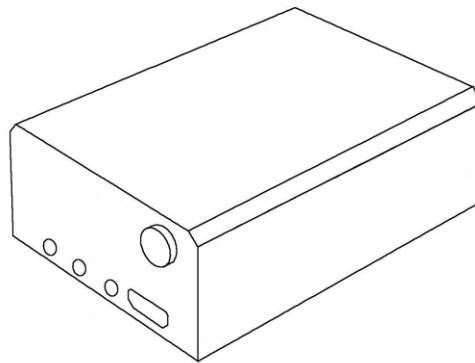




UAV Hardware Tracker User's Manual



Model:	GRT-001
Version:	1.0
Manual version:	1.10
Manual revision:	2022-06-03



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About This Manual

Thank you for purchasing a MyDroneFleets UAV Hardware Tracker.

This user's manual contains the information you need to set up, operate and maintain your tracker. For your safety, please read this manual before operating the tracker.

The information contained in this manual has been verified to be accurate at the time of publishing. For the latest version, download it from mydronefleets.com

Some sections of this manual may be annotated with one or more of the following icons:



NOTE: A NOTE Indicates important information that helps you make better use of your tracker.



CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.



WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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About Your Tracker

Congratulations on your purchase of a MyDroneFleets UAV Hardware Tracker!

Once the Tracker has been mounted on your UAV, you will be able to transmit and monitor its location via a 4G cellular network.



Compliance

Depending on where you purchased and use your tracker, you may need to comply with one or more specific usage conditions described in the following table:



Note: Garuda Robotics makes a reasonable effort to ensure the information contained in this section is up to date at the time of publishing. The user of the UAV Hardware Tracker bears final responsibility for ensuring compliance with all applicable local regulations.

Retail Trackers

This tracker is linked to your Garuda Plex company account. By using this tracker, you consent to Garuda Robotics operating a location tracking service for your UAVs.

The location tracking service (**MyDroneFleets**) is located at track.mydronefleets.com.

All your location data will be kept strictly private according to our product Terms and Conditions at <https://garuda.io/terms> and <https://garuda.io/privacy>

Centralised Flight Management System (CFMS) Trackers

by the
Civil Aviation Authority of Singapore (CAAS)

The use of this tracker is mandatory for all commercial UAV operators in Singapore. A tracker unit must be mounted on your UAV(s) during commercial flight operations to allow CAAS to monitor your flight activities.

You may only use this tracker while operating UAVs commercially in Singapore. You may not use this tracker for any other purposes. This tracker unit is linked to your operator permit and cannot be used on another operator permit.

Additional details may be found in the Acceptable Use Policy for CFMS UA Tracker.

For more information, see clause 19D in [ANR 101 \(wef 1 June 2022\)](#).

Package Contents

Your Tracker ships with the components shown below. Make sure that you have received all the components. Contact Technical Support if something is missing.

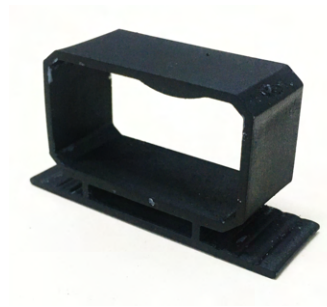


Note: Some items may be optional and may not ship with your tracker. Some components may not be available in certain countries.

UAV Hardware Tracker



Mount



3M Dual Lock Reclosable Fastener SJ3560 Velcro Strip (x2)



USB charging cable (Only included in selected packages)



Additional tracker mounts may be purchased from Garuda Robotics. Additional velcro strips, USB cables and other accessories may be purchased from Garuda Robotics or a suitable electronics store.

Tracker Specifications

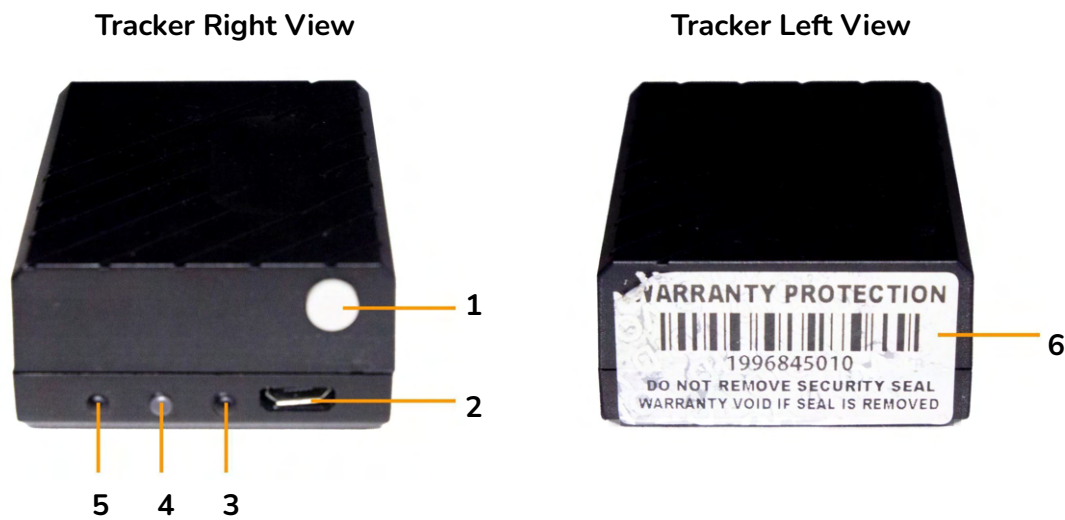
Dimensions	60.0 x 45.0 x 23.5mm (2.36 x 1.77 x 0.93 in)
Weight	60 g (2.12 oz)
Casing	High-strength engineering plastic
CPU	48MHz ARM Cortex-M0
GNSS	GPS/GLONASS/Beidou
Cellular Mobile Terminal	4G LTE B3/B7/B8 Complies with IMDA standards – DA109033
SIM	Nano SIM
Sensors	Accelerometer Gyroscope Compass Temperature
Battery	Non-removable Lithium Polymer 500mAh
Charger	Integrated two-stage USB charger with safety circuit and intelligent cutoff
Charging time	60 min
Operating time	60 min
Operating temperature	0 to 55 °C (32 to 131 °F)

