

**Deployment Guide**  
**for**  
**OmniAccess Stellar**  
**Asset Tracking Solution**  
**Version 1.0.3**



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## Overview

The Asset Tracking Solution allows various enterprises to track assets and also determine how assets are utilized on site. Without Asset Tracking, enterprises must rely on feedback from customers/employees, and rough estimates to determine out how various assets are used, and how many assets they may need to procure to remove any existing or potential issues. By individually tracking each asset and its usage over time, enterprises can solve any existing and future potential needs for assets that directly impact their bottom line.

The Asset Tracking Solution tracks assets with BLE tags in real time. This information can be collected for a longer duration (Historical Data) to analyze usage patterns, which is very helpful for planning purposes. Assets can be people or equipment, such as wheelchairs, medical devices, golf carts, laptops, etc.

Real-time tracking drastically reduces the time required for employees and customers to locate assets, improving employee and customer satisfaction. Employees can find assets faster and can then focus on providing services for the customer instead of wasting time locating resources.

## BLE Gateways

The Asset Management Solution mainly relies on classification algorithms and fingerprint algorithms. The deployed fixed tags can be used in classification algorithms to determine the approximate range of position tags and can also be used to calculate fingerprint data in the position area.

## Available Devices

The following gateways can be deployed in an Asset Tracking Solution:

- OAW-AP1201
- OAW-AP1201BG
- OAW-AP1231
- OAW-AP1232
- OAW-AP1301
- OAW-AP1321
- OAW-AP1322
- OAW-AP1351
- OAW-AP1361
- OAW-AP1361D
- OAW-AP1362.

Gateways minimum firmware version is **AWOS 4.0.2.MR2** or **AWOS 4.0.3 GA**.

## BLE Gateway Deployment

### General recommendations

Gateway deployment requirements in asset-tracking environments differ from wireless coverage network environments. In a wireless coverage network environment, the basic requirement is that any location in the area has wireless coverage. The basic requirement in an asset-tracking environment is that **a ble tag in any location of the asset-tracking area must be scanned by at least 3 or more gateways** that are not on the same straight line.

It is recommended to deploy the gateways horizontally. A vertical mount of the gateway may still be possible but has not been validated.

It is not advised to deploy the gateways upper than a 4 meters height. The signal received by the gateways could be attenuated due to the distance from the ground where the tags are emitting the rssi frames.

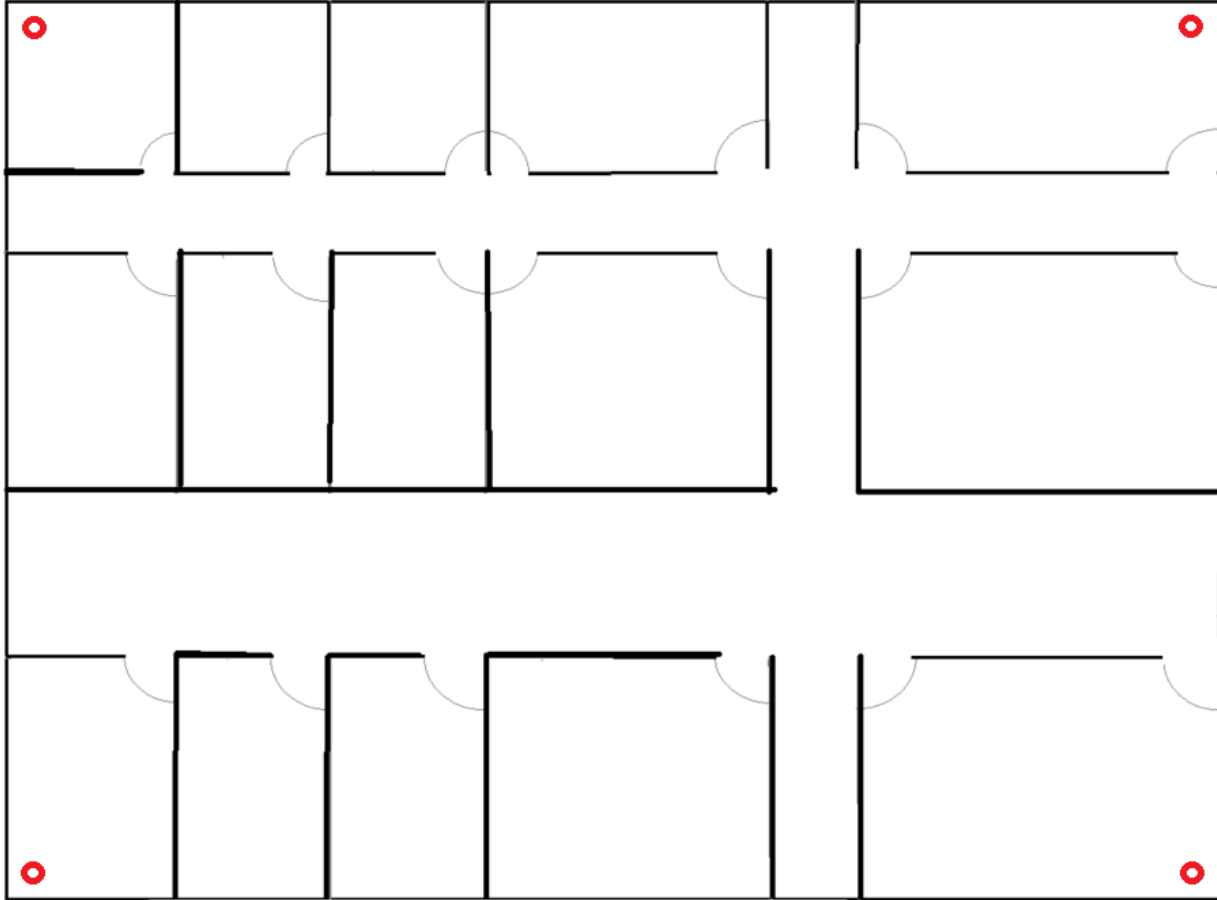
In open areas, the recommended distance between gateways is **10 to 15 meters**.

In complex areas, the recommended distance between gateways is 10 meters, and needs to change according to the number of obstacles, complexity, etc.

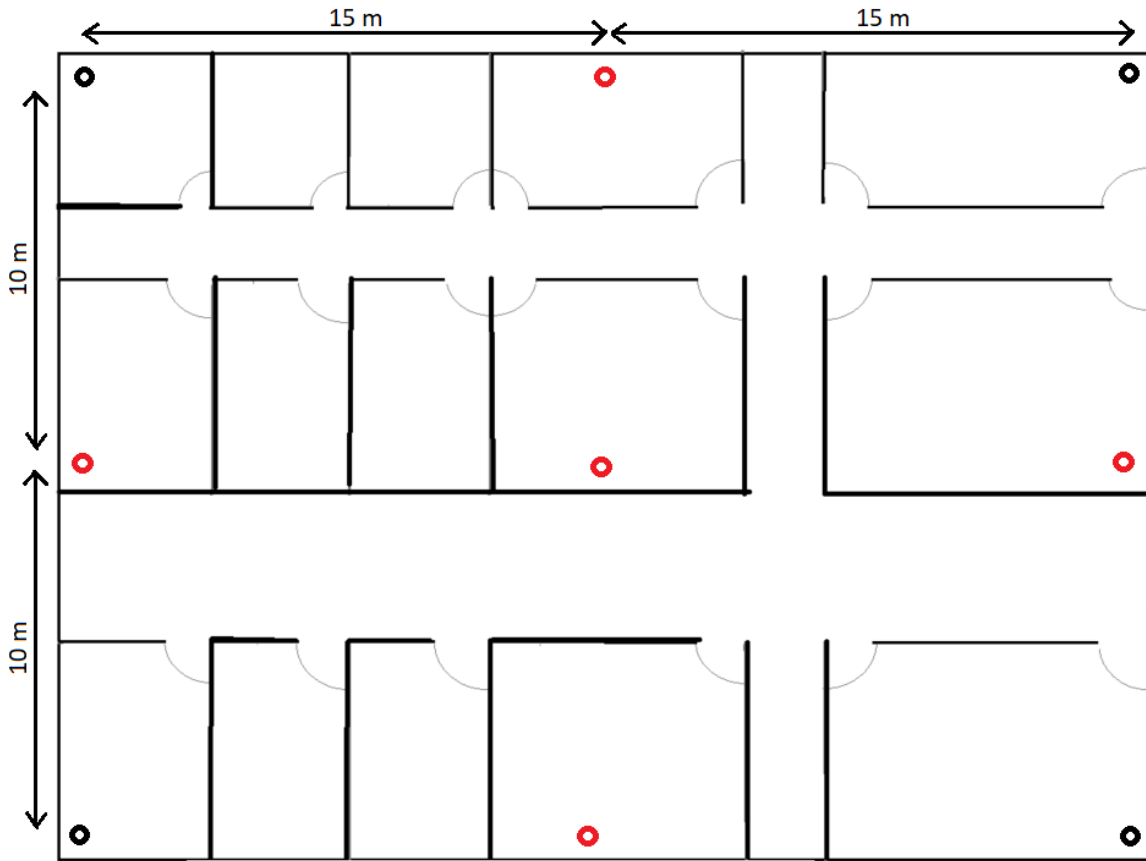
It is required that the BLE tags at any location in the position area can be stably scanned by at least 3 gateways that are not in the same straight line, and that the gateways are distributed as evenly as possible.

First, position some gateways in the corners of the area to be covered:

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Then, complete the deployment by adding other gateways in order to cover the area in the most evenly way possible, respecting the expected distances between gateways:



## Multi-floor deployment

Multi-floor deployment is possible with Asset-Tracking solution.

The attenuation between floors must be sufficient, in order to ensure a correct differentiation of the BLE measures received from the different floors. In limit cases, if the attenuation between the floors is too low, assets may appear on another floor than the one they are currently located.

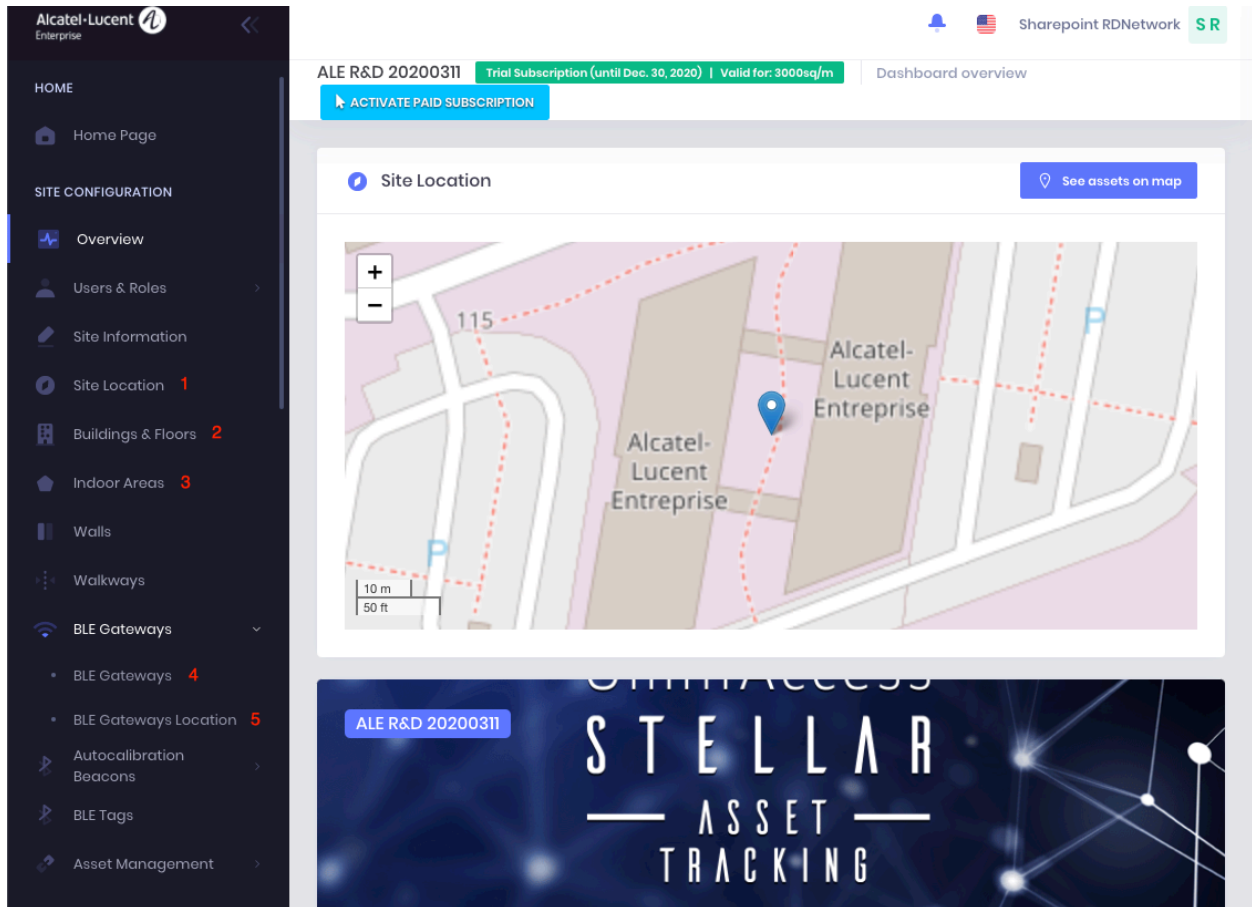
In case of multi-floor deployment:

- Position the gateways on each floor according to the above recommendations
- When possible, position one gateway near to the floor accesses (stair, elevator) to speed up the assets' floor transitions.
- It is recommended to position the gateways juxtaposed at the same place on each floor, so that they will be positioned right below an above floor's gateway (or right above a below floor's gateway).

## Configuration Using the Asset Tracking Administration Interface

Open the Asset Tracking Administration interface: <https://omniaccess-stellar-asset-tracking.com/>

Create your site, and provide site required information. Then access the newly created site configuration.



1. In the Site Location menu, precisely locate your site on the map.
2. Create buildings and floors and upload the map for each created floor.
3. Create an indoor area on each area where you want Asset Tracking to operate.

You can then declare the BLE gateways:

4. Declare each BLE gateway manually or import them from an Excel File/OV csv file.
5. Position each gateway precisely on the map. Specify the accurate height of each gateway.

### Gateways and Walls:

When positioning your gateways on the map, avoid to place them on a wall that may be added in site's configuration later on (see [Mobile](#) tags)



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Mobile tags will allow you to track your assets on the asset-tracking map.

### Available Devices

The following BLE mobile tags models are supported by ALE Asset Tracking Solution :

- Kontakt.io S18-3 asset tags
- Kontakt.io CT18-3 card tags
- Tatwah OAL-AT-WRIST wristband tags

Other tags may be compatible with Asset-Tracking solution. They are listed in a document available on demand. Please note that ALE do not resell these models and do not guarantee the same location accuracy than with above supported tags models.

### Configuration in Asset Tracking Administration Interface

Note: if your site is already in Production, it is **not required** to put it out of Production.

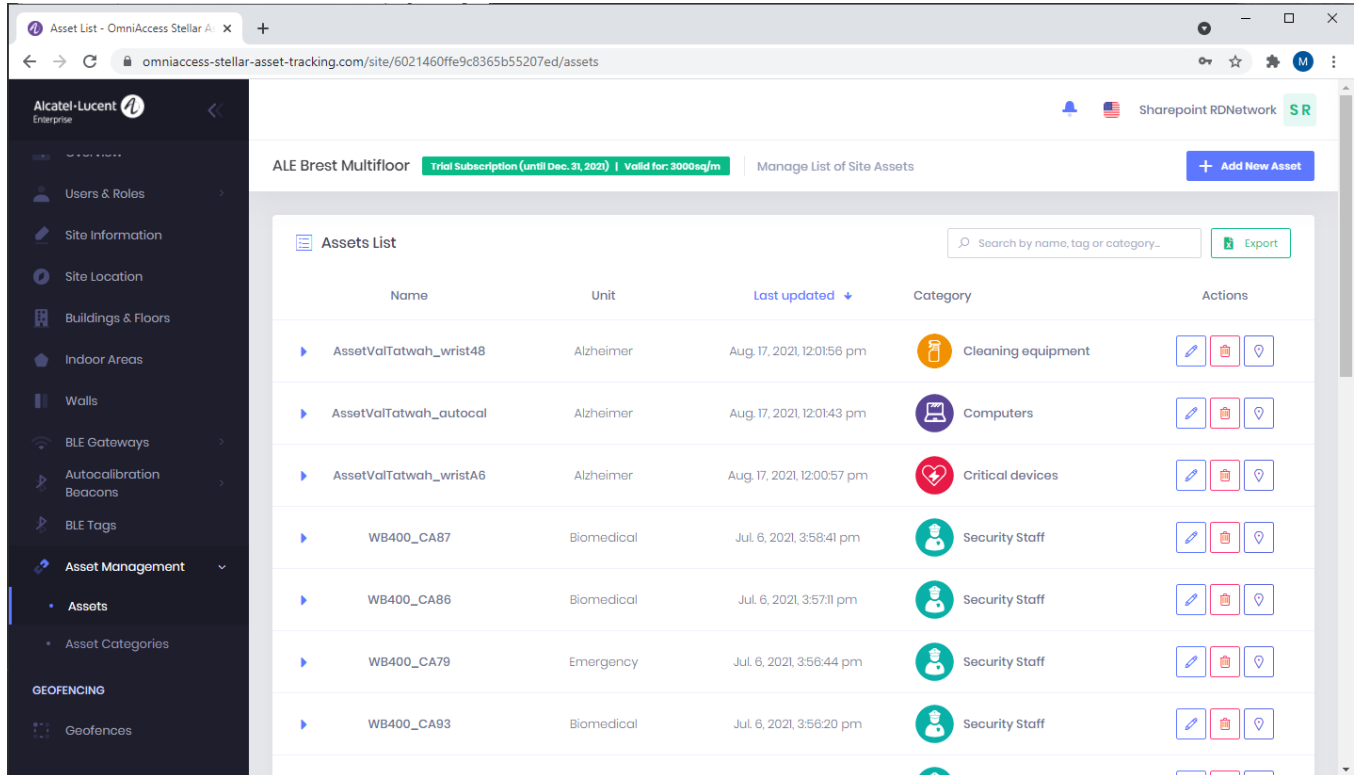
Open the Asset Tracking Administration Interface and access to the site's configuration. Click on BLE tags menu. Add the mobile tags one by one or use the Excel import.

The screenshot shows the 'Tags List' page in the OmniAccess Stellar Administration Interface. The page title is 'Tags List - OmniAccess Stellar As: X'. The URL is 'omniaccess-stellar-asset-tracking.com/site/6021460ffe9c8365b55207ed/tags'. The page displays a table of tags with the following columns: Serial Number, Model, Associated Asset, Battery Status, and Actions. The table contains the following data:

Serial Number	Model	Associated Asset	Battery Status	Actions
StmJle_Card	Card (CT18-3)	AI_Carte_StmJle	100 %	[Edit] [Delete]
StUoNZ_Square	Asset (S18-3)	Demo_AI_Square_StUoNZ	100 %	[Edit] [Delete]
fixedtag_StbfBZ	Asset (S18-3)	AI_asset de test StbfBZ	100 %	[Edit] [Delete]
St3GHE_Square2	Asset (S18-3)	AI_Square2_St3GHE	100 %	[Edit] [Delete]
Fake_RPO	Asset (S18-3)	Patient 6543	Estimote <sup>d</sup>	[Edit] [Delete]
StfebM_Square	Asset (S18-3)	Tablet Nolwenn	100 %	[Edit] [Delete]
StEU3x_Square	Asset (S18-3)	AI_StEU3x_Square	100 %	[Edit] [Delete]
3312_4807-Tatwah-2ndSource-60:C0:BF:19:1C:23	Wristband (WRI-3)	AI_2ndSource_Tatwah	89 %	[Edit] [Delete]
STa0bN	Card (CT18-3)	Visitor #12		[Edit] [Delete]

Once the tags declared, access the asset management menu, create assets and attach them to declared tags. An asset will be displayed on the map **once it is attached to a tag**, and **once the system has detected a movement from this tag**.

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Walls configuration). This will be hard to know in which area it has been positioned and may induce some issues during the heatmap generation.

As an example, if there is a wall between a meeting room and a corridor, and that the gateway has been mounted near to this wall, then when positioning it on map:

- If it has been deployed in the meeting room side of the wall, then position it on the Asset-Tracking map slightly inside the meeting room (and not on the wall).
- If it has been deployed in the corridor side of the wall, then position it on the Asset-Tracking map slightly inside the corridor (and not on the wall).

### BLE Gateway Configuration in Pure Cluster (without OmniVista)

Access Points with BLE function (e.g., AP1201BG, AP1201, AP1230, AP1320, AP1360) can be deployed in a specific position and used as a Bluetooth beacon, announcing a Bluetooth signal in regular time. The gateway can also be used as a Bluetooth signal scanner, scanning the Bluetooth signal in regular time and reporting to the required server. This is the configuration that must be used for Asset Tracking deployment.

The AP1201BG mainly works as a BLE device, and its Wi-Fi function is ONLY used for BLE management. The BLE Feature is enabled by default for the AP1201BG and includes three types of working mode: Advertising, Scanning, and Advertising & Scanning. It advertises the

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Bluetooth signal in Advertising Mode, and scans/collects the Bluetooth signal in Scanning Mode. For Asset Tracking deployment, you must select Scanning & Advertising mode.

To configure the gateways, connect to your cluster in a browser:

*http://<cluster\_ip\_address>:8080*

The screenshot shows the Alcatel-Lucent Enterprise management interface. At the top, it displays 'Alcatel-Lucent Enterprise' and 'AP Group : AP-Group'. The main content area is divided into several sections:

- WLAN:** Shows a table with columns 'WLAN Name', 'Status', and 'Clients'. One entry 'TestForHan' is shown with a status of 'off' and 0 clients.
- AP:** Shows a table with columns 'Primary Name', 'Status', and 'Clients'. Four entries are listed: AP-4B:40, AP-00:00, AP-64:E0, and AP-8D:20, all with a status of 'Working' and 0 clients.
- Monitoring:** Contains four charts:
  - Throughput(Mbps):** A line chart showing RX (blue) and TX (orange) throughput over time (15:49:04 to 15:49:15).
  - Wireless Client:** A line chart showing the number of wireless clients over time.
  - Wireless Client Distribution:** A bar chart showing the distribution of wireless clients across 2.4GHz and 5GHz bands.
  - Wireless Client Health:** A bar chart showing the health status of wireless clients, categorized as Best, Good, or Fair.
- Clients:** A table with columns 'User Name', 'IP', 'MAC', 'WLAN', and 'Auth'. The total number of clients is 0.
- System, Wireless, Access, IOT:** A vertical navigation menu on the left side of the interface.

Open the IOT section to see the public BLE configuration in the Detailed Information section.

The screenshot shows the 'IOT' configuration page. It is divided into two main sections:

- Bluetooth:** A table listing Bluetooth configurations for different APs.
 

Primary Name	IP	Model	Status	Working Mode	Operate
AP-4B:40	172.25.190.39	OAW-AP1201	On	Advertising & S...	Edit
AP-00:00	172.25.190.38	OAW-AP1201	On	Advertising & S...	Edit
AP-64:E0	172.25.190.30	OAW-AP1201	On	Advertising & S...	Edit
AP-8D:20	172.25.190.33	OAW-AP1201			Edit
- Detailed Information:** A panel showing the configuration for the selected Bluetooth device.
 

