KIT SQUID V2

Search

1. Dangers and Warnings

Manufacturer is not responsible for user's failure to comply with the instructions contained in this manual.
Any service performed on this product must be completed by a qualified individual.
Replacement of this product must be performed by a qualified individual.
Failure to use this equipment in accordance with the specifications in this documentation could lead to a hazard.
No parts in this device should be replaced or removed.
Disconnect all power supplies before servicing this device.

2. Homologations and Conformities

EMC

- EN 61000-6-2 : Immunity for industrial environment
- EN 61000-6-3 : Emission for residential environment
- EN 55022 : IT equipment immunity

Radio

- EN 300220

Safety

- EN 61010 : IT equipment

Was this helpful? Yes No

Suggest edit

3. References

SQUID :

SQUID V2 in LoRaWAN™ version (by default) or Lora Ewattch version allowing measurement of currents up to 600A.

KIT-SQUID :

Kit including the SQUID V2 sensor and all necessary accessories: a power supply with rail din 230VAC-5VDC mounting (ref: ALIM-RAIL-5V) and a magnetic antenna for mounting outside the cabinet (ref: ANTMAGNSUP). Possibility of power supply via mains adapter upon request (ref: ALIM-BLOC-5V).

Accessories :

CURCLAMP-HC-S1

Measurement clamps for SQUID-HC – Ø10mm – 75A eff max

CURCLAMP-HC-S2
Measurement clamps for SQUID-HC – Ø16mm – 100A eff max

CURCLAMP-HC-S3
Measurement clamps for SQUID-HC – Ø24mm – 300A eff max

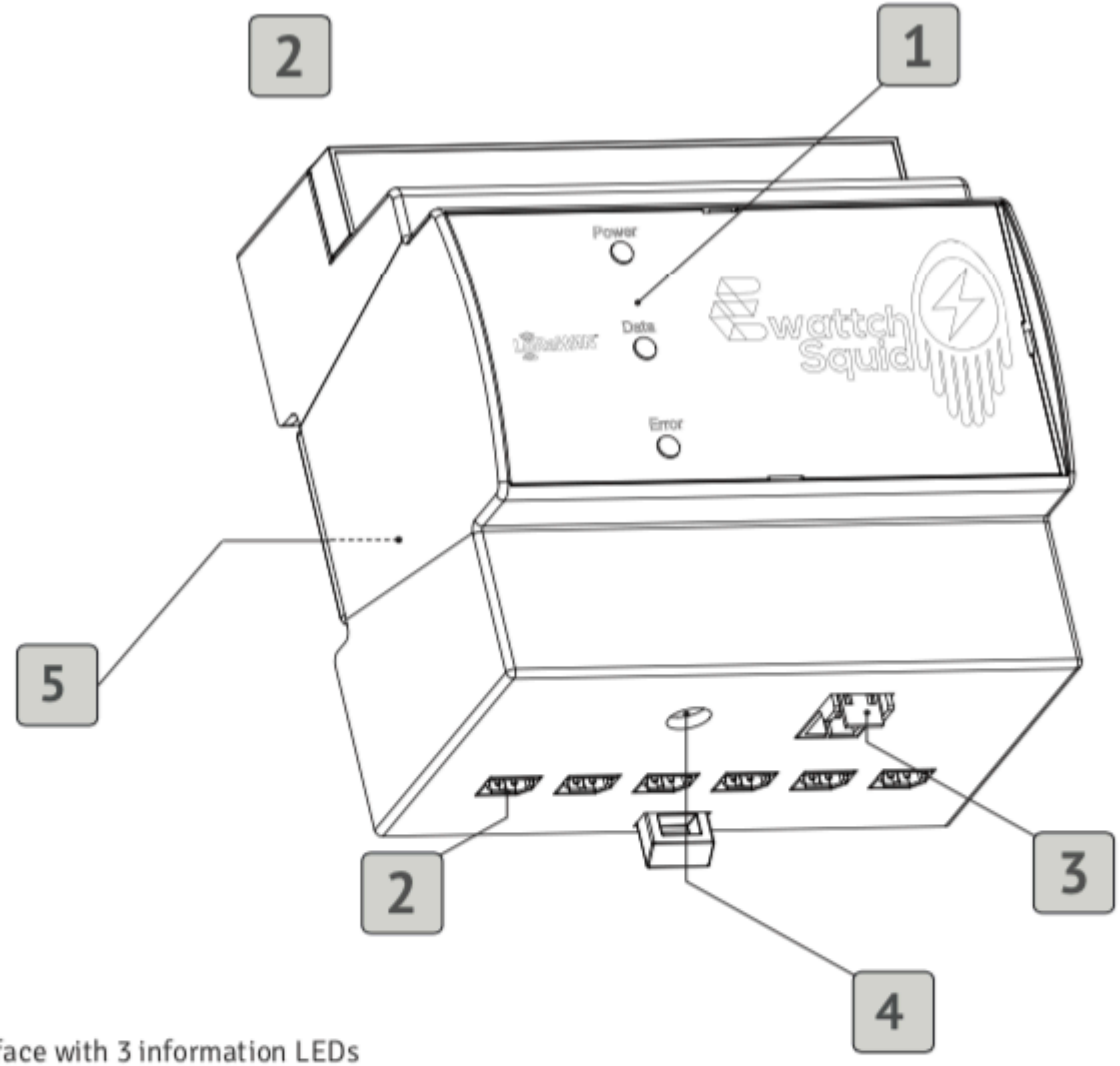
CURCLAMP-HC-S4
Measurement clamps for SQUID-HC – Ø36mm – 600A eff max

ANTMAGNSUP
Antenna with magnetic base. Cable length: 4m.

ALIM-RAIL-5V
230VAC – 5VDC power supply with din rail mounting

ALIM-BLOC-5V
230VAC – 5VDC power supply of block type. Cable length: 1.1m.

4. Presentation



1 Front face with 3 information LEDs
Power: Presence of supply voltage
Data: Transmission of radio frame
Error: Operation error or product reset

2 12 x configurable current sensor inputs

3 Power connector 5VDC-1A

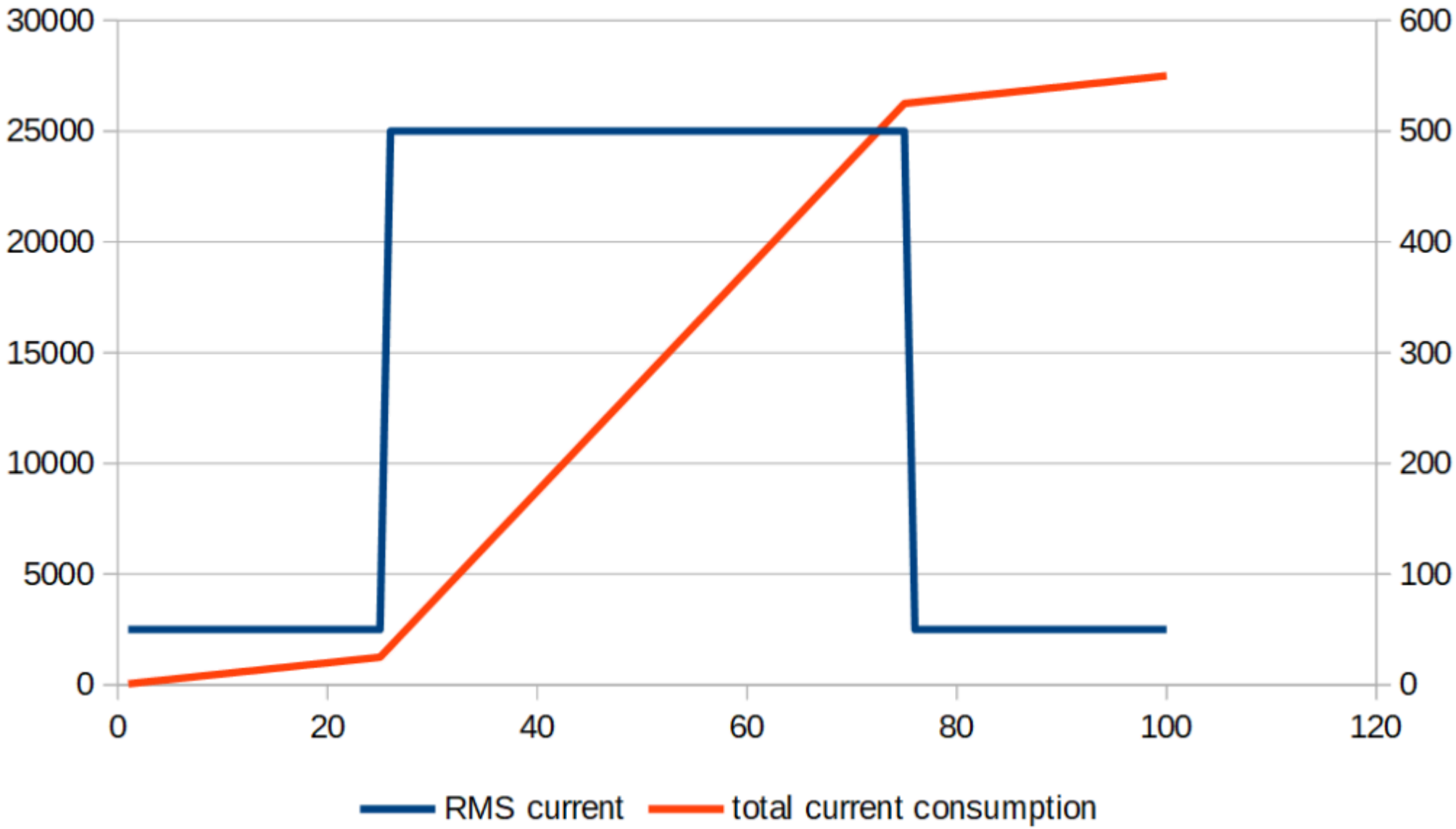
4 Antenna output (option)

