BHIVE

User Manual



© BeePlanet Factory 2026

LEGAL INFORMATION

BEEPLANET FACTORY S.L. is a company incorporated under Spanish law, with registered office at Polígono Ipertegui II, 12, Orkoien (Navarra), registered in the Registro Mercantil de Navarra, in Tomo 1891, Folio 53, Hoja NA-37577, and holding Tax ID (NIF) B71340889

DISCLAIMER

This manual is not a legal document and may not cover all the potential risks arising from the use and handling of High Voltage equipment.

IMPORTANT NOTICE

In the event of an adverse incident, the equipment must be inspected by BeePlanet Factory personnel before it is used. again.

SAFETY ALERT SYMBOL



This symbol appears throughout this document on the left hand margin. Sections in which the symbol appears must be read and followed carefully to prevent personal injury.

© BeePlanet Factory 2026

Table of Contents

ABOUT THIS MANUAL 5
1. Scope 5
2. Nomenclature and symbols 5
3. Contact information 5

PRODUCT DESCRIPTION 5
1. BHive components 5
   1.1. AXC F 2152 controller 5
   1.2. AXC F 3152 controller 6
2. Auxiliary modules 6
3. Profinet bus couplers 7
4. Product specifications 8

INSTALLATION 9
1. Safety recommendations 9
2. Bus module base 10
3. Power supply 10
4. Ethernet 10
   4.1. PLC AXC F 2152 11
   4.2. PLC AXC F 3152 11

CONFIGURATION 11
1. Commissioning 11
2. User interface 14
3. User management 14
   3.1. LDAP configuration 15
4. Plant configuration 15
   4.1. Configuration wizard 15
   4.2. Batteries 17
      4.2.1. Communication with Huawei batteries 18
   4.3. Grid connection 19
      4.3.1. Meter via RS485 20
      4.3.2. Chint meter option 20
      4.3.3. Janitza meter option 20
   4.4. Photovoltaic 21

© BeePlanet Factory 2026

4.4.1. IngeTeam photovoltaic option 22
4.4.2. Huawei photovoltaic option 22
4.5. Charging points 22
4.5.1. IngeTeam charging option 23
4.5.2. Alpitronic HyperCharger charger option 25
4.5.3. Kempower charger option 27
4.6. Auxiliaries 27
4.6.1. Auxiliary connection via Profinet bus couplers option 30
4.6.2. Auxiliary connection via inputs/outputs option 31
4.6.3. Panasonic HVAC unit option 31
4.6.4. AC Precision HVAC unit option 33
4.7. System 33
4.7.1. Network configuration 34
4.7.2. Date and time 34
4.7.3. Redundancy 35
OPERATING MODES 36
1. Manual mode 36
2. Automatic mode 36
2.1. Peak-shaving 37
2.2. Grid charge 37
2.3. Discharge 38
2.4. Peak-shaving and charge 38
2.5. Configuration example 38
EXTERNAL CONTROL 39
1. Connection 39
2. Strategies 40
2.1. Grid charge only 40
2.2. Grid injection 40
WEB PLATFORM 40
ALARMS AND EVENTS 41
1. Response to faults 42
ANNEX I: Compatible devices 48
1. Storage inverters 48
2. Photovoltaic inverters 48
3. Grid meters 48
4. Charging points 49

© BeePlanet Factory 2026

5. HVAC 49

© BeePlanet Factory 2026

ABOUT THIS MANUAL

1. Scope

The purpose of this manual is to describe the features and use of the BHive energy manager for installations that incorporate storage, as well as the connection and configuration of the system for its commissioning.

2. Nomenclature and symbols



Electrostatic discharge.



General information.



General caution.



Electrical hazard of the equipment.

3. Contact information

SPAIN

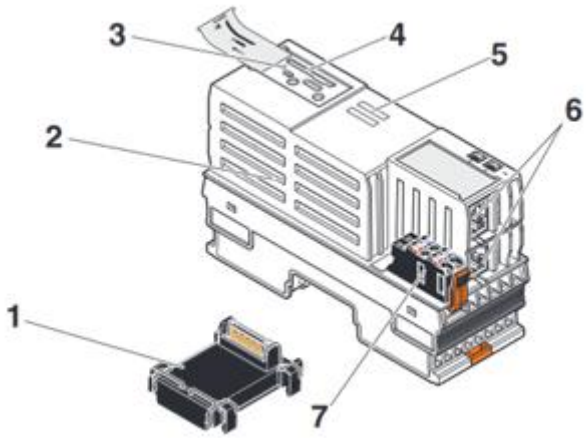
Phone: +34 948 234 386

Email: support@beeplanetfactory.com

PRODUCT DESCRIPTION

1. BHive components

1.1. AXC F 2152 controller



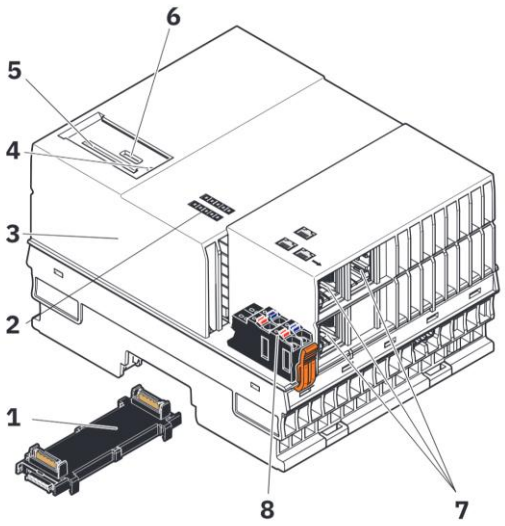
The BHive is made up of the following components:

1. Bus module base
2. PLC
3. Reset button

© BeePlanet Factory 2026

4. SD card slot
5. Status and diagnostic indicators
6. Ethernet interfaces (X1, X2)
7. Power connector

1.2. AXC F 3152 controller

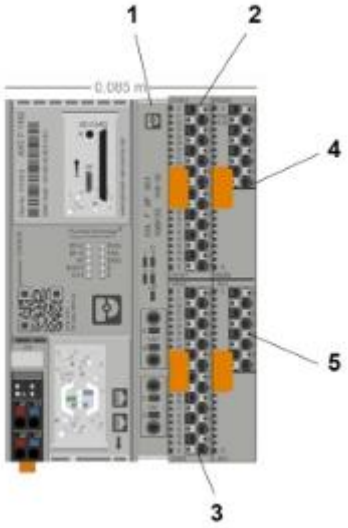


The BHive is made up of the following components:

1. Bus module base
2. Status and diagnostic indicators
3. PLC
4. Reset button
5. SD card slot
6. Service interface (X4)
7. Ethernet interfaces (X1, X2, X3)
8. Power connector

2. Auxiliary modules

© BeePlanet Factory 2026

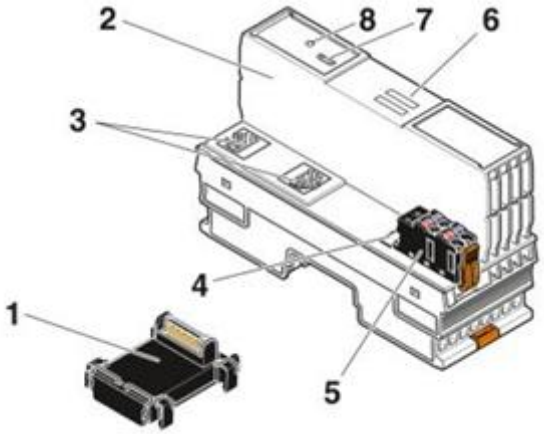


The BHive can be installed with auxiliary modules to provide optional functionalities:

1. Auxiliary module base
2. Digital output module
3. Digital input module
4. RS-485 communication module
5. 4-20 mA analogue input module

3. Profinet bus couplers

The auxiliary modules can be located in places other than the BHive. In those cases, the modules are attached to a bus coupler:



It is made up of the following elements:

1. Bus module base
2. Bus coupler
3. Ethernet interfaces (X1, X2)
4. Label
5. Power connector
6. Status and diagnostic indicators

© BeePlanet Factory 2026

7. Service interface
8. Reset button

4. Product specifications

SYSTEM	AXC F 2152	AXC F 3152
Operating system	Linux	Linux
Network interfaces	Ethernet x2	Ethernet x3
Temperature range	-25°C...60°C	-25°C...60°C
Communication protocols	ModBus TCP, RS-485, OPC-UA, MQTT, FTP and VPN	ModBus TCP, RS-485, OPC-UA, MQTT, FTP and VPN
Data consumption (internet)	600 MB/month	600 MB/month
Weight	223 g	536 g
Protection class	III	III
Overvoltage category	II	II
Processor	ARM® Cortex®-A9 2x 800 MHz	Intel® Atom® x5-E3930 2x 1.3 GHz
Flash memory	512 Mbyte (internal flash memory)	1 Gbyte (internal flash memory)
Retentive data memory	48 kbyte(s) (NVRAM)	1 Mbyte
Working memory	512 Mbyte DDR3 SDRAM	2048 Mbyte
Control redundancy	Optional	Optional
Display	No	No
Application interface	OPC-UA	OPC-UA
Real-time clock	1.73 s/day ≈ 20 ppm at 25 °C	0.7 s/day ≈ 8 ppm at 25 °C
Supply voltage	19.2 VDC ... 30VDC	19.2 VDC ... 30VDC
Current draw	max. 442 mA	max. 650 mA
Power consumption	max. 10.6 W	typ. 15 W
Protection circuit	Overvoltage prot.: electronic	Overvoltage prot.: electronic
Protection circuit (cont.)	Reverse-polarity prot.: electronic Reverse-polarity prot.; electronic	Reverse-polarity prot.: electronic

DIMENSIONS	AXC F 2152	AXC F 3152
Width	45 mm	100 mm

© BeePlanet Factory 2026

Height	126.93 mm	126.93 mm
Depth	75 mm	75 mm

ENVIRONMENTAL CONDITIONS	AXC F 2152	AXC F 3152
Protection rating	IP20	IP20
Ambient temperature (operation)	-25 °C ... 60 °C up to 2000 m above sea level (observe derating) / -25 °C ... 55 °C up to 3000 m above sea level (observe derating) / ≤ 55 °C (with max. 1 A on Ubus) / > 55 °C ... 60 °C (only in combination with an Axioline F AXL F PWR 1H power feed-in module (article no. 2688297))	-25 °C ... 60 °C up to 2000 m above sea level (observe derating) / -25 °C ... 55 °C up to 3000 m above sea level (observe derating) / 55 °C (with max. 1 A on Ubus) / 55 °C ... 60 °C (only in combination with an Axioline F AXL F PWR 1H power feed-in module (article no. 2688297)) / -40 °C ... 70 °C (extended, see user manual)
Ambient temperature (storage / transport)	-40 °C ... 85 °C	-40 °C ... 85 °C
Permissible air humidity (operation)	5 % ... 95 % (in accordance with DIN EN 61131-2)	5 % ... 95 % (in accordance with DIN EN 61131-2)
Permissible air humidity (storage / transport)	5 % ... 95 % (in accordance with DIN EN 61131-2)	5 % ... 95 % (in accordance with DIN EN 61131-2)

STANDARDS AND CE MARKING	
Class I, Zone 2, AEx nA IIC T4. Class I, Div. 2, Groups A, B, C, D. Ex nA IIC Gc T4.	E366272
Industrial IT Security, IACS Component	IITS2 029429 0027
cULus	E238705
Anti-injection certificate	RD 244/2019 / UNE 217001:2020

INSTALLATION

1. Safety recommendations



Note: electrostatic discharge

The device contains components that can be damaged or destroyed by electrostatic discharge. When handling the device, observe the necessary safety precautions against electrostatic discharge (ESD) in accordance with standards EN 61340-5-1 and IEC 61340-5-1.

© BeePlanet Factory 2026

NOTE: Damage to the electronics due to inadequate external protection. Reliable fuse tripping in the event of a fault.

The electronic components of the device will be damaged if the external fuse protection is inadequate.

- Protect the supply voltage externally according to the connected load (number of Axioline F devices / amount of logic current consumption of each device).

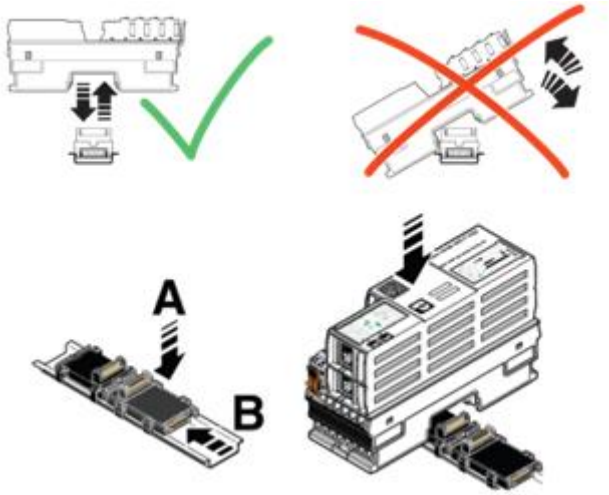
- Make sure that the external fuse trips reliably in the event of a fault.

The controller is automatically connected to earth (FE) when it is snapped onto an earthed DIN rail.

There are two FE springs on the rear of the controller that contact the DIN rail when the controller is placed on the DIN rail.

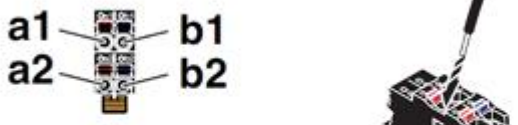
2. Bus module base

Snap the bus module base onto the DIN rail and connect the PLC or the bus coupler to the base:

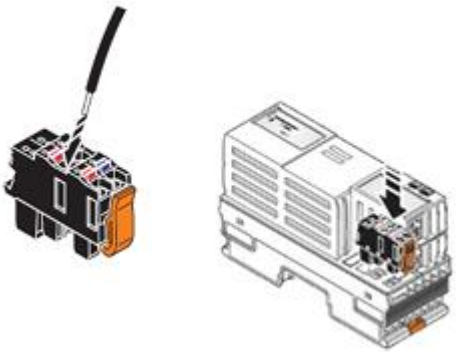


3. Power supply

Connect the PLC or bus coupler to 24 V from the power input using a cable of no more than 8 mm.



Terminal point	Color	Assignment
a1, a2	Red	DC 24 V (U_s)
b1, b2	Blue	GND

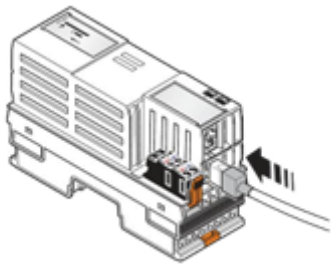


4. Ethernet

© BeePlanet Factory 2026

4.1. PLC AXC F 2152

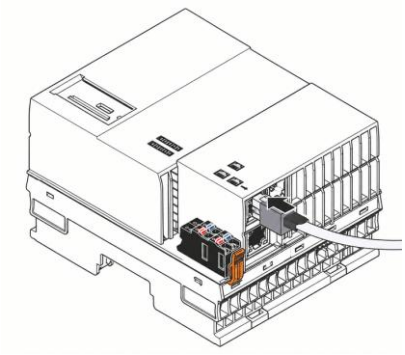
Connect the network communication cable to the Ethernet X1 port.



4.2. PLC AXC F 3152

Connect the network communication cable to the Ethernet X2 port.

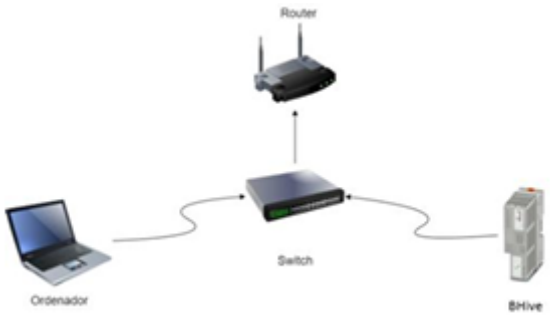
Use the Ethernet X1 port to establish redundancy between the two PLCs, if required.



CONFIGURATION

1. Commissioning

To configure the BHive and the Profinet bus couplers, a laptop connected to the installation network is required.



