DRAFT

Installation and Set Up Instructions

Superfy Mini Smart Ultrasonic Fill Level Sensor

Contents

Safety Precautions

Superfy will not shoulder responsibility for any loss or damage resulting from not following the instructions of this operating guide.

- The device must not be disassembled or remodeled in any way.
- The device is not intended to be used as a reference sensor, and Superfyt won't shoulder responsibility for any damage which may result from inaccurate readings.
- Do not place the device close to objects with naked flames.
- Do not place the device in where the temperature is below/ above the operating range.
- The device must never be subjected to shocks or impacts.

Declaration of Conformity

The product is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.

For assistance, please contact: **support@superfy.com**

01 Product Introduction

Overview

The **Superfy Mini Fill Level Sensor** is a smart waste management sensor for monitoring the fill level status of all waste and recycling materials across a wide range of containers and bins.
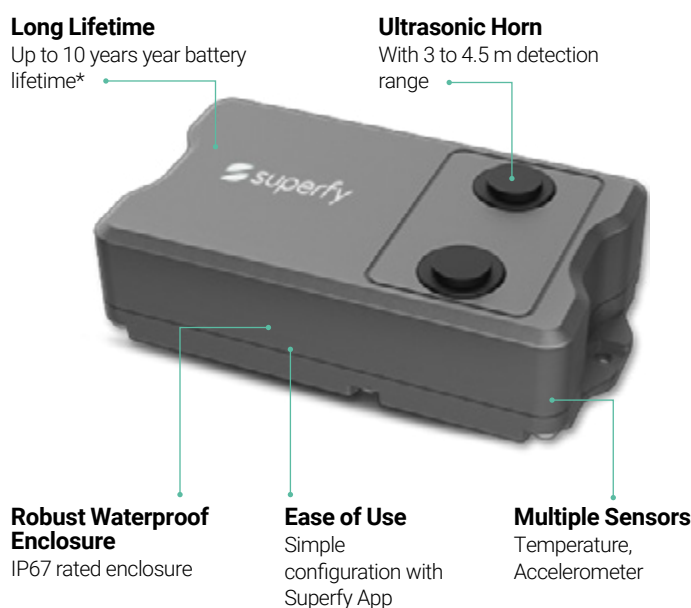
The ultrasonic sensor implementation provides accurate distance and fill level sensing capability, up to 4.5 m. A robust enclosure includes a long lasting battery* and cellular connectivity options for NB-IoT/Cat M.

Used in conjunction with the **Superfy Platform**, the sensor can enhance the operational and sustainability performance around the monitoring, collection and transport of waste and recycling material.

Ideal for smart cities, commercial waste and recycling collectors, construction sites, estates and parks, campuses and shopping malls.

Key Features

- Mobile app for ease of use and configuration

- Long lifetime replacable batteries of up to 7 years*

- Robust waterproof enclosure

- Built-in 3-axis accelerometer sensor to monitor device tilt status

- Flame retardant enclosure

Long Lifetime
Up to 10 years year battery lifetime*

Ultrasonic Horn
With 3 to 4.5 m detection range

Robust Waterproof Enclosure
IP67 rated enclosure

Ease of Use
Simple configuration with Superfy App

Multiple Sensors
Temperature, Accelerometer

SPECIFICATIONS

Sensors

Capability	Distance, Temperature, 3-axis Accelerometer
Distance measurement	Ultrasonic
Minimum / Maximum distance	1 cm / 450 cm
Measurement calculation	Multi measurement with weight approximation

Connectivity

Connectivity	LNB-IoT/Cat-M, GNSS
Adaptive Data Rate	Yes
Downlink configuration	Yes
Measurement times	Up to 48 readings per day

Physical

Dimensions	118 × 65 × 32.5 mm (L x W x H)
Operational temperature	- 30°C ~ +70°C (-22°F ~ +158°F)
Enclosure	ABS + PC (Flame Retardant)

Power

Power supply	2 x 9000 mAh ER26500 Li-SOCL2 replacable Batteries
Battery life	Up to 10 years (Estimated battery life, 4 Times Report per Day)*

Environmental

IP Rating	IP67

Certifications

|	
Certifications	CE, FCC, IC, EAC, ROHS

Note: For optimal battery life, we recommend a heartbeat of every 6 hours or more.

Note: When installing the sensor, both optical lenses must be positioned facing downwards towards the centre bottom of the container. If one of the optical lenses is directed towards the side of the container or any other direction, it can result in inaccurate data readings.
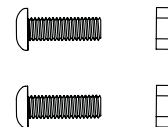
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*Battery life estimates are influenced by several factors including temperature, installation and orientation of the device, the frequency of location updates, network coverage, sensor integrations, peripherals, accelerometer settings, and more.In some circumstances these environmental factors can materially affect the expected battery life of a device.

02 Hardware

Packing List
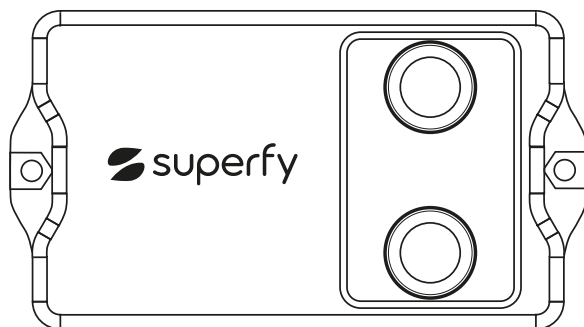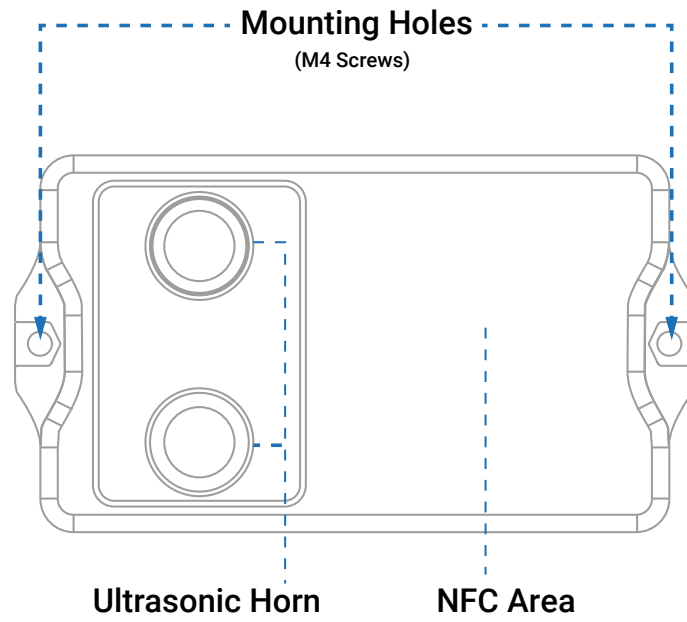

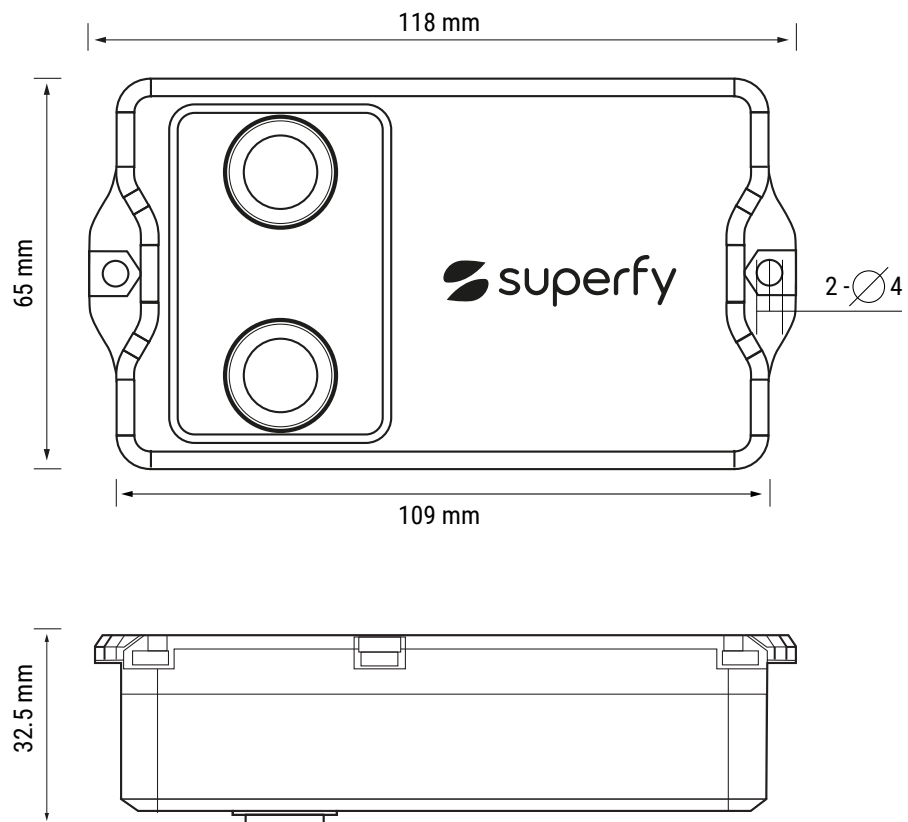**1 X Superfy Mini Smart Ultrasonic Fill Level Senso**   **2 × Mounting Kits**

