


# USER MANUAL & INSTRUCTIONS

*MOC2511 FLIGHT TERMINATION SYSTEM FOR DJI FLYCART*

***Flight Manual (MOC2511) - FTS-MOC KRONOS FC V1.0***

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*External Flight Termination System for DJI FlyCart 30*

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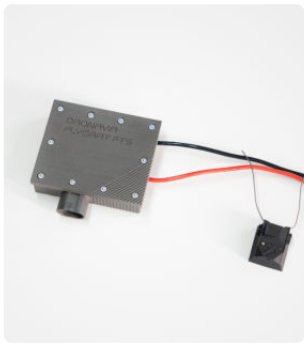
# WE MAKE YOUR DRONE SAFER









Since 2015, Dronavia has been designing and manufacturing innovative safety accessories for professional drones in France. Developed in our workshops, the Kronos range of devices, including Parachute Recovery Systems (PRS) and Flight Termination System (FTS), are the result of 10 years of research and development and meet the highest standards set by EASA.

Thanks to these solutions, which comply with European regulations, professional drones operator benefit from the best guarantees in terms of safety and risk management for their flight missions.

Thank you for your trust and have a good flight.

*Ludovic Pelletey, CEO of Dronavia*



# VERSION NOTE

***Version 1.0***

- Initial version

# DRONAVIA UPDATER

*Dronavia has recently launched an innovative software solution specifically designed to simplify the updating of Kronos systems. Thanks to this new software, Dronavia customers can now manage and update their systems more quickly and easily.*

Download Dronavia Updater software

# GENERAL

*presentation*

Dear Customer,

Congratulations on purchasing your new MOC2511 FTS-MOC Kronos FC External Flight Termination System (FTS) for your DJI FlyCart 30 drone.

You have chosen the device that we are confident is the most effective system of its kind. Extensive research and testing have been carried out to make it as safe and effective as possible.

Based in Remiremont, France, DRONAVIA is at your service to advise you on the purchase of your MOC2511 FTS-MOC Kronos FC External Flight Termination System (FTS) and answer any technical or commercial questions you may have.

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# GENERAL
*presentation*




**TO BE READ CAREFULLY**

This emergency device does not guarantee the preservation of equipment integrity nor the prevention of damage to property or persons. It is a safety feature designed to complement other security systems. Dronavia and its distributors cannot be held liable for any malfunction or for performance deemed insufficient or ineffective.

***Use of this system on any drone other than the DJI FlyCart 30 is strictly prohibited. The configuration of the Flight Termination System must not be altered, as doing so may compromise its proper functioning.***

Activating a drone Flight Termination System is a critical action that carries inherent risks. It must only be used in emergency situations.

# COMPLIANCE *with MOC2511*

***The MOC2511 External Flight Termination System FTS-MOC Kronos FC, for DJI FlyCart 30, was developed to meet the requirements of MOC 2511 published by EASA:***

> "A Flight Termination System (FTS) is a system that, when triggered, terminates the flight. By nature, it is an emergency measure and not a precautionary measure. Its purpose is to ensure that an out-of-control UAS does not enter adjacent areas with an undefined trajectory but, on the contrary and preferably, that it stops, and that its crash/debris areas are strictly maintained within the ground risk buffer zone."
>
> EASA

The purpose of these requirements is to enable the drone operator to intervene in the event of the drone escaping control due to a failure of the flight controller or its sensors. In such situations, autonomous can make the difference between a minor scare and a more serious accident. The MOC2511 FTS-MOC Kronos FC external Flight Termination System for DJI FlyCart 30 can be activated in less than a second.




# WARNINGS
## & safety precautions

TO BE READ CAREFULLY

***Dronavia may suspend the warranty and disclaim all liability to any person who fails to comply with the basic safety instructions set out below.***

Before handling the MOC2511 FTS-MOC Kronos FC External Flight Termination System for DJI FlyCart 30, you must carefully read this manual. This manual provides information on how to use the Flight Termination System. In addition to the important notes and information mentioned in this manual, the owner of the device must comply with all the important instructions set out below.

