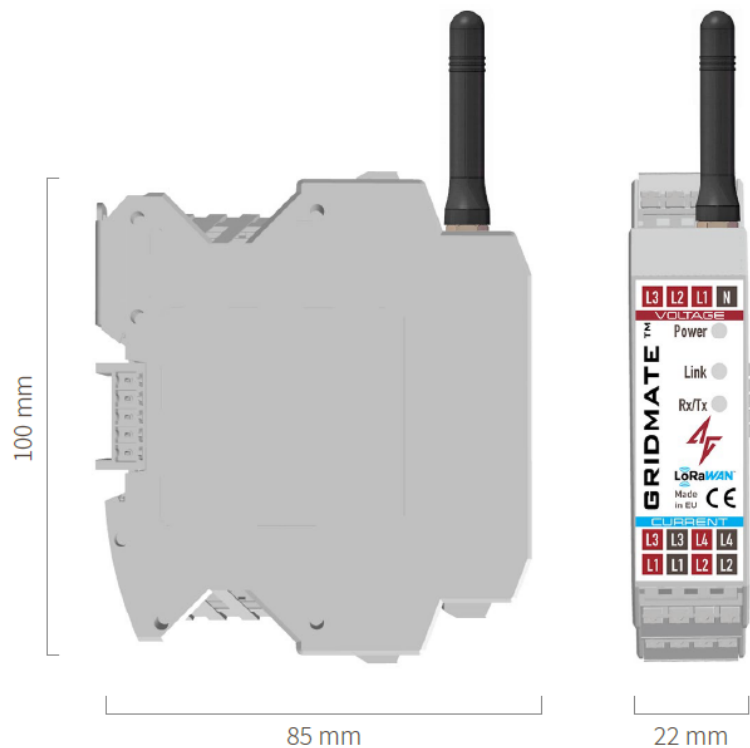


Wireless 3-phase 4-wire Power Monitoring Sensor

AdvanGrid GridMate LoRaWAN

User Manual



2019

Contacts
Address: Ganību dambis 17a, Rīga,
LV-1045, Latvia
Phone +371 2645 1114
E-mail info@advangrid.com

Commercial Register
Legal address: Dunties street 28-155
Rīga, LV-1005, Latvia
Reg. No.: LV40103868579
VAT No.: LV40103868579

Managing Director
Miks Sturītis

Bank
Swedbank, A/S
Swift code: HABALV22
IBAN: LV07 HABA 0551 0394 3592 0

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1.Introduction

AdvanGrid GridMate LoRaWAN AGGMSET001 EU868:

AdvanGrid GridMate LoRaWAN AGGMSET001 EU868 is a LoRa WAN enabled power monitoring sensor. It works in 3-phase 4-wire systems capable of simultaneously measuring up to 4 single phase circuits or one 3-phase circuit. The sensor can be bundled with different Current Transformers or Rogowski Coils (current transducers) for measuring current up to 5000A:

- AdvanGrid GridMate LoRaWAN AGGMSET001 – 3 x 100A CT (16 mm clamping range)
 - 4th CT on demand (4 single phase circuit)
- AdvanGrid GridMate LoRaWAN AGGMSET002 – 3 x 400A CT (24 mm clamping range)
- AdvanGrid GridMate LoRaWAN AGGMSET003 – 3 x 600A CT (36mm clamping range)
- AdvanGrid GridMate LoRaWAN AGGMSET004 – 3 x 2000A RC (60 mm clamping range)
 - 4th RC on demand (4 single phase circuit)
- AdvanGrid GridMate LoRaWAN AGGMSET005 – 3 x 5000A RC (180 mm clamping range)

Each set consists from the following components:

- 1 x GridMate sensor
- 3 x current transducers with wires and connectors (4th on demand)
- 4 x alligator clips for phase conductors (3 for each phase and 1 for neutral)
- 1 x cable for voltage connection
- 1x extender for neutral wire

2.Appearance

2.1 GridMate sensor

Device enclosure is made from V-0 class plastic (according to UL94), with a sticker indicating the wiring scheme. It has IP40 protection class. There are 3 diodes on the front of the sensor. 35mm DIN rail mount is attached to the back of the sensor for attaching purposes.

