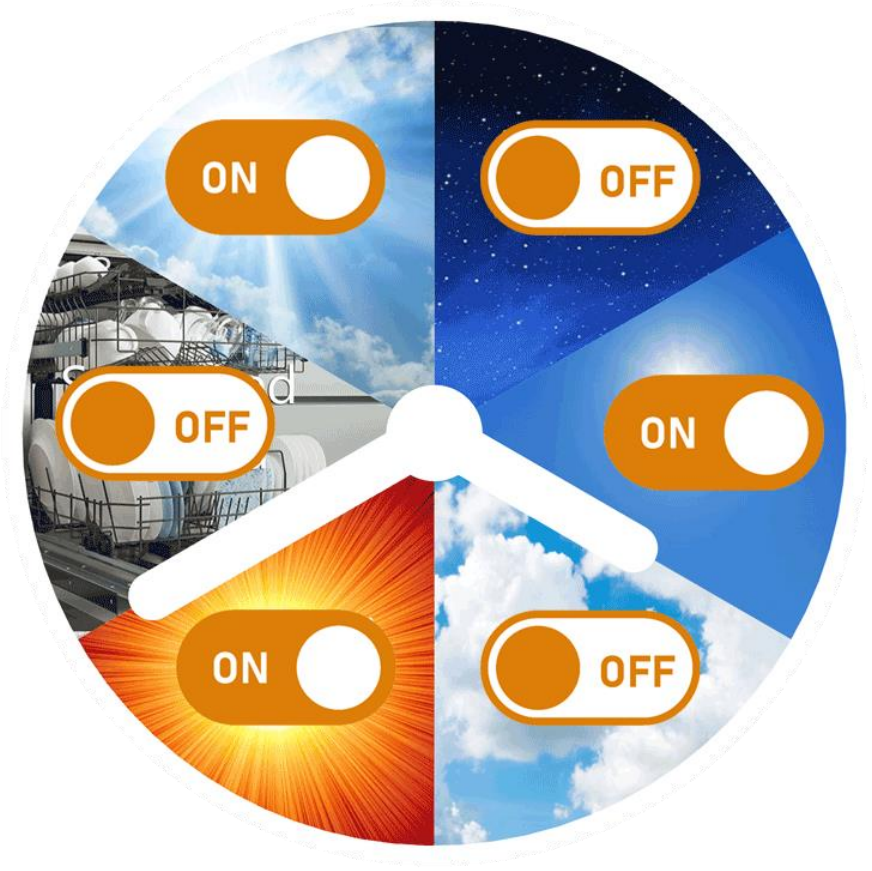


SolarDirector

INSTALLATION AND USER MANUAL

SolarDirector

Thank you for choosing SolarController.

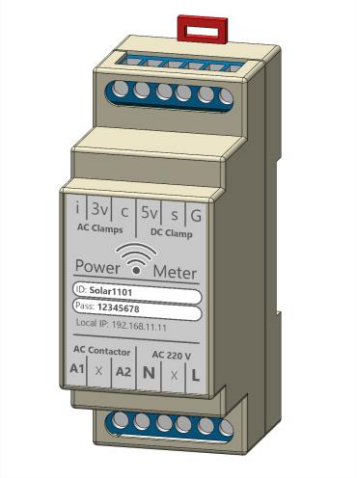
It is necessary to scrupulously follow the instructions given in this document, in order to obtain satisfactory results.

All operations to access the electrical system must be carried out by qualified personnel.

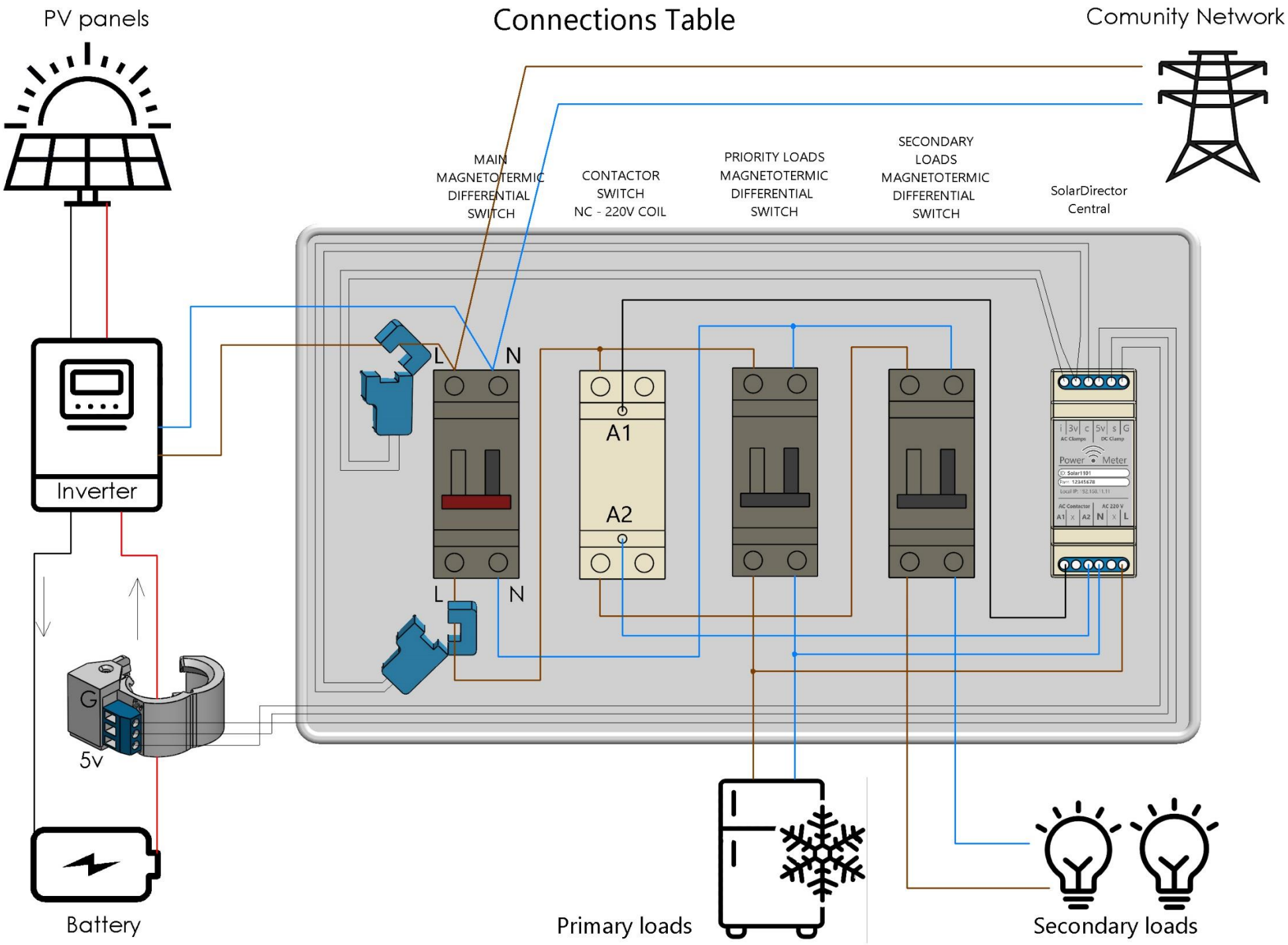
WARNING: Do not work with tension applied. Always unplug the main circuit breaker before performing any operation on devices that expose 220 Volt AC cables.
SolarDirector is not liable for any damage caused by improper use of the equipment.

