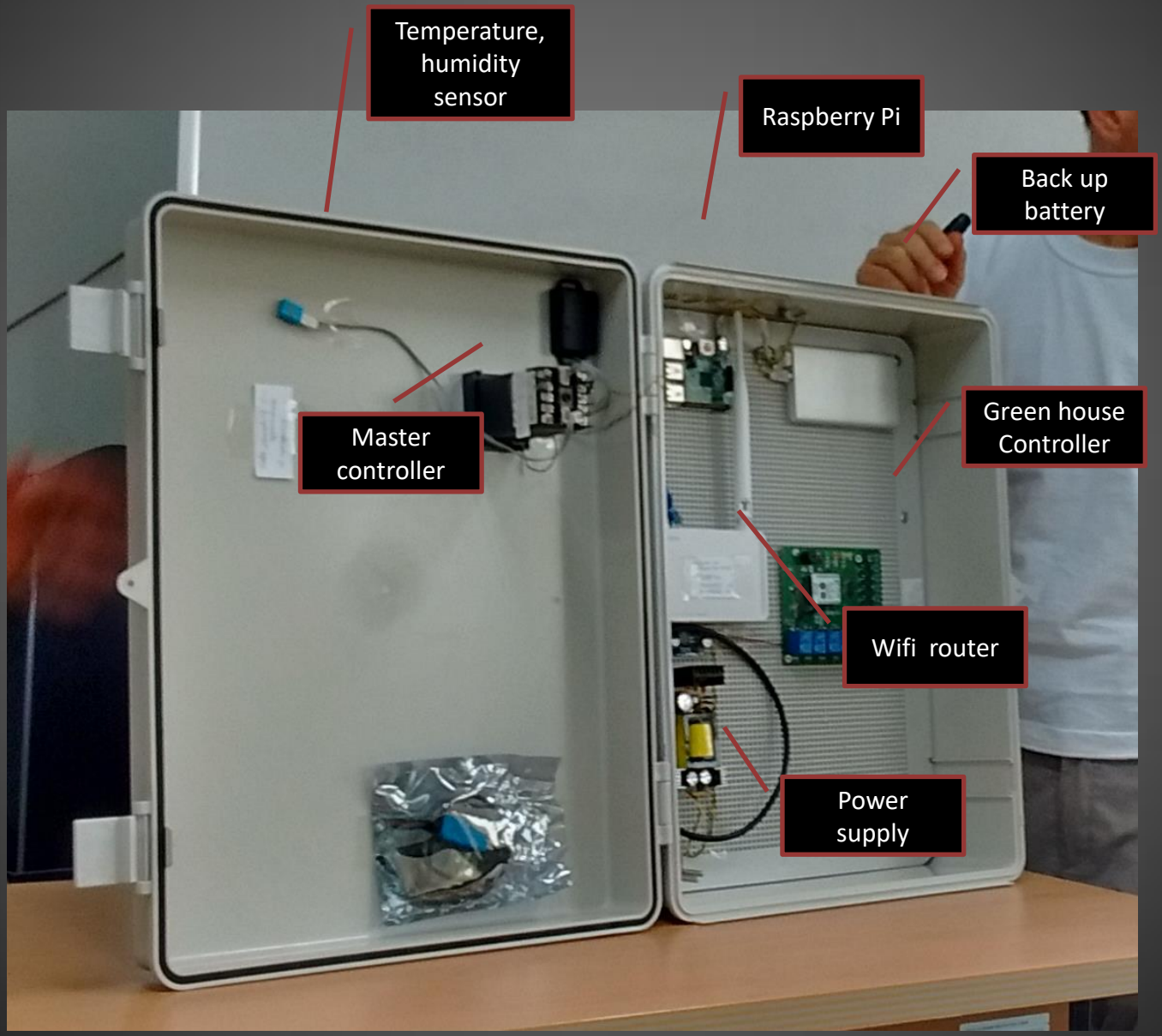


Open source IoT software




Development, configuration, diagnostics
Visualization (HMI)
Mobile visualization (HMI)
ON
OFF
58.4°C
TCP/IP, HTML5
Configuration, diagnostics (via TCP/IP)
Target device with runtime modules
Raspberri Pi
GPIO
1-Wire
Modbus
S7 Comm
I2C, SPI
TCP, UDP
SQL (ODBC)
Webserver
ON
OFF

Wiring trianing



IoT education