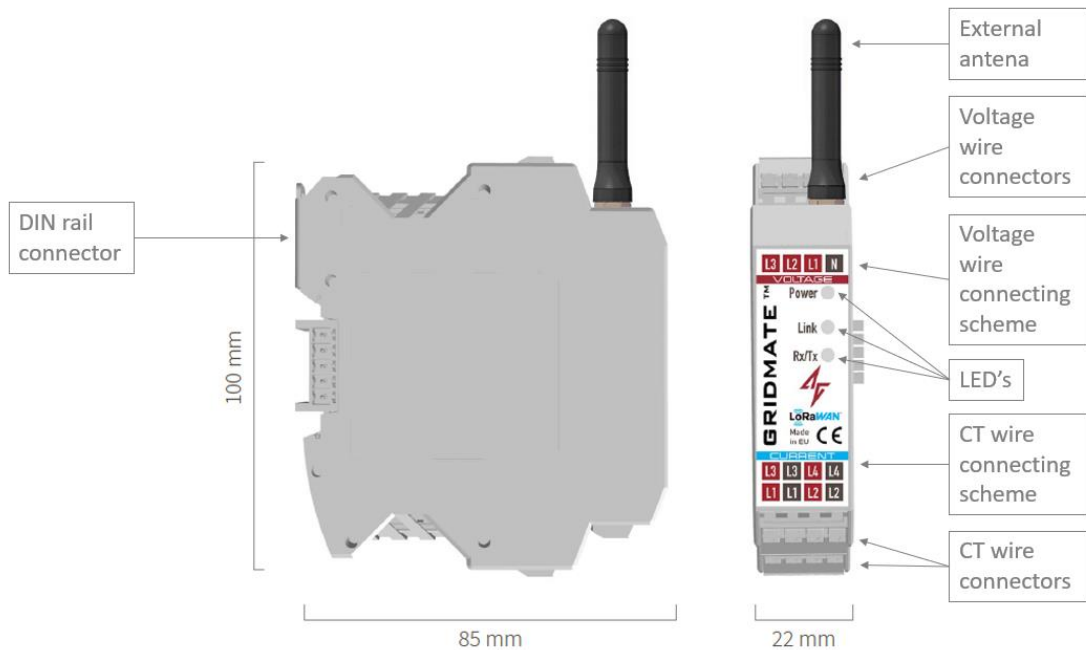


Image 2.1.1

2.2 Current transformers

Each GridMate sensor is bundled with 3 Current Transformers (or Rogowski Coils). These can be ordered with different diameters and measuring ranges (depending on installation needs). Current Transformer wires are marked with indicators: L1, L2, L3.



Image 2.2.1

2.3 Voltage connectors

Each GridMate sensor is bundled with 3 Alligator clips for voltage measurements and 1 Alligator clip for neutral. Alligator clip wires are also marked with numbers: 1, 2, 3. Neutral wire is in bright green/yellow color.

