



# REAL TIME LOCATION SYSTEM DEMO

TagoIO

## [Abstract](#)

This documentation describes how to setup and operate the application



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## Glossary

Section gives definitions of terms used in documentation and system.

**Bucket:** database storage used at TagoIO. Individual for each device.

**Analysis:** scripts that run algorithms of the devices and operations.

**TagoRUN:** the environment deployed by TagoIO and accessed through the customized URL for the users to sign in.

**Devices:** refers to the end-point LoRaWAN devices used in this application to collect location through GPS.

**EUI:** also called as DevEUI, it is a 64-bit globally-unique Extended Unique Identifier (EUI-64) assigned by the manufacturer, or the owner, of the end-device. The EUI can be found in the back of the end-point device or in its box.

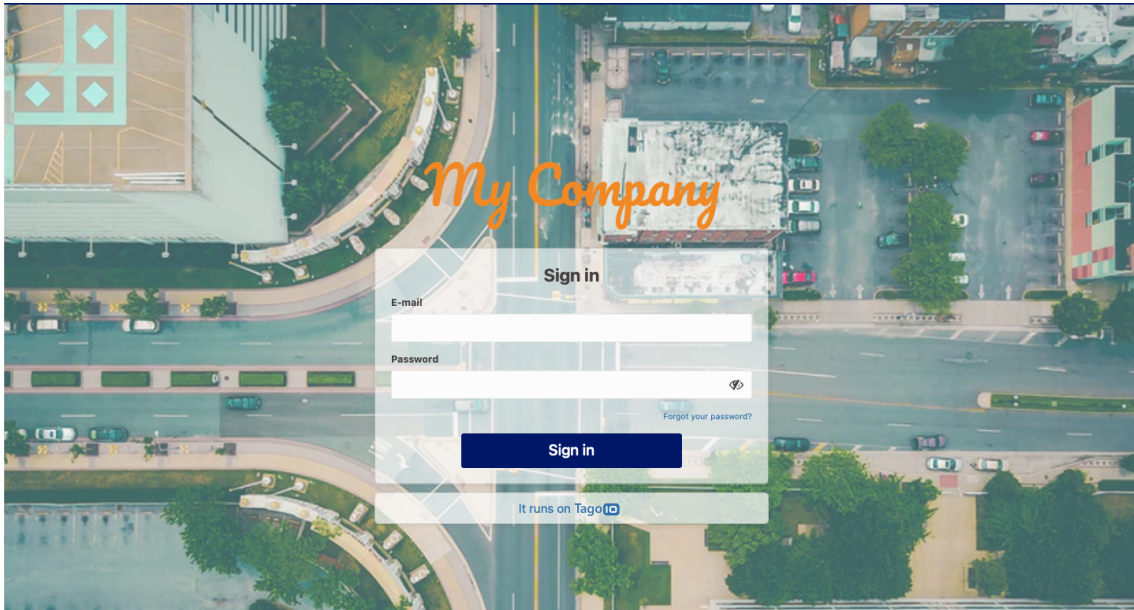


## Introduction

The purpose of this document is to describe the Real Time Location System demo (RTLS). It is created as a manual guide for understanding each process of the application, explaining types of users and setting the application.

You can access the application through:

<https://rtls.run.tago.io>



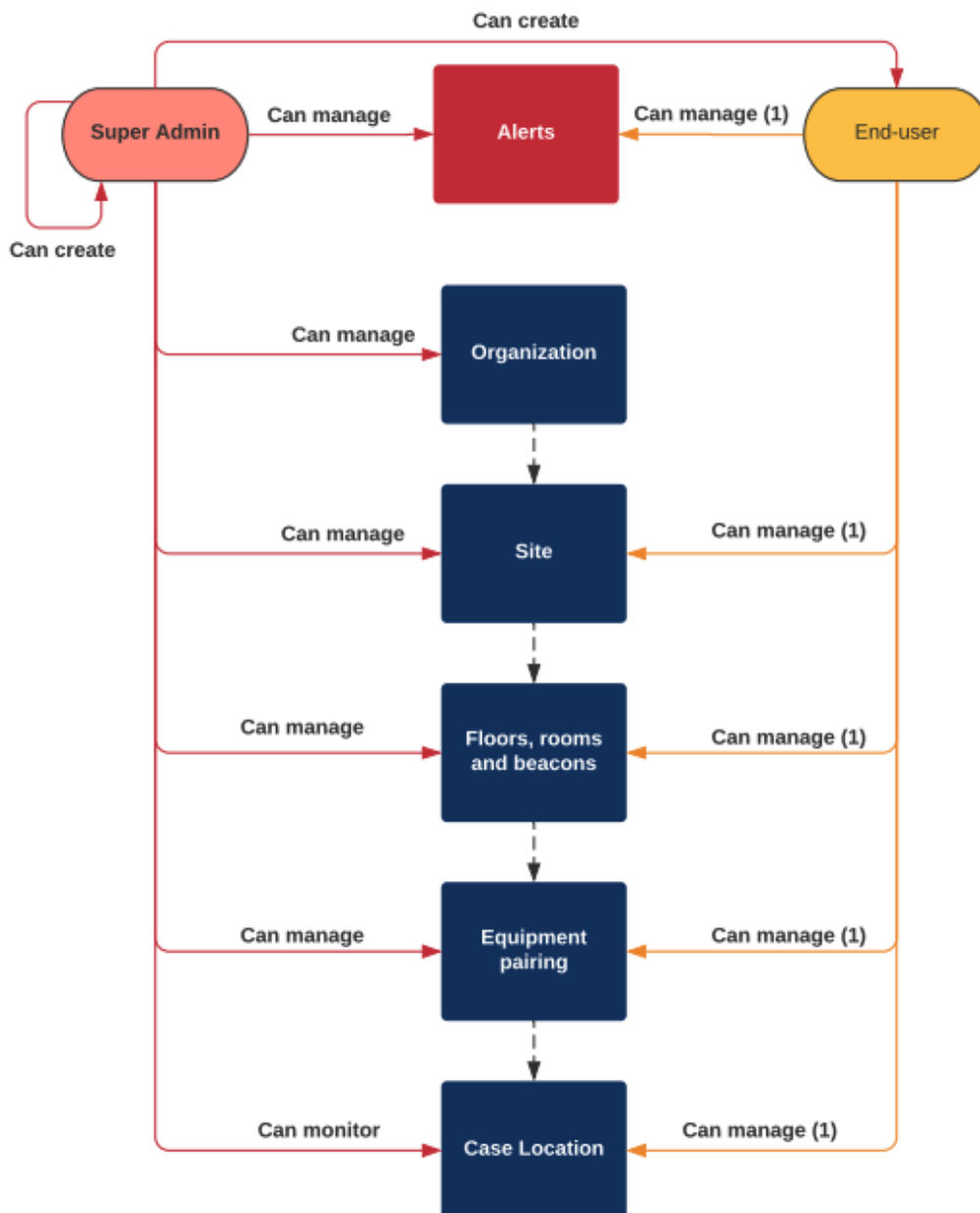
## Product functionalities

### Access management

There are two types of users that can be configured for this system:

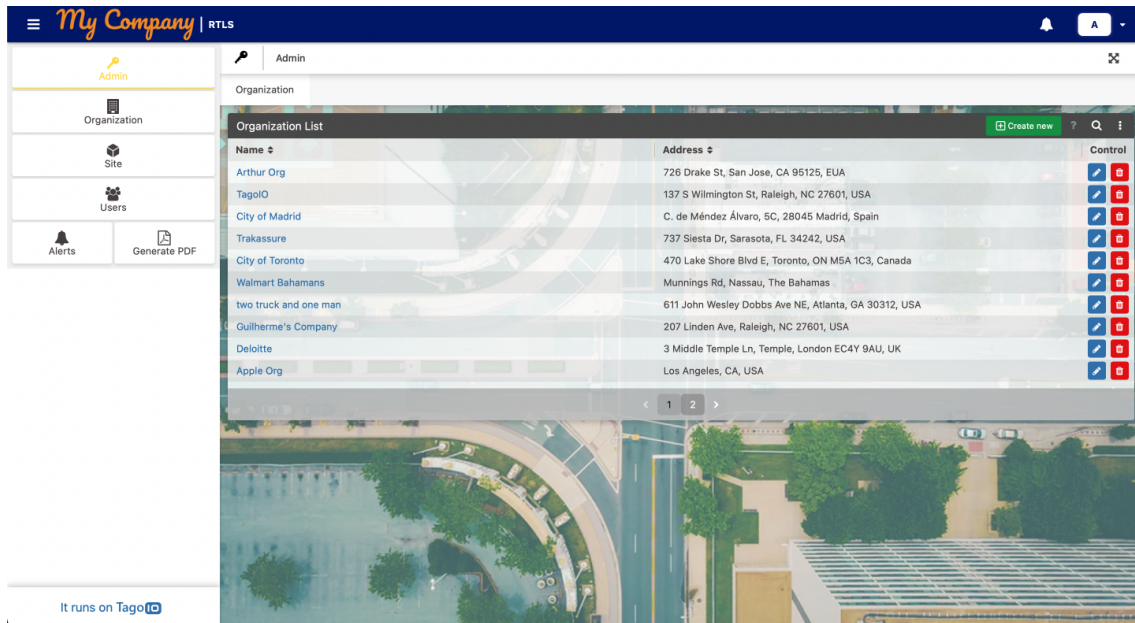
#### RTLS - User Permissions Diagram

TagoIO - Guilherme Costa | November 16, 2021



(1) Only those related to the user's site

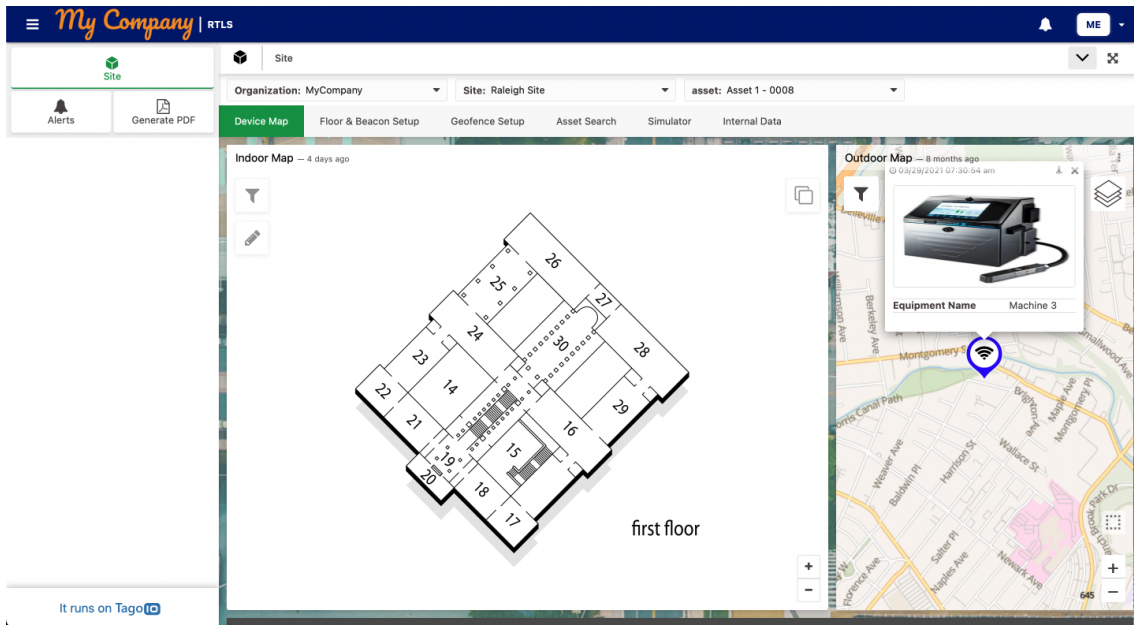
- **Administrator:**
  - Can manage organizations;
  - Can manage sites;
  - Can manage Floor and beacons setup;
  - Can manage tracking device pairing;
  - Can manage equipment location;
  - Can setup alerts;
  - Can generate PDFs.



- **End-User**

- Can manage sites (1);
- Can manage Floor and beacons setup (1);
- Can manage tracking device pairing (1);
- Can manage equipment location (1);
- Can setup alerts (1);
- Can generate PDFs (1);

(1) Only those related to the user's site;



## Adding new organization

An organization acts as an umbrella and holds all the data from sites, devices and users.

To add a new organization, you will need a name, and an address.

- Click on the 'Admin' button at your sidebar.
- At the 'Organization List' table click the 'Create new' green button at the top right position.
- A window will open, enter the organization's details. Upon completion, click the 'Create' button at the bottom.