# WARNINGS
## & safety precautions

**TO BE READ CAREFULLY**

The MOC2511 FTS-MOC Kronos FC External Flight Termination System for DJI FlyCart 30 is a safety device that, under certain conditions, prevents the drone equipped with it from flying outside its regulatory flight envelope by cutting its engines.

***Activation of the Flight Termination System inevitably causes the drone to fall.***

This equipment does not prevent technical problems from occurring on the drone. Any flight with a drone involves a risk to equipment and people in the vicinity, regardless of the safety equipment used. The use of the MOC 2511 FTS-MOC Kronos FC External Flight Termination System for DJI FlyCart 30 must not under any circumstances increase your risk-taking.

# 11 SAFETY

## instructions to follow

**TO BE READ CAREFULLY**

1. *It is prohibited to perform any operations other than those specified in the manual.*

2. *The device should only be used by or under the supervision of a responsible adult. Always keep the device out of reach of children. Do not let them play with it.*

3. *Under no circumstances should you dismantle the various components of the device.*

4. *Do not place the device in a damp or wet environment and keep it away from direct sunlight.*

5. *Do not expose the system to high temperatures, significant shocks, risks of impact, contact with chemicals or acids, or long-term storage in a highly humid or dusty environment. The maximum operating temperature is 40°C and the minimum operating temperature is -5°C.*

6. *The condition of the Flight Termination System must be checked before each use. Do not use the device if it is damaged or malfunctioning. If necessary, contact your reseller.*

7. *The Flight Termination System cannot prevent the drone from malfunctioning.*

8. *Any flight with a drone involves a risk to nearby equipment and people, with or without a Flight Termination System.*

# 11 SAFETY

## instructions to follow

**TO BE READ CAREFULLY**

9 *The use of a Flight Termination System should not increase your risk-taking behaviour in any way.*

10 *The Flight Termination System must be actively triggered by the user. Regular training is necessary to be able to react correctly in an emergency. For the safety of the equipment and third parties, perform a simulated trigger exercise on the ground once a day.*

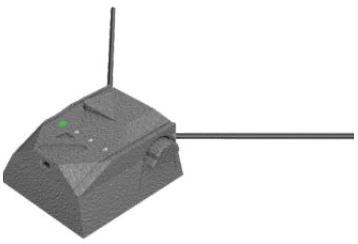
11 *After switching on the system, if the LED turns solid red, the Flight Termination System will not be operational. Contact your dealer for assistance.*



