



Converter NBnano



The **NBnano** is a LoRaWAN management system that brings the IoT world into the Automation, Energy Management and Building Management System. It translates LoRaWAN sensor into BACnet, or ModBus.

This document is a summary of instructions on how to quickly set up your NBnano and LoRaWAN Network.



Product Features

- ModBus or BACnet interfaces
- Configure alerts & notifications
- Sensor data visualization and exporting
- Local data storage
- Remote access via VPN
- Support for hundreds of LoRaWAN devices
- Integration into most Energy Management and Building Management Systems

Advantages

- Cost effective solution
- Only one NBnano is required per installation
- Flexible deployment of gateways
- Bring data from different sensors into a single unified data stream

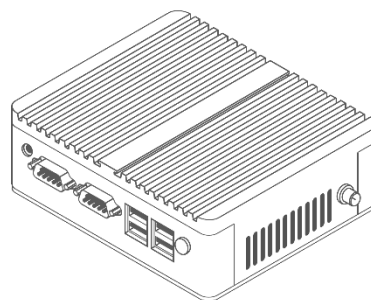
Registering Your Product

○ What you will need

An Ethernet Internet Connection for the NBnano
A PC or Laptop that can connect to WiFi
Your NBnano + Power Supply
Ethernet cable

○ Connecting to the NBnano

1. To begin registration, power up the NBnano using the 12V power supply and connect it the internet using an ethernet cable.
2. Access the NBnano by connecting to its WiFi access point using your PC or laptop. The access point name will be the NBnano serial number, e.g. **nano0123**, with password **iqnexus-nano**
3. Once connected open a web browser and navigate to page **192.168.12.1**. This is the dashboard IP address of your NBnano when connected over WiFi. After that start the registration process by following the steps.

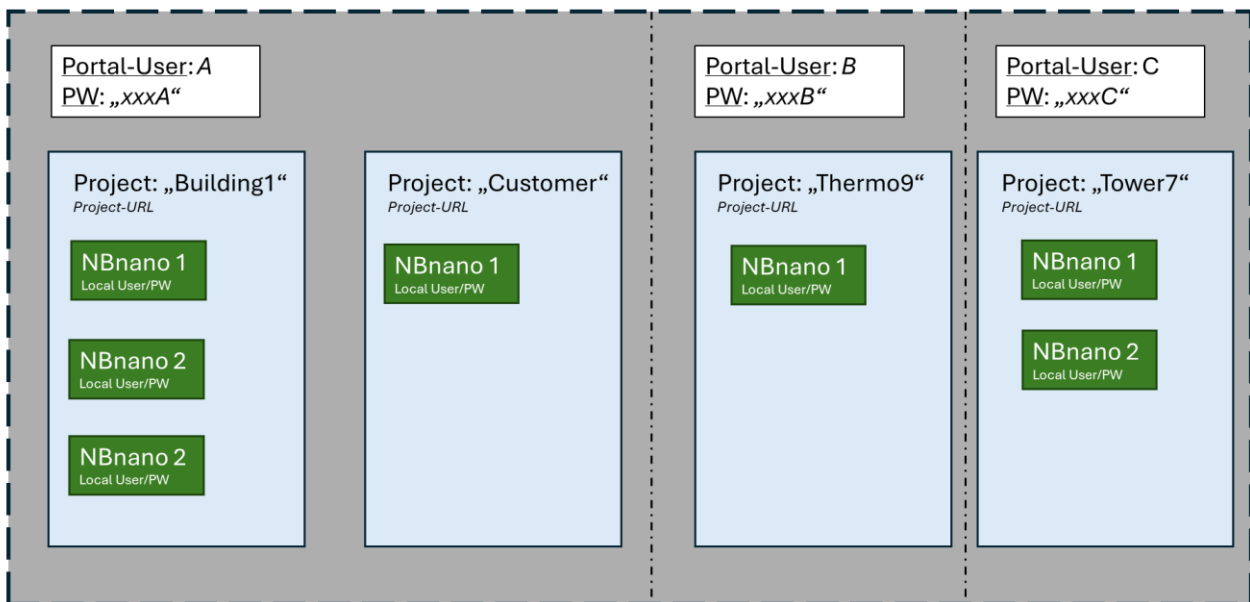


○ Registration

Registering your NBnano is required for management purposes, it will allow you to download the latest device drivers, download the latest firmware, access to the NBnano portal and remote VPN access. Afterwards there is no internet connection needed for running the NBnano at a local network

Note: During setup you will define a new password for the NBnano WiFi access point as well as for the local admin account. Make sure to write it down and re-connect to the WiFi after finishing setup.

