

TRIWA^AVE SYSTEMS

ENSC 440

Akriveia Beacon

User Manual Mock Up

Team 5

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Project Team Jeffery Yeung CCO
 Keith Leung CTO
 Scott Checko COO
 Ryne Waterson CIO
 Jerry Liu CEO

Contact Jeffery Yeung
 zjyeung@sfu.ca

Submitted to Dr. Andrew Rawicz
 School of Engineering Science
 Simon Fraser University

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Glossary

IP	Internet Protocol address
MCU	Microcontroller Unit
URL	Uniform Resource Locator bar
UWB	Ultra-wideband

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1. First Responder Instructions

1.1 Joining Akriveia Network

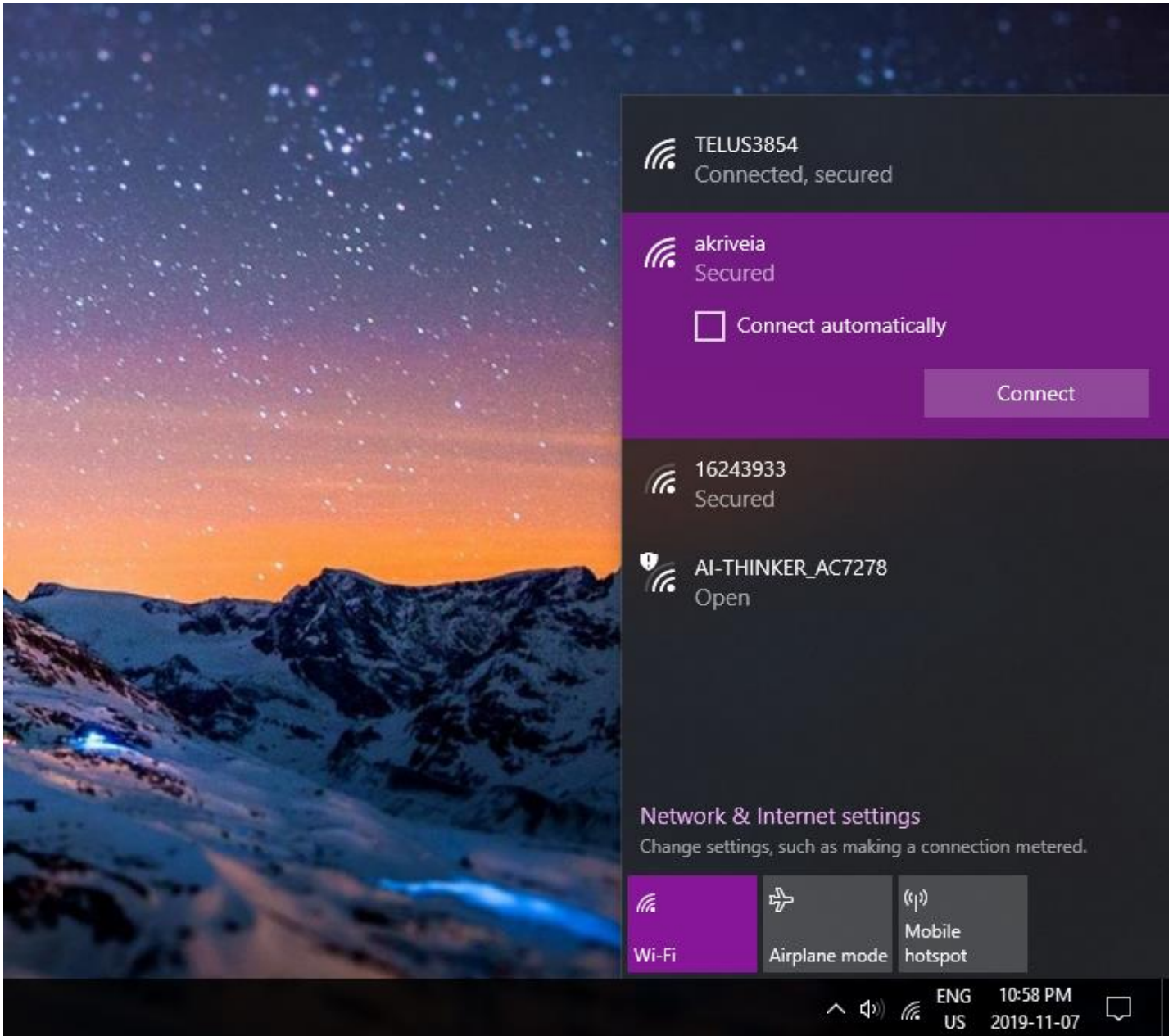


Figure 1: Akriveia Wi-Fi Configuration

- 1) Connect Laptop or tablet device to Akriveia Access point (SSID: akriveia).



Figure 2: Host IP URL

- 2) Enter Server Host IP and port into web browser URL (Default IP: 10.0.0.2:8080).

1.2 View Maps

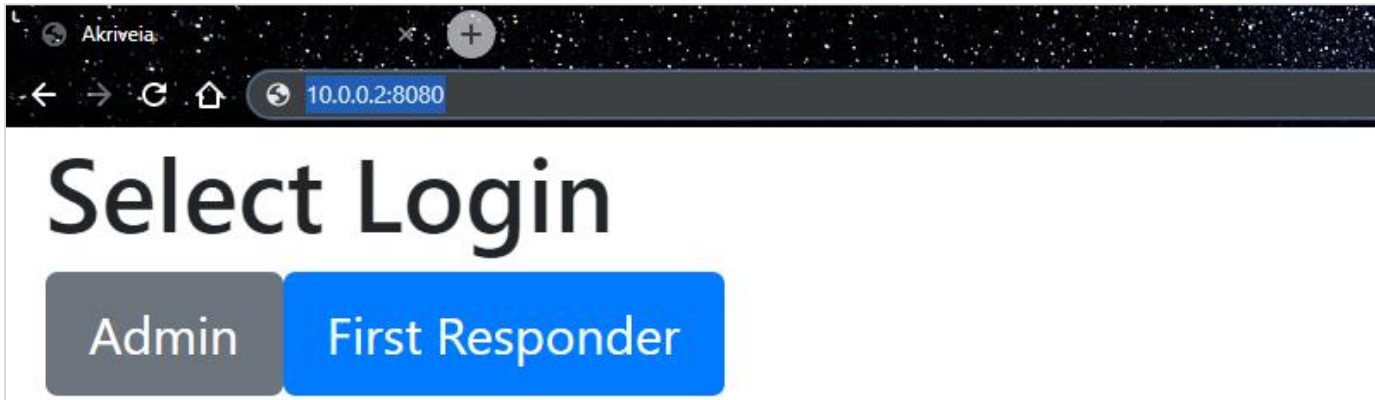


Figure 3: User Selection Screen

3) Select **First Responder** Button

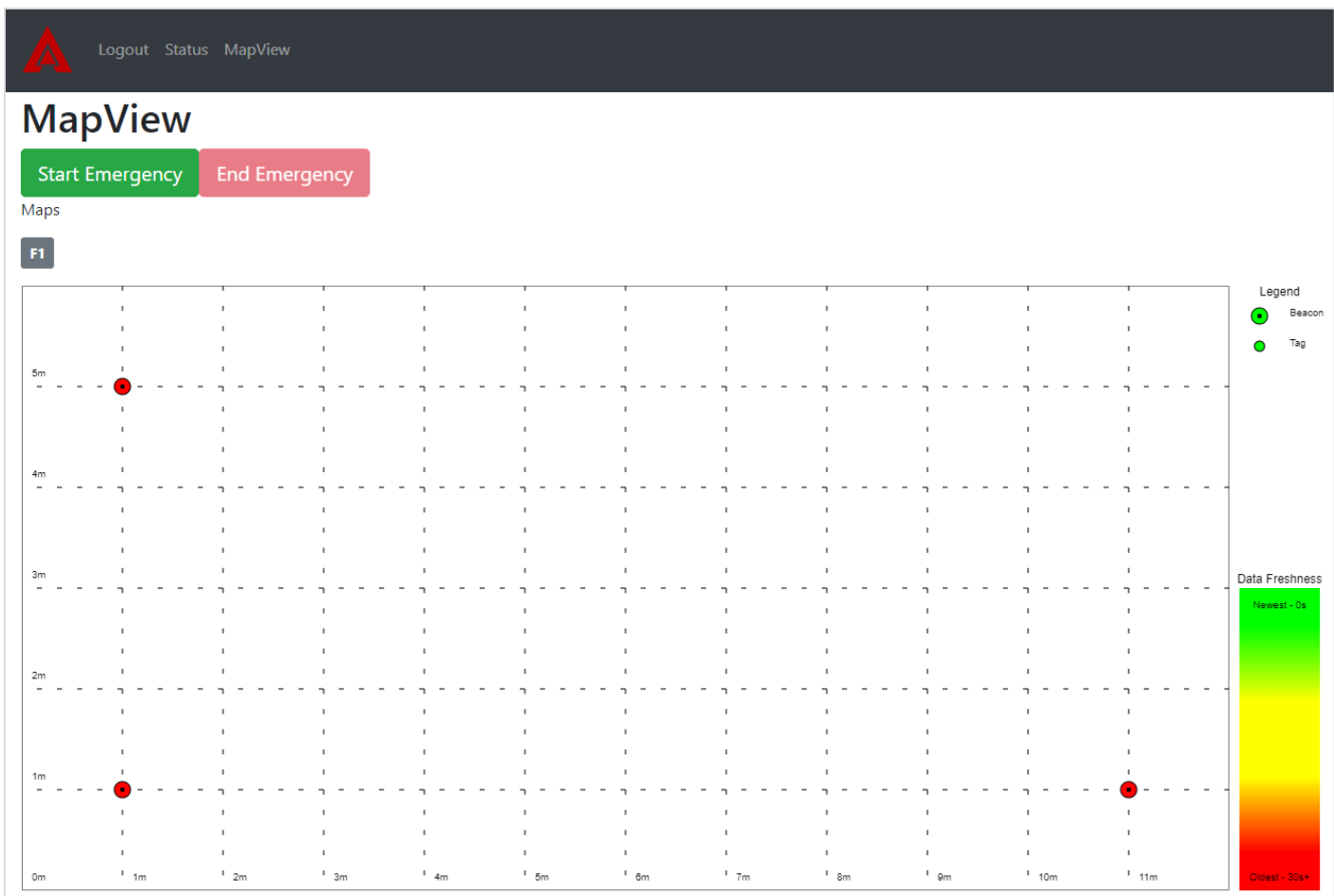
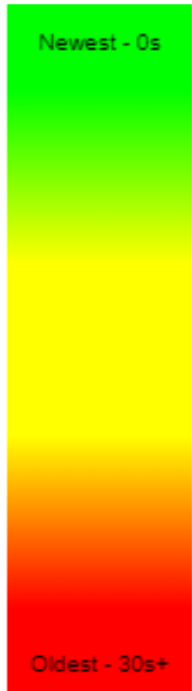


Figure 4: First Responder Maps View

- 4) Maps shown will be similar to image above.
- 5) Circle icons are ID tags and circles with black dot are beacons.

Last Seen Time Bar



- 1) Used to indicate last seen time.
- 2) Ranges from 0 to 30+ seconds.
- 3) The greener the color the more recent the location.
- 4) The redder the color the less recent the location.