## Editing an organization

To edit an existing organization:

- Click on the 'Admin' button at your sidebar.
- At the table 'Organization List', click the pencil icon button located at the controls column. It will allow you to change information.
- Confirm by clicking on save.



The screenshot displays the 'My Company' admin dashboard. The top navigation bar includes the company logo, 'RTL5', and user information. The left sidebar contains navigation options: Admin, Organization, Site, Users, Alerts, and Generate PDF. The main content area shows the 'Organization List' table with columns for Name, Address, and Control. A 'Create new' button is visible in the top right of the table area.

Name	Address	Control
Arthur Org	726 Drake St, San Jose, CA 95125, EUA	[Edit] [Delete]
TagolO	137 S Wilmington St, Raleigh, NC 27601, USA	[Edit] [Delete]
City of Madrid	C. de Méndez Álvaro, 6C, 28045 Madrid, Spain	[Edit] [Delete]
Trakassure	737 Siesta Dr, Sarasota, FL 34242, USA	[Edit] [Delete]
City of Toronto	470 Lake Shore Blvd E, Toronto, ON M5A 1C3, Canada	[Edit] [Delete]
Walmart Bahamans	Munnings Rd, Nassau, The Bahamas	[Edit] [Delete]
two truck and one man	611 John Wesley Dobbs Ave NE, Atlanta, GA 30312, USA	[Edit] [Delete]
Guilherme's Company	207 Linden Ave, Raleigh, NC 27601, USA	[Edit] [Delete]
Deloitte	3 Middle Temple Ln, Temple, London EC4Y 9AU, UK	[Edit] [Delete]
Apple Org	Los Angeles, CA, USA	[Edit] [Delete]

## Adding new site

To add a new site, you will need a name and an address.

- Click the organization's name link at the Organization list. (You will be redirect to `Organization` dashboard)
- At table `Site list` click `Add site button` in the top right position.
- Fill the required fields.
- Upon completion, click the `Create` button at bottom.

Pay attention to the selected organization on the top left selector, that shows the organization that is being accessed.

## Editing an existing site

To edit an existing site:

- At the `Organization` dashboard, Site List table, click on the blue pencil icon below the 'Controls' column. It will allow you to change information.
- After changing, click on save to confirm.

The screenshot displays the 'My Company | RTLS' dashboard. The top navigation bar includes a menu icon, the company name, and user information. The left sidebar contains navigation options: Admin, Organization (selected), Site, Users, Alerts, and Generate PDF. The main content area is titled 'Organization' and shows 'Organization: Apple Org' selected. Below this, there are three tables: 'Site List', 'Sensor List', and 'Equipment list'. The 'Site List' table has columns for Name, Address, and Controls. The 'Sensor List' table has columns for Name, Type, EUI, Site, Battery, Last Report, and Controls. The 'Equipment list' table has columns for Image, Name, Serie, Asset Device, and Controls. A 'Tago' logo is visible at the bottom left.

Name	Address	Controls
site Interlaken	Lindenallee 98, 3800 Interla...	[Pencil] [Trash]
First Site 22	Los Angeles, CA, USA	[Pencil] [Trash]

Name	Type	EUI	Site	Battery	Last Report	Controls
Jurgen	Tektelic Ind...	838383	site Interlak...			[Pencil] [Trash]
Tracker #6...	Tektelic Ind...	6546546	First Site 22			[Pencil] [Trash]

Image	Name	Serie	Asset Device	Controls
[Image]	Freezer 001	Freezer 001	Tracker #65456	[Trash]



## Adding new tracker device

To add a new tracker device, you will need an organization, site, name and EUI (device id).

- Click on the 'Organization' button at your sidebar.
- Select the desired organization on the top left selector.
- At the 'Tracker device List' table click the 'Add new' green button at the top right position.
- A window will open, enter the device's details. Upon completion, click the 'Create' button at the bottom.

## Editing a tracking device

To edit an existing tracking device:

- Click on the 'Organization' button at your sidebar.
- Select the desired organization on the top left selector.
- At the table 'Tracker device list', click the pencil icon button located at the controls column. It will allow you to change information.
- Confirm by clicking save.