Mount Specifications

Base weight	9 g (0.32 oz)
Weight with velcro strip	12 g (0.42 oz)
Material	High-strength thermoplastic polyester

AS PART OF A POLICY OF CONTINUOUS IMPROVEMENT, WE RESERVE THE RIGHT TO ALTER DESIGN AND SPECIFICATIONS WITHOUT NOTICE.

Identifying Parts and Controls



Label	Description	Use
1	Power button	Latching power button. Press fully and release to toggle tracker on/off state.
2	Micro USB port	Connect a USB cable to the tracker and a USB power source (5V) to charge the tracker.
3	Charging indicator	Lights up red when charging. Lights up blue when fully charged.
4	Power indicator	Lights up green when powered on. Unlit when powered off.
5	Status indicator	Lights up orange to indicate tracker status through a combination of short and long flashes.
6	Tamper-proof label	Indicates if the tracker has been opened. Labels are single use and can only be replaced at an Authorised Service Centre.

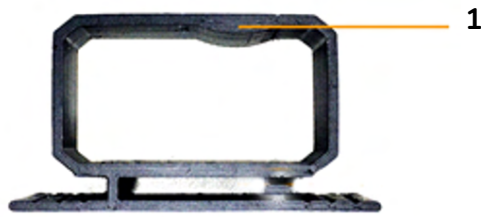
Tracker Bottom View

Engraved or Sticker

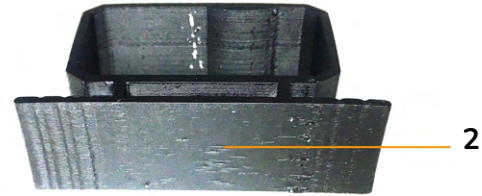


Label	Description	Use
1	Serial number	Globally unique serial number of the tracker.
2	International Mobile Equipment Identity (IMEI)	Globally unique hardware address of the onboard 4G LTE communications module.
3	Regulator logo (only present in some versions)	Trackers issued through a UAV-regulating authority bear the official logo of said entity.

Mount Side View



Mount Bottom View



Label	Description	Use
1	Mounting lock	Mates with corresponding cutout on the tracker body to ensure secure hold.
2	Adhesive point	Designated surface for attaching velcro strips.

Warranty

The warranty policy that applies to your tracker depends on where it was purchased. These policies are described in the following table:

Retail trackers	<p>Trackers are covered by a warranty of three (3) months against manufacturing defects.</p> <p>This warranty does not cover wear and tear experienced in the course of normal usage. It does not cover failure or damage caused by improper usage.</p>
CFMS Trackers	<p>Trackers are covered by a warranty of up to three (3) years against manufacturing defects. The warranty period depends on the date of manufacture and collection.</p> <p>This warranty does not cover wear and tear experienced in the course of normal usage. It does not cover failure or damage caused by improper usage.</p> <p>Batteries are consumable items which degrade over time. The battery in your tracker is covered for one (1) year after purchase. If your battery needs to be replaced due to normal wear and tear, the cost of parts and labour are not covered by the warranty.</p>

Support

For all technical support matters, please contact support@garuda.io.

Setting Up the Tracker

Step 1: Initial Hardware Setup

The initial hardware setup steps for your tracker will depend on where you purchased it.

For **Retail Trackers**, please follow the following steps for initial hardware setup.

For **CFMS Trackers**, initial hardware setup will be done on-site during tracker collection by Garuda Robotics in front of you.

Initial Hardware Setup

- 1 Take the tracker outdoors to a location where it has an unobstructed view of the sky (to receive GNSS signals) and a good 4G network signal.
- 2 Turn on the tracker. The power indicator should light up solid green, while the status indicator light flashes orange.
- 3 The startup process is complete once the power indicator changes from being continuously lit to flashing. At this point, the tracker is transmitting data to MyDroneFleets.

The startup process should take no more than 30 seconds. If you are unable to connect after 30 seconds, you may be in a location with poor 4G connectivity. Turn off the tracker and repeat Step 3 in another location with better 4G connectivity.

CFMS Trackers

At this point, the tracker is transmitting data to CAAS.

- 4 The status indicator should be flashing orange once every 3 seconds, meaning the tracker has locked onto a GNSS signal and is transmitting location data back to MyDroneFleets.

