

HUB

Installation Guide



Intuitive IoT gateway

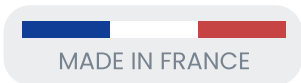


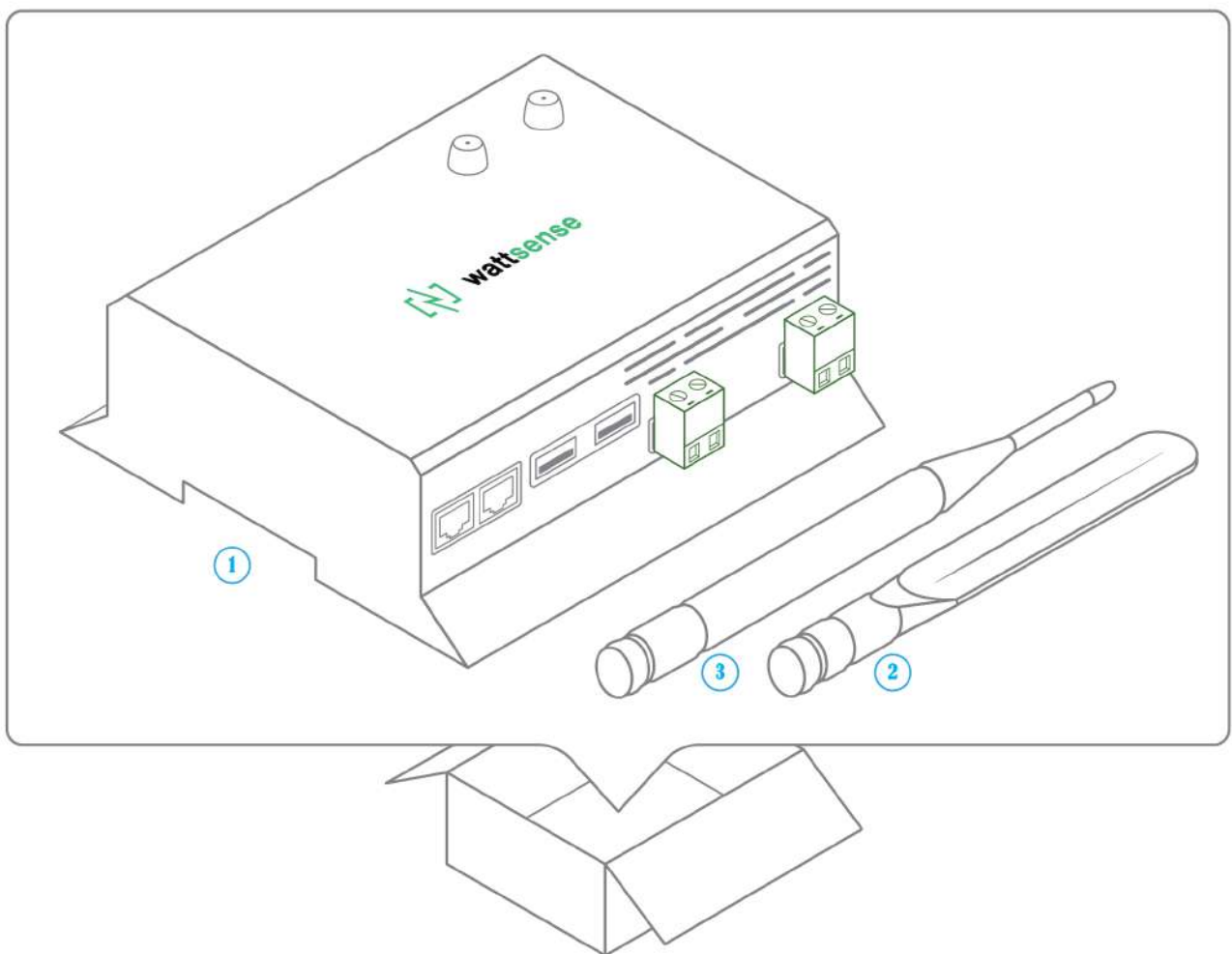
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What do you need before starting?

Provided material

- Hub
 - Dimensions: 160 x 110 x 55 mm
 - Weight: 340 g
- GSM standard antenna
- LoRa standard antenna
- USB to USB micro cable



Required material

- Powerline voltage (100 to 250VAC) to 12-24V DC +/-10%, 2A Max. Power supply
- A cable between the power supply and the Hub: 2 wires (red, black), 22 AWG, minimum section: 0.35 mm²
- Flat screwdriver
- Cutting pliers
- Wire stripper

Optional hardware depending on the type of connection

- Bus connection cable: 2 wires, 24 AWG, minimum section: 0.22 mm² + braid
- Ethernet cables
- Ethernet switch
- Echelon U60 FT DIN USB Gateway (for LON FT10)
- High-gain GSM antenna
- High-gain LoRa antenna
- GSM or LoRa antenna cable
- Double side high-performance adhesive tape
- Technical documentation of equipment
- Technical documentation of IoT sensors
- Schematic of the communication network(s) of the BMS

Hub configuration software

Each customer receives an email titled "Your Hub Is Coming" outlining the instructions for installing the Desktop Application and configuring the Hub.

Step 1 - Download the Java SDK

Step 2 - Install the Desktop application

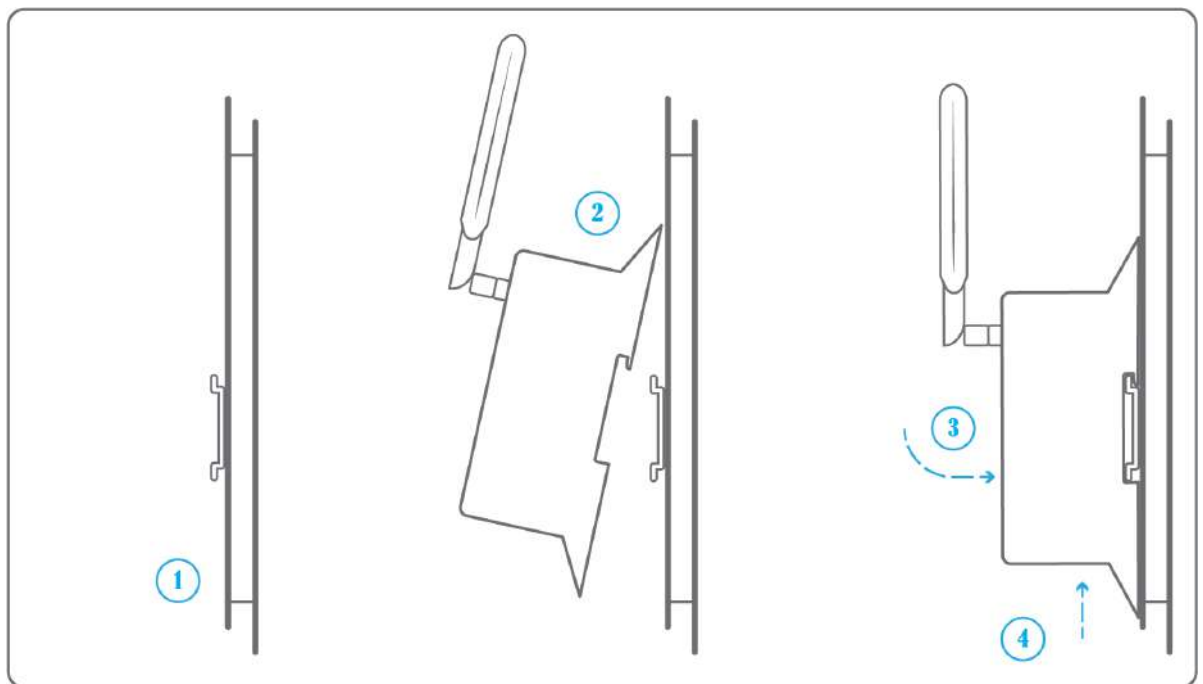
Step 3 - Run the Desktop Application

[Read the Hub Desktop Application guide for more information.](#)

The power supply of the Hub

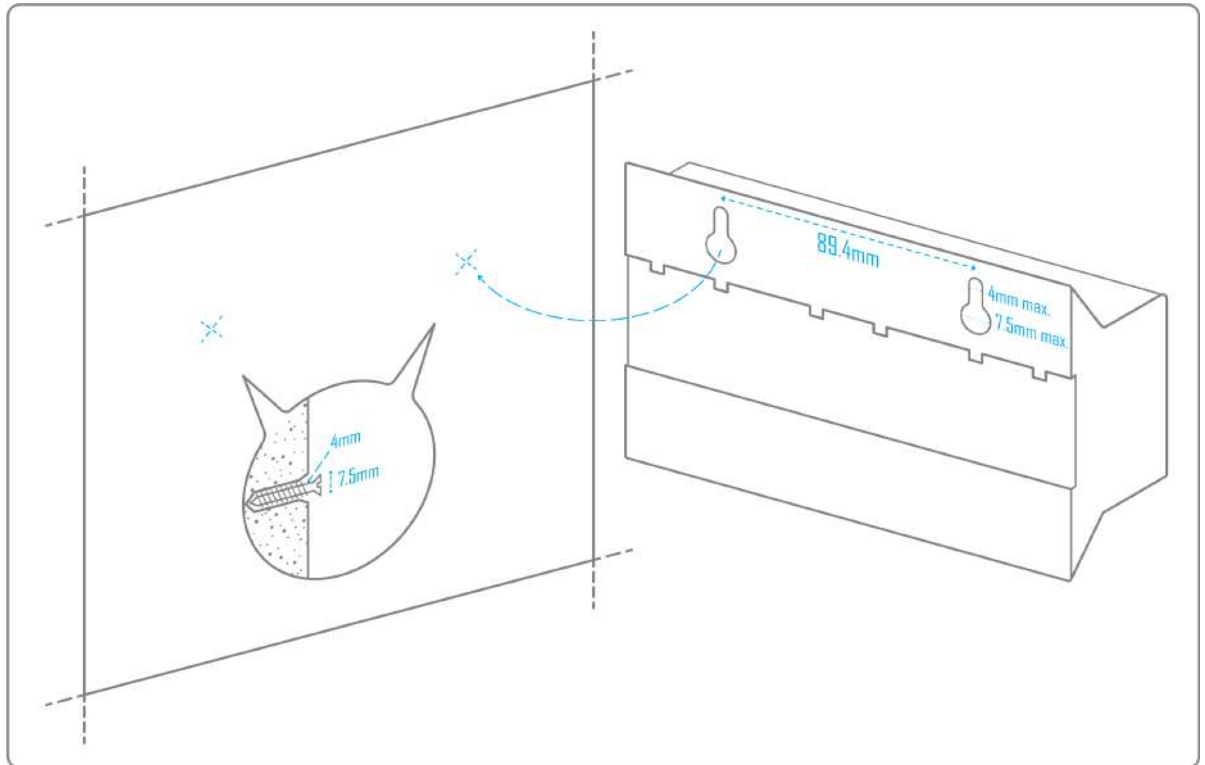
Make sure that the Hub has been activated beforehand on the user console.

- Ideally, place the Hub in an electrical enclosure or cabinet.
- This type of equipment is not suitable for installation in places that can accommodate children.
- Attach the Hub:
 - Mount the Hub on a DIN rail.



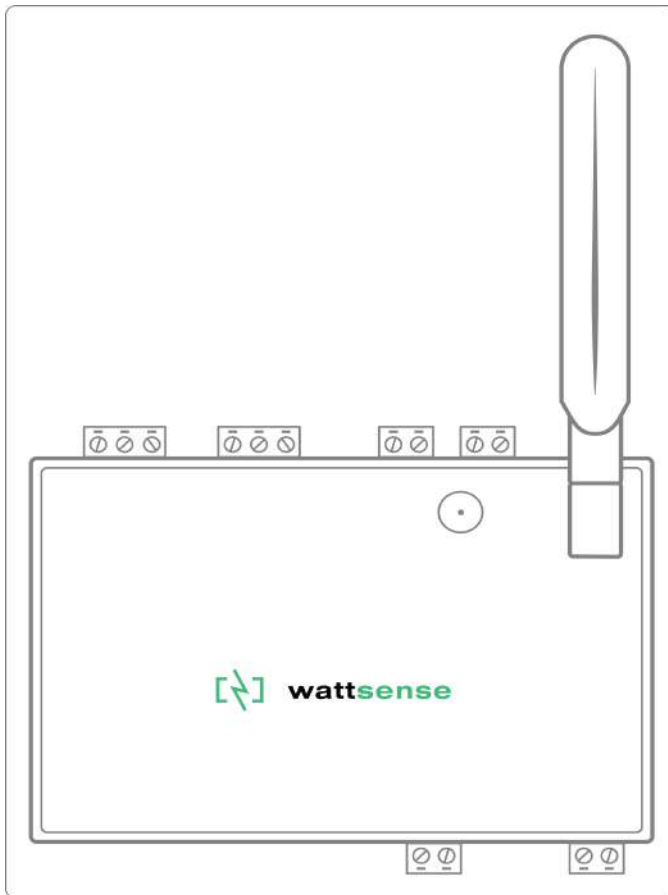
- Or attach two screws to a wall and hook the Hub using the notches on the back of the case: Screws of maximum 4 mm in diameter, with a head of

maximum 7.5 mm diameter, a spacing of 89.4 mm.

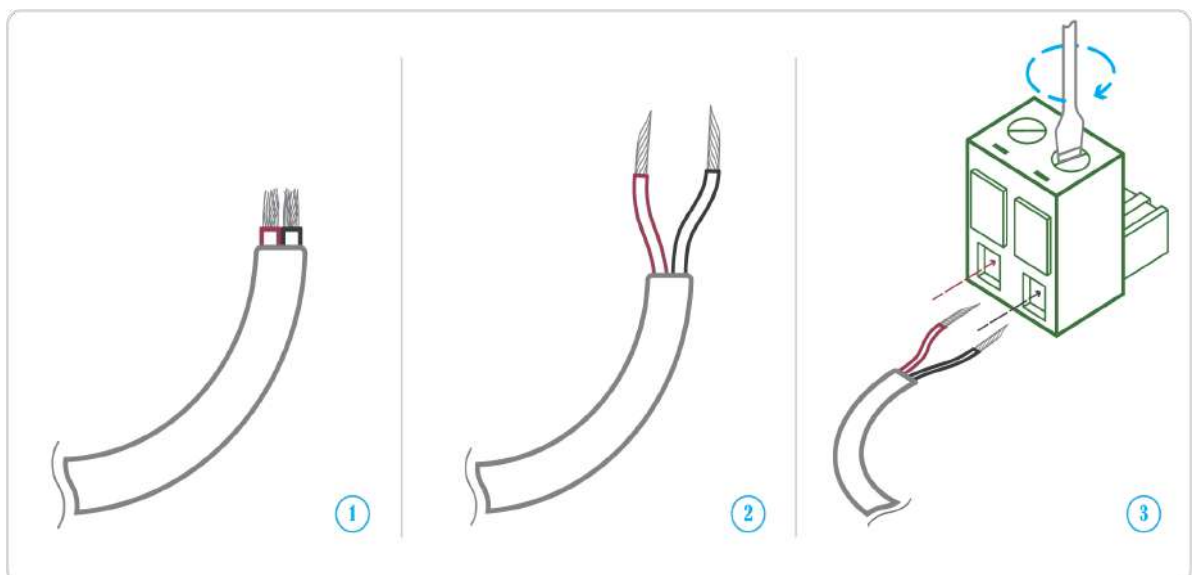


- To avoid any risk of injury caused by the Hub falling, the Hub must not be installed more than 2 meters from the ground.
- Use a DC power supply of 12-24V DC +/-10%, 2A Max.
- Even though the Hub will not connect to the Internet through the GSM network, we advise you to install the original antenna delivered with the Hub so the Wattsense

