

Symphia NowForce

Indoor Positioning Planning and Installation Guide

For versions 5.5 and above

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Preface

Symphia NowForce's advanced dispatch and response technology provides comprehensive situational awareness. Symphia NowForce allows dispatchers, responders and third-party resources to share insights in real-time, creating faster response times to potential threats and active incidents. Symphia NowForce leverages an integrated system of live and historical event data, state-of-the-art mapping, and tailored mobile applications for responders' and reporters' input to ensure that the closest, best equipped and most appropriate personnel is dispatched.

About this Document

This Planning and Installation Guide provides the recommended sequence of tasks required to prepare and install the NowForce Indoor Positioning feature.

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To request the latest versions of firmware and software or to download other product-related documents, you need access to the Cognyte extranet. To register, go to https://oaccess.verint.com/ExtranetRegistration/Forms/SISRegistration.aspx.

Introduction

NowForce Indoor Positioning integrates indoor beacons with NowForce Mobile Application and NowForce Dispatcher. The installed beacons broadcast their identifier to passing NowForce Mobile Application users (responders). The NowForce Mobile Application in turn relays this data to the NowForce dispatch engine which calculates the responders real-time location and enables their optimal dispatch.

This Indoor Positioning Planning and Implementation Guide is intended for System Integrators and Project Managers. The guide assumes that the reader knows what NowForce does, how it works, and how to configure NowForce. To read more about how the NowForce system integrates Indoor Positioning, see "Components" (page 8).

The guide is intended for two personae, the Project Manager and System Integrator, and is comprised Planning and Implementation sections:

The **Planning** section includes:

- "Overview" (page 10)
- "Tasks" (page 11)
- "Project Manager Planning Tasks" (page 12)
- "System Integrator Planning Tasks" (page 13)

The **Implementation** section includes:

- "Creating Map Tiles" (page 16)
- "Beacon Installation" (page 24)
- "Uploading Beacon Details" (page 28)
- "Beacon Validation" (page 31)

Components

This section describes how NowForce Dispatcher and NowForce Mobile Application facilitate the NowForceIndoor Positioning feature. It also provides hardware guidelines for the Bluetooth beacons required in the deployment.

Note

To configure your organization's Indoor Positioning the **Use Indoor Positioning** setting must be enabled in **Settings>Organization>System Configuration>Incident Location**.

Beacons

NowForce supports all beacons that use the Eddystone and iBeacon Bluetooth Low Energy (BLE) protocols. A typical range for a BLE signal is 80 meters, although this varies according to manufacturer. Each beacon broadcasts a BLE signal called an ID. Beacon manufacturers have a predefined range of IDs that are broadcast. NowForce administrators can configure the prefix of beacon IDs so that the NowForce application only receives BLE signals from beacons installed as part of the specific NowForce deployment. Eddystone-compliant and iBeacon-compliant beacons are detectable by both Android and iOS mobile devices.

Note

- NowForce recommends using Eddystone beacons as they provide telemetry data.
- A list of all the beacon manufacturers using the Eddystone protocol can be found here.

NowForce Mobile Application

The user's phone must have Bluetooth active and the NowForce Mobile Application open and not minimized to receive a beacon's signal. The NowForce Mobile Application then transmits this data to the NowForce server and this is used to calculate the real-time location of the user.

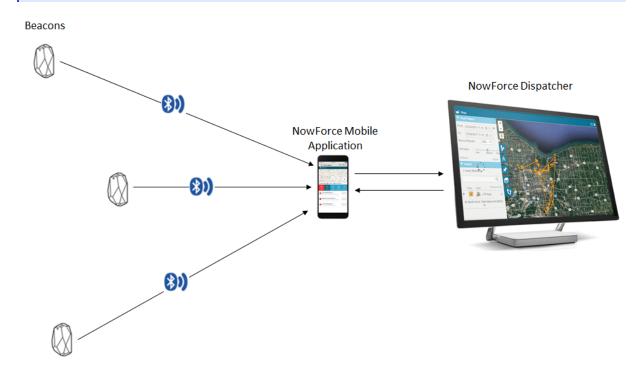
NowForce Dispatcher

NowForce's **Map** has a new floorplan layer that displays beacons within a building's unique **Point of Interest** (POI). To read more about floorplan mapping see "Creating Map Tiles" (page 16) and

"Uploading Beacon Details" (page 28). The NowForce server receives the data from user's NowForce Mobile Application and displays each User and Beacon on the **Map** in real-time.