NBnano Portal



1. Every NBnano is registered at the NBnano portal for management purposes. For registering a NBnano a Portal-User must be created previously. This portal user can manage the assigned NBnano's later. At <https://id.nbnano.eu/login> a Portal-User can be created.
Note: Please note the Portal-User and corresponding password properly.
2. During the registration process you are asked for a project to add the NBnano to. If this is the first NBnano then choose to create a new project, otherwise select your existing project to add your NBnano to. Projects are used to separate the NBnano for different purposes eg. different customers or different properties.
3. Every project provides a dedicated project-URL. This URL is provided during the registration process. By accessing the project with this project URL authorized users can manage the portal functions of the NBnano. The cloud access can be activated and deactivated from the NBnano.
4. The NBnano's Local admin user and password is determined by during the registration process. This local admin user and password are used to log in to the NBnano locally.
Note: Please note the NBnano's local admin user and password properly.

The whole registration and setup process is also shown at [this tutorial](#).

Configuring the network settings

What you will need

A PC or Laptop that can connect to WiFi

Your NBnano + Power Supply

Procedure

Connect to the NBnano's access point using the new WiFi password created during the setup process.

1. Open a browser on your PC or mobile phone and navigate to 192.168.12.1. Log into your NBnano with the local admin user using the password set up during setup.
2. Navigate to Project > Network.
3. Change the network settings according to your requirements (Static or DHCP). Settings off the network interfaces are only possible with a connected ethernet cable.

Note: Port LAN1 (BMS) is configurable (Static or DHCP) and is intended to be used for connection to BMS network. Port LAN2 (Support) is always working in DHCP mode and is intended to be used for support purposes.

4. Click Apply and wait for the success message to appear.

Name	IP	Broadcast	Subnet	Gateway	Type
LAN1: bms	192.168.168.1	192.168.168.255	255.255.255.0	192.168.168.6	Static
LAN2: support	192.168.0.107	192.168.0.255	255.255.255.0	192.168.0.1	DHCP
WIFI: ap_wifi	192.168.12.1	192.168.12.255	255.255.255.0		DHCP

Connect a gateway

○ What you will need

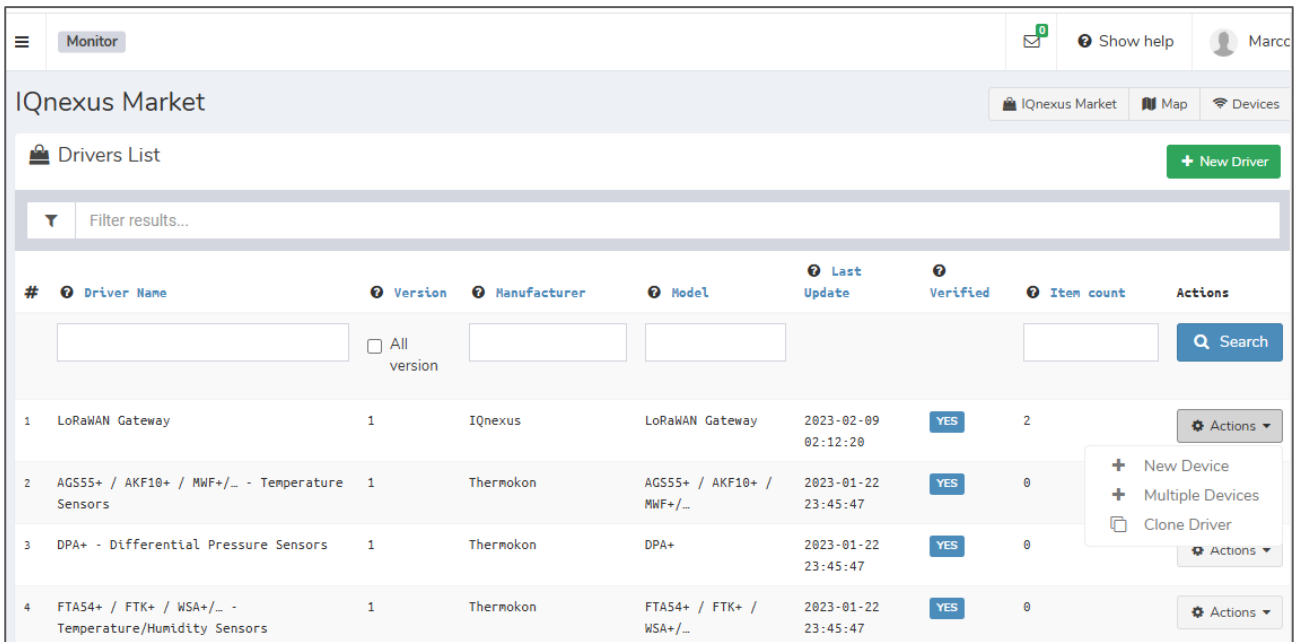
A PC or Laptop that can connect to Ethernet or WiFi
Your NBnano + Power Supply
Ethernet cables
LoRaWAN® Gateway(s)

