12-channel electrical submeter with LoRaWAN wireless communication

Discover the **SQUID Pro**, a revolutionary 12-channel energy meter for electrical submetering of your single-phase and three-phase installations.

Capable of measuring and transmitting via a **LoRaWAN** wireless connection: **active power**, **reactive power**, **phase shift**, and other information. This PRO version surpasses the performance of traditional meters for optimized management of your installations.

Using its 12 clip-on current measurement clamps, its 3 voltage inputs, and its secure, long-range connectivity, the SQUID Pro transmits real-time energy data, providing you with total control over your consumption and a comprehensive view of your electrical network.

Experience unparalleled performance and intelligent energy management for energy savings and improved operational efficiency.

Advantages

- Electrical submetering with **12 measurements using clip-on clamps**
- Accurate measurement of **active and reactive power**, and **phase shift** for optimized energy management
- Wireless **LoRaWAN** communication for reliable, long-range, and secure connectivity
- **Real-time** data transmission for optimal monitoring of your energy consumption
- **Configuration and updates** via a simple and intuitive application
- 4 clamp sizes available, from 10mm (75A) to 36mm (600A). No setup required.

Mesures

- Energies : consumed active, produced active, positive reactive, negative reactive, apparent
- Powers : active, reactive, apparent
- Currents
- Voltages
- Frequency

Use Cases

- **Building Management :** The SQUID Pro is the ideal solution for monitoring and optimizing energy consumption in tertiary buildings such as offices, shopping centers, and hospitals. Thanks to its advanced technology, it detects energy-intensive equipment, analyzes consumption peaks, and identifies energy-saving opportunities, allowing you to reduce your costs and improve your energy performance.
- **Industry :** Industrial companies can take advantage of the SQUID Pro to effectively monitor and control the energy consumption of their machines and equipment. This translates into optimized preventive maintenance, improved production processes, and significant reductions in energy costs.
- **Regulatory Requirements:** By choosing the SQUID Pro, you facilitate the implementation of your energy management project and ensure compliance with various regulatory requirements worldwide. Opt for a high-performance and accurate solution for efficient and sustainable energy management, tailored to meet the diverse regulatory obligations in different regions.