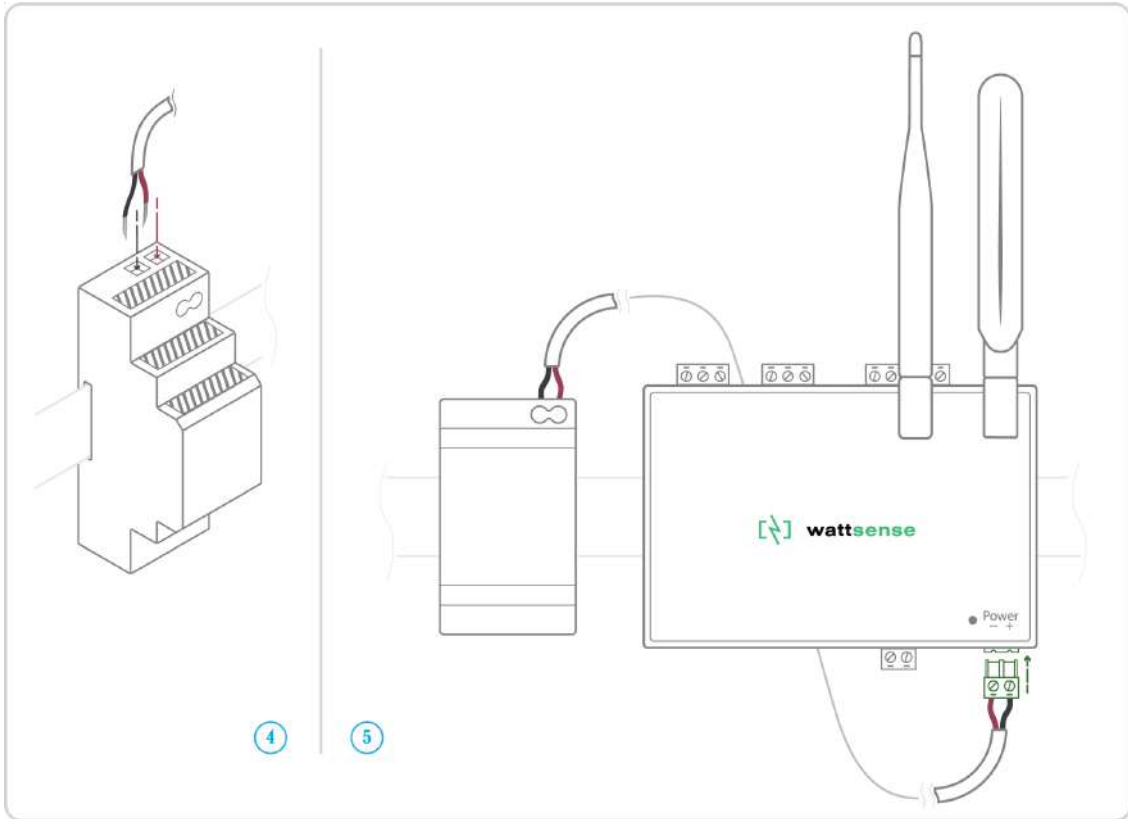
support team can be able to reach your Hub when troubleshooting issues.



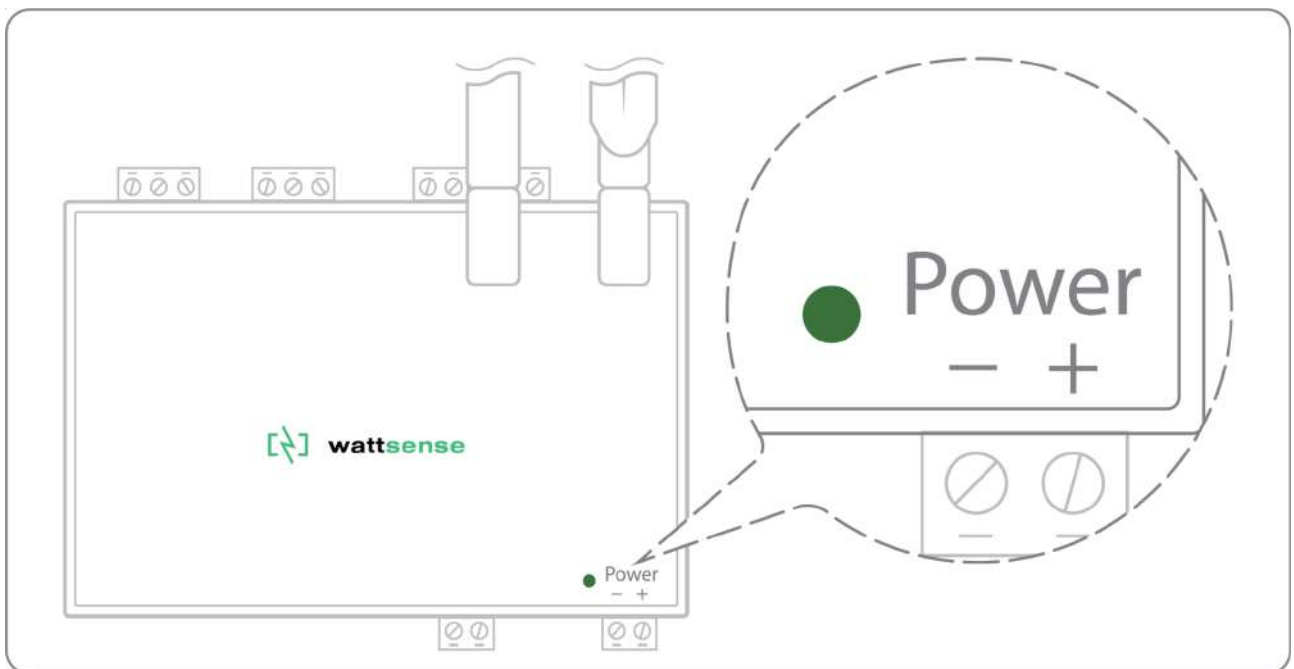
- Screw the cable into the power connector of the Hub.



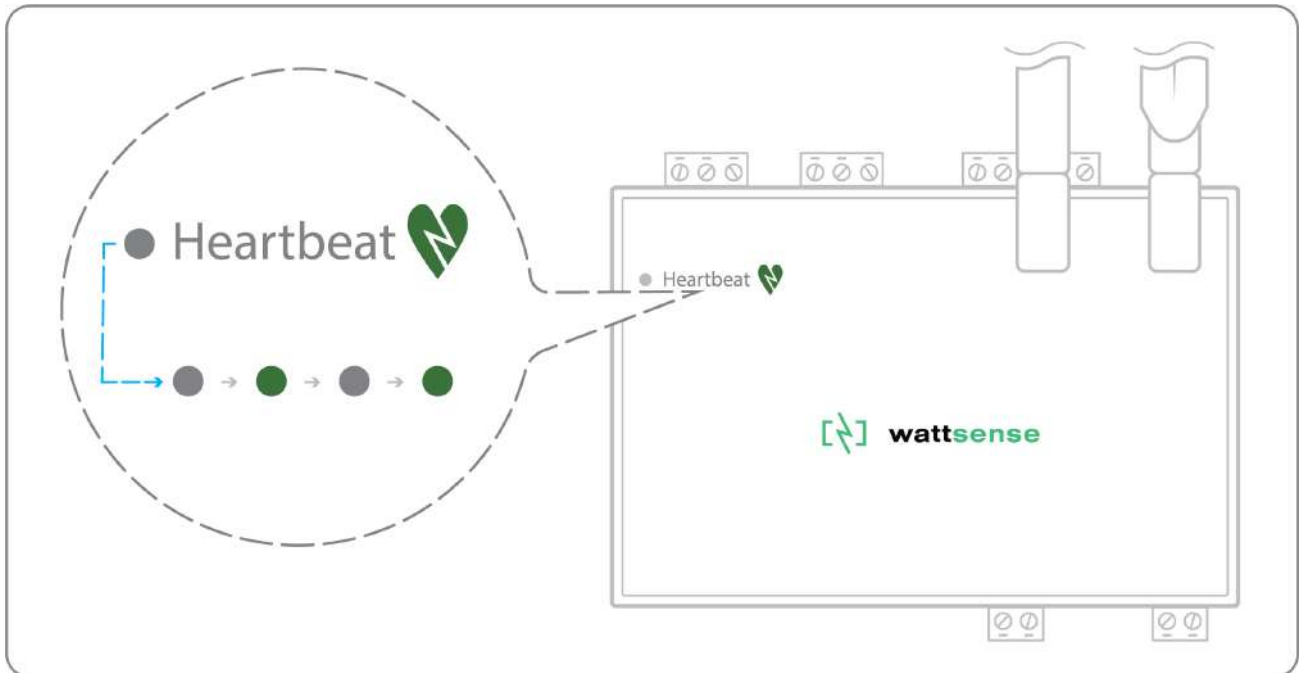
- Connect the cable to the power supply.



- Check that the "Power" LED is lit (steady green light).



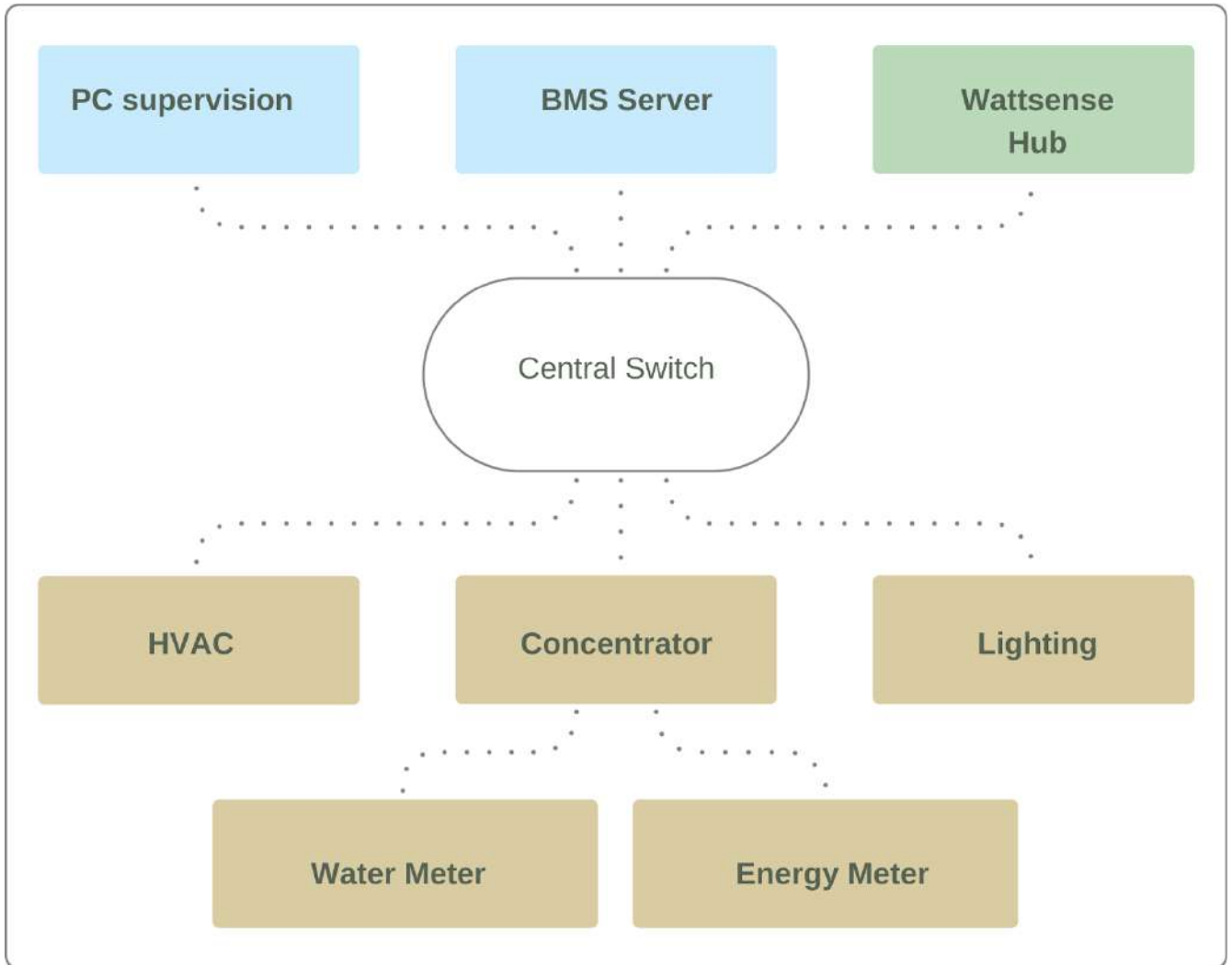
- The Hub is protected against overvoltage, undervoltage, overcurrent from the power supply with indication by LED: green LED when the power supply is compatible, red LED if it is not suitable.
- Wait for ten seconds: the "Heartbeat" LED flashes (green light).



To connect the Hub to the BMS

- Determine the type(s) of network(s) associated with the BMS (communication protocols between the BMS server and the technical equipment).
- Obtain, if possible, the schematic of the communication network(s) of the BMS.

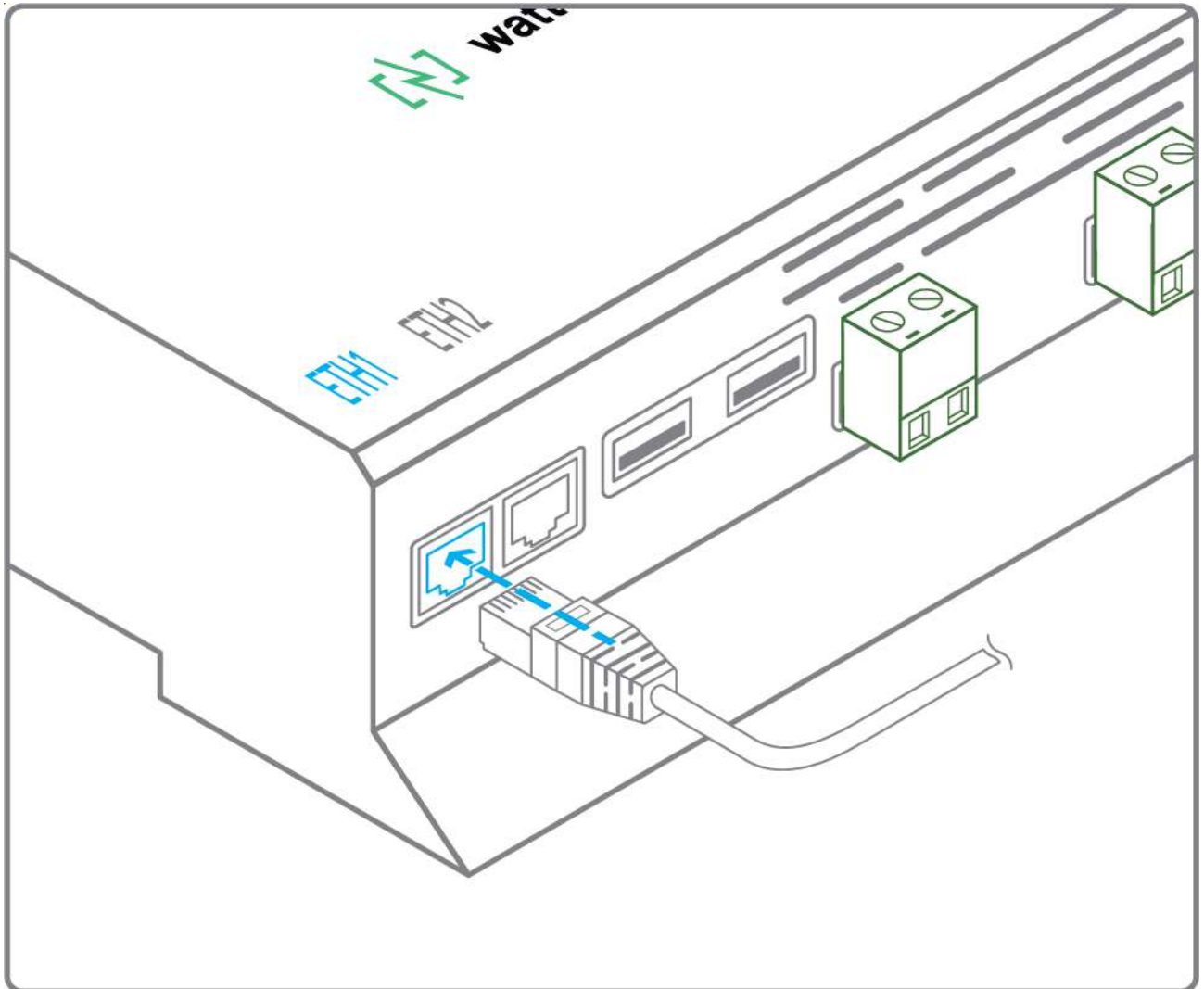
Identify where and how the BMS server connects to the building's network.