⚠️ **If any of the above items is missing or damaged, please contact your sales representative.**

Hardware Overview

Mounting Holes
(M4 Screws)

Ultrasonic Horn

NFC Area

Dimensions (mm)

118 mm

65 mm

superfy

2 - ⌀ 4

109 mm

32.5 mm

03 Before you start

To get started with your **Superfy Platform** account setup and installation of the **Superfy Mini Smart Ultrasonic Fill Level Sensor**, please make sure to:

- Download the **Installation Checklist**

- Fill out the **Container Information Template**

    Note: To complete the platform onboarding process, please fill out this form and return it via email to your **Superfy Customer Success Manager** or **support@superfy.com.**
    Only complete and submit this form if you have not already done so.

- Email the forms to your customer success manager, or **support@superfy.com**

Minimum Tools Required

	Screwdrivers PH2, PH1
	Drill
	Laser Measuring Tool (recommended)
	Container Key(s) (if required)
	Torque Driver
	4 mm Hex
	Cleaning Wipes

04 NFC Configuration

Superfy Mini can be configured via NFC

1. **Click here** to download and install the **'Toolbox App'** from Google Play or App Store.

2. Enable NFC on the smartphone and open **Superfy Installer App**.

3. Attach the smartphone with NFC area to the device to read the basic information.

4. Basic information and settings of devices will be shown on the **Toolbox** if it's recognized successfully. You can switch on/ off, read and write the device by tapping the button on the App. In order to protect the security of devices, password validation is required when configuring via unused phone.
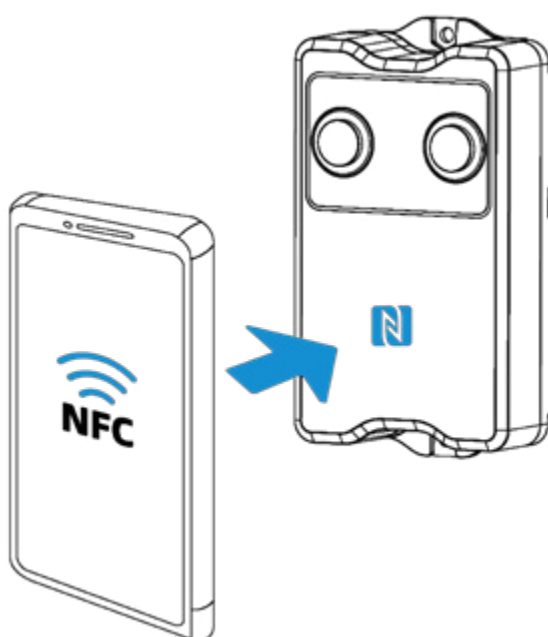
Status	Setting	Maintenance
SN		6329C42865570081
Model		EM400-MUD-915M
PN		B045-2
Device EUI		44E124329C429243
Firmware Version		V1.1-a4
Hardware Version		V1.0
Device Status		ON

Note:

1. To ensure the location of smartphone NFC area and it's recommended to take off the phone case.

2. If the smartphone fails to read/write configurations via NFC, move the phone away and back and try again.

Basic Settings

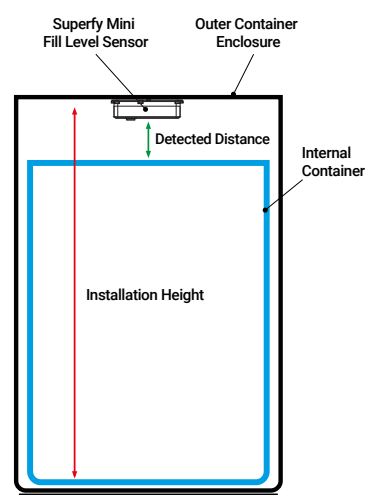Go to **Device > Setting > General Settings** of **Superfy Installer App** to change the reporting interval, etc.

Parameters	Description
Installation Height	Set the installation height between device and ground when in Parking Lot Mode. Default: 3m; Range: 0.030~ 4.500m Threshold Distance Value (Δ) is 1m as default, triggering logic is as below: • Installation Height - Detected Distance > Δ, the sensor will report occupied immediately. • Installation Height - Detected Distance < Δ, the sensor will report vacant immediately.
Tilt & Distance Switch	When detecting that the offset angle is greater than 20 degrees, turn off the distance sensor.
Cumulative Numbers	Store this number of periodic packets to report together.
Positioning Settings	Enable GNSS positioning. When the device is on motion status, it will only upload positioning data instead of distance data.
The duration of Motion	When the device is detected to move beyond this duration, it will upload a GNSS data packet.
The duration of Stationary	When the device is detected to stop moving beyond this duration, it will upload a GNSS data packet.
Motion Report Interval/ Min	The interval to report GNSS data during the motion.

05

Sensor Installation Process

Download the latest version of the Superfy App onto your mobile phone/tablet:
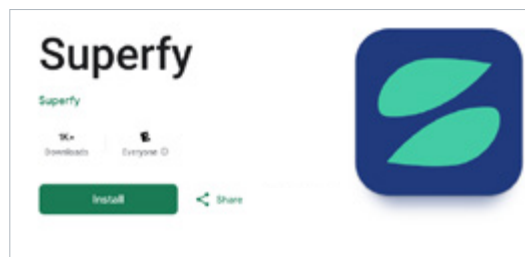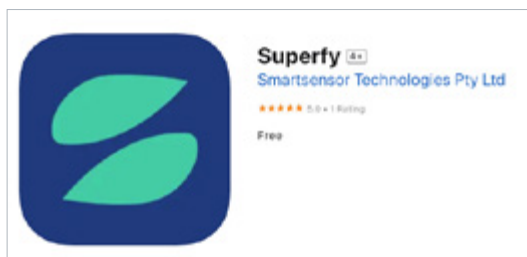
Apple users –

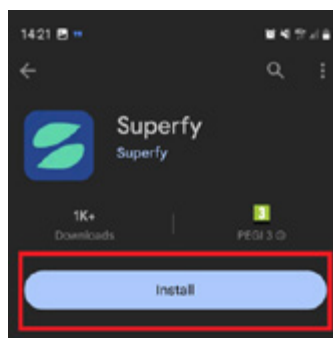Please download the Superfy App from the **APP Store here**

OR

- Log into your **App Store**
- Search for **Superfy** using the **Search Bar**
- Select **Superfy** and click **Install**

Android users –

Please download the Superfy App from the **Google Play store here**

OR

- Log into your **Google Play Store**
- Search for **Superfy** using the **Search Bar**
- Select **Superfy** and click **Install**

! Ensure to download the Superfy App NOT the Superfy Tracker App.

Login is the same login as you were initially set up with

Don't have a login?

Please reach out to your **Company Admin, Account Manager,**

Customer Success Manager, or

email support@superfy.com

They will be able to assist you in creating a login for your account.

Measuring Fill Height and Fill Gap for Superfy Mini Fill Level Sensor

Superfy Mini Device Fitment - Standard Bracket

For accurate container fullness levels:

⚠️ Before you go on site to install your Superfy Mini Fill Level Sensor in a **Container** the ***Capacity or Volume** of each **Container** must be correctly recorded on the **Container Information Template.**

⚠️ The **Fill Height** and **Fill Gap** must be recorded during installation on the **Superfy App**.

