

## Installation and operating instructions

Model / Typ	Description	Part No.
Repeater-EnO868USB	EnOcean Repeater (radio amplifier) 868 MHz , Power supply via USB port, with USB power supply unit (EC), black	104126

### Universal repeater (radio amplifier) for all EnOcean products

- EnOcean TCM 300 (Dolphin Inside) future-proof and backward-compatible
- Optimized RF antenna design combined with the surface-mounted location, for exceptionally good radio range.
- Attractive designer plastic housing for surface mounting (Wall or ceiling) made of ABS flame retardant.
- Power supply via USB interface, with USB type A plug and approx. 1.2 m cable or with SELV with 6V DC, via cable 1.2 / 2.2m with open ends.
- Repeater function selectable by hardware switch (no repeater, only post-master or level 1 or level 1 + 2).
- Future-proof, because of "Dolphin Inside". Supported services: The old and new EEPs, Post-Master for up to 10 Ids, Smart-ACK and Remote Management (locate).



### Application

Universal repeater (radio amplifier) for EnOcean radio technology. The radio transmission takes place on the European harmonized frequency of 868.3 MHz. With this device, the range between EnOcean transmitters and receivers can be increased. The radio signal can be cascaded to the receiver via a maximum of two repeaters. A configuration or teach-in is not required. Also as a replacement for radio range problems in existing installations. This device is identical and replaces the predecessor RepeaterEnO868USB Article-No. 104107 and RepeaterEnO868SELV Article-No. 104106.

### Function

The repeater is used for signal amplification of the radio telegrams between EnOcean sensors and receivers. This function is used when the sensor placement is outside of the receiving range of the receiver or there are range problems between transmitter and receiver in an existing installation.

In position **Rep. ON** is the Repeater function active. All received EnOcean telegrams will be re-sent automatically. The sent telegrams are marked as repeater signals. This tag distinguishes once or twice forwarded signals.

In operating mode **Level 1**, only original telegrams, which are telegrams originate directly from a transmitter, are processed and amplified again.

In operating mode **Level 1+2**, only original telegrams and, in addition, telegrams that have already been amplified once are processed and amplified again.

If the repeater is switched off **Rep. OFF**, then only the post master is active.

### Technical specifications

Supply voltage: 4.75..8V DC or via USB	Power consumption: typically 70 mA @ 5V DC
Antenna: internally	Transmitter: EnOcean TCM 300, Step Code: DB
Transmission power: <10mW	Housing: ABS flame retardant, white cover, black bottom
Transmission frequency: 868.3 MHz	Humidity: 0 ... 75% rh, non-condensing
Ambient temperature: 0...45°C	Storage temperature: -25...75°C
Protection class: IP20 IEC/EN 60529	Dimensions: diameter 93 mm height 29 mm
CE Marking	Weights: 125g

## Safety / Legal regulations

The device is only intended for its intended use. An unauthorized conversion or change is prohibited! The following points should be considered:

- The applicable laws, standards, regulations and the state of the art at the time of installation.
- The manuals of the radio transmitters and receivers..
- The instruction manual can only give general instructions. These have to be seen in connection with a specific application.

**Specified proper operation: The duty cycle of 1% per hour must be observed for this device!**

**Caution!!** This device **may not be used** in conjunction with devices that, directly or indirectly, serve human, health, or life-saving purposes, or that could cause danger to people, animals, or property.

Do not leave the packing material carelessly, plastic foil / bags, etc., could be a dangerous toy for children.



### **Disposal: Do not throw old devices into the trash!**

Dispose the device according to the laws and standards of the country in which the device is operated! The device contains electrical components that must be disposed as electronic waste. The housing is made of recyclable plastic.

BootUp products (Repeater-EnO868USB, Repeater-EnO868SELV) comply with the R&TTE Directive 1999/5/EC and comply with EU regulations. The products may be sold and operated free of registration and toll-free in the countries of the European Union, the CH, IS and N.

## Installation instruction

The designer plastic housing is prepared for direct surface mounting (wall or ceiling). The housing does not have to be opened for mounting. The device can be hung in screwed-in screws. Two blind holes at a distance of 55 mm are provided on the underside of the device. The screws should not be thicker than 4 mm and the screw head should not be larger than 6 mm.