In the case of IP network (Except LON)

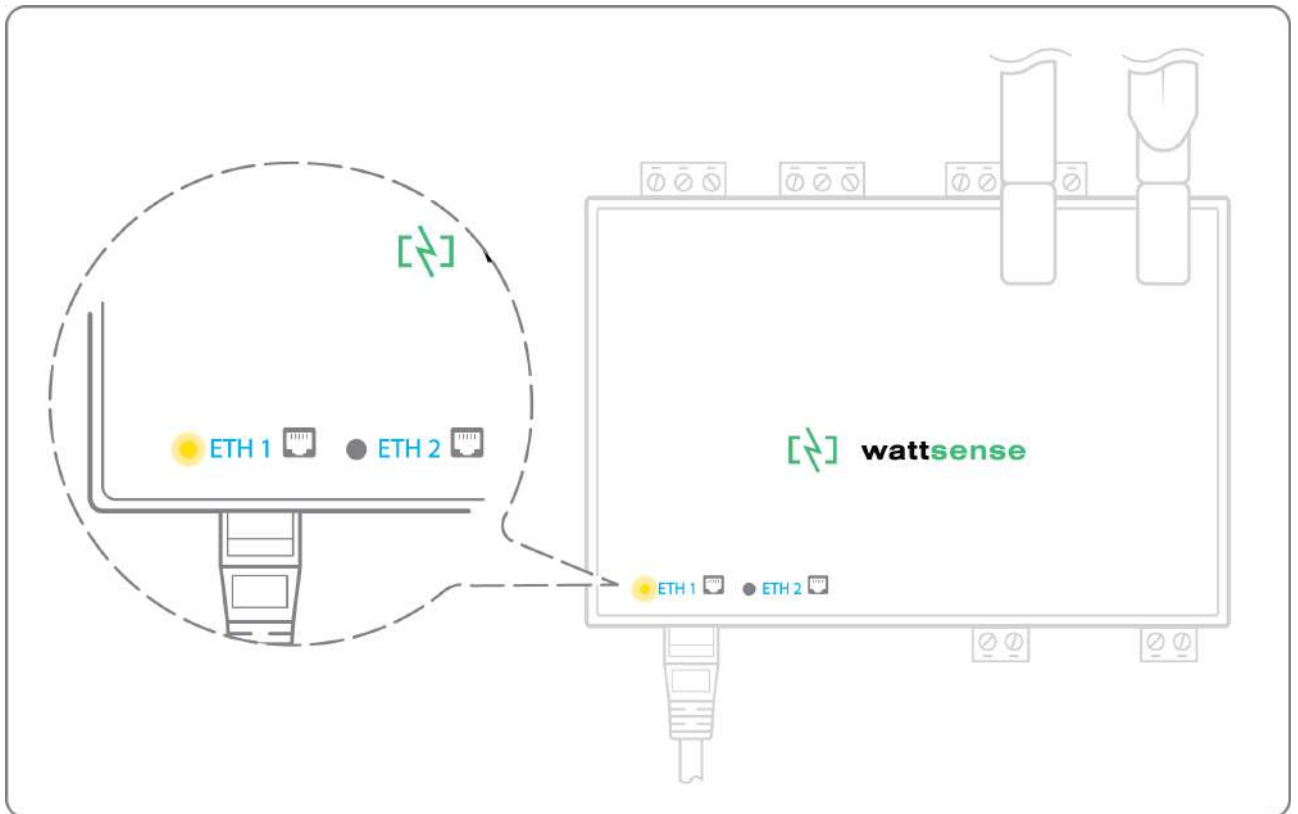
Connection:

- Make sure to have an Ethernet cable
- Connect the cable to the Ethernet port of the Hub ETH1 or ETH2.



- Connect the Hub to the switch (IP network) on which the supervision PC/BMS server is connected.

- Check that the ETH1 or ETH2 LED lights up.



Configuration:

- If there is no DHCP server on the network, attribute a static IP address, its mask, and the gateway, if necessary, to the Hub (Discuss with the building's IT manager).
- If there is a DHCP server on the network, the address is automatically assigned.

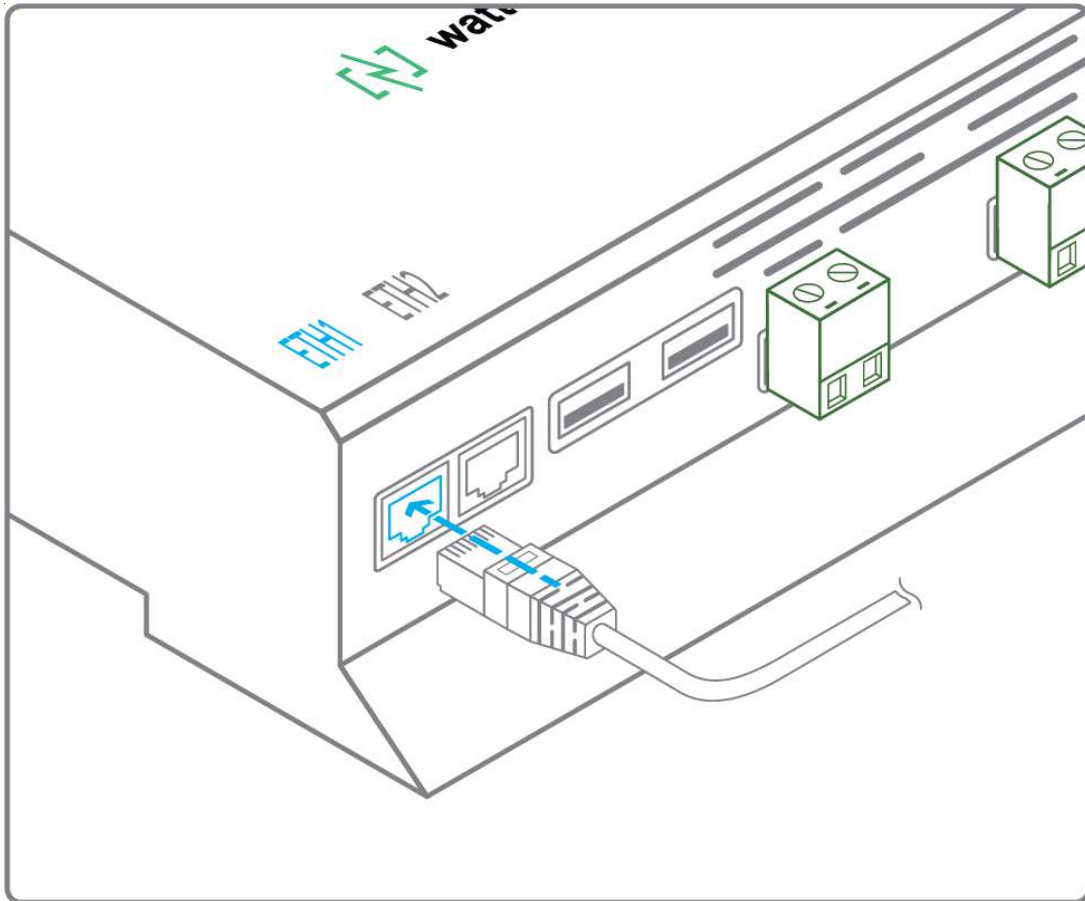
Information to retrieve in preparation for the configuration:

- For each device that communicates in Modbus IP
 - From the BMS software, perform an extract of the available properties: list the data types provided by the different devices to which the BMS has access.
 - If it is impossible to retrieve this information, get the IP address and TCP port (and, if needed, for some devices, the slave address (Slave ID), the brand and model of the equipment, and extra identifying information. This information is necessary for the installation configuration and to retrieve data.
- In the case of a BACnet IP network
 - Write down the BACnet port of the network. This information will be necessary for the installation configuration and to retrieve data.

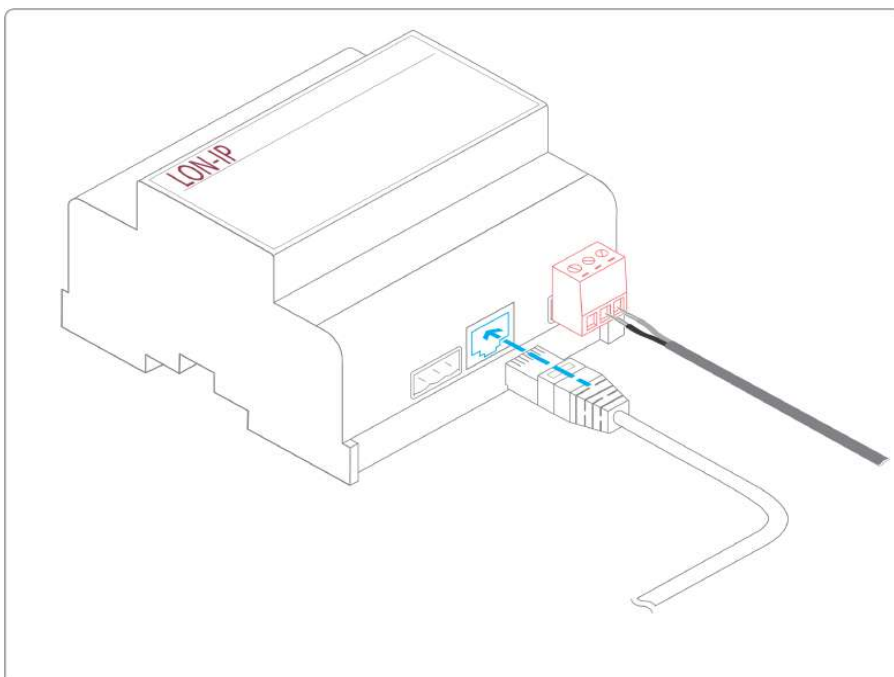
In the case of LON IP-852 network

Connection:

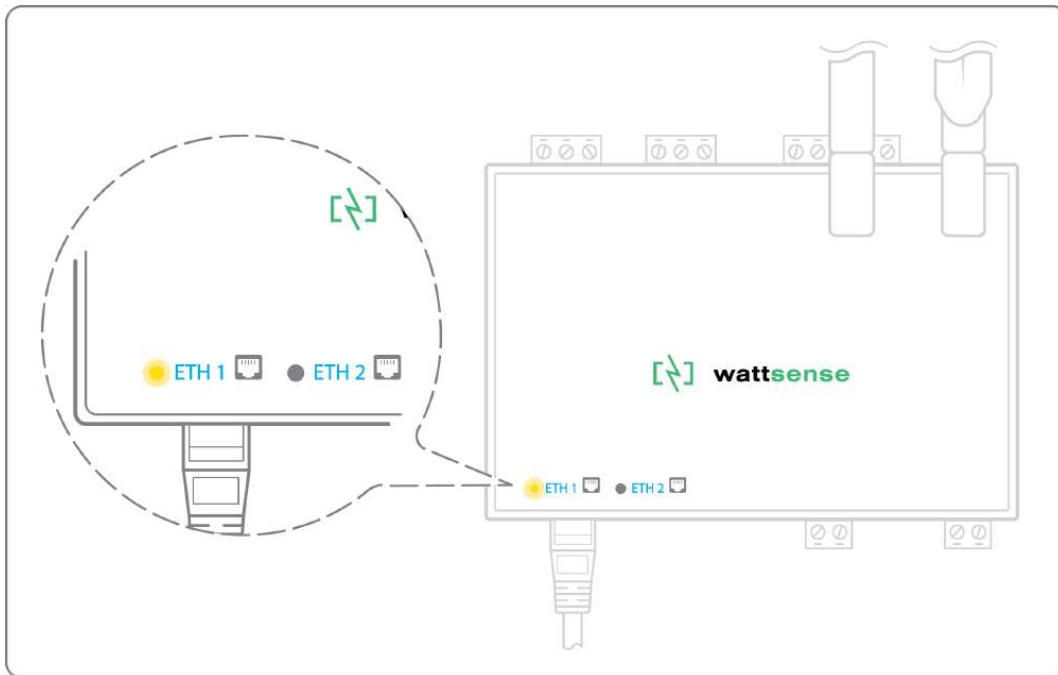
- Make sure to have an Ethernet cable.
- Connect the cable to the Ethernet ports of the Hub ETH1 or ETH2.



- Connect the other end of the cable to the IP-852 server on the LON network.



- Verify that the ETH1 or ETH2 LED lights up



- Register the IP address of the Hub on the IP-852 server of the LON network; the IP-852 server's password is probably required.

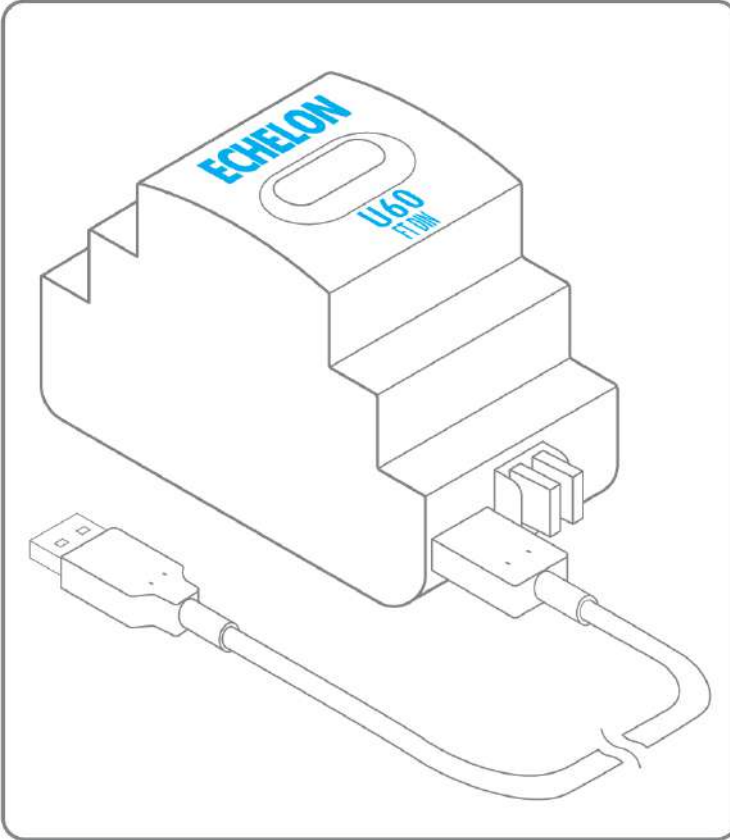
Information to retrieve in preparation for the configuration:

- Write down the Neuron-ID, brand, and model of the equipment and any identifying information. This information will be necessary for the installation configuration and to retrieve data.
- If you have the NL220 software, export the LON database as an archive file or as an NLC file.

