

## Instruction manual gateway

### Gateway GW-01



Version 1.0, 1/2018

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# 1. Introduction

## 1.1. Indicators for product information

The following product information contains important indicators according to the usage, assembling and commissioning of the gateway GW-01. The instruction manual should be kept at a qualified place where it is accessible for maintenance and repair.

## 1.2. Used symbols and warning notices



Important indicator/information



Danger/Warning

## 2. Safety instructions



**The instruction manual has to be read carefully before assembling, commissioning or usage of this device.**

**The following points should be observed:**

- Assembling, installation, commissioning and repairs of electrical devices have to be done by qualified staff.
- Applied standards and specifications for the installation of the device have to be observed.
- Before commissioning the device has to be checked for possible transport damage. It is not allowed to install and run the device if there are any mechanical damages.
- The devices have to be assembled only at dry, indoor places. Direct contact with water is prohibited.
- By using lightning protection it has to be ensured that the connectors will not be exceeding a voltage of 24V DC.
- The casing must not be opened.
- Avoid direct sunshine.
- Cleaning of the casing shall be done with dry cloth.
- The device can be assembled on a DIN top hat rail (35 mm). If the device should be installed in a switch cabinet the standards and specifications of the respective manufacture have to be observed
- The cabling has to be installed in a way that no one is able to step or stumble on the cabling.
- Any other usage or failure to comply with this instruction leads to a loss of warranty/guarantee.