The screenshot displays the 'My Company | RTLS' dashboard. The left sidebar contains navigation options: Admin, Organization, Site, Users, Alerts, and Generate PDF. The main content area is titled 'Organization' and shows 'Organization: Apple Org'. Below this, there are three tables: 'Site List', 'Sensor List', and 'Equipment list'. The 'Sensor List' table is highlighted with a red border and contains the following data:

Name	Type	EUI	Site	Battery	Last Report	Controls
Jurgen	Tektelic Ind...	838383	site Interlak...			[Pencil] [Trash]
Tracker #6...	Tektelic Ind...	6546546	First Site 22			[Pencil] [Trash]

The 'Equipment list' table below it shows:

Image	Name	Serie	Asset Device	Controls
[Image]	Freezer 001	Freezer 001	Tracker #65456	[Trash]

At the bottom left, it says 'It runs on Tago'.

## Pairing new equipment

Pairing new equipment with a sensor will help you to create an association between the sensor and the tracking case.

To pair a new equipment, you will need an organization, site, sensor, name and an image;

- Click on the 'Organization' button at your sidebar.
- Select the desired organization on the top left selector.
- At the 'Equipment list' table click 'Pair new' green button at the top right position.
- A window will open, enter the case details. Upon completion, click the 'Create' button at the bottom.

## Unpairing an equipment

- Click on the 'Organization' button at your sidebar.
- Select the desired organization on the top left selector.
- At the table 'Equipment list', click the red bin icon. It will unpair the sensor and it will be available to be paired again.
- Confirm by clicking on 'Unpair'.

The screenshot displays the 'My Company | RTLS' dashboard. The left sidebar contains navigation options: Admin, Organization, Site, Users, Alerts, and Generate PDF. The main content area is titled 'Organization' and shows 'Organization: Apple Org'. Below this, there are three tables: 'Site List', 'Sensor List', and 'Equipment list'. The 'Equipment list' table is highlighted with a red border and contains the following data:

Image	Name	Serie	Asset Device	Controls
	Freezer 001	Freezer 001	Tracker #65456	

The bottom of the interface features the text 'It runs on Tago'.



## Setting floors and beacons

When a new site is created, a floor, rooms and beacon setup can be done.

To set floors:

- Click the site name on the 'Site List' table, you will be redirected to 'Site' dashboard.
- At the second tab 'Floor & Beacon Setup' click on the pencil icon located at the top left corner of 'Floor & Beacon Setup' widget.
- Enter a floor name and floor background image, click on save to confirm.

To set beacons:

- Click the site name on the 'Site List' table, you will be redirected to 'Site' dashboard.
- At the second tab 'Floor & Beacon Setup' click 'Add new' green button located at the top right of 'Beacon List' table.
- A window will be shown. Fill up the fields with a name, MAC address and a room, click 'Create' to confirm.

The screenshot displays the 'Floor & Beacon Setup' interface. The top navigation bar includes 'Organization: MyCompany', 'Site: Raleigh Site', and 'asset: Asset 3 - 0026'. The main menu has tabs for 'Device Map', 'Floor & Beacon Setup' (active), 'Geofence Setup', 'Asset Search', 'Simulator', and 'Internal Data'. The 'Beacon Setup' section shows a floor plan with three beacons (blue Bluetooth icons) placed in a bedroom, living room, and kitchen. On the right, the 'Beacon List' table is visible:

Name	ID	Room	Controls
Beacon 3	ac233f5b8...	Bedroom	[Edit] [Delete]
Beacon 2	ac233f5b8...	Living room	[Edit] [Delete]
Beacon 1	ac233f5b8...	Kitchen	[Edit] [Delete]

Below the 'Beacon List' is the 'Floor list' table:

Name	Scale X	Scale Y	Controls
Ground Floor	10	10	[Edit] [Delete]

