

INTEL-IRRIS

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



Intel-Irris



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



Building the INTEL-IRRIS LoRa IoT platform Part 4: the INTEL-IRRIS Irrigation WaziApp

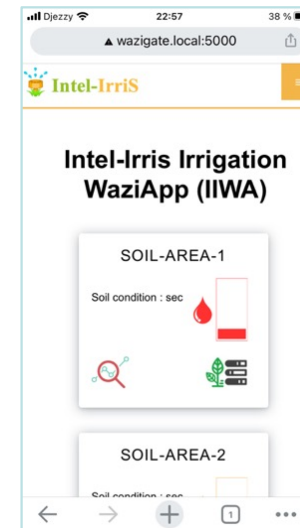


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INTEL-IRRIS Irrigation WaziApp

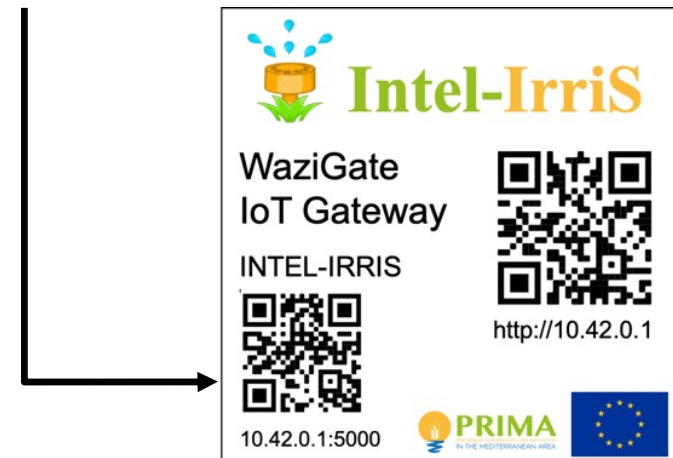
- ⦿ The INTEL-IRRIS Irrigation WaziApp (IIWA) is an embedded application running on the INTEL-IRRIS WaziGate itself
- ⦿ It is included in the starter-kit to implement the "intelligent Irrigation in-the-box" & "plug-&-sense" approach
- ⦿ Its objective is to enhance the irrigation indication by applying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



Connect to IIWA

- ⦿ First, connect to INTEL-IRRIS WaziGate 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 WaziGate's WiFi
- ⦿ Then, scan the static QR code on the WaziGate sticker to connect to the INTEL-IRRIS Irrigation WaziApp on : <http://10.42.0.1:5000>

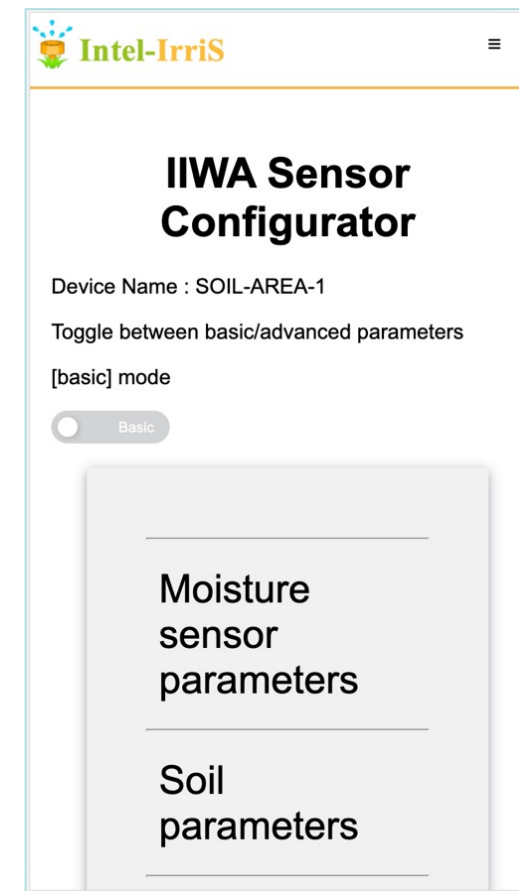
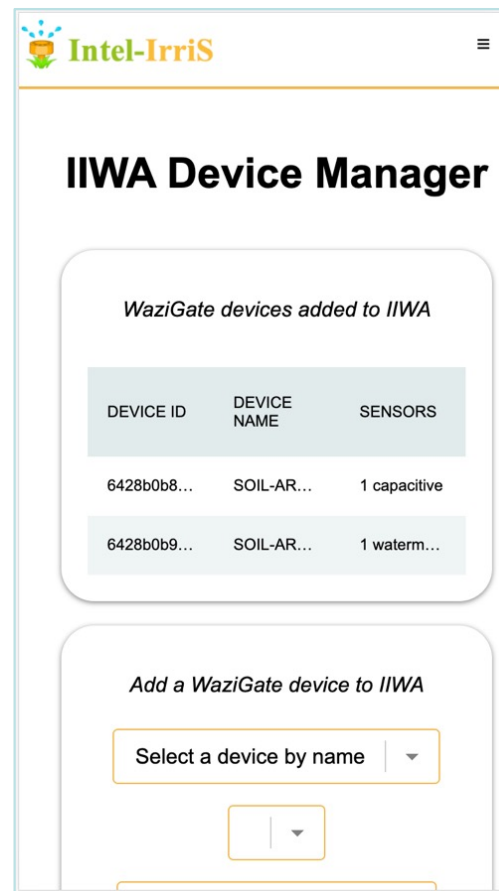
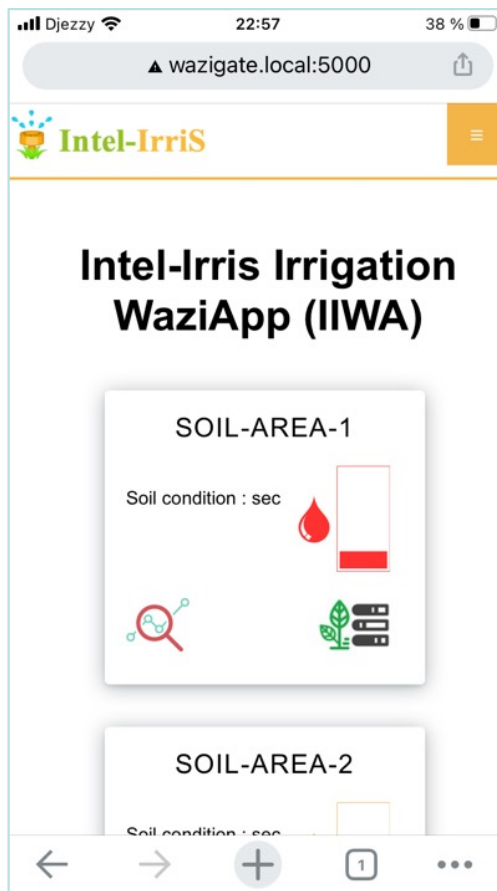
WAZIGATE_DCA6325C2A7A