CONTROL UNIT

Remove the device named "*SolarDirector Central*" from the packaging.

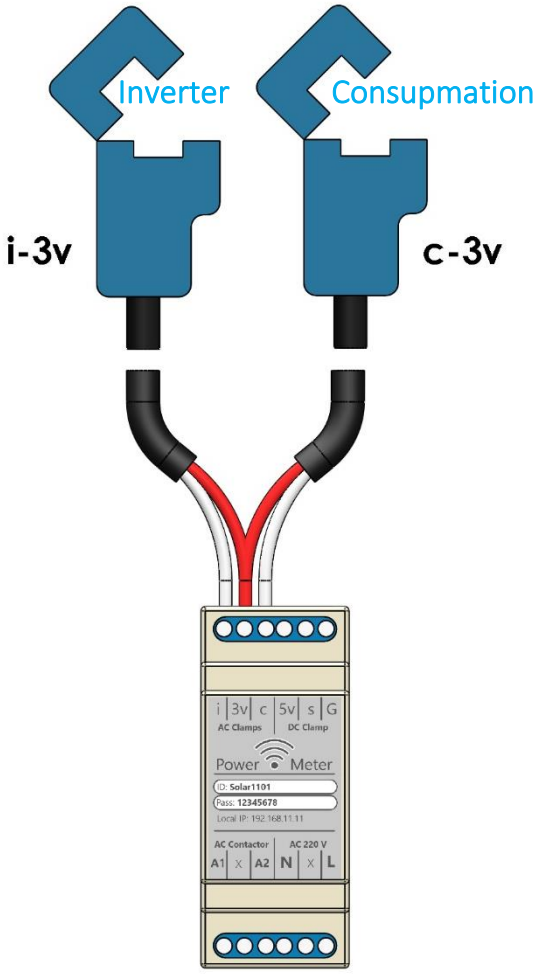


Identify the installation position (2 modules on DIN rail) in the main electrical panel, trying to stay as far as possible from cables crossed by large flows of electric currents (electromagnetic interference).


PV panels
Connections Table
Comunity Network
MAIN
MAGNETOTERMIC
DIFFERENTIAL
SWITCH
CONTACTOR
SWITCH
NC - 220V COIL
PRIORITY LOADS
MAGNETOTERMIC
DIFFERENTIAL
SWITCH
SECONDARY
LOADS
MAGNETOTERMIC
DIFFERENTIAL
SWITCH
SolarDirector
Central
L
N
A1
A2
L
N
Inverter
G
5v
Battery
Primary loads
Secondary loads

Connecting the clamp meters

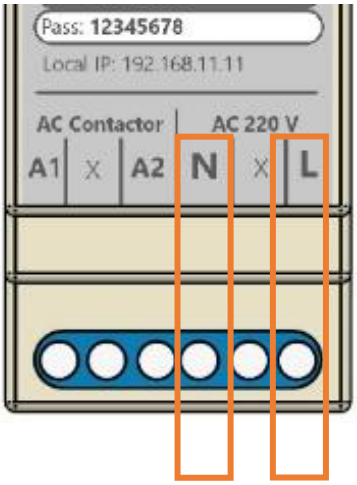
- Place the blue clamp meters in the main electrical panel, wrapping the one called "i-3v" on the cable that comes from the photovoltaic inverter, while the "c-3v" in the cable that brings electricity to utilities and appliances. See "Connection Table" on the previous page.



In detail: The i-3v clamp (i= inverter) will have to measure the flow of 220v alternate current that comes from the photovoltaic (from panels or battery), and which can go towards our consumption, or towards the national electricity grid.
The c-3v clamp (c = consumption) will have to measure all the consumption of our home.

WARNING: connect the clamp meters only on one of the 2 cables (L or N).
Winding both cables would result in a cancellation of the magnetic field, as the incoming flow would be canceled by the outgoing flow.

- Connect the terminals of the 2 clamps to the "*SolarDirector Central*" *device*, as shown in the diagram on the side.



Power supply

Connect the device connectors N (Neutral, blue) and L (Line, black, brown or other colors other than blue or yellow+green) to the primary power supply, **AFTER** the output of the residual current magnetormic and other safety and circuit breaker devices. It is also possible to start the power supply from subsequent connected modules, but if the load management function is used (see next chapter) they must be on the primary line, and not on the secondary.

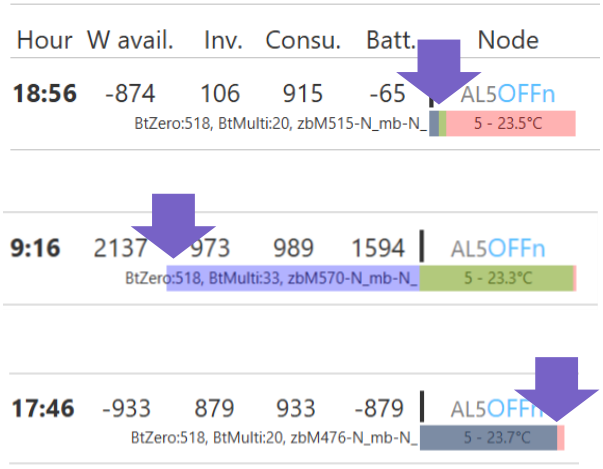
SolarDirector

Battery flow sensor

If the PV system is equipped with a storage battery, it is also useful to connect the SolarDirector Hall sensor to the positive or negative cable that connects the battery to the inverter.