### **3. Scope of supply**

1 x Gateway GW-01

1 x 24V DC power adapter

1 x Antenna

1 x Top hat rail

1 x Instruction manual

Optional: 24V connecting cable

Optional: Extension cable for antenna

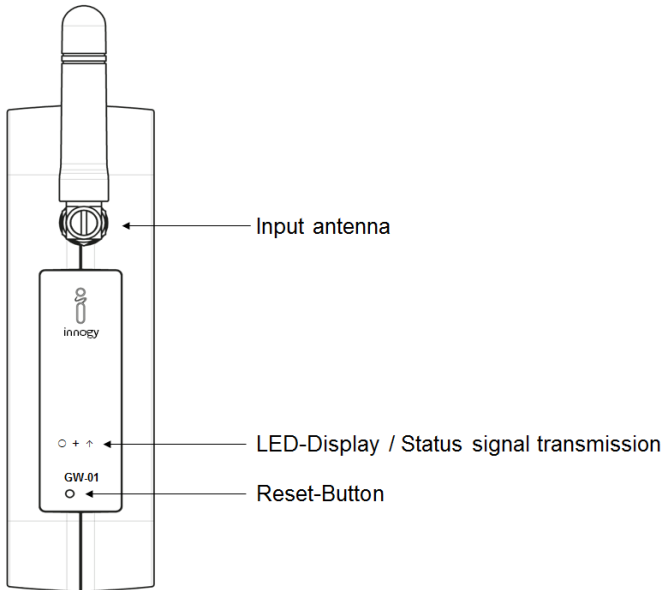
Optional: WiFi-USB-Adapter

Optional: UMTS-USB-Adapter

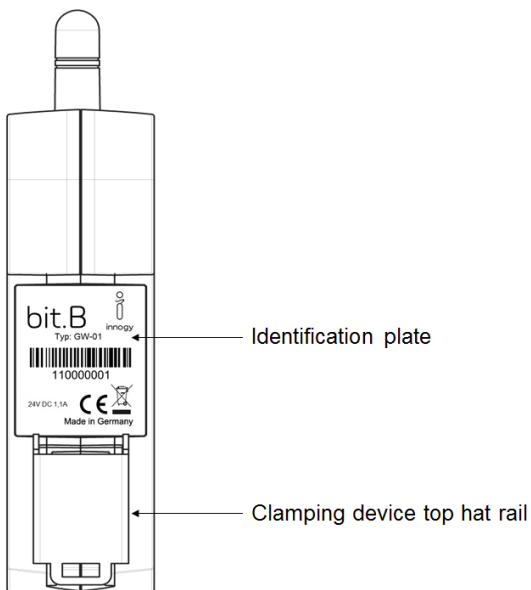
Optional: 2 Port LAN-Switch

## 4. Technical description

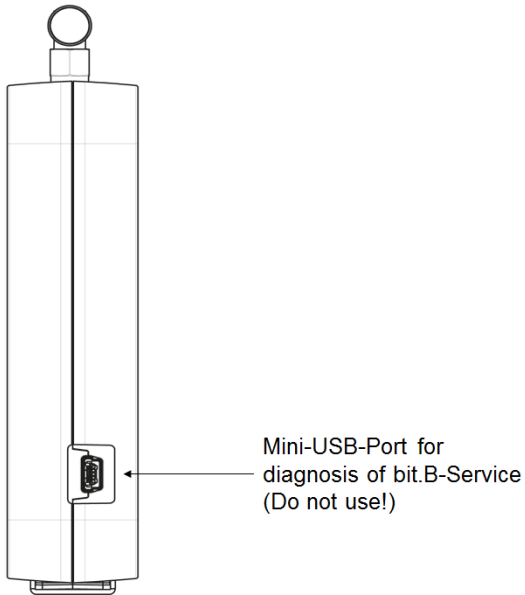
### 4.1. Front



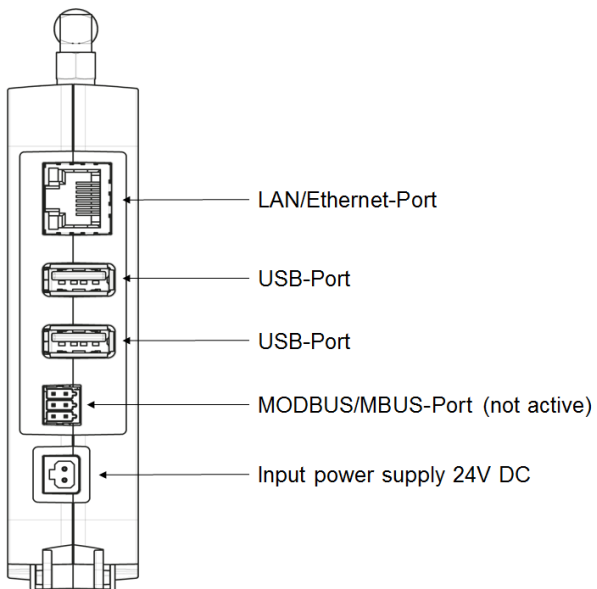
### 4.2. Back



### 4.3. Top



### 4.4. Bottom



## 5. Commissioning



In order to ensure the correct function of the gateway, the sequence of the commissioning steps have to be followed.

### 5.1. Assembling of the gateway on the top hat rail



For safety reasons and interference-free usage the gateway has to be attached at the corresponding measuring point.

#### **Step 1:**

If there is no attachment possibility at the measuring point in form of a top hat rail (35 mm), install the supplied top hat rail in a suitable location.

#### **Step 2:**

The gateway can be attached to the top hat rail by using the clamping device at the back of the gateway. To remove the gateway from the top hat rail use a screwdriver. By pushing down the clamping device, the gateway can be pulled away from the underside of the top hat rail.

#### **Step 3:**

The separate supplied antenna has to be attached to the front of the gateway (see also 4.1) by turning it onto the antenna input. If the gateway is installed in a switch cabinet use the extension for the antenna to install the antenna outside of the switch cabinet. One end of the antenna extension has to be attached to the gateway, the other end to the antenna by using the supplied antenna connector. While attaching the antenna or antenna extension make sure that the antenna input on the front of the gateway will not get damaged by excessive turning.