Figure 5: Last Seen Time Bar

1.3 Start Emergency Mode

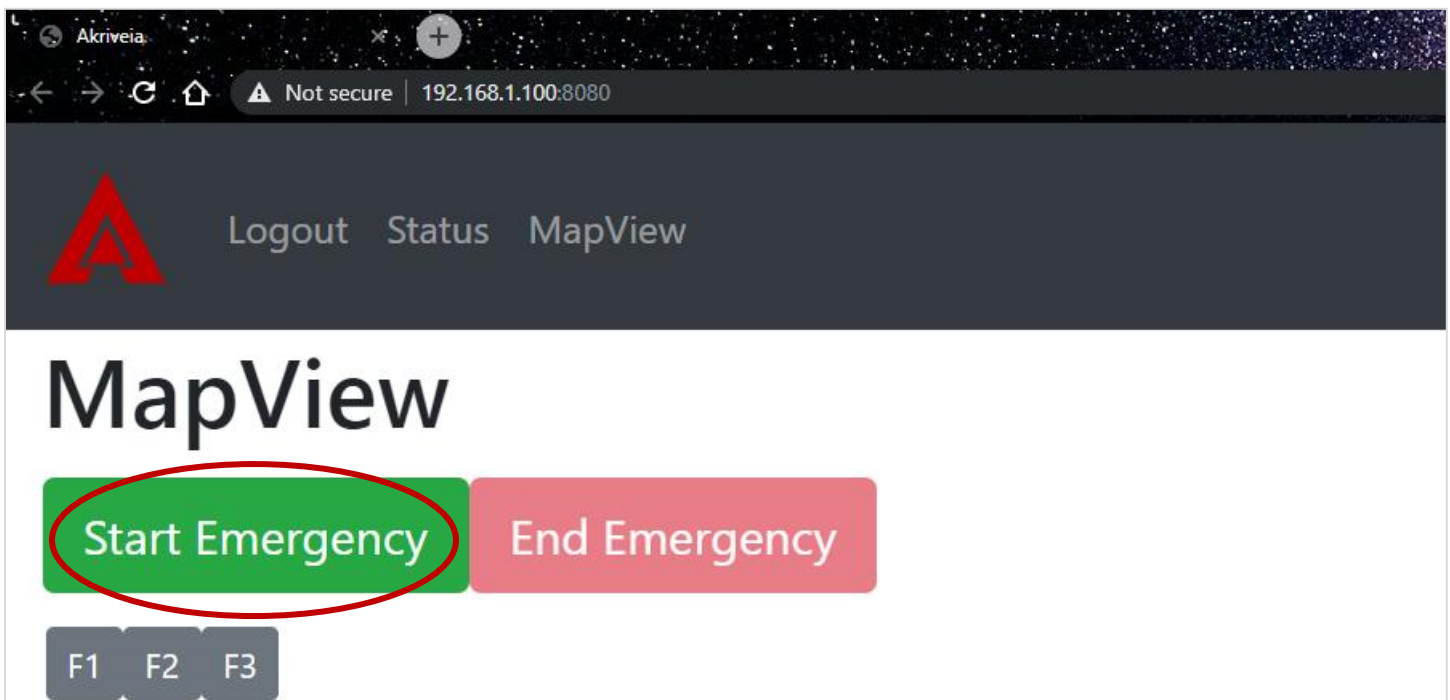


Figure 6: Start Emergency Button

- 1) Click on **Start Emergency** button to start tag location tracking.

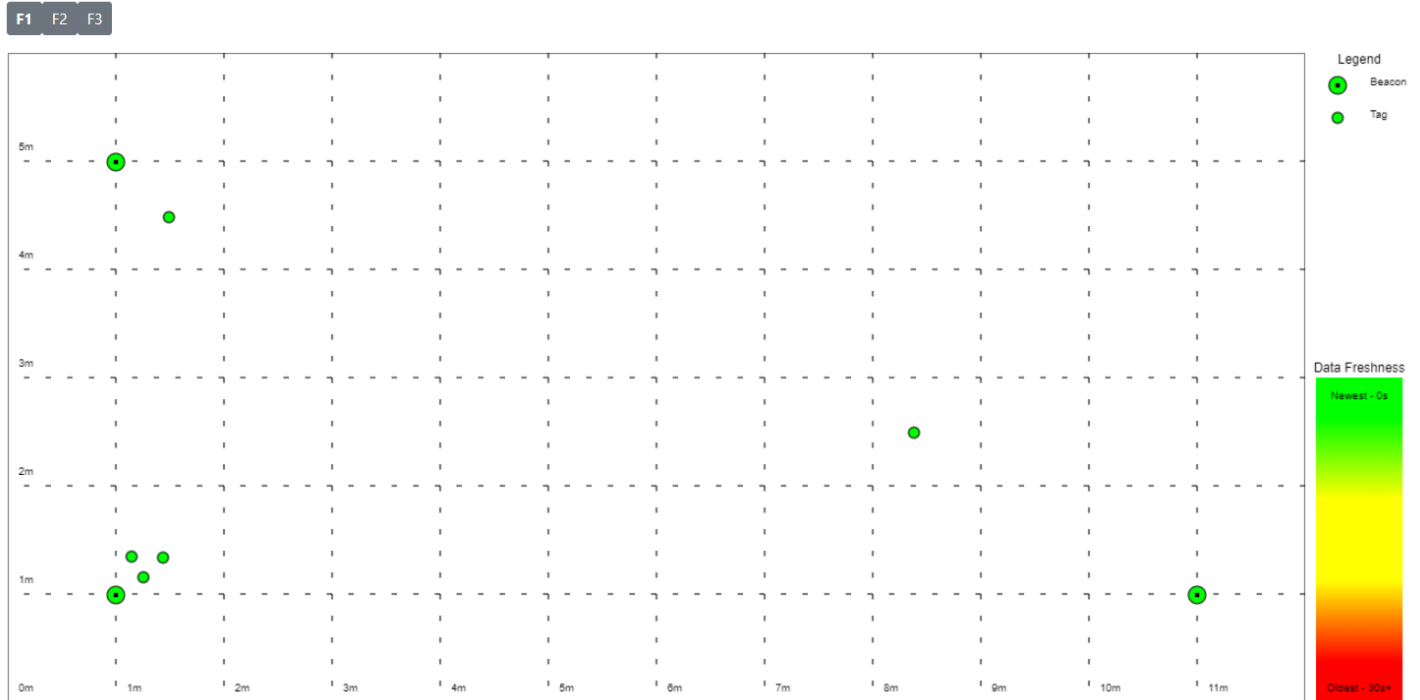


Figure 7: Start Tracking Map

- 2) This will allow beacons to track ID tag locations in near-real time.

1.4 End Emergency Mode

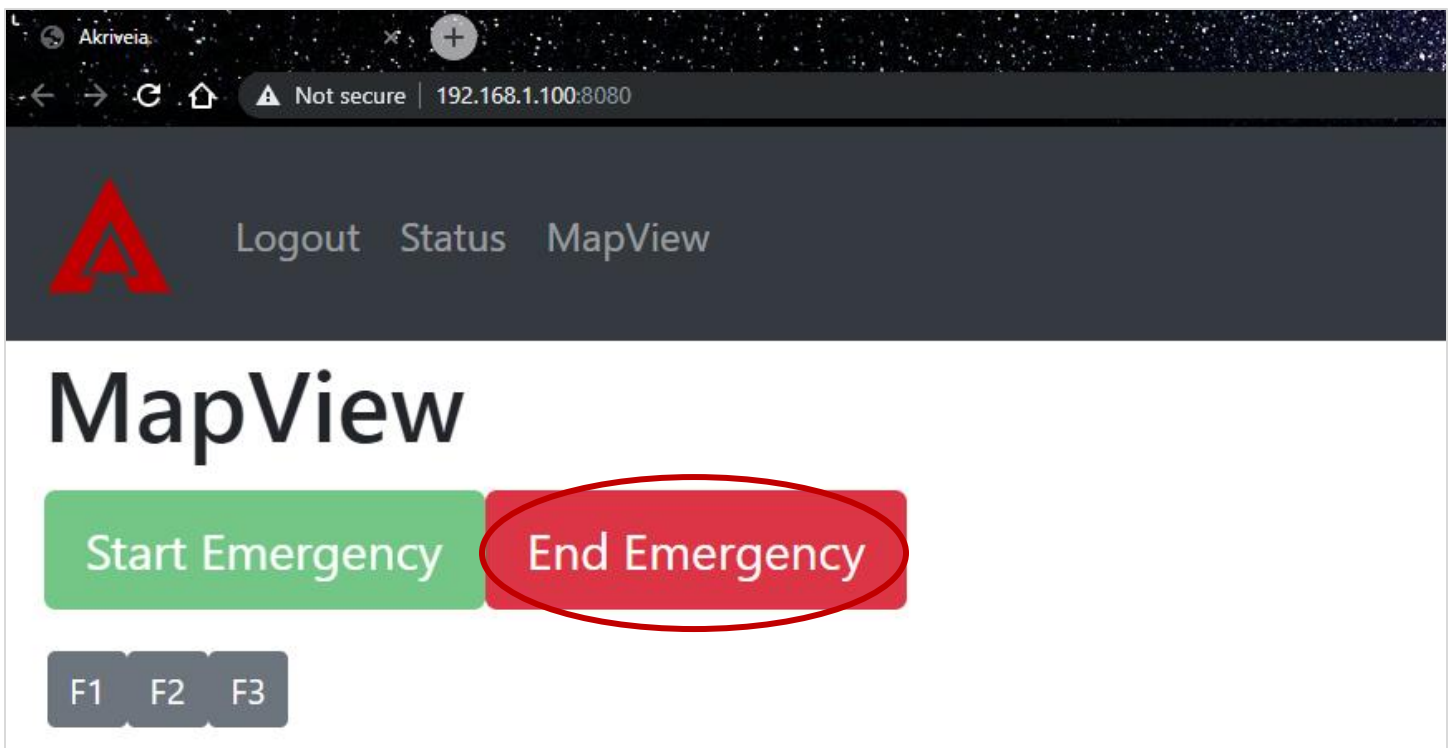
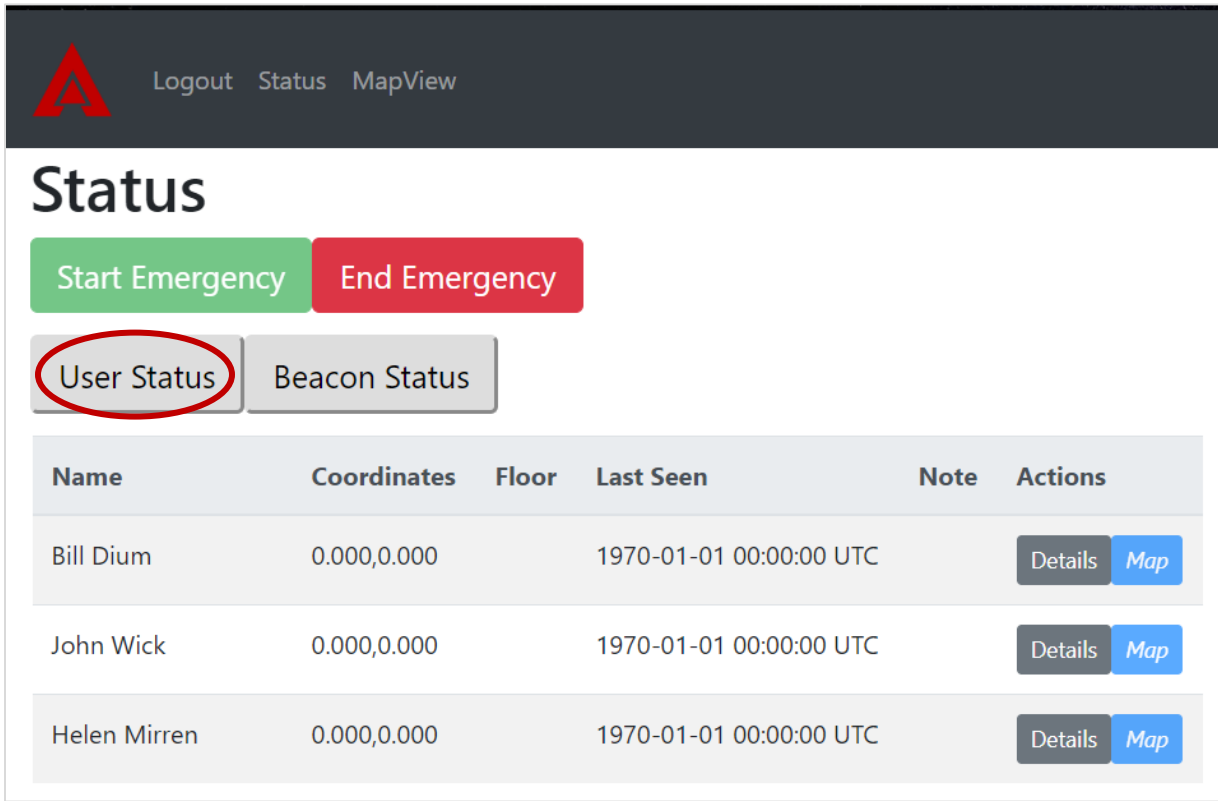


