Smappee Infinity SMP Series

Installation manual

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Smappee Infinity SMP Series – Installation manual – English (US)

1. Safety instructions

Safety warning

Carrying out electrical work in a home or workplace can be dangerous.
The Voltage Module, CT Hub, Solid Core 3-Phase CT, Current Transformers (CT) and Rogowski coils are usually installed inside the distribution board under a protective cover. The other components can be installed both inside and outside the distribution board.

Only certified electricians may carry out the installation, which must be in accordance with the national safety regulations.

Safety precautions

⚠	**CAUTION:** Risk of electric shock.
⚠	**CAUTION:** Refer to the accompanying documentation whenever you see this symbol.
⊘	DO NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burns, or arc flash.

Please observe the following safety precautions to avoid potential electric shock, fire, or personal injury:
- Use this product only for its intended purpose.
- Use the product indoors only.
- Only mount the power cable in a sealed enclosure.
- Locate a free fuse or install an additional fuse for the protection of the Voltage Module. Connect the power cable according to the connection diagram, see next pages.
- The circuit breaker acts as the disconnect device and must meet IEC 60947-2
- Do not open the equipment or touch any of its electronic circuitry.
- Do not attempt to open, repair, or service any parts.
- Only use the cables delivered with the product.
- Do not use the product if damaged.
- Do not use damaged current transformers or cables.
- Do not immerse the product in water or any other liquids.
- Do not expose the product to heat, flame, or extreme cold.

Product identification

- Smappee Voltage Module
- Smappee CT Hub
- Smappee Solid Core 3-Phase CT
- Smappee Gateway Module Advanced
- Smappee Wi-Fi Connect
- Smappee Connect
- Smappee Input module
- Smappee Output module

Maintenance

- Clean the outside only with a dry, clean cloth.
- Do not use abrasive agents or solvents.

Responsibility

- Assembly, connection, and use must be carried out in accordance with the installation standards currently in force.
- The device must be installed in accordance with the instructions given in this manual.
- Failure to observe the instructions for installing this unit may compromise the device's intrinsic protection.
- The device must be placed in a system that complies with the applicable standards and safety regulations of the country of installation.
- Cables may only be replaced with cables of the correct rating.

Explanation of the safety symbols

The table below explains the safety symbols.

▢	Class II equipment does not require an earth connection.
⚠ IK 06	This device has been tested according to IEC 62262 and complies to impact class 6 (Impact energy: 1 Joule).

Residual safety risk

- The device's housing has IK06 impact immunity level. Therefore, it is essential that the housing is not damaged during installation.
- When there is visible damage to the device's housing, it is recommended to replace the device to prevent any hazardous situation to occur.

Support

Only certified electricians or equivalent may install the Smappee Infinity SMP Series.
If you have any questions, please contact your local distributor.

In case your local distributor is unable to help you, you can contact Smappee at:
support@smappee.com.

Smappee n.v.
Evolis 104
8530 Harelbeke
Belgium

2. Smappee Infinity SMP Series modularity

Smappee Infinity SMP Series is an all-in-one energy management system that offers detailed real-time and historical energy data as well as IoT-enabled control and dynamic load balancing. It monitors solar PV, home storage, individual or groups of appliances and complex energy consumers such as heat pumps, air conditioning or electric cars. In addition, it offers intelligent automations that enhances security, comfort and cost savings. The system is future-proof and can adapt to any scenario, allowing over-the-air updates and extra modules to be added at any time.

Smappee Infinity SMP Series is a global solution that is compatible with all inverters and almost any electrical installation worldwide. Thanks to the compact hardware, it fits easily into almost any distribution panel. Once the system is up and running, maintenance requires little effort, resulting in a low total cost of ownership. The two-step installation process consists of the physical installation in the distribution panel followed by configuration via the installation wizard in the Smappee App. The Smappee Dashboard also allows further configuration. Preparing the set up at your premises prior to carrying out the physical installation for your customer, saves valuable time.

A modular solution for every energy need.

The strength of the Smappee Infinity SMP Series system lies in its modularity, allowing you to mix and match according to your energy needs. Depending on the setup, Smappee Infinity SMP Series will gather energy data, communicate that data to a data platform and, if desired, control the energy flows in the building. Discover the different Smappee modules for different features and services.

- **Data gathering**
  The Smappee CT Hub gathers energy data by measuring different currents with up to 4 CTs or Rogowski Coils. You can have up to 7 CT hubs, allowing flexibility from a single circuit to 28 Circuits. You can also use the Smappee Solid Core 3-phase CT as a simple installation alternative. Or add a Smappee Input module to count pulses or monitor input status with up to 4 digital inputs which enables other utilities like water, gas or steam. .
- **Communication**
  The Smappee Gateway Module Advanced is the gateway between the Smappee modules and the Smappee Cloud and ensures secure data storage. It also interacts with Smappee's controlling modules and 3rd party components. Use the Smappee Connect or Wi-Fi Connect as a cost-efficient gateway to add communication to the Smappee Infinity SMP Series.
- **Control**
  Control any load or device with the Smappee Output module. The Output module can also be used as a control signal for smart devices. On top of that, you can integrate third party IoT products via the Smappee App. Finally, set up rules to connect and control these smart devices with the Smappee Automations in the App to perform advance demand, Time of Use and energy penalty mitigation plans.
- **Power supply**
  The Smappee Voltage Module measures the line voltage of the connected phases, collects the currents from the CTs and calculates power, active, reactive and other energy and power quality data. The Voltage Module does not need its own control power circuit, it is powered of the voltage sense circuitry.

The Smappee Infinity SMP Series is configured through the Smappee Energy Monitor mobile app (which you can download from the Apple App store or Google Play store). The real-time and historical monitoring data are accessible for visualization and analysis purposes.

Smappee Infinity SMP Series can easily pair with IoT products and platforms such as Nest, Amazon Alexa, Home Assistant and OpenHAb and uses the MQTT and EEBUS communication protocols for even more integrations. Or simply add a Output module to manage any load. Discover pre-defined automations for self-consumption, smart EV charging and overload protection. Our dynamic load balancing technology directs energy to the HVAC, hot water system and home battery to provide additional energy efficiency and peace of mind.

3. How to install

The installation procedure consists of the following steps:

1 Planning and site preparation: to determine the complete monitoring solution.

2 Initial setup and configuration: the creation of a location, its properties, and the loads to be measured.

3 Physical installation: the physical installation of all the Infinity SMP Series components.

4 Smappee cloud connection: the selection of internet connectivity and configuration.

5 Configuration of CTs.

6 Validation of the installation: checking the accuracy of live power values.

Optional steps:

7 Configuration of Smappee Input module: the configuration of the pulse input sensors.

8 Configuration of Smappee Output module: the configuration of the relay outputs.

This procedure is done with the Smappee mobile app.

Download on the App Store   GET IT ON Google Play

4. Planning and site preparation

The first step is to determine the complete monitoring solution. This consists of listing all the loads that need to be measured, their properties, and the required hardware (Smappee and others).

