

INTEL-IRRIS

Intelligent Irrigation System for Low-cost Autonomous Water Control
in Small-scale Agriculture



This project is part of the PRIMA
Programme supported by the
European Union



Intel-IrriS



PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION
IN THE MEDITERRANEAN AREA

Intelligent Irrigation System for Low-cost Autonomous Water Control in Small-scale Agriculture



The INTEL-IRRIS starter-kit user guide



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INTEL-IRRIS starter-kit

- "Intelligent Irrigation in-the-box", "plug-&-sense"
- From idea to reality!



2 versions of the soil device



A soil temperature sensor can be added

SEN0308
capacitive sensor

Watermark WM200
Water tension sensor

Installation steps for the starter-kit

- Boot and check the INTEL-IRRIS gateway
- Preparing soil sensor device
- Testing transmission to INTEL-IRRIS gateway
- **IMPORTANT**
 - 1 starter-kit = 1 soil sensor device + 1 INTEL-IRRIS gateway
 - device can be either with capacitive sensor or tensiometer sensor
 - 1 starter-kit per farm to be deployed and tested
 - The INTEL-IRRIS gateway is **pre-configured to be ready for**
 - 1 capacitive sensor & 1 tensiometer sensor (but only 1 device in starter-kit)
 - If there are need for other devices in a farm, see **advanced configuration**
- **All tutorials & videos: <https://intel-iris.eu/tutorials-slides>**

INTEL-IRRIS

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GATEWAY

Installing a higher gain antenna



- The "small" antenna shipped by default with the INTEL-IRRIS gateway may be too small to provide good reception in case of large distance or many obstacles between the soil sensor device and the gateway
- You can use a higher gain antenna to be screwed in an indoor antenna base
- More information in the [antenna tests tutorial](#)



Gateway power consumption



RPI3B consumes less than 300mA

There can be peak up to 800mA when booting

However, a 2.5A micro USB charger is needed to avoid undervoltage

Power the gateway

Option 1: with Internet, enabling RTC to sync on boot

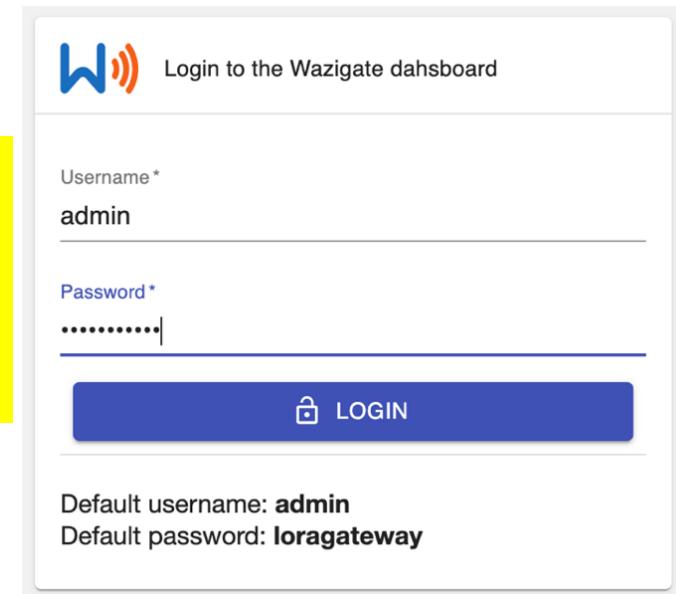
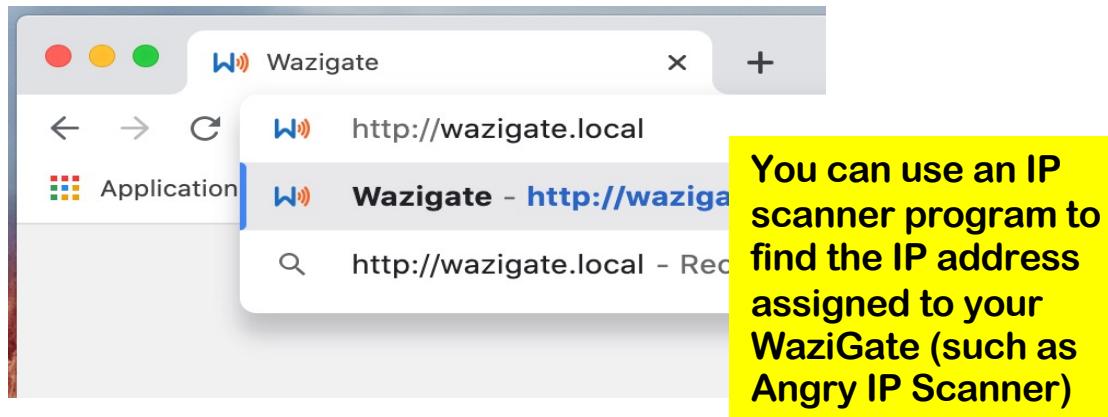
- Use your laptop that should itself be **connected to the Internet** (using your smartphone's WiFi sharing feature for instance)
- Make sure that your laptop will share its Internet connection to devices connected on its Ethernet port. See how to do so:
<https://www.waziup.io/documentation/wazigate/v2/install/#connect-with-ethernet-cable-to-pc>
- **Before powering gateway, connect it to your laptop by Ethernet cable**
- As the gateway will normally run without Internet, so its clock should be synched with an **RTC module that also needs to be synched once**
- Then power the gateway. You should see the first [Internet OK] screen.
 Wait 3-4mins for the main INTEL-IRRIS OLED screen to appear
- **On boot (and only on boot), the RTC**
 module will then be automatically
 synched with Internet's time & date



Checking the gateway

Solution 1

- Once the QR code appears on the gateway's OLED screen
- Open web navigator. Go to <http://wazigate.local> or use IP address



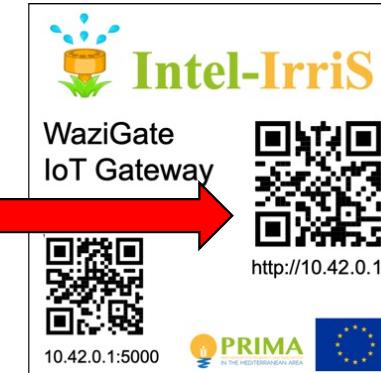
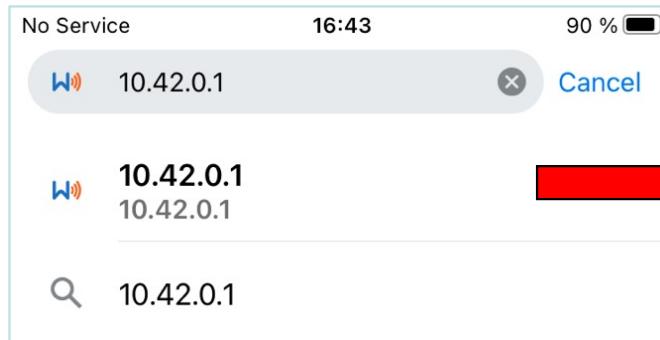
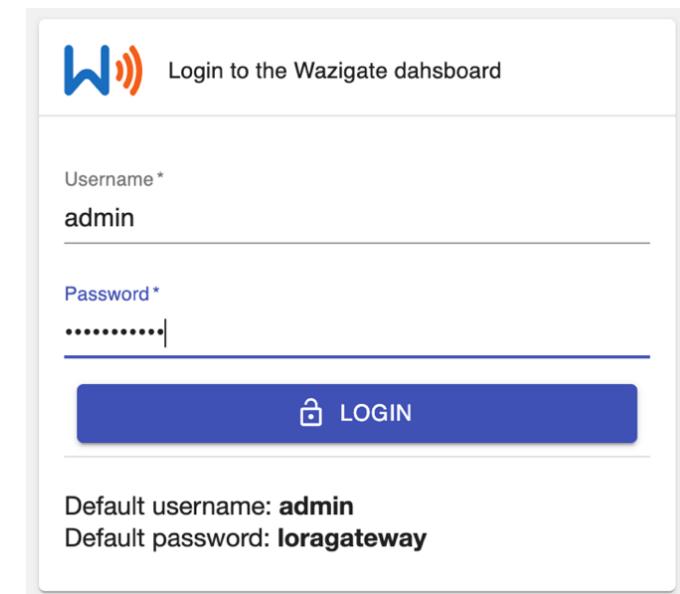
A screenshot of the "Login to the Wazigate dashboard" page. It features a logo with a blue "W" and a red signal icon. The form has two fields: "Username *" with "admin" typed in, and "Password *" with "loragateway" typed in. Below the form is a note: "Default username: admin" and "Default password: loragateway". At the bottom is a large blue "LOGIN" button.

- Use default login to connect
 - User: admin
 - Password: loragateway

Checking the gateway

Solution 2: with WiFi

- Use a smartphone/laptop to access WaziGate through WiFi
- Connect to **WAZIGATE_XXXXXXXXXXXXXX** WiFi network
 - default WiFi password is loragateway
- Open web navigator. Go to <http://wazigate.local> or <http://10.42.0.1> or flash QR code

Login to the Wazigate dashboard

Username *
admin

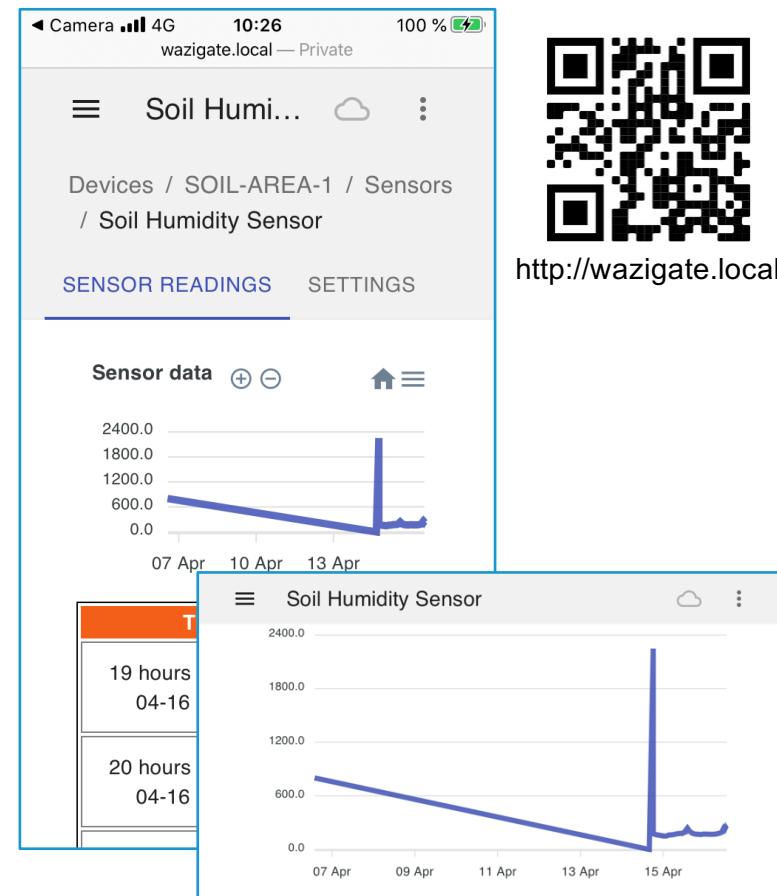
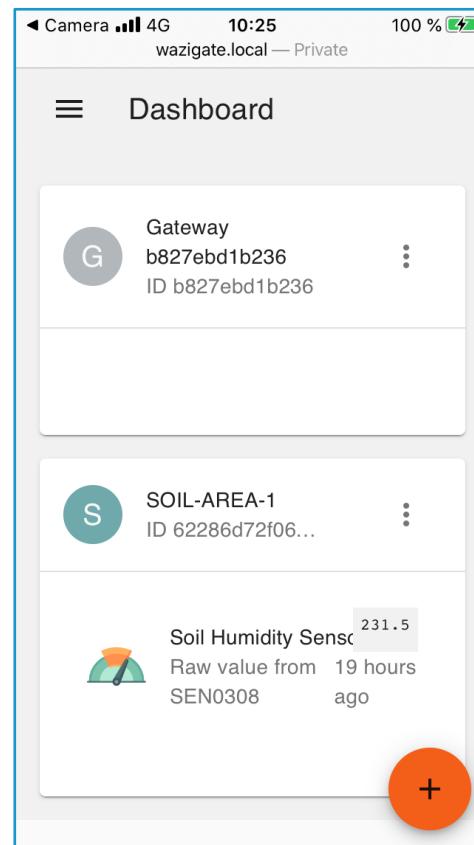
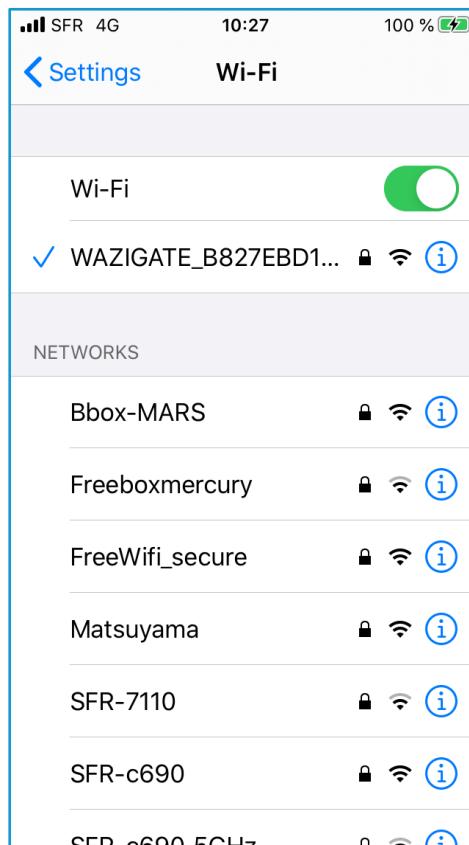
Password *
.....