For the first configuration, you need to download the NetNames+ application to set the IP address that the BHive will use in the installation. To do so, go to the following link:

https://www.phoenixcontact.com/en-pc/products/data-interface-em-pnet-gateway-ifs-2904472

In the Downloads > Software section, download the following compressed file:

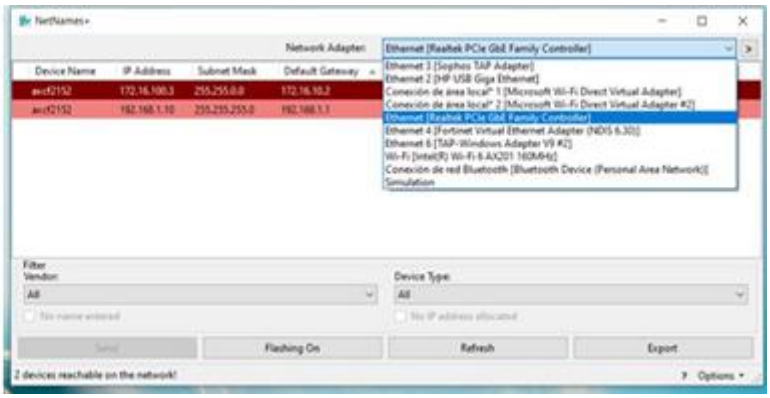
© BeePlanet Factory 2026

NetNamesSetup.zip (321 MB)	The NetNames+ tool can be used to adapt IP parameters and device names of PROFINET devices. The DCP protocol (Discovery and Configuration Protocol) is used.	Multilingual	1.50

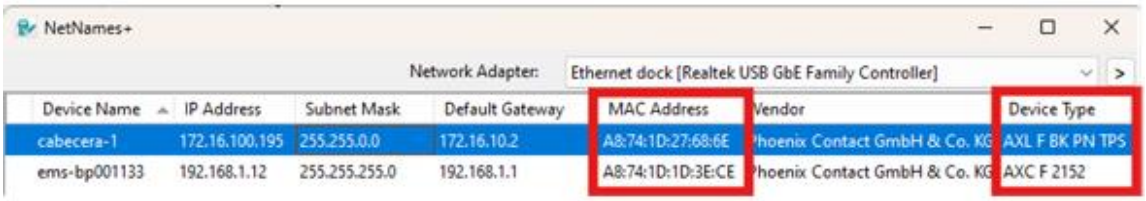
SHA256 checksum: 6f25f185438809f144671c6d1bf857d2b6f41c75bbf3d332e62ada4c41d3e1a8

Then extract it on the computer and run the installer. Once installed, open the NetNames+ application and select the Ethernet network adapter being used (Ethernet, Wi-Fi, etc.):





When you press the Refresh button, the connected Profinet devices will appear. If the PLC/bus coupler is correctly connected, a device should appear with the Device Name "axcf2152" and the MAC address of the BHive in the case of the PLC, and "AXL F BK PN TPS" in the case of the bus coupler:







For the BHive, the installation's network parameters are configured from the NetNames+ application:

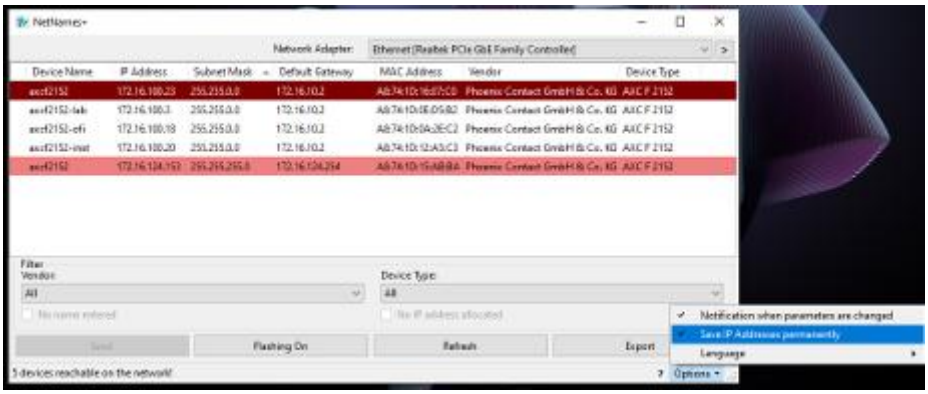
- IP address (IP Address)
- Subnet mask (subnet mask)
- Gateway (Default Gateway)

For the bus coupler, the device name is configured from the NetNames+ application:

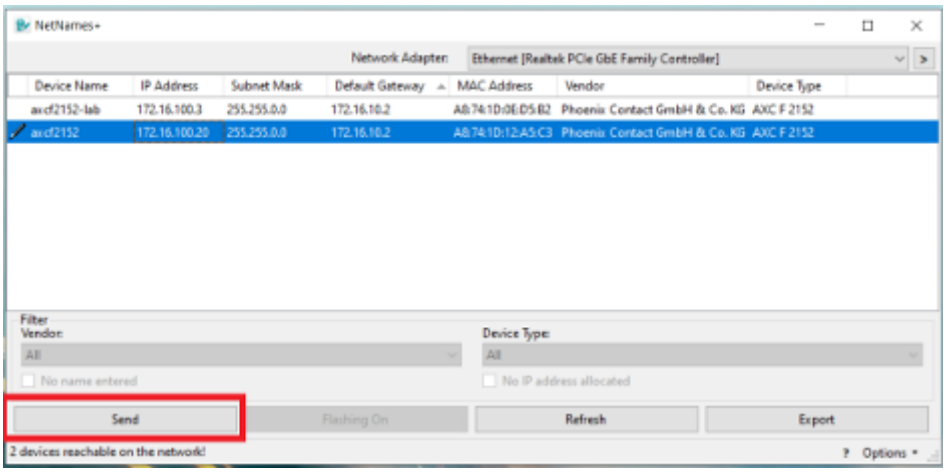
- Device name (Device name)

IMPORTANT!

Configure NetNames to save the IP address permanently by enabling the option in the bottom menu:



After editing them, they take effect by pressing the Send button.



From then on, the BHive should be accessible at the newly configured IP address, and the bus coupler under the configured name.

2. User interface

The BHive has a user interface that can be accessed from any internet browser. The interface can only be accessed from the LAN by connecting to the configured IP address.

https:// + <configured IP>

When you access the interface, the home page will request the username and password credentials.

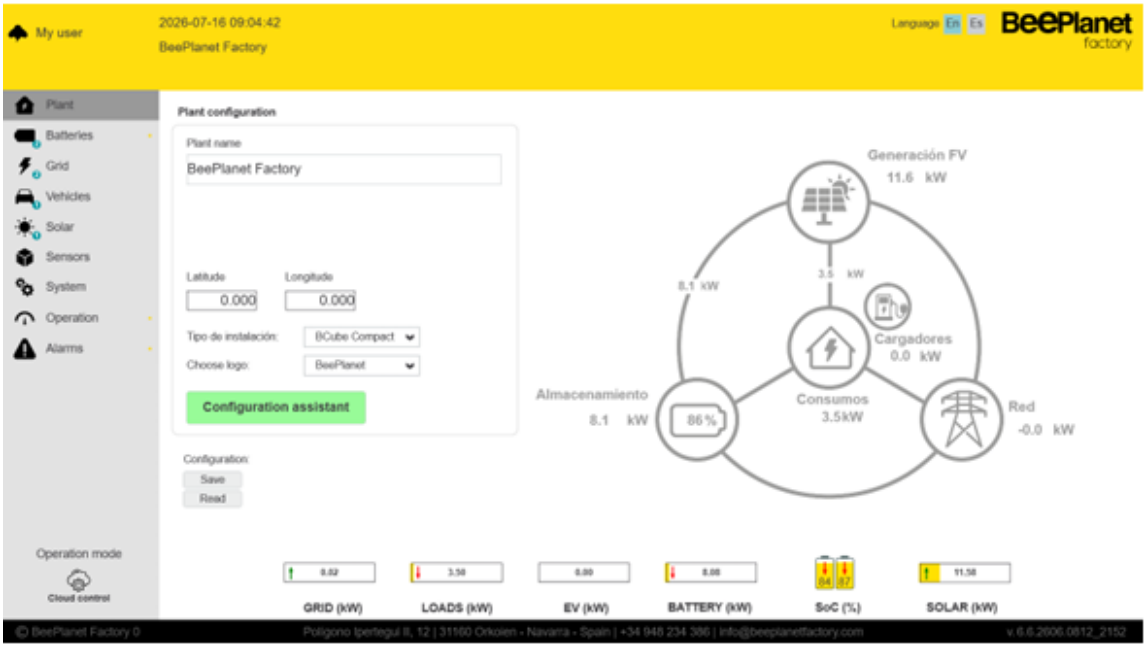
3. User management

Access to the BHive interface is protected by credentials to ensure the user's security and privacy and to prevent unauthorised access. By default, the BHive contains the following users:

- **Installer**: a user with viewing and configuration permissions through the web interface.
- **Advanced**: a user with permissions to view and configure some parameters through the web interface.
- **Basic**: a user with viewing permissions through the web interface.
- **Cliente_OPC**: a user with viewing and editing permissions through the OPC-UA server. Aimed at control centres or Supervisory Control and Data Acquisition systems (SCADAs) that will control the BHive, and charging point operators that will communicate with the BHive.



The passwords will be provided by BeePlanet and can be edited once you have logged in.



In addition to the default users, it is possible to configure, modify or delete users from the device's administration page. To do so, contact BeePlanet.

3.1. LDAP configuration

The BHive can be connected to an LDAP server for user and password management. The connection to the LDAP server is made using secure certificates thanks to the TLS protocol. LDAP authentication is added to the authentication of the local users mentioned above. The LDAP connection configuration contains the following parameters:

Option	Description	Default	Optional/ Mandatory
LDAP host/IP	DNS name or IP address of the LDAP server		Mandatory
Port	TCP port of the LDAP server	"389"	Optional
timeout	The network timeout after a connection attempt to the ldap server failed	"10s"	Optional
Enable TLS	Activate/deactivate TLS	"true"	Optional
Use StartTLS	Usage of StartTLS instead of TLS (this option only has an effect when TLS is activated)	"true"	Optional
TrustStore name	Name of the Trust Store, that is used for verification.	"ldap"	Optional
cipherList	List of permitted TLS cipher suites for the LDAP connection	"NORMAL:-VERS-TLS1.0:-VERS-TLS1.1:-VERS-DTLS1.0:-SHA1:-SIGN-RSA-SHA1:-SIGN-ECDSA-SHA1:-RSA"	Optional
Base DN	DN (Distinguished Name) where the LDAP search for users starts		Mandatory
Search filter	LDAP filter that is used for the search for users.		Mandatory
Bind DN	DN that is used for the bind before the search		Optional
Bind password	Password for the "Bind DN"		Optional
Group attributes	List of LDAP attributes that save the group membership of a user, e. g. "memberof"		Mandatory
LdapGroup / Role Mapping	Mapping configuration of LDAP groups to PLCnext roles		Optional

4. Plant configuration

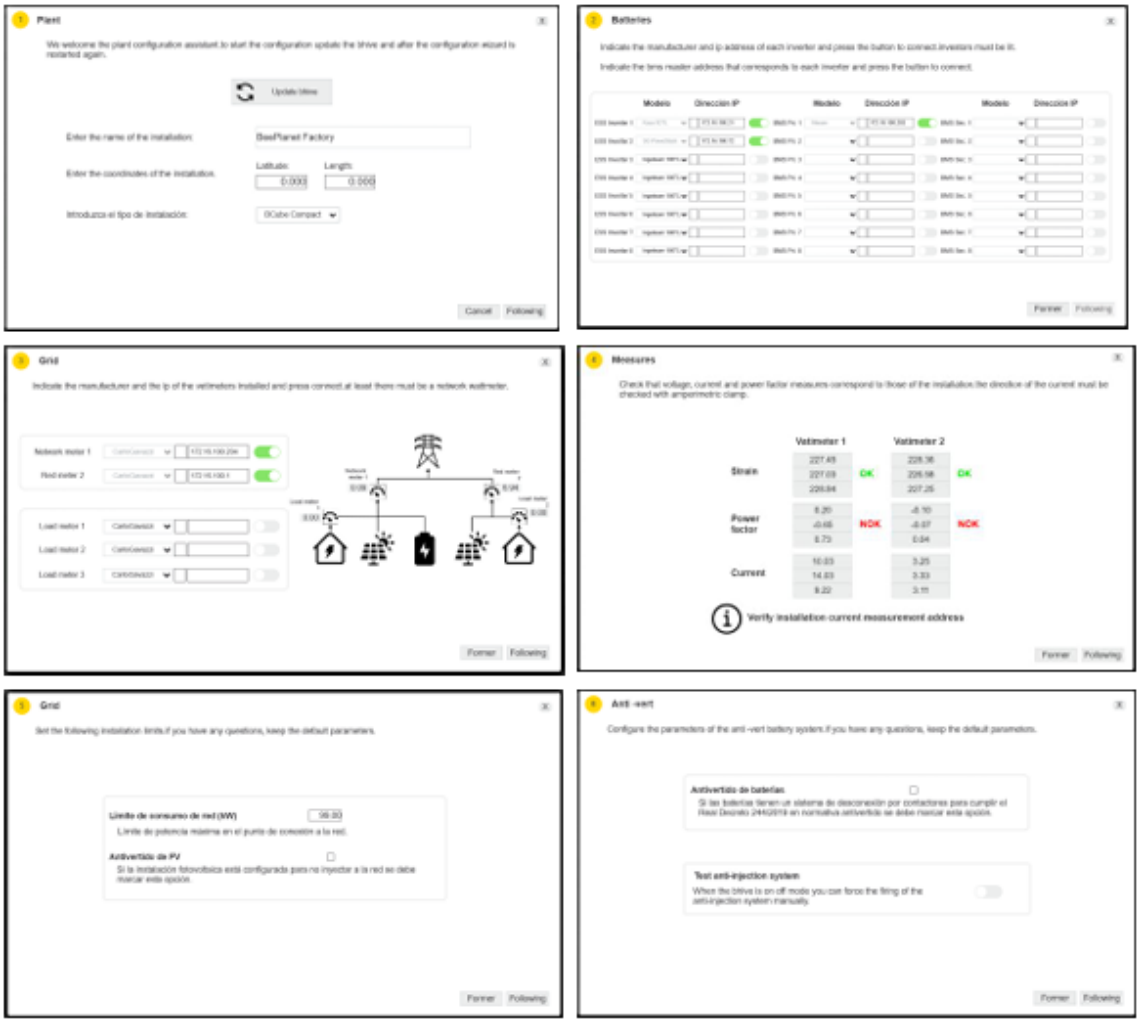
Configuring a plant in the BHive is necessary for the system to monitor and control the rest of the energy systems in an installation. The aforementioned user interface is used for this. The plant configuration can be carried out using the configuration wizard or the advanced configuration.

As a minimum, a grid wattmeter and a battery inverter must be configured for the plant to work correctly; in addition, photovoltaic systems, other meters or charging stations can be configured.

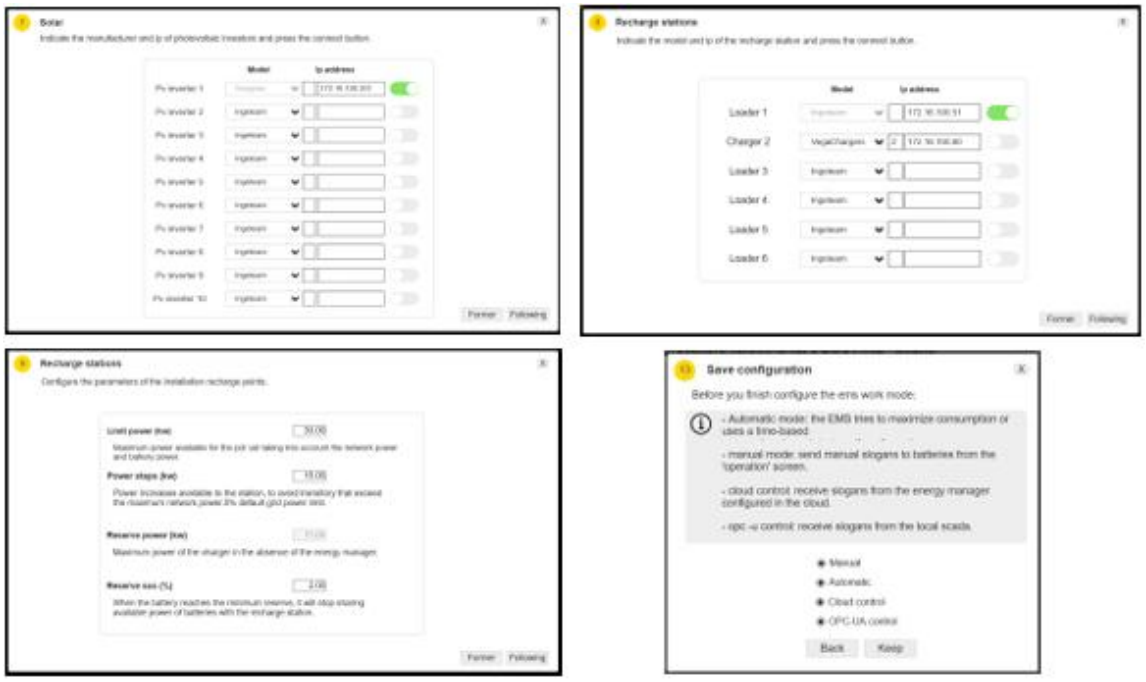
4.1. Configuration wizard

If this is the first time this equipment is being configured on site, it is recommended to use the Configuration Wizard. This wizard will guide you through the steps needed to configure a plant from scratch:

- **Plant**: name, systems and grid profile.
- **Batteries**: IP addresses of the battery inverters.
- **Grid meters**: IP addresses of the grid meters.
- **Grid**: configuration of the plant's maximum limits.
- **Solar**: IP addresses of the PV inverters.
- **Charging stations**: IP address of the EV charging station.
- **Auxiliary systems**: HVAC, insulation sensor, fire-protection system, etc.
- **Operating mode**: automatic, manual, Cloud control or OPC control.