Figure 8: End Emergency Button

- 1) When system is currently under Emergency Mode, Click **End Emergency** button to stop beacons from tracking tags.

1.5 View User Status



Status

Start Emergency End Emergency

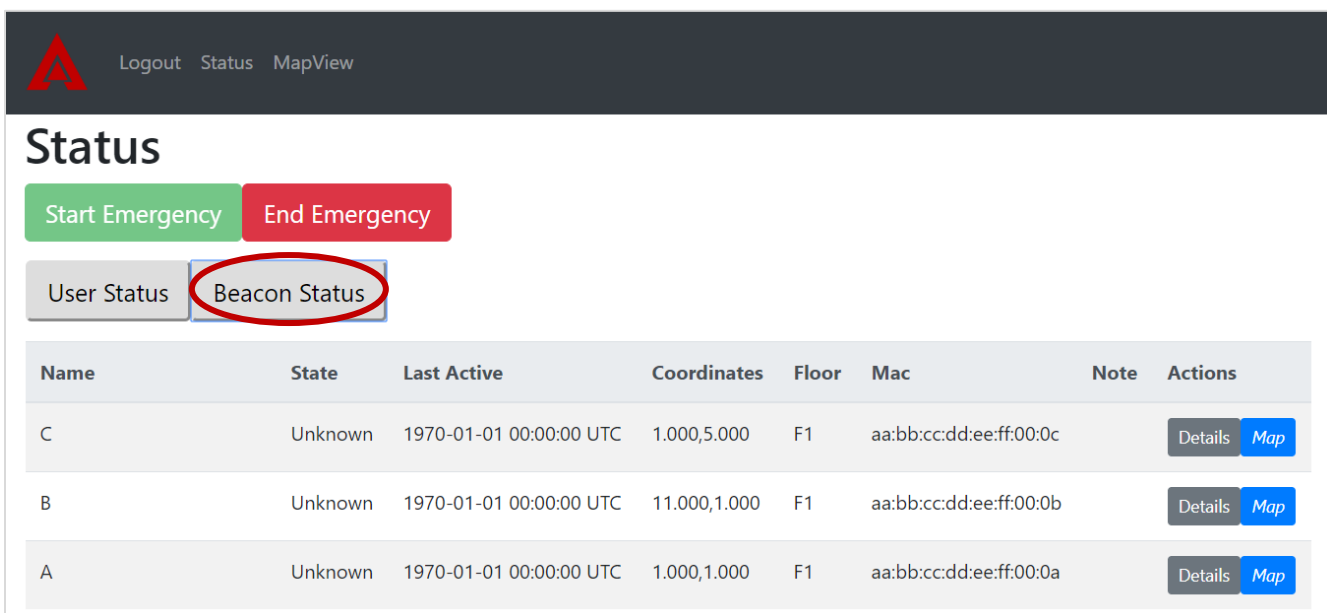
User Status Beacon Status

Name	Coordinates	Floor	Last Seen	Note	Actions
Bill Dium	0.000,0.000		1970-01-01 00:00:00 UTC		Details Map
John Wick	0.000,0.000		1970-01-01 00:00:00 UTC		Details Map
Helen Mirren	0.000,0.000		1970-01-01 00:00:00 UTC		Details Map

Figure 9: First Responder - User Status

- 1) Select **Status** button on the top navigation bar then select **User Status** to view status and information for each user.
- 2) Status table include name and last seen time stamp for their ID tags, as well as last known coordinates which can also be seen on the map by clicking the **Map** button.

1.6 View Beacon Status



Status

Start Emergency End Emergency

User Status Beacon Status

Name	State	Last Active	Coordinates	Floor	Mac	Note	Actions
C	Unknown	1970-01-01 00:00:00 UTC	1.000,5.000	F1	aa:bb:cc:dd:ee:ff:00:0c		Details Map
B	Unknown	1970-01-01 00:00:00 UTC	11.000,1.000	F1	aa:bb:cc:dd:ee:ff:00:0b		Details Map
A	Unknown	1970-01-01 00:00:00 UTC	1.000,1.000	F1	aa:bb:cc:dd:ee:ff:00:0a		Details Map

Figure 10: First Responder - Beacon Status

- 1) Select **Beacon Status** button to view status, state and other information for each Beacon.

2. Beacon Instructions

2.1 Beacon Safety Information

Read all safety information before using the product to ensure safe and proper use.



Warning

- Do not expose the product to physical impact or damage.
- Do not handle or touch the beacon battery or internal components with wet hands.
- Avoid leaving the case open for long periods of time to limit dust and debris.
- Ensure no foreign objects are left in case after maintenance.

2.2 Beacon Layout

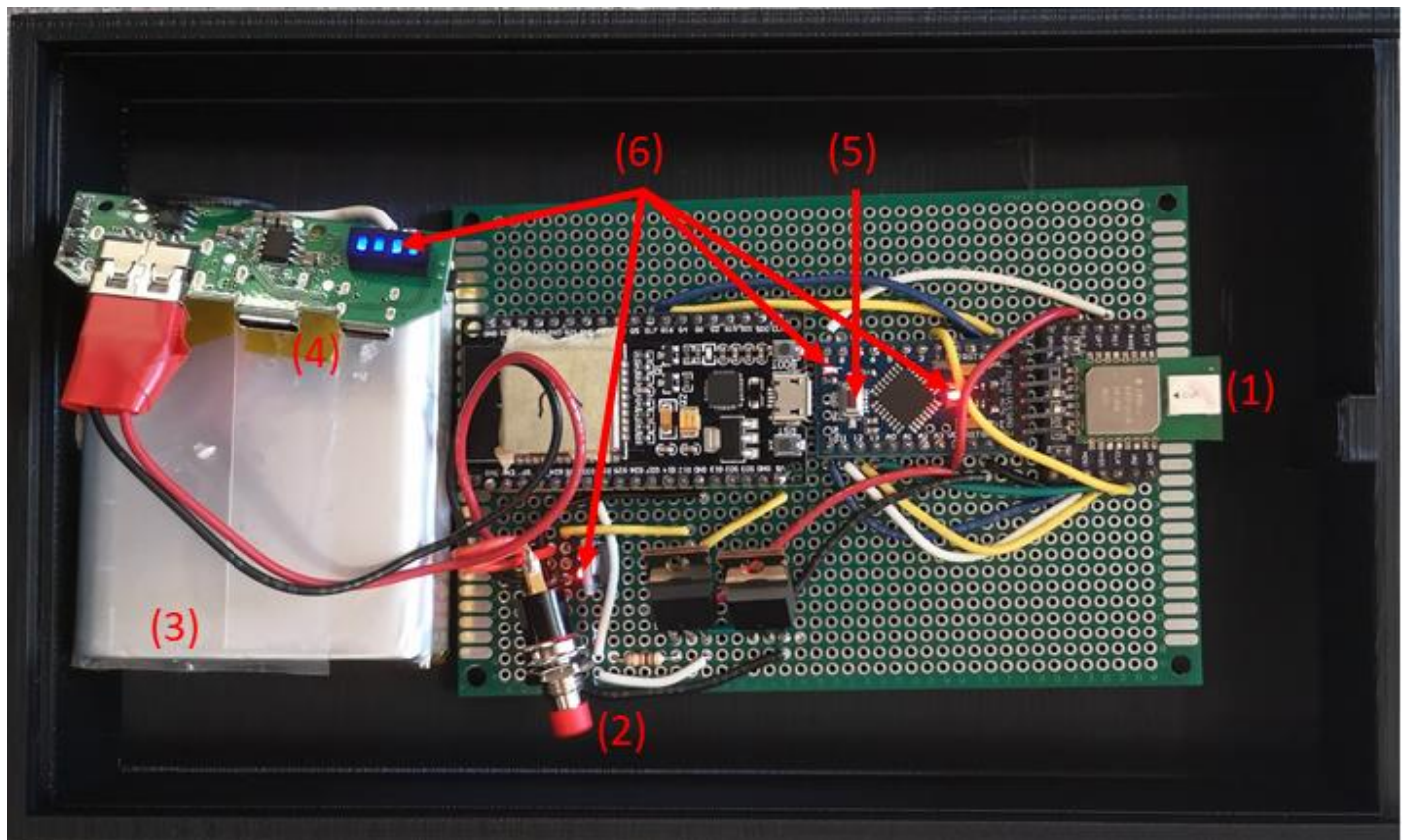


Figure 11: Beacon Internal Components

1	Antenna	UWB module antenna
2	Power Switch	Toggle to turn on and toggle again to turn off.
3	Backup Battery	5.0V 10000mAH rechargeable battery pack.
4	Charging Port	Micro/C-USB type charging port.
5	Reset Button	Used to perform a hardware reset on MCU and Wi-Fi module.
6	Status LEDs	Used to observe power to electronic components

