FLYING EYE

FLYSAFE KIT

DJI Matrice 350 RTK

Circuit-breaker + Parachute + Geofencing option
(EASA C5 certification)

5

User Manual

Made in France

Summary

About Us

Flying Eye has been your specialist partner in drone technology since 2009. We've been developing parachute arrestor systems since the introduction of drone regulations in 2012. With our pyrotechnic system, derived from aviation technology, you have the most effective and lightest system on the market.

We would be delighted to provide you with any technical or commercial information you may require.

www.flyingeye.fr

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info@flyingeye.fr

Read this manual carefully before operating the Flysafe system.

Warnings and precautions

Flying Eye reserves the right to suspend the warranty of any person who fails to comply with the basic safety instructions set out below.
Flying Eye accepts no liability for any damage or injury caused directly or indirectly by the use of pyrotechnic cartridges or by the use of pyrotechnic cartridges that do not comply with safety requirements and standards.

- It is forbidden to carry out any manipulations other than those described in this manual.
- The device may only be used by (or under the supervision of) a responsible adult. Always keep the device out of the reach of children.
- Do not place the device in a damp or wet environment, and keep it away from UV light.
- Do not expose the system to high or low temperatures, strong vibrations, shock, chemicals, acids, or long-term storage in a humid or dusty environment. Improper use may cause the pyrotechnic cartridges to explode, putting you at risk. The maximum operating temperature is 50°C and the minimum operating temperature is -20°C.

Warnings and precautions

Check that the parachute system is in good condition before each use. Do not use the device if it is damaged or if the test procedure is inconclusive. If necessary, contact your dealer.

The parachute does not affect the operation of the drone.

Any flight with a drone implies the existence of a risk for equipment and people in the vicinity, with or without a parachute.
The use of a parachute should in no way increase your risk.

The parachute must be activated manually by the user. Regular training is essential if you are to react correctly in an emergency. To ensure the safety of your equipment and of third parties, you should regularly perform dummy ground drills using the Test LEDs.

The ejection system works only once.
Once used, the pod containing the parachute and the load must be replaced before any further use.

Technical specifications

Description

- Kit for EASA Class C5 certification by the DGAC (French Civil Aviation Authority)
- Manual release parachute
- Compatible with DJI Matrice 350 RTK
- Declaration of conformity: MoC2511 & MoC2512
- Declaration of conformity MoC2511
- Declaration of conformity C5
- Geofencing option

Even if drones are used and maintained correctly, they can sometimes find themselves in severe weather conditions, or encounter problems such as loss of GPS signal, technical failure of the motors, or radio control failure.

In this kind of critical, emergency situation, immediate activation of a safety device is crucial.

Technical specifications

Specifications

Weight	760 g
Range	4900 m
Trigger	• Manual triggering by simultaneous double-pressing • Automatic triggering on leaving the flight zone (Geofencing optional)
Autonomy	Over 30 hours of radio control (1800mAh li-po battery rechargeable via USB-C
Remote control	Automatic power-down after 30 minutes without connection Secure switch-on and switch-off (short press then long press)
Communication	Bidirectional link FTS transmission frequency: 868MHz 256-bit encrypted and authenticated frames
Security	Redundant power supply for Flysafe kit
Maximum impact energy	No wind: 93 Joules Maximum wind speed (43km/h): 750 Joules

Equipment

Included

Flysafe modules

Parachute pods

Flysafe remote control

Undercarriage support

Safety pin

Battery latch

Pyrotechnic charges

Test leds

Protective caps

Flysafe radio control screws

Conformity Certificate

Design certification

Not included

Drone

Remote Control

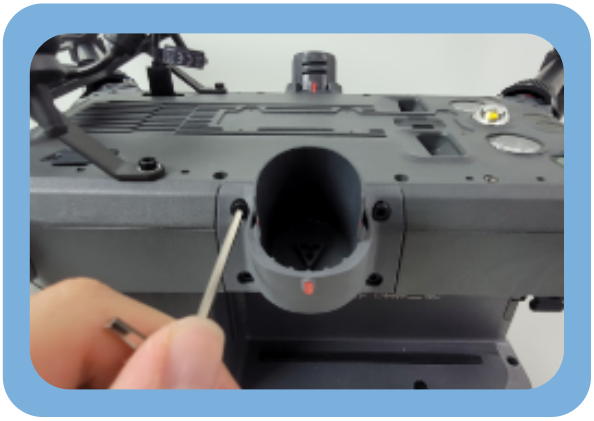
Screwdriver

Using the radio control with this system is easier with a harness.