Bluetooth Configuration	
Working Mode:	Advertising & Scanning
Tx Power:	7
Emission Frequency:	1000
Transmit Channel:	37,38,39
Beacon Mode:	iBeacon
UUID:	01020304-1a2b-3c4d-5e6f-123456789Aaa
Major:	65535
Minor:	65535
Scan Filter Mode:	NoFilter
Scan Type:	Passive
Scanning Interval:	100
Scanning Period:	100

Check the Working Mode in the Detailed Information Panel. it must be “Advertising & Scanning”.

There is a Public BLE configuration and a Private BLE configuration. A Private BLE configuration has a higher priority than a Public BLE configuration. When BLE devices are configured with a Public BLE configuration and Private BLE configuration, the devices will use the Private BLE configuration.

To know which configuration is used on gateways, check the color of the Bluetooth icon for the gateway:

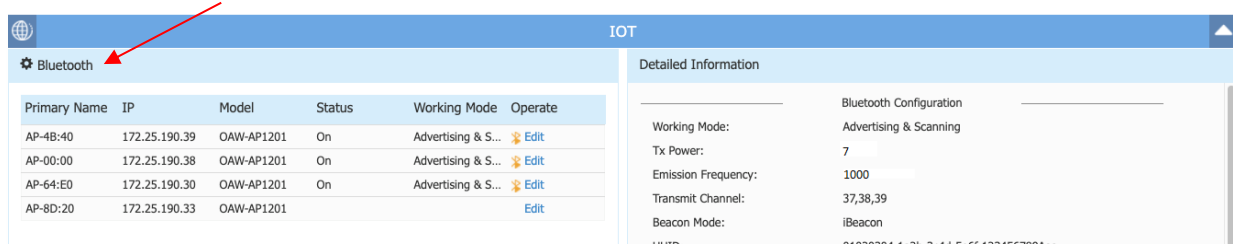
- If the icon is blue, a public configuration is used,

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- If the icon is yellow as in the picture below, a private configuration is used.

### How to Change a Public BLE Configuration

To edit a public BLE configuration, click on the “Bluetooth” label.



The screenshot shows the IOT management interface. At the top, there is a blue header with a globe icon on the left and the text 'IOT' in the center. Below the header, there is a navigation bar with a gear icon and the text 'Bluetooth'. A red arrow points to this 'Bluetooth' label. The main content area is divided into two panels. The left panel is a table with the following data:

Primary Name	IP	Model	Status	Working Mode	Operate
AP-4B:40	172.25.190.39	OAW-AP1201	On	Advertising & S...	<a href="#">Edit</a>
AP-00:00	172.25.190.38	OAW-AP1201	On	Advertising & S...	<a href="#">Edit</a>
AP-64:E0	172.25.190.30	OAW-AP1201	On	Advertising & S...	<a href="#">Edit</a>
AP-8D:20	172.25.190.33	OAW-AP1201			<a href="#">Edit</a>

The right panel is titled 'Detailed Information' and shows the configuration for a selected Bluetooth device. The configuration includes:

- Bluetooth Configuration
- Working Mode: Advertising & Scanning
- Tx Power: 7
- Emission Frequency: 1000
- Transmit Channel: 37,38,39
- Beacon Mode: iBeacon

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In the window displayed, you can set the Working mode. Set it to “Advertising & Scanning”, and ensure that the emission frequency is 1000 ms:

Bluetooth Switch:  on

Working Mode: Advertising & Scanning

Tx Power: 7 (0-19)dbm

Emission Frequency: 1000 (20-10485)ms

Transmit Channel:  Channel 37  Channel 38  Channel 39

Beacon Mode: iBeacon

UUID: 01020304-1a2b-3c4d-5e6f-1234

Major: 65535 (0-65535)

Minor: 65535 (0-65535)

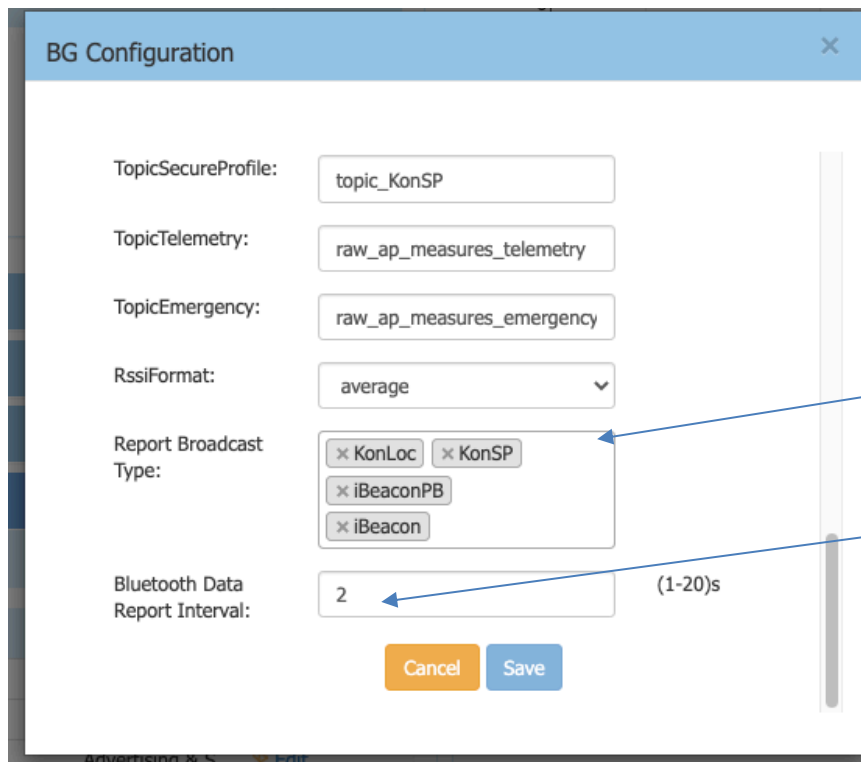
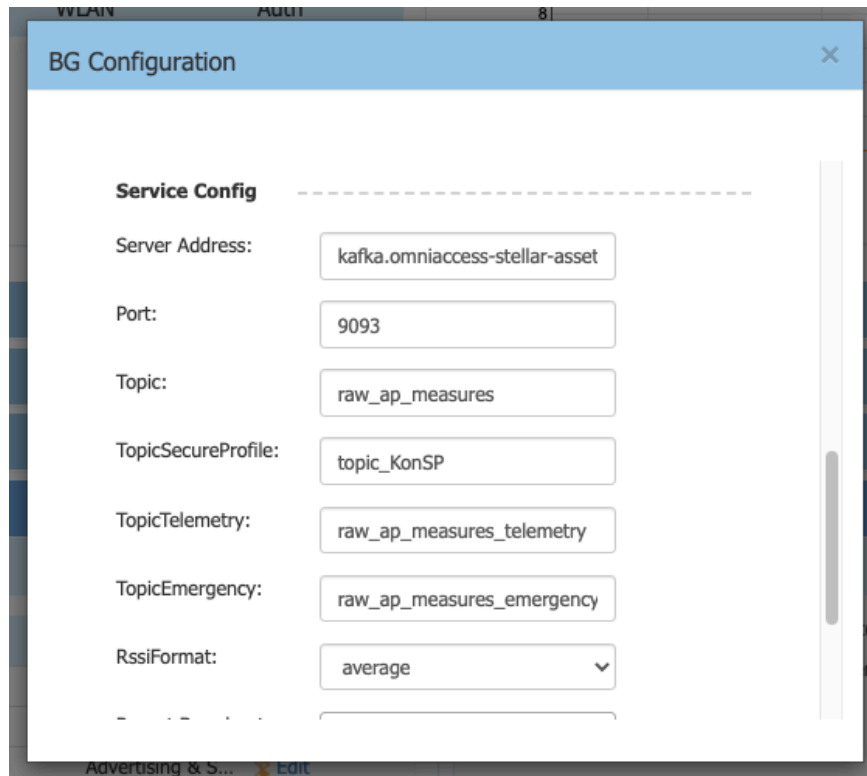
Scanning Interval: 100

Make sure that Beacon Mode is set to “iBeacon” for each gateway.

You also need to check the server configuration:

- Server name should be set to **kafka.omniaccess-stellar-asset-tracking.com**
- Port should be set to **9093** [please note that ports 9093, 9094 and 9095 must be opened on firewall]
- Topic must be set to **raw\_ap\_measures**
- TopicSecureProfile must be set to **topic\_KonSP**
- TopicTelemetry must be set to **raw\_ap\_measures\_telemetry**
- TopicEmergency must be set to **raw\_ap\_measures\_emergency**
- RSSI format can be set to either Average or Complete. Default value is Average
- Report broadcast type must be set to at least **KonLoc**, **KonSP**, **iBeaconPB** and **iBeacon**.

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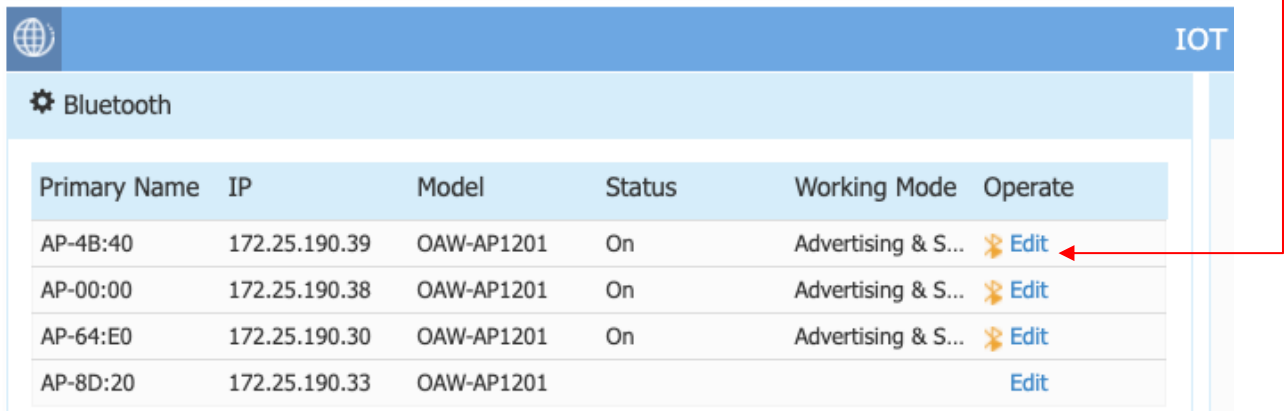


Click inside the area to edit the Report Broadcast Type, if needed.

Ensure that Bluetooth data report interval is set to 2 seconds or less.

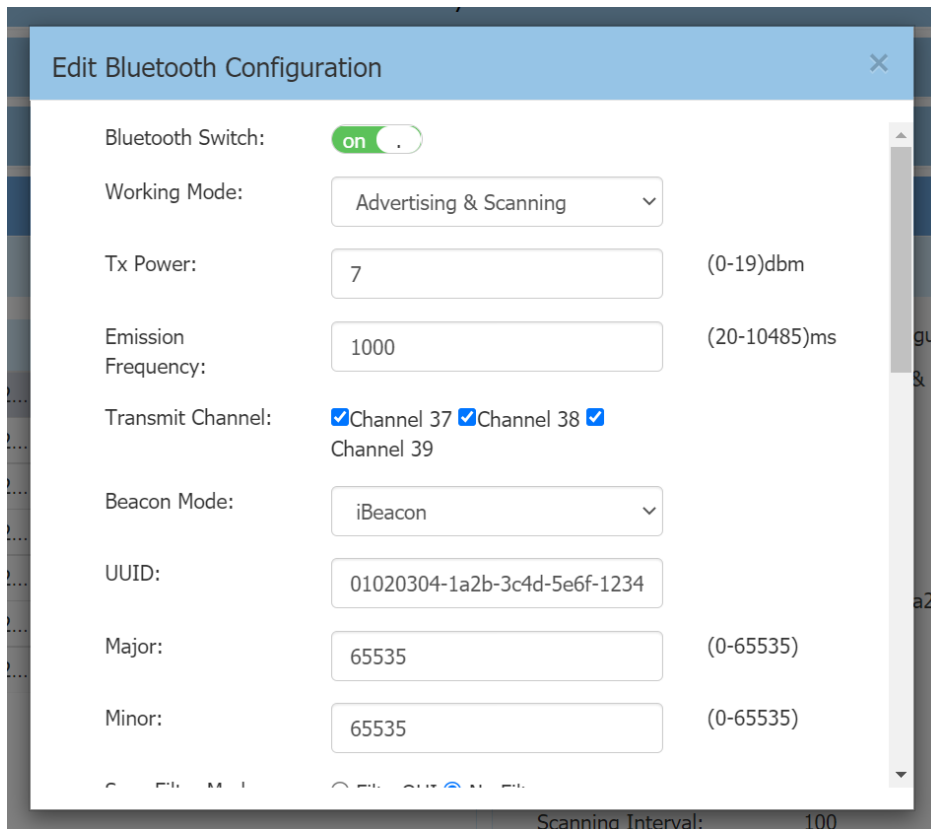
## How to Access and Change a Private BLE Configuration

To access the gateway private configuration, click on the “Edit” label to the right of each gateway:



Primary Name	IP	Model	Status	Working Mode	Operate
AP-4B:40	172.25.190.39	OAW-AP1201	On	Advertising & S...	<a href="#">Edit</a>
AP-00:00	172.25.190.38	OAW-AP1201	On	Advertising & S...	<a href="#">Edit</a>
AP-64:E0	172.25.190.30	OAW-AP1201	On	Advertising & S...	<a href="#">Edit</a>
AP-8D:20	172.25.190.33	OAW-AP1201			<a href="#">Edit</a>

A new window opens in which you can set the Bluetooth parameters for the selected gateway.



**Edit Bluetooth Configuration** ✕

Bluetooth Switch:  on

Working Mode: Advertising & Scanning ▾

Tx Power:  (0-19)dbm

Emission Frequency:  (20-10485)ms

Transmit Channel:  Channel 37  Channel 38  Channel 39

Beacon Mode: iBeacon ▾

UUID:

Major:  (0-65535)

Minor:  (0-65535)

Scanning Interval: 100

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**Edit Bluetooth Configuration**

Server Address: kafka.omniaccess-stellar-asset-ti

Port: 9093

Topic: raw\_ap\_measures

TopicSecureProfile: topc\_KonSP

TopicTelemetry: raw\_ap\_measures\_telemetry

TopicEmergency: raw\_ap\_measures\_emergency

RssiFormat: average

Report Broadcast Type: KonLoc, KonSP, iBeaconPB, iBeacon

**Edit Bluetooth Configuration**

Topic: raw\_ap\_measures

TopicSecureProfile: topc\_KonSP

TopicTelemetry: raw\_ap\_measures\_telemetry

TopicEmergency: raw\_ap\_measures\_emergency

RssiFormat: average

Report Broadcast Type: KonLoc, KonSP, iBeaconPB, iBeacon

Bluetooth Data Report Interval: 2 (1-20)s

Cancel Save

Don't forget to click on Save to apply your changes



## BLE gateway Configuration in Enterprise or OmniVista Cirrus Mode

The AP1201BG does not have a dedicated management UI application in OmniVista, it uses the AP Group and AP management UI. The AP Group configuration page has been enhanced on OmniVista to add in this section the BLE configuration part.

Configuration in OmniVista Cirrus is similar to OmniVista Enterprise. The only difference is that the AP1201BG will not register with OmniVista Cirrus because it does not consume a license. Please note that in OmniVista Cirrus, the status of the AP will remain a “Down”.

## AP1201BG to OVE Registration and License

WMA can have a built-in default AP1201BG group created; if so, when an AP1201BG is registered, it is automatically added to the default-BLEGW-Group and does not consume a license.

Group Name	Auto-Group VLANs	Group Description	Managed AP Count	UnManaged AP Count	RF Profile	Timezone	NTP Server List
default-BLEGW-Group		Not Allowed To Be Deleted	4 APs	0 AP	default profile	Brussels,Copenhagen,Madrid...	pool.ntp.org
default group		Not Allowed To Be Deleted	AP	0 AP	default profile	Brussels,Copenhagen,Madrid...	pool.ntp.org

When other AP models that support the BLE feature (e.g., AP1201, AP1230, AP1320, and AP1360) are registered, they are automatically added to the Default Group but not the default-BLEGW-Group, and they do consume license.

A new attribute, “BLE MAC”, is displayed in the AP registration Access Point Screen as shown below.

AP Name	Group Name	AP MAC	BLE MAC	IP Mode	IP Address
BG-DE:E0	default-BLEGW-Group	dc:08:56:32:de:e0	DC:08:56:32:DE:FF	DHCP	10.130.10.51
BG-E8:80	default-BLEGW-Group	dc:08:56:32:e8:80	DC:08:56:32:E8:9F	DHCP	10.130.10.53
AP-07:00	default group	dc:08:56:0d:07:00		DHCP	192.168.21.50
BG-E8:E0	default-BLEGW-Group	dc:08:56:32:e8:e0	DC:08:56:32:E8:FF	DHCP	10.130.10.54
BG-E7:E0	default-BLEGW-Group	dc:08:56:32:e7:e0	DC:08:56:32:E7:FF	DHCP	10.130.10.52

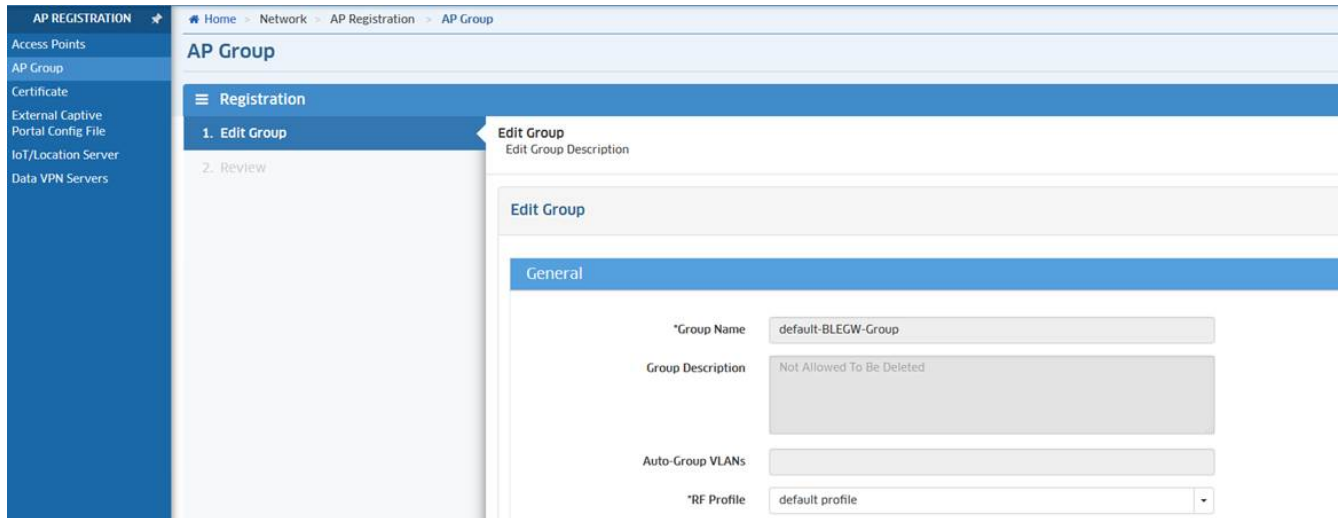
## BLE Configuration in AP Group

The default BLE configuration in the default group and the default-BLEGW-Group are different. For the default group, Advertising Mode and Scanning Mode are both disabled by default; for the default-BLEGW-Group, Scanning Mode is enabled by default.

## Public BLE Configuration

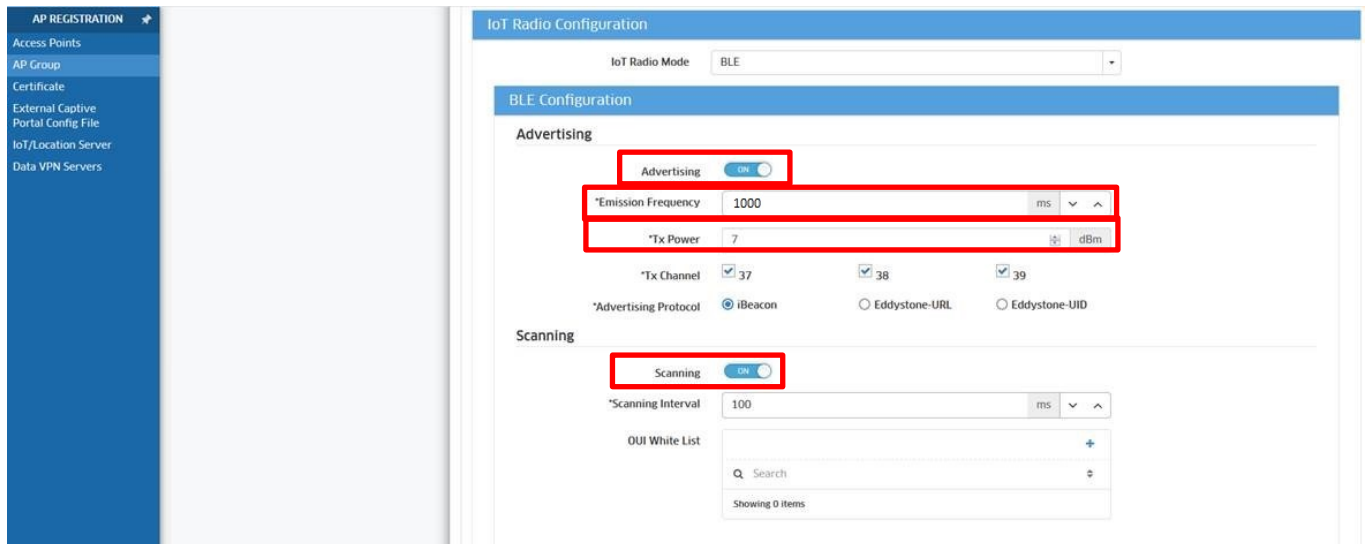
The BLE configuration is done through AP Group configuration modification as shown below.

Path: Home→Network→AP Registration→AP Group, and click on the “Edit” icon.



Configure Advertising and Scanning Mode as shown below.

Path: Home→Network→AP Registration→ AP Group →IoT Radio Configuration and click the Edit icon to set the parameters:



When Scanning Mode is enabled on an AP Group, BLE Location should be selected in Location Service in the AP Group.

The detailed parameters for BLE location are configured as below:

Path: Home→Network→AP Registration→IoT/Location Server, then check the BLE Location and click the Edit icon to set the parameters:

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AP REGISTRATION

Home > Network > AP Registration > IoT/Location Server

### IoT/Location Server

Edit Profile

\*Name: BLE Location

Description: Not Allowed To Be Deleted

\*Engine Type: Stellar

\*Engine Server IP/Host: kafka.omniaccess-stellar-asset-tracking.com

AP Listen Port Number: 9093

#### BLE Location

BLE Location: ON

\*Upload Interval: 2 Second(s)

\*Scanning Type White List: iBeacon, KonLoc, KonSP, iBeaconPB

\*RSSI Format: Average

### Private BLE Configuration

An AP with the BLE feature can also use its private BLE configuration after it is registered with OVE. The private BLE configuration can be set as shown in the screenshots below.

Please note that if the “Use Private Config” switch is disabled, the AP will use the public BLE configuration in its AP Group.

Go to Home→Network→AP Registration→Access Point. First select the AP, and then click on Menu ‘Edit IoT Radio Configuration’.