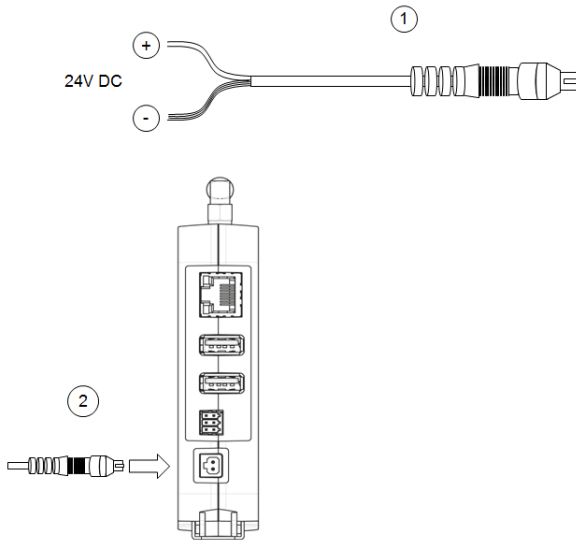
#### **Step 4:**

Depending on the chosen communication connect the corresponding cable or USB-Adapter to the gateway. For the LAN communication connect the LAN/Ethernet port of the gateway with the desired network by using a standard LAN cable (patch cable). For the WiFi or UMTS communication connect the supplied USB-Adapter to the gateway.

## 5.2. Establishing the power supply

### a) Option 1: Connection to 24V supply

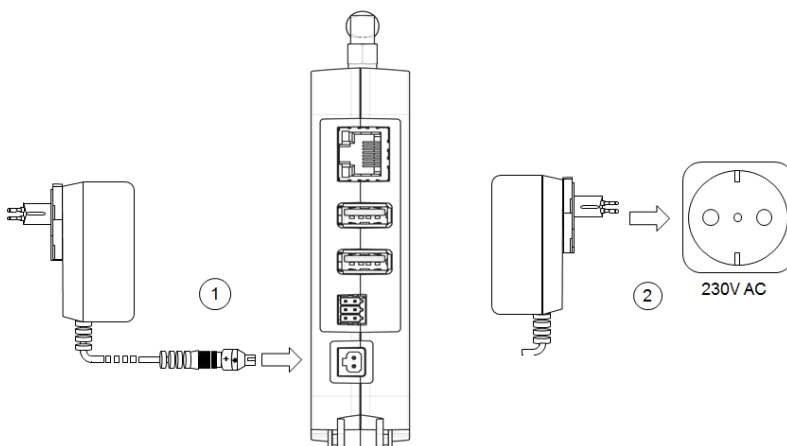
Please proceed as follows:



The connection cable of the 24V supply consists of two wires. The GND cable is corrugated outside.

### b) Option 2: Connection to 230V supply by using a power adapter

Please proceed as follows:





### 5.3. Configuration for the data transfer of the gateway

The bit.B-Gateway GW-01 transmits the captured data of the sensor nodes to the bit.B-Server. The gateway communicates with the server via internet. There are three different options to connect the gateway to the internet:

- Ethernet (LAN)
- SIM card (UMTS-USB-Adapter and SIM card can be supplied as an option)
- WiFi (WiFi-USB-Adapter can be supplied as an option)

#### 5.3.1. Configuration UMTS-USB-Adapter

To connect the bit.B-Gateway with the bit.B-Server the UMTS-USB-Adapter, incl. SIM card, has to be connected to the gateway. If the SIM card is in not part of the scope of supply make sure that there is no SIM lock on the SIM card before commissioning. The activation of the SIM card, for example in a web interface of your service provider, has to be done before usage.



SIM cards which have to be activated several times are not applicable with the bit.B-Gateway. Moreover make sure that the service at the place where the gateway is located is for communication reasons sufficient.

If the power supply to the gateway is established, the connection to the bit.B-Server is made automatically. After successful connection both outer LEDs of the gateway will shine green. The meaning of all LED combinations is described in section 5.4. The installation of the gateway is now complete, please continue with the installation of the sensor node.