Please note that the device is designed for indoor use only. Do not mount in places that can be sprayed directly with water! Wipe clean with a damp cloth only.

For optimal placement of the device and radio range, please refer to the information "Radio ranges between transmitters and receivers" on the next pages.

The ideal installation place (best radio range) is located in rooms about 1 m below the ceiling. The distance to other transmitters (e.g. GSM / DECT / Wireless LAN / EnOcean transmitters) should be at least 2 m.

**Note:** NEVER mount the transmitter unit in a metal enclosure or near large metal objects. An installation near the ground or on the ground is not recommended.

## Commissioning

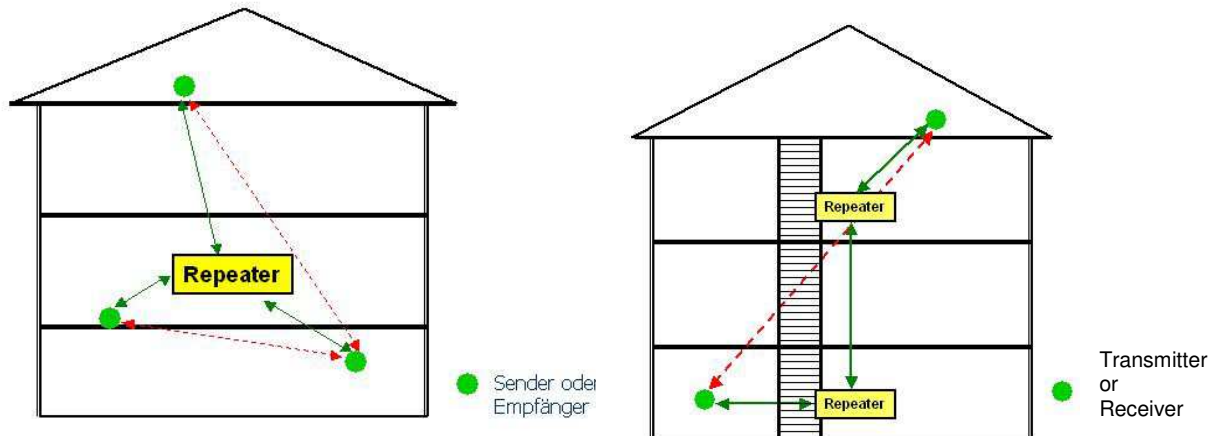
The device is connected to the power supply via the connecting cable and is thus in operation. Any configuration or teach-in is not required. The power is supplied via appropriate lines.

For the USB Repeater via a USB power adapter by inserting the USB Type A plug.

With the SELV Repeater by connecting to the power supply. It is important to pay attention to correct polarity. Repeater GND (black) on UP6 black, repeater + UB (red) on UP6 red.

The green <Power> LED lights up as soon as the device is powered. A special "learning procedure" between transmitter and repeater is not necessary. Each received radio signal is indicated by the yellow LED <Radio>.

The appropriate repeater mode can be activated via the switch.



Repeaters should be placed centrally.

Source: EnOcean GmbH

**Note:** Using bi-directional communication and signal routing via two repeaters, both must be in the operating mode **Level 1+2**.

### Operating status display and mode of operation settings via switches

Lower side of the device: LEDs show the operating state. Switch is used for settings.

Rep. ON	<input type="checkbox"/>	Rep. OFF	<input type="checkbox"/>	Power
Level 1+2	<input type="checkbox"/>	Level 1	<input type="checkbox"/>	Radio

**Operating status display:**

- green LED <Power> is on, when device is powered.
- yellow LED <Radio> flashes for each received radio signal, even if the signal is not amplified.

**Settings via switch**

- Repeater Function: Deactivate / Activate  
In position **Rep. OFF** is the Repeater function switched off, only the post-master is activ.  
In position **Rep. ON** is the Repeater function switched on.
- Repeater Function Mode: Level 1 / Level 1+2  
Only active, when **Rep. ON**  
In position **Level 1** is the Repeater function Level 1 active.  
In position **Level 1+2** is the Repeater function Level1+2 active.

