Dronavia

MADE IN FRANCE

# USER MANUAL & INSTRUCTIONS

*C5 CONVERSION KIT FOR DJI MAVIC 4*

***Flight Manual (C5) - PRS-FTS-MOC Kronos AD Mavic 4 V1.0***

# SUMMARY

## 1 INTRODUCTION



## 2 PARACHUTE SYSTEM



## 3 ANNUAL MAINTENANCE

# SUMMARY

# 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

# TUTORIAL

*Parachute Recovery System Installation*

*Parachute Recovery System Rearming*

*Flight Termination System Testing Procedure*

*User’s manual Klick trigger remote control*

# 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*

Congratulations on acquiring your Kronos MVC4 C5 conversion kit, which includes a Parachute Recovery System & autonomous Flight Termination System, specifically designed for the DJI Mavic 4 drone.

***The Kronos MVC4 C5 conversion kit complies with the technical requirements of the EASA-defined C5 Class category and has been developed through a rigorous R&D process, ensuring the highest level of safety for flight operations under STS-01 scenarios.***

Based in Remiremont, France, Dronavia is here to support you with the use of your Kronos MVC4 C5 conversion kit and to answer any technical or commercial questions you may have.

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# GENERAL *presentation*

The Kronos MVC4 Parachute Recovery System and internal Flight Termination System have been specifically designed for DJI Mavic 4 drones, with the primary goal of ensuring ultra-fast deployment to optimize deceleration and minimize impact energy in the event of an in-flight issue.

Multirotor drones, even when properly maintained and operated, can sometimes encounter emergency situations—such as severe weather conditions, radio transmission failure, propulsion system malfunction, or GPS signal loss—where immediate activation of a safety system is crucial.

In such critical scenarios, the combined deployment of the Flight Termination System and Parachute Recovery System can mean the difference between a minor incident and a serious accident. Kronos MVC4 systems are engineered to activate and deploy in under one second.

# GENERAL
*presentation*

**TO BE READ CAREFULLY**

These safety devices do not guarantee the integrity of the equipment, nor the absence of damage to property or injury to persons. They are complementary safety features, designed to enhance existing safety measures. Under no circumstances shall Dronavia or its distributors be held liable for any malfunction, perceived performance shortcomings, or failure to deploy.

# COMPLIANCE *with C5 Class*

**TO BE READ CAREFULLY**

The Kronos MVC4 Parachute Recovery System and internal Flight Termination System form a conversion kit specifically designed to upgrade a Class C2 drone to Class C5, in full compliance with the technical and regulatory requirements set by EASA.

# COMPLIANCE *with C5 Class*

## EXTRACT FROM REQUIREMENTS PUBLISHED BY EASA

A Class C5 UAS complies with the requirements defined in Part 4, except for those specified in points 2) and 10) of Part 4.

In addition, it meets the following requirements:

1. It must be an aircraft other than a fixed-wing aircraft, unless it is a tethered aircraft;
2. If equipped with a geo-awareness function, it must comply with point 10) of Part 4;
3. During flight, it must provide the remote pilot with clear and concise information regarding the UA's height above the surface or take-off point;
4. Unless it is a tethered aircraft, it must be equipped with a selectable low-speed mode that limits the maximum ground speed to 5 m/s;
5. Unless it is a tethered aircraft, it must provide the remote pilot with a means to interrupt the UA's flight, which must:
6. a) Be reliable, predictable, and independent of the automatic flight guidance and control system —including its activation;
7. b) Force the descent of the UA and prevent horizontal powered movement;
8. c) Include a means to reduce the impact energy of the UA;
9. Unless it is a tethered aircraft, it must allow the remote pilot to continuously monitor the quality of the command and control link and provide:
10. a) An alert when the link is about to degrade or disconnect to the extent that safety is compromised;
11. b) A second alert when the link is fully disconnected;
12. In addition to the instructions specified in point 15(a) of Part 4, the manufacturer's instructions must also include a description of the flight termination method as defined in point 5);
13. A Class C5 UAS may be a Class C3 UAS fitted with an accessory kit that transforms it into a Class C5 UAS. In this case, the C5 class label must be affixed to all accessories.

