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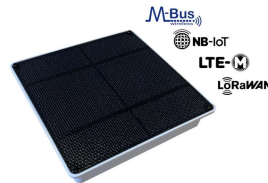
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## LOB-GW-SUN-WMBUS

### Solar Wireless M-BUS Gateway

### Product Identification

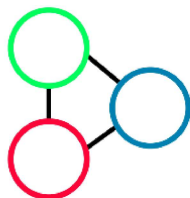


Type	LOB-GW-SUN-WMBUS
Name	Solar Wireless M-Bus Gateway
Order number	#8000179

## Overview

The maintenance-free and lightweight Lobaro Solar Wireless M-Bus Gateway for indoor or outdoor environments collects consumption data from up to 500 commercially available water meters, heat meters, heat cost allocators, etc. with 868 MHz wireless M-Bus radio interface or Sensus RF Bubble Up and forwards them regularly encrypted via NB-IoT, LTE-M1 mobile radio or LoRaWAN (configurable) to the Internet for evaluation and further processing.





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high-performance solar cell in conjunction with an ultra long life super-capacitor, meter data can be transmitted several times a day in many applications when mounted with daylight incidence, even indoors. The achievable readout intervals can, with a suitable installation location, be many times higher than with our [battery-powered variant](#) without the risk of drained batteries and costly maintenance. In addition to the typical smart metering application for billing, this innovative design also enables novel areas of application in the field of predictive maintenance.

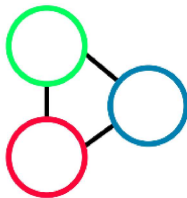
The sealed gateway housing is designed to be used indoors and outdoors (approx. IP54).

The gateway does not contain toxic heavy metals and is not considered a hazardous good, it is environmentally friendly as an electronic device can be.

## Differences to battery powered variant

This device differs from the [battery powered variant](#) in the following ways:

- **The device can't be opened in any way** - It was sealed with glue during production to achieve high waterproofing for outdoor use.
- A LTE-M / NB-IoT SIM card has been already inserted by Lobaro. Std. Tarif: 3 MB / per month over 10 years.
- The only kind of configuration adjustment can be done via the Lobaro platform or LoRaWAN downlinks. The USB cable option is not available.
- The device is shipped in standby mode. Before first use, it must be activated via the magnetic contact on the housing indicated by a dot.



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- The default WAN selection is "LTE". Please use the Lobaró Platform to switch to LoRaWAN if this is the needed uplink technology.
- The daily status uplink is done at 12:00h (UTC+0) instead of 00:00h (UTC+0)

Beside this differences the solar powered variant runs the same firmware and has the same functionalities.

## Quick Start

### Initial Startup

To reset the device hold the magnet for 5 seconds+ to the dot marking and hold it until you hear **three fast beeps after the rhythmic sound**.

1. A rhythmic on/off tone sounds until three fast beeps indicate the device reset
2. Release the magnet
3. An ascending tone signals the restart / reset of the device
4. If the device was in standby mode, this flag got reset by this reset / activation.
5. Login into your Lobaró Platform account
6. The device will upload it's status after an initial wMBUS collection phase

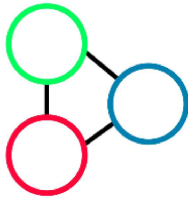
**i** Note: If the magnet gets removed before the three fast beeps during the rhythmic sound no reset will be performed.

### Energy Level Check

To check the device current energy level shortly (< 1 second) hold an magnet to the dot marking on the housing.

1. Release the magnet
2. The devices indicated the current power level by audio (3-0 range, 3 beeps = fully charged)
3. If the device is in "standby" mode a descending tone is played after the energy level audio indication
4. If the level is not 3 or at least 2 place the device in a position with daylight incidence for some hours and check again later (1)

## Default Configuration



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- Note: If the energy is not sufficient the collection + upload cycle will be skipped until enough (see *RequiredVoltage* parameter) energy has been harvested.
- Up to Firmware 0.15.1: Default CRON: 0 0 8-18 \* \* \* (Collection and upload every hour between 8h-18h UTC during day time)
- Collect wireless M-BUS (C1/T1 mode) for 900 seconds (15 Minutes)
- Upload all data to public [Lobaró Platform instance \(https://platform.lobaro.com\)](https://platform.lobaro.com)

**i** A wireless M-BUS readout and upload can be initiated at any time using the magnetic contact reset method (see below) if the stored energy is sufficient.