Default username: **admin**
Default password: **loragateway**

- Use default login to connect
 - User: admin
 - Password: loragateway

Dashboard from a smartphone

Solution 2: with WiFi



<http://wazigate.local>



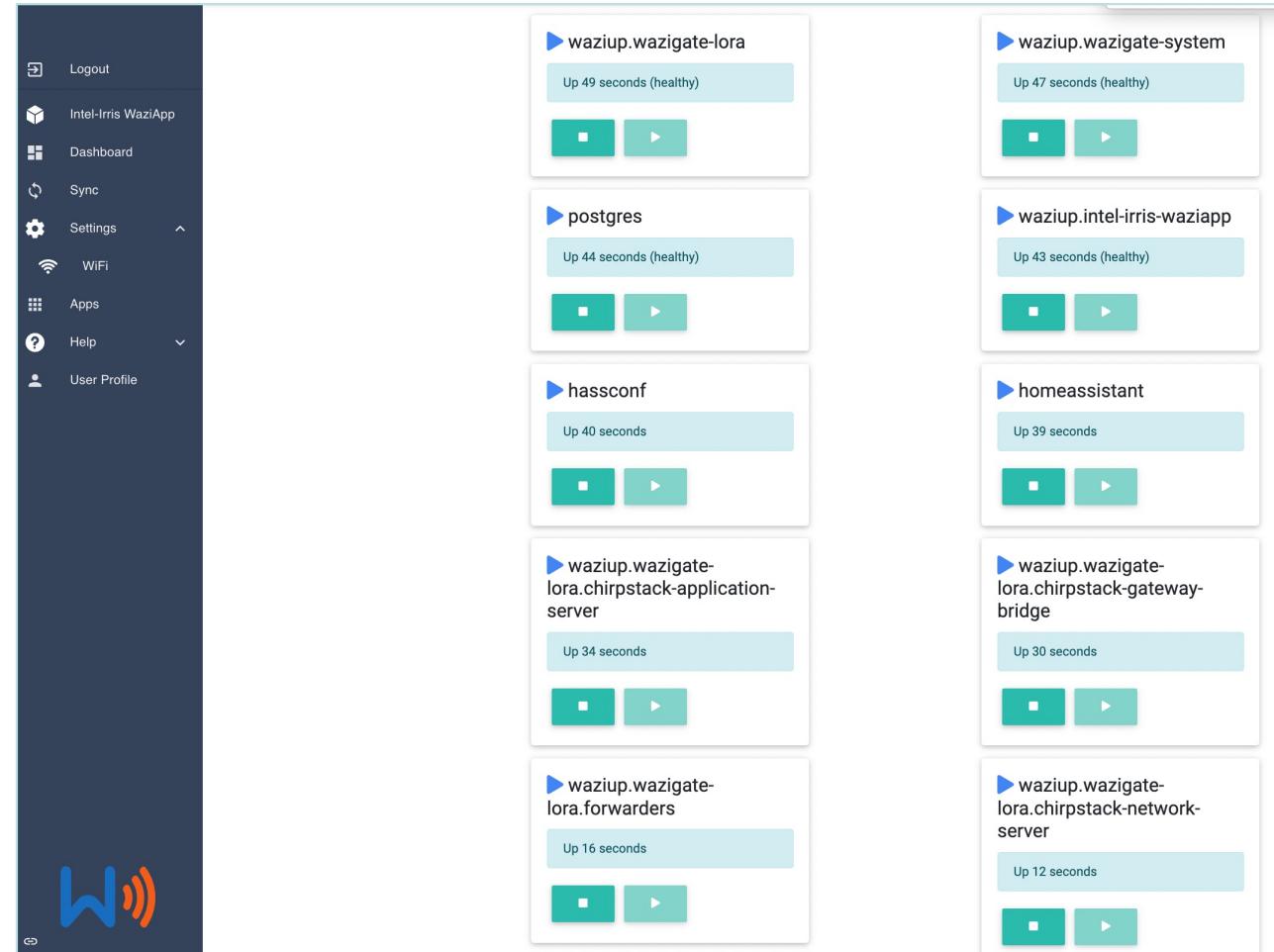
<http://10.42.0.1>

Look at [Video n°4 at t=239s](#)

<https://youtu.be/j-1Nk0tv0xM?t=239>

Check all containers

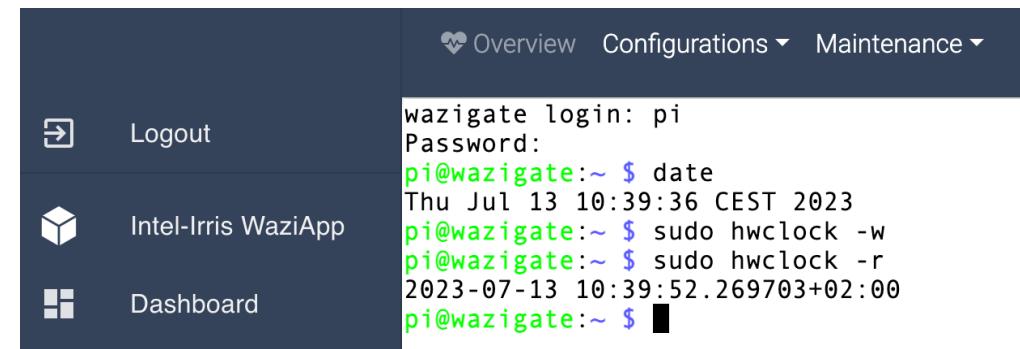
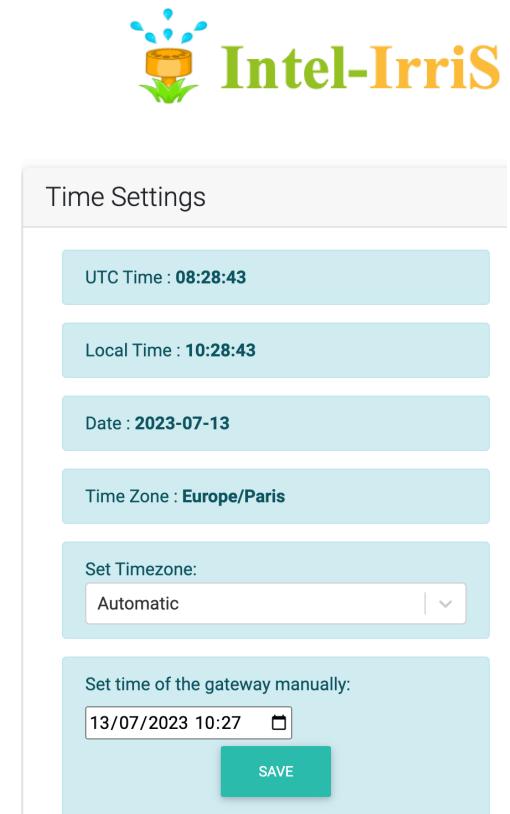
- Go in Settings/Maintenance/Containers
- Check that all containers are up and running
- Otherwise, click on the "run" icon of the faulty container



Synching the RTC module

Option 2: without Internet (or not on boot)

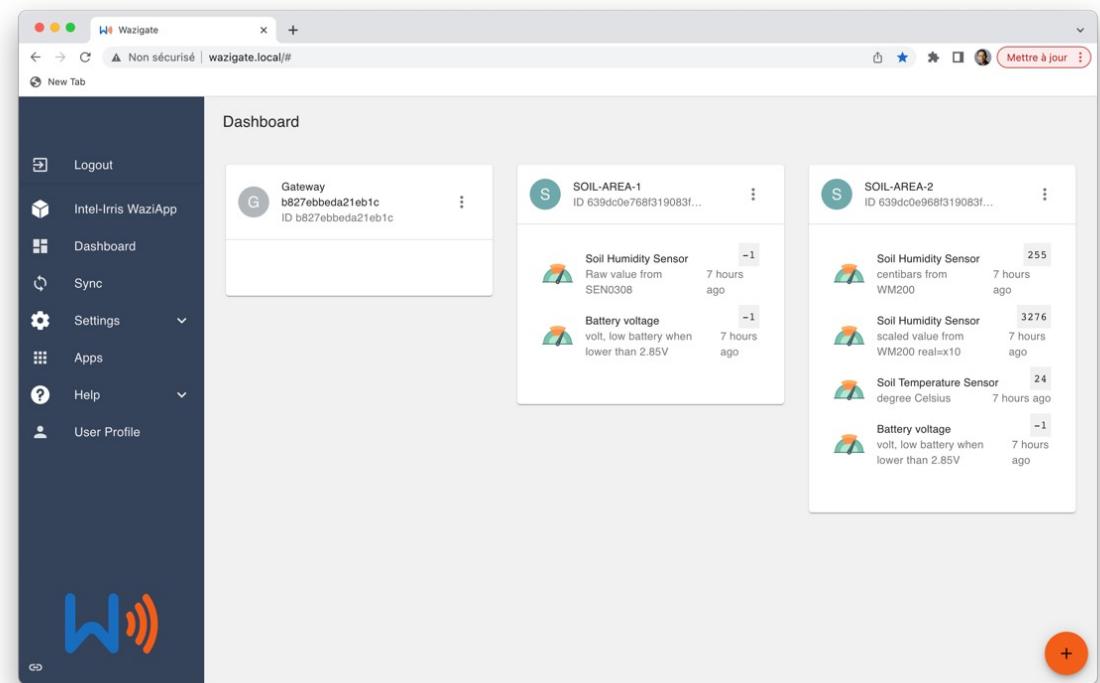
- It is possible to sync the RTC manually, after boot
- First, power then connect to gateway's WiFi
- Go to Settings then Configuration in Configurations top menu. Set time & date manually. Click on SAVE
- Then use the embedded SSH functionalities (in Settings/Maintenance) to log in the gateway (user pi/ pwd loragateway)
- Then type "date" to check if the previously date & time has been saved
- Then "sudo hwclock -w"
- Check with "sudo hwclock -r"
- **It is possible to sync other RTC modules with this method by hot plugging another RTC module**



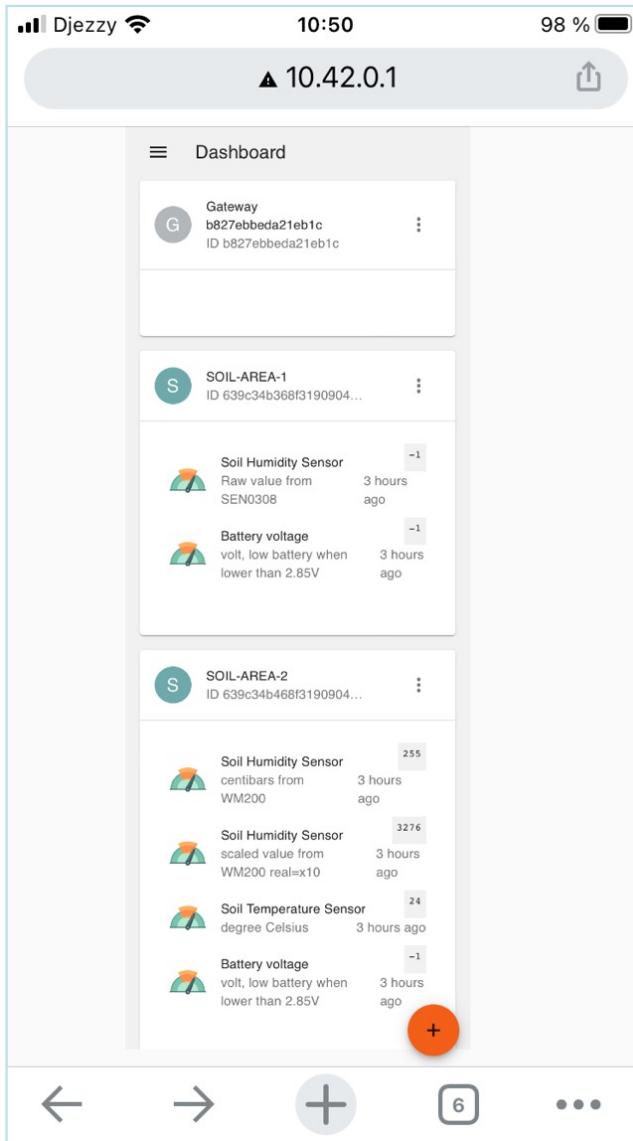
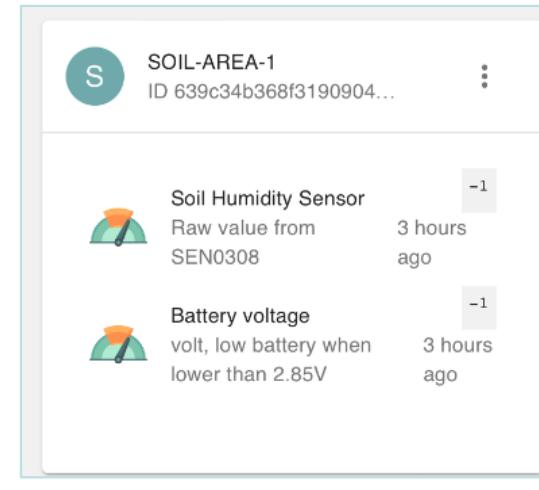
Default gateway configuration (1)

