Smart Level Measuring Device, DIN rail mount



Name	Model	Logical devices
Smart Level Measuring Device, DIN rail mount	GMB-HAR-L01-B02	1 x Metering device

User Guide

version 2.0

Technical specification

Network type	**ZigBee 3.0**
Frequency	**2.4 GHz**
Coverage	**100 m (open space)**
Network repeater (router)	**Yes**
Operating temperature	**-10 ℃ to +85 ℃**
Operating humidity	**≤ 95% RH**
Nominal voltage	**AC 110 V – 240 V**
Insulation resistance (500 V DC)	**min. 1000 MΩ**
Shock resistance	**98 m/s²**
Dimensions	**91.5 x 36 x 70.5 mm**
Weight (without sensor)	**≤ 150 g**
Housing material	**ABS**
Overvoltage category	**CAT III**
Mounting	**DIN rail**
PIN code	**Included in the package**
PUK code	**Included in the package**

Description

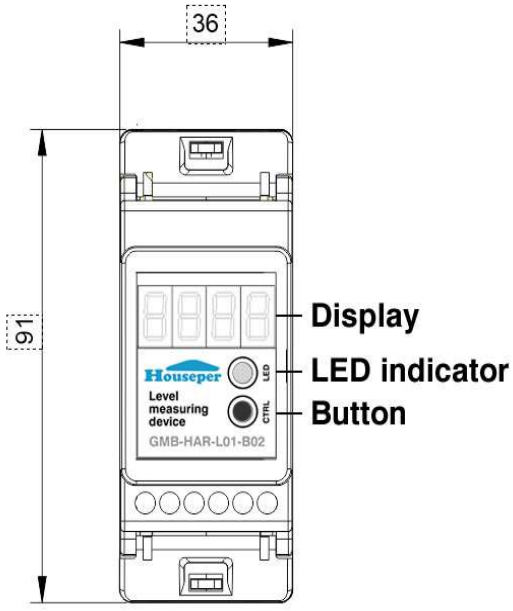


Fig. 1

The device is designed for measuring the level of non-aggressive liquids, such as water, aqueous solutions, oils, lubricants, as well as food, household, and specialized technical fluids. It consists of two components – a main DIN-rail mounted module and an external submersible level sensor connected to it. The built-in ZigBee module allows integration into a ZigBee 3.0 network. Depending on the capabilities of the control system, the device supports remote monitoring and can trigger automation scenarios with other smart devices.

Functionality (ZigBee Clusters)

- (input 0x0000) Basic
- (input 0x0003) Identify
- (input 0x000C) Analog Input

Indicators

• **Display:** Displays the current level in millimeters (mm) or **Err** in case of an error.

• **Light indicator (LED):** The device has one blue (or green) LED for status indication:

• **FAST blinking** (4 times/second) – when executing a command.

• **SLOW blinking** (1 time/second) – when entering a command or returning the result of a command.

Error codes (in case of an invalid command or configuration error):

In case of a problem, the blue LED indicator will blink **SLOWLY** the corresponding number of times depending on the type of error:

• **1** – invalid command.

• **2** – the device is not connected to a ZigBee network and the command cannot be executed.

• **3** – the device is locked and the configuration command cannot be executed.

• **4** – the device is already part of a ZigBee network and the command cannot be executed.

• **5** – wrong PIN/PUK code entered and the command will not be executed.

Preparation and installation

1. Switch off the power supply.
2. Mount the device on a DIN rail.
3. Connect the device as shown in Fig. 2.
4. Switch on the power supply.
5. Calibrate the sensor.