IIWA main screens

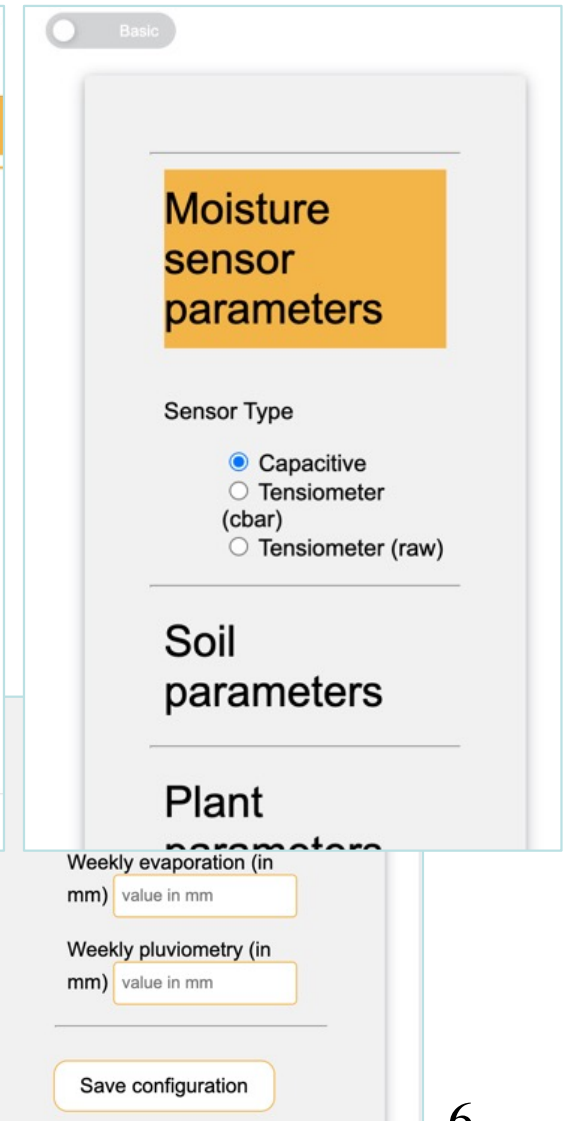
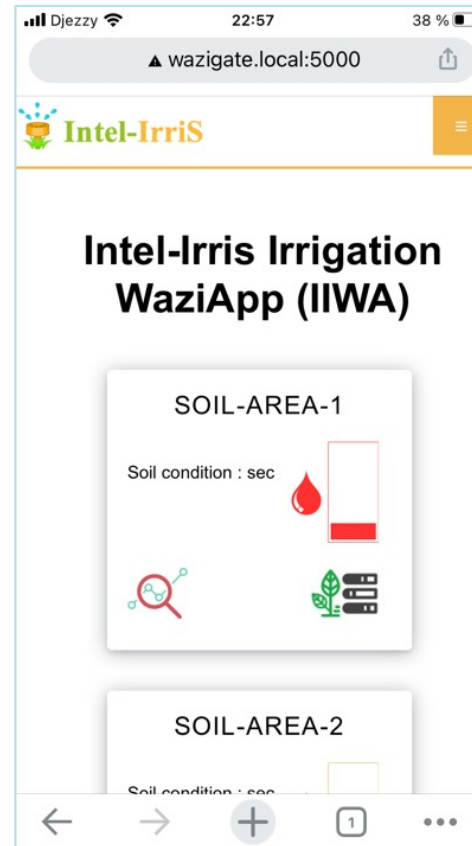
DEVICE NAME & ID ARE
ONLY INDICATIVE