## Magnetic reset and audio indications

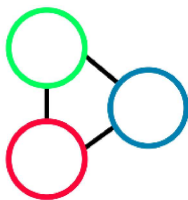
The Solar Wireless M-Bus Gateway has an internal magnetic switch that can be activated by holding a neodym magnet at the side of the housing marked with a dot. This can be used to query the current energy level of the internal capacitor and to initiate a reset with subsequent wireless-MBus readout and data upload phase.



## Device Energy Level Indication

The Solar Gateway has an internal supercapacitor for energy storage. This capacitor can be charged by the PV panel up to 3.8V.

The current filling level of the energy storage can be queried by briefly actuating the magnetic switch:



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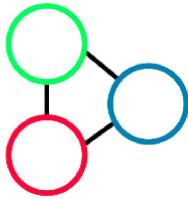
- b. The devices indicated the current power level using audio feedback (3-0 range, 3 beeps = fully charged)
- c. If the device is in "standby" mode a fast descending tone is played after the energy level audio indication
- d. If the device is completely discharged, no sound is emitted.
- e. If the internal voltage is below the voltage set by the "RequiredVoltage" parameter, a falling tone will sound to indicate that the current voltage is not sufficient for normal operation.

Stored Energy	Internal Voltage Level (max. 3.8V)	Audio Indication	C + S + M
<b>Fully Charged</b>	Level > 3.65 V	3x Beep	Tr C & N
<b>Good</b>	3.5V > Level < 3.65 V	2x Beep	C & N
<b>Useable</b>	Level > RequiredVoltage (Parameter)	1x Beep	C & N
<b>Level not sufficient*</b>	Level < RequiredVoltage (Parameter)	Descending tone	C &
<b>Absence of Energy</b>	Level < aprox. 3.0 V	None / Silence	C &

**NOTE (\*)**

If the RequiredVoltage parameter is set to a higher voltage than "Good" or "Fully Charged" the Descending tone will be played nevertheless. The device will remain in sleep mode until the configured voltage has been reached.

**Device Reset + Manual Readout**



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- To reset the device hold the magnet between **5-6 seconds** to the dot marking **until** you hear **three fast beeps after the rhythmic sound**.
  - The stored energy indication feedback is given
  - A rhythmic on / off tone starts until three fast beeps
  - Release the magnet
  - An ascending tone signals the restart / reset of the device
  - The device performs a complete wireless M-BUS readout cycle with data upload via LTE (NB-IoT or LTE-M) or LoRaWAN.

**i** If the magnet is removed before at least 5 seconds have elapsed (b), there will be no reset! Then only the current energy level is signaled.

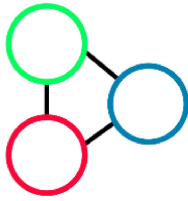
### Standby Mode Indication

In case the device is in the "Standby" mode, after the signalization of the energy level, the device emits an additional fast decaying tone. In case the internal voltage level is below the RequiredVoltage parameter this leads to a slow and fast descending tone right after each other.

### Variant Specific Parameters

Normally, the default values of the following solar variant specific parameters should only require an adjustment for special applications with particularly low light incidence or very many consumption meters to be read out.

Name	Description	Default	V D &
Standby	In standby mode the gateway remains in a low-power mode until the user performs an "Device Reset" via the	true	•



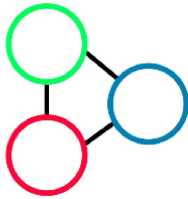
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	<p>changes to false after this reset. It can be reactivated via a remote configuration downlink. This mode can be determined via the "Standby Mode Indication" when active.</p> <p><b>⚠</b> The device can conserve in this mode its energy for some months. If the device has not been exposed to daylight for a very long time, a charging process may be necessary before initial installation.</p>			
RequiredVoltage	Required voltage level for normal operating mode. If the voltage in the device is lower, CRON based readouts are skipped until enough energy can be stored from the solar cell.	3500		V in R 3 3 M gi R pi
RestVoltage	Voltage level under which an active wireless MBUS readout and	3100		V in R 3 3



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prevent a power failure reset.