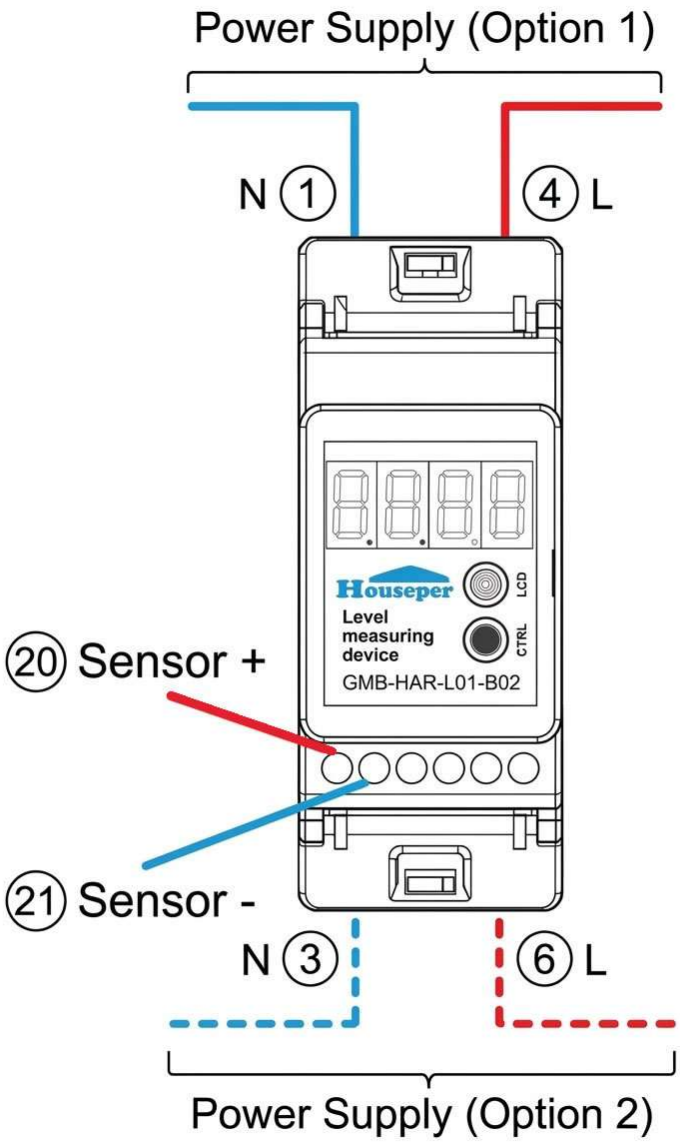


Fig. 2

Fig. 2 – Wiring diagram

- **1 / 3 (N):** Neutral (AC 110 V – 240 V)
- **4 / 6 (L):** Line / Phase (AC 110 V – 240 V)
- **20 (Sensor +):** Sensor positive terminal (red wire)
- **21 (Sensor -):** Sensor negative terminal (blue/black wire)

*** Note: Terminals 1 and 3 (N), as well as 4 and 6 (L), are internally bridged. Power supply can be connected either to the top terminals (1 and 4) or to the bottom terminals (3 and 6) – do not connect both pairs simultaneously**

Initial power on

On power-up, the device will check if it has a configured ZigBee network and:

a. If there is a ZigBee network configured, the device will start periodically trying to join it until it successfully joins. If you want to terminate this process, you need to execute the "Leave network" command. This command will reset the device to its factory default settings.
b. If there is no ZigBee network configured and the device is unlocked, it will make 4 consecutive attempts to join an open ZigBee network within 1 minute. If the device does not join a ZigBee network, it can be configured later.

*** If there is no ZigBee network configured and the device is locked, it will not automatically try to join a ZigBee network at power-up. To allow such a device to join a network, first unlock it and then execute the join network command.**

Configuration

To configure the device, press and hold the button. After 3 seconds, the green LED indicator will turn off, if it is on. After another 2 seconds, the green LED indicator will start blinking SLOWLY. Wait until the green LED indicator blinks the CORRESPONDING NUMBER of times (NUMBER OF BLINKS) for the desired command, and release the button. Possible error indications:

- If a wrong or invalid command is entered, the green LED will blink 1 time SLOWLY.
- If the device is not part of a ZigBee network and you execute a command related to a ZigBee network, the green LED indicator will blink 2 times SLOWLY, indicating that the command cannot be executed.
- If the device is locked, the green LED will blink 3 times SLOWLY, indicating a locked state, and the command will not be executed.
- If the device is part of a ZigBee network and you execute a command to join or form a network, the green LED indicator will blink 4 times SLOWLY, indicating that the command cannot be executed.
- When a wrong PIN/PUK code is entered, the green LED indicator will blink 5 times SLOWLY.

*** When the device is in configuration mode, no other commands can be executed, but it can be controlled.**

Commands

Command	Number of blinks on hold	Description
Network status	4	Information about the presence of a configured ZigBee network.
Binding	5	Binding with another ZigBee device. Duration: until 60 sec. have elapsed or the command ends.
Allow joining	6	Opening the ZigBee network for new devices to join. Duration: 60 sec.
Join network	7	Joining an existing ZigBee network. The device makes 4 consecutive attempts.
Leave network	8	When leaving a network, the device resets to its factory default settings.
Form network	9	Creates its own ZigBee network.
Lock/Unlock	10	Denies/Allows configuration changes.
Change PIN code	11	Configures a new PIN code.
Calibration	13	Calibrates the sensor.

Network status

1. Submit the network status command by pressing the button and wait for 4 blinks.
2. The green LED indicator will start blinking SLOWLY:
   - 2 times if the device is not part of a ZigBee network.
   - 4 times if the device is connected to a ZigBee network.

