

# PowerLogic™ HeatTag Installation

## Implementation & Commissioning Guide

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# 1. Introduction

## 1.1. Purpose of the Document

This guide is dedicated to PowerLogic™ HeatTag installations for early detection of cable overheating. This is a generic guide for low voltage switchboards (also known as low voltage panels), which is not specific to one brand of switchboard.

The purpose of this guide is to:

- support engineering and tendering teams during the quotation phase to calculate the correct installation of HeatTag sensors and, particularly, the quantity of different devices (such as sensors, gateways, and power supplies)
- support panel builders during the installation phase, by giving generic rules and recommendations regarding the positioning of these devices in the cubicles

The guide covers design, installation, wiring, settings and functional testing of connected devices and their digital architectures.

The rules and recommendations apply to implementation of digital architectures and the related devices listed in chapter “1.2 Scope of the document”. The settings are limited to the key communication parameters. For implementation and settings of the electrical functionalities of the devices please refer to the User Guides for the devices.

## 1.2. Scope of the Document

### 1.2.1. Technology and Device Ranges

The architectures presented in this guide are built with the following devices:

- PowerLogic™ HeatTag wireless sensor
- EcoStruxure Panel Server wireless concentrator and gateway

### 1.2.2. Architecture Principles

Ethernet and wireless communication are used in the architectures presented in this document.

### 1.2.3. Communication Protocols

Modbus TCP/IP, Wi-Fi and IEEE802.15.4 communication protocols are used in the proposed architectures.

### 1.2.4. Edge Control and Cloud Solutions

This guide covers installation up to the Gateway level. It does not include guidance regarding Edge Control Software, or Cloud Solutions, like the Energy Management System. This solution can however be utilized with an Edge Control Software, or Cloud Solutions, such as EcoStruxure Power Monitoring Expert or EcoStruxure Energy Hub. Contact the local Schneider Electric representative for more information regarding what is available in each country.

## 2. Safety Information

### 2.1. Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed



This is the safety alert symbol. It is used to alert of potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death

|  |
|--|
| <b>⚠ DANGER</b>  |
| <b>DANGER</b> indicates a hazardous situation which, if not avoided, <b>will result in</b> death or serious injury.    |
| <b>⚠ WARNING</b>   |
| <b>WARNING</b> indicates a hazardous situation which, if not avoided, <b>could result in</b> death or serious injury.  |
| <b>⚠ CAUTION</b>   |
| <b>CAUTION</b> indicates a hazardous situation which, if not avoided, <b>could result in</b> minor or moderate injury. |
| <b>NOTICE</b>  |
| <b>NOTICE</b> is used to address practices not related to physical injury.   |

### 2.2. Please Note

Electrical equipment should be installed, operated, serviced, and maintained by qualified personnel only. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

## 3. About the Document

### 3.1. Validity

This document is valid for wireless architectures utilizing HeatTag and EcoStruxure Panel Server.

This document describes topologies and performances available with the following firmware versions of the devices and software:

| Device name                        | Part number     | Firmware version |
|------------------------------------|-----------------|------------------|
| PowerLogic™ HeatTag                | <b>SMT10020</b> | ≥ SV2.2.9        |
| EcoStruxure Panel Server Entry     | <b>PAS400</b>   | ≥ SV1.6.0        |
| EcoStruxure Panel Server Universal | <b>PAS600</b>   | ≥ SV1.6.0        |
| EcoStruxure Panel Server Advanced  | <b>PAS800</b>   | ≥ SV1.6.0        |

Table 1: Firmware version

**Note:** The latest EcoStruxure Panel Server firmware versions are available on <https://www.se.com>. The HeatTag firmware is not to be updated.

### 3.2. References

The following table lists the documents which can be used to become familiar with the content of this guide.

| Document name   | Reference            |
|---|----------------------|
| PowerLogic™ Energy and Power Meters for Panel Builders - Catalog                  | <b>PLSED310126EN</b> |
| PowerLogic™ HeatTag - User Guide  | <b>DOCA0171EN</b>    |
| PowerLogic™ HeatTag - Instruction sheet   | <b>MFR5173801</b>    |
| EcoStruxure Panel Server - User Guide   | <b>DOCA0172EN</b>    |
| EcoStruxure Panel Server Entry - Instruction Sheet                                | <b>NNZ76760</b>      |
| EcoStruxure Panel Server Universal - Instruction Sheet                            | <b>GDE74119</b>      |
| EcoStruxure Panel Server Advanced - Instruction Sheet                             | <b>JYT24469</b>      |
| EcoStruxure Panel Server - Wireless Devices / Wi-Fi Antenna - Instruction Sheet   | <b>NNZ58425</b>      |
| EcoStruxure Panel Server Entry - Firmware Release Notes                           | <b>DOCA0249EN</b>    |
| EcoStruxure Panel Server Universal - Firmware Release Notes                       | <b>DOCA0178EN</b>    |
| EcoStruxure Panel Server Advanced - Firmware Release Notes                        | <b>DOCA0248EN</b>    |
| EcoStruxure Panel Server - Cybersecurity Guide                                    | <b>DOCA0211EN</b>    |
| Wireless Communication Architectures with EcoStruxure Panel Server - Design Guide | <b>DOCA0289EN</b>    |
| EcoStruxure Panel Server - Modbus File  | <b>DOCA0241EN</b>    |

Table 2: Reference Documents

## 3.3. Glossary

| Term          | Description                             |
|---------------|---|
| EPC           | EcoStruxure Power Commission software   |
| IEEE 802.15.4 | Standard for Low-Rate Wireless Networks |
| IP            | Ingress Protection                      |
| PAS           | EcoStruxure Panel Server                |
| PoE           | Power over Ethernet                     |
| RF            | Radio Frequency                         |
| RSSI          | Received Signal Strength Indicator      |

Table 2: Glossary

## 3.4. Prerequisites

The following prerequisites are recommended to correctly implement the architecture considered in this guide. This applies to:

- The networks and communication protocols used in the architectures:
  - IEEE802.15.4 communication
  - Ethernet or Wi-Fi network
  - Modbus TCP/IP protocol
- The devices used in the architectures:
  - PowerLogic™ HeatTag wireless sensor
  - EcoStruxure Panel Server (**PAS400**, **PAS600** and **PAS800**)
  - The Wireless Devices / Wi-Fi Antenna is needed in some architectures
  - Power Supply for HeatTag and Panel Server
- Software used for the solution:
  - EcoStruxure Power Commission (EPC)

## 3.5. Device Description

### 3.5.1. PowerLogic™ HeatTag

The HeatTag is a wireless sensor for early detection of overheating wire connections or overheating cables (Ref: **SMT10020**).



HeatTag is a sensor for early detection of overheating wire connections or overheating cables.

HeatTag helps prevent electrical switchboards from being damaged, by analyzing gas and particles in the air and sending alerts before any smoke or insulator browning.

The HeatTag sensor includes the following features:

- 3 levels of alert according to the criticality of the detected situation
- 11 levels of air quality index (0 to 10)
- Analysis of gas and micro-particles emitted by cable sheaths when overheating
- Measurement of temperature and humidity inside the switchboard
- Self-diagnostics
- Communication with Schneider Electric gateways including EcoStruxure Panel Server, PowerTag Link and PrismaSeT Active Integration in EcoStruxure software solutions

For detailed information concerning this device, refer to **PLSED310126EN**.

#### **WARNING**

##### **FIRE HAZARD**

Do not use the HeatTag sensor as a safety device.