AP REGISTRATION

Home > Network > AP Registration > Access Points

### Access Points

Managed AP Unmanaged AP Bridge AP

Access Point List

AP Name	Group Name	AP MAC	BLE MAC
<input checked="" type="checkbox"/> BG-E7E0	default-BLEGW-Group	dc:08:56:32:e7:e0	DC:08:56:32:E7:FF
<input type="checkbox"/> BG-E880	default-BLEGW-Group	dc:08:56:32:e8:80	DC:08:56:32:E8:9F
<input type="checkbox"/> BG-E8E0	default-BLEGW-Group	dc:08:56:32:e8:e0	DC:08:56:32:E8:FF
<input type="checkbox"/> AP-0700	default_group	dc:08:56:0d:07:00	
<input type="checkbox"/> BG-DEE0	default-BLEGW-Group	dc:08:56:32:de:e0	DC:08:56:32:DE:FF

General

AP Name: BG-E7E0

Group Name: default-BLEGW-Group

AP MAC: dc:08:56:32:e7:e0

BLE MAC: DC:08:56:32:E7:FF

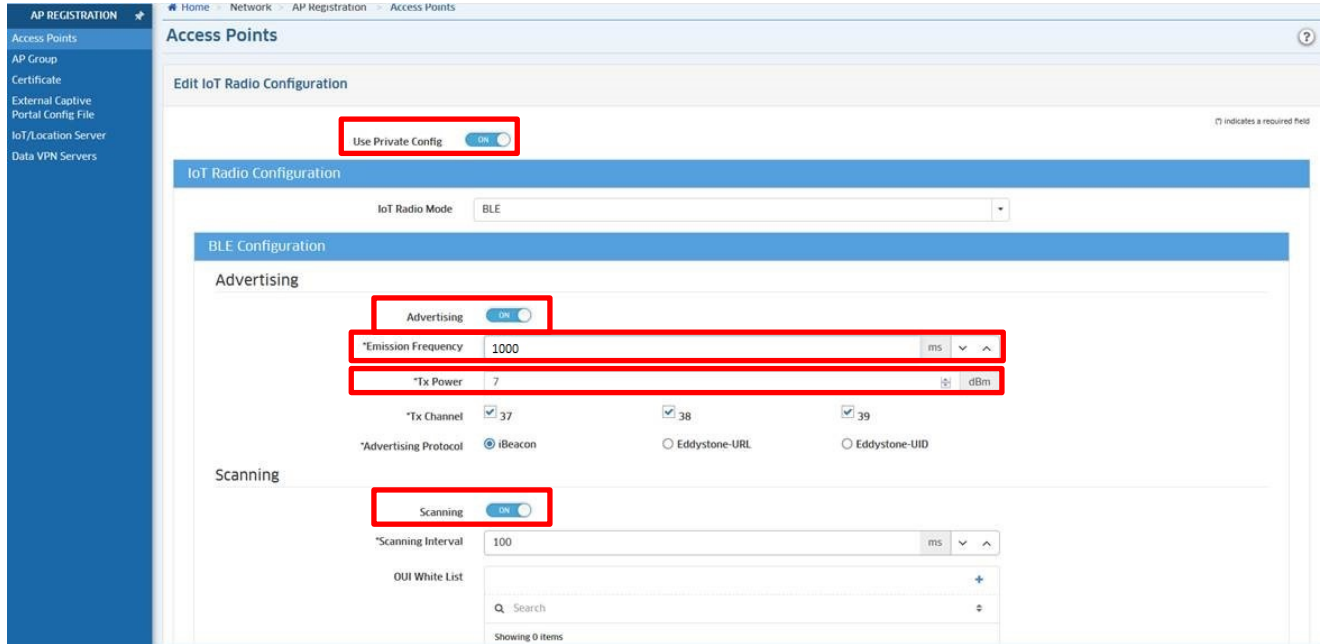
Status: Up

IP Mode: DHCP

IPv4

Edit IoT Radio Configuration

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Then, activate Advertising and Scanning as in the screenshot above.

### Check BLE Gateways Status

Open the Asset Tracking Administration Interface to access to the site's configuration, and open the "BLE Gateways Status" page in the [Troubleshooting](#) section.

Name	MAC Address (BLE)	BLE Gateway Status	Location Frame	Secure Profile Frame	Upload Interval	Last emission ↓
A1_AP4	DC:08:56:13:8D:3F	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:48 pm (5 minutes ago)
A1_AP3n	DC:08:56:2A:4B:5F	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:47 pm (5 minutes ago)
A1_AP8	DC:08:56:2A:00:1F	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:47 pm (5 minutes ago)
A0_BG-E7:E0	DC:08:56:32:E7:FF	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:47 pm (5 minutes ago)
A0_BG-E8:E0	DC:08:56:32:E8:FF	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:47 pm (5 minutes ago)
A0_BG-DE:E0	DC:08:56:32:DE:FF	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:47 pm (5 minutes ago)
A0_BG-E8:C0	DC:08:56:32:E8:DF	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:47 pm (5 minutes ago)
BG-DE-60	DC:08:56:32:DE:7F	• UP	✓	✓	1s	Sep. 7, 2021, 5:48:47 pm (5 minutes ago)

Each of the gateways must appear as **UP** in the BLE Gateway Status column (meaning that tag measures are well received from these gateways).

Each gateway must relay the Location and Secure Profile frames with an upload interval lower than or equal to 2 seconds.

## Troubleshooting

In case of issues with your gateways, have a look to the [Gateways](#) troubleshooting section.

## Autocalibration Beacons

### Available Devices

The following autocalibration beacons can be deployed in an Asset Tracking Solution:

- Polestar OAL-BT beacons
- Tatwah OAL-AT-FIXED beacons
- Kontakt.io S18-3 asset tags, used as beacons (necessitates a tag specific setup, see chapter Kontakt.io Beacons Specific Configuration)
- Kontakt.io CT18-3 card tags, used as beacons (necessitates a tag specific setup, see chapter Kontakt.io Beacons Specific Configuration)

### DISCLAIMER:

In order to get an optimized accuracy, it is highly recommended to use the Tatwah OAL-AT-FIXED beacons, introduced in AT 1.0.3, for the autocalibration as fixed tag.

Polestar OAL-BT beacons, even if compatible with the solution, sometimes deliver some signal variations that may affect the overall system accuracy. Homogeneity of tags measures and frames is key to get the best level of accuracy.

Kontakt.io S18-3 and CT18-3 are not aimed to be used as beacons, as their batteries are not sized for this purpose.

## Autocalibration Beacon Deployment

### General recommendations

Fixed tags are used to collect data to generate fingerprints and optimize algorithms. Fixed tags should be evenly distributed in the covered area.

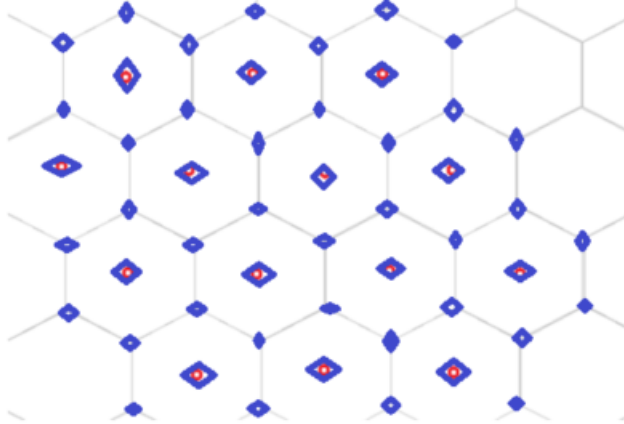
Fixed tags must be deployed from 1,5 to 3 meters in height. Their elevation height should be lower than the site's gateways height.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

The interval between fixed tags should be **about 4 to 8 meters**, and the tags should be deployed on a walkway as much as possible.

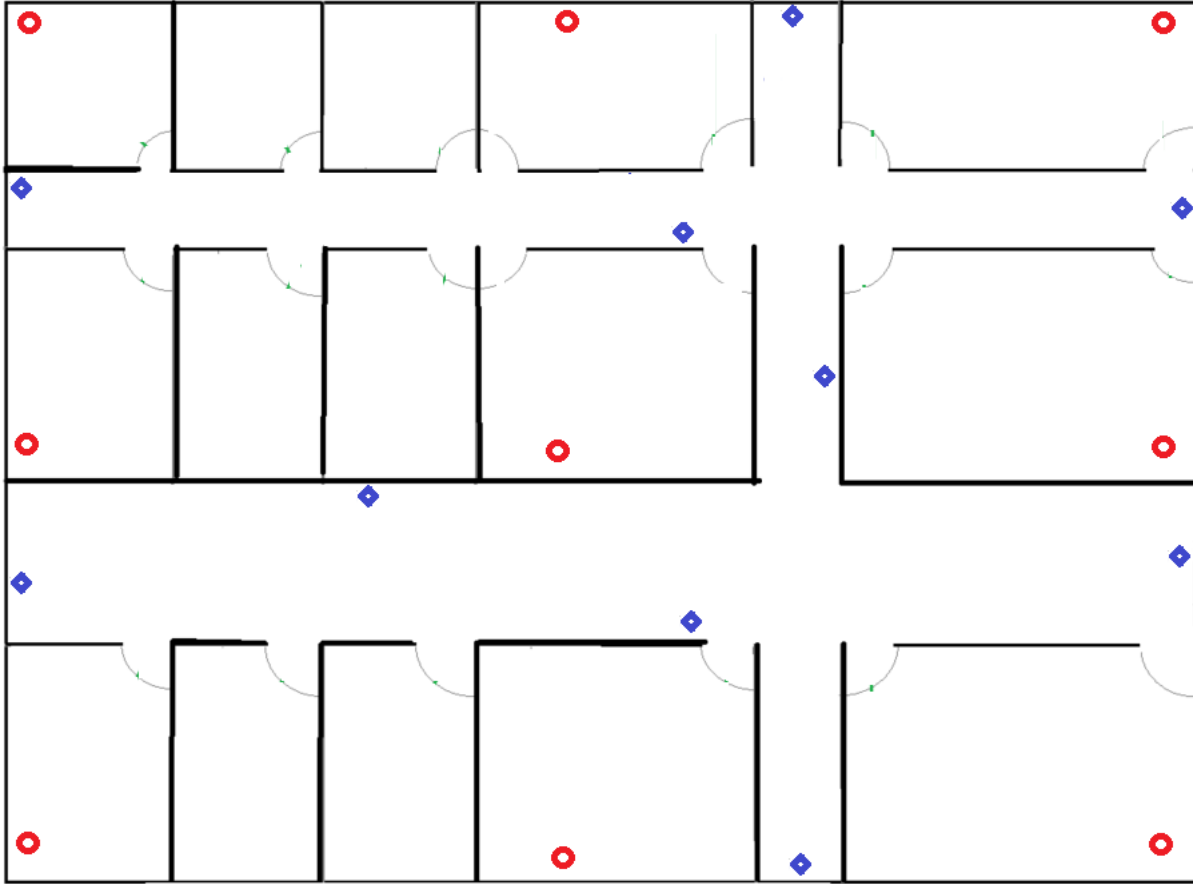
**In any place of the covered area, there should be a beacon deployed within 5 meters.**

In open areas, fixed tags should be deployed as evenly as possible in the covered area.



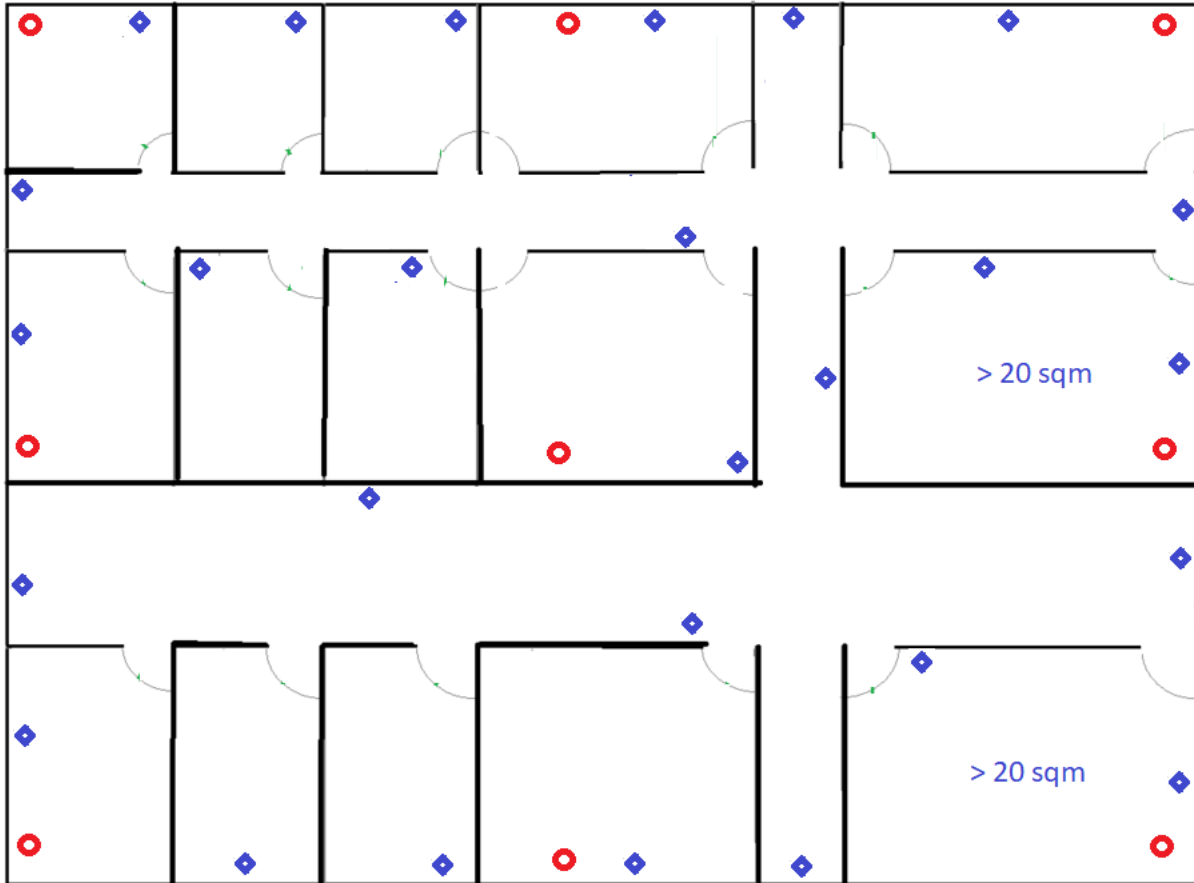
In a narrow aisle area, the fixed tag spacing should be about 4 to 8 meters.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



Within a room, depending on the size of the room, one or more fixed tags should be deployed in each room. When a room is larger than 20 square meters, one fixed tag should be deployed approximately every 20 square meters.

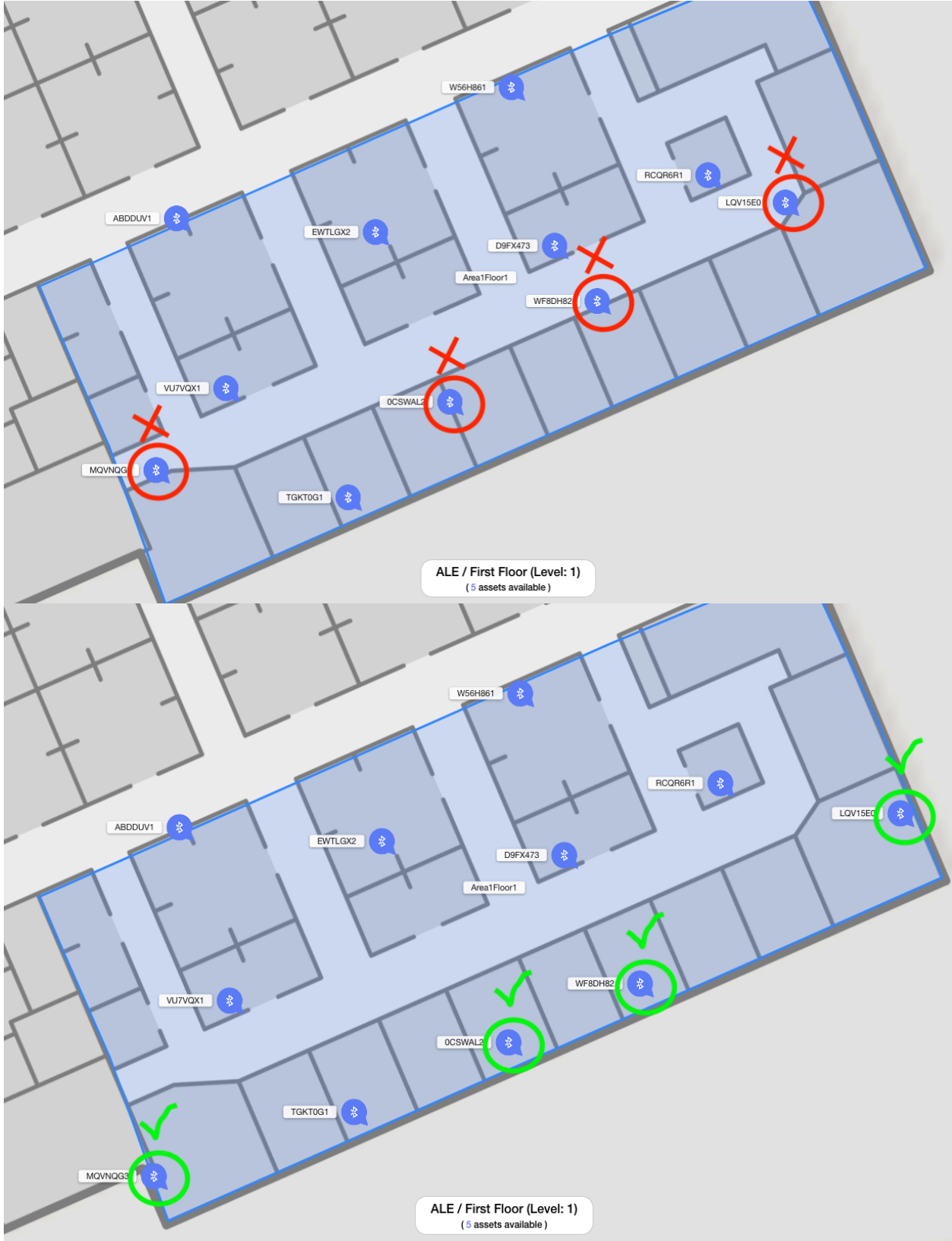
## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



When possible, try to position the calibration beacons **on the outer walls** of the defined indoor area, rather than on a dividing wall between two spaces inside the indoor area.

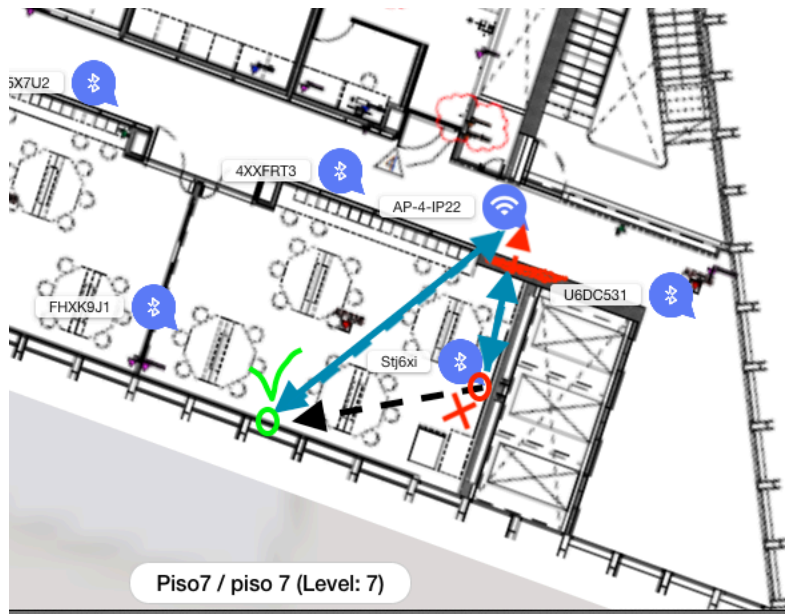


# OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

When positioning the beacons, check that their signal towards the nearest gateways will not be obstructed by some concrete wall, concrete pillar or elevator cab for example. If so, try to find another more appropriate location.



### Particularly for the Polestar beacons:

The beacons that are positioned **on the outer walls of the indoor area** can be positioned **vertically** on the walls.

When positioning a Polestar beacon **somewhere inside the indoor area**, try when possible to position them **horizontally** so that they will emit equally in all directions. Our tests have shown that a Polestar beacon emits much stronger from its large faces.

On a low wall like the dividing walls of an open space, prefer to position the beacons horizontally on the top side of the wall rather than vertically on the side of the wall.

### **Multi-floor deployment**

Multi-floor deployment is possible with Asset-Tracking solution.

**The attenuation between floors must be sufficient, in order to ensure a correct differentiation of the ble measures received from the different floors.** In limit cases, if the attenuation is too low, assets may appear on another floor than the one they are currently located.

In case of multi-floor deployment:

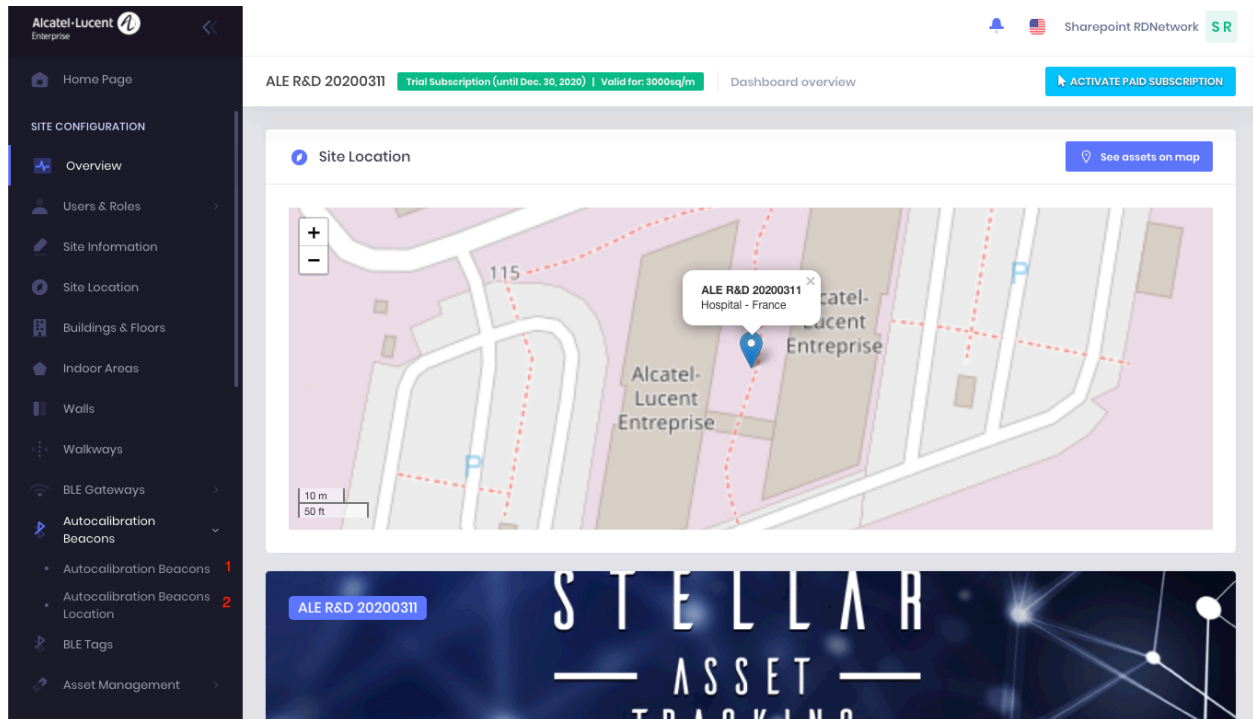
- Position the beacons on each floor according to the above recommendations

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

- When possible, position one beacon near to the floor accesses (stair, elevator) to speed up the assets' floor transitions.