#### 5.3.2. Configuration Ethernet (LAN)

To connect the bit.B-Gateway to the bit.B-Server, the LAN cable has to be plugged into the LAN/Ethernet port of the gateway and into the LAN/Ethernet port of the corresponding router or network socket.

The gateways are configured for a dynamic reference of the IP address. This requires a DHCP server in the network. If a fixed IP address should be assigned to a gateway, a fixed IP address has to be reserved within the rule set of DHCP server for the MAC address of the device. To ensure the connection of the bit.B-Gateway to the bit.B-Server, the following firewall settings have to be released:

Port	Protocol	Host(s)
80 (TCP)	HTTP	gatewayapi.bitb.innogy.com
443 (TCP)	HTTPs	gatewayapi.bitb.innogy.com
8883 (TCP)	MQTT	mqtt.bitb.innogy.com
50222 (TCP)	SSH	remote-admin.bitb.innogy.com
123 (UDP)	NTP	0.de.pool.ntp.org, 1.de.pool.ntp.org, 2.de.pool.ntp.org, 3.de.pool.ntp.org

The above mentioned ports should be activated as a standard. Nevertheless, please check the release of the firewall settings before commissioning of the bit.B-Gateway.

If the power supply to the gateway is established, the connection to the bit.B-Server is made automatically. After successful connection both outer LEDs of the gateway will shine green. The meaning of all LED combinations is described in section 5.4. The installation of the gateway is now complete, please continue with the installation of the sensor node.

### 5.3.3. Configuration WiFi

To connect the gateway with customers WiFi, the gateway has to create a configuration WiFi. The configuration WiFi will be created by the WiFi-USB-Adapter. There are four steps to connect the gateway with customers WiFi.

#### **Step 1: Connecting WiFi-USB-Adapter & gateway**

Before switching on the gateway, connect the WiFi-USB-Adapter to the gateway. For this, the WiFi-USB-Adapter has to be plugged into one of the two USB ports of the gateway.

The gateways are configured for a dynamic reference of the IP address. This requires a DHCP server in the network. If a fixed IP address should be assigned to a gateway, a fixed IP address has to be reserved within the rule set of DHCP server for the MAC address of the device. To ensure the connection of the bit.B-Gateway to the bit.B-Server, the following firewall settings have to be released:

Port	Protocol	Host(s)
80 (TCP)	HTTP	gatewayapi.bitb.innogy.com
443 (TCP)	HTTPs	gatewayapi.bitb.innogy.com
8883 (TCP)	MQTT	mqttd.bitb.innogy.com
50222 (TCP)	SSH	remote-admin.bitb.innogy.com
123 (UDP)	NTP	0.de.pool.ntp.org, 1.de.pool.ntp.org, 2.de.pool.ntp.org, 3.de.pool.ntp.org

The above mentioned ports should be activated as a standard. Nevertheless, please check the release of the firewall settings before commissioning of the bit.B-Gateway. Afterwards the power supply can be established.

#### **Step 2: Access to the configuration WiFi**

If the WiFi-USB-Adapter is connected to the gateway and the power supply is assured, the application process starts. The LED color routing of the application process is described in section 5.5. As soon as the Power-LED shines permanently green and the Internet-LED flashes red, the gateway's reset button has to be pressed for 5 seconds. After pressing the reset button for 5 seconds the Power-LED flashes three times green, the configuration WiFi is now activated for one hour. With an appropriate device, like a smartphone, tablet or laptop, the configuration WiFi can be searched. Access to the configuration WiFi can be done with the following user data:



The name of the network and the corresponding password to get access to the configuration WiFi are on a separate configuration paper, which can be found in the enclosure package of the gateway.

**Step 3: Connection to customers WiFi**

After successful login into the configuration WiFi, visit [www.wifi.bitb.innogy.com](http://www.wifi.bitb.innogy.com) with the connected device. All existing WiFi networks will be shown at this website. By selecting the desired customer WiFi, the connection between gateway and customer WiFi can be established. For this purpose, enter the network key after selecting the customers WiFi



The network key is the password of the router from which the WiFi network is established.