**EnOcean Repeater USB**  
**Repeater-EnO868USB**  
 ArtNr: 104126  
 EnOcean© 868.3 MHz  
  
  
**IP20**  
  
**BootUp**  
 Switzerland www.BootUp.ch  
 www.myHomeControl.ch

Upper side of the device:

**Operating status display:**

- red LED in the housing cover (middle circle) <Locate>, lights up as soon as the remote management request "locate" has been received.

## Power supply

If a different power supply is used, it should be noted that this may affect the function of the device.

### USB power adapter (supplied with RepeaterEnO868USB)

The device with the USB plug can be connected directly to the USB power adapter. This is a plug and play solution and can be run by the layman. This complete system consisting of the repeater and the USB wide-range power supply 230V AC 5V DC, 0.7A has been tested (CE relevant measurements).

Electronic short circuit and overload protection

Input voltage: 110V ... 230V AC

Output voltage: 5V DC; maximum 0.7A

Black. Euro plug

Ordering Information:



Model / Type	Description	Article No.
USB Power Supply EC	USB Power Supply 230V AC 5V DC, 0.7A	001.915

### SELV 6V DC (not included in the delivery)

The repeater is supplied via low voltage 6V DC. This whole system consisting of the repeater and the UP6 wide range power supply 100-240V AC, 6V DC, SELV power supply has been tested (CE relevant measurements).

Input voltage: 100 to 240 V AC (+- 10%), 150 mA, 50 to 60 Hz

Output voltage: 6V DC, 1000mA, ripple 300 mVpp, current limited, sustained short-circuit proof, standby <0.3W.

Standards: Fulfills Class II SELV for the following applications: EN 60950 / IEC 60950, UL 60950, VDE, CE

EMC: Conforms to EN 55011, 55014, EN 55022 / B, EN 55024, FCC 41 part 15, EN 61000-3-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11,

Dimensions: 51 x 48 x 35 mm, 95 g, IP 64

Bestellinformationen:



Model / Type	Description	Article No.
UP6	Flush mounting wide range power supply 100-240V AC, 6V DC 1000mA; SELV	001.900

### To operate the USB Repeater with the UP6 power supply

1. Cut off the USB cable with the plug and shorten as per installation, then stripping
2. Cut off the following wires: Shield, green, white and isolate the shield
3. Connect to the UP6 power supply, repeater ground (black) on UP6 black, repeater + UB (red) on UP6 red.

## Radio ranges between senders and receivers

The signal strength of the radio signals decreases as the distance between transmitter and receiver increases. In buildings, the range of the radio signals depends on the building materials used there. In addition, the angle plays a role with which the signal sent hits the wall. Depending on the angle changes the effective wall thickness and thus the attenuation of the signal. If possible, the signals should run vertically through the masonry. Wall niches are to be avoided.

### Material typical ranges:

Sight connection	30m in corridors and up to 100m in halls
Masonry	20m, by maximal 3 walls
Reinforced concrete	10m, by maximal 1 wall / ceiling
Plasterboard / wood	30m, by maximal 5 walls

**Radio range is restricted by:**

- Leaded glass or glass with metal coating, steel furniture
- Moisture in materials increase damping
- Hollow lightweight walls with insulating wool on metal foil
- False ceilings with metal or carbon fibre panels
- When mounting the transmitters on metal surfaces: Please do not mount the receiver in the same plane (same wall) as the metal surface significantly reduces the propagation of the signals in this plane.
- Fire walls, lift shafts, staircases and supply areas should be considered as separation.
- Keep close to objects made of metal or materials with metal components, minimum distance of 10 cm.
- Devices which also operate with high-frequency signals, e.g. Computers, audio / video systems, electronic transformers and electronic ballasts (ECGs) for lamps, etc. are considered as other sources of interference. The minimum distance to these devices should be 0.5m.

