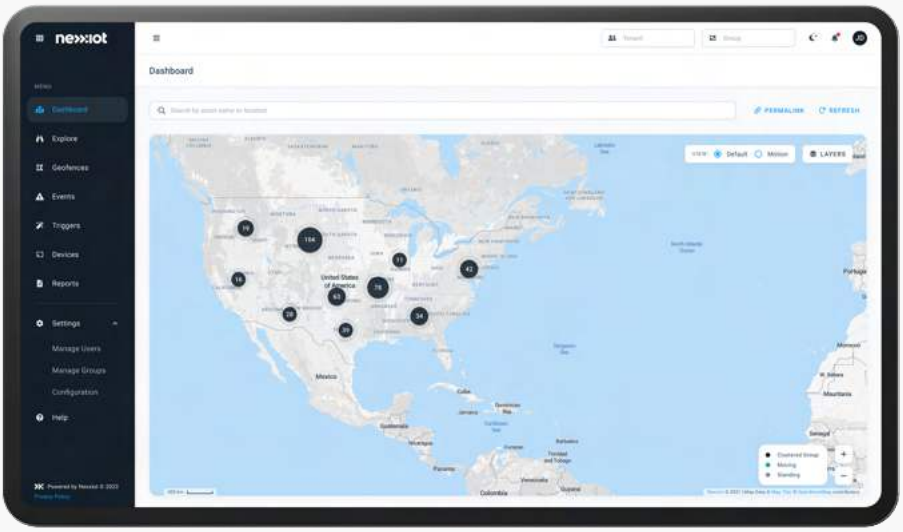
Connect Intelligent Cloud
User Manual



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Table of Contents

1 Revision History 5
2 Intended Audience 6
3 Abbreviations and Definitions 7
3.1 Abbreviations 7
3.2 Definitions 7
4 References 8
4.1 Documents Version Published 8
4.2 Links and Webpages 8
5 Scope of the Document 9
6 Background 10
7 Requirements 11
8 Accessing Connect Intelligent Cloud 12
8.1 URL 12
8.2 Registration 12
8.3 Login 13
9 Nexxiot Connect 14
9.1 Dashboard View 14
9.1.1 Status 14
9.1.2 Ask Scope AI or Search 15
9.1.3 Layers 16
9.2 Explore 16
9.2.1 Navigation 17
9.2.2 Asset Details 17
9.3 Geofences 20
9.3.1 Create a Geofence 20
9.4 Triggers and Events 22
9.4.1 Set a Trigger 22
9.4.2 Events 23
9.5 Devices 24
9.6 Reports 24
9.6.1 Predefined Reports 25
9.7 User Management 26
9.8 Group Management 27
9.8.1 Create a New Group 28
9.8.2 Add Assets and Unpair Devices 29
9.9 Monitors 31

9.9.1 Vector 31
9.9.2 Temperature Monitor 33
9.9.3 Kingpin Monitor 34
9.9.4 Loadtracker 35
9.10 ITSS 36
9.10.1 ITSS Push 36
9.10.2 ITSS Pull 36
9.10.3 Setup ITSS 36

Table of Figures

Figure 1: Activate Account....12
Figure 2: Assign Password....12
Figure 3: Nexxiot Website....13
Figure 4: Dashboard View....14
Figure 5: Status....14
Figure 6: Layers View....16
Figure 7: Explore View....18
Figure 8: Asset Metadata....19
Figure 9: Geofences View....21
Figure 10: Triggers....22
Figure 11: Set a Trigger....23
Figure 12: Events Page....24
Figure 13: Devices Page....24
Figure 14: Reports....25
Figure 15: Manage Users....26
Figure 16: Create User and Set Permissions....27
Figure 17: Group Management....28
Figure 18: Group Creation....28
Figure 19: Add Assets to a Group....29
Figure 20: Add Multiple IDs....29
Figure 21: Filters View....30
Figure 22: Asset Configuration....30
Figure 23: Handbrake and Door View....32
Figure 24: Temperature View....33
Figure 25: Trailer Loading View....34
Figure 26: Loadtracker View....35
Figure 27: ITSS Configuration View....37

1 Revision History

Version	Author	Publishing date	Reason of the change
1.0	Nexxiot AG	2023-10-23	Template, text, and screens update
1.1	Nexxiot AG	2023-03-31	Text, screens

2 Intended Audience

This document is intended for Nexxiot clients, who work with Connect Intelligent Cloud. Readers are not required to have any technical knowledge before reading this document.

This manual covers the basic usage of the platform and provides a general orientation of the main pages and functionalities. Additionally, this user guide walks you through the steps to create, edit, and access content in Connect Intelligent Cloud; depending on roles and privileges, this also includes administering the system via the interface.

It is not intended for systems administrators and developers seeking information on the installation, configuration, maintenance, and development of this application. Technical audiences interested in customizing and developing new modules and working with the application's API can review our guidelines for developers.

You can find answers to frequently asked questions (FAQs) at https://help.nexxiot.com/ or send us an e-mail at support@nexxiot.com.

3 Abbreviations and Definitions

3.1 Abbreviations

HW Hardware
SW Software
N.B. Nota Bene
e.g. exempli gratia (“for example”)
i.e. id est (“that is”)

3.2 Definitions

Asset A specific wagon, container, or another object that is intended to be tracked and traced.

Device An individual tracking device (e.g. Nexxiot’s Globehopper).

ID A system-generated identifier used to locate a specific item (e.g. asset, device, etc.).

Gateway A device that collects, analyzes, and manages all data from various sensors. Nexxiot’s Globehopper and Edge are gateway devices.

Monitor A device used to track and measure specific parameters such as temperature, pressure, or motion, and that is placed strategically on an asset to monitor in real-time. Sometimes referred to as a “sensor,” it must be connected to a gateway device.

Connect Also termed Connect Intelligent Cloud or Nexxiot Connect, it is a SaaS platform that provides asset intelligence in real-time thanks to gateways and/or monitors that deliver online IoT-sensing data to users that then benefit from increased asset availability, optimized lifecycle costs, and greater operational efficiency.

Mounting The act of digitally associating Nexxiot devices with railcars or intermodal containers and displaying this virtually on the platform.

4 References

4.1 Documents

		Version	Published
[1]	Connect Intelligent Cloud 2023	v1	20231023
[2]	Connect Intelligent Cloud 2024	v2	20240331

4.2 Links and Webpages

[3]	Nexxiot Connect Intelligent Cloud	N/A	N/A
[4]	Nexxiot Connect Intelligent Cloud API	v1	N/A
[5]	Nexxiot Track and Trace API	v1	N/A
[6]	Nexxiot Connect Intelligent Cloud API Guide	N/A	N/A
[7]	Nexxiot Blog	N/A	N/A
[8]	Nexxiot Help Center	N/A	N/A
[9]	Nexxiot Mounting App iOS	1.6.2	18.12.2023
[10]	Nexxiot Mounting App Android	1.6.2	17.12.2023
[11]	Nexxiot Vector	N/A	N/A
[12]	Nexxiot Temperature Monitor	N/A	N/A
[13]	Nexxiot Kingpin Monitor	N/A	N/A
[14]	Nexxiot Loadtracker	N/A	N/A

5 Scope of the Document

Provide guidance to Nexxiot clients on how to use Connect Intelligent Cloud's full range of functionalities and leverage the platform's full potential for their business.

This user manual was developed as a standalone document to help onboard new and existing Nexxiot clients. This material incorporates pictures and texts as a means of distance learning.

Nexxiot clients can use it for in-house training of their employees, as well as external consultants.

6 Background

Connect Intelligent Cloud is an online interface that enables the visualization and management of digitized physical assets. It is a cloud-native service (SaaS) operated by Nexxiot. Users do not have to install or operate any specific software to use it. It is accessible using a web browser.

Users have access to information about the current position of their assets, the routes taken, sensor insights, shock measurements as well as the device's technical condition.
Based on that information, users have the option to define events and set triggers to ensure they are notified when a pre-defined important event occurs.

Data presented in this document, such as users, assets, geofences, rules, and system configuration, is considered Master Data. Such data does not automatically expire, it is by default kept in Nexxiot's systems until it is explicitly deleted by a client via Connect or API, or at least until a subscription expires or a contract is not renewed.

However, data which is *not* explicitly created and managed by Nexxiot clients (Client Transaction and Telemetry) might expire after some time and might be removed from Nexxiot's systems to reduce storage costs, guarantee response times, and to ensure operational health of all systems.

7 Requirements

To ensure the best possible experience, users will need:

- A PC or Mac with Windows 10 or higher or Mac OS
- Access to an internet connection
- Any of the following browsers: Brave, Firefox, Edge, or Safari

8 Accessing Connect Intelligent Cloud

8.1 URL

To enter Connect Intelligent Cloud, please use the following URL: https://cloud.nexxiot.net/. Alternatively, you can also access Connect from our website via the Login section.

8.2 Registration

A user account is typically created by an organization's administrator. Once the administrator has created the account, the user will receive an email that includes a link to activate the account.

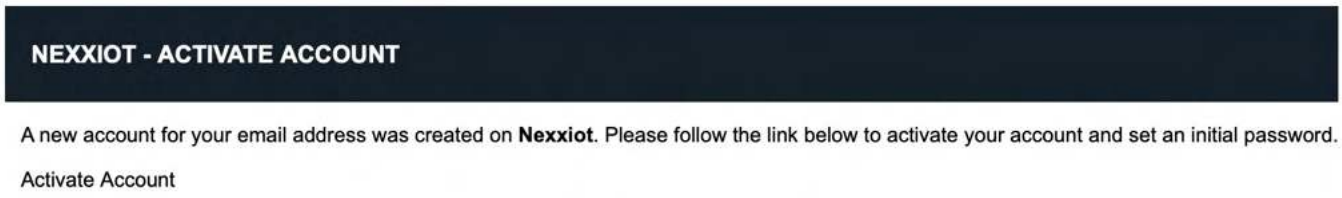


Figure 1: Activate Account

By clicking on "Activate Account," a webpage opens on Connect Intelligent Cloud, and the user can select, enter, and confirm a new password. Once a password has been set, the user is directly logged into Connect Intelligent Cloud.

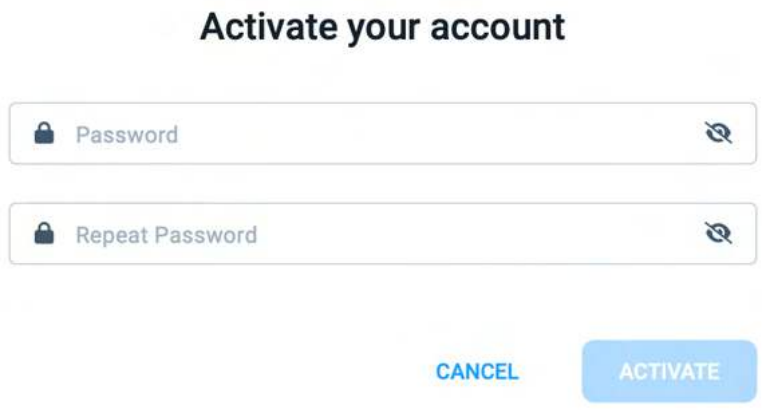


Figure 2: Assign Password

N.B.: Nexxiot clients should designate an administrator in their organization to create and manage users.

8.3 Login

To return to Connect Intelligent Cloud, users can go to www.nexxiot.com. On the top right of the page, simply click on "Login." Next, select "Connect Intelligent Cloud" and use the username (e-mail address) and password combination that was set during the user registration process (see 8.2).