### Configuration in the Asset Tracking Administration Interface

Open the Asset Tracking administration interface and access the site's configuration.



A Site must be out of Production during configuration. If your site is already in Production, take the site out of Production, make any needed configuration updates, then put it back into Production.

1. Open the “Autocalibration Beacons” page. Create each of the beacons manually or import them from an Excel template file.
2. Open the “Autocalibration Beacons Location” page. Precisely locate each beacon on the appropriate floor. Make sure that each beacon is in the previously-defined indoor areas, or they will not be taken into account by Fingerprint.
3. While defining each beacon’s location, ensure to also provide their accurate height.

## Autocalibration beacons and Walls:

When positioning your beacons on the map, avoid to place them on a wall that may be added in site's configuration later on (see [Mobile](#) tags)

Mobile tags will allow you to track your assets on the asset-tracking map.

## Available Devices

The following BLE mobile tags models are supported by ALE Asset Tracking Solution :

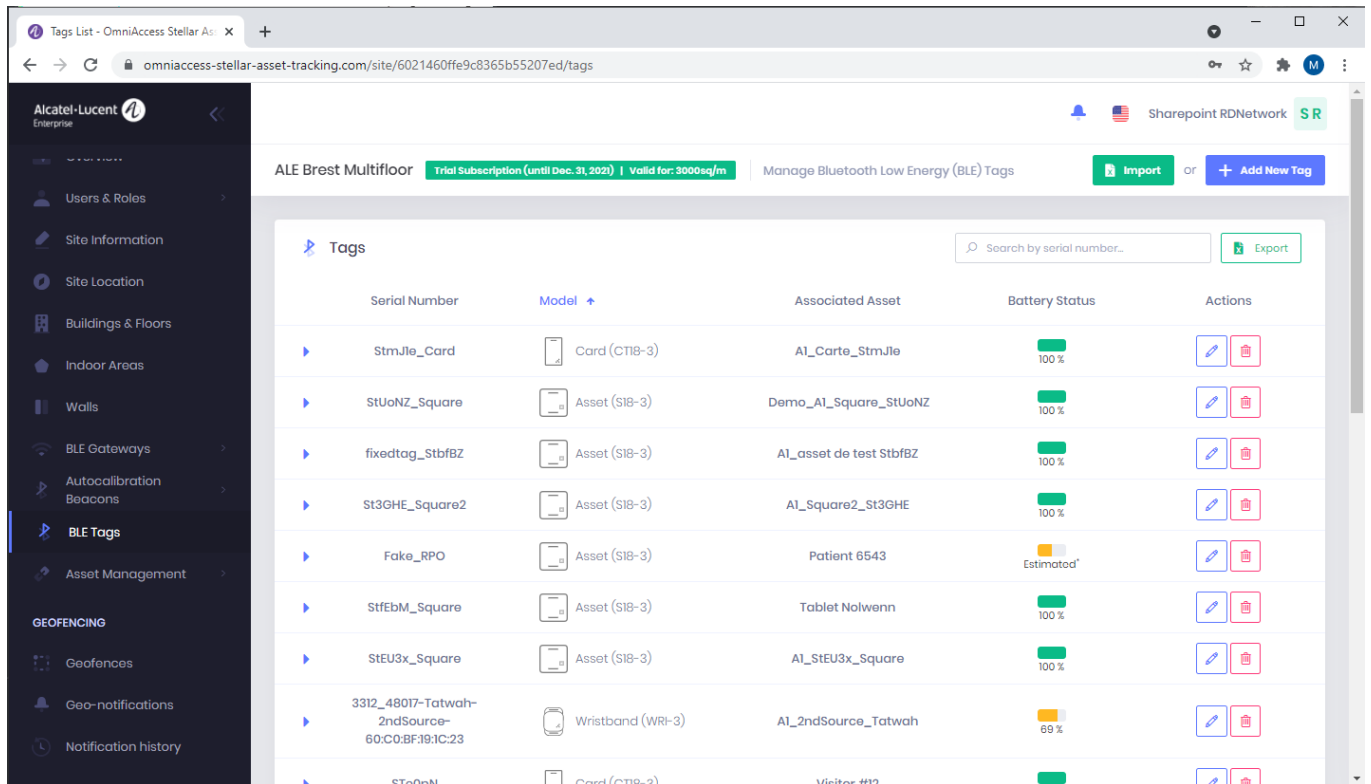
- Kontakt.io S18-3 asset tags
- Kontakt.io CT18-3 card tags
- Tatwah OAL-AT-WRIST wristband tags

Other tags may be compatible with Asset-Tracking solution. They are listed in a document available on demand. Please note that ALE do not resell these models and do not guarantee the same location accuracy than with above supported tags models.

## Configuration in Asset Tracking Administration Interface

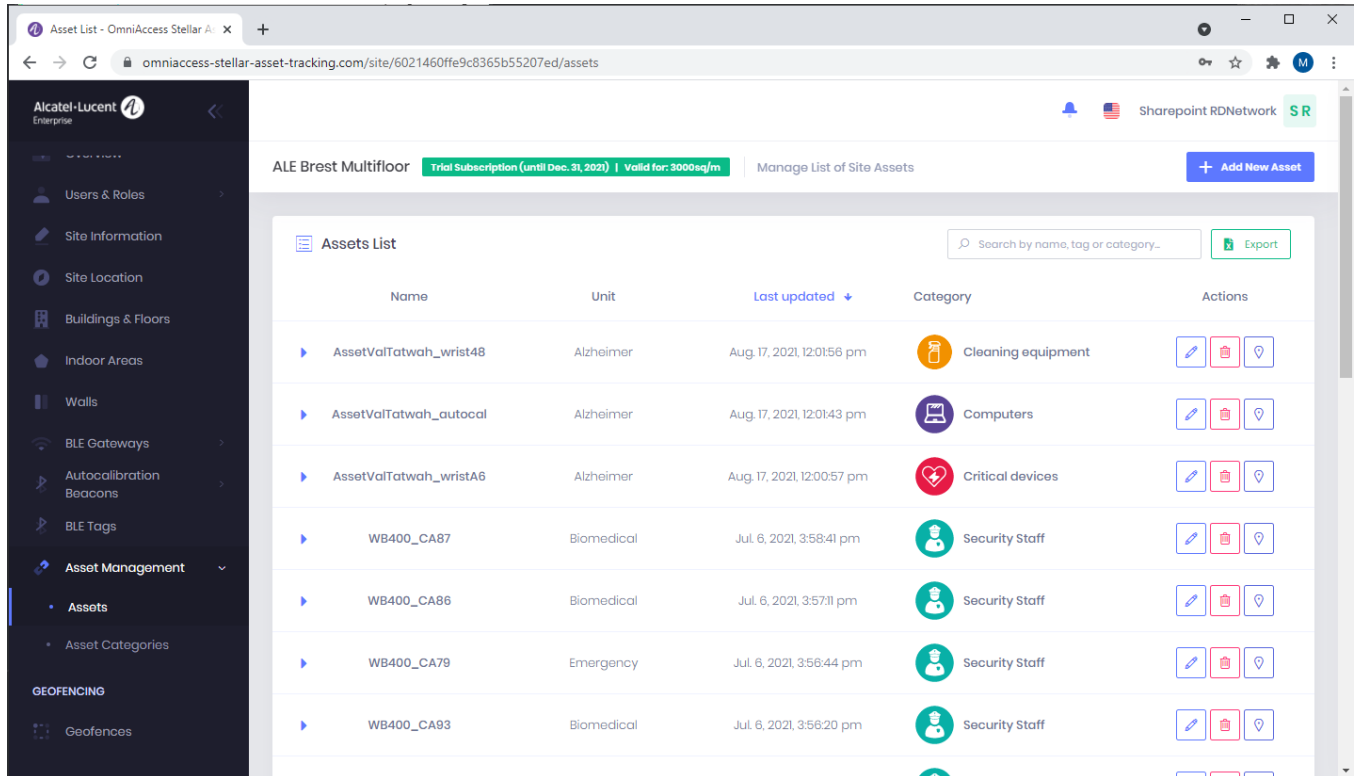
Note: if your site is already in Production, it is **not required** to put it out of Production.

Open the Asset Tracking Administration Interface and access to the site's configuration. Click on BLE tags menu. Add the mobile tags one by one or use the Excel import.



## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

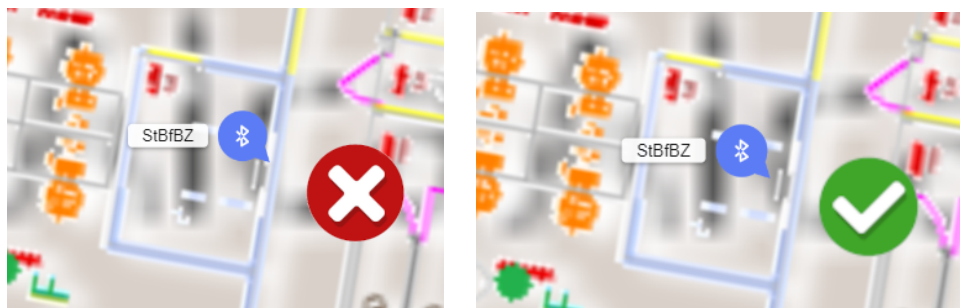
Once the tags declared, access the asset management menu, create assets and attach them to declared tags. An asset will be displayed on the map **once it is attached to a tag**, and **once the system has detected a movement from this tag**.



Walls configuration). This will be hard to know in which area it has been positioned and may induce some issues during the heatmap generation.

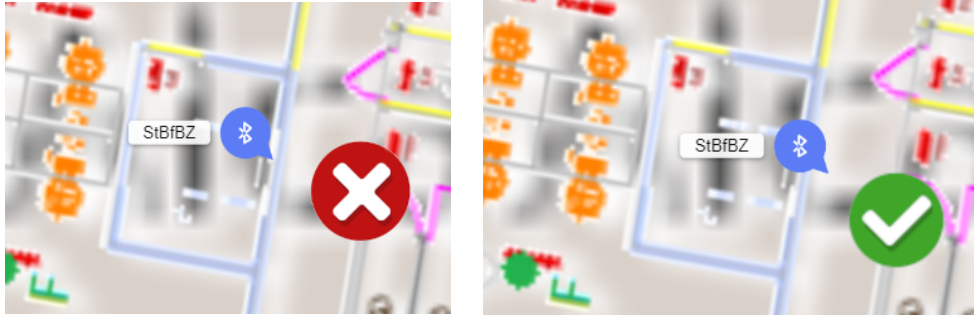
As an example, if there is a wall between a meeting room and a corridor, and that the beacon has been stuck on this wall, then when positioning it on map:

- If it has been deployed in the meeting room side of the wall, then position it on the Asset-Tracking map slightly inside the meeting room (and not on the wall).



## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

- If it has been deployed in the corridor side of the wall, then position it on the Asset-Tracking map slightly inside the corridor (and not on the wall).

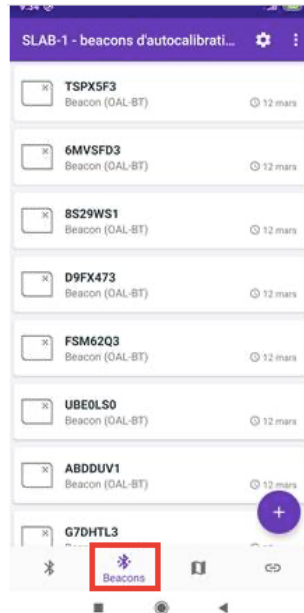


### Provisioning Autocalibration Beacons with the Asset Tracking Android App

Autocalibration beacons can also be declared using the OmniAccess Stellar Asset Tracking Android application, available on the Play Store:

<https://play.google.com/store/apps/details?id=com.ale.omniaccessassettracking>

1. Start the application and sign in using the same account used in the web application.
2. Select the site on which you want to register new Autocalibration Beacons.
3. Click on the “Beacons” item available on the bottom menu.



4. Click on the “+” button to add a new Beacon.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

5. Click on the “Scan Bar Code” or “Scan QR Code” button to scan the QR code of your tag:



6. The form is automatically completed with all Beacon information.
7. Click on the “Create Beacon” button to add your new Beacon.

### Kontakt.io Beacons Specific Configuration

This configuration is **not required** for Kontakt.io tags used as mobile tags.

In order to get an optimized accuracy, it is highly recommended to use the Tatwah OAL-AT-FIXED beacons, introduced in AT 1.0.3, for the autocalibration as fixed tags.

Kontakt.io S18-3 and CT18-3 tags are not aimed to be used as beacons, as their batteries are not sized for this purpose.

If you want anyway to use Kontakt.io tags as autocalibration tags, you will have to do a custom configuration. By default, these tags are configured with power-saving mode activated and will not emit RSSI frames except when they are in motion. This mode must be deactivated in this specific use case.

To help configuring these beacons by using the internal tool, please contact the ALE professional services teams.

If you want to do it by yourself, here are the guidelines to disable the power saving mode.

**⚠ Note:** the internal tool is the only way to change the frequency emissions of beacons to save the battery life. For this specific need, please contact the ALE professional services teams.

For this configuration phase, you will have to:

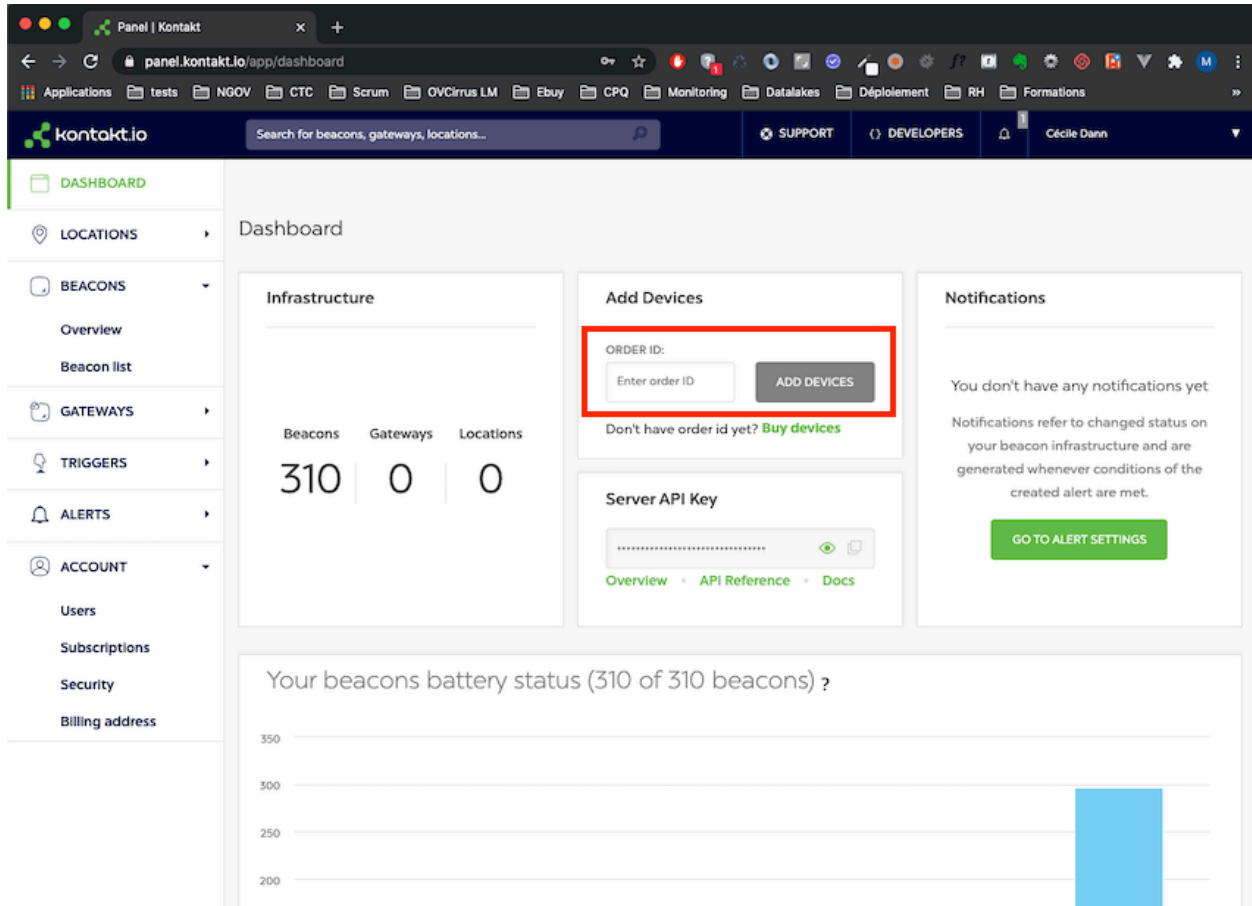
- Be near to the tag,

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

- Have an http browser with access to internet
- Have an Android/IOS smartphone with the Kontakt.io application installed.

With your browser, login on Kontakt.io web panel: <https://panel.kontakt.io/app/dashboard>

If you have not already done so, create an account on the Kontakt.io website. After logging in, you will need to associate your tags to your account by entering the Order ID in the interface, as shown below.

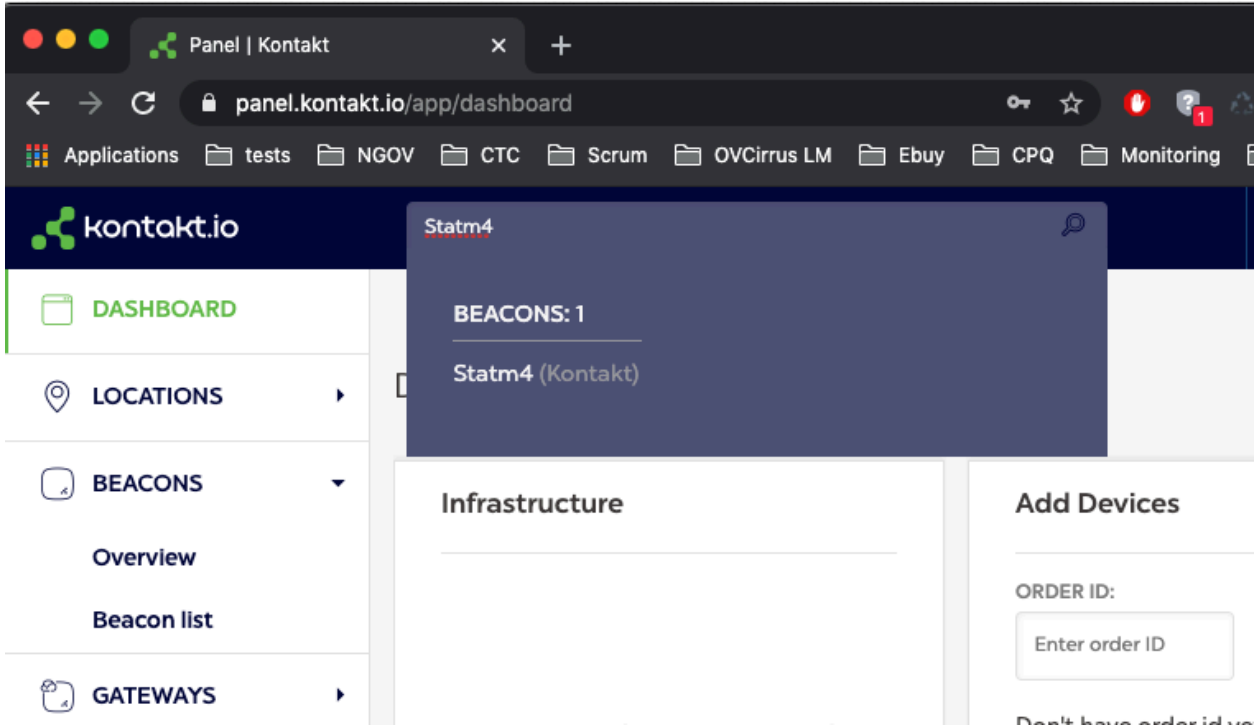


You can find the Order ID either in the box you received with your tags, or in the email received following the order.

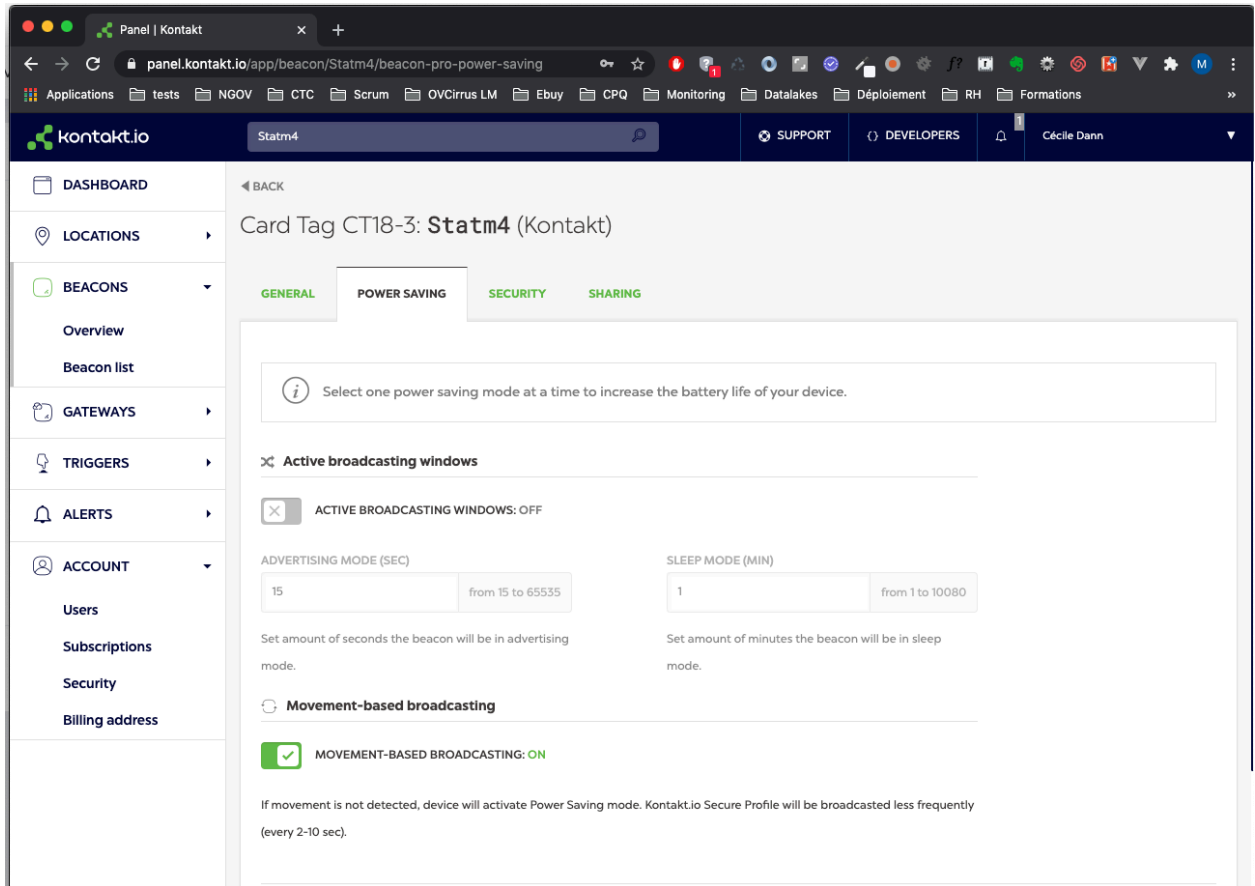
Once your tags available in the web panel, search for the tag you want to configure by entering the serial number in the search bar at the top of the panel.