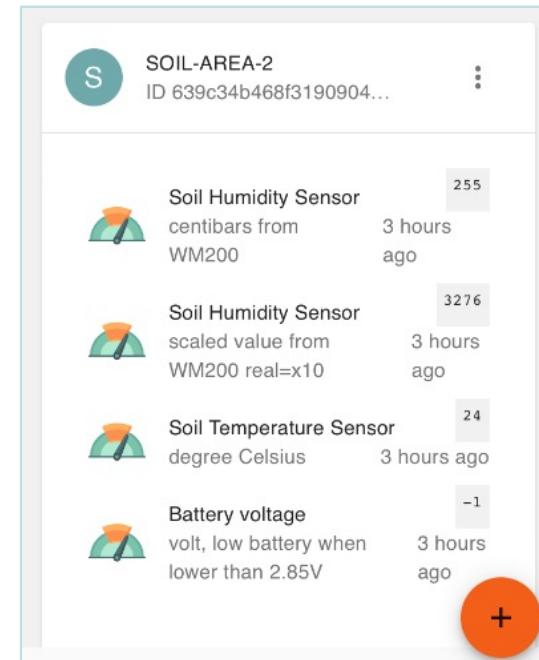


- For the starter-kit, the INTEL-IRRIS gateway will be ready for
 - **1 capacitive sensor named SOIL-AREA-1 with address 26011DAA**
 - **1 tensiometer sensor named SOIL-AREA-2 with address 26011DB1**
- Capacitive device will show humidity and battery values
- Tensiometer device will show centibar, raw resistance, soil temperature and battery values



Default gateway configuration (2)



Default values for the SEN0308 capacitive sensor



Default values for the WM200 tensiometer sensor



QR code for connecting to WiFi

- The gateway WiFi is WAZIGATE_XXXXXXXXXXXX where XXXXXXXXXXXX is the MAC address of the RPI
- For instance WAZIGATE_B827EBD1B236
- With the OLED, a QR code for joining the WiFi network is dynamically generated at boot time and displayed for 10s before the main screen so that users can automatically join with a smartphone
- Then, users can scan the static QR code on the gateway sticker to connect to the gateway's dashboard or the INTEL-IRRIS IIWA App



INTEL-IRRIS

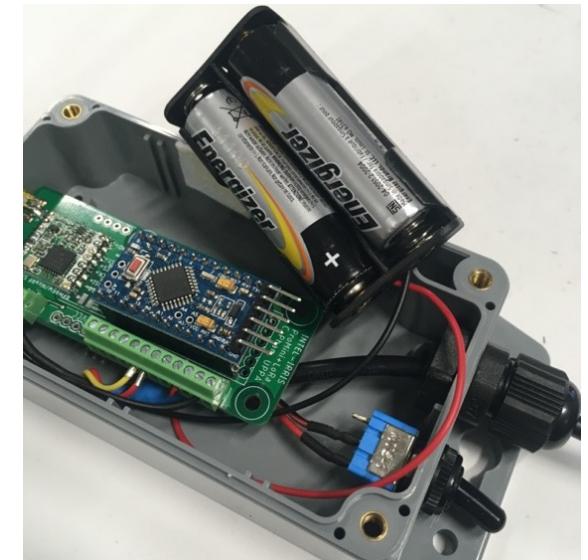
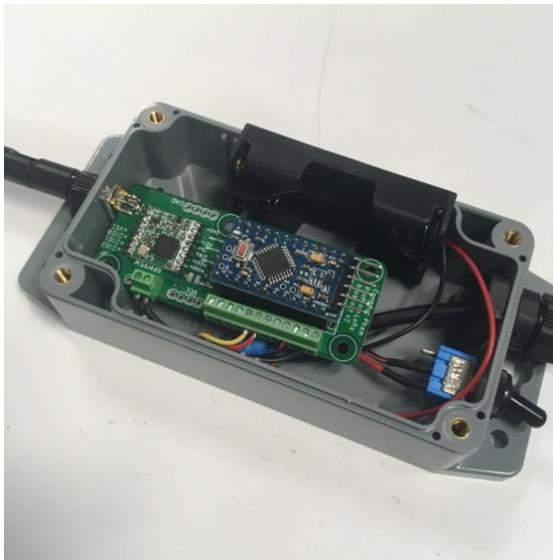
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SOIL DEVICE

Preparing soil sensor device

install batteries

- Remove cover & install 2-AA batteries in battery holder
- Best way is to pull out the battery holder



- Put back cover and be sure to tighten the cover
- Procedure is the same if you need to replace the batteries



Take good AA batteries

- Install new & high-grade alkaline AA batteries to allow for at least 2 years of autonomy
- Take a well-known brand





Never transmit without antenna

- NEVER, NEVER transmit without an antenna
- Doing so can damage the radio module
- If you deploy a device, make sure that the antenna is correctly connected before powering on the device and realizing any transmission test

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TESTING

Testing transmission to gateway

- Test with the fully assembled & configured soil sensor device
 - Check that antenna is connected
 - Switch ON the soil sensor device to get data transmission
 - Wait for about 10s, then switch OFF the soil sensor device
 - Check reception of data on gateway's dashboard
 - You need to refresh the web page on the web navigator



Look at [Video n°4 at t=331s](#)

<https://youtu.be/j-1Nk0tv0xM?t=331>

Transmission to gateway



Parameters for
INTEL-IRRIS gateway
(default in red)

LoRaWAN™
SF12BW125
868.1MHz | 433.175MHz
Node id is 26011DAA
1 msg/60mins
1 sensor
XLPP data



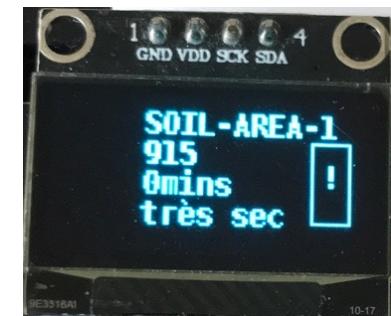
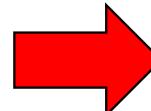
This dedicated video will show all these steps, from connecting the SEN0308 to testing transmission to the gateway
 Video n°4: <https://youtu.be/j-1Nk0tv0xM>

Check data reception on OLED

YOU CAN ALSO VIEW ON DASHBOARD

Testing with
capacitive device

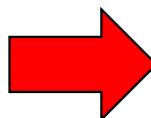
Default values for the
SEN0308 capacitive sensor



Testing with
tensiometer device

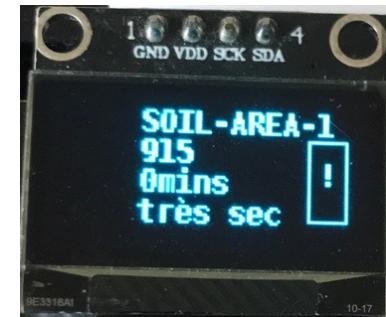
Default values for the WM200
tensiometer sensor

VALUES ARE ONLY INDICATIVE

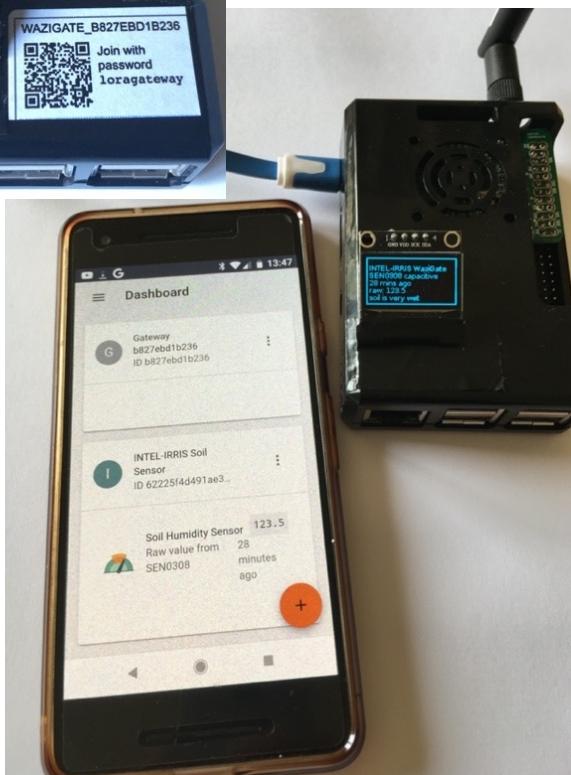
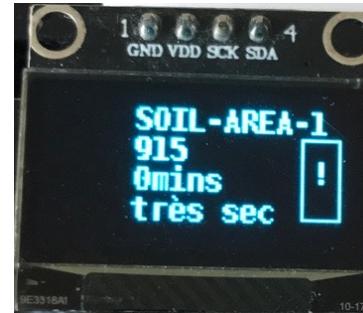


Soil sensor information on OLED

- The OLED displays the latest received sensor data for the end-user: the device name, the time of last received data, the sensor raw value and the soil condition
- The main screen is displayed for 6s every 30s. Then a screen saver display will show a shorter version of these information with a 5-bar visual
- 5 bars: saturated | 4 bars: wet
- 3 bars: wet | 2 bars: dry
- 1 bar: dry | 0 bar: very dry



Summary of INTEL-IRRIS gateway various User Interfaces



SOIL-AREA-1

Soil condition : wet
capacitive
Value : 123



SOIL-AREA-2

Soil condition : saturated
tensiometer_cbar
Value : 5



Deploying the starter-kit

- Install the soil sensor device in the field
 - See dedicated slides/videos
- Install the INTEL-IRRIS gateway in the farmer's office/home
 - Just power the gateway, no Internet is required
 - Test access to gateway's dashboard with farmer's smartphone
- **NEVER TRANSMIT WITHOUT AN ANTENNA**
- Test correct data reception on INTEL-IRRIS gateway
 - Switch ON the soil sensor device to get data transmission
 - Check reception of data on gateway's dashboard or OLED screen

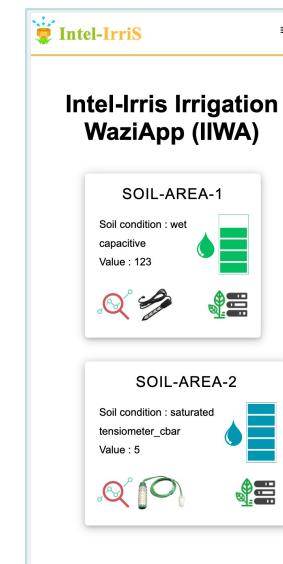
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IIWA APPLICATION

INTEL-IRRIS Irrigation WaziApp

- The INTEL-IRRIS Irrigation WaziApp (IIWA) is an embedded application running on the INTEL-IRRIS gateway itself
- It is included in the starter-kit to implement the "**intelligent Irrigation in-the-box**" & "**plug-&-sense**" approach
- Its objective is to enhance the irrigation indication by applying sensor calibration models with soil/plant/weather parameters



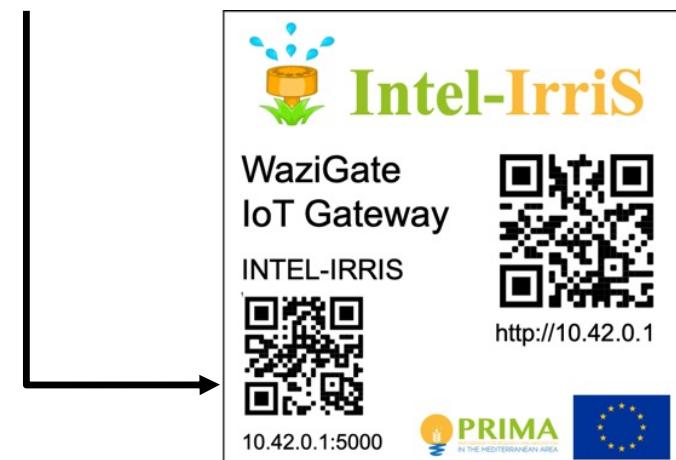
Connect to IIWA

- First, connect to INTEL-IRRIS gateway WiFi which should look like WAZIGATE_XXXXXXXXXXXX
 - Password is loragateway
- Otherwise, with the OLED screen, a QR code for automatically joining the WiFi network is periodically displayed for 10s
 - scan the displayed QR code with a smartphone to connect to gateway's WiFi
- Then, scan the static QR code on the gateway sticker to connect to the INTEL-IRRIS Irrigation WaziApp on : <http://10.42.0.1:5000>



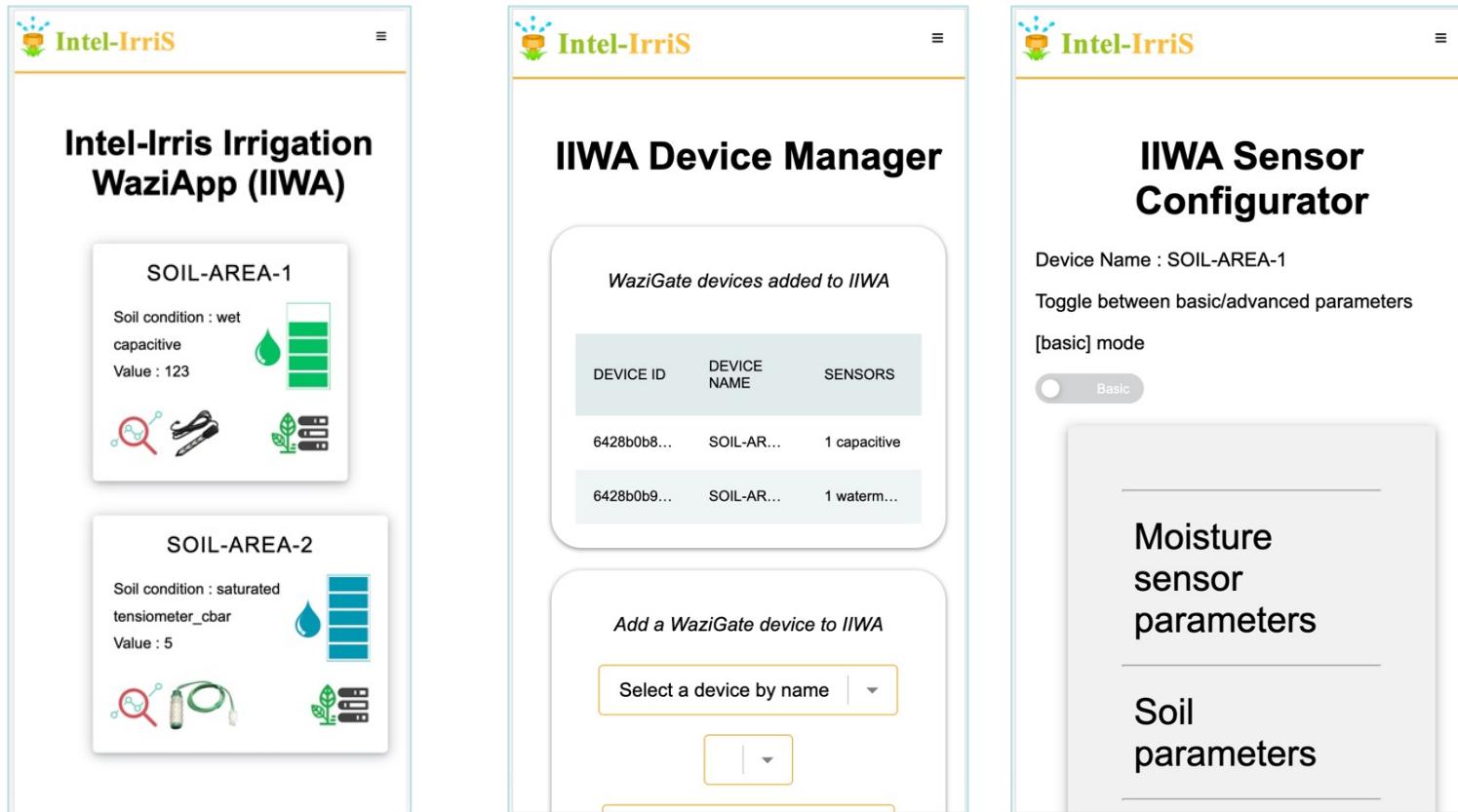
EXAMPLE:

WAZIGATE_DCA6325C2A7A



Get the IIWA presentation slides

- Part 4: the INTEL-IRRIS Irrigation WaziApp
 - [Tutorial slides on the INTEL-IRRIS Irrigation WaziApp](#)



The image displays three screenshots of the Intel-Irris Irrigation WaziApp (IIWA) interface, showing different features of the system:

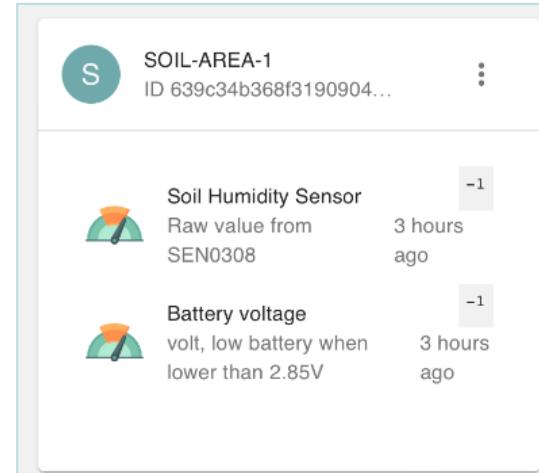
- Intel-Irris Irrigation WaziApp (IIWA)**: This screen shows two soil monitoring areas.
SOIL-AREA-1: Soil condition: wet, capacitive; Value: 123.
SOIL-AREA-2: Soil condition: saturated tensiometer_cbar; Value: 5.
- IIWA Device Manager**: This screen lists WaziGate devices added to IIWA.

DEVICE ID	DEVICE NAME	SENSORS
6428b0b8...	SOIL-AR...	1 capacitive
6428b0b9...	SOIL-AR...	1 waterm...

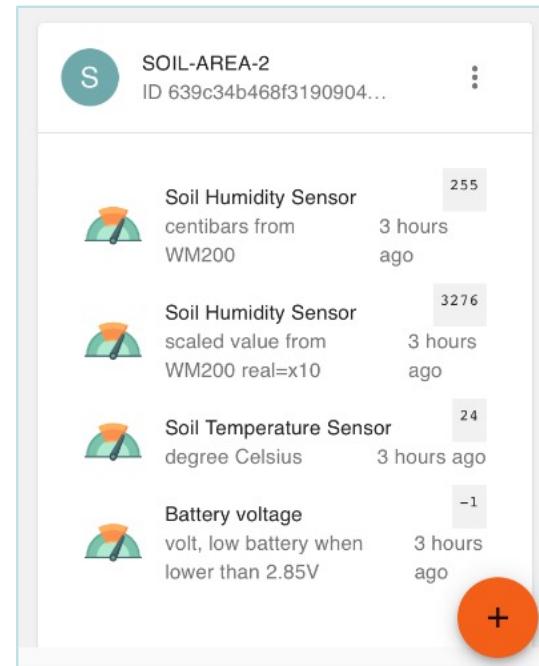
 Below this is a section to "Add a WaziGate device to IIWA" with a dropdown menu labeled "Select a device by name".
- IIWA Sensor Configurator**: This screen is for configuring sensors. It shows the device name: SOIL-AREA-1, and a toggle switch between basic and advanced parameters, currently set to [basic] mode. It includes sections for "Moisture sensor parameters" and "Soil parameters".

Default gateway configuration & IIWA

- For the starter-kit, the INTEL-IRRIS gateway will be ready for
 - 1 capacitive sensor named SOIL-AREA-1 with address 26011DAA
 - 1 tensiometer sensor named SOIL-AREA-2 with address 26011DB1
- IIWA default configuration
 - Both SOIL-AREA-1 & SOIL-AREA-2 are added to IIWA
 - Soil condition will be determined for both devices, if relevant data are received



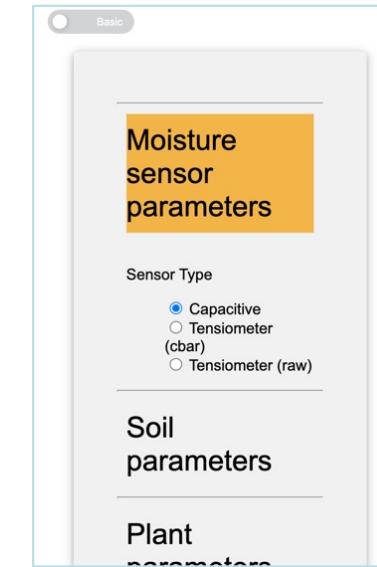
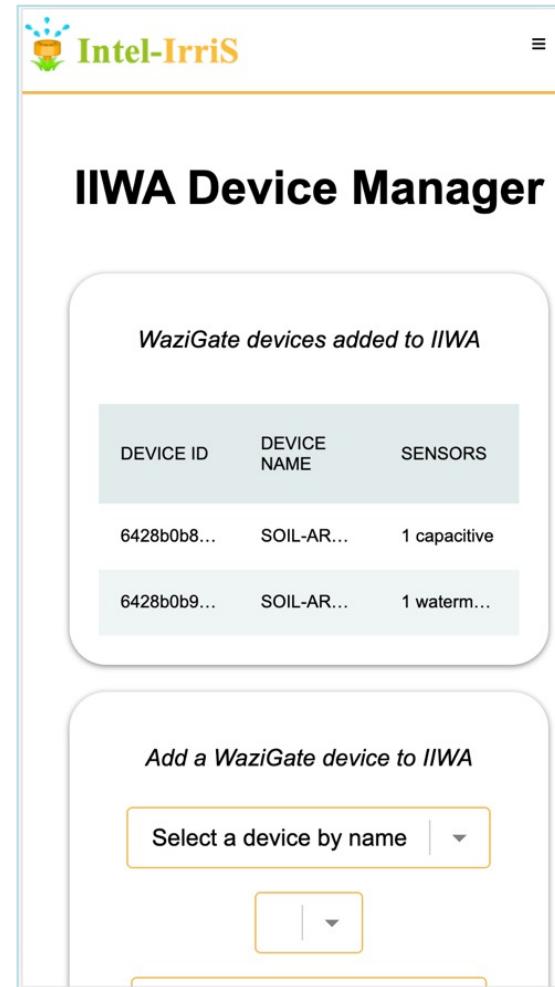
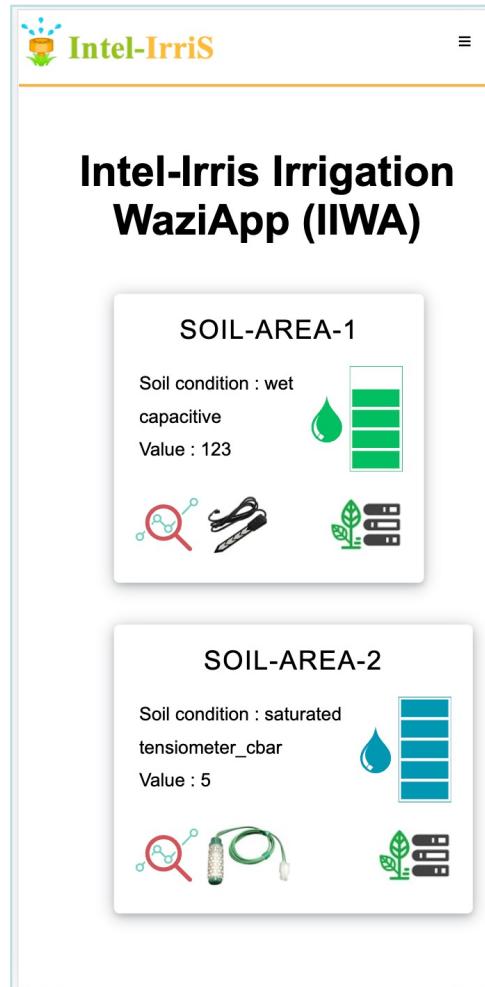
Default values for the SEN0308 capacitive sensor



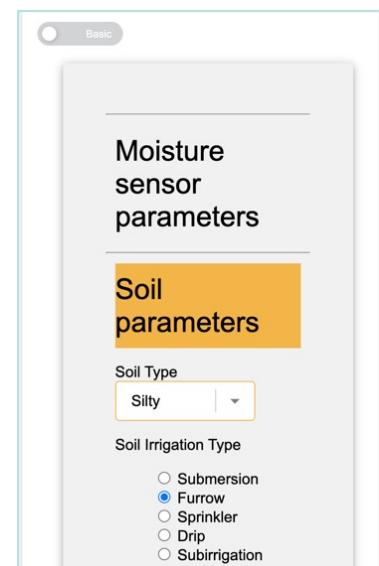
Default values for the WM200 tensiometer sensor



Default IIWA screens & configuration



It is OK to use the IIWA default configuration



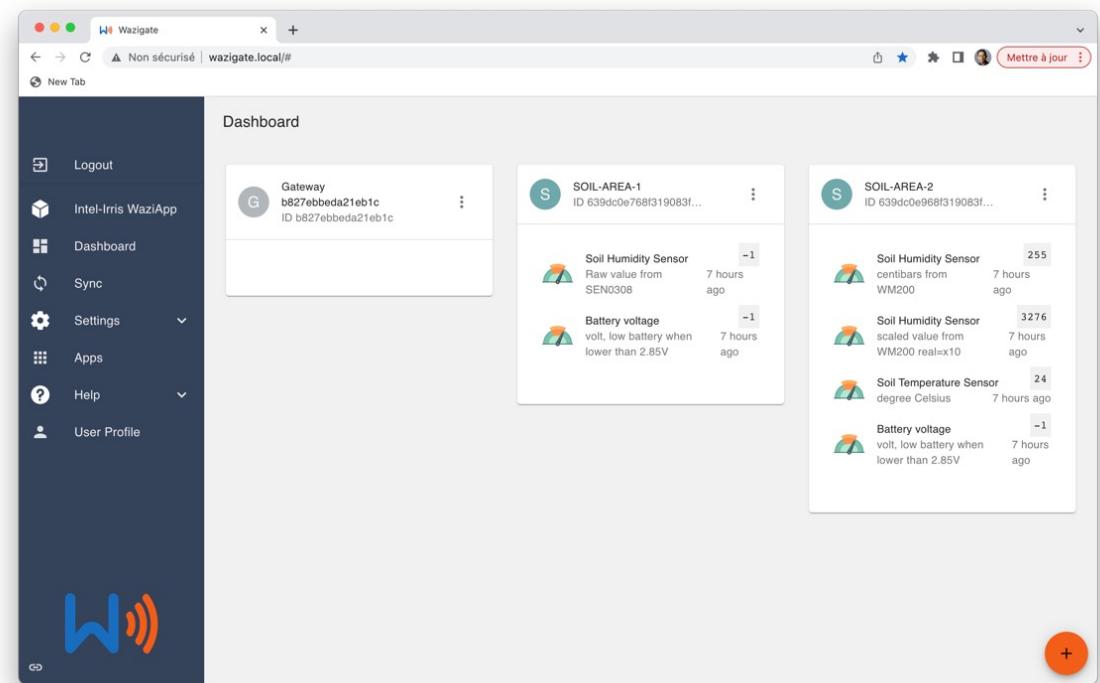
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DEFAULT CONFIGURATION

Default gateway configuration

- For the starter-kit, the INTEL-IRRIS gateway will be ready for
 - **1 capacitive sensor named SOIL-AREA-1 with address 26011DAA**
 - **1 tensiometer sensor named SOIL-AREA-2 with address 26011DB1**
- Capacitive device will show humidity and battery values
- Tensiometer device will show centibar, raw resistance, soil temperature and battery values



Other configuration

- Your iNTEL-IRRIS gateway may be already pre-configured for a specific setting
 - A number C of capacitives devices
 - A number T of tensiometer devices
- The general rule is as follows
 - Name of devices are SOIL-AREA-X
 - X increasing from 1 to C+T
 - Capacitive devices are listed first, then tensiometer devices
 - SOIL-AREA-1, ..., SOIL-AREA-C: for the C capacitive sensors
 - SOIL-AREA-[C+1], ..., SOIL-AREA-[C+T]: for the T tensiometer sensors
 - Capacitive devices have addresses in the form
 - 26011D**AA**, 26011D**AB**, 26011D**AC**, ...
 - Tensiometer devices have addresses in the form
 - 26011D**B1**, 26011D**B2**, 26011D**B3**, ...