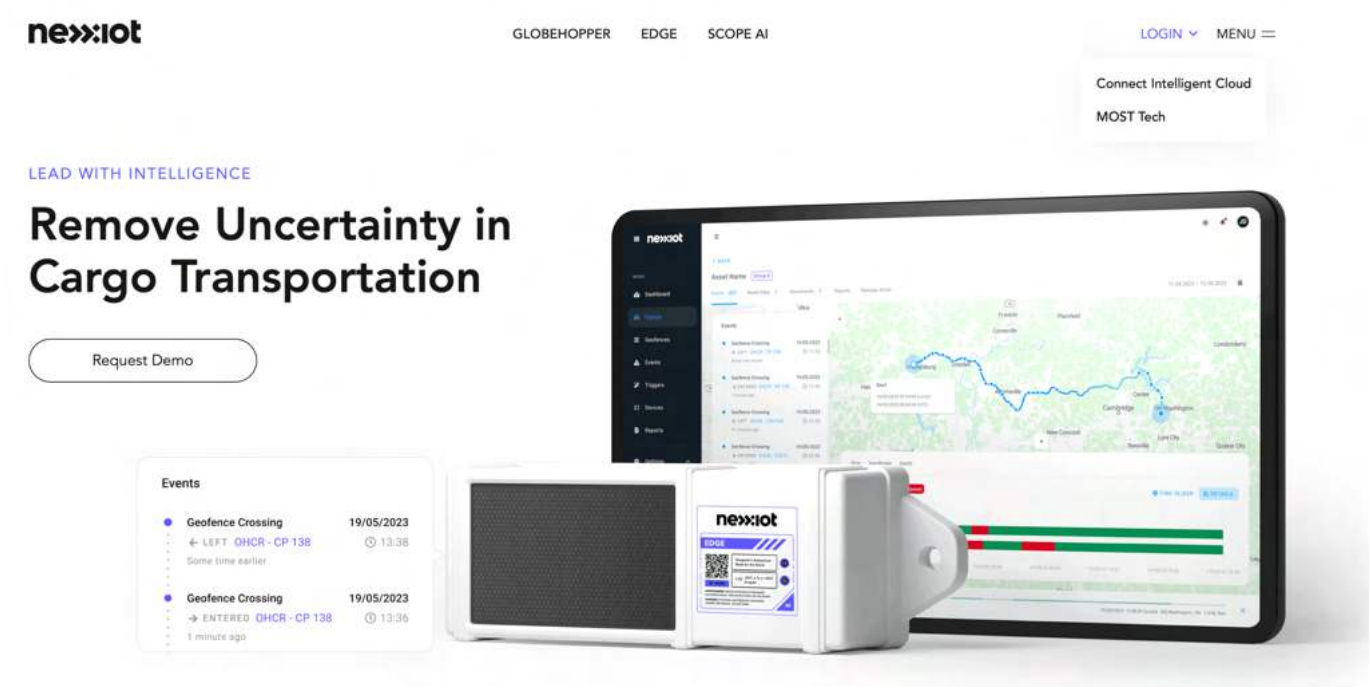


Figure 3: Nexxiot Website

N.B.: Each client's data is strictly separated from others using software-enforced isolation. If necessary, Nexxiot clients can opt-in to a dedicated database to add a second physical isolation layer.

All stored data (data at rest) and backups are encrypted using AES-256. Finally, data transmitted over networks (data in flight) is encrypted using Transport Layer Security (TLS).

9 Connect Intelligent Cloud

9.1 Dashboard View

"Dashboard" is the default view after logging into Connect Intelligent Cloud. It provides full transparency on the current position and motion status of assets. On the left-hand side, users (with global access other than "pairing") will find all available options. Specific assets can be found by name or number (described under 9.1.2) via the free text search field.

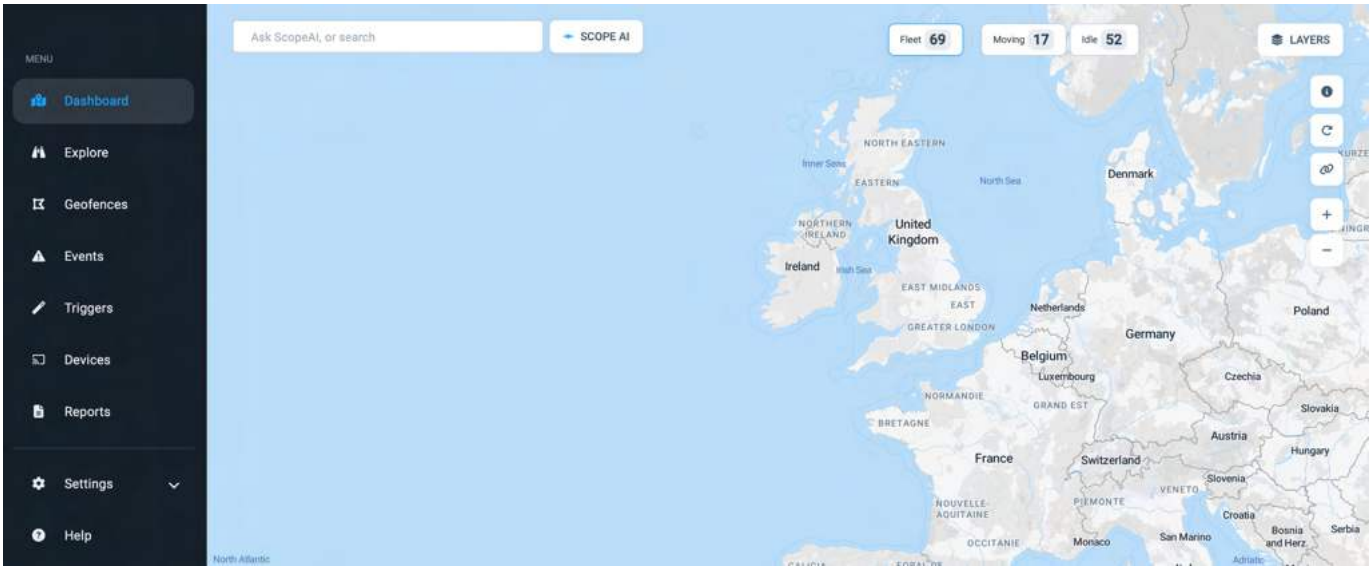


Figure 4: Dashboard view

9.1.1 Status

On the top right of the screen, users can clearly identify the status of their fleet by state:



Figure 5: Status

- **"Fleet"** displays clusters of assets. By clicking on "Fleet", groups of assets (a number indicates how many assets belong in each cluster) are shown. When zooming in, groups quickly get broken down into smaller groups and finally into individual assets.

- **"Moving"** means that a gateway device (e.g. Globehopper) has detected the movement of its asset within the last hour. When an asset is moving, the connected Globehopper detects the motion and records and updates its geolocation.

- **"Idle"** means that no movement is detected by the gateway device. When an asset stands still, a Globehopper will change its reporting frequency of every 5 minutes for the subsequent 30 minutes. If 30 minutes pass while the asset remains stationary, it then reports every 12 hours.

N.B.: When an asset stands still and is identified as "idle", the reporting interval is simply set to 12 hours to save battery. Once the asset moves again, it switches back to a 5-minute reporting interval.

Finally, users are advised that numbers shown in the dashboard view might differ from an actual fleet size. Only digitized assets that have a location are shown, not newly created assets that are not digitally associated with a gateway device.

9.1.2 Ask Scope AI or Search

Scope AI allows you to inquire about an asset's location, status, or sensor data using natural language. In short, Scope AI facilitates contextualized decision-making, while providing a conversational interface into Nexxiot's data on locations, status, conditions of cargo, and supply chain events (e.g. delays).

Scope AI has been in closed Beta since 2023 and this is continuing in 2024. Currently, users can ask questions such as "Show me all moving assets" or "Which of my assets do not have a temperature sensor?" Ultimately, these are going to be used to expand the underlying database schema and overall end-to-end service. Clients' data remain confidential and is not shared with any third party. Currently Connect is hosted in the following regions: Frankfurt, Germany, and Ohio, USA.

As for "Search", it can be used to look for assets using their names, which typically are a wagon number (UIC code / EVN (European Vehicle Number), AAR mark) or BIC code. Users are asked to use the following format:

- **UIC/EVN** example: 21 81 2471 217-3
- **BIC** example: CSQU3054383
- **AAR mark** example: NEXX 12345

9.1.3 Layers

By clicking on "Layers", users can choose different map styles, in addition to a range of additional information, such as geofences and graphical overlays to visualize regional information on rain, wind speed, or temperature.

N.B.: Additional icons found below "Layers" are the three main views: Railway, Transport, and Satellite. The figure below shows a typical screenshot showing the default Map view.
Additionally, users can easily zoom in and out of a location by using the + or - buttons. Alternatively, this can be similarly achieved by using the trackpad on a computer.

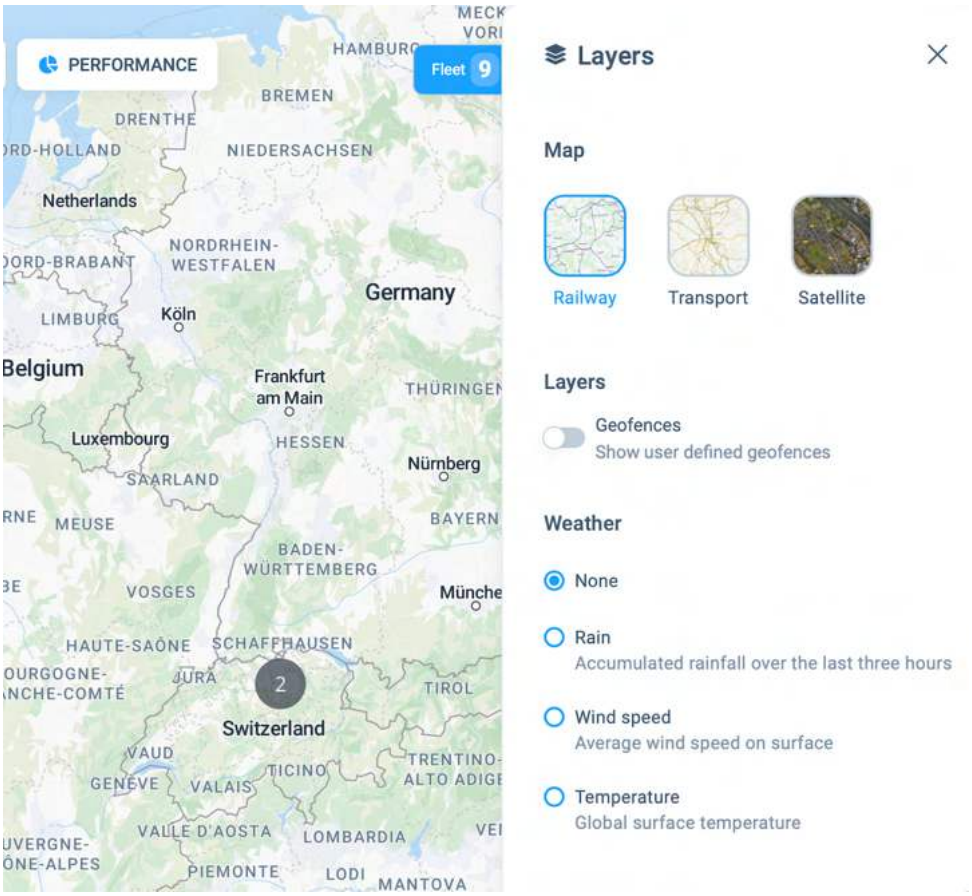


Figure 6: Layers view

9.2 Explore

"Explore" is a dynamic interface providing a tabular view of all assets by name and current location, motion status, last message sent, group membership, and sensor (if any).

9.2.1 Navigation

Assets in Connect are digitized via the Nexxiot Mounting App, a mobile application used to activate and associate Nexxiot devices with railcars or intermodal containers.
Additionally, assets can be created by clicking on the "+ Create Asset" button. In the "Search and filter by Asset Name" ribbon, users can search for a particular asset by name, with or without spaces or hyphens. Clicking on the name will then take users to the detailed asset view.

An export of all data can easily be made by clicking on "Export". The file can conveniently be renamed on the spot, specific columns can also be removed by unticking them after selecting the option "specific columns".

As a matter of personal preferences, assets can either be displayed in a grid view or one after another next to a map. Both lead to asset details.