Respect the polarities, otherwise the current flows "outgoing" from the battery will be considered as "incoming", producing wrong calculations and choices in SolarDirector.
In case of reversal, mount the device upside down or on the opposite cable.

In the figure below, you can check the correct direction of the storage battery flows (purple bar). If they are reversed, mount the sensor upside down on the wire.



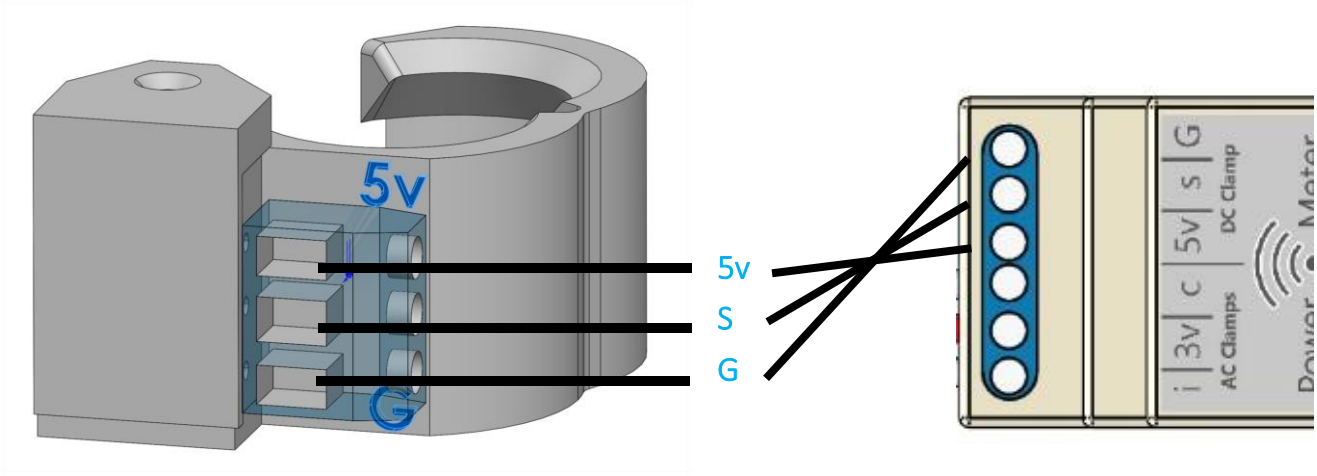
Battery is INACTIVE

Battery is CHARGING (day)

Battery is DISCHARGING (night)

Once the pliers are positioned, secure it through small stop screw.
Connect through the connectors, as shown in the figure below.

SolarDirector

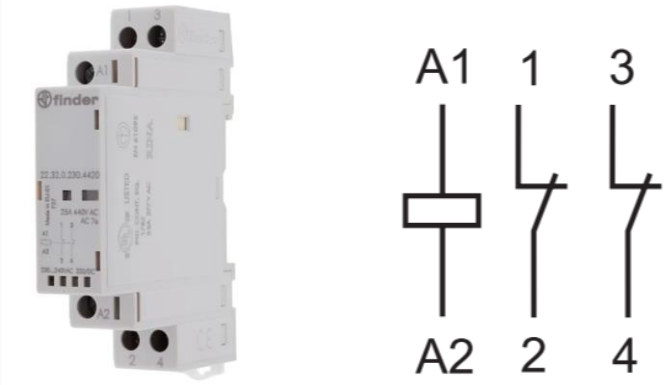


WARNING: Be very careful not to reverse the mounting directions. Accidental reversal of the poles will cause the sensor to break.

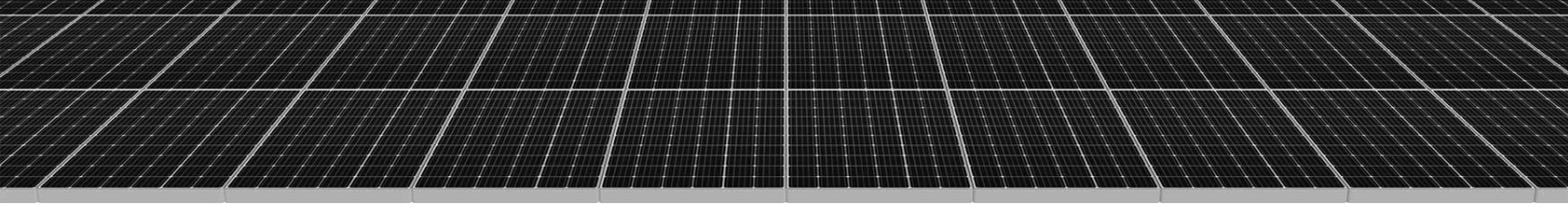
LOAD MANAGER

If you also intend to use the load manager function included in *SolarDirector Centrale*, you will need additional space in the electrical panel for the contactor module (contactor) that controls the secondary power line.

Example:
22.32.0.230.4410



SolarDirector



The contactor, of the brand of your choice (we recommend quality), must meet these characteristics:

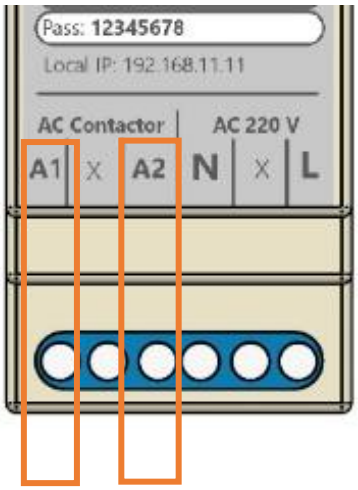
- be adequately sized for the maximum power of the system (25 A, 40 A, 63 A, etc..);

- have the activation coil at 220v AC;

- the secondary line must pass through NC (Normally Closed) contacts in the contactor. The *SolarDirector Central* relay will bring voltage to the contactor coil ONLY in the event of overload, anticipating what the electricity supplier's meter would do due to excess power. After 20 seconds, the voltage will be removed from the relay, which will close the secondary line circuit again, automatically restoring power to the utilities.