Table 1: Beacon Internal Components

2.3 Beacon Installation

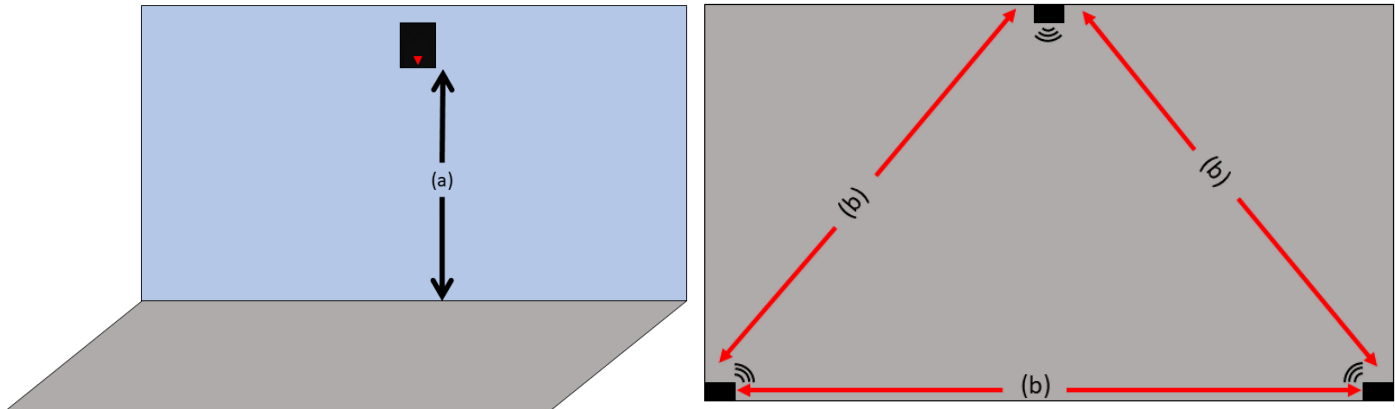


Figure 12: Recommended Beacon Installation Placement

- (a) Mounting height from floor: 2-4m
- (b) Distance between beacons: 4-9m

**Ensure all beacons are installed at the same height, with few obstructions nearby.

2.4 Beacon Basic Operations

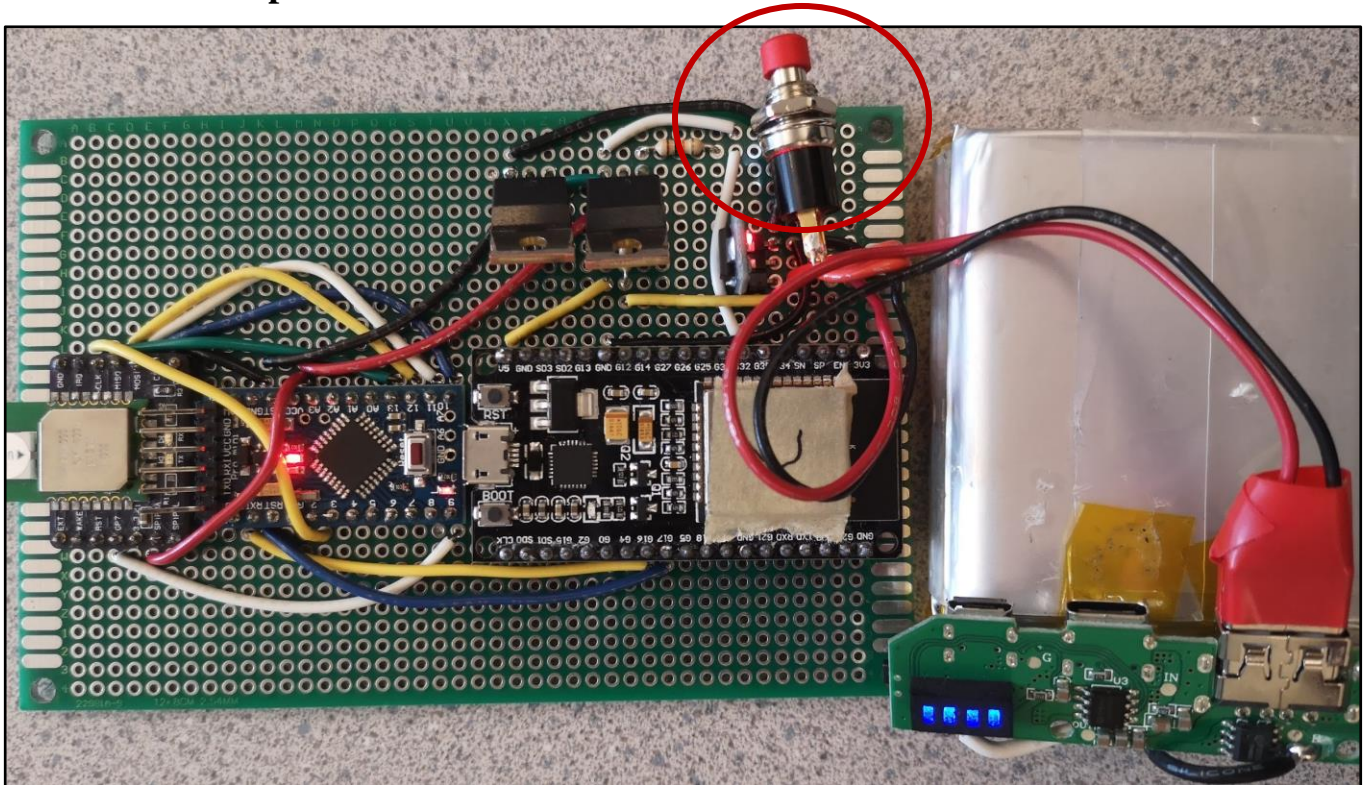


Figure 13: Beacon Operations

- 1) Click red toggle button to turn on beacons.
- 2) Status LEDs should turn on to indicate beacon is on.
- 3) Click red toggle button again to turn off Beacons.

2.5 Beacon Maintenance & Repair

- 1) Click red toggle button to turn off beacon. Blue device LED should turn off.
- 2) Internal components accessible by unscrewing locking screw and removing lid from casing.
- 3) Ensure all components are powered off by observing status LEDs. All should be off.
- 4) Click red toggle button to turn on beacon.
- 5) Click red 'reset' button on MCU and black 'RST' button on the Wi-Fi module to reset device firmware.

3. ID Tag Instructions

3.1 Tag Safety Information

Read all safety information before using the product to ensure safe and proper use.



Warning

- Do not expose the product to physical impact or damage.
- Do not carry the device in your back pockets.
- Do not turn on the device in the absence of Akriveia Beacons.
- Do not turn on the device in the absence of an emergency.
- Do not touch the charger or the device with wet hands while the device is charging

3.2 Tag Layout

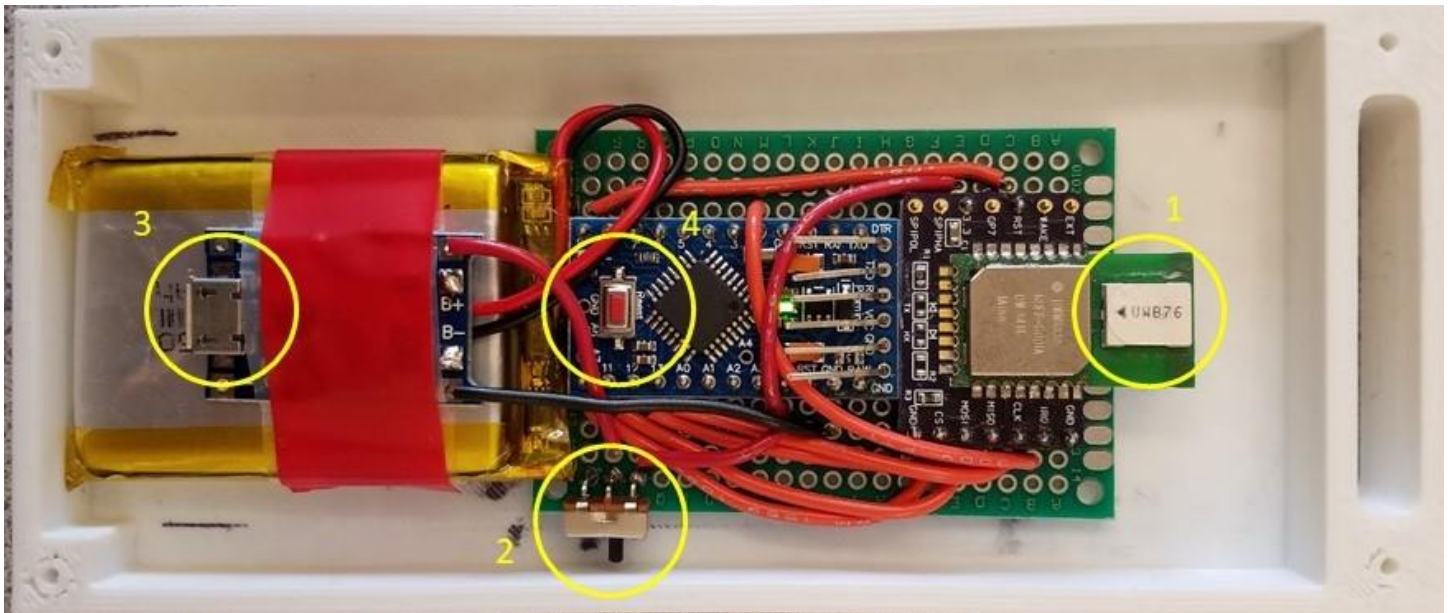


Figure 14: ID Tag Internal Components

1	Antenna	UWB module antenna
2	Power Switch	Slide right (towards battery) to turn on and left (away from battery) to turn off.
3	Charging Port	Micro-USB type charging port.
4	Reset Button	Used to perform a hardware reset on MCU.

Table 2: ID Tag Components

3.3 Activating the Tag

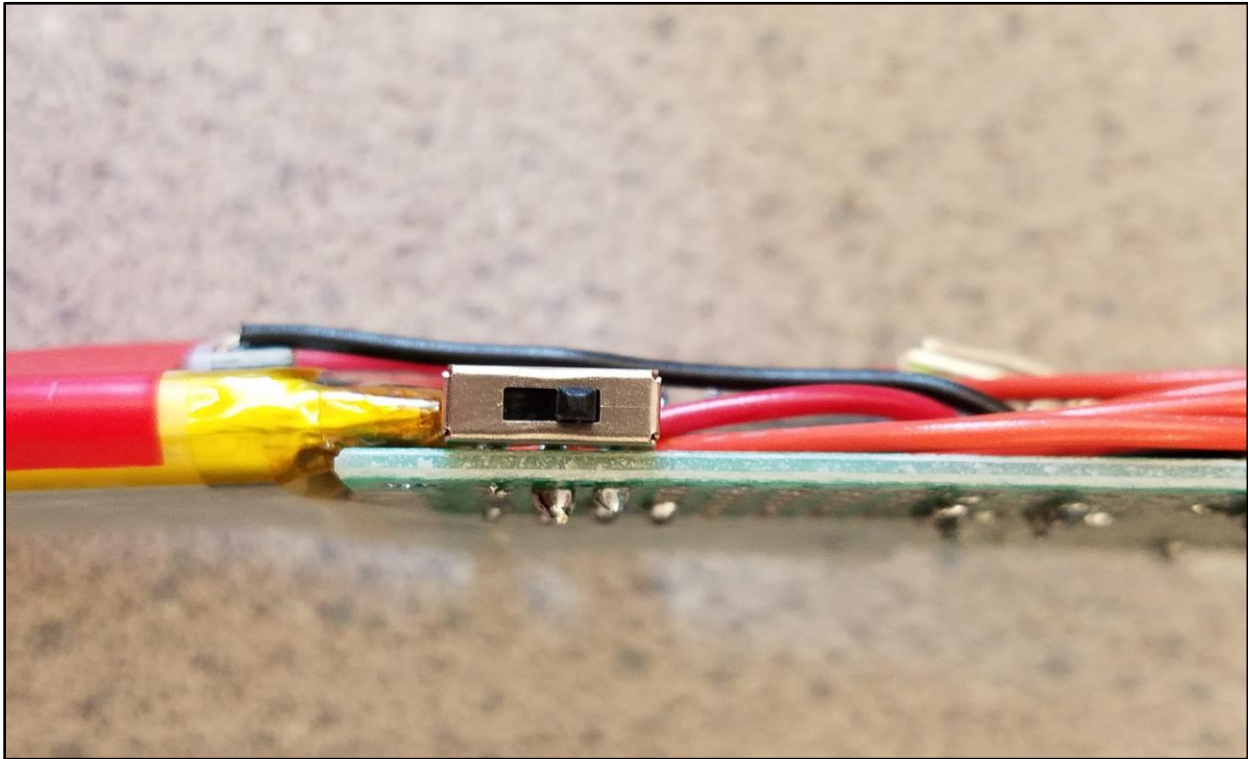


Figure 15: Tag Toggle On

- 1) Power on the tag by switching the toggle switch to **On** position.