More information [EnOcean Wireless Systems – RANGE PLANNING GUIDE\(PDF\).  
www.enocean.com/fileadmin/redaktion/pdf/white\\_paper/WP\\_RANGE\\_PLANNING\\_May09\\_en.pdf](http://www.enocean.com/fileadmin/redaktion/pdf/white_paper/WP_RANGE_PLANNING_May09_en.pdf)

The radio range can be extended by the use of radio amplifiers, an EnOcean repeater (e.g., Repeater-EnO868SELV or Repeater-EnO868USB). When planning the retrofitting of repeaters should be considered (power connection).

**Measurement of radio quality:**

For verification of the installation and during optimization or troubleshooting, the EnOcean signals can be easily and reproducibly simulated and measured with test equipment (e.g. P30 see [www.probare.biz](http://www.probare.biz)). Please visit [www.myHomeControl.ch](http://www.myHomeControl.ch).

**Fault diagnosis, error analysis and rectification****For a new plant or an existing plant:**

- Check whether the green <Power> LED is lit.
- Check the reception function by sending (press PTM button) the yellow LED <Radio> must flash briefly.
- Check if changes have been made in the environment of the system that cause interference (for example, metal cabinets, furniture or walls have been moved, etc.).
- If the transmitting unit / receiver works at a reduced distance, they are disturbed or used outside the transmission range.
- Placement of the transmitting unit at a more favourable location or use of another radio repeater.
- Check the mains voltage of the actuators.
- Check whether the actuator is correctly connected.
- Check the function of the connected loads.
- Delete all learned transmitters in the actuator and reprogram the actuator.

**The actuator switches ON or OFF:**

- This can happen if an other transmitter is operated within the reception area, which was previously also trained on the actuator.  
→ Delete all learned transmitters in the actuator and reprogram the actuator.

**Transmitter does not work:**

- Take the transmitter and move in the direction of the actuator. If the system operates at a reduced distance, the transmitter has been mounted outside the transmission range, or is disturbed.  
→ Mount transmitter / actuator in a more convenient location.

**Repeaters will increase the radio traffic**

Actuators and permanently powered sensors can perform not only the actual function but also the repeater function. This can have undesirable effects as the radio traffic is increased with each repeater. If you make observations that you can not explain, then a suitable instrument can provide the appropriate insight.

**Note: Repeaters should only be used if necessary!**



Repeater-EnO868SELV

# EnOcean Repeater 868 MHz

Repeater-EnO868USB

Read the operating instructions carefully before commissioning.

Installation and operating instructions

## High frequency emissions from radio sensors

An expert opinion from the Institute for Socio-Ecological Research and Education (ECOLOG) has confirmed that the high-frequency emissions of radio switches and sensors with EnOcean technology are significantly lower than comparable conventional switches. In addition, due to the reduced wiring of radio switches, potential exposure to low frequency magnetic fields radiated over the line is reduced. If one compares the radio emissions of the radio switches with other radio frequency sources in the building, e.g. DECT phones and base stations, these systems are a factor of 1500 above those of the radio switch.

Download [Ecolog Report on EnOcean Frequency Emissions \(PDF\)](#).

[www.enocean.com/fileadmin/redaktion/pdf/articles/ECOLOG\\_measuringreport\\_v1.2.pdf](http://www.enocean.com/fileadmin/redaktion/pdf/articles/ECOLOG_measuringreport_v1.2.pdf)

## Warranty conditions

These operating instructions are part of the device and the guarantee conditions. It is to be presented to the user. The technical design of the devices may change without prior notice. BootUp products are manufactured and quality-tested using state-of-the-art technology in accordance with applicable national and international regulations. In the event of a defect, you can send the device to your dealer along with a clear description of the claim (type of use, defect detected, etc.). Claims for defects shall be settled in accordance with the current delivery and payment conditions of BootUp GmbH. The processing of warranty claims is governed by Swiss law.

## Additional information

Further information on the application with the BootUp SW **myHomeControl**, the EnOcean extension for visualization and control tasks in building services, test equipment for radio quality measurement and other EnOcean devices, visit [www.myHomeControl.ch](http://www.myHomeControl.ch).

### Customized versions / firmware update:

It is possible to load a custom firmware on this device (TCM300). A corresponding programming interface is available. A firmware update in the field is not provided. It is also possible to design the connection cable according to customer requirements. If you are interested, please contact us.