Installation

Turn the drone over and place it on a soft surface to avoid damaging it

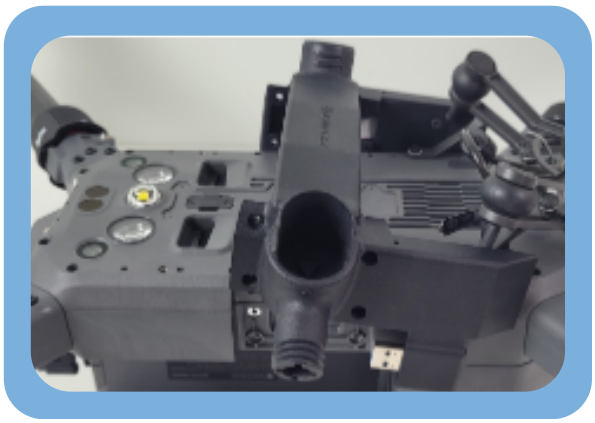
Unfold arms

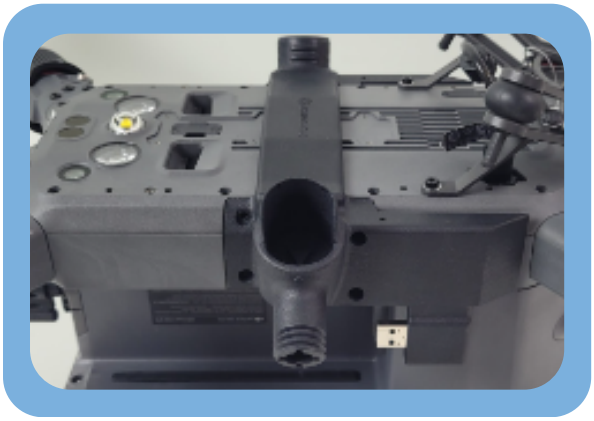


Unscrew the 4 landing gear support screws using a wrench

Remove the undercarriage support and do the same on the other side

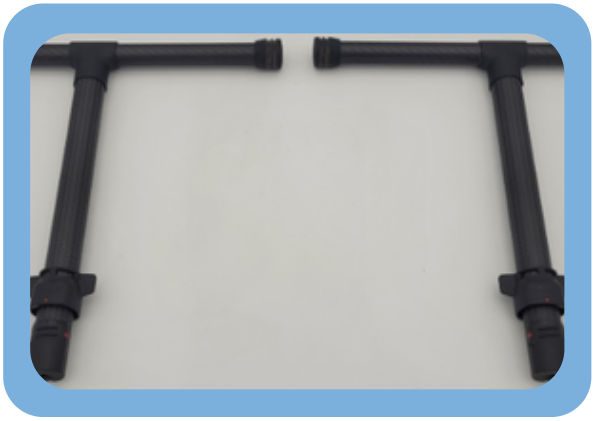
Installation





Take the train support and insert it as shown in the photo

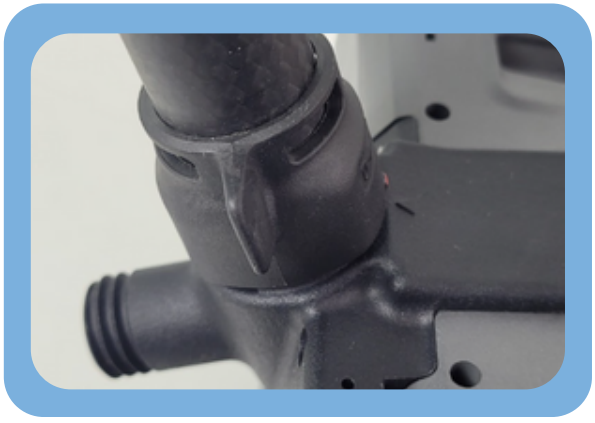
Screw on both sides



Take both landing gear

Installation

Retracting the train into its support

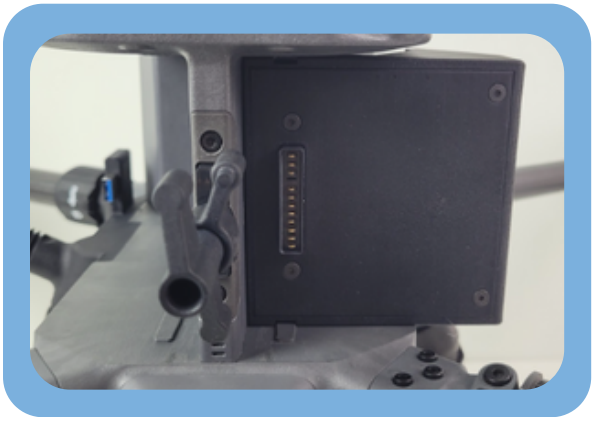


Tighten the undercarriage on both sides