Do not disable the equipment's other monitoring and safety devices.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**



### 3.5.2. EcoStruxure Panel Server



EcoStruxure Panel Server is a Wireless Concentrator and Modbus Gateway (Ref: **PAS400/PAS600/PAS600T/PAS600L/PAS800/PAS800L/PAS800P**).

Panel Server provides connection to edge control software such as EcoStruxure Power Monitoring Expert or EcoStruxure Building Operation, and to cloud applications such as EcoStruxure Asset Advisor and EcoStruxure Energy Hub.

- All-in-one gateway to retrieve data from both wireless sensors and Modbus devices, and optimize energy management solutions.
- Ease of commissioning with the EcoStruxure Power Commission tool, enabling device to plug & play and auto discovery features.
- Ease of operation with user friendly embedded webpages, and data contextualization for more relevant analytics.
- Enhanced Cybersecurity, designed through a development Life Cycle in accordance with IEC 62443-4-1.

Equipped with multiple communication protocols (including Ethernet, IEEE802.15.4 wireless sensors, Bluetooth, Wi-Fi, and optional cellular routers), the Panel Server adapts to fast evolving communication technologies.

For detailed information concerning this range of devices, refer to **PLSED310126EN**.

### 3.5.3. EcoStruxure Panel Server - Wireless Devices / Wi-Fi Antenna



The Wireless Devices / Wi-Fi Antenna (Ref: **PASA-ANT1**) can be used to extend the wireless network.

- It can be utilized with both the Universal (**PAS600/PAS600T/PAS600L**) and Advanced (**PAS800/PAS800L/PAS800P**) Panel Server to extend the Wi-Fi network.
- It can be utilized with the Advanced Panel Server (**PAS800 / PAS800L / PAS800P**) to extend the IEEE 802.15.4 network.

The antenna is provided with a 3m cable.

# 4. Architecture

To monitor the overheating of cables inside low voltage switchboards, EcoStruxure Panel Server and PowerLogic™ HeatTag devices are required. In some cases, the wireless antenna will also be required.

For the EcoStruxure Panel Server, the three following variants are considered:

- Entry Panel Server – **PAS400**
- Universal Panel Server – **PAS600, PAS600T, PAS600L**
- Advanced Panel Server – **PAS800, PAS800L, PAS800P**

## 4.1. Topology

EcoStruxure Panel Server access points communicate natively in Modbus TCP/IP and can be directly connected to any Ethernet network. Alternatively, the Wireless Devices / Wi-Fi Antenna can be used as a Wi-Fi Antenna, regardless of the Panel Server version.

However, the Wireless Devices / Wi-Fi Antenna can only be used as an IEEE 802.15.4 antenna with the Advanced Panel Server.

With the Daisy Chain topology, there is no limitation to the number of Panel Servers. With this topology, an issue with an Ethernet cable or a Panel Server will affect all downstream Panel Servers.

In Daisy Chain topology, the optional external antenna can be used only for IEEE802.15.4 coverage extension, not Wi-Fi.

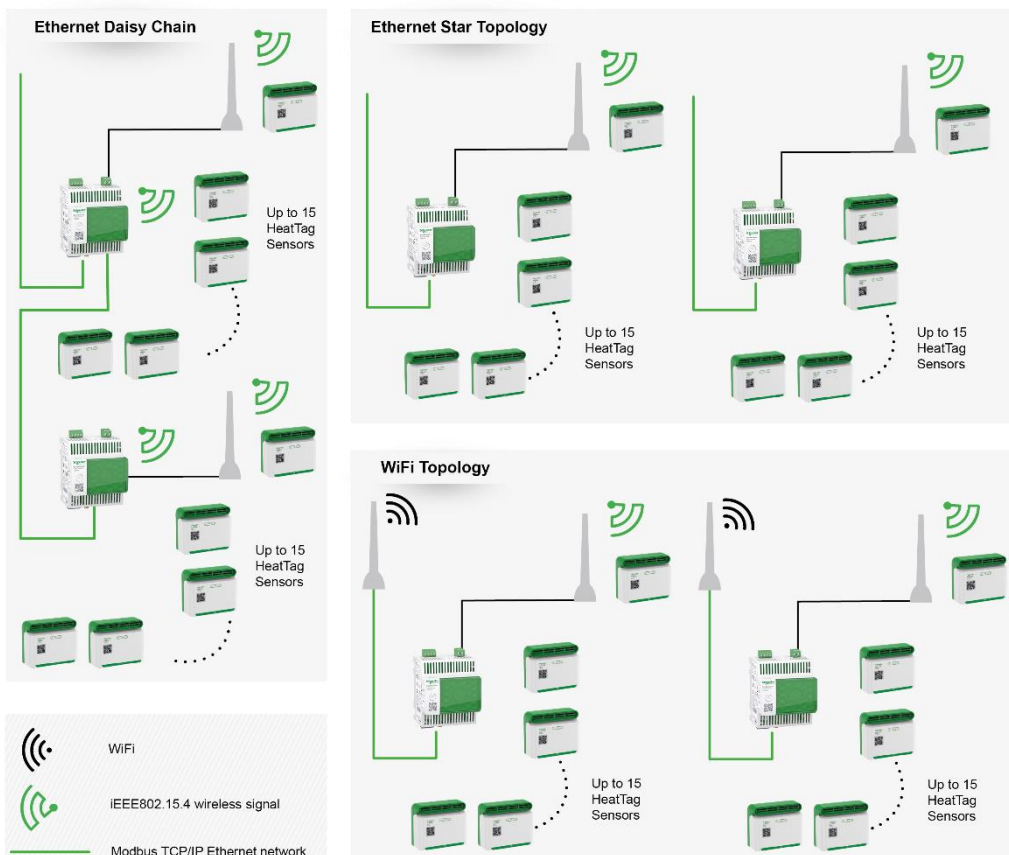


Illustration 1 : Digital architecture for cable overheating early detection system\*

\*The Wireless Devices / Wi-Fi Antenna used as an IEEE 802.15.4 antenna is not always necessary. Refer to chapter “4.2 Distance and Switchboard Form of Internal Separation-Rules and Recommendations”.

## 4.2. Distance and Switchboard Form of Internal Separation- Rules and Recommendations

| Switchboard Form of Internal Separation | Panel Server  | Wireless Devices / Wi-Fi Antenna   | HeatTag   |
|---|---|--|---|
| 1, 2A and 2B                            | <p>One Entry Panel Server, Universal Panel Server or Advanced Panel Server can cover the column (Max width 800 mm) it is in plus 2 columns on either side (maximum 5)*</p> <p>If the switchboard is longer, consider utilizing Advanced Panel Server with a wireless antenna or adding additional Panel Servers</p> | <p>The maximum number of external antennas per Panel Server is 1. The length of the cable is 3 meters.</p> <p>The antenna can cover the column it is in plus 2 columns on either side.</p> <p><b>Note:</b> The antenna only works as an IEEE 802.15.4 antenna with Advanced Panel Server</p> | <p>The maximum number of HeatTag Sensors per Panel Server is 15.**</p> <p>This number is not altered if the Wireless Devices / Wi-Fi Antenna is added to the architecture.</p>  |
| 3A, 3B, 4A and 4B                       | <p>One Entry Panel Server, Universal Panel Server or Advanced Panel Server can cover the column (Max width 800 mm) it is in plus 1 column on either side (maximum 3)*</p> <p>If the switchboard is longer, consider utilizing Advanced Panel Server with a wireless antenna or adding additional Panel Servers</p>  | <p>The maximum number of external antennas per Panel Server is 1. The length of the cable is 3 meters.</p> <p>The antenna can cover the column it is in plus 1 column on either side.</p> <p><b>Note:</b> The antenna only works as an IEEE 802.15.4 antenna with Advanced Panel Server</p>  | <p>The maximum number of HeatTag Sensors per Panel Server is 15.**</p> <p>This number is not altered if the Wireless Devices / Wi-Fi Antenna are added to the architecture.</p> |

Table 3: Components needed based on switchboard form of internal separation and size

**\*Note:** The actual maximum distance is affected by a variety of factors.


**\*\*Note:** The number of devices is affected if other IEEE 802.15.4 devices are added. For more details regarding number of devices, when other IEEE 802.15.4 devices are added, refer to **DOCA0178EN** and **DOCA0248EN**.