9.2.2 Asset Details

- **Map** offers a simple way to track and trace the route of an asset. In the date field, users can select and validate from the day a device was first paired to its asset up to today's date.
  At the bottom of the screen, there is a media player to control the speed of replay for the predefined period. It is possible to navigate across and zoom in and out of the map.

  On screen, the asset journey can be quickly checked via the "Start Position" and "End Position", based on the time range defined before. If an asset bears a sensor too (e.g. Temperature Sensor), this is shown below under "Sensors".

  Hint: To quickly exit the sensors' view, enter full screen mode via the full screen square  and close it using the arrow button.

  The proportion of routed and airline mileage is available once the information has been successfully processed. Data gathered by devices is transformed via an algorithm into a calculated route. To process data in full, it can take several hours. When our algorithm cannot connect two location points, it will draw an "Airline" (meaning, the two dots are simply connected with a straight line and the route will not be matched to a road or rail track).

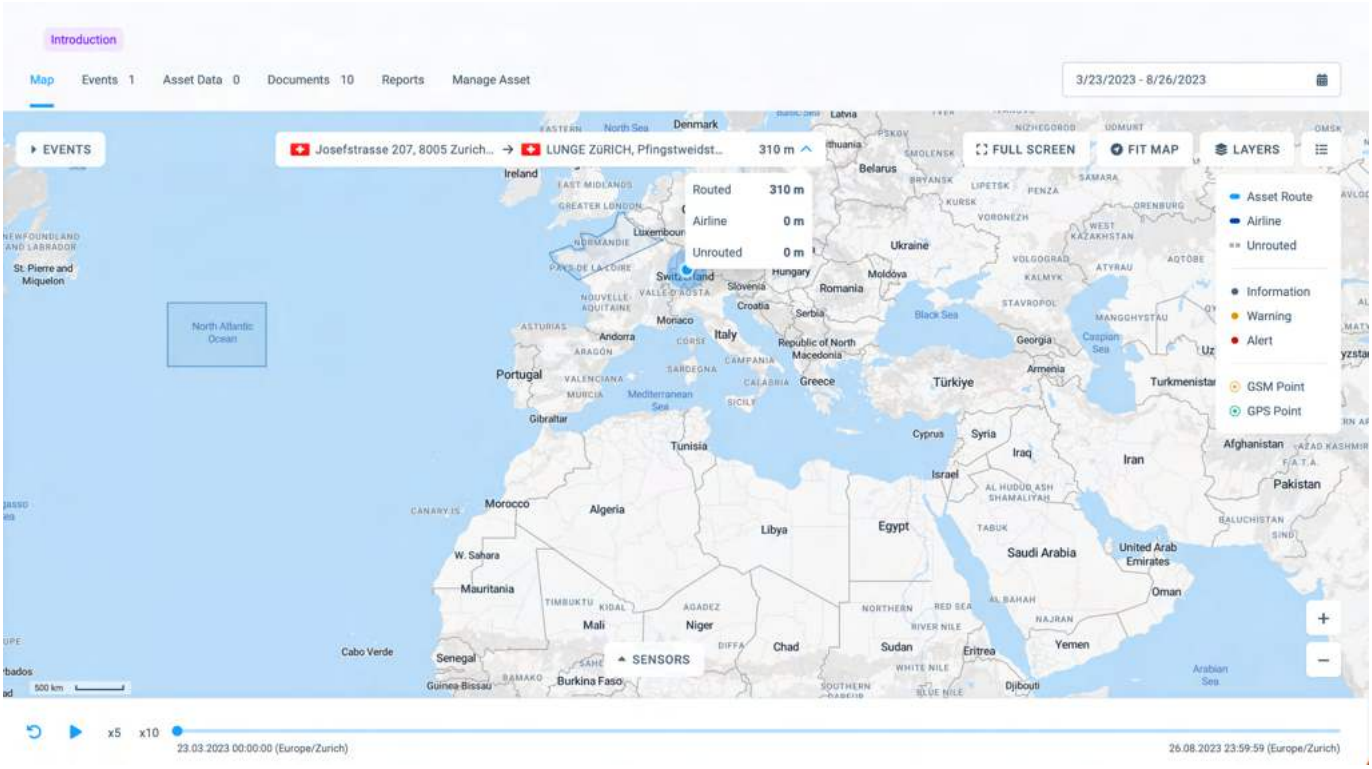


Figure 7: Explore view

On the left-hand-side of the page, a timeline of events can be displayed on request. By clicking on "Events", the map automatically jumps to the respective location along with additional information. Additionally, GSM points, which are used to calculate an asset route, can be shown by selecting "Basic Location" under "Layers".

- **Events** are based on pre-defined triggers (see 9.4), that are all outlined in this tab. Information includes the following: date and time of the event, severity (Information or Warning), related trigger, event details, and location.
  "Details" opens the event in the map tab. When clicking on a related trigger, for instance "Geofence crossing", users are brought to an interface where the trigger can be edited.

- **Asset Data** is dedicated to storing important metadata pertaining to an asset. This data can be used to sort or filter on other pages, enabling users to manage their assets more efficiently. In general, metadata fields are completely flexible in terms of fields and format. You can add any data you need to this page.

  On the right-hand-side of the screen, new metadata can be added for an asset by either selecting a key from an existing drop-down list or creating a new one via "Custom Key-value Pair". If the key must

be part of a certain metadata group, it must be added in the format "group.key". In the field "Value", the respective meta data value is entered.

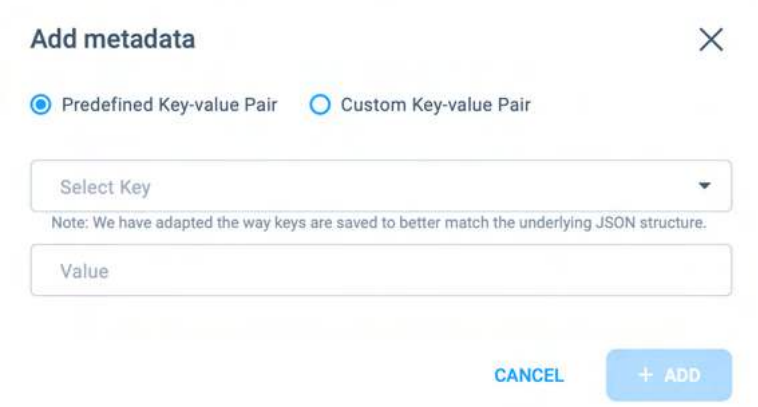


Figure 8: Asset meta data

Predefined key-values are classified by asset types: Truck, Wagon, and Tank Container.

- **Documents** is a place to store files of a specific asset, usually uploaded during the pairing process. Typically, documents are split into four categories, namely Transport, Accompanying, Maintenance, and Pairing. These can be manually added too by clicking on "Browse for file" to choose one or more files to be uploaded and then clicking on "Submit".

- **Reports** is predefined with the "Location Data Export" that contains an asset's information. Users can download the file as a .CSV. A report shows the exact location during a selected time range, along with the average speed. If there is a temperature sensor paired as well, another report named "Temperature Export" will be made available.

- **Manage Assets** is a tab dedicated to configuration and settings. An asset can be renamed, and its type can be changed (Other, EVN Wagon, Container or Tank Container – if an asset type is missing, please contact support@nexxiot.com and ask to have it added to your tenant). On this screen, administrators can also mount or unmount a device from its asset or delete it entirely. Moreover, basic details about a device can be found and accessed, such as battery level, message history and its internal temperature.

Note that deleting an asset will remove all an asset's data (e.g. metadata, documents) from the system. Location history and sensor data collected by the corresponding device is not lost, however.

9.3 Geofences

The default view of this section provides an overview of all pre-defined or customized geofences and can further be used to search for existing or create new geofences. For the creation of geofences, a user must have a read/write authorization.

A geofence is a virtual fence or perimeter around a physical location. Like a real fence, a geofence creates a separation between that location and the area around it. Unlike a real fence, it can also detect movement inside the virtual boundary.

It can be of any size or shape. The Polygon itself can be convex or concave.

Geofences are created using mapping software, which allows the user to draw the geofence over the desired geographic area. It is made up of a collection of coordinates (i.e., latitude and longitude) or in the case of a circular geofence one point that forms the center.

When integrated with fleet management and telematics solutions, geofences can be used to alert in near real-time if an asset with a Globehopper attached to it is either entering or leaving an area.

9.3.1 Create a Geofence

Users can define geofences on the dashboard and use them to set up triggers for real-time event notifications as assets enter and exit borders.

After clicking on "+ Create", users can see the instructions on how to create a geofence. Choose a geofence type/shape on the left: rectangle, polygon, or circle. To map a geofence, users are invited to follow some basic rules.

Select the place by entering a location or coordinates in the search bar, then pick the draw style you need (i.e. Rectangle, Polygon, Circle) before applying the first point on the map.
In the case of a rectangle, simply add more points by dragging from the original vertex, then release. Put points as close or as far from each other as you want.

For a Polygon, it is even easier. Place the first dot, then create a triangle. Afterward, drag any dots until the required Geofence is finalized.
To delete a form, use the "remove" option. This instantly deletes the shape.

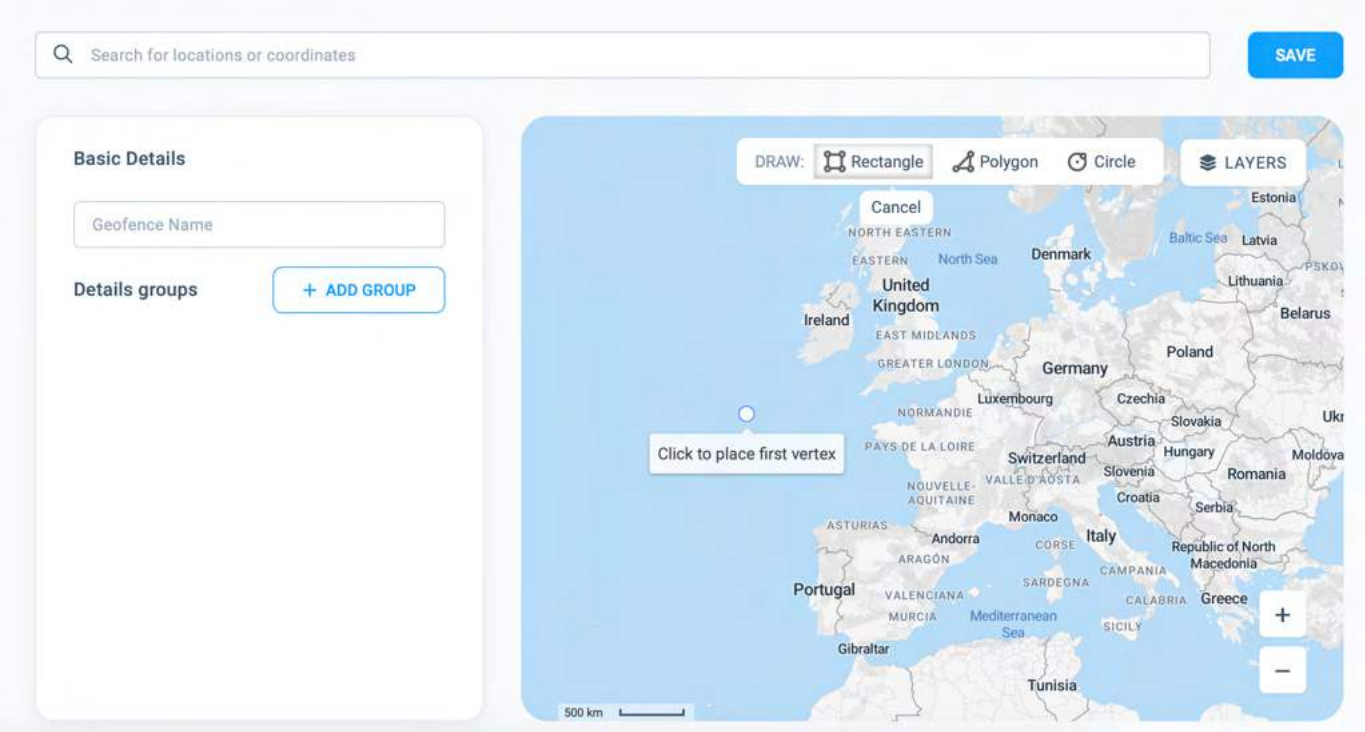


Figure 9: Geofences view

After defining a name for the geofence, users have the option to insert a name for a geofence in the field "Geofence name" next to the map. A contact can also be added, along with a Railway Station, a Harbor and/or a Workshop.

