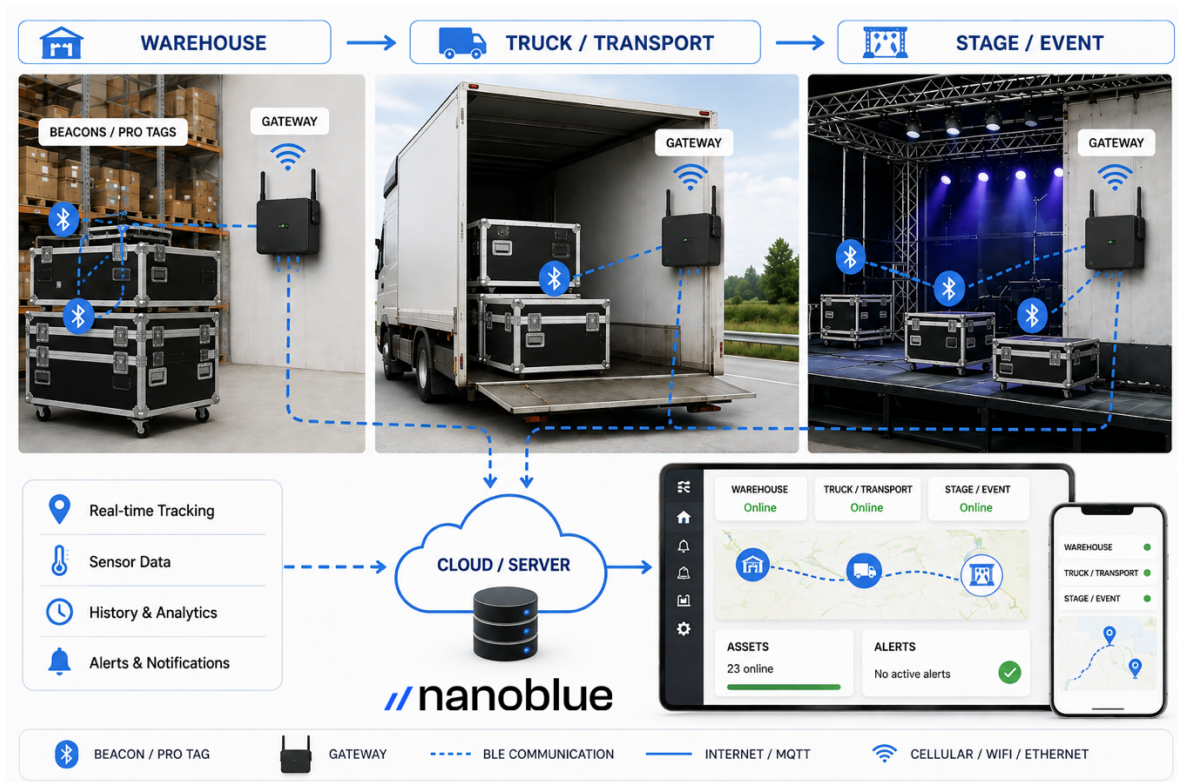


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Live Assets – System Overview