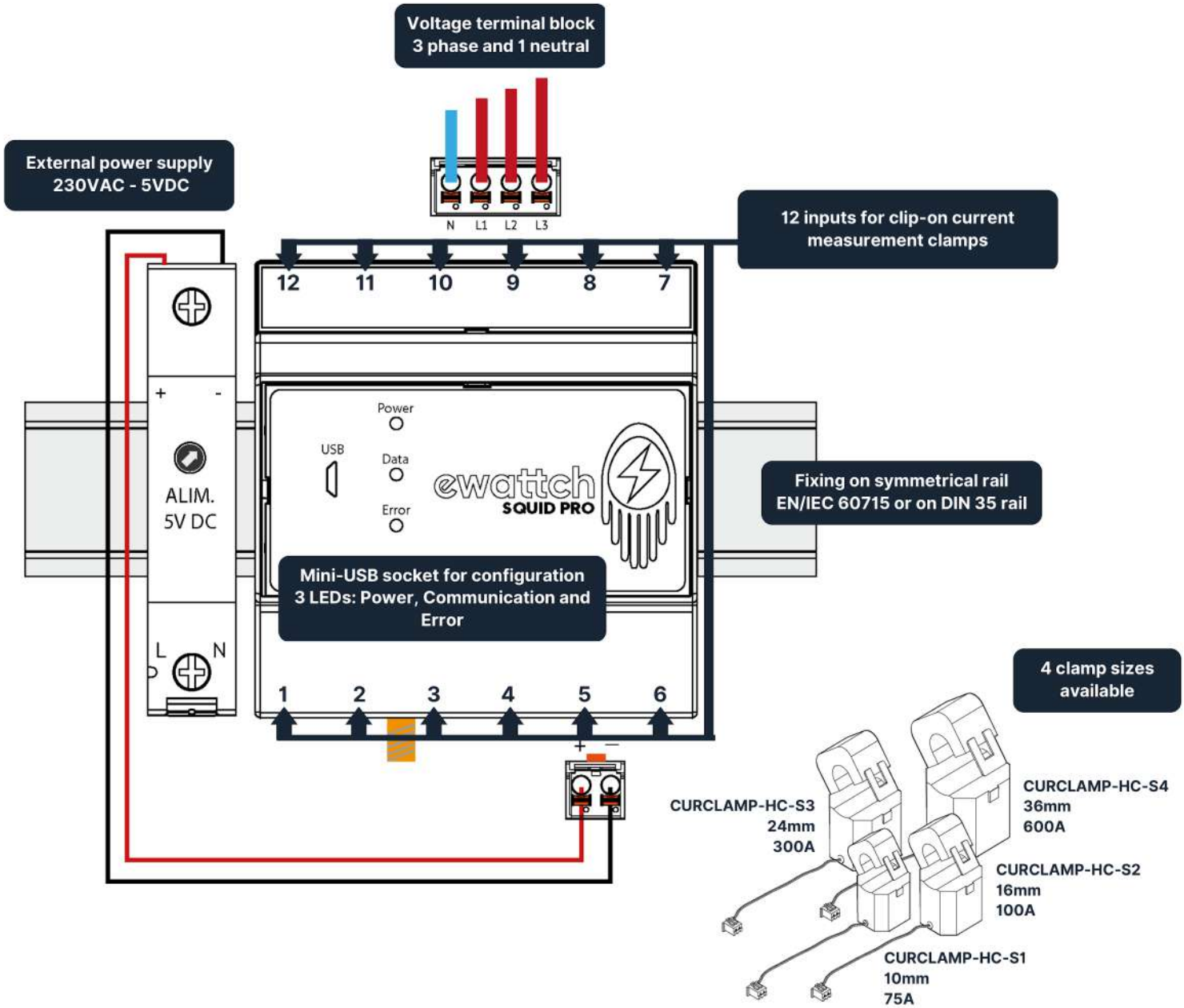
Installation and Implementation

Before starting the installation of the SQUID Pro, make sure to use a 5VDC – 2A power supply placed at the head to power the device. It is important to maintain and separate the wiring of the SELV (Safety Extra Low Voltage) circuits from the circuits under dangerous voltage in order to ensure the safety and proper functioning of the system.

Connecting the measurement clamps to the SQUID Pro is simplified thanks to a quick connector, eliminating the need for tools. Connect the measurement probes to the 12 connectors located on the top and bottom of the device. Make sure not to exceed the maximum current specification for each measurement clamp to avoid any risk of damage or overheating.

To ensure safety during the installation of the clamps, it is imperative to perform this operation when the circuit is de-energized. Use only Ewattch CURCLAMP-HC-SX measurement clamps, specially designed for optimal compatibility with the SQUID Pro.

By following these installation and implementation recommendations, you will ensure safe and efficient operation of your SQUID Pro electrical submetering system.