If the status indicator is flashing twice per second or more, the tracker has yet to lock onto a GNSS signal. The GNSS lock procedure usually takes around 1 minute. If you're unable to receive the location information after 1 minute, consider moving to a different location.

If you see any other combination of flashes from the status indicator, see the Troubleshooting section of this document.

- 5 You have completed the initial hardware setup of your tracker. Do not turn it off yet. Next, you will set up the software applications needed to use your tracker.
-

Step 2: Initial Software Setup

The software application(s) you use to manage your tracker will depend on where you purchased it.

For **Retail Trackers**, please continue to section:
 For **CFMS Trackers**, please continue to section:

Setting up MyDroneFleets
Setting up FlytSafe

Setting up MyDroneFleets

1 Visit <https://track.mydronefleets.com>

2 Login using your Garuda Plex account

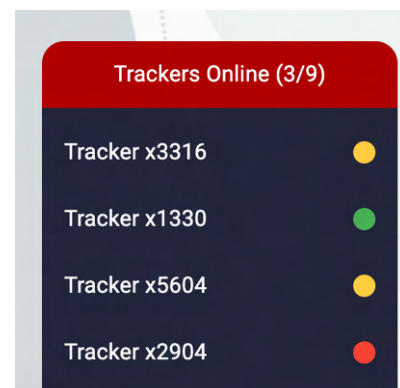
3 Click on My Trackers.

You will see all the trackers you purchased.

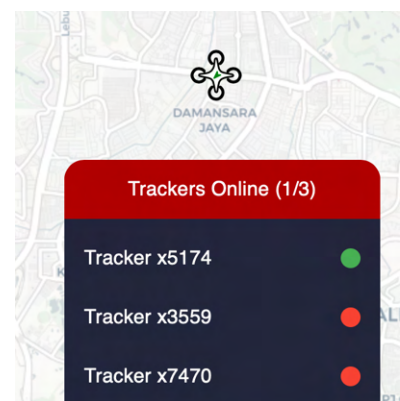
My Trackers				
Serial Number	Hardware IMEI	Sim Card IMSI / ICCID	Notes	Assigned to
GRT-0012-0100	861123054827470	502162059021010 89601620062201507836	Deployed to Malaysia	frederick@garuda.io
GRT-0012-0074	861123052203559	502162059021011 89601620062201507844	Deployed to Malaysia	frederick@garuda.io

4 Power on your tracker. Click on Dashboard.

When your tracker comes online, the indicator will turn yellow.



5 If you are outdoors and the tracker gets a GPS lock, the indicator will turn green and you will see your tracker animated on the map



6 You have successfully completed the initial setup of your tracker. You may now turn it off.

Setting up FlyItSafe

In this section, you will verify that you can pair your tracker to the FlyItSafe mobile application. For detailed information on the use of FlyItSafe, please refer to the **User Operating Manual for FlyItSafe**.

- 1 Download the FlyItSafe mobile application from the Google Play Store or Apple App Store.

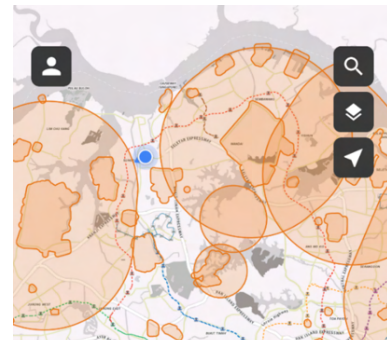


- 2 Ensure that location services have been enabled on your mobile device.

- 3 Launch the FlyItSafe application.

The home screen will display a map of Singapore with the designated No-Fly Zones clearly marked.

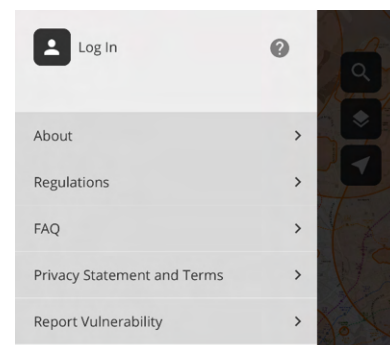
Select the Avatar icon on the top left corner of the screen to access the menu.