Several factors affect whether the wireless signal between the Panel Server and the HeatTag is strong enough. Functional units and metal partitioning can restrict the signals. Their placement and thickness have a significant impact, while holes in the partitioning can let the signal through. The maximum distances listed above consider most of these factors, and can be used as generic rules, based on the multiple qualifications done in Schneider Electric switchboards. However, in some cases the solution could work over a greater distance.

In cases where it is not certain that the signal strength will be sufficient, it is recommended to use an Advanced Panel Server and add an antenna if needed.

It is always recommended to test the signal strength to verify that it is strong enough. Refer to chapter “5.3.3. Received Signal Strength Indicator (RSSI)”.

## 5. Installation Rules and Recommendations

|  <b>DANGER</b>   |  |
|---|--|
| <b>ELECTRIC SHOCK, EXPLOSION OR ARC FLASH HAZARD</b>  |  |
| It is mandatory to read the detailed instruction sheet for the devices and to look at the devices to become familiar with them before attempting to install them, operate them, repair them or perform maintenance on them. |  |
| Use appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, CSA Z462, NOM-029-STPS or local equivalent.  |  |
| Equipment must only be installed and serviced by qualified electrical personnel.  |  |
| Turn off all power supplying the equipment before working on or inside equipment.   |  |
| Always use a properly rated voltage sensing device to confirm the power is off.   |  |
| <b>Failure to follow these instructions will result in death or serious injury.</b>   |  |

### 5.1. Power Supply

The HeatTag sensors installed in the different cubicles will be connected through IEEE 802.15.4 to Panel Server.

- HeatTag power supply: 230V AC

Panel Server power supply:

- 110-277V AC/DC 50-60Hz for **PAS400**, **PAS600** and **PAS800**
- 110-240V AC/DC 50-60Hz for **PAS600T**
- 24V DC for **PAS600L** and **PAS800L**
- PoE (Power over Ethernet) for **PAS800P**

## 5.2. HeatTag Installation Rules

### 5.2.1. General Implementation Rules

#### NOTICE

##### Limitations and rules

HeatTag can only be installed in cubicles with natural ventilation (no fans).  
It shall not be installed if there is any forced ventilation inside the switchboard

- Generally, one HeatTag is recommended to be installed per cubicle to mitigate risk of fire caused by thermal runaway. It can be in the power cable compartment and/or auxiliary cable compartment
- HeatTag cannot be installed if the ambient temperature around the HeatTag is higher than 70°C
- HeatTag can be installed in cubicles with an IP range from IP20 to IP55 (only with natural ventilation)
- One HeatTag can cover a maximum volume equivalent to 1m<sup>3</sup>
- The cubicle width cannot exceed more than 400mm on either side of the HeatTag sensor
- HeatTag can be installed in switchboards with Form 1, 2, 3 and 4
- HeatTag can detect the overheating of power cables and/or of auxiliary cables ( $\geq 1.5 \text{ mm}^2$ )

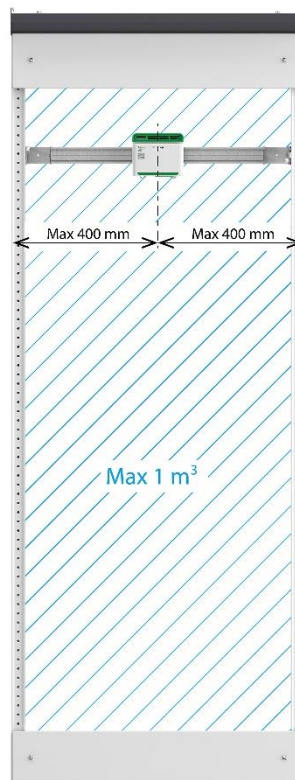


Illustration 2 : Cubicle volume and size limitations

| Cable Type                   | Insulator  |
|------------------------------|--|
| U1000 RV2                    | PVC (Polyvinyl - Chloride)                         |
| U1000A RV2                   | PVC (Polyvinyl - Chloride)                         |
| HO7RNF                       | EPR (Ethylene Propylene Rubber)                    |
| HO7VR                        | PVC (Polyvinyl - Chloride)                         |
| HO7VK                        | PVC (Polyvinyl - Chloride)                         |
| HO7VU                        | PVC (Polyvinyl - Chloride)                         |
| HO7Z1-K AS                   | LSZH (Low Smoke Zero Halogen - Unfused Polyolefin) |
| FS17-450/750 V               | PVC (Polyvinyl - Chloride)                         |
| RHH or RHW-2 or USE-2        | XLPE (Cross-Linked Polyethylene)                   |
| MTW or THWN or THHN          | PVC (Polyvinyl-Chloride)                           |
| THHN or THWN-2 or MTW or AWM | PVC (Polyvinyl-Chloride)                           |
| XHHW-2 or SIS                | XLPE (Cross-Linked Polyethylene)                   |
| THHN or THWN-2               | PVC (Polyvinyl-Chloride)                           |
| RHW or RHH                   | XLPE (Cross-Linked Polyethylene)                   |
| XHHW-2                       | XLPE (Cross-Linked Polyethylene)                   |
| THW                          | PVC (Polyvinyl-Chloride)                           |

Table 4 : Types of cables already tested and validated with HeatTag

## 5.2.2. Monitoring of Power Cables

HeatTag can detect the overheating of power cables, for incomers and for feeders. The general rule is to install one HeatTag in each cubicle that has power cables. It must be located in the cable compartment with the power cables (front access or rear access). The HeatTag must be located over the cables, close to the air exhaust.

- HeatTag must be installed just above the cable for the incomer
- HeatTag must be installed at the top of the cable compartment for the feeder

### NOTICE

The HeatTag **must not** be installed at the bottom of the cubicle. A HeatTag installed at the bottom of the cubicle will have zero function, as it will not be able to detect any particles.



Illustration 3: HeatTag must be installed at the top of the cable compartment for feeder

Typical implementations are provided in the following examples.