Note

The distance of the user from the incident is calculated using aerial distance (Pythagoras calculation), without consideration of corridors, walls, elevators, etc. When the **Use Indoor Positioning** setting is enabled, the dispatch engine calculation includes the time required by a responder to travel between floors. Priority is given to responders on the same floor as the incident.



Planning

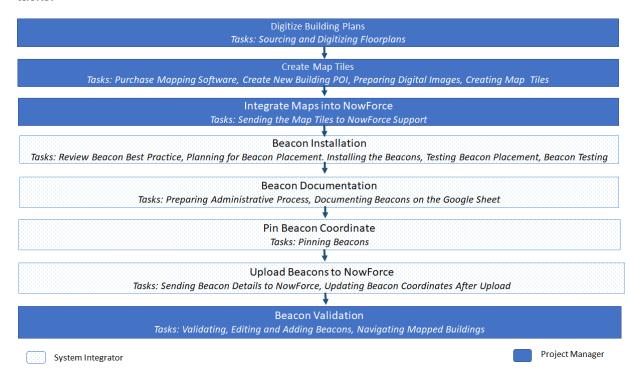
This section describes the Planning workflow and details specific steps and relates them to the relevant deployment personae.

The following topics are included:

- "Overview" (page 10)
- "Tasks" (page 11)
- "Project Manager Planning Tasks" (page 12)
- "System Integrator Planning Tasks" (page 13)

Overview

The diagram illustrates the high-level process overview for the Indoor Positioning deployment. The color coding shows who is responsible for each of these areas of activity and the associated tasks.



Tasks

The numbered tasks in the table are in the recommended order of actions for a successfulNowForce Indoor Positioning deployment. Each task is allocated to the responsible personae.

No.	Tasks	Performed By
1	"Sourcing and Digitizing Building Floorplans" (page 12)	Project Manager
2	"Purchasing Mapping Software" (page 12)	Project Manager
3	"Creating a New Building POI" (page 12)	Project Manager
4	"Reviewing Beacon Best Practice" (page 13)	System Integrator
5	"Planning for Beacon Placement" (page 13)	System Integrator
6	"Installing Beacon Testing Software" (page 14)	System Integrator
7	"Preparing the Administration Process" (page 14)	System Integrator
8	"Preparing Digital Images" (page 16)	System Integrator
9	"Creating Map Tiles in MapTiler" (page 18)	System Integrator
10	"Sending the Files to NowForce Support" (page 23)	System Integrator
11	"Installing the Beacons " (page 24)	System Integrator
12	"Testing Beacon Placement" (page 25)	System Integrator
13	"Documenting Beacons on the Google Sheet" (page 25)	System Integrator
14	"Pinning Beacon Coordinates" (page 26)	System Integrator
15	"Sending Beacon Details to NowForce" (page 28)	System Integrator
16	"Updating Beacon Coordinates Upload" (page 29)	System Integrator
17	"Validation Testing" (page 31)	Project Manager
18	"Editing and Adding Beacons" (page 31)	Project Manager
19	"Navigating a Mapped Building" (page 33)	Project Manager

Project Manager Planning Tasks

The Project Manager must consider and plan for:

- Sourcing and digitizing building floorplans
- · Purchasing mapping software
- · Creating a new building POI

Sourcing and Digitizing Building Floorplans

To render the building floorplans as map layers, each floor must be generated in a digital format.

Note

The floorplans must be in either JPG or PNG format.

Purchasing Mapping Software

You will need to purchase, download and install the MapTiler Desktop Start edition. You can purchase and download the software from the MapTiler Website.

Creating a New Building POI

You will need to create a unique Point of Interest for the mapped building. You can read more about adding and managing Points of Interest.