Turning over the drone

Installation

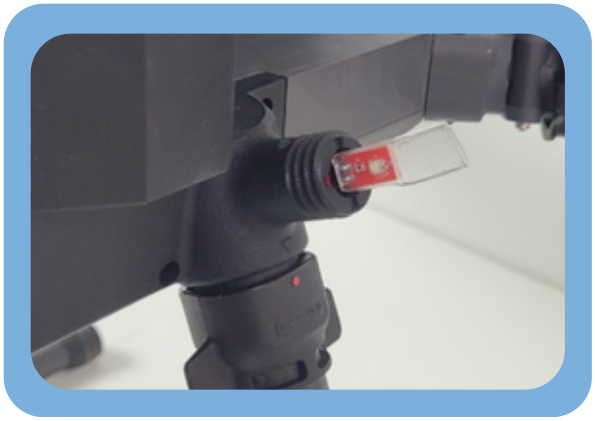
Take the right-hand module



Push the module into the battery slot in the right direction (there's a rail for sliding the module in)

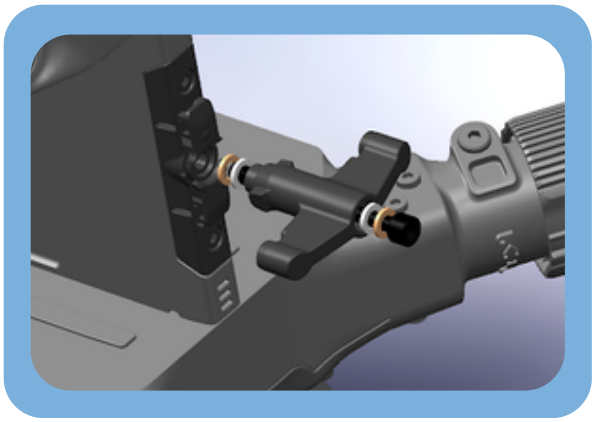
Insert as much as possible and do the same on the left

Installation



Place the 2 test LEDs in the load slots (for functional testing)

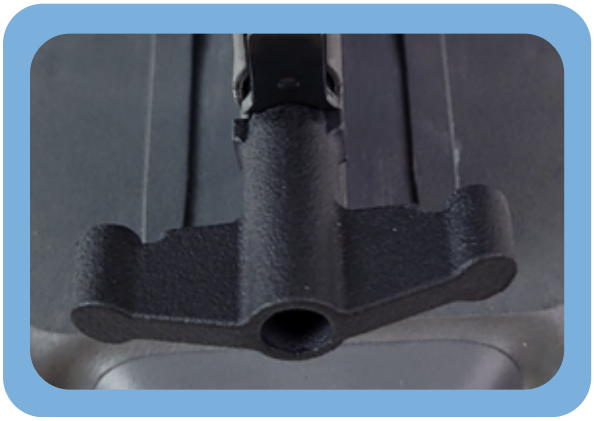
Before inserting the batteries, unscrew the battery latch with a wrench



Put the washers the right way round

Installation

Replace the part with the springs in its slot by holding it.