### 5.2.3. Front Access / Bottom Connection

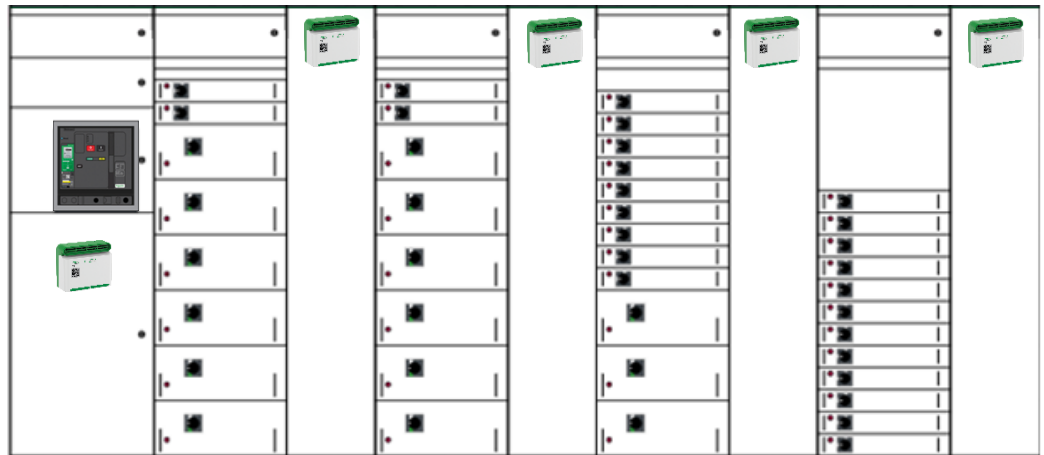


Illustration 4: Front access/bottom connection example 1



Illustration 5: Front access/bottom connection example 2

In these example, 5 HeatTag Sensors should be installed

- The HeatTag Sensors must be installed just above the incomer cable and below the incomer breaker
- The HeatTag Sensors must be installed at the top of the cable compartment for the feeder



## 5.2.4. Front Access / Top Connection

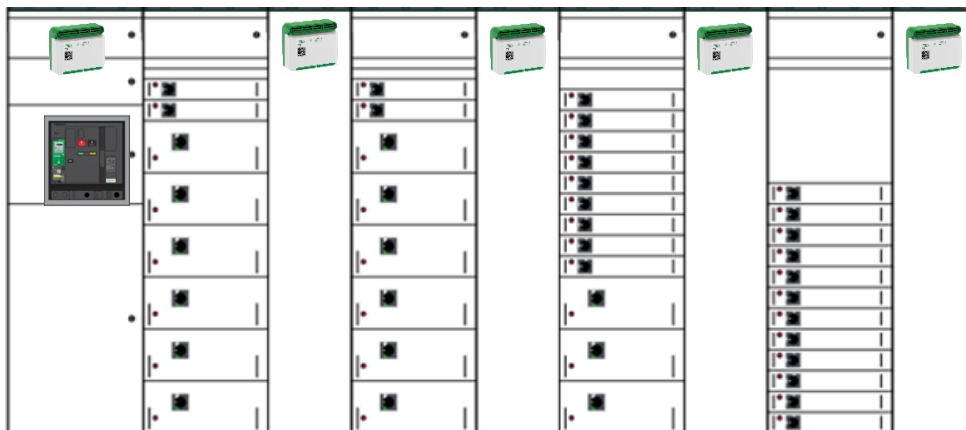


Illustration 6: Front access/top connection example 1



Illustration 7: Front access/top connection example 2

In these examples, 5 HeatTag Sensors should be installed

- The HeatTag sensors must be installed at the top of the cubicle.

## 5.2.5. Rear Access / Top and Bottom Connection

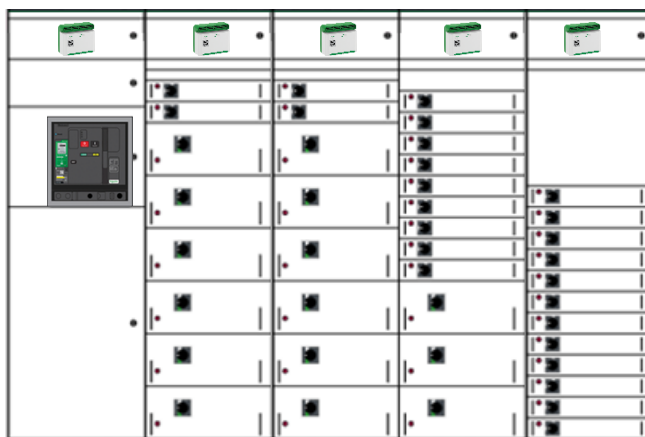


Illustration 8: Rear access/top and bottom connection example 1



Illustration 9: Rear access/top and bottom connection example 2



Illustration 10: Rear access view

In these examples, 5 HeatTag Sensors should be installed

- The HeatTag sensors must be installed at the top of the cubicle, on the rear cubicle.

### 5.2.6. Synthesis for HeatTag Sensor Quantities

One HeatTag sensor must be installed in each cable compartment. To get the required quantity of HeatTag sensors, consider the quantity of both incomer and feeder cubicles.

For example, for power cable monitoring:

- For a switchboard with 1 incomer cubicle and 6 feeder cubicles,  $1+6 = 7$  HeatTag sensors are required
- For a switchboard with 2 incomers (in 2 cubicles, connected by cables and not busways), 1 bus-tie and a total of 10 feeder cubicles,  $10+2 = 12$  HeatTag sensors are required

## 5.3. Panel Server Installation Rules

### 5.3.1. Panel Server Positioning in the Switchboard

The Panel Server must be mounted in an area with acceptable environmental conditions.

Panel Server pollution performances:

- Pollution degree 2 for the **PAS400**, **PAS600** and **PAS800** with AC power supply
- Pollution degree 3 for the **PAS600L** and **PAS800L** (24V DC)

It is therefore recommended to use Panel Servers with a 24V DC power supply unless the switchboards are located in rooms with pollution degree 2 or lower or equivalent protection measures are implemented.

**Note:** From the Radio Frequency standpoint, the solution to maximize performances is to install the EcoStruxure Panel Server close to the HeatTag sensors located at the top of the compartment, where there are fewer obstacles to Radio Frequency propagation. However, temperature in these compartments in some types of switchboards can be more stringent. Hence, a good compromise is to install the EcoStruxure Panel Server in a dedicated compartment as shown below, or similar.

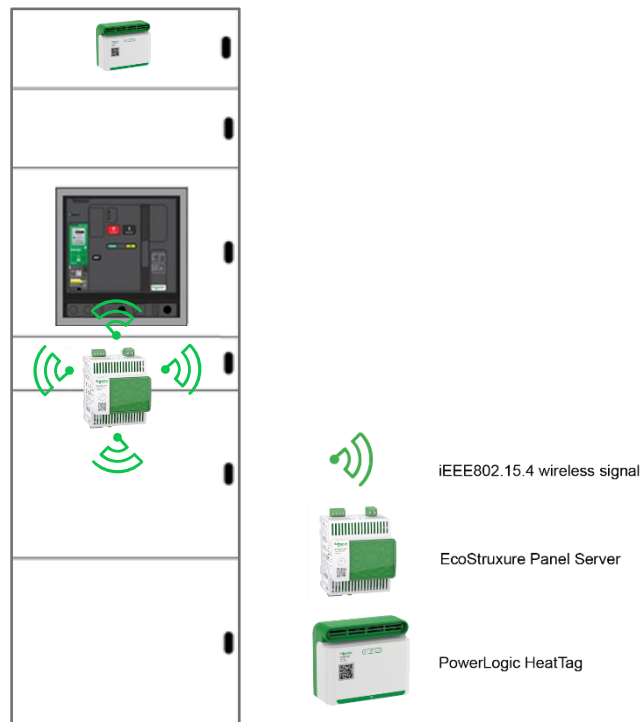


Illustration 11: EcoStruxure Panel Server position in Low Voltage Switchboard

### 5.3.2. Radio Frequency Channel

The wireless channel is obtained automatically (default setting). It is recommended to keep this setting. However, if other wireless devices are used in the same zone, the channel can be selected manually. Refer to **DOCA0172EN**.