Under "Layers", users can select different map styles to increase the accuracy of their customized geofence.
Geofence types can be created to mark an area of any size, allowing to create smaller ones as part of superordinated Geofences.

- Polygons offer high flexibility and are often used to mark buildings or loading areas. A Polygon can consist of as many points as needed.

- Square and Circle geofences can be created quickly and are usually used as superordinated geofences.

Again, all Geofences can easily be re-centered or enlarged/narrowed by holding and shifting the connection points. Finally, they can be searched and filtered by name on the Geofences main page.

9.4 Triggers and Events

In Nexxiot Connect, users can define triggers for certain events for which they want to be notified, while informing other members of their organization or customers automatically.

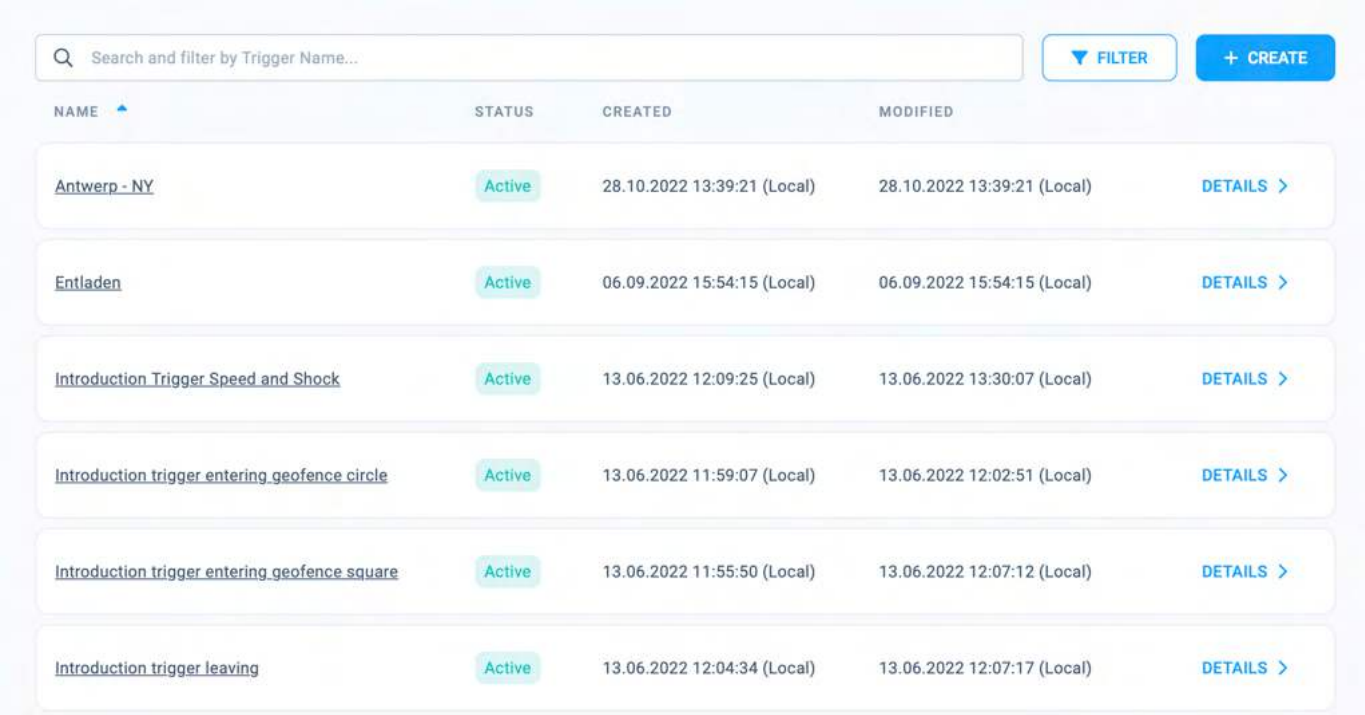


Figure 10: Triggers

9.4.1 Set a Trigger

The default view of the "Triggers" section provides a summary of all events whose occurrence will be documented or whose occurrence users will be notified of.

Click on "+ Create" to create triggers, which are used to generate alerts and notifications as soon as some predefined conditions take place. The trigger will be released as soon as they are met.

Under "Conditions", users have the option to create different triggers from the dropdown menus given in each selection field. In case they wish to create a combined trigger, press the "+ Add Condition" button and define the second trigger.

N.B.: Users must understand the distinction between "All" and "Any" for conditions. The former means that the conditions must be met at once for the trigger to be released, unlike the latter.

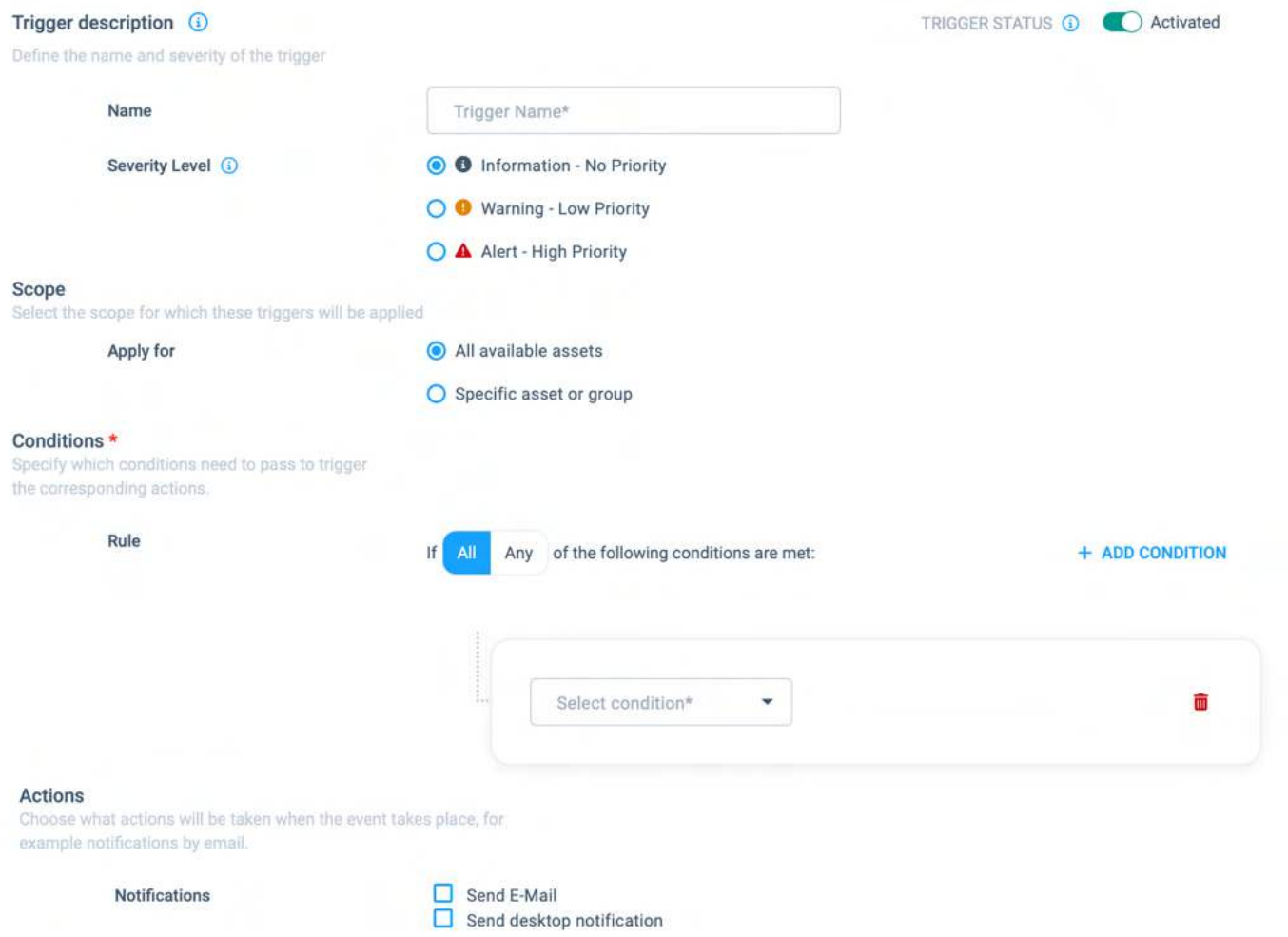


Figure 11: Set a trigger

No matter the "Severity Level", a triggered event will be reported, documented, and registered in Connect under Events. In addition, users can notify an unlimited number of internal and external users via email. Email addresses do not need to be previously registered in Connect for users to receive these emails. Additionally, users can instead select to be notified via desktop notifications.

9.4.2 Events

Click on "Date and Time" to sort out all events in chronological order for the selected period (top right corner) and all available assets. For more information, please go to "Details".

In addition, the event notifications can be clustered according to their severity levels. Within each section, the results can be sorted by date and time, while events can easily be found via the search field. Once you are redirected to the asset view, the selected event will be displayed on the map.



Figure 12: Events page

9.5 Devices

The "Devices" page displays a list of all devices and a link to their respective asset, if mounted. Here, it is possible to show additional information like device ID, serial number, type, and mounting time - and even to export a full list with the given values as a .CSV or Excel file. "Details" then brings users to a more detailed view of an individual device.

Is it also possible to quickly sort out devices by clicking on any of the labels (Mounted, Not Mounted, Gateway, Sensor, Good battery, Low battery) shown at the top of the page. When chosen, they are highlighted in blue, this means only devices matching those selected identifiers are displayed.

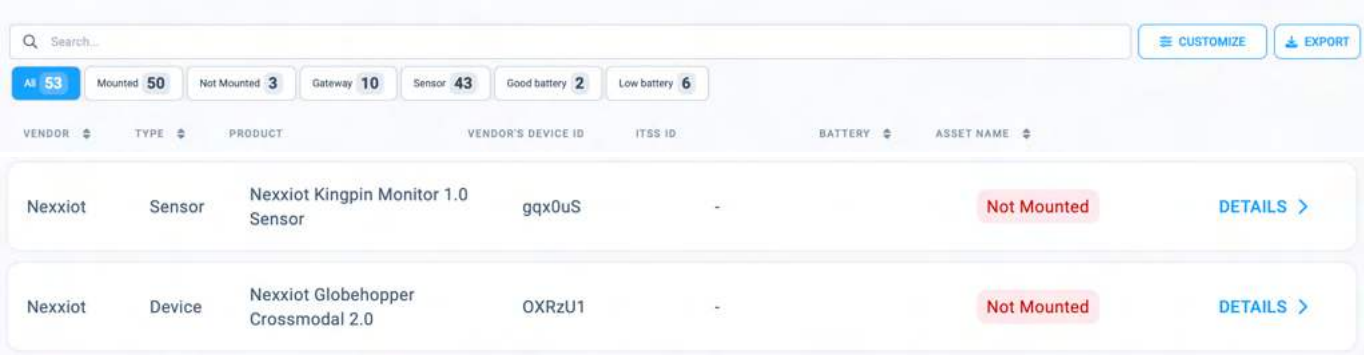


Figure 13: Devices page

9.6 Reports

In the "Reports" section, users can select from pre-defined reports. These are presented on this page. Please note that users do not have the option to create their own reports. If you have any suggestions or requests for new reports to become available, please reach out to your Account Manager at Nexxiot to give your feedback.