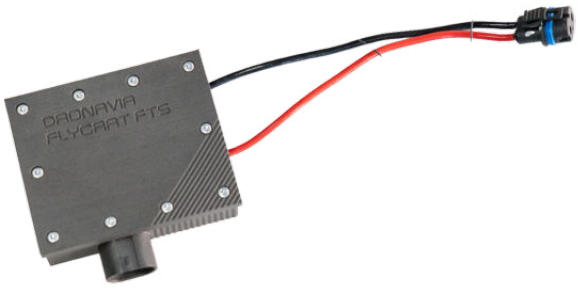

# KRONOS FLYCART

FLIGHT TERMINATION SYSTEM FOR DJI FLYCART

# COMPONENTS
*presentation*

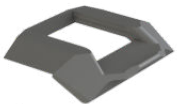


Klick trigger remote control




Flight Termination System Module

## ADDITIONAL ACCESSORIES PROVIDED

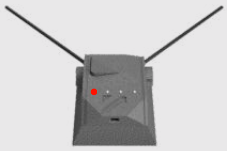


*Klick remote control support*

# SYSTEM

## LEDs states

AUDIBLE BEEP

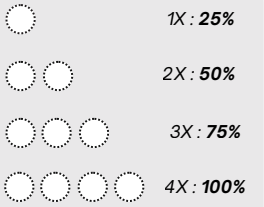


RAPID FLASHING

1

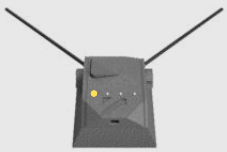
Initialising the remote control






2

Battery level indicator

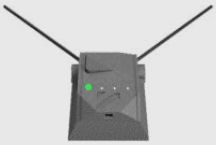


SLOW FLASHING

3

FTS awaiting connection

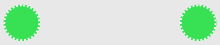




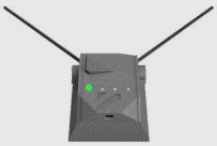
SLOW FLASHING

4

FTS Connected



AUDIBLE BEEP



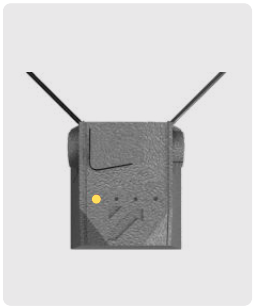
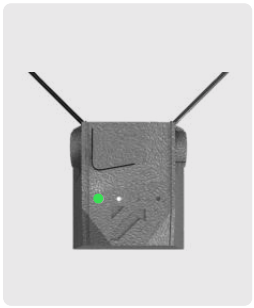
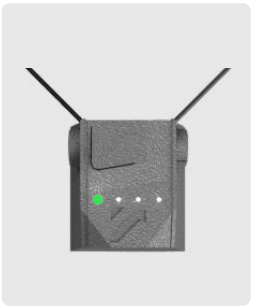
RAPID FLASHING

FTS triggered



# SIGNAL

## LEDs states

| *Lost signal* | *Weak signal* | *Medium signal* | *strong signal* |
| --- | --- | --- | --- |
|  |  |  |  |
| LONG BEEPS<br>FIXED LED | DOUBLE BEEP<br>FIXED LED | FIXED LED | FIXED LED |

# KRONOS FLYCART

*Technical specifications*

| | |
|---|---|
| TOTAL WEIGHT | *132 GRAMS* |
| COMMUNICATION WIRELESS RADIO | *SRD860 WITH ENCRYPTED KEY (869 MHZ / 100 MW)* |
| RANGE OF THE REMOTE CONTROL | *1300 METRES** |
| BATTERY LIFE REMOTE CONTROL | *30 HOURS* |
| OPERATING TEMPERATURE | *-5°C À 40°C* |
| DIMENSIONS | *93 X 93 X 25 MM* |

**The range can reach up to 1.3 km under optimal conditions and in an environment free of obstacles and interference.*

# KRONOS FLYCART

## Minimum Size of the Ground Risk Buffer (GRB)

| OPERATING VOLUME VERTICAL LIMIT | SOIL-RELATED RISK BUFFER ZONE |
|---|---|
| 30 | 130 |
| 40 | 138 |
| 50 | 144 |
| 60 | 150 |
| 70 | 156 |
| 80 | 161 |
| 90 | 166 |
| 100 | 171 |
| 110 | 175 |
| 120 | 179 |
| 130 | 183 |
| 140 | 187 |
| 150 | 191 |

*The ground risk threshold can be calculated based on various drone parameters and assumptions. Please refer to the document dedicated to calculating the ground risk threshold if you need to calculate more accurate ground risk thresholds based on your application.*

# INSTALLATION
## *of Flight Termination System*

*The Kronos FlyCart Flight Termination System for DJI FlyCart 30 can be installed in just a few minutes. To install the Flight Termination System module, please follow these instructions in order:*

### *Instructions*

1 Switch off the DJI FlyCart 30. Unscrew the two fasteners on the front of the DJI FlyCart 30 drone, then carefully remove the front cover.