Load Manager Connection

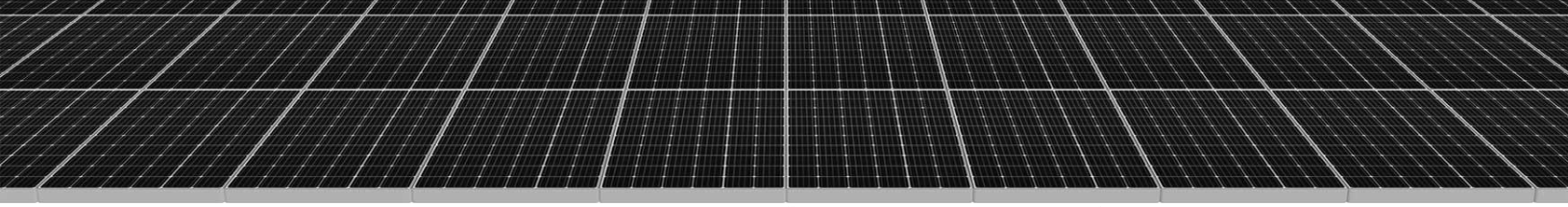
Divide and define secondary power lines (lights, sockets, etc.) from primary power lines (refrigerators, freezers, emergency pumps, etc.)
Leave the primary lines downstream of the general differential MCB connected, while diverting the phase (L) of the secondary lines through the SolarDirector-controlled contactor, which in turn will be connected downstream of the general RCD, along with the primary lines.



Connect the contactor activation coil outputs (called A1 and A2 generally) to the A1 and A2 poles of the *SolarDirector Central device*.

INSTALLING SYSTEM PERIPHERALS

Close the electrical panel and check everything is safe before repowering the system.
Insert the various peripheral devices (smart plugs and IR remote controls) into their sockets and power supplies/chargers. The USB power supply must provide at least 300 mA at 5 volts DC.

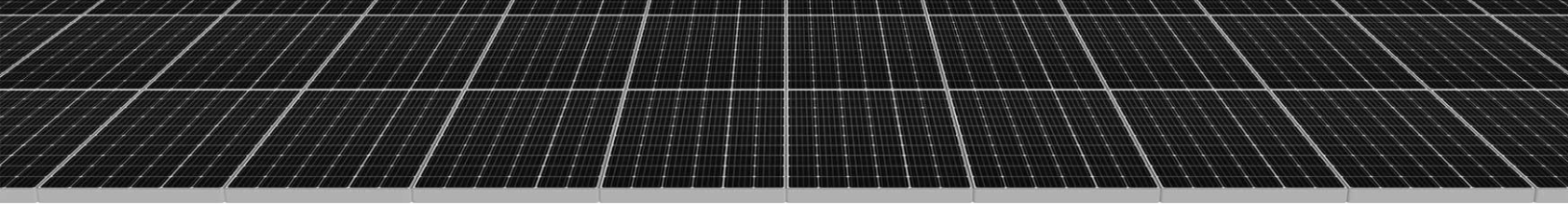


Consider that the communication range between 2 nodes is approximately 10-15 meters in free air, or 4-5 meters with 1 wall in between. Crossing 2 walls in some geometric conditions can be complicated. Evaluate different placements to allow the creation of a stable communication network between devices.

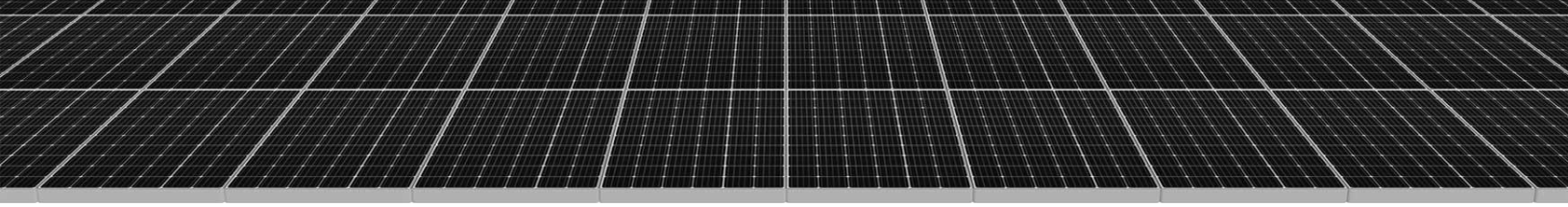
SYSTEM SETUP

Each device is numbered, and will correspond to the ID in the configuration panel.
It is necessary to know the indicative average consumption of each appliance to be checked in order to set it in the system. In order to know these values in watts, you can use a consumption measuring socket. Or, from the SolarDirector app, by turning on the device for more than 5 minutes (and leaving the other consumption unchanged) you can deduce the consumption of the device (e.g. air conditioner) from the difference between the total consumption with the device on and off. A rating error of 50-100 watts is acceptable, and already provided for in the system tolerances.

In general, some reference values could be:
Air conditioning, summer, 12000 btu, 1 split = 800w
Heat Pump, winter, 12000 btu, 1 split = 1500w
Fan = 30w
Air purifier = 30w
Home Dehumidifier, 20L/24h = 250w
Electric Heater = 2600w (DO NOT USE)



The control unit consists of software that self-calibrates through 5-minute cycles. It generally requires a complete battery discharge and charging process (1 day) to provide reliable data on the flow of energy from the storage, while it is immediately operational from the beginning as regards consumption flows and from the inverter (AC 220V).
During the hours of self-learning on the energy flows of the SolarDirector battery will still work, but without considering the storage active. To monitor its status, use the appropriate web portal, on the "telemetry" page ("Data" field):
mis.602zb.N.611_mb. Y.67.93.68.33_ See Appendix A).



CENTRAL CONNECTION TO THE CONFIGURATION PORTAL

The configuration of the system is simplified through the use of the free web portal.

NOTE: The configuration currently CANNOT be done completely offline, which requires a greater understanding of the "syntax" of the system.

To permanently store *the credentials to access your wi-fi network (2.4 Ghz)* in the device's memory SolarDirector_Centrale, follow the following procedure.

After powering *SolarDirector_Centrale* a local WiFi network will be created, which stops and restarts every 5 minutes.

During the approximately 4-minute phases, you can connect and configure the device. Wait and try again between phases.