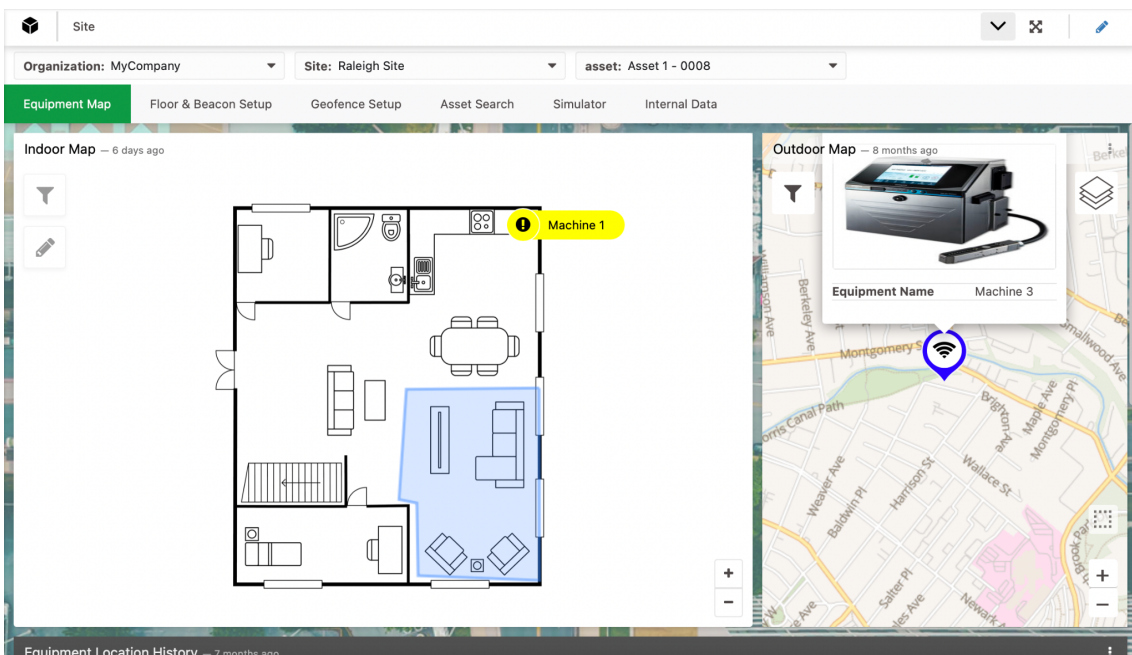
## Monitoring equipment positioning (Indoor & Outdoor positioning explained)

When a tracker which is paired with an equipment sends an information, a pin will be plotted on Site -> Equipment Map. To see a pin plot on either map (Indoor or Outdoor) the device should send the correct information. For outdoor positioning it's simple and your actions should not interfere, the only information demanded is a latitude and longitude coordinate. For indoor positioning, the device should send information containing the beacon ID which should be created before on the Floor and Beacon Setup tab (see point "Setting floors and beacons").

It's important to understand that on this first version, RTLS will compare the beacon RSSI sent by the indoor tracker and then it will plot the equipment on top of the strongest beacon position. (No triangulation is being done).

What can be monitored?

- You can monitor equipment real time positioning.
- You can not add/edit/delete the geofence on this map. See "Geofence Setup" point.
- You can filter the equipment and select a specific one to be visible, it will be available on the filter icon at top left of the widget.