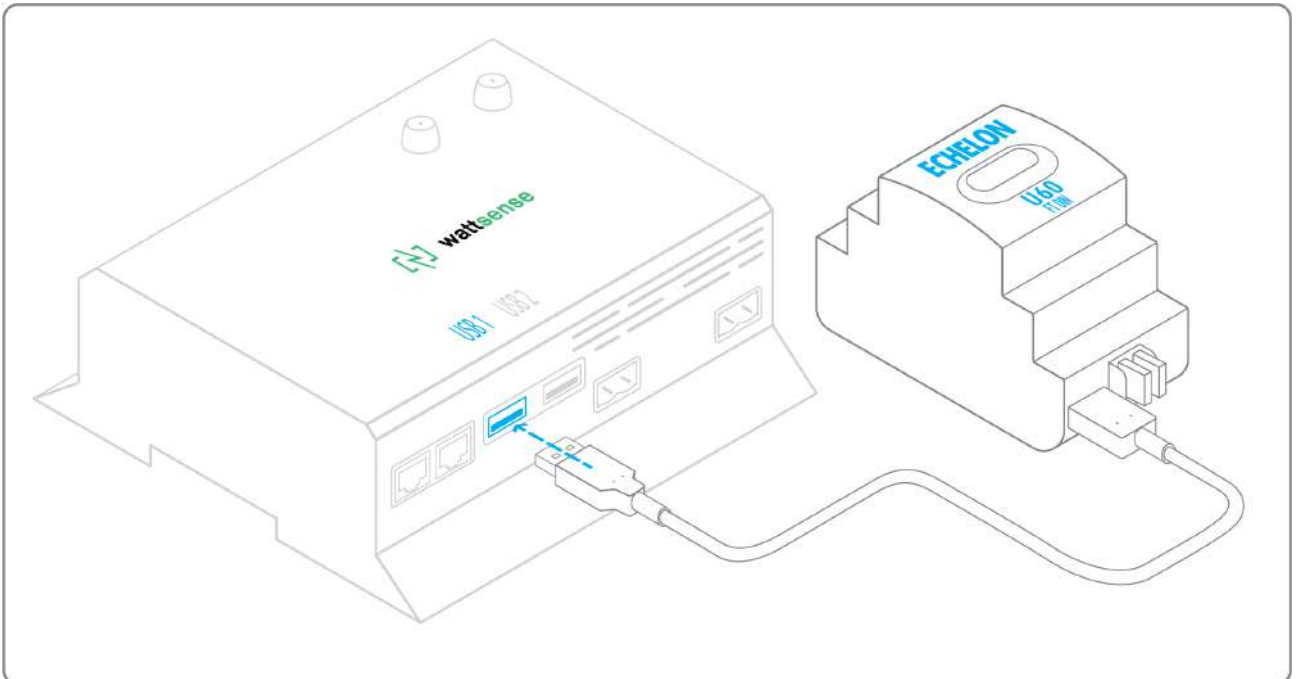
In the case of LON FT10 network

Connection:

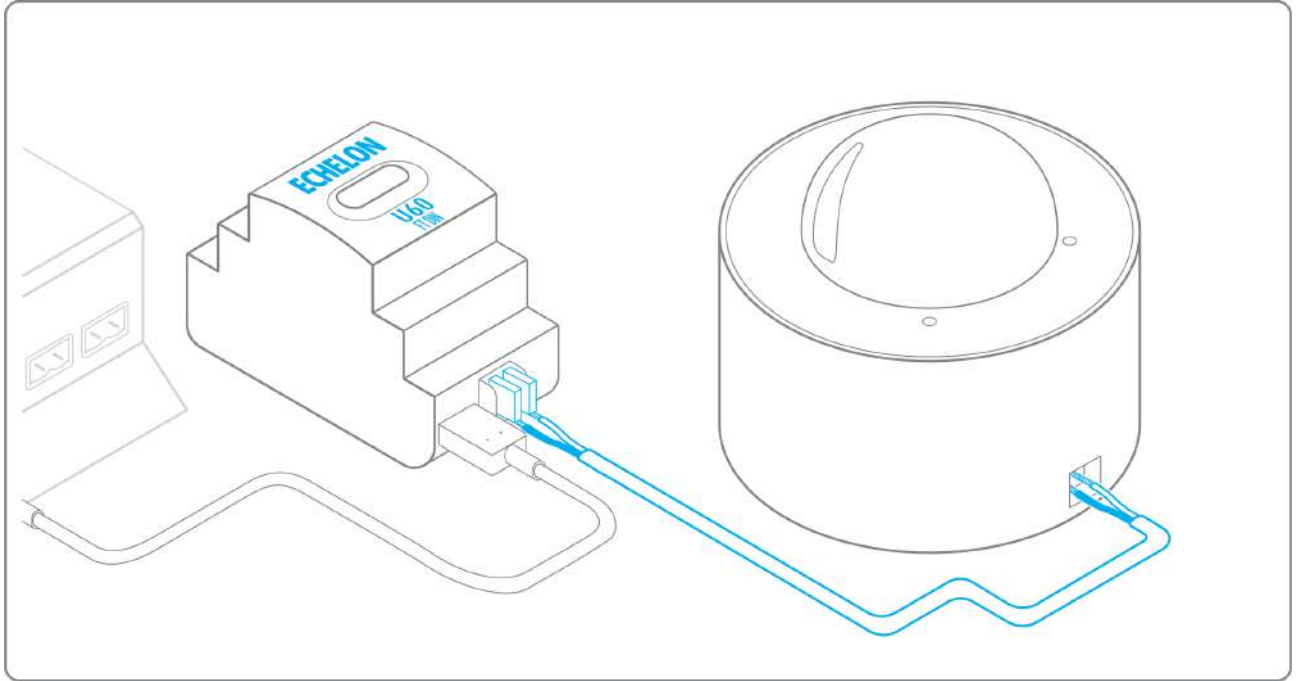
- Make sure to have a USB Echelon U60 FT DIN gateway.



- Connect this gateway to the USB port 1 or 2 of the Hub.



- Connect also this gateway to the LON FT10 network.



Information to get in preparation for the configuration:

- Write down the Neuron-ID, brand, and model of the equipment and any identifying information. This information will be necessary for the installation configuration and to retrieve data.
- If you have the NL220 software, export the LON database as an archive file or as an NLC file.

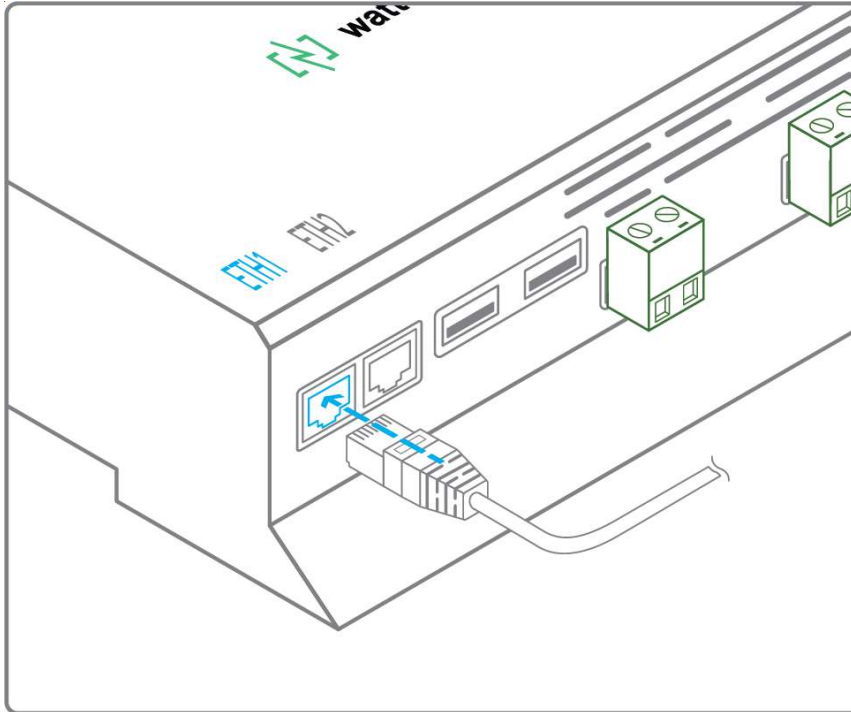
To connect the Hub directly to the technical equipment in the absence of a BMS

- Prepare the list of equipment to be connected and their respective communication protocols.
- Collect the technical documentation of each manufacturer to know where and how to connect to its devices (user console, configuration wizard, manufacturer's site, etc.).
- Draw up an installation schematic.

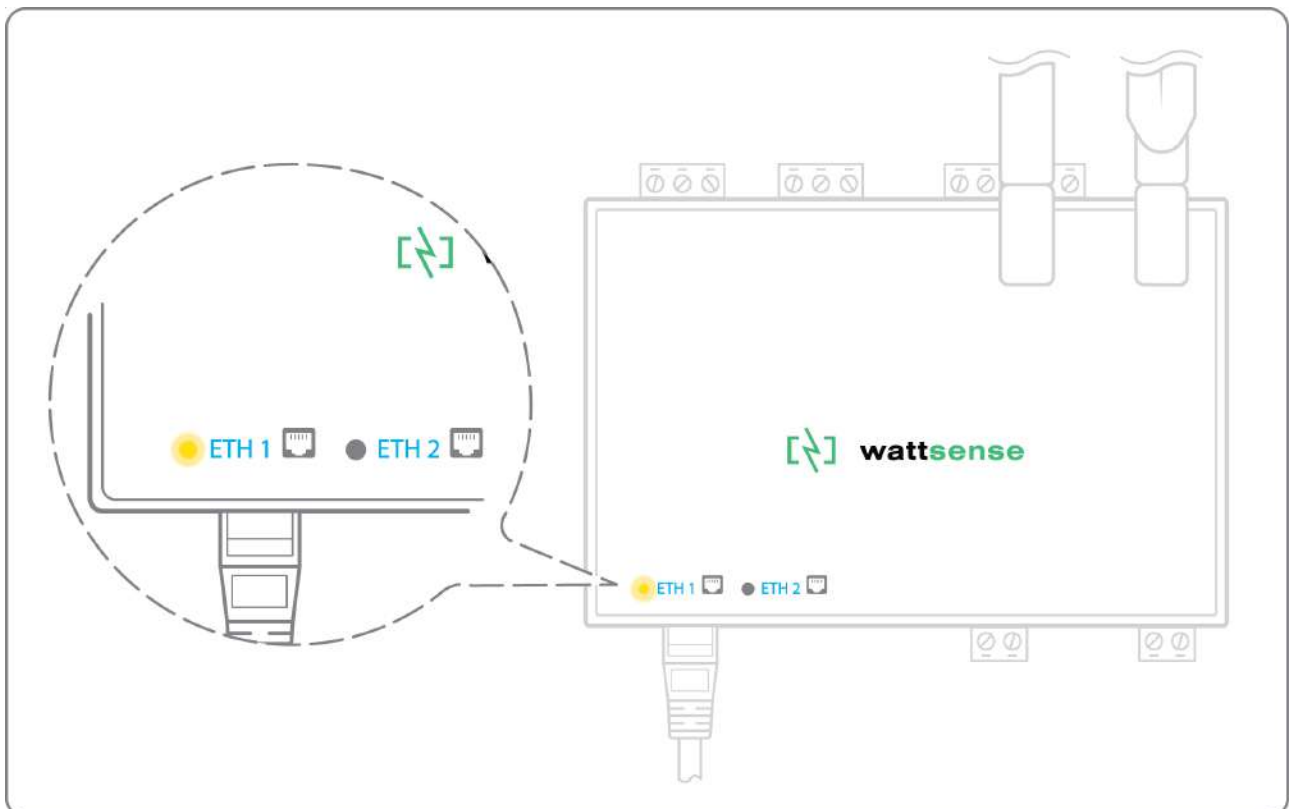
The equipment communicates in Modbus IP

To connect only one equipment:

- Make sure to have an Ethernet cable.
- Connect the cable to the Ethernet port of the Hub ETH1 or ETH2.

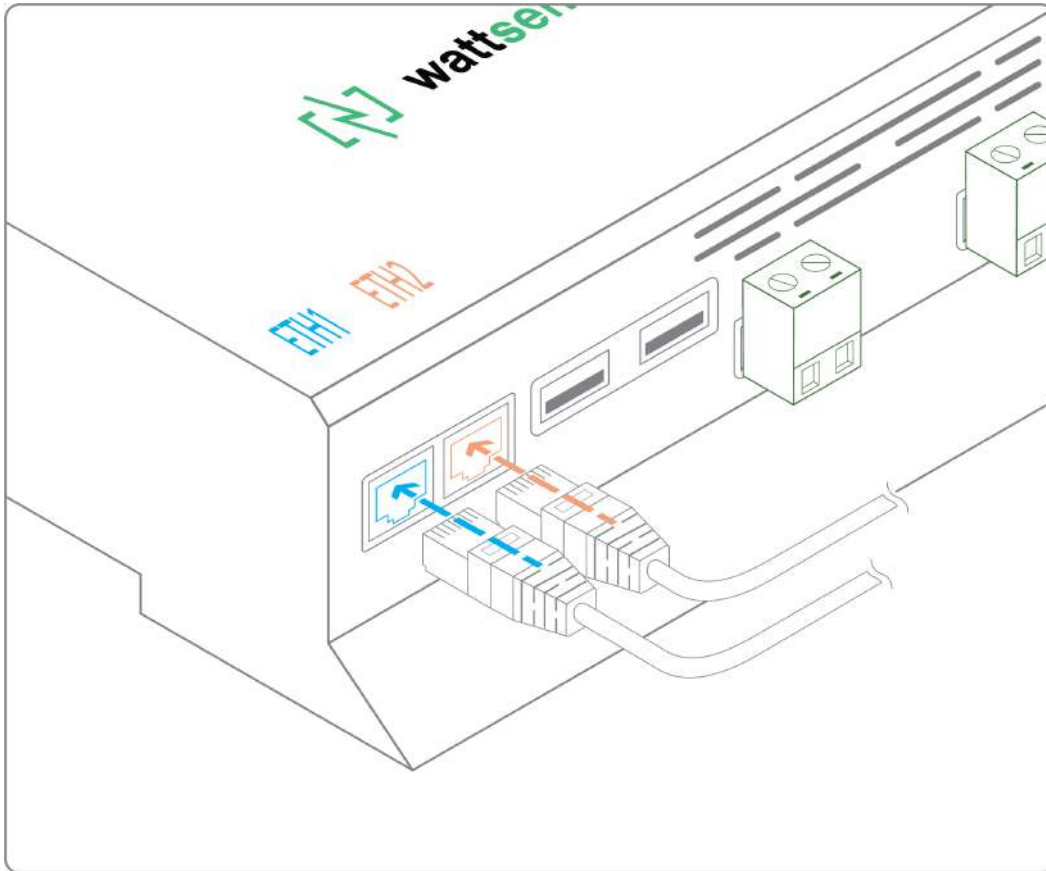


- Connect the other end of the cable to the equipment.
- Verify that the ETH1 or ETH2 LED lights up.



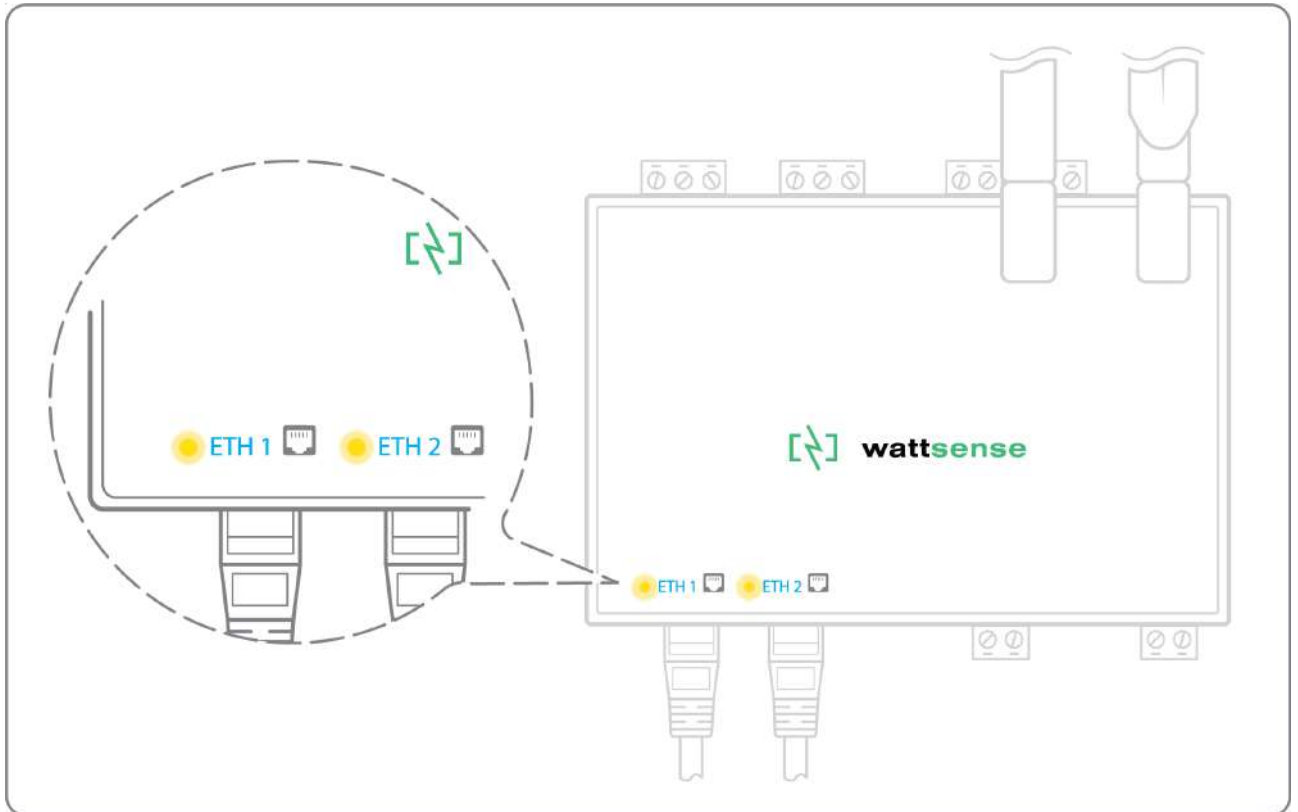
To connect two devices

- Make sure to have two Ethernet cables.
- Connect the cables to the Ethernet ports of the Hub ETH1 and ETH2.