Steps for setting up wifi credentials on the device

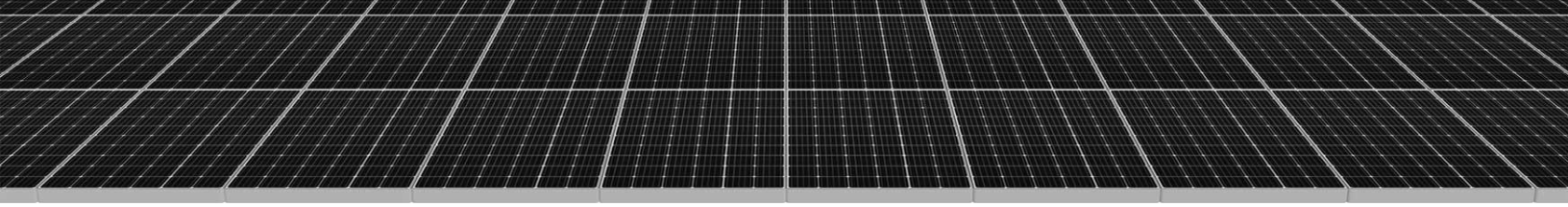
1.Power the device

2. From your computer or smartphone, within a radius of 4-5 meters, search for the 2.4 GHz WIFI network called with the number 1 after your ID code that you find written above the *SolarDirector_Centrale device*.
For example, if your ID is **Solar1234**, the wifi network to search for is **Solar12341**

3.La **SolarDirector_Centrale**'s wifi network *password* is written on the device label. It can be erased AFTER using it and STORED with the method that is most convenient for you.

4.Il your computer/smartphone needs to connect to this network, but since it does not have internet access, it will ask you after a few seconds if you want to disconnect. Reply to the operating system "YOU STILL WANT TO STAY CONNECTED TO THIS NETWORK". Check during the next steps if you are actually connected to this wifi.

5. Once you have verified that the connection to the internal wifi of the control panel is connected, open a web browser (Chrome, Safari, Edge, Firefox, etc...) and type in the address bar:
http://192.168.11.11
Press enter or refresh the page, until the configuration screen appears.



If the procedure fails, repeat from step 1 (disconnect the power supply and try again)

6. Enter your WiFi details:

ID: name of your wifi (also the hotspot of your smartphone, which you will activate later with the credentials you have set here)
PASSWORD: security key of your wifi
URL: Type **http://solardirector.somee.com** , or the new web address if you have been notified of a change since this document was written.

7. Save the configuration, and check that the green text "**Saved successfully!" appears**

8. Delete the wifi network storage from your smartphone/computer, so that it does not accidentally reconnect at future unwanted times.

INITIAL CONFIGURATION VIA WEB PORTAL

ACCESS TO THE SITE

If the points of the previous paragraph have been set correctly, the system will communicate a small data packet on the measurements made to the SolarDirector central webserver every 5 minutes.

Connect to the website:
https://solardirector.somee.com (or future URLs that will be communicated to you)

Login (not Demo Page!) with the **ID** and **Password** credentials above the *SolarDirector_Centrale device*.

Save a link on the homepage of your smartphone to log in faster in the future.

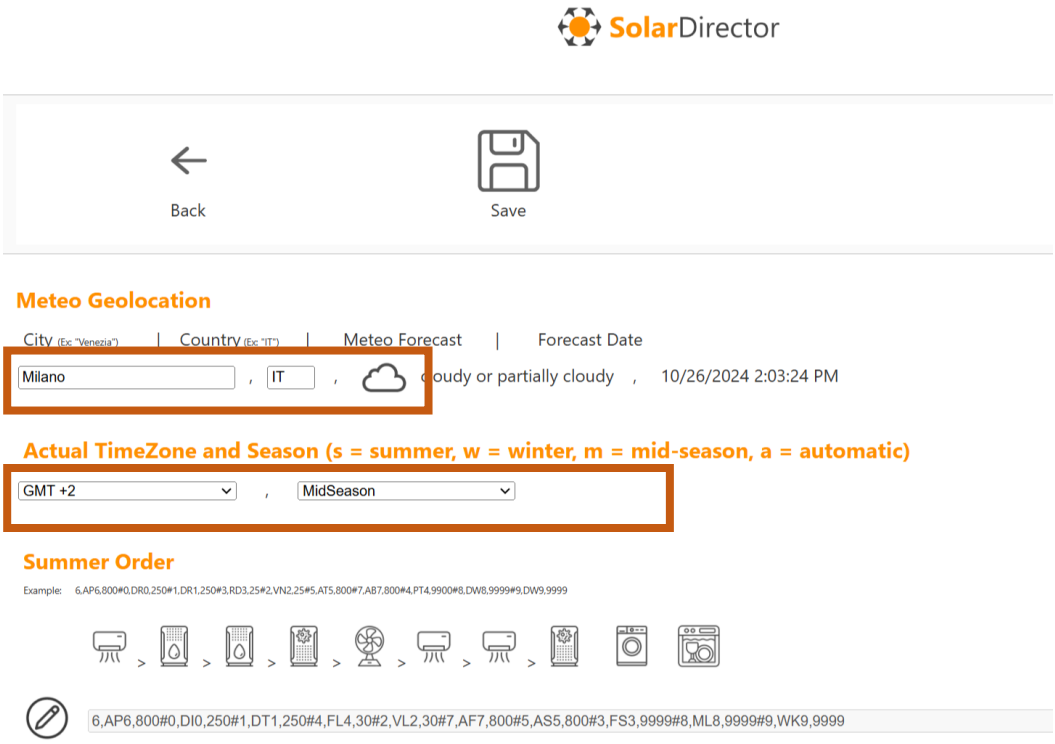
Every 5 minutes the data from *SolarDirector_Centrale* to the web portal will be sent. Check that the data arrives regularly. The control panel must be in the range of the home wifi internet in order to communicate.

SETTINGS

Locality

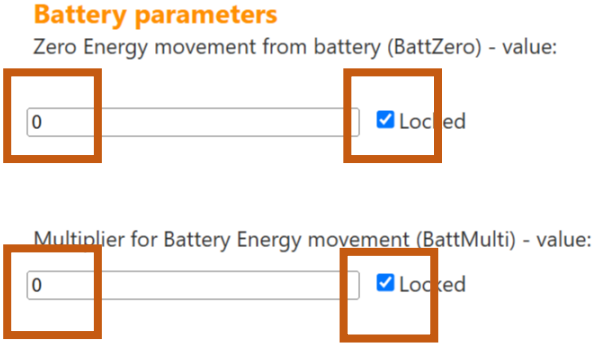
Go to the **Settings section**

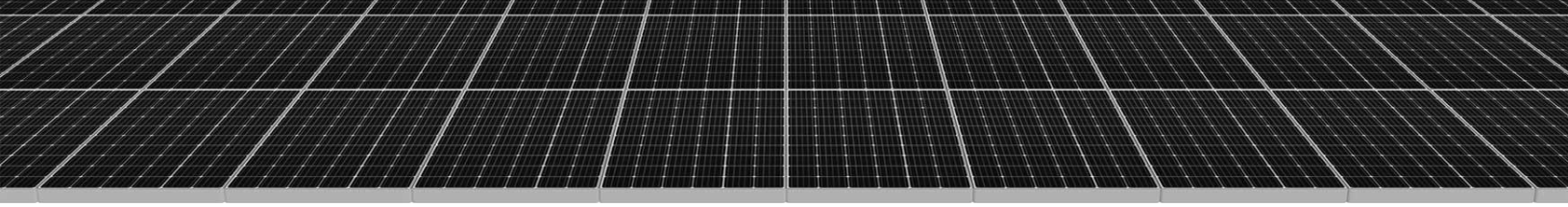
Set location, country, time zone, and season (summer, winter, mid-season)



Storage battery parameters

If your photovoltaic system is **NOT** equipped with a **storage battery**, set both Battery Parameters to LOCKED and value =0.

