

Instruction manual sensor node

Sensor node SN-01



Version 1.0, status 09/2017

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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 sensor node SN-01. The instruction manual should be kept at a qualified place where it is accessible for maintenance and repair.

1.2. Used symbols and warnings



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 items 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 exceed 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

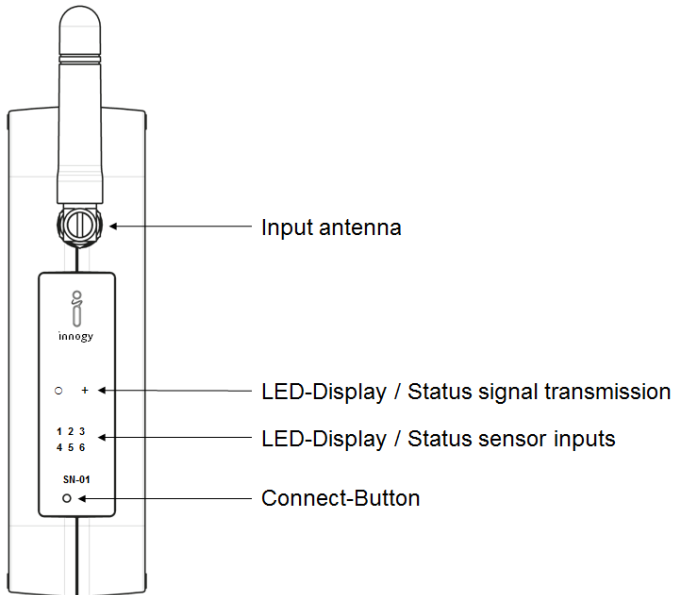
- 1 x Sensor node SN-01
- 1 x 24V DC power adapter
- 1 x Antenna
- 1 x Top hat rail
- 6 x Sensor plugs
- 1 x Manual/installation information
- Optional: 24V connection cable
- Optional: Extension cable for antenna

4. Function

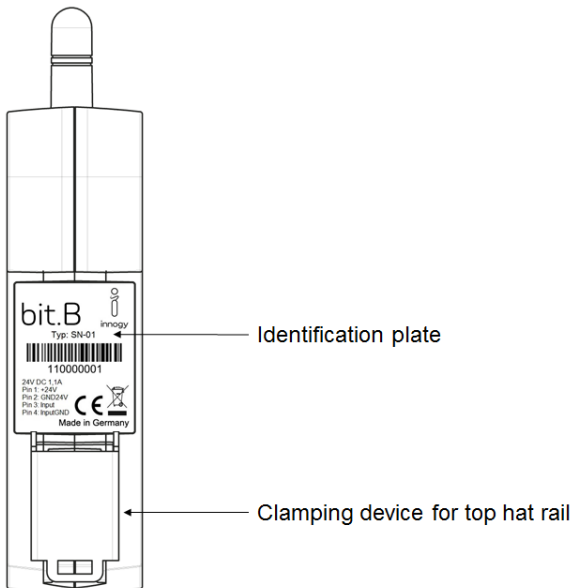
The sensor node SN-01 receives the sensor signals and processes them to a data format that is understandable for the bit.B-System. You can connect up to six sensors with the sensor nodes. The standardised output signal has to be 0-10 V respectively 0/4-20 mA. Sensors or meters with impulse transfer are also compatible with bit.B. The maximum level of the signals must not exceed 0-24 V or 0-24 mA. Via Lemonbeat radio protocol the sensor data is transmitted to the bit.B-Gateway which sends the data to the bit.B-Server and bit.B-Online-Monitor.