Please ensure to save the **Fill Height** and **Fill Gap** measurements, as you will need these measurements when assigning a sensor to its container in the Superfy App. This will be covered in more detail later in **Sections 9 & 10**.

FILL GAP: Measure the distance from the face of the Superfy Mini Sensor to the top of the internal container. This is the **Fill Gap**.

FILL HEIGHT: Measure the distance from the top of the internal container to the base of the internal container **(i.e. to where the container will be considered '100% full')**. This is the **Fill Height**.
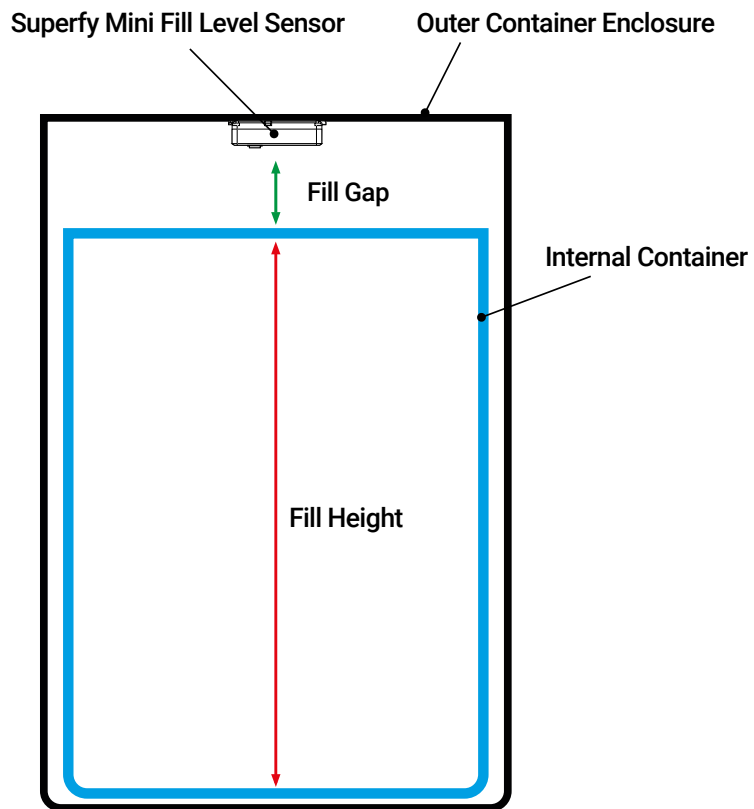
Note: If these measurements are not accurate, you will receive incorrect fill level data.

*Container capacity refers to the measurement of the container volume or capacity which is typically included in the container specification manual or data sheet provided by the container manufacturer. Additionally, you may be able to find the volume or capacity measurements on the manufacturer's website.
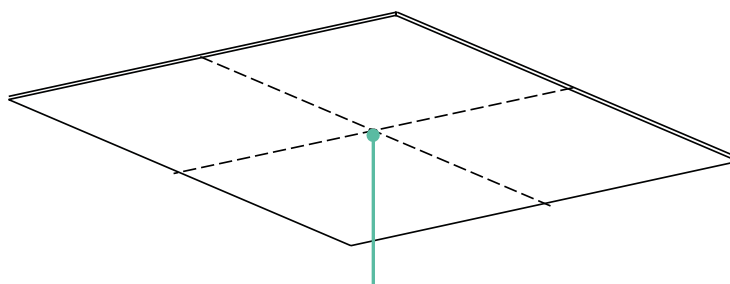
06 Installation of Superfy Mini Fill Level Sensor

**! Turn on the sensor immediately before installation**

1. Measure and mark centre point

Measure the length and width of the container surround on the top of the container lid so that the centre point can be marked. Mark the centre point on the container surround with a marker.

2. Align and mark Superfy Mini holes

Align the Superfy Mini with the centre mark and use this as template to mark the 2 mounting holes in the centre of each slot. Measure the length and width of the container surround on the top of the container lid so that the centre point can be marked. Mark the centre point on the container surround with a marker.
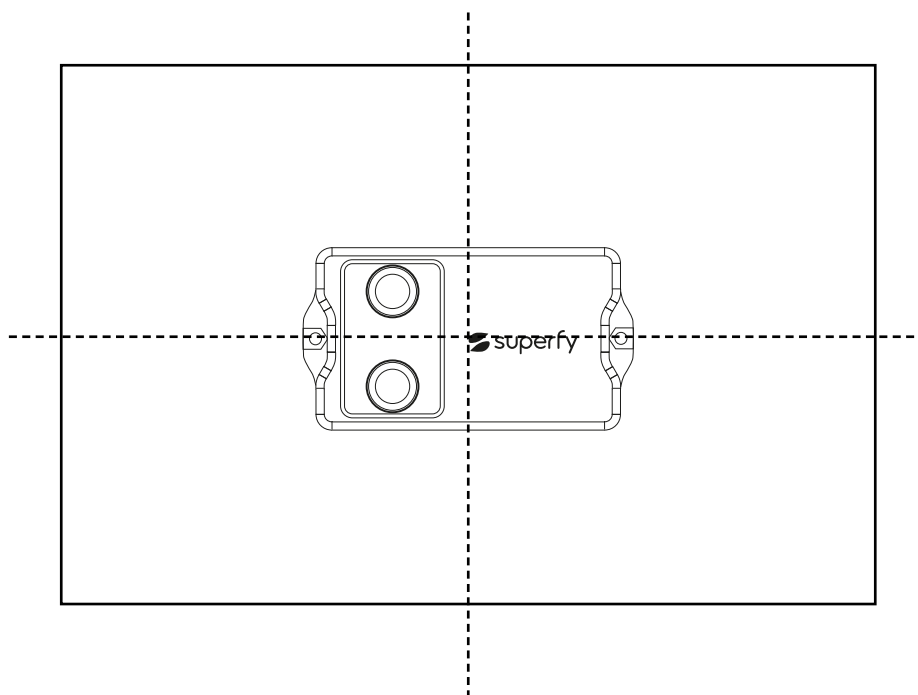
1. Drill Superfy Mini Mounting holes

Drill 4 x 4.5mm on the container cover according to the location of device mounting holes.

2 Align the Superfy Mini

Put the device under container cover and align the holes in order to perfectly screw the bolts into the holes from the other side of the cover.

The **Superfy Mini** can can also be fixed by two M4 mounting screws and wall plugs.