The checklist provided helps you to determine all necessary technical information for the next steps and also to collect all the necessary hardware.

General architecture - what is to be monitored

- ☐ Single or multiple metering locations: Where are the fuse boxes or loads to be monitored? (Location inside the building, distances between them, etc.).

- ☐ Total load (main service): Yes/no?

- ☐ Specific appliances? (e.g. HVAC, Chillers, Heat pump, EV, Solar, Hot Water etc.).
- ☐ Circuits (main sockets, lighting area, etc.).

- ☐ Digital pulse inputs to be measured? (e.g. Gas, Water or Steam meter, sensors, Contacts etc.).

- ☐ Any load to be controlled? Directly or with a Contactor (single or 3-phase).

Details

- ☐ Topology: Verify the mains voltage – single phase (1P), three-phase 3P+N (3*208) or 3P (3*347) .

- ☐ Phases of each measured load (circuits and appliances): Single-phase, three-phase, 3P+N (3*208V) or 3P (3*347V), voltage, frequency, power, amps.

- ☐ Cross-sectional area or diameter of the wiring.

- ☐ How will a stable internet connection be provided to the energy monitor: Wi-Fi, Ethernet, or 3G/4G cellular network?

Smappee Configurator

Use the Smappee Configurator to easily determine your Smappee setup and components. A four step process will get you a detailed Bill of Materials (BoM) with article number, article description and quantity.

Smappee Configurator

Easily determine your Smappee setup and components.

①————②————③————④
General   Loads   Licenses   Setup

You can access the Smappee configurator using the Smappee Partner Portal and choose 'Smappee configuration tool'

3. Smappee configuration tool.

Configure the right set-up with the Smappee configurator.

Tools (not included)

☐ Multimeter.

☐ Screwdrivers.

☐ Wire stripper.

☐ Flashlight.

☐ Needle-nose pliers.

☐ Wire cutter.

☐ Optional: drill, drill bits and screws.

Supplies (not included)

☐ Cable ties.

☐ Single or three-phase circuit breaker (fuse for Smappee Voltage Module only).

☐ Ethernet cable in the case of wired communication.

☐ External Smappee Wi-Fi antenna in the case of low Wi-Fi signal.

☐ 3G/4G Dongle in case of cellular communication.

☐ Single phase or 3-phase breaker when installing an Output module in combination with a breaker.

☐ Solid cable with diameter range 0.5 to 1.5 mm² (20 AWG – 15 AWG) when installing an Input and/or Output module.

5.   Initial setup and configuration

The first step of the Smappee Infinity SMP Series installation is creating a location and defining the measured loads and their properties. The location defines where the Smappee will be installed (e.g. house, store, or site address).

This procedure is done with the Smappee Energy Monitor mobile app.

Remarks

- The Smappee App will guide you through the various steps to fill in all the required information.

Steps

- Log in to the Smappee App with the corresponding Smappee username or create a new account.
- Create a new location.
- Follow the steps shown in the mobile app.

> To add a new location under the same user account in the mobile app, go to Settings > Your Locations > Add a new location.

6.   Physical installation

This procedure describes the required steps for the physical installation of the Smappee Infinity SMP Series.

> ⚠️ **WARNING:** For safety purposes, it is necessary to **power off the installation** before proceeding with the physical installation.

Steps

1 Locate a free fuse or install an additional fuse for the protection of the Voltage Module.

2 Connect the power cable according to the connection diagram, see next pages.

3 Mount the Voltage Module and connect the power cable.

4 Mount the CTs, Rogowski coils and Solid Core 3-Phase CTs around the phase wires. Keep in mind that the arrow indicated has to point in the direction of the current flow (K > L).

5 Connect the installed CTs to their corresponding CT Hub.

6 Mount the gateway (Gateway Module Advanced or Connect-series).

7 Make the following interconnections:
   a. **The first CT Hub or Solid Core 3-Phase CT to Port A of the Voltage Module** using the supplied Smappee Bus cable.
   b. Connect all the CT Hubs and/or Solid Core 3-Phase CTs with the supplied Smappee Bus cable or a custom twisted-pair RJ10 cable.
   c. Plug the supplied **bus termination plug** in the free port of the **last CT Hub or Solid Core 3-Phase CT.**
   d. Connect **Port B of the Voltage Module to Port B of the gateway** using the (longest) supplied Smappee Bus cable or a custom twisted-pair RJ10 cable.
   e. When you're installing Input and/or Output modules, connect them between the Voltage Module and the gateway.

> 💡 In a multi-phase environment, all phases must be connected to the Smappee Voltage Module according to the topology. This means that the appropriate wires of the power cable must be connected to their respective phases (L1, L2, L3).

|	
	Label the current transformers on the clamp and connector side to enhance visualization.
	The arrow indicated on the Split Core CT, Solid Core 3-Phase CT or Rogowski coil (K > L) should point in the direction of the current flow.
💡	Mount the supplied bus termination plug in the free port of the last CT Hub.
	You can use a custom RJ10 cable instead of the standard Smappee Bus cable. The RJ10 must be a twisted pair cable. Pins 1 & 4 and Pins 2 & 3 must be twisted pairs. **See the Smappee Bus cable specification in section 13.**

Connection diagram – 2P+N (2*120V)