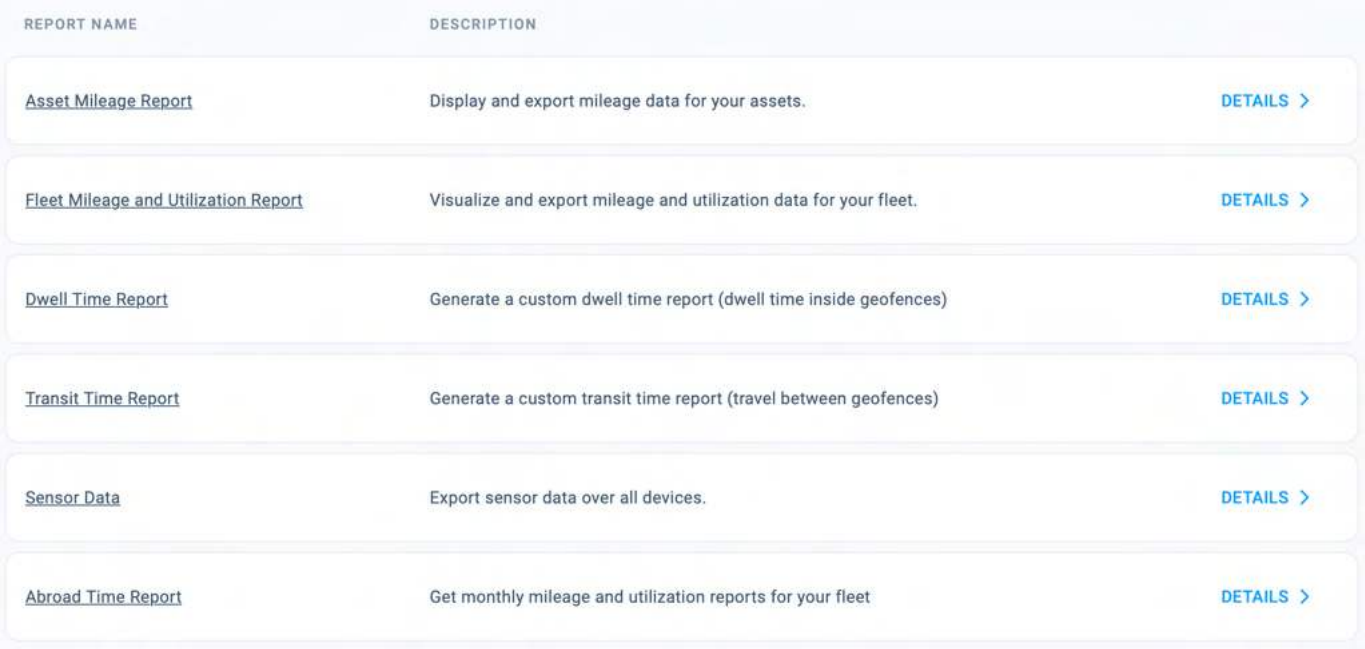


Figure 14: Reports

9.6.1 Predefined reports

By default, users have access to only two of the below reports: **Asset Mileage** and **Fleet Mileage and Utilization**. The others are on request and additional fees can apply.

- **Asset Mileage Report** lets users see the daily mileage, utilization, and number of shocks per asset.
- **Fleet Mileage and Utilization Report** is a collection of charts that show aggregated mileage and utilization for an entire fleet. This includes the total accumulated mileage, the moving versus standing time percentage, and mileage broken down by country.
- **Dwell Time Report** measures time spent within a pre-defined, customized and identified geofences.
- **Transit Time Report** displays information about each transit of assets between any two geofences. Among others, it will typically show the start and end dates and locations of a trip.
- **Sensor Data** lets users export sensor data - if sensors are paired with a gateway device.
- **Abroad Time Report** produces a monthly mileage and utilization report for a fleet.

9.7 User management

New user accounts can be configured under "Manage Users" in the settings menu. At first, users will see all users, their activity status, and their group memberships. Please note that a user must have "Administrator" privileges to update or delete user profiles.

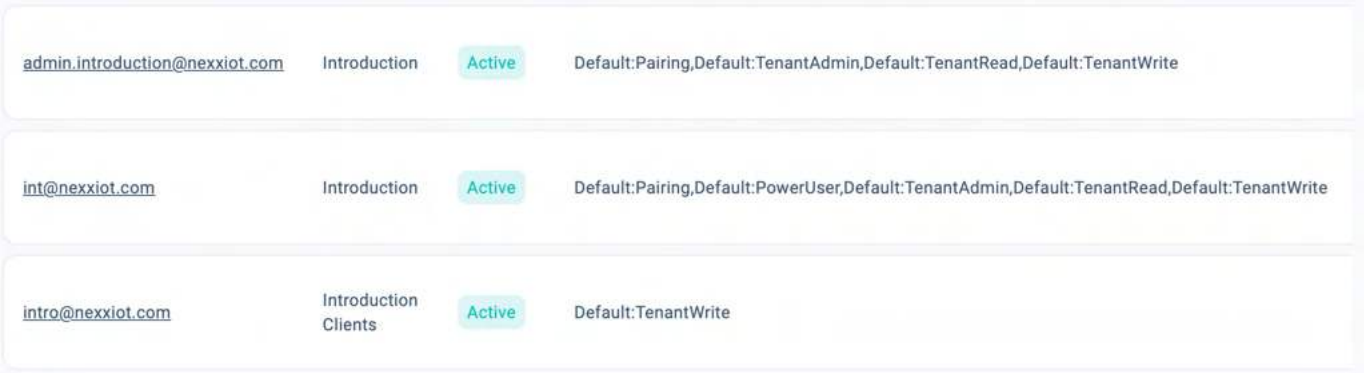
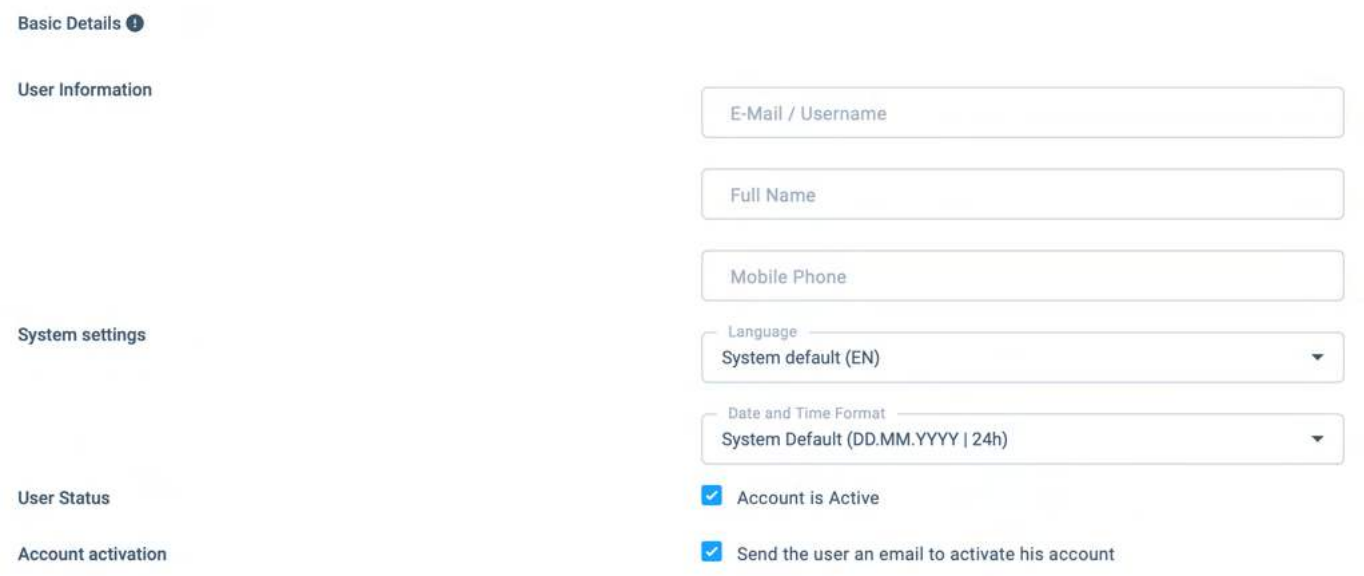


Figure 15: Manage Users

Click on "+ Create User" to configure a new user:



N.B.: Unlike the email address, a mobile telephone number is not mandatory to register a new user. Also, if "send the user an email to activate his account" is left unchecked, the user will *not* receive an e-mail. Instead, a pop-up window will appear on the screen with a randomly generated password.

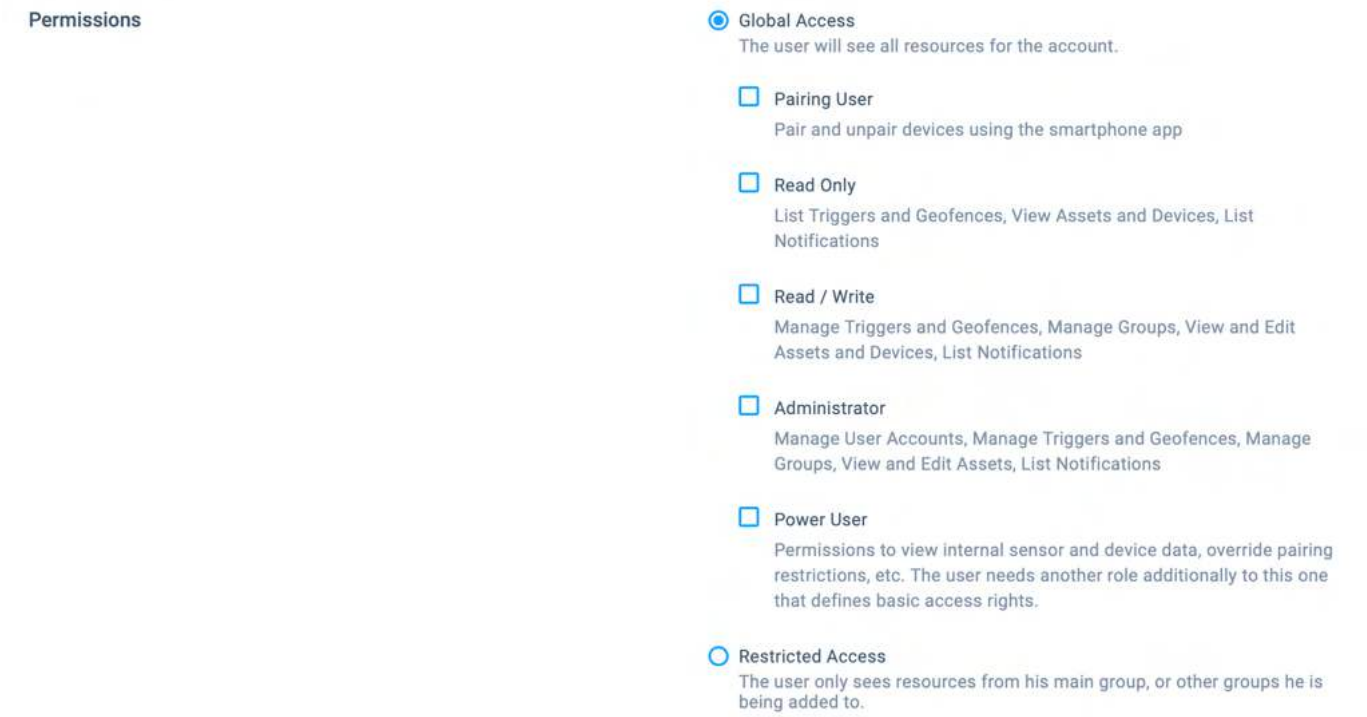


Figure 16: Create user and set permissions

Permission rights for users working outside of any groups are assigned under "Global Access". Here you can select which permissions should be given to the user. Usually, you will also have to define permissions for external users who are involved in the installation, pairing, or need to have access to maintenance relevant documents - for these kinds of users the "Pairing User" and "Read Only" permissions are most suitable.