**Step 4: Establishing of the data transfer between gateway & server**

After the successful configuration the gateway connects to the customers WiFi automatically. All data is now send from the gateway to the server by using the WiFi-USB-Adapter. After successful connection both outer LEDs of the gateway will shine green. The meaning of all LED combinations is described in section 5.4. The installation of the gateway is now complete, please continue with the installation of the sensor node.

**5.4. Meanings of the LEDs on the front of the gateway**

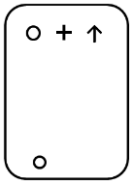
LED	Description
○	Power-LED
+	Lemonbeat-LED
↑	Internet-LED

LED	Color	Status	Meaning
○	grey	off	Gateway is not provided with power.
○	green	on	Gateway is provided with power.
○	green	disappears 3 times	After pressing the reset button for 5 seconds the LED flashes green three times. It is possible to connect with the configuration WiFi.
○	red	flashes	Internal device error.
+	grey	off	The Lemonbeat-Network is not active.
+	green	on	The Lemonbeat-Network is active.
+	green	flashes	The Lemonbeat-Network is active and waits for the reception of data.
+	green	disappears	Gateway receives data from a sensor node or sends data to a sensor node.
+	red	on	Error in radio communication of the Lemonbeat network.

↑	grey	off	Data connection to bit.B-Server is ongoing.
↑	green	on	Data connection via selected communication option is ensured.
↑	green	disappears	Gateway sends data to bit.B-Server.
↑	red	flashes	No data connection by using the selected communication option possible.

## 5.5. LED color routing

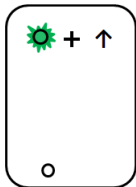
### Step 1:



Gateway is not provided with power.

### Step 2:

The LED color routing starts when the gateway is provided with power. The LED color routing consists out of four different LED combinations, which take place sequentially

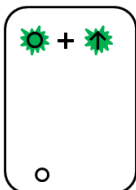


1. Power-LED is green and Internet LED is red.
2. Internet-LED lights green.
3. Internet-LED and Lemonbeat-LED light green.
4. Power-LED is permanently green.

First the gateway remains in the 4th LED combination. The gateway now attempts to connect to the bit.B-Server automatically.

The gateway cannot connect automatically to the bit.B-Server by using the communication option WiFi. In this case the Power-LED is green and the Internet-LED flashes right after a while. To connect the gateway and the server follow the WiFi configuration (see 5.3.3)

### Step 3:



After a successful connection to the bit.B-Server both outer LEDs are permanently green. The Lemonbeat-LED will light green after the sensor node is configured.

If the Internet-LED flashes red, check the internet connectivity of the network. If using the communication option UMTS please check the service at the place where the gateway is located or read the manual of the UMTS-USB-Adapter.



The UMTS-/WLAN-USB-Adapter has to be connected to the gateway before providing the gateway with power.

## 6. Technical data

<b>Electrical attitudes</b>	
Input voltage	24 V DC
Protection	1,1 A
Power	max. 3 Watt
Number of USB-Ports	2
Number of Ethernet-Ports	1
Number of serial interface	1x RS485 (Modbus/RTU) (not active)
<b>Mechanical attitudes</b>	
Dimensions Body (W x D x H) in cm	3 x 12 x 10
Weight in g	145
Body material	ABS / PC
Assembling IEC EN 60999-1 / DIN EN 50022	DIN top hat rail (35 mm)
<b>Environmental condition</b>	
Temperature	Operation: K55 (-40 ... +70 °C)
Humidity	Operation: 0 till 95 % RH
Operating height	0 ... 2.000 m above sea level
Assembling position	any
<b>Electromagnetic compatibility</b>	
Electromagnetic compatibility of operating equipment	Norm 2004/108/EG
Electrical equipment for use within certain voltage limits	Norm 2006/95/EG
<b>Radio transmission</b>	
Communication protocol	Lemonbeat (868 MHz)
<b>Safety Features</b>	
Identification	CE
Protection class according to EN 60529	IP20 (only indoor usage)