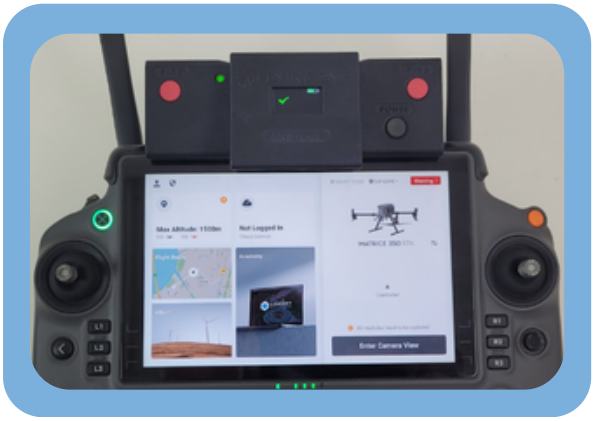
Screw on latch

Add batteries and close latch

Switching on the drone

Installation

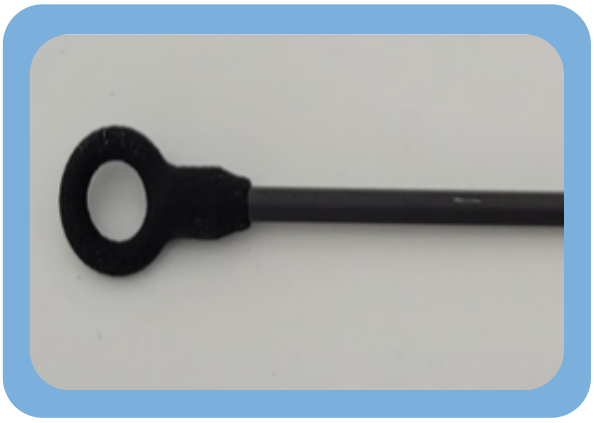
Switching on the remote control



Switching on the Flysafe remote control

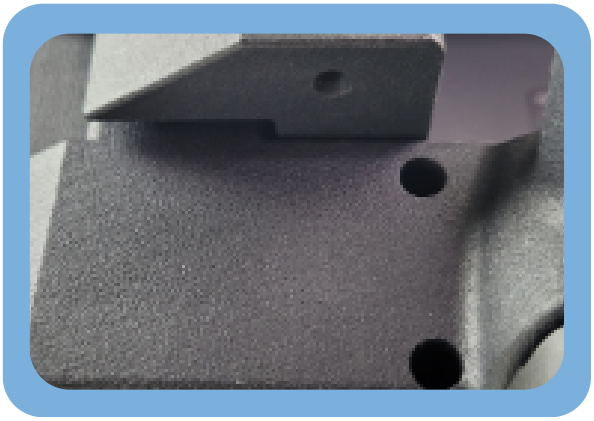
- A green tick appears on the remote control, indicating that the Flysafe system has been activated.
- Activate the system by pressing the 2 red “FIRE” buttons
- The motors cut out, the LEDs light up and the buzzer sounds. Then remove the drone's battery to stop the system.