Ex: 1 capacitive & 3 tensiometer

- SOIL-AREA-1
 - Capacitive, address is 26011D**AA**
- SOIL-AREA-2
 - Tensiometer, address is 26011D**B1**
- SOIL-AREA-3
 - Tensiometer, address is 26011D**B2**
- SOIL-AREA-4
 - Tensiometer, address is 26011D**B3**

INTEL-IRRIS

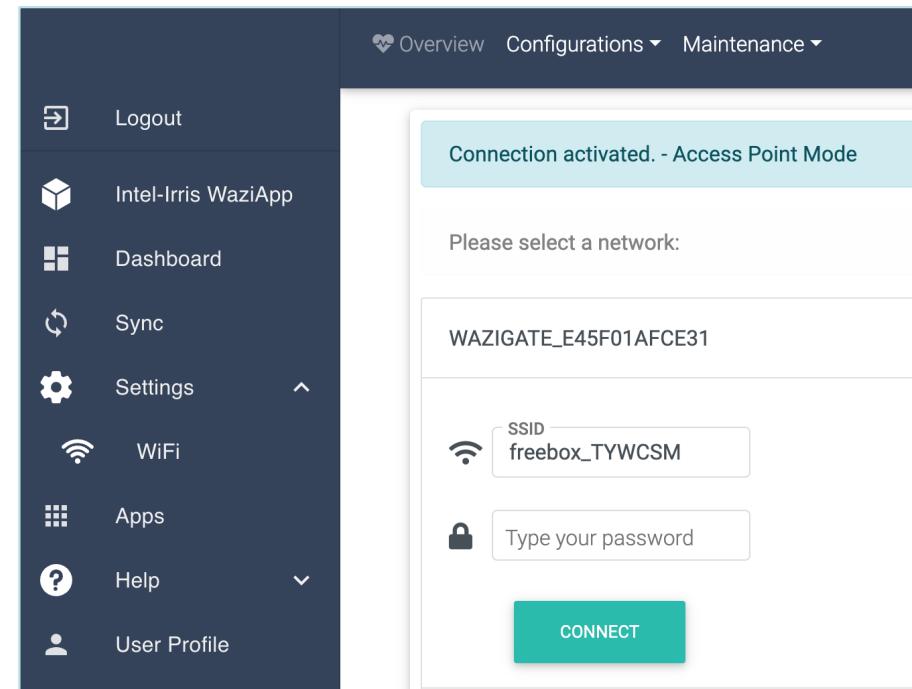
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ADVANCED CONFIGURATION

Advanced configuration

connect gateway to a WiFi network

- By default, the gateway acts as a WiFi Access Point
- To connect the gateway to a WiFi network, go to Setting/WiFi to list all available WiFi networks
- Then select the one you want in order to provide the WiFi password
- Ex: connect to freebox_TYWCSM
- Once connected, gateway is in WiFi Client mode



Advanced configuration

connect gateway to a WiFi network, con't

- You can connect to several WiFi networks, one after another, to have a list of known WiFi networks
- They will be memorized and if the current WiFi network is not available, another available network in the list of known WiFi networks will be selected
- If there are no available WiFi networks in the list of known WiFi networks anymore, then the gateway switches back to Access Point mode

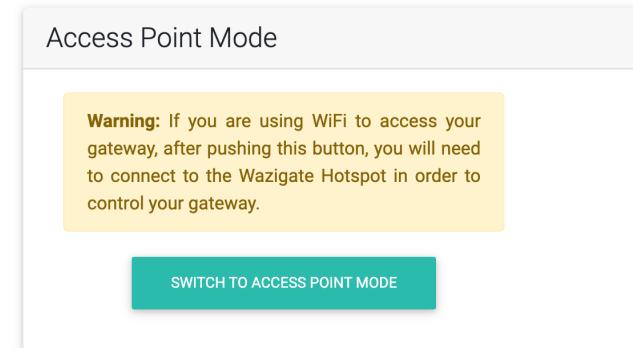
Advanced configuration

switch gateway back to WiFi access point mode

- To get back to Access Point mode, go to Setting/WiFi and simply click on "Forget" for the current WiFi network



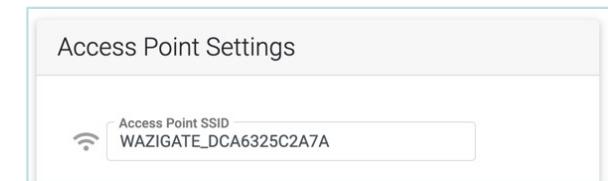
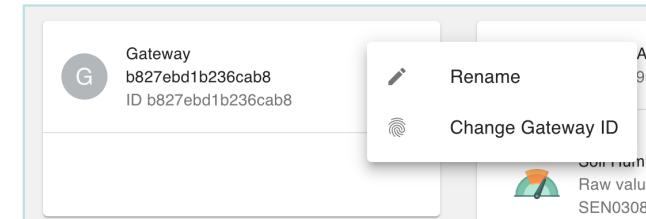
- If you previously added several WiFi networks, click on "Forget" for **ALL** known & memorized WiFi networks
- **DO NOT USE** the "SWITCH TO ACCESS POINT MODE" option
- **IT IS NOT STABLE!**



Advanced configuration

sync gateway and its devices to the cloud

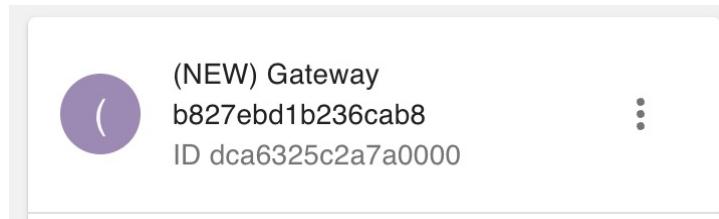
- To sync your gateway to the Waziup Cloud, look at this tutorial
 - <https://www.waziup.io/documentation/wazigate/v2/install/#registration-with-the-cloud>
- You will need an account on Waziup Cloud dashboard
 - If you don't have one, you need to create one first
 - <https://dashboard.waziup.io/>
- Then, you NEED to change your gateway id
 - Use the unique MAC address of your gateway that appears in Settings/Configuration (it is used as your gateway's WiFi hotspot)
 - Here: DCA6325C2A7A
 - Add 0000 at the end to have 16 digits
 - -> DCA6325C2A7A0000



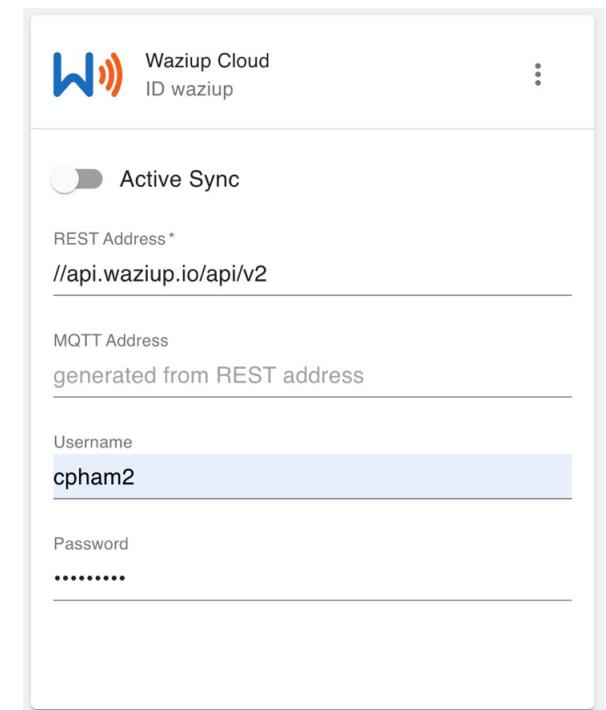
Advanced configuration

sync gateway and its devices to the cloud, con't

- You should have a new gateway on your dashboard with the new ID



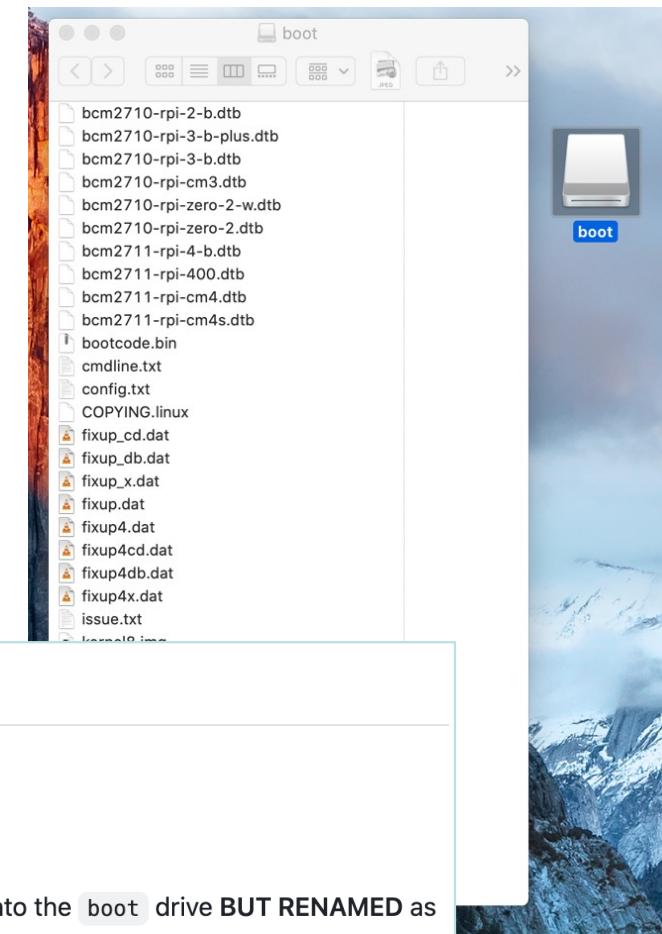
- Enter your Waziup Cloud credentials in the Sync menu
- Then, just activate sync on your gateway which needs to be connected to Internet
- Log in the Waziup Cloud dashboard and check that you see your gateway and your device
- You can activate/deactivate synchronization at anytime



Advanced configuration

use 433MHz frequency band

- The default SD card image uses EU868 frequency band
- To set to 433MHz, read carefully & use the auto-configuration mechanism
 - <https://github.com/CongducPham/PRIMA-Intel-Irris/tree/main/Gateway/boot#auto-configuration-on-boot-for-the-intel-irris-wazigate>



Example 1: set INTEL-IRRIS WaziGate in 433MHz version

- flash the INTEL-IRRIS WaziGate SD card image
- insert the SD card in any computer (Windows, Linux, MacOS)
- open the `boot` drive that should appear on your computer
- download from INTEL-IRRIS GitHub (`Gateway/boot`) `intel-irris-band-433.txt` to be copied into the `boot` drive **BUT RENAMED** as `intel-irris-band.txt`
- be sure that there is no `intel-irris-auto-config.done` file in the `boot` drive, otherwise delete the file
- safely eject the `boot` drive
- insert the SD card in the RPI and power the RPI

ex 1: have several capacitive soil sensor devices

- Only to have several capacitive soil devices on 1 Wazigate – change the device address in the soil device Arduino code

```
Intelirris_Soil_Sensor | Arduino 1.8.13

Intelirris_Soil_Sensor DS18B20.cpp DS18B20.h RadioSettings.h SK128X_RadioSettings.h SK127X_RadioSettings.h SK128X_RadioSettings.h
181 //*****
182 //***** [REDACTED]
183 //***** [REDACTED]
184 //***** [REDACTED]
185 //***** [REDACTED]
186 //*****
187
188 /////////////////
189 // LORAWAN OR EXTENDED DEVICE ADDRESS FOR LORAWAN CLOUD
190 #if defined LORAWAN || defined EXTDEVADDR
191 //////////////////
192 //ENTER HERE your Device Address from the TTN device info (same order, i.e. msb). Example for 0x12345678
193 //unsigned char DevAddr[4] = { 0x12, 0x34, 0x56, 0x78 };
194 //////////////////
195
196 #if defined WITH_WATERMARK && not defined WMLAS_PRIMARY_SENSOR
197 //Watermark soil sensor device has a different address from the default address 26011DAA
198 //26011DB1
199 //if you need another address for tensiometer sensor device, use B1, B2, B3,..., BF
200 unsigned char DevAddr[4] = {0x26, 0x01, 0x1D, 0xAA};
201 #else
202 //default device address for WaziGate configuration, mainly for SEN0308 capacitive soil sensor device
203 //26011DAA
204 //if you need another address for capacitive sensor device, use AA, AB, AC,..., AF
205 unsigned char DevAddr[4] = {0x26, 0x01, 0x1D, 0xAA};
206 #endif
207
208 #else
209 //////////////////
210 // DO NOT CHANGE HERE
211 unsigned char DevAddr[4] = { 0x00, 0x00, 0x00, node_addr };
212 //////////////////
213 #endif
214
215 //////////////////
216
```