Groups are used to share digital insights with your customers and are therefore also referred to as "Subtenants". External users will receive a "Restricted Access" to a specific main group (e.g. created specifically for a customer), which for instance could contain all users of one of your customers. After you press "Save" in the top right corner, the user will receive an email to define login credentials.

New users can only be configured by the administrators or by administrators with restricted access for subtenants.

9.8 Group management

Under "Manage Groups", users can define groups to create and manage assets, geofences, and user groups ("Parent").

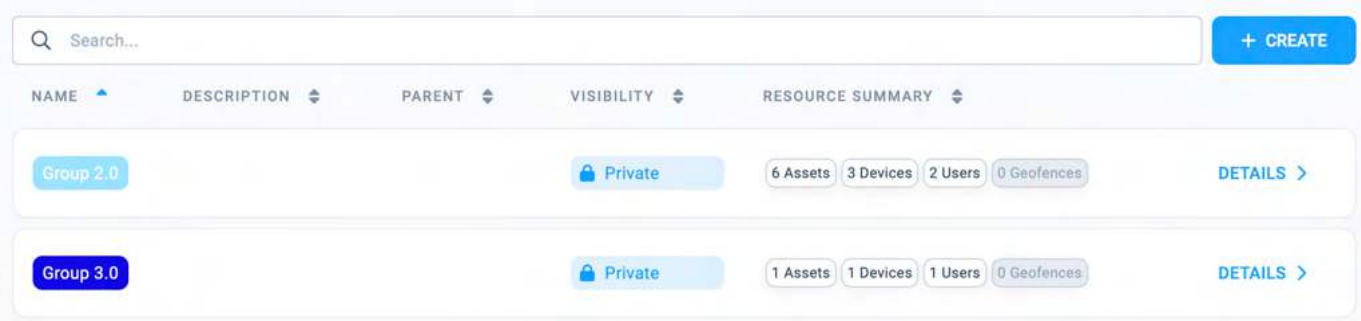


Figure 17: Group management

9.8.1 Create a new group

Users simply need to press on the "+ Create" button to set up a new group and define its name and color. Next, users have also the option to hide the group to the other users or make it visible only to selected or all groups on the dashboard.

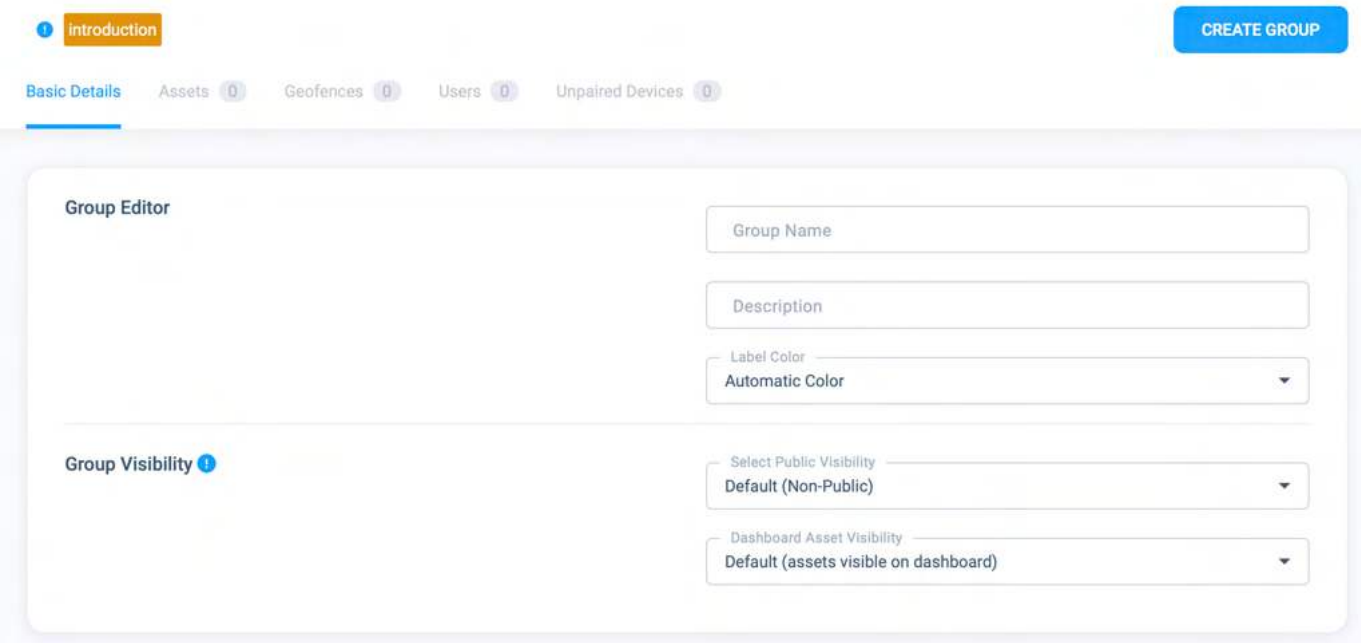


Figure 18: Group creation

N.B.: Please be aware that group users have permission to edit information and settings related to assets assigned to the same group. In case you want to limit this authorization, please create a separate group with all users and select a separate group for public visibility for this group.

9.8.2 Add assets and unpair devices

To add assets to a group, users must go to settings and click on "Manage Groups". Enter the desired group and go to the Assets tab. Finally, press on "+ Select Assets".



Figure 19: Add assets to a group

Afterward, users can either pick one asset in the "List Selection" or add multiple IDs at the same time, up to thousands. When IDs are listed, press "add the above IDs to the group" and they will be uploaded.

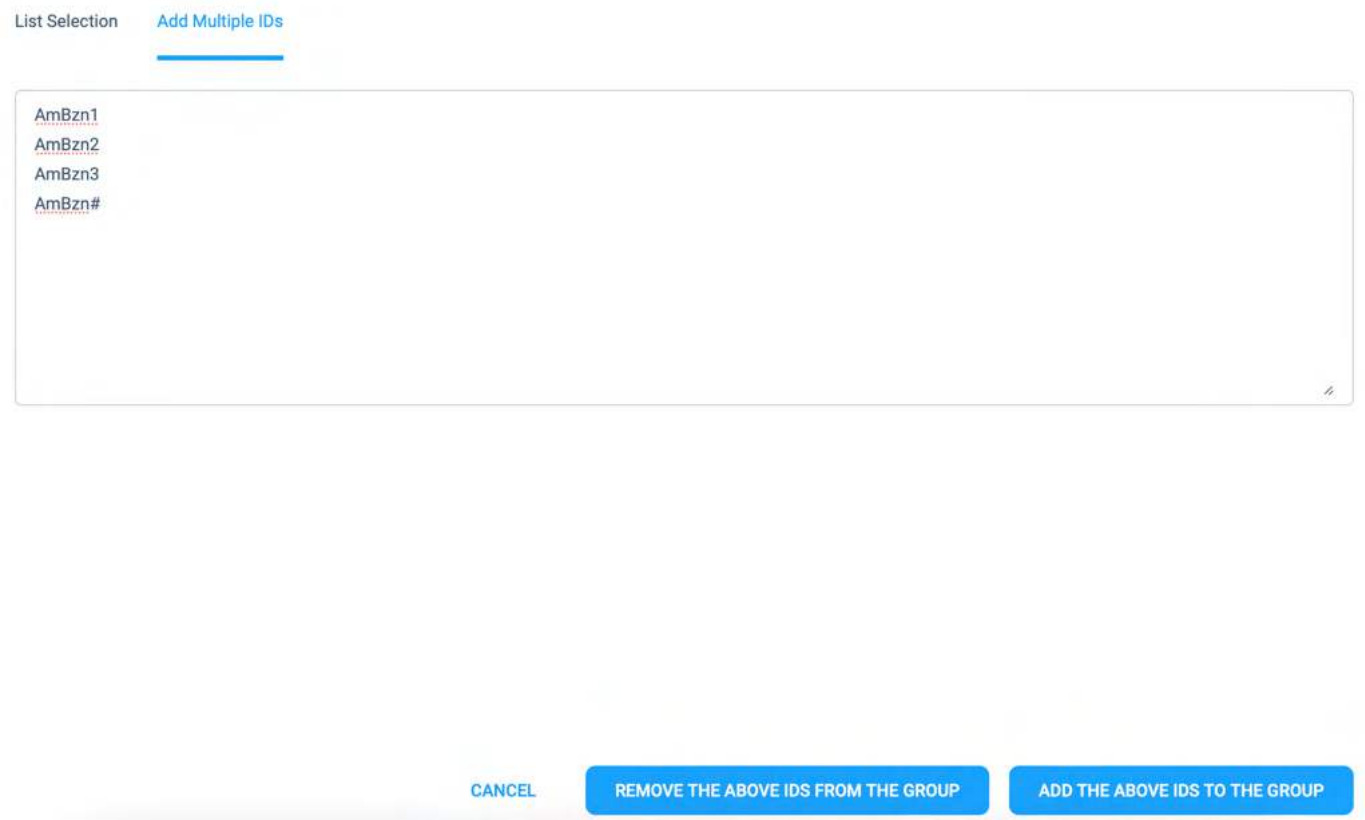


Figure 20: Add multiple IDs

When assets have been added to Connect, they can be found in the "Explore" view. If those assets are not mounted with a device, users must always tick "not digitized" in the filters, so that newly created assets are revealed.

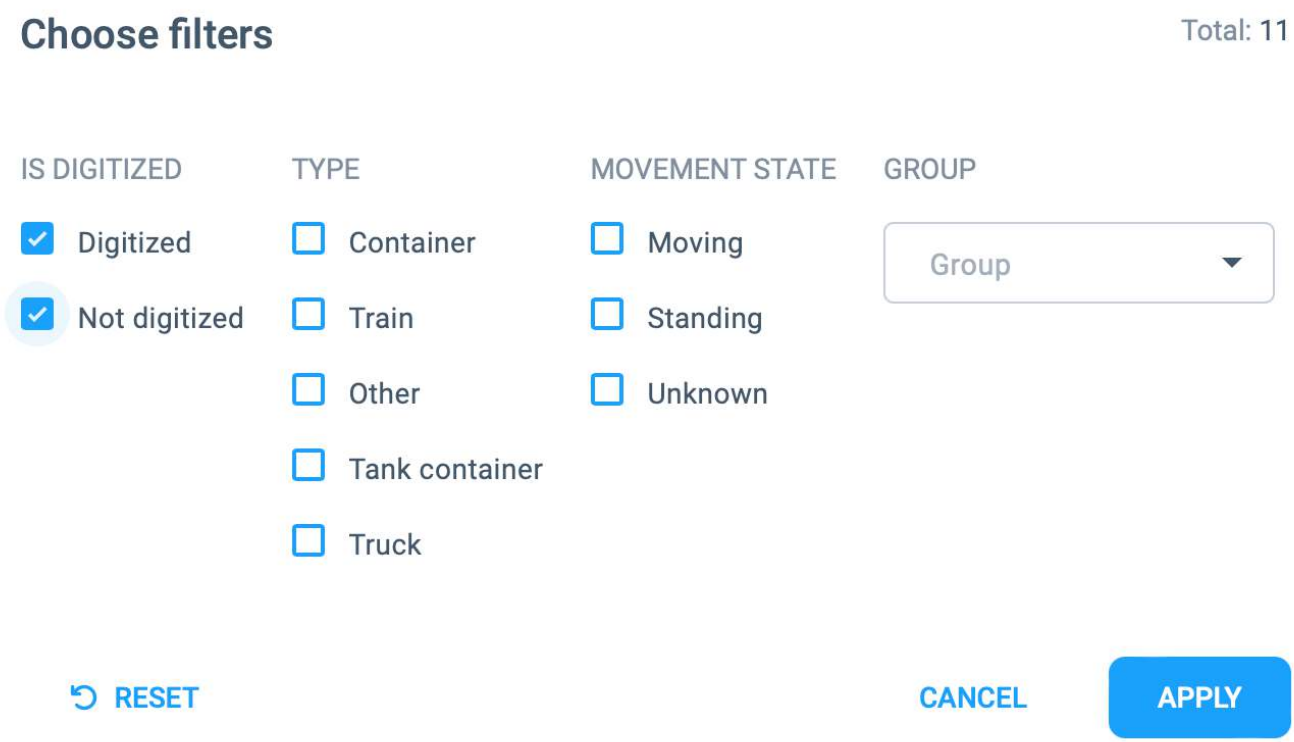


Figure 21: Filters view

Upon clicking on "Details" of an asset that has not yet been mounted with a gateway device, users will be brought to the asset details view. From there, go directly to the manage section to manually pair a device online, should users choose to do so instead of using the Nexxiot Mounting App.