- Connect the cables to the two devices.

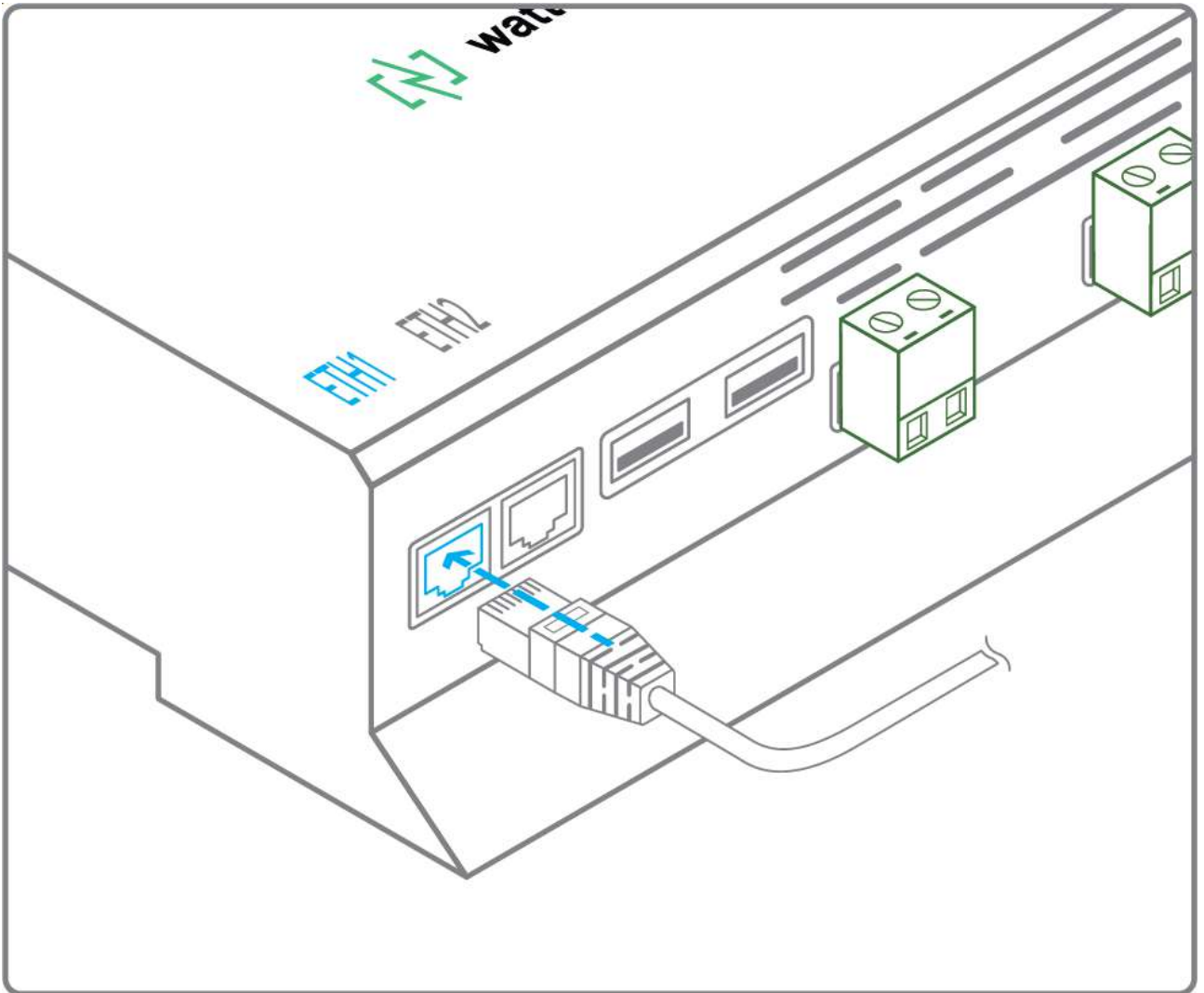
- Check that the ETH1 and ETH2 LEDs light up.



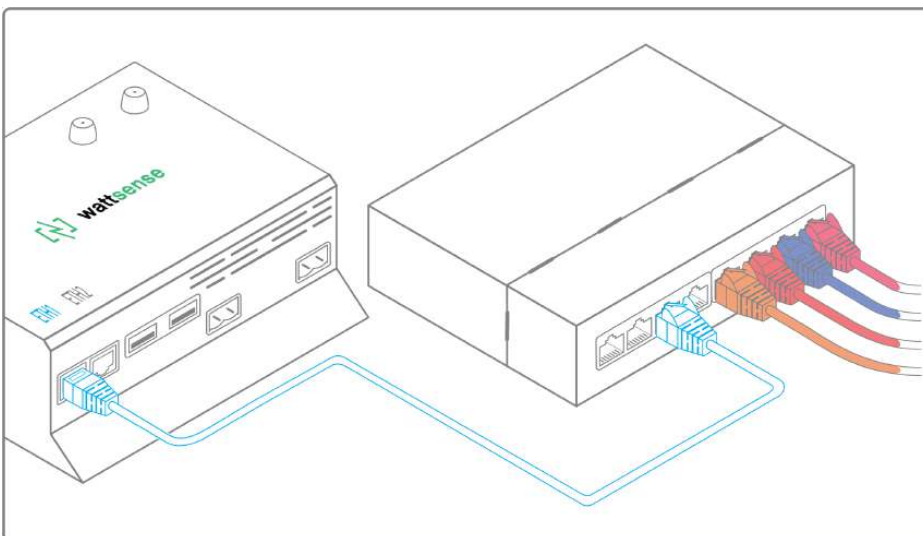
To connect three equipment or more, make sure to:

- Have an Ethernet cable for the Hub.
- Have as many Ethernet cables as equipment to connect.
- Have an Ethernet switch.
- Connect the switch to the power supply

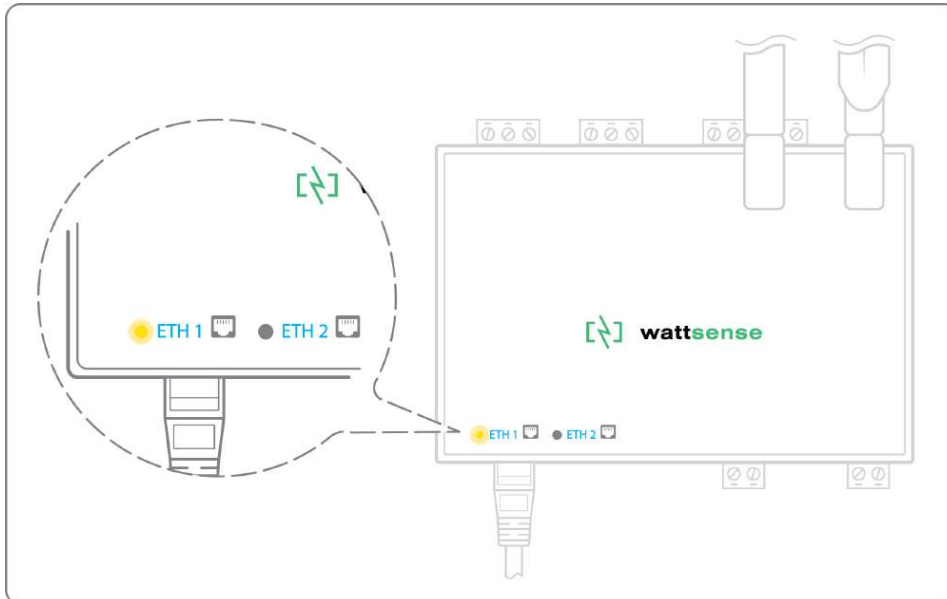
- Connect an Ethernet cable to the Ethernet port of the Hub ETH1 or ETH2.



- Connect the other end of this cable to the Ethernet switch.



- Check that the ETH1 or ETH2 LED lights up.



- Connect all equipment to the switch via the Ethernet cables.

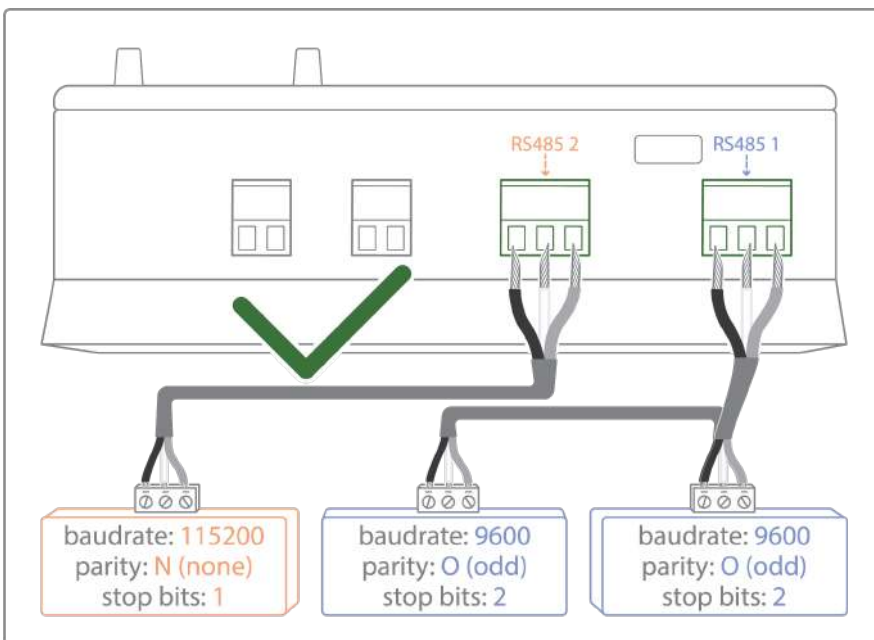
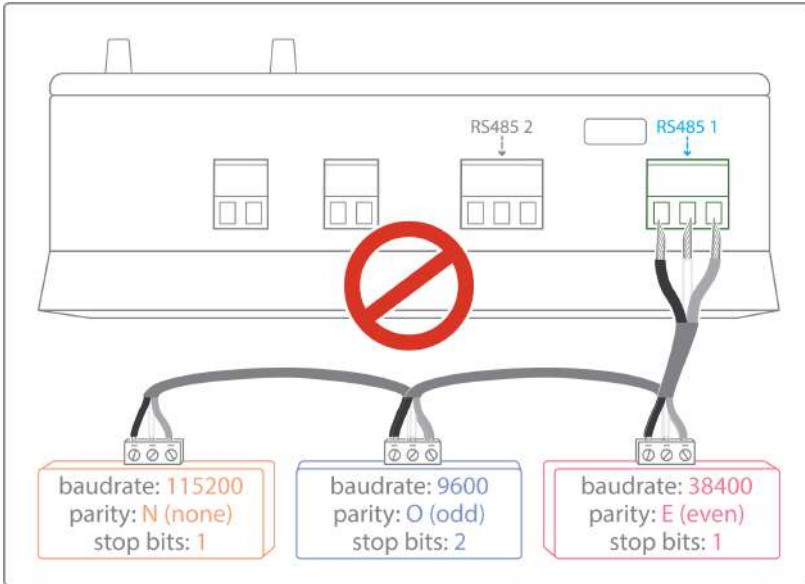
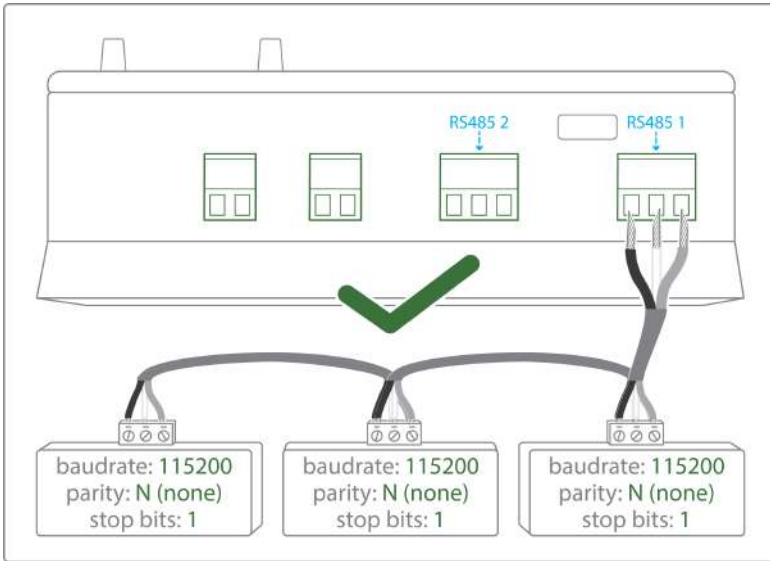
To configure each of the equipment

- Using the technical documentation of the equipment, find its IP address and TCP port (and, if necessary, for some devices, the address of the slave "Slave ID").
- If the equipment does not have an IP address, assign one to it, 192.168.1.1 for the first device, then 192.168.1.2 for the second device, 192.168.1.3 for the third device, and so on.
- Write down the IP address and TCP port (and, if necessary, for certain devices, the address of the Slave ID), the brand and model of the equipment, and any information that allows it to be identified. This information will be necessary for the installation configuration and to retrieve data.