Default address for capacitive sensor is

```
{ 0x26, 0x01, 0x1D, 0xAA };
```

Just increase the last byte

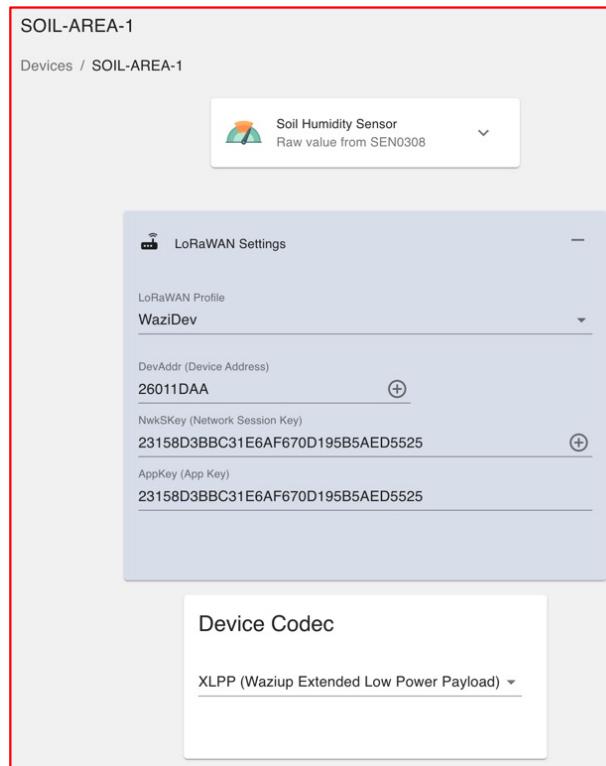
```
{ 0x26, 0x01, 0x1D, 0xAB };
```

Compile and upload the code to the additional soil sensor device

Advanced configuration

ex 1: have several capacitive soil sensor devices, con't

- Left figure shows gateway config with 1 soil sensor device
- Create a new device, e.g. device name SOIL-AREA-2
- Avoid space, limit to 12 characters for correct display on OLED



SOIL-AREA-1

Devices / SOIL-AREA-1

Soil Humidity Sensor
Raw value from SEN0308

LoRaWAN Settings

LoRaWAN Profile: WaziDev

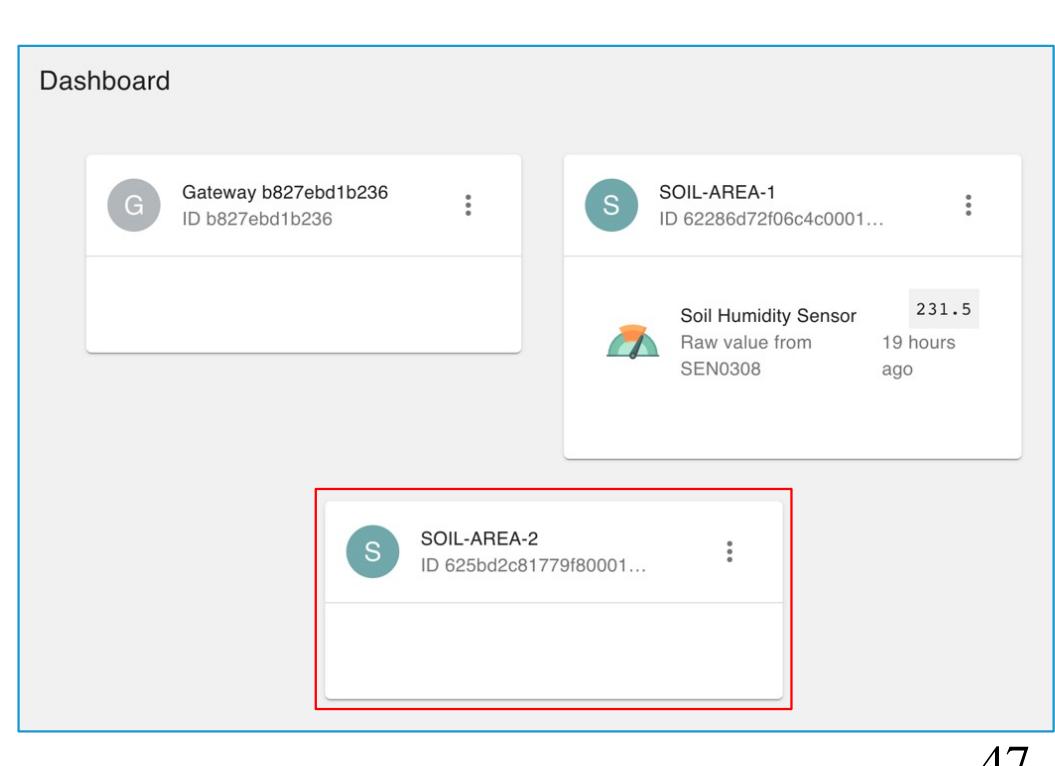
DevAddr (Device Address): 26011DAA

NwkKey (Network Session Key): 23158D3BBC31E6AF670D195B5AED5525

AppKey (App Key): 23158D3BBC31E6AF670D195B5AED5525

Device Codec

XLPP (Waziup Extended Low Power Payload)



Dashboard

G Gateway b827ebd1b236 ID b827ebd1b236 ...

S SOIL-AREA-1 ID 62286d72f06c4c0001... ...

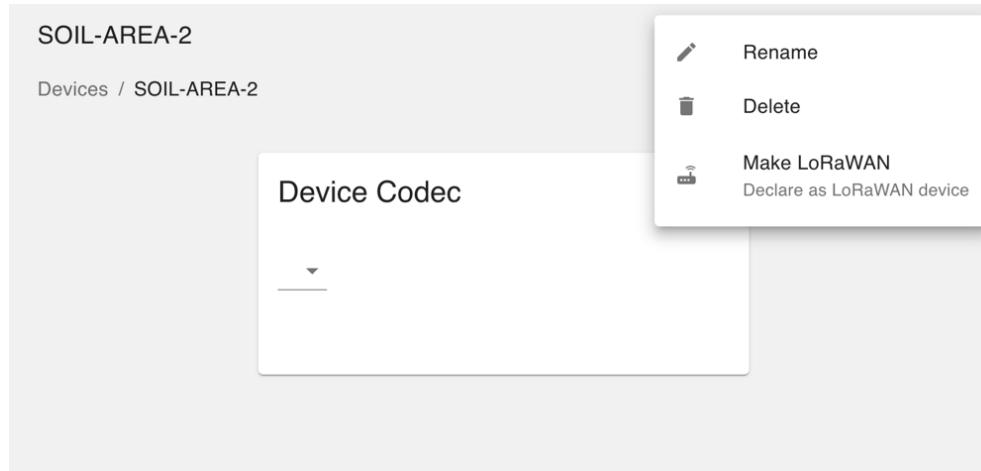
Soil Humidity Sensor Raw value from SEN0308 231.5 19 hours ago

S SOIL-AREA-2 ID 625bd2c81779f80001... ...

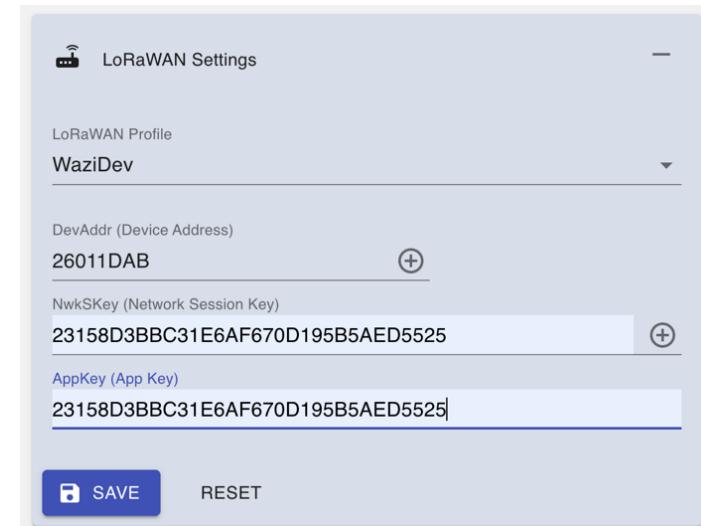
Advanced configuration

ex 1: have several capacitive soil sensor devices, con't

- Select the new device and make it as LoRaWAN device



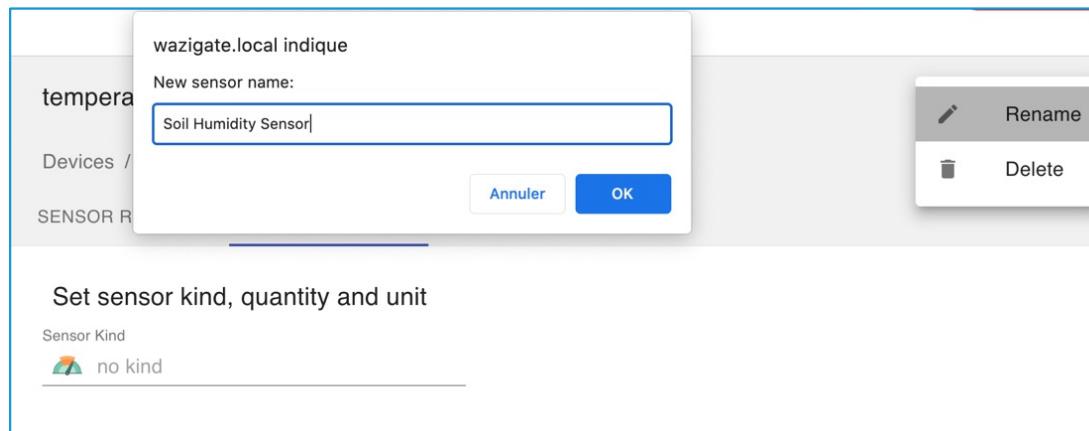
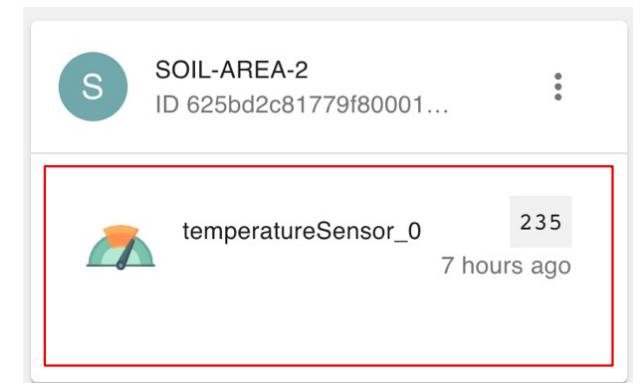
- Set the new address, matching the one of the Arduino code: 26011DAB
- keep same encryption keys
- Select XLPP as codec



Advanced configuration

ex 1: have several capacitive soil sensor devices, con't

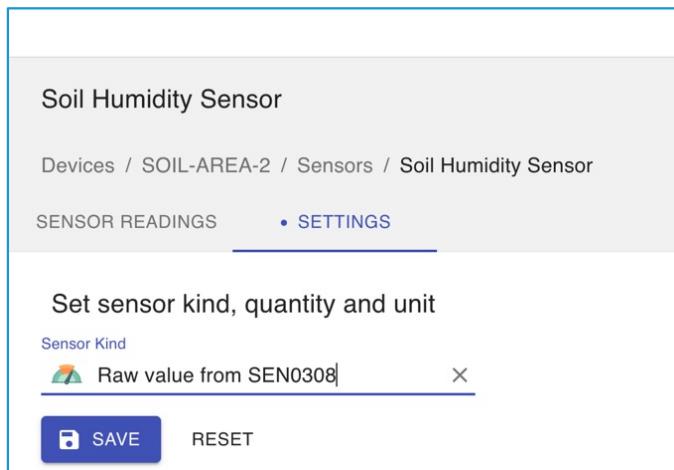
- DO NOT manually create a sensor. Instead,...
- ... power on the new soil sensor device for data transmission
- Refresh the gateway dashboard, the new data should appear
- New sensor name is "temperatureSensor_0"
- Click on "temperatureSensor_0" and then rename it, e.g. "Soil Humidity Sensor"



Advanced configuration

ex 1: have several capacitive soil sensor devices, con't

- Change Sensor kind to "Raw value from SEN0308"



Soil Humidity Sensor

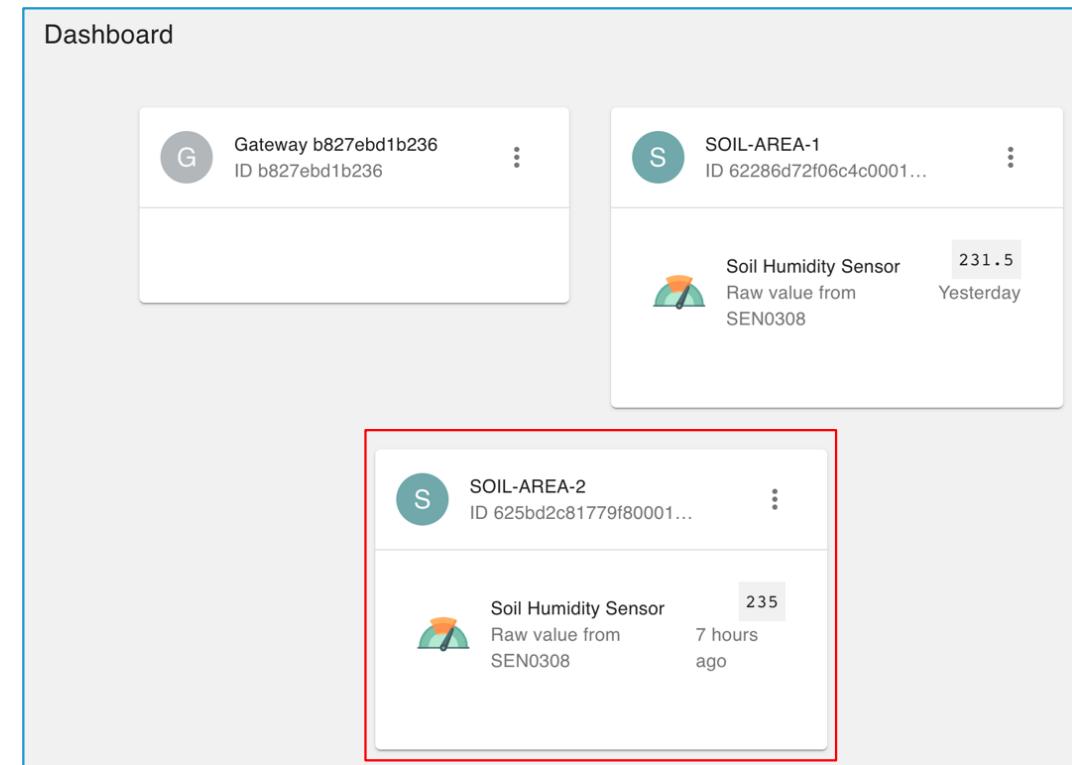
Devices / SOIL-AREA-2 / Sensors / Soil Humidity Sensor

SENSOR READINGS • SETTINGS

Set sensor kind, quantity and unit

Sensor Kind: Raw value from SEN0308

SAVE RESET



Dashboard

G Gateway b827ebd1b236 ID b827ebd1b236 ...