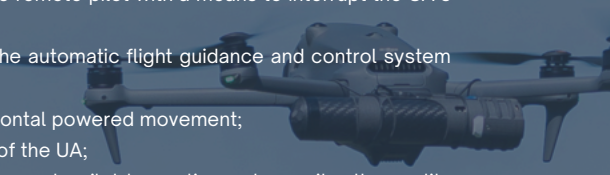
The accessory kit may only transform a Class C3 UAS that complies with point 1) and includes the necessary interfaces for use with the accessories.

The accessory kit must not include any modifications to the software of the Class C3 UAS.

The accessory kit is designed and each component is identified in a way that ensures it can be completely and correctly installed by a UAS operator on a Class C3 UAS, following the instructions provided by the kit manufacturer.

The accessory kit may be placed on the market independently of the Class C3 UAS it converts. In this case, the kit manufacturer must place on the market a conversion kit that:

1. Does not compromise the compliance of the Class C3 UAS with Part 4 requirements;
2. Ensures that the UAS equipped with the accessory kit meets all additional requirements outlined in this part, except for point 3) above;
3. Is accompanied by manufacturer's instructions that include:
4. i) A list of all Class C3 UAS models compatible with the kit;
5. ii) Detailed instructions on how to properly install and operate the accessory kit.

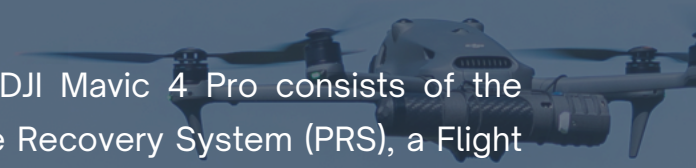


EASA European Aviation Safety Agency APPROVED

# COMPLIANCE *with C5 Class*

The Kronos AD Mavic 4 Pro drone, designed and tested by Dronavia, is based on the DJI Mavic 4 Pro originally classified with a C2 marking. The information provided in this manual is intended as a supplement to the original DJI manual, and in the event of any overlap, the information contained in this manual shall prevail.

The Kronos AD Mavic 4 Pro is classified with a C5 marking, derived from the original C2 marking of the DJI Mavic 4 Pro.



The modification of the DJI Mavic 4 Pro consists of the integration of a Parachute Recovery System (PRS), a Flight Termination System (FTS) independent from the flight controller, a dedicated remote control for triggering both the FTS and PRS (FT link) operating independently from the drone's main control link (C2 link), as well as additional components designed to minimize potential damage to the drone in case of parachute deployment. The C5 marking is valid only if all these elements are present during flight, namely the PRS, the FTS, the remote control and the additional components.

The original DJI warranty remains valid provided the drone is restored to its original configuration before being sent to DJI after-sales service. For further information, please contact Dronavia or your authorized reseller.

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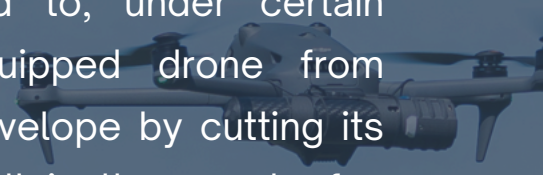
# WARNINGS
## & safety precautions

TO BE READ CAREFULLY



The Kronos MVC4 conversion kit includes two safety accessories designed to, under certain conditions, prevent the equipped drone from exiting its regulatory flight envelope by cutting its motors, and to avoid free fall in the event of a critical failure.

Activating the Flight Termination System and/or the Parachute Recovery System will inevitably result in the drone falling.

These systems do not prevent technical failures from occurring. Any drone operation inherently involves a risk to equipment and nearby individuals, regardless of the safety systems in place. The use of the Kronos MVC4 Flight Termination System and Parachute Recovery System must never lead to increased risk-taking during flight operations.

# WARNINGS
## & safety precautions

TO BE READ CAREFULLY

Dronavia may suspend the warranty and disclaim any responsibility for anyone who fails to adhere to the basic safety instructions outlined below.

Before handling the Kronos MVC4 systems, you must carefully read this manual. It provides information on the deployment of the Parachute Recovery System and the Flight Termination System. In addition to the important notes and information mentioned in this manual, the device owner must comply with all the essential safety instructions outlined below.