⬛	Black – L1
🟥	Red – L2
⬜	White – Neutral
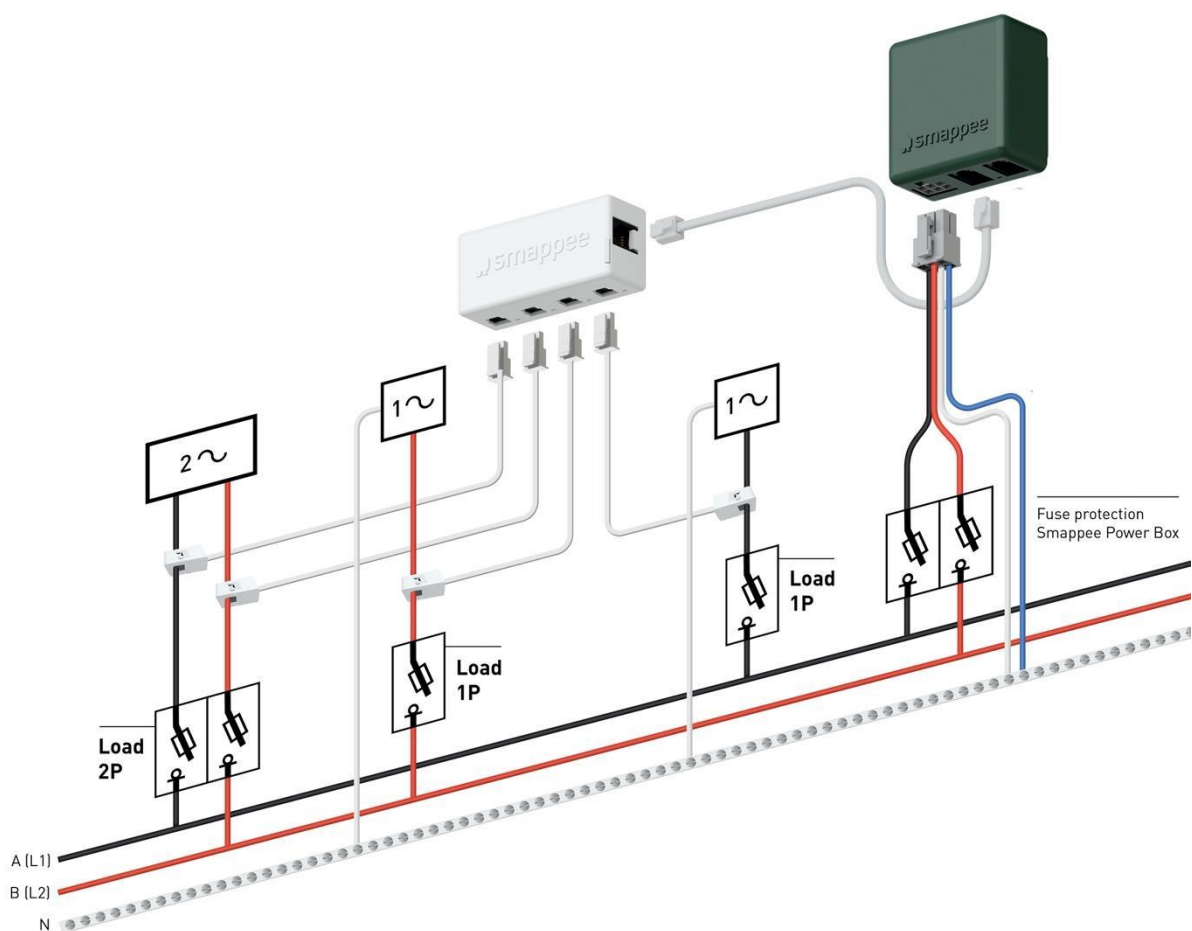
> ⚠️ **WARNING:** The above wiring and color scheme is indicative. National regulations must be respected. Wiring for the Americas region should be minimum 18 AWG/600 V UL-style 1015 protected by a 6 A circuit breaker and maximum 16 AWG/600 V UL-style 1015 protected by a 6 A or 10 A circuit breaker. The circuit breaker must comply with UL 489.

Connection diagram – 3P+N (3*208V)

⬛	Black – L1
🟥	Red – L2
🟦	Blue – L3
⬜	White – Neutral
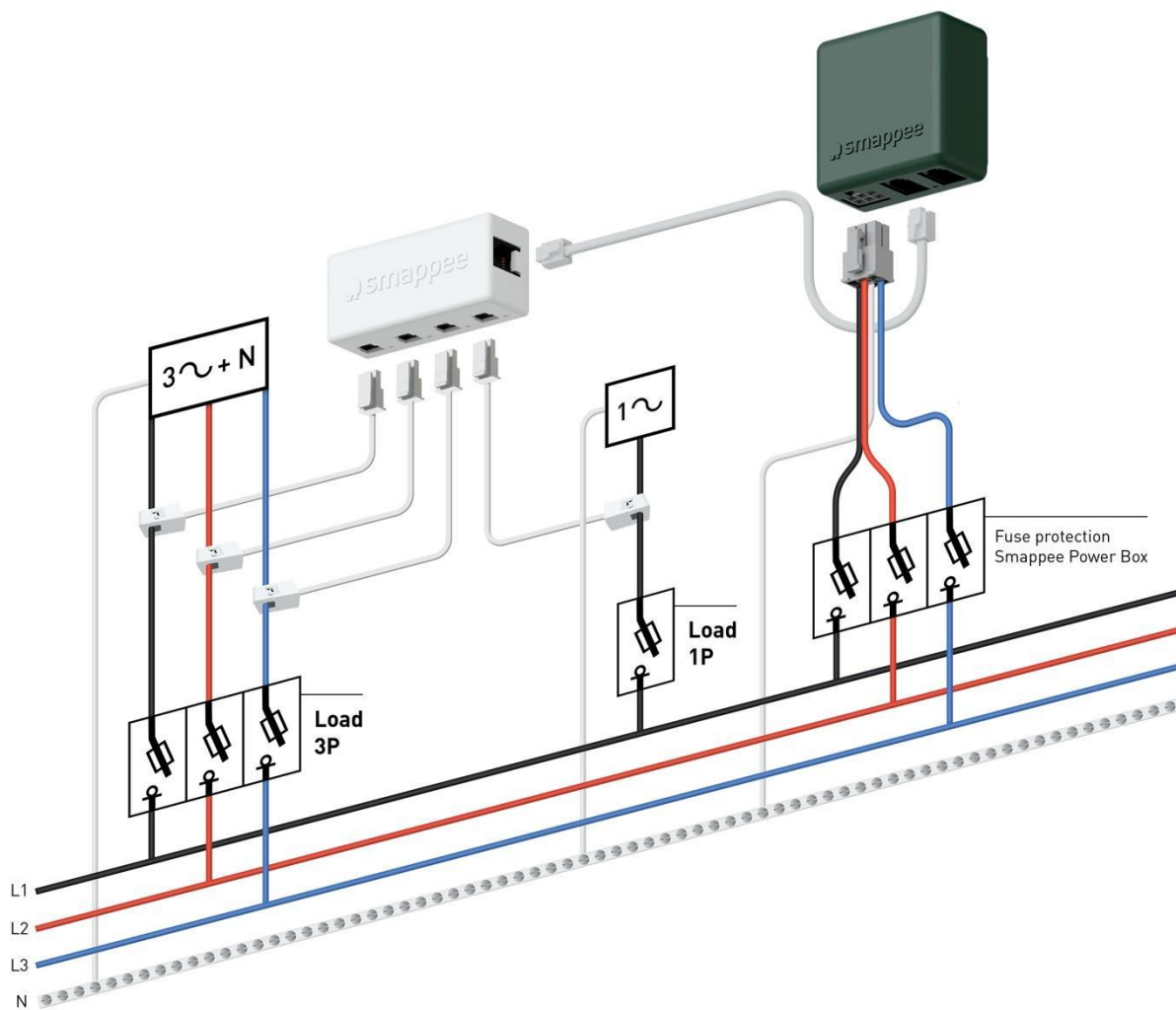
Fuse protection
Smappee Power Box