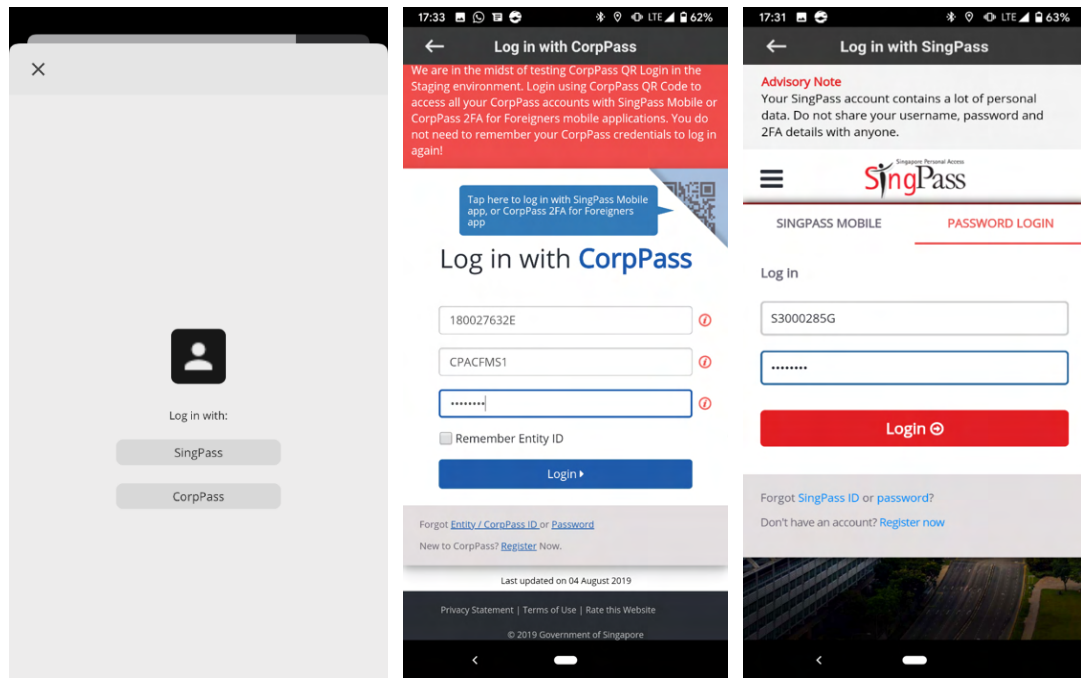


- 4 From the menu, select Log in to login with your CorpPass account (for businesses), or SingPass account (for individuals). Please request for your company's administrator to issue you a CorpPass account, and assign you to the **CFMS** service.

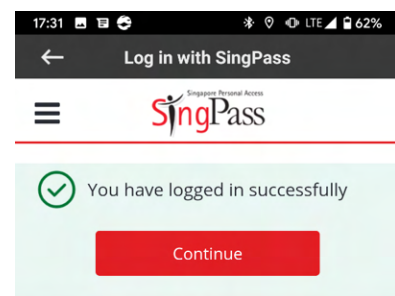


Note: You must already have CFMS access in CorpPass before you collect your Tracker.





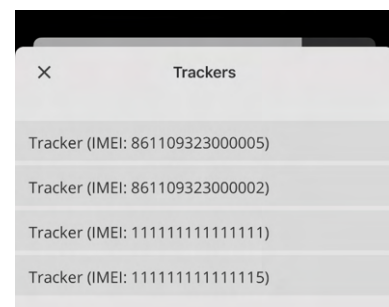
- 5 Once you have successfully logged in with your SingPass or CorpPass, you will be redirected to the home screen.



- 6 From the menu, navigate to the **Trackers** page.

All trackers registered under your SingPass or CorpPass by the tracker distributor will be listed here.

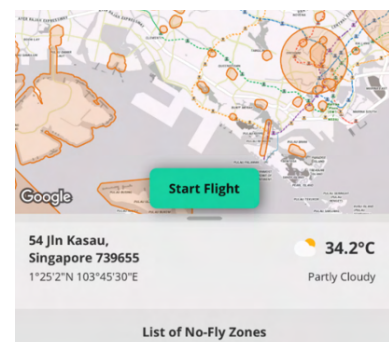
Verify that the IMEI of the tracker you are setting up is shown in the list.



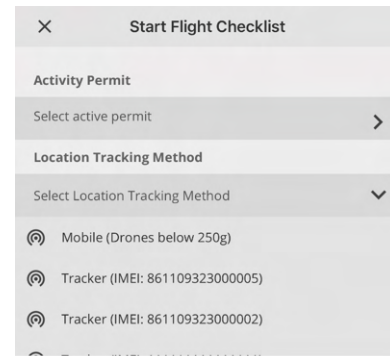
- 7 Your tracker should be powered on and located near your mobile device for this step.

From the home screen of the application, click on the **Start Flight** button.

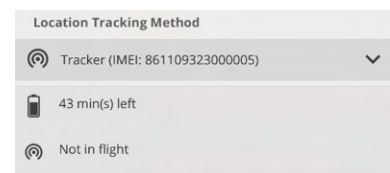
You will be directed to the **Start Flight Checklist** screen.



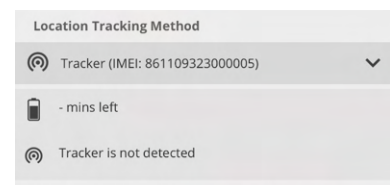
- 8 Under **Location Tracking Method**, select your tracker using the IMEI number.



- 9 If your tracker is turned on and communicating with the server, its status will be reported as “Not in flight”. **Your tracker is working normally.**



If your tracker is turned off, its status will be reported as “Tracker is not detected”. **You should turn the tracker off, then on again, and repeat Step 5.**



- 10 You have successfully completed the initial setup of your tracker. You may now turn it off.

Step 3: Attaching the Velcro Strip



NOTE: Before you can use the tracker on the UAV, you must position the velcro strip in a suitable location. The following procedure may be carried out with or without the tracker inserted in the mount to help with estimating the physical footprint required. If you are attaching the mount without the tracker inserted, take extra care to verify the conditions described in Step 3.



NOTE: All mounting methods mentioned below are recommended based on UAVs that have a top flat surface. Users should assess the stability of the mounted tracker on their specific UAV before determining the suitability of such methods.



WARNING: The velcro strip provided has an average life usage of 800 times. The strength of the velcro strip is reduced each time it is removed from the mounted surface. Velcro strips are required to be replaced after 800 times of usage. Velcro strips, once removed from its mounted surface, should not be reused.