- Dashboard, Device Manager and Sensor Configuration



Sensor configuration

- To enable IIWA to calibrate the sensor, the minimum information is to provide the sensor type
- From the Dashboard, go to Sensor Configuration () and select the Moisture Sensor Parameter menu
- Then, select "Capacitive" for instance
- Scroll to the bottom and click on "Save configuration"



DEVICE NAME & ID ARE ONLY INDICATIVE

List of advanced parameters

More parameters will be integrated in IIWA during the project

Basic

Moisture sensor parameters

Sensor Type

☒ Capacitive
 ☐ Tensiometer (cbar)
 ☐ Tensiometer (raw)

Soil parameters

Plant parameters

Advanced

Moisture sensor parameters

Sensor age

0

Maximum sensor value

800

Minimum sensor value

0

Soil parameters

Basic

Moisture sensor parameters

Soil parameters

Soil Type

Silty

Soil Irrigation Type

☐ Submersion
 ☒ Furrow
 ☐ Sprinkler
 ☐ Drip
 ☐ Subirrigation

Basic

Moisture sensor parameters

Plant parameters

Plant type

Tomatoes

Planting Date

01 / 04 / 2023

Basic

Moisture sensor parameters

Weather parameters

Region

Semi-Arid

Save configuration

Advanced

Moisture sensor parameters

Soil parameters

Soil Salinity

empty or -1 for disable

Soil Bulk Density

empty or -1 for disable

Soil Field Capacity

empty or -1 for disable

Advanced

Moisture sensor parameters

Plant parameters

Plant category

Vegetable

Plant Variety

feiza tomatoes

Advanced

Moisture sensor parameters

Weather parameters

Weekly evaporation (in mm)

value in mm

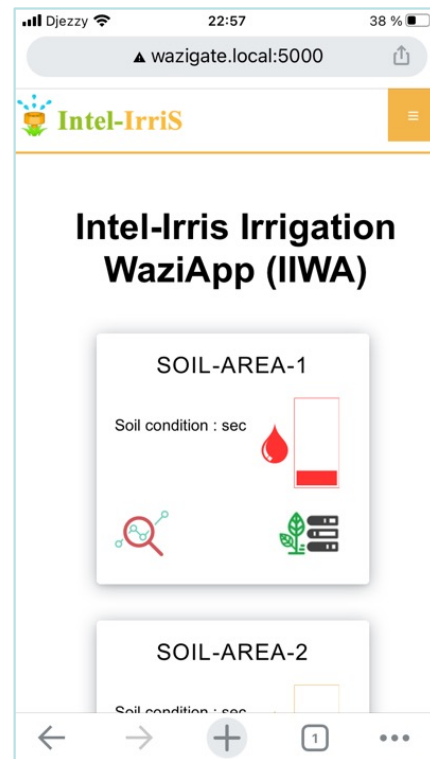
Weekly pluviometry (in mm)

value in mm

Save configuration

IIWA dashboard

- The dashboard mainly show the soil condition using a graphic display with 5 horizontal bars



THE Intel-IrriS STARTER-KIT

PRIMA IN THE MEDITERRANEAN AREA

QUICKLY VIEW LAST SENSOR VALUE AND SOIL CONDITION ON OLED

Packaged with 1 gateway and 1 capacitive or tensiometer sensor

INTERPRETING MEASURED SENSOR VALUE AND SOIL CONDITION INDICATION ON OLED

-1 : no sensor			255 : no sensor	
0 - 83	<div>Usual range for irrigation</div> <div>> 416</div>	saturated	0 - 10	<div>Usual range for irrigation</div> <div>> 100</div>
84 - 166		wet	11 - 30	
167 - 249		wet	31 - 60	
250 - 333		dry	61 - 100	
334 - 416		dry		
		very dry		

The starter-kit is still under development, testing and adjustment. The proposed thresholds are indicatives for the testing phase.

<https://www.irrometer.com/basics.html#using>

Indication on the OLED screen

- IIWA monitors devices that are added to the IIWA application and **only** process sensor data from sensors that have been **configured** – i.e. at least the sensor type must be selected

- When the device/sensor has been properly configured then "IIWA" text is shown on the summary screen associated to the device

- If the irrigation indication computed by IIWA is older than the received time of the last value from the device then "IIWA" text will not show anymore, indicating that the irrigation indication may not be accurate

- This can happen if IIWA application is not running for some reasons. In this case, try to reboot the INTEL-IRRIS WaziGate **if you are sure that device/sensor configuration has been performed properly**



IIWA is active.
Irrigation indication "très sec" (very dry) reflects the soil condition



IIWA is NOT active.
Irrigation indication "sec-hum" (dry-wet) does not reflect correctly the soil condition as sensor type and soil type are not taken into account