SWARM Asset Tracker Subsidiary Launches Satellite Based Tracking Device User Guide

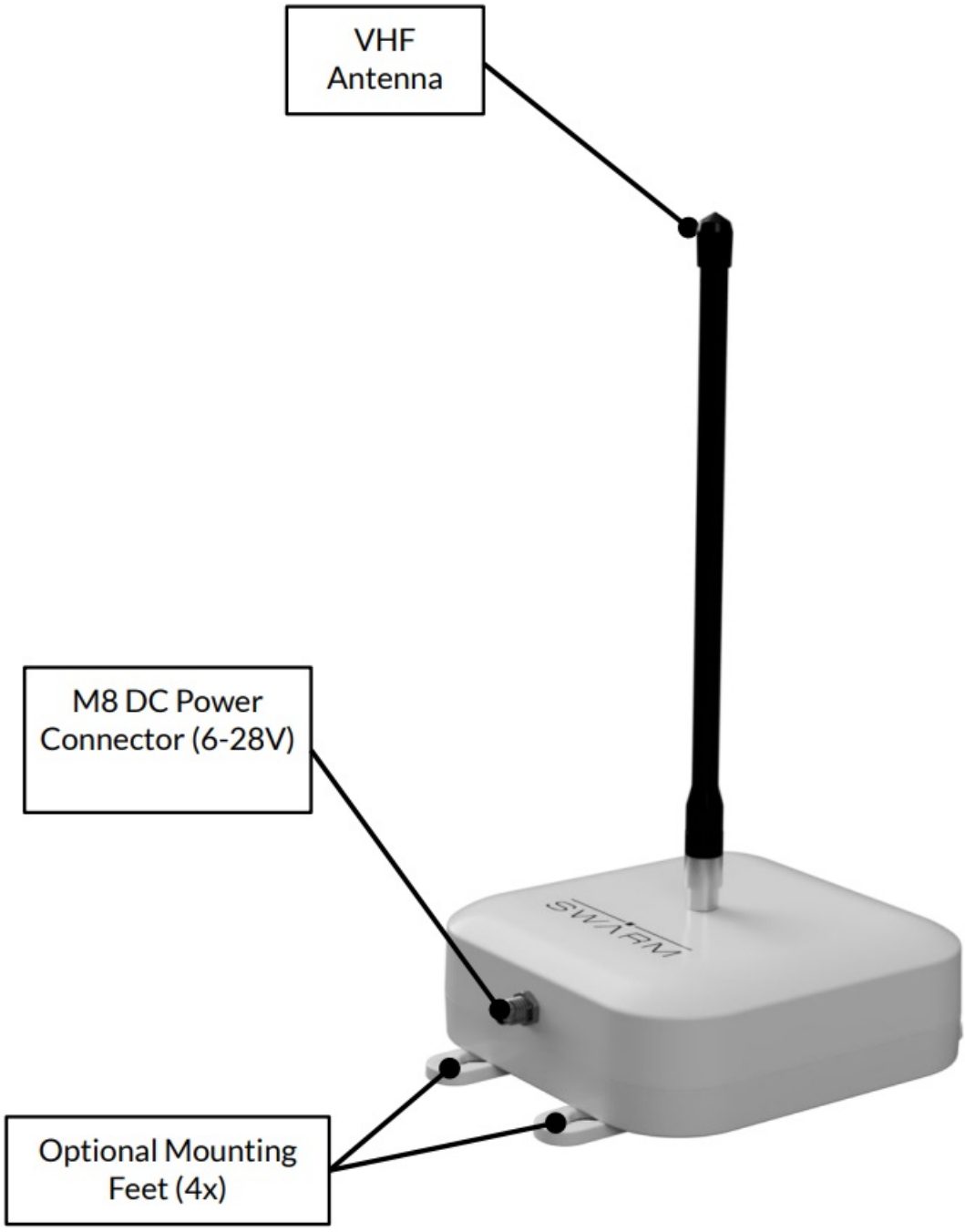
SWARM Asset Tracker Subsidiary Launches Satellite Based Tracking Device

Contents

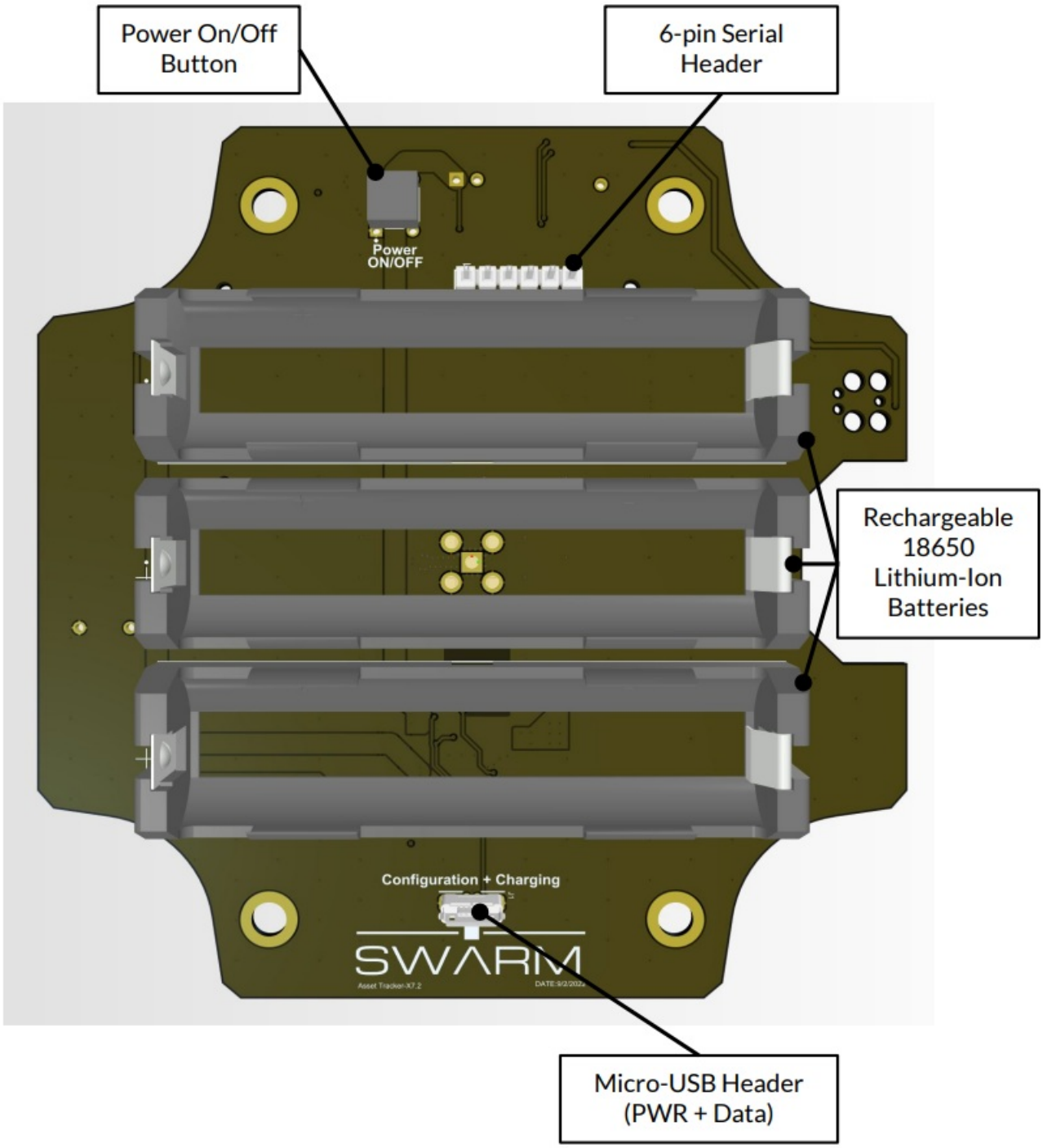
What’s Included: Compatible Accessories

Compatible Accessories

Overview & Setup – External View



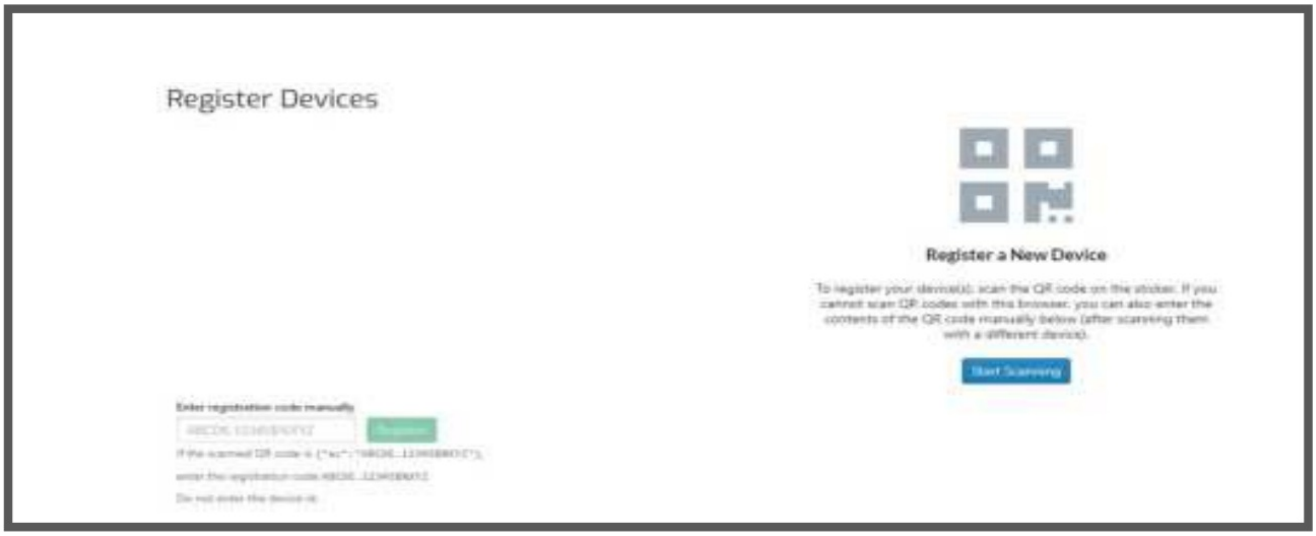
Overview & Setup – Bottom Internal View



Overview & Setup – Register your Device

1. Create your Hive account and sign in
   https://bumblebee.hive.swarm.space/hive/ui/sign-up
   After signing up, an activation email will be sent to you.