3.4 Deactivating the Tag

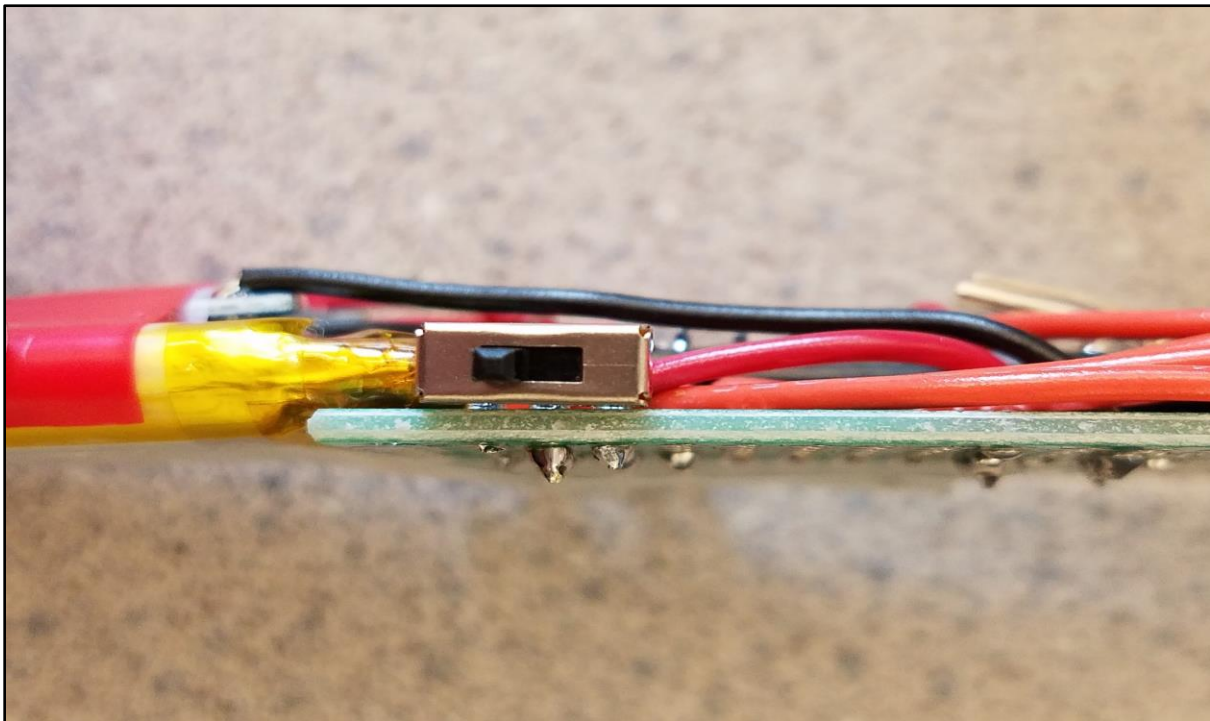


Figure 16: Tag Toggle off

- 1) Power off tag by switching the toggle switch to the **Off** position.

3.5 Charging the Tag Battery



Figure 17: ID Tag Charging Port

- 1) Power off tag by switching the toggle switch to the **Off** position.
- 2) Unscrew the cover of the case to open the ID tag.
- 3) Connect the ID Tag to a power source through a charging cable (*Micro-USB* connectors).

3.6 Resetting the Tag

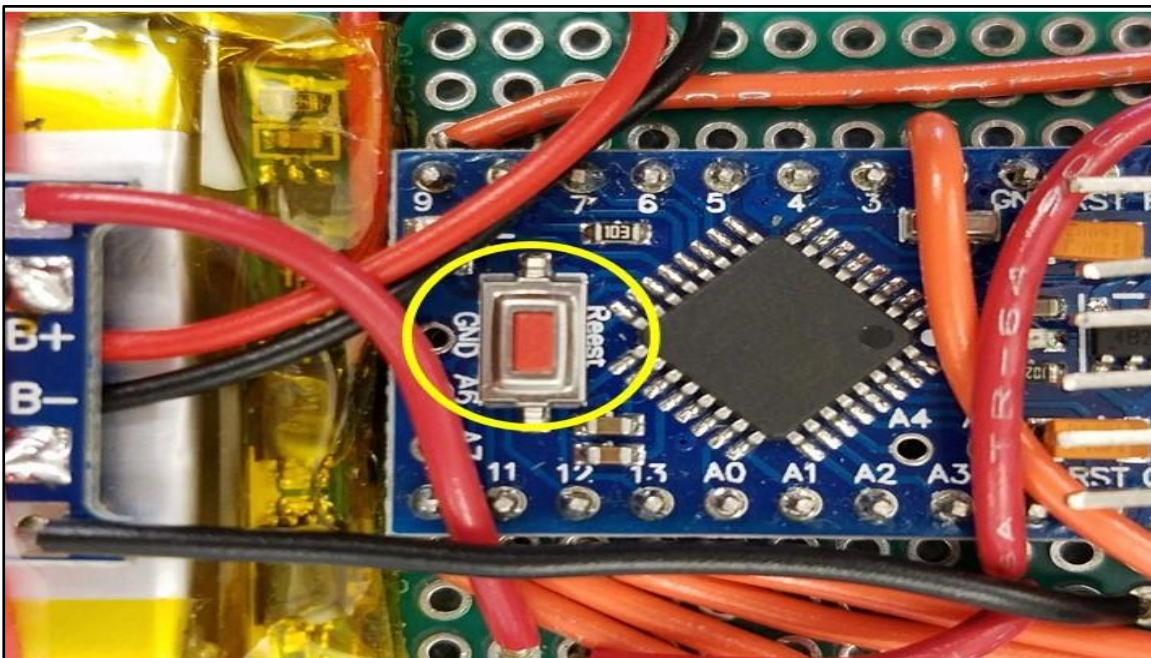


Figure 18: ID Tag Reset Button

- 1) Unscrew the secure screws on the four corners of the case to open the ID tag and power **on** tag.
- 2) Click the reset button on MCU to reset tag devices. LED should turn off then immediately on.

4. Administrator Configuration

4.1 Admin Login

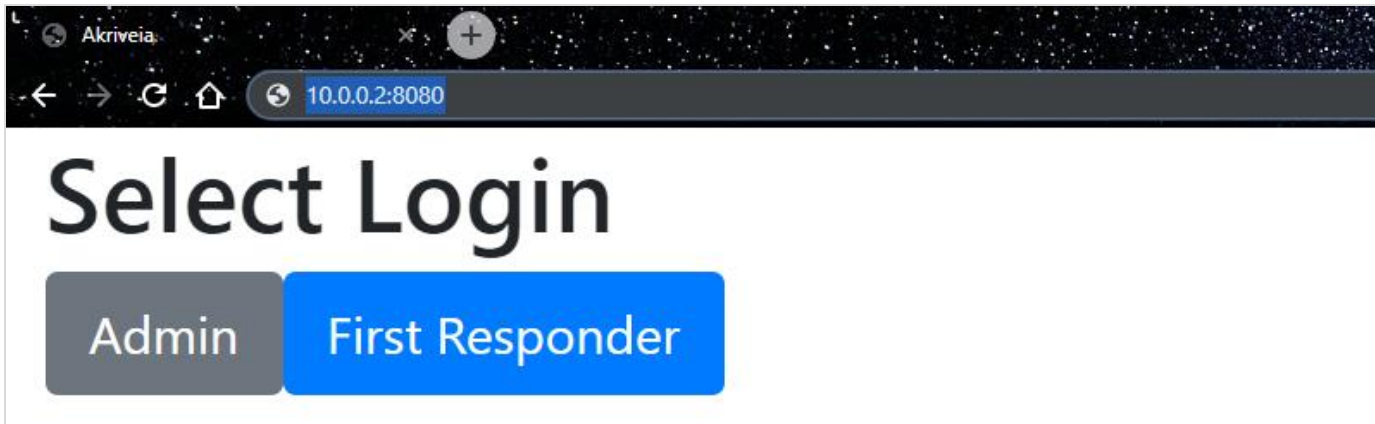


Figure 19: Admin User Selection

- 1) Enter Server Host IP and port into browser URL. Default IP: 10.0.0.2:8080
- 2) Select **Admin** Button to access admin configuration

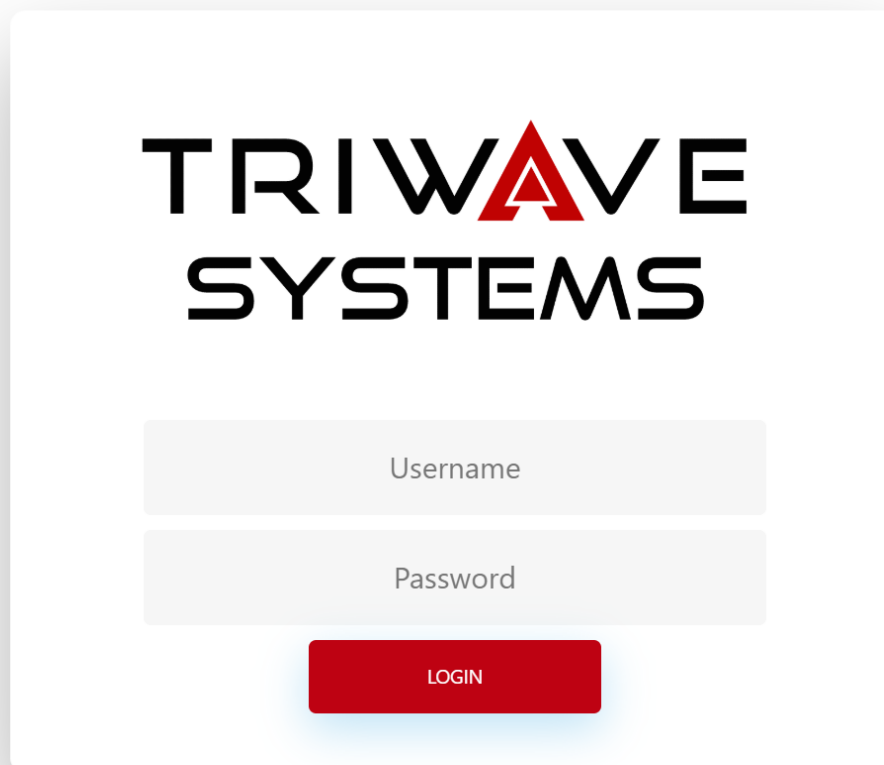


Figure 20: Admin Login Screen

- 3) Enter username and password (default user: admin, default password: admin).
- 4) Click the **Login** button to access administrator configurations.