System Integrator Planning Tasks

Th System Integrator must consider and plan for the following tasks:

- Reviewing beacon best practices
- Planning for beacon placement
- · Acquiring beacon testing software
- Preparing beacon documentation

Reviewing Beacon Best Practice

It is highly recommended that you use the following settings when configuring beacons:

Protocol: Eddystone: using UID

Transmission power: 0 dBm

• Broadcasting interval: 300 - 500 ms

Planning for Beacon Placement

Depending on manufacturer specifications beacons typically transmit up to 80 meters in obstruction free environments. It is important to consider the positioning of the beacons ahead of time using the building's floorplans to plan for the best coverage. Larger open spaces will require additional beacons for coverage.

Tip

Deploy more beacons in areas when higher accuracy is required.

The following obstruction types can impact beacon transmissions:

- Electronics and electrical cabling
- Metallic surfaces
- Wall thickness
- Bulletproof glass

Installing Beacon Testing Software

You will need to download and install either the Google Beacon Tools application or the beacon manufacturer's application for beacon testing .

Preparing the Administration Process

Before installing beacons, request the Beacon Data Google Spreadsheet from NowForce Support. You will need to populate this sheet with the full list of beacons deployed in your building.

Tip

During the planning phase, pre-populate the fields in the Google Spreadsheet with the available information you have for each beacon, like the Unique ID and Beacon Name. This will speed up the recording of beacons and their locations.

Implementation

The NowForce Indoor Positioning implementation tasks are described in the following:

- "Creating Map Tiles" (page 16)
- "Beacon Installation" (page 24)
- "Uploading Beacon Details" (page 28)
- "Beacon Validation" (page 31)

Creating Map Tiles

Floorplan map layers are created by taking a cleaned up digital image of each floor and rendering it into a map tile using MapTiler's software. The floorplan layer is then imported into NowForce and can be displayed as a map layer.

Preparing Digital Images

To render the building floorplans as map layers each individual floor must be generated into a digital format image.

Note

The floorplans must be in either JPG or PNG format.

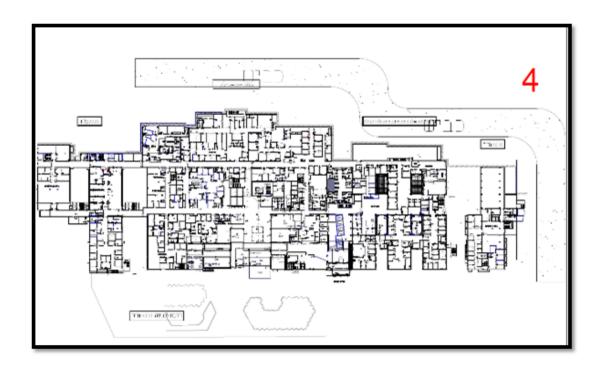
Once you have created your digital image it must be cleaned.

- ▼ To clean your digitized floorplan
- 1. Remove all labels, notes, roads, legends from the image.
- 2. Change the background of the image to transparent.
- 3. Crop image to the external walls.

An example of a correctly rendered image with no visible labels or extra roads, and cropped to a building's external walls is shown below.



Below is an example of an incorrectly prepared image:

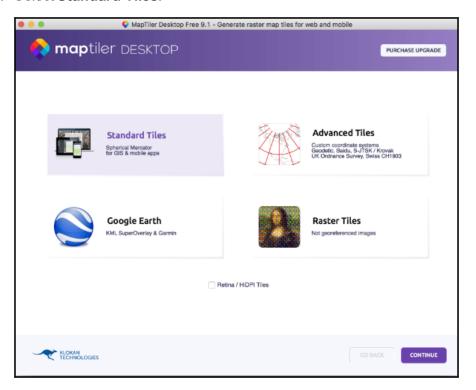


Creating Map Tiles in MapTiler

▼ To Create Map Tiles

Once you have downloaded and installed MapTiler Desktop Start edition:

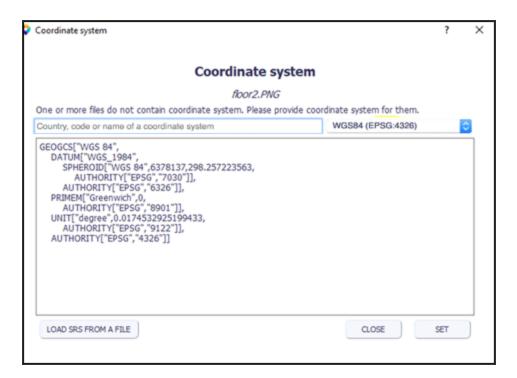
- 1. Launch MapTiler.
- 2. Select Standard Tiles.