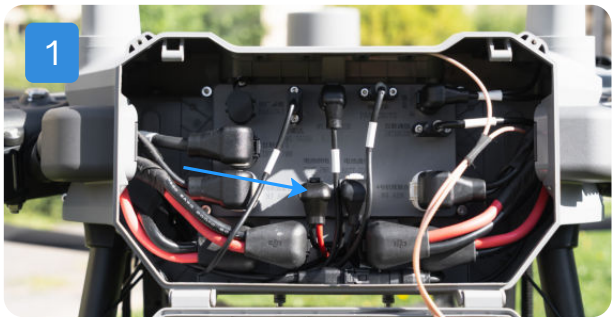


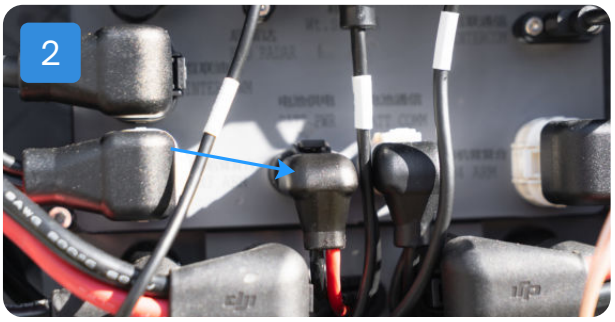





# INSTALLATION
## *of Flight Termination System*

2 Disconnect the main ribbon cable from the DJI FlyCart 30 drone, as shown below.



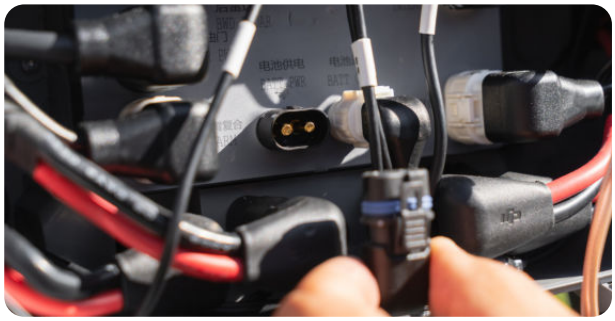









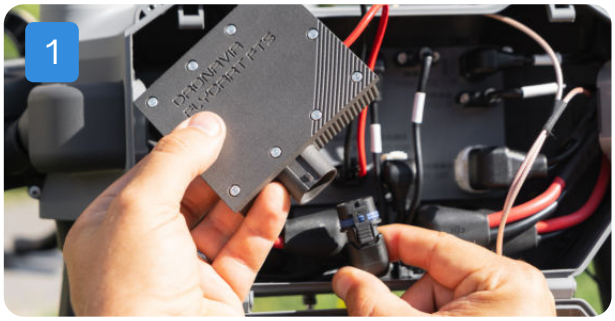

3 Connect the Flight Termination System module ribbon cable to the location of the main ribbon cable that was previously disconnected.

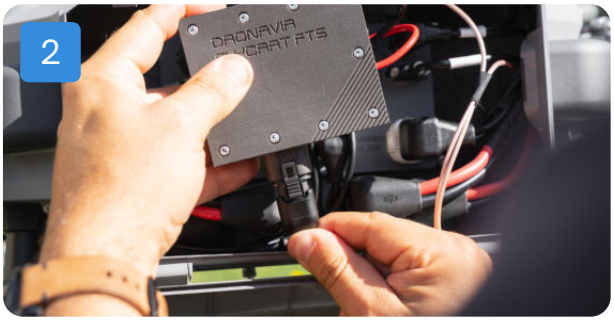




# INSTALLATION
## *of Flight Termination System*

4 Connect the main cable of the DJI FlyCart 30 drone, which was previously disconnected, to the Flight Termination System module. Then carefully place the Flight Termination System module inside the front cover.









# INSTALLATION
## *of Flight Termination System*

5 Carefully reattach the front cover of the drone using the two original screws.













6 ***Your Kronos FlyCart Flight Termination System for DJI FlyCart 30 is now operational.***

# INITIALIZATION
## *of Flight Termination System*

*To initialise the Kronos FlyCart Flight Termination System, please follow these instructions in order:*

### *Instructions*

1 Switch on the DJI FlyCart 30 drone. The Flight Termination System will switch on automatically.



2 Switch on the Klick remote control. Once the Flight Termination System is correctly connected, a green LED will flash on the Klick remote control.