2. Navigate to Register Device



3. **Click Start Scanning to scan your Asset Tracker's QR Code:** A QR code is provided on the Asset Tracker's

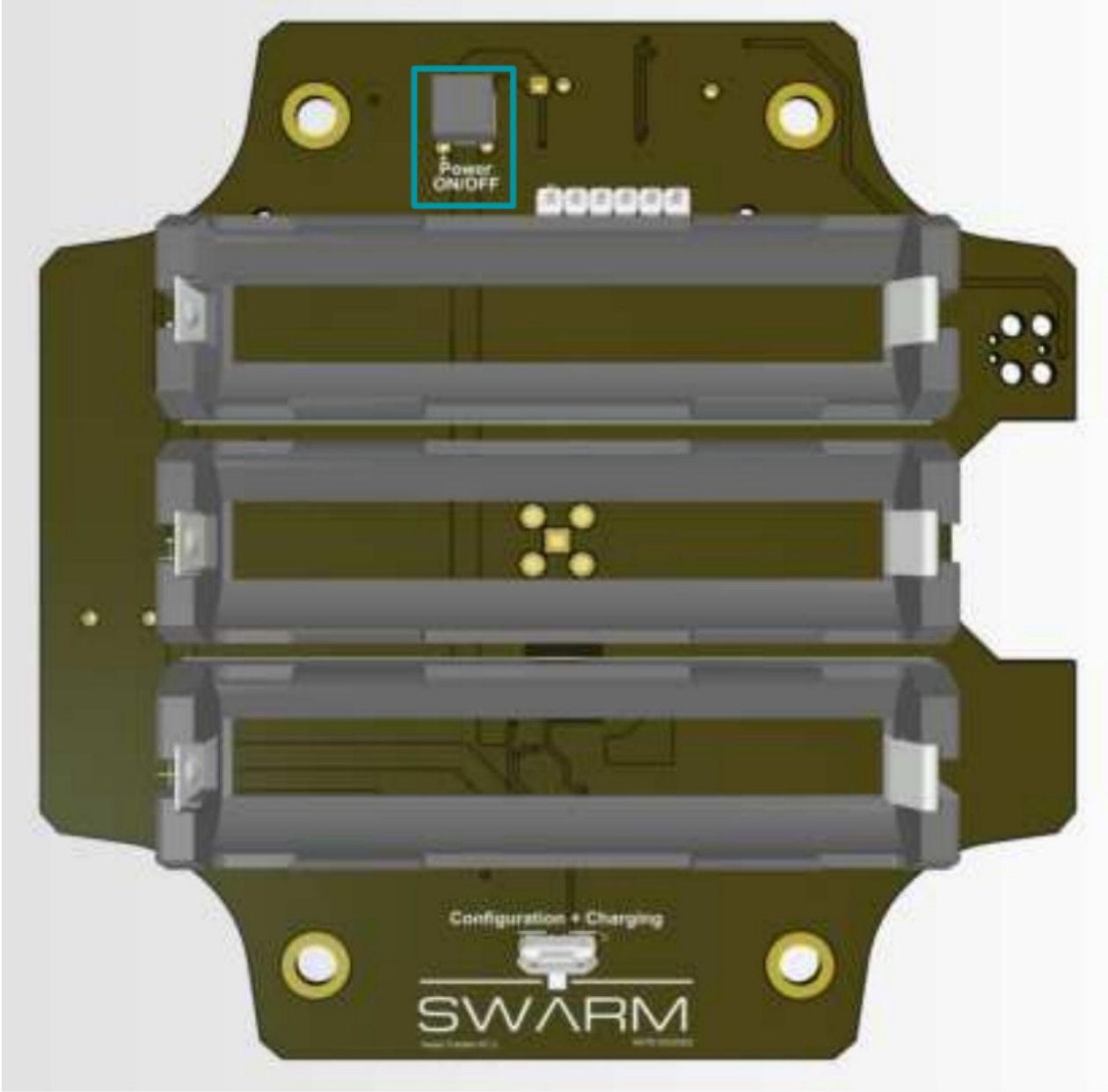
label. If you are unable to use the browser-based scanner, you can also use your camera app to scan the Asset Tracker QR code, and enter the auth code in the Hivemanually. See example below:

Overview & Setup

- Place the Asset Tracker on a flat surface.
- Turn the Asset Tracker over and remove the 4 enclosure screws located on the back using a phillips screwdriver.

- The battery insulating tabs can be removed by either removing the batteries themselves, or by gently pulling on the tabs until removed.

    - The batteries may have to be reinstalled following the polarity markers shown on the PCB.
- Press the power on/off button once to turn the device on.
    - Dim lights around the edge of the PCB will light up.
    - To power the Asset Tracker OFF, press the on/off button again.



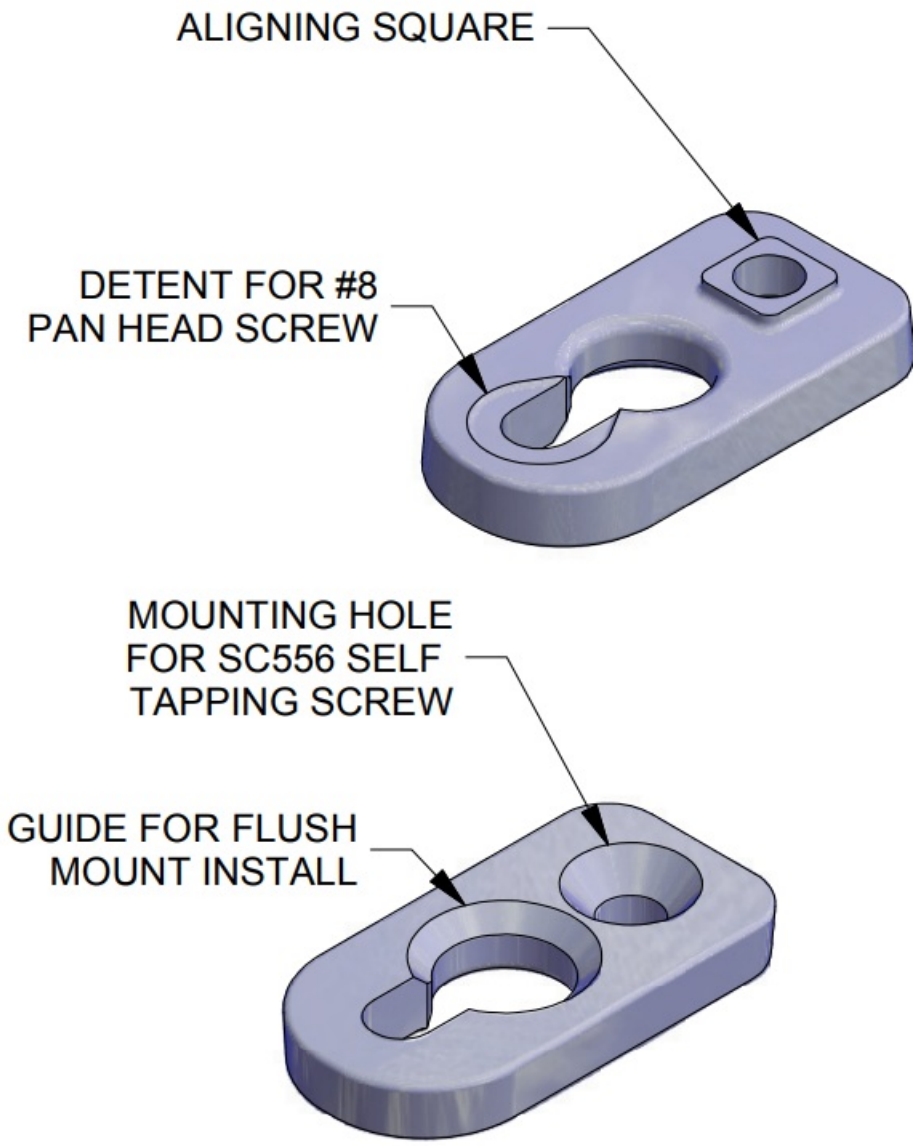
- Reassemble the enclosure with the Asset Tracker powered on using the 4 screws from the previous step.
    - The torque specifications for the enclosure screws is between 71 and 85 ozf-in.

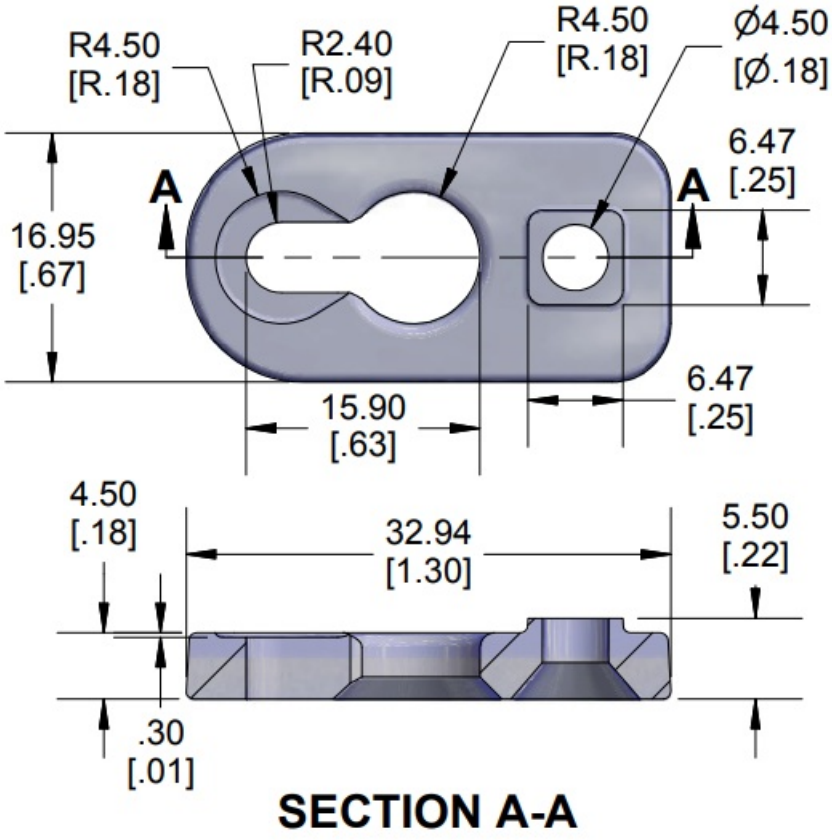
Overview & Setup – Mounting

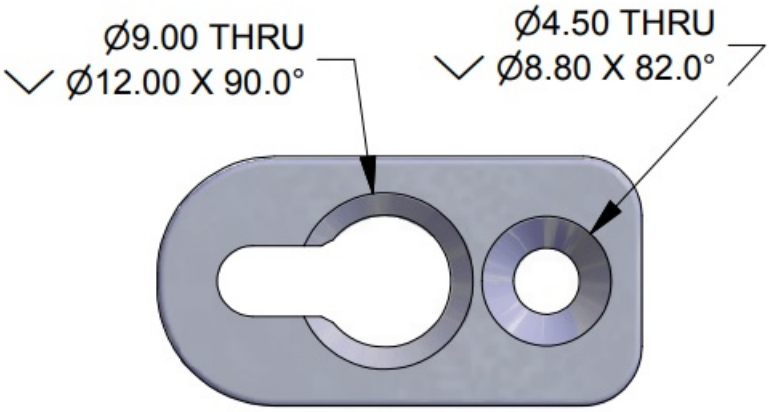
There are multiple options available to mount the Asset Tracker:

 **Mounting Feet**	The included mounting feet can be attached to the enclosure using either a heavy duty mou nt installation method, or using a flush mount installation method. The 2 different installation options for the mounting feet are shown on page 9
 Magnet Mounts	Using the magnet mounts requires the use of the mounting feet installed using the heavy du ty method. The installation of the magnet mounts in shown on page 10. Part number recom mendations for the magnets and screws are provided in Section 5.2 of the Product Manual.
 Pole Mounts	A pole mounting kit can also be used to mount the Asset Tracker. Installation instructions for the pole mounting kit are provided on page 11 of this document. An example of the enclosur e with the pole mounting kit installed is shown on page 12. A part number recommendation f or the pole mount kit is provided in Section 5.4 of the Product Manual.
 VHB Tape	The Asset Tracker ships with 3 pieces of VHB tape installed on the back of the enclosure. To use the VHB tape option, simply remove the tape backing and mount the Asset Tracker by p ressing firmly on the enclosure body. If choosing another mounting method, then the pre-inst alled VHB tape can easily be removed. Part number recommendation for the VHB tape are provided in Section 5.3 of the Product Manual.