○ Procedure

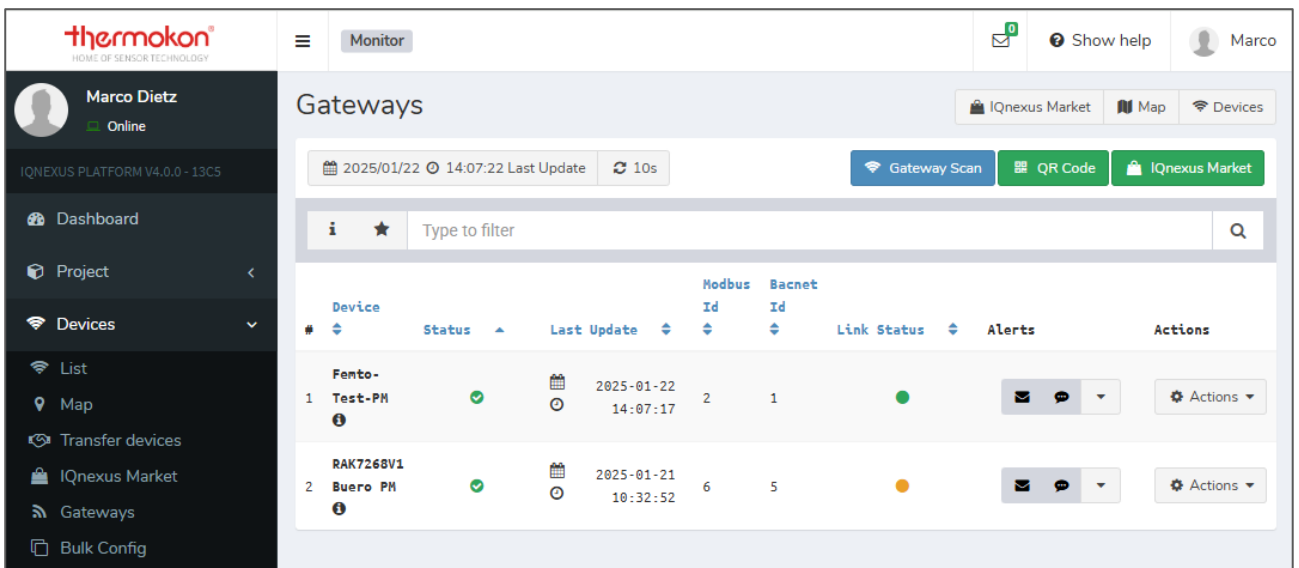
Connect your gateway and NBnano in one network via a switch/router and power on both devices with their appropriate power supplies. Connect your PC also to the same network via Ethernet or connect to the NBnano's WiFi access point.