5. Technical description

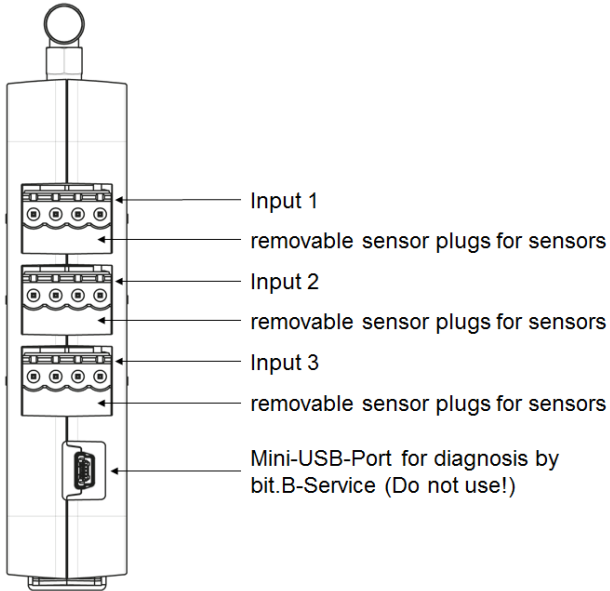
5.1. Front



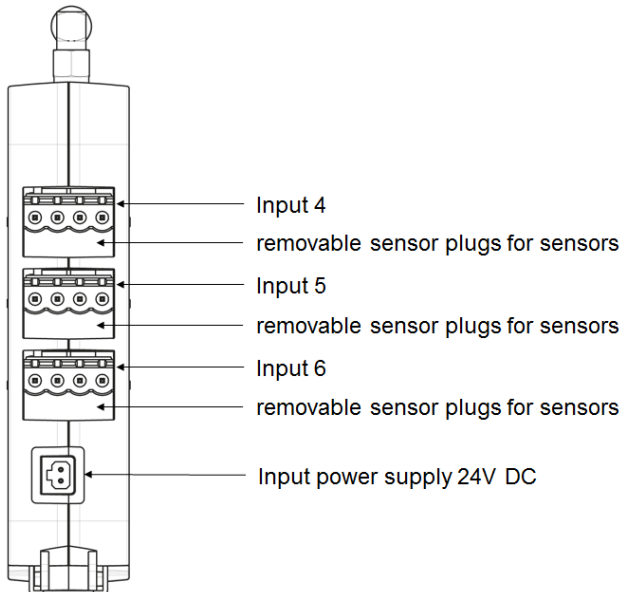
5.2. Back



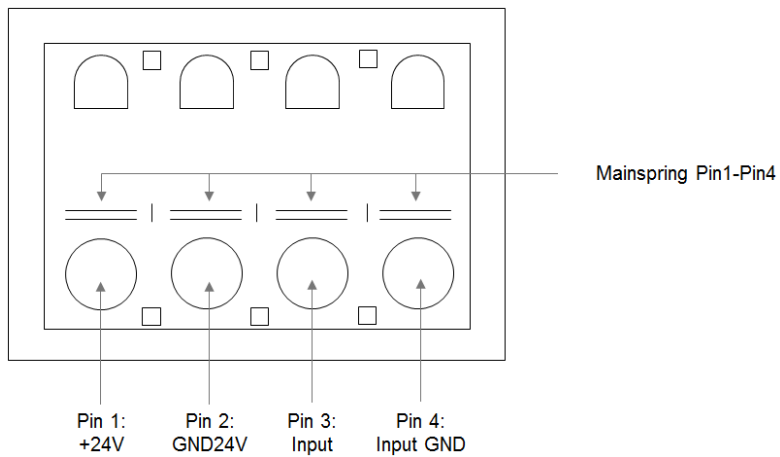
5.3. Top



5.4. Bottom



5.5. Connections at sensor plugs for sensor connection



6. Commissioning



To enable the data transmission of the sensor node to the bit.B-Server you need a bit.B-Gateway GW-01. After installing the bit.B-Gateway you can continue with the commissioning of the sensor node.

6.1. Connection of the sensor node

Step 1:

Connect the sensors with the right measuring point and connect the cable to the sensor node. Please notice that the cable isn't bent or damaged. The limited length of the connection cable is 30 m.

Step 2:

The delivered sensor plugs have to be connected with the plug socket of the sensor nodes. The cable of the sensors has to be connected to the sensor plugs as well. To connect the cable with the sensor plugs the mainspring has to be pushed down. Afterwards the conductors can be fixed to the sensor plug by inserting the conductors (see 5.5). The conductors will be positioned automatically by losing the mainspring.



The conductors can be pushed into to the sensor plugs by using ferrules.