WALL MOUNT FOOT



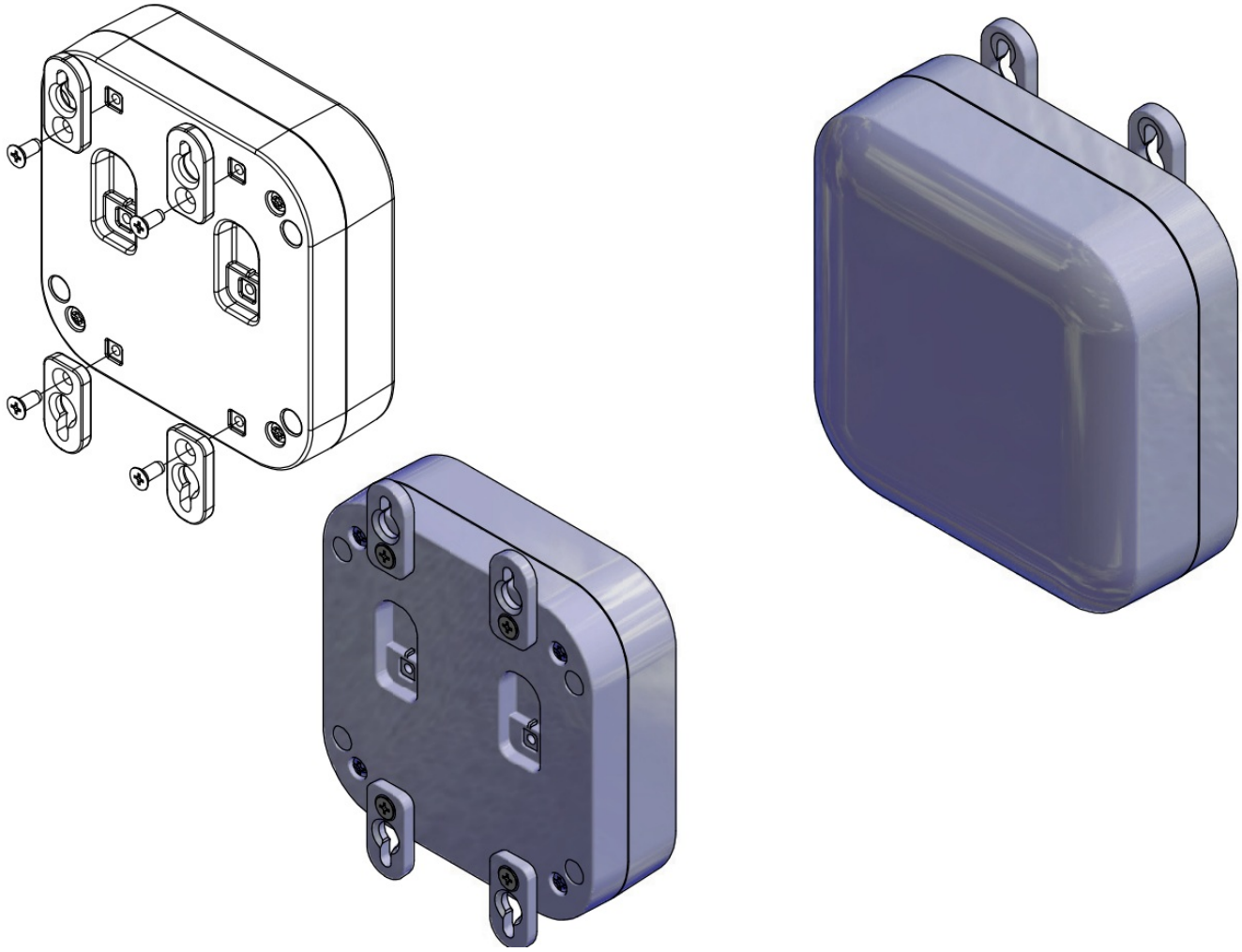




HEAVY DUTY MOUNT INSTALLATION

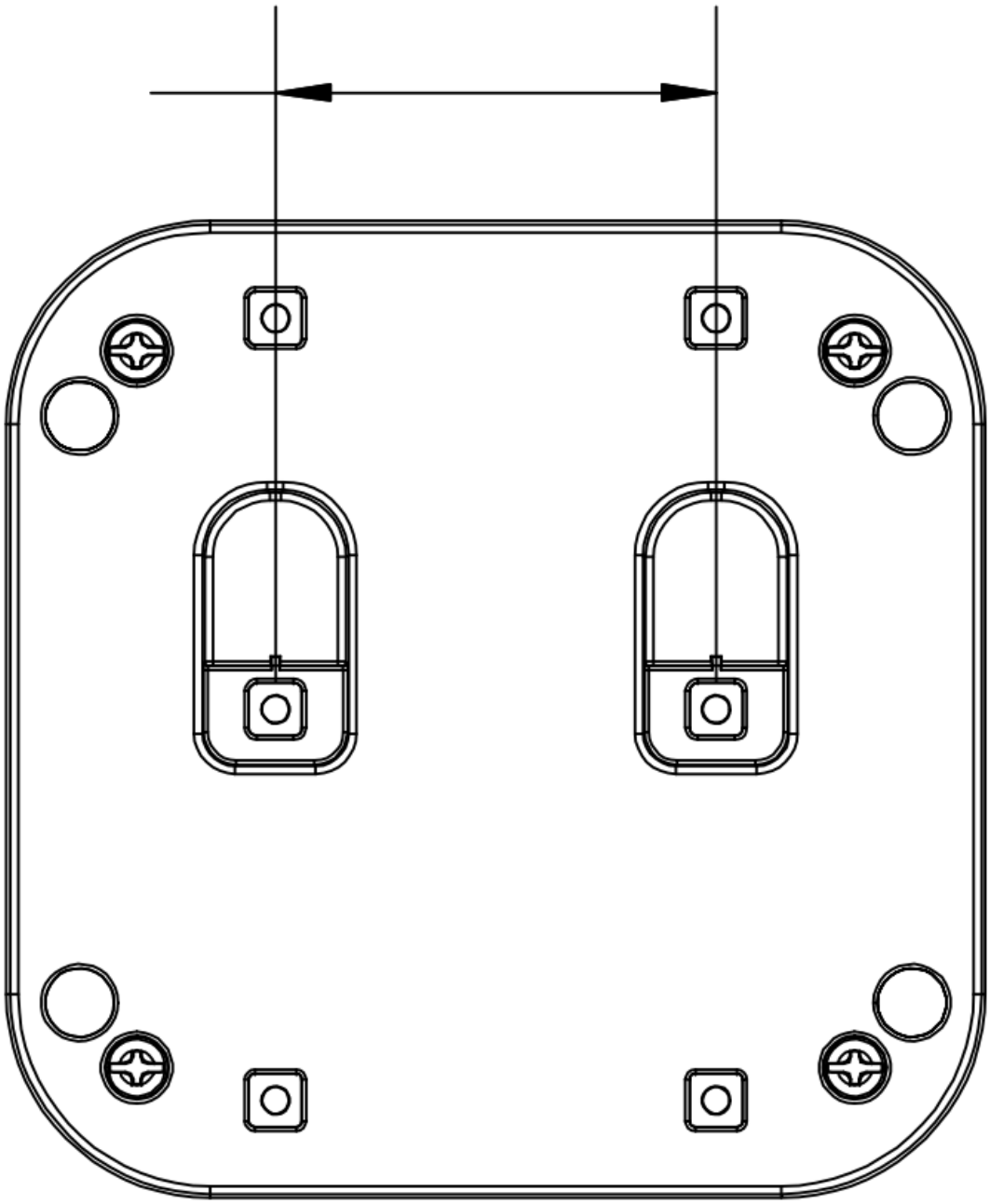
Install mounting feet to enclosure, using supplied screws with a torque of

1. Polycarbonate 100 – 110 cN-m or 8.8 – 9.7 lbf-in. ABS 80 – 90 cN-m or 7 – 8 lbf-in.
2. Mount enclosure to object. Recommend 2. using #8 pan head screws **(not included).**