5 Configuration switch (located under the cover on the bottom of the product)

5. The product description

The SQUID V2 is a sensor equipped with 12 current measuring clamps, which sends the measured current values via a LoRaWAN or Lora Ewattch wireless link. The product sends consumption values in Ah (in orange on the graph below) of the 12 clamps at a configurable interval.

The SQUID is powered by a 5V DC external power supply.



Was this helpful? Yes No

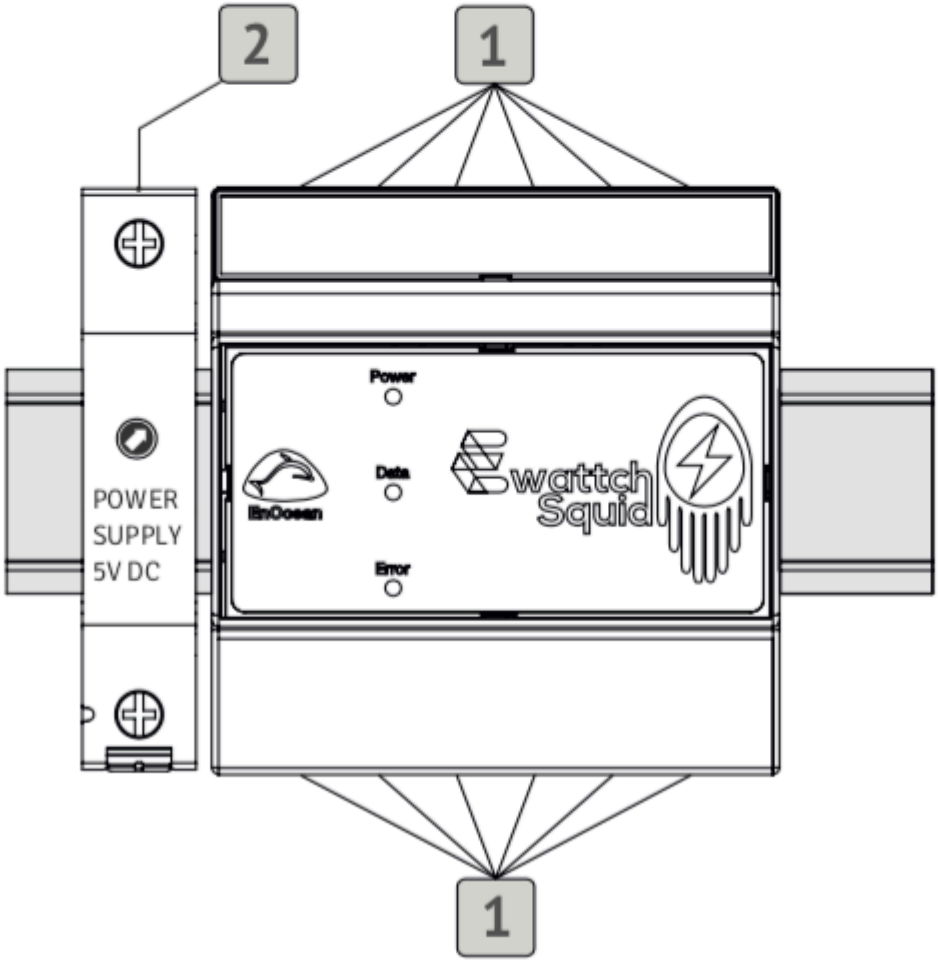
Suggest edit

6. Installation of the product

RISK OF ELECTROCUTION, EXPLOSION OR ELECTRICAL ARC

Disconnect all power supplies before working on the equipment.
Manufacturer cannot be held responsible for failure by user to comply with the instructions in this manual.

Installation of the sensor



Mounting and Disassembly

This equipment must be installed on a horizontal DIN rail of 35mm in the electrical panel. Be sure to lock the product securely onto the DIN rail.

Allow a space of 5 modules to install the product in the electrical panel. To disassemble, use a flat screwdriver to unlock the black clip at the bottom of the device.

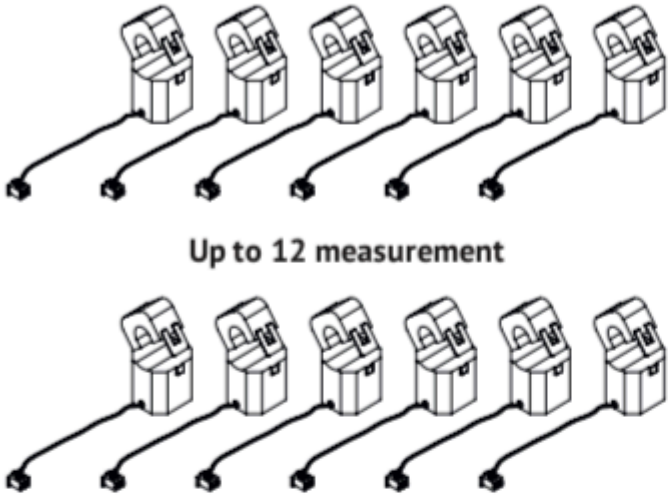
Prerequisites

A 5V DC-2A power supply must be used to power the SQUID. The wiring of the Safety Extra Low Voltage circuits must be maintained and kept separated from circuits carrying hazardous voltages.

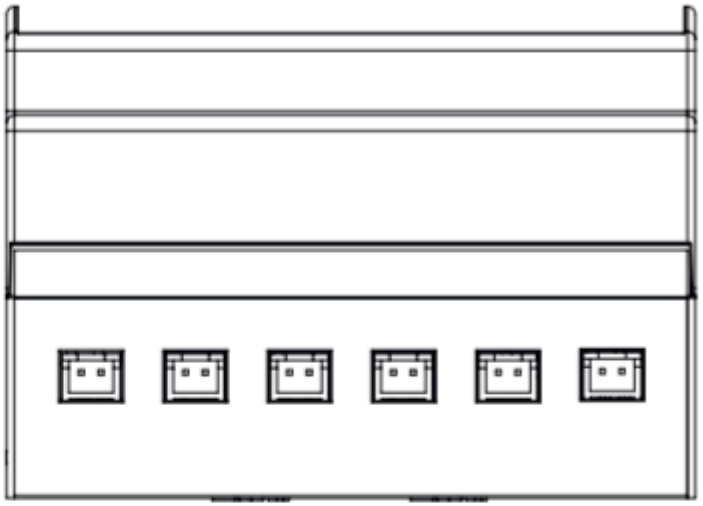
- Connecting the current sensors 

Connect the measurement probes to the 12 connectors on the top and bottom of the device.

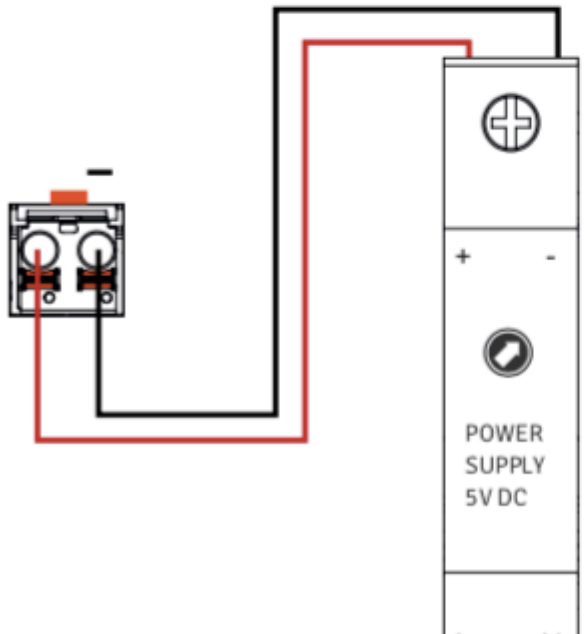
CAUTION: Only install the probes when the circuit is powered off.
It is essential only to use reference measurement clamps: CURCLAMP-HC-SX.
These are type C clamps.