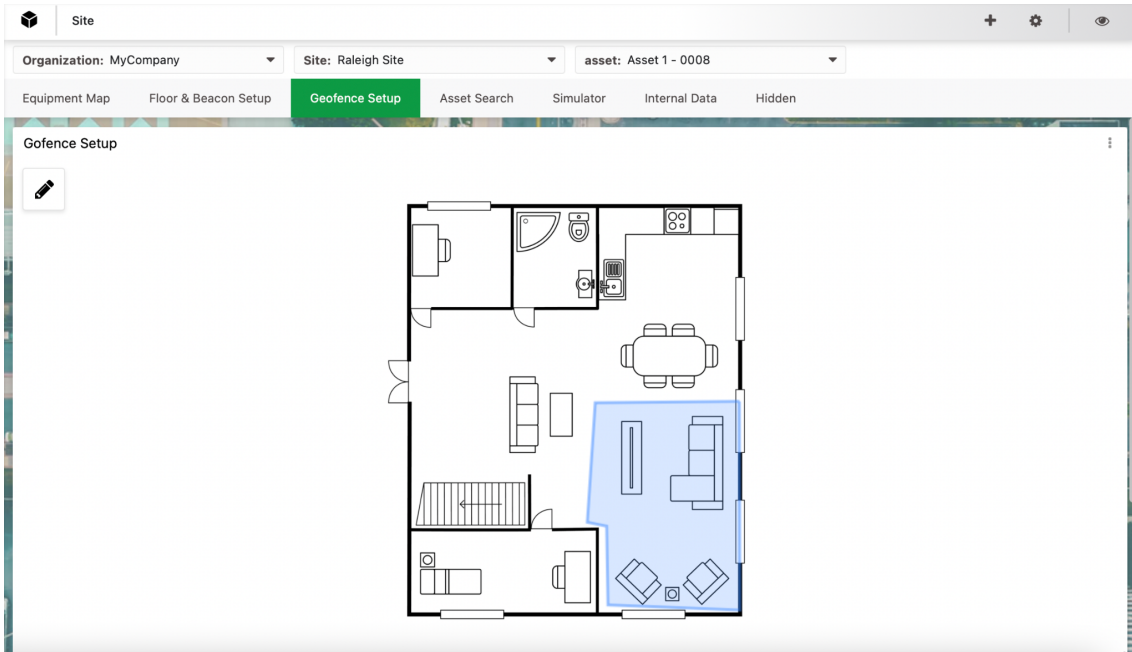


## Setting a Site Geofence

After setting up the floor and beacon, you should also consider setting the geofence.

To set a geofence:

- At Site, the second tab 'Geofence Setup' click the pencil icon located at the top left corner of the map widget.
- Draw a new, edit or delete a geofence.



## Adding users

To add a new user, you will need a name, email, phone number and possibly a site.

- Click the 'Users' button at your sidebar.
- At the 'Users List' table click the 'Invite User' green button at the top right position.
- A window will open, enter the user's information. Upon completion, click the 'Invite' button at the bottom.
- Each user has a different type of access, you can learn more about it at the User Permission Diagram on section Access management.

An email will be sent to the user with their credentials, the email registered and a random password (it can be changed later by the user);

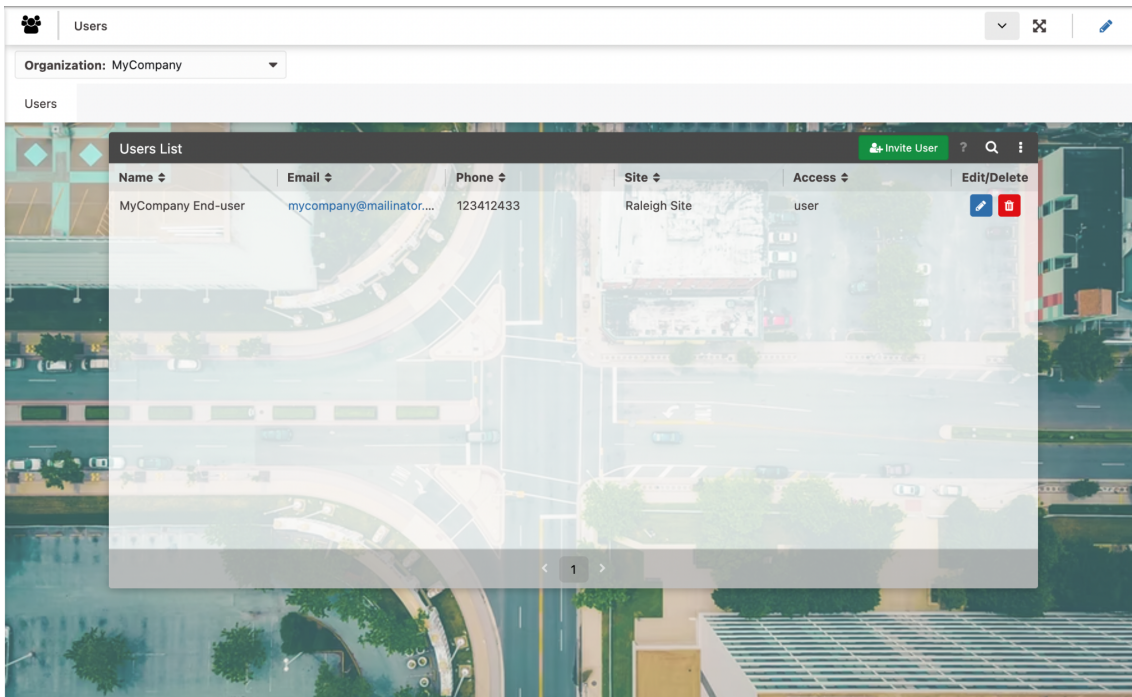
After inviting an user they will be able to log into the application through the URL provided at Introduction section of this document;

If an user is deleted, they will no longer have access to the application;

## Editing an existing user

To edit an existing user:

- Click on the 'Users' button at your sidebar.
- At the user in the list, click on the pencil icon button located at the controls column. It will allow you to change any information that you want.
- Click on save to confirm.