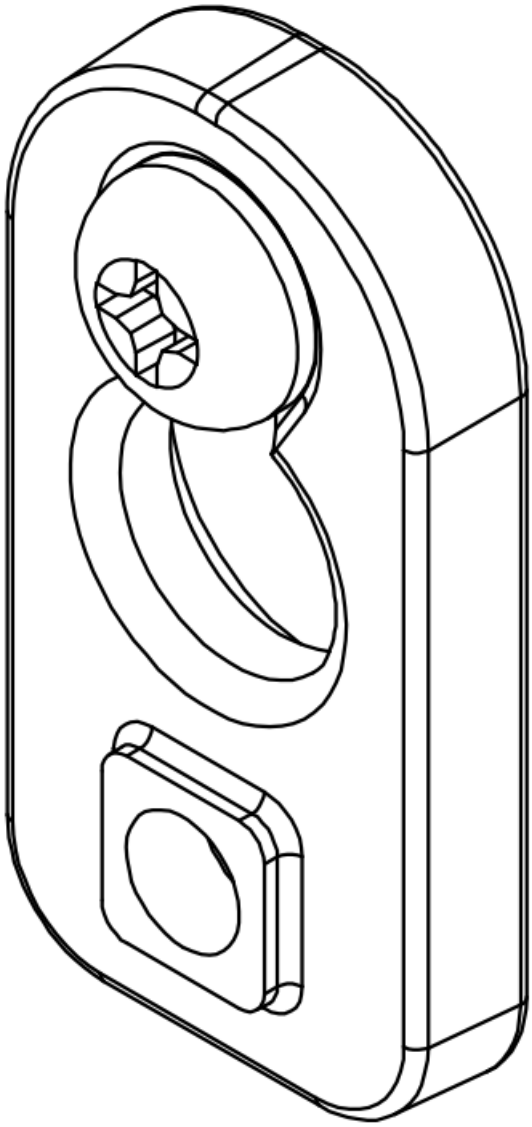
FLUSH MOUNT INSTALLATION

1. At the correct spacing for your enclosure, we recommend installing two #8 pan head screw (not included),



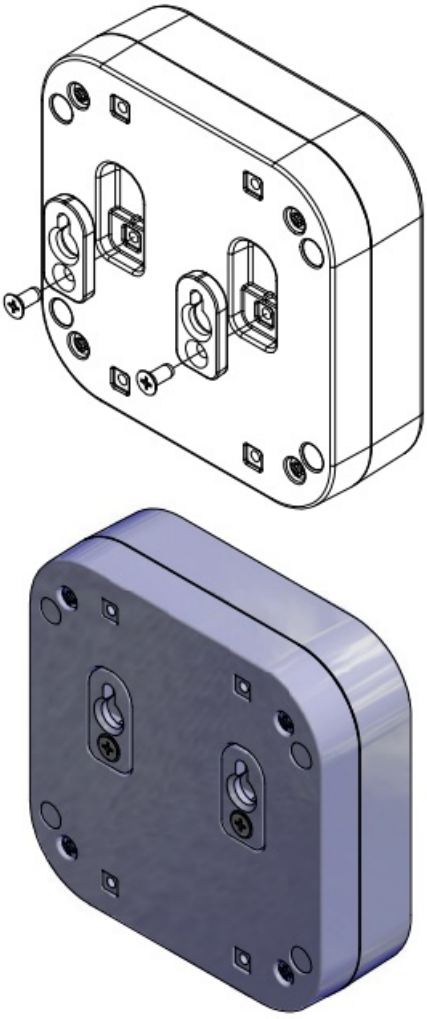
Install mounting feet to enclosure, using supplied screws with a torque of

2. Using a mounting foot, set the height for the screw by loosely tightening the screw onto the foot. Remove foot and give the screw 1/4 turn more.

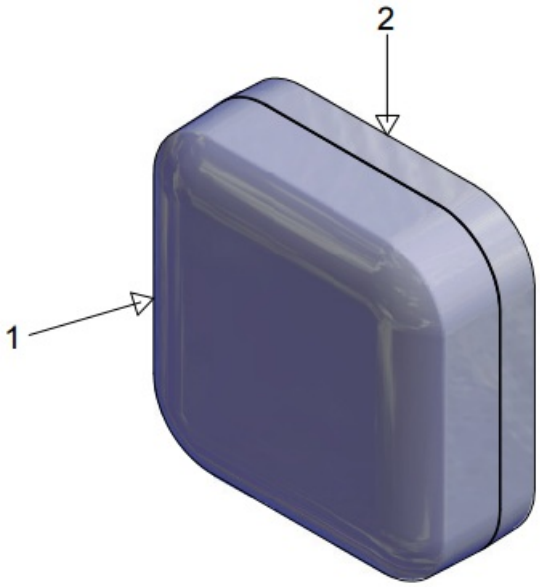


Push enclosure onto installed screws

3. Polycarbonate 100 – 110 cN-m or 8.8 – 9.7 lbf-in. ABS 80 – 90 cN-m or 7 – 8 lbf-in.



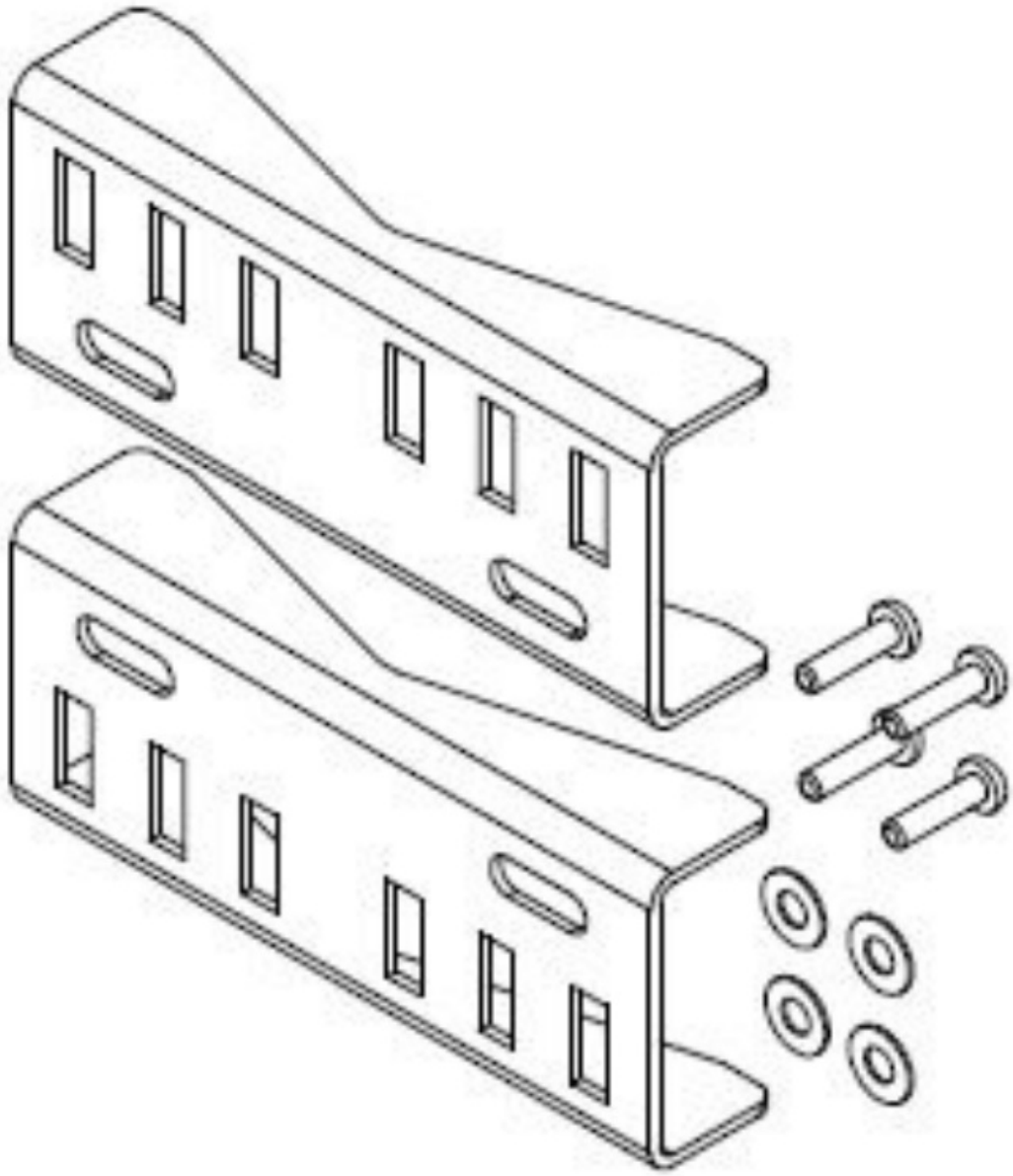
4. Press down on top of the enclosure till you feel the detent click over the pan head screw. some adjustment may be required.



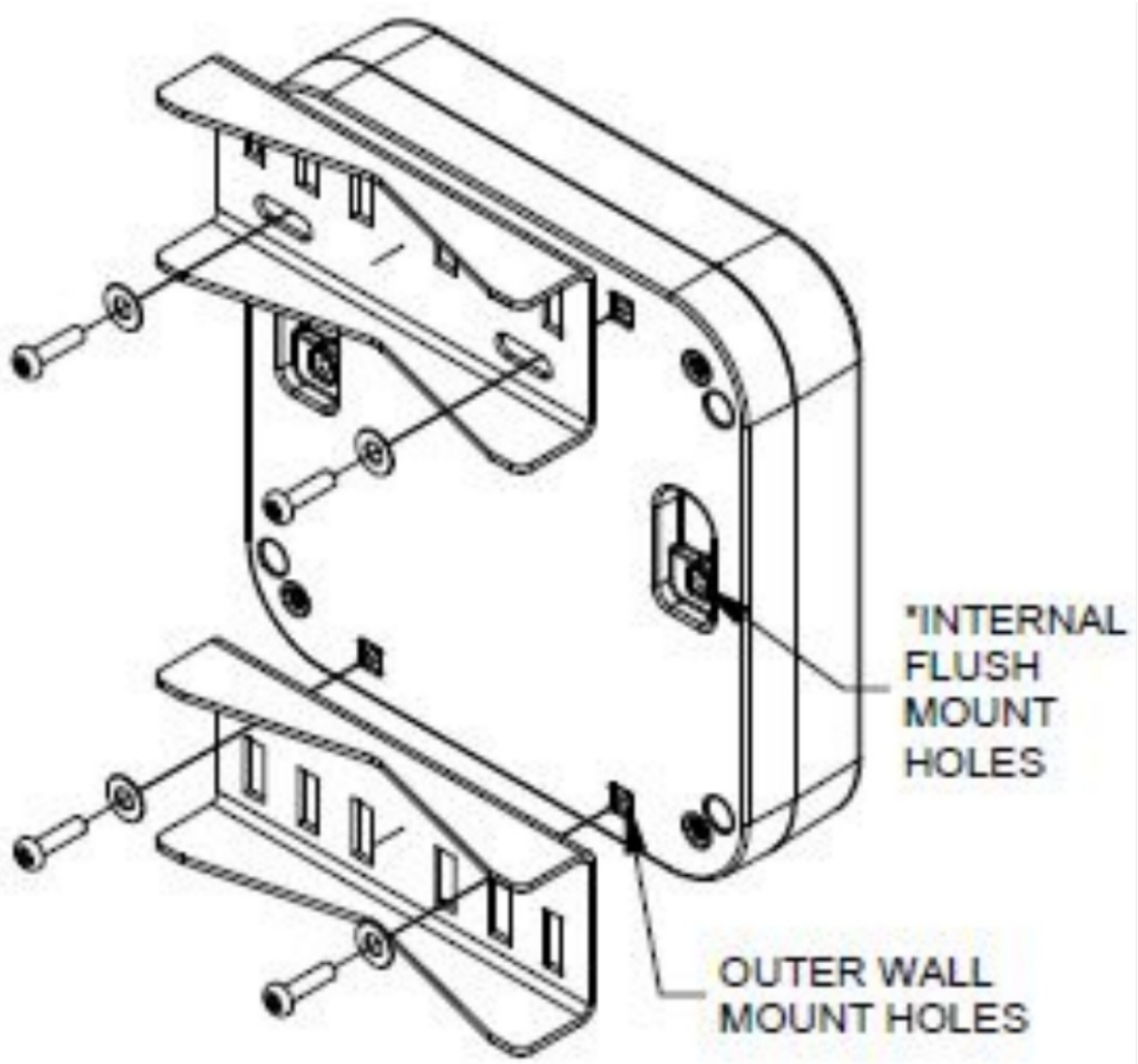
Overview & Setup – Magnet SUPPORT@SWARM.SPACE Mounts