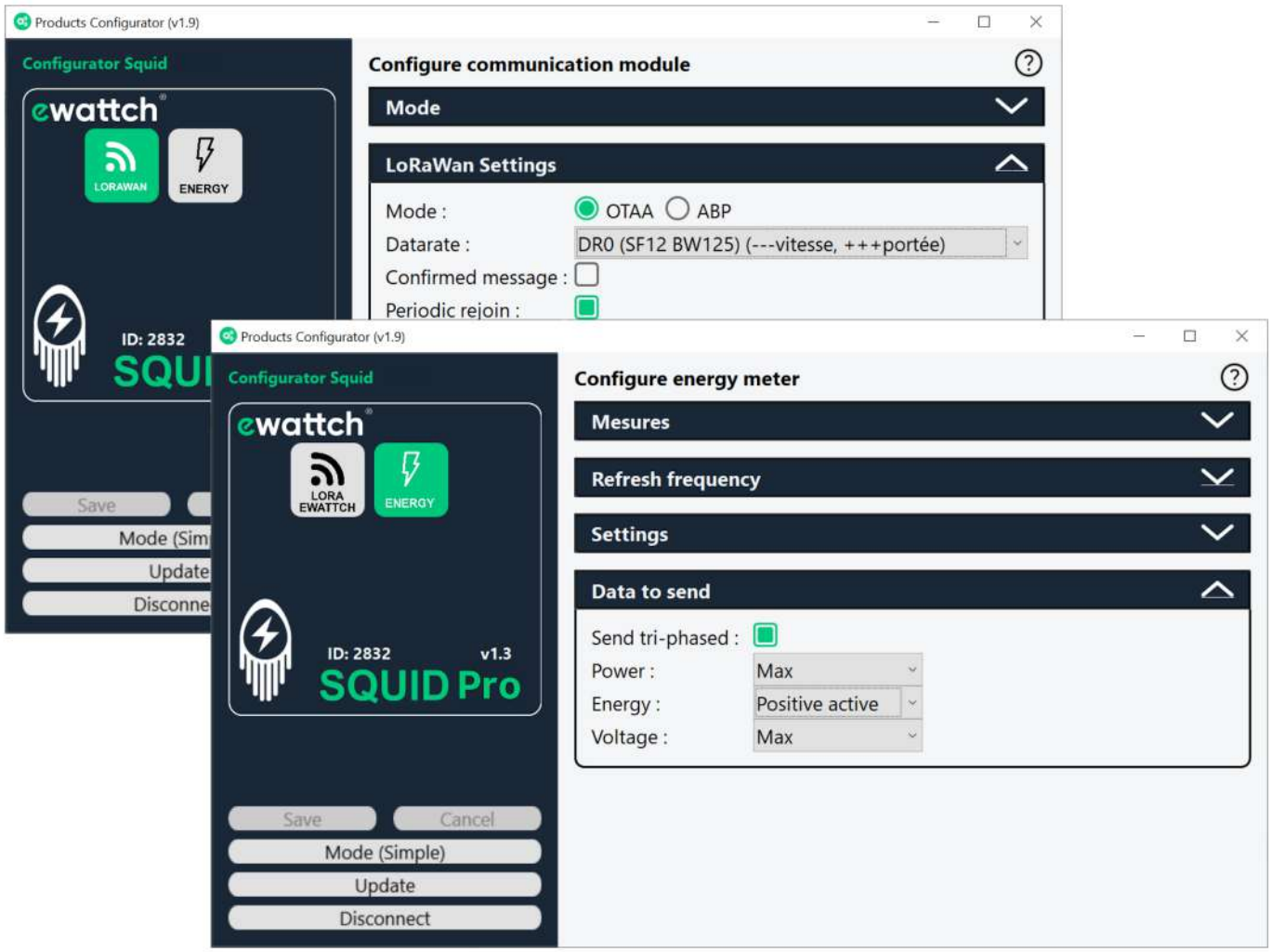


Configuration Software

The SQUID Pro is equipped with a user-friendly and intuitive configuration software, specially designed to facilitate the updating and setting of your electrical submetering device. Thanks to its mini-USB connection, you can easily connect the SQUID Pro to your computer and access the software to customize the settings according to your needs.

The software allows you to configure the desired measurement types, transmission intervals, LoRa communication, and many other options, with just a few clicks.

In addition, you benefit from support for firmware updates, ensuring that your device stays up to date with the latest improvements and features. With the SQUID Pro configuration software, you have total control of your submetering system, guaranteeing accurate monitoring and continuous optimization of your energy consumption.



Description of LoRaWAN frames (payloads)

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

The periodic frames

The periodic frames contain the data measured by the SQUID.

Example of periodic frame (HEXA) transmitted:

00 26 40 C3 860400 040000 28E866 3C6692 D29766 9FB967 040000 040000 DF0C01 040000 050000 32A400

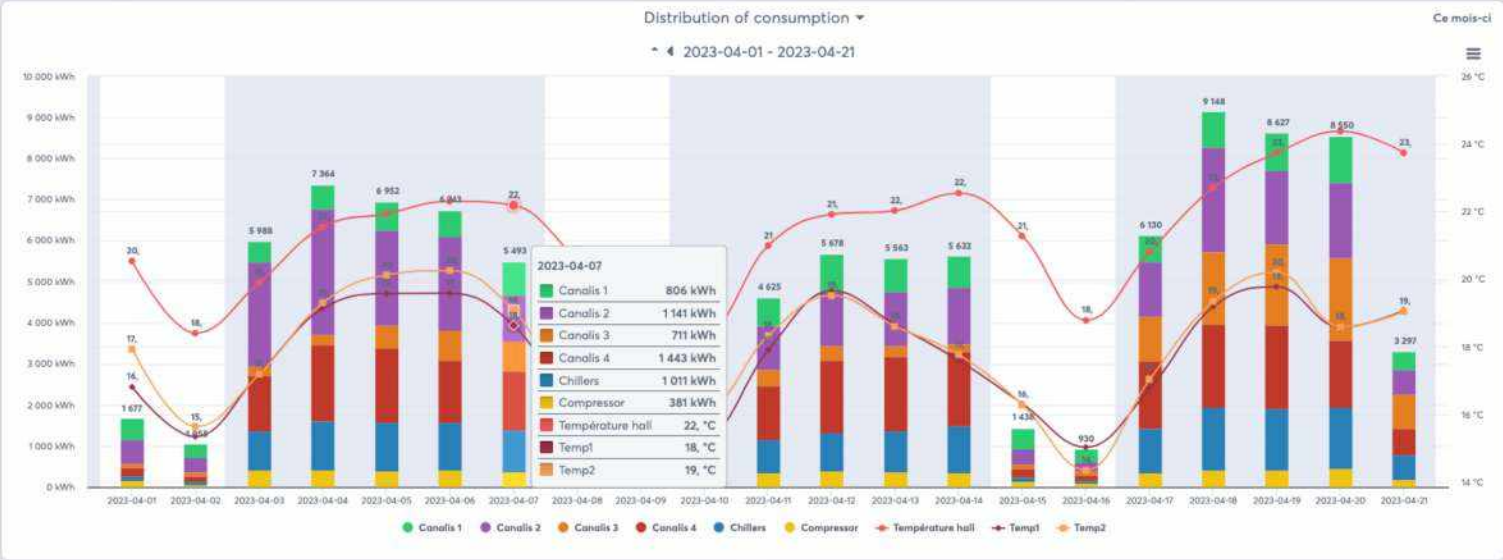
Index	Name	Example	Description
1	Frame type	00	Data sent periodically Other possible values: 0x01: Data sent on event 0x10: Sensor status data
2	Payload size	26	Number of bytes sent. 0x26 in hexadecimal gives 38 bytes (excluding header: Frame type and Payload Size)
3	Object Type	40	Energy meter
4	Measurement Type	C3	4 bits MSB = number of measurements and 4 bits LSB = type of measurement C: 12 bars 3: Active energy index consumed (10Wh). See Table Type of measurement
The data below is in 16 or 24 bit format, signed or not depending on the type of measurement, and encoded in little endian. As indicated above, there will be 12 measurements of the Active Energy Consumed Index type that will be required per 10Wh.			
5-7	Channel 1	**860400**	0x860400 => 0x000486 => 1158 or 11,580 Wh
8-10	Channel 2	**040000**	0x040000 => 0x000004 => 4 i.e. 40 Wh
11-13	Channel 3	**28E866**	0x28E866 => 0x66E828 => 6744104 i.e. 67441040 Wh
14-16	Channel 4	**3C6692**	0x3C6692 => 0x92663C => 1205820 or 12058200 Wh
17-19	Channel 5	**D29766**	...
20-22	Channel 6	**9FB967**	...
23-25	Channel 7	**040000**	...
26-28	Channel 8	**040000**	...
29-31	Channel 9	**DF0C01**	...
32-34	Channel 10	**040000**	...
35-37	Channel 11	**050000**	...
38-40	Channel 12	**32A400**	0x32A400 => 0x00A432 => 42034 or 420340 Wh

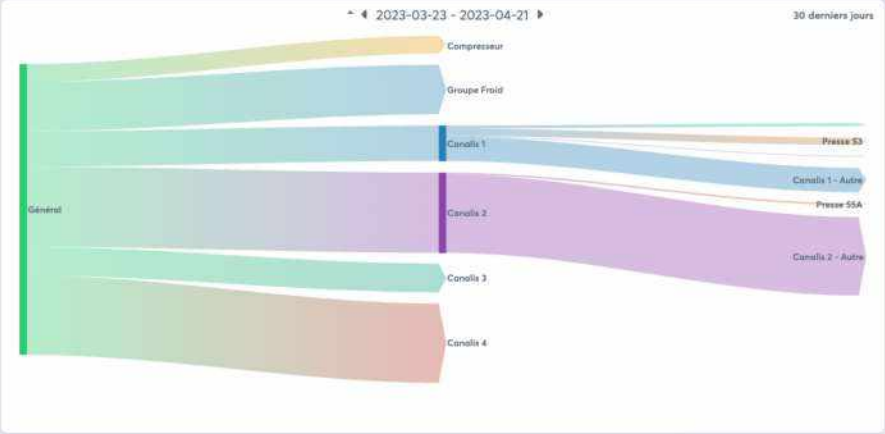
Type of measurement	Code (Hexa)	Frame format	Measurement size
Current index (10mAh)	0	x Index in multiple of 10mAh	3 bytes
Current (mA)	1	x current measurements in mA	3 bytes
Current index (10mAh) + Current (mA)	2	x Index in multiple of 10mAh followed by x current measurements in mA	3 bytes
Active energy consumed index (10Wh)	3	x Index in multiple of 10Wh	3 bytes
Active power (w)	4	x active power measurement w	3 bytes (signed)
Active energy index produced (10Wh)	5	x Index in multiple of 10Wh	3 bytes
Positive reactive energy index (10varh)	6	x Index in multiple of 10varh	3 bytes
Negative reactive energy index (10varh)	7	x Index in multiple of 10varh	3 bytes
Reactive power (var)	8	x reactive power measurement in var	3 bytes (signed)
Apparent energy index (10VAh)	9	x index in multiple of 10VAh	3 bytes
Voltage (100mV)	10	x voltage measurement in multiple of 100mV	2 bytes
Apparent power (VA)	11	x apparent power measurement in VA	3 bytes
Frequency (0.01Hz)	12	x frequency measurement in 0.01hz	2 bytes

