



Manual for NB-xxx devices

*NB-IoT devices communicate via the Narrow Band network only.
Devices are delivered with a prepaid SIM card.*

Safety Notices

The device complies with regulations and standards in force in the Czech Republic and the European Union. The device has been tested and is supplied in working order. To keep the device in this condition, it is necessary to adhere to the following safety and maintenance instructions.

Using the device in a manner other than prescribed by the manufacturer may cause its safeguards to fail!

The power supply outlet or disconnection point must be freely accessible.

The device must not be used in particular under any of the following conditions:

- The device is noticeably damaged
- The device does not function properly
- Unfastened parts can be heard moving inside the device
- The device has been exposed to moisture or rain
- The device has been serviced by unauthorized personnel
- The power adapter or power supply cable are noticeably damaged
- If the device is used in a manner other than designed for, the protection provided by the device may fail.
- The local electrical system must include a power switch or a circuit breaker and overcurrent protection.

The manufacturer warrants the device only if it is powered by the supplied power adapter or an approved power supply.

If you have any problems with installing or operating the device, please contact the technical support:

HW group s.r.o.

<http://www.hw-group.com>

email: support@HWg.cz

Formanská 296

Prague, 149 00

Phone: +420 222 511 918

Before contacting technical support, please have at hand the exact type of your device (at the type plate) and, if known, the firmware version (see later in this manual).

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IoT Monitoring products

All NB-xxx devices are IoT Monitoring devices = it has to be connected to any SensDesk Technology-based portal. All the SMS / email alerts, PDF reports, and central device management is realized **from the portal**.

Manufacturer provides limited free of charge portal service (HWg-cloud.com) and paid service (SensDesk.com), check the Portal providers for other available portals.

NB-xxx devices product family

NB-xxx Devices is a family of environmental monitoring products using the Narrowband (NB-IoT) mobile network. All products feature a robust design, battery-powered operation, and seamless integration with any portal based on the SensDesk Technology. The HWg-cloud.com portal is for free, others can be paid services.

All devices include a 3V alkaline CR123A battery that allows continuous operation for up to 3 years (depending on the device type, application and connected sensors).



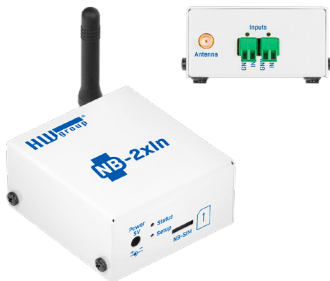
NB-2x1Wire

A device for remote monitoring external 1W-UNI sensors (Temperature, Relative Humidity, Light intensity, ...). 2 RJ11 ports for external sensor to measure up to 4 sensor values.



NB-WLD

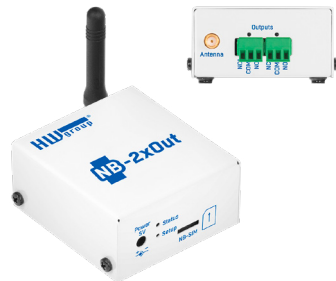
Water Leak Detection unit with 1 WLD zone input (external WLD Type A water sensing cable). One WLD detection zone is max. 60 m.



NB-2xIn

A device for remote monitoring of 2x DI (Digital Inputs) - state + pulse counter. Any dry contact can be connected (door or window contact, PIR motion detector or a smoke / gas detector with a relay output).

Pulse counters are designed for connecting energy meters with SO output (external power required).



NB-2xOut

A module with 2 DO (relay outputs) controlled from the portal (HWg-cloud.com or others) over the NB-IoT network.

Shared features of the NB-LoT product family

- Robust metal design, 67×78×33 mm (without antenna)
- External antenna, SMA connector
- 4FF (nano SIM) holder
- LED indicator
- Plug&Play – connect power or remove the insulating strip and the device is immediately available in the portal
- Device & communication settings (communication period, safe ranges) are configured in the portal
- Battery state appears in the portal as another sensor
- Powered from a 5V adapter or the built-in replaceable CR123A battery
- Default "subscribed" version of the device is delivered with 3-years prepaid simcard for Vodafone NB-LoT network



WARNING

NB-LoT SIM card is different from LTE or 2G / 3G GSM SIM cards. Even regular NB-LoT SIM card have to support preconfigured services. Contact us with detailed questions.



Subscribed = 3 years subscription
NB-LoT SIM (Vodafone) included

For specifics of individual devices, including any differences in the measurement period, battery life and so on, see the respective device page.

Measurements and data upload

External sensors measurement and data upload periods

The period for logging the measured values and uploading them to the portal is fully configured automatically via the portal, separately for operation with an external power source and battery-powered operation.

External power – default [SensDesk.com](https://sensdesk.com) portal values:

- Logging period (measuring, storing values in the internal memory): **5 minutes**
- Data upload period (connecting to the portal and uploading all logged values): **1 hour**
- Check period (NB-2xOUT brief query for output state changes): **10 minutes**

Battery power – default SensDesk.com portal values:

- Logging period (measuring, storing values in the internal memory): **15 minutes**
- Data upload period (connecting to the portal and uploading all logged values): **10 hours**
- Check period (NB-2xOUT brief query for output state changes): **1 hour**

Only the Portal administrator may provide you with other than automatic logging / Data update period settings (setup per each device). Keep in mind device lifetime when powered by battery.

Data upload period cannot be shorter than 60 minutes and the Logging period shorter than 5 minutes.



Periodic and non-periodic reading of sensors

Sensor values are regularly read in the fixed Log Period, which is configured via the portal. However, in addition to the periodic reading, the values can also be read if the following happens:

- 1) The device is powered up by connecting to the battery or an external power supply
- 2) The button is pressed
- 3) If the SafeRange is exceeded at the moment of periodic reading, the measurement is repeated after the Delay interval

Periodic and non-periodic data upload

Sensor values are uploaded to the server periodically in the fixed period, which is configured via the portal. However, in addition to the periodic upload, data can be also uploaded if the following happens:

- 1) SIM card is inserted
- 2) Device power is connected or changed
- 3) The button is pressed
- 4) SafeRange is exceeded (if the Delay is set, then only after the Delay elapses)

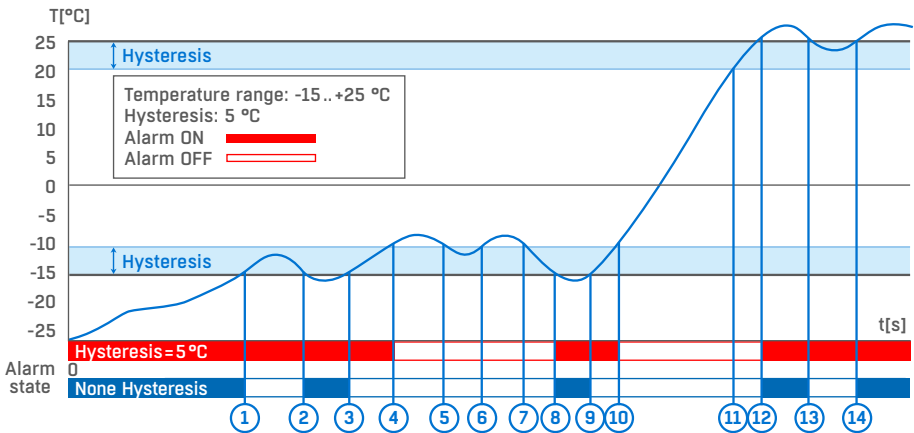
SafeRange – range of allowed values

SafeRange is configured in the portal independently for each sensor. Whenever the measured value is passing by this range, a message to the portal is sent (even out of the Data Upload period - default 10 h).