Overview & Setup – Pole SUPPORT@SWARM.SPACE Mounts

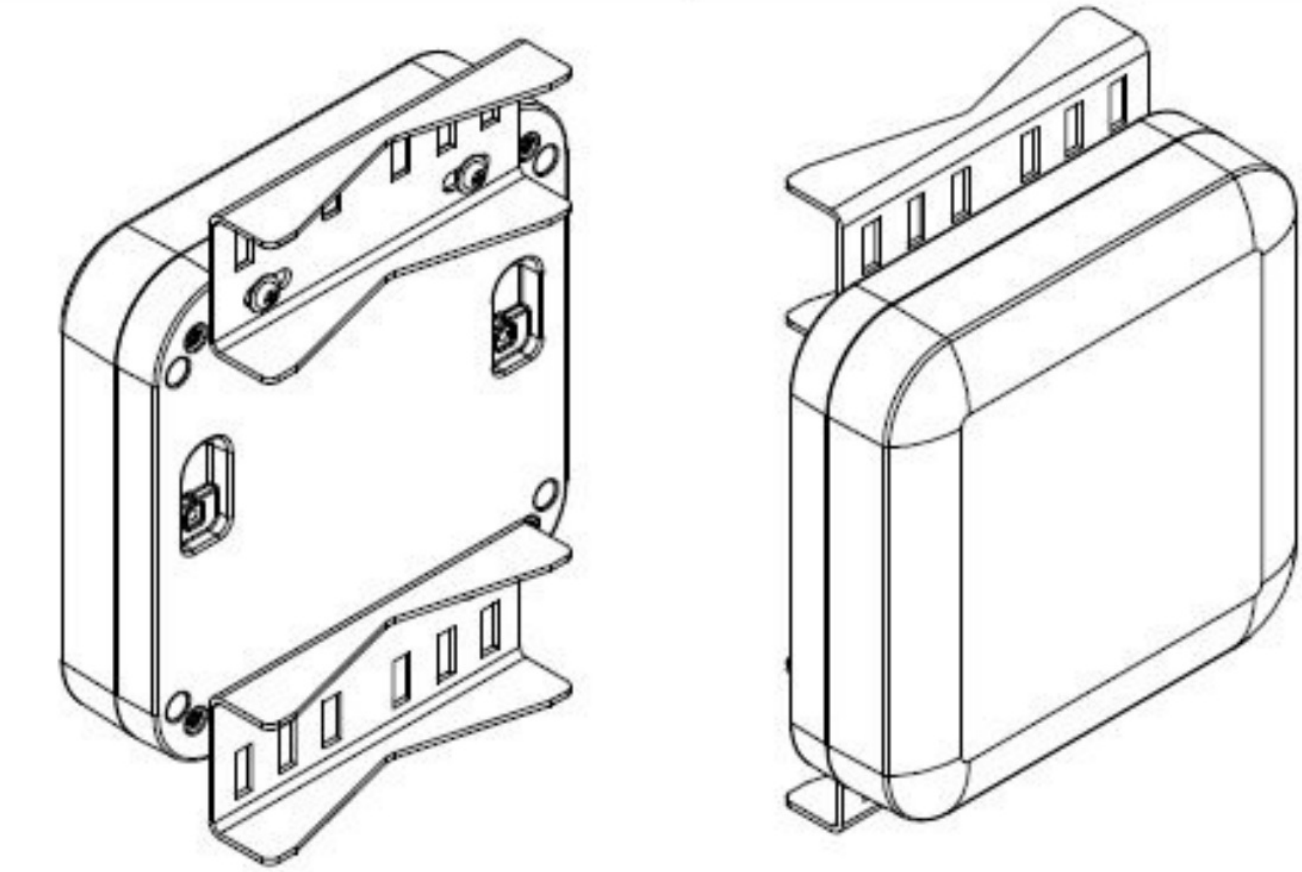
1. KITS ARE SUPPLIED WITH BRACKETS, #8 SELF TAPPING SCREWS, AND WASHERS.
   NOTE:1557B/BA USES ONE BRACKET



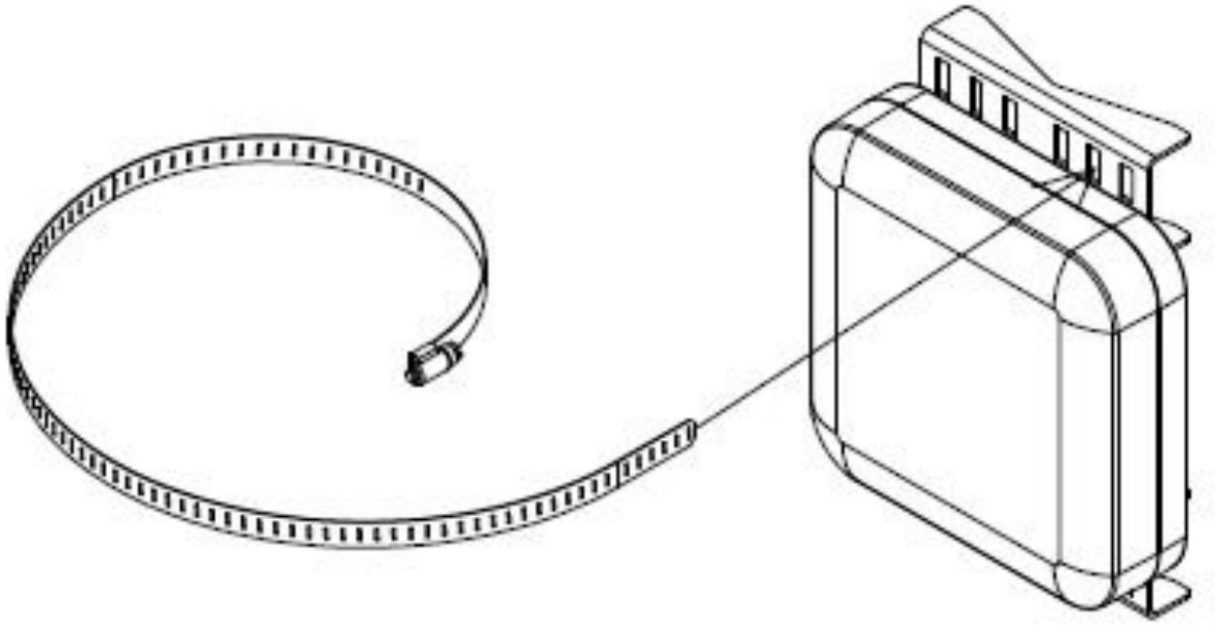
2. INSTALL BRACKET, WASHER AND SCREW TO THE OUTER WALL MOUNT HOLES,
   *FOR 1557B/BA USE INTERNAL FLUSH MOUNT HOLES.



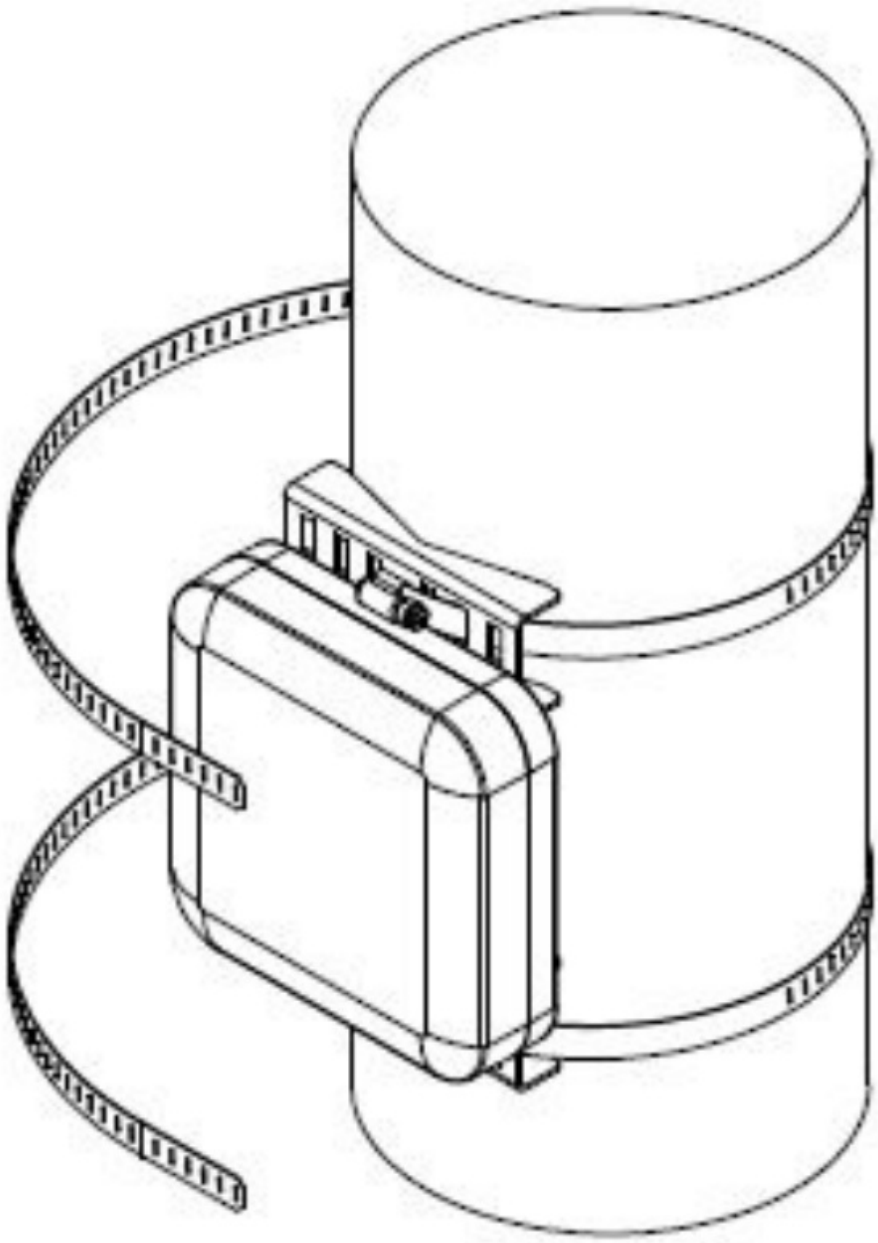
3. FOR #8 HARDWARE USE A #2 PHILLIPS HEAD. TORQUE ASSEMBLY TO 150 cN.m (13.5 lbf.in)