The equipment communicates in Modbus RTU (RS485)

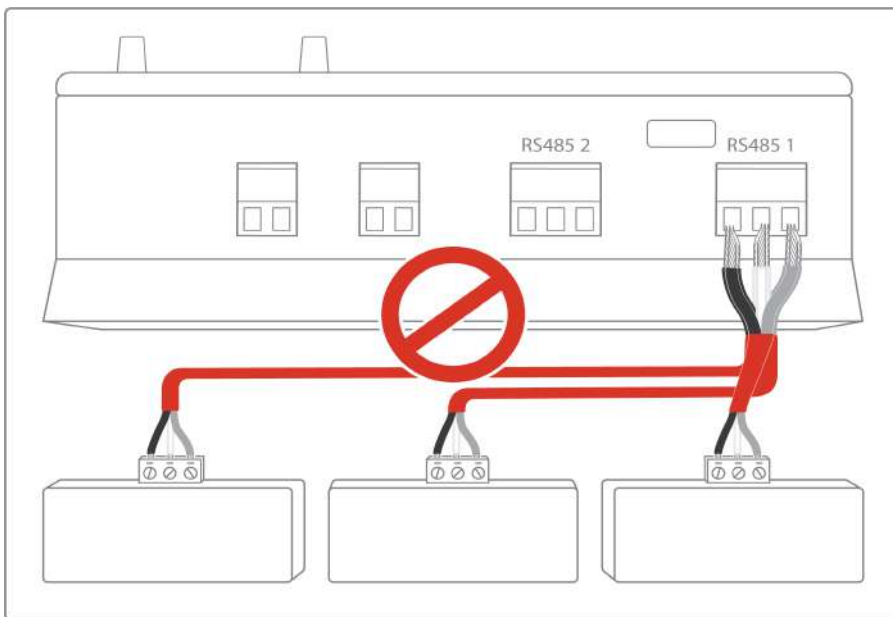
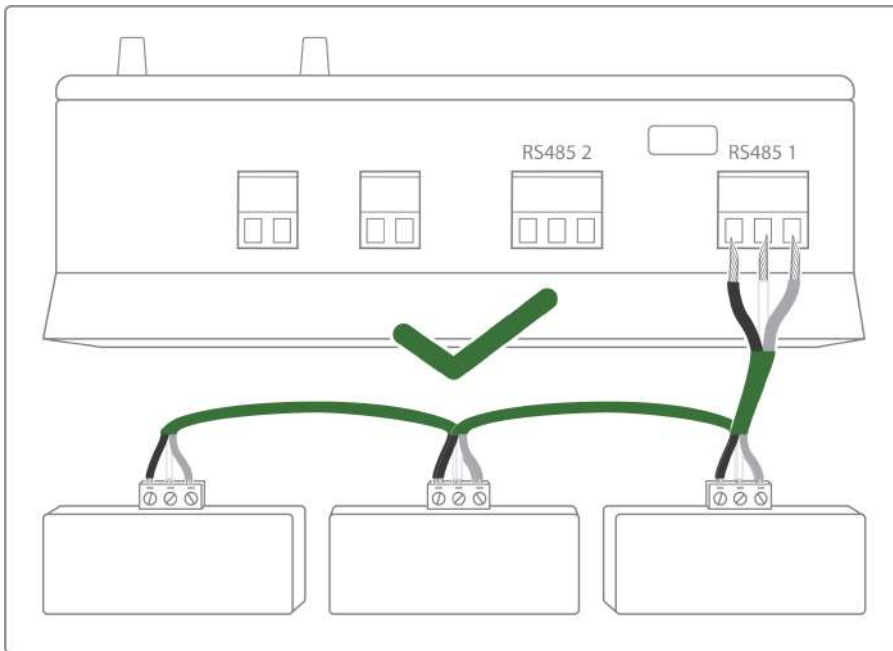
Organization of the Bus architecture:

- Gather the necessary information for each device: Bus speed, character size, parity bit, stop bit (from the user console's configuration wizard, from the manufacturer's technical documentation, or directly from the control panels of the equipment).
- The goal is to create a maximum of two networks, each grouping equipment with the same communication configuration, and assign them to the two RS485 ports of the Hub.
- If the characteristics of the equipment require to set more than two homogeneous networks. In that case, it is necessary to order another Hub.

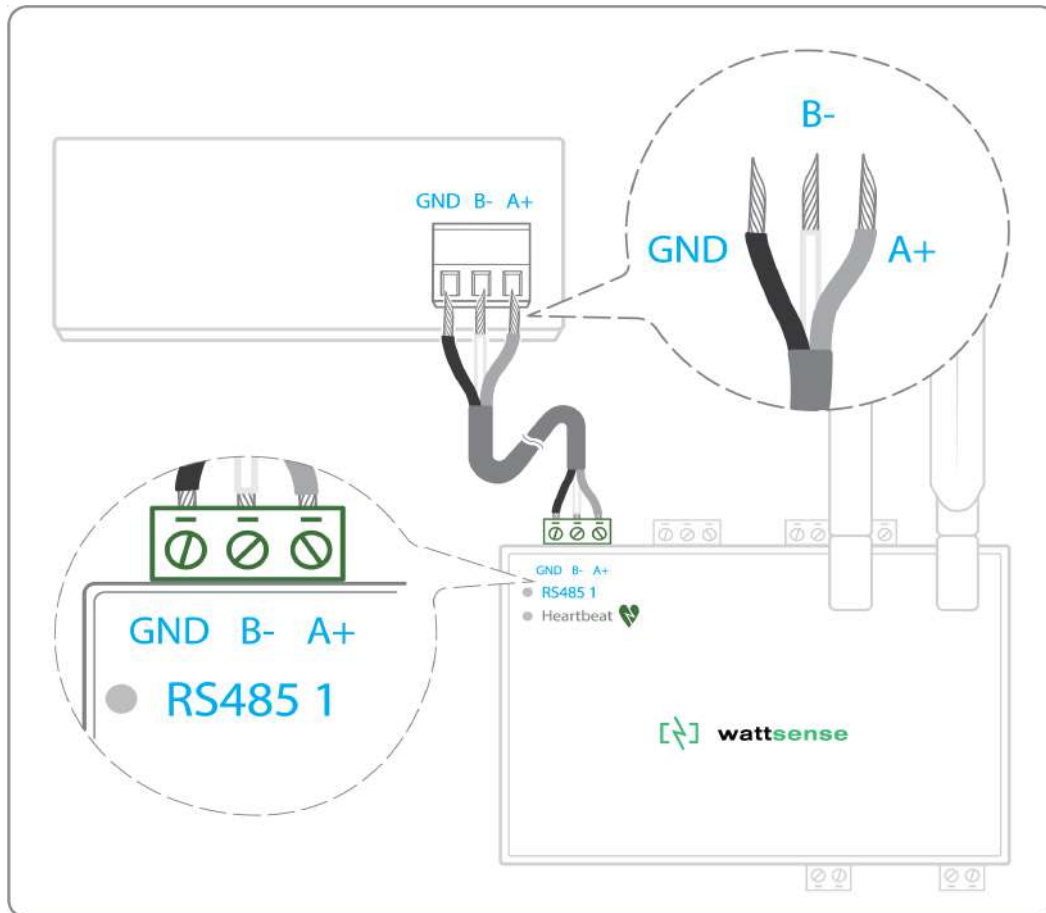


To connect the equipment:

- Caution: Do not group together devices with different communication parameters on the same Bus.
- Serial wire the network or each of the 2 networks.



- Connect the network to one of the two RS485 ports of the Hub



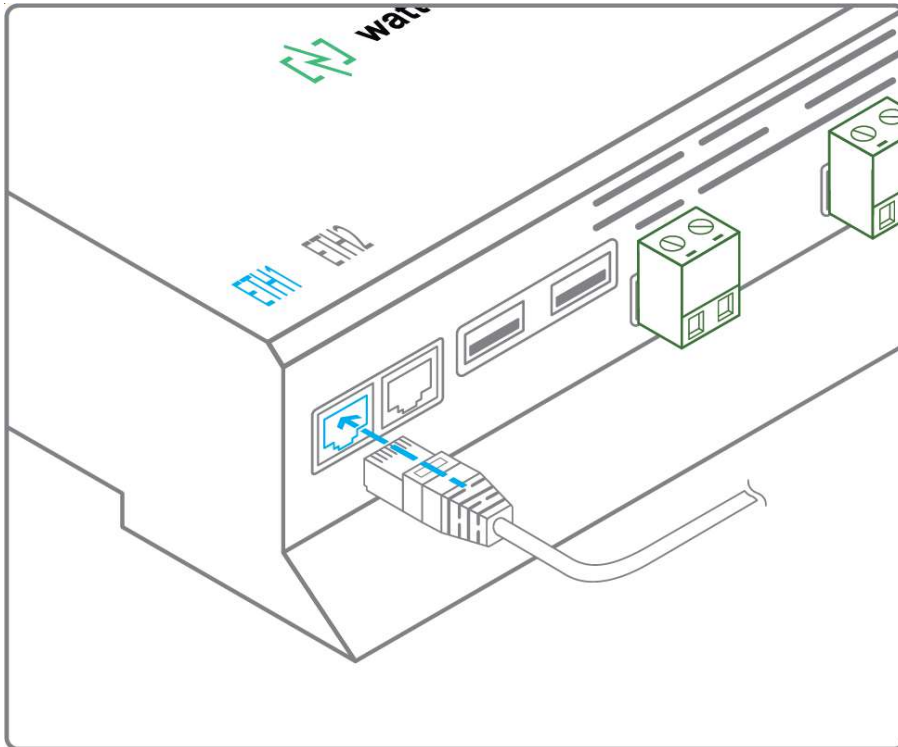
To configure each one of the equipment:

- Configure the address of the 1st Modbus slave to 1, the 2nd to 2, the 3rd to 3 and so on.
- Caution: a network must not contain multiple slaves with the same address.
- Write down the network to which the equipment is connected as well as its address, brand, and model of the equipment and any identifying information. This information will be necessary for the installation configuration and to retrieve data.

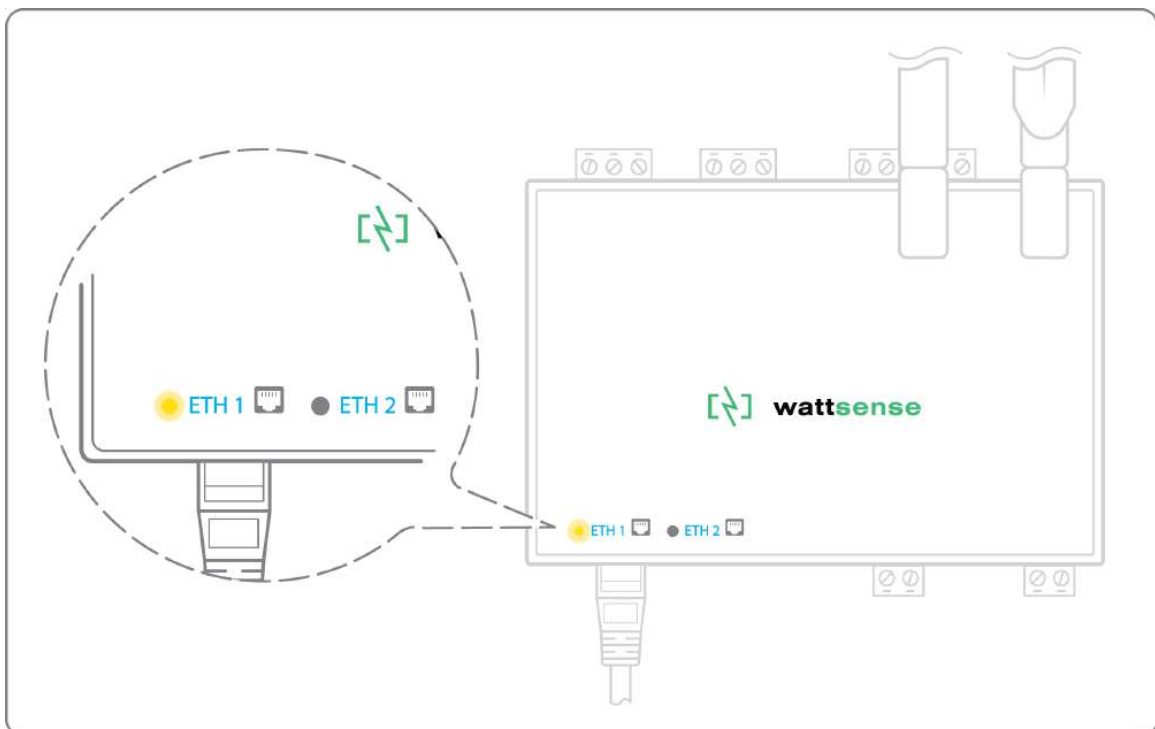
The equipment communicates in BACnet IP

To connect one equipment

- Make sure to have an Ethernet cable.
- Connect the cable to the Ethernet port of the Hub ETH1 or ETH2.

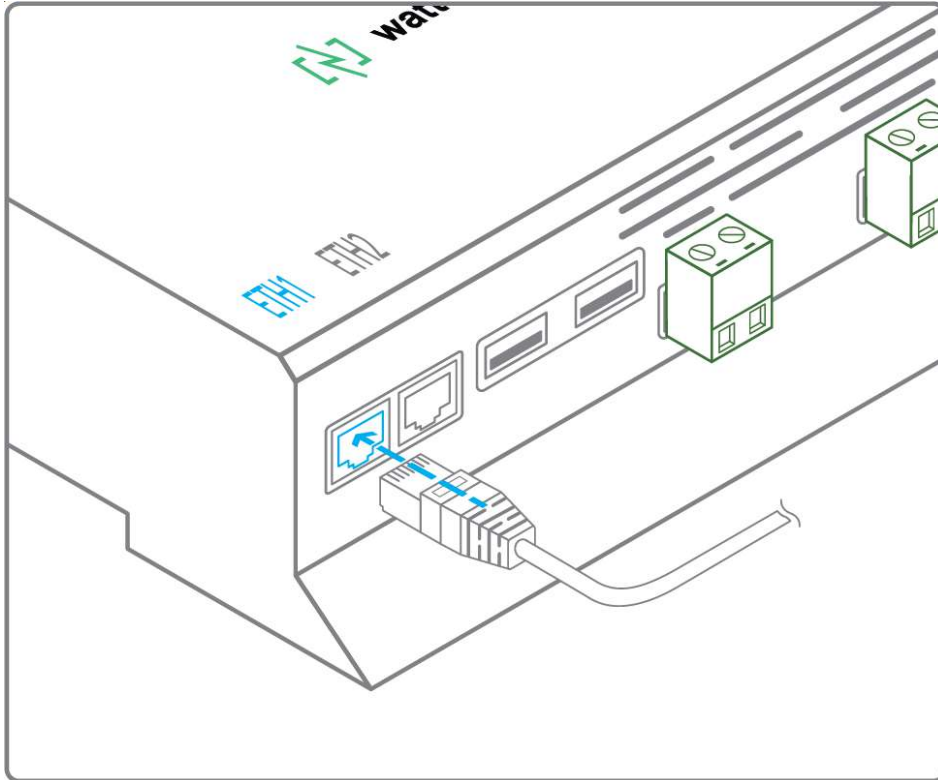


- Connect the other end of the cable to the equipment.
- Verify that the LED ETH1 or ETH2 lights up.

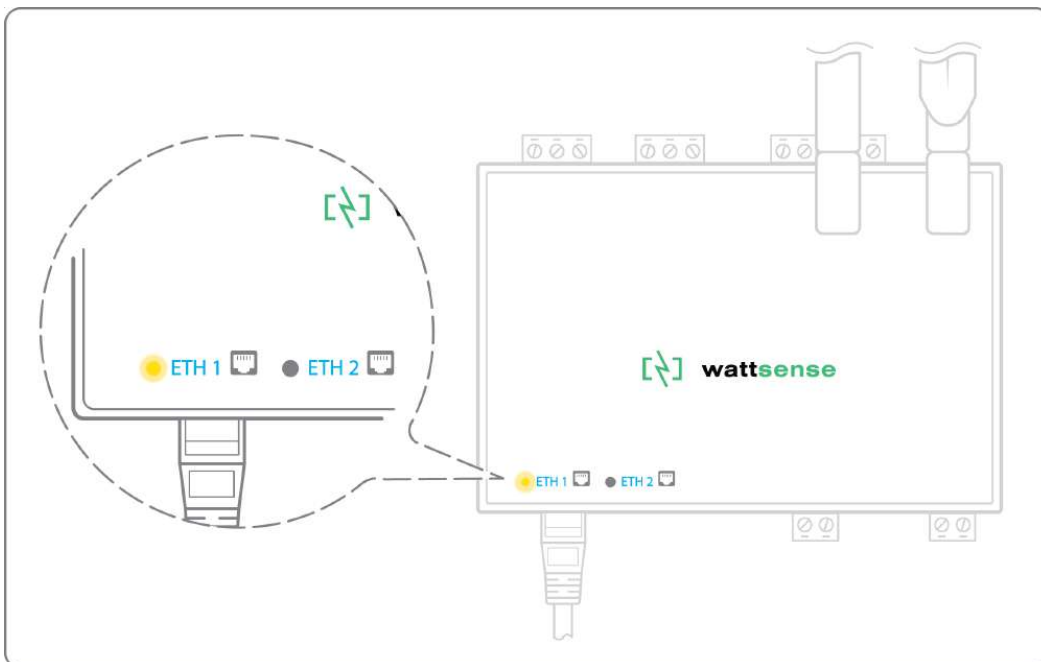


To connect two or more devices:

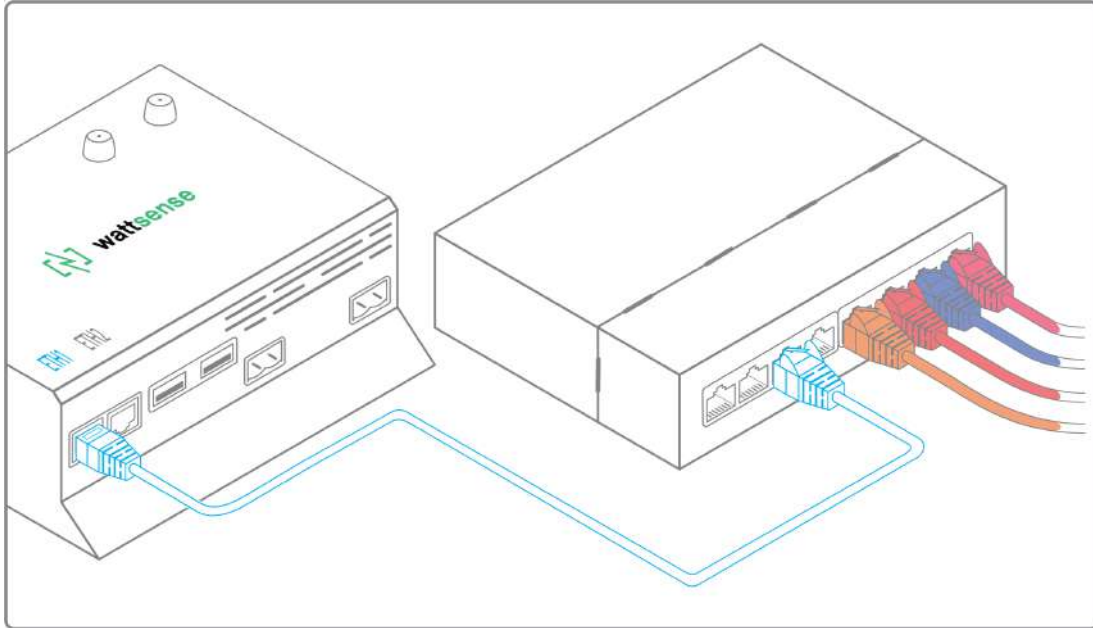
- Make sure to have an Ethernet cable for the Hub.
- Make sure to have as many Ethernet cables as equipment to connect.
- Make sure to have an Ethernet switch.
- Connect the power supply to the switch.
- Connect an Ethernet cable to the Ethernet port ETH1 or ETH2 of the Hub.