1. Open a browser on your PC or Laptop and navigate to the NBnano and log in with the local admin user.
 - Via 192.168.12.1. when connected via NBnano's WiFi access point.
 - Via assigned IP address when connected via ethernet
2. Navigate to IQnexus Market >and add a new LoRaWAN gateway

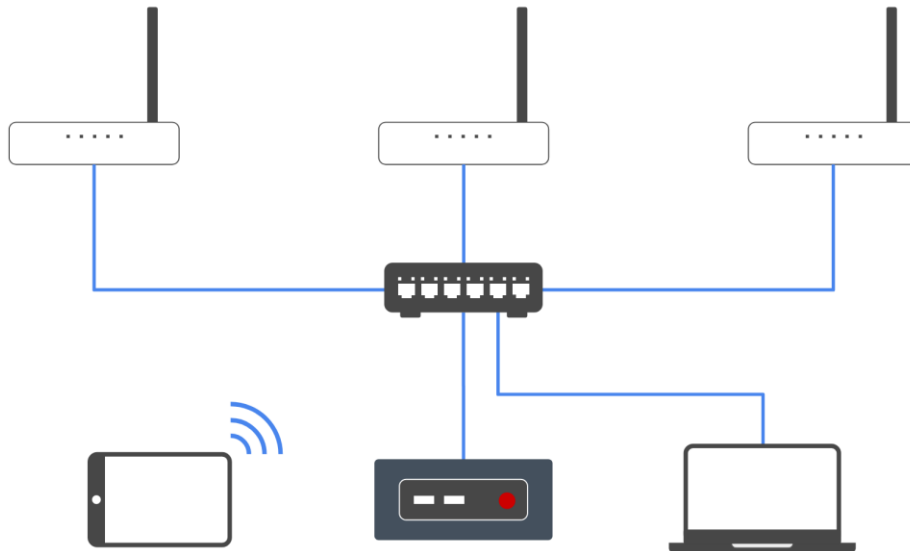


3. Extract the needed data (Gateway EUI/ID) out of the gateway itself. Please refer to the corresponding documentation of the gateway itself.
4. Configure the gateway accordingly. Point the UDP packet forwarder to the IP address (server address) of the NBnano. Please refer to the corresponding documentation of the gateway itself.
5. Gateway will appear online it gateway list after receiving LoRaWAN telegrams from a sensor.



○ Connection Diagram

If more than one gateway is connected please refer to the connection diagram below



Adding a device

What you will need

- An NBnano test network (refer to previous section)
- A LoRaWAN® sensor (Thermokon MCS LRW sensor for this demo)

Procedure

Log into the dashboard and navigate to the IQnexus Market. Here search for the model's name of your device, Thermokon MCS in the model column*. Click on the actions button and select New Device.

The screenshot shows the Thermokon IQnexus Market dashboard. The user is logged in as Marco Dietz. The main content area is titled 'IQnexus Market' and shows a 'Drivers List' table. A search filter is applied to the 'Model' column with the value 'mcs'. The table contains one entry:

#	Driver	Version	Manufacturer	Model	Last Update	Verified	Item count	Actions
1	MCS - Multi Compact Sensors	1	Thermokon	MCS	2023-01-22 23:45:47	YES	0	<ul style="list-style-type: none"> New Device Multiple Devices Clone Driver

You will be prompted to fill in the device details. Use the DEVEUI and APPKEY Keys provided to you by Thermokon (either via .csv-file, printed list or via LRWapp/uConfig). for the new device. Once you have filled these in click the apply button and navigate back to the devices page.

The screenshot shows a configuration form for a new device. At the top, there are tabs for '+ New Device', 'Modbus', and 'BACnet'. Below these are 'Storage' and 'Devices' options. The main content area is titled 'Please complete the information below:' and contains the following sections:

- Driver:** A dropdown menu is open, showing 'MCS - Multi Compact Sensors (Ver.1)' selected. Other options include 'Thermokon', 'MCS', 'LoRa Alliance Device', and 'sensun'. A green checkmark indicates it is 'Trusted by Sensun.'. A 'Change driver' button is below the list.
- DevEUI:** A text input field containing '70B3D55810000012'. Below it is the label 'Unique ID of the end device(HEX)'.
- Name:** A text input field containing 'MCS Room1-10'. Below it is the label 'Name' and a note: 'The name may only contain words, numbers and dashes.'
- Application key:** A text input field containing '78A976E7A50942C5DACEACC87A525133'. Below it is the label 'Application key' and a note: 'Application root key (128 Bytes HEX encoded)'.