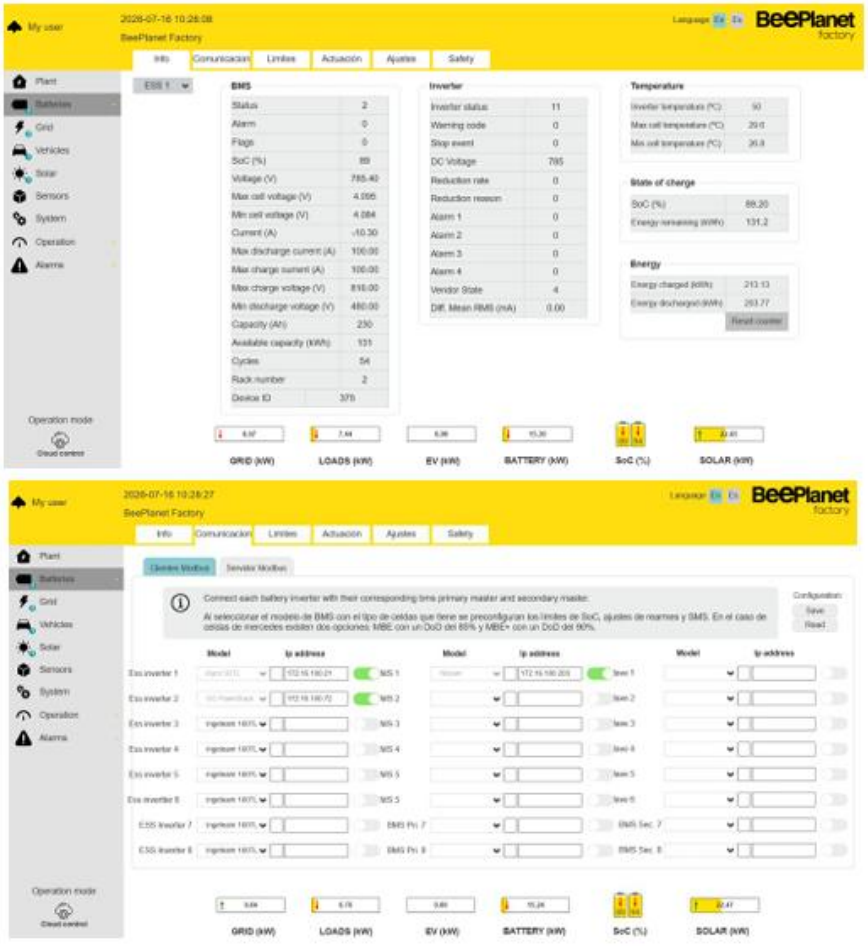


© BeePlanet Factory 2026

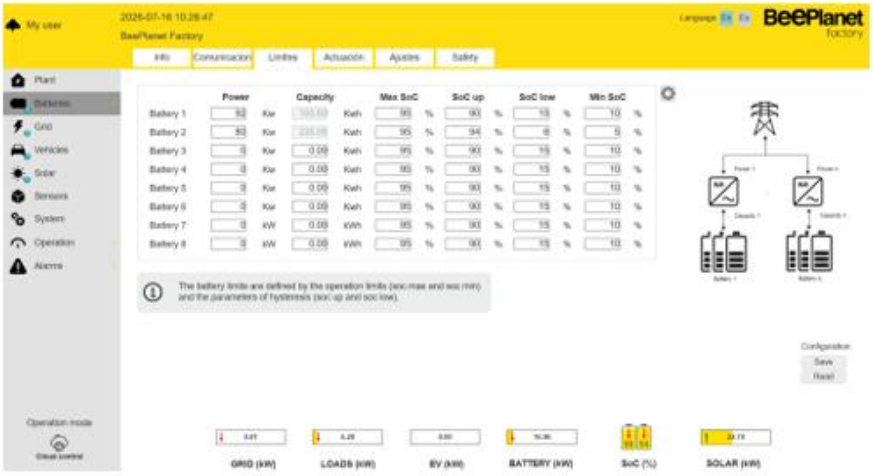


4.2. Batteries

This section configures communication with the storage systems and the maximum and minimum state-of-charge (SoC) limits of the battery, as well as the charge and discharge hysteresis SoC values. These parameters are configured by default to operate the batteries within their safe operating ranges.

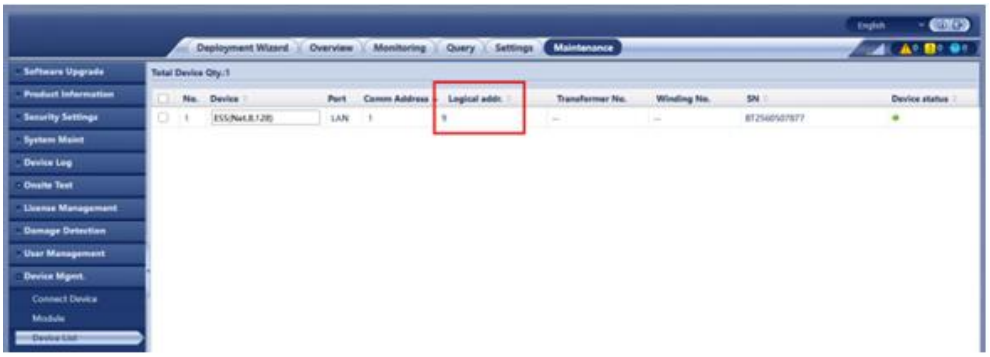


© BeePlanet Factory 2026

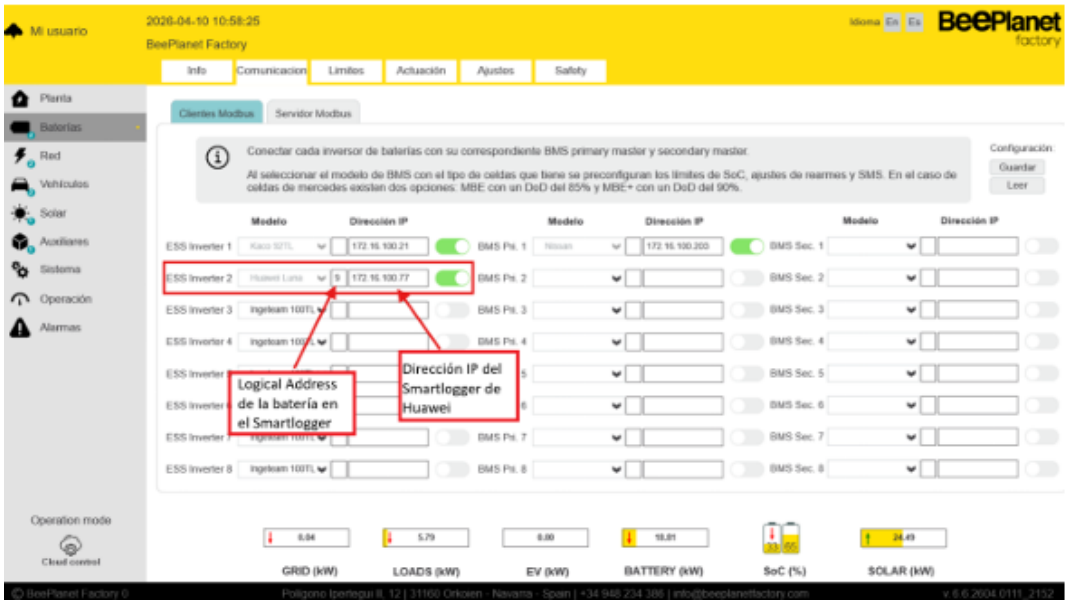


4.2.1. Communication with Huawei batteries

To communicate with a Huawei battery, configure the connection to the IP address of the Huawei Smartlogger associated with the battery installation. You must also specify the battery ID assigned by the Smartlogger. To view the battery ID, go to the Smartlogger web interface, Maintenance > Device List section. There you will find the list of batteries connected to the Smartlogger and the "Logical address" assigned to each battery.



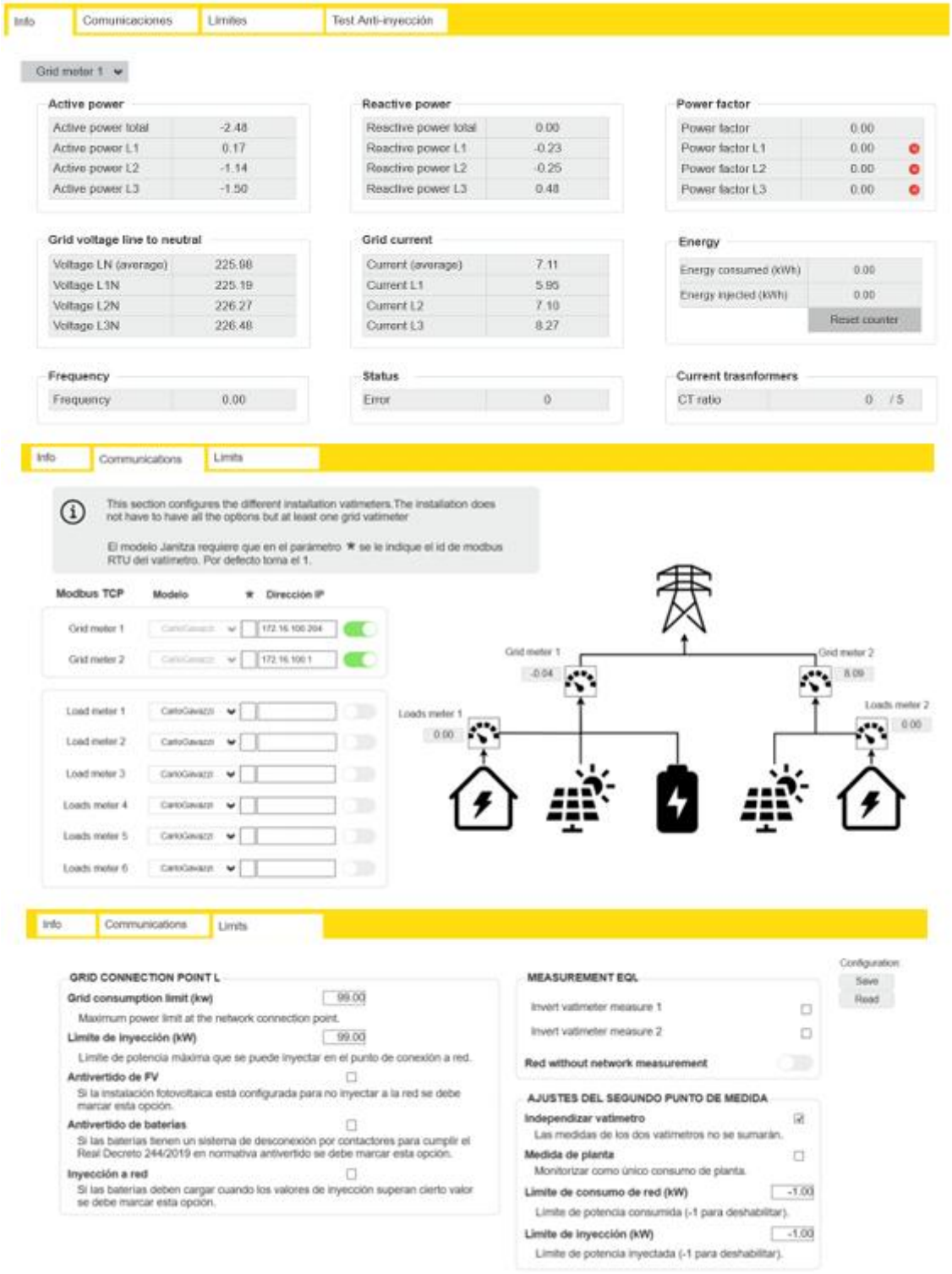
In the BHive, you must configure as many connections as there are batteries. The IP address of all the connections must be that of the Smartlogger, and in the adjacent field enter the Logical Address assigned by the Smartlogger.



© BeePlanet Factory 2026

4.3. Grid connection

This section configures communication with the installation's grid meter(s) and the consumption or injection limits that must not be exceeded in the installation. The parameters of the battery anti-injection system are also configured here.



The BHive needs to know whether the PV installation has an anti-injection system and whether a battery anti-injection system is to be configured. Both are set up in this section.

When the PV installation has an anti-injection system, it will never inject power into the grid, because the PV inverters curtail their production to prevent any export to the grid.

As a result, the grid meter never registers a surplus, and the BHive cannot detect the available excess energy from the grid measurement alone. So that the BHive can still detect when surpluses may be available and charge the battery, a minimum consumption power must be configured. When the installation's grid consumption drops to this minimum value, the BHive interprets that the PV system is being curtailed because there is surplus generation, and it charges the battery to make use of that energy, allowing the PV system to increase its production.

4.3.1. Meter via RS485

If a meter via RS485 is used, it is recommended to use a Modbus RTU to Modbus TCP converter such as the FL ComServer from Phoenix Contact. The Modbus parameters must be configured to the following values on both the meter and the protocol converter:

- Baud Rate: 9800
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Id: 1

Regarding the communication cable, a 120 Ohm resistor must be placed at each end, unless the device connected at that end already has that resistor internally (the FL ComServer has a physical switch that engages an internal 120 Ohm resistor).

4.3.2. Chint meter option

If connecting to a Chint meter that acts as anti-injection for a GreenHeiss photovoltaic system, the Modbus parameters must be configured to the following values using the physical buttons on the device:

- Prot: n.1
- bAud: 9.600
- Addr: 3

This configuration is incompatible with the one required to communicate with the Panasonic HVAC system, so different RS485 cards must be used for the two devices.

Regarding the communication cable, this is how Chint is connected to the FL ComServer:

a. D(A) of the ComServer connects to pin 25 of Chint RS485(B)
b. D(B) connects to pin 24 of Chint RS485(A)

The bus termination instructions from the previous section must also be considered.

4.3.3. Janitza meter option

If connecting to a Janitza meter, communication requires that the same Modbus TCP identifier configured on the meter be used. Its default value is 1, but if it has been modified, its value must be entered on the meter's connection screen:

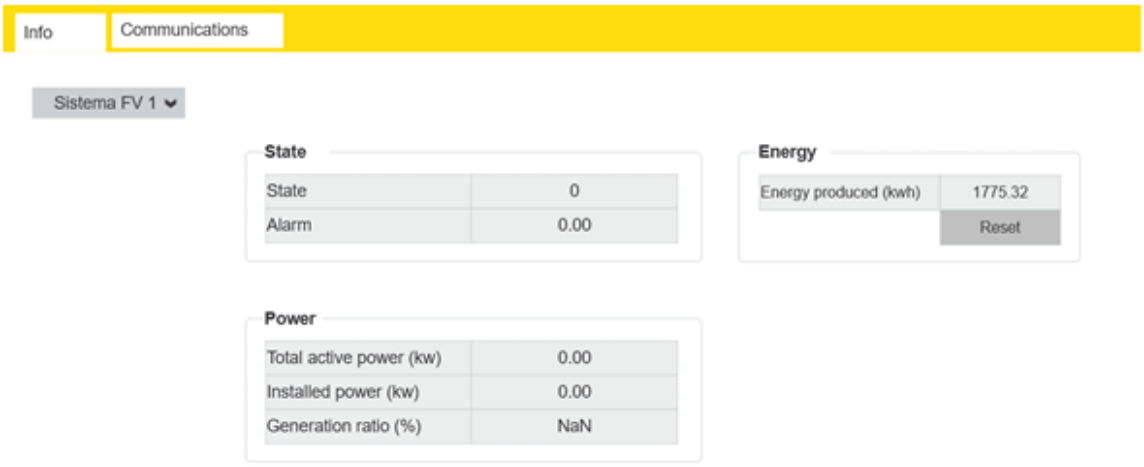
© BeePlanet Factory 2026

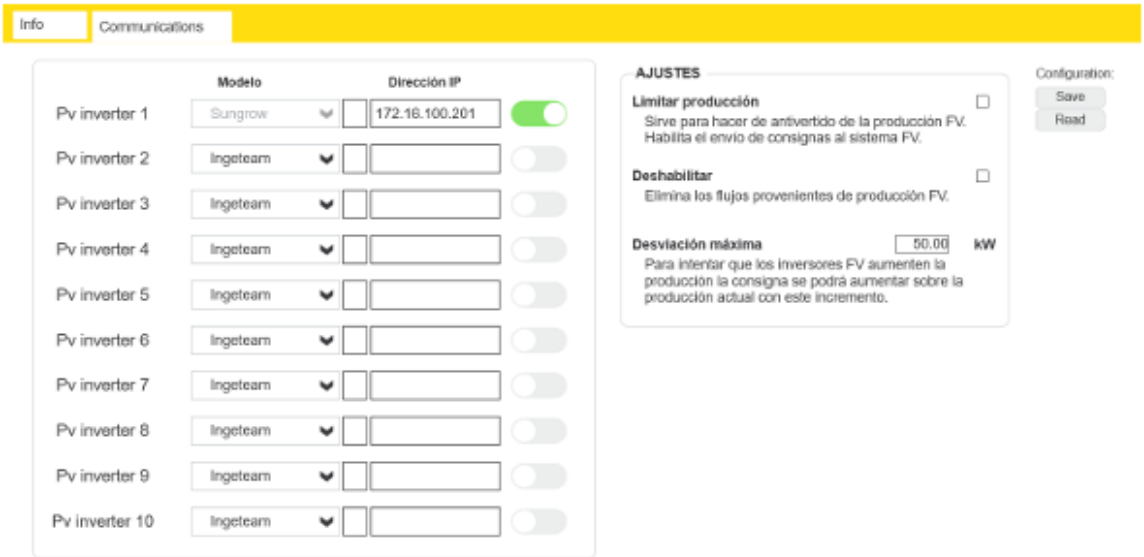


4.4. Photovoltaic

In this section you can monitor and configure one or more photovoltaic systems. It is preferable to connect to PV system loggers that aggregate the information from all the PV inverters. The connection to the PV systems is made via Modbus TCP through the device's IP address and port 502.