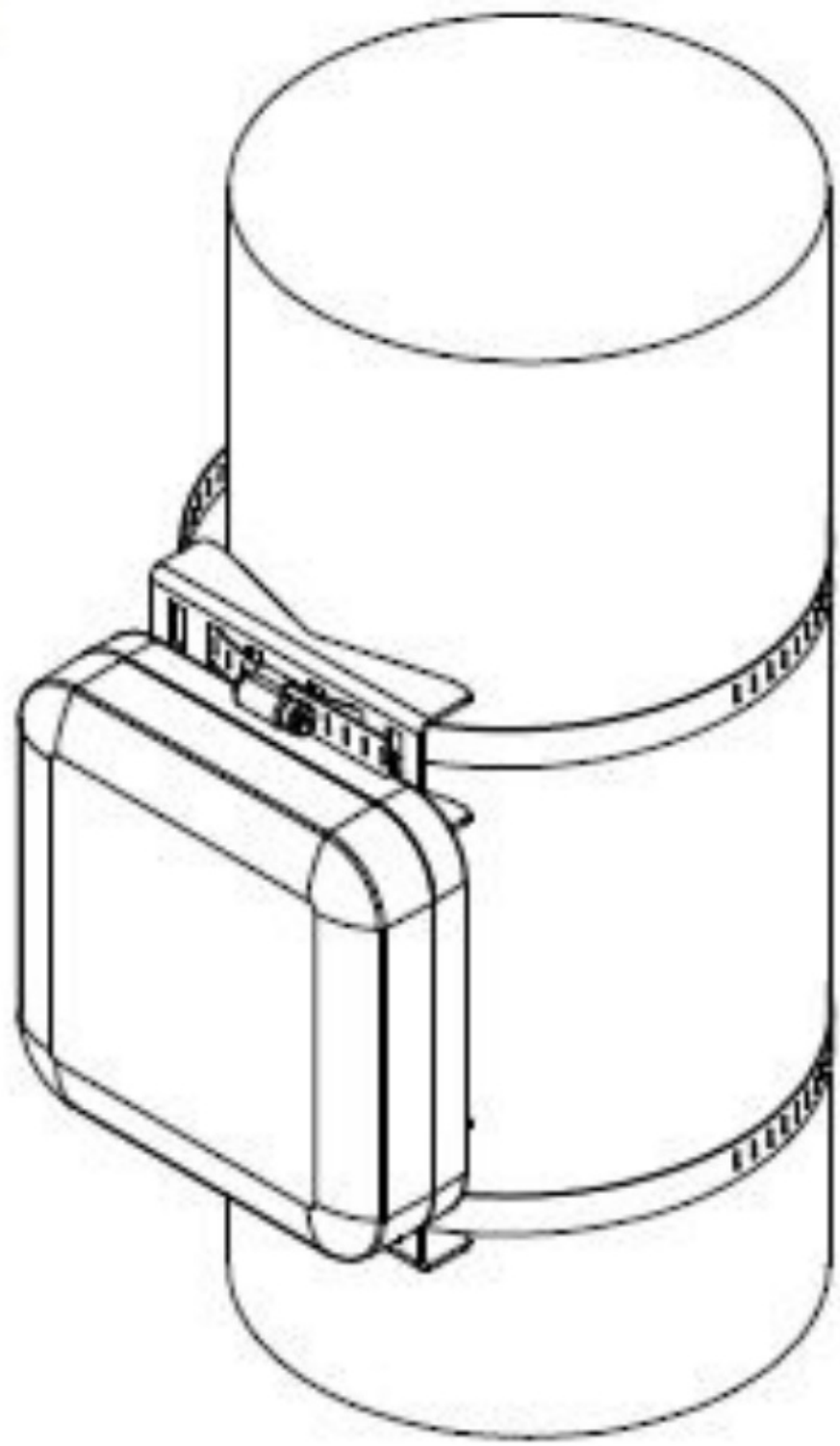
4. SMALL CLAMP (HCLAMP1), POLE DIAMETER RANGE 1.5in TO 7in (3.8cm to 17.8cm) LARGE CLAMP (HCLAMP2), POLE DIAMETER RANGE 1.5in TO 15in (3.8cm to 38.1cm)
   TO INSTALL BRACKETS ON POLE, START BY THREADING CLAMP THROUGH DESIRED SLOT



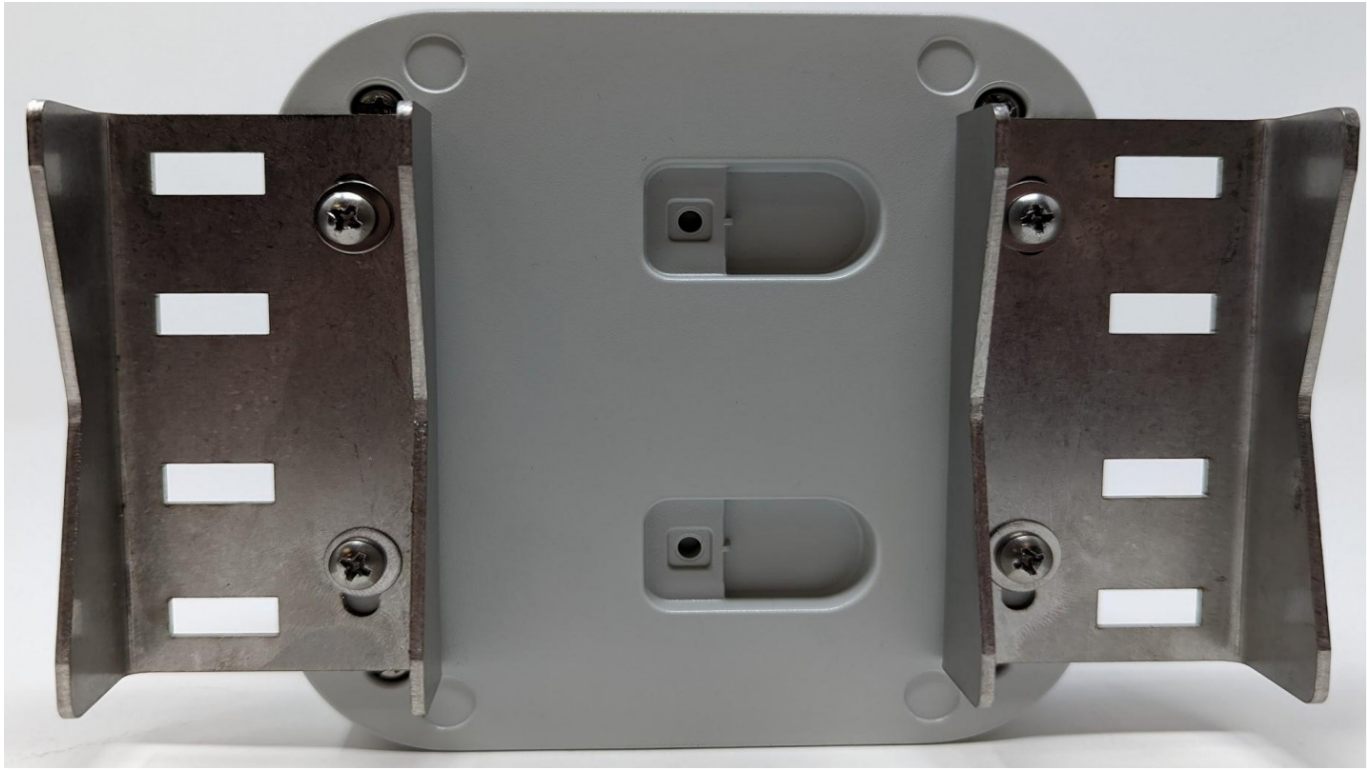
5. WRAP CLAMPS AROUND POLE AND THREAD THE CLAMPS BACK THROUGH BRACKET



6. WHILE HOLDING ENCLOSURE AGAINST THE POLE, TIGHTEN CLAMPS WITH 5/16in (8mm) NUT DRIVE

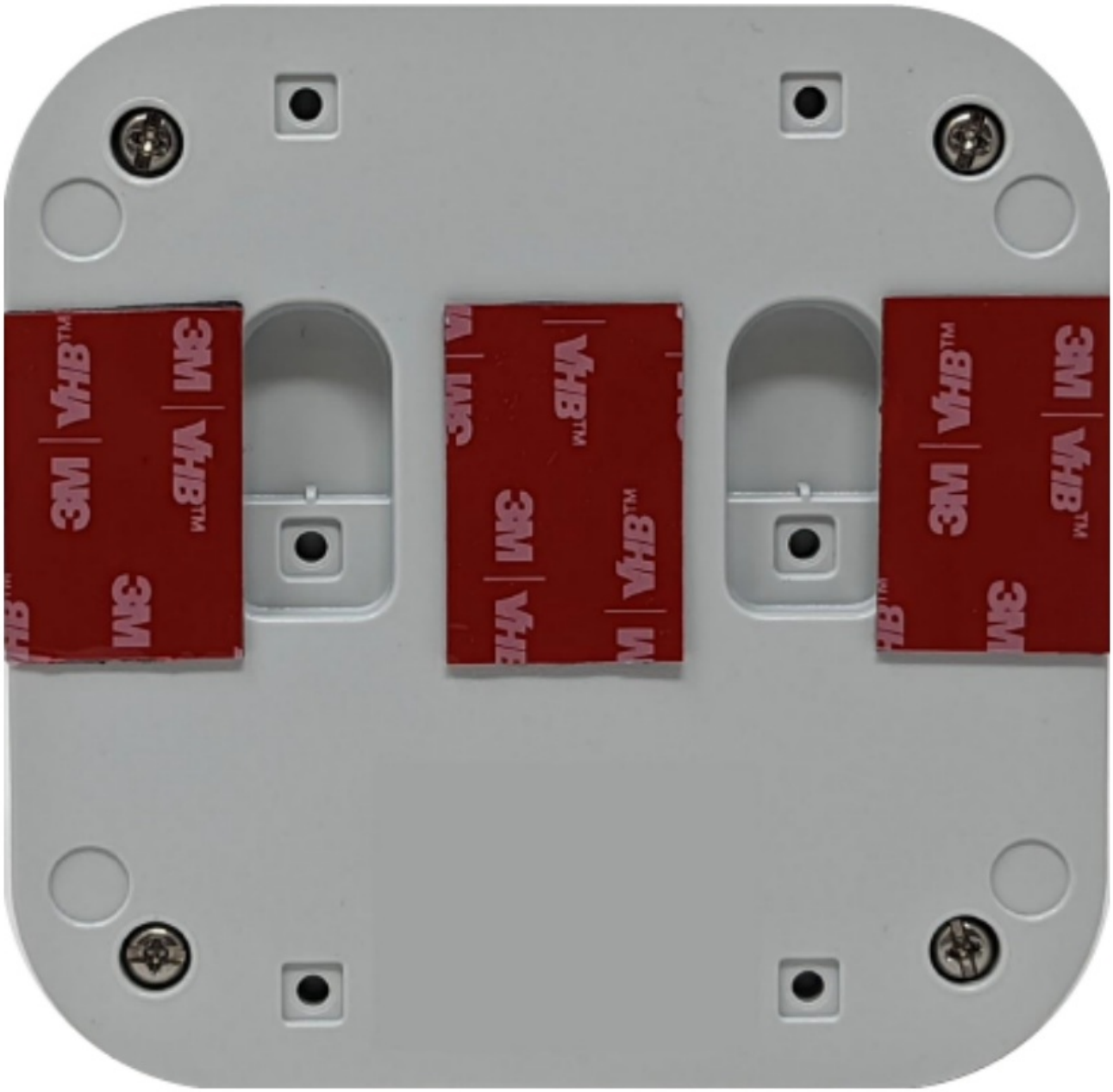


Overview & Setup – Pole Mounts



Overview & Setup – VHB Tape

- To use the VHB tape option, simply remove the red tape backing and mount the Asset Tracker by pressing firmly on the enclosure body. If choosing another mounting method, then the pre-installed VHB tape can easily be removed.