Up to 12 measurement



- Power cable 2



Prerequisite
Use a 5V DC power supply with minimum output current of 2A

Make sure to use the correct polarity.

7. Radio communication

Procedure for connecting to the network

- Our products attempt to connect to the network upon startup.
- If this does not work, they will retry every 24 hours until successful.

Periodic reconnection to the network

- Our products initiate a network connection procedure every 7 days. These reconnections improve security. Indeed, reconnecting to the network renews encryption keys.

Description of payloads

The SQUID-LoRaWAN™ transmits its data in a raw format on various public and private LoRaWAN™ networks. The section below shows how to decode the frames (PayLoad) sent by the SQUID V2.

Periodic frames

A payload decoder is available at the following link: https://ewattch-documentation.com/?page_id=3439

Periodic frames contain the data measured by the SQUID V2.

Example of transmitted periodic frame (HEXA):

Index (in bytes)	Name	Example	Description	
1	Frame type	**0**	Data sent periodically	
2	payload size	**26**	"Number of bytes sent. 0x26 in hexadecimal gives 38 bytes (excluding header: Frame type and payload size)"	
3	Object type	**40**	Type of object 0x40 Energy meter.	
4	measurement type	**C0**	12 index measurements. Unit: 10mAh	
			Number of measures	Type of measurement 0 : current index (10mAh) 1 : current (mA) 2 : index (10mAh) + current (mA).
			0xC in hexadecimal gives 12 measures	0
5 – 7	Index channel 1	**624D00**	HEXA : 004D62 (little endian) => 198100mAh	
8 – 10	Index channel 2	**927A00**	HEXA : 007A92 (little endian) => 313780mAh	
11 – 13	Index channel 3	**4D5736**	HEXA : 36574D (little endian) => 35612930mAh	
14 – 16	Index channel 4	**128630**	HEXA : 308612 (little endian) => 31800500mAh	
17 – 19	Index channel 5	**677712**	HEXA : 127767 (little endian) => 12102150mAh	
20 – 22	Index channel 6	**51169**	HEXA : 691105 (little endian) => 68856370mAh	
23 – 25	Index channel 7	**448572**	HEXA : 728544 (little endian) => 75052200mAh	
26 – 28	Index channel 8	**81511**	HEXA : 111508 (little endian) => 11194960mAh	
29 – 31	Index channel 9	**486925**	HEXA : 256948 (little endian) => 24517840mAh	
32 – 34	Index channel 10	**D59800**	HEXA : 0098D5 (little endian) => 391250mAh	
35 – 37	Index channel 11	**D03336**	HEXA : 3633D0 (little endian) => 35522080mAh	
38 – 40	Index channel 12	**948800**	HEXA : 008894 (little endian) => 349640mAh	

8. Product Configuration

Two configurations are available:

LoRaWAN™ mode

The SQUID V2 periodically sends current measurements from its 12 measurement probes, in the form of consumption values(Ah), via a LoRaWAN radio link. To configure a SQUID V2 on a LoRaWAN network, you must use the following codes:

- DevEUI: This is a factory-programmed identifier that makes each object unique and is indicated on the label of each product. Example: 70B3D54750120168
- As well as the two codes AppEUI and AppKey provided with the sensors when you order.

These keys can be found in the email with the product keys, which is sent to you when your order is shipped, or in the Squid configuration software (see below).

LoRa Ewattch mode

The SQUID V2 periodically sends current measurements from its 12 measurement probes, in the form of consumption values(Ah), via a Lora Ewattch radio link.

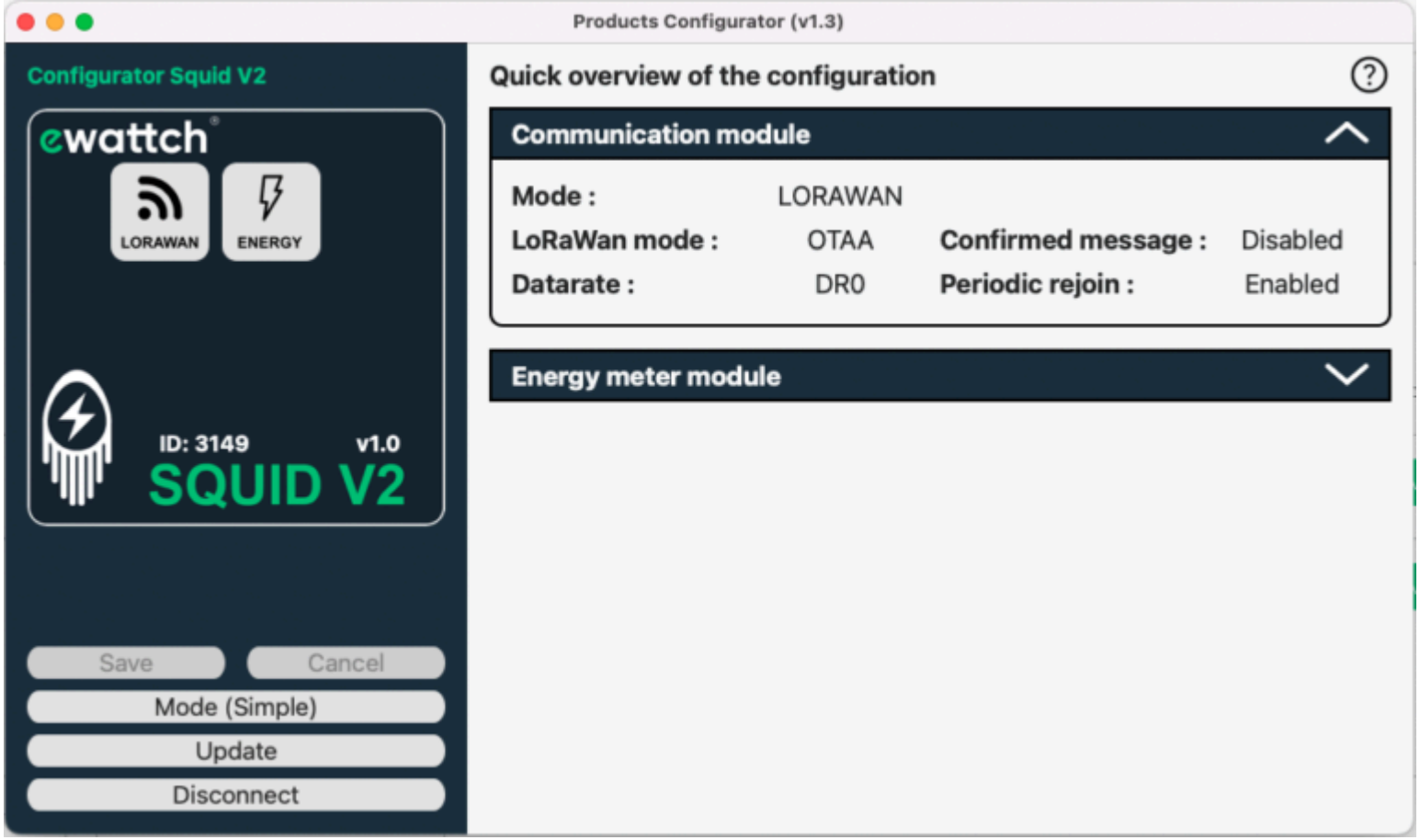
To connect the SQUID V2 to the private Lora Ewattch network, simply configure the SQUID V2 in Lora mode and on the same communication channel as the concentrator (Toolbox or Tyness 4G) to which it will send its data.

The SQUID V2 will automatically search for devices in its vicinity that are on the same communication channel as itself.

Here is how to configure your Squid V2 according to your preferences, via the configuration software:

Implementation

1. Download the configuration software, available in the "Downloads" section of the technical documentation.
2. Run the program (no installation required, available on Windows 8 or higher and Apple computers).
3. Connect your computer to the miniUSB input on the front of the device, using a MiniUSB cable. **Note: some USB cables only allow charging of mobile devices such as phones, and may not connect to a computer.**
4. Power up the Squid V2: a new communication port will appear in the "Serial Port" dropdown menu. Select it.
5. Click on the "Connect" button. You will arrive at the main page of the Squid Configurator.