To extend life time of the device powered from the battery, sensors are read only in the **Logging period** (default 15 min). With the exception of NB-2xIN, sensors are NOT read at any other period. If a **Delay** is set together with the SafeRange, the repeated measurement is performed at the next Logging period, and an Alarm is raised only if the repeated measurement is also out of the SafeRange.

Hysteresis / Idle range (sensor value)

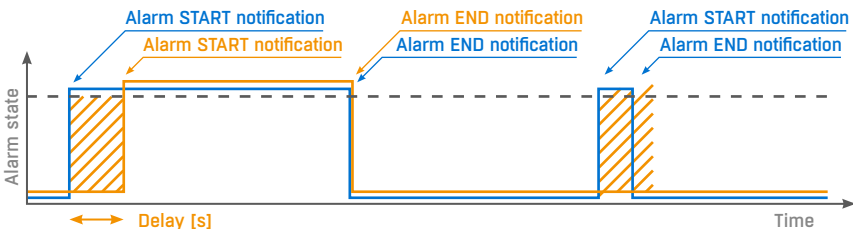
The **Hysteresis** setting defines a tolerance range for suppressing alarm alerts. The function prevents multiple alarm alerts (too many emails or SMS from the portal) if the reading oscillates around the specified threshold. The hysteresis is configured independently for each sensor.



The figure demonstrates two cases. Without the hysteresis idle range of 5°C, the alarm raised in point 8 would end in point 9; however, the hysteresis function keeps the alarm active until the temperature reaches the upper limit of the tolerance band (point 10): $5\text{ °C} + (-15\text{ °C}) = -10\text{ °C}$.

- **Hysteresis = 5°C** – The portal sends **4 Email (SMS) messages**. Alert is sent with beginning and end of Alarm State (points 4, 8, 10, 12)
- **No hysteresis (0°C)** – The portal sends **8 Email (SMS) messages**. Alert is sent with beginning and end of Alarm State (points 1, 2, 3, 8, 9, 12, 13, 14)

In determining when the Alarm ends, the Hysteresis value applies. The end of an Alarm is only notified when the measured value is well within the SafeRange. However, the value is only read according to the Log Period.



Alarm status notification based on a Delay value:

- **Blue:** Delay = 0
- **Yellow:** Delay is non-zero

To increase battery life, be careful when setting the SafeRange and Hysteresis values.

Description of HW elements

LED indicator (Status)

The blue LED gives a quick status indication for debugging and troubleshooting. It can indicate these states:

- **Short flash** – reading of sensors and inputs
- **Rapid flashing** – registration to the NB-IoT network
- **Continuously on** – communication over the NB-IoT network, data transfer

When power is connected to the device, the indicator briefly lights up to indicate modem initialization and 1-Wire sensor detection. Then, it quickly flashes as the device connects to the network, and lights up whenever the device communicates with the portal. It also briefly flashes when the 1-Wire sensors or the WLD cable state are being read.

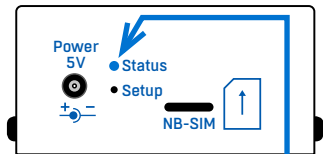
Setup button

The button is used to send values to the portal immediately and to detect sensors.

- **Press** – sensors are detected and data are sent to the portal
- **Press for longer than 10 s** – reset to factory defaults

Status LED signalization

- Short blinking [2–5 seconds] is standard communication with NB-IoT network
- Short blinking [2–5 seconds] when “Setup” button pushed is standard communication with NB-IoT network
- Initialization blinking [30–240 seconds] NB-IoT network Initialization process



Installation process

Standard subscribed version of the device is already preset for local NB IoT network/provider. No configuration needed.

Connect external power (remove plastic stripe disconnecting internal battery). First approx. 20 minutes will device search for existing NB-IoT network coverage and connect to predefined portal (HWg-cloud.com).

- **First 4 min:** Blue LED activity = Searching for NB-IoT network (Fast blue LED blinking, short pause and repeat again)
- **First 5–20 min:** Blue LED activity = First start & Initialization with NB-IoT network (up to 20 minutes). Once completed and device stays in the same location (not moved) not needed to repeat Initialization again.
- **First 5–20 min:** None Blue LED activity = Compatible NB-IoT network not found, consider possibility there is no compatible NB-IoT network signal in your location. Searching for the NB-IoT network will be tried again next hour for several times with prolonging interval.

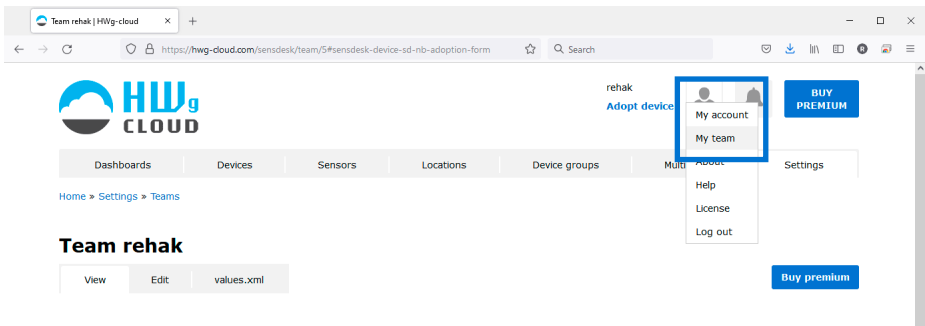
Setting up the device

- 1) Attach the external antenna
- 2) Connect 1-Wire sensors (NB-2x1Wire only)
- 3) Insert SIM card
- 4) With a slight force, pull out the insulating strip that insulates the battery from the contacts
- 5) Connect the external power supply and wait until the device connects to the operator's network (i.e. until the blue LED turns off). Depending on the network and device configuration, this can take up to 20 minutes (when the device is first connected to an operator's network, including in a new country or region). During this time, do not disconnect external power to avoid battery drain.
- 6) Install new IoT Monitoring device on the default portal [HWg-cloud.com](https://www.HWg-cloud.com) (+ migrate to other portal).
When you power-up IoT monitoring device, it's in default connected to the free portal from the manufacturer ([HWg-cloud.com](https://www.HWg-cloud.com)).
 - a) You have an existing account on the HWg-cloud and you would like to adopt a new device to that
 - b) You can migrate the connected device to another account on another portal
- 7) Option to having user account on the [HWg-cloud.com](https://www.HWg-cloud.com) is to Adopt (**SET DEVICE**) new device on another SensDesk Technology based portal
- 8) Define **sensor name** & **SD SafeRange** for each sensor

6a) Adopt a new device to [HWg-cloud.com](https://www.HWg-cloud.com) account

Useful for all new (load default) IoT monitoring devices.