07
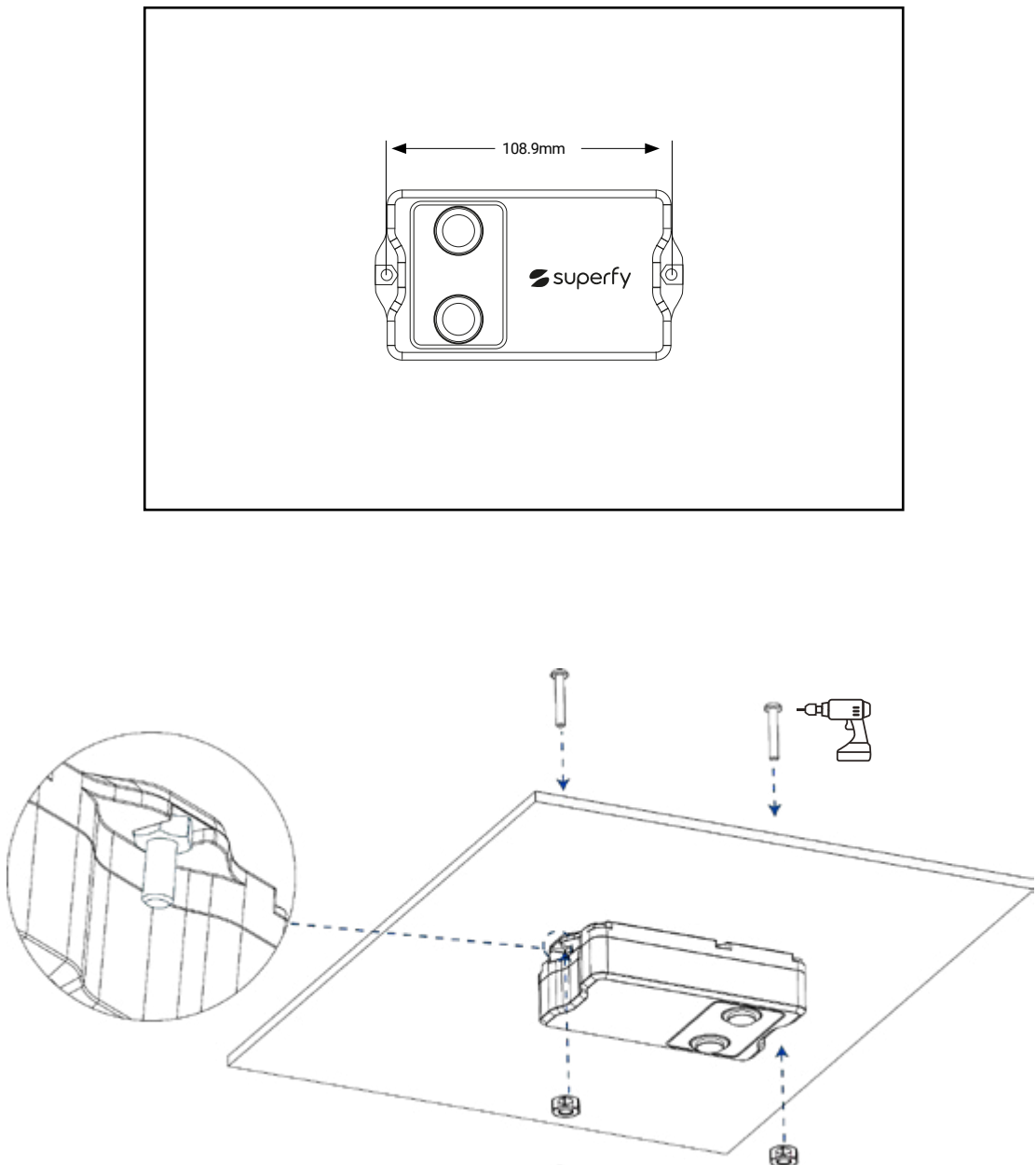
## Optional sidewall Bracket Installation

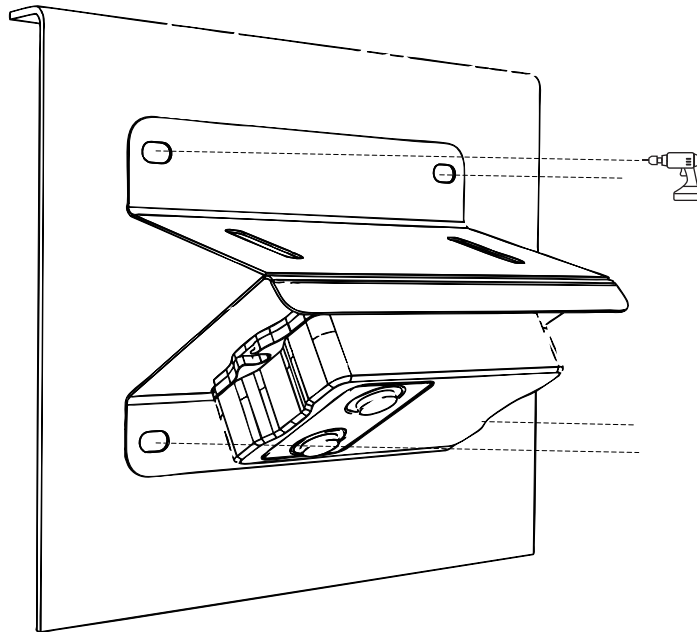| Required Tools | | Fixings | |
|---|---|---|
| M4 Allen Key | Cordless Drill | 4 x M5 x 16 Tamper Proof Bolts |
| Measuring Tape | 5 mm Drill Bit | 4 x M5 Lock Nuts |
| Pencil / Marker | Tamper Proof Bit | 4 x M5 x 20 Washers |

1. Attach the Superfy Mini Fill Level Sensor (if required)

Remove the Standard Bracket from the back of the Container Sensor. Using the same 4 x M4 x 6 button head socket screws, fasten the Container Sensor to the 45° mounting bracket as shown.
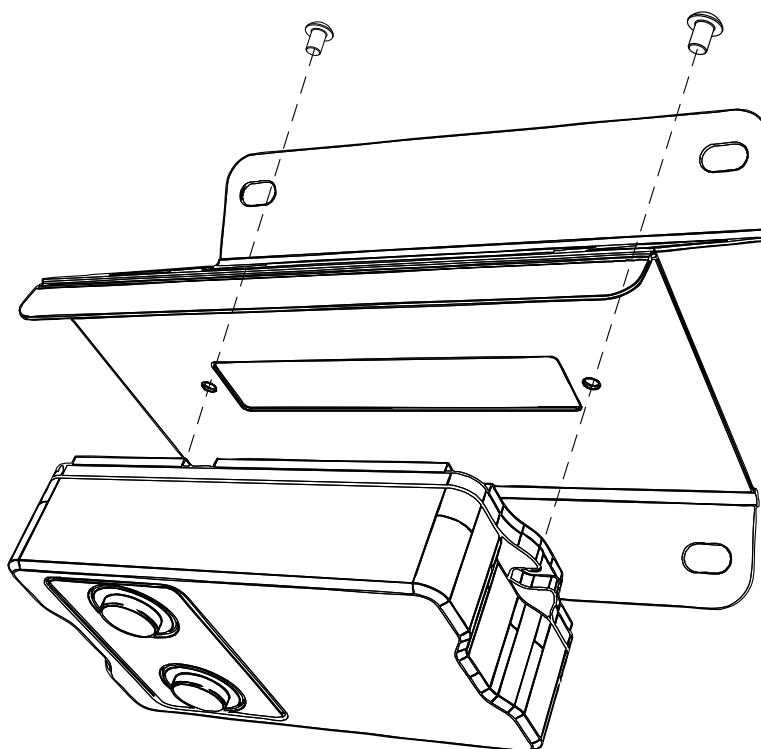
2. Drill bracket holes

Once the installation position has been determined, use the 45° mounting bracket to mark and drill 4 x 5 mm holes through the wall of the container. Ensure that the bracket remains level.

3 Fasten the Superfy Mini Fill Level Sensor

Fasten the sensor, with attached 45° mounting bracket, to the container wall using 4 x M5 x 16* Button Head Tamper Proof bolts, 4 x M5 x 20 Washers and 4 x M5 Lock Nuts.