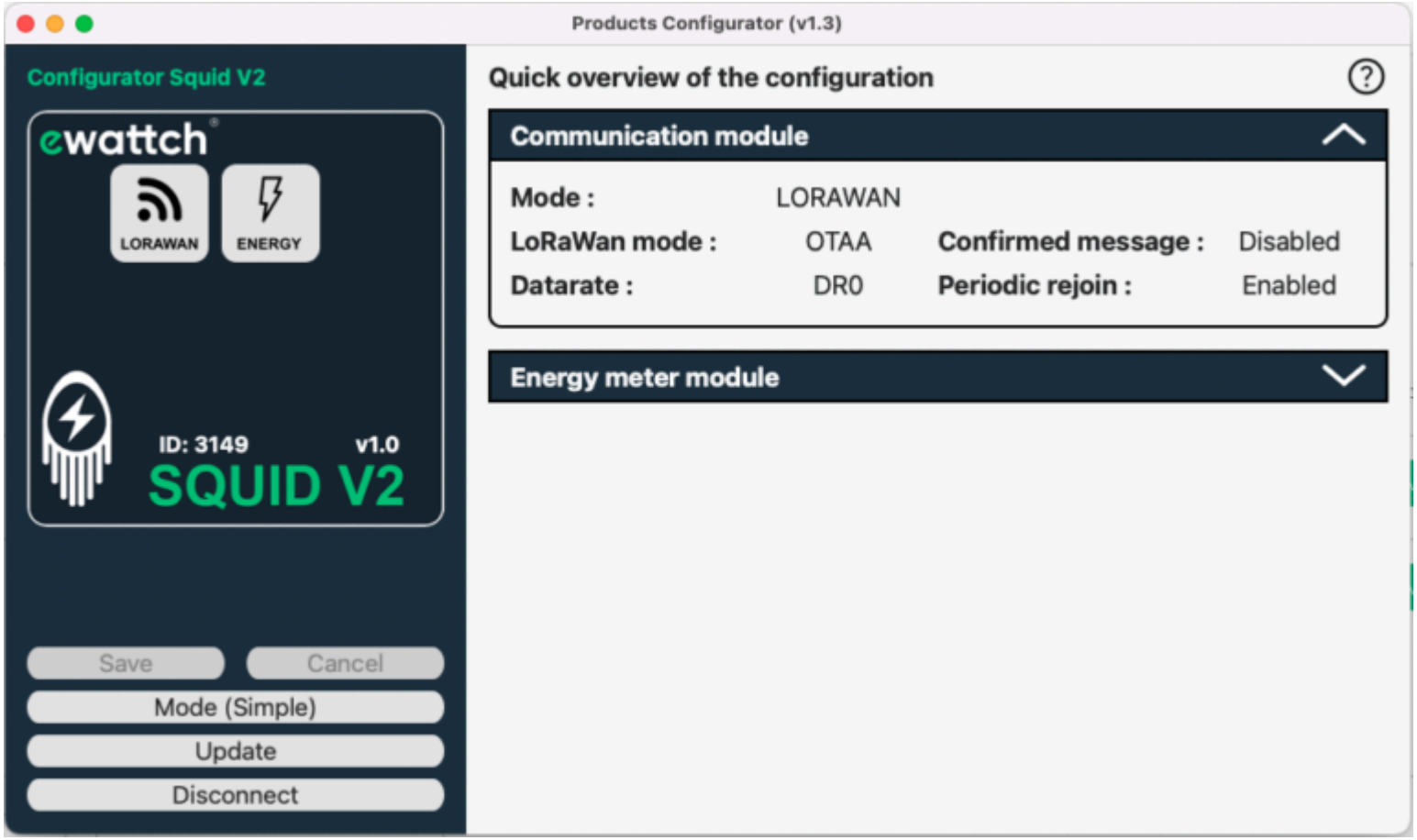


Main page

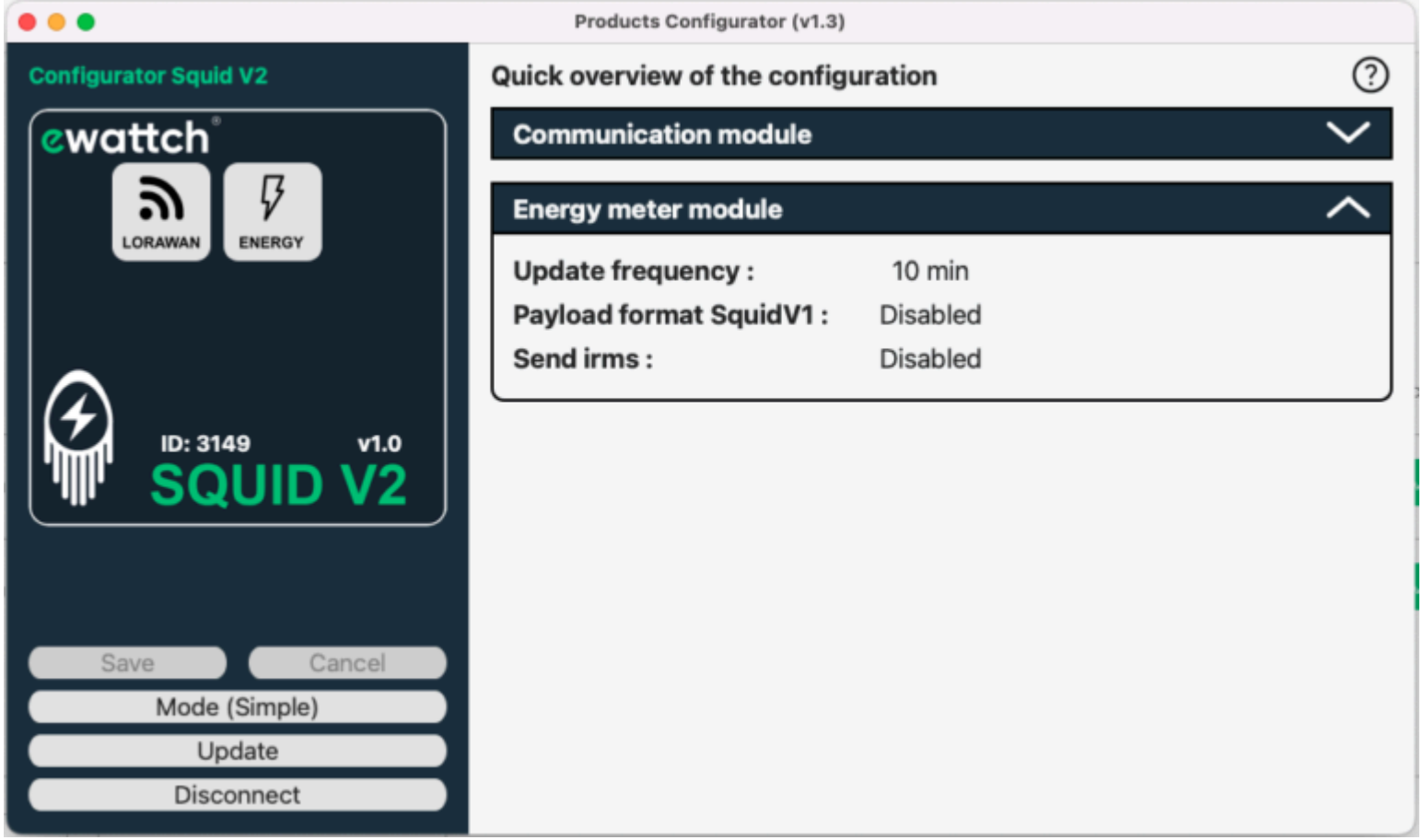
The main page gives you access to several functionalities and basic informations about the configuration of your Squid V2:

- In the top left corner, in the “Squid V2” box, the first gray box allows you to know directly in which communication mode the Squid V2 is currently in (here: LoRaWAN mode, which is the default mode).
- Next to it, the “Energy” box allows you to consult the parameters related to energy measurements. We will come back to this later.
- At the bottom left, there are also several buttons:
  - “Save”: to confirm the modifications made to the configuration of your Squid V2.
  - “Cancel”: to cancel the modifications made to the configuration of your Squid V2.
  - “Mode (Simple/Advanced)”: to change the configuration mode of your Squid V2. Generally, the “Simple” mode will be more than enough.
  - “Update”: to update your Squid. (See below)
  - “Disconnect”: to disconnect your product before removing the USB cable.
- On the right, you have access to two panels: “Communication module” and “Energy Meter module”.

- “The Communication module” will inform you about the main parameters related to the communication of your Squid V2:



- “The “Energy Meter module” will provide you with the main settings related to the measurements of your Squid V2:



Update

An update of your Squid V2 may be necessary and is recommended, as our products are constantly evolving.

To do this, first go to the technical documentation to download the update file, to be imported into the configuration software.

Then, click on the "Update" button at the bottom left and then on "Select a file".