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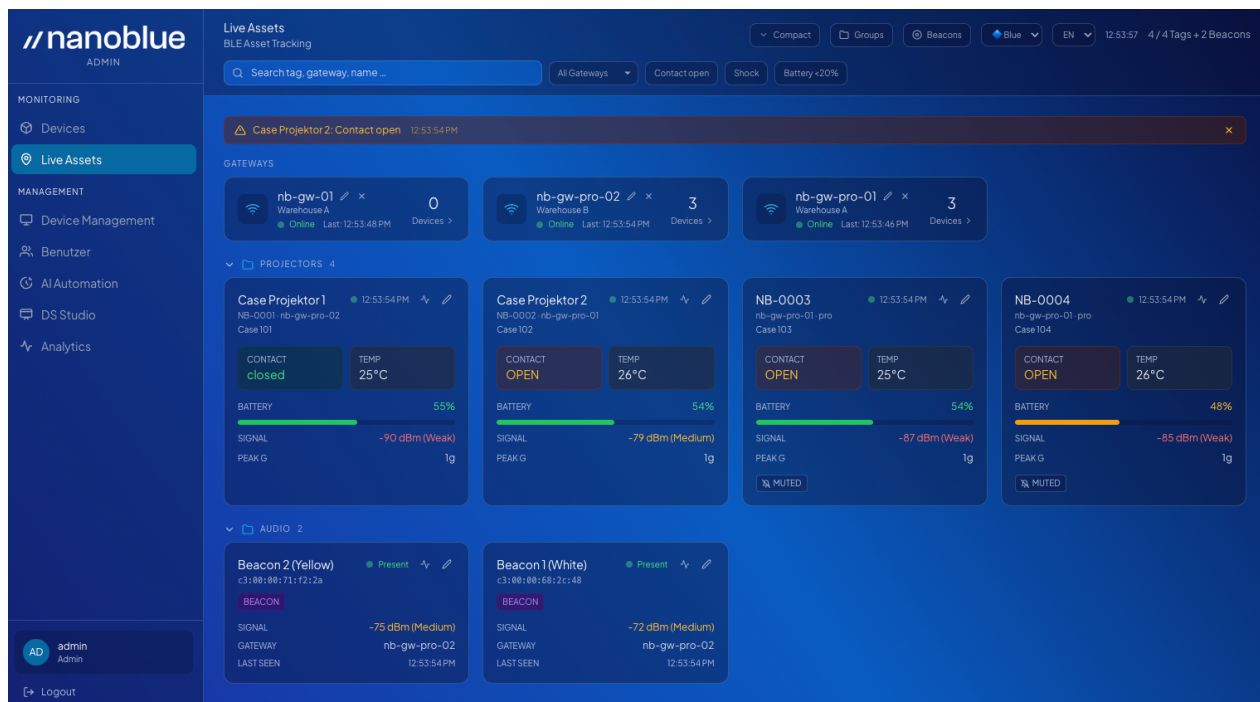
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nanoblu[®] Live Assets – System Overview

nanoblu[®] Live Assets is a system for real-time monitoring and localization of BLE assets.

It is suitable for warehouses, event and staging technology, vehicles, or buildings and enables real-time equipment monitoring.

The system supports both intelligent **nanoblu[®] Pro Tags** with integrated sensors as well as simple **Bluetooth-Beacons** from various manufacturers.



System Architecture

A Live Assets system consists of three components:

1. **nanoblu[®] Pro Tags / Beacons** - transmit data via Bluetooth LE Advertising
 2. **nanoblu[®] Gateways** - receive data and forward it encrypted
 3. **nanoblu[®] Cloud / Admin Portal** - stores, analyzes, and visualizes
-

Supported Hardware

nanoblu[®] Pro Tag

The nanoblu[®] Pro Tag regularly transmits:

- Battery status
- Temperature
- Contact status (e.g. contactless reed switch)
- Motion
- Vibration (Shock)
- Maximum acceleration (Peak-G)
- Charge status (Charging)

All data is transmitted connectionlessly via BLE Advertising only, achieving particularly low power consumption. The estimated battery life is 2–3 months with a 3000 mAh LiPo battery.

nanoblu[®] Ethernet Gateway

Recommended solution for stationary installations.

- Gateway receiver station with Ethernet
- PoE power supply
- External BLE antenna (IPEX MHF4)
- No WiFi configuration required
- High 24/7 operational reliability

Typical deployment locations: warehouses, technical rooms, event venues, buildings.

nanoblu[®] WiFi Gateway

Mobile receiver station for temporary installations.

- WiFi connectivity (2.4 GHz)
- Integrated OLED display (status, tag count)
- Ideal for events and mobile deployments
- Powered via power bank or USB-C

nanoblue® LTE-M Gateway

Fully self-sufficient variant for outdoor locations without WiFi/Ethernet.

- Compact receiver station
- IoT SIM card (e.g. A1 IoT or Magenta IoT)
- LiPo battery + optional solar panel (JST connector)
- PSM mode (Power Saving Mode) for minimal power consumption
- Publish interval configurable (5 min recommended for mobile operation)

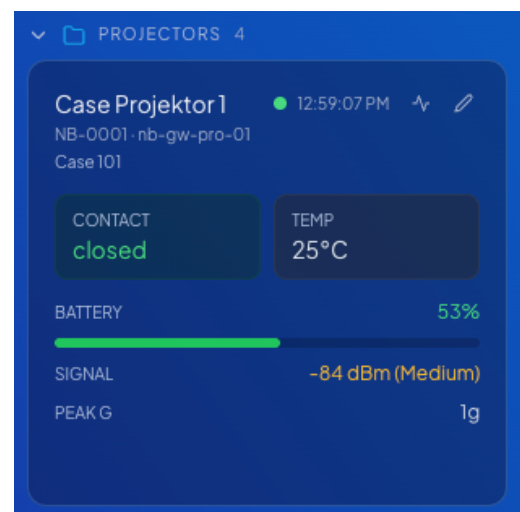
Typical deployment locations: outdoor storage, construction sites, vehicles, containers.