- Connect the other end of this cable to the Ethernet switch.
- Check that the ETH1 or ETH2 LED lights up.



- Connect all equipment to the switch via the Ethernet cables.



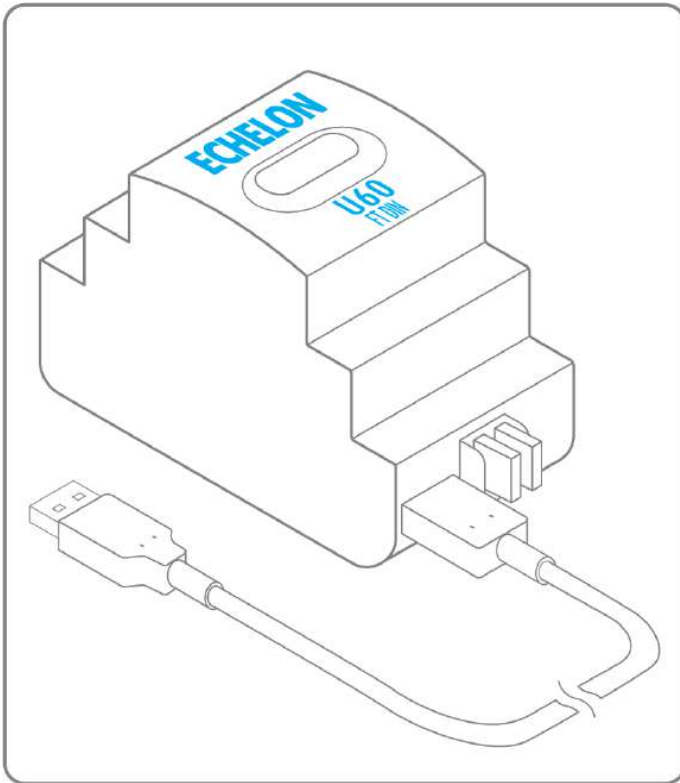
To configure each one of the equipment:

- From the technical documentation of the equipment, retrieve its IP address and the BACnet port.
- If the equipment does not have an IP address, assign one to it, 192.168.1.1 for the first device, then 192.168.1.2 for the second device, 192.168.1.3 for the third device, and so on.
- Write down the IP address and BACnet port, the brand, and model of the equipment, and any other identifying information. This information will be required to configure the installation and to retrieve data.

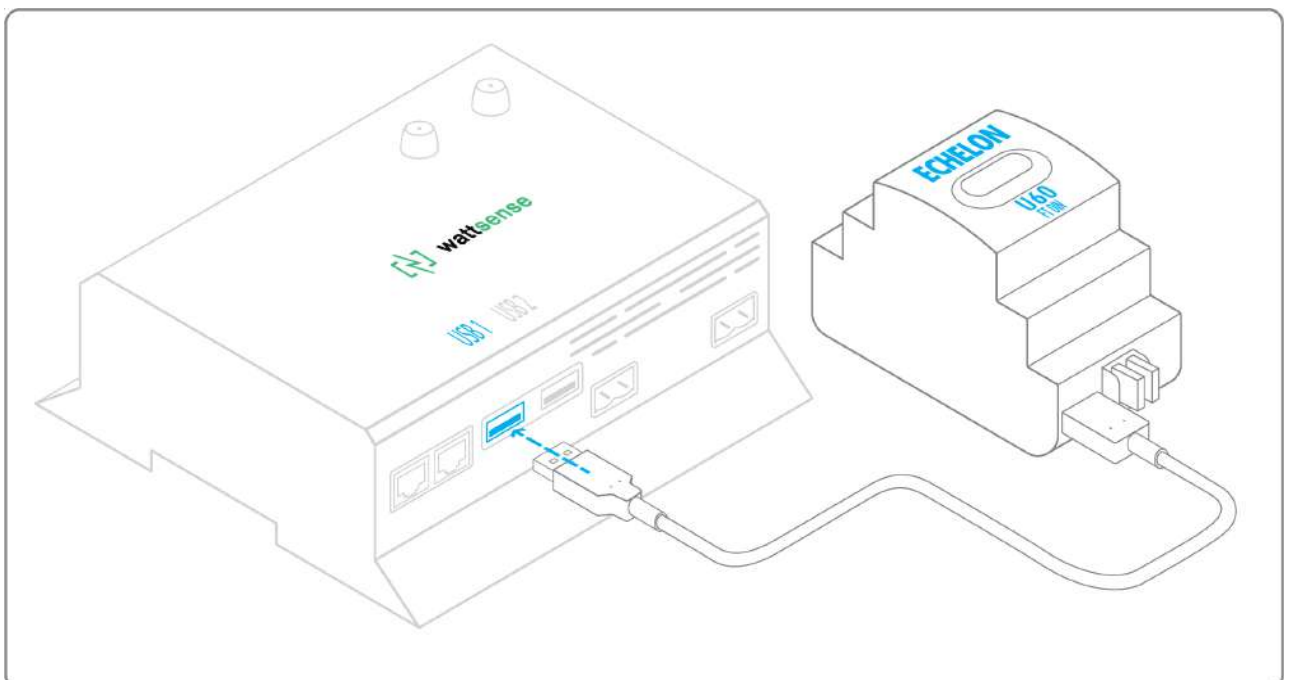
The equipment communicates in LON FT10

To connect the equipment

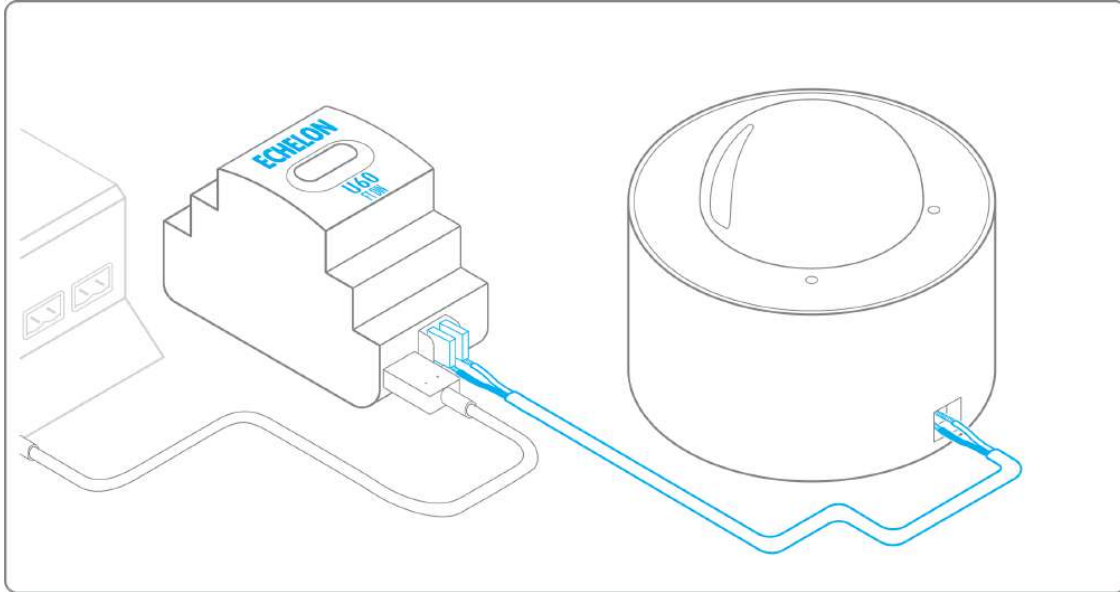
- Make sure to have an Echelon U60 FT DIN USB Gateway.



- Connect it to the USB port 1 or 2 in the Hub.



- Wire the gateway to different devices as you wish, in serial, star, etc.



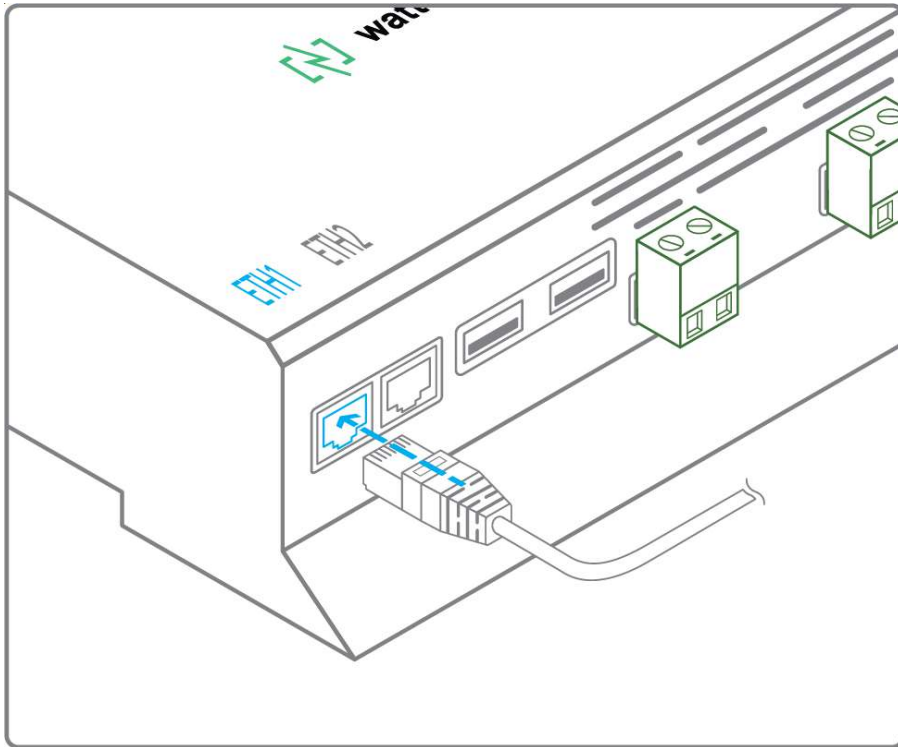
To configure each of the equipment:

- Retrieve the Neuron-ID that appears on the equipment.
- Write down the Neuron-ID, brand, model of the equipment and any identifying information. This information will be necessary for the installation configuration and to retrieve data.
- If you have the NL220 software, export the LON database as an NLC file.

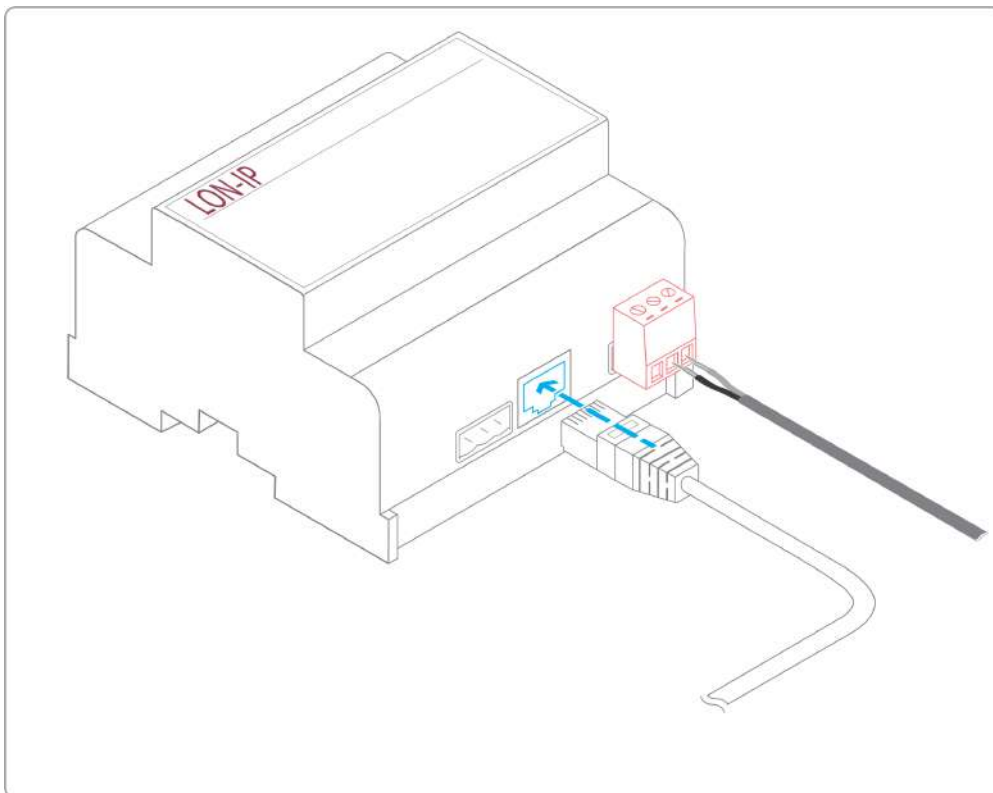
The equipment communicates in LON IP-852

To connect one or several types of equipment.

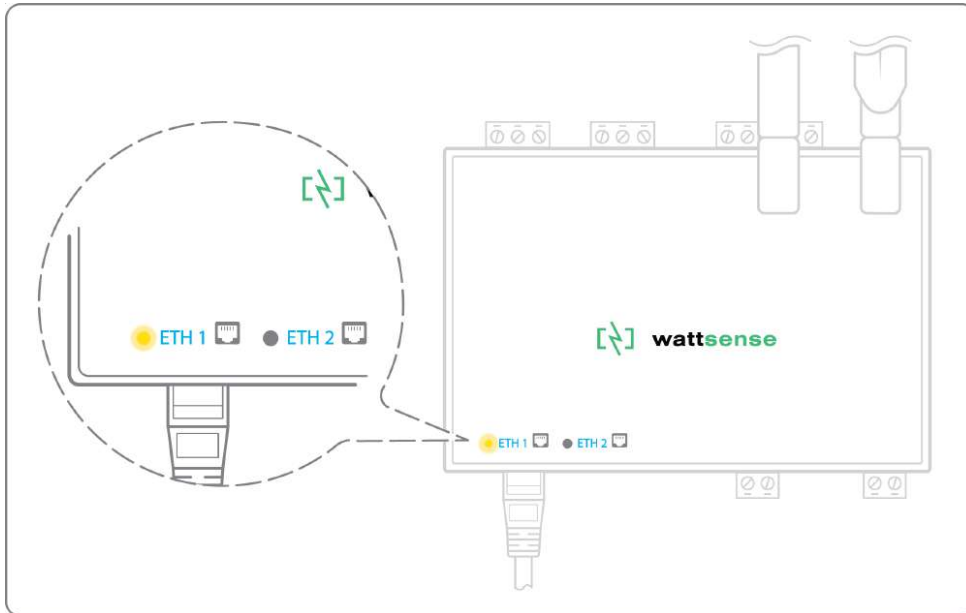
- Make sure to have an Ethernet cable.
- Connect the cable to the Ethernet port of the Hub ETH1 or ETH2.