4.2 Add Beacon

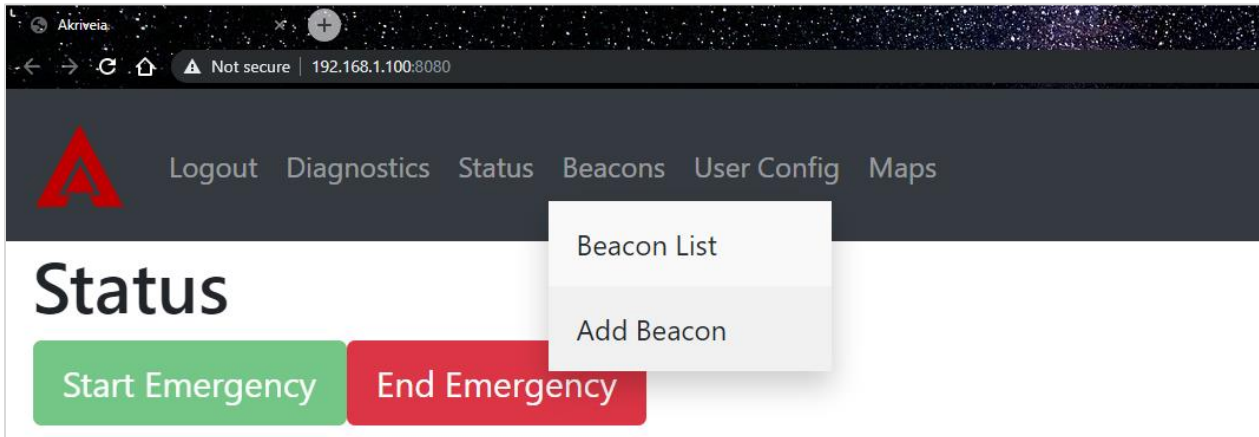


Figure 21: Add Beacon Button

- 1) From top navigation bar mouse over **Beacons** and select **Add Beacon** from drop down menu.

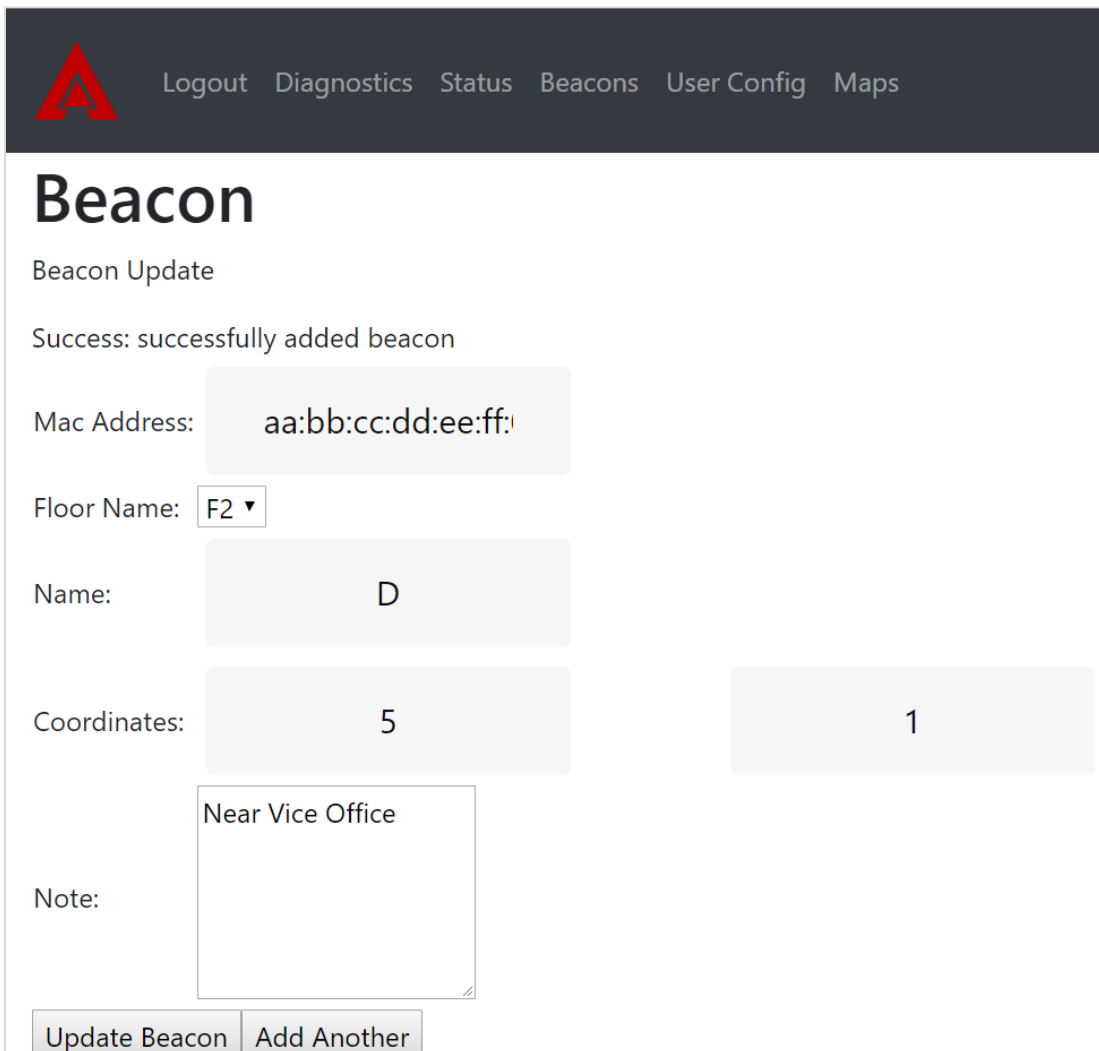
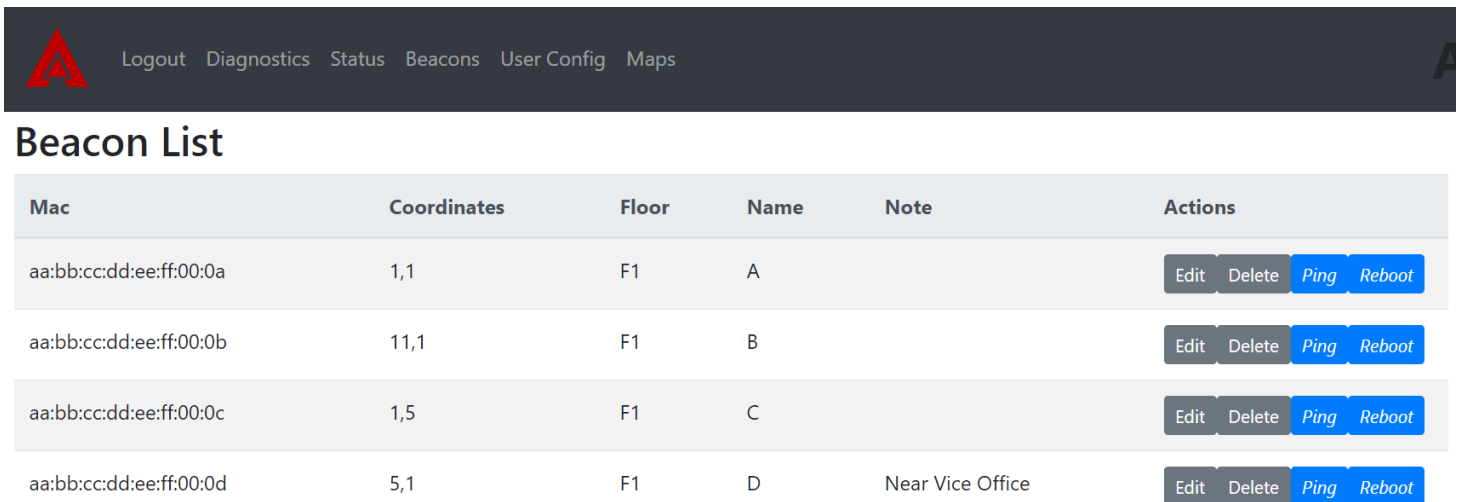
The screenshot shows the 'Beacon' page in the Akriveria web interface. The page has a dark navigation bar with links: Logout, Diagnostics, Status, Beacons, User Config, and Maps. The main content area is titled 'Beacon' and contains a 'Beacon Update' section. A success message 'Success: successfully added beacon' is displayed. Below the message are input fields for 'Mac Address' (containing 'aa:bb:cc:dd:ee:ff:'), 'Floor Name' (a dropdown menu with 'F2' selected), 'Name' (containing 'D'), and 'Coordinates' (containing '5' and '1'). There is also a 'Note' field with the text 'Near Vice Office'. At the bottom of the form are two buttons: 'Update Beacon' and 'Add Another'.

Figure 22: Add Beacon Page

- 2) Once in Beacon add page, fill in information such as beacon hardware **MAC address**, **floor**, **name** of beacon and any additional **notes** related to beacon configuration.
- 3) Click **Add Beacon** button to add beacons to list of existing beacons

Beacon Fields	Description
Mac Address	Required. The unique Mac Address of the beacon. The address must be a valid hexadecimal encoded 8 byte address of the form 00:00:00:00:00:00:00:00.
Floor Name	Required. Choose the floor the beacon will be located on.
Name	Required. The name of the beacon. This string must be unique across all beacons.
Coordinates	Required. The coordinates of the beacon, relative to the location <0, 0> (bottom left corner) on the chosen map, in meters.
Notes	Optional Notes for Emergency Responders to view during an emergency.

Table 3: Beacon Fields Descriptions



The screenshot shows the 'Beacon List' page. At the top is a navigation bar with a red 'A' logo and links: Logout, Diagnostics, Status, Beacons, User Config, and Maps. Below the navigation bar is the title 'Beacon List'. The main content is a table with columns: Mac, Coordinates, Floor, Name, Note, and Actions. There are four rows of beacon data, each with 'Edit', 'Delete', 'Ping', and 'Reboot' buttons in the Actions column.