For other sensor types please check the list for the corresponding type and choose the suitable version.

o Testing the sensor

When the sensor is turned on (insert battery) it should join the NBnano Test Network and start sending data. Once the sensor starts emitting data, refresh the Platform page, and it will show as connected. The actions menu can be used to see the logs and stats generated graphs.

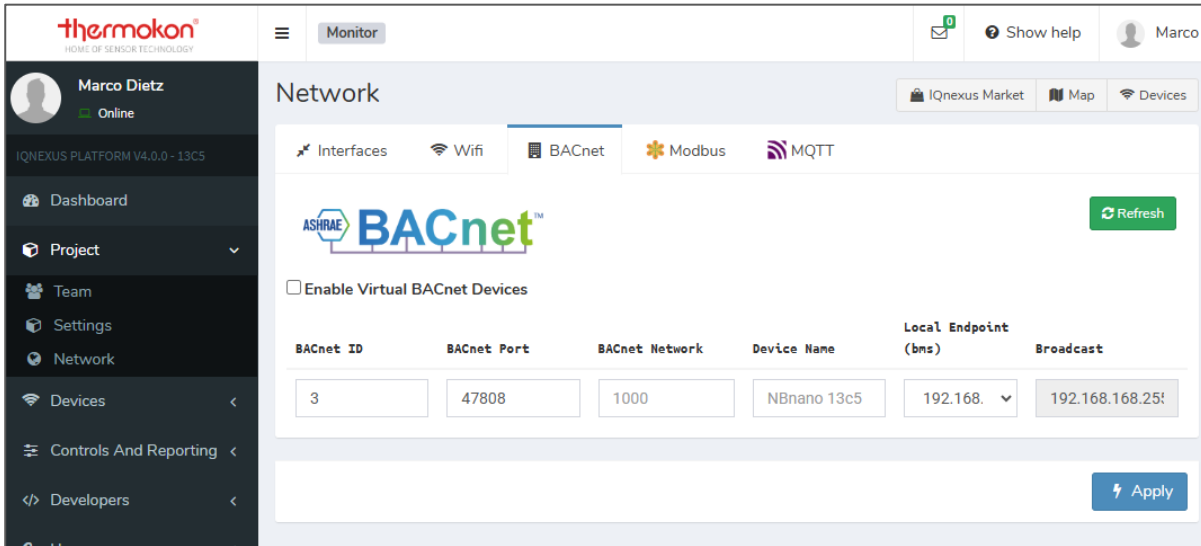
The screenshot shows a device status card for 'MCS Room1-10'. It features a green checkmark indicating the device is connected. To the right, there is a signal strength indicator (three bars), a calendar icon, and a date/time stamp: '2025-01-22 14:09:32'. Further right are two small circular indicators, one green and one red. At the bottom right, there is an 'Actions' button with a dropdown arrow. The card also shows 'SF:7' and a small bar chart icon.