### Feedback is welcome

If you are satisfied with this product and this data sheet, please share it to others. If you are not satisfied, miss information, have corrections or suggestions for improvement, then we look forward to receiving an email. Many Thanks.

## Manufacturer

BootUp GmbH, Sonnenbergstrasse 23, CH-5236 Remigen, Switzerland

[www.BootUp.ch](http://www.BootUp.ch)

[www.myHomeControl.ch](http://www.myHomeControl.ch)

[info@BootUp.ch](mailto:info@BootUp.ch)



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**EnOcean Gateway (Modem) and Repeater 868 MHz****USB ESP2 868MHz**

Model / Type	Description	Article No.
USB2-EnOcean868	USB 2.0 EnOcean Gateway (Modem) Bidirektional 868 MHz	104100

is replaced by:

Model / Type	Description	Article No.
USB2+Rep-EnO868	USB2.0 EnOcean Gateway (Modem) Bidirektional + Rep 868MHz	104110

**RS232 ESP2 868MHz**

Model / Type	Description	Article No.
RS232+Rep-EnO868	RS232 EnOcean Gateway (Modem) Bidirektional + Rep 868 MHz	104102

**RS485 ESP2 868MHz**

Model / Type	Description	Article No.
RS485+Rep-EnO868	RS485 EnOcean Gateway (Modem) Bidirektional + Rep 868 MHz	104104

**USB ESP3 868MHz**

Model / Type	Description	Article No.
USB2+Rep-EnO868-ESP3.0	USB2.0 EnOcean Gateway(Modem) Bidirektional ESP3.0 868MHz	104112
USB2+Rep-EnO868-ESP3.0	USB2.0 EnOcean Gateway(Modem) Bidirektional ESP3.0 868MHz	104123
USB-EnO868-Stick-ESP3.0	USB EnOcean TranceiverStick (Modem) ESP3.0 868MHz	104180

**RS232 ESP3 868MHz**

Model / Type	Description	Article No.
RS232+Rep-EnO868-ESP3.0	RS232 EnOcean Gateway (Modem) Bidirektional ESP3.0 868 MHz	104116

**RS485 ESP3 868MHz**

Model / Type	Description	Article No.
RS485+Rep-EnO868-ESP3.0	RS485 EnOcean Gateway (Modem) Bidirektional ESP3.0 868 MHz	104114

**Repeater 868MHz**

Model / Type	Description	Article No.
Repeater-EnO868SELV	EnOcean Repeater SELV 868MHz	104106
Repeater-EnO868USB	EnOcean Repeater USB 868MHz	104107
Repeater-EnO868USB	EnOcean Repeater USB 868MHz	104126

**EnOcean Gateway (Modem) und Repeater 315 MHz**

Model / Type	Description	Article No.
USB2-EnOcean315	USB2.0 EnOcean Gateway (Modem) Bidirektional 315MHz	104101
USB2+Rep-EnO315	USB2.0 EnOcean Gateway (Modem) Bidirektional + Rep 315MHz	104111
RS232+Rep-EnO315	RS232 EnOcean Gateway (Modem) Bidirektional + Rep 315 MHz	104103
RS485+Rep-EnO315	RS485 EnOcean Gateway (Modem) Bidirektional + Rep 315 MHz	104105
USB2+Rep-EnO315-ESP3.0	USB2.0 EnOcean Gateway(Modem) Bidirektional ESP3.0 315MHz	104113
USB-EnO315-Stick-ESP3.0	USB EnOcean TranceiverStick (Modem) ESP3.0 315MHz	104181
RS232+Rep-EnO315-ESP3.0	RS232 EnOcean Gateway (Modem) Bidirektional ESP3.0 315 MHz	104117
RS485+Rep-EnO315-ESP3.0	RS485 EnOcean Gateway (Modem) Bidirektional ESP3.0 315 MHz	104115
Repeater-EnO315SELV	EnOcean Repeater SELV 315MHz	104108
Repeater-EnO315USB	EnOcean Repeater USB 315MHz	104109