### 5.3.3. Received Signal Strength Indicator (RSSI)

The quality of the Radio Frequency (RF) communication between EcoStruxure Panel Server and each paired HeatTag sensor can be evaluated by using the Received Signal Strength Indicator (RSSI).

The RSSI (unit dBm) is affected by different factors, such as distance and metal partitions between the Panel Server and the HeatTag Sensor. Refer to chapter “4.2 Distance and Panel Form of Internal Separation-Rules and Recommendations” for details.

To guarantee a robust RF communication, the RSSI must be higher than -75 dBm

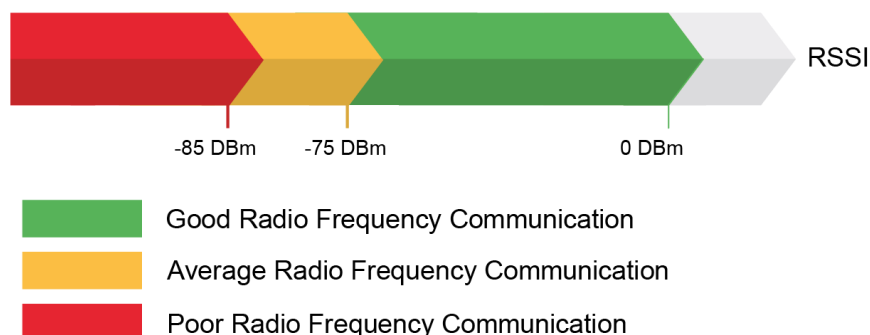
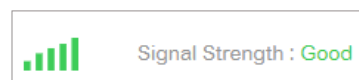


Illustration 12: RSSI levels

There are two ways to check the RSSI:

- Using EPC which gives the information about strong, medium, or weak RSSI signal,
  - From the EcoStruxure Panel Server icon, select "**Wireless devices**", the signal strength is represented by the graphic and text as in the following example:



- Using the PAS Webpages to get values
  - From the EcoStruxure Panel Server webpages, select "**Maintenance > Device Communication > Wireless Devices > Wireless Network Indicator > Panel Server Indicator** “

Measured value in text as in the following example:



## 5.4. Antenna Installation Rules

The external antenna has a 3 meter long cable, which can be plugged into the Advanced Panel Server for extended IEEE802.15.4 communication. The antenna itself is magnetic and is attached to the desired location using the magnet.

Refer to **NNZ58425** for more details.

**Note:** The antenna only works as an IEEE 802.15.4 antenna with Advanced Panel Server (**PAS800 / PAS800L / PAS800P**).

## 6. Architecture Implementation and Commissioning

### 6.1. EcoStruxure Panel Server Modbus Table

The EcoStruxure Panel Server Modbus table is available in the document **DOCA0241EN**.

### 6.2. Configuration and Setting

The following chapters explain the different steps to configure this architecture, here below an overview:

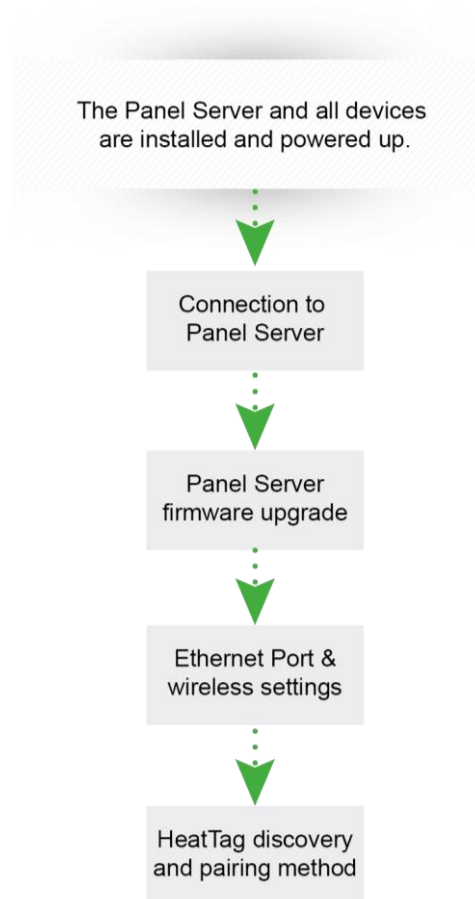


Illustration 13: Configuration overview

The following chapters explain a use case with a static IP address for the Panel server and how to establish the communication with HeatTag.

The EcoStruxure Panel Server commissioning can be performed either:

- Using the software EcoStruxure Power Commission (EPC)
- From the EcoStruxure Panel Server webpages

It is recommended to use the software EcoStruxure Power Commission (EPC) to perform the commissioning of the EcoStruxure Panel Server (PAS).

To install EcoStruxure Power Commission (EPC) software on a computer, proceed as follows:

- Search for “EcoStruxure Power Commission” on <https://www.se.com>
- Download EPC software
- Install EPC on a computer

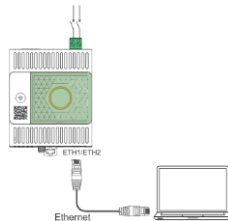
The following pre-requisites are required for the configuration and settings:

- EPC software is installed with the latest version
- Devices are properly installed, connected, and powered

### 6.2.1. Connection to the Panel Server

To commission the PAS with EPC, proceed as follows:

1. Power on the EcoStruxure Panel Server and connect it to a computer.



To connect a computer to the PAS through Ethernet, connect an Ethernet cable between the computer and one of the Ethernet ports on the PAS (ETH1 or ETH2).