Step 3:

The sensor plugs have to be connected to the sensor while using the inputs 1-6 of the sensor node (labelling of the sockets at the site of the sensor node). Are not all sensor node inputs connected to a sensor, please put the unused sensor plugs for safety reasons into the empty sensor node inputs.

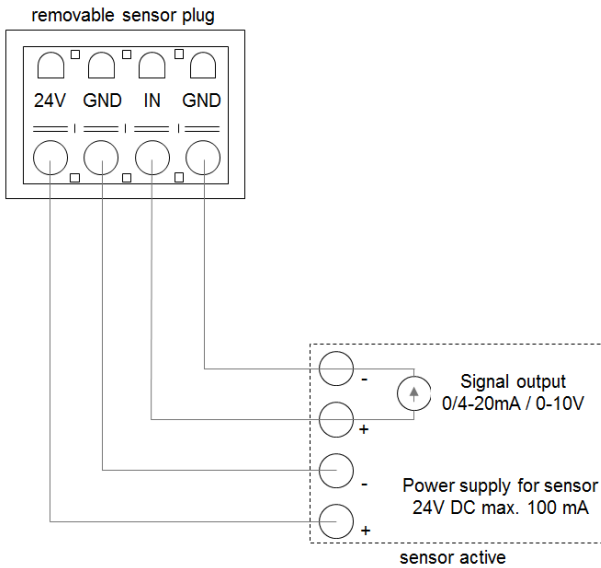
Step 4:

The delivered antenna has to be turned on the antenna input at the front of the sensor node (see 5.1). If the sensor node is located in a switch cabinet use an extension cable to install the antenna outside the cabinet. Therefore the extension cable has to be connected to the sensor node and the antenna. Please notice, don't damage the antenna or antenna input by excessive rotation...

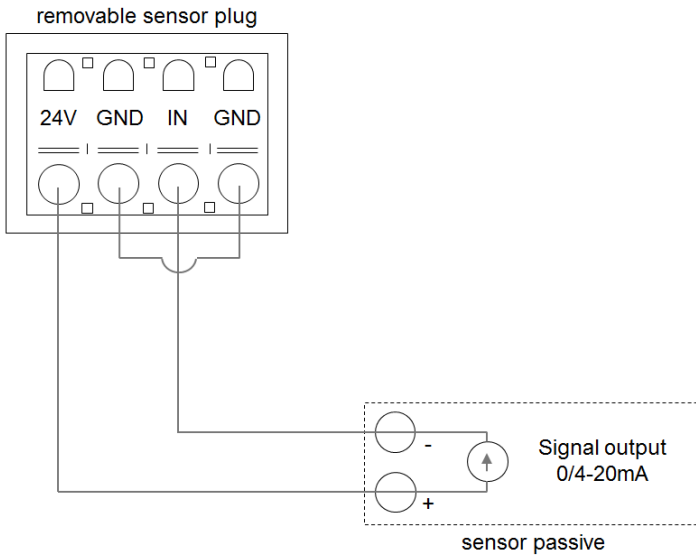
The sensor node SN-01 is now ready for the installation.

6.2. Sensor connection example

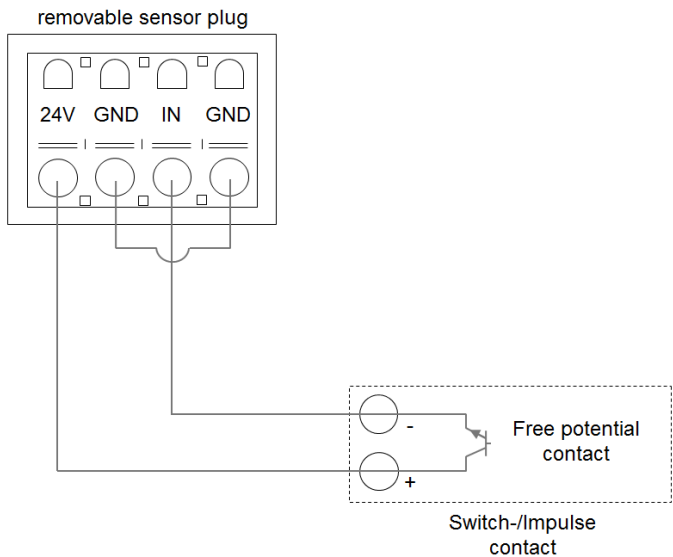
6.2.1. Active sensor (temperature sensor, Rogowski coil etc.)