# 15 SAFETY

## instructions to follow

TO BE READ CAREFULLY

1. *It is forbidden to carry out any manipulations 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 the reach of children. Do not let them play with it.*

3. *Do not under any circumstances dismantle the various parts of the device, except when resetting it in accordance with the instructions in this manual.*

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

5. *Do not expose the system to high temperatures, strong shocks, shock hazards, contact with chemicals or acids, or long-term storage in a high-humidity or dusty environment. The maximum operating temperature is 40°C and the minimum operating temperature is -5°C.*

6. *Check that the Kronos Parachute Recovery System and Flight Termination System is in good condition before each use. Do not use the device if it is damaged. If necessary, contact your dealer.*

7. *The Kronos Parachute Recovery System and Flight Termination System cannot prevent the drone from malfunctioning.*

8. *Any flight with a drone implies the existence of a risk for equipment and people in the vicinity, with or without Kronos safety systems.*

# 15 SAFETY

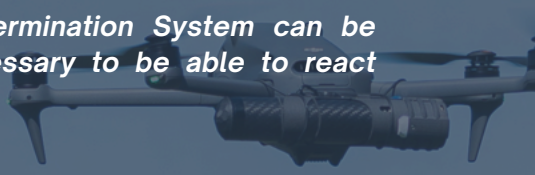
instructions to follow

## TO BE READ CAREFULLY

9 *Using a Kronos Parachute Recovery System and Flight Termination System should in no way increase your risk.*

10 *The Kronos Parachute Recovery System and Flight Termination System attempts to prevent a drone experiencing a malfunction from free-falling. However, there are fall situations in which the effectiveness of the Kronos Parachute Recovery System may be limited or impeded.*

11 *The Kronos Parachute Recovery System and Flight Termination System can be actively deployed by the user. Regular training is necessary to be able to react correctly in an emergency.*



12 *The spring ejection system only works once. You can recharge the system yourself by following the instructions in this manual. It is your responsibility to ensure that the system is under warranty.*

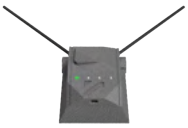
13 *When reloading, it is forbidden to do so with people nearby, and especially with the barrel pointing in their direction. You must take the same precautions as when handling a loaded rifle. In the event of accidental firing during this stage or mishandling, the spring could be ejected and cause serious injury. Safety glasses must be worn.*

14 *After deploying the device, we recommend that you carefully inspect each component to ensure its integrity. If in doubt, contact your reseller.*

15 *After switching on the system, if the LED changes to a steady red, do not use it and contact your reseller for assistance.*

# LISTING

*and identification of accessories*

| PART | QUANTITY | IMAGE | C5 LABEL | DESCRIPTION |
|---|---|---|---|---|
| **PRS** | 1 |  | YES | *The Kronos Mavic 4 plug & play Parachute Recovery System for DJI Mavic 4 makes your flights safer by slowing your drone's fall speed and impact energy in the event of a problem. The parachute can be deployed automatically or manually using the Klick trigger remote control.* |
| **FTS** | 1 |  | YES | *The Kronos Mavic 4 internal Flight Termination System, developed for the DJI Mavic 4, prevents the drone fitted with it from leaving its regulation flight envelope by cutting (manually or automatically) the drone's power supply in less than a second.* |
| **KLICK** | 1 |  | | *The Klick trigger remote control offers a fast, secure way of remotely deploying your Kronos safety accessories (parachutes and circuit breakers). Totally independent of the drone, this lightweight, ergonomic remote control features LED status indicators and a secure wireless connection.* |

| PART | SOFTWARE VERSION | VERIFICATION METHOD | DIMENSIONS | MASS |
|---|---|---|---|---|
| **PRS** | v1.1.1 | *See 'System states' on page 30* | ***18 x 3.9 x 4.5 cm*** | ***130 G*** |
| **FTS** | v1.0.0 | *See 'System states' on page 30* | ***9 x 5.9 x 2 cm*** | ***3 G*** |
| **KLICK** | Radio_MOC_v1.3 | *See 'System states' on page 30* | ***32 x 28 x 13 mm*** | ***20 G*** |

# LISTING

*of drones compatible with the C5 conversion kit*

| MODEL | MANUFACTURER | CONFIGURATION | VERSION OF SOFTWARE TESTED | ORIGINAL C2 DECLARATION OF CONFORMITY |
|---|---|---|---|---|
| **Mavic 4 Pro** | DJI | *Any payload if the take-off weight is less than 1.15 KG, including conversion kit.* | | *See appendix* |

# CONFIGURATION

*of the C2/C5 conversion kit*

Depending on the nature of your missions and the associated regulatory requirements, two flight configurations are available: C2 and C5. To switch from one configuration to the other, follow the instructions below in order:

1. When the Kronos MVC4 conversion kit is installed on the DJI Mavic 4 drone, (PRS + FTS) your drone is in C5 flight configuration.