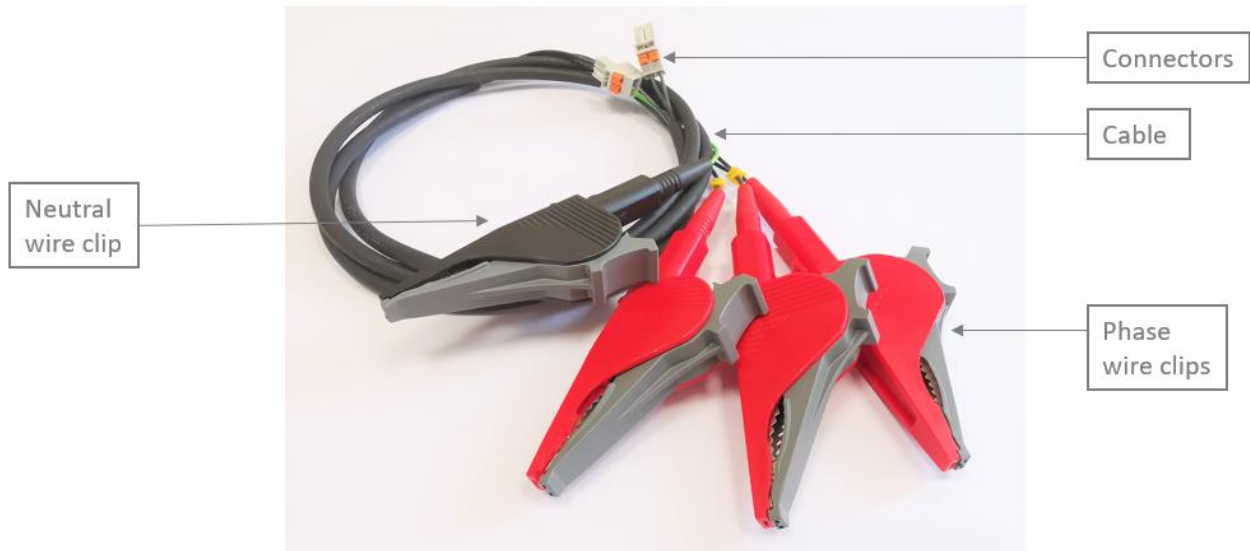


Image 2.3.1

2.4 Extension wire for neutral

Each GridMate sensor is bundled with one Neutral wire extender. The extension wire is designed to facilitate installation in cases where the neutral wire without the extension wire appears to be too short for easy attachment.



Image 2.4.1.

3. Installation manual

This manual explains how to set up a GridMate sensor. Please read this manual before setting up and using the GridMate sensor.

The manufacturer doesn't take any responsibility for any damage that has been done to the sensor while not following the installation and operation requirements in this manual. The manufacturer doesn't take any responsibility for fully or partially lost data caused by unprofessional actions made by a third-party.

3.1 Work safety requirements

Installing and servicing the GridMate sensor is an increased hazard task, that can be done only by a specially trained electrician. Personnel doing GridMate set up, maintenance and check-ups must be qualified and certified to do electrical work. Live-line working must be done with extreme caution and according to all regulations regarding live-line, electrical work and personal safety in your country.

3.2 Preparation before installation

Find out the type and voltage of the electricity grid. The GridMate sensor can only be used in 0.4kV electricity grids with a neutral.

Before installing the GridMate device, make sure that the particular device configuration fits the electrical wiring and parameters. Check if the Current Transformers (or Rogowski Coils) can be clamped around the chosen cables or busbars and choose the appropriate voltage connection option.

Make sure that the maximum current doesn't exceed the current transducer range - 100A (or higher – depending on chosen option) per phase.

3.3 GridMate setup

3.3.1 Installation of Current Transformers

Installation starts with mounting Current Transformers (or Rogowski Coils) on the electrical conductors. Current transformers are marked with phase numbers that are important for making a correct voltage connection and phase load traceability. Also, it's important to note the direction of the arrow on the Rogowski coil- it needs to be pointed from the electricity source to the load (see Image 3.3.1.1).



Image 3.3.1.1

Make sure that the Current Transformers fixation mechanism is properly closed. The fixation clip must be closed by pushing it until you hear a clicking sound.

In the process of setting up the device you must follow the state of the cable connector and make sure that it's not exposed to any harmful factors (water, mud, oil, etc.).

In installations where Rogowski coils are used the surplus cable length should be rolled up in a loop with a diameter no smaller than 15cm and fastened in a way that the connector and coil aren't exposed to unnecessary strain.

When the Current Transformers have been set up, they can be connected to the GridMate sensor.

3.3.2 GridMate setup and wire connecting

GridMate can be mounted on 35mm DIN rail (using the mount) or in any appropriate place, while making sure that it isn't hanging by its cables and there is no unnecessary strain on the connectors.

It is recommended to mount the device as far as possible from hot objects and in places where the temperature doesn't exceed 50°C. Also, any unnecessary exposure to direct sunlight should be avoided.

3.3.3 Connection of voltage cables

When installing a GridMate sensor, the neutral must always be the first connected voltage wire. When removing the device, the neutral must be disconnected last.

When connecting the voltage wires, special attention must be paid to the neutral connection place. Make sure that the contact surface is clean and decrease the probability that the neutral connection could be lost while installing and using the GridMate sensor.

The voltage phase wire connecting order is not important, but make sure that the phase markings fit the markings on the Current Transformers.

When connecting the phase wires to live conductors be ready for some sparking that occurs because of the transition processes in the device. As the **device is fed (powered) from the 1st phase**, when connecting, the sparking caused will be more severe than when the other phases are connected.

To minimize load on the GridMate components, the phase connection should be performed fast to avoid repeating sparks because of a bad connection.

After installing the voltage connection make sure that there is no unnecessary strain on the connectors because of the weight of cables or other factors as it could lead to a loss of contact.

3.3.4 Operation of the sensor

After setting up the sensor it will start to search an available LoRaWAN network to join. 3 diodes on the sensor indicate operating modes and possible problems (see Image 3.3.4.1).