*Bolt length is based on a container wall thickness of 4 - 8 mm, length may need to be changed for different wall thicknesses.
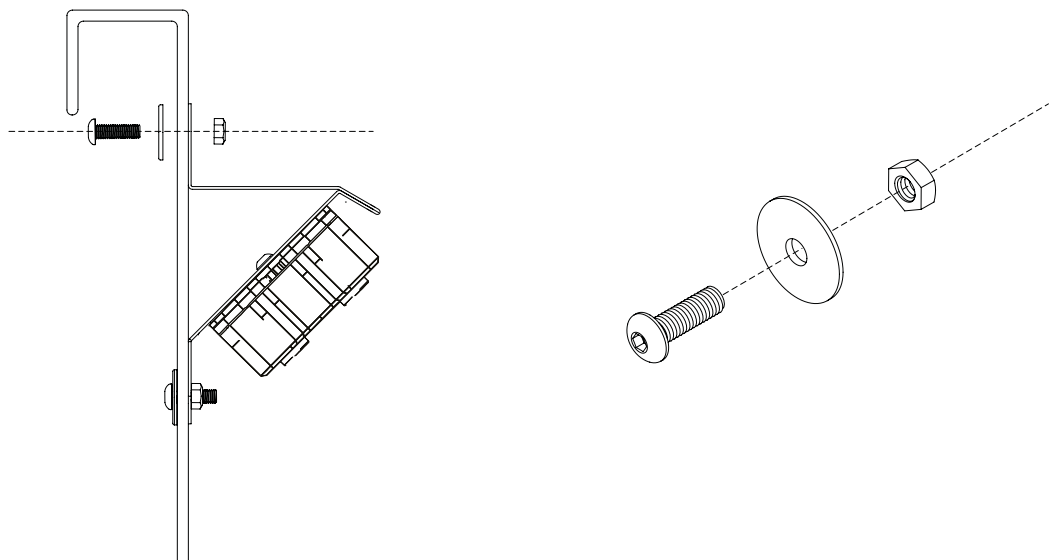
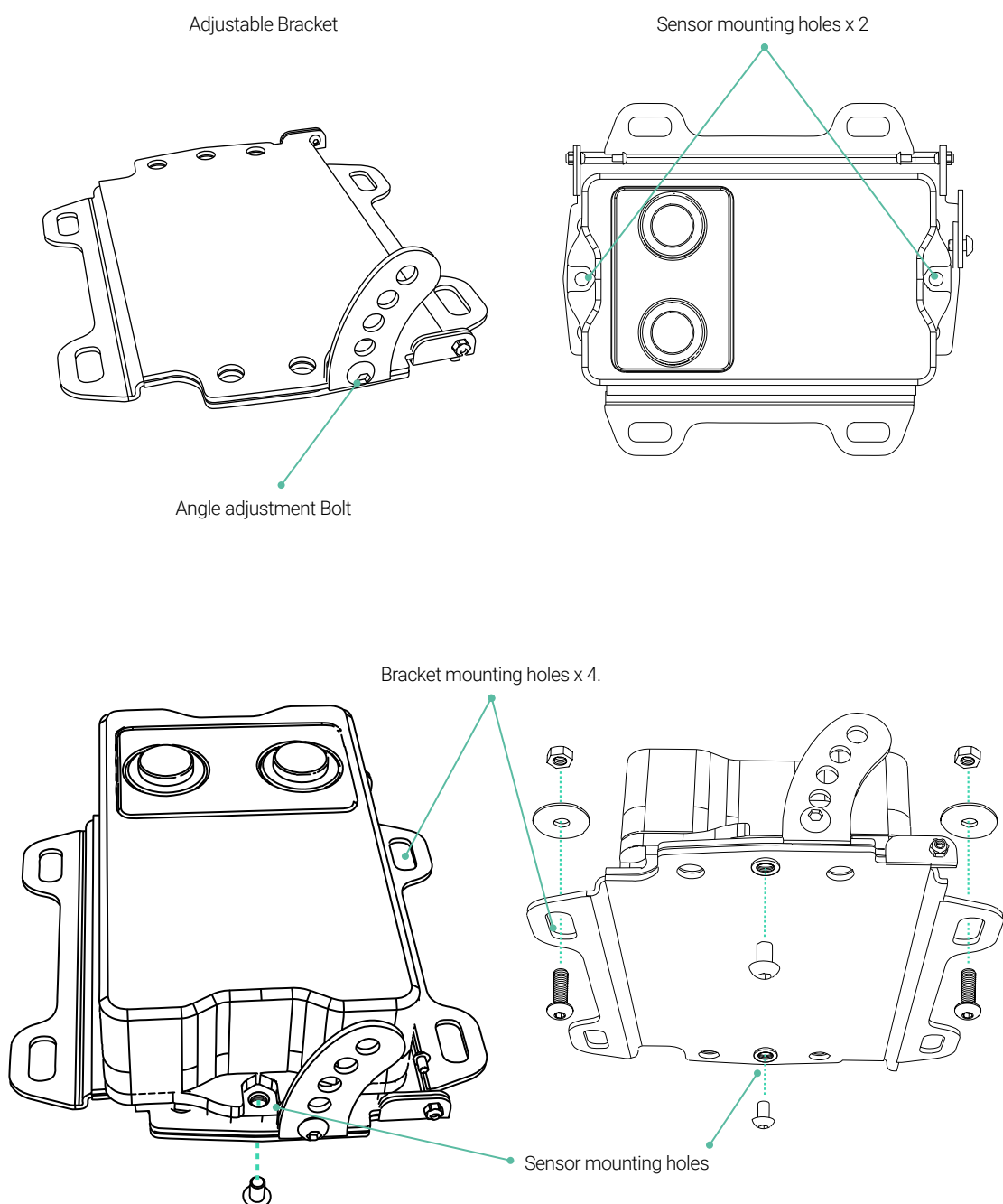# 08 Optional Adjustable Bracket Installation

Required Tools		Fixings
M4 Allen Key	Cordless Drill	4 x M5 x 16 Tamper Proof Bolts
Measuring Tape	5 mm Drill Bit	4 x M5 Lock Nuts
Pencil / Marker	Tamper Proof Bit	4 x M5 x 20 Washers

1. Overview

Device angle fixing and mounting holes.

Adjustable Bracket

Sensor mounting holes x 2

Angle adjustment Bolt

Bracket mounting holes x 4.

Sensor mounting holes

2 Bracket Adjustment

Angle set by M4 screw installed in the holes on the side tab.

Screw needs to be removed when setting position.
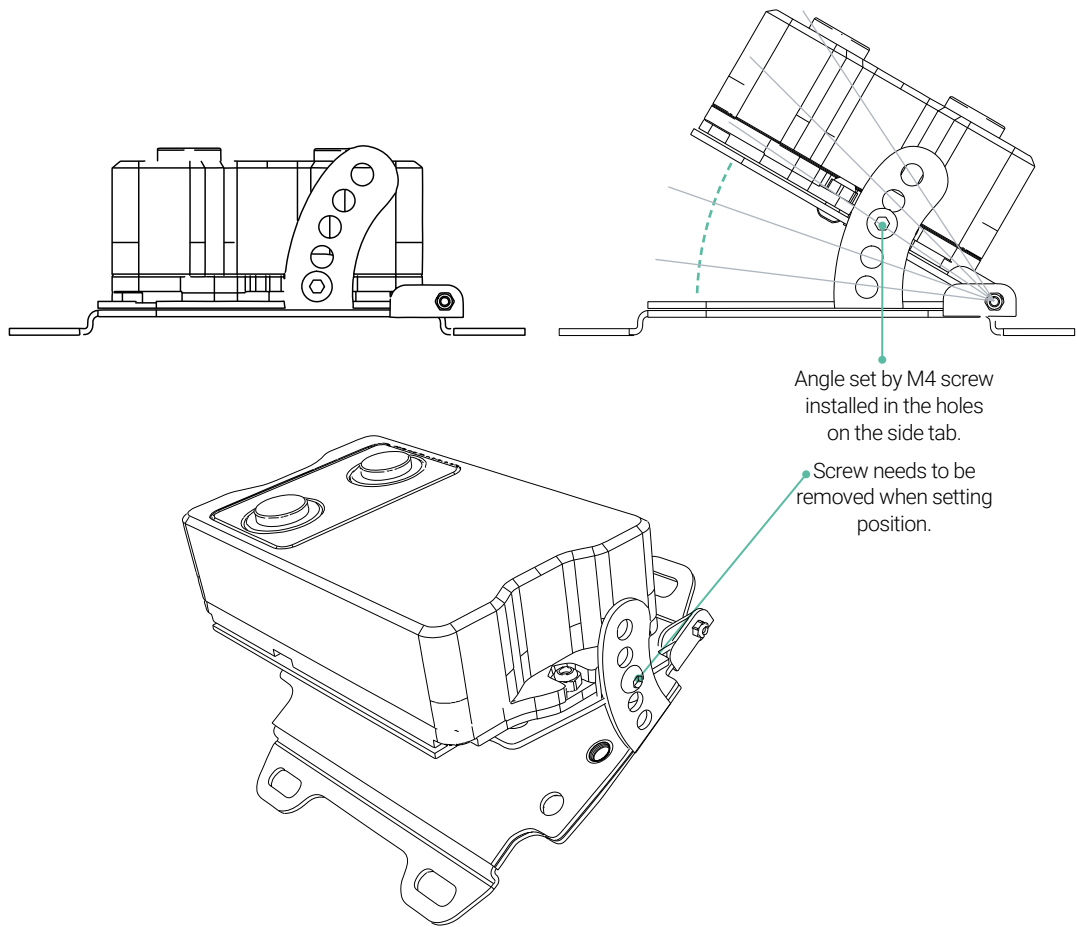
# Superfy Mini Device Fitment - Adjustable Bracket

Measure the installation position

Measure the **Internal Height (Y)** and **Width (X)** of the container. If the container height **(Y)** of the back wall is less than the container width **(X)**, install the sensor in **Position 1**, if greater, install in **Position 2**.

The container sensor should be installed as close to the top edge of container as possible **(Z)**, however, consideration needs to be made for access and fixings through the container wall, avoiding any hinges or obstructions.