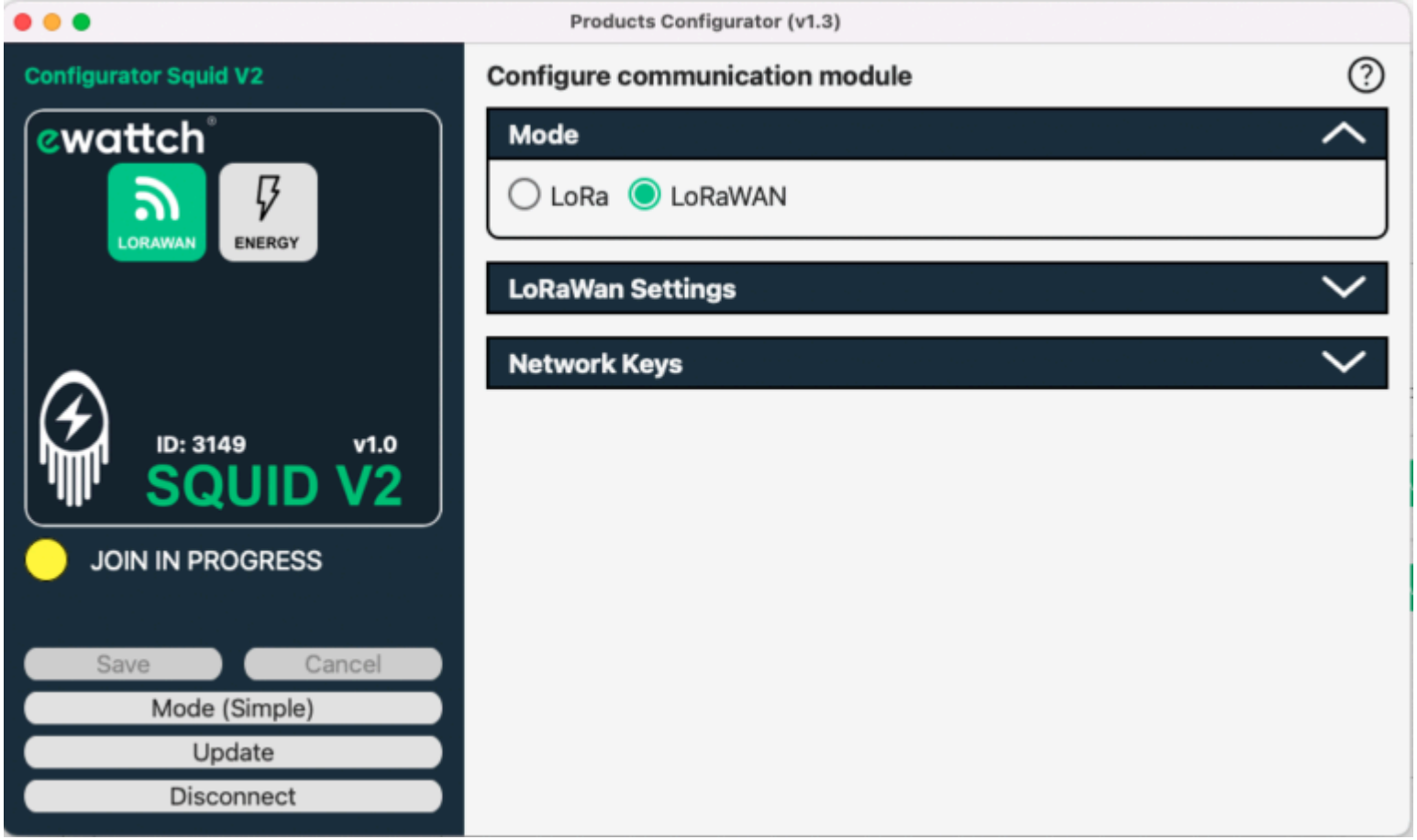
Choose the update file that you just downloaded from the technical documentation.

Click on "Update product" to start the update. A window will appear to let you know that the update is complete.

LoraWan Configuration

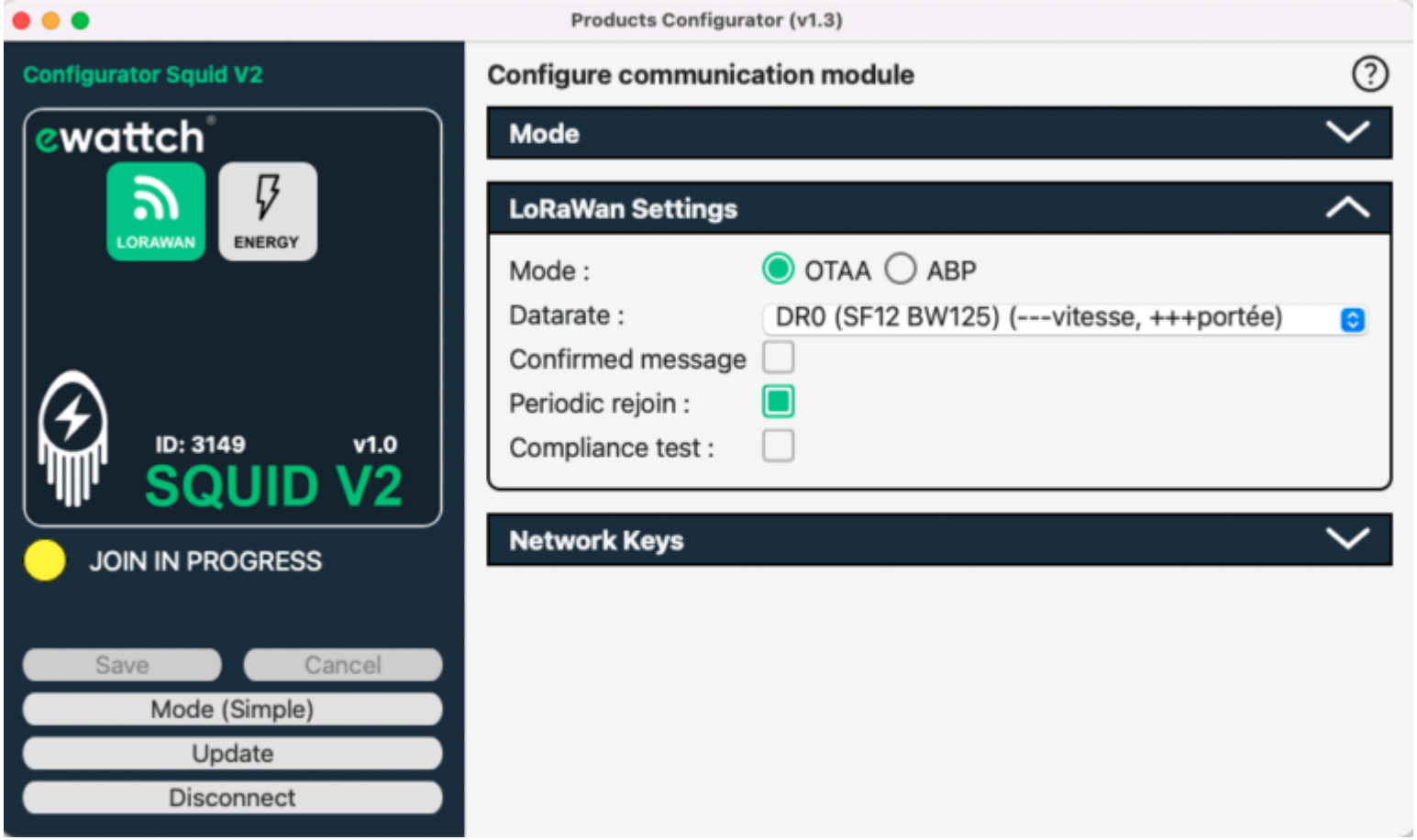
To configure your Squid V2 in LoraWan mode, click on the box in the top left corner, symbolizing radio communication (green box in the image below).

Then, open the “Mode” panel (1st panel) and check the “LoRaWAN” option.