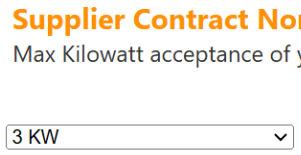




If the system is equipped with a battery and its sensor, deselect locked, and wait a few days for the system to perform self-calibration.

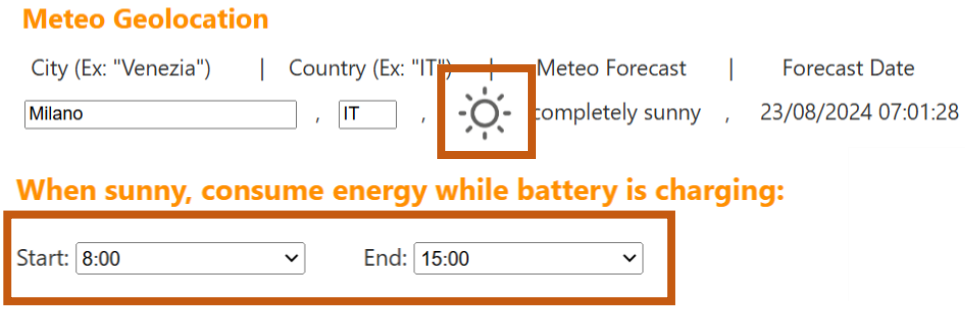
Maximum rated power of electric power supply

Set the maximum continuous consumption value provided for in the contract with your supplier.



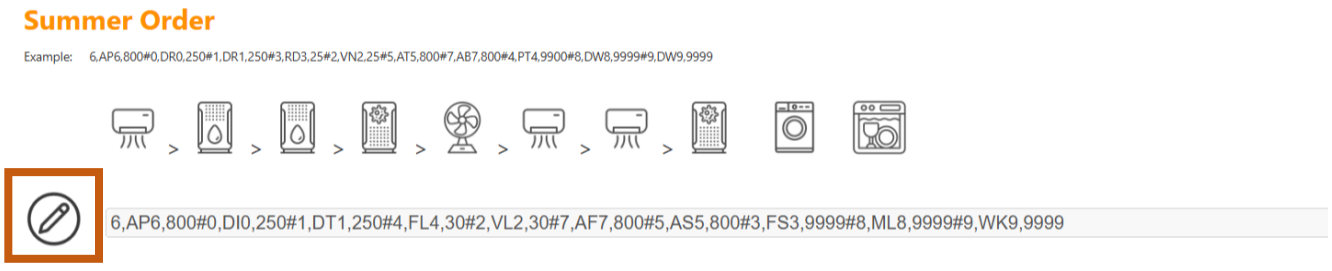
Weather cloudiness prediction (only with storage battery)

Based on the weather forecast (automatically calculated 1 time a day, based on the cloud quantity parameter), if the day is mostly sunny, the utilities will be turned on BEFORE reaching the maximum charge of the photovoltaic storage battery, within the specified time range.



Device setting and sorting

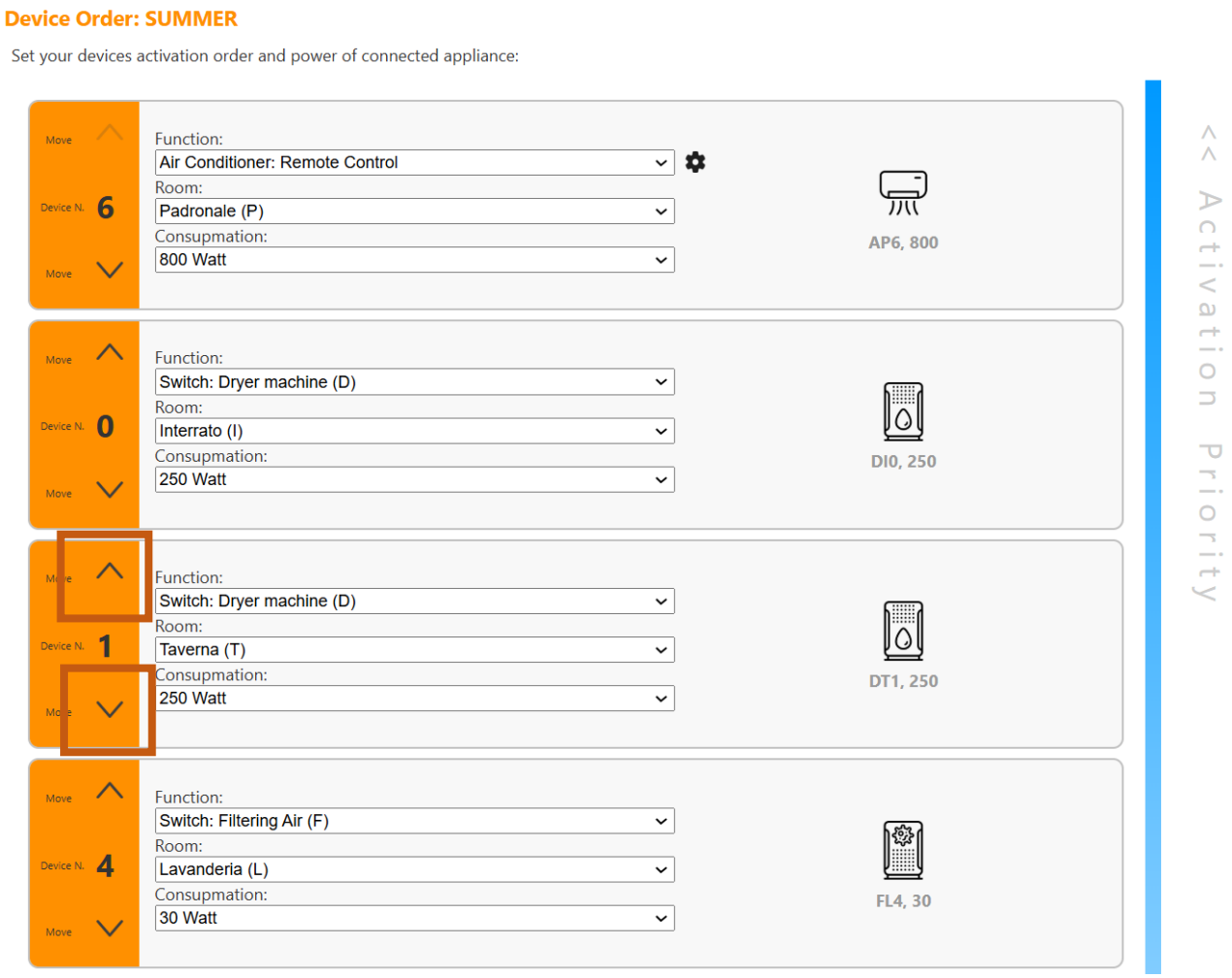
For each of the 3 types of season, it is possible to set a different order of priority of users and related consumption. Press the edit button to go into the details of the season