Open the www.HWg-cloud.com website, log in to your account and go to the **My Team** page.



Scroll down to the **Device Adoption**.

Fill in the device hash (1234-5678 number on the label of the physical device).

Re-generate

Time zone: UTC

Autologout timeout: 1 day

DEVICE ADOPTION

Device hash *

3107-2639

Unique device ID in XXXX-XXXX format – you can find it on the device's nameplate.

Adopt

New device will appear after some time in the **Devices**:

HWg CLOUD

rehak Adopt device

BUY PREMIUM

Dashboards Devices Sensors Locations Device groups Multigraphs Settings

Home

Devices

Filter by

Device type Family

Alias (contains)

Sort by

State Alias Clear filter

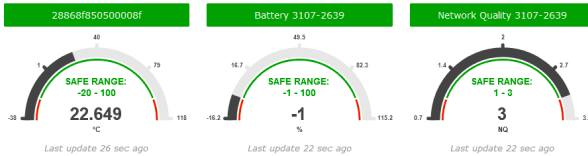
Device Hash	Device Name	Last Update
3107-2639	HWg 2x1Wire	Last update 21 sec ago
Damodes2 MINI JanH	Damodes2 MINI	Last update 4 min 44 sec ago
3077-0183	HWg 2x1Wire	Last update 1 month 1 week ago
STE2 Zbraslav	STE2 Zbraslav	Last update 1 month 9 hours ago

6b) Device Migration from [HWg-cloud.com](https://www.hwg-cloud.com) to another portal

When the device is visible in the [HWg-cloud.com](https://www.hwg-cloud.com) portal, can be migrated to another user account on another portal (SensDesk Technology based).

A connected and working device can also be easily migrated from one portal to another. For example in this case from the paid portal [SensDesk.com](https://www.sensdesk.com) to the free [HWg-cloud.com](https://www.hwg-cloud.com).

The screenshot shows the HWg-cloud.com interface for a specific device. At the top, there's a navigation bar with 'Dashboards', 'Devices', 'Sensors', 'Locations', 'Device groups', 'Multigraphs', and 'Settings'. The device ID '3107-2639' is prominently displayed. Below it, there are tabs for 'View', 'Edit', 'Edit sensors', 'Actions', 'EventLog', 'Delete', and 'Debug'. The 'View' tab is active, showing details: 'Last log: 18.09.2021 01:58' with a green checkmark, 'Device groups: Not assigned', 'Location: Not assigned', and 'IP Address: 0.0.0.0'. A red box highlights a link that says 'Migrate device to another SensDesk technology based portal'. To the right is an image of the physical device, a white box with 'HWg-portal NB-2x4Wire' printed on it.



Fill in the **Team login** and **Team password**, choose the right SensDesk Technology based portal.

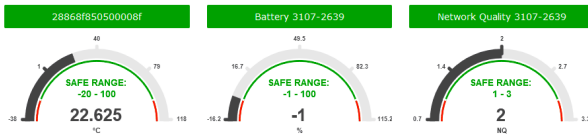
The screenshot shows the 'Migrate device' form in the HWg-cloud.com portal. The form has the following fields: 'Device hash' with the value '3107-2639'; 'Team login' with the value 'rehak'; 'Team password' which is empty; and 'Portal' with a dropdown menu set to 'HWg-cloud.com'. There is a 'Save' button at the bottom. The form also includes some explanatory text: 'Unique device ID in XXXX-XXXX format - you can find it on the device's nameplate.' and 'The name of the team on the target portal - you can find it at http://your_portal/sensdesk/team/'.

After you click the **Save** button on the web page, take a pencil or other tool and briefly **press the Setup button on the device**. It will start blinking (communication with the portal) and finalize the device migration process.

The screenshot shows the HWg Cloud web interface. At the top, there's a navigation menu with options like Dashboards, Devices, Sensors, Locations, Device groups, Multigraphs, and Settings. A notification bar says "Configuration saved. Restart the device or wait for the device to log on." Below this, the device ID "3107-2639" is displayed. A table of actions (View, Edit, Edit sensors, Actions, EventLog, Delete, Debug) is visible. The device information section shows:

- Last log: 18.09.2021 02:06 (with a green checkmark)
- Device groups: Not assigned
- Location: Not assigned
- IP Address: 0.0.0.0

 A link "Migrate device to another SensDesk technology based portal" is present. To the right is an image of the HWg NB-2x1Wire device.



The device will appear on the target portal.

Only sensor names will be transferred between the portal. You will lose the device configuration and data history!

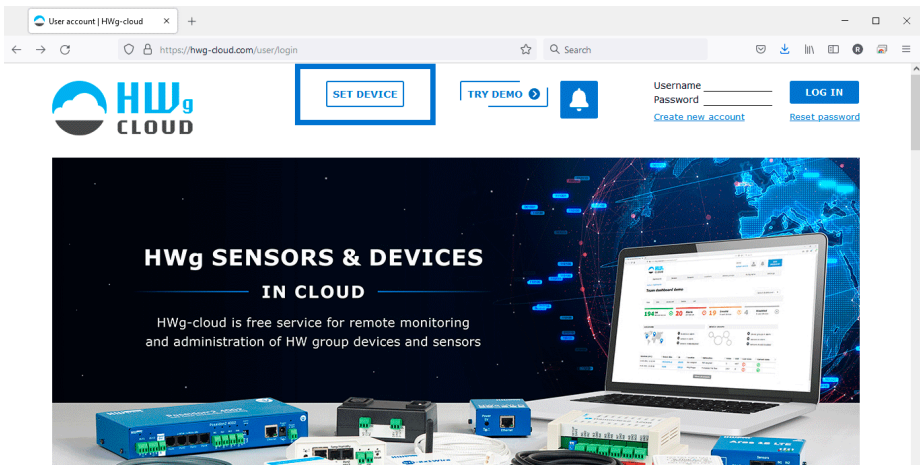
The screenshot shows the SensDesk web interface. The navigation menu is similar to HWg Cloud. The "Devices" section is active, showing a list of devices. The first device, "3107-2639", is highlighted with a blue border and a green checkmark. Other devices in the list include "Damocles2 MINI JanH", "3077-0183", and "STE2 Zbraslav". Each device entry includes an image and a "Last update" timestamp.