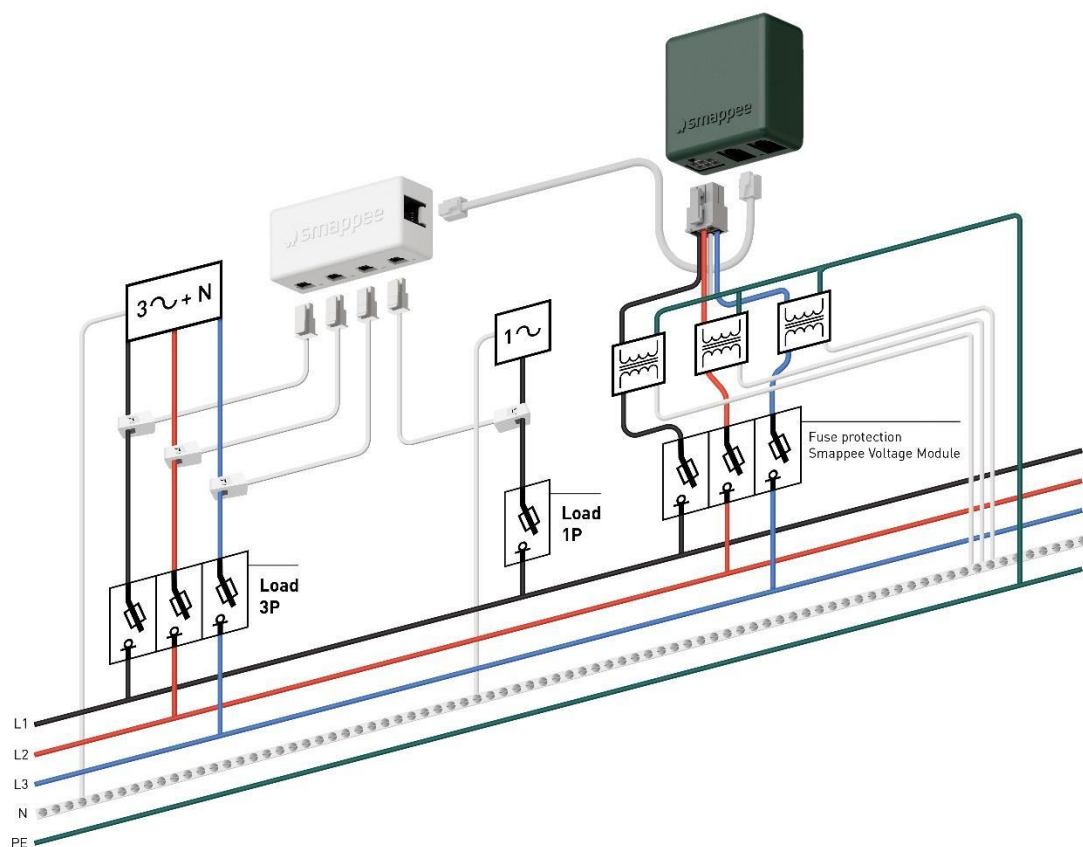Load 3P

Load 1P

3∿+N

1∿

L1
L2
L3
N

⚠️	**WARNING:** The above wiring and color scheme is indicative. National regulations must be respected. Wiring for the Americas region should be minimum 18 AWG/600 V UL-style 1015 protected by a 6 A circuit breaker and maximum 16 AWG/600 V UL-style 1015 protected by a 6 A or 10 A circuit breaker. The circuit breaker must comply with UL 489.

Connection diagram – 3P+N (3*347V)

For 347/600V installation the use of Potential Transformers is required.
Contact Smappee for suggested potential transformers.

■	Black – L1
■	Red – L2
■	Blue – L3
□	White – Neutral
■	Green – Ground

⚠	**WARNING:** The above wiring and color scheme is indicative. National regulations must be respected. Wiring for the Americas region should be minimum 18 AWG/600 V UL-style 1015 protected by a 6 A circuit breaker and maximum 16 AWG/600 V UL-style 1015 protected by a 6 A or 10 A circuit breaker. The circuit breaker must comply with UL 489.

7. Smappee Cloud connectivity

In this chapter the possible internet options to connect to the Smappee cloud are described. The internet connectivity options depend on the type of gateway (Gateway Module Advanced or Connect series) of your Infinity SMP Series installation.

Smappee Gateway Module Advanced as gateway

During start-up, the Gateway Module Advanced will automatically check which internet connectivity is used.

Option A – Connection through Ethernet:
The internet connection will be established automatically. The light on the Gateway Module Advanced will display a continuous green color when ready.

Option B – Connection using Wi-Fi
● The Gateway Module Advanced will open its hotspot, which allows configuring the Wi-Fi network and password.
● The Gateway Module Advanced will emit a flashing blue color when the hotspot can be selected in the list of available Wi-Fi networks on your smartphone. Please note that it can take a few minutes before the hotspot is open.
● Make sure your mobile data (3G/4G/5G) is switched OFF on your smartphone before proceeding.
● For more details about the Wi-Fi properties, please see Addendum 2 – Wi-Fi connection properties and firewall rules.

Option C – Connection through a 3G/4G/5G cellular network:
In order to use a 3G/4G/5G cellular network, first follow all steps to setup a Teltonika RUT240 4G Router. This way a local Ethernet and Wi-Fi network is created available for the Gateway Module Advanced.

Once the Teltonika RUT240 4G router is configured, follow the steps as described in option A or option B.

	Resetting the Wi-Fi: If the Smappee has to be connected to another Wi-Fi network or the authentication password has to be changed, select in the Smappee App Settings > Your Smappee Monitors > Infinity SMP Series modules > Smappee Gateway Module Advanced > Change your Wi-Fi settings and follow the steps in the app.
	Smappee Gateway Module Advanced reset button: Press the reset button on the bottom of the Gateway Module Advanced using a small pin.

	Factory reset: Carry out a factory reset when you re-install a Smappee Infinity SMP Series monitor at another location or when you want to start with the factory settings. Press the reset button of the Gateway Module Advanced with a small pin until the light turns blue, after approximately 20 seconds. During this process, the Gateway Module Advanced will first emit a purple color, then a yellow color, then no color, and finally a blue color.

Smappee Connect series as gateway

Option A – Connection through Ethernet
Only possible with a Smappee Connect. Insert the ethernet cable before power-up.

Option B – Connection using Wi-Fi
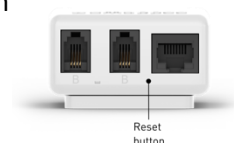Possible with a Smappee Connect and Smappee Wi-Fi Connect.

Setup
- Select and set up the internet connection in the Smappee mobile app.
- The Connect will open its hotspot.
- The light on the bottom of the Connect will emit a flashing blue color when the hotspot can be selected in the list of available Wi-Fi networks on your smartphone. Please note that it can take a few minutes before the hotspot is open.
- Make sure your mobile data (3G/4G/5G) is switched OFF on your smartphone before proceeding.
- For more details about the Wi-Fi properties, please see Addendum 2 – Wi-Fi connection properties and firewall rules**.**

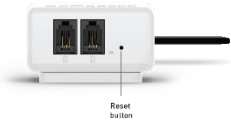|	**Resetting the Wi-Fi:** If the Smappee has to be connected to another Wi-Fi network or the authentication password has to be changed, select in the Smappee App Settings > Your Smappee Monitors > Infinity SMP Series modules > Smappee Connect > Change your Wi-Fi settings and follow the steps in the app.
	Smappee Connect reset button: Press the reset button on the bottom of the Connect using a small pin.
	Factory reset: Carry out a factory reset when you re-install a Smappee Infinity SMP Series monitor at another location or when you want to start with the factory settings. Press the reset button of the Connect with a small pin until the light at the bottom of the Connect turns blue.