Installation



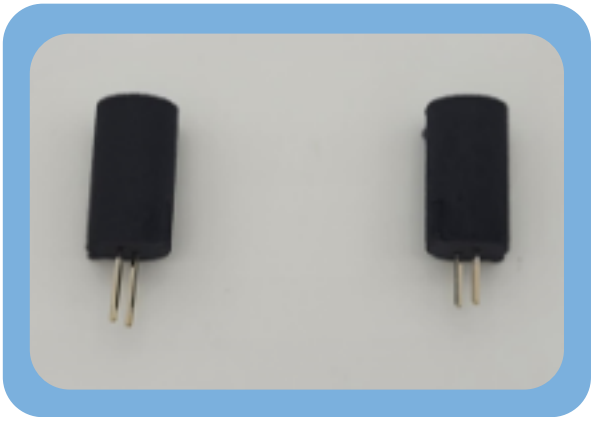
Take the pin

Locate the disarming hole on the left module



Insert pin into hole

Installation



Take the loads and remove the test LEDs previously installed

Insert loads instead

Then screw the 2 parachute pods to each side of the M350

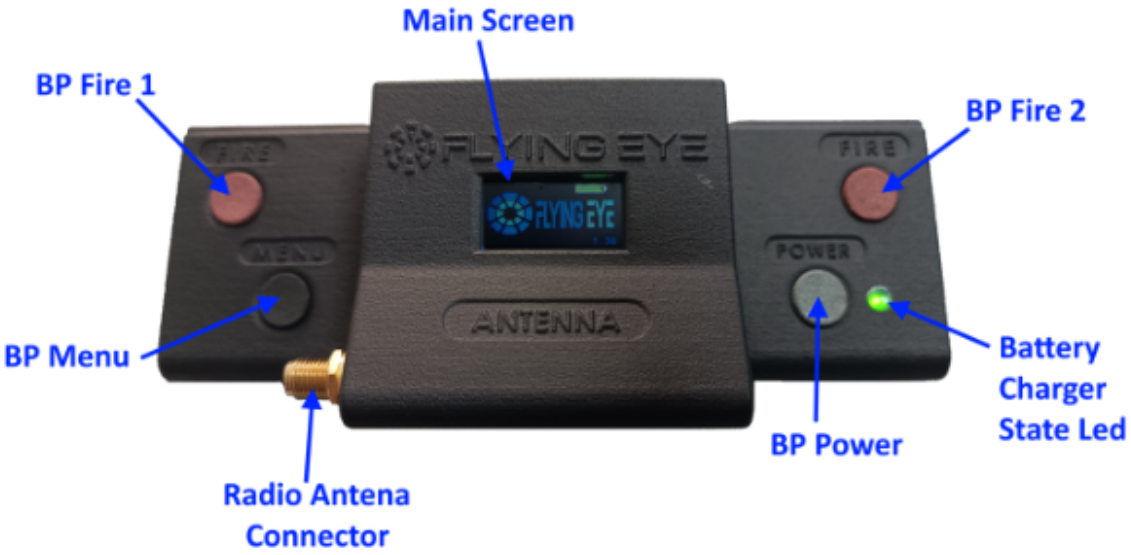
Installation

The system is now correctly installed

As soon as the drone is switched on, the remote control switched on and the Flysafe remote control switched on:

-> Remove the pin
-> The green tick will appear on the Flysafe remote control
-> Flysafe system is activated

Flysafe remote control



START-UP

To switch on the Flysafe radio control, press and hold the power button (black).
The charge level is indicated on the display.

TRIGGER

The parachute is released by pressing the 2 “FIRE” (red) buttons simultaneously.

USB TRANSFER MODE

To switch on the Flysafe radio control in USB transfer mode, connect it to a computer and switch it on while holding down the menu button. To exit USB mode, restart the remote control.

Flysafe remote control

The main display provides telemetric feedback to the receiver and continuous status information. It is divided into four distinct parts:

the strength of the radio link with the receiver

Radio control battery level

The status of the on-board FTS cut-off system (detailed in the next section).

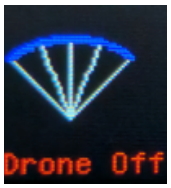
- The status of the Geofencing system on board the receiver (detailed in the next section).

Flysafe remote control

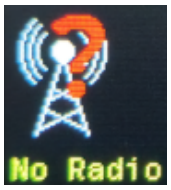
FTS status

The status of the FTS, i.e. the cut-off system, is displayed on the left-hand side of the main screen, and the following icons may be displayed, corresponding to a particular status :

The cut-off system is fully operational. The user can initiate manual shutdown.

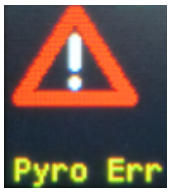


The system has been switched off, either manually by the user or by the geofencing system.



The radio link to the receiver is broken. The drone is powered down or out of range.

Pyrotechnic charges are not connected. Please check parachute assembly.

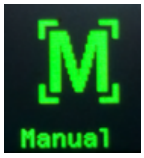


If the pyrotechnic charges are damaged, contact your dealer.

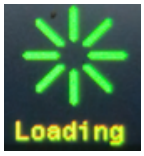
Flysafe remote control

GeoFence status

The geofencing status is displayed on the right-hand side of the main screen, with the following icons corresponding to a particular status :

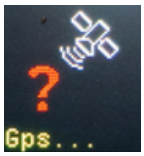


Manual mode only (geofencing not available)



Loading or checking the fence in progress can take some time for large fences.

Initializing the geofence system



Searching for an adequate GPS signal

Geofence activated and drone inside the fence

Geofence activated and drone inside warning zone

Drone outside fence, flight aborted in 0.2s

N.B.: The geofence functionality is only available as an option. In its absence, the manual mode icon will always be displayed.

Using geofence

(Optional)

Start-up procedure

Geofencing requires the following operation. The radio control must be switched on first, so that the active fence is available. The drone is then switched on to load a new fence, or to confirm that the fence on board the receiver matches that on the radio control. Once the fence has been validated, the GPS signal confirmed and the icon indicating that the drone is inside the fence, the user can take off and complete the mission.

Fence update

- Create your own fence using the editing tool.
- Save the fence as “fences.json”.
- Connect the remote control to the USB port and start it up in USB transfer mode.
- Copy the fence file fences.json to the root (be careful to respect the file name).
- Restart the remote control (in normal mode).
- Restart the machine and wait for the fence to load.
- Once loaded, the geofence status confirms its activation.
- The user can proceed with the flight.

N.B.: If the fence is invalid (incorrect structure or format, see next section), the system will automatically switch to manual mode, and the fence must be corrected using the tool.