1 When selecting a location for the tracker mount, the following principles should be observed:

- 1) The tracker should be kept as far away from propellers and other moving parts as possible. If the tracker must be mounted in the vicinity of propellers or other moving parts, it should be mounted equidistant from all such parts.
- 2) The tracker should be placed on top of the drone where possible, to ensure its GPS and LTE antennas have a clear view of satellites and transmission towers respectively.
- 3) The tracker mount should be attached to a flat surface as far as possible. If there are no flat surfaces available, you must ensure that the majority of the velcro strip is in good contact with the UAV.
- 4) The tracker should be placed as close to the centre of gravity of the drone as possible. This is especially important for smaller drones.

One method of determining the centre of gravity of a drone is to find the intersection point of lines drawn between the centres of opposing propellers. This works well for drones which are fully symmetrical.

If your drone is not symmetrical in both the x and y axes, you may need to determine its centre of gravity by balancing it on opposing arms and observing how the drone comes to rest.

- 5) You should avoid mounting the tracker on removable parts such as batteries.
 - 6) You should avoid mounting the tracker directly over critical radio-frequency transmitting and / or receiving components
-

such as transmitter antennas or GPS antennas.

-
- 2 Before sticking the velcro strip, ensure that the target surface is clean and free of any dust, debris or loose parts. Clean the surface with an alcohol pad if necessary to remove any oil or grease.

Identify the exact position where the mount base will be positioned, taking care to ensure that the mount orientation is correct.



-
- 3 Verify that the tracker does not obstruct or impede in any way the moving parts of the UAV while in operation, including propellers and any other rotating propulsion components.

Verify that you can easily remove the battery, propellers and any other user-swappable parts of the UAV without having to remove the tracker mount.

-
- 4 A velcro strip has been pre-applied to the base of the tracker mount.

Place the mount onto the UAV at its chosen location. Apply firm pressure onto the mount to ensure both velcro strips on the tracker mount and drone surface are fully secured.



-
- 5 To verify that the mount is secure, give the UAV a gentle shake and turn it upside down.

The mount should remain securely fastened to the UAV.

-
- 6 Suggested mounting points for a number of popular UAV models can be found in the Appendix of this document.
-

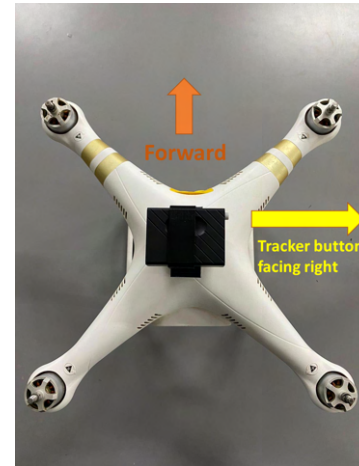
Step 4: Mounting the Tracker



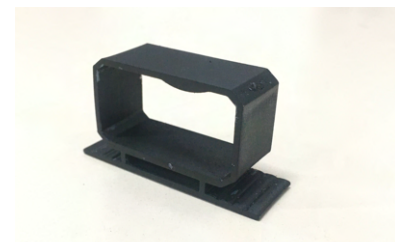
WARNING: Ensure the Mount and Tracker are secure prior to each flight. Improper insertion of the Tracker into the Mount or failure of the mount attachment during flight may result in detachment of the Tracker.

- 1 Take note of the tracker's intended orientation.

When the drone is viewed from the back, a correctly mounted tracker should have its power button and indicator lights facing to the right.



The top face of the tracker has a round cutout that mates with the mount to ensure a secure hold when correctly attached.



- 2 With one hand holding the tracker with the forward face facing forward, insert the left edge of the tracker into the mount opening, taking care to keep the tracker as square to the opening as possible.

- 3 Hold on to the mount body with your other hand to support it while inserting the tracker, ensuring that it is not dislodged from its attachment point on the UAV.

- 4 Apply pressure to the right face of the tracker. The mount is designed to flex slightly under pressure, allowing the tracker to slide in.



- 5 Notice that the convex registration hump on the inside of the mount loop will mate with the concave
-

registration feature of the tracker body to provide a secure hold.

The mount should be positioned in the middle of the long axis of the tracker..

-
- 6** To verify that the mount remains secure, give the UAV a gentle shake and turn it upside down.

The tracker and mount should remain securely fastened to the UAV.

Do not hold the tracker as a way to carry your UAV as this might dislodge the velcro strips.

Your tracker is now securely inserted in the mount and ready for flight.



Trackers mounted on UAVs
See Appendix for more suggestions on how to mount the tracker

Operating the Tracker

Charging the Tracker

-
- 1 Turn off your tracker.

Your tracker will not charge its battery while it is turned on.



-
- 2 Connect a USB cable to the tracker and a USB power source (5V).

Battery charging will begin, and the charging indicator will light up solid red.

The integrated charger uses an intelligent two-stage charging process, with a fast initial charge followed by a trickle charge to top off the battery.



-
- 3 When the battery is fully charged, the charging indicator will light up solid blue. The charging circuit will stop charging the battery.

A full charge of an empty tracker battery should take around 60 minutes.

In the Field

The operational workflow you follow will depend on where you purchased your tracker.