Set a corresponding name for each DeviceId to more easily identify it and its average consumption.

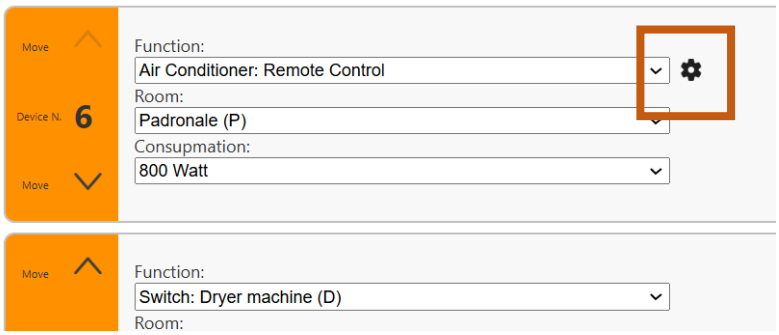
Es: Device ID 1 -> Dryer Machine, Taverna, 250 Watt

Set the power-on priority of the devices with the arrow keys highlighted in the figure below. The first one at the top will turn on first, if the surplus photovoltaic energy is sufficient. Otherwise, the system will try to find in the list of subsequent devices some other device that can be powered with lower consumption.



Setting the Air Conditioning Remotes

If the DeviceId is configured to "AirConditioner", the icon for setting the make and model of the device to be controlled will appear.



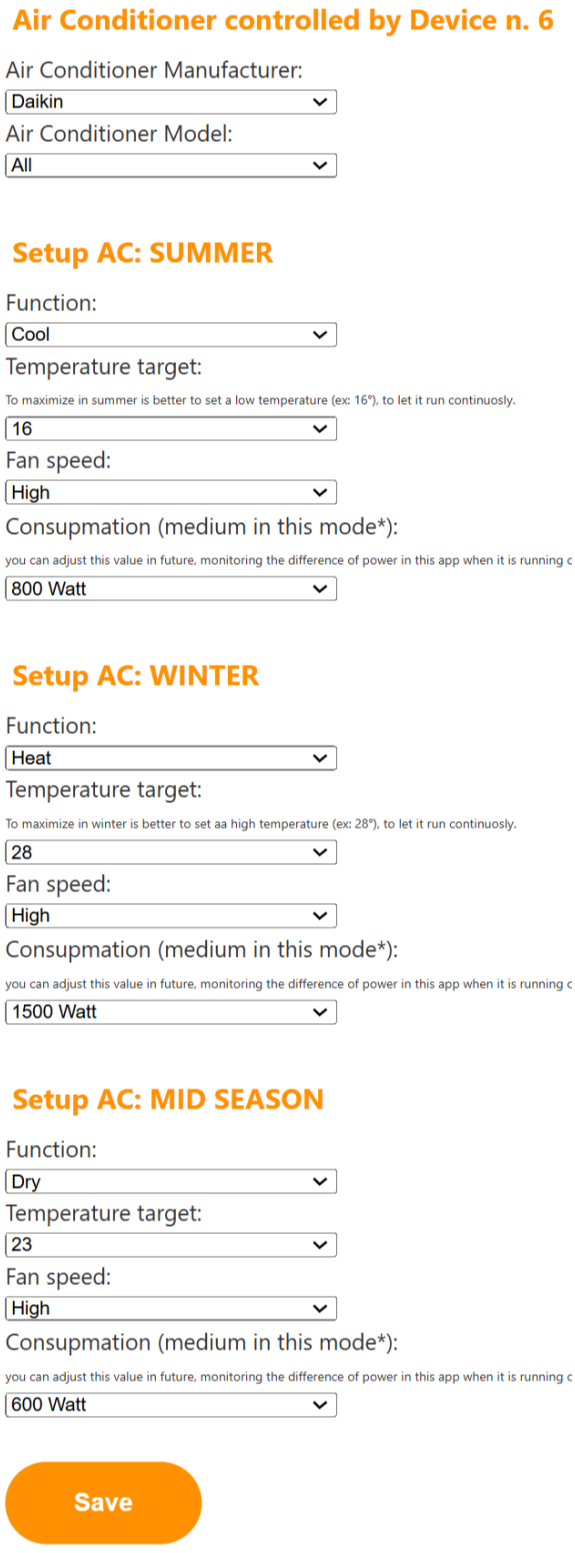
AFTER saving any changes to this page, pressing this button can access the AC configuration page.