SIDE VIEW   TOP VIEW
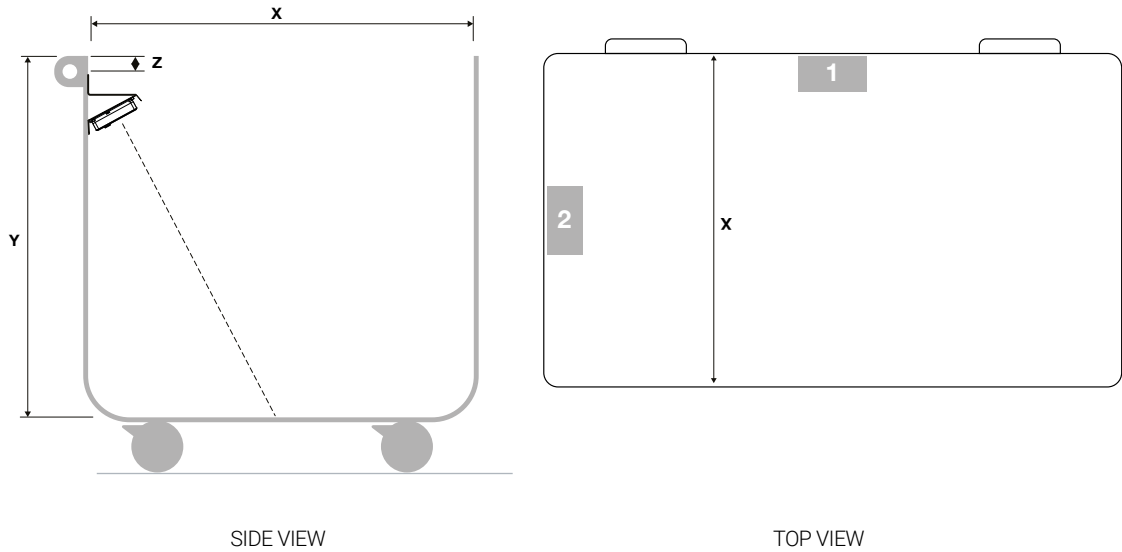
Fill Height is the measurement from the bottom of the container to where you establish 100% fullness (see **Red Line** below). The **Fill Gap** is the measurement from the sensor to the 100% fullness level. (see **Green Line** below).

SIDE VIEW
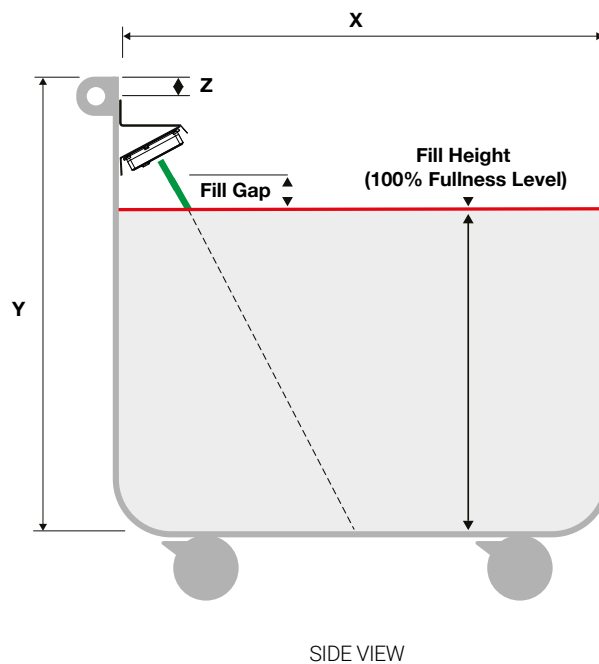
09 | Add a Container to the Map Using the Superfy App

This step is only necessary if the containers have **not been already added to their respective location on the Superfy Platform. If the containers are already added, please skip to Section 10** on how to Allocate a Superfy Mini Fill Level Sensor to a Container using the App.

There are 3 main container types within the Superfy Platform: a **Managed Container**, **QR Container** or a **Connected Container**. A Container can also have both a QR code and a Sensor associated to it.

Connected Container: these containers are **equipped with sensors** that enable them to deliver real-time data on their fullness and temperature levels. You have the flexibility to adjust the frequency at which the **Superfy Mini Fill Level Sensor** records the fullness readings from the container and transmits this information to the **Superfy Platform**.

QR Container: these containers are equipped with **QR Codes**, allowing the public or your direct customers to scan the code to request collections, report damages, contamination or litter, making the collection process more efficient and accessible for all involved parties. These containers do not display fullness level data either.

Managed Container: these containers are not equipped with a QR code or sensor. Instead, they operate based on collection threshold rules, making them suitable for locations that do not require frequent pickups. They do not provide data on fullness levels; rather, they employ a color-coded system that shifts between **Green**, **Orange**, and **Red** to indicate their status according to predefined **Intermediate and Maximum Collection Thresholds**.

QR and Connected Container - the best of both worlds, you can assign a **QR Code and a Sensor** to a container.

To facilitate a seamless installation process, it is essential for customers to complete the **Container Information Template** and submit it to their **Account Manager** or **Customer Success Manager**. This important step enables our **Customer Success team** to add the containers to their designated location on the map prior to the installation of the **Fill Level Sensor** or **Smart Container**.

Alternatively, the installation technician(s) has the option to utilise the **Superfy App** to complete this process while on-site.

Ensuring that the containers are placed in their designated locations on the map is crucial for a smooth installation process. This step allows the installation technician(s) to verify that the **Fill Level Sensors** are turned on, assigned to the appropriate containers, and recording accurate fill level data. It also helps in proactively troubleshooting any issues while on-site.

- Open the **Superfy App** on your phone.

- Your phone's GPS will show your current location as a **Blue Dot** on the map.
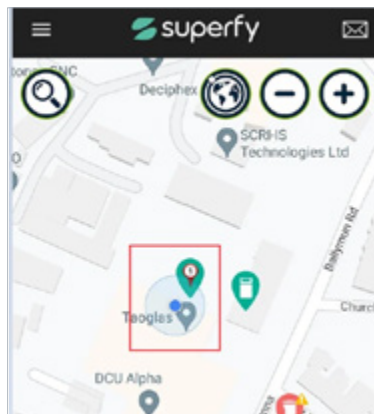
If adding a container remotely, use the **Magnifying Glass** (⊕) icon located in the top left corner of the **Map View** to search for the desired address for where you wish to place the container. **Choose Streets/Location** from the available search options when looking for specific addresses.
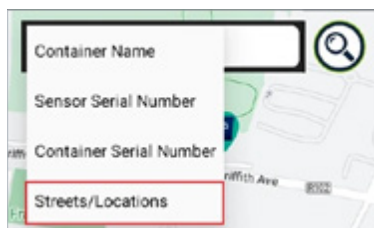
- At the bottom of your phone screen, tap on **Add Container** (👤) and tap on the location on the map where you wish to place the container.
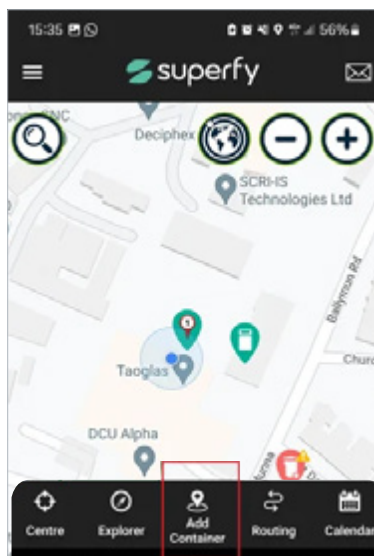
- Complete the below information on the **New Container Details** screen by selecting from available options or adding new items:

  - **Name** - use your preferred name for the container **(i.e. Container Identification Number**).
  - **Zone** - choose the **Zone** where you wish to place the container.
  - **Icon** - choose your preferred icon from the available list of container icons.

A **Zone** is a defined set of containers, often corresponding to the customer's own segmentation of their city**.**

  - **Images** - It is required to add photos during the installation of the **Fill Level Sensor** or **Smart Containers**.

- Include clear and detailed photos showcasing the installation of the sensor, providing a visual representation of where and how the sensor was installed.
- Photos of the **container (type, Container Identification Number etc.)**
- Include clear and detailed photos that showcase the environment surrounding the container. These photos will provide a visual representation of the area where the container is located, helping to provide context and a better understanding of its surroundings.