Mac	Coordinates	Floor	Name	Note	Actions
aa:bb:cc:dd:ee:ff:00:0a	1,1	F1	A		Edit Delete Ping Reboot
aa:bb:cc:dd:ee:ff:00:0b	11,1	F1	B		Edit Delete Ping Reboot
aa:bb:cc:dd:ee:ff:00:0c	1,5	F1	C		Edit Delete Ping Reboot
aa:bb:cc:dd:ee:ff:00:0d	5,1	F1	D	Near Vice Office	Edit Delete Ping Reboot

Figure 23: Beacon List

4) New beacon will appear under list of beacons (Top Navigation Bar->Beacons->Beacon List).

4.3 Add User

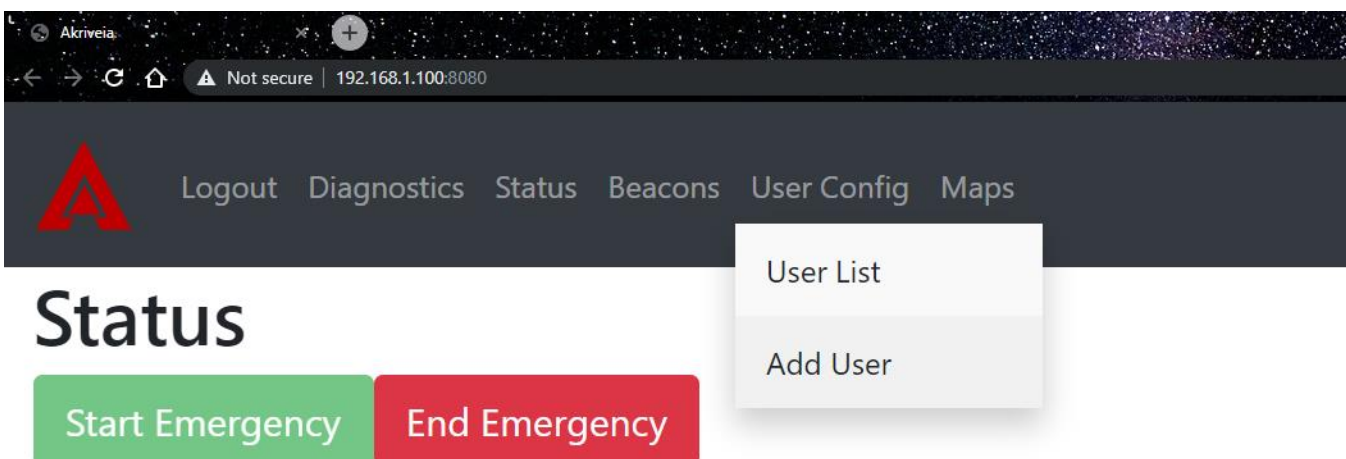


Figure 24: Add User Button

1) From top navigation bar mouse over **User Config** and select **Add User** from drop down menu.



User

User Add

Name: Amy Santiago

Mac Address: 00:02

Employee ID: A123B

Work Phone: 778-123-4567

Mobile Phone: 778-123-4568

Note:

Emergency Contact Information

Name: Mom

Employee ID:

Work Phone:

Mobile Phone:

Note:

Figure 25: Add User Page

- 2) In add user page, fill in information such as user name, MAC, employee ID, phone numbers, notes.
- 3) While optional, it is highly recommended to add an emergency contact to the user.
- 4) To edit the emergency contact, type into the contacts name and the associated fields
- 5) Click the **Add User** button to add user to list of existing users.

User Fields	Description
Name	Required. The name of the employee.
Mac Address	Required. The unique address of the ID TAg the employee will be wearing. The address must be a valid hexadecimal encoded 2 byte address of the form 00:00,
Employee ID	Optional. The internal company id of the employee if applicable.
Work Phone	Required. The phone number of the employee.
Mobile Phone	Required. The phone number of the employee.
Notes	Optional Notes for Emergency Responders to view during an emergency.

Table 4: User Field Description

Emergency Contact Fields	Description
Name	Required. The name of the contact.
Employee ID	Optional. The internal company id of the employee if applicable.
Work Phone	Required. The phone number of the employee.
Mobile Phone	Required. The phone number of the employee.
Notes	Optional Notes for Emergency Responders to view during an emergency.

Table 5: Emergency Contact Fields Description

The screenshot shows the ADM interface with a top navigation bar containing links: Logout, Diagnostics, Status, Beacons, User Config, and Maps. A zoom control is set to 150%. Below the navigation bar, the 'User' section is active, displaying a 'User List' table. The table has columns: Name, Coordinates, Mac, Employee ID, Last Active, Work Phone, Mobile Phone, and Actions. The Actions column contains 'Edit' and 'Delete' buttons for each user entry.

Name	Coordinates	Mac	Employee ID	Last Active	Work Phone	Mobile Phone	Actions
John Wick	0,0	00:00		1970-01-01 00:00:00 UTC			Edit Delete
Helen Mirren	0,0	00:01		1970-01-01 00:00:00 UTC			Edit Delete
Bill Dium	0,0	00:02		1970-01-01 00:00:00 UTC			Edit Delete
Amy Santiago	0,0	00:03	A123B	1970-01-01 00:00:00 UTC	778-123-456	778-123-457	Edit Delete

Figure 26: User List

6) New users will appear under list of beacons (Top Navigation->User Config->User List).

4.4 Add Map

The screenshot shows the ADM interface with the 'Status' page selected. The top navigation bar is the same. Below the navigation bar, the 'Status' section has two buttons: 'Start Emergency' (green) and 'End Emergency' (red). A dropdown menu is open over the 'Maps' navigation link, showing three options: 'Map List', 'Add Map' (highlighted), and 'MapView'.

Figure 27: Add Map Button

1) From top navigation bar mouse over **Maps** and select **Add Map** from drop down menu.



Map

Name:

F4

Bounds:

0

0

Scale:

1

Note:

Upload Map Image

Add Map

Figure 28: Add Map Page

- 2) Enter the **Name** of the map, the **bounds** of the image to be uploaded, a **scaling factor** for m to pixel, and any additional **notes**.

Map Fields	Description
Name	Required. The name of the map.
Bounds	Required. The pixel width and height of the map image.
Scale	Required. The pixel per meter ratio for the map image. Used to convert coordinates in meters to a location on the image.
Notes	Optional. Notes for Emergency Responders to view during an emergency.

Table 6: Map Field Description



Map

Name:

Bounds:

Scale:

Note:

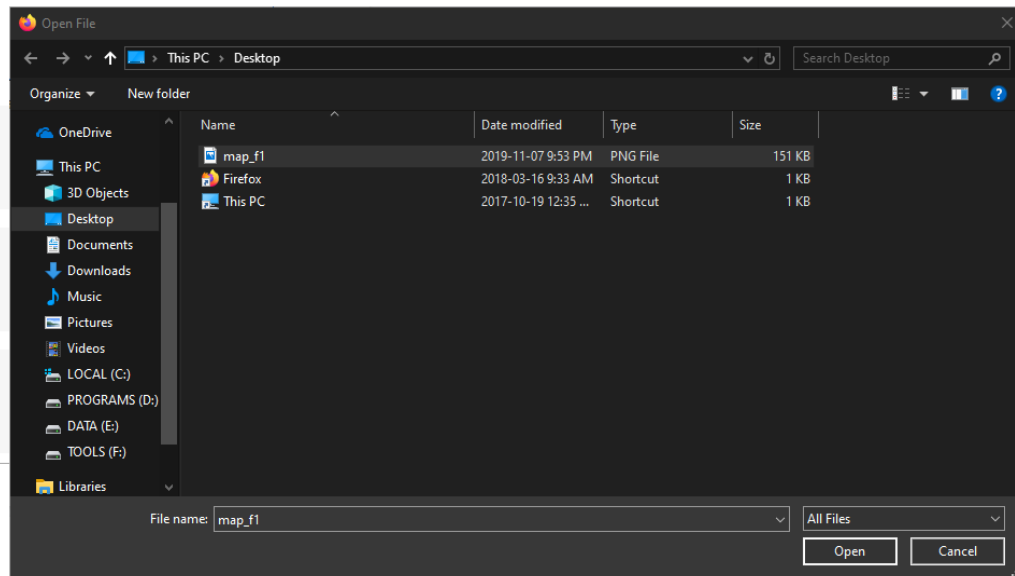


Figure 29: Upload Map Image

- 3) Click **Upload Map Image** and select an image file containing the blueprint or floor plan of the current map.



Map

Map List

Name	Bounds	Scale	Note	Actions
F1	1200,600	100		<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="View"/>
F2	800,600	100		<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="View"/>
F3	800,600	100		<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="View"/>
F4	800,1200	1		<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="View"/>

Figure 30: Map List

- 4) New Map will appear under list of Maps (Top Navigation->Maps->Map List).

4.5 Assign Beacons Placement on Map

[Logout](#) [Diagnostics](#) [Status](#) [Beacons](#) [User Config](#) [Maps](#)

ADMIN

Map

Name:

Bounds:

Scale:

Note:

Beacon Placement

Name Location Actions	
D	0 0
A	0 0
C	0 0
B	0 0

<input type="button" value="Save"/>	<input type="button" value="Toggle Placement"/>
<input type="button" value="Save"/>	<input type="button" value="Toggle Placement"/>
<input type="button" value="Save"/>	<input type="button" value="Toggle Placement"/>
<input type="button" value="Save"/>	<input type="button" value="Toggle Placement"/>

Figure 31: Map Edit Page

- 1) If beacons are assigned to map (steps in 4.2 Figure 22.) they will be shown similar to above.

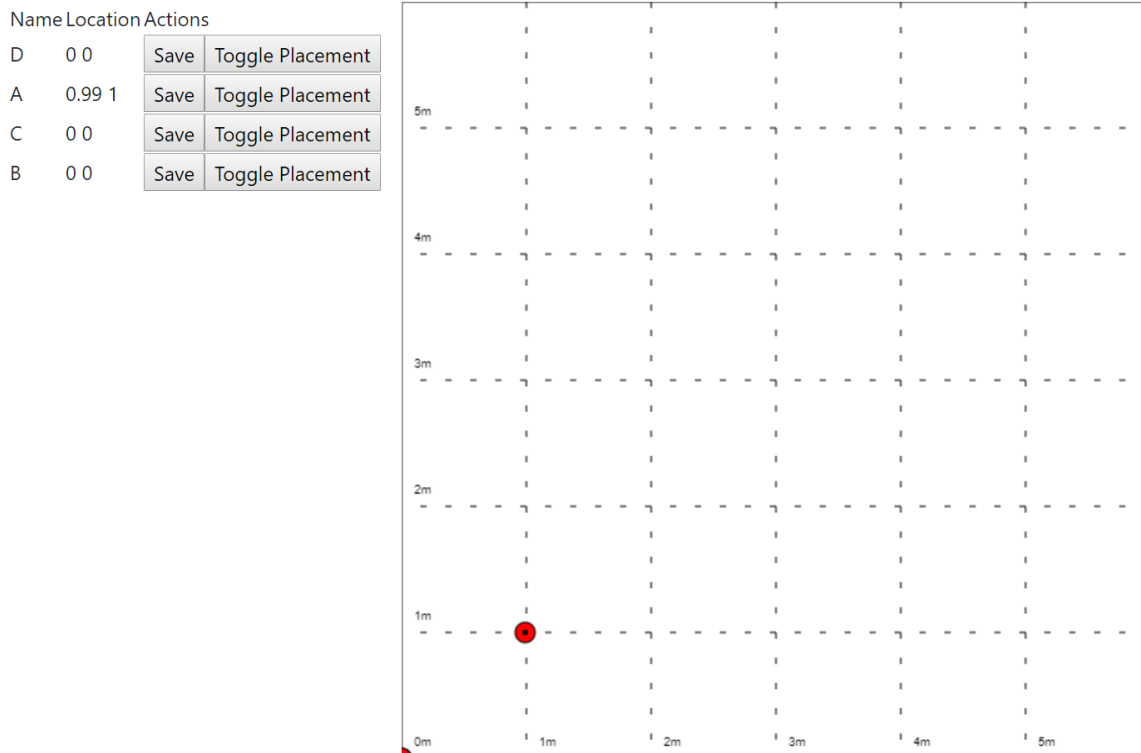


Figure 32: Beacon Placement

- 2) Click **Toggle Placement** on beacon to be assigned and click on desired location on map.
- 3) Once beacon placement is complete click save.
- 4) Once All beacon placement is complete click update map to save configurations.