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Open the tag configuration, and browse to the 2<sup>nd</sup> tab (Power Saving tab).



## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

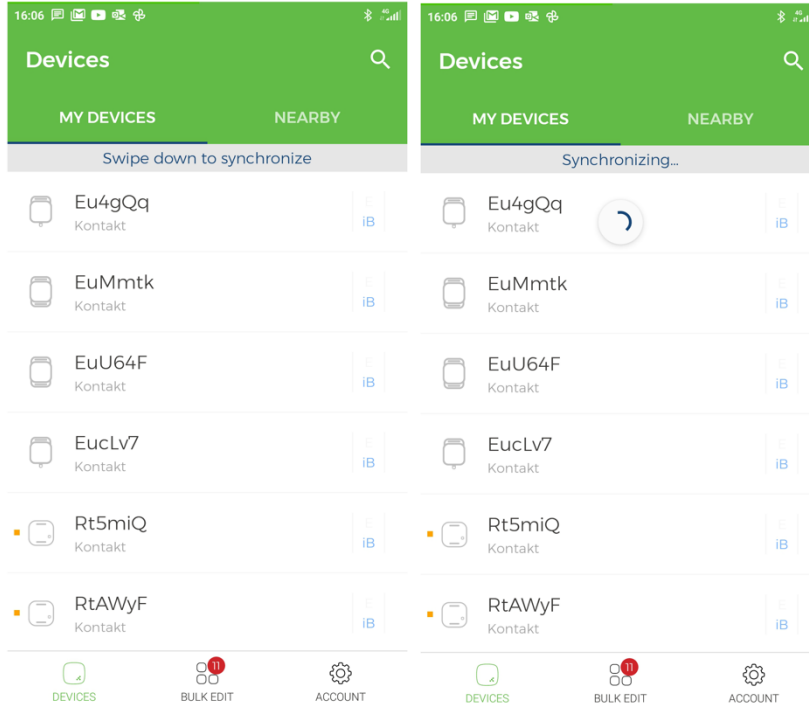
The Movement-Based Broadcasting option might be enabled by default. This is the option that we want to modify.

Before doing the update, open the Kontakt.io application on your smartphone.

<https://play.google.com/store/apps/details?id=io.kontakt.app&hl=fr>

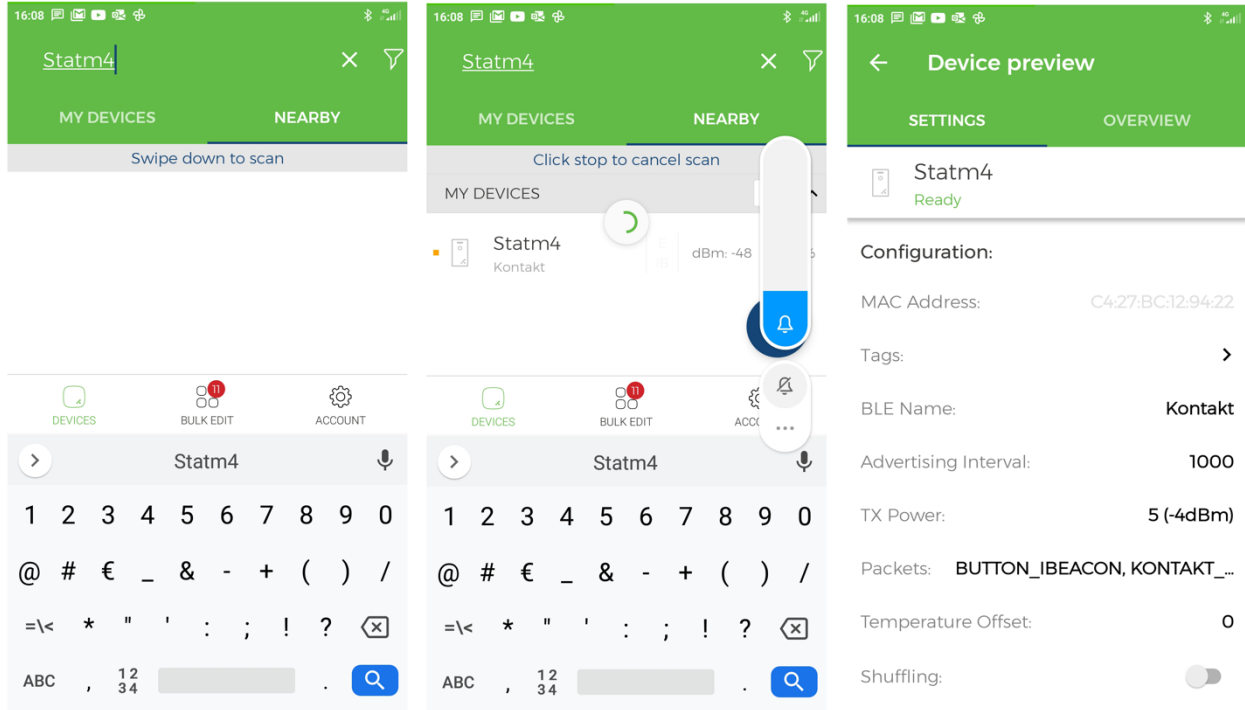
<https://apps.apple.com/us/app/kontakt-io-administration-app/id1067320511>

Login with your Kontakt.io account, swipe down on the “My devices” tab to ensure that your tags configuration is up-to-date in the application.

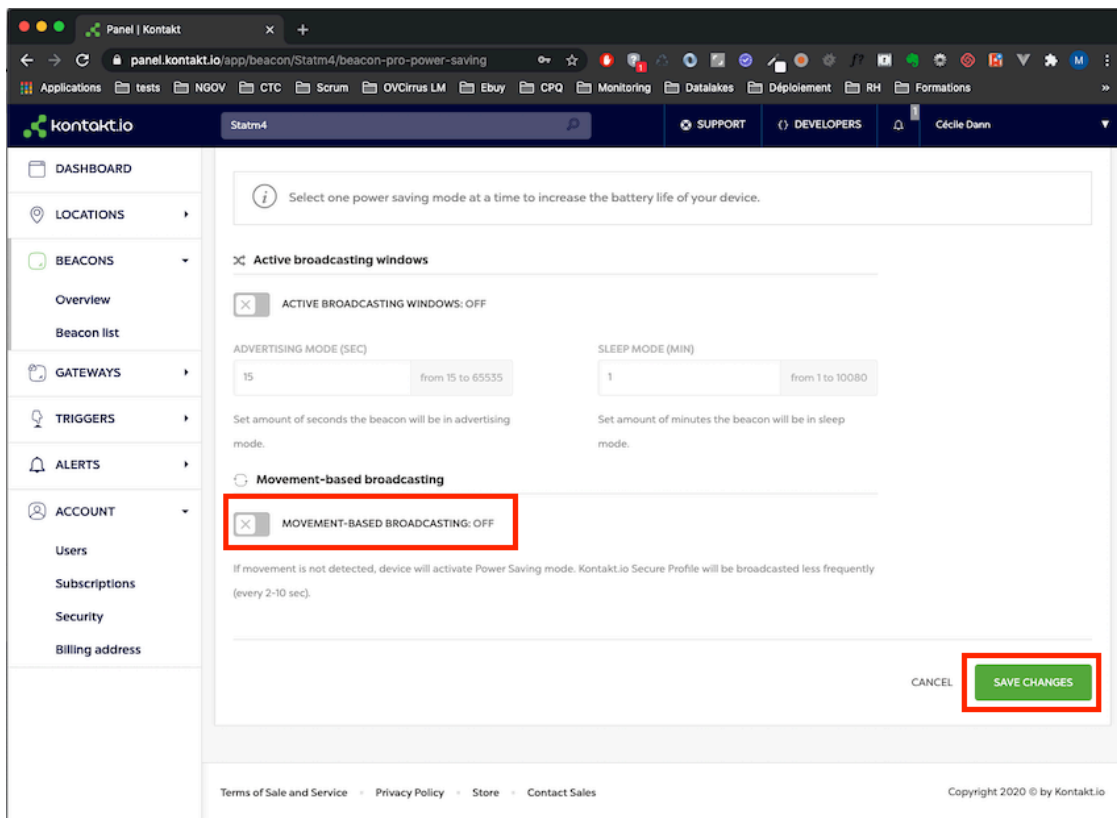


Go to the “Nearby” tab and enter the tag serial number on top search bar. Then swipe down, if you are near to your tag it may appear in the list. Open the Tag Configuration page.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



You can now go back to Kontakt.io web panel and update the tag configuration. Set the Movement-Based Broadcasting option to “Off” and click on the “Save Changes” button.



The following message may appear in the browser.

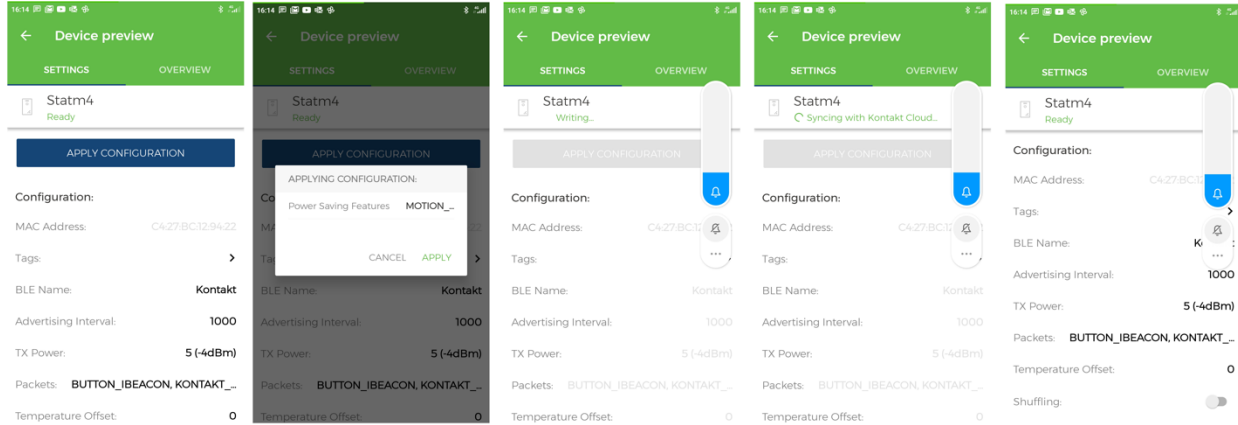
## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

Card Tag CT18-3: Statm4 (Kontakt)

GENERAL POWER SAVING SECURITY SHARING

Some properties aren't synchronized with your device. Your device's settings can be updated by Gateway with Infrastructure Management or with the Kontakt.io Admin App [Cancel config](#)

This is normal. You now must push the configuration to the tag using the mobile application. In the mobile application, a button “Apply configuration” should have appeared in the tag configuration. Confirm the configuration, this will propagate it to the tag.



Your tag is now correctly configured to be used as an autocalibration tag in your asset-tracking solution.

### Check Beacons Status through administration interface

Once the beacons are deployed on site and configured in the Administration Interface, open the Asset Tracking Administration Interface and access the “Beacons Status” page in the [Troubleshooting](#) section.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

Beacons with low coverage  
(Seen by less than 3 BLE Gateways) **0**

Beacons with good coverage  
(Seen by 3 or more BLE Gateways) **6**

### Autocalibration Beacons List

Search by serial number... Refresh

Serial Number	Beacon MAC Address	Beacon scanned by	Coverage	Actions
C3GRQB1	C8:DF:84:34:20:7C	3 BLE Gateways	• Acceptable	More details
M7SBK33	C8:DF:84:34:23:05	3 BLE Gateways	• Acceptable	More details
3URBAK0	C8:DF:84:34:26:24	4 BLE Gateways	• Excellent	More details
X92MMK0	C8:DF:84:2A:1C:97	4 BLE Gateways	• Excellent	More details
7AHNME3	C8:DF:84:34:20:75	4 BLE Gateways	• Excellent	More details
9SM09E0	C8:DF:84:34:24:92	4 BLE Gateways	• Excellent	More details

20 Showing 1 - 6 of 6 records

All beacons must have acceptable coverage, which means that they must be seen by at least 3 BLE gateways. If this is not the case, check for the following:

- BLE gateways are out-of-date or incorrectly configured. All BLE gateways must be up-to-date and properly configured as described in previous chapters of this document.
- BLE gateways are too far from each other. The recommended distance between 2 gateways is 10 to 15 meters. See full recommendations in the previous chapters of this document.
- Beacons may be flat or dysfunctional. You can check it with Kontakt.io Android/IOS application.

### Check Beacons RSSI distribution using ALE Asset-Tracking Bot interface

See chapter [Check Beacons Status using ALE Rainbow Bot](#) in troubleshooting section.

### Troubleshooting

In case of issues with the deployment of the autocalibration beacons, have a look to the [Autocalibration Beacons](#) troubleshooting section.

## Mobile tags

Mobile tags will allow you to track your assets on the asset-tracking map.

## Available Devices

The following BLE mobile tags models are supported by ALE Asset Tracking Solution :

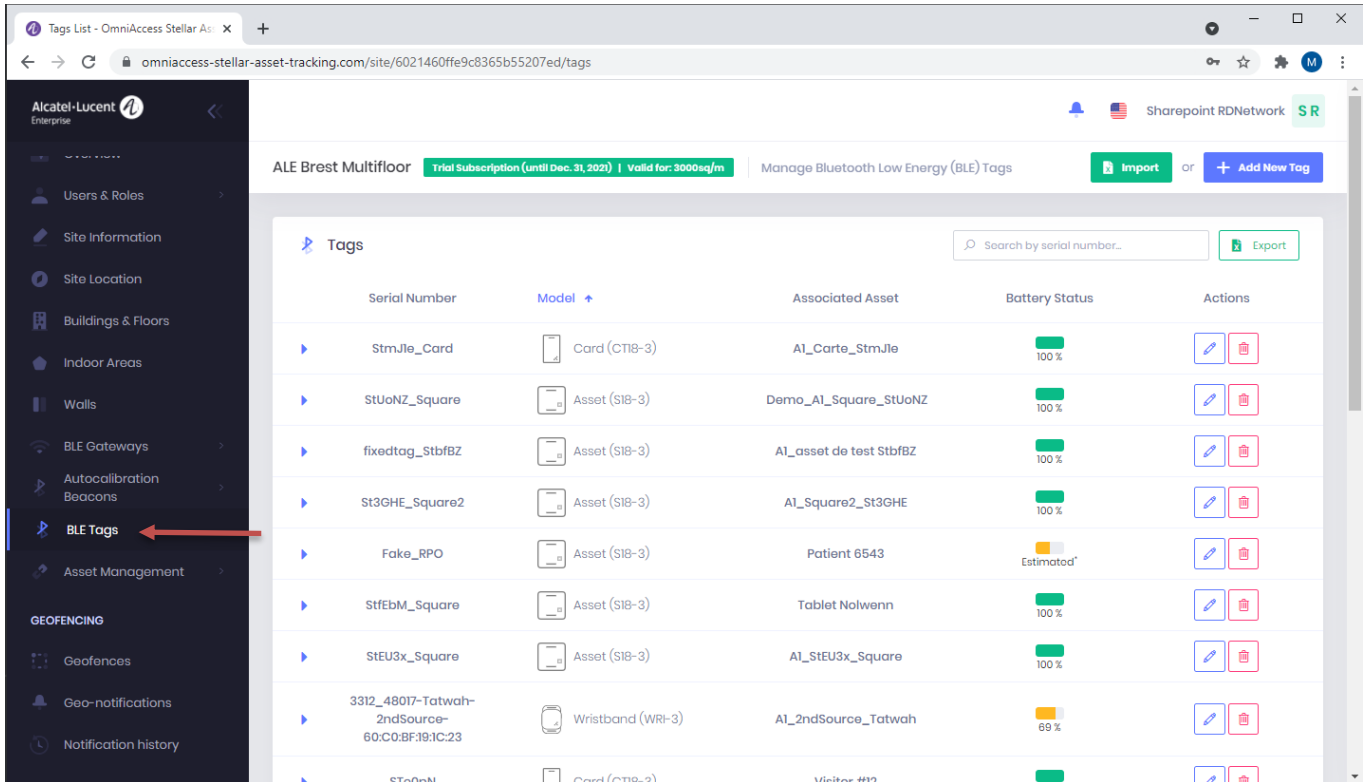
- Kontakt.io S18-3 asset tags
- Kontakt.io CT18-3 card tags
- Tatwah OAL-AT-WRIST wristband tags

Other tags may be compatible with Asset-Tracking solution. They are listed in a document available on demand. Please note that ALE do not resell these models and do not guarantee the same location accuracy than with above supported tags models.

## Configuration in Asset Tracking Administration Interface

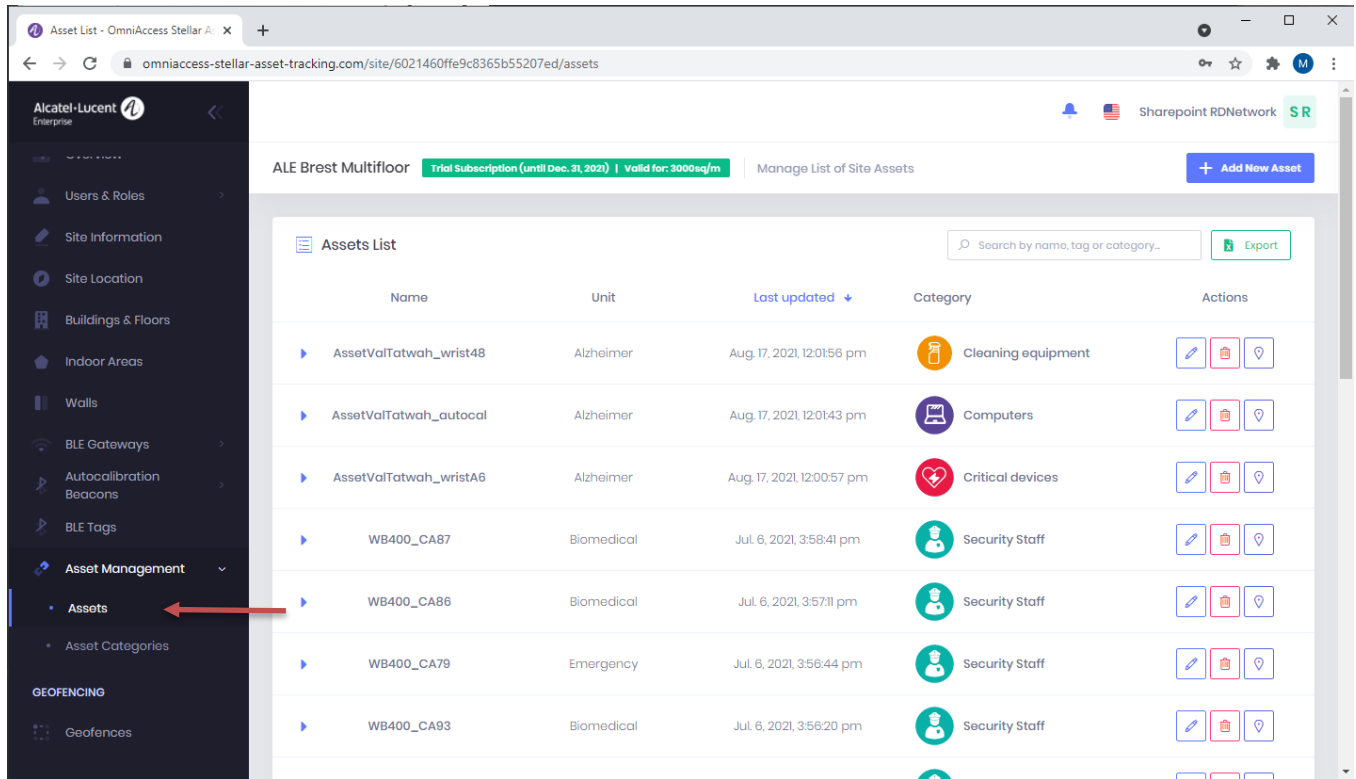
Note: if your site is already in Production, it is **not required** to put it out of Production.

Open the Asset Tracking Administration Interface and access to the site's configuration. Click on BLE tags menu. Add the mobile tags one by one or use the Excel import.



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Once the tags declared, access the asset management menu, create assets and attach them to declared tags. An asset will be displayed on the map **once it is attached to a tag**, and **once the system has detected a movement from this tag**.



## Walls

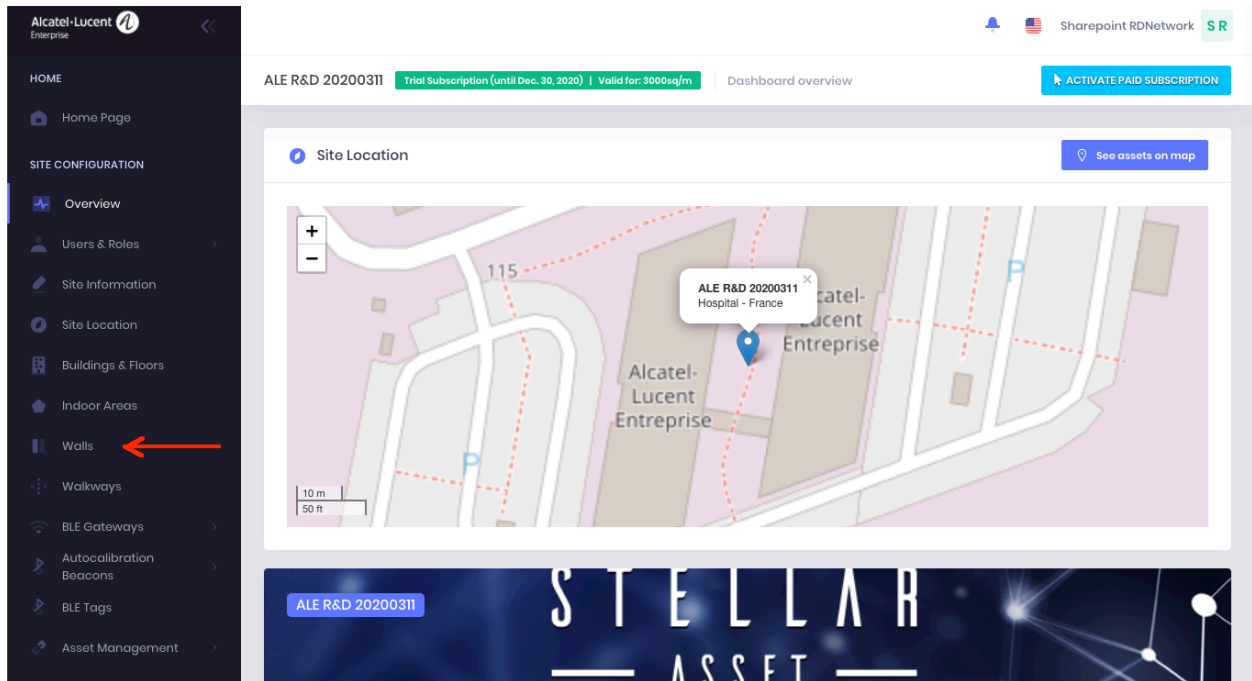
Walls will help to increase the Asset-Tracking position accuracy, taking into account the space configuration for the Asset-Tracking Fingerprint calculation.