  - Tap on **Camera Image** (⊘) to take and add a photo.
  - **Add Title** (i.e. container name).
  - **Add Description** - this is optional!
    - Tap **Done**.
  - Tap **Save**.

You can only upload One photo during the initial container creation. However, you can add additional photos once the container has been successfully created and added to the platform. This will be covered later below.

- **Subscription Type** - choose the container subscription type by sliding the toggle next to your preferred option: QR Container, Connected Container, or both. Please be aware that the Managed option will be selected by default.
- **Container Type** - choose the appropriate container type from the available options in the list.
- **Container Tags** - this is optional. You can add any additional tags of your choice to a container.
- **Waste Type** - select the appropriate waste material.
- **Account** - select the appropriate account associated with the container.
- **Location** - select the appropriate location associated with the container.

Please note to allocate a sensor, the **Connected Container Subscription Type** must be enabled. When this is enabled, you are required to allocate a sensor to the container as the next step.

When you select the **Connected Container** option for a container and save it, **this cannot be changed** on the app. This can only be changed on the platform.

- If you have selected the **Connected Container** subscription type, tap **Next** to allocate a sensor. Otherwise, tap **Save** to add the container to the platform.
    - On the **Connected Container** screen, tap on **Sensor Name** to search and allocate a sensor.
    - Select the **Sensor** from the list of available sensors or use the search bar to search for the sensor.
    - Tap on the sensor and tap **Done**.
    - Enter the accurate fill height on the **Fill Height** field.
    - Enter the accurate fill gap on the **Fill Gap** field.
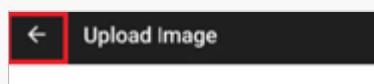   - Tap **Save**.

If the sensor is turned **ON**, the **Container Icon** (📍) will change colour accordingly from **Grey** to one of the below depending on the fullness level recorded by the sensor or the applied **Intermidate** or **Max Threshold**.

Mostly Empty (Green)

Partially Full (Orange)

Mostly Full (Red)
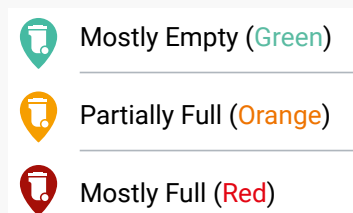
- To take and add more photos:
  - Tap on the **Container** (🔖) on the map view.
  - Tap on **View**.
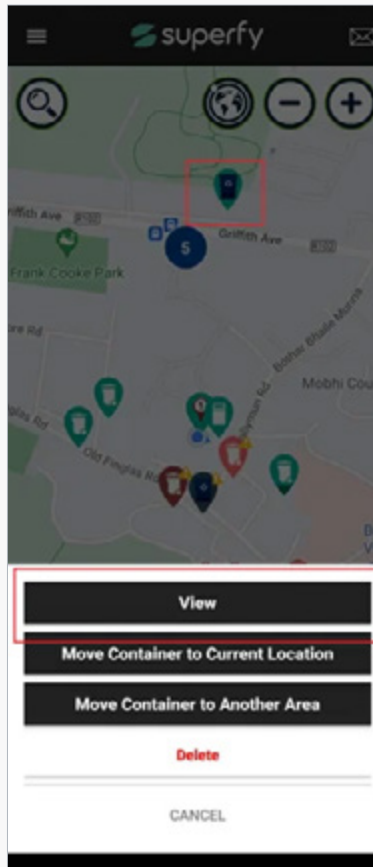
- On the **Container Details** screen, scroll down to **Images** again and tap on it.
- Tap **Plus** (**+**) icon to take and add more photo
- Tap **Save**.
- Tap the Back (**<**/**←**) button located at the top left-hand side of the screen to add more photos and repeat the same steps by clicking the **Plus** (**+**) icon again if necessary.

- Tap the **Back** (**<**/**←**) button once more to update the Container Details.
- Tap **Next**.
- Tap **Save Container**.

10 Allocate a Superfy Mini Fill Level Sensor to a Container using the App

To accurately monitor the current **Fill Level and Temperature** of a container, it is essential to install, activate, and assign a Superfy Mini Fill Level Sensor to the container.

To ensure a smooth installation process, we highly recommend **Turning ON** the **Superfy Mini Fill Level Sensor** and allocating it to the container just before installation.

- Open the **Superfy App** on your phone.
- Your phone's GPS will show your current location as a **Blue Dot** on the map.
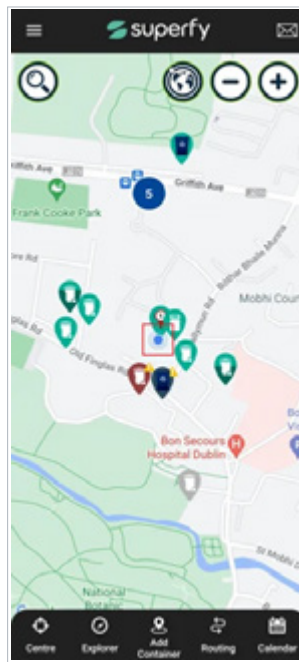
- Tap on the **Container** displayed at your current location on the **Map**, then tap on the **View** option.
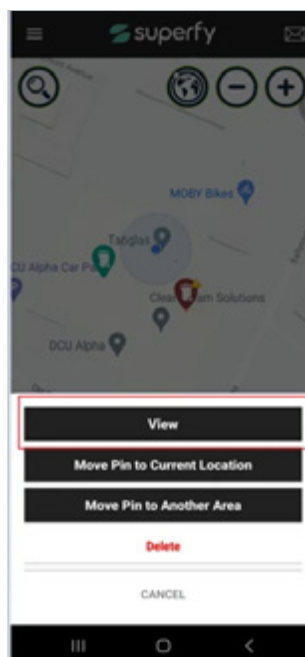
If you're not at the container's location, use the **Magnifying Glass** (Q) located at the top left-hand side in the **Map View** to search by **Container Name**, **Sensor Serial Number**, **Container Serial Number** and **Street/Location**.
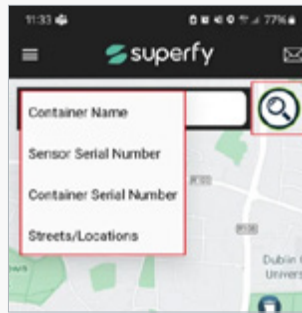

Alternatively, you can tap on **Explorer** (⊚) located at the bottom of the screen. This will provide you with a comprehensive list of all the **Containers** available for viewing.

- Tap on the **Container** of your choice.

- Tap on the **Arrow** beside the **Container Name** at the bottom of the screen to open the **Container Details** screen.

- On the **Container Details** screen, scroll down to the **Sensor** field and tap.
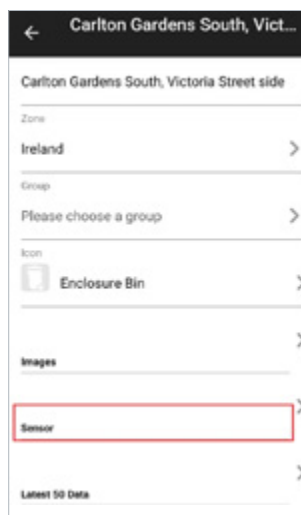
Before you allocate a new sensor to a container, you must first detach any sensor that is currently assigned to it. **A container can only have one sensor assigned at a time**, so this step is essential for a successful installation.

If a sensor is currently not allocated to the container, skip the below.

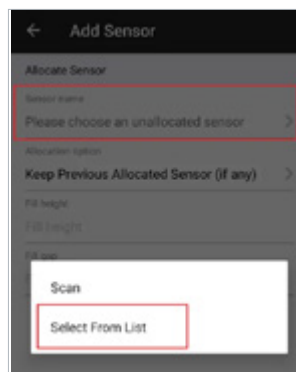- Tap on the **3 dots** beside the **Sensor ID Number**.

- Tap on **Detach Sensor** to detach the sensor from the container.
- Tap **Okay** (Android) or **Detach** (IOS) to detach sensor from container.
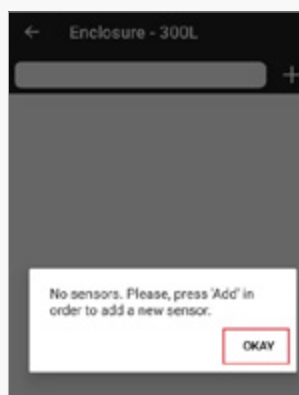
- To add a new **Sensor**, tap the **+** icon.