For **Retail Trackers**, please continue to section:

For **CFMS Trackers**, please continue to section:

Flight Operations

Flight Operations (CAAS)

Flight Operations

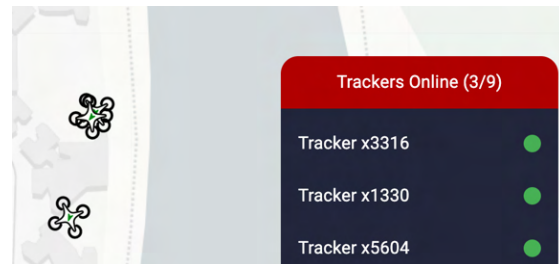
- 1 Ensure the tracker is securely mounted on the UAV.

- 2 Turn on the tracker and wait for the power indicator to come on.



- 3 Verify that the tracker is broadcasting its location on the MyDroneFleets app.

If it is not broadcasting, check the status indicator light to determine if there is a problem with the tracker.



- 4 Turn on the UAV and proceed with your mission.

Ensure that you limit your flight to the Area of Operations described in your Activity Permit.

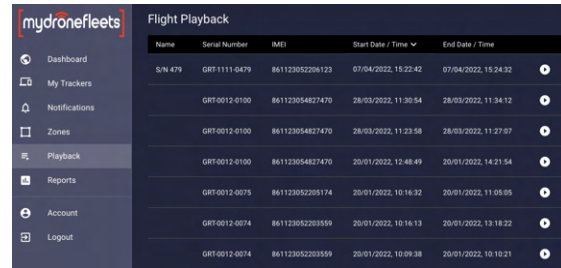
- 5 Turn off the UAV after the mission is complete.

- 6 Either keep the tracker attached to the mount, or unmount it for storage.
-

7 For Retail Trackers

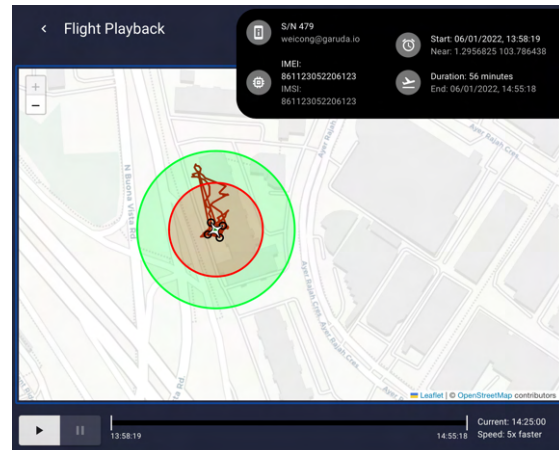
To playback your previous flight, click on Playback, and click on the Play button of the previous flight.

You can then play and pause the flight.



The screenshot shows the 'mydronefleets' Flight Playback interface. On the left is a sidebar menu with options: Dashboard, My Trackers, Notifications, Zones, Playback (selected), Reports, Account, and Logout. The main area displays a table of flight records.

Name	Serial Number	IMEI	Start Date / Time	End Date / Time	
S/N 479	GRT-1111-0479	861123052206123	07/04/2022, 15:22:42	07/04/2022, 15:24:32	▶
	GRT-0012-0100	861123054827470	28/03/2022, 11:30:54	28/03/2022, 11:34:12	▶
	GRT-0012-0100	861123054827470	28/03/2022, 11:23:58	28/03/2022, 11:27:07	▶
	GRT-0012-0100	861123054827470	20/01/2022, 12:48:49	20/01/2022, 14:21:54	▶
	GRT-0012-0075	861123052206174	20/01/2022, 10:16:32	20/01/2022, 11:05:05	▶
	GRT-0012-0074	861123052203959	20/01/2022, 10:16:13	20/01/2022, 13:18:22	▶
	GRT-0012-0074	861123052203959	20/01/2022, 10:09:38	20/01/2022, 10:10:21	▶



Flight Operations (CAAS)

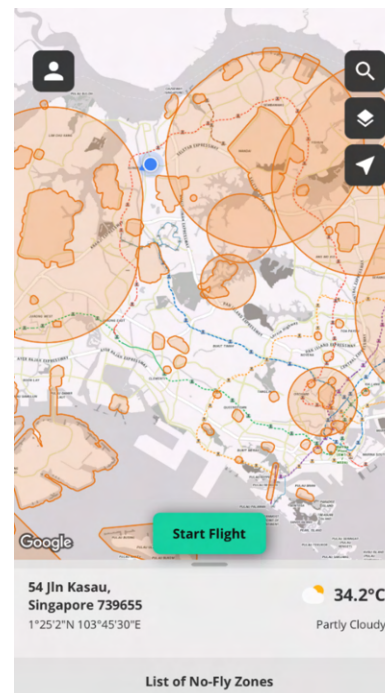
- 1 Ensure the tracker is securely mounted on the UAV.
- 2 At the takeoff point, turn on the tracker and wait for the power indicator to come on.

Your tracker should be powered on and located near your mobile device before you proceed to the next step.

- 3 Launch the **FlyItSafe** mobile application.

From the home screen of the application, click on the **Start Flight** button.

You will be directed to the **Start Flight Checklist** screen.



- 4 Select the Activity Permit you will be using for this flight. Select the tracker mounted on the UAV.