Binding

1. Submit a binding command by pressing the button and wait for 5 blinks.
2. The green LED indicator will start blinking FAST for 1 minute or until the command is completed.
3. Follow the binding instructions of the device you want to bind it with. It must be part of the same ZigBee network.

Alternatively: When both devices you want to bind are part of a Houseper system, binding can be done via the Houseper app.

*** To execute this command, the device must be part of a ZigBee network.**

Allow joining

1. Submit the allow joining command by pressing the button and wait for 6 blinks.
2. The green LED indicator will start blinking FAST for 1 minute. During this time, the ZigBee network is open for new devices to join.
3. Follow the instructions of the device you want to join to the ZigBee network.

Note: In case another device opens the ZigBee network, the green LED indicator will indicate this by blinking FAST until the command expires. No configuration commands can be executed during this time.

*** To execute this command, the device must be part of a ZigBee network.**

Join network

1. Make sure that the ZigBee network you want to join the device to is open. If you are using a Houseper system, press the "Add device" button in the Houseper app.
2. Submit the join network command by pressing the button and wait for 7 blinks.
3. The green LED indicator will start blinking FAST, and the device will make 4 consecutive attempts to join an open ZigBee network, within 1 minute.

Alternatively: If the device is not connected to a ZigBee network, make sure the device is not locked and turn off the power for about 30 seconds. When the power is restored, the device will automatically start searching for a ZigBee network to join.

*** To execute this command, the device must NOT be part of a ZigBee network.**

Leave network

1. Submit the leave network command by pressing the button and wait for 8 blinks.
2. The command will return the device to its factory default settings and it will reboot.

Alternatively: If the device is part of a Houseper system, you can execute this command through the app.

*** To execute this command, the device must be part of a ZigBee network. When leaving a ZigBee network, the PIN code does not return to its original value, but the last one entered is saved.**

Form network

1. Submit the form network command by pressing the button and wait for 9 blinks.
2. The green LED indicator will start blinking FAST until the device forms its own network or until 1 minute has passed.

Note: This command can be executed in a very short time and the green LED may not blink.

*** To execute this command, the device must NOT be part of a ZigBee network.**

Lock/Unlock

1. Submit the Lock/Unlock command by pressing the button and wait for 10 blinks.

A. Lock

2. If the device is unlocked, it will lock. The green LED indicator will blink 3 times SLOWLY, indicating that the device is now locked and no configuration commands can be executed.

B. Unlock

2. If the device is locked (**and not blocked**), the green LED will remain off, waiting for a PIN/PUK code to be entered.
3. Enter the 4 digits of the PIN/PUK code sequentially by pressing the button and holding it until the green LED blinks the number of times corresponding to the entered digit. If no digit is entered within 10 seconds, PIN/PUK code entry will be terminated and the device will remain locked.
4. After entering the 4 digits of the PIN/PUK code, the green LED indicator will blink:
    a. 10 times SLOWLY if the code entered is correct and the device is unlocked.
    b. 3 times SLOWLY if the code entered is wrong and the device remains locked.

*** If you enter the wrong PIN/PUK code 3 times in a row, the device will be blocked for 1 hour. During this time, it cannot be unlocked even after rebooting. This 1 hour is measured only when power is on.**

C. Blocked device

2. If the device is **blocked**, the green LED indicator will blink 3 times SLOWLY, indicating a locked and blocked device.

Change PIN code

1. Submit the change PIN code command by pressing the button and wait for 11 blinks.
2. The green LED indicator will remain off, waiting for a new PIN code to be entered.
3. Enter the 4 digits of the new PIN code 2 times consecutively (for example: If the new PIN code is 1234, you must enter 12341234) by holding the button until the device blinks green as many times as the corresponding digit. If no digit is entered within 10 seconds, the command will be terminated.

   *** The new PIN code can only contain digits from 1 to 9.**

4. After entering the 8 digits of the new four-digit PIN code, the green LED indicator will blink:
   a. 11 times SLOWLY if the entered PIN code is accepted.
   b. 5 times SLOWLY if the entered PIN code is wrong:
      - The first 4 digits do not match the second 4 digits.
      - A digit greater than 9 has been entered.
      - No digit has been entered for 10 seconds.

Calibration

1. Make sure the sensor is not submerged.
2. Submit the Calibration command by pressing the button and wait for 13 blinks.
3. After successful calibration, the display will show 0.
4. Submerge the sensor.

*** If the display shows Err, make sure you have connected the sensor properly to the main unit and that you have executed the Calibration command.**