Geofence editing

(Optional)

User access

Access GeoFence Editor :

https://geofence-editor.flyingeye.fr/

Log in using the login details you received

Choose a new password and change it by clicking on “setting” :

Get to know the interface and discover its various functions

Editing a geofence

(Optional)

Creating your flight zone

Editing procedure is as follows:
Search for the location of your operation using the search engine.
Draw the main fence and confirm.
Draw and validate the warning fence.
Add No Fly Zone (NFZ) and validate (optional step).
Add and validate NFZ warnings (optional step).

	The search engine enables the user to easily find a precise location by entering the name of a town or address. A dialog box appears, in which the user can type the name into a text field and validate with the "Search" button.
	Edit main fence. Allows you to draw the fence polygon (orange with red border). Click to enter edit mode, click on the map to draw, then validate the contour by selecting the first point or by clicking this button again.
	Edit warning fence. Draws the warning polygon associated with the Fence (green with orange border).
	Edit No Fly Zone (NFZ). Allows you to draw NFZ polygons (red with red border).
	Warning NFZ editing. Allows you to draw Warning polygons associated with NFZs (orange with orange border).
	Switch to polygon editing mode. Allows the user to correct polygons already drawn, add and/or delete points.

Editing a geofence

(Optional)

	Polygon deletion. Allows the user to delete a targeted polygon.
	Save. Saves the current Fence in the json format expected by the Standalone remote control (standard geojson with extended properties).
	Fence loading. Allows the user to reload a previously edited fence.
	Cleaning. Allows the user to delete all fences currently being edited (reset editing to zero).

The criteria for invalidating a fence relate to the integrity of each element. There can only be one fence associated with a single warning fence. By definition, each fence perimeter drawn must correspond to a single, closed, uncrossed polygon. Similarly, there can only be a maximum of five NFZs associated with five warning NFZs. It is necessary to define a warning fence internal to the main fence, and similarly, it is necessary to define a Warning NFZ external to its associated NFZ.

It is the user's responsibility to define a valid fence and ensure that it is loaded. Likewise, he must ensure that he takes off within the active fence, otherwise the geofence will not be activated at start-up, but only when the drone enters it.

Example complete fence valid with NFZ.

Pre-Flight Test

Before the first flight of the day at a given operating site, check all system components and verify their integrity. If any anomaly is found, do not proceed with the flight and contact your dealer.

Ground test:

1	Make sure the entire drone system is switched off. Battery disengaged, automatic module off
2	Remove parachute pods and pyrotechnic charges
3	Insert test LEDs in place of pyrotechnic charges
4	Installing batteries
5	Switching on the drone's remote control
6	Switching on the Flysafe remote control
7	Switching on the drone
8	Start up the drone's motors
9	Activate the Flysafe system by pressing the 2 red “FIRE” buttons: all four motors stop and the test LEDs light up.
10	Switching off the drone
11	Switch off both remote controls
12	Remove test LEDs
13	Hand over pyrotechnic charges and parachute pods

Flight preparation

Simplified memo for preparing flights in specific categories:

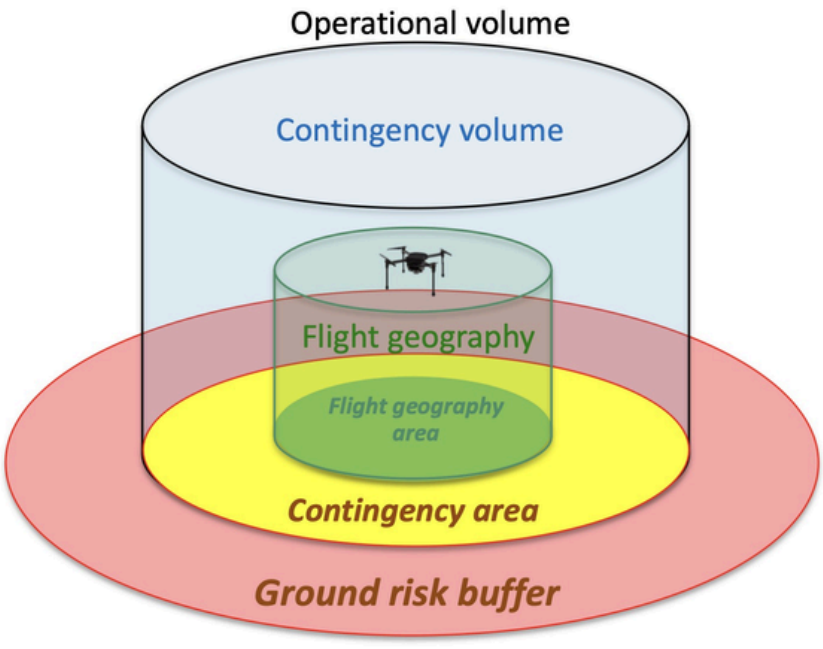
Volumes, Limits and Zones to be defined for your operations with automatic FTS:

Flight Geography: Volume of flight programmed in the case of automatic flight or planned for your trajectory in manual mode.