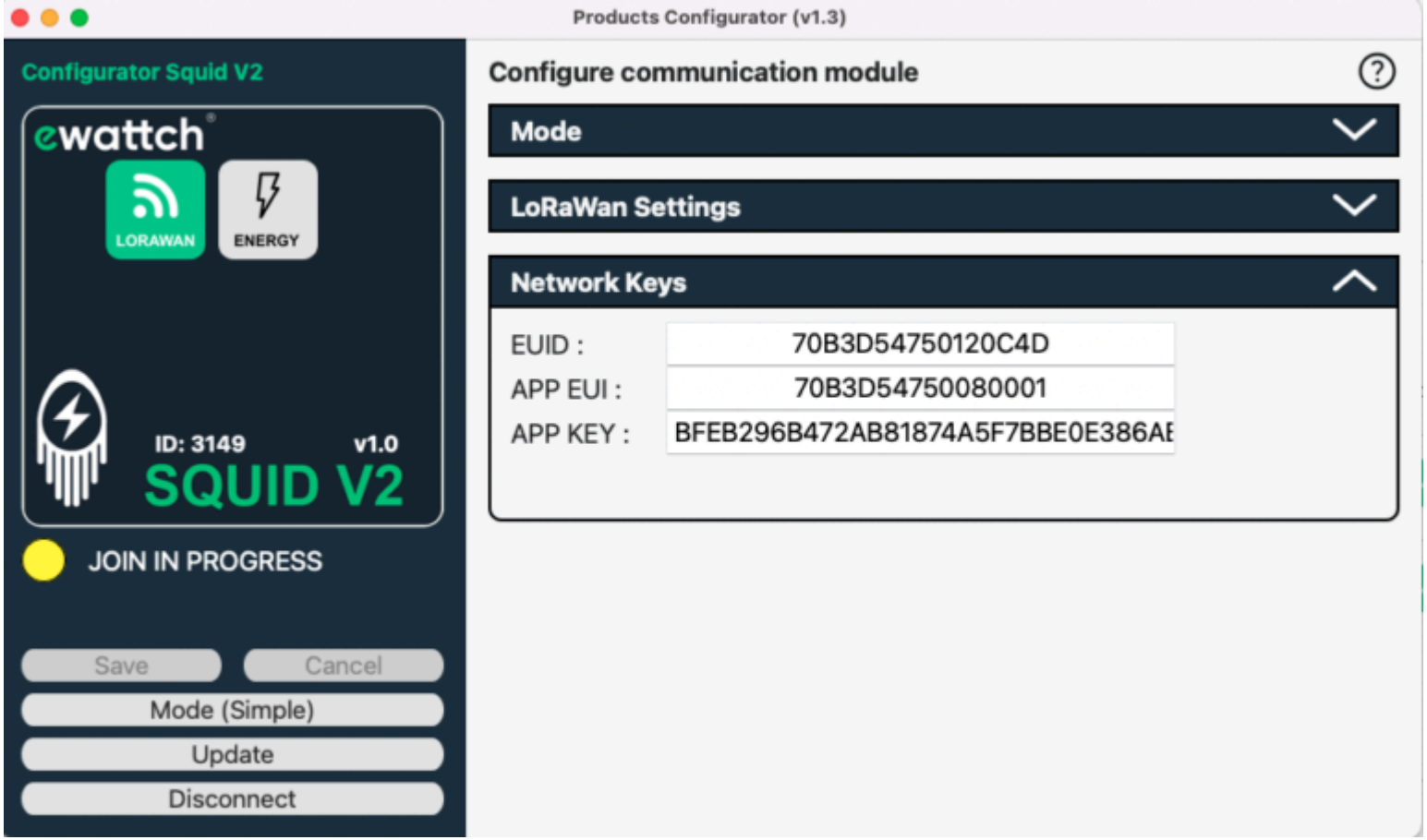


The second panel “LoRaWan Settings” allows you to:

1. Adjust the LoRaWAN communication mode (OTAA or ABP);
2. Adjust the datarate;
3. Choose whether or not you want to receive a confirmation of successful data transmission (“Confirmed message”);
4. Choose whether you want the Squid V2 to automatically restart a connection procedure every 7 days, which is ideal for the security of your data (“Periodic Rejoin”).”



The third panel “Network Keys” gives you access to the keys of your Squid V2, which are necessary for the proper provisioning of your Squid V2 on a LoRaWAN network (private or public).

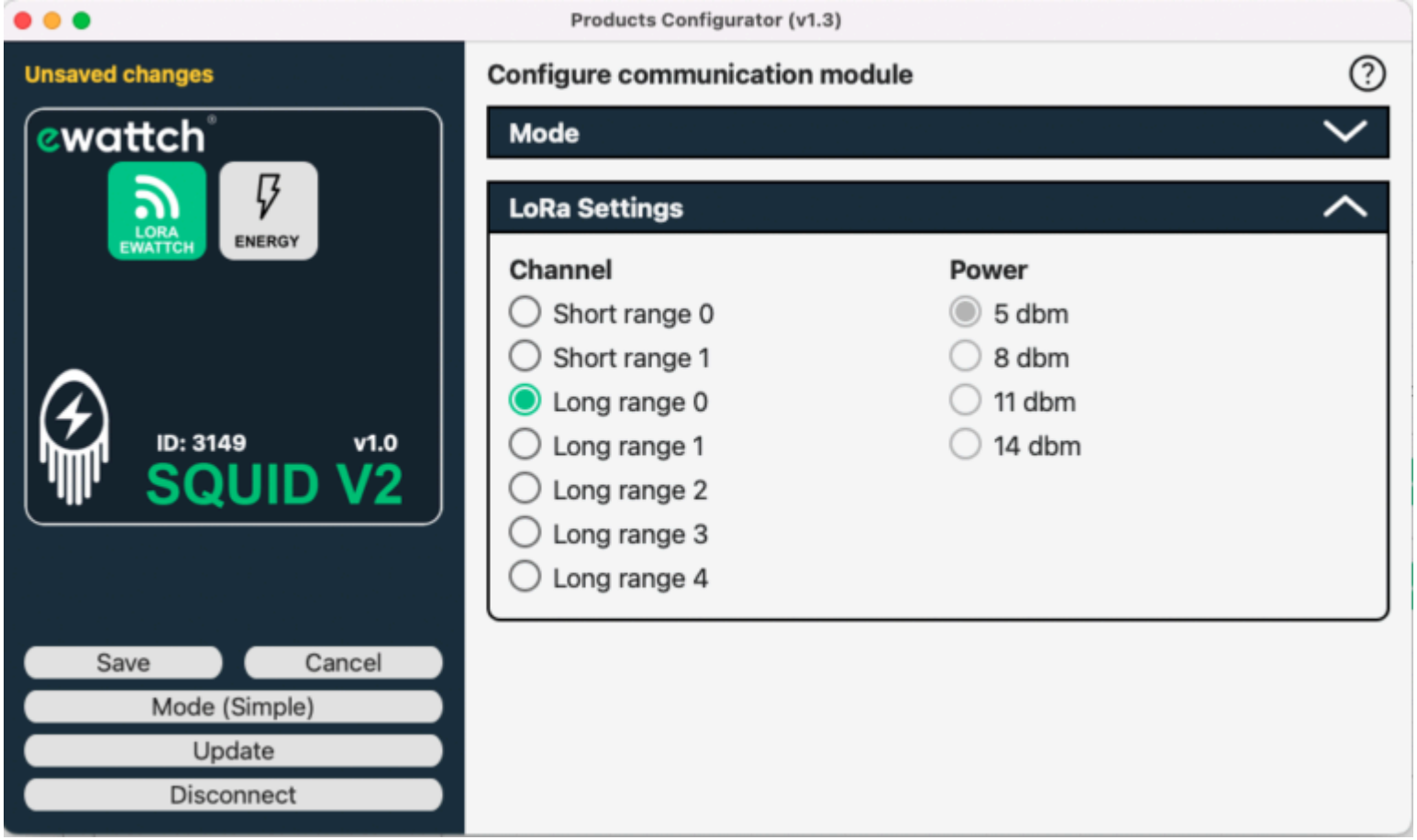


Lora Ewattch Configuration

To configure your Squid V2 in LoRa mode, click on the radio communication icon in the top left corner (green box in the image below).