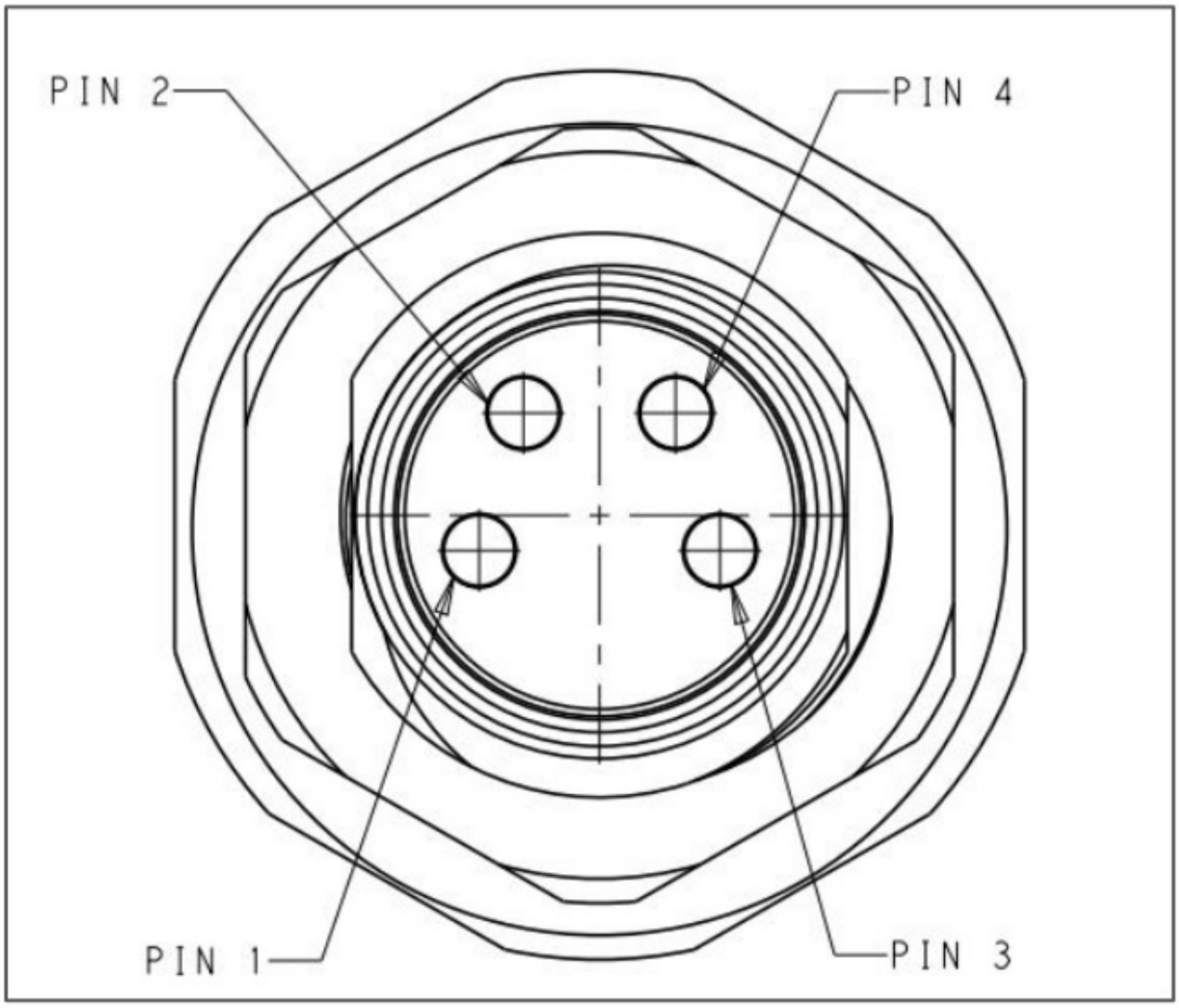


Overview & Setup

- Once the selected mounting option has been installed, please attach the Asset Tracker to the asset of interest.
- Attach the included antenna to the exposed SMA connector on the Asset Tracker ensuring that the antenna is hand-tight.

External Power

- External power can be provided to the Asset Tracker to charge the batteries and extend the lifetime of the deployment.
- The pinout of the M8 connector located on the Asset Tracker is provided below



External View of the Asset Tracker’s M8 Connector.

Pin	Function
3,4	6-28VDC
1,2	GND

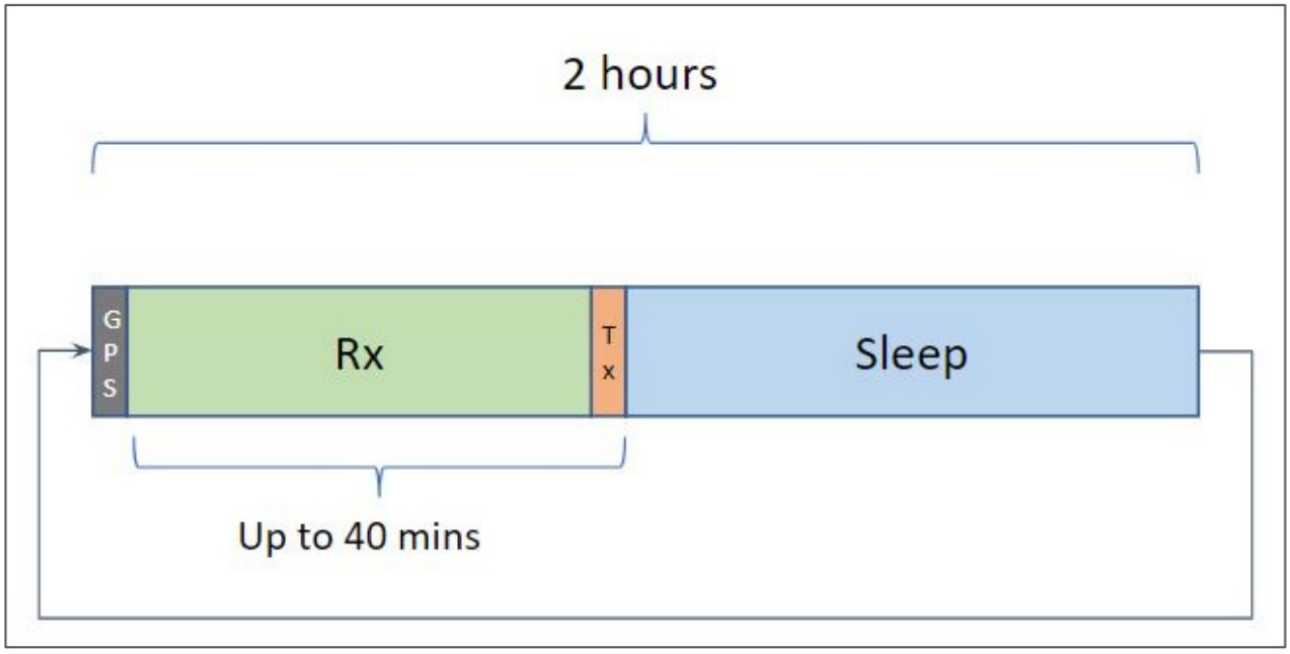
Example Power Cable	
FESTO	NEBB-M8G4-P-5-LE4

Example Mating Connector	
TE	T4010008041-000

- The Asset Tracker's batteries can also be charged by using the internally located micro-USB connector. The Asset Tracker should be in its OFF state with the VHF antenna removed while charging the batteries via the micro-USB connector.

Data Transmission – Motion Detection Disabled

- The Asset Tracker ships preconfigured for 1 of 3 different asset tracking profiles.
- The configuration of the Swarm Asset Tracker is 1 GPS acquisition every 2 hours with 1 transmission per 2 hour window. Motion detection is also enabled by default.



Visual Representation of the Swarm Asset Tracker's Configuration

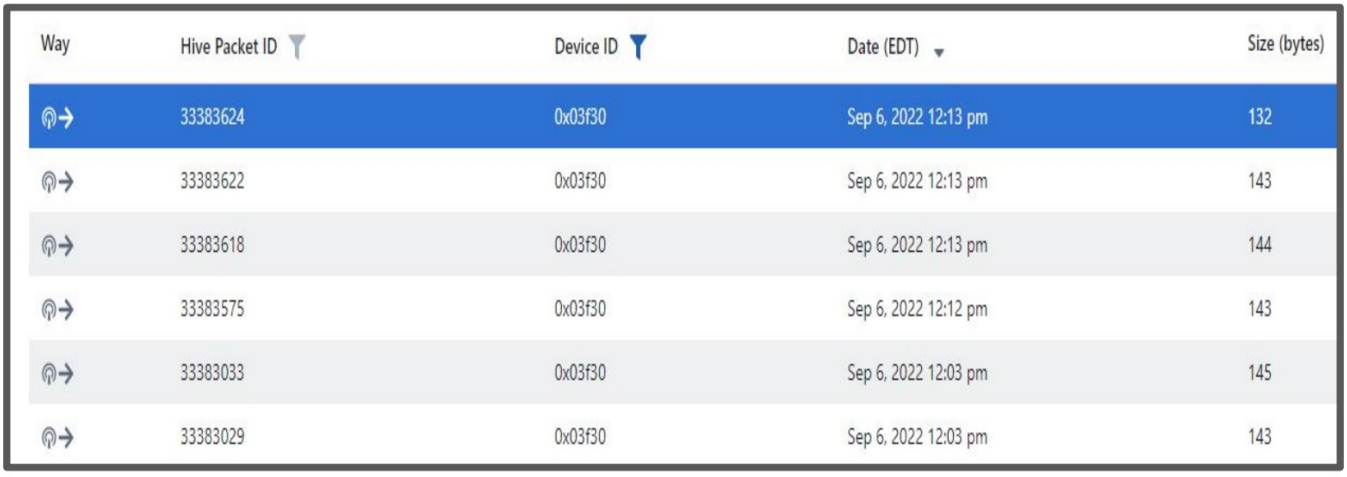
- In the first GPS state, the Asset Tracker will attempt to acquire a GPS fix for up to 4 minutes. The acquired data will be queued for transmission.
- Once a GPS fix is acquired, the Asset Tracker will transition to its receiver state (Rx) for up to 40 minutes where

it will listen for satellite beacons to trigger a transmission (Tx).