S SOIL-AREA-1 ID 62286d72f06c4c0001... ...

SOIL-AREA-2 ID 625bd2c81779f80001... ...

Soil Humidity Sensor Raw value from SEN0308 231.5 Yesterday

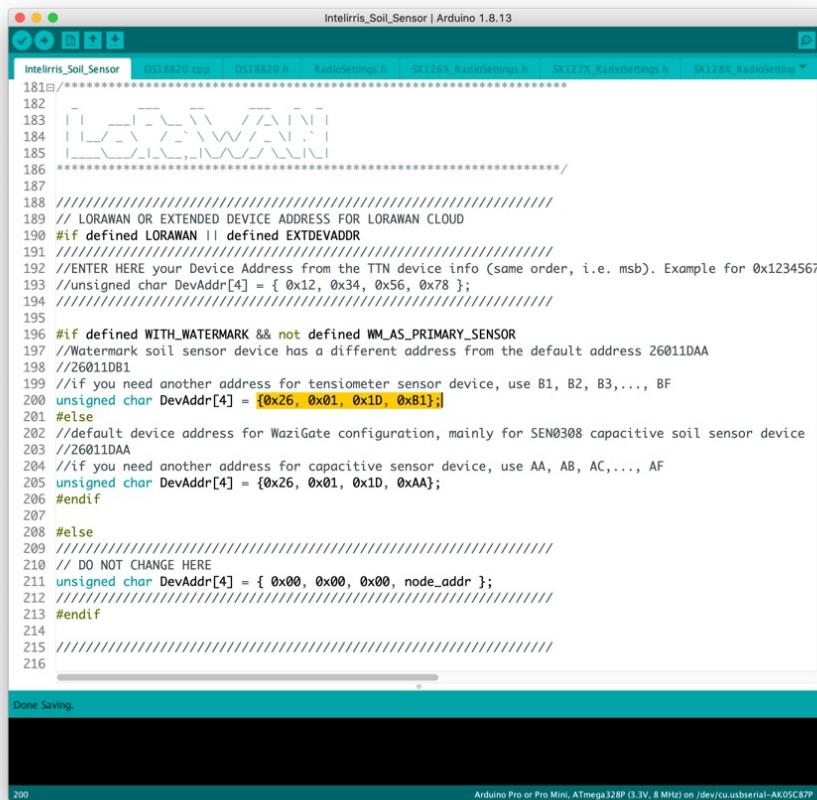
Soil Humidity Sensor Raw value from SEN0308 235 7 hours ago

- The dashboard now displays correctly the new device with its sensor

Advanced configuration

ex 2: have several tensiometer soil sensor devices

- Only to have several tensiometer soil devices on 1 Wazigate – change the device address in the soil device Arduino code



```

 181 //*****
 182 // WAZIGATE
 183 // WAZIGATE
 184 // WAZIGATE
 185 //*****
 186 *****/
 187
 188 //////////////// LORAWAN OR EXTENDED DEVICE ADDRESS FOR LORAWAN CLOUD
 189 #if defined LORAWAN || defined EXTDEVADDR
 190 //ENTER HERE your Device Address from the TTN device info (same order, i.e. msb). Example for 0x1234567
 191 //unsigned char DevAddr[4] = { 0x12, 0x34, 0x56, 0x78 };
 192 ///////////////
 193 #if defined WITH_WATERMARK && not defined WM_AS_PRIMARY_SENSOR
 194 //Watermark soil sensor device has a different address from the default address 26011DAA
 195 //26011DB1
 196 // if you need another address for tensiometer sensor device, use B1, B2, B3,..., BF
 197 //unsigned char DevAddr[4] = {0x26, 0x01, 0x1D, 0xB1};
 198 #else
 199 //default device address for WaziGate configuration, mainly for SEN0308 capacitive soil sensor device
 200 //26011DA
 201 //if you need another address for capacitive sensor device, use AA, AB, AC,..., AF
 202 //unsigned char DevAddr[4] = {0x26, 0x01, 0x1D, 0xAA};
 203 #endif
 204 //DO NOT CHANGE HERE
 205 //unsigned char DevAddr[4] = { 0x00, 0x00, 0x00, node_addr };
 206 #endif
 207
 208 //else
 209 //DO NOT CHANGE HERE
 210 //unsigned char DevAddr[4] = { 0x00, 0x00, 0x00, node_addr };
 211
 212 //endif
 213
 214
 215 *****/
 216

```

Done Saving.

Arduino Pro or Pro Mini, ATmega328P (3.3V, 8 MHz) on /dev/cu.usbserial-AK05C87P

Default address for tensiometer sensor is

{ 0x26, 0x01, 0x1D, 0xB1 } ;

Just increase the last byte

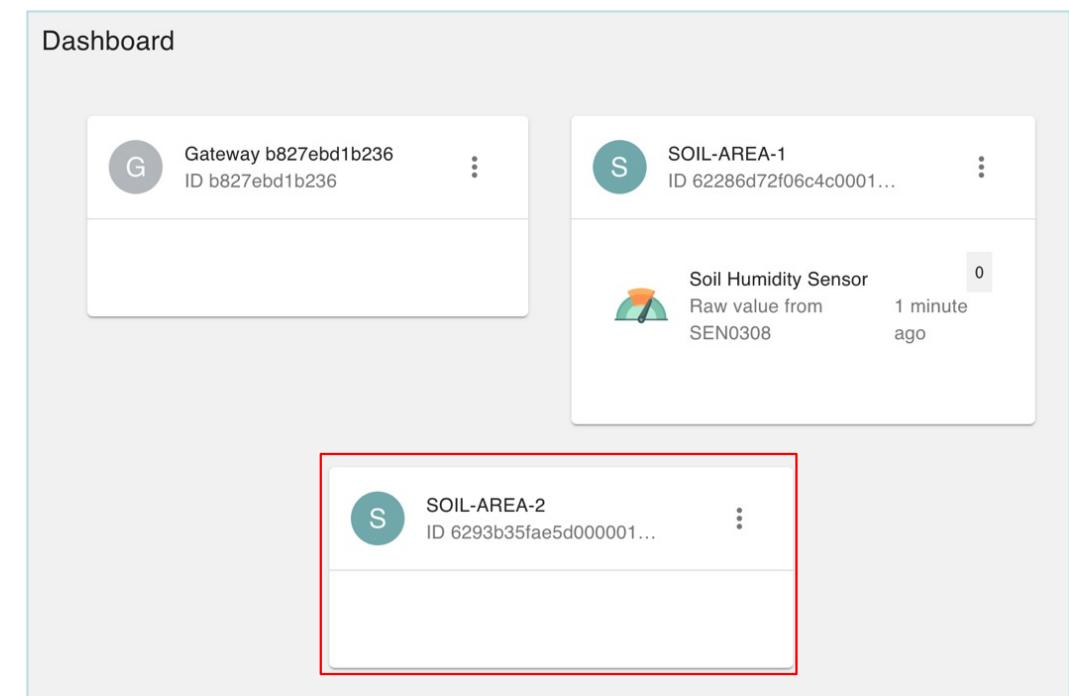
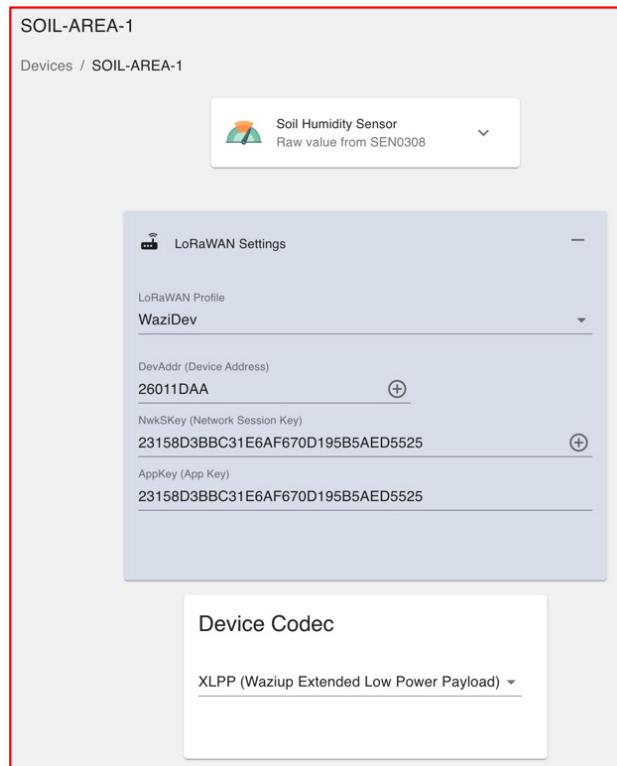
{ 0x26, 0x01, 0x1D, 0xB2 } ;

Compile and upload the code to the soil sensor device

Advanced configuration

ex 2: have several tensiometer soil sensor devices, con't

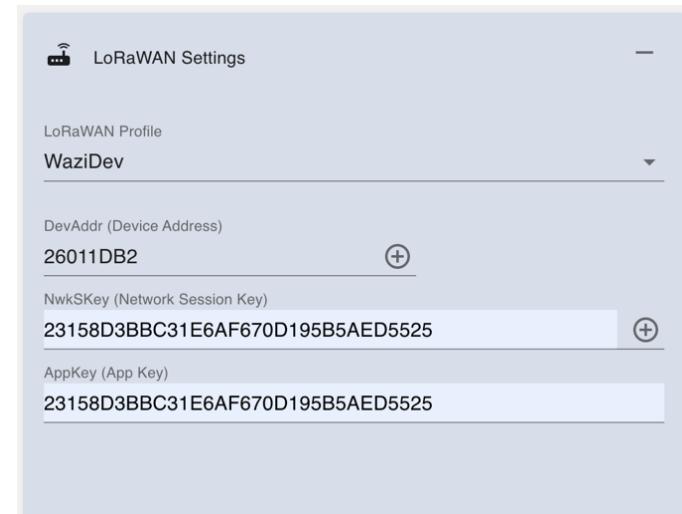
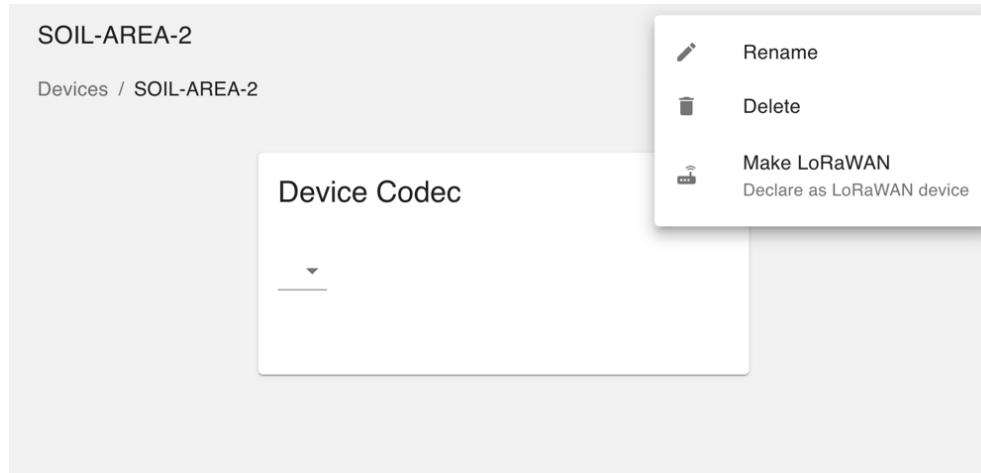
- Left figure shows gateway config with 1 soil sensor device
- Create a new device, e.g. device name SOIL-AREA-2
- Avoid space, limit to 12 characters for correct display on OLED



Advanced configuration

ex 2: have several tensiometer soil sensor devices, con't

- Select the new device and make it as LoRaWAN device

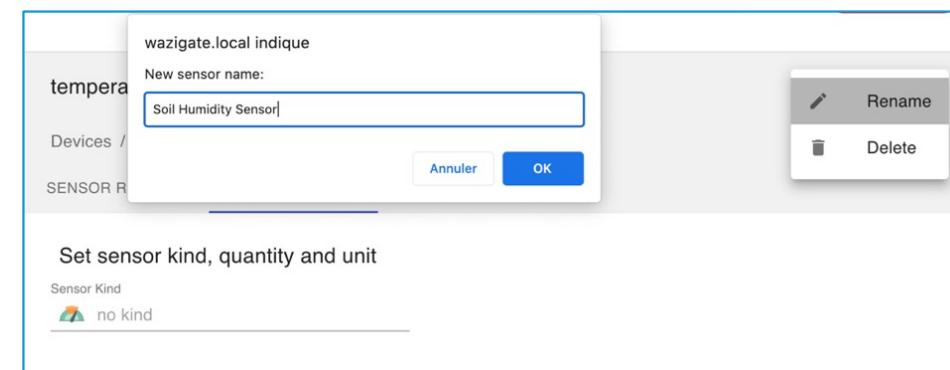
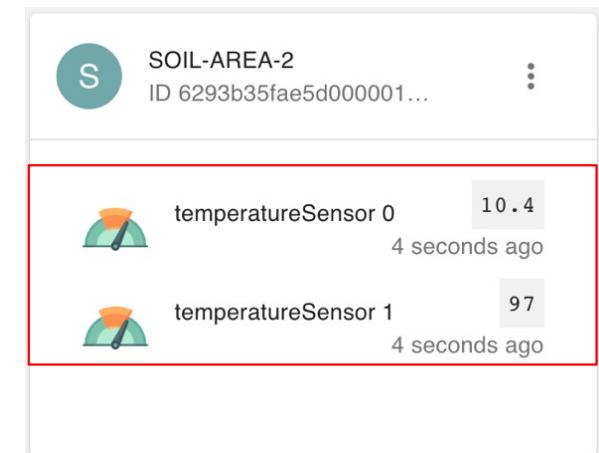