- Tap on **Sensor Name** to search and allocate a sensor.
- Tap on **Select from List**.

If you are unable to find the sensor in the list of available sensors, it is possible that the sensor has not been allocated to your account. In this case, please urgently reach out to your **Account Manager**, **Customer Success Manager**, or contact **support@superfy.com** for assistance.

- Alternatively, search for the **Sensor ID Number** using the **Search Bar**.

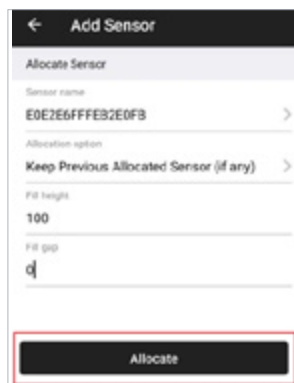- Tap on the **Sensor ID Number** to allocate it to the container and tap on **Done**.

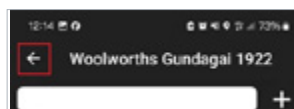- Enter the accurate **Fill Height** and **Fill Gap measurements**.
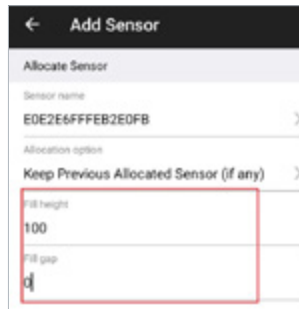
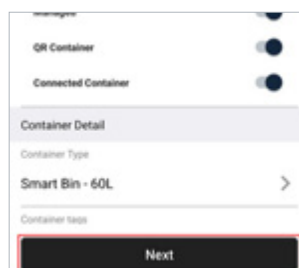Refer to **Section 05** on how to take the **Fill Height** and Fill Gap Measurement.

- Tap on **Allocate** to allocate the sensor to the container.

- Tap on **Back** (❮/←) to return to the **Container Details** screen.

- Tap on **Next** located at the bottom of the screen.

- Tap **Save Container** to update the **Container Details**.

- After saving the container, tap **Okay** on the pop-up message.

If the sensor is turned **ON**, the **Container Icon** ( )will change colour accordingly from **Grey** to one of the below depending on the fullness level or the applied **Intermidate** or **Max Threshold**.

 Mostly Empty (Green)

 Partially Full (Orange)

 Mostly Full (Red)

11 Add Images to a Container using the Superfy Mobile App

Including detailed images of the sensor's installation inside a Container and its surroundings is crucial for troubleshooting and strongly recommended.

When installing a sensor in a **Container,** it is crucial to:

- Include clear and detailed photos showcasing the installation of the sensor, providing a visual representation of where and how the sensor was installed.

- Photos of the **Container (type, ID number etc.)**

- Include clear and detailed photos that showcase the environment surrounding the **Container**. These photos will provide a visual representation of the area where the **Container** is located, helping to provide context and a better understanding of its surroundings.

- Open the **Superfy App** on your phone.

- Your phone's GPS will show your current location as a **Blue Dot** on the map.
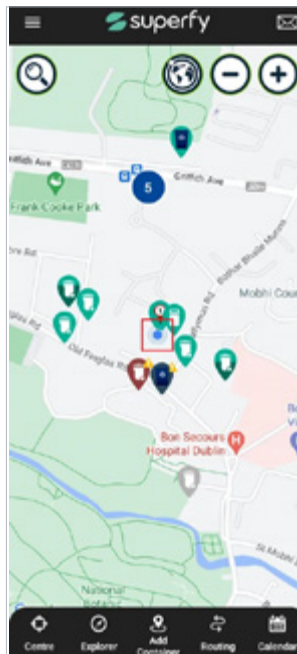
- Tap on the **Container** displayed at your current location on the **Map**, then tap on **View**.
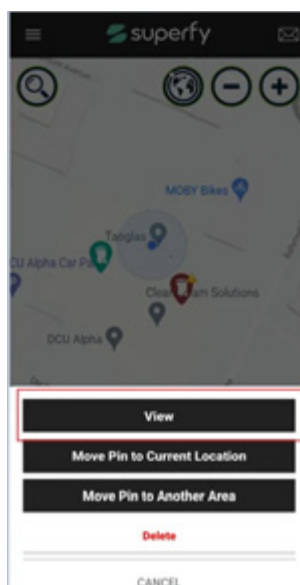
If you're not at the container's location, use the **Magnifying Glass** (🔍) on the left-hand side of the **Map View** to search by **Address**, **Container Name**, **Container Serial Number**, or **Sensor Serial Number**.
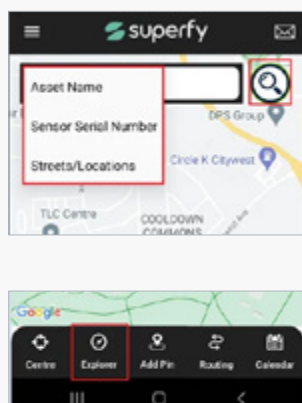
Alternatively, you can tap on **Explorer** (◎) located at the bottom of the screen. This will provide you with a comprehensive list of all the **Containers** available for viewing.
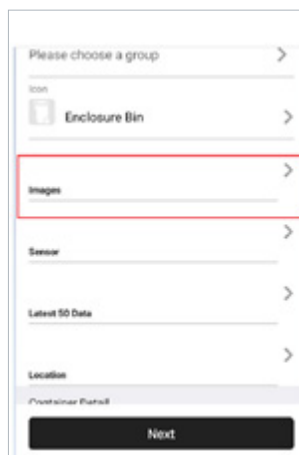
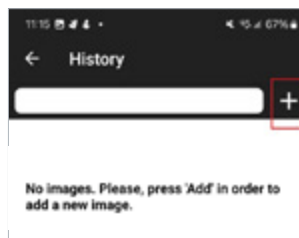- Tap on the **Container** of your choice.

- Tap on the **Arrow** beside the **Container Name** to open the **Container Details**.
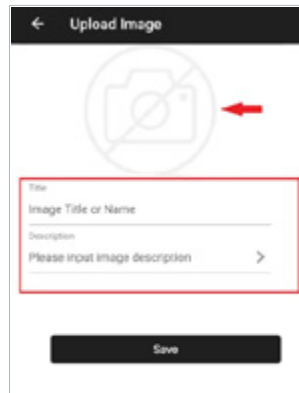
- On the **Container Details** screen, scroll down to **Images** and tap.

- Tap on the **Plus (+)** icon located on the top right-hand side of the screen.

- Tap on **Camera Image** (⊘) to take a photo.
- **Add Title** (ie: container name).
- **Add Description** - this is optional.
  - Tap **Done**.
- Tap **Save**.

- You can only add **One** photo at a time. Once you have saved the initial photo,
  - Tap the **Back** (‹/←) button once and tap on the Plus (+) icon again to add more photos.
  - Repeat the steps above until all photos are uploaded

- Tap on **Back** (‹/←) to return to the **Container Details** screen.

- Tap on **Next** located at the bottom of the screen.

- Tap **Save Container** located at the bottom of the screen to update the **Container Details**.

12 | Maintenance

Superfy highly recommends regular cleaning of the sensor. This must be done with an eco-friendly cleaner.

Cleaning the Superfy Mini Fill Level Sensor and Bracket

Gently clean the two ultrasonic sensors with a clean cloth, no detergent required. Wipe over both the device and the bracket removing any dirt and grime from both surfaces. Do not spray cleaner directly onto the device. There is no need to remove the device from the container.

13 | Warranty and RMA

The Superfy Mini Fill Level sensor has a 12-month warranty from the date of shipment of the Hardware to Customer during which Customer may perform Return Merchandise Authorization (RMA).

For products that are not covered under warranty, whether they are out of warranty or have subsequent defects, applicable charges for parts and services will apply. We recommend that customers consider the delivery costs before sending items for repair.

For more information on the RMA process please see:

https://knowledge.superfy.com/knowledge/rma-process

If you need any further assistance please contact:

support@superfy.com

www.superfy.com