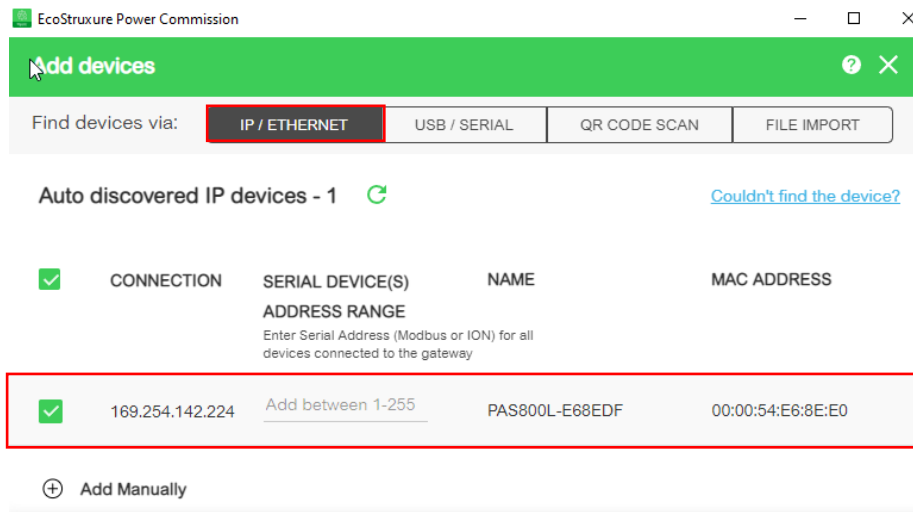
2. Launch the EPC software

3. From EPC, click on “Launch Device Discovery”

4. Select Find device via “IP/ETHERNET”

5. Once Panel server appears in the list, click “NEXT” then click “ADD DEVICE”

6. Enter the project name and details, then click on “NEXT” and “CONTINUE” and follow the project creation steps





## 6.2.2. Panel Server Firmware Upgrade

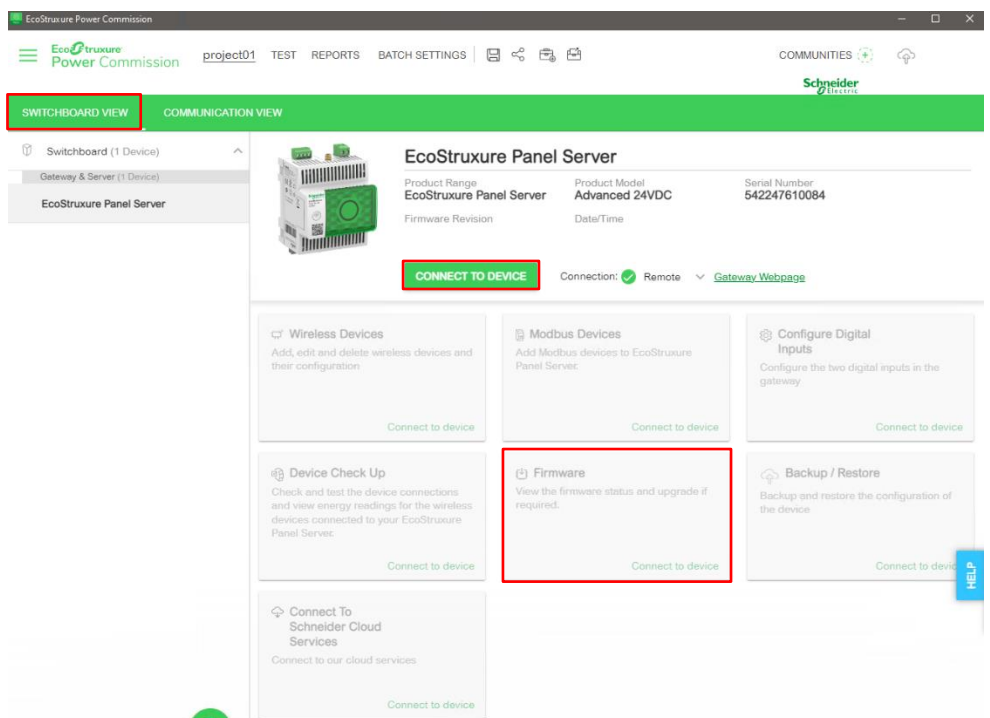
There are two different ways to update the Panel Server firmware

### Option number 1 – with EPC


1. From the switchboard main screen click on **“CONNECT TO DEVICE”** then select **“Firmware”**
2. The installed firmware version of the device is displayed. If a newer version is available, the new version is displayed and **“Upgrade required”** is displayed under **“Recommended action”**
3. To upgrade the firmware, select the device  then click on **“NEXT”**
4. Enter the **“username”** and **“password”** then click on **“UPGRADE”**
5. Follow the update process steps.

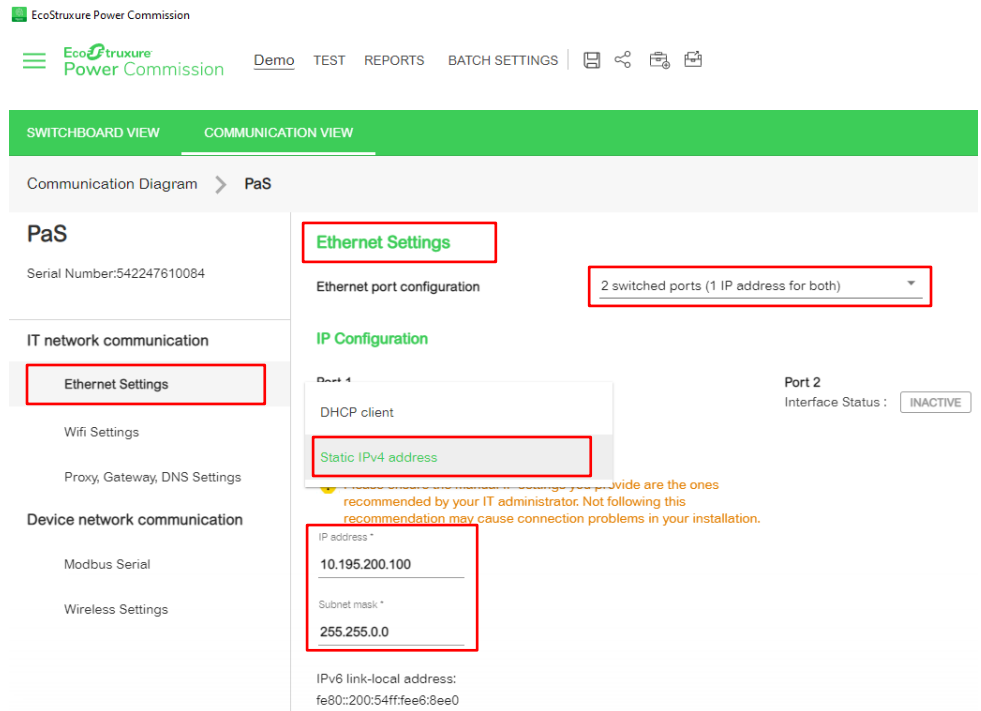
### Option number 2 – with the Panel Server webpages

1. From the EcoStruxure Panel Server webpages, select **“Maintenance >Firmware revision > Firmware update”**
2. Import the firmware file and follow the instructions
3. Reboot the EcoStruxure Panel Server to update the firmware
4. After the reboot, check that the firmware version is the latest available, to make sure that the update was successful



### 6.2.3. Ethernet Port & Wireless Settings with EPC

1. On the top green banner and click on “**COMMUNICATION VIEW**”.
2. Then, click on the  icon to edit the device’s communication settings on the Panel Server area.
3. On “**Ethernet Setting**” configuration screen, select the relevant mode between “**2 switched ports**” and “**2 separated ports**”.
4. Complete the Ethernet port fields. For more information regarding these options, refer to **DOCA0172EN**.



5. Select “**Wireless Settings**”. Switch “**ON**” the “**Network status**” to activate the wireless. There are two possibilities, depending on the number of PAS.
  - For the architecture with **one PAS** only, the default Panel Server wireless settings (communication periods and **Automatic** channel selection) can be used. In automatic mode, the panel server selects one of the 16 channels available (from 11 to 26), balancing communication loads to avoid disturbance.
  - For the architecture with two or more PAS, it is recommended to assign a channel to each PAS to improve the wireless communication.

6. When the settings are complete click **“APPLY”**.

The screenshot displays the 'EcoStruxure Panel Server' configuration page in the 'COMMUNICATION VIEW'. The left sidebar lists 'IT network communication' (Ethernet, Wifi, Proxy, Gateway, DNS) and 'Device network communication' (Modbus Serial, **Wireless Settings**). The main area shows 'Wireless settings' with a 'Network status' toggle (on), 'Channel selection' set to 'Manual', 'Channel' set to 20, 'Output power' set to 'LOW', and 'Wireless antenna' set to 'INTERNAL'. Below this, 'Communication Period' settings are shown: 'Communication period for power meter & protection (s)' at 15, 'Communication period for sensor (s)' at 120, and 'Communication period for control (s)' at 60. A 'HELP' button is on the right, and 'CANCEL' and 'APPLY' buttons are at the bottom right.