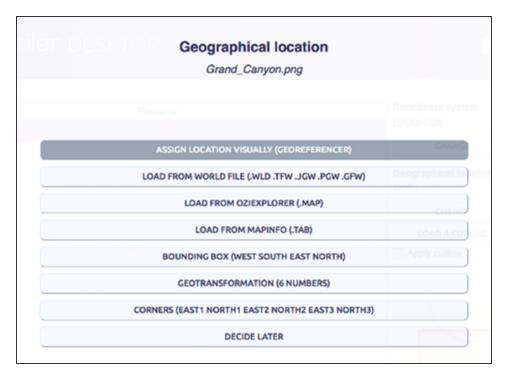
Tip

You can follow a MapTiler tutorial here.

- 3. Select the cleaned up floorplan image that you prepared in advance.
- 4. Set the Coordinate System to WGS84 and click SET.



5. Select ASSIGN LOCATION VISUALLY.



- 6. Zoom in on the world map, to the location of the building you want to map.
- 7. In the right-hand pane, select one corner of the floor plan, and then select the exact physical location on the map in the left-hand side pane.

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8. Repeat this for three additional points on the floor map.

9. Adjust the anchors by dragging the dots you marked to the precise position.

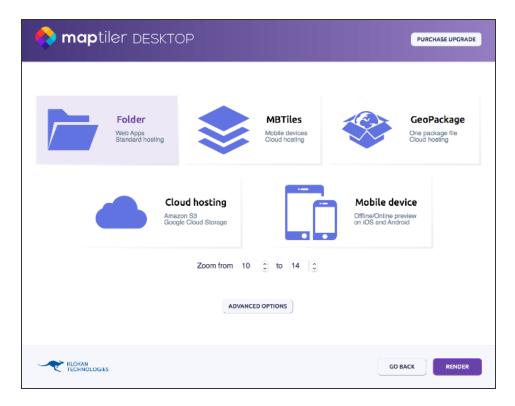
Tip

For the full list of screen controls see this functionality list.

- 10. Click SAVE.
- 11. Click CONTINUE.
- 12. Select **Folder** and a **Zoom from** setting of **16 to 22**, and click **RENDER**.

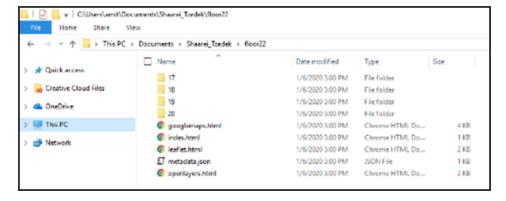
Note

To ensure your floorplan displays correctly on the NowForce Map you must select a **Zoom from** setting of **16 to 22**.

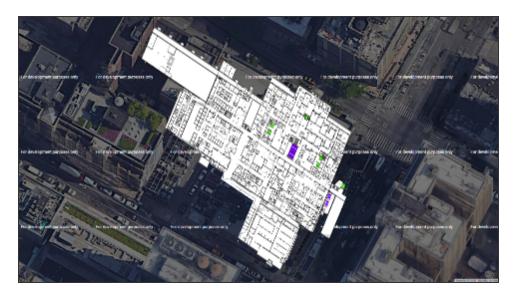


13. Create a new folder named "Floor X" with the floor number of the floorplan you are processing (e.g. "Floor 1").

Once the rendering is completed, a sub-folder for each zoom level (17, 18, 19, 20) appears within the "Floor X" folder.



14. Open the <code>googlemaps.html</code> output file to check that the floorplans align correctly on top of the building. You can test the different zoom levels views.