Contingency volume: Flight volume in which you can trigger contingency procedures to return to the programmed or planned flight zone.

Contingency volume limit: If this limit is exceeded, emergency procedures must be triggered. This is particularly the case for the automatic FTS Flying Eye Flysafe.

Ground Risk Buffer: A projected area on the ground where no third party should be present in the event of an aircraft crash, also known as a Third Party Exclusion Zone (TPEZ).



Operating conditions

Minimum height (for optimum parachute efficiency): 15 m
Maximum transmission distance: 4900 m (over flat, clear terrain with no interference)
Maximum wind speed: 43km/h
Parachute opening time: 1.5s
Drop speed under parachute: 4.5 m/s
Operating temperature : - 20 to 50°C
Windless impact energy: 93 Joules

Frequency used: 868MHz
LORA 869 MHz is shared with other users and devices using the same frequency band, such as remote controls for home automation, energy networks (Linky), IoT home networks, industrial communication systems, etc. These devices can interfere with the FTS system, causing interference in transmissions between the radio control and the receiver, resulting in transmission delays, data loss, or even complete interruption of communication.
It is therefore essential to check the signal strength before the flight, and to monitor it throughout the flight.
It is also important not to fly near high-power radio frequency transmitters or electrical installations.

Ground Risk Buffer dimensions

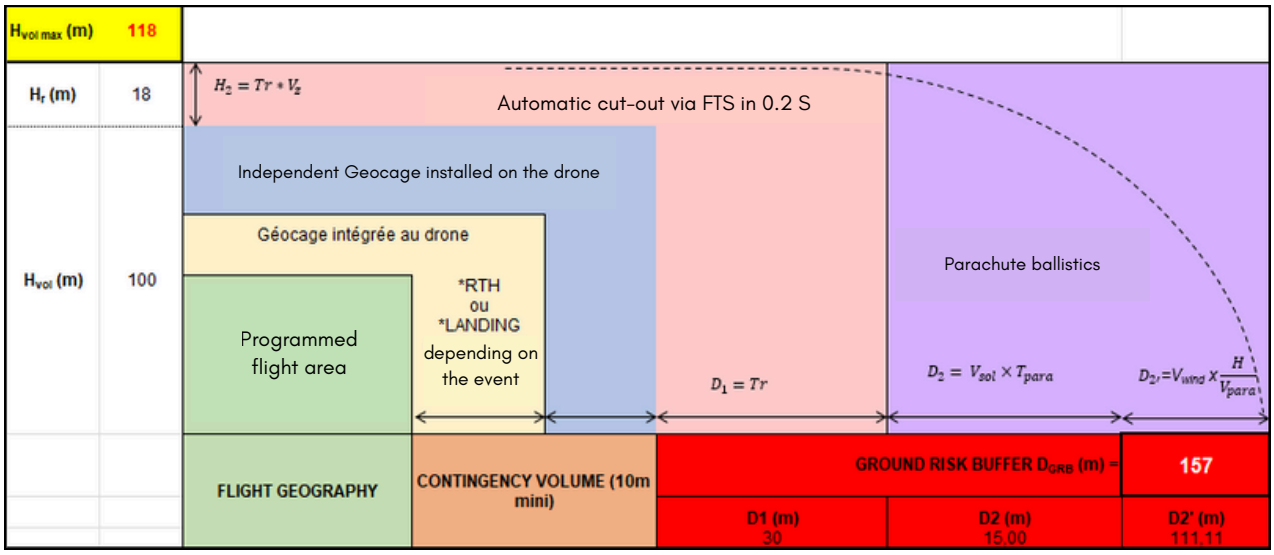
Sub-scenario STS-01 :

	Minimum distance to be covered by the buffer zone for the prevention of risks on the ground for non-captive aircraft without crew on board	
Maximum height above ground	**With a MTOM of 10 kg or less**	**With a MTOM greater than 10 kg**
30 m	10 m	20 m
60 m	15 m	30 m
90 m	20 m	45 m
120 m	25 m	60 m

Ground Risk Buffer dimensions

Under license :

Evaluation of the crash zone when using the Flysafe kit in manual mode, assuming an operator reaction time of 3s and a ground speed of 10m/s.