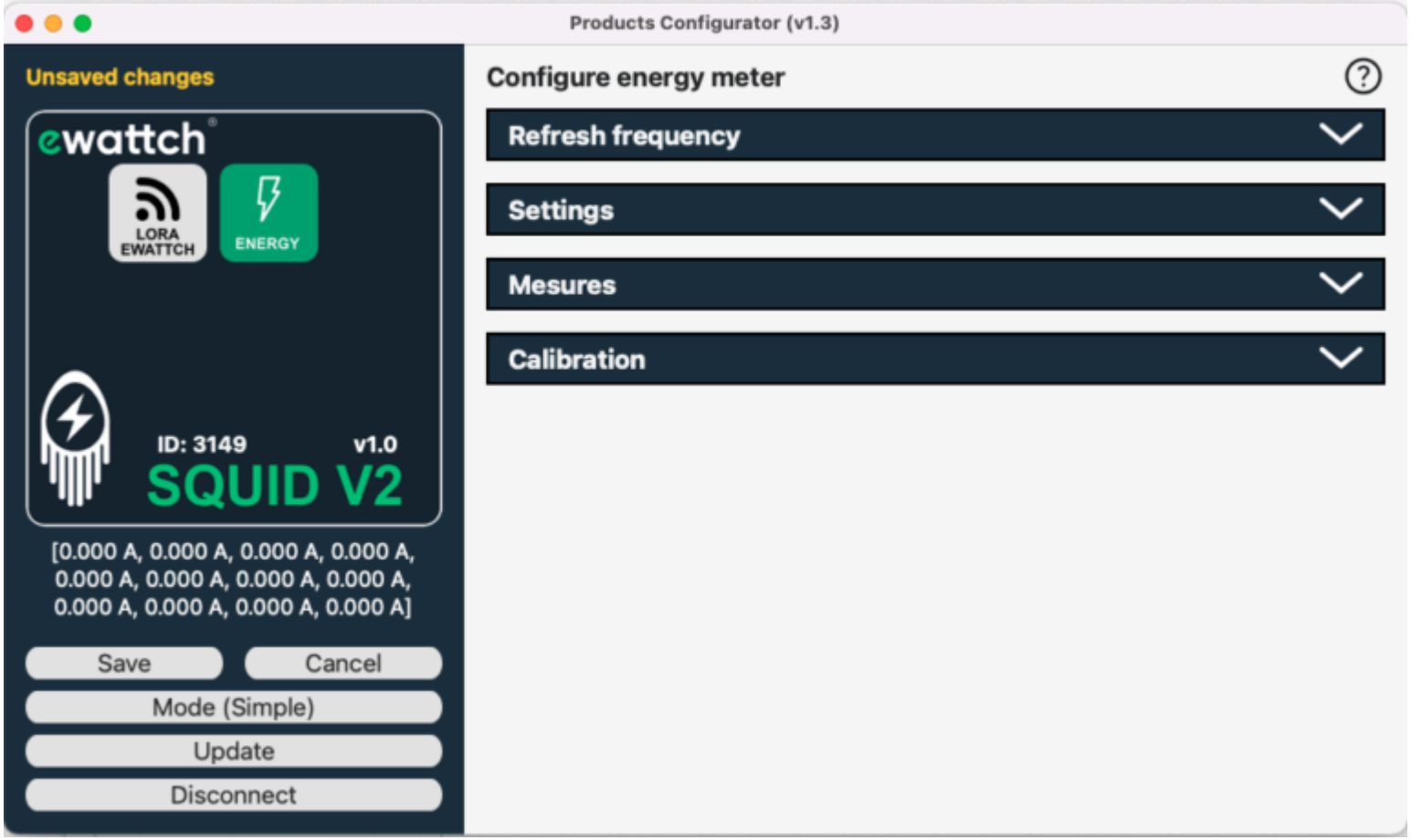
Then open the "Mode" panel (first panel) and check the "LoRa" option.

The second panel "LoRa Settings" allows you to define on which channel and with which power your Squid should try to communicate.

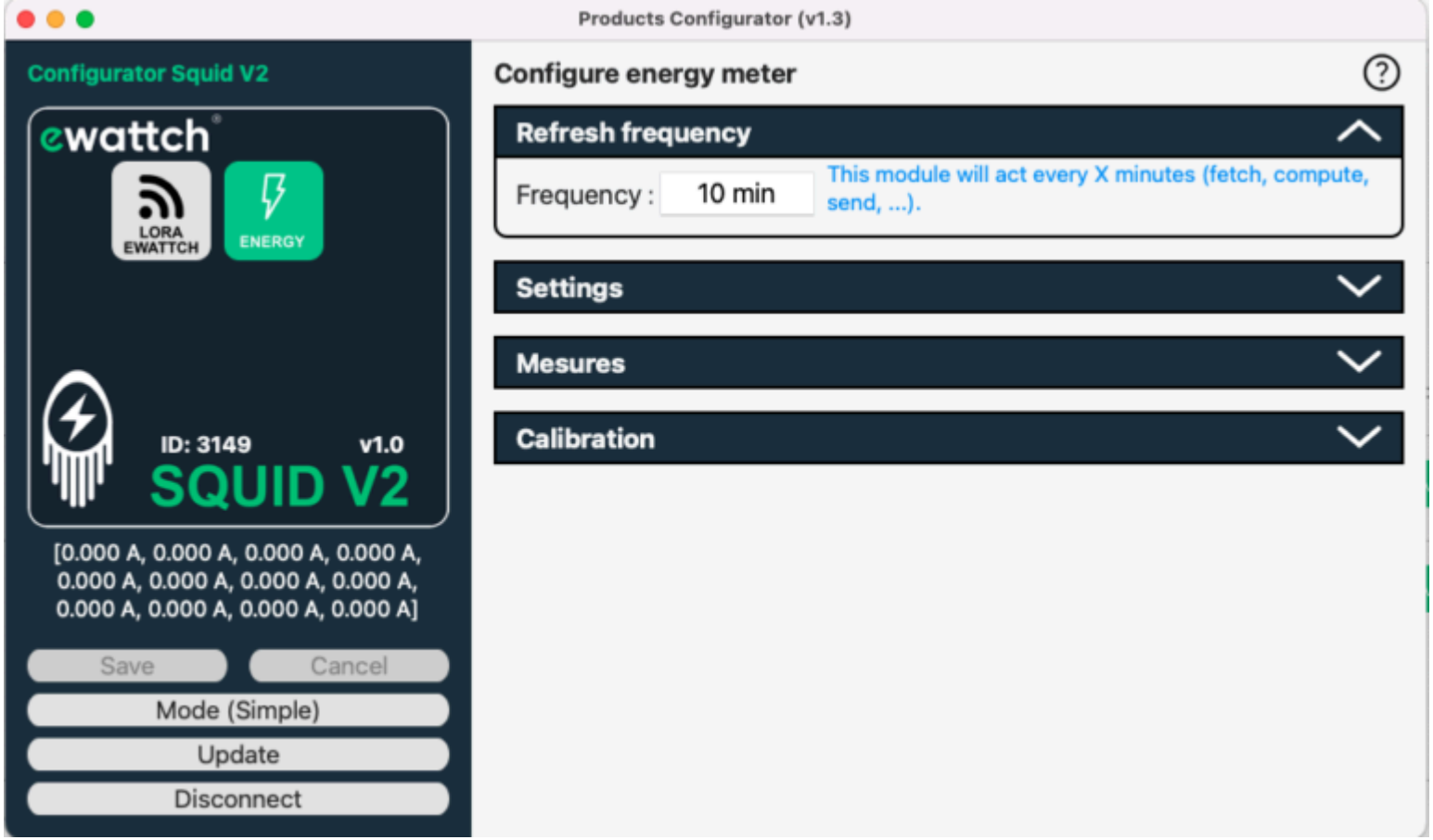


Energy parameter configuration

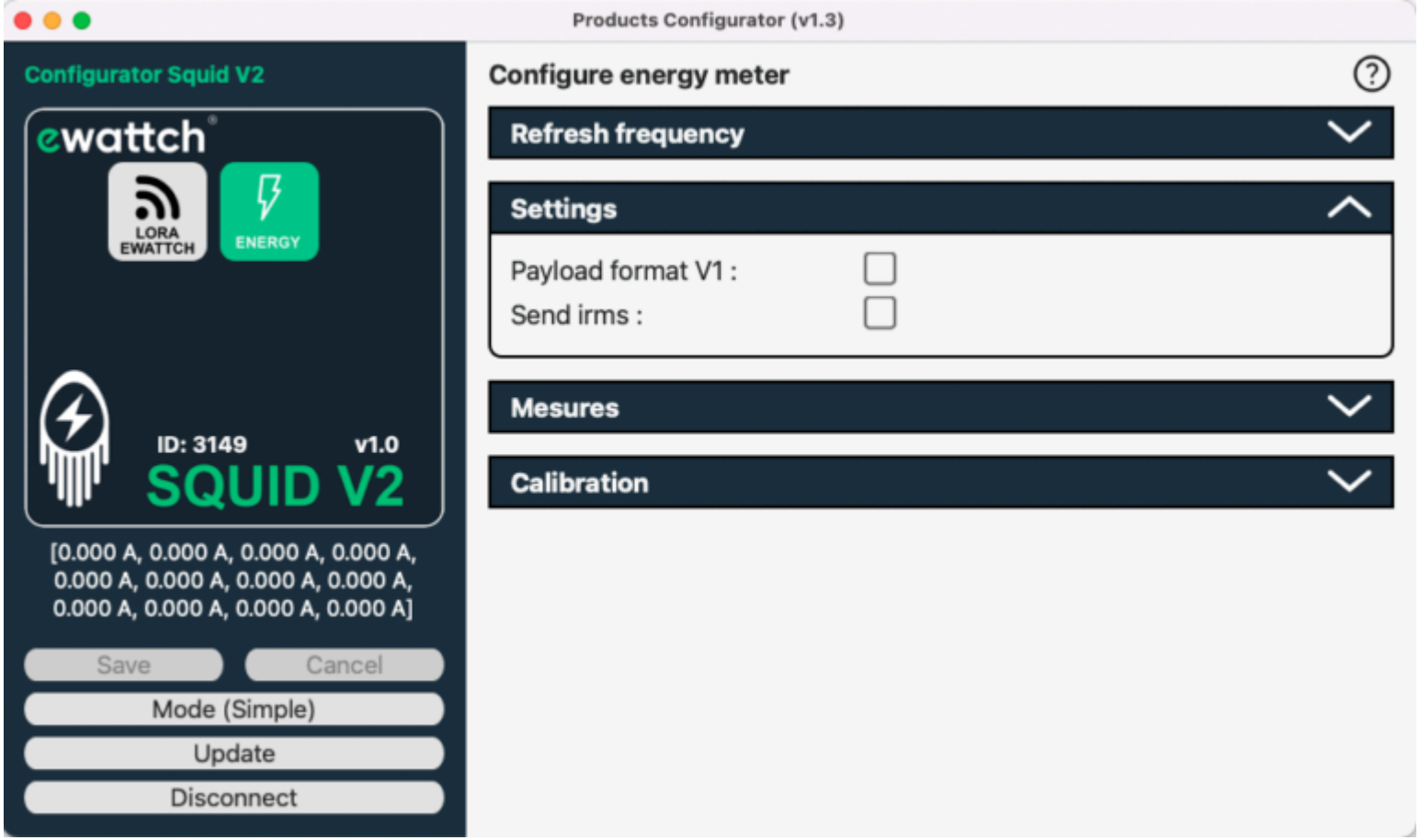
To access the configuration parameters for the measurements of your Squid, click on the energy icon in the top left corner (green box in the ima ge below).