10:28 80%

Start Flight Checklist

Activity Permit

AP1/20200406/4321/UOP/0001

Changi Airport

Various time slots from 01 Apr 2020 to 30 Jul 2020

AMSL 2400FT

Alex, +6597874321

Jasmine, +6588388130

Location Tracking Method

Tracker (IMEI: 861109323000004)

- mins left

Tracker is not detected

The Operator shall seek positive clearance from RSAF Paya Lebar Air Base Tower Duty Controller (Tel.: 6381 3513 / 6381 3514), at least 15 minutes prior to the commencement of operations and again at completion of flights.

Start Flight

- 5 Select the tracker mounted on the UAV (identified by the IMEI number)

Start Flight Checklist

Activity Permit

Select active permit

Location Tracking Method

Select Location Tracking Method

Mobile (Drones below 250g)

Tracker (IMEI: 861109323000005)

Tracker (IMEI: 861109323000002)

- 6 If your tracker is turned on and communicating with the server, its status will be reported as "Not in flight". **Your tracker is working normally.**

Location Tracking Method

Tracker (IMEI: 861109323000005)

43 min(s) left

Not in flight

If your tracker is turned off, its status will be reported as "Tracker is not detected". **You should turn the tracker off, then on again, and repeat Step 5.**

Location Tracking Method

Tracker (IMEI: 861109323000005)

- mins left

Tracker is not detected

- 7 Click on Start Flight.

Turn on the UAV and proceed with your flight.

Ensure that you limit your flight to the Area of Operations described in your Activity Permit.

Start Flight

- 8 Turn off the UAV and tracker after the mission is complete.

Either keep the tracker attached to the mount, or unmount it for storage.

Monitoring Battery Status

During normal operations, the battery indicator light will blink green at different rates to indicate the state of charge of the battery.

Sequence	Battery Status	Action
Solid green	Tracker is starting up	
1 blink every 3 seconds	50% to 100% charge remaining	Sufficient for flights
1 blink every second	10% to 50% charge remaining	Sufficient for 1 flight
2 blinks every second	Less than 10% charge remaining	Do not fly, charge tracker



CAUTION: When the tracker battery is almost empty, data transmission ceases and the tracker prepares to shut down. In jurisdictions where location transmission from the tracker is mandatory during a UAV flight, this may result in you becoming non-compliant with local regulations. It is the responsibility of the UAV operator to ensure that the tracker battery has sufficient charge at all times to complete the required UAV missions while complying with local UAV regulations.

Care and Maintenance

Your tracker is a sophisticated electronic device that contains technologies found in modern mobile phones. Although it is designed to operate in a variety of environmental conditions, you should take proper care of your tracker to enable it to perform optimally.



WARNING: The tracker contains a Lithium Polymer rechargeable battery. You must follow the recommended procedures for safely charging and operating your tracker.

General Care

- 1 Do not disassemble or open the tracker. Unauthorised disassembly of the tracker will void its warranty.
 - 2 Do not insert foreign objects into the tracker.
 - 3 To prevent electric shock, explosion, or other injury, do not operate the tracker if it has been damaged in any way, whether by immersion in liquid, crushed by mechanical forces, etc.
 - 4 Do not subject the tracker to extreme forces such as crushing, bending, puncturing, or shredding.
 - 5 Avoid placing heavy objects on the tracker.
 - 6 Avoid dropping the tracker.
 - 7 Store the tracker in a cool dry place when not in use.
-

Operating Environment

- 1 Do not submerge the tracker in liquids of any form. The tracker is designed to resist splashes but is not waterproof.
 - 2 Avoid using the tracker in extremely dusty conditions. The tracker is designed with limited dust resistance, but using it in environments with plenty of fine particles may cause its performance to degrade over time.
 - 3 Do not expose the tracker to environments that contain fine metallic particles or any other substances that may lead to electric short circuits.
 - 4 Do not expose the tracker to corrosive environments.
 - 5 Keep the tracker away from heat sources, combustible gases, and liquids.
-

Charging and Power

- 1** Do not leave the tracker unattended while charging. Do not charge the tracker overnight.
 - 2** Stop charging the tracker once it is fully charged.
 - 3** Always charge the tracker in a ventilated area. Do not place the tracker under pillows, blankets, fabrics, or other flammable materials while charging.
 - 4** If you will not be using the tracker for an extended period, the battery should be discharged to approximately 50% charge before storage.
-

Frequently Asked Questions

Question	Answer
How will the tracker affect the flight time of my UAV?	<p>The UAV Tracker is designed to be light weight at 60g. You should expect a slight reduction in flight endurance when your UAV is operating with the Tracker mounted.</p> <p>Popular UAV models are estimated to show an average flight time reduction of 10% for UAVs weighing less than 500g and 5% for UAVs weighing between 500g and 1kg, depending on operating conditions.</p> <p>The flight time reduction for UAVs weighing more than 1kg is likely negligible.</p>
How accurate is the altitude of the tracker?	<p>The UAV Tracker currently measures the AMSL of itself with reference to the WGS84 geoid using satellite positioning data.</p> <p>To adjust to your local geoid, such as the SGEOID09 geometric geoid in Singapore, WMGEOID04 for west Malaysia, or EMGEOID05 for east Malaysia, see your geoid reference page for the formula to convert between WGS84 and your local geoid.</p>
CFMS Trackers	
What happens when I fly outside the Area of Operations applied for and stated in my Activity Permit?	An incident report will be triggered within CFMS to CAAS and other stakeholders.