## 7. Fault repair

The gateway GW-01 left our house in a perfect condition. Comprehensive tests to verify the operation and the protective functions were carried out successfully. If the device still does not work properly, we recommend the following procedure to correct the malfunction, depending on the error:

**a)** *Red flashing Internet-LED / No shown data in the web-based Online-Monitor.*

Please check the Internet connection of the gateway. A faulty connection is indicated by a red flashing Internet-LED on the front of the gateway.

Option LAN-Connection:

- 1.) Please first check the LEDs on the Ethernet port of the gateway. The green LED should light continuously. If this is not the case, the LAN cable or the LAN connection must be checked for a defect.
- 2.) Please check the Internet connection of the used network connection.
- 3.) Check the firewall settings for correct configuration (see chapter 5.3.2). The following outgoing ports have to be enabled for correct operation:

TCP: 80, 443, 8883, 50222

UDP: 123

Option WiFi-Connection:

- 1.) Ensure that the WiFi-USB-Adapter is properly plugged into one of the USB ports of the gateway. The WiFi-USB-Adapter has to be plugged in before the gateway is switched on!
- 2.) Please check Internet connectivity of the used WiFi.
- 3.) Please check if the access data to the WiFi have been correctly consigned in the configuration interface (see chapter 5.3.3). The following outgoing ports have to be enabled for correct operation:

TCP: 80, 443, 8883, 50222

UDP: 123

Option UMTS-Connection:

- 1.) Ensure that the UMTS-USB-Adapter is properly plugged into a USB port. The UMTS-USB-Adapter has to be plugged in before switching on the gateway!
- 2.) Please check the mobile radio reception directly at the gateway. Ensure that there are no interfering influences or structural conditions (steel cabinet, reinforced concrete, etc.) which influence the reception.
- 3.) If the used SIM card is not part of the scope of delivery of bit.B, the notes from section 5.3.1 have to be taken into account.

**b) Red flashing Power-LED / Internal device error.**

Correction of the internal device error has to be carried out by the bit.B support. Please do not hesitate to contact us. You will find our contact data on our homepage [www.bitb.innogy.com/contact](http://www.bitb.innogy.com/contact)

**c) Red flashing Lemonbeat-LED of sensor node / the installed sensor node cannot connect to the corresponding gateway.**

Please reduce the distance between the gateway and the sensor node. Walls, doors and other structural obstacles can limit the range of the radio signal. When installing in a metal switch cabinet, use the optional antenna extension cable to install the antenna out of the cabinet.

If it is not possible to correct the error despite the described methods before, please contact us. You will find our contact data on our homepage [www.bitb.innogy.com/contact](http://www.bitb.innogy.com/contact)

## **8. Warranty and Liability**

### **8.1. Warranty**

The warranty period covers a period of 12 months from delivery of the device and applies to defects which are due to material or processing errors. Should any faults occur within or outside the warranty period, please contact us.

### **8.2. Liability exclusion**

Warranty and liability claims for indirect or direct damages, which are based on

- transport damage,
- faulty installation or commissioning,
- changes or attempts to repair
- incorrect use or improper operation,
- disregard of the relevant safety regulations (VDE et al.) or
- force majeure (lightning, overvoltage, storm, fire)

are excluded.

## 9. Disposal instructions



Dispose the device separately from household waste while disposing the device to a collection point for electronic waste. The responsible collection center is to be requested from your local authority or city administration. The device can also be returned to us for disposal.



The packaging has to be disposed separately in collecting containers for cardboard and paper or plastic.

## 10. CE-Declaration of conformity

The product complies with the CE regulations. Should conformity requirements be required, please send us a written request or call us.

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44137 Dortmund  
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