In addition to communication with photovoltaic inverters or inverter loggers/data managers, the reading of an energy meter that measures photovoltaic production can be configured. This meter must be installed at the point where the photovoltaic installation connects to the rest of the installation. The compatible energy meters are listed in the section.





To configure some photovoltaic systems, it is necessary to set certain parameters in the

© BeePlanet Factory 2026

photovoltaic system itself.

4.4.1. IngeTeam photovoltaic option

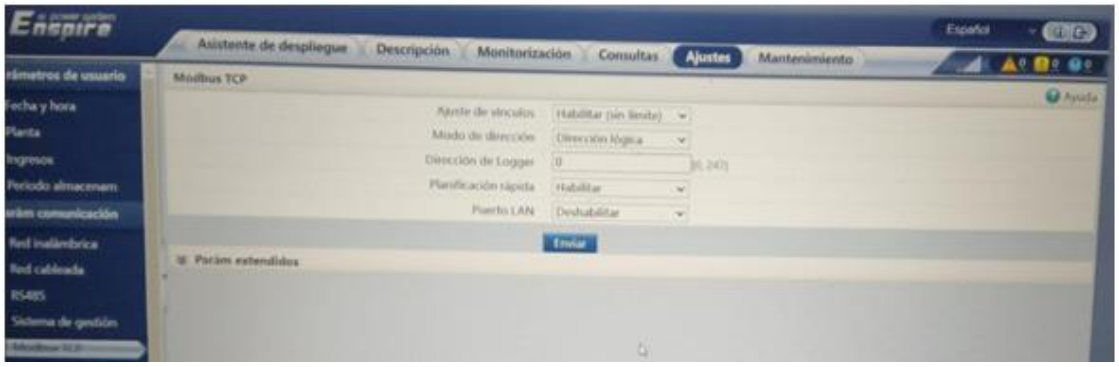
If connecting to an Ingeteam photovoltaic system, you must access the Ingeteam EMS interface (at its IP address), in the Estrategia>EMS Gateway section, and enable this option.



4.4.2. Huawei photovoltaic option

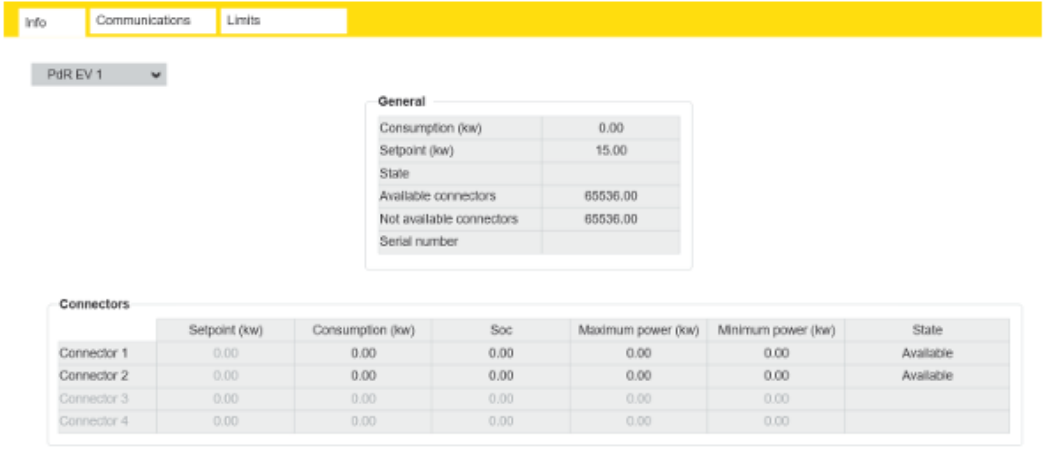
If connecting to a Huawei photovoltaic system, you must access the Huawei Smartlogger interface (at its IP address), in the Settings>Param. Communication>Modbus TCP section, and configure the following options:

- Link setting: Enabled (no limit)
- Address mode: Logical address
- Logger address: 0
- LAN port: Enable



4.5. Charging points

In this section you can monitor and configure communication with the compatible charging stations.



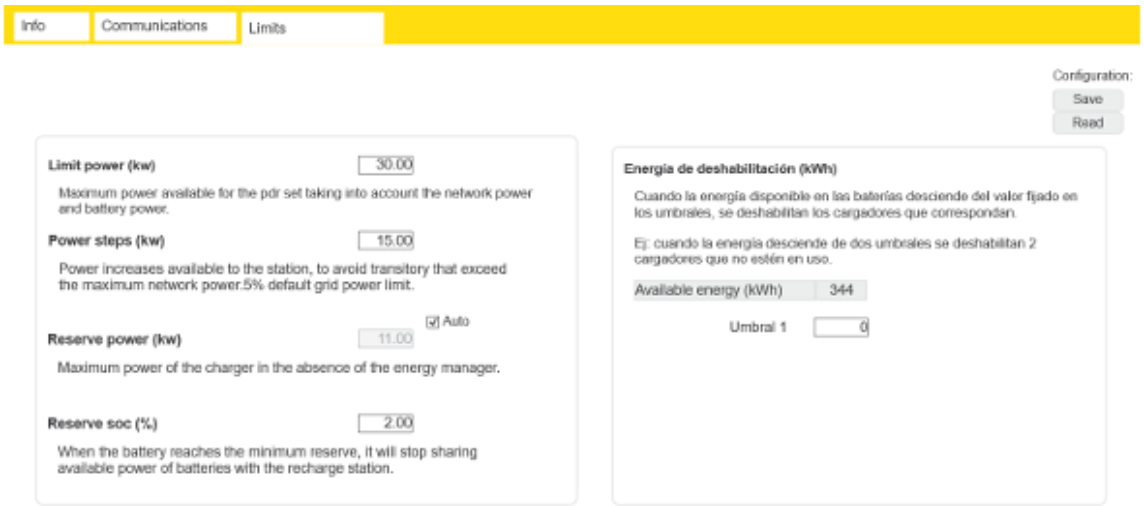
© BeePlanet Factory 2026

Modbus TCP communication is configured by connecting to the IP address of the charging station. OPC-UA communication is performed from the charging station, and the communication timeout is configured here.

By default, when a charging station is connected in this section, the BHive will perform power control; in addition to monitoring consumption, the BHive will send limitation setpoints when the installation's consumption is about to exceed the grid limit.



In the "Limits" tab, the following parameters are configured for the installation's charging stations.



There is also the option to disable chargers based on the energy available in the batteries.

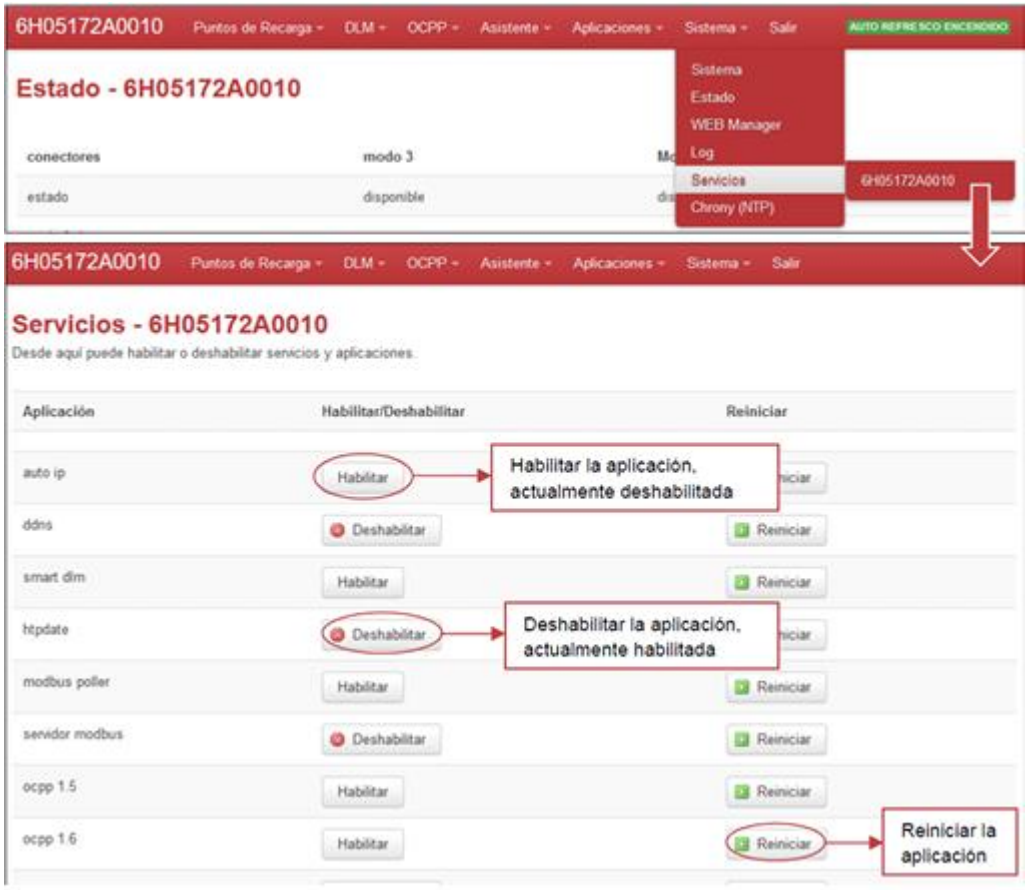
When the energy in the storage system reaches threshold 1, a charging point that is not in use is deactivated, starting with the one configured as 1; if it is occupied, it moves to the next one. When the battery reaches energy threshold 2, a second unused charging point is deactivated, and so on progressively.

4.5.1. IngeTeam charging option

If connecting to an Ingeteam Rapid or Ingeteam Fusion charging point, you must access the charging point's web interface, available at its IP address, with the user "operator" and the password set by the customer (please check), and configure the following parameters:

- **Modbus server**: in the Sistema>Servicios tab, enable the "Servidor modbus" and restart the application. The status should remain at "Deshabilitar":

© BeePlanet Factory 2026



- **Maximum DLM current**: in the DLM>Planta tab, you must configure a maximum installation consumption current per phase. For example, if the installation has a maximum consumption power of 200 kW even though the charger is 22 kW, a maximum plant current of 500 A is configured. The minimum current can be left as it is.



© BeePlanet Factory 2026

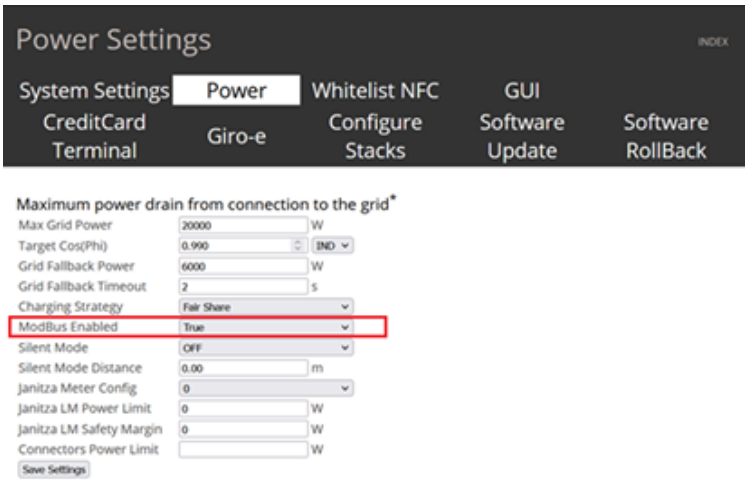
4.5.2. Alpitronic HyperCharger charger option

To communicate with the charger via Modbus, the following checks must be carried out:

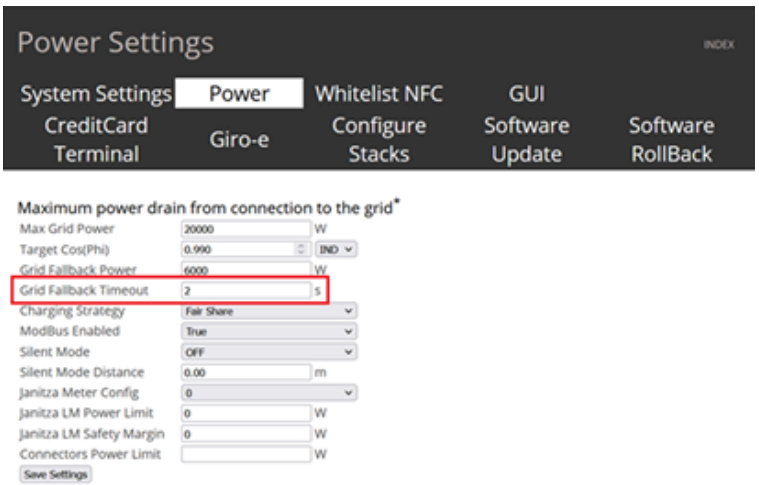
- The charger's Ethernet socket must be connected to the port marked "Service" or "XF1" in the following screenshot. If the Ethernet socket is connected to the "cliente" or "XF2" port, power control will not work.



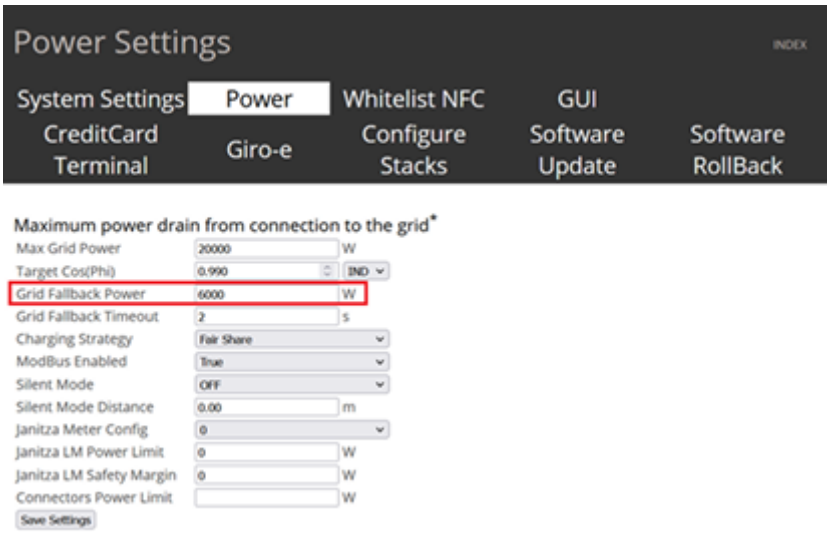
- Enable Modbus communication in the charger's web interface, General Settings>Power section:



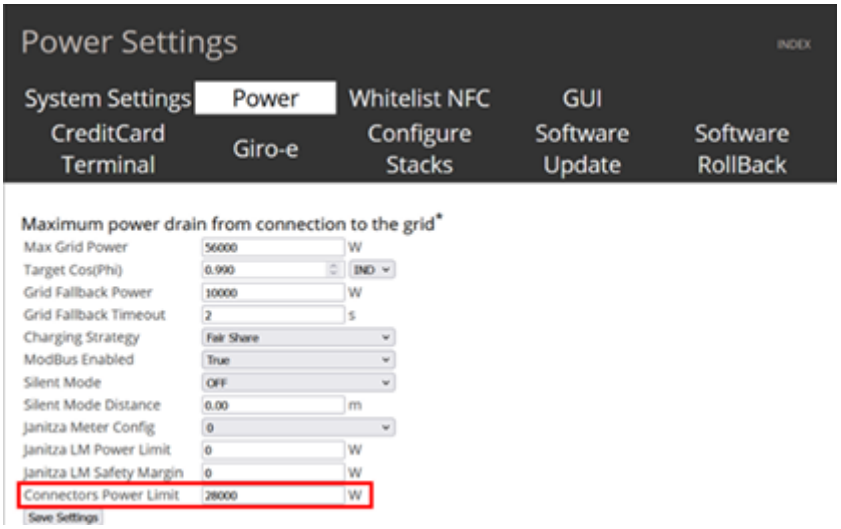
- Set the Grid Fallback Timeout to 2s:



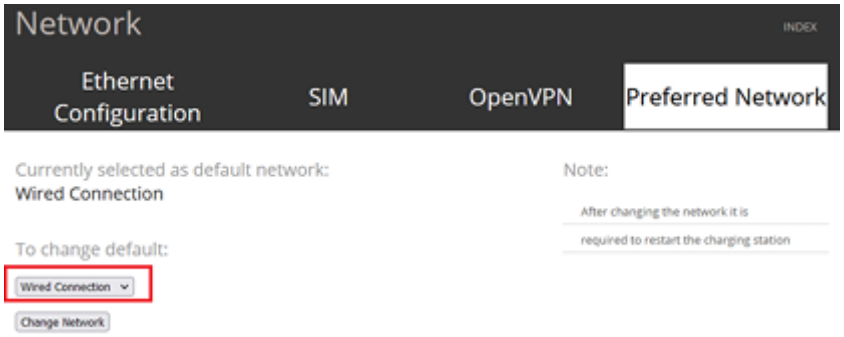
- Set the Grid Fallback Power to the power available in the installation in question divided by the number of charger outlets. Example: an installation with 60kW of grid power and 3 outlets, the Grid Fallback Power is 20kW.