Expose data via BACnet IP



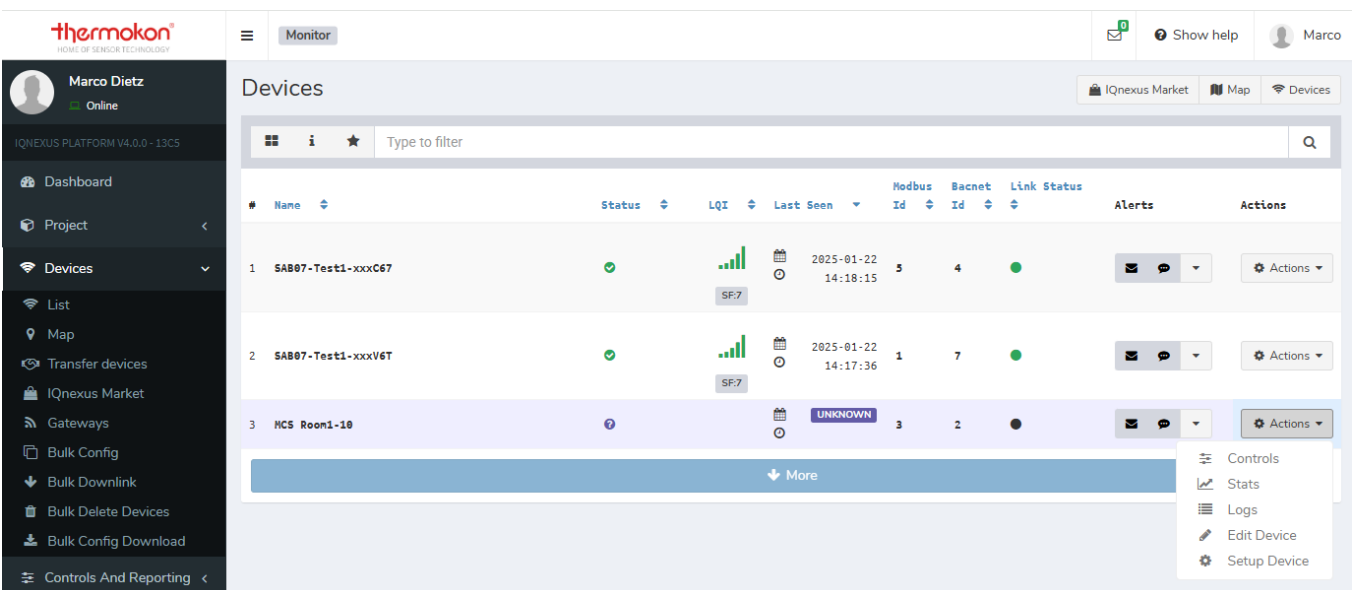
Global settings

Configure global BACnet settings via Project→Network→BACnet



Device Settings

When you set up your LoRaWAN sensor, you can choose which Key Performance Indicators (KPIs) you want to expose as BACnet points. Go to Action→Setup Device→BACnet



For instance, the MCS sensor below is exposing as BACnet points RSSI-Value, Temperature and Humidity.

Readable Objects				
KPI	Export	Type	Unit Type	Instance
SNR	<input type="checkbox"/>	ANALOG_VALUE	NO_UNITS	201
RSSI	<input checked="" type="checkbox"/>	ANALOG_VALUE	NO_UNITS	202
LQI	<input type="checkbox"/>	ANALOG_VALUE	NO_UNITS	203
DevEUI	<input type="checkbox"/>	CHARACTERSTRING_VALUE	NO_UNITS	204
Time	<input type="checkbox"/>	DATETIME_VALUE	NO_UNITS	205
FCNT	<input type="checkbox"/>	ANALOG_VALUE	NO_UNITS	206
FPORT	<input type="checkbox"/>	ANALOG_VALUE	NO_UNITS	207
ADR	<input type="checkbox"/>	ANALOG_VALUE	NO_UNITS	208
DevADDR	<input type="checkbox"/>	CHARACTERSTRING_VALUE	NO_UNITS	209
SF	<input type="checkbox"/>	ANALOG_VALUE	NO_UNITS	210
Temperature	<input checked="" type="checkbox"/>	ANALOG_VALUE	NO_UNITS	216
Relative Humidity	<input checked="" type="checkbox"/>	ANALOG_VALUE	NO_UNITS	217