15. Repeat these steps for all the floors in the building.

Floorplan Map Tile Integration in NowForce

This section describes the steps required to integrate the map tiles created for your building into NowForce Dispatcher.

Sending the Files to NowForce Support

Once you have created all your Map Tiles for each floor, create a zip file with all the floor folders and send the zip file along with the name of the POI created "Project Manager Planning Tasks" (page 12) and your Organization ID to support@nowforce.com for uploading.

The NowForce support team will upload the floor images and associate them to the building's POI. You will be notified by email once this is completed.

Beacon Installation

This section provides guidelines for the placement, installation, testing and documenting of beacons in your NowForce Indoor Positioning deployment.

Installing the Beacons

Factor	Guideline
Placement	2 - 3 meters above floor height, or
	On the ceiling
Line of sight	Ensure nothing is between the beacons and the user devices.
Orientation	For best results, orientate the beacons according to manufacturer's instructions.
Interference	Avoid placing the beacons near:
	Other electronic equipment that uses the 2.4GHz band
	Metallic surfaces
	Plaster
	Concrete
	Bulletproof glass
Surface quality	Placement on clean surfaces:
	Use high-strength adhesive tape for good adherence or
	Screw beacons into the wall

Testing Beacon Placement

A successful Indoors deployment requires that a minimum of three beacons, with a signal strength of 50dBM, must be captured at all times by the NowForce Mobile Application. You may need to reposition your beacons for this requirement to be met.

Note

It is highly recommended that you use of the beacon manufacturer's mobile application or Google's Beacon Tools mobile application for the test process. See the "System Integrator Planning Tasks" (page 13).

▼ To calibrate your beacon placement

- 1. Walk through the building using the beacon test application. The application must pick up 3 simultaneous beacon signals at all times.
- 2. Confirm that the minimum signal strength 50dBM is received.
- 3. Relocate beacons as required.
- 4. Re-test signal strength with the test application until the application receives three simultaneous beacon signals at all times.

Documenting Beacons on the Google Sheet

As you install the beacons throughout the building, you should use the Google Sheet provided by NowForce Support to record where each beacon was installed. The longitude and latitude will be added when you pin the beacon, see "Pinning Beacon Coordinates" (page 26).

The following mandatory fields must be completed in the document:

Unique ID

Note

Beacon unique identification conventions differ between Eddystone and iBeacon:

- UID for Eddystone
- Minor Major for iBeacon
- Building
- Floor
- Longitude
- Latitude

Note

You will need to use the NowForce Map to determine each beacon's longitude and latitude. See "Pinning Beacon Coordinates" (page 26) for more details.

Additional fields provided for in the document include:

- Beacon name
- Room
- Transmission power
- Broadcasting interval
- Installation date

Pinning Beacon Coordinates

Each beacon must be documented with its full latitude and longitude coordinates so that the NowForce system can correctly locate and dispatch Responders.

Note

Beacon coordinates can be included in the Google Spreadsheet uploaded to NowForce, or added manually in the beacon's settings after the upload. For details see "Updating Beacon Coordinates Upload" (page 29).

- ▼ To add beacon coordinates to the Google Spreadsheet
- In NowForce Dispatcher display your building's POI on the Map and simultaneously open the Google Sheets document in a second browser tab.

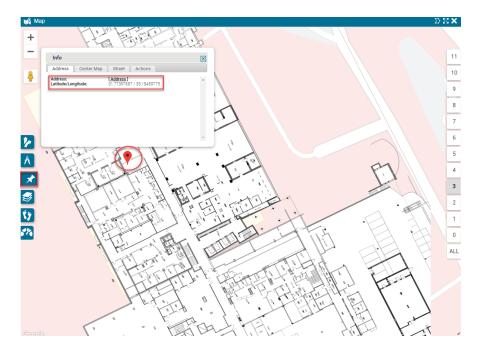
I ip

Use two screens to easily toggle between the Google Spreadsheet and the **Map** module in NowForce Dispatcher.

- 2. On the **Map** select the numbered tab of the floor you wish to display.
- 3. Select the **Drop Pin** tool to create the location for a beacon on that floor of the **Map**.

Пр

Complete the full process for each beacon one at a time to ensure that all steps are completed.