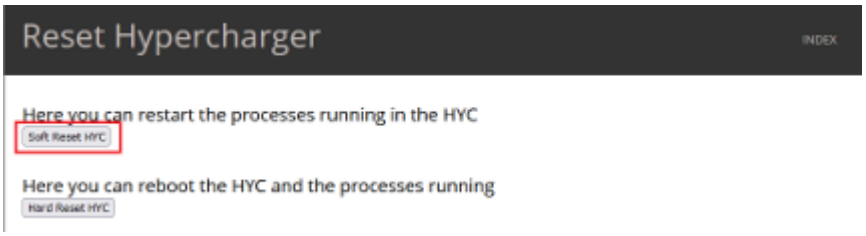
- Set the Connector Power Limit as the maximum power available for the charger's connectors in the installation in question, considering the grid, the batteries and the photovoltaic. Example: an installation with 30kW of grid, 20kW of photovoltaic and 100kW of batteries, the Max Grid Power would be 150kW.



- Set the wired network as the preferred one in Network settings>Ethernet Configuration:



- After editing the configuration, the charger must be restarted; from the Reset menu, enable the Soft Reset HYC option.



4.5.3. Kempower charger option

When communicating with standalone Kempower chargers or with a PowerUnit with satellites, they must have the Modbus server enabled.

For the PowerUnit, a connection must be established for each satellite. The following image shows an example of an installation with three satellites:



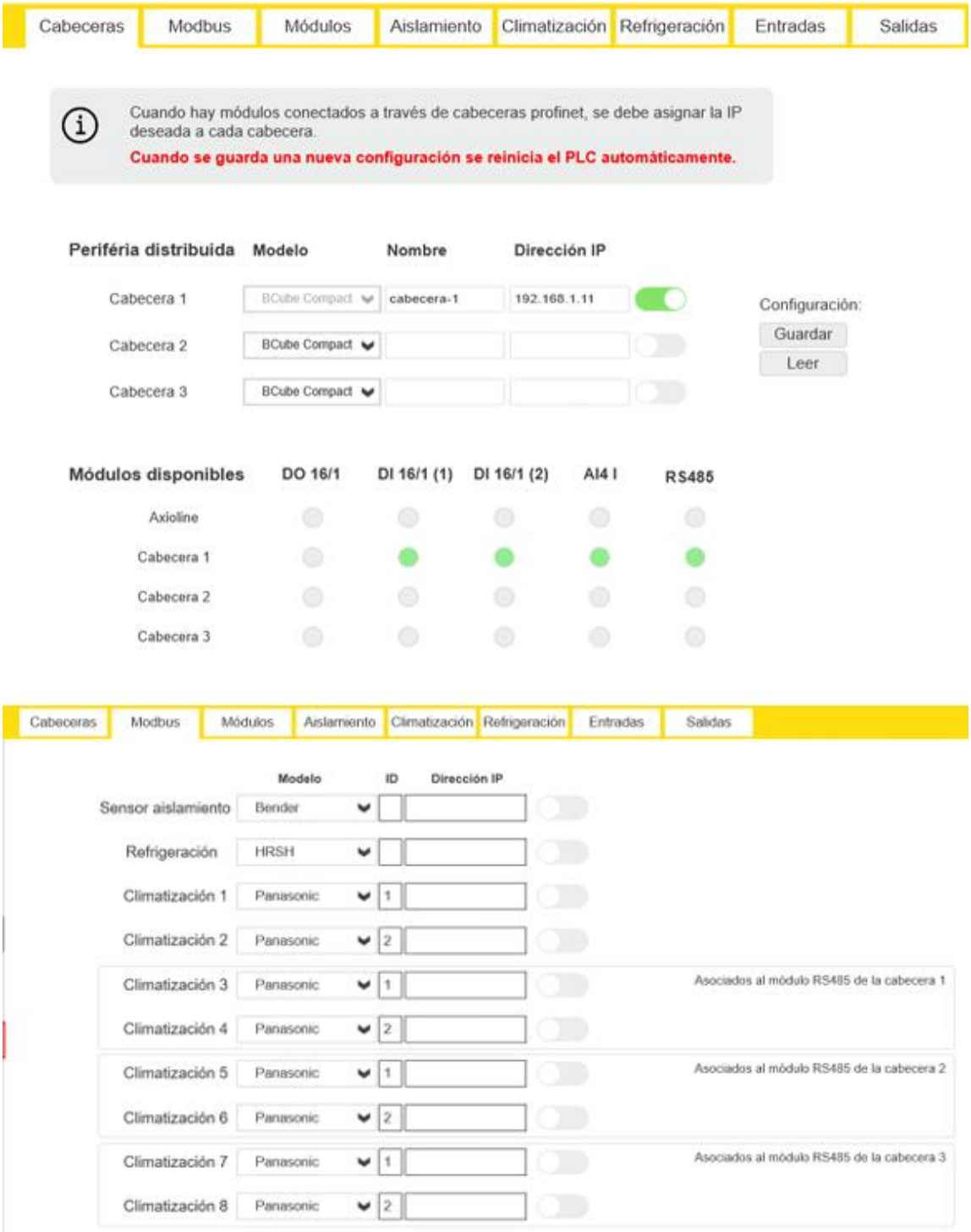
4.6. Auxiliaries

Note: this section only applies to BeePlanet batteries (BCube, Compact, Power or BZell). Skip it otherwise.

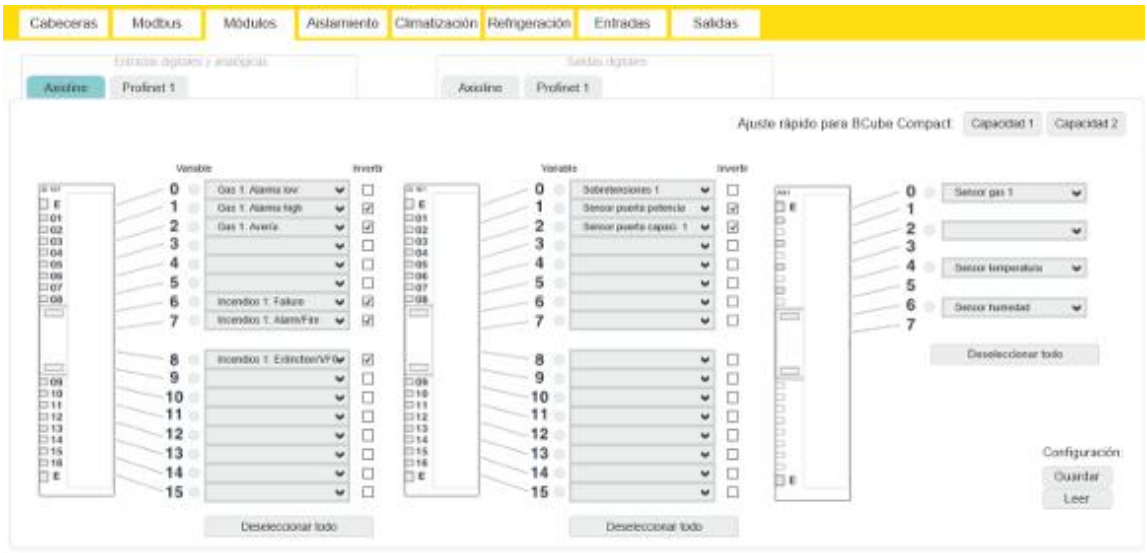
This section monitors and configures the auxiliary systems of the storage system, such as:

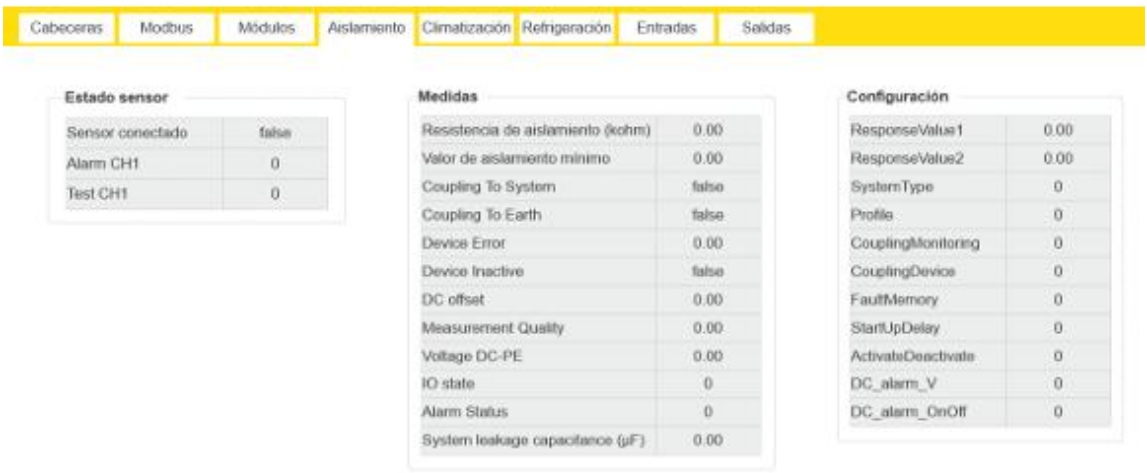
- HVAC
- Fire-protection system
- Insulation sensor
- Access control
- Hydrogen sensors
- Humidity sensors
- UPS
- Beacon

© BeePlanet Factory 2026



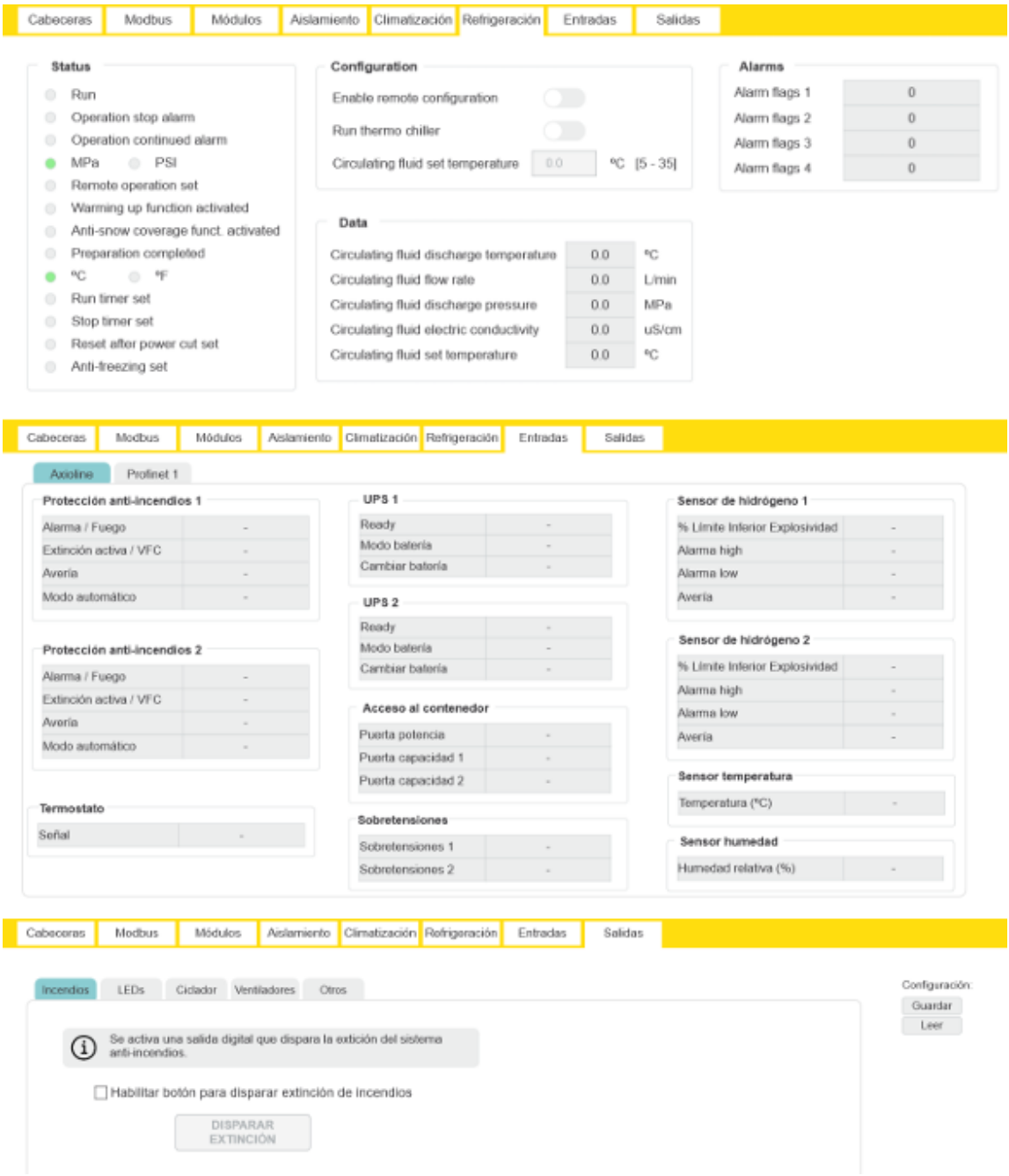
© BeePlanet Factory 2026







© BeePlanet Factory 2026



4.6.1. Auxiliary connection via Profinet bus couplers option

When connecting inputs/outputs to the PLC using Profinet bus couplers, the netnames program must be used to assign a name to each bus coupler (cabecera-1, cabecera-2…).

Once the name has been assigned, the bus coupler name must be linked to the IP address you want to assign to it in the "Cabeceras" tab of the BHive. Once the assignment has been made, the connection must be activated and the configuration saved:



This runs a sequence in which the PLC restarts. During this operation, the connection to the BHive is lost and is automatically restored after about 60s.

4.6.2. Auxiliary connection via inputs/outputs option

When the auxiliary systems are connected via inputs/outputs, in the modules tab you must configure the inputs/outputs of each device, both the assignment of the corresponding input and the assignment of direct or inverse logic:

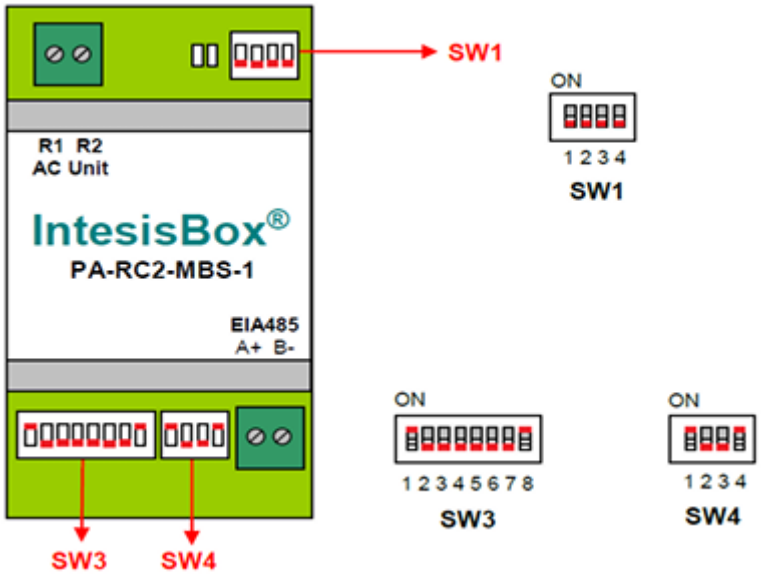


These assignments must be made both to the signals of the peripherals connected directly to the PLC via Axioline (Phoenix Contact's communication protocol) and to the peripherals connected via Profinet bus couplers:



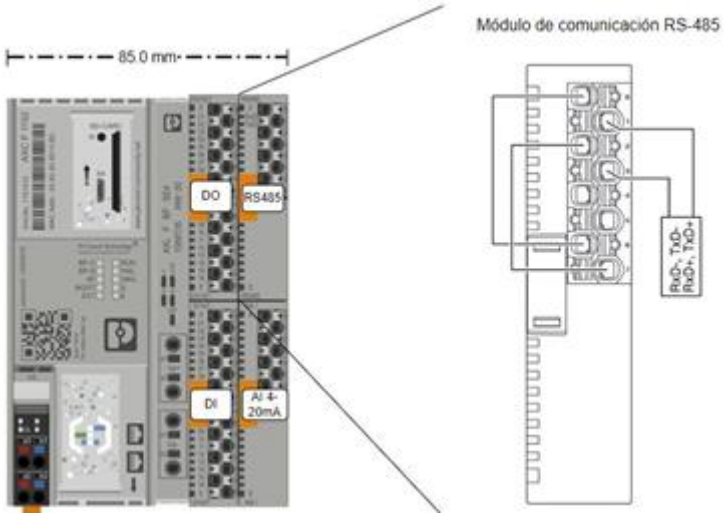
4.6.3. Panasonic HVAC unit option

For the Panasonic HVAC unit, communication is carried out via Modbus RTU using the RS485 module in the PLC and an intermediate gateway that converts Modbus RTU to the HVAC unit's R1R2 protocol. The gateway is the PA-RC2-MBS-1 from Intesis. This gateway has jumpers that must be set as shown in the following image:



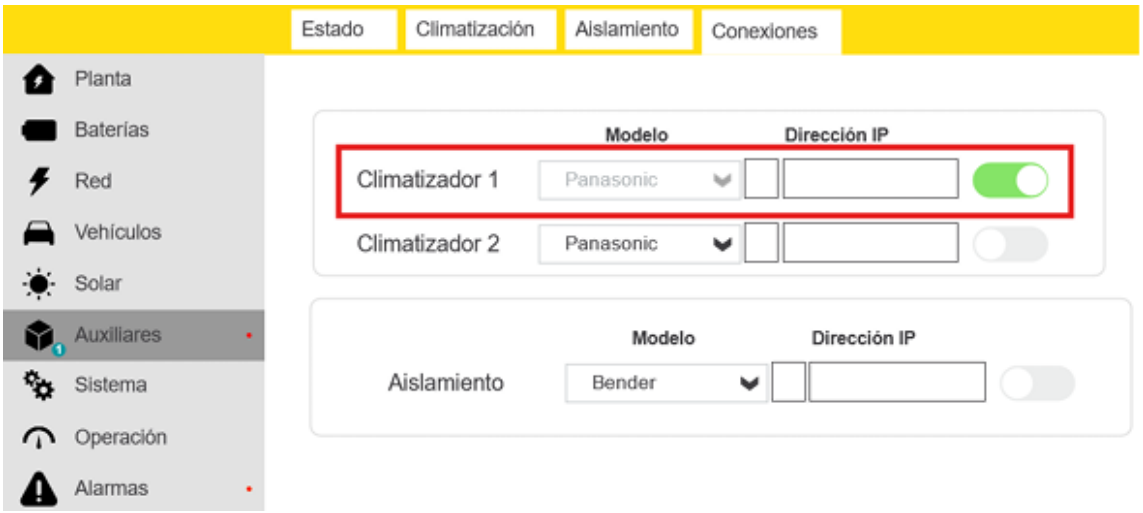
On the PLC, the wiring is done as shown in the following diagram:

© BeePlanet Factory 2026

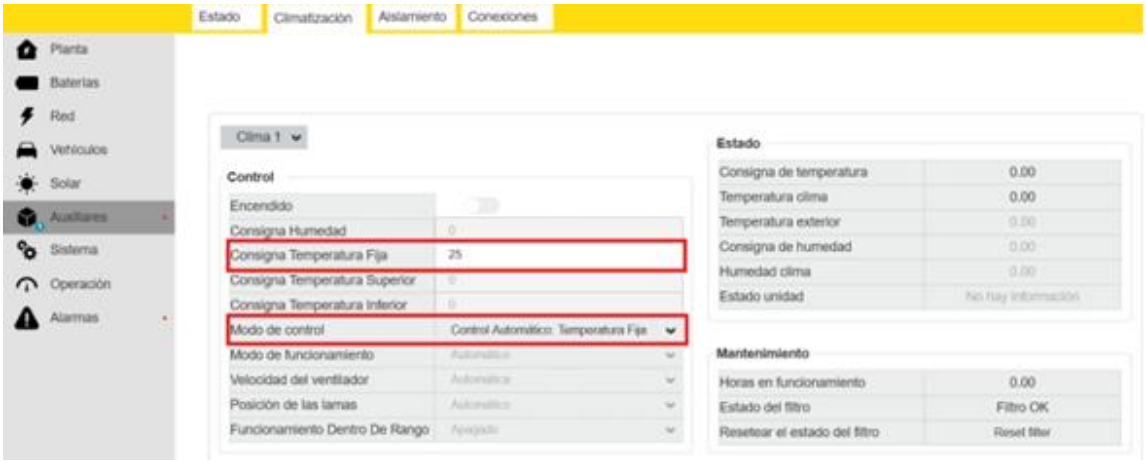


The jumpers shown in the diagram must also be fitted.

To connect the BHive to the HVAC unit, in the Auxiliaries section go to the connections tab and activate its connection. It only works in the Climatizador 1 position:



Once connected, in the HVAC tab it is most common to use the automatic control mode at a fixed temperature and assign it a temperature setpoint:



However, it can also be left as monitoring only, or automatic control within a temperature range can be used.

© BeePlanet Factory 2026

4.6.4. AC Precision HVAC unit option

If you have an AC Precision HVAC unit, you will need to verify the configuration of the following Modbus parameter in the HVAC unit's web interface.

To access the HVAC unit's web interface, type the HVAC unit's IP address into a web browser. Log in with the user "ADMIN" and the password "SBTAdmin!". Click the "Login" button in the top right corner and enter the code "6969":

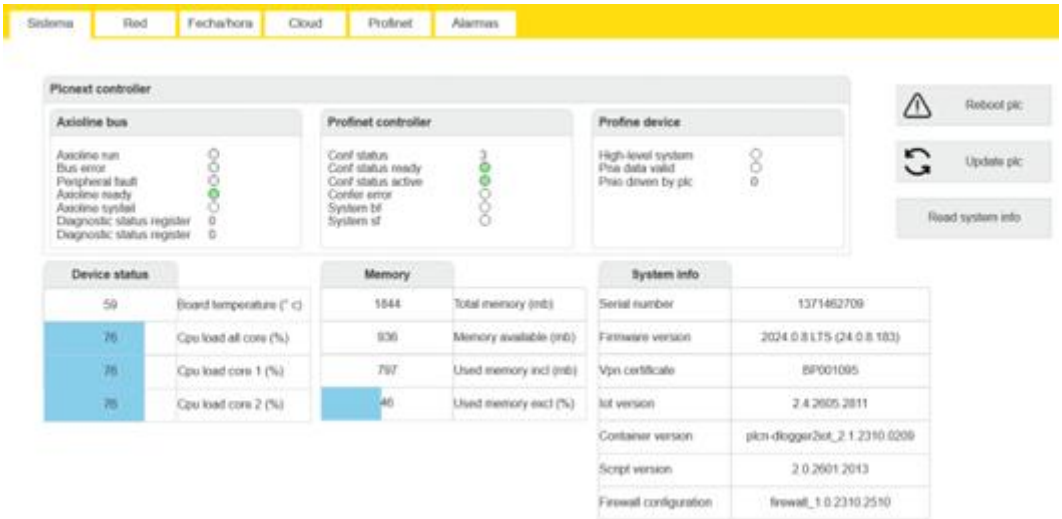


Go to Menú principal > Ajuste parámetros > Comunicaciones > Modbus and check that the Modbus slave number is set to 1. If it needs to be edited, perform a reset afterwards.



4.7. System

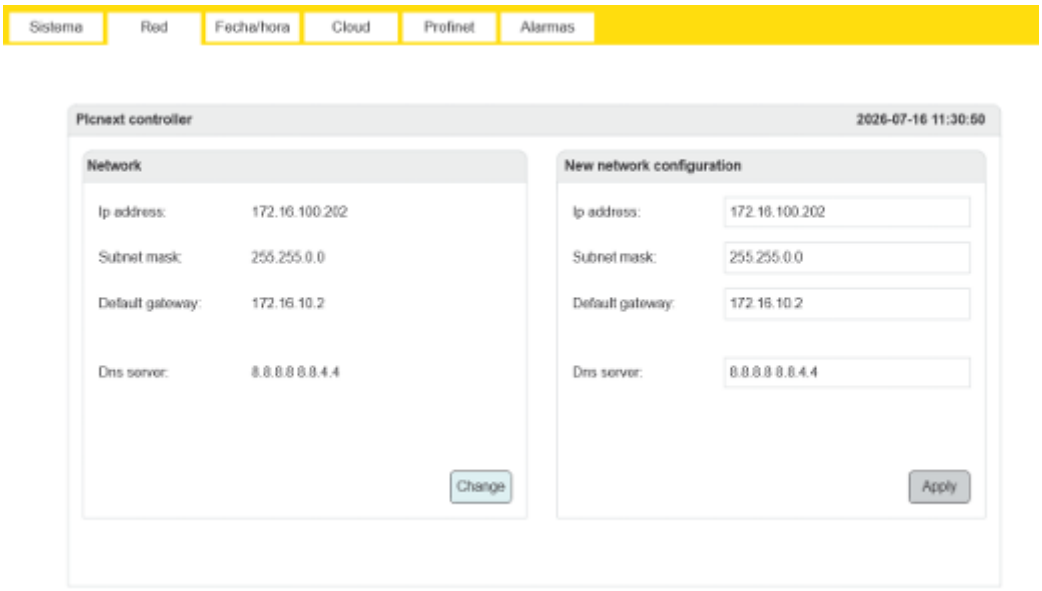
In this section you can monitor and configure the BHive's operating system.



© BeePlanet Factory 2026

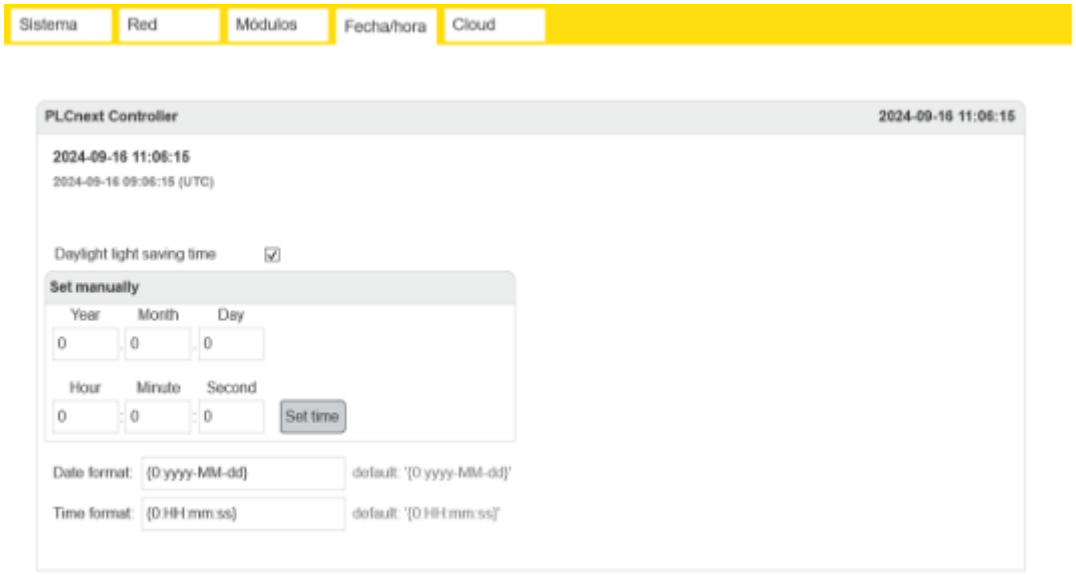
4.7.1. Network configuration

In this section you can configure the BHive's network parameters such as the IP address, the subnet mask, the gateway and the DNS servers:



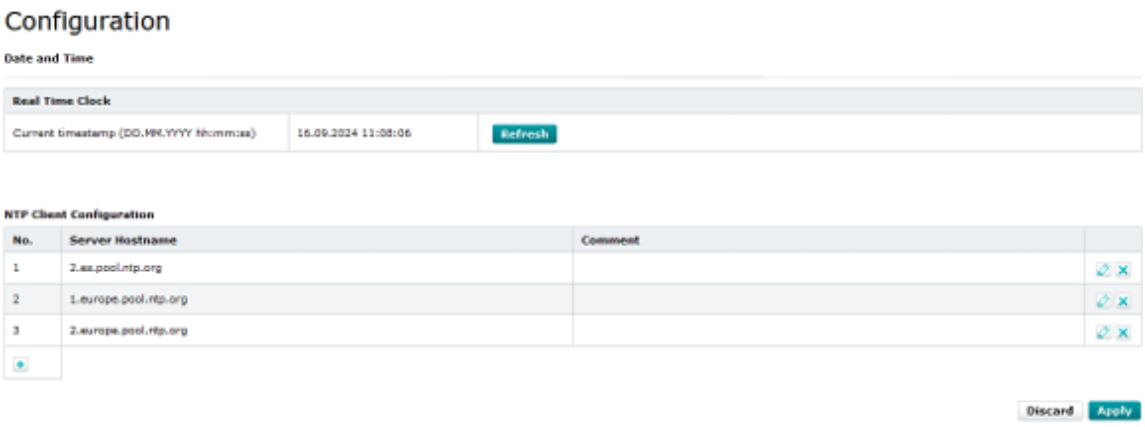
4.7.2. Date and time

In this section you can set the BHive's date and time manually:



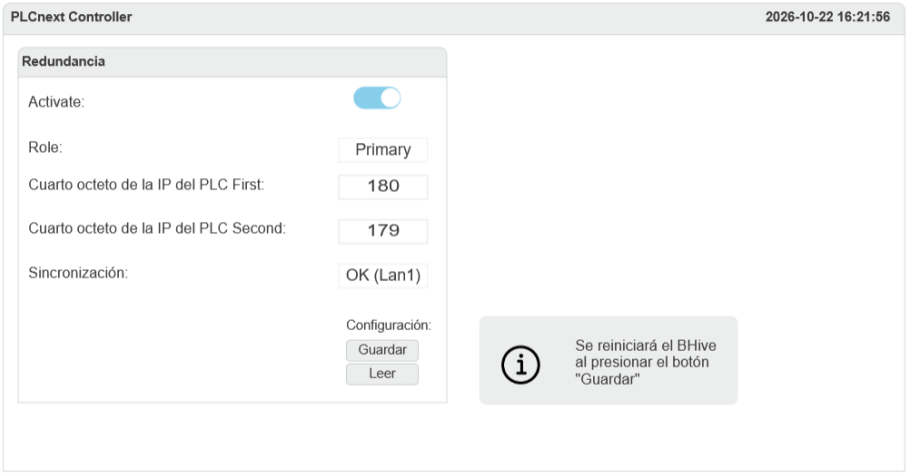
In addition, by default the BHive connects to public NTP servers to keep the date and time up to date. The address of the NTP server to be used can be changed on the BHive administration screen; to do so, contact BeePlanet.

© BeePlanet Factory 2026



4.7.3. Redundancy

In this section you can configure a redundant system.



Configurable Parameters	Function
Activate	Activate or deactivate the redundancy
Cuarto octeto de la IP del PLC First	Enter the fourth octet of the First PLC's IP address.
Cuarto octeto de la IP del PLC Second	Enter the fourth octet of the Second PLC's IP address.

Monitoring Parameters	Function
Role	Identify the role of each PLC.
Sincronización	Verify proper synchronization between the PLCs.

© BeePlanet Factory 2026

It is necessary to save the configuration by pressing the “Guardar” button. The PLC will restart at this point.

OPERATING MODES

The BHive can work in different operating modes, which are configured from the Configuration Wizard or from the Operation window.

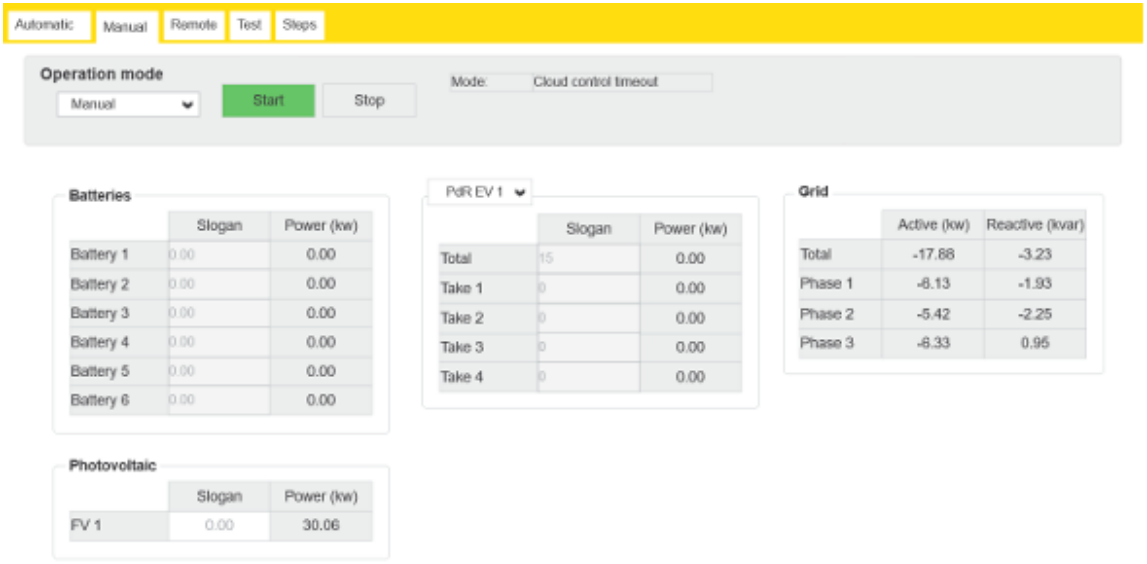
1. Manual mode

Manual mode control of the BHive can be useful for verifying in an installation that everything works correctly and that the batteries charge and discharge.