If mounting has already occurred, an asset will always be displayed with its respective gateway device, but also with its monitor, if any. When necessary, users have the option to either mount or unmount a gateway device online. Should they choose to do so online, press the "- Unpair Device" button.
Since Connect is a cloud native service (SaaS), all historical data and settings remain on the platform, even after gateway devices are exchanged.

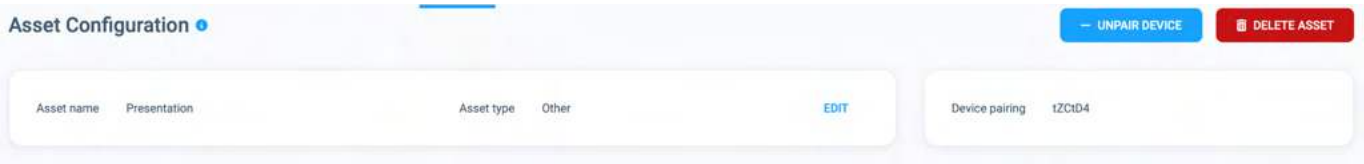


Figure 22: Asset configuration

9.9 Monitors

Four different types of monitors can be paired with a gateway device like the Globehopper, namely:

- Vector
- Temperature Monitor
- Kingpin Monitor
- Loadtracker

Data is collected by a Globehopper, which acts as a central hub, but it is not analyzed locally. Users of Connect should know that the platform is a highly scalable IoT (Internet of Things) platform, so sensor data ingestion happens in near real-time.
Monitor's information is then displayed in Connect, where it can be accessed from anywhere, at any time, and in the same place as that of a Globehopper.

All monitors are paired to a gateway device by using the Nexxiot Mounting App. This step is **required**.

N.B.: Datasheets can be found on Nexxiot's website. These documents will introduce readers to use cases and return on investment:

- Vector
- Temperature Monitor
- Kingpin Monitor
- Loadtracker

9.9.1 Vector (U.S. only)

The Vector sensor addresses multiple use cases as it provides data on hand brakes, access hatches, and train doors. By connecting the Vector to the gateway device via the Nexxiot Mounting App, it connects wirelessly to a Globehopper using Bluetooth LE (BLE), the data is then sent to the Connect for processing and analysis. Clients can easily access data and enhance decision-making capabilities and responses in the Explore view.

The Vector Sensor must be installed on rail cargo assets, it provides measurements based on the following functional capacity:

- Tank car manway hatch state (open / closed)
- Covered hopper hatch state (open / closed)
- Door State (open / closed)
- Bellcrank Handbrake (applied or not applied)

The different states can be seen in Connect under "Sensors" in the asset details section of Explore. Because the installation location of the device is paramount for achieving the best performance, the Vector and Globehopper should be mounted with the least number of obstacles between them. A bad installation can prevent data to be communicated between devices and ultimately sent to Connect.

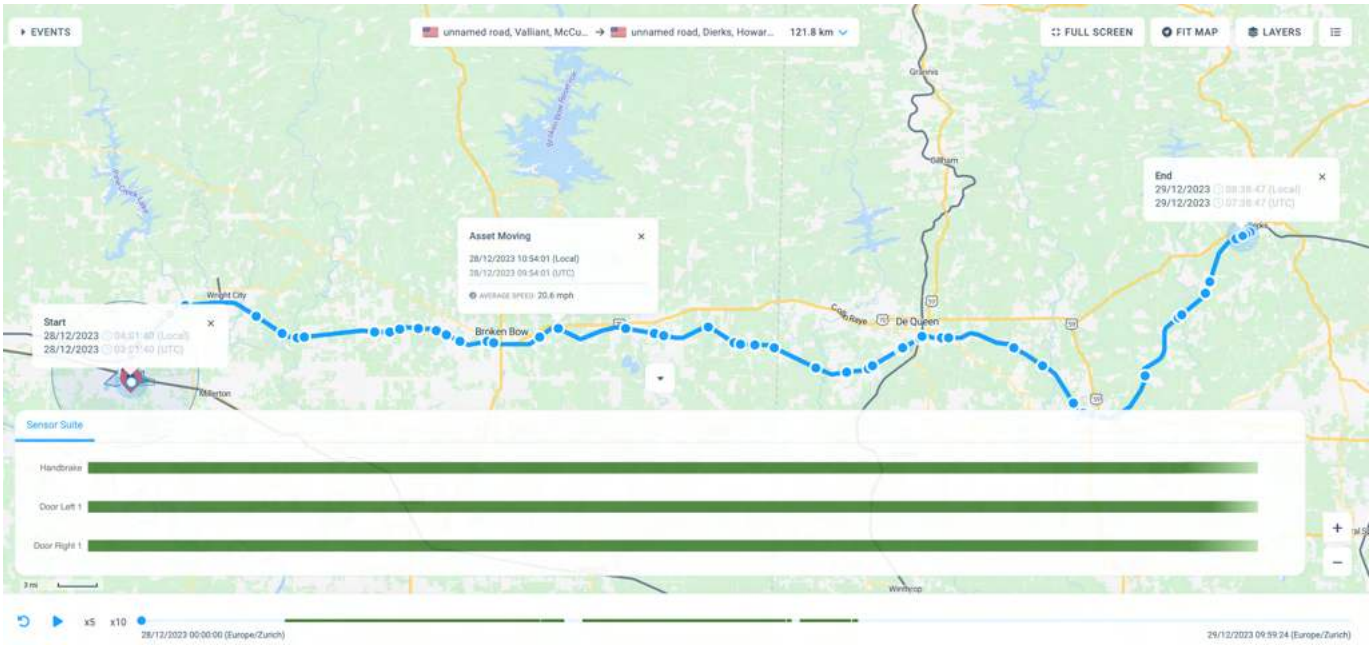


Figure 23: Handbrake and Door view

Each color conveys a unique condition, depending on what the device monitors. Even if they are self-explanatory, these are listed and described below.

Hatch (open / closed)

No data. Devices with no network connection will default to this status
Hatch Closed. This indicates closure of the Hatch.
Hatch Open. This indicates an absence of pressure; the Hatch is unlocked

Door (open / closed)

No data. Devices with no network connection will default to this status
Door Closed. This indicates closure of the Door.
Door Open. This indicates an absence of pressure; the Door is unlocked

Handbrake (applied / not applied)

Unknown. Devices with no network connection will default to unknown status
Handbrake Off. Handbrake is off when the asset is either moving or stationary
Handbrake On. Handbrake is on when the asset is parked.
Handbrake Partial. Handbrake triggered the warning light, but it is not engaged

Monitors that logged events, which are also associated with triggers, will be enumerated in the Events tab of the Explore view in Connect.

9.9.2 Temperature Monitor

A Temperature Monitor is a digital thermometer that sends temperature measurements to its paired Globehopper. It ensures optimal temperature for near real-time temperature monitoring, while allowing users to receive urgent data and automating processes and workflows.

The probe itself measures the outside of an inner tank; in return this gives an approximation of the loaded goods temperature. The data is sent to Connect and presented via the user interface (as seen below).

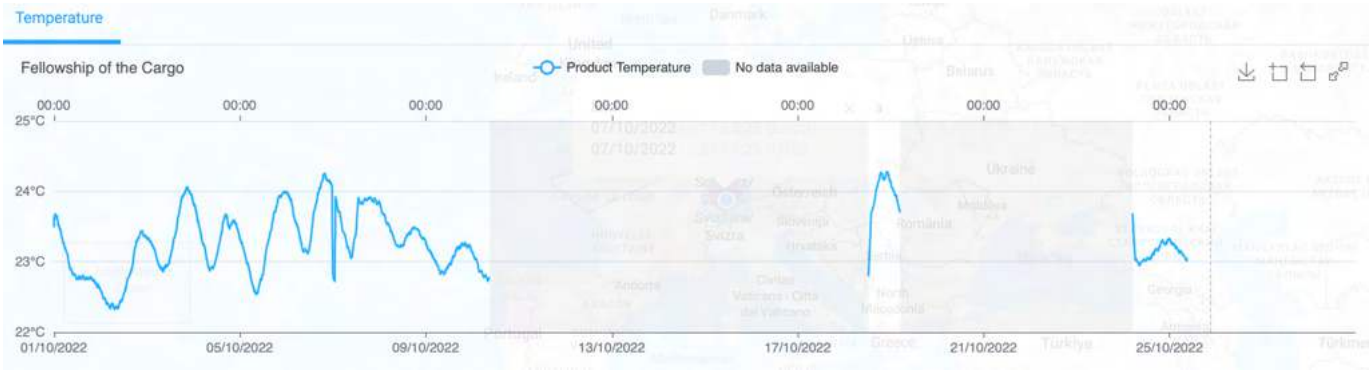


Figure 24: Temperature view

Temperature data can be found under the Sensors button. Once dates have been selected in the calendar, the curve shown represents the variations of either the tank temperature or the heating line during that period. As it sometimes happens, when no data is collected, the graph will default to a light grey.

Temperature

Product Temperature. Values continuously logged and wirelessly sent to Connect

No data. Devices with no network connection will default to this status

Hint: When a value is hard to see on the graph – for instance, when immersed in a period of no data – then users should use the zoom button to zero in on it.

9.9.3 Kingpin Monitor

Kingpin Monitor is a solution to support safe loading of semi-trailers. Safety statuses can be viewed in Connect as they get updated in near real-time.

After using the Nexxiot Mounting App to connect the sensors and the displays to the respective Globehopper of the wagon, loading statuses will be presented in a timeline, along with a timestamp of each event.

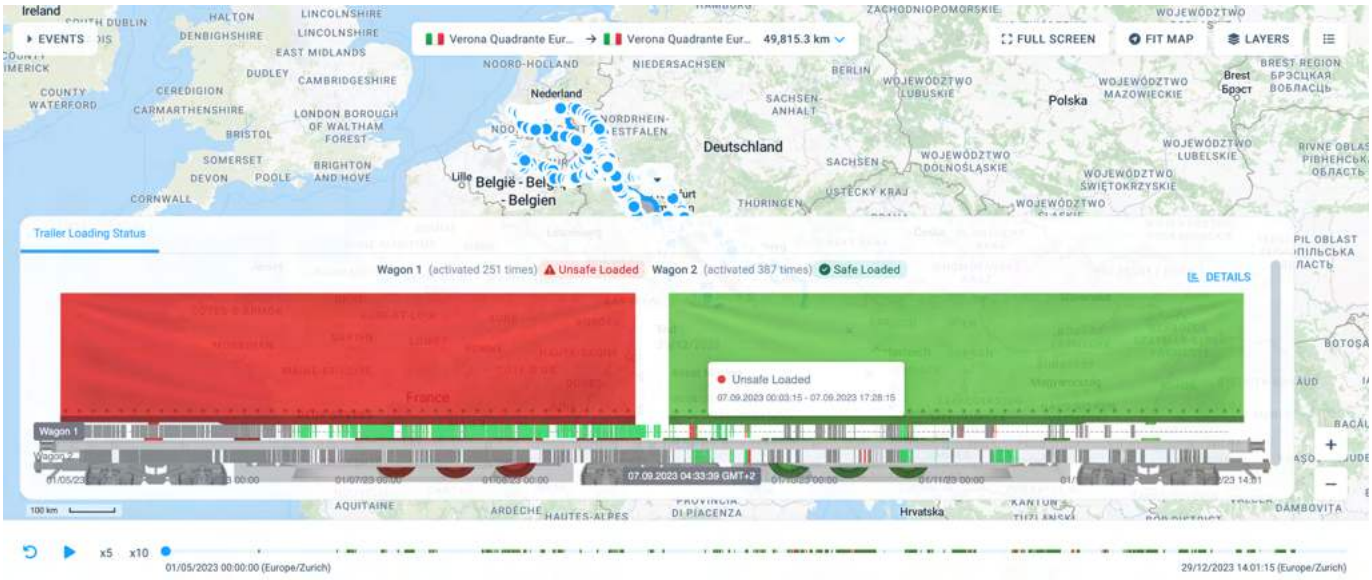


Figure 25: Trailer Loading view

Trailer Loading (Safe / Unsafe)

No data. Devices with no network connection will default to this status

No Trailer Loaded. This suggests that nothing is carried

Safe Loaded. This indicates that the load is secured on the trailer

Unsafe Loaded. This indicates that the load is not secured on the trailer

9.9.4 Loadtracker

The Loadtracker is self-powered and easy to install and monitors in near real-time the load status for non-powered rail cars. This means end users can gain an instant view of whether railcars are full or empty, and whether they are available for utilization.
It can also prevent titled loads to avoid damage to the cargo, infrastructure, or the asset itself.