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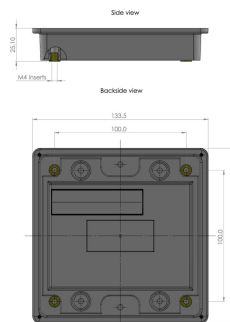
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## SIM-Card

The device is delivered as standard with a permanently installed internal SIM card allowing an initial data volume usage of 3 MB per month over a 10 years period. The utilized cellular networks can be either NB-IoT or LTE-M with [coverage in many different countries](#). Additional data volume may be obtained from Lobaró if required, or the SIM card can be transferred to your organization allowing data volume purchases independent from Lobaró.

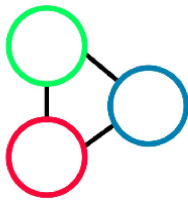
For larger orders with dedicated production runs other (E)SIM cards can be used customer specific. Please contact Lobaró if your own sim cards should be inserted during production before sealing.

## Physical specifications



Width	133.5mm
Length	133.5mm
Height	25.1mm
Mounting	4x M4 Thread with 100mm ; 100mm spacing
Material	ABS+PC (Fireproof)
Rating	IP54 (Suitable for outdoor use)
Weight	185g
Drawing	<a href="#">Dimensions_GW-SUN-WMBUS.pdf</a>





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⚠ **Please Note**

The responsibility for selecting a durable and stable mounting method lies with the customer. In case of doubt, the mounting type with back plate must be used (*Lobaro article #8000183*). Lobaro accepts no liability for alternative mounting methods.

### Mounting with backplate (Indoor + Outdoor)

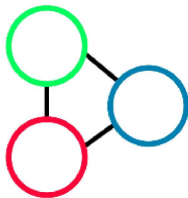
Lobaro Article: [#8000183](#)

To mount the unit to a wall, the optional transparent "plexiglas" back plate is available from Lobaro.

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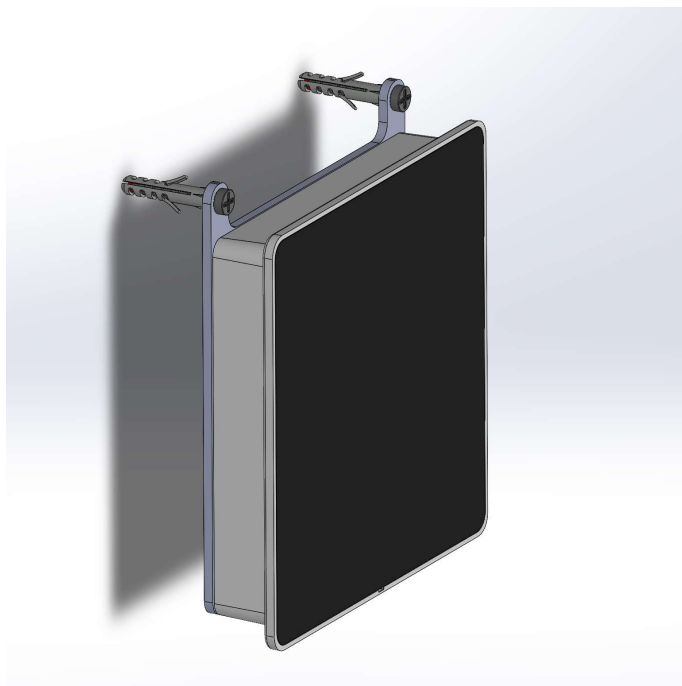
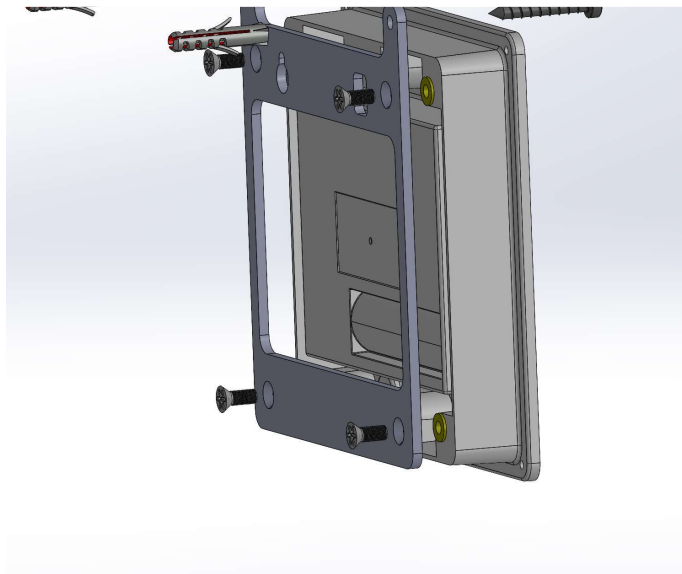
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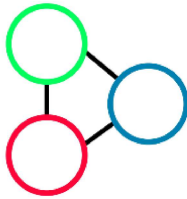
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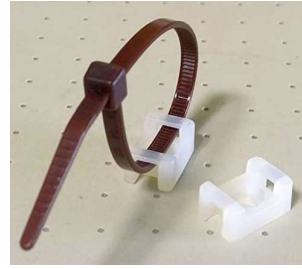
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- Backplate Drawing: [Dimensions\\_LOB-GW-SUN-BACKMOUNT.PDF](#)
- **i** The anchors and wall screws are not part of the contents of delivery.
- **!** For optimal antenna performance, the back plate should not be screwed to metal walls.
- **>** [Instructions](#)
  1. Use the provided four T20 M4x8 screws to attach the backplate to the housing.
  2. Use two appropriate screws of at least 4mm x 50mm size and anchors matching the wall material to fix the gateway.