Note that it is not required to draw the outer walls. This will not increase the accuracy, only inner walls which may obstruct the signal between tags/beacons and gateways are valuable information to be considered for location calculation.

## Configuration in Asset Tracking Administration Interface

Open the Asset Tracking Administration Interface and access to the site's configuration.

# OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



A Site must be out of Production during configuration. If your site is already in Production, take the site out of Production, make any needed configuration updates, then put it back into Production.

Open the “Walls” page. Create each wall on site, taking into account the type of wall. Depending on the wall type, Fingerprint will be calculated with the appropriate RSSI attenuation.

## Fingerprint

### Fingerprint Generation

After positioning all the gateways and beacons on site, switch the site to Production mode.

For 5 minutes, the system will collect measures coming from the site’s beacons.

Then, the FingerprintEngine will start generating the fingerprint. After fingerprint generation is complete, the LocationEngine will start working.

**Note:** If you want to modify information such as gateways, fixed tags, or walls after the fingerprint is generated, you should first turn off Production mode, perform the modification, and then regenerate the fingerprint.

Modifications that required you to regenerate fingerprints:

- add or delete building
- add or delete floor
- add, delete or edit indoor areas
- add or delete gateways



## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

- change gateway's location
- add or delete fixed tags
- change fixed tags location
- add, delete or edit walls

## Troubleshooting

Once the site is deployed and fully configured, you can follow the steps described below to troubleshoot your deployment.

Connect to the [OmniAccess Stellar Asset Tracking](#) webapp and select your site.

In the page displayed, you should see the Troubleshooting Menu.

The screenshot displays the webapp interface. On the left, a dark sidebar contains a menu with the following sections: HOME (Home Page), SITE CONFIGURATION (Overview), ASSET TRACKING (Asset Search), and TROUBLESHOOTING (Autocalibration List, BLE Gateways Status, Beacons Status, BLE Tags Status, Heatmap). The TROUBLESHOOTING section is highlighted with a red border. The main content area shows a map titled 'Site Location' for the site 'ALE R&D Brest-3AP-Kontakt.io autocal'. The map includes a location pin, a scale bar (10m/50ft), and a 'See assets on map' button. Below the map, there is a 'Site informations' section.

## Gateways

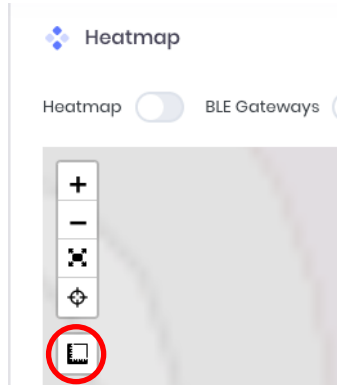
### Deployment

Click on the Heatmap link.

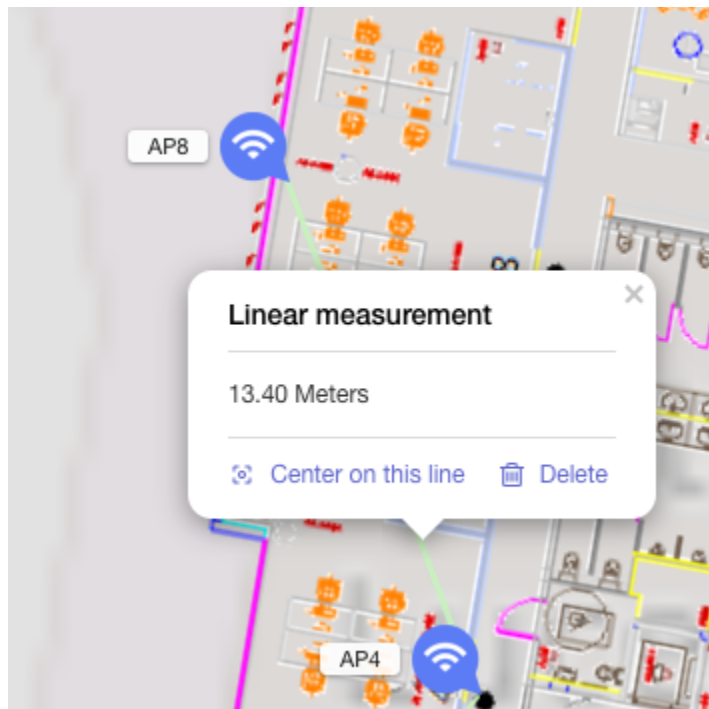
Disable the display of heatmap, autocalibration beacons, indoor area and walls.

On the page displayed, you have a tool that allows you to verify the distance between elements:

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

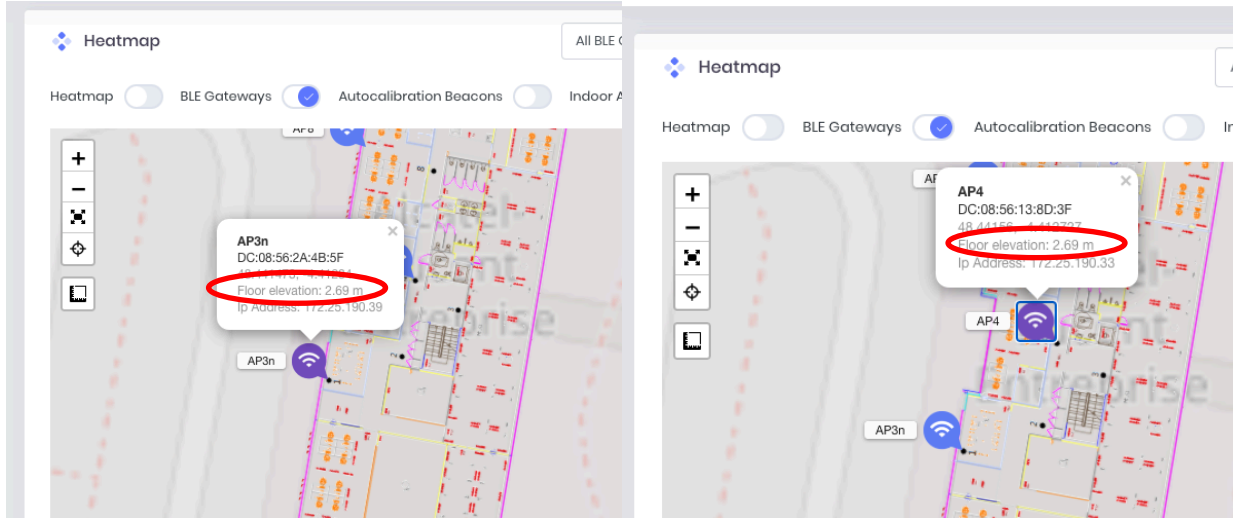


Using the previous tool, measure the distance between the gateways. The distance should be between 10 to 15m.



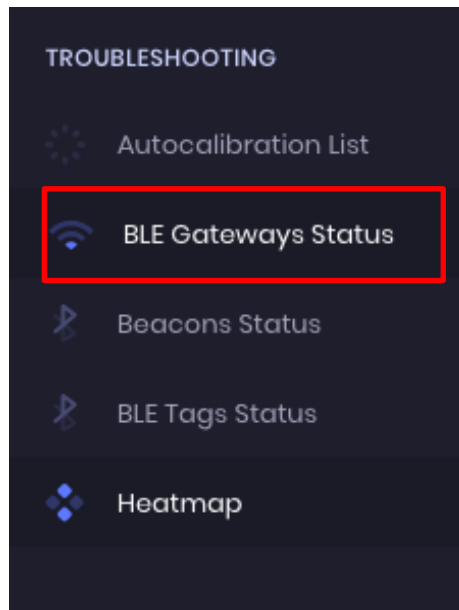
By clicking on each gateway in the map, you have access to some gateways details, such as floor elevation. All gateways deployed on a site should be, whenever possible, installed at the same height on a floor.

# OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



## Gateways Status

Select the BLE Gateways Status Menu.



All gateways must be up, as shown below.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

Gateways List

Name	MAC Address (BLE)	BLE Gateway Status	Location Frame	Secure Profile Frame	Upload Interval	Last emission <span>↓</span>
AP3n	DC:08:56:2A:4B:5F	- UP	✓	✓	2s	Sep. 30, 2020, 6:12:47 pm (2 minutes ago)
AP4	DC:08:56:13:8D:3F	- UP	✓	✓	2s	Sep. 30, 2020, 6:12:47 pm (2 minutes ago)
AP8	DC:08:56:2A:00:1F	- UP	✓	✓	2s	Sep. 30, 2020, 6:12:45 pm (2 minutes ago)

Each gateway must relay Location Frames as well as Secure Profile frames. If this is not the case, check each BLE gateway configuration again as described in sections [BLE gateway configuration in pure cluster \(without OmniVista\)](#) or [BLE gateway configuration in Enterprise or OmniVista Cirrus mode](#).

The Upload Interval of each gateway must be less than 2 seconds. If it is not, verify the corresponding parameter in the gateway configuration as described in the following sections [BLE Gateway Configuration in Pure Cluster \(without OmniVista\)](#) or [BLE Gateway Configuration in Enterprise or OmniVista Cirrus Mode](#).

If the Stellar Gateway is Down:

**Step 1:** Try to reboot the gateway

**Step 2:** Verify that the Service is enabled, host URL is kafka.omniaccess-stellar-asset-tracking.com, port 9093

```
support@AP-63:80:/tmp/cluster_config$ cat kafka_location.conf
{
  "LocationProfile":{
    "ServiceSwitch":"enable",
    "DataType":"ble",
    "EngineType":"Stellar",
    "Host":"kafka.omniaccess-stellar-asset-tracking.com",
    "Port":9093,
```

The section is named `LocationProfile` in AWOS 4.0.2 and previous. It has been renamed as `LBS_config` in AWOS 4.0.3.

If you just upgraded your gateway in AWOS 4.0.3 and the section is badly named, reapply the IoT configuration through gateway configuration interface, and check again. You may have to reboot the gateway.

**Step 3:** Verify that the ports are established

```
support@BG-E8:80:~$ netstat -anp | grep 9093
tcp        0      0 10.130.7.74:52750    3.122.93.174:9093    ESTABLISHED -
```

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

```
tcp      0      0 10.130.7.74:54425      3.120.69.60:9093      ESTABLISHED -
tcp      0      0 10.130.7.74:46849      35.156.6.163:9093     ESTABLISHED -
support@BG-E8:80:~$ netstat -anp | grep 9094
tcp      0  1507 10.130.7.74:55501      3.122.93.174:9094     ESTABLISHED -
support@BG-E8:80:~$ netstat -anp | grep 9095
tcp      0      0 10.130.7.74:52183      3.122.93.174:9095     ESTABLISHED -
```

## Autocalibration Beacons

### Deployment

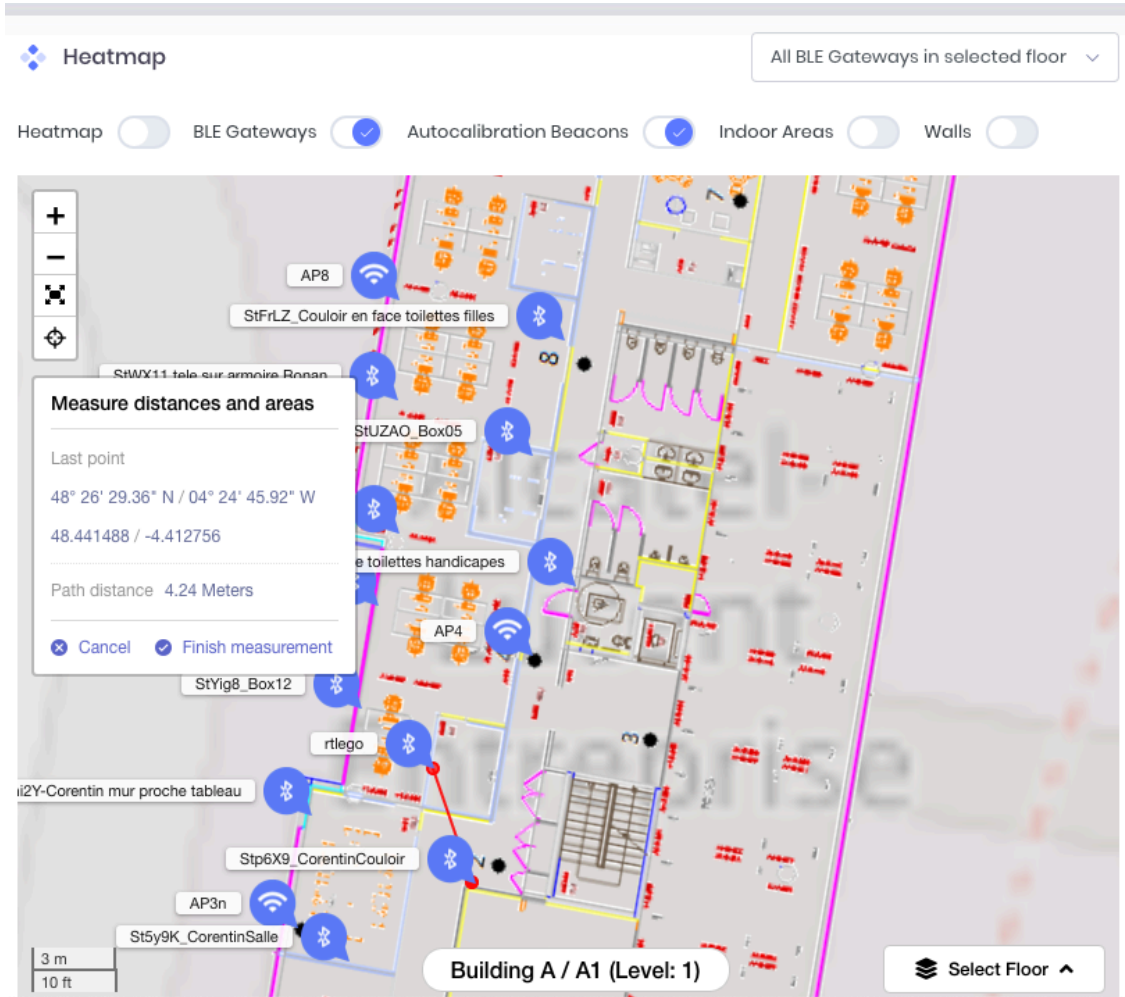
Click on the Heatmap link.

Disable the display of heatmap and walls.

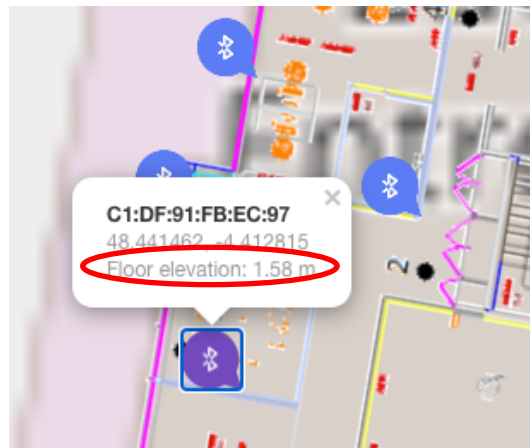
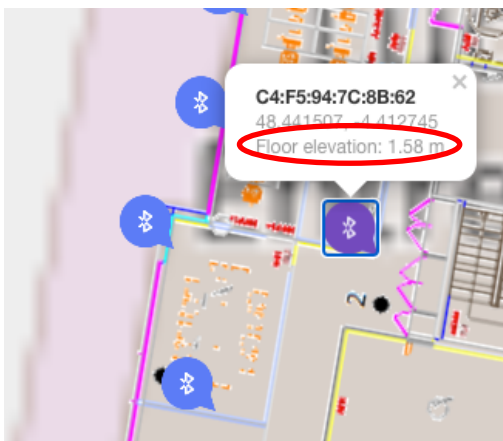
The autocalibration beacons should be distanced from 4 to 8m each and not next to Gateways. It is better to put the autocalibration beacons 2 to 4 meters from the gateways. The recommendation is to deploy at least 3 autocalibration tags per gateway.

**In any place of the covered area, there should be a beacon deployed within 5 meters.**

# OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

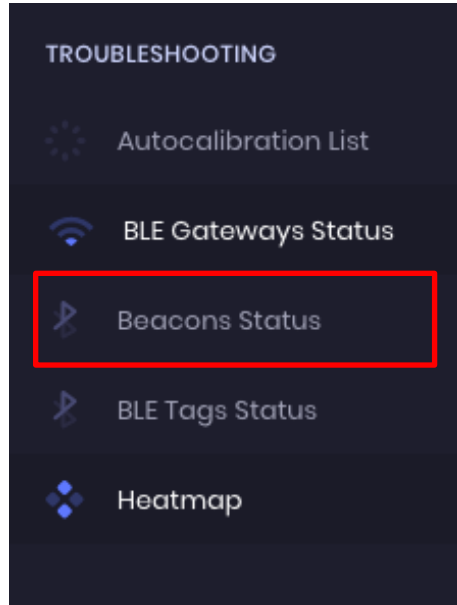


The autocalibration tags, whenever possible, should be installed at the same height on a floor. Here, all autocalibration tags are at 1.58m high:



## Beacons Status

Select the Beacons Status Menu.



### Out-of-Coverage Beacons

Some beacons might be out of coverage. In this case:

- Check their configuration, and particularly the declared MAC address (see the [Configuration in the Asset Tracking Administration Interface](#) section)
- Check the battery level
- For Kontakt.io tags used as beacon : Check that [Kontakt.io Tags Specific Configuration](#) has been done.

### Poor Coverage Beacons

Try as much as possible to have the Coverage set to at least “Acceptable” for all beacons; this means that the beacon is seen by 3 gateways.

If not, try the following:

- Move the beacon to another area with better coverage
- Move one of the deployed gateways, so that this gateway finally covers the area where the beacon is located
- Add another gateway to the deployment, to ensure that the specific area is correctly covered.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

Autocalibration Beacons List				
Search by serial number...				Refresh
Serial Number	Beacon MAC Address	Beacon scanned by	Coverage ↑	Actions
St5y9K_CorentinSalle	C1:DF:91FB:EC:97	2 BLE Gateways	• Bad	More details
Stp6X9_CorentinCouloir	C4:F5:94:7C:8B:62	3 BLE Gateways	• Acceptable	More details
StYig8_Box12	D5:50:C6:BC:1B:6A	3 BLE Gateways	• Acceptable	More details
Ste0v5_FenetreNat	E9:63:8C:85:17:02	3 BLE Gateways	• Acceptable	More details
StFrLZ_Couloir en face toilettes files	C1:92:42:DE:B6:CD	3 BLE Gateways	• Acceptable	More details

Some warnings might be displayed on the “More details” button.

Autocalibration Beacons List				
Search by serial number...				Refresh
Serial Number	Beacon MAC Address	Beacon scanned by	Coverage	Actions
012C8E	D0:B5:C2:FD:45:D6	4 BLE Gateways	• Excellent	More details
0FB746	04:A3:16:0F:BC:47	4 BLE Gateways	• Excellent	More details
0D1764	D0:B5:C2:BC:F8:93	No BLE Gateway	• Out of coverage	-
080B58	5C:F8:21:FE:81:93	4 BLE Gateways	• Excellent	More details ⚠

Open the detailed information window.

**Seen by the following BLE Gateways:** ✕

The signal received by all BLE Gateways seems insufficient. Please check the location of the tag and the remaining battery level.

Name	Last emission	Location Frame	RSSI
AP8	Oct 5, 2020, 2:35:31 pm (2 minutes ago)	✔	-65
AP4	Oct 5, 2020, 2:35:30 pm (2 minutes ago)	✔	-75
AP3n	Oct 5, 2020, 2:35:31 pm (2 minutes ago)	✔	-73

Close



## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

A warning message is displayed because the RSSI measures received from the beacon are low (no measure stronger than -65dB).

Check the position of the beacon on the site. If this beacon is not near to a gateway, this might be normal, then ignore this warning.

If it is near to a gateway, it should be relayed by this gateway with an RSSI level strength < -60dB. If this is not the case, there is something wrong with the beacon: bad position, or low battery level issue.

### Check Beacons Status using ALE Rainbow Bot

ALE Rainbow Bot interface allows you to get the full rssi distribution of your site in one csv file.

This is helpful to have an overview of the received measures, and identify:

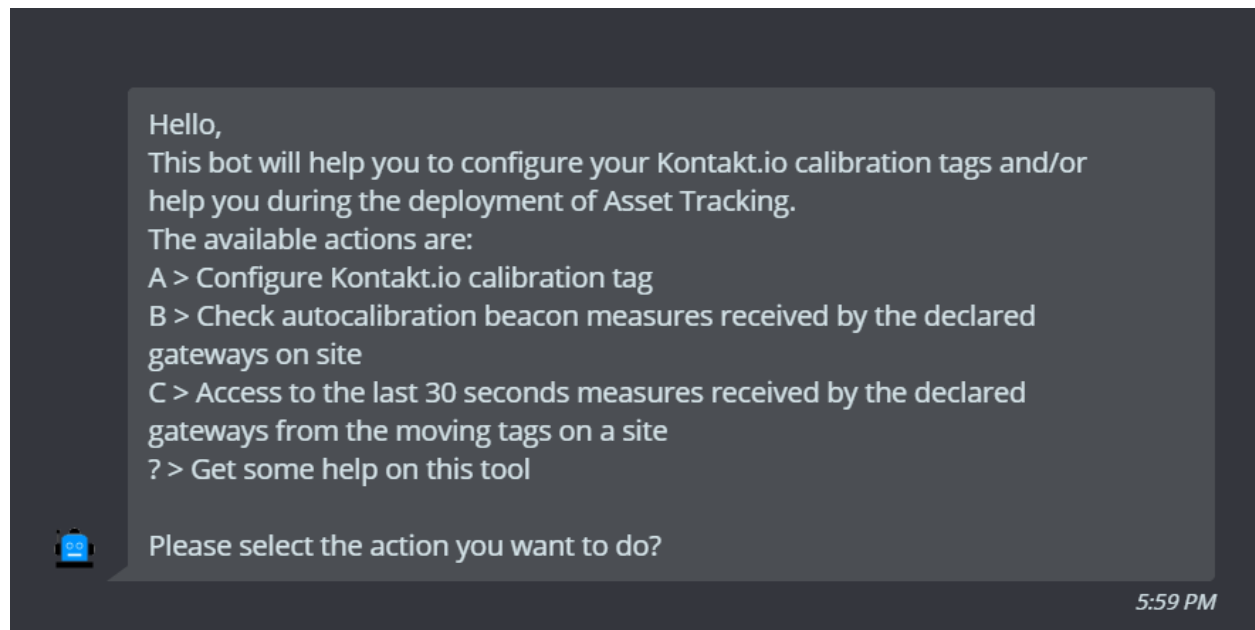
- gateways that always relay weak rssi measures, whatever the considered beacon. In this case, either:
  - o the ble signal is obstructed because of some concrete parts near to the gateway,
  - o or some beacons may be added in the gateway area.
- beacons that relay similar measures while they shouldn't. This can lead to assets badly positioned, i.e. positioned near to the wrong beacon. In this case you should consider move this beacon to another place.

Connect to Rainbow web application

<https://web.openrainbow.com/>

Search for "Bot AssetTracking" and initiate an instant messaging conversation.