7) Adopt (SET DEVICE) a very new device on another portal than [HWg-cloud.com](https://www.HWg-cloud.com)

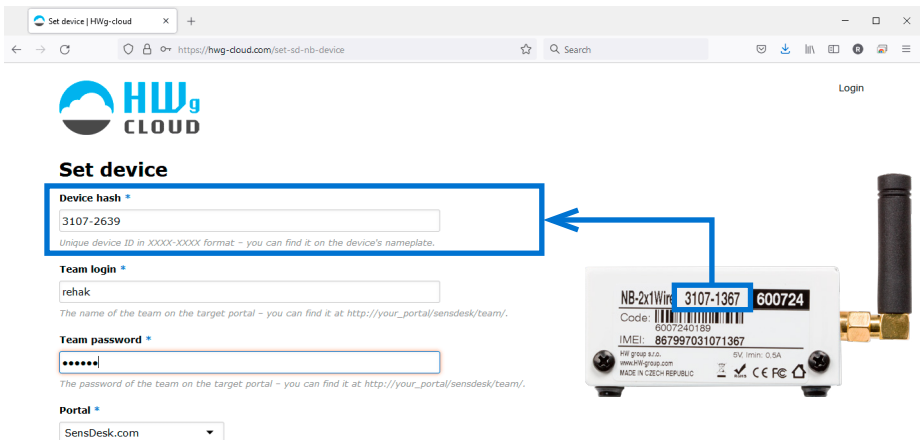
The [HWg-cloud.com](https://www.HWg-cloud.com) is the default portal, where a very new device (or after load defaults) will be connected when power-up. If you don't have a user account on [HWg-cloud.com](https://www.HWg-cloud.com), you can forward (redirect) a new device to another portal. Within one step the very new device will be forwarded to another portal server and assigned to the defined user account.

It's a useful function for all SensDesk Technology based portals ([SensDesk.com](https://www.SensDesk.com), [HWportal.cz](https://www.HWportal.cz), [SensDesk.at](https://www.SensDesk.at), ...)

Open the www.HWg-cloud.com, do not log in, click to **SET DEVICE** button on the top of the page.



Fill in the **Device hash** (1234-5678 number is on the label of physical device).



For **Team login** & **Team password** put data from the SensDesk Technology based portal, where you have the account. You will find them on the **My team** page.

Set device | HWg-cloud

https://hwg-cloud.com/set-td-nb-device

HWg CLOUD

Set device

Device hash *

3107-2639

Unique device ID in XXXX-XXXX format - you can find it on the device's nameplate.

Team login *

rehak

The name of the team on the target portal - you can find it at http://your_portal/sensdesk/team/.

Team password *

The password of the team on the target portal - you can find it at http://your_portal/sensdesk/team/.

Team rehak | SensDesk

https://www.sensdesk.com/sensdesk/team/11599

SensDesk IoT PORTAL BY HW GROUP

rehak Adopt device My account My team PREMIUM

Dashboards Devices Sensors Locations Device groups Multi... Settings

Home » Settings » Teams

Team rehak

View Edit values.xml Buy premium

SMS

Gateway: Portal Twilio

From number: +13203453482

Credit limit (per month): 5 0.147 used

SMS price limit (per one SMS): 1

Total credit counter: 2.075

PORTAL SETTINGS

This is credential for your devices.

Portal URL: <http://sensdesk.com/portal.php>

Portal port: 80

Team: rehak

Team password: 292929

LIMITS

Date of expiration: 31.12.2021

Action - E-mail limit: - Unlimited - 0 used

Action - Set output limit: - Unlimited - 0 used

Action - SMS limit: 50 2 used

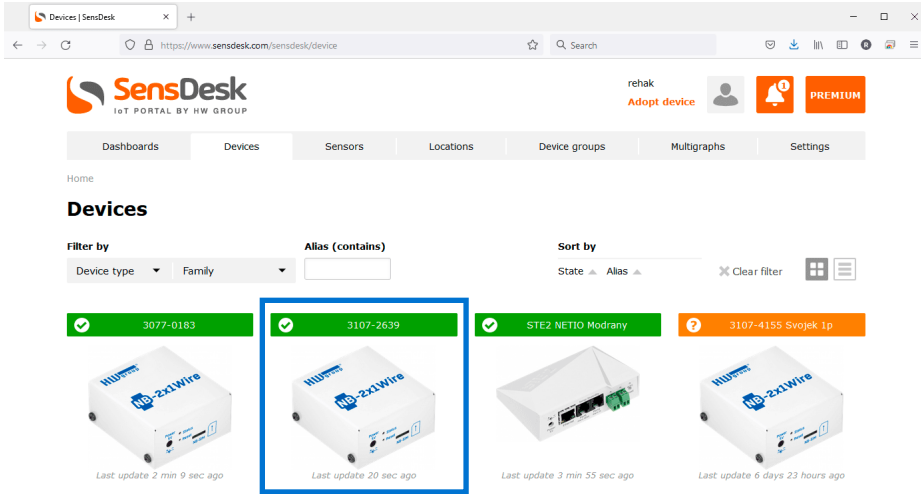
Action - SNMP trap limit: - Unlimited - 0 used

After you click the **Save** button on the web page, take a pencil tip or other tool and briefly **press the Setup button on the device**. It will start blinking (communication with the portal) and finalize the device migration process.



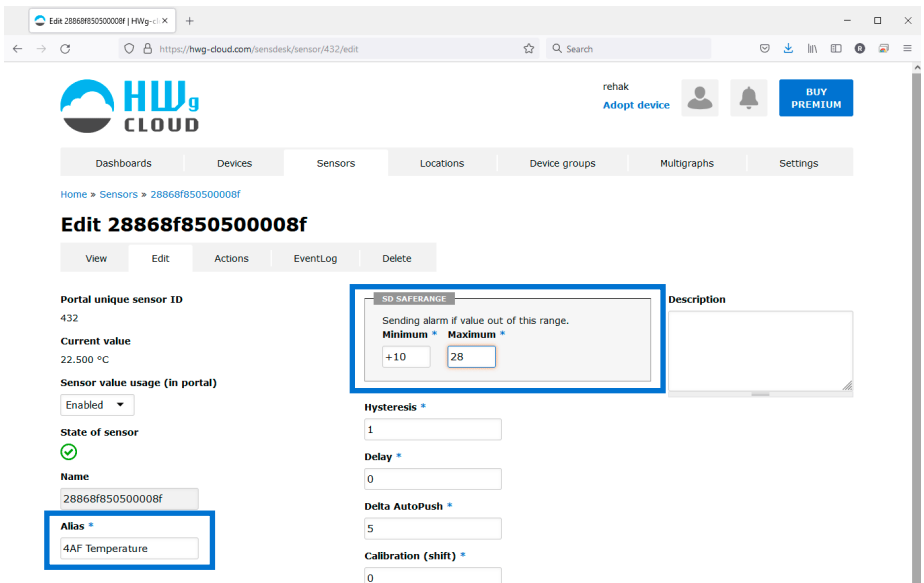
Setup button

The device will appear in the **Devices** list:



8) Define sensor name & SD SafeRange for each sensor

Part of the device installation is to define sensor name (**Alias**) & **SD SafeRange** for each sensor. Define SD SafeRange to significantly speed-up alerts when sensor value exceeds the SafeRange limit.