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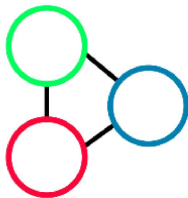
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- [GSM-2C Datasheet \(GW Kabelbinder-Technik GmbH\)](#)
- [Buy GSM-2C on Amazon](#)
- Use externally available GSM-2C clips and cable ties.
- ⓘ Max. cable tie width is 4.8mm
- ⚠ Using metal cable ties might degrade the antenna performance!
- > [Instructions...](#)
  1. Mount at least two clips to the backside of the gateway using M4x8 countersunk head screws with the backside M4 housing inserts.
  2. Apply two cable ties that can hold the approx. 185g weight of the gateway.

## Mounting with double sided tape (Indoor testing only)

Due to the low gateway weight of approx. **185g** it may be mounted using double sided tape in some indoor cases.

- For indoor mounting "[tesa® Adhesive Strips for Wallpaper & Plaster 1kg](#)" may be used.
- [Buy Adhesive Strips on Amazon](#)
- ⚠ Please read the instructions for use and check the wall material for suitability.
- ⚠ Regularly check whether the adhesive connection is still stable enough to ensure a secure hold.
- ⚠ Lobaro recommends this mounting option for short term testing only, for long term secure mounting the back plate must be used.
- > [Instructions...](#)
  1. Clean the surface of dirt and dust with a dust-free cloth.
  2. Attach Strip to the wall (blue tab facing the wall).



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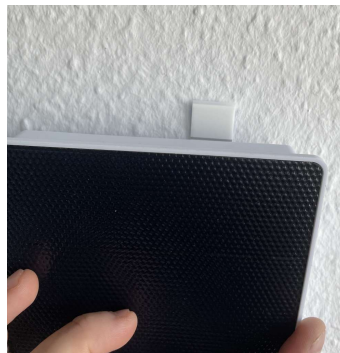
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3. Press down evenly over the entire strip for at least 5 seconds, and only then remove the protective foil.



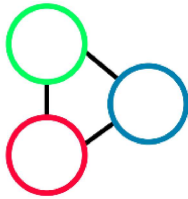
4. Now apply the Solar Gateway by aligning it on the top edge of the strip with an off-center orientation as shown.



5. Press down evenly all over the entire gateway for at least 5 seconds.



6. The tab should be left accessible over the gateway for easy removal.  
7. With elevated mounting, the viewing angle should not allow a view of the strip



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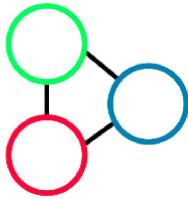
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## Mounting Hints & Examples

- When selecting an indoor installation location, make sure that at least some daylight reaches the gateway.
- Even low non optimal light levels could be sufficient for some data transmissions per month.
- Inside, the direct proximity to a window is ideal.
- For outdoor installation, any location is normally suitable for transmitting data at least multiple times a day.