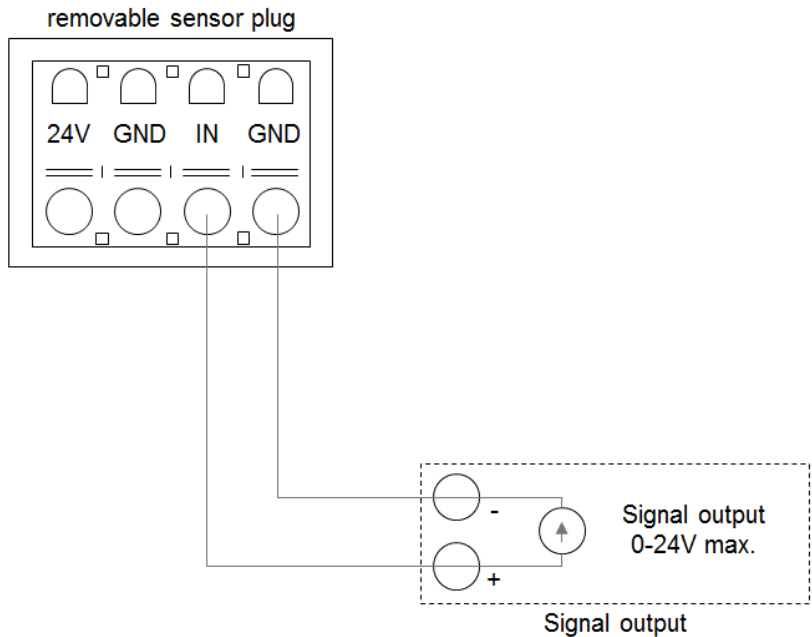
6.2.2. Passive sensor (Folding TC etc.)



6.2.3. Switch and impulse contact (S0 interface etc.)



6.2.4. Potentially effected signal outputs (digital output, active switch output etc.)



6.3. Assembling of the sensor node on the top hat rail



For safety reasons and interference-free usage the sensor node has to be installed to 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), use the supplied top hat rail in the desired location.

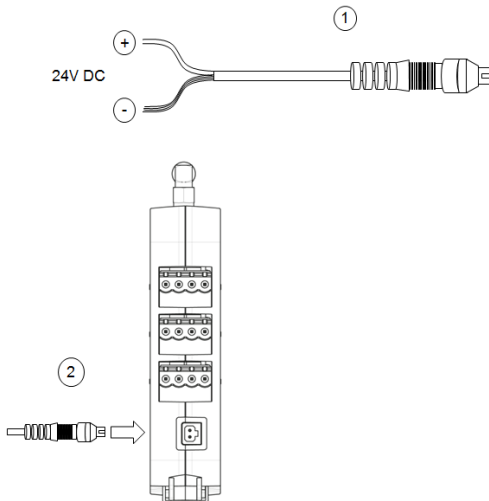
Step 2:

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

6.4. Establishing the power supply

a) Option 1: Connection to 24V supply

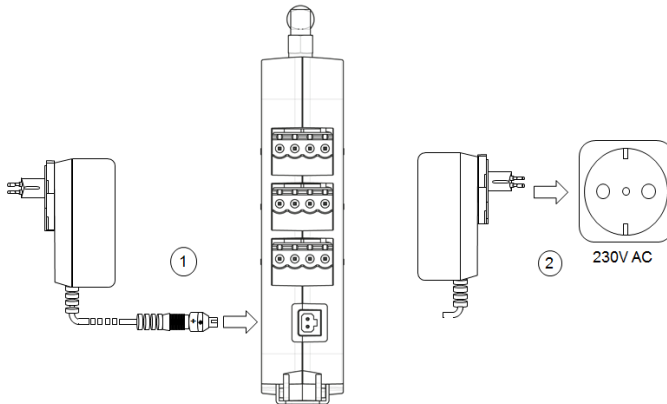
Please proceed as follows:



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:



If the power supply is connected, the sensor node will connect automatically to the bit.B-Gateway GW-01 and a green LED will light.