2. To revert to the C2 configuration, the drone must be returned to the Dronavia workshop (or to an approved reseller) so that our technicians can remove the internal Flight Termination System. Once this system is removed, the drone regains its C2 classification and retains its full DJI warranty.

## *Warning*

*If the drone is returned to DJI for after-sales service, it must first be taken to the Dronavia workshop (or an approved reseller) so that our technicians can remove the internal Flight Termination System. Once this operation has been carried out, the drone will be returned to its original C2 class configuration, guaranteeing that the DJI manufacturer's warranty will remain in force.*

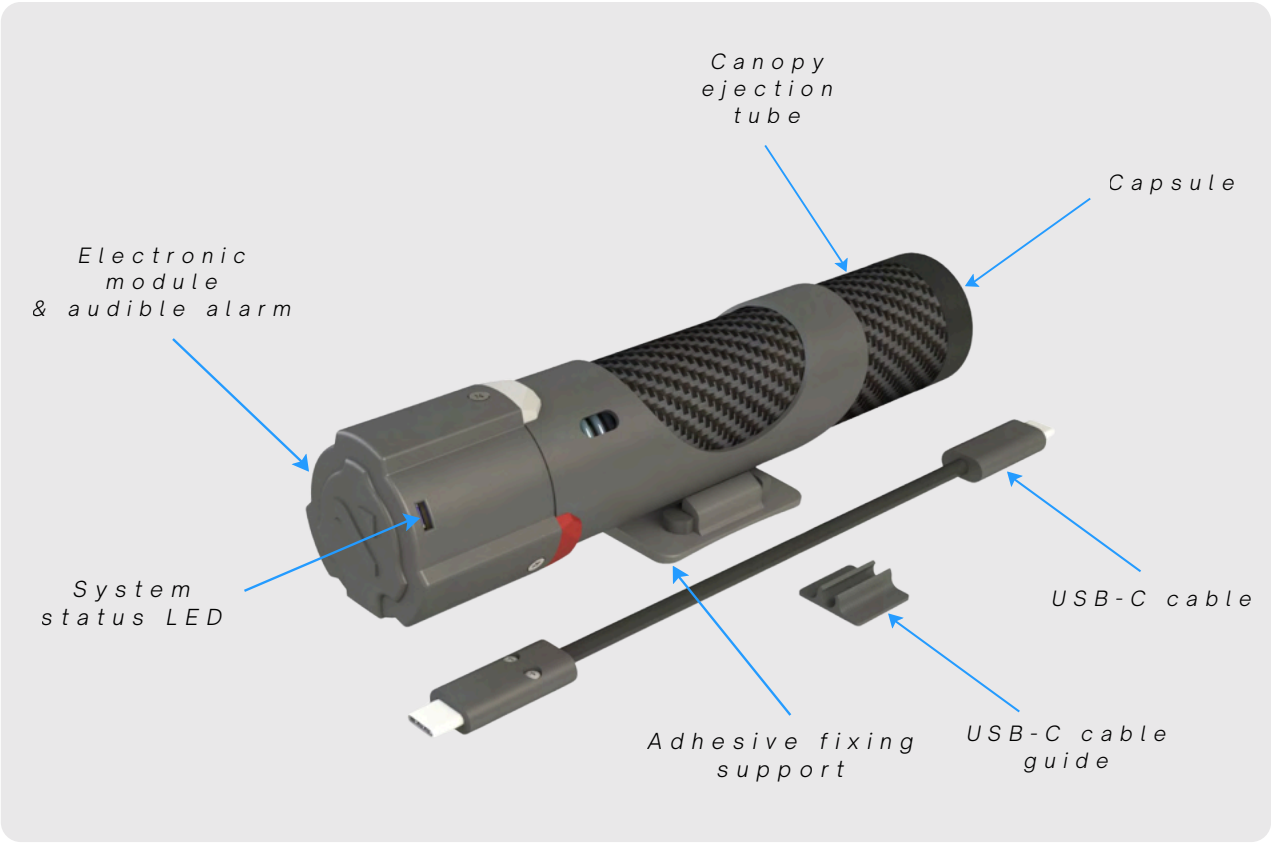
SECTION

# KRONOS MVC4

PARACHUTE RECOVERY SYSTEM FOR DJI MAVIC 4

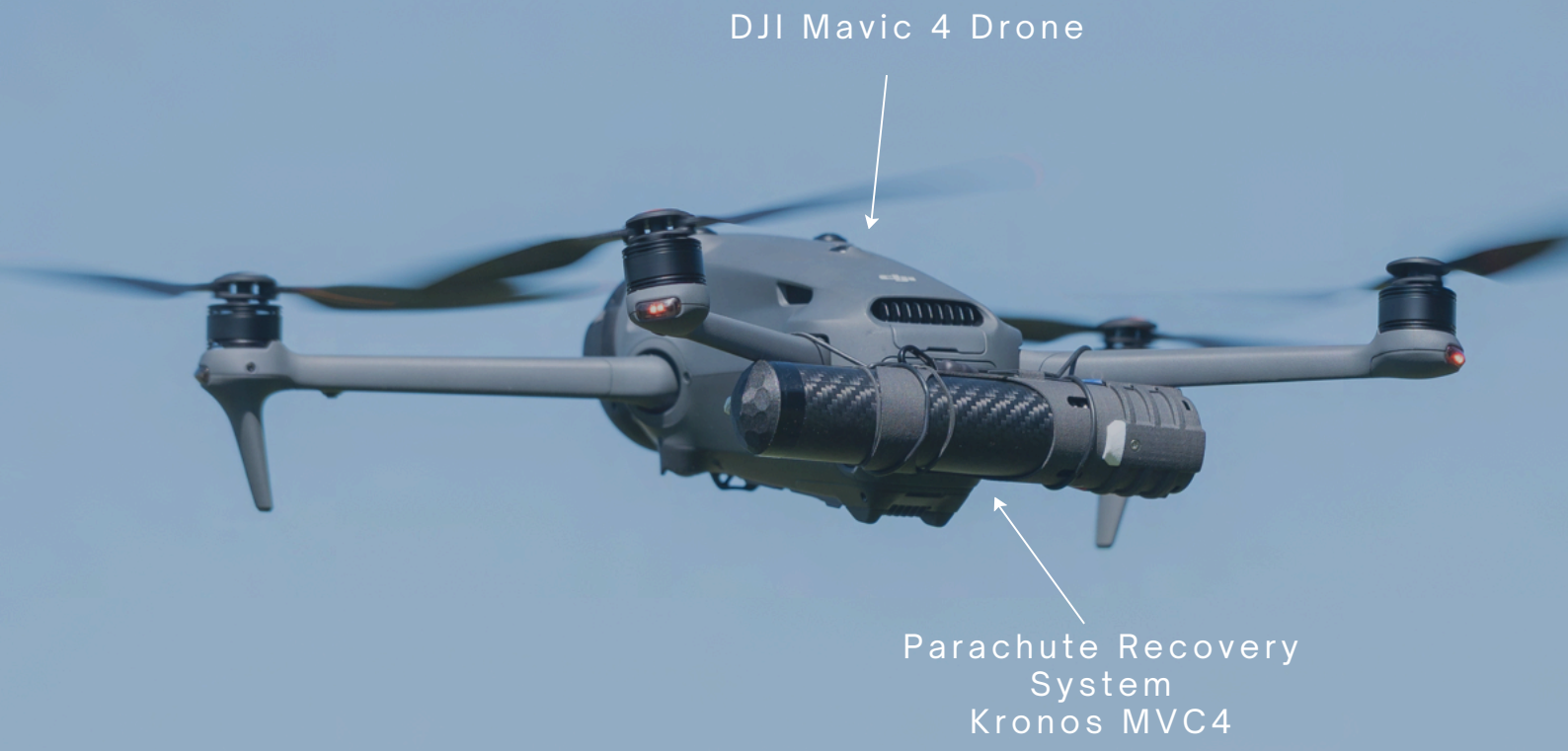
# COMPONENTS

*presentation*



# KRONOS MVC4

*System Visual Representation*



# KRONOS MVC4

*System Visual Representation*

# KRONOS MVC4

*Overview of Key System Figures*

# KRONOS MVC4

## Technical specifications

*TOTAL WEIGHT (PRS+FTS) : 137G