- Set the new address, matching the one of the Arduino code: 26011DB2
- keep same encryption keys
- Select XLPP as codec

Advanced configuration

ex 2: have several tensiometer soil sensor devices, con't

- DO NOT manually create a sensor. Instead,...
- ... power on the new soil sensor device for data transmission
- Refresh the gateway dashboard, the new data should appear
- There should be 2 new sensor names
 - "temperatureSensor_0" & "temperatureSensor_1"
- Click on "temperatureSensor_0" and then rename it, e.g. "Soil Humidity Sensor"
- Do the same for "temperatureSensor_1"



Advanced configuration

ex 2: have several tensiometer soil sensor devices, con't

- For first sensor, change Sensor kind to "centibars from WM200"
- For second sensor, use "scaled value from WM200 real=x10"

Soil Humidity Sensor

Devices / SOIL-AREA-2 / Sensors / Soil Humidity Sensor

SENSOR READINGS • SETTINGS

Set sensor kind, quantity and unit

Sensor Kind

 centibars from WM200 ×

SAVE RESET

Dashboard

G Gateway b827ebd1b236 ID b827ebd1b236 ...

S SOIL-AREA-1 ID 62286d72f06c4c0001... ...

Soil Humidity Sensor Raw value from SEN0308 0 12 minutes ago

SOIL-AREA-2 ID 6293b35fae5d000001...

Soil Humidity Sensor centibars from WM200 10.4 3 minutes ago

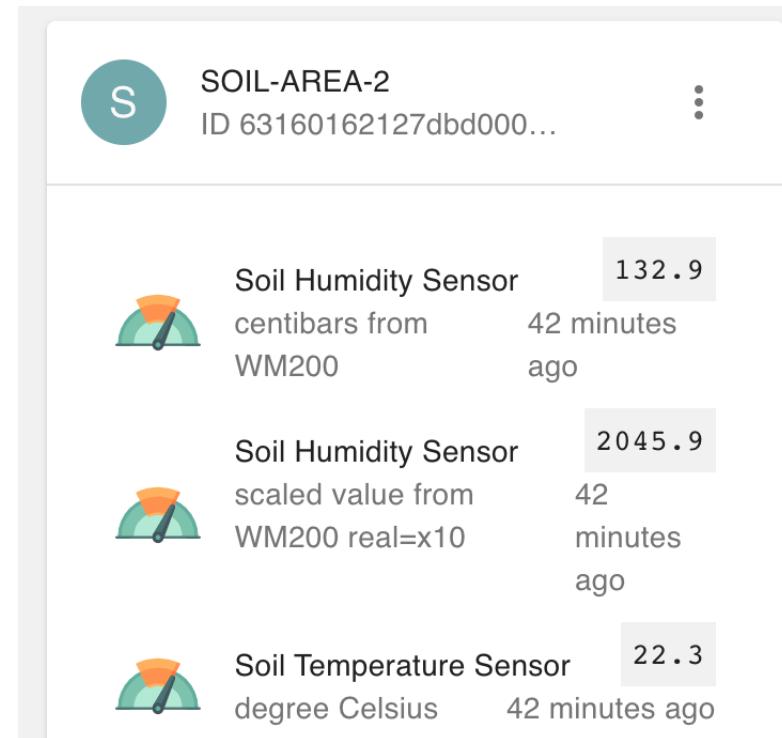
Soil Humidity Sensor Scaled value from WM200 real=x10 97 3 minutes ago

- The dashboard now displays correctly the new device with its sensors

Advanced configuration

ex 1 & 2: with a soil temperature sensor

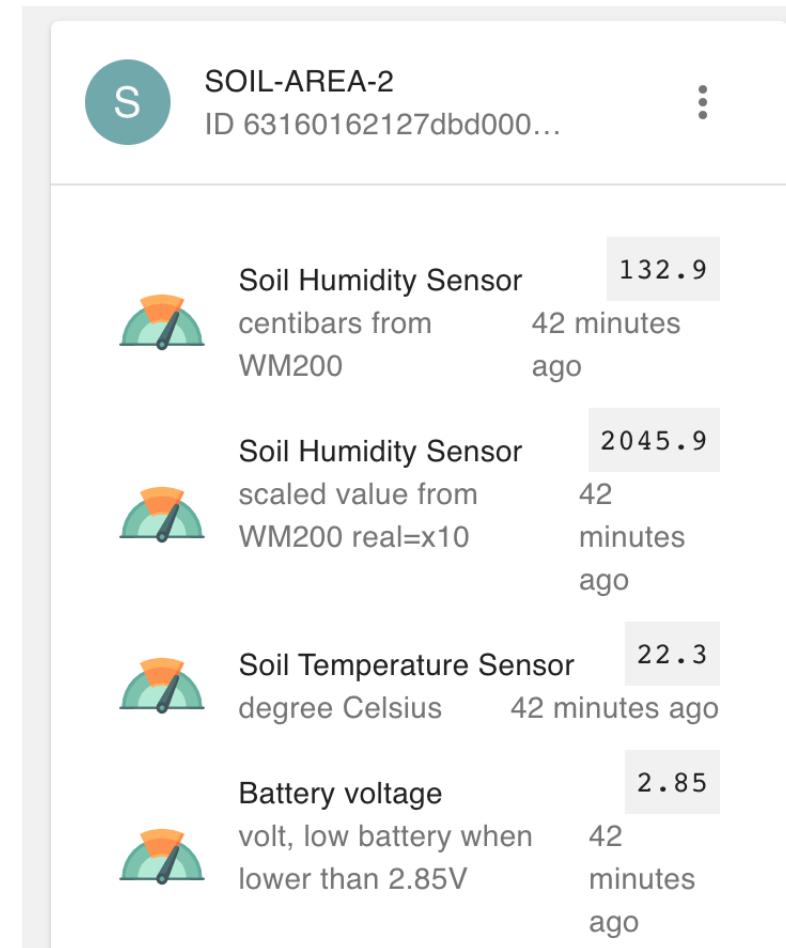
- If there is a soil temperature sensor attached, a sensor named "temperatureSensor_5" will also appear
- Click on "temperatureSensor_5" and then rename it, e.g. "Soil Temperature Sensor"
- Change Sensor kind to "degree Celsius"
- Reload dashboard which should now displays correctly the new device with its sensors



Advanced configuration

ex 1 & 2: with battery voltage monitor

- With battery voltage monitor, a sensor named "analogSensor_6" will also appear
- Click on "analogSensor_6" and then rename it, e.g. "Battery voltage"
- Change Sensor kind to "volt, low battery when lower than 2.85V"
- Reload dashboard which should now displays correctly the new device with its sensors



Advanced configuration

execute automatic custom configuration

- Default SD card image defines
 - 1 capacitive sensor SOIL-AREA-1
 - 1 tensiometer sensor SOIL-AREA-2
- To change configuration, read carefully & use the auto-configuration mechanism
 - <https://github.com/CongducPham/PRIMA-Intel-Irris/tree/main/Gateway/boot#auto-configuration-on-boot-for-the-intel-irris-wazigate>
- Default auto-configuration (GitHub: Gateway/boot)
 - create-starter-kit-demo-capacitive-watermark-st-iiwa-ha
default capacitive: SOIL-AREA-1, 26011DAA
default tensiometer + 1 soil temperature: SOIL-AREA-2, 26011DB1
Home Assistant included
these 2 devices are added to IIWA and HA

Advanced configuration

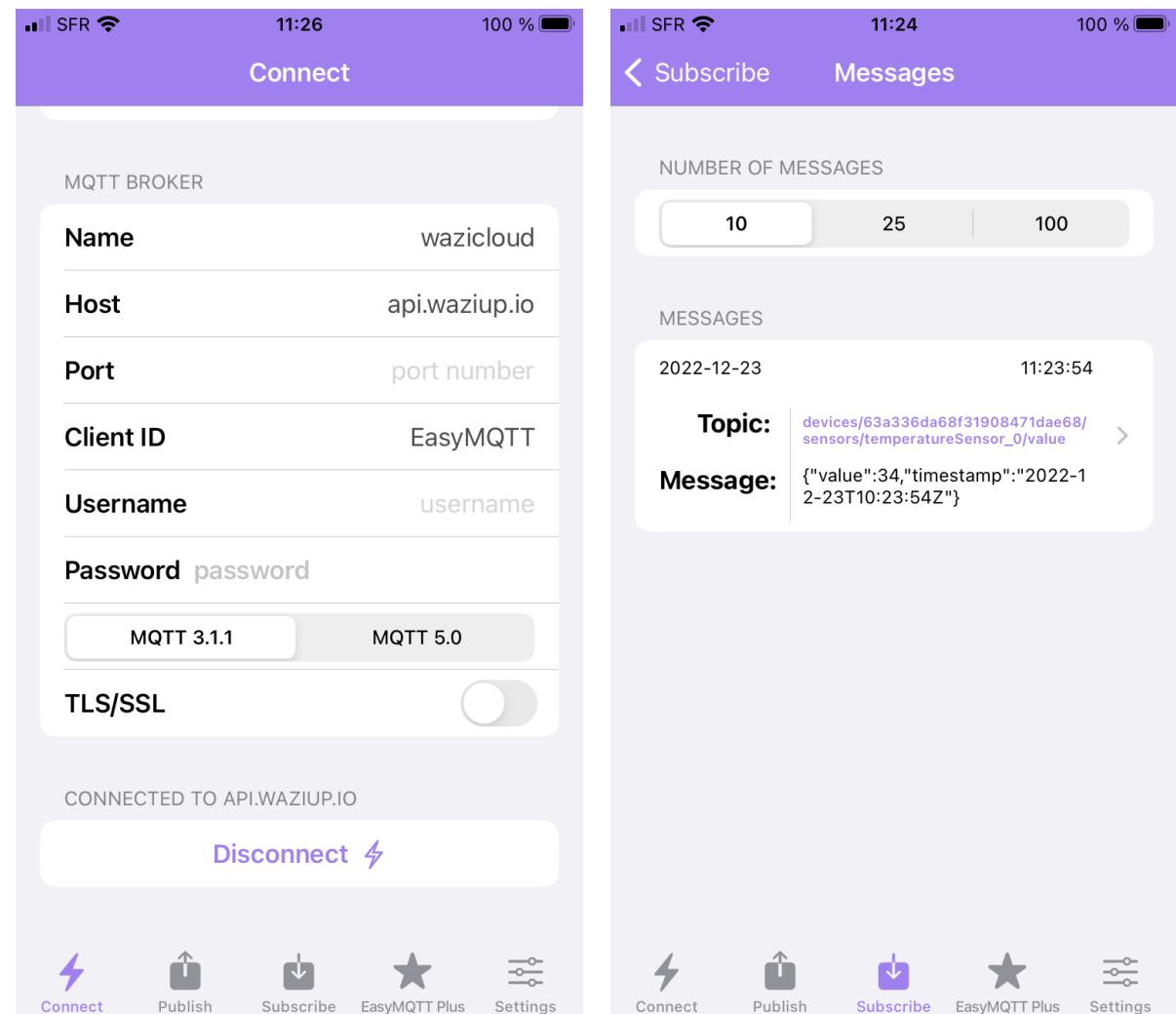
MQTT integration

- With sensor data on WaziCloud, it is possible to subscribe to those data with MQTT protocol
- With command line mosquitto_sub
 - mosquitto_sub
-L "mqtt://api.waziup.io/devices/<deviceID>/sensors/<sensorID>/value"
 - mosquitto_sub
-h api.waziup.io -t devices/<deviceID>/sensors/<sensorID>/value
- With other MQTT integration client/platform
 - Host: api.waziup.io
 - Topic: devices/<deviceID>/sensors/<sensorID>/value
- Output
 - { "value": 34, "timestamp": "2022-12-23T10:23:54Z" }

Advanced configuration

MQTT integration, con't

- Example with an MQTT client (EasyMQTT) on an iPhone7



NOTICE ON THE STARTER-KIT



- NEVER TRANSMIT WITHOUT AN ANTENNA
- 1 FULLY ASSEMBLED & CONFIGURED SOIL SENSOR
 - NEED TO INSTALL 2-AA BATTERIES
 - TAKE HIGH-GRADE BATTERIES
 - DO NOT SWITCH ON WITHOUT ANTENNA ATTACHED
 - ALREADY CONFIGURED FOR WAZIGATE
- STARTER-KIT= 1 SOIL SENSOR + 1 GATEWAY
- INTEL-IRRIS GATEWAY IMAGE TO BE DOWNLOADED FROM <https://intel-iris.eu/results>
- FLASH IMAGE ON 8GB SD CARD (OR 16GB OR 32GB)
- THE GATEWAY IS ONLY PRE-CONFIGURED FOR 1 SOIL SENSOR PER FARM
- STARTER-KIT TUTORIAL : <https://intel-iris.eu/tutorials-slides>