Asset Types

nanoblue® Pro Tags

The intelligent tags provide comprehensive sensor data in addition to presence detection:

Sensor	Description
Battery	Charge level in %
Temperature	Ambient temperature in °C
Contact	Reed switch (open/closed)
Motion	Motion detection
Shock	Vibration detection
Peak-G	Maximum acceleration in g
Charging	Charge state (charging / not charging)

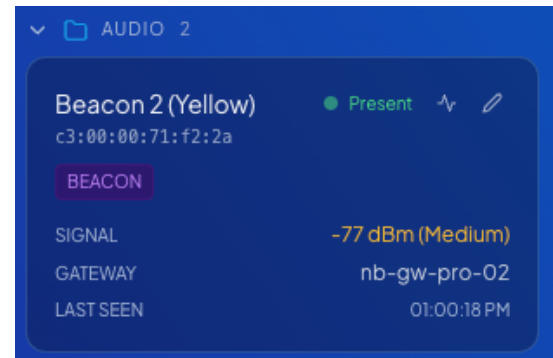


BLE Beacons

Additionally, standard BLE beacons from virtually all manufacturers can be integrated (e.g. SenseCAP BC01 Indoor, BC02 Outdoor).

These provide:

- Presence (Present / Not seen)
- Signal strength (RSSI)



Registration is done via the Bluetooth MAC address - either manually or directly from the list of BLE devices discovered by the gateway. Beacons can be assigned to the same groups as Pro Tags and appear together in the dashboard.

Tracking

Multi-Gateway Detection

When a tag is within range of multiple gateways, signal strength is automatically evaluated. The dashboard always displays the gateway with the currently strongest reception. This automatically provides the user with the most likely location of the asset.

Stale Detection

If a tag or beacon is not received by any gateway for more than 60 seconds, it is automatically marked as unreachable (red status dot). This allows immediate detection of powered-off devices, depleted batteries, lost assets, and radio issues.

nanoblu[®] Cloud Dashboard

The nanoblu[®] Cloud Dashboard provides a quick overview of all gateways and assets.

It is available in German, English, Spanish, and Portuguese. Additionally, the theme can be set to Blue (default), Light, or Dark.

Gateway View

For each gateway, the following is displayed:

- Online/offline status (green/red)
- Name and location
- Last contact
- Device counter (tags + beacons)
- Expandable device list - shows all tags and beacons transmitted via this gateway

nanoblu[®] Tags & Beacons - Unified Display

nanoblu[®] Tags and registered beacons are displayed **together in the same groups** dargestellt. Beacon cards sind durch ein lila "BEACON"-Badge erkennbar.

Tag cards show: name, gateway, contact status, temperature, battery, signal, Peak G, motion/shock/charging badges.

Beacon cards show: name, MAC address, signal (RSSI), gateway, last seen.

Both card types support compact mode (collapsible groups).

Beacon Registration

Three ways to register:

1. **Manual:** "Beacons"-Button → enter MAC-Adresse and Name
2. **Discovery:** "Beacons"-Button → The Discovered section displays all unregistered BLE devices within range (can be 2,000+ in office environments), with live MAC address search and a "+ Add" button.
3. **Quick Register:** Click "+ Add" on a discovered beacon, enter a name, and the beacon is registered immediately.

Groups

Tags and beacons can be assigned to any groups. Examples: warehouse, event, vehicle, project, customer, case 1, case 2.

Groups can be created, renamed, and deleted. This allows larger installations to be organized clearly.

Search

Assets can be quickly found using the global search. Searchable fields include: tag name, gateway, description, group name.

Filters

Various filters are available for quick analysis:

- Specific gateway
- Contact opened
- Shock detected
- Battery below 20%

Alerts

Critical events appear immediately in the dashboard as alert banners:

- Vibration detected (with Peak-G value)
- Contact opened
- Low battery (< 20%)
- No signal (> 60 s)

Alerts can be dismissed individually or all at once. Alerts can be muted per tag.