| | |
|---|---|
| TOTAL WEIGHT | 130 GRAMS |
| EJECTION DEVICE | SPRING PRESTRESSED |
| MINIMUM HEIGHT EFFICIENCY | FROM 20 METERS |
| COMMUNICATION WIRELESS RADIO | SRD860 WITH ENCRYPTED KEY (869 MHZ / 100 MW) |
| RANGE OF THE KLICK REMOTE CONTROL | 1500 METERS* |
| KLICK REMOTE CONTROL AUTONOMY | 30 HOURS |
| ENERGY GROUND IMPACT | < 9 JOULES |
| OPERATING TEMPERATURE | -5°C TO 40°C |
| STORAGE TEMPERATURE | 10°C TO 40°C |

*can reach up to 1.5 km, under optimum conditions and in an environment free of obstacles and interference.

# KRONOS MVC4

## Operating limits

| | |
|---|---|
| MAXIMUM WIND SPEED AT GROUND LEVEL | *9,22 m/s* |
| MINIMUM FLIGHT ALTITUDE (AGL) | *15.5 metres* |
| OPERATING TEMPERATURES | *MIN : -5°C*<br>*MAX : 40°C* |
| USABLE IN RAINY WEATHER | *No* |

# KRONOS MVC4

## Dimensions and weights

### DRONE

22.1 x 9.6 x 9.03 cm

1063 G

### PARACHUTE

18 x 3.9 x 4.5 cm

130 G

### PARACHUTE + DRONE + ACCESSOIRES

22.1 x 9.6 x 9.03 cm

1204 G MTOM

# KRONOS MVC4

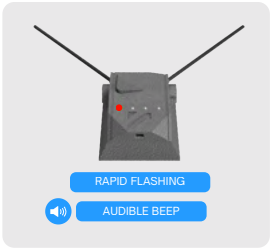