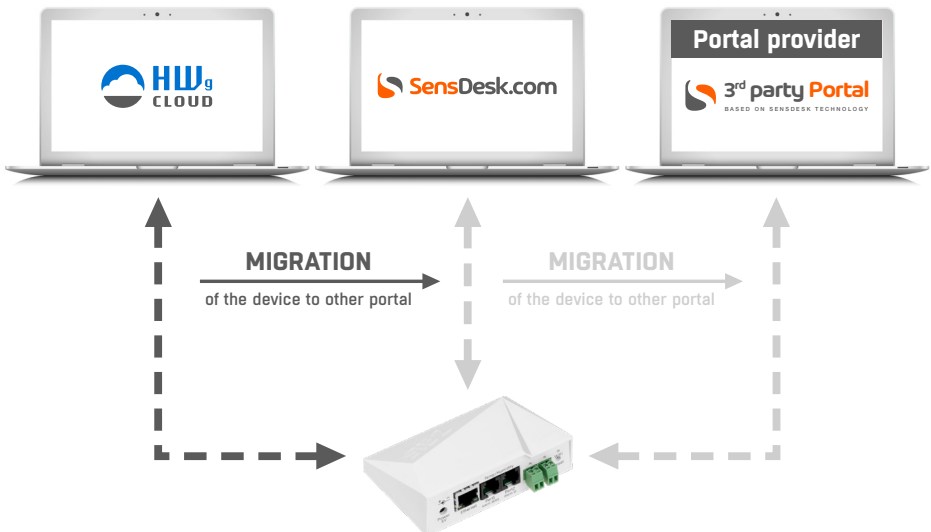


NB-Devices have to be connected to one of the portals



www.HWg-cloud.com	www.SensDesk.com	Portal providers
<ul style="list-style-type: none"> • SaaS (Software as a Service) • Default portal for all HWg devices (latest FW required) • Basic free portal for 20 HW group devices (all types) • Simple Email alerts for 2 recipients • 10 days history, no API, no SMS, basic graphs • Devices can be migrated to any other portal • Based on SensDesk Technology 	<ul style="list-style-type: none"> • SaaS (Software as a Service) • SensDesk is technology • SensDesk.com is the public example of this technology (by HWg) • It's the Paid option for all HWg devices • 3 subscription plans (5D / 10D / 25D for 1 year) • Differences are also in service mix (how many SMSs, PDFs, ...) not device limits only • Any plan can be ordered as a 1 year subscription plan 	<ul style="list-style-type: none"> • SaaS (Software as a Service) • Paid service provided by HW group partners • Various mix of free / paid services • Based on SensDesk Technology <ul style="list-style-type: none"> • SensDesk.at / .gr / .lv / .ro / ... • HWportal.cz • Other (list on HWg-cloud.com)

Migration of connected device from the portal



Portal options

All NB-xxx devices have to be connected to any online Portal **based on SensDesk Technology**.

- 1) HWg-cloud.com is free portal provided by the manufacturer with limited functions
- 2) SensDesk.com is paid portal provided by the manufacturer
- 3) **Portal providers** are independent companies running their own compatible portals. A list of them can be found on the main page of www.HWg-cloud.com.



HWg-cloud.com
HWg sensors & devices in cloud

HWg-cloud.com

- Free service
- Up to 20 devices
- Device management




SensDesk.com
Monitoring and Alerting system in cloud by HW group

SensDesk.com

- Paid service
- Subscription plans
- SMS, Voice calls, graphs

Portal providers




Do you need advanced features?

SensDesk.com is comprehensive professional system for remote monitoring of your environment.

- Higher device or user limit
- Advanced alerts (SMS, Phone-calls)
- Look further in history (more log DB)
- Integration into 3rd party system (Open API)
- Reports in PDF

Portal providers

Global:	SensDesk.com	HW.group.s.r.o		
Austria:	SensDesk.at	BellEquip.GmbH	Netherlands:	SensDesk.nl
Belgium:	SensDesk.be	MCS.N.V	Luxembourg:	SensDesk.lu
Czech Republic:	HWportal.cz	HW.server.s.r.o	Romania:	SensDesk.ro
France:	SensDesk.fr	QLD	Switzerland:	SensDesk.ch
			Latvija:	SensDesk.lv
				MCS.N.V
				MCS.N.V
				Sinero Systems s.r.l
				INSERTO.AG
				Baltic-Project-Group.SIA