Management

Tags, beacons, and gateways can be edited at any time (name, description, group assignment). A tag can be removed from the view - as soon as it starts transmitting data again, it automatically reappears. No manual re-registration required.

History & Analytics

In addition to the live view, nanoblue® Live Assets stores all received sensor data in a time-series database. This allows events to be traced at any time and evaluated over the long term.



nanoblue® Pro Tag Analytics

The following charts are available for each nanoblue® Pro Tag:

Chart	Description
Battery	Charge level over time
Temperature	Temperature history
RSSI / Signal	Signal strength
Peak G-Force	maximale Beschleunigung
Contact	Contact open/closed
Motion	Motion detection
Shock	Vibration events
Charging	Charge state

Beacon Analytics

For each registered beacon:

Chart	Description
RSSI / Signal	Signal strength over time
Present	Presence yes/no

Time Range Selection

All charts support: 1 h, 6 h, 24 h, 7 d, 30 d as well as a custom time range (date/time picker). Each chart can be displayed in full screen.

Application Examples

Battery history: Plan battery replacements, detect unusual power consumption, identify devices with increased energy demand.

Temperature history: Transport monitoring, cold chains, warehouse monitoring, technical/server rooms.

Motion analysis: Track when a case was moved, how often equipment was transported, whether assets are moved unusually frequently.

Shock history: Track when a flight case was dropped, which devices were subjected to unusual stress (incl. Peak-G value).

Contact history: Doors, flight cases, cabinets, transport boxes - exactly when opened or closed.

Location History

Since each received BLE packet is assigned to the strongest gateway, the movement history of an asset can also be reconstructed:

Time	Location
09:15	Warehouse
10:42	Truck
13:08	Exhibition hall
15:20	Stage

Map View

When gateways are assigned geographic coordinates or building locations, assets can additionally be visualized on a map: current location, last known location, online/offline status, number of tags per gateway, heatmap of asset distribution.

Infrastructure

All communication is fully encrypted (MQTT over TLS).

Data flow: BLE → Gateway → MQTT/TLS → nanoblu[®] Editor → Database → Admin Portal

The nanoblu[®] Editor handles: BLE data decoding, event detection, alert generation, forwarding to database and dashboard.

The database stores all measurements as time series and enables historical evaluations.

User and Permission Management

The system supports multiple tenants. Each customer sees only their own gateways, tags, and projects. Multiple organizations can operate securely on the same cloud infrastructure.

Persistent Configuration

All configuration data (gateways, tags, beacons, groups, descriptions, assignments) is permanently stored server-side in JSON files and is retained independently of measurement data.

Reports & Notifications

Reports

All stored data can be evaluated for defined time periods:

- Devices with low battery
- Frequently moved assets
- Shock events in the last 24 hours
- Temperature exceedances
- Contact openings

- Unreachable devices
- Gateway availability
- Inventory per location

Intelligent Notifications

Rules can be defined based on historical data that automatically trigger actions:

Trigger	Action
Battery below 20%	Dashboard alert, push, email
Temperature above/below threshold	Dashboard alert, email
Vibration / Peak-G above threshold	Dashboard alert, push
Contact opened	Dashboard alert
Asset unreachable (> 30 min)	Email, MQTT
Gateway offline	Dashboard alert, email
Asset changed location	Push, webhook

Typical Applications

- Event and staging technology (cases, racks, flight cases)
 - Warehouse management
 - Vehicle and transport monitoring
 - Buildings and technical rooms
 - Rental equipment
 - Museum and exhibition technology
 - AV installations
 - Mobile project logistics
 - Construction sites and outdoor storage
-

Outlook: Predictive Asset Monitoring

Since all sensor data is stored long-term, AI-powered analytics can be added in the future:

- Battery replacement prediction based on actual consumption
- Detection of unusual movement patterns
- Identification of devices with frequent impacts or vibrations
- Analysis of transport stress over extended periods
- Detection of outliers and anomalies in temperature trends
- Maintenance interval recommendations based on actual usage data

This transforms nanobblue Live Assets from a traditional BLE tracking system into a platform for **Condition Monitoring**, **Predictive Maintenance** and **Asset Intelligence**.