- Connect the other end of the cable to the IP-852 server of the LON network.



- Verify that the LED ETH1 or ETH2 lights up.



- Register the IP address of the Hub on the IP-852 server of the LON network.

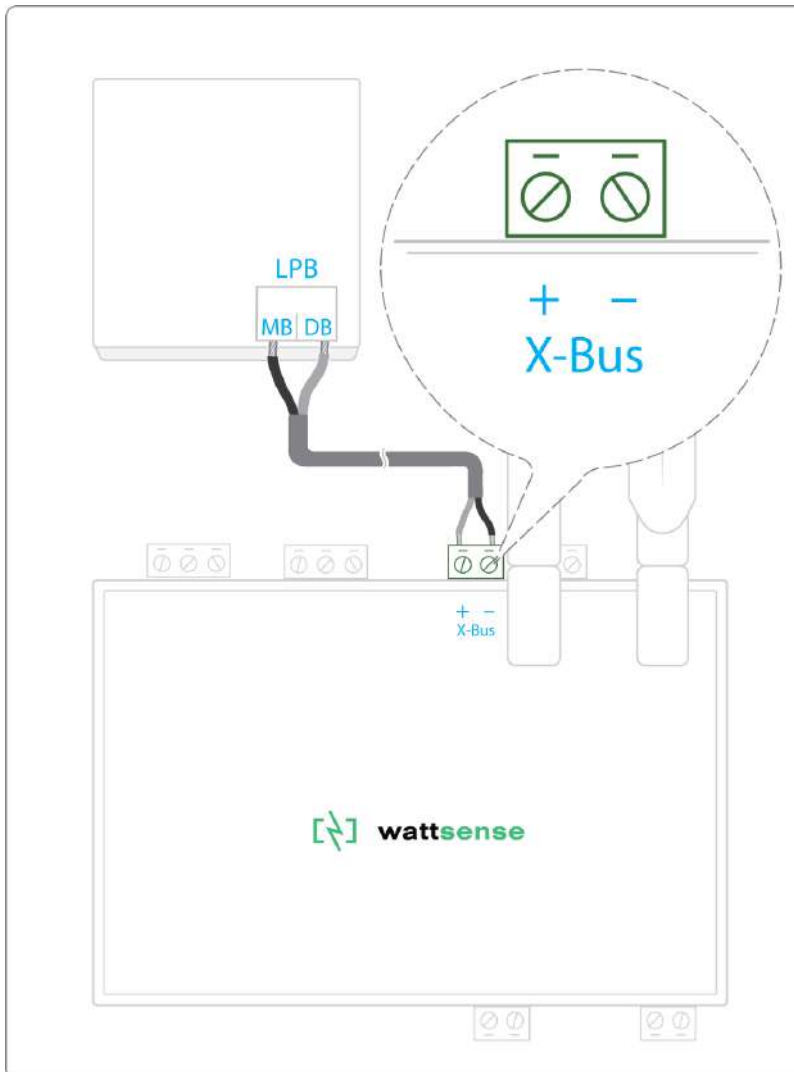
To configure each one of the different equipment:

- Write down the Neuron-ID, brand, model of the equipment, and any identifying information. This information will be necessary for the installation configuration and to retrieve data.
- If you have the NL220 software, export the LON database as an archive file or as an NLC file.

The equipment communicates in LPB

To connect one or several equipment :

- Connect the LPB Bus to the X-Bus port of the Hub.
- For each device, connect its MB cable to the X-Bus(-) port and its DB cable to the (+) port of the Hub.



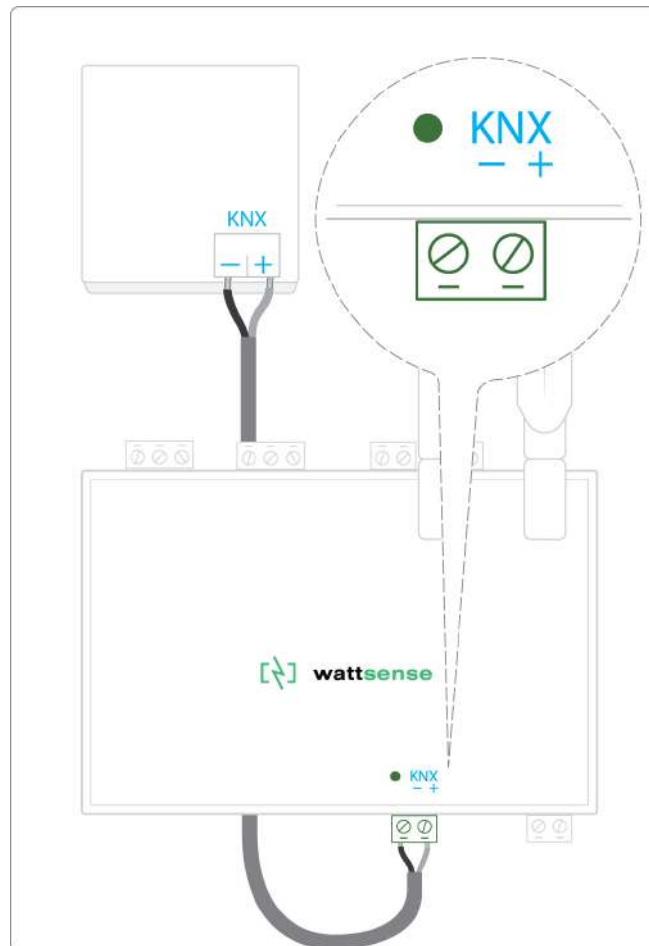
To configure each of one of the equipment:

- As a precaution, check that the equipment does not power the LPB Bus.
- For each device, configure a unique segment address (from 1 to 14).
- Proceed to make the connection as indicated.
- Designate one and only one equipment as the one that supplies the Bus.

The equipment communicates in KNX

To connect one or several equipment :

- Connect the KNX Bus to the KNX Bus port of the Hub.
- For each device, connect its (-) wire to the KNX Bus (-) port and its (+) wire to the KNX Bus (+) port in the Hub.

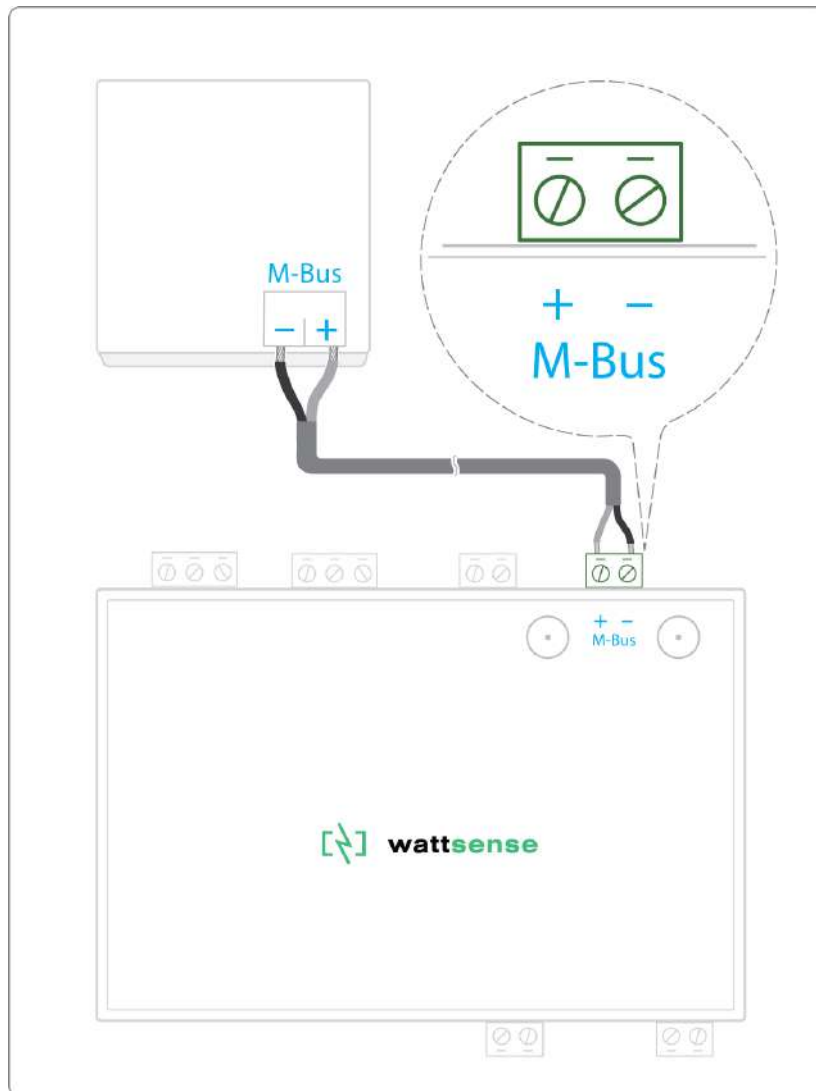


The equipment communicates in M-BUS

To connect one or several equipment:

The maximum unit load that the Hub can handle is three devices (3,6mA). If you want to connect more than three M-bus devices, you'll have to use an M-bus signal repeater.

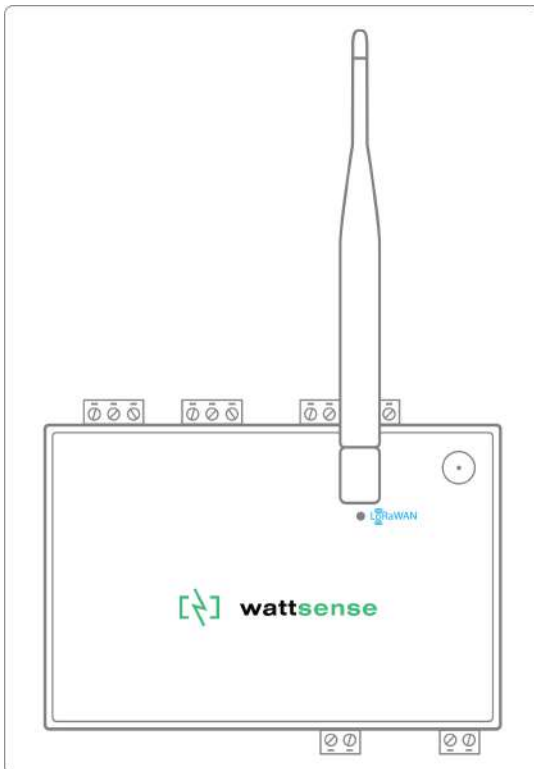
- Connect the M- Bus device to the M-Bus port of the Hub.
- Each M-Bus device must connect its (-) wire to the M- Bus (-) port and its (+) wire to the (+) port of the Hub.



To connect the Hub to LoRaWAN sensors

Install the Hub:

- Install the Hub in a central location to ensure the reception of all sensors.
- If the quality of the LoRa signal is good: keep the original antenna installed on the Hub. You can check the quality of the LoRaWAN signal with:
 - A field tester
 - The Wattsense Desktop Application, once the Hub and the LoRaWAN device are paired you can verify the [quality of the signal](#).



- If the signal quality is insufficient: move the original antenna out of the cabinet; use an RF extension cord with an SMA connector up to two meters + one adhesive support to hold the antenna.
- If the signal quality is still insufficient: use a high-gain antenna with a maximum of 10 meters of cable; this antenna can, for example, be used outside or in other floors to obtain the best signal quality.

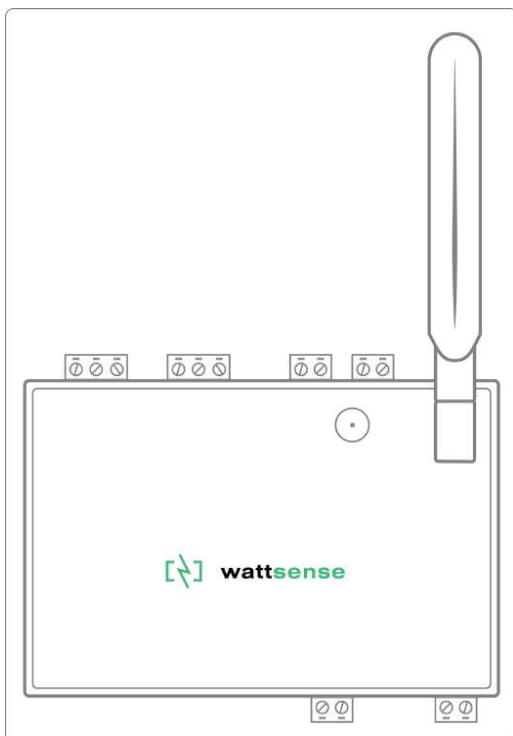
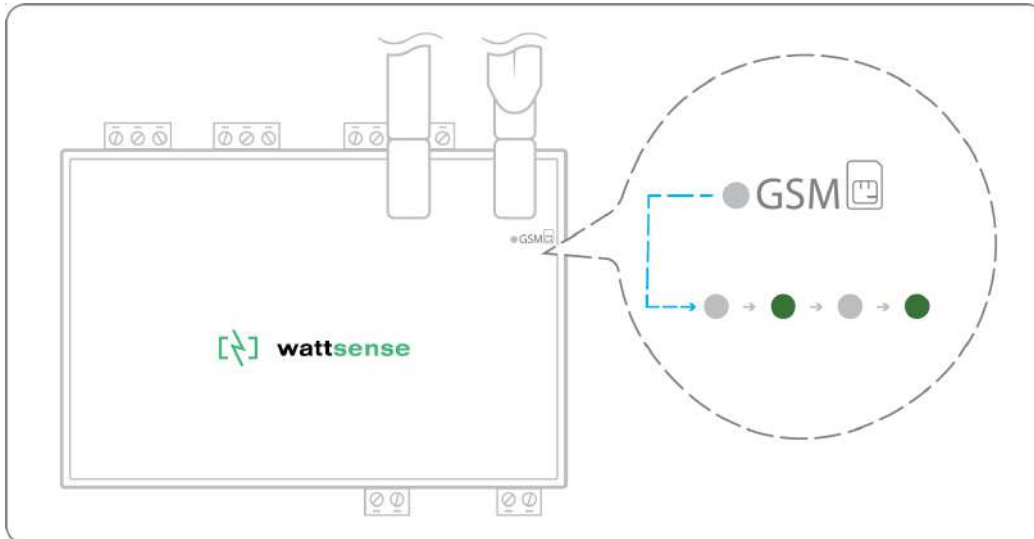
For each sensor, follow these steps:

- Step 1: Add the sensor to the Desktop Application by naming it to be identifiable.
- Step 2: Save and send the configuration to the Hub.
- Step 3: Activate the sensor; to do this, use the manufacturer's technical documentation.
- Step 4: Check on the user console that the sensor is detected.

GSM Antenna

We recommend connecting the GSM antenna to allow remote support to the Hub when needed. In that case:

- Check the GSM signal strength at the location of the Box with a mobile phone
- If there is a GSM signal that allows data (at least 2G) connect the standard GSM antenna supplied with the Hub.



- If the signal quality is insufficient: move the original antenna out of the cabinet; use an RF extension cord with SMA connector, up to two meters, + 1 adhesive support to hold the antenna.

- If the signal quality is still insufficient: use a high-gain antenna with a maximum of 10 meters of cable; this antenna can, for example, be moved to the outside or to the other floors to obtain a better signal quality.
- Please note that, beyond 15 meters of cable, the GSM signal is significantly weakened.

If you need assistance with the installation of the Wattsense Hub please contact our technical support team. Write us at: support@wattsense.com