## In-Development Features

Few existing sections on the RTLS current version are still in the development process. The mockup dashboards are already implemented but its not totally functional, below a brief description of each still in development sections:

### 1. Report System

For each Site a report system can be generated hitting the main button "Send Now". It will dispatch a PDF report containing the last 10 readings of the site's equipment tracking. Notice that you should include the email address which will be sent to on the form below the button.

The PDF content is not functional yet and you should always receive the PDF below via email:

Monthly Report - All device 2021-11-18	<i>My Company</i>
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<b>Total Equipments Paired</b> <b>4</b>	<b>Total Active Equipments</b> <b>3</b>	<b>Asset Tracker Devices</b> <b>4</b>
--	--	--

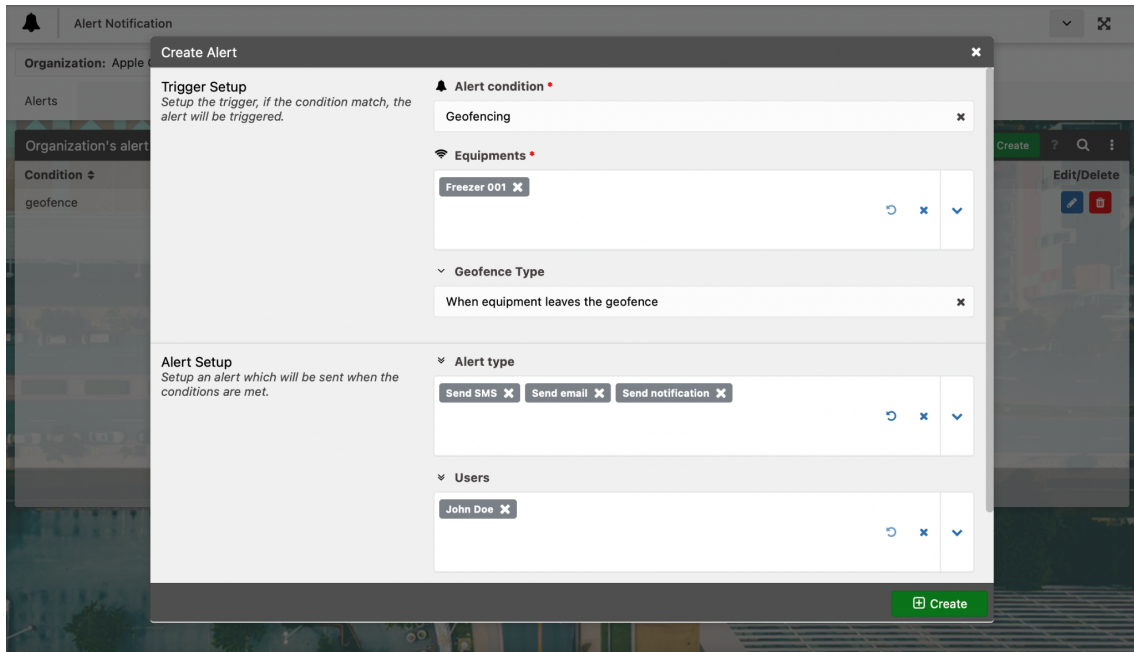
Equipment name	Asset device	Closest beacon	RSSI signal	Date and time
Red Machine #003	BLE Tracker 0008	Beacon 1	-67	01/08/2021 09:56:02 am
Machine #0002	BLE Tracker 0126	Beacon 3	-20	01/08/2021 09:56:02 am
Red Machine #0123	BLE Tracker 0026	Beacon 1	-62	01/08/2021 09:56:02 am
Machine #0002	BLE Tracker 0126	Beacon 3	-20	01/08/2021 09:56:02 am
Red Machine	BLE Tracker			01/08/2021 09:56:02



## 2. Alert System

At the "Alerts" sidebar button, you can set up alerts which will warn the users if a condition matches. Two types of alerts are available, battery voltage threshold and geofencing entering and leaving. You can also set the recipients (who will receive) and the communication mean (email, sms and push notification).

The alerts are not functional yet and will not dispatch to the user the message.



## 3. Asset Search

At the "Site" sidebar button, "Asset Search" you can select a tracker and search its positioning.

The Asset Search feature is not done yet and will not be functional.