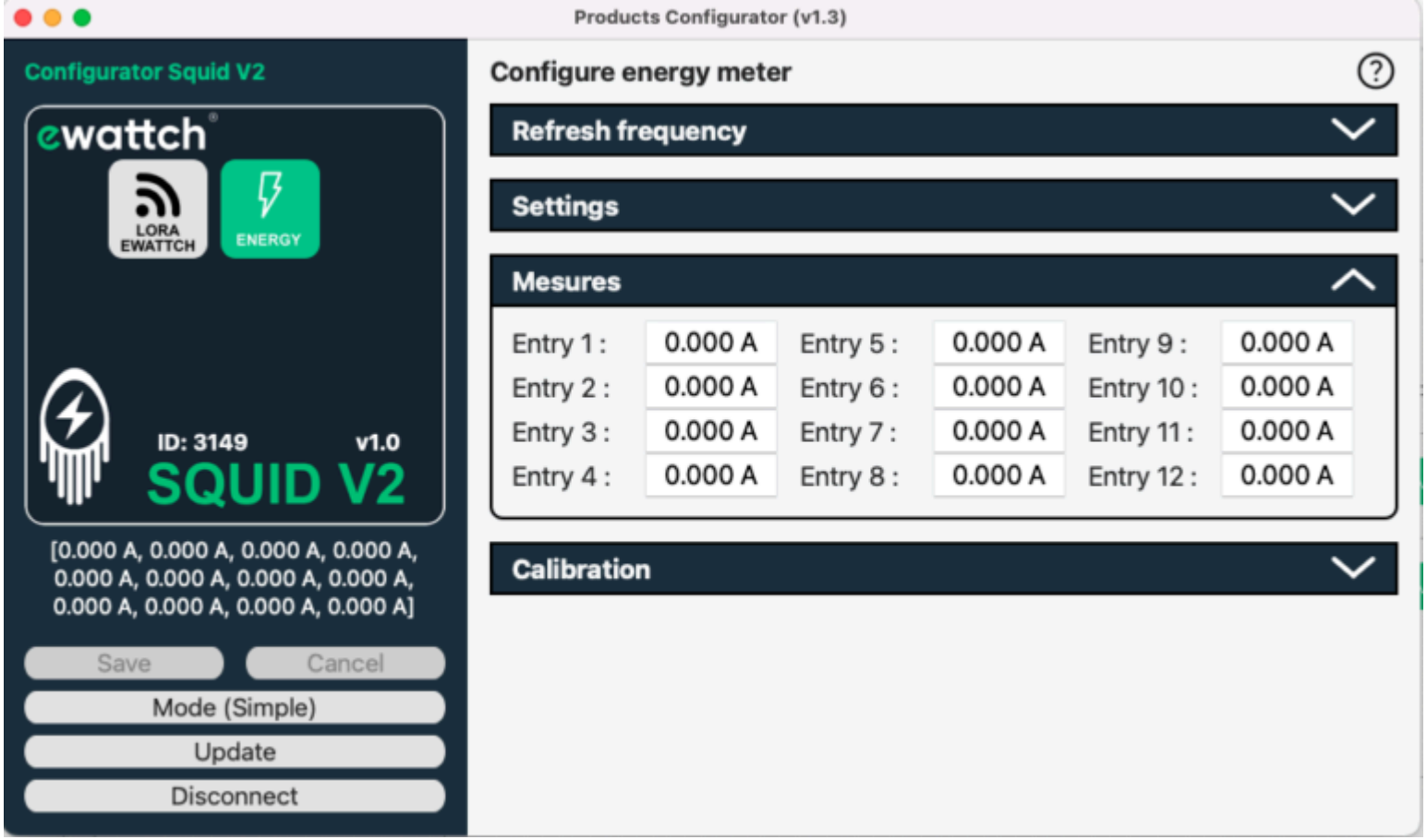
The first panel “Refresh frequency” allows you to set the granularity of radio transmission of measurements from your Squid V2. By default, this is set to 10 minutes.



The second panel “Settings” allows you to configure the type of data transmission: V1 format or not (to keep the same message format as the Squid V1), and the transmission of instantaneous measurement (check “Send irms”). By default, these two boxes are not checked.



The third panel “Measurements” allows you to view in real-time the measurements taken by your Squid.



When you have finished your configurations, don't forget to click on the "Save" box in the left column to save all your changes. Otherwise, they will be lost.

Click on "Disconnect" in the bottom left corner to properly disconnect the Squid.

9. Default parameters

- Radio communication: LoRaWan
- LoRaWan mode: OTAA
- datarate: Fixed DR0/SF12

- Messages confirmed: deactivated
- Periodic reconnection to the LoRawan network: deactivated
- Time between two radio communication of mesures: 10 minutes
- Measurement: 12 measurement channels with measures in mAh

10. Technical Specifications

POWER SUPPLY

- **Voltage :** 5 VDC
- **Maximum consumption** : 0,5A
- **Power supply voltage fluctuation** : +- 10% of the nominal voltage

CONNECTIONS

Current clamp inputs

- **Number of inputs :** 12 independent channels for current clamps
- **Available clamps :** 4 different sizes (10, 16, 24, and 36 mm)
- **Clamp type :** split core current transformer
- **Clamp cable length :** 2m
- **Maximum current :** 75A – 100A – 300A – 600A
- **Accuracy :** +- 2% from 1A.
- **Resolution :** 10mAh
- **Sampling :** 7,8Khz
- **Bandwidth :** 0-3,6Khz at -3db

Antenna

- **Type of connector** : female SMA
- **Resistance :** 50 ohms
- **Frequency :** 868 MHz
- **Remote antenna :** Yes

RADIO COMMUNICATION

LoRaWAN™:

- **Frequency :** 868MHz
- **Maximum transmission power :** 25mW
- **Communication distance :** up to 15km in open field
- **Version :** 1.0.1
- **Class :** A
- **Micro USB configuration software :** Yes

ENVIRONMENTAL CONDITIONS

- **Operating environment :** indoor (IP20)
- **Operating temperature :** from 5 to 60°C
- **Storage temperature :** from -20°C to +70°C
- **Operating humidity :** 10 to 80%, without condensation
- **Storage humidity :** 10 to 80%, without condensation
- **Maximum altitude :** 2000 m
- **Power supply voltage fluctuation :** +-10% of nominal voltage
- **Pollution degree :** 2

- **Overvoltage category :** III

PHYSICAL CHARACTERISTICS

- **Dimensions (H X L X W) :** 90 x 88 x 62 mm
- **Size :** 5 modules
- **Weight :** 152 g
- **Mounting :** DIN EN 6 0715 rail (1 x 35 mm)

CERTIFICATIONS

- **CE Certification :** YES

11. Contact

ewattch®

13, Rue Maurice Jeandon
88100 Saint-Dié des Vosges
FRANCE
sales@ewattch.fr
www.ewattch.com

Was this helpful? Yes No

Suggest edit

Contact

sales@ewattch.com

+33(0)3 29 57 75 97

http://www.ewattch.com

Website

Produits

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ewattch®

13, rue Maurice Jeandon
88100 Saint-Dié-des-Vosges
FRANCE

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