### *Warning*

***The Flight Termination System module does not have any indicator LEDs. Operating statuses can only be viewed via the LEDs on the Klick remote control.***

# INITIALIZATION
## of Flight Termination System

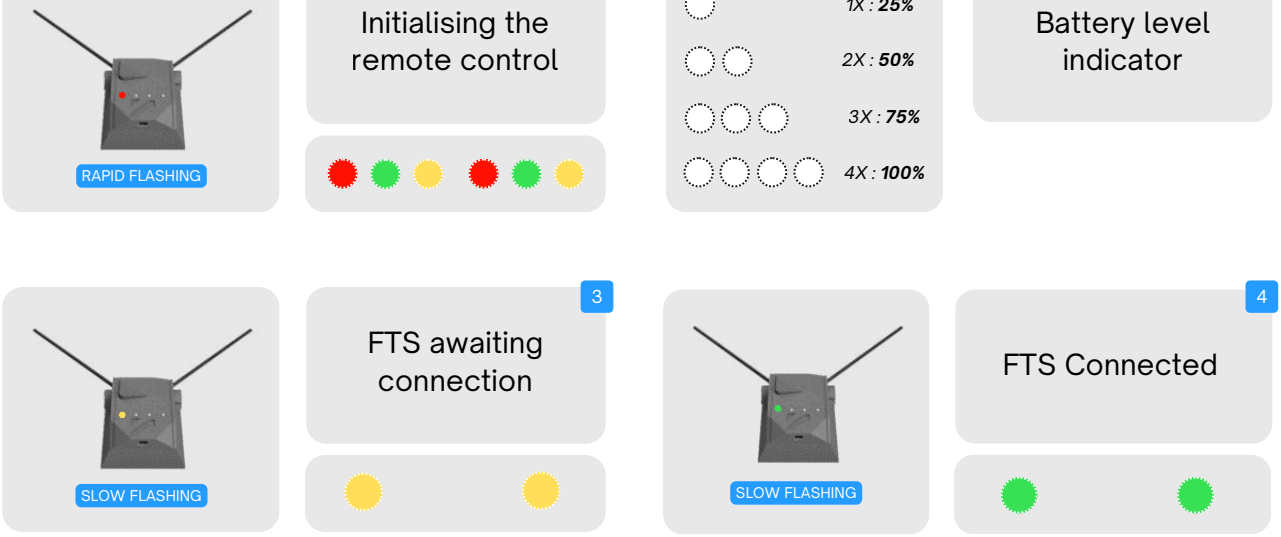
3 ***Your Kronos FlyCart Flight Termination System for DJI FlyCart 30 is initialised.***

### *Warning*

***Once the Flight Termination System has been initialised, handle the Klick remote control carefully to avoid accidentally triggering the system.***

### *The different LED states*

AUDIBLE BEEP



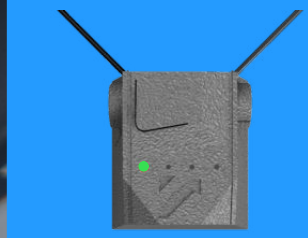



# YOUR FTS IS ACTIVE AND OPERATIONAL!

# KLICK

*Manual activation of the Flight Termination System*

CONSULT THE KLICK USER MANUAL



# PROCEDURE

## *of Flight Termination System Test*

*Before the flight or before the first flight of the day, you can test the Kronos FlyCart Flight Termination System. Follow these instructions in order:*

### *Instructions*

1 Switch on the DJI FlyCart 30 drone. The Flight Termination System will switch on automatically.



2 Switch on the Klick remote control. Once the Flight Termination System is correctly connected, a green LED will flash on the Klick remote control.





### *Warning*

***The Flight Termination System module does not have any indicator LEDs. Operating statuses can only be viewed via the LEDs on the Klick remote control.***

# PROCEDURE

## *of Flight Termination System Test*

3 Start the engines and initiate rotation while keeping the DJI FlyCart 30 drone on the ground.



4 Stop the motors from rotating by pressing the double trigger button on the Klick remote control. Check that the motors stop correctly and that the LED indicator flashes green rapidly on the Klick trigger remote control.