## Minimum Size of the Ground Risk Buffer (GRB)

| OPERATING VOLUME VERTICAL LIMIT | SOIL-RELATED RISK BUFFER ZONE |
|---|---|
| 30 | 140 |
| 40 | 182 |
| 50 | 223 |
| 60 | 265 |
| 70 | 306 |
| 80 | 348 |
| 90 | 389 |
| 100 | 431 |
| 110 | 472 |
| 120 | 514 |

*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.*

# SYSTEM states

## INITIALIZATION

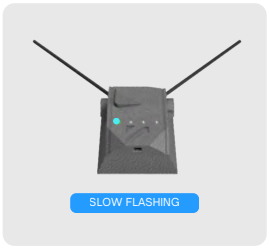



System initialisation


Waiting phase



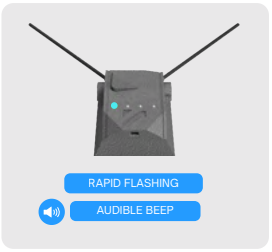
## CONNECTION




FTS & PRS Connected


FTS & PRS Connected with Autonomous Deployment

## ACTIVATION AND DEPLOYMENT




FTS triggered & PRS deployed with Klick

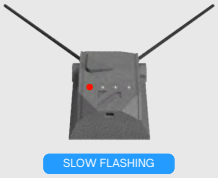

FTS triggered & PRS deployed with Autonomous deployment

# SYSTEM states

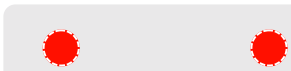
## SYSTEM & BATTERY ALERTS

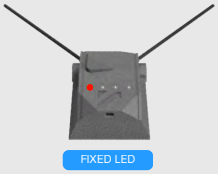

Signal lost with remote control (Klick)






Low battery

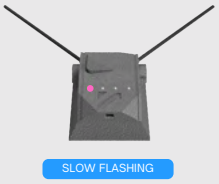




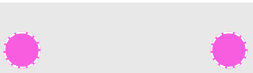

System error


Charging the battery






Signal scrambled