- The Asset Tracker will then transition to its sleep mode as soon as the queued message is transmitted, or if 40 minutes have passed. It will remain in its sleep mode until 2 hours have passed since its initial power-on time and it will then repeat the same sequence.
- When motion detection is enabled, it acts as a modifier for the profiles described on the previous page.
- **Scenario 1:** Motion is detected while the Asset Tracker is awake and not in sleep mode.
    - No change to configured profile
- **Scenario 2:** Motion is detected while the Asset Tracker is in sleep mode between acquisition periods.
    - If the motion event occurs before the next scheduled normal wake time, then the device will go back into sleep mode until the next scheduled wake time.
    - If the motion event occurs after the next scheduled normal wake time, then the device will wake immediately and start a new acquisition cycle.
- **Scenario 3**: Motion is detected when the device is ready to transition into sleep mode.
    - The device will continue its profile configuration while it still has messages pending transmission.
    - Once the device's transmission queue is empty after completing its profile configuration, the device will enter its sleep mode indefinitely until a new motion event is detected.
- For all profiles, regardless of whether motion detection is enabled or not, the device will return to sleep early if all messages are transmitted.

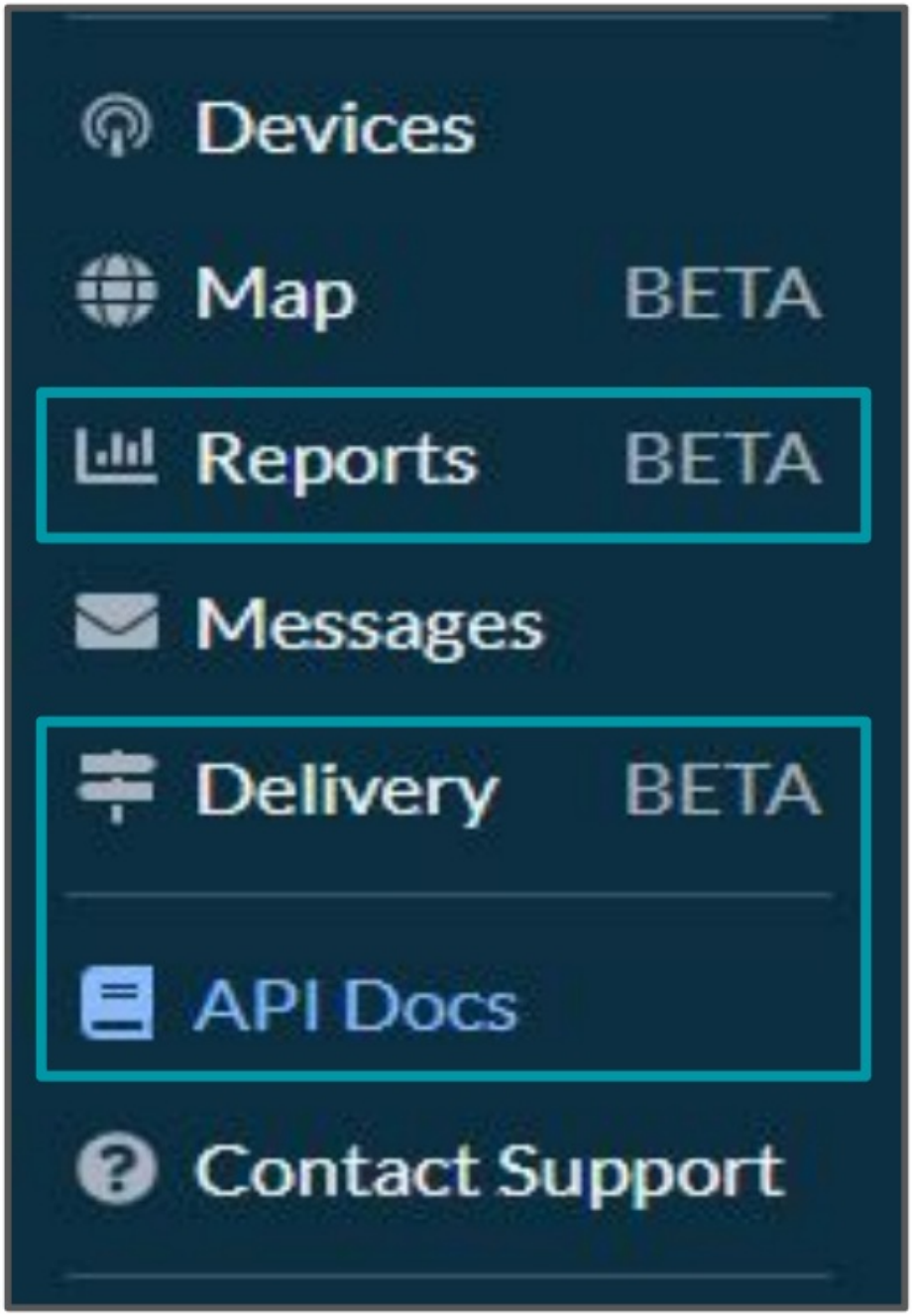
Data Transmission – Accessing Data in the Hive

When your device has successfully transmitted through the Swarm Network, you will see your messages displayed in the Swarm Hive.

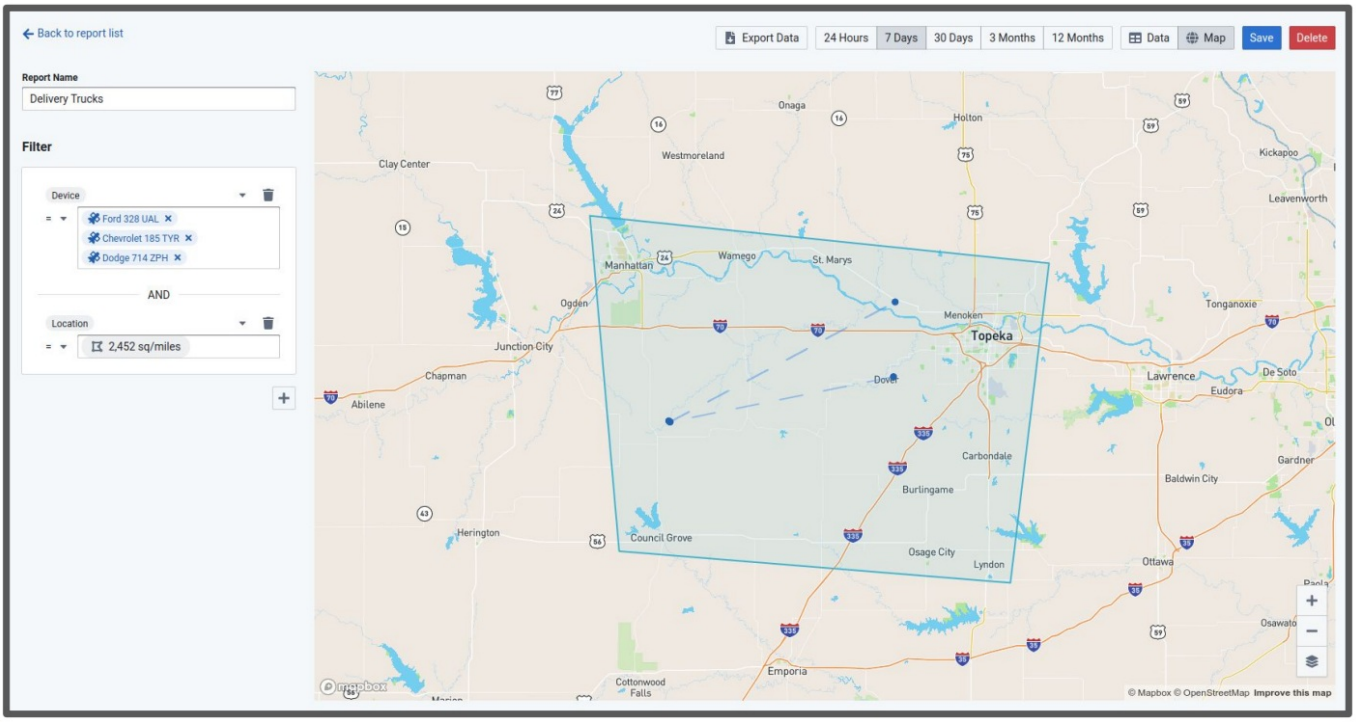


Way	Hive Packet ID	Device ID	Date (EDT)	Size (bytes)
→	33383624	0x03f30	Sep 6, 2022 12:13 pm	132
→	33383622	0x03f30	Sep 6, 2022 12:13 pm	143
→	33383618	0x03f30	Sep 6, 2022 12:13 pm	144
→	33383575	0x03f30	Sep 6, 2022 12:12 pm	143
→	33383033	0x03f30	Sep 6, 2022 12:03 pm	145
→	33383029	0x03f30	Sep 6, 2022 12:03 pm	143

When your device has successfully transmitted through the Swarm Network, you will see your messages displayed in the Swarm Hive.



Customers can create reports for transmitted Asset Tracker data using the new Reports Page. Custom reports can be generated and data can be viewed in eithertabular, or map format. Several filters are available such as device, date, and location filters.Filtered data can also be exported as a CSV
file to perform analysis as necessary. Customers can also extract data from theHive using either the provided REST API, or Webhooks.
The image below shows an example of a report generated on the Swarm Hive. The report can be used to filter data by devices, date range, and location. The generated report can be viewed in tabular format or on a map. The data can also be exported and downloaded as a CSV file.



The table below provides a description of the various parameters included within the transmitted message.

Identifier	Description	Units
dt	GPS date/time of sample at time of packet creation	Epoch seconds
lt	GPS latitude	Degrees
ln	GPS longitude	Degrees
al	GPS altitude	Meters
sp	GPS speed	m/s
hd	GPS heading	Degrees
bv	Battery voltage	mV

tp	CPU temperature	°C
rs	Background RSSI at time of packet creation	dB
tr	RSSI of most recent satellite beacon	dB
ts	SNR of most recent satellite beacon	dB
td	GPS date/time of most recent satellite beacon	Epoch seconds
gj*	GPS jamming level*	N/A
gs*	GPS spoofing indicator*	N/A
hp*	Horizontal dilution of precision*	N/A
vp*	Vertical dilution of precision*	N/A
tf*	Time to fix*	N/A

Resources/Troubleshooting

Please send us your comments/questions regarding the Swarm Asset Tracker directly by email to support@swarm.space.

Below are some additional helpful resources for using your device:

Swarm Resources

❑ Swarm Developer Tools
❑ Swarm Frequently Asked Questions
❑ Swarm Asset Tracker Product Manual
❑ Swarm Getting-Started GitHub
❑ Swarm Getting-Started Wiki

FCC Statement of Compliance

Swarm Technologies, Inc.
435 N. Whisman Rd.
Ste 100
Mountain View, CA 94043
Model: ATM138

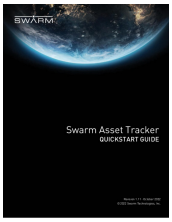
Contains FCC ID: 2AVE9-M138
Contains IC: 25817-M138

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. (This device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 Canada

Documents / Resources

	SWARM Asset Tracker Subsidiary Launches Satellite Based Tracking Device [pdf] User Guide Asset Tracker Subsidiary Launches Satellite Based Tracking Device, Subsidiary Launches Satellite Based Tracking Device, Satellite Based Tracking Device, Tracking Device

References

- Swarm Hive Login