Height of operational volume (m)	Corresponding ground risk buffer (m)
10	57
20	68
30	79
40	90
50	101
60	112
70	123
80	134
90	145
100	157
110	168
120	179
130	190
140	201
150	212

Example with the following data:

Max. vertical speed Vz = 6 m/s
Reaction time Tr = 3 s
Max drone speed Vsol = 10 m/s
Deployment time Tpara = 1.5 s
Drop speed Vpara = 4.5 m/s

This method is an example. The operator can refine the GRB calculation by referring to Appendix 1 of the SORA implementation guide.

Emergency procedures

Important note:
The procedures below do not exhaustively describe the actions to be taken by the remote pilot in response to all possible types of anomaly.
They assume that the telepilot has first attempted to return to a normal flight situation and are limited to describing the ultimate safeguard measures when :

-The aircraft cannot be maintained within the flight limits provided;
-In the event of flight out of sight, the telepilot no longer has sufficient information to pilot the aircraft or ensure that it remains within the flight limits provided.

Scenario S2 or STS-02 :

Flying out of sight: if the remote pilot no longer has the aircraft's altitude or location information, or if there is any doubt about the validity of this information, he must abort the mission by activating a failsafe device, either manually or, if necessary, by shutting down the engines.
If the aircraft cannot be kept within the flight limits, the remote pilot must abort the flight by shutting down the engines using the Flysafe radio control system.
In the event of a loss of connection to the Flysafe radio control system, as indicated by the corresponding LED lighting up, the mission must be aborted immediately and an RTH procedure initiated.

Scenario S3 or STS-01 :

In the event of a malfunction that causes the aircraft to crash, or prevents it from remaining within its flight limits, the remote pilot must immediately activate the FTS.
In the event of a loss of connection to the Flysafe radio control system, as indicated by the corresponding warning light. The mission must be aborted immediately and an RTH procedure initiated.

Maintenance

Maintenance after each activation
Change pyrotechnic charges. Change parachute pods. Return used pods to Flying Eye.

Drone tracking
Each day of flight, the operator completes the flight monitoring file provided (see appendix 1) or any other monitoring tool. In the event of malfunction, he fills in the “incident sheet” (see appendix 2) and sends it back to Flying Eye.

Maintenance
- Maintenance every 18 months
- Maximum system life: 1,100 deployments
- Only return parachutes for maintenance.

Cleaning
Clean the accessory kit with a damp cloth. Do not use chemicals. Do not use high-pressure cleaners.

Support and warranty

Technical support

If you encounter any difficulties during installation or have any further questions about using the Flysafe kit, please contact Flying Eye technical support.

Warranty

The Flysafe kit for DJI Matrice 350 RTK comes with a 12-month warranty according to the conditions of purchase. The warranty covers manufacturing defects, but does not apply to damage caused by incorrect installation, accident or improper use.

Monitoring tool (Appendix 1)

Flight feature					Weather		FTS default tracking				
Date <dj/mm /aaaa>	Nature flight	duration in min	Remote pilot	Location	average wind speed (m/s)	Temperature (°C)	FTS activation	Activation failure	Unintentional activation of the FTS	Remarks	Year for annual review

Incident form (Appendix 2)

FLYING EYE	Circuit-breaker and parachute system log sheet	Version : 01 Date d'application : 23/06/2023

1. UAS identification	
Date	
UAV serial number	
UAS number	
Number of UAS flight hours	

2. Circuit-breaker activation failure during pre-flight	
Number of UAS flight hours	

3. Failed to activate circuit breaker during		
Number of UAS flight hours		
Distance between remote control circuit breaker and drone		
Place of operation		
Presence of high-power transmitters in the operational volume	Yes	No

4. Activating the circuit breaker during flight		
Number of UAS flight hours		
Controlled activation	Yes	No
Distance between remote control circuit breaker and drone		
Place of operation		
Presence of high-power transmitters in the operational volume	Yes	No

You'll find all the detailed information you need to use the aircraft in the manual, which you can download from this page:

https://dl.djicdn.com/downloads/matrice_350_rtk/20250326UM/Matrice_350_RTK_User_Manual_v1.2_fr3.pdf

FLYING EYE

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09.72.62.78.50

400 AVENUE ROUMANILLE
GREEN SIDE - BATIMENT 1B
06410 BIOT / SOPHIA ANTIPOLIS