SensDesk.com portal features

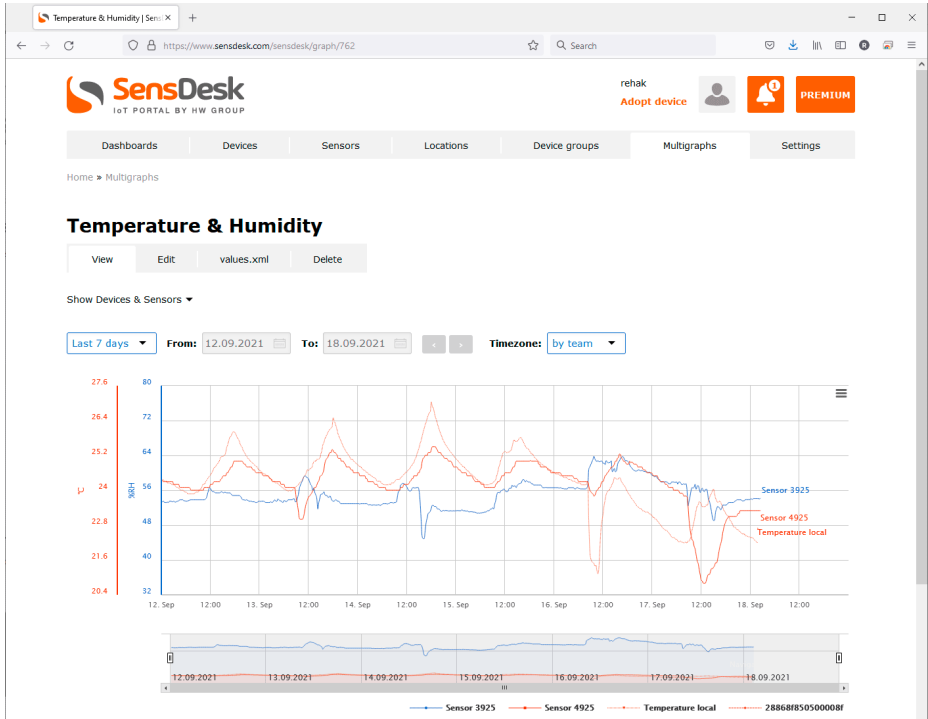
SMS & Voice call alerts

The screenshot shows the SensDesk portal interface for configuring actions on a sensor. The page title is "Actions on sensor Temperature local". There are tabs for "View", "Edit", "Actions", "EventLog", and "Delete". The "Actions" tab is active, showing a list of actions. One action is visible: "Action = Temp-VoiceCall" with a sub-label "Temperature.local". Below the action list, there is a "Name" field, a "Sort by" dropdown, and a "Type" dropdown. A "Clear filter" button and an "Add action" dropdown are also present. A blue callout bubble with the text "Enable Voice call in SMS settings" is overlaid on the page. To the right of the callout, there is a red circle with a white plus sign next to a grey exclamation mark icon. At the bottom, there is a "1 Target" dropdown and a "+ Manage Action" button.

Graphs of values



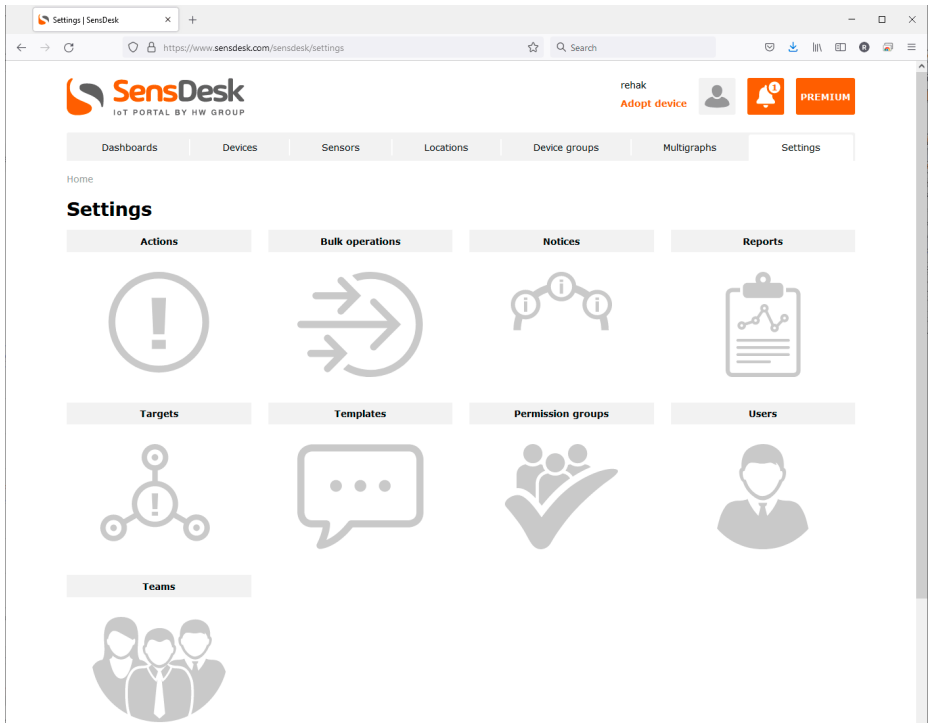
Multigraph of several values



Open API (SNMP & XML)

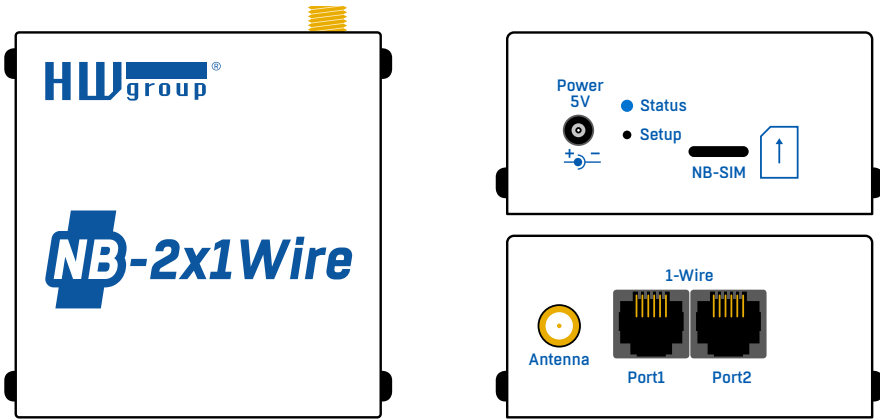
The screenshot shows the SensDesk interface for the "Team rehak" settings page. The URL is "https://www.sensdesk.com/sensdesk/team/11599/values.xml". The page title is "Team rehak". The navigation menu includes "Dashboards", "Devices", "Sensors", "Locations", "Device groups", "Multigraphs", and "Settings". The main content area is titled "Team rehak" and includes buttons for "View", "Edit", and "values.xml". Below this, there is a "Team" section with a link to "https://www.sensdesk.com/sensdesk/team/11599/values.xml?values_xml_key=ENnRVHdVjWn9IkznXkUUM17_uf70pge7aZ3". The "User" section has a link to "https://www.sensdesk.com/sensdesk/team/11599/values.xml?values_xml_key=pudVwDxSj0eJxEUK6_Ghu9Zwz9TgoUDMdh7y". The "How to use values.xml" section provides instructions on how to access the data via XML over HTTP(s) for reading:

- Host - see above
- The values.xml download period is limited to 1x minute for each URL. We recommend to read it with 15 min period.
- There is no username & password, authentication is realized with the generated key parameter.
- User can provide limited data from the Team (defined by permission groups).
- XML structure will be updated with every new device connected to your team / user account.