If we want to give manual setpoints to the storage inverters, it must be considered that the limits configured for the power, the maximum grid consumption or the grid injection power will not apply. Therefore, this mode must be used with caution so as not to exceed any of the installation's limits.

To command the batteries manually, go to the 'Operation' screen. Here we select the 'Manual' mode and press the 'Start' button.



Once in manual mode, we can edit the setpoints of the connected batteries, bearing in mind that positive power is discharge power and negative power is battery charge power.



Positive power = battery discharge

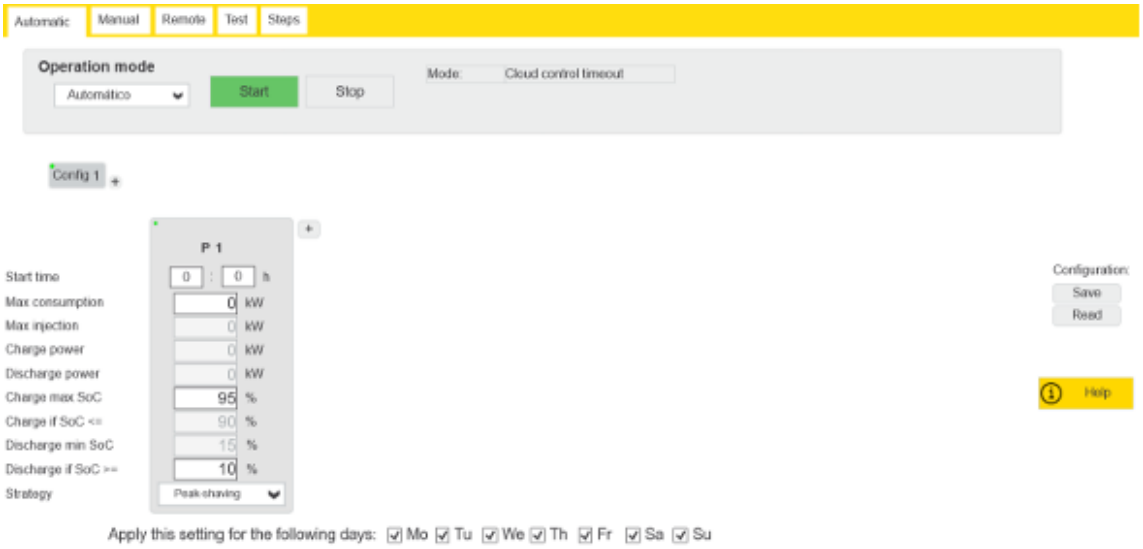
Negative power = battery charge

2. Automatic mode

In automatic mode, the BHive acts according to the strategy programmed by time periods. In this mode, up to 7 configurations can be created and each configuration can be applied to a day of the week. Different configurations cannot be applied to the same day

© BeePlanet Factory 2026

of the week.

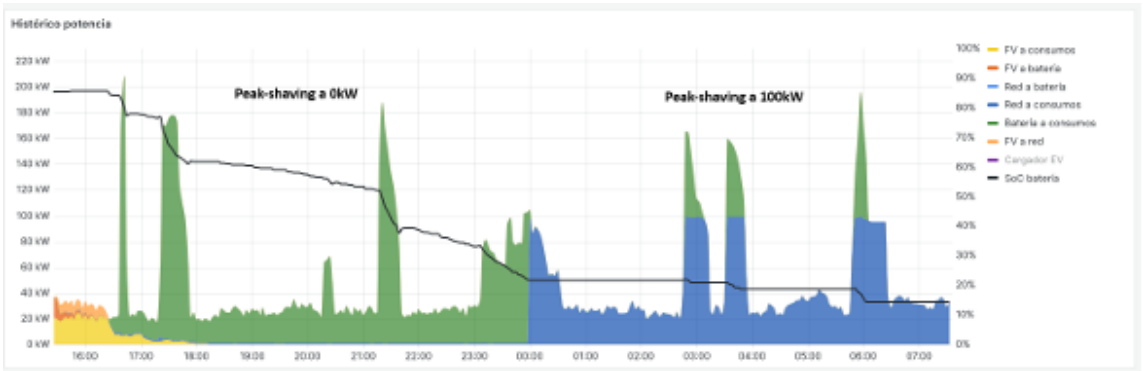


In each configuration, up to 6 periods can be programmed, and in each period the following strategies can be configured. In addition, in all modes the BHive will by default charge the battery if there are surpluses in the installation and will discharge the battery if the installation's maximum consumption is exceeded.

2.1. Peak-shaving

During this mode, the battery discharges so that grid consumption does not exceed the maximum consumption configured for that period.

Example: in the following image, the BHive has worked with peak-shaving at 0 kW until 00:00. The battery discharges to cover all consumption. From 00:00, the BHive works with peak-shaving at 100 kW, so the battery supplies power to cover all consumption exceeding 100 kW.



During this mode, if there are surpluses in the installation, the battery charges with these surpluses. In addition, for safety, the battery will always discharge if consumption exceeds the installation's maximum power.

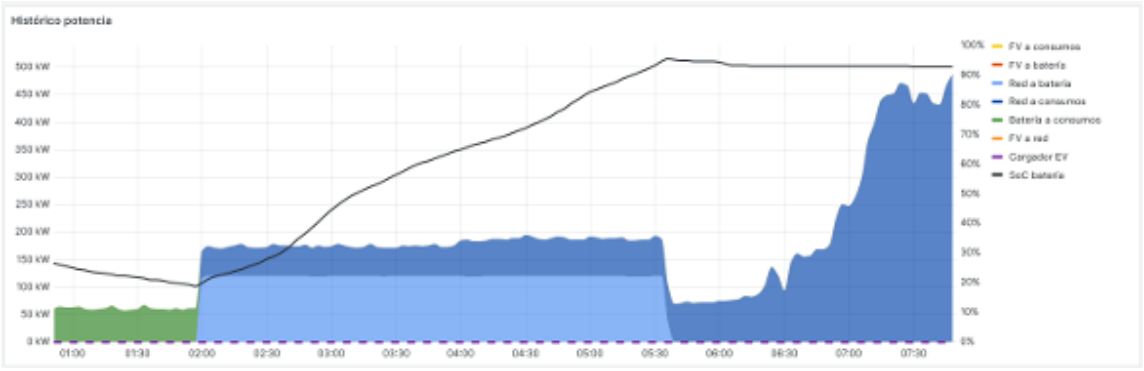
2.2. Grid charge

During this mode, the battery charges at a minimum power specified in the charge power parameter until the battery reaches the maximum SoC of 95% or another period begins. The battery's charge power is reduced if the installation's total consumption is about to exceed the maximum power. In addition, the charge power increases if there are surpluses in the installation.

Example: a battery charge from the grid at 120 kW is programmed during night-time

© BeePlanet Factory 2026

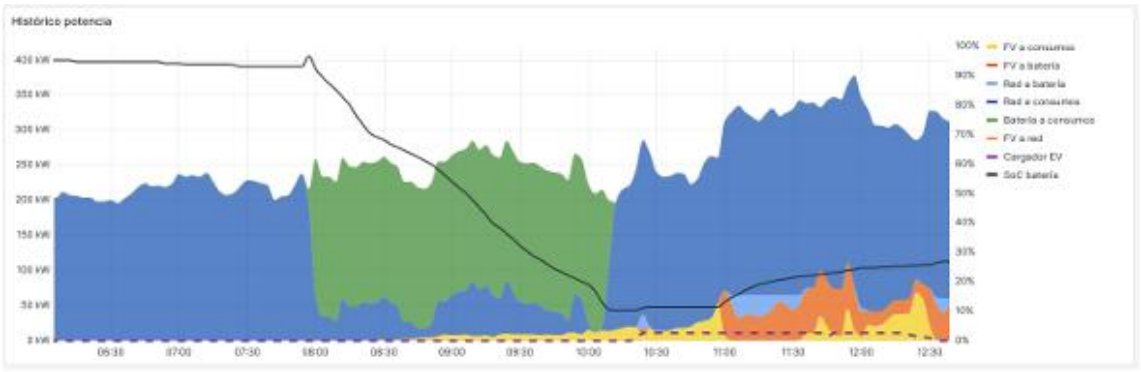
hours when energy is cheaper.



2.3. Discharge

The battery discharges at a configured power; if the grid injection limit is exceeded, the discharge power is reduced. If the injection limit continues to be exceeded, the battery is charged with the surplus.

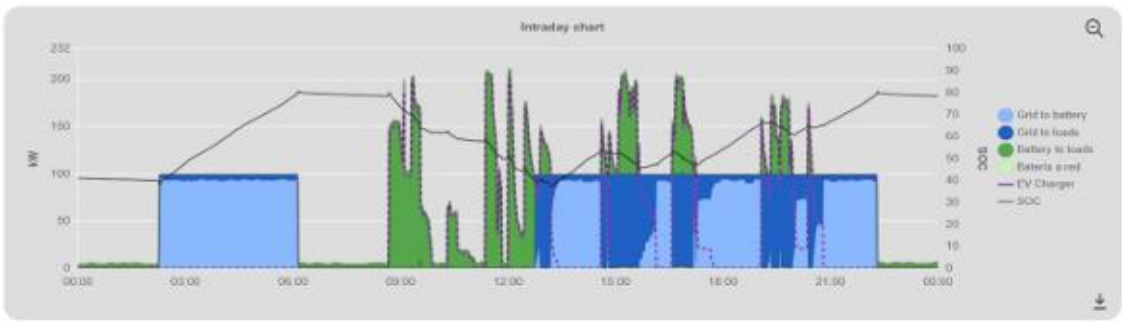
Example: a battery discharge at a constant power of 200 kW is programmed.



2.4. Peak-shaving and charge

The battery works in peak-shaving mode or in charge mode depending on its SoC. This is useful in charging-point installations where it is desirable for all consumption to be covered by the battery's energy, but a minimum SoC level is required to ensure availability.

Example: a night-time charge and peak-shaving at 0 during the day are programmed, on condition that it charges when the SoC drops below 40%:



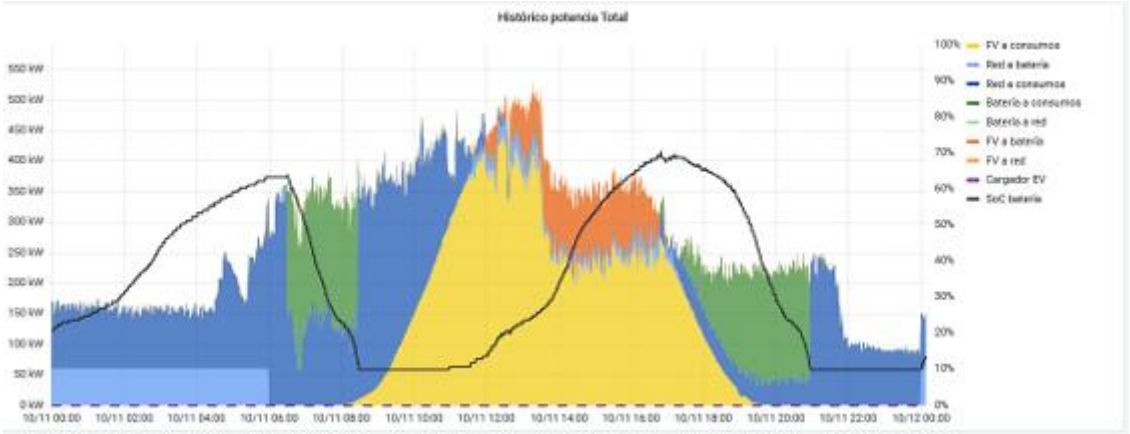
2.5. Configuration example

Using the time-based strategy scheduling, the following energy management strategies can be configured, as they were done in the following plant:

- 00:00 – 06:00: Battery charge from the grid at 60kW

© BeePlanet Factory 2026

- 06:30 – 09:00: Battery discharge at 200kW
- 09:00 – 17:00: Battery charges with surpluses
- 17:00 – 00:00: Battery discharge for peak-shaving at 30kW.



EXTERNAL CONTROL

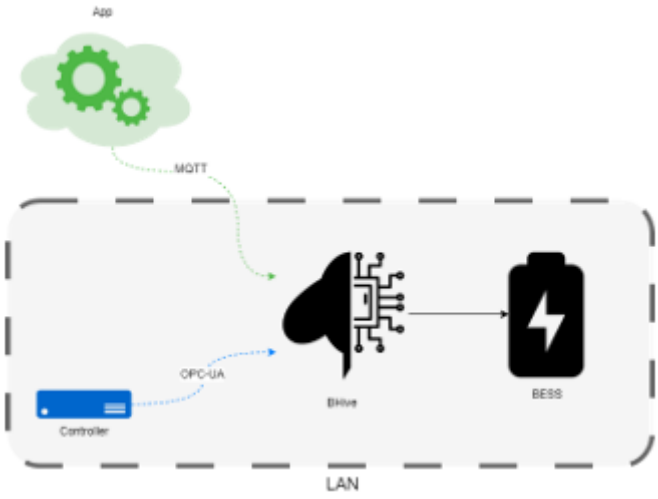
You can connect to BHive from an external application to monitor the plant's status or to control the strategies applied by BHive. The BHive controls the plant's devices and shares the plant telemetry with the external control. In turn, the external control can control the modes and strategies applied by the BHive in real time.

In external control mode, the BHive acts according to the strategy set externally. The possible strategies are the same as those available in automatic mode, but the change frequency depends on the third-party application.

1. Connection

The BHive's external connections can be divided into two groups:

- **Local connection**: within the BHive's LAN, a device can connect to a BHive using the OPC-UA protocol. For a detailed description of the connection to the OPC-UA server, see the document "BHive OPC-UA connection guide".
- **Remote connection**: through a connection to the BeePlanet cloud, you can connect to a BHive using the MQTT protocol. For a detailed description of control via MQTT, see the document "BHive MQTT connection guide".



© BeePlanet Factory 2026

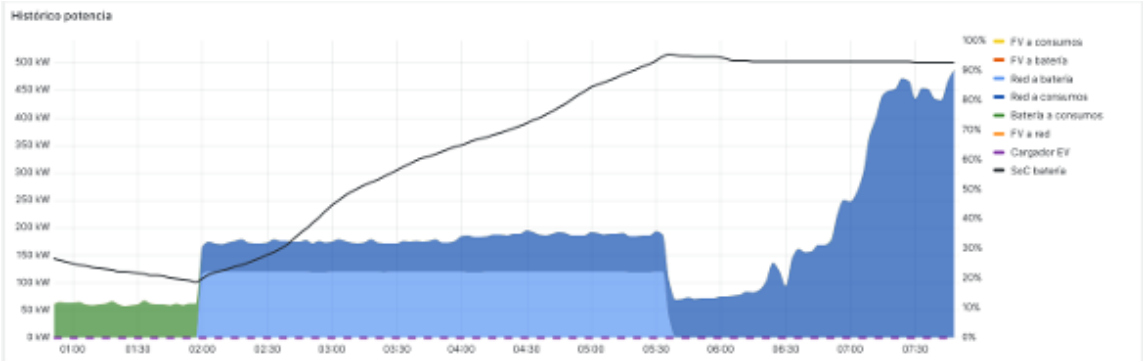
2. Strategies

Through external control, a control center or an application can control the strategy applied by BHive. In addition to the strategies defined in the section "Automatic mode", in remote control mode the following strategies are available:

2.1. Grid charge only

During this mode, the battery charges at a power specified in the charge power parameter until the battery reaches the maximum SoC of 95% or another period begins. The battery's charge power is reduced if the installation's total consumption is about to exceed the maximum power. The charge power does not increase if there are surpluses in the installation.

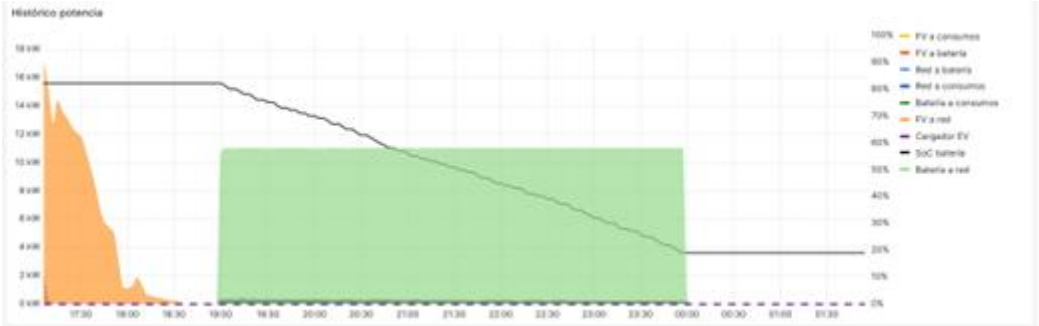
Example: a battery charge from the grid at 120 kW is programmed during night-time hours when energy is cheaper.