### 6.2.4. HeatTag Discovery and Pairing Method with EPC

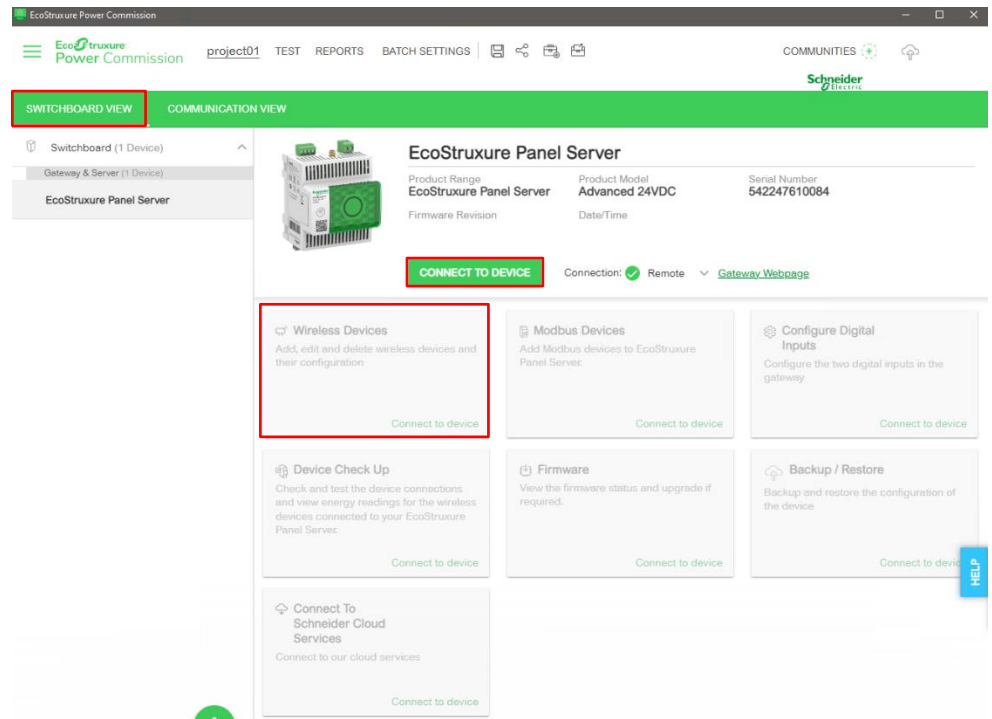
**Note:** HeatTag uses mesh network technology, messages are forwarded to their destination via intermediate nodes (other HeatTag sensors), extending the range of the network beyond the range of an individual device’s radio.

For this reason, it is recommended to add them one by one, going from nearest to farthest from the Panel Server.

If the Panel Server is in the middle of the switchboard, it is recommended to pair the HeatTag sensors on one side of the switchboard and then on the other side.

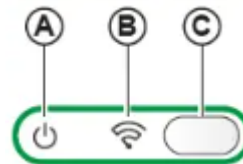
If several EcoStruxure Panel Servers are required to cover the full switchboard, it is necessary to pair each Panel Server separately with its allocated HeatTag sensors, to avoid mixing up the devices.

1. From the Switchboard main screen click on **“CONNECT TO DEVICE”** then select **“Wireless Devices”**.



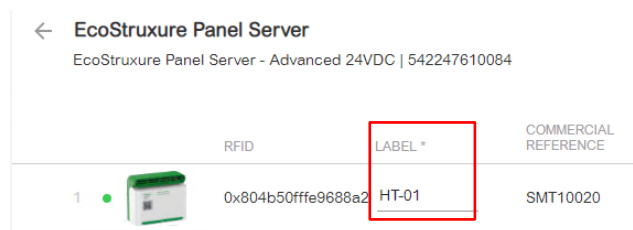
2. Once the **“Network status LED”** is steady orange (unpaired). From EPC, select **“Automatic discovery”**, then on the HeatTag, press the **“Operation button”** ((Z)) Automatic discovery (Network status LED blinking orange).

- A: Operation LED
- B: Network status LED
- C: Operation button



3. After few seconds the Panel Server will find the HeatTag sensors, and it will be possible to give them labels.

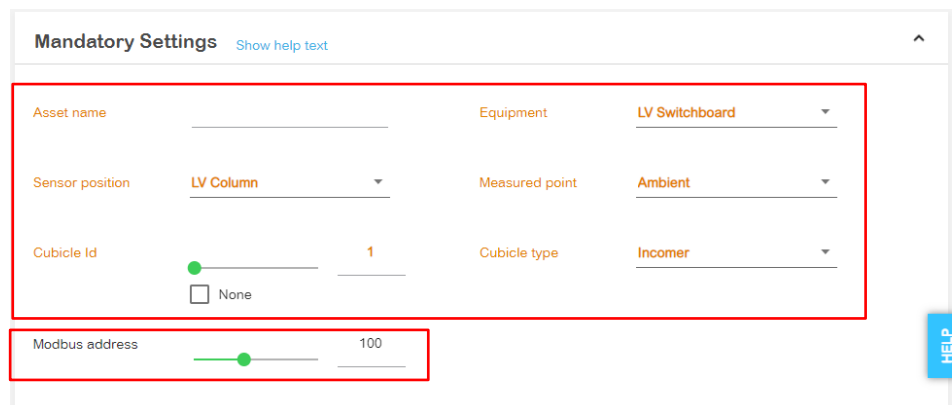
4. When all HeatTags have been added, click **“CONFIRM”**



5. The Panel Server implements a set of virtual Modbus register tables per paired IEEE 802.15.4 wireless device. Each time a new wireless device is paired to the Panel Server, the device is automatically assigned a virtual Modbus server ID. The first paired HeatTag assigned virtual server is ID 100. Each subsequent HeatTag takes the next virtual ID, which gets automatically incremented by one each time a new device is paired. (If Modbus serial line devices are also connected, make sure their Modbus slave addresses are below 100 to avoid any conflicting addresses.)

It is also possible to update the virtual server ID as follows:

- Select the HeatTag and give it the new Modbus address (Virtual sensor ID) from 1 to 254.
- On the same screen, it is also possible to enter information to identify / locate the HeatTag.



6. Save the project.

For more information regarding Configuration & settings, refer to **DOCA0172EN**.


### 6.2.5. HeatTag Alarms Configuration

HeatTag alarms can be managed through the PAS webpages:

1. Select the HeatTag and go to **“Settings” > “Data management” > “Alarms”**.

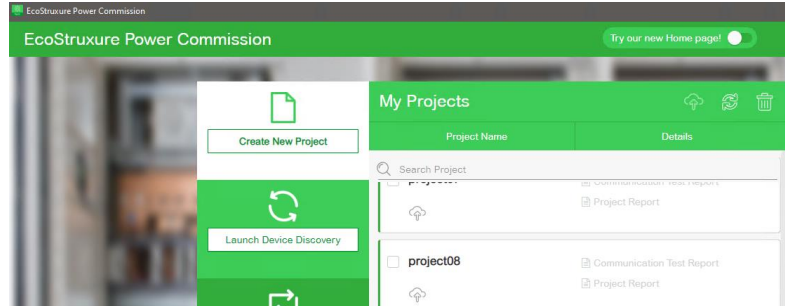


An alarm can be activated or deactivated with the Enable alarm checkbox.