NB-Devices models and their specific features

NB-2x1Wire



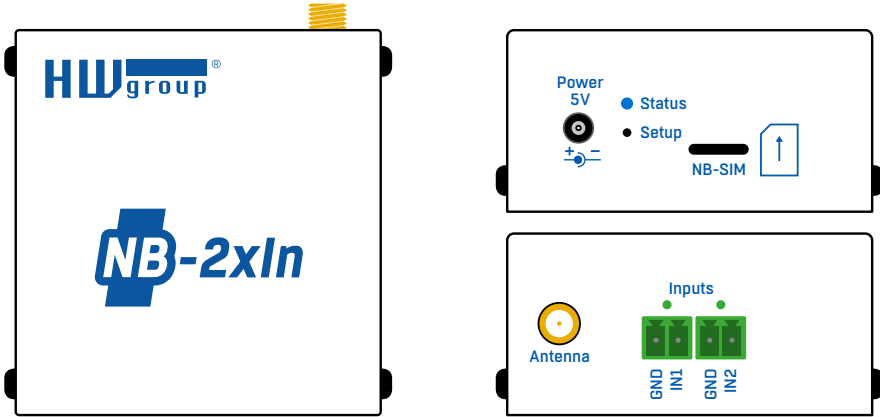
A device for connecting external sensors of Temperature, Relative Humidity, Voltage or other values via the RJ11 1-Wire (UNI) bus. 2 RJ11 ports allows connecting several external physical sensors to measure up to 4 sensor values simultaneously.

The sensors are detected whenever power is connected to the device or the Setup button is pressed.

The device can be powered from an external 5V adapter, from its internal battery, or using a combination of these. With a single connected Temp-1Wire IP67 temperature sensor and the default sensor reading and data upload periods, the battery lasts up to 3 years. When using 1-Wire UNI sensors, either the sensors or the NB-2x1Wire device should be powered from an external adapter because such sensors significantly reduce the battery life.

External sensors	
Port/connector	Port1, Port2 / RJ11 (1-Wire, 1-Wire UNI)
What can be connected	2 ports for external sensors. Up to 4 sensor values in total.
Sensor types	Only sensors by HW group s.r.o.
Sensors / distance	4 values, max. 2 probes per port (max. 60m total length per port)
Alarm LED	Alarm Port1 – Alarm SENS – lights up if the sensor is in alarm – on external power only

NB-2xIn



Remote monitoring device for connecting external detectors to 2x DI (Digital Input). To each DI input you can connect a door or window contact, a PIR motion detector or a smoke / gas detector with a dry contact (relay) output.

Pulse counter (SO) on each DI input

An advanced feature of each DI input is a 4bytes pulse counter for counting pulses. To each DI input you can connect an energy or water meter with pulses (SO) output. Only pulses longer than 20 ms are detected. Due to the high energy requirements of SO outputs, external power is required for reliable pulse counting. When the device is powered from an internal battery, reliable operation cannot be guaranteed.

Alarm state

The input mode (Alarms or Counters) can be changed in the Digital Input configuration at the portal using the "Alarm level" parameter.

If the "Not Defined" option is selected (default portal configuration), DI input is in pulse counting mode and 0/1 state is communicated only in the regular data upload period.

When Alarm level=1 or Alarm level=0, DI input is in the Alarm mode. The input 0/1 state is communicated in the regular data upload period as well as whenever there is a state change. To comply with the transmission limit, the device will send no more than 3 alarms per 10 minutes. Frequent state changes can have a significant impact on battery life.

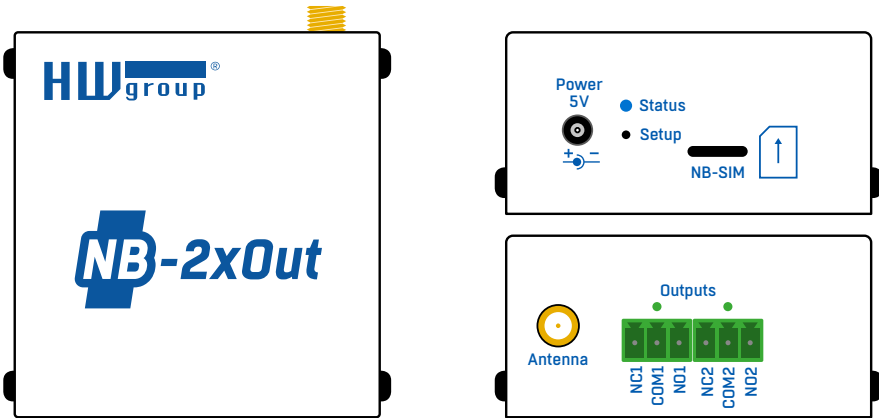
For battery operation, wiring cables should be as short as possible to avoid false pulses.

LED indication

The default mode is the counter mode (i.e. Alarm level = Not defined). When DI input is activated (=1/contact closed) and the device is powered from an external adapter, the respective green LED lights up. The LEDs are inactive on battery power.

DI – Dry Contact Inputs	
Port/connector	I1, I2 / terminal block \varnothing 2 mm
Type	Digital Input (supports NO/NC Dry contact)
Sensitivity	1 (On) = 0 – 500 Ω
Max. distance	Up to 10 m
Counter sensitivity	20 ms
LED	2 \times green – input contact closed – on external power only
Pulse counter	Ext. power required for reliable pulse counting – S0 = min 5 V / 2–10 mA

NB-2xOut



IoT monitoring device 2 DO (relay outputs) controlled from the portal over the NB-IoT network. It can be connected to any SensDesk Technology based portal.

To reduce power consumption (when running from the internal battery), the device uses internally latching relays. To increase reliability, internal relays are energized periodically every 10 minutes. When powered from an internal battery only, the estimated battery lifetime is around 2 years.

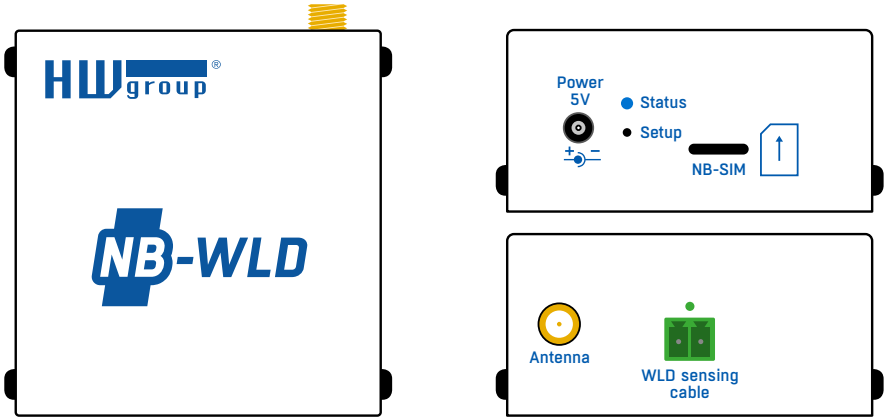
Note: The device is not suitable for mobile applications due to vibration issues (in car for example).