Option C – Connection using 4G
Possible with a Smappee 4G Connect.

Setup
- Select and set up the internet connection in the Smappee mobile app.
- The Connect will open its hotspot.

- The light on the bottom of the Connect will emit a flashing blue color when the hotspot can be selected in the list of available Wi-Fi networks on your smartphone. Please note that it can take a few minutes before the hotspot is open.
- Make sure your mobile data (3G/4G/5G) is switched OFF on your smartphone before proceeding.

💡	**Smappee 4G Connect reset button:** Press the reset button on the bottom of the Connect using a small pin.
	Factory reset: Carry out a factory reset when you re-install a Smappee Infinity monitor at another location or when you want to start with the factory settings. Press the reset button of the Connect with a small pin until the light at the bottom of the Connect turns blue.

8. Configuration of CTs

In this procedure, the initial setup and configuration are linked to each physical CT.

Proceed in the Smappee Energy Monitor mobile app and follow the steps as shown.

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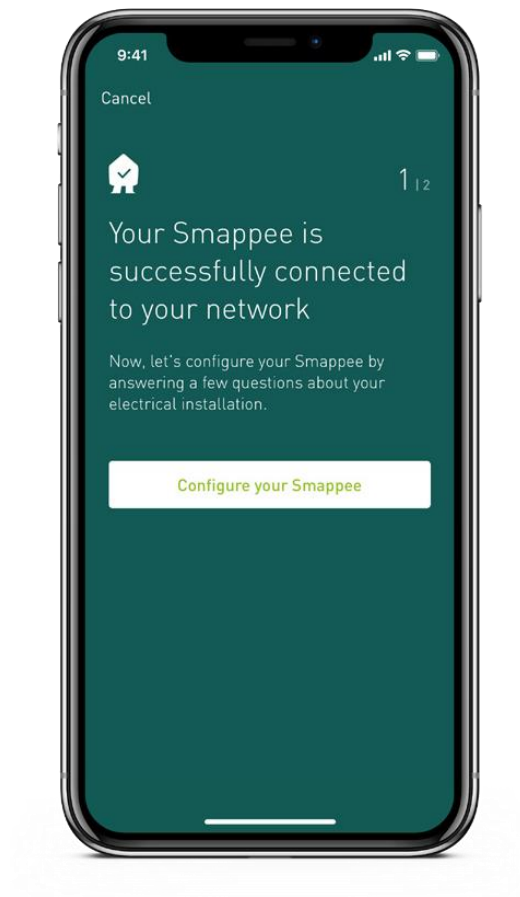
9. Validation of the installation

Once the installation is complete, it is good practice to validate the correct operation of the monitoring solution.

You should check that all CTs are operational and measuring the correct power values. If loads are being measured, this does not automatically mean that the power values are correct. Incorrect line voltage and current mapping could lead to incorrect power values and wrong monitoring data.

To check the correct operation of the Smappee Infinity SMP Series, Smappee provides real-time values of all measured loads. You can access these real-time values with the mobile app or via the Smappee Dashboard.

There are two options for visualizing real-time values:

1. The Smappee App reports real-time active power values for each input individually.
2. The Smappee Dashboard reports real-time the active and reactive power, line & phase voltage, power factor, and current of each input: https://dashboard.smappee.net – see Live electricity values card.

	Real-time values in the Smappee App: go to Settings > Your Smappee monitors > Load Configuration. Tap a specific load to get a more details.
	The details of each measured load, such as the used CT Hub input and the phase mapping properties, are accessible under Load Configuration in the Smappee App. Select in the Smappee App Settings > Your Smappee Monitors > Load Configuration.
	Real-time values in Smappee Dashboard: Go to **https://dashboard.smappee.net** and check the "Electricity usage" card.

Live electricity values   Star (3P+N)   Edit configuration

Channel	Phase	P [W]	Q [var]	PF	I [A]	V$_{LL}$ [V]	V$_{LN}$ [V]
Grid	L1	15	75	0.20	0.322	240.4	416.0
Grid	L2	11	33	0.32	0.146	239.7	415.4
Grid	L3	71	25	0.94	0.317	239.8	415.8

Use a digital multimeter to determine which phase powers the different loads. Please note that the color code inside the fuse box and/or phase numbering may be incorrect.

0 volt is measured when both loads are on the same phase.

400.0 V   0.0 V

10. Configuration of Smappee Input module

The Smappee Input module only works with a Smappee Infinity SMP Series setup including a Gateway Module Advanced as gateway. It is not compatible with the Smappee Connect series.

You can connect up to 10 Smappee Input and/or Output modules to one gateway.

The Input module has 4 digital inputs to count pulses from other meters like Water, Air, Gas, Electric and Steam or monitor input status from other equipment. (low/high/on/off).
The inputs are indicated on the bottom of the module. One input has two horizontal wire connections next to each other.
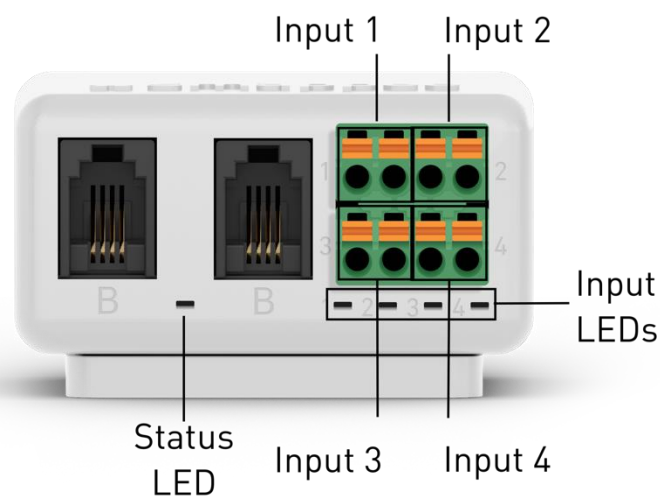
Step 1: Physical installation

1 Remove the green connector from the Input module.

2 Connect the two pulse wires of the appliance you want to monitor to a pulse input of the green connector by mounting wires* using the removable push in spring connection.

3 Place the green connector back in the module.

4 Connect the Input module between the Voltage Module, Gateway Module Advanced or other modules via the B-bus using both B ports. Use the supplied Smappee Bus cable or a custom twisted-pair RJ10 cable.

	*Use a solid cable with diameter range 0.5 to 1.5 mm² (20 AWG - 15 AWG) to connect the pulse output with the green connector. Stranded cable is not recommended. **Strip the wire for 5 mm.**
	Removable push in spring connection: ● Press the orange push button above each wire input using a small flat screwdriver. Keep the button pressed when inserting the wire. Release the orange push button to hold the wire in place. ● Make sure the wire is connected correctly. Pull gently on the wire and check whether it's connected firmly.
	You can use a custom RJ10 cable instead of the standard Smappee Bus cable. The RJ10 must be a twisted pair cable. Pins 1 & 4 and Pins 2 & 3 must be twisted pairs. **See the Smappee Bus cable specification in section 13 of the Infinity SMP Series Installation manual.**
	Both ports (RJ10 connectors) of the modules are identical. There's no special attention needed for making the interconnections.
	Make sure the wire connection of the green connector is connected correctly. Pull gently on the wire and check whether it's connected firmly.