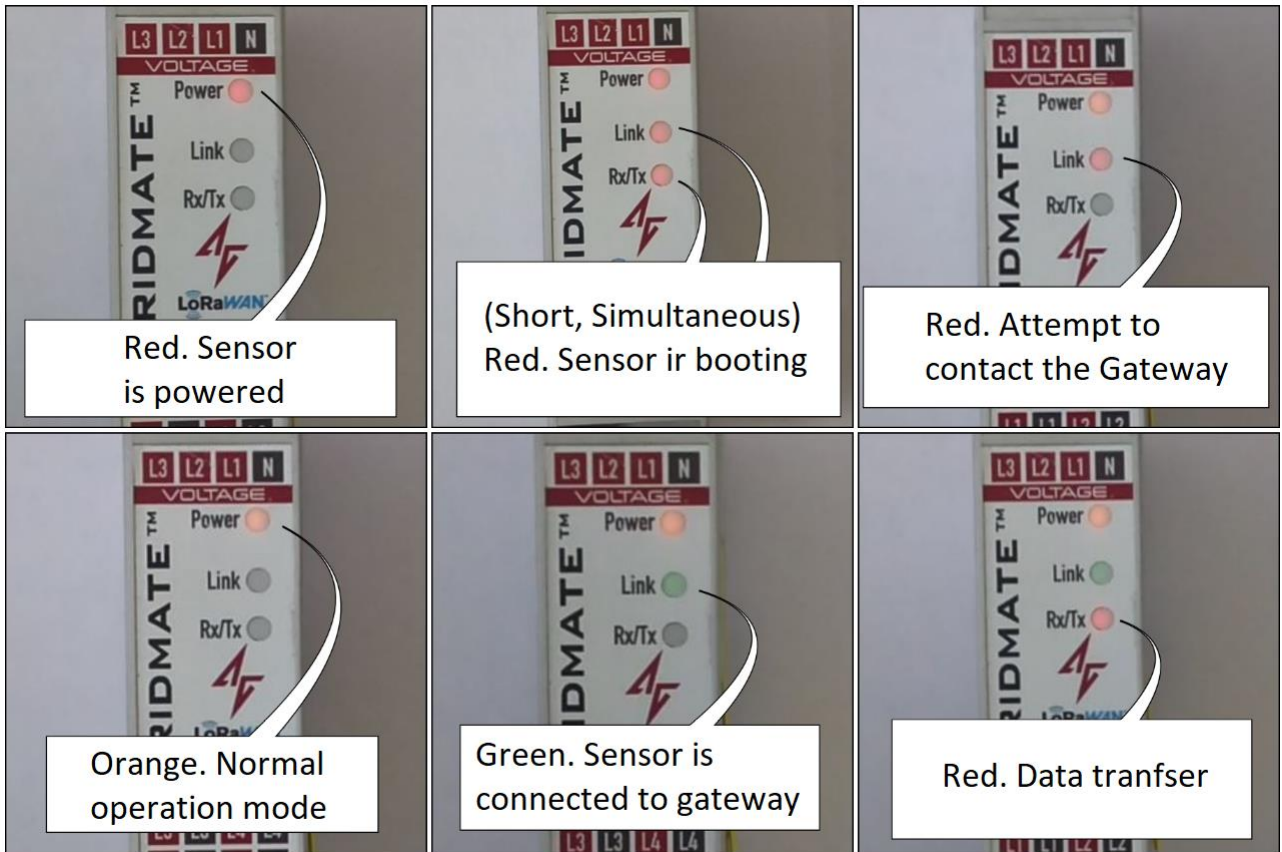


Image 3.3.4.1

As soon as the device is installed it immediately starts reading electricity data. First data pack is sent as soon as the device is properly connected to the grid. Subsequent data packs will be sent every 5 minutes.

4. Maintenance

GridMate sensor is a product of superior design and craftsmanship and should be used with care. The following suggestions will help you use the warranty service effectively:

- Keep equipment dry. Rain, moisture and various liquids may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.
- Do not use or store in dusty or dirty areas. This can damage detachable parts and electronic components.
- Do not store in excessive heat. High temperatures can shorten the life of electronic devices, destroy batteries and deform or melt some plastic parts.
- Do not store in a cold place. Otherwise, when the temperature rises to normal temperature, moisture will form inside, which will destroy the board.
- Do not throw, knock or shake the device. Rough handling of equipment can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents or strong detergents.
- Do not apply with paint. Smudges can block debris in detachable parts and affect normal operation.

All of the above suggestions apply equally to the sensor and accessories. If any sensor is not working properly, please contact manufacturer for repair.