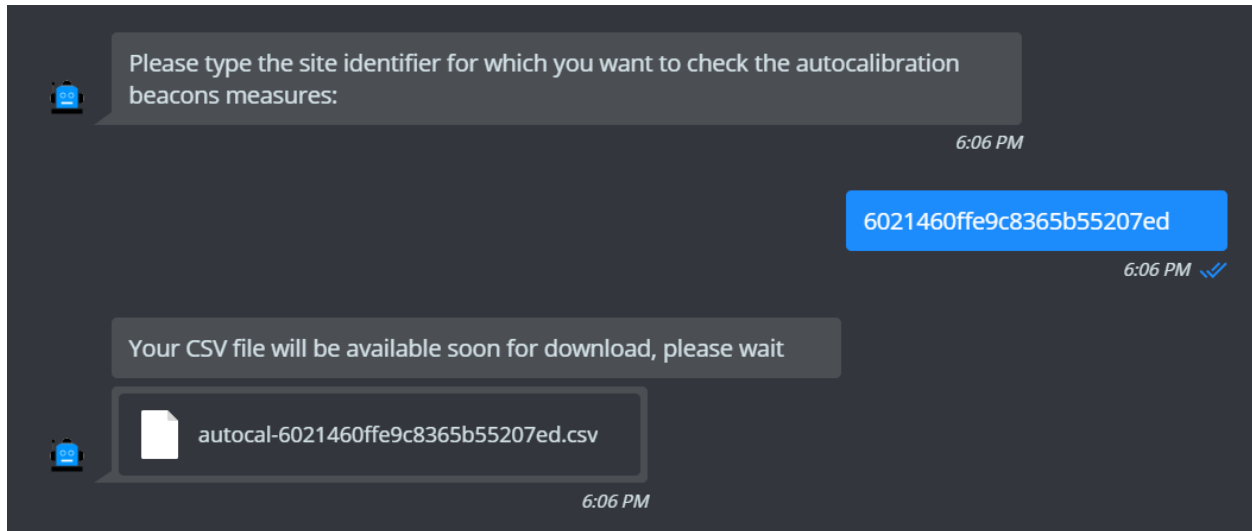
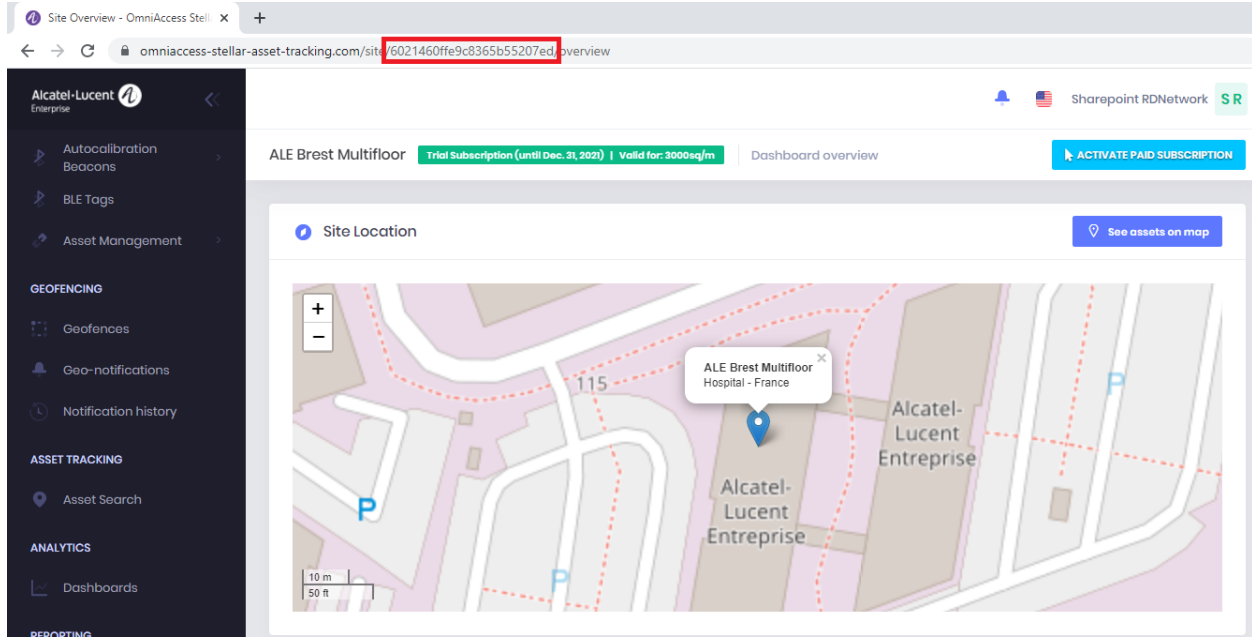
Type "?" to get information about how to use it.



## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

You can access to the autocalibration beacon measures through menu B.

You will be asked for the siteId, which you can find in the administration interface URL:



Your measures are finally exported as a csv file, which you can render in Excel to have an overview of the rssi measures received from all the site's beacons.

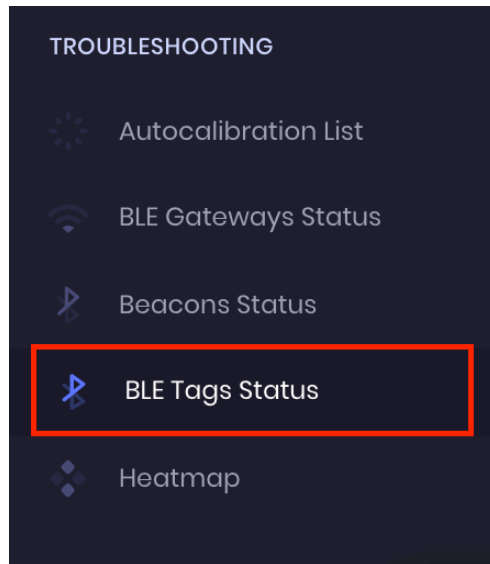
## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Calibration Items	AO_BG-DE:AO_new	AO_BG-DE:EO	AO_BG-E0:00	AO_BG-E7:EO	AO_BG-E8:80	AO_BG-E8:C0	AO_BG-E8:E0	A1_AP3n	A1_AP4	A1_AP6	A1_AP8	BG-DE-60
2	AO_012C8E	-91	-80	-79	-81	-88	-78	-68	---	---	---	---	-90
3	(AP) A1_AP4	---	---	---	---	---	-83	-89	-69	-45	-65	-71	---
4	A1_StCI5r	---	---	---	---	---	-92	---	-85	-76	-69	-61	---
5	AO_vuFOZa	-54	-84	---	---	-70	---	---	---	---	---	---	-78
6	A1_vuOqHa	---	---	---	---	---	---	---	---	-79	-50	-60	---
7	AO_OEABE9	---	---	---	---	---	---	---	-73	-58	-77	-65	---
8	Stp6X9_CorentinCouloir	---	---	---	---	---	---	---	-53	-59	-74	-81	---
9	Stni2Y-Corentin mur proche tableau	---	---	---	---	---	---	---	-52	-79	---	---	---
10	A1_StQ0EG_escalier	---	---	---	---	---	-90	---	-83	-54	-81	-86	---
11	AO_vuzcUY	---	---	-64	---	-83	-85	-91	-87	-86	---	---	---
12	AO_OFB746	-89	-61	---	-70	-89	-81	-78	---	---	---	---	-77
13	(AP) AO_BG-E8:E0	-85	-65	-78	-69	-81	-73	-45	---	-87	---	-92	-79
14	AO_vuGeQk	---	---	-66	---	---	---	---	---	---	---	---	---
15	AO_vuOMMC	---	-71	-86	-85	---	-80	-62	---	---	---	---	---
16	(AP) AO_BG-E0:00	---	-87	-45	---	-90	-84	-79	-82	---	---	---	---
17	vu4IGs	---	---	---	---	---	---	---	-78	-59	-77	-77	---
18	AO_080B58	-89	-82	-73	-82	-86	-71	-75	---	-80	---	---	---
19	AO_vumCl4	---	-89	-83	-67	---	-57	---	---	-93	---	---	---
20	St5y9K_CorentinSalle	---	---	---	---	---	---	---	-51	-80	-90	-89	---
21	AO_OEEEA3	-72	-78	---	-91	-74	---	-90	---	---	---	---	-61
22	StWX11 tele sur armoire Ronan	---	---	---	---	---	---	-89	-87	-72	-75	-63	---
23	StxROt Mur Poteau Pierrick	---	---	---	---	---	---	---	---	-77	-79	-70	---
24	A1_vuxWnV	---	---	---	---	---	---	---	---	-79	-81	-66	---
25	(AP) AO_BG-DE:E0	-72	-45	-86	-70	-74	-77	-65	---	---	-82	-94	-71
26	(AP) AO_BG-E8:80	---	-72	-89	-88	-45	-89	-81	---	---	---	---	-76
27	AO_vuEPJO	-82	-69	---	-79	-83	-85	-90	---	---	-85	-87	-81
28	(AP) BG-DE-60	-71	-71	---	-63	-77	-81	-79	---	---	-84	---	-45
29	AO_vuNvMI	---	---	-86	-85	---	-84	-89	---	---	---	---	---
30	AO_06BAE3	-77	-84	---	-86	-81	---	---	---	---	-90	---	-59
31	(AP) AO_BG-DE:AO_new	-45	-73	---	-91	---	---	-85	---	---	---	---	-72
32	AO_vuyTRH	---	-81	---	-61	---	-71	---	---	---	---	---	-82
33	(AP) A1_AP8	---	-91	---	---	---	---	---	-82	-69	-62	-45	---
34	(AP) AO_BG-E8:C0	---	-77	-84	-55	-91	-45	-74	---	-81	---	---	-81
35	AO_vupMKV	-59	---	---	---	-59	---	-90	---	---	---	---	-76
36	SteOv5_FenetreNat	---	---	---	---	---	---	---	-72	-66	-92	-72	---
37	AO_OD1764	---	-83	-73	-90	-86	-70	-73	---	-88	---	---	---

autocal-6021460ffe9c8365b55207e

### BLE Tags Status

Select the BLE Tags Status Menu.



### Out-of-Coverage Tags

Some specific tag might be out of coverage. In this case:

- Check its configuration, particularly the declared MAC address
- Check the battery level
- Connect on gateways:

#### Step 1: Verify that Bluetooth is Enabled:

```
support@AP-63:80:/tmp/cluster_config$ cat btd.conf
{
    "btd_params":{
        "bt_control":{
            "bt_switch":"On",
            "workmode":"Advertise_Scanner"
        }
    }
}
```

#### Step 2: Verify that Bluetooth Data is Being Received:

```
support@BG-E8:80:~$ sudo ble_data_rx /dev/ttyUSB0 115200 0
Starting up...
System booted.
BOOT-VERSION: 0x1050001
TARGET-VERSION: 1.0.2
ble_mac: dc:08:xx:xx:e8:9f
Start Scanning!
```

#### Step 3: Verify that Measure Data is Being Sent to the Asset Tracking Solution:

```
support@AP-63:80:/tmp/cluster_config$ tail -f /tmp/log/kafka_uploader.log
2020-09-16 18:38:30(001018,483) [kafka-uploader] - ProduceData2Server
2020-09-16 18:38:30(001018,485) [kafka-uploader] - % Sent 907 bytes to topic
raw_ap_measures partition -1
2020-09-16 18:38:30(001018,486) [kafka-uploader] - MsgDelivered
```

### Poor Coverage Tags

Some specific tags might be poorly covered.

- If only this tag has poor coverage, check its battery level
- It might be in a poorly covered area. In this case, and if you notice some location accuracy issues in this area, you might consider:
  - moving one of the existing gateways to cover this area,
  - or adding a new gateway to the deployment.

## Tags only emitting SecureProfile frames

This is normal behavior. When the tags are not in motion, they only emit the secure profile frames.

Try to move the tags, then refresh the Tags Status page. You might see *Location* frames received.

## Assets not appearing on asset-tracking map

Try to move the tags.

First location can only be calculated when the location frames are received, i.e. when the tag is in motion. If no location has ever been calculated by Asset-Tracking solution for given tag, then the corresponding asset will not be displayed on asset-tracking map.

Specifically, for Kontakt.io S18-3 square tags:



There is a known issue on these tags, when after a while without activity, the accelerometer seems not to operate properly anymore. The tag doesn't detect its motion, and do not emit the location frames anymore. Only secure profile frames are then emitted, whatever the tag is moving or not.

In this case, proceed to a reboot of the tag:

- Press the button for 5 seconds. The red led will light up continuously for 2 seconds, then the tag will shut down.
- Press again the button for 5 seconds. The red led will blink for 2 seconds, the tag will come back in service.
- Check again the location frames emitted by the tag.

According to Kontakt.io support team, this issue may be fixed in latest firmware version 2.4. It is advised to upgrade the tags to the latest firmware version using the Kontakt.io mobile application.

If it still doesn't solve the issue, then refer to the above sections of this chapter.

## Assets disappearing from asset tracking map

If assets are displayed on the map when the tags are in motion, then disappear from the map when they are no longer moving, you may not receive secure profile frames.

To confirm, open the "More details" window of a given tag.

The "Secure Profile Frame" column might appear in red for all gateways.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

Seen by the following BLE Gateways:



Name	Last emission	Location Frame	Secure Profile Frame	RSSI
AP8	Oct. 5, 2020, 1:33:28 pm (29 minutes ago)			-82
AP4	Oct. 5, 2020, 1:33:28 pm (29 minutes ago)			-64
AP3n	Oct. 5, 2020, 1:33:28 pm (29 minutes ago)			-68

Close

In this case, check again each BLE gateway configuration as described in the [BLE Gateway Configuration in Pure Cluster \(without OmniVista\)](#) or the [BLE gateway Configuration in Enterprise or OmniVista Cirrus Mode](#). There might be an issue with TopicSecureProfile / Report Broadcast Type (add KonSP frames) parameters.

### Check Tags measures using ALE Rainbow Bot

ALE Rainbow Bot interface allows you to get the last received measures of your site's tags in one csv file.

Only the tags that are currently in motion will be exported in this file. When a tag is not moving, it is not emitting location frames.

This can be helpful to check if all tags:

- are correctly emitting frames,
- have similar measures, when positioned in the same area. This can help to identify a faulty tag.

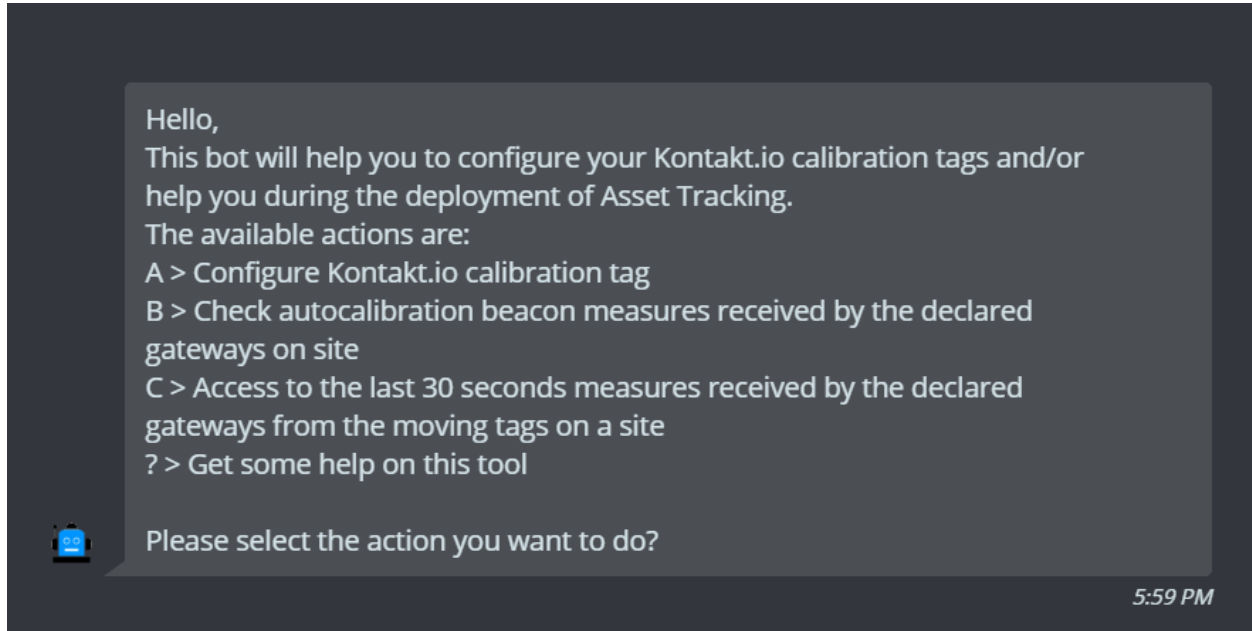
Connect to Rainbow web application

<https://web.openrainbow.com/>

Search for "Bot AssetTracking" and initiate an instant messaging conversation.

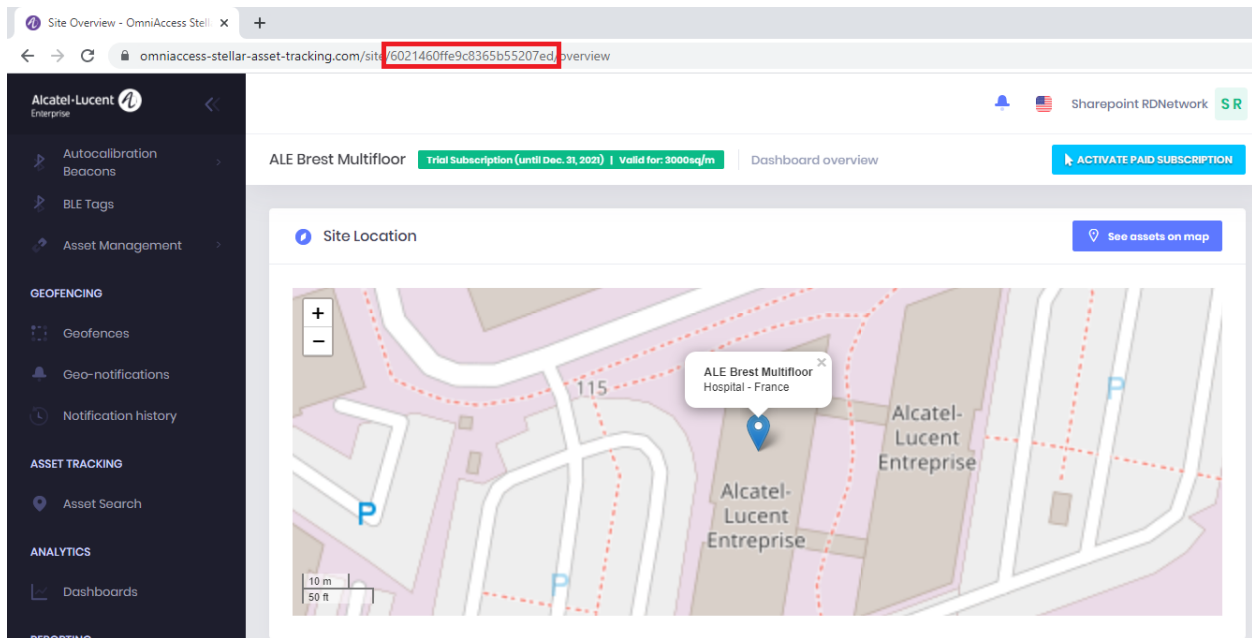
Type "?" to get information about how to use it.

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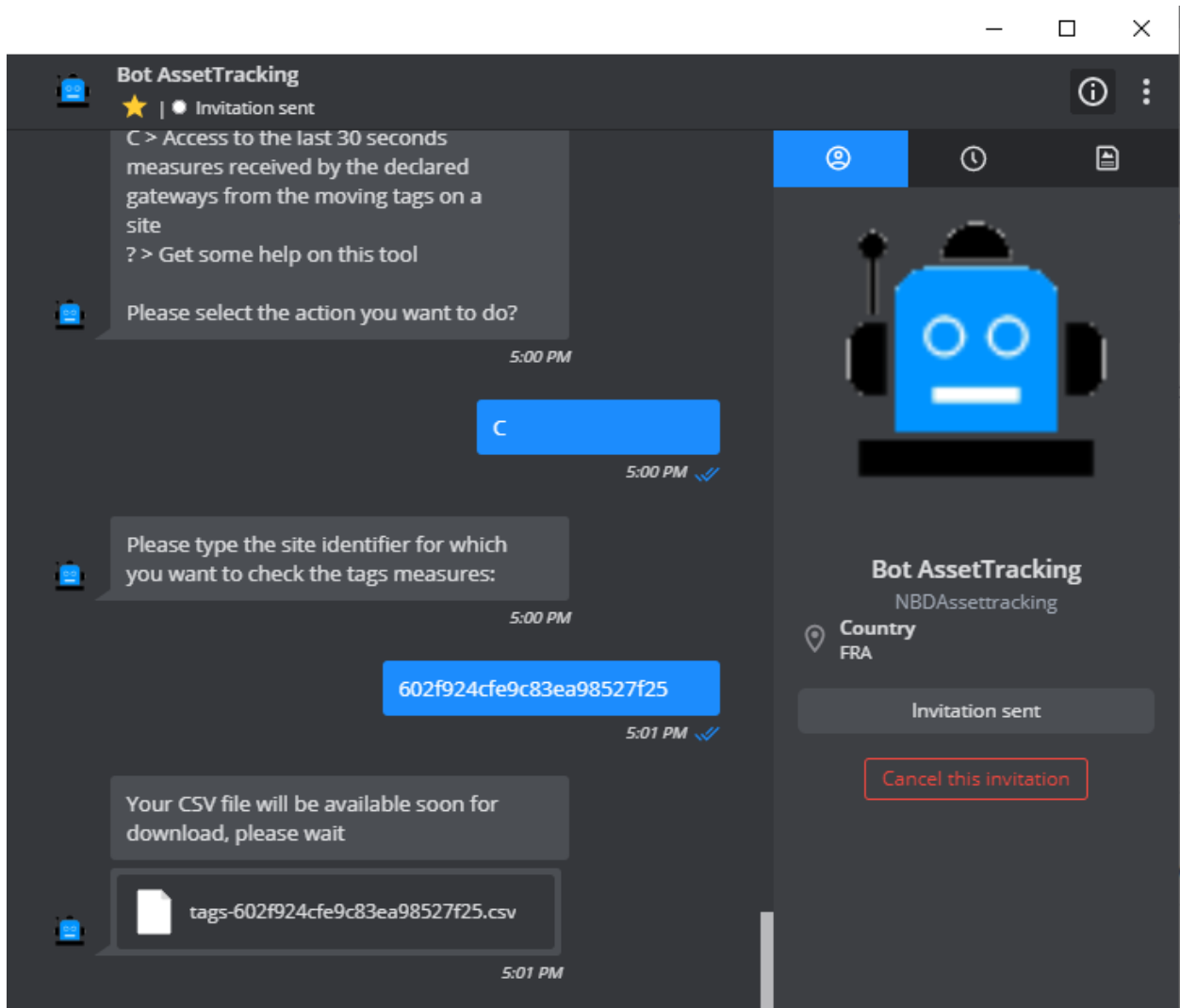


You can access to the tags measures through menu C.

You will be asked for the siteId, which you can find in the administration interface URL:



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Your measures are finally exported as a csv file, which you can render in Excel to have an overview of the last rssi measures received from all the site's tags currently in motion. The most recent measure is the last one for each tag.