Step 2: Configuration

The Input module can be configured when the Smappee Infinity SMP Series is installed and operational. The inputs of the module have to be configured individually.

	Configure the Input module using the Smappee App: Go to Settings – Your Smappee monitors – Infinity SMP Series modules – Select Input module. Follow the procedure in the app to complete the configuration of each input.
	If a physically installed Input module is not shown in the Infinity SMP Series modules list in the Smappee App, tap Scan for modules at the bottom of the Infinity SMP Series modules screen.

Consult the data of the inputs in the Smappee App and Dashboard:
- App: Open the App and scroll down on the dashboard screen to Live inputs. Tap a specific input to view its historical data.
- Dashboard: Open the Dashboard and add a Live inputs card.

11. Configuration of Smappee Output module

The Smappee Output module only works with a Smappee Infinity SMP Series setup including a Gateway Module Advanced as gateway. It is not compatible with the Connect series.

You can connect up to 10 Smappee Input and/or Output modules to one gateway.

The Output module has 2 insulated relay outputs. Each output has 3 contacts per output: NO (Normal Open), C (Common) and NC (Normal Closed). These 3 contacts are mounted horizontally from left to right for each output.
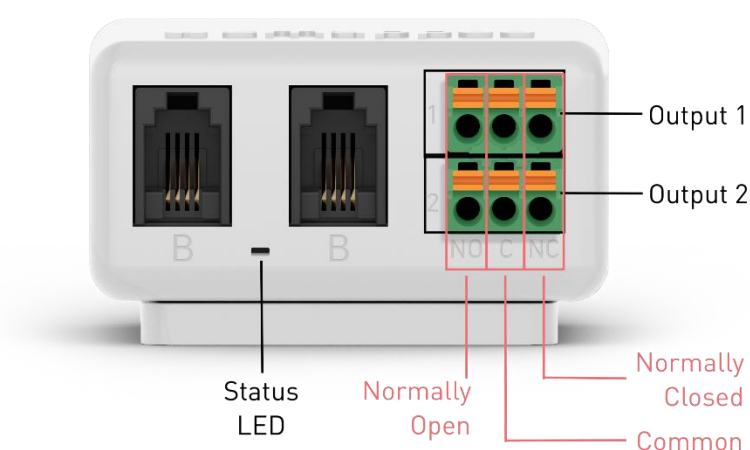
Step 1: Physical installation

1 Remove the green connector from the Output module.

2 Connect the appliance or breaker you want to control to the green connector by mounting wires* using the removable push in spring connection.

3 Place the green connector back in the Output module.

4 Connect the Output module between to the Voltage Module, Gateway Module Advanced or other modules via the B-bus, using both B ports. Use the supplied Smappee Bus cable or a custom twisted-pair RJ10 cable.

💡	*Use a solid cable with diameter range 0.5 to 1.5 mm² (20 AWG - 15 AWG) to connect the output relay with the green connector. Stranded cable is not recommended. **Strip the wire for 5 mm.**
	Removable push in spring connection: ● Press the orange push button above each wire input using a small flat screwdriver. Keep the button pressed when inserting the wire. Release the orange push button to hold the wire in place. ● Make sure the wire is connected correctly. Pull gently on the wire and check whether it's connected firmly.
	You can use a custom RJ10 cable instead of the standard Smappee Bus cable. The RJ10 must be a twisted pair cable. Pins 1 & 4 and Pins 2 & 3 must be twisted pairs. **See the Smappee Bus cable specification in section 13 of the Infinity SMP Series Installation manual.**
	Both ports (RJ10 connectors) of the modules are identical. There's no special attention needed for making the interconnections.
	Make sure the wire connection of the green connector is connected correctly. Pull gently on the wire and check whether it's connected firmly.

Step 2: Configuration

The Output module can be configured when the Smappee Infinity SMP Series is installed and operational. The outputs can be configured separately (output 1 and output 2) or combined (output 1 & 2).

💡	Configure the Output module using the Smappee App: Go to Control – All – Smart devices – Add a smart device – Select Smappee Output Module. Proceed in the Smappee Energy Monitor mobile app and follow the steps as shown.
	If a physically installed Output module is not shown in the Output modules list in the Smappee App, tap Scan for modules.

	If you configure the outputs separately, redo these steps. Control – All – Smart devices – Add a smart device – select Smappee Output Module.
	Control the appliance(s) connected to the Smappee Output module easily in the Smappee App. Go to Control – All – Smart devices. Or add them to your Favorites.
	Trigger the appliance(s) connected to the Smappee Output module based on a certain event with Automations in the Smappee App. Go to Control – Automations.
	The events of the Output modules can be consulted in the Smappee App and Dashboard: ● App: Open the App and scroll down on the dashboard screen to Events. ● Dashboard: Open the Dashboard and go to the Events card.

12. Troubleshooting

General

Problem	Possible cause	Possible resolution
The Smappee Infinity SMP Series does not switch on.	The power cable is connected incorrectly to the fuse.	Verify that the power cable is connected according to the connection diagram.
	Fuse is not switched on.	Switch on the fuse.
	Gateway is not connected to port B of the Voltage Module	The gateway and Voltage Module are to be interconnected via Port B.
	Power cable is not correctly connected to the fuse and Voltage Module.	Connect the power cable to the Voltage Module according to the installation instructions.
One or all CT Hubs are not available in the mobile app during installation.	RJ10 cables between CT Hubs are not connected properly.	Check that all required RJ10 cables are connected and the bus termination plug is plugged in the free port of the last CT Hub. A green blinking LED light at a rate of 1 blink per 3 seconds is visible on input A of each CT Hub when the connection is operational.
		Check that all CT Hubs have a green flashing light. 1 blink per 3 seconds.
	CT Hubs are not connected to port A.	Connect the CT Hubs chain to port A of the Voltage Module.
	Check the LED blinking rate on the Voltage Module. When the LED is blinking once every second, there is a communication error between the CT Hubs and the Voltage Module.	Check that the CT Hubs are connected to port A of the Voltage Module and the Gateway Module Advanced to port B. Carry out a restart by power cycling the Voltage Module after connecting the and gateway to the correct port.
		In the case of a custom RJ10 cable, check the operation of the RJ10 cable and review the Smappee Bus cable specification in section 13.
	More than 7 CT Hubs are connected to the Voltage Module	In the app, go to Settings – Your Smappee monitors – Infinity SMP Series modules, Remove the obsolete CT Hub(s).
No real-time measurements of the connected CTs.	CT is not connected properly to the CT Hub.	Check the connector of the CT into the CT Hub.
	CT is not closed properly	Close the CT correctly.
During installation: the Smappee App states that the serial number of the gateway is invalid.	The serial number is wrong	Check if you are scanning the serial number of the gateway.
	The gateway has already been installed at another location.	Carry out a factory reset on the gateway.