For each season it is possible to configure:
-type of function (hot, cool, fan or dehumidifier)

- temperature taget, considering "exaggerating" this value to optimize self-consumption performance

-Fan speed

- average consumption in this mode (cooling generally consumes less than heating)



SolarDirector

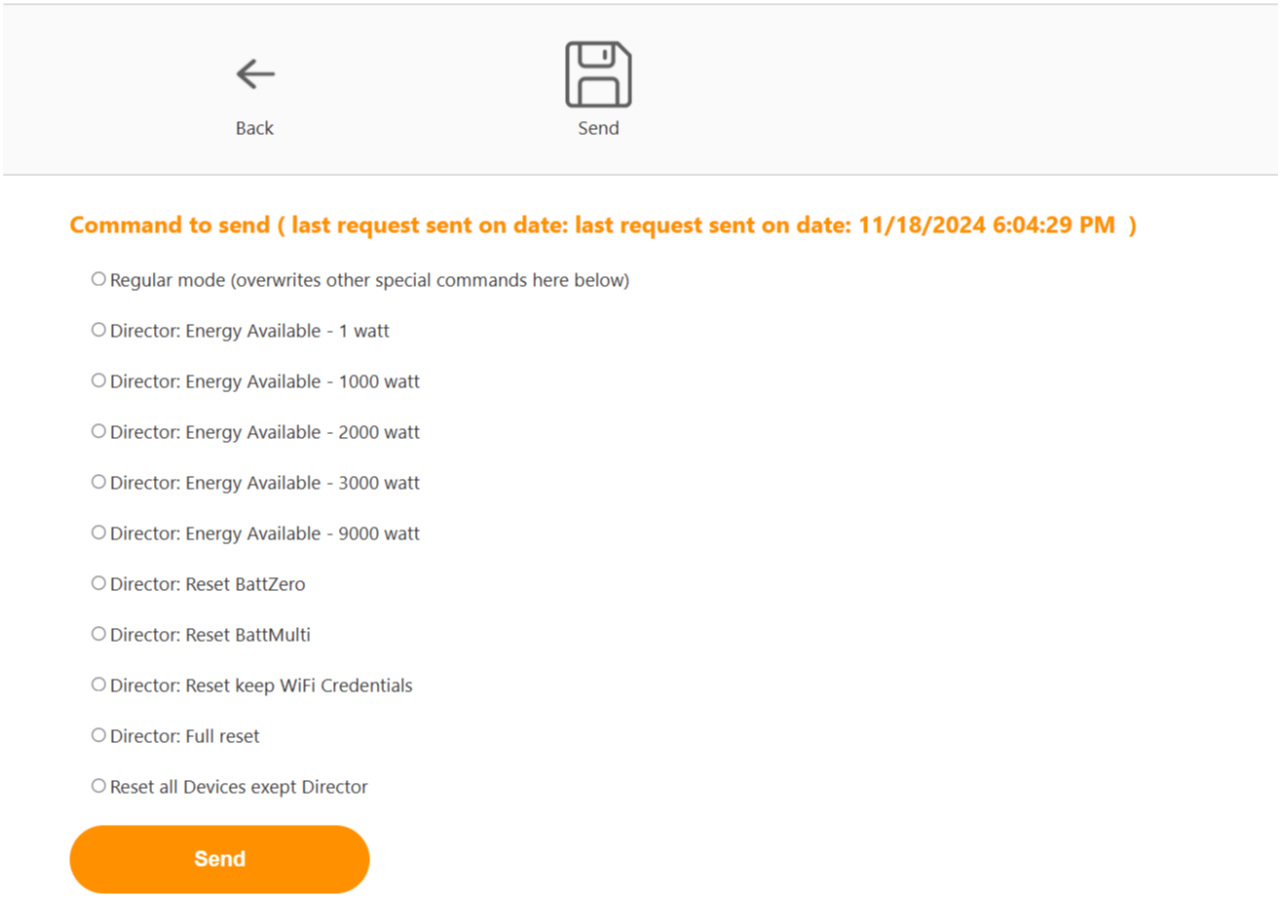
Save before exiting the configuration panel.

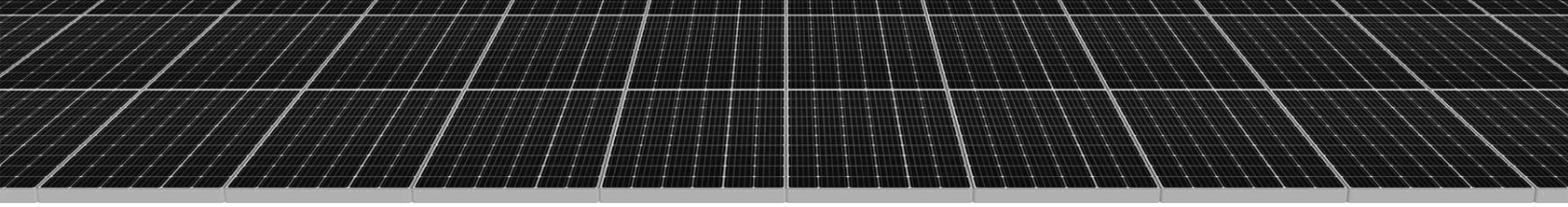
SENDING COMMANDS

Using the "Send Command" functionality you can

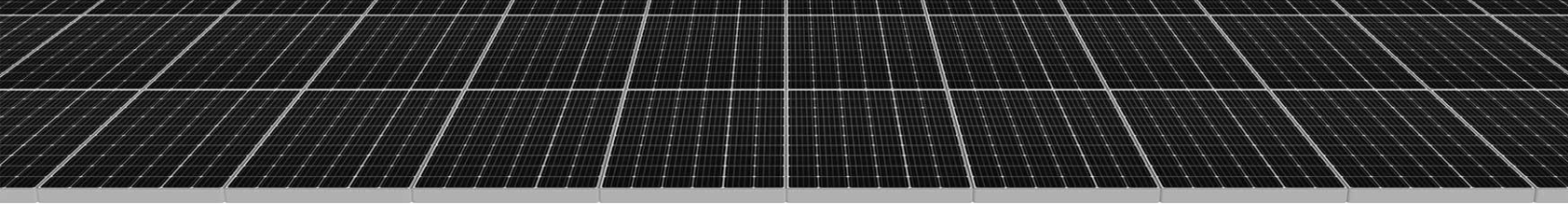
- perform simulations: overwrite the available energy value, to make the devices access or turn off the control, and test/activate their operation at any time, even remotely.

- reset the devices or some values contained in it (useful for recreating the mesh network in a different way)





Wait a few minutes (usually 10-15 min.) for the command to be processed and to be visible in the portal from subsequent cycles.



APPENDIX A : Meaning of Battery Telemetry Values

ZB = Zero battery. Integer value measured by the sensor when there is no flow of energy from the battery
MB = Multiplier Battery. Watts of energy flux calculated for each unit of increase or decrease from zero

Example 1:
Current value = 480
ZB = 510
SCR = 20
→ (480-510)*20 → -600 watts supplied by battery

Example 2:
Current value = 550
ZB = 510
SCR = 20
→ (550-510)*20 → 800 watts charging to the battery