5 Perform a final flight test with the Flight Termination System switched on, but without activating it. If the flight proceeds normally and you do not receive any error messages, the Flight Termination System is operational.

### *Warning*

***This final flight test (step 5) does not involve activating the in-flight Flight Termination System. For this step, simply fly the drone and check whether an error message appears during the flight. Please note that activating the Flight Termination System in flight will inevitably cause the drone to crash.***

# STOP
## *of Flight Termination System*

*To stop, turn off, and reset the Flight Termination System, follow these instructions in order:*

### *Instructions*

1 Stop the DJI FlyCart 30 drone. The Flight Termination System will shut down automatically.



2 Stop the Klick remote control.



# DISASSEMBLY
## of Flight Termination System

*To remove the Flight Termination System, follow these instructions in order:*

### *Instructions*

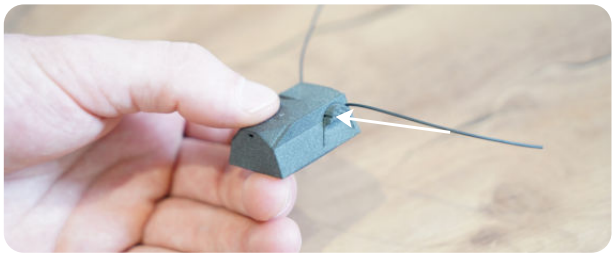
1. To remove the Flight Termination System, simply follow the installation instructions in reverse order. The Klick remote control can remain installed on the DJI FlyCart 30 remote control without affecting its operation.

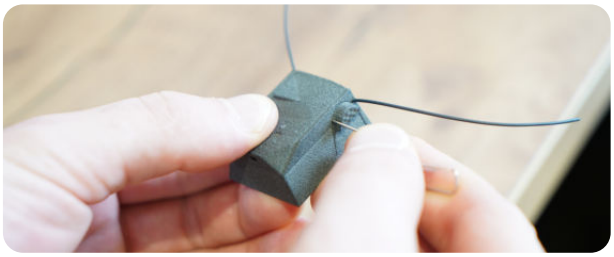
# RESET
## of Flight Termination System

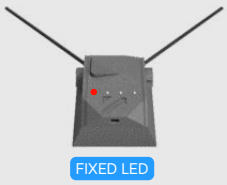
*In the event of a malfunction or any bug, follow these instructions in order:*

### Instructions

1 To reset the Klick remote control, locate the small hole on the left side. Insert a paper clip or other thin object into the hole and press briefly.








System error



2 If the malfunction persists, contact Dronavia customer service or your reseller.

# MAINTENANCE & warranty

## STORAGE

Store the Kronos Flight Termination System in a dry place, at a temperature between 10°C and 30°C, clean and protected from UV rays.

## WARRANTY

Dronavia takes the utmost care in the design and production of its products. We guarantee our Flight Termination Systems for one year from the date of purchase against any manufacturing or design defects that may arise during normal use of the product. Any misuse or improper use, or exposure to aggressive factors (high humidity, excessive heat, etc.) that may cause damage will void this warranty.

## NOTICE OF LIABILITY

Flying a drone, whether manually or automatically, is an activity that requires attention, specific knowledge and good judgement. Be careful, train at suitable facilities, take out insurance and comply with the requirements set out in the DGAC decrees of 11 April 2012 and 17 December 2015 and by EASA.

Ask our sales team your questions



# LINKS to know

For France, we recommend that you consult the website of the Ministry of Ecology, Sustainable Development and Energy if you have any doubts or questions. For Europe, we recommend that you consult the EASA website. Remember that you are flying under your own responsibility.

Website of the Ministry of Ecological Transition and Territorial Cohesion

Details of MOC 2511 published by EASA:

The IGn map of restricted areas for drones

European Union Aviation Safety Agency (EASA)

The French Civil Aviation Authority (DGAC)

Ask our sales team your questions



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