2.2. Grid injection

During this mode, the battery discharges to try to hold the configured injection value; if this value is exceeded, the battery stops discharging, but if the injection exceeds the maximum injection value, the battery is charged with the remaining power.

In addition, the discharge of power increases if the installation's total consumption exceeds the maximum of the supply connection.



WEB PLATFORM

BeePlanet has a web platform for monitoring and configuring the storage systems that have a BHive. This website is available at the following link:

https://bhive.beeplanetfactory.com

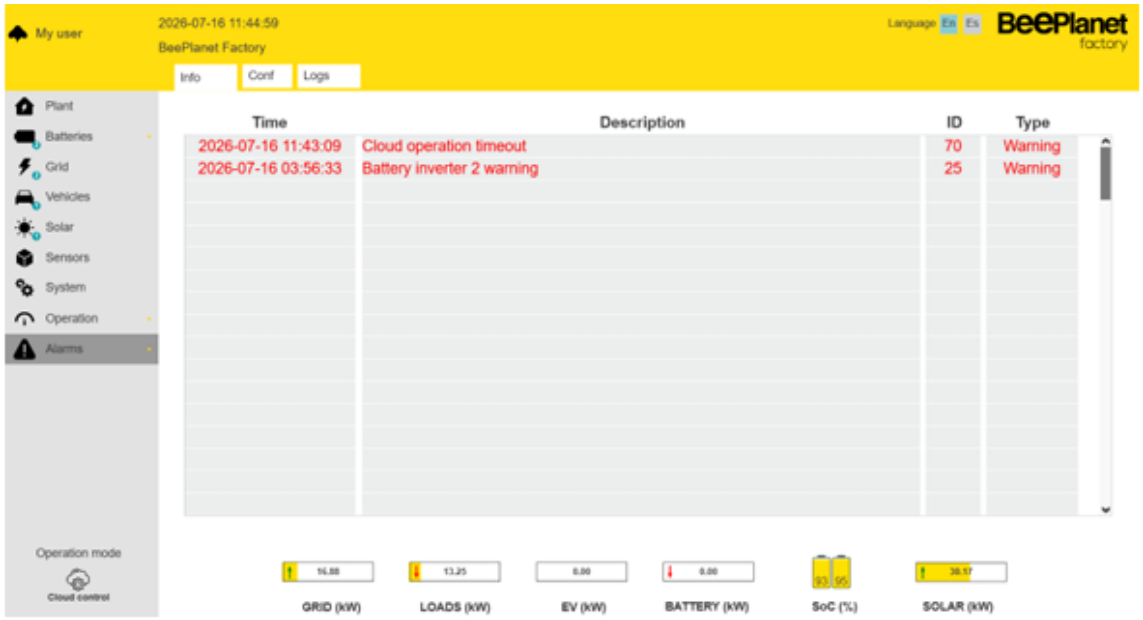
© BeePlanet Factory 2026



ALARMS AND EVENTS

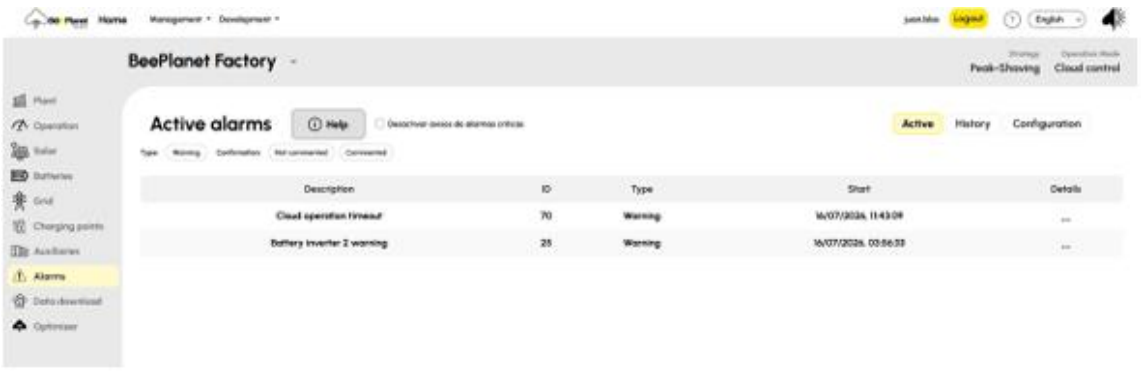
The alarms and events of any element of the plant monitored by the BHive are shown both in the local web interface (HMI) and on the web platform, as well as on the OPC-UA server.

In the local web interface, alarms and events can be viewed in the Alarms section. All the alarms programmed in the BHive are recorded here, with the date and time of occurrence, the alarm description, the alarm ID and the alarm type.



The BHive web platform also displays the alarms and events recorded by BHive in the Alarms section.

© BeePlanet Factory 2026



The BHive alarms can also be consulted through the OPC-UA server; for more information, see the document "BHive OPCUA connection guide".

1. Response to faults



WARNING: The equipment is designed to prevent hazards arising from possible faults. However, BeePlanet Factory® cannot guarantee absolute safety in the handling or use of the equipment.



WARNING: Compliance with all applicable safety legislation for electrical work is mandatory. Responsibility for ensuring this lies with the authorized maintenance personnel.

Faults may occur in the following systems of the storage plant:

- **BMS**: Battery Management System, the system that monitors and controls the correct operation of the battery.
- **ESS**: Energy Storage System, the energy storage system made up of the battery and the battery inverter.
- **PV**: Photovoltaic system, the system made up of the installation's photovoltaic inverters. Communication is normally centralised in an aggregator device (datalogger, smartlogger, etc.).
- **Grid**: energy meter or meters at the grid connection point.
- **Loads**: meters of the energy consumed in the installation.
- **EV**: Electric Vehicle, electric vehicle charging stations connected in the installation.
- **Auxiliary systems**: auxiliary systems of the storage system such as HVAC, fire system, gas sensors or other sensors.

{id} indicates the number of the device where the alarm occurred Personnel:

- **(O) Operator**: The specified work may be carried out by the battery operator.
- **(E) Authorized electrician**: The specified work may only be carried out by an authorized electrician.
- **(B) BeePlanet**: The specified work may only be carried out by BeePlanet Factory personnel.

Event type:

- **Critical**: a fault that must be reviewed immediately because it affects the safety

© BeePlanet Factory 2026

of the plant.

- **Alarm**: a fault that may affect the normal operation of the plant.
- **Warning**: a fault that does not affect the normal operation of the plant but should be reviewed.

ID	Event	Recommended action	Type	Pers.
1	Grid meter [id] communication error	Check the Ethernet connection between grid meter [id] and the BHive	Alarm	E
2	Grid meter [id] anti-injection tripped	Check the anti-injection system parameters	Alarm	O
3	Grid meter [id] measurements out of range	Check the installation of grid meter [id]	Warning	E
4	BMS [id] communication error	Check the Ethernet connection between BMS [id] and the BHive	Alarm	E
5	BMS [id] disconnected	Check the status and errors of the BMS	Warning	E
6	BMS [id] cell overvoltage	To be reviewed by BeePlanet personnel	Alarm	B
7	BMS [id] cell undervoltage	To be reviewed by BeePlanet personnel	Alarm	B
8	BMS [id] cell overtemperature	To be reviewed by BeePlanet personnel	Alarm	B
9	BMS [id] cell under temperature	To be reviewed by BeePlanet personnel	Alarm	B
10	BMS [id] overcurrent	To be reviewed by BeePlanet personnel	Alarm	B
11	BMS [id] CMU connection failed	To be reviewed by BeePlanet personnel	Alarm	B
12	BMS [id] hall sensor failure	To be reviewed by BeePlanet personnel	Alarm	B
13	BMS [id] short-circuit detected	To be reviewed by BeePlanet personnel	Alarm	B
14	BMS [id] contactor malfunction	To be reviewed by BeePlanet personnel	Alarm	B
15	BMS [id] heartbeat timeout	To be reviewed by BeePlanet personnel	Alarm	B
16	BMS [id] overload limit	To be reviewed by BeePlanet personnel	Alarm	B
17	BMS [id] power electronics error	To be reviewed by BeePlanet personnel	Alarm	B

© BeePlanet Factory 2026

18	BMS [id] power supply error	To be reviewed by BeePlanet personnel	Alarm	B
19	BMS [id] emergency button active	To be reviewed by BeePlanet personnel	Alarm	B
20	BMS [id] IC internal	To be reviewed by BeePlanet personnel	Alarm	B
21	BMS [id] hall timeout	To be reviewed by BeePlanet personnel	Alarm	B
22	BMS [id] voltage mismatch	To be reviewed by BeePlanet personnel	Alarm	B
23	Battery inverter [id] communication error	Check the Ethernet connection between storage inverter [id] and the BHive	Alarm	O
24	Battery inverter [id] error	Check storage inverter [id] for more information about the error	Alarm	E
25	Battery inverter [id] warning	Check storage inverter [id] for more information about the error	Warning	-
26	Battery inverter [id] AC disconnected	Check the AC protections of storage inverter [id]	Alarm	E
27	Battery inverter [id] ground fault	Check the inverter installation	Alarm	E
28	Battery inverter [id] DC over voltage	To be reviewed by BeePlanet personnel	Alarm	B
29	Battery inverter [id] DC disconnect	To be reviewed by BeePlanet personnel	Alarm	B
30	Battery inverter [id] cabinet open	Check the inverter installation	Alarm	E
31	Battery inverter [id] manual shutdown	Check the inverter installation	Alarm	E
32	Battery inverter [id] AC limits	Check the inverter installation	Alarm	E
33	Battery inverter [id] temperature limits	Check the inverter installation or the inverter's fans and filters	Warning	E
34	Loads meter [id] communication error	Check the Ethernet connection between loads meter [id] and the BHive	Warning	O
35	Loads meter [id] measurements out of range	Check the installation of grid meter [id]	Warning	E
36	EV charger [id] communication error	Check the Ethernet connection between EV charger [id] and the BHive	Warning	O

© BeePlanet Factory 2026

37	EV charger [id] error	Check the charger status for more information	Warning	O
38	EV charger [id] consumption limit	Check the EV charger limit configuration	Warning	O
39	PV [id] communication error	Check the Ethernet connection between photovoltaic system [id] and the BHive	Warning	O
40	PV [id] error	Check the photovoltaic system for more information	Warning	O
41	Clima [id] communication error	Check the Ethernet connection between the HVAC unit and the BHive	Alarm	E
42	Clima [id] alarm	Check the HVAC unit status for more information	Alarm	E
43	Chiller [id] communication error	Check the Ethernet connection between the liquid cooling system and the BHive	Alarm	O
44	Chiller [id] alarm	Check the status of the liquid cooling system for more information	Alarm	E
45	Insulation meter [id] communication	Check the Ethernet connection between the insulation monitor and the BHive	Warning	O
46	Insultation meter [id] alarm	To be reviewed by BeePlanet personnel	Warning	B
47	Open door in container [id]	Check the power door of the storage container or the status of the open-door sensor	Warning	E
48	Overvoltage protection in container [id]	Check the surge protection of container [id]	Warning	E
49	Fire system: fire detected in container [id]	To be reviewed by BeePlanet personnel	Critical	B
50	Fire system: extinction activated in container [id]	To be reviewed by BeePlanet personnel	Critical	B
51	Fire system: failure in container [id]	Check the status of the container, the batteries, the fire control panel and the fire sensors	Alarm	E
52	Fire system: preactive in container [id]	To be reviewed by BeePlanet personnel	Critical	B

© BeePlanet Factory 2026

53	Fire system: not in auto in container [id]	Check that the operating mode of the fire control panel is set to Automatic	Warning	E
54	Fire system: disabled in container [id]	Check that the operating mode of the fire control panel is set to Automatic	Warning	E
55	UPS error in container [id]	Check the status of the UPS in container [id]	Warning	E
56	Gas detector alarm high in container [id]	To be reviewed by BeePlanet personnel	Critical	B
57	Gas detector alarm low in container [id]	To be reviewed by BeePlanet personnel	Alarm	B
58	Gas detector fault in container [id]	Check the connection of hydrogen sensor [id] to the BHive	Alarm	E
59	Gas detector [id]: sensor error	Check the connection of hydrogen sensor [id] to the BHive	Alarm	E
60	Gas detector [id]: sensor alarm	To be reviewed by BeePlanet personnel	Critical	B
61	Gas detector [id]: high concentration	To be reviewed by BeePlanet personnel	Critical	B
62	Gas detector [id]: calibration expired	Check the connection of hydrogen sensor [id] to the BHive	Alarm	E
63	Gas detector [id]: low sensibility	Check the connection of hydrogen sensor [id] to the BHive	Alarm	E
64	Gas detector [id]: change sensor	Check the connection of hydrogen sensor [id] to the BHive	Alarm	E
65	Gas detector [id]: modbus error	Check the connection of hydrogen sensor [id] to the BHive	Alarm	E
66	Axioline module error	Check the status and power supply of the Profinet input/output/RS485 modules	Alarm	E
67	Profinet module error in container [id]	Check the status and power supply of the Profinet communication modules	Alarm	E
68	Operation mode OFF	Check the operating mode configured in the BHive	Warning	O
69	Schedule configuration error	Check the period-based strategy configuration in the BHive	Warning	O

© BeePlanet Factory 2026

70	Cloud operation timeout	Check the remote operation commands	Warning	O
71	Cloud operation command error	Check the remote operation commands	Warning	O
72	OPC operation timeout	Check the remote operation commands	Warning	O
73	Cloud communication error	Check the internet connection and the status of the IoT module	Warning	O
74	System storage limit	To be reviewed by BeePlanet personnel	Warning	B
75	System internal error	To be reviewed by BeePlanet personnel	Alarm	B
76	System execution task error	To be reviewed by BeePlanet personnel	Alarm	B
77	System ethernet error	To be reviewed by BeePlanet personnel	Alarm	B

© BeePlanet Factory 2026

ANNEX I: Compatible devices

This section lists the devices compatible with BHive for integration into installations.

1. Storage inverters

Manufacturer	Model	Protocol
Ingeteam	STORAGE 100TL	Modbus TCP
KACO	Blueplanet gridsave 92.0 TL3	Modbus TCP
Sungrow	Powerstack ST225, ST455, ST510 / Power Titan	Modbus TCP (through LC300)

2. Photovoltaic inverters

The connection of the BHive to photovoltaic inverters is intended to monitor photovoltaic production, but in no case to control that production.

Most photovoltaic installations have a system that aggregates the PV production data (smartlogger, datalogger, etc.). For this reason, the BHive normally communicates with aggregators, loggers, etc. and not with the inverters individually.

Manufacturer	Model	Protocol
Ingeteam	Ingecon Sun EMS	Modbus TCP
Fronius	Datamanager 2.0	Modbus TCP
Huawei	Smartlogger 3000A	Modbus TCP
ABB/Fimer	PVS-100/120-TL / PVS-50/60-TL	Modbus TCP
Sungrow	Logger 1000/3000/4000	Modbus TCP
GreenHeiss	GH-I STYLE / GH-IT 2M / GH-IT 20 2M ADVANCED / GH-IT 25-33 3M ADVANCED / GH-IT 40-50 4M ADVANCED / GH-IT 100 9M ADVANCED	Modbus TCP

In addition, PV production can be monitored by installing a meter upstream of the generation point, or the installation's consumption can be monitored by installing a meter upstream of the installation's consumption.

3. Grid meters

Manufacturer	Model	Protocol
Carlo Gavazzi	WM20	Modbus TCP / Modbus RS-485 option with FL ComServer gateway.

© BeePlanet Factory 2026

Renesys	Prisma 310A	Modbus TCP
Lacecal	ITR 2.0	Modbus TCP
Janitza	UMG 604-PRO	Modbus TCP
CHINT	DTSU666 (Requires RS485 modules in the BHive)	Modbus RS-485
Siemens	PAC4200	Modbus TCP

4. Charging points

The integration of charging points into the BHive can serve two functions:

- **Monitoring**: energy, status, alarms, etc.
- **Control**: limiting the charging point according to the power available in the installation, in addition to monitoring it.

Manufacturer	Model	Protocol	Functions
Ingeteam	Rapid, Fusion	Modbus TCP	Control and monitoring
Alpitronic	Hypercharger	Modbus TCP	Control and monitoring
Kempower	Power Unit	Modbus TCP	Control and monitoring
VegaChargers	Aloha Gravity*	Modbus TCP	Control and monitoring

*The VegaChargers Aloha Gravity model has been integrated, but the system is ready to integrate other models from the same manufacturer.

The BHive can also monitor and control charging points via the OPC-UA protocol with a specific development; contact BeePlanet.

5. HVAC

BHive communicates with the following HVAC systems to maintain a correct operating temperature in BeePlanet's containerized solutions.

Manufacturer	Model	Protocol
Panasonic	S-3650PK3E with IntesisBox gateway	Modbus RS-485
AC Precision	CLIMATIX POL 638	Modbus TCP
Envicool	MC50HDNC1A	Modbus RS-485

Polígono Industrial Ipertegui II, 12 Orkoien 31160 – Navarra – España
info@beeplanetfactory.com
+34 948 234 386
www.beeplanetfactory.com