LED indication

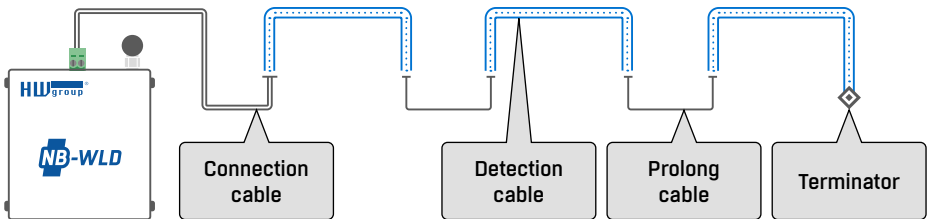
When powered from an external adapter, output states are signaled by green LED when output=1. The LEDs are inactive on battery power.

Relay outputs	
Type	Latching (bipolar) relay
Connector	Terminal block
Rating	Max. 500 mA at 125 V AC, 1 A at 30 V DC
LED	2 \times green – output contact closed – on external power only

NB-WLD



Water Leak Detection unit with 1 zone input (external WLD Type A moisture-sensing cable). Length of the external cable can be max. 60m (any combination of WLD sensing + non-sensing prolong cable).



Flood detection is performed every **5 min.** (15 min. when powered from the battery). Estimated battery life with **15 min.** detection is 4 years.

LED indication

If the cable is flooded or disconnected and the device is powered from an external adapter, the red LED lights up.

Note: The LED is inactive on battery power.

WLD cable	
Type	Moisture sensing cable
Connector	Terminal block
Sensor states	0 = OK, 1 = Flooded, 2 = Cable disconnected
Sensing cable length	Max. 60m in total (WLD sensing cable + prolong cable)
Cable extension	May be extended by AWG 24 cable to max length
LED	1x red – flooded or cable disconnected – on external power only

Technical specifications for all models

NarrowBand	
Supported bands	B1 / B2 / B3 / B4 / B5 / B8 / B12 / B13 / B17 / B18 / B19 / B20 / B25 / B26* / B28 / B66
Certifications	<p>Carrier: Vodafone (Global) Deutsche Telekom / Telefónica* (Europe) AT&T / T-Mobile / Verizon* / Sprint* (North America) LGU+* (South Korea) SoftBank / NTT DOCOMO* (Japan) Telstra* (Australia)</p> <p>Regulatory: GCF (Global) CE (Europe) FCC / PTCRB (North America) IC (Canada) KC (South Korea) NCC (Taiwan) JATE / TELEC (Japan) RCM (Australia) NBTC (Thailand) IMDA (Singapore)</p> <p>Others: RoHS ATEX (Europe)</p>
Output power	23 dBm ±2 dB
Sensitivity	129 dBm
Antenna	External, SMA
Supported protocols	IP: UDP/IP (COAP)

Power	
Supply voltage	5 VDC / 120 mA
Connector	Jack Ø 3.5 x 1.35 / 10 mm
Battery	Lithium 3V model CR123A

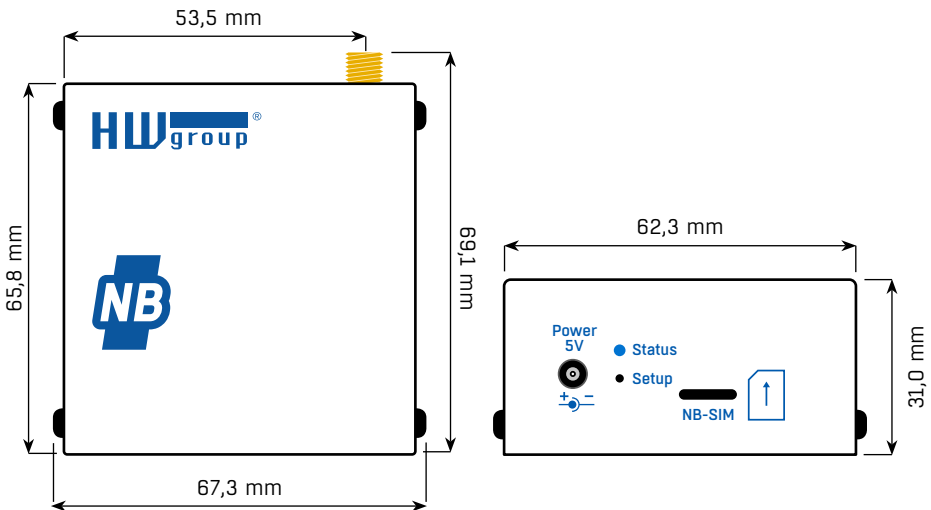
Common LEDs	
Status	Blue – communicating in the NB-IoT network (on), connecting to the network (flashing), reading sensors (brief flash)

* Under development

Button	
Setup	Short press – sensor detection, immediate upload of values on portal Pressed for longer than 10 s – reset to factory defaults

Miscellaneous	
Operating temperature	-10 to +60 °C (for the device – sensors may support different operating ranges)
Dimensions / weight	67×78×33 mm / 250 g
Electromagnetic radiation	CE / FCC Part 15, Class B
EMC	EN 55022, EN 55024, EN 61000

Mechanical dimensions



More monitoring devices by HW group



Poseidon2 4002

Designed for demanding monitoring applications, such as in data centers and industrial settings.



Poseidon2 3468

Remote monitoring of temperature, humidity and other sensors. Industrial version.



Poseidon2 3266/3268

Basic unit for monitoring temperature, humidity, and other sensors over the network.



Ares 10/12

Remote environment monitoring at any place with GSM coverage.



SD family

Simple devices for the monitoring of temperature, humidity, voltage, current, and other parameters.



WLD2

Quad water leak detector with WiFi and Ethernet.

NB-Devices have to be connected to one of the portals:



www.HWg-cloud.com	www.SensDesk.com	Portal providers
<ul style="list-style-type: none">• SaaS (Software as a Service)• Default portal for all HWg devices (latest FW required)• Basic free portal for 20 HW group devices (all types)• Simple Email alerts for 2 recipients• 10 days history, no API, no SMS, basic graphs• Devices can be migrated to any other portal• Based on SensDesk Technology	<ul style="list-style-type: none">• SaaS (Software as a Service)• SensDesk is technology• SensDesk.com is the public example of this technology (by HWg)• It's the Paid option for all HWg devices• 3 subscription plans (5D / 10D / 25D for 1 year)• Differences are also in service mix (how many SMSs, PDFs, ...) not device limits only• Any plan can be ordered as a 1 year subscription plan	<ul style="list-style-type: none">• SaaS (Software as a Service)• Paid service provided by HW group partners• Various mix of free / paid services• Based on SensDesk Technology<ul style="list-style-type: none">• SensDesk.at / .gr / .lv / .ro / ...• HWportal.cz• Other (list on HWg-cloud.com)



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