The unique BACnet unit identifier can be adjusted via Action→Edit device→BACnet

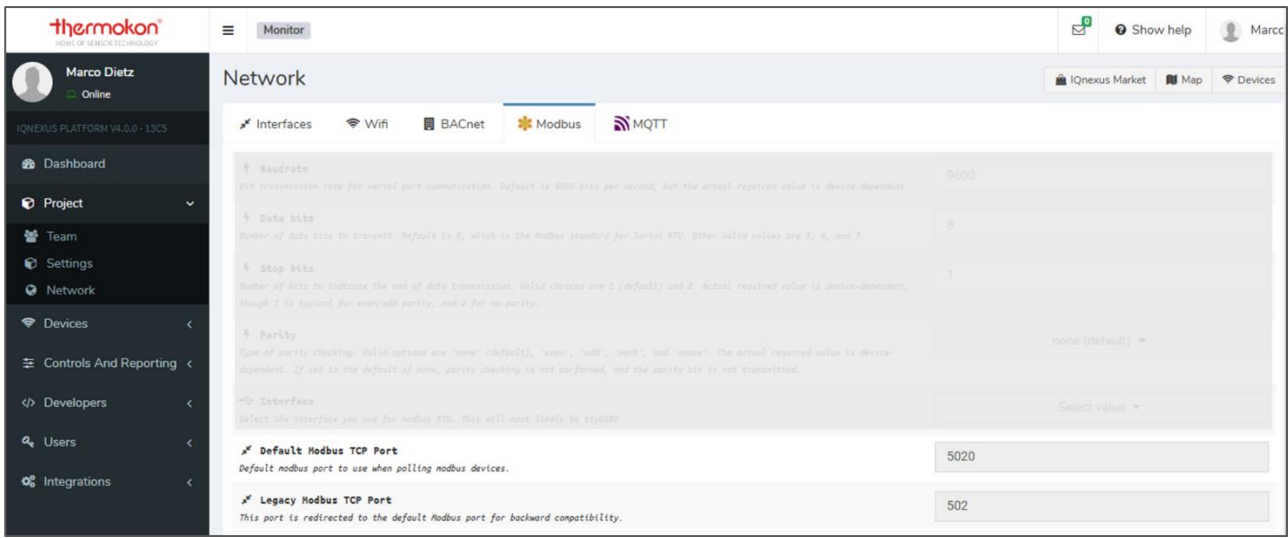
The screenshot shows the 'Edit Device' interface for 'MCS Room1-10' (#70B3D55810006789). The 'BACnet' configuration tab is selected, showing a 'BACnet Unit Identifier' field with the value '2'. The interface includes a sidebar with navigation options like 'Dashboard', 'Project', 'Devices', 'List', 'Map', 'Transfer devices', 'IQnexus Market', 'Gateways', 'Bulk Config', and 'Bulk Downlink'. At the bottom of the configuration panel, there are 'Delete Device' and 'Apply' buttons.