## Antenna Shielding

- ⚠️ Avoid antenna shielding, e.g. using a solid metal mounting plate, in the red marked minimal keep-out area.
- ⓘ For optimal antenna performance do not block the keep-out area shown in [Drawing](#) and in pictures below:



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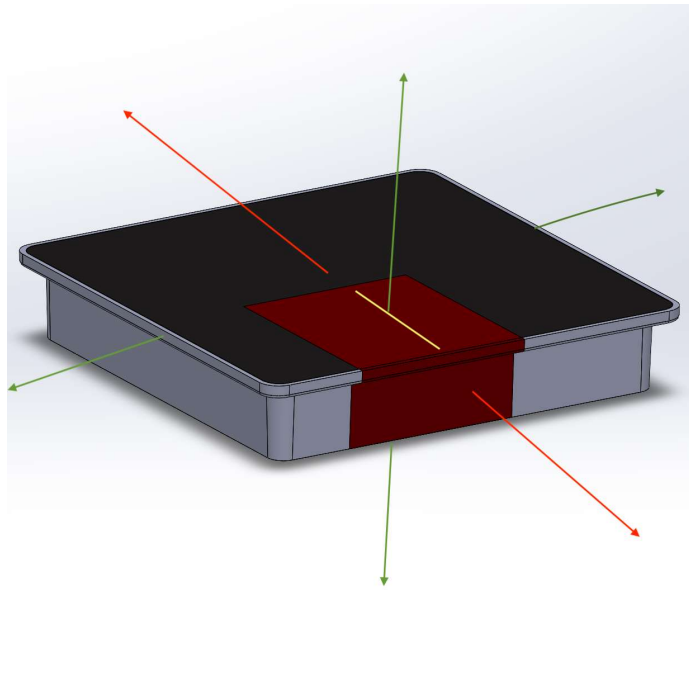
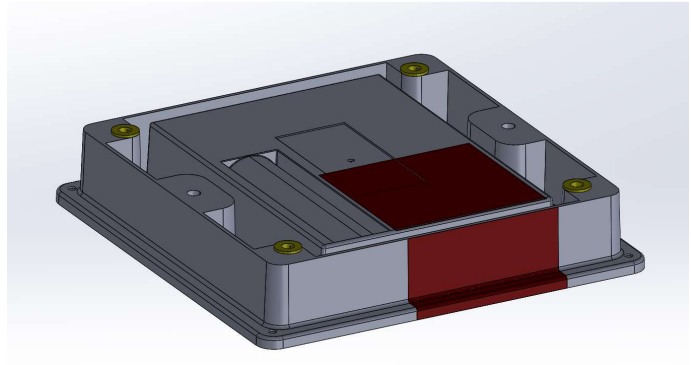
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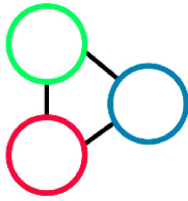
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### Indoor near window mount

Housing attached using double sided tape. Location good enough for multiple readings during daytime.



Lobaro Docs

## Products

### Wireless M-Bus Gateways

SMGW Anbindung DE

#### LOB-GW-HYB-WMBUS

#### **LOB-GW-SUN-WMBUS**

Firmware (LOB-GW-SUN-WM...

#### LOB-GW-DINRAIL-HYB-WMBUS

#### LOB-GW-WMBUS-NB2

### Hybrid Modbus Gateways

#### Multi Temperature V2 (LoRaWAN, ...

#### EDL21 electricity meter bridge V2 (...

Modbus Gateway (LoRaWAN)

#### GPS Tracker V3 (LoRaWAN)

#### Wireless M-Bus Bridge V2 (LoRaW...

#### Discontinued Products

### Device Configuration

### Lobaro IoT Platform

### Background Articles

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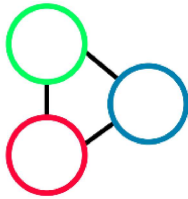
## Outdoor mounting in the basement staircase

Housing attached using GSM-2C clips (4 pcs.) and cable ties. Covered outdoor location good enough for hourly readings.



## Outdoor pole mounting

The gateway was bolted to a wooden board, which was then attached to the pole. Outdoor location good enough for hourly readings 24h / day.



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∨ Products

∨ Wireless M-Bus Gateways

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∨ **LOB-GW-SUN-WMBUS**

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In this test, the internal antenna was compared with an external one, as well as a larger internal supercapacitor with the standard size.

Therefore, four gateways were mounted on one pole at the same time.

## Outdoor impressions

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