Troubleshooting

This section describes the common problems you may encounter while using the tracker.

Diagnosing Common Problems

The Status indicator allows you to quickly determine the operating condition of the Tracker.

Indicator Sequence	Status	Actions
Normal Operation		
1 short blink every 3 seconds • •	Normal operations	None, good for flights
Long blinks only - - - - -	Tracker auto restarting due to an internal system error	Wait up to 1 minute for the restart to complete
Expected Status or Errors		
2 short blinks / irregular blinks • • • • •	Normal operations, GPS no lock	Go outdoors
3 short blinks • • • • •	Searching for network	Go outdoors or anywhere with 4G LTE coverage
1 short blink followed by 2 long blinks • - - • - -	4G LTE failure a) Missing / invalid SIM card b) Telco subscription expired c) Roaming	Check for tampering (e.g. removal of SIM card) Be in your Telco's 4G LTE coverage CFMS Trackers: Be in Singapore & have a valid operator permit
3 short blinks followed by 1 long blink • • • - • • • -	Data transmission failure a) Low power b) Drop in 4G LTE signal strength c) Server not available At extremely low power, you might also see the power indicator light turn solid green.	Stop using the Tracker, recharge it, and try again. If left alone, Tracker will auto restart to try to resolve the issue after 1 min

Unexpected Errors		
1 short blink followed by 1 long blink • — • —	Abnormal readings from IMU	If the issue persists, please contact technical support
1 short blink followed by 3 long blinks • — — — • — — —	Abnormal readings from GNSS	If the issue persists, please contact technical support
2 short blinks followed by 1 long blink • • — • • —	Authentication failure (CFMS Trackers only) a) Security tokens no longer valid (e.g. when operator permit expires) b) Tracker is officially decommissioned	Renew your operator permit with CAAS



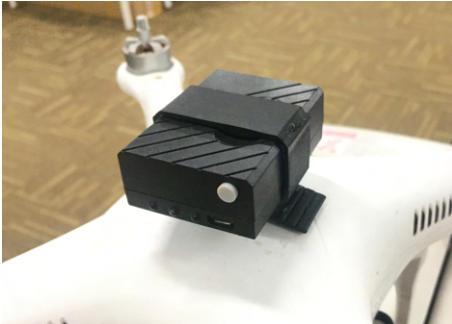
Appendix

Suggested Mounting for Common UAVs

This section lists suggested tracker mounting configurations for common UAV models.



CAUTION: The mounting configurations shown here are intended as general recommendations based on our internal testing. The UAV operator is ultimately responsible for ensuring the secure mounting of the tracker. The security of the final mount may be affected by the cleanliness of the UAV surface and other factors.

UAV model(s)	Method	Example setup
DJI Mavic Mini		Not recommended. The DJI Mavic Mini is unable to carry the tracker.
DJI Mavic Air Series	Adhesive	
DJI Mavic Pro Series	Adhesive	
DJI Phantom Series DJI Phantom 2 Series DJI Phantom 3 Series DJI Phantom 4 Series (non RTK)	Adhesive	

DJI Phantom 4 RTK

Adhesive

Mount on top of RTK antenna



DJI Spark

Adhesive



Garuda Robotics M4X

Adhesive and
velcro



Garuda Robotics M400

Adhesive



Garuda Robotics Cerana X4-21

Adhesive



Garuda Robotics Cerana X8-28

Adhesive



Acceptable Use Policy for CFMS UA Trackers

A user of the CFMS Tracker shall not, either directly or indirectly:

- A. modify, reverse-engineer, adapt, or redistribute the CFMS Tracker;
- B. manufacture, assemble, disassemble, sell, or supply a CFMS Tracker;
- C. use a Tracker belonging to another Operator Permit (OP) holder or allow others to use your Tracker;
- D. use the CFMS Tracker for any purpose other than for the purpose of operating your unmanned aircraft (UA) in accordance with your OP, or for the benefit of any third party (save where authorised by CAAS, or in accordance with your OP), including renting, selling, leasing or directly or indirectly charging others for the use of the CFMS Tracker;
- E. remove, circumvent, impair, bypass, disable or otherwise interfere with any feature of the CFMS Tracker;
- F. misrepresent or make false or misleading claims regarding the CFMS Tracker;
- G. use the CFMS Tracker for any illegal activity, unlawful purpose, or purposes prohibited by these Terms or in breach of these Terms;
- H. use any device, software, exploits, or routine, including any virus (e.g. Trojan horse, worm, time bomb, or any other methods not specifically mentioned herein) intended to damage or interfere with the proper operation of the CFMS Tracker or to intercept or expropriate any data from the CFMS Tracker;
- I. use the CFMS Tracker in any manner that could damage, disrupt, disable, overburden, or impair the operation of the CFMS Tracker or interfere with any person's use of CFMS Trackers;
- J. use the CFMS Tracker to access data not intended for you.

You are to ensure that the CFMS Tracker and the associated mounting is adequately secured to the UA before the conduct of each flight.

Loss of a tracker must be reported by emailing CAAS_CFMS_Helpdesk@caas.gov.sg and support@garuda.io immediately.