Expose data via Modbus TCP/IP



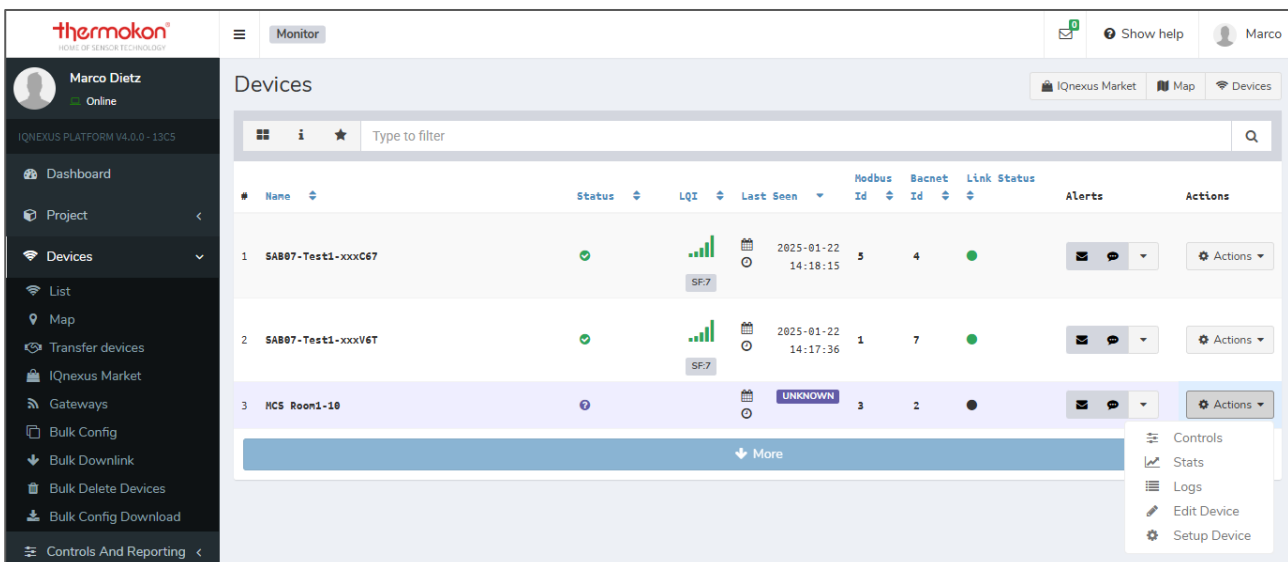
Global settings

The Modbus TCP/IP communication is carried out via Port 502 and Port 5020 simultaneously. If more than 255 devices are within a project the Port 5020 is incremented by one per each 255 devices.



Device Settings

The available Modbus Registers per device are shown via Actions → Setup Device → Modbus



The connection parameters, number and sizes of the registers are shown in the following list.

+ **MCS Room1-10** (#70B3D55810006789)

Alerts ▾
Data ▾
Look and Feel ▾
Tags
Sharing
Uptime settings
⚡ MODBUS
⚡ BACNET

Access

Master IP Address	192.168.0.107
Allowed IP Addresses <small>IP Address we allow to connect to this device. (0.0.0.0 allows all)</small>	0.0.0.0
Port	5020
Unit Identifier	3

Read Registers

KPI	Type	Register Address	Count
DevEUI ₆₄	INTEGER	18000	4
LQI ₃₂	FLOAT	18004	2
SNR ₃₂	FLOAT	18006	2
RSSI ₃₂	FLOAT	18008	2
TIMESTAMP ₆₄	INTEGER	18010	2
FCNT ₁₆	INTEGER	18012	1
FPORT ₁₆	INTEGER	18013	1
ADR ₁₆	INTEGER	18014	1

The unique Modbus Unit Identifier can be adjusted via Actions→Edit Device→Modbus.

Marco Dietz
Online

IQNEXUS PLATFORM V4.0.0 - 13CS

- Dashboard
- Project <
- Devices ▾
- List
- Map
- Transfer devices
- IQnexus Market
- Gateways
- Bulk Config
- Bulk Downlink
- Bulk Delete Devices
- Bulk Config Download
- Controls And Reporting <
- Developers <

IQnexus Market
Map
Devices

+ **MCS Room1-10** (#70B3D55810006789)
 ⌵ ⌶ ⌵ ⌵ ⌵

Edit Device
⚡ Modbus
BACnet
Storage

Configure

Allowed IP Addresses

IP Address we allow to connect to this device. To allow multiple ips seperate them by a comma(,) 0.0.0.0 allows all

MODBUS Unit Identifier

Modbus Unit ID. Must be unique per project / modbus socket port

Delete Device
Apply

FAQ



○ Licences

Causes the NBnano regular fees?

No, the NBnano does not cause any regular fees. The NBnano solution is a one-time investment and is equipped with a time unlimited software license.

How many LoRaWAN device licenses are included in the NBnano?

In delivery state it is possible to connect up to 50 devices (sensor, actuators and gateways) with the NBnano.

Is it possible to subsequently increase the number of licensed devices?

It is possible to increase the number of licensed devices afterwards. Therefore, different packages (amount of devices) are available. These additional device licenses are also a one-time investment and are time unlimited.

○ Device Selection

Is it possible to connect 3rd party products to the NBnano?

All Thermokon LoRaWAN devices are out-of-the box ready to be used with the NBnano through predefined device drivers. Furthermore, also 3rd party products can be used with the NBnano.

○ Offline/Online Mode

Does the NBnano always need an internet connection during operation?

No, the NBnano does not need an internet connection during operation. It works as on-premise solution.

During the initial setup an internet connection is required for registration and updating the latest firmware.

During operation an internet connection is only needed in case of a device update or VPN connection for due to support reasons.