6.5. Meanings of the LEDs on the front of the gateway

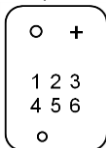
LED	Description
○	Power-LED
+	Lemonbeat-LED
1-6	Sensor-Status-LED

LED	Color	Status	Meaning
○	grey	off	Sensor node is not provided with power.
○	green	on	Sensor node is provided with power.
○	red	flashes	Internal device error.
+	grey	off	The Lemonbeat network is not active.
+	green	on	The Lemonbeat network is active.
+	green	disappears	Data have been sent or received.
+	red	on	The sensor node has not been registered to the gateway.
+	red	disappears	The sensor node has been tried to register to the gateway.

+	red	flashes slowly	When you press the connect button for period of time the Lemonbeat LED will flashes slowly. The Lemonbeat network has to be left manual.
+	red	flashes fast	When you press the connect button for period of time the Lemonbeat LED will flashes slowly. When the Lemonbeat LED flashes fast you can release the Power button. The Lemonbeat network will be left manually.
1-6	grey	off	The sensor channel is not active.
1-6	green	on	The sensor channel is active.
1-6	green	disappears	Connected sensors are measuring successfully. The period between the flashes is the desired measuring interval.

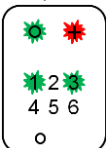
6.6. LED color routing

Step 1



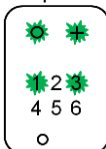
The sensor node is not provided with power.

Step 2



The power supply has been connected successfully (green power LED). The Lemonbeat LED is lighting red while connecting with the bit.B-Gateway (Lemonbeat LED disappears for a short period to start connection). The image shows that channel 1 and 3 are active.

Step 3



When the Lemonbeat LED turns green the sensor node and the gateway have been connected successfully.

➔ Ready

If the sensor node remains in step 2 the distance between sensor node and gateway could be too large. In this case please try to reduce the distance between sensor node and gateway.

7. Technical data

Electrical attitudes	
Input Voltage	24 V DC
Protection	1,1 A
Power	max. 30 Watt
Number of sensor ports	6
Input signals for sensors	0-24 V, 0-20 mA
Max. cable length for sensors	30 m
Mechanical attitudes	
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)
Environmental conditions	
Temperature	Operation: K55 (-40 ... +70 °C)
Humidity	Operation: 0 till 95 % RH
Operating height	0 ... 2.000 m above sea level
Assembling position	any
Electromagnetic compatibility	
Electromagnetic compatibility of operating equipment	Norm 2004/108/EG
Electrical equipment for use within certain voltage limits	Norm 2006/95/EG
Radio transmission	
Communication protocol	Lemonbeat (868 MHz)
Safety features	
Identification	CE
Protection class according to EN 60529	IP20 (only indoor usage)

8. Fault repair

The bit.B-Sensor-Node SN-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) *The bit.B-Online-Monitor displays the measured value 0.*

Please check if the LEDs are lighting orderly and if the sensor node is connected with the gateway. If the measuring channel does not light please activate the channel in the bit.B-Online-Monitor. Is the configuration of the measuring channel correct please check the function and the cabling of the sensor.

b) *The bit.B-Online-Monitor displays an unrealistic value.*

Please compare the manufacturer specifications of the sensors with the settings in the configuration level of the bit.B-Online-Monitor.

c) *The sensor node does not connect to the gateway*

Please reduce the distance between sensor node and gateway. Walls, Doors and other barriers possibly restrict the range of the radio signal. If the sensor node is installed in a metallic cabinet please use the optional extension cable for the antenna and fix it outside of the cabinet.

If there is no connection although reducing the distance please connect the sensor node and the gateway manually. Therefore use the connect button on the front of the sensor node (see 5.1). Press the button and the red Lemonbeat-LED will disappear for a short time. Afterwards the sensor node will start an application at the corresponding gateway. When the application has been successful the Lemonbeat LED lights green.

d) *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

e) *The sensor node has to assign to another Lemonbeat network.*

The connection of the Lemonbeat network between the sensor node and the gateway is made automatically.

Please contact the bit.B support if a sensor node, which is already connected to a gateway, should be connected to another gateway.

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

9. Warranty and Liability

9.1. 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.

9.2. 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.

10. 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.

11. 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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