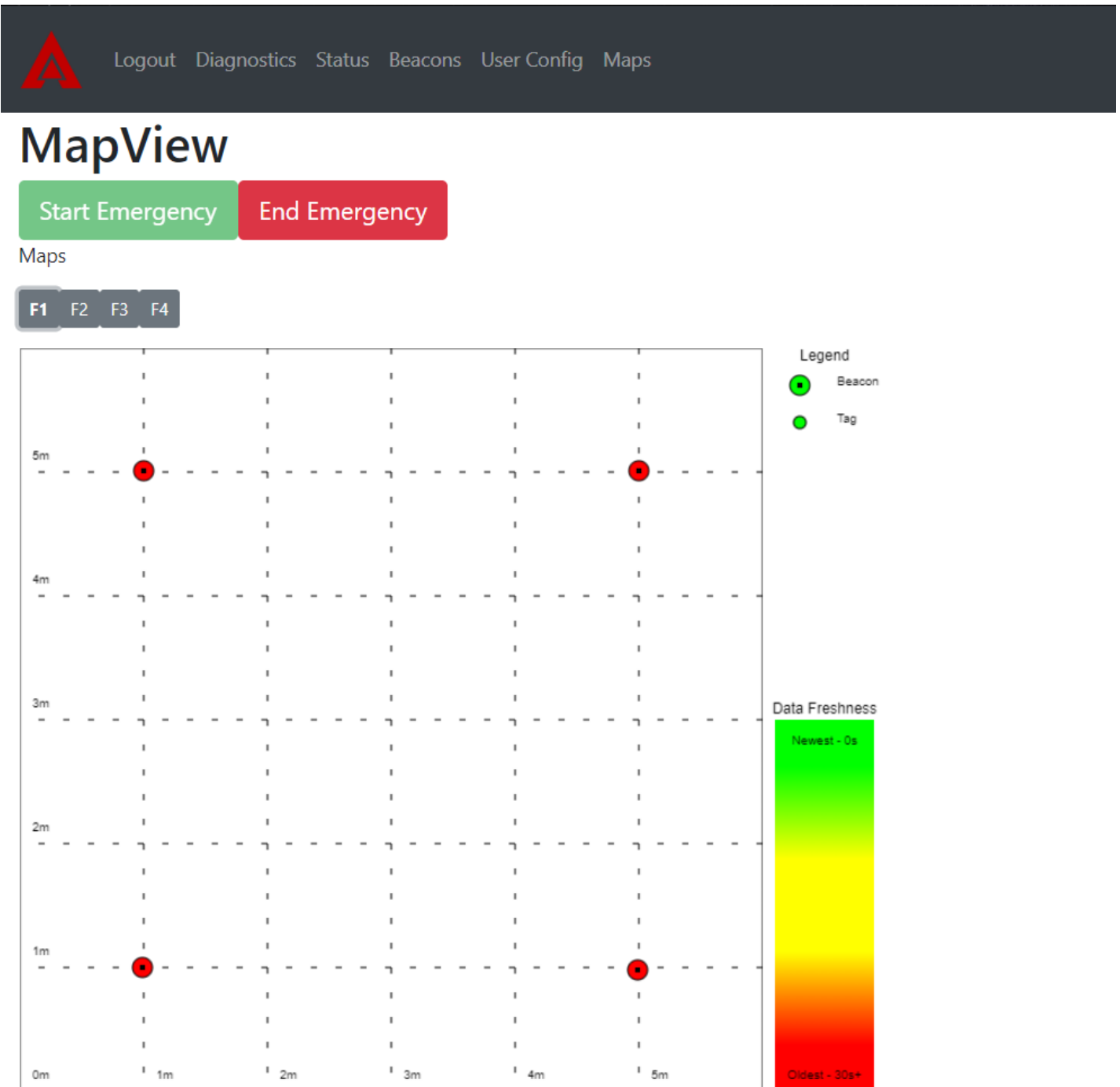



Figure 33: Updated Beacon Map View

- 5) To view new beacon placement, go to Navigation Bar-> Map View and click on the map that was updated.
- 6) New beacon placement should be updated and shown.

Appendix A - Beacon List Column Explanations

	Logout	Diagnostics	Status	Beacons	User Config	Maps
---	--------	-------------	--------	---------	-------------	------

Beacon List

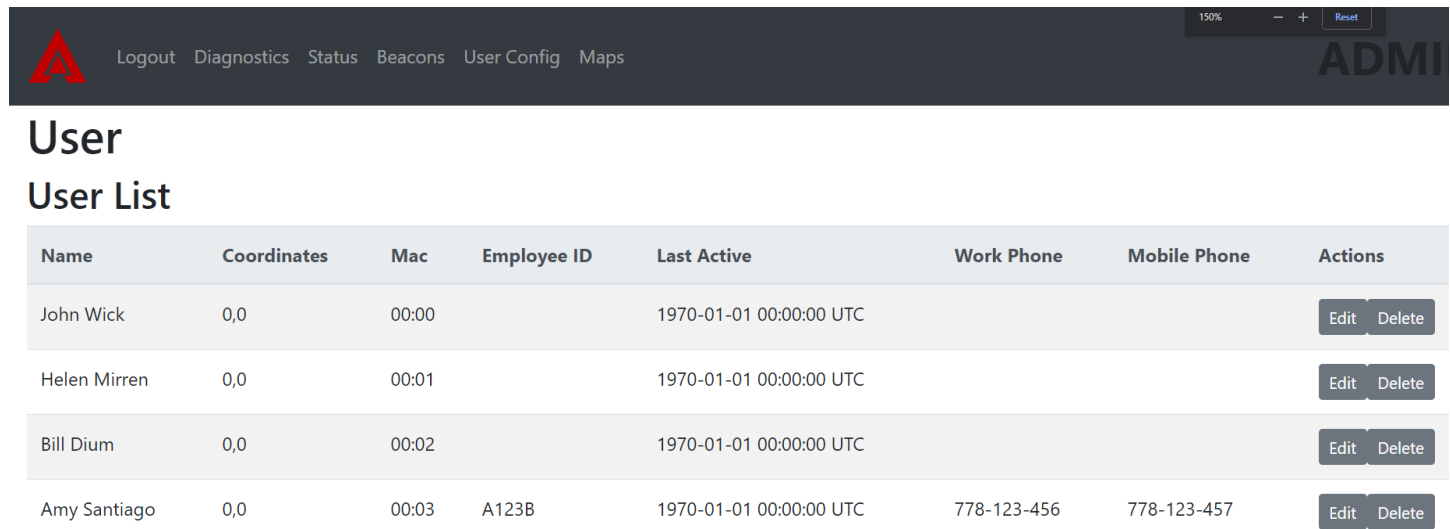
Mac	Coordinates	Floor	Name	Note	Actions
aa:bb:cc:dd:ee:ff:00:0b	0,0	F1	B		<a>Edit <a>Delete <a>Ping <a>Reboot
aa:bb:cc:dd:ee:ff:00:0c	0,0	F1	C		<a>Edit <a>Delete <a>Ping <a>Reboot
aa:bb:cc:dd:ee:ff:00:0a	0,0	F1	A		<a>Edit <a>Delete <a>Ping <a>Reboot
aa:bb:cc:dd:ee:ff:00:0d	0,0	F1	D	Near Vice Office	<a>Edit <a>Delete <a>Ping <a>Reboot

Figure 34: Beacon List

Beacon List Fields	Description
Mac	The Mac address of each beacon is listed. This is the identifier for the beacons.
Coordinates	The coordinates in (x, y) on the map listed under Floor . These coordinates are per the map's coordinates and have not been scaled to reflect the physical location.
Floor	The map name of which the beacon is located.
Name	The name of the beacon.
Note	Any additional information required to be known about the beacon.
Actions	This column contains following actions that administrators can do: <ol style="list-style-type: none"> 1. Edit - Goes to the <i>Edit Beacon</i> page 2. Delete - Deletes the beacon from beacon list 3. Ping - Sends a ping to try to get response back 4. Reboot - Restarts the beacon

Table 7: Beacon List Field Description

Appendix B - User List Column Explanations




Name	Coordinates	Mac	Employee ID	Last Active	Work Phone	Mobile Phone	Actions
John Wick	0,0	00:00		1970-01-01 00:00:00 UTC			Edit Delete
Helen Mirren	0,0	00:01		1970-01-01 00:00:00 UTC			Edit Delete
Bill Dium	0,0	00:02		1970-01-01 00:00:00 UTC			Edit Delete
Amy Santiago	0,0	00:03	A123B	1970-01-01 00:00:00 UTC	778-123-456	778-123-457	Edit Delete

Figure 35: User List

Beacon List Fields	Description
Name	The user's name who is assigned the ID tag.
Coordinates	The coordinates in (x, y) on the map. These coordinates are per the map's coordinates and have not been scaled to reflect the physical location.
Mac	The Mac address assigned to the ID tag.
Employee ID	The company employee ID.
Last Active	The last seen time-stamp from when the ID tag was active.
Work Phone	The employee's work phone.
Mobile Phone	The user's cell phone.
Actions	This column contains following actions that administrators can do: <ol style="list-style-type: none"> 1. Edit - Goes to the <i>Edit User</i> page 2. Delete - Deletes the user from user list

Table 8: Beacon List Field Description

Appendix C - Map List Column Explanations

	Logout	Diagnostics	Status	Beacons	User Config	Maps
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Map

Map List

Name	Bounds	Scale	Note	Actions
F1	1200,600	100		Edit Delete View
F2	800,600	100		Edit Delete View
F3	800,600	100		Edit Delete View
F4	800,1200	1		Edit Delete View

Figure 36: Map List

Map Fields	Description
Name	The name of the map.
Bounds	The pixel width and height of the map image.
Scale	The pixel/meter ratio for the map image. To convert coordinates in meters to a location on the image.
Notes	Notes for Emergency Responders to view during an emergency.
Actions	This column contains following actions that administrators can do: <ol style="list-style-type: none"> 1. Edit - Goes to the <i>Edit Map</i> page 2. Delete - Deletes the map from <i>Map List</i> 3. View - Goes to the <i>Map View</i> page

Table 9: Map List Fields Description