The main feed measurement values are incorrect.	Power Connectors L1, L2, L3 do not correspond with the current phases (phase-mapping).	Use a multimeter to check that the voltage L1, L2, L3 corresponds with the Load Configuration of the Grid (phase setting). See the tips in the chapter "Validation of the installation".
Output module is not available in the mobile App	Gateway Module Advanced has not scanned the module yet.	Use the scan function in the App, found under "Infinity SMP Series Components" or reboot the Gateway Module Advanced.
	The module is connected to the wrong bus.	The module needs to be connected to the B bus chain.
Input module is not available in the mobile App	Gateway Module Advanced has not scanned the module yet.	Use the scan function in the App, found under "Infinity SMP Series Components" or reboot the Gateway Module Advanced.
	The module is connected to the wrong bus.	The module needs to be connected to the B bus chain.

Smappee Gateway Module Advanced

Problem	Possible cause	Possible resolution
The light of the Gateway Module Advanced flashes red.	The Gateway Module Advanced had a previously working internet connection but has now lost its connection to the internet.	Verify if the internet connection is still active. If this was caused by a temporary outage, then the Gateway Module Advanced will automatically reconnect to the internet after 5 minutes. You can also do a power cycle to speed up the process but be aware that you will lose data.
	The Wi-Fi password has been changed.	The Gateway Module Advanced needs to be reconfigured with the correct Wi-Fi settings. Go in the App to "Settings – Your Smappee Monitors – Infinity SMP Series components – Smappee Gateway Module Advanced - Change your Wi-Fi settings" and follow the steps in the app.
	The Gateway Module Advanced lost its connection to the 4G network.	If this happens during installation then this means that the mobile network is unstable and does not have a strong enough signal, please either reposition the Gateway Module Advanced to receive a better signal or use 3G instead of 4G.
		If this happens after a couple of days, the Gateway Module Advanced will automatically attempt to reconnect after a maximum of 24 hours. You can also power cycle the device but then you will lose data.

The light of the Gateway Module Advanced is blue continuous	The Gateway Module Advanced is still booting up or installing an update.	Wait for 5 minutes.
	The Gateway Module Advanced is blue for more than 10 minutes.	Restart the Smappee Gateway Module Advanced by unplugging the RJ10 cable and plugging it back in and wait 5 minutes. If the problem persists, contact your supplier.
The light on the Gateway Module Advanced flashes blue after start-up with an Ethernet connection	The Ethernet cable is not connected correctly.	Check Ethernet cable connection and restart the Gateway Module Advanced by unplugging the RJ10 cable and plugging it back in.
		Check with a laptop or other ethernet compatible device if the ethernet cable is working. Ping to an internet address (e.g. google.com)
The light of the Gateway Module Advanced is red after start-up with an Ethernet connection.	The Ethernet cable is not connected correctly.	Check Ethernet cable connection and restart the Gateway Module Advanced by unplugging the RJ10 cable and plugging it back in.
		Check with a laptop or other ethernet compatible device if the ethernet cable is working. Ping to an internet address (e.g. google.com)
	Internet connection is down.	Check and solve the internet connection and restart the Gateway Module Advanced by unplugging the RJ10 cable and plugging it back in.
	A firewall blocks outgoing communication.	The Smappee servers cannot be reached. Check the firewall rules. For details, see Addendum 2.
The light on the Gateway Module Advanced flashes blue after start-up with an Ethernet connection.	The Ethernet cable is not connected correctly.	Check Ethernet cable connection and restart the Gateway Module Advanced by unplugging the RJ10 cable and plugging it back in.
The Gateway Module Advanced remains blue blinking during the Wi-Fi connection attempt	Connection to the Wi-Fi failed	Check Addendum 2 if the Wi-Fi settings are compatible
		Make sure the Wi-Fi password you entered is correct.
		Check if the Wi-Fi signal is strong enough

The Gateway Module Advanced is purple or yellow after a factory reset	The reset button was not pressed long enough	Press the reset button for at least 15 seconds until the Smappee is blue
The SSID of the Wi-Fi does not appear in the Wi-Fi list of the Gateway Module Advanced	The Smappee booted faster than the Wi-Fi router	Reboot the Smappee by doing a power cut. The Wi-Fi is scanned when the gateway is booting up.
	The SSID is not supported	Check Addendum 2
	The Wi-Fi signal is not strong enough	Make sure the Gateway is close enough to the Wi-Fi router / repeater

Smappee Connect series

| Problem	Possible cause	Possible resolution
The light of the Connect flashes red.	Same causes as the Gateway Module Advanced, please see the previous section.	Same resolution as the Gateway Module Advanced, please see the previous section.
The light of the Connect is blue continuous		
The light of the Connect flashes red when using an ethernet connection		
The SSID of the Wi-Fi does not appear in the Wi-Fi list of the Connect		
The Connect remains blue blinking during the Wi-Fi connection attempt		
The light of the Connect is green breathing but does not activate	The Connect is plugged into port A of the Voltage Module.	Please make sure that the Connect is linked to Port B of the Voltage Module.
The light of the Connect is green continuous	Internet connection is down.	Check and solve the internet connection and restart the Connect by unplugging the RJ10 cable and plugging it back in.
	A firewall blocks outgoing communication.	The Smappee servers cannot be reached. Check the firewall rules. For details, see Addendum 2.
The CT's are measuring current, but no power is being calculated	The Connect did not receive the configuration correctly.	Resend the configuration via the App. Select in the Smappee App Settings > Your Smappee Monitors > Load Configuration. Press 'Apply changes'. If this is not shown, make a change and undo the change to a load or CT. This will present the 'Apply changes' button on the Load Configuration screen.

13. Smappee Bus cable specification

Custom RJ10 cables can also be used. Please note the following specifications and limitations:

- A cable containing 2 unshielded twisted pairs (e.g. Cat5 UTP cable). Shielded cable may also be used (e.g. CAT6 UTP cable).
- Straight connection: pin 1 to 1, etc.
- Unshielded.
- Pins 1 and 4 and pins 2 and 3 must be twisted pairs.
- Characteristic impedance of 100 ohm.
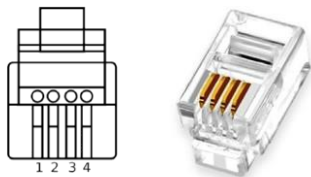
- AWM style 2835: 60°/30 V – 24 AWG.
- The total length of the CT bus must be no more than 330 feet (100 meters).
- The length of the gateway-Voltage Module bus must be no more than 1640 feet (500 meters).
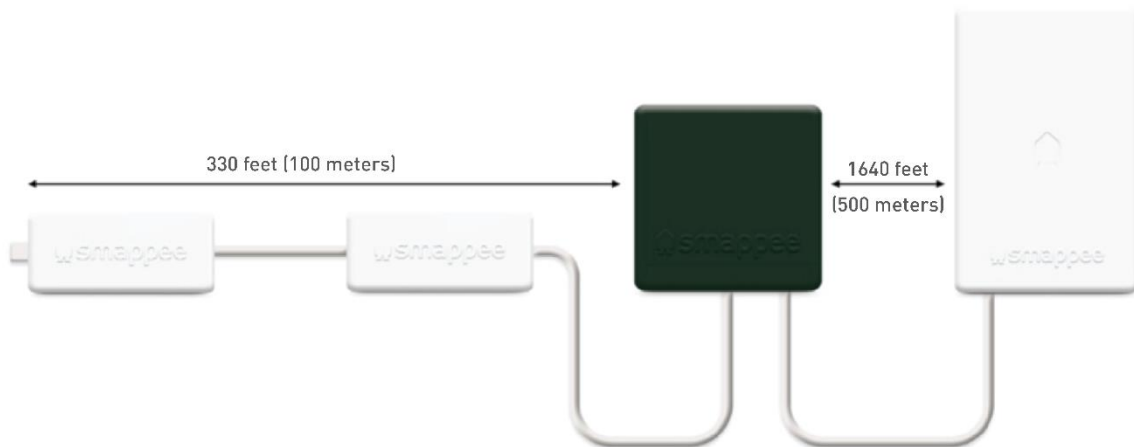
⚠	**WARNING:** the bus termination plug must be plugged into the output of the last CT Hub or Solid Core 3-Phase CT. The plug is supplied in Port A of the Voltage Module.

14. Specification and Certifications

Safety:
    UL: 61010-1
    CSA: C22.2 No 61010-1-12
    CE: Non Radio Function : IEC 61010-1 Ed 3.0 (2010-06) + A1:2016
    CE: Radio Function : IEC 60950-1

Accuracy :
    ANSI C12.20 Class 0.5

EMC :
    FCC 47 Part 15
    IEC 61326-1

Emissions:
  Non Radio Function : (EN61326-1 : 2013)
    Radiated Emission: EN 55011:2009 / EN 55032:2015 (Class B)
    Conducted Emission: EN 55011:2009 / EN 55032:2015 (Class B)
    Harmonic current Emission: EN 61000-3-2:2005 +A1:2008 + A2:2009
    Flicker: EN 61000-3-3:2008
  Radio Function : (EN301 489-1 : V2.2.0 2017) / (EN301 489-17 : V3.2.0 2017)
Immunity:
  Non Radio Function : (EN61326-1 : 2013)
    ESD : EN 61000-4-2:2008 / EN 61000-4-2 :2009
    Radiated immunity : EN 61000-4-3:2006 + A1:2007 + A2: 2010
    Power frequency magnetic field: EN 61000-4-8:2009
    Voltage dips/interruptions: EN 61000-4-11:2004
    Common Mode Immunity: EN 61000-4-6:2008 / EN 61000-4-6:2009
    Burst : EN 61000-4-4:2004 / EN 61000-4-4:2012
    Surge: EN 61000-4-5:2005 / EN 61000-4-5:2006
  Radio Function : (EN301 489-1 : V2.2.0 2017) / (EN301 489-17 : V3.2.0 2017)

15. Addendum 1 – Color code explanation

Gateway Module Advanced

Green pulsing	All good. The Gateway Module Advanced is working correctly.
Green continuous	Network connection is successful, but the Gateway Module Advanced is not yet activated on a location. Ethernet: Connected to the local network. Wi-Fi: Connected to the Wi-Fi and the local network (i.e. the Wi-Fi password is correct) 3G/4G Dongle: Connected to the 3G/4G network.
Blue continuous	The Gateway Module Advanced is starting up. This may take up to 5 minutes. The light may briefly go off during that time. If this takes more than 10 minutes, please contact support.
Blue flashing	The Gateway Module Advanced is ready to be connected to the local Wi-Fi network.
Red continuous	The Gateway Module Advanced has no connection to the internet during start-up. Connection issue.
Red flashing	The Gateway Module Advanced had a working internet connection but has lost its connection to the Smappee cloud.
Yellow	The Wi-Fi hotspot access point has been activated to allow the Gateway Module Advanced to reconfigure the Wi-Fi settings.

Connect series

Green pulsing	**All good.** The Connect is working correctly.
Green continuous	The Connect is connecting to the internet and must become Green pulsing. If this takes more than 2 minutes, please contact support.
Blue continuous	The Connect is **starting up**. If this takes more than 30 seconds, please contact support.
Blue flashing	The Connect is **ready to be connected** to the network.
Red continuous	The Connect has **no connection** to the internet during start-up. Connection issue.

Voltage Module

Status LED is pulsing once every 3 seconds.	Voltage Module is powered on and operating correctly.
Status LED is pulsing once every 1 second.	Smappee Bus B error.

CT Hub

LED at input A, B, C or D 3 pulses per second, on any of the inputs A, B, C, D.	Indication of the selected CT input during CT configuration.
LED at input A Short pulse every 3 seconds.	CT Hub is powered on and operating correctly.
LED at input A One pulse every second.	Communication error.
LED at input A 2 pulses per second.	Configuration problem.

Solid Core 3-Phase CT

LED at input A, B, C or D 3 pulses per second, on any of the inputs A, B, C, D.	Indication of the selected input during configuration.
LED at input A Short pulse every 3 seconds.	Solid Core 3-Phase CT is powered on and operating correctly.
LED at input A One pulse every second.	Communication error.
LED at input A 2 pulses per second.	Configuration problem.

Input module

LED Short pulse every 3 seconds.	Input module is powered on and operating correctly.
LED One pulse every second.	No communication or communication error.
LED Short pulse every 1 sec.	Configuration problem.
Input LED (one for each input)	ON when input is closed or pulse is given.

Output module

LED Short pulse every 3 seconds.	Output module is powered on and operating correctly.
LED 3 pulses per second.	Indication of the selected output during configuration.
LED One pulse every second.	No communication, communication error or configuration problem.

16. Addendum 2 – Wi-Fi connection properties and firewall rules

Wi-Fi Connection properties

- 2.4 GHz Wi-Fi required, preferably with automatic channel selection.
- Networks without DHCP server are not supported.
- WPA or WPA2 encryption mandatory.
- Networks without security are not supported.
- SSID must be visible and should not be hidden during installation.
- Not all characters are allowed in the SSID or Wi-Fi password
- Allowed characters for SSID: [a-z],[A-Z],[0-9],[!#$%&'()*+-./:;<>?@[]^_`{|}~]
- Allowed characters for Wi-Fi password: [a-z],[A-Z],[0-9],[!"#$%&'()*+-./:;<>?@[\]^_`{|}~]
- MAC filtering must not be active on the router.
- Your firewall should allow Smappee to create outbound secure HTTP connections.
- The maximum number of characters for the WPA2/PSK is 20.

> The DHCP of your router assigns the IP address of your Smappee.

Firewall rules

No specific firewall settings are required in your network. If you use a firewall, use the commonly applied secure firewall rules:

- **Inbound communication**: All inbound ports closed. No port forwarding.
- **Outbound communication**: All outbound ports allowed.