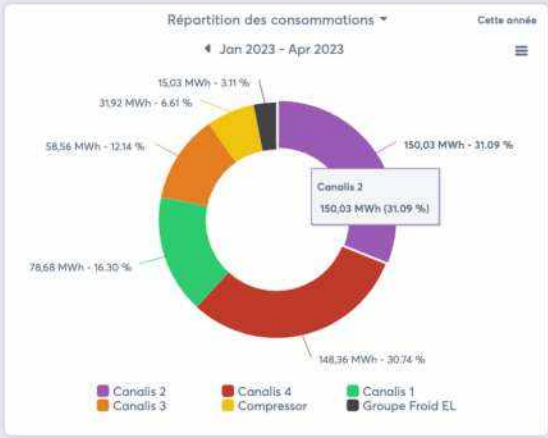
Tip - Decoding LoRaWAN frames

To facilitate the integration of products communicating via the LoRaWAN network, Ewattch has developed a payload decoder available at this address: https://ewattch-documentation.com/?page_id=10390

Examples of Widgets







Compatible Platforms

We are committed to providing extensive compatibility for our products, including the SQUID PRO, with various market platforms. We understand the importance of flexibility and interoperability for our customers, which is why we strive for seamless integration of our solutions with the most popular and innovative platforms. If you wish to use a platform that is not yet listed as compatible, please do not hesitate to contact us.

advizeo

ewattch® Cloud

Power BI

ENERGIENCY

HXPERIENCE

energisme

myDevices

Technical characteristics

Measures

- Energies: active consumed, active produced, positive reactive, negative reactive, apparent
- Powers: active, reactive, apparent
- Currents
- Tensions
- Frequency

Wireless communications

- Frequency: 868MHz
- Maximum transmission power: 25 mW
- Communication distance: up to 15 km in open field
- Version: 1.0.1
- Class: A

Power Supply

- Voltage: 5VDC via external power supply
- Maximum consumption: 0.5A

Connectors

Measurement Clamp Inputs
- 12 inputs
- 4 clamp sizes available: 10mm (max 75A) / 16mm (max 100A) / 24mm (300A) / 32mm (600A)

Voltage Inputs
- 4-pole connector
- 3 phases and neutral (230VAC)

Configuration
- 1 mini-USB port

Antenna Connector
- type: SMA female
- Impedance: 50 ohms
- Frequency: 868 MHz

Power Supply
- 2-pole connector: 5VDC and ground

Environmental characteristics

- Area of use: indoors (IP20)
- Operating temperature: from 5°C to +60°C
- Storage temperature: from -20° to +70°C
- Operating humidity: 10 to 80%, non-condensing
- Maximum altitude: 2000m
- Supply voltage fluctuation: ± 10% of nominal voltage
- Pollution degree: 1
- Overvoltage category: III

Physical characteristics

- Dimensions (H x W x D): 90.5 x 87.8 x 62 mm
- Size: 5 modules
- Weight: 152g
- Mounting: Rail according to DIN EN 6 0715 (1 x 35 mm)

Approvals and conformity

- EMC
- EN 61000-6-2: Immunity for the industrial environment
- EN 61000-6-3: Emission for the residential environment
- EN 55022: IT equipment immunity
- RADIO
- EN 30022
- SECURITY
- EN 61010: Electrical measuring devices

References

- **SQUID-PRO KIT:** Kits including a SQUID-PRO, all necessary accessories:
  - 1 power supply with fixing on a 230VAC-5VDC din rail (ref.: ALIM-RAIL-5V)
  - 1 magnetic antenna for mounting outside the cabinet (ref.: ANTMAGNSUP)
  - Attention: There is no pliers in the kit.

- **CURLAMP-HC-S1:** Clip-on measuring clamp ø10mm - 75A eff max
- **CURLAMP-HC-S2:** Clip-on measuring clamp ø16mm - 100A eff max
- **CURLAMP-HC-S3:** Clip-on measuring clamp ø24mm - 300A eff max
- **CURLAMP-HC-S4:** Clip-on measuring clamp ø36mm - 600A eff max
- **SQUID-PRO:** Product reference only, without accessories.
- **ALIM-RAIL-5V:** 230VAC 5VDC power supply fixing on DIN RAIL
- **ANTMAGNSUP:** Antenna with magnetic base (Cable length: 4m)

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