4. Click on the dropped pin to display the pin's coordinate.

Note

It's recommended to register the coordinates up to the 6th decimal point for high accuracy (I.e. 40.894377, -73.883581).

5. Copy the coordinates to the Google Spreadsheet.

Tip

Systematically work through the list of beacons in the Google Spreadsheet using the hard copy building floorplan as a visual guide.

- 6. Click Save.
- 7. Repeat for each beacon on the floor.
- 8. Repeat for each floor of the building.

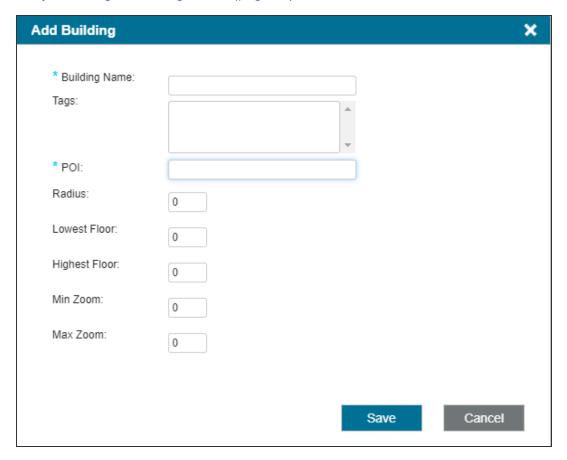
Uploading Beacon Details

This section details the process for uploading your beacons to NowForce.

Sending Beacon Details to NowForce

Ensure that all mandatory fields are completed in your Google Spreadsheet before uploading your list of beacons to NowForce. For more information see "Documenting Beacons on the Google Sheet" (page 25).

- ▼ Uploading beacons to NowForce
- 1. In **Settings** > **Geography** > **Indoors**, click + to add the building POI that was created in "Project Manager Planning Tasks" (page 12).

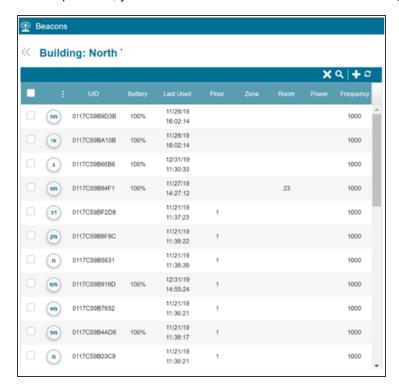


Tip
The mandatory fields are **Building Name** and **POI**.

- 2. Click Save. The Building is now listed in the Indoors settings table.
- 3. Click the to open the **Building's Beacons** settings to add new beacons.



- 4. Use the Google Sheet provided by NowForce Support to create a list of all the beacons. Contact support@nowforce.com for the automated upload procedure.
- 5. Once uploaded, you can see the list of beacons for the building.



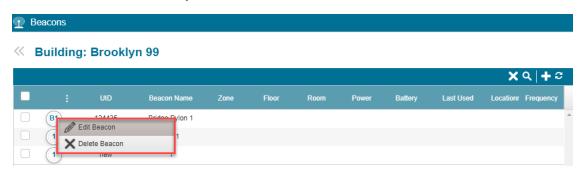
Updating Beacon Coordinates Upload

You can add and update beacon co-ordinates once your beacons have been uploaded to NowForce. Each beacon must have its full latitude and longitude coordinates included for the NowForce system to correctly locate and dispatch Users.

You add the coordinates manually in the Beacons settings.

▼ To add beacon coordinates manually after beacon list is uploaded

- 1. In **Settings** > **Geography** > **Indoors** select your building from the table.
- 2. Click to open the beacons table.
- 3. Hover over the beacon that you want to edit and click **Edit Beacon**.



4. Open the NowForce Map to display your building's POI.

Tip

Use two screens to easily toggle between the **Beacon Settings** and the **Map** module.

- 5. In the **Map**, select a floor to display of your building's floorplan.
- 6. Select the **Drop Pin** tool to create the location for the beacon on that floor of the **Map**.
- 7. Click on the pin to display the coordinates.