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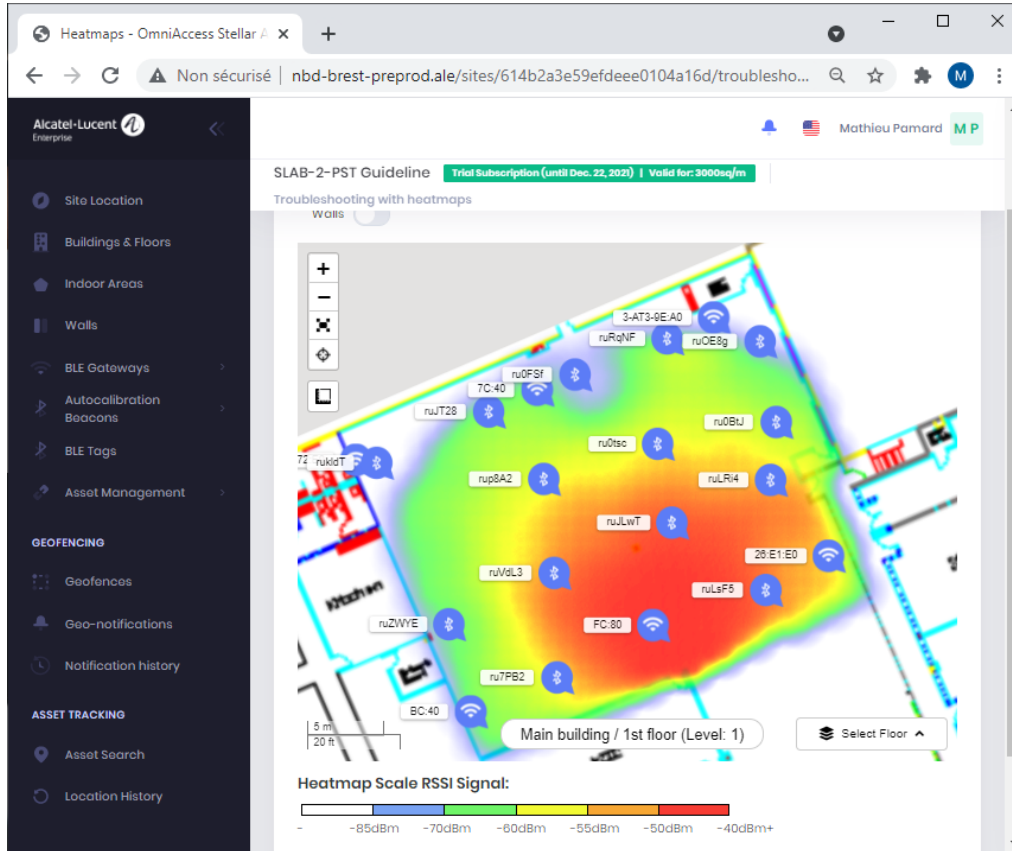
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	tagSN	A0_BG-DE:A0	A0_BG-DE:E0	A0_BG-E0:00	A0_BG-E7:E0	A0_BG-E8:80	A0_BG-E8:C0	A0_BG-E8:E0	A1_AP3n	A1_AP4	A1_AP6	A1_AP8	BG-DE-60
2	St3GHE_Square2	---	---	---	---	---	---	---	-77	---	-81	---	---
3	St3GHE_Square2	---	---	---	---	---	---	---	---	-48	-81	-73	---
4	St3GHE_Square2	---	---	---	---	---	---	---	-77	-48	-80	-73	---
5	St3GHE_Square2	---	---	---	---	---	---	---	-78	---	-81	-73	---
6	St3GHE_Square2	---	---	---	---	---	---	---	---	-48	---	-73	---
7	TB18 beacon kontakt	---	---	---	---	---	---	---	---	-79	---	-78	---
8	TB18 beacon kontakt	---	---	---	---	---	---	---	---	-79	---	-79	---
9	TB18 beacon kontakt	---	---	---	---	---	---	---	---	-78	---	-78	---
10	TB18 beacon kontakt	---	---	---	---	---	---	---	---	-80	---	-79	---
11	A0_StClI3	-76	-47	---	-87	---	---	---	---	---	---	---	-74
12	A0_StClI3	-75	-46	---	---	---	---	---	---	---	---	---	-73
13	A0_StClI3	-75	-46	---	-86	---	---	---	---	---	---	---	---
14	A0_StClI3	-75	-46	---	-87	---	---	---	---	---	---	---	---
15	A0_StClI3	-75	---	---	-88	---	---	---	---	---	---	---	-74
16	Wristband tag Polestar	---	---	---	---	---	---	---	-86	-64	-78	-68	---
17	Wristband tag Polestar	---	---	---	---	---	---	---	---	-62	---	-78	---
18	Wristband tag Polestar	---	---	---	---	---	---	---	---	-63	-86	-67	---
19	Wristband tag Polestar	---	---	---	---	---	---	---	---	-61	-79	-68	---
20	571-Tatwah3-2ndSource	---	---	-66	-85	---	-72	---	---	---	---	---	---
21	571-Tatwah3-2ndSource	-88	---	-75	-80	---	-74	---	---	-89	---	---	---
22	571-Tatwah3-2ndSource	---	-75	-69	-76	---	-74	---	---	---	---	---	---
23	571-Tatwah3-2ndSource	---	-85	-69	-85	---	-72	---	---	---	---	---	---
24	571-Tatwah3-2ndSource	---	-89	-66	-80	---	-74	---	---	---	---	---	---
25	571-Tatwah3-2ndSource	---	---	-73	-80	---	-74	---	---	---	---	---	---
26	Radius Network	---	---	---	---	---	---	---	-79	-66	-55	-55	---
27	Radius Network	---	---	---	---	---	---	---	-79	-66	-55	-55	---
28	Radius Network	---	---	---	---	---	---	---	---	---	-55	-55	---
29	Radius Network	---	---	---	---	---	---	---	-79	-66	-55	---	---
30	Radius Network	---	---	---	---	---	---	---	-80	-66	-55	-55	---

### Heatmap

Once gateways and autocalibration tags are deployed, you can access to the generated heatmap through Troubleshooting section of web panel. The heatmap can be displayed **for the whole site** and **gateway per gateway**.

Check the homogeneity of the heatmap color for each gateway.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide

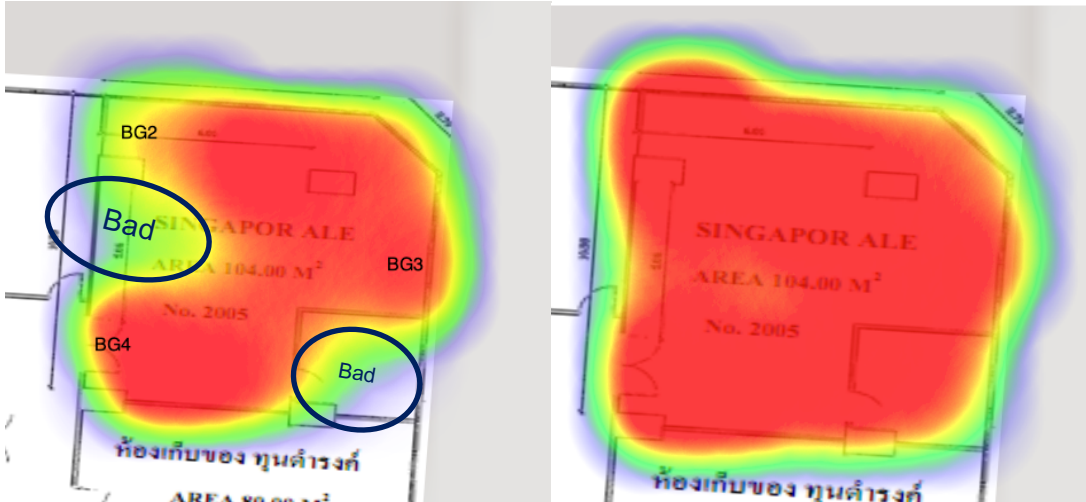


The heatmap scale below the heatmap will help you to identify abnormal rssi values on the heatmap. Red color represents a strong rssi signal ( $< -50\text{dBm}$ ) while green/blue colors represent a weak rssi signal ( $> -65\text{dBm}$ ). You should normally have a large red area around each of the gateways, except if some concrete part is obstructing the signal. Check the heatmap by displaying all gateways' heatmap, then specific heatmap for each of the gateways. If something looks strange on one specific heatmap, then it is most probably linked to the measures relayed by one given autocalibration beacon.

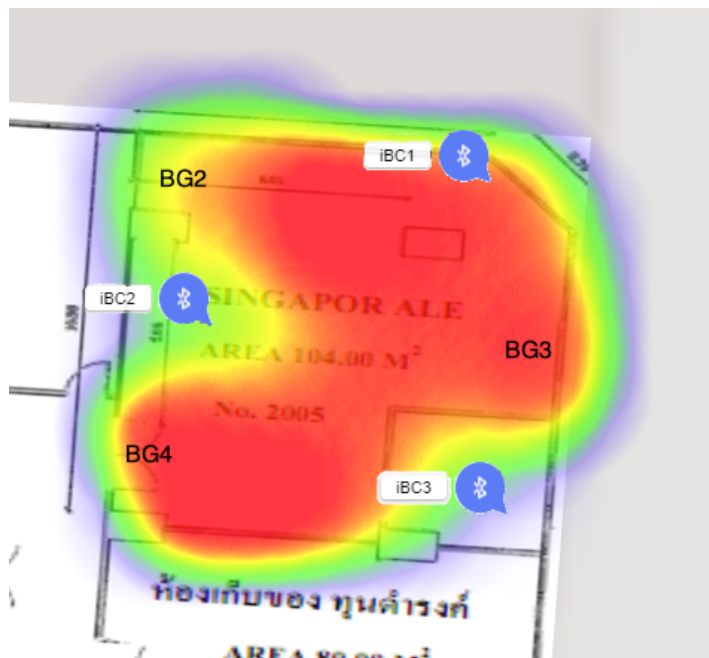
As an example:

You should not have any region of the indoor area covered as shown in the picture on the left below. The picture on the right is correct.

## OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



If you have any regions that are not fully covered, display the autocalibration beacons above the heatmap.



You might doublecheck the beacons that are in the badly covered areas (here iBC2 and iBC3).

Check the rssi measures relayed by these beacons in [Beacons Status](#) page.

If the measures are abnormally low (with regards to the distance between the beacon and gateways), this could be either an end-of-life battery issue, or a bad positioning of the beacon so that its signal is obstructed.

## Accuracy

After running through the checks in the previous sections, the next step is to check accuracy. Put your asset in a room and look at the map (Asset Search Menu) to check accuracy room by room or zone by zone as shown below.

(▲ represents the real position of the assets)

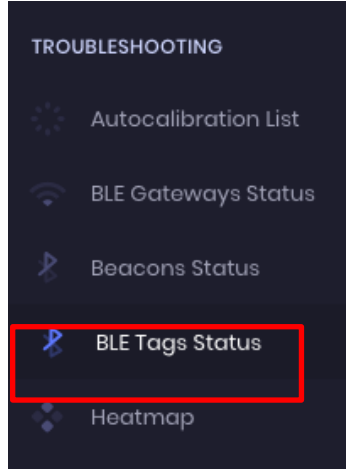


Accuracy should be approximately **5 meters**.

To reach room accuracy, it is recommended that you add an autocalibration beacon **in each room** - sometimes 2 if the room's surface is greater than 20 sqm.

Try as much as possible to have the BLE tags associated to your assets **seen by 3 gateways simultaneously**; this will enhance the accuracy. To check this, go to the BLE Tags Status Menu.

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Serial Number	BLE Tag MAC Address	BLE Tag scanned by	Coverage	Actions
StmJle_Card	C5:CD:A1:65:02:C4	1 BLE Gateway	• Bad	<a href="#">More details</a>
StUoNZ_Square	D3:A9:C8:C9:A9:FD	3 BLE Gateways	• Acceptable	<a href="#">More details</a>
fixedtag_StbfBZ	F7:D0:AB:34:E7:EA	2 BLE Gateways	• Bad	<a href="#">More details</a>
St3GHE_Square2	DEFA:44:E1:8ED2	2 BLE Gateways	• Bad	<a href="#">More details</a>
Fako_RPO	D3:A9:C8:C9:A9:FE	No BLE Gateway	• Out of coverage	-

Showing 1 - 5 of 5 records

If you observe an accuracy issue:

- Verify that all gateways are up through [Gateways Status](#) interface.
- Verify that all beacons are up through [Beacons Status](#) interface.
- Verify that gateways density and locations are in line with the [BLE Gateway Deployment](#) recommendations.
- Verify that the beacons density and locations are in line with the [Autocalibration Beacon Deployment](#) recommendations.
- Check the generated heatmaps (see [Heatmap](#) section).
- Ensure to have created all the [Mobile](#) tags

Mobile tags will allow you to track your assets on the asset-tracking map.

## Available Devices

The following BLE mobile tags models are supported by ALE Asset Tracking Solution :

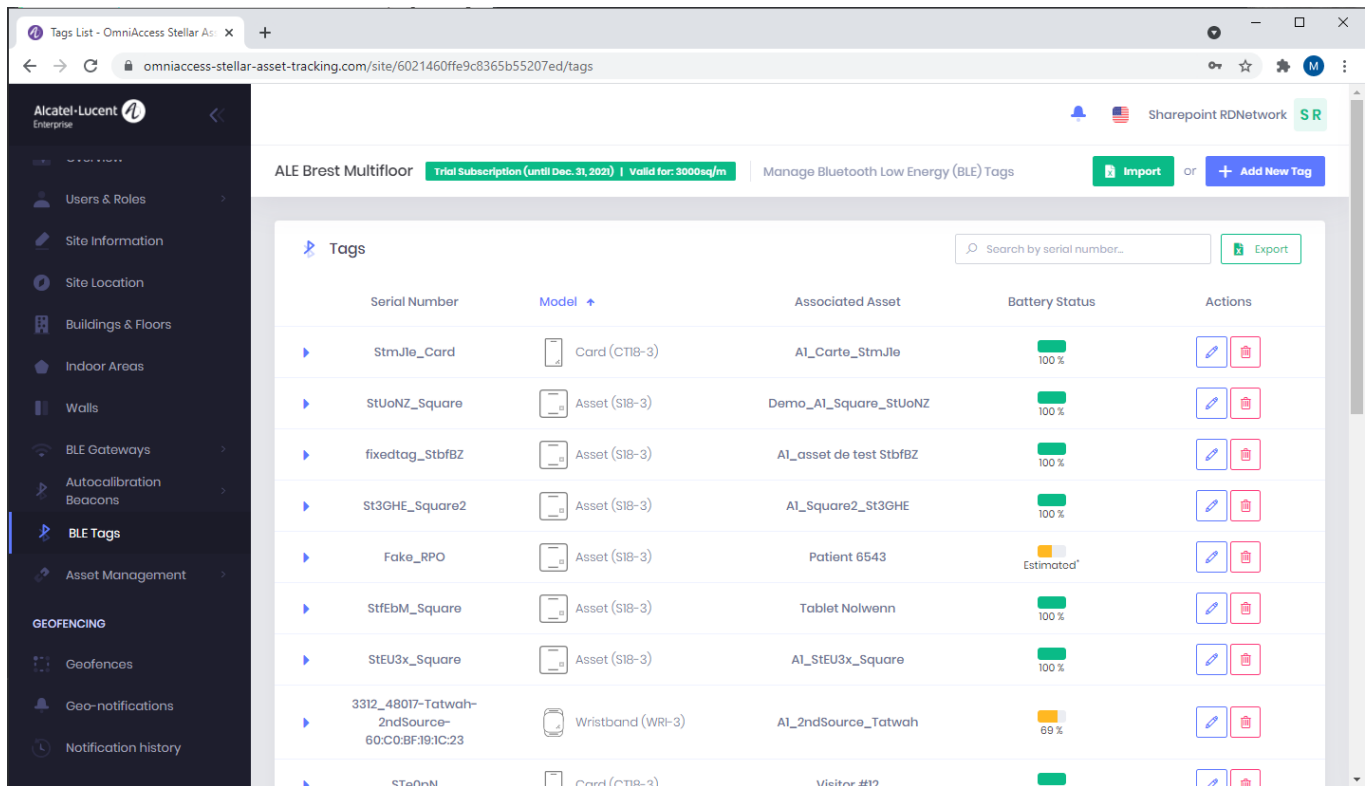
- Kontakt.io S18-3 asset tags
- Kontakt.io CT18-3 card tags
- Tatwah OAL-AT-WRIST wristband tags

Other tags may be compatible with Asset-Tracking solution. They are listed in a document available on demand. Please note that ALE do not resell these models and do not guarantee the same location accuracy than with above supported tags models.

## Configuration in Asset Tracking Administration Interface

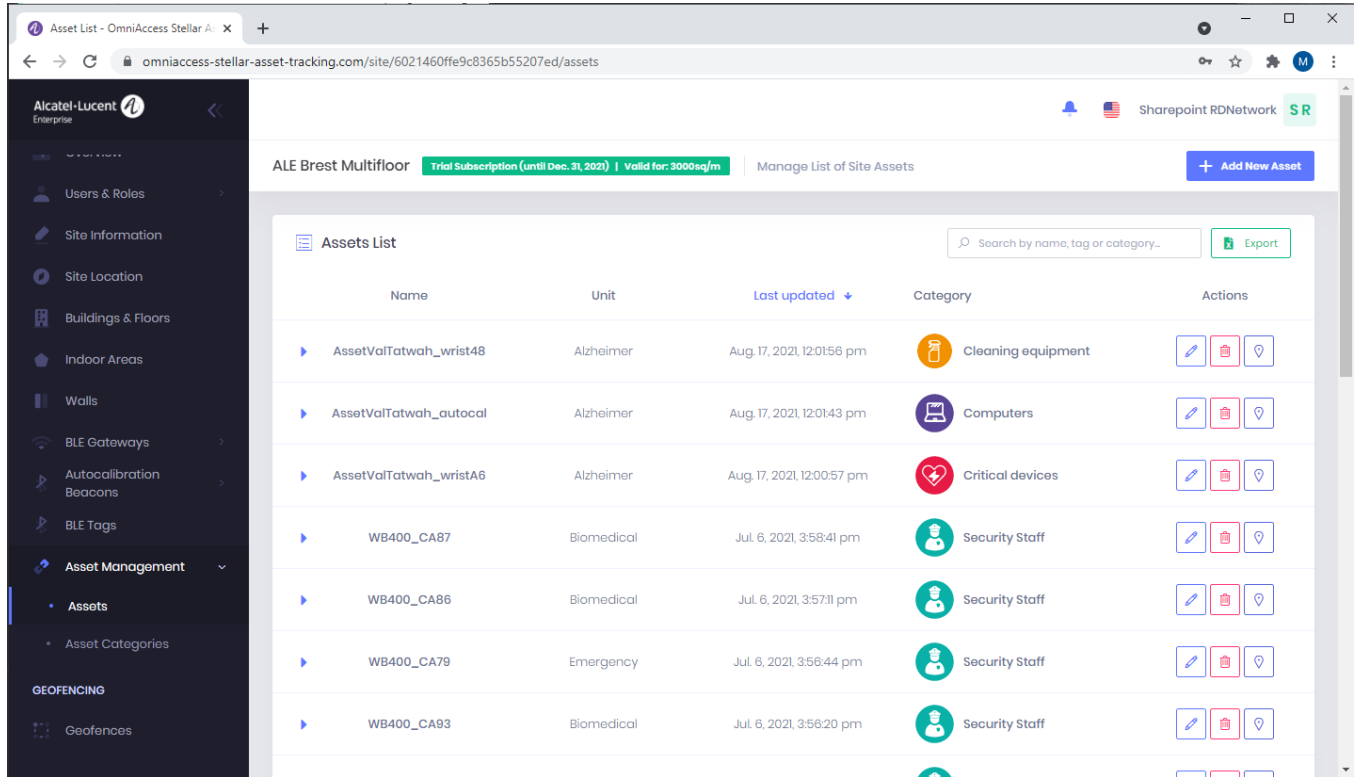
Note: if your site is already in Production, it is **not required** to put it out of Production.

Open the Asset Tracking Administration Interface and access to the site's configuration. Click on BLE tags menu. Add the mobile tags one by one or use the Excel import.



Once the tags declared, access the asset management menu, create assets and attach them to declared tags. An asset will be displayed on the map **once it is attached to a tag**, and **once the system has detected a movement from this tag**.

# OmniAccess Stellar Asset Tracking Solution 1.0.3 Deployment Guide



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- Walls in configuration, so that they will be taken into account during fingerprint generation. This can really increase the overall accuracy.
- Verify the gateways configuration:

**Step 1: Verify Bluetooth Transmission Power is Set to 7 and frequency to 1000 ms:**

```
support@AP-63:80:/tmp/cluster_config$ cat btd.conf
```

```
{
  "btd_params":{
    "bt_control":{
      "bt_switch":"On",
      "workmode":"Advertise_Scanner"
    },
    "bt_beacon":{
      "beacon_mode":"iBeacon",
      "instance":"020304060778",
      "major":65535,
      "minor":65535,
      "tx_power":7,
      "channel":0,
      "namespace":"0102030405060708090a",
      "plain_url":"https://github.com/",
      "uuid":"01020304-1a2b-3c4d-5e6f-123456789Aaa",
      "frequency":1000
    },
    "bt_scanner":{
      "scan_type":"Passive",
      "scan_interval":100,
      "scan_window":100,
      "filter_mode":"NoFilter"
    },
    "bt_whitelist":[]
  }
}
```



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### Step 2: Verify That the Upload/Reporting Interval is Set to 2 seconds or less:

```
support@AP-63:80:/tmp/cluster_config$ cat kafka_location.conf
{
  "LocationProfile":{
    "ServiceSwitch":"enable",
    "DataType":"ble",
    "EngineType":"Stellar",
    "Host":"kafka.omniaccess-stellar-asset-tracking.com",
    "Port":9093,
    "RssiFormat":"average",
    "BleTopic":"raw_ap_measures",
    "BleTopicSecureProfile":"topic_KonSP",
    "BleTopicTelemetry":"raw_ap_measures_telemetry",
    "BleTopicEmergency":"raw_ap_measures_emergency",
    "UploadAdvType":[
      "KonLoc",
      "KonSP",
      "iBeacon"
    ],
    "ReportingIntervalBle":2
  }
}
```

#### In case of location accuracy issue only in some specific areas:

If a mobile asset is badly located near to a calibration beacon [bc1] while another calibration beacon [bc2] is nearer to this asset:

- First consider repositioning the beacon [bc1] elsewhere, by following the good practices detailed in the chapter [Autocalibration Beacon Deployment](#).
- If [bc1] appears to be correctly positioned, consider repositioning [bc2].
- This could also be linked to a battery issue on either one of the beacons, or the mobile tag. You can compare the rssi measures of each beacon / tag in the troubleshooting section of asset tracking web panel ([Beacons Status](#), [BLE Tags Status](#)).

If a mobile asset is badly located in an area where there is currently no beacon deployed, consider adding a new beacon in this area, or move an existing one to this area, following the deployment recommendations detailed in the chapter [Autocalibration Beacon Deployment](#).

**In any place of the covered area, there should be a beacon deployed within 5 meters.**

## Useful Commands

Here is a list of commands to get basic information from Stellar AP and perform basic troubleshooting:

Command	Action
showsysinfo	Display the SN, Device model, MAC Address, country, soft version
getmode	Display the deployment mode (cluster, OV, Cloud)
showver	Display the exact version
uptime	Display the time since AP is in service
showurlinfo	Display the URL to connect with Instant SSID
show_cluster	Display cluster information
getovinfo	Display the OV IP Address
getlocation	Display the location information
cat /tmp/BTHOST_BD_ADDR	Display the BLE MAC Address
ssudo /etc/init.d/bt-one stop	Restart the bluetooth module
ssudo ble_data_rx /dev/ttyUSB0 115200 0	Redirect the bluetooth scanning data to console
check_ble_status cat /tmp/ble_status.conf	Check the bluetooth status