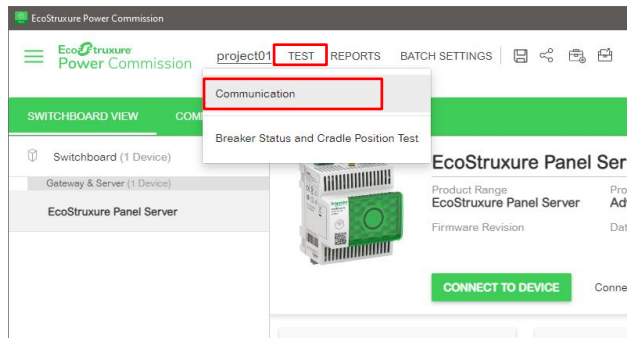
2. Then click on disc symbol  to save. When an alarm is enabled and becomes active, it is displayed in the page of the device on the “Monitoring and Control” webpage.

### 6.3. Testing

1. Open the project from the EPC main page



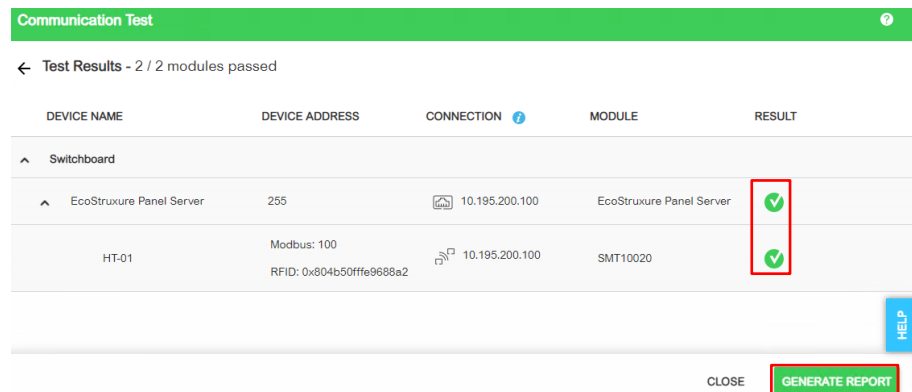
2. Select “Communication” in the “TEST” menu



3. The Communication Test page will open, select the devices to perform the test on and click on “RUN TEST”



A green tick mark will appear in the result column if the communication test is successful, otherwise a red cross will be displayed. In that case, double check the HeatTag (refer to next chapter “6.4 Troubleshooting”) and run the test again.



Click on “GENERATE REPORT” to generate the communication test report and save it.

Number of devices tested: 2

**PASSED: 2**  
**FAILED: 0**

**Switchboard**

| Device name              | Device Address                | Connection     | Module                   | Parameter Read              | Result        |
|--------------------------|-------------------------------|----------------|--------------------------|-----------------------------|---------------|
| EcoStruxure Panel Server | 255                           | 10.195.200.100 | EcoStruxure Panel Server | Serial number 542247610084  | <b>PASSED</b> |
| HT-01                    | 100<br>RFID:0x804b50ffe9688a2 | 10.195.200.100 | SMT10020                 | Serial number RN22252010053 | <b>PASSED</b> |

Communication Test Report Example

## 6.4. Troubleshooting

Different types of issues might occur during implementation. Some possible issues and their remedial actions are addressed below.

### 6.4.1. For HeatTag

| Issue  | Diagnostic                                  | Action                     |
|--|---|----------------------------|
| The operation LED blinks fast red after a HeatTag self-diagnostics | Fan clogging detected in the HeatTag sensor | Clean the fan air inlet    |
| The operation LED turns on red after a HeatTag self-diagnostics.   | HeatTag sensor inoperative                  | Replace the HeatTag sensor |

Table 5: HeatTag troubleshooting

For cleaning the HeatTag fan air inlet proceed as follows (requirements: dry air duster):

1. Check that the tamper-seal tapes are not damaged. If the tamper-seal tapes are damaged or missing, contact the Schneider Electric local representative
2. Disassemble the HeatTag sensor from the DIN rail
3. Put the HeatTag rear face on a flat surface, with the HeatTag fan air inlet is visible
4. Position the dry air duster vertically (spray nozzle to the top), 5 centimeters (1.97 in) away from the fan air inlet and spray dry air for 10 s on the fan air inlet
5. Re-install the HeatTag sensor
6. Switch on the HeatTag sensor
7. Check that the HeatTag sensor is operating normally (operation LED steady green)
8. If the problem persists, repeat the cleaning procedure
9. If the problem persists, replace the HeatTag sensor

### 6.4.2. For Panel Server

| Issue                                      | Diagnostic   | Action  |
|--|--|---|
| Panel Server status LED is not lit         | Panel Server is not powered, or power source is not stable | Power on the Panel Server or check power source quality   |
| Panel Server status LED is blinking orange | Panel Server is in degraded health state                   | <p>Check the Panel Server health state, which gives information regarding which internal component caused the Panel Server to start blinking orange.</p> <p>For example:</p> <ul style="list-style-type: none"> <li>• If Modbus is identified, then a Modbus- SL device may have been powered off or removed from EPC software, but EPC software did not remove the device as seen from the gateway</li> <li>• If IEEE 802.15.4 is identified, then a device may be powered off and stop communicating for a few cycles</li> <li>• If a local device is identified, then there may be an IPv4 address conflict</li> </ul> |
| Panel Server status LED is steady red      | Major malfunction  | Contact the Schneider Electric service representative for assistance  |

Table 6: Panel Server troubleshooting

### 6.4.3. Panel Server Troubleshooting for Webpages and Communication

| Issue   | Diagnostics   | Action  |
|---|---|---|
| The HeatTag is not discovered by the Panel Server or does not communicate with the Panel Server | <ul style="list-style-type: none"> <li>• EcoStruxure Panel Server does not recognize the HeatTag</li> <li>• The same Modbus server ID is set to two Modbus devices in the network</li> <li>• Incorrect device configuration settings</li> </ul> | <ul style="list-style-type: none"> <li>• Verify that a server ID is not used twice in the Modbus network</li> <li>• Verify that the HeatTag settings are set according to the Panel Server</li> </ul>   |
| Status of the HeatTag is not updated in the Panel Server webpages or EPC software               | The HeatTag is powered off or has stopped communicating with the Panel Server (for example, if the HeatTag has been moved out of range) and has the status Not connected in the webpages  | <ul style="list-style-type: none"> <li>• Verify that the device is powered on</li> <li>• Verify that the wireless device is not installed out of range of the EcoStruxure Panel Server</li> </ul>   |
| Unable to browse the Panel Server webpages  | Incorrect network configuration   | <ul style="list-style-type: none"> <li>• Verify that all IP parameters are correct</li> <li>• Verify that the Panel Server receives requests (ping the Panel Server in the DOS prompt. Type ping and Panel Server IP address. For example, ping 169.254.0.10)</li> <li>• Verify that all connection settings are correct in the browser Internet options</li> </ul> |
| The Panel Server has lost communication with the HeatTag  | Interference on the radio frequency channel   | <ul style="list-style-type: none"> <li>• Change the radio frequency channel that communicates between the HeatTag and the Panel Server in EPC software or Panel Server webpages</li> </ul>  |

Table 7: Panel Server troubleshooting for webpages and communication

For more details, refer to **DOCA0172EN**, **DOCA0178EN** and **DOCA0248EN**

For more details regarding HeatTag - Operation and Network status LED, refer to **DOCA0171EN** and **MFR517801**.



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