Note

It's recommended to register the coordinates up to the 6th decimal point for highest accuracy (I.e. 40.894377, -73.883581).

- 8. Copy the coordinates into their respective fields in the beacon settings' **Location** tab.
- 9. Click Save.

Beacon Validation

Once your Indoor Positioning installation is completed, it is recommended that you run simulations to confirm Indoor Positioning beacon location and settings are optimized for your organization.

Validation Testing

Feedback from this validation process can be used in the management of your beacons.

- Create a simulated incident to test dispatch engine's responder selection with and without the Use Indoor Positioning setting.
- Compare the dispatch engine's predicted response times over multiple floors by manually dispatching additional responders to incidents.
- Run Track User simulations to test responders NowForce mobile applications adequately capture beacon signals throughout your building.

As a result of these validations, any adjustments required adjustments to beacon settings and positioning can be made in the Beacon settings, see "Editing and Adding Beacons" (page 31).

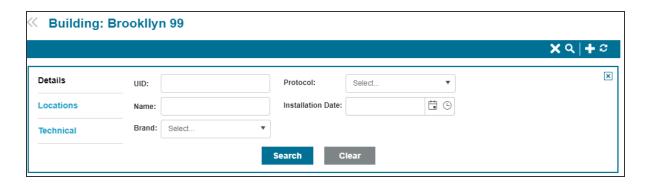
Editing and Adding Beacons

You can edit beacons in the Beacons settings.

- To edit a beacon
- 1. In **Settings** > **Geography** > **Indoors** and select your Building from the table.
- 2. Click to open the beacons table.
- 3. Hover over the beacon that you want to edit and click **Edit Beacon**.



In the **Search** function of the Beacons settings page you can locate a specific beacon.

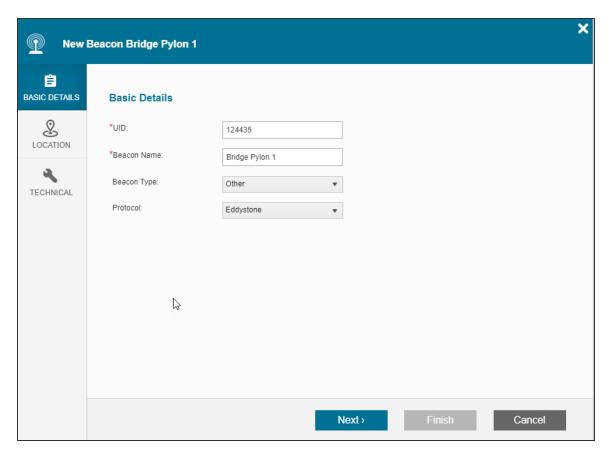


You can add a beacon to your building in the Beacons settings page.

- ▼ Adding a Beacon Manually
- 1. In **Settings** > **Geography** > **Indoors** and select your building from the table.
- 2. Click the to open the edit beacon settings.



- 3. Click + to add a new beacon.
- 4. Complete the **BASIC DETAILS**. All fields marked with an asterisk are compulsory.



- 5. Click Next.
- 6. Complete the **LOCATION** tab. All fields marked with an asterisk are compulsory.

Note

To find the beacon coordinates see "Updating Beacon Coordinates Upload" (page 29).

- 7. Click Next.
- 8. Complete the **TECHNICAL** tab.
- 9. Click Finish.

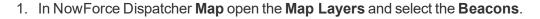
The beacon is added to the list of beacons for the building.

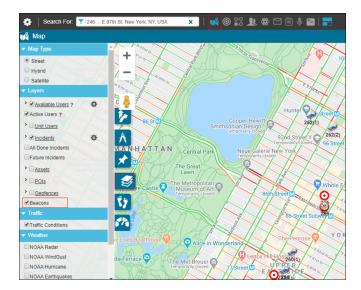
Navigating a Mapped Building

You can navigate your mapped building in NowForce Dispatcher Map.

▼ To navigate a mapped building

After beacons have been added to your organization's NowForce the beacons are visible as a layer on the Map.





- 2. On the Map zoom into your building's POI.
- 3. On the right hand side of the map, select the relevant **Floor Number** tab of the you want to view.



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