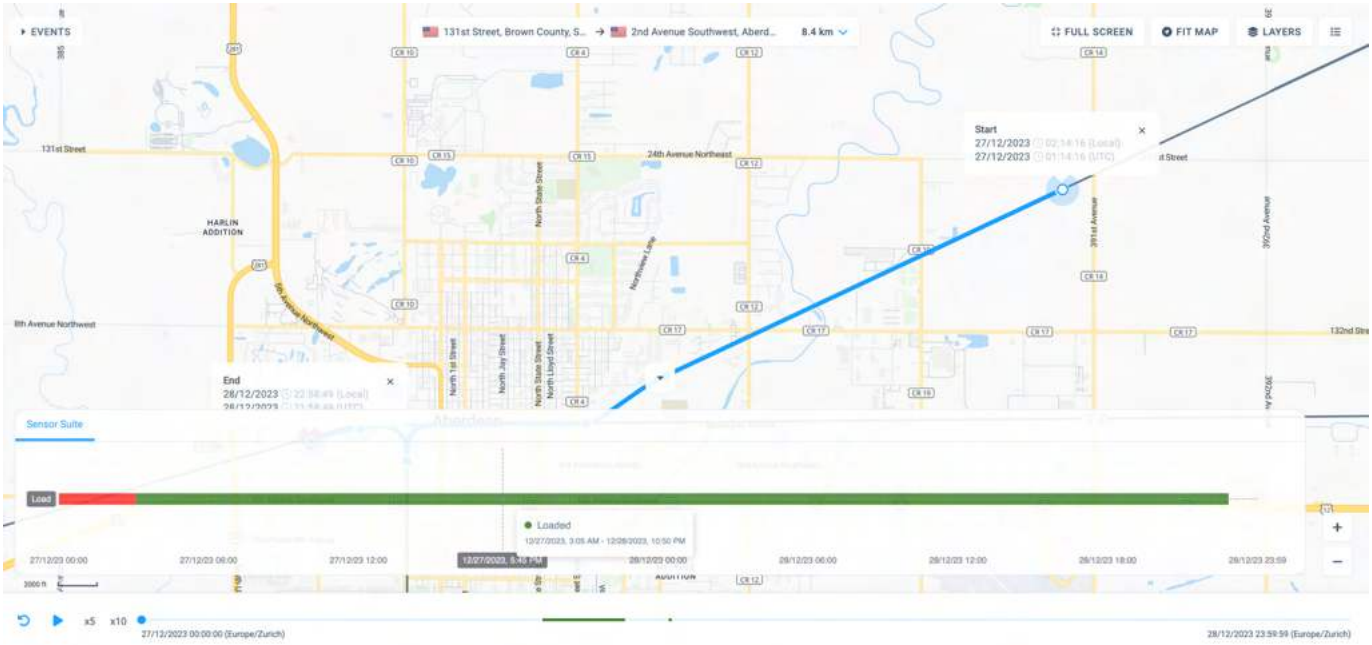


Figure 26: Loadtracker view

Once a Loadtracker has been mounted to its asset, paired with a Globehopper using the Nexxiot Mounting App, information can be accessed through Connect in the Explore view, under Sensors of an asset details.

Sensor Suite

No data. Devices with no network connection will default to this status
Loaded. This means a cargo carries a load and is likely full
Unloaded. This means a cargo does not carry a load and is likely empty

9.10 ITSS

ITSS stands for "Industrieplattform Telematik und Sensorik im Schienengüterverkehr" or "Intelligent Transportation Systems Society". It is a joint effort of different telematic and sensor providers to define common interfaces to allow for better interoperability.

ITSS was created by the Technical Innovation Circle for Rail Freight Transport (TIS), which continues to be involved in the process. The two most relevant artefacts of ITSS are:

- ITSS Interface 1 (ITSS IF1): an HTTP-based interface to send sensor data between systems.
- ITSS Interface 2 (ITSS IF2): a wireless interface for device-to-device communication (gateway to sensor).

As we use the term ITSS in this document, it often relates to ITSS IF1:

- **ITSS Push**: when Nexxiot sends data (new location, temperature) over ITSS IF1 to other systems.
- **ITSS Pull**: when other systems request data (for example list devices) from Nexxiot via ITSS IF1.

9.10.1 ITSS Push

ITSS Push is a service that sends messages according to the ITSS specification to registered customers endpoints.

- **Last position**: Generate a notification every time a device sends a message with position data
- **Shock**: Generate a notification every time a device detects a shock/impact
- **Mileage**: Send daily mileage information for each asset
- **Movement State**: Get notifications about changes of movement state (moving/standing)
- **Geofence Event**: Get notifications when an asset enters or leaves a geofence
- **Sensor Value**s: Get notifications when a sensor emits new values
- **Asset Data**: Specify part of asset data to be sent with JMESPath

9.10.2 ITSS Pull

ITSS Pull is a Rest API that allows users to request specific telematic data for their tracked assets & devices. Its counterpart message delivery system is ITSS Push. This service only contains a single endpoint for retrieving all known devices.

9.10.3 Setup ITSS

When setting up a configuration on the page in Connect for an endpoint of yours, Nexxiot will then push ITSS messages every time (for instance) a new position is available for an asset or other types of events that a user wishes to be notified of.

The steps for setting up ITSS Push in Connect are the following (no prior knowledge about API or endpoint is necessary at this stage):

- Go to the "**Configuration**" tab in Connect, that is located under the settings:

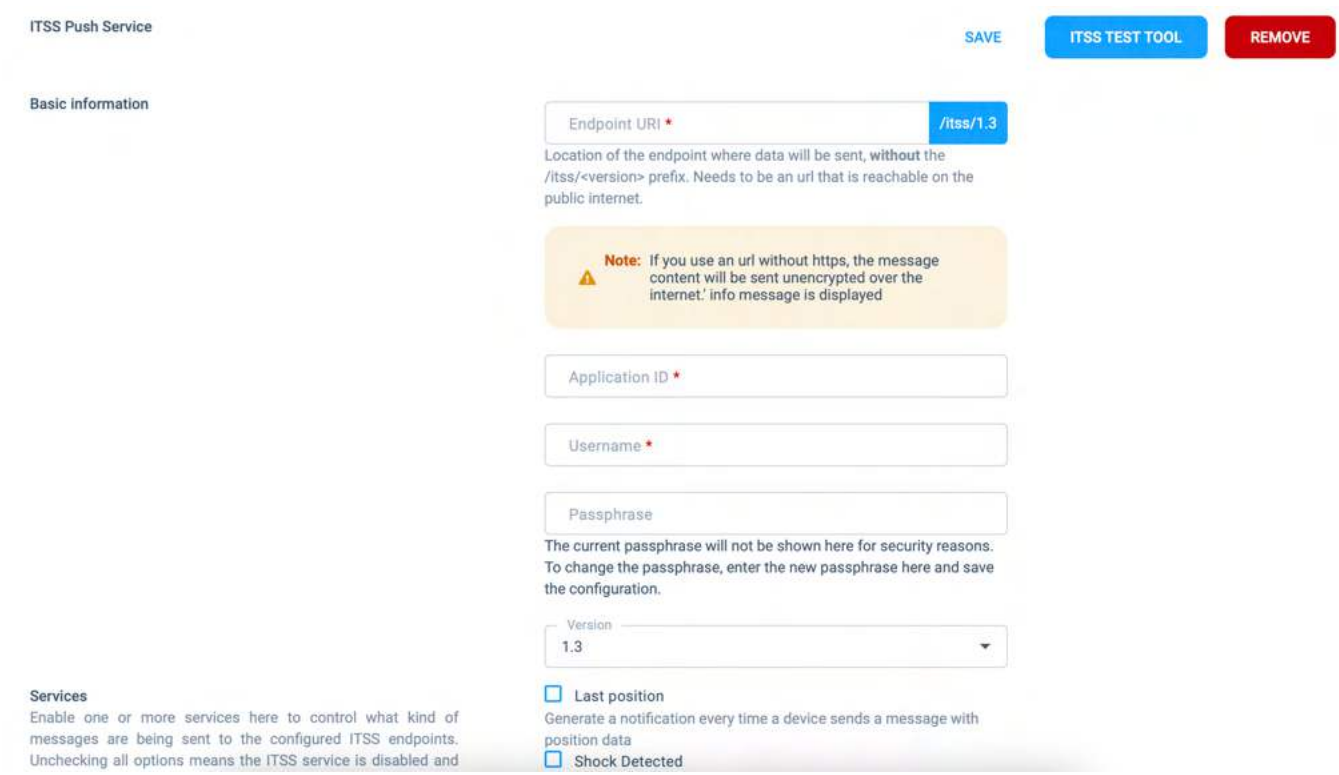


Figure 27: ITSS Configuration view

- Next, fill in ITSS Push credentials, as directed on screen, starting with:

  - **Endpoint URL**: the location of the endpoint where data will be sent, without the /itss/<version> prefix. IT Needs to be an URL that is reachable on the public internet.

  - **Application ID**: Nexxiot uses UUID, as it is generally available, and every application can generate IDs by itself without having to contact any central authority

  - **Username**: ITSS IF1 uses a Basic Auth header containing a username and password in every request to authenticate the user.

  - **Passphrase**: a string of words used for authentication that is longer than a traditional password, easy to remember and difficult to crack

Afterward, deploy a public RESTful endpoint with a route per customer, in this example called "ExampleCarrier": http://itss.yourinfra.com:8444/examplecarrier/itss/1.2

A carrier generates a username/password combination on your platform, the carrier then goes onto Connect and enters these credentials (endpoint URL, login, password).

- Finally, it is time to choose the data which is going to be received via ITSS push:
  - **Last position/ Location of the devices/ assets**: Generate a notification every time a device sends a message with position data
  - **Shock Detected**: Notify you every time a device detects a shock/impact
  - **Mileage**: This is the daily mileage information for each asset
  - **Movement State**: Get notifications about changes of movement state (moving/standing)
  - **Geofence Event**: Get notifications when an asset enters or leaves a geofence
  - **Sensor Values**: Get notifications when a sensor emits new values
  - **Asset Data** [Nexxiot extension]: Specify part of asset data to be sent with JMESPath
- **Test the credentials**: To check if ITSS credentials are working, please click on the button "ITSS Test Tool".
- **Receive data via ITSS Push**: After a successfully test, go back to the ITSS Configuration tab, and click on the button "save". Data should now be received on your platform via ITSS Push.

Regardless of whether you are a startup or an established enterprise, using Connect should be easy and can open a multitude of opportunities and drive your business toward success. Should you still need support or have questions, please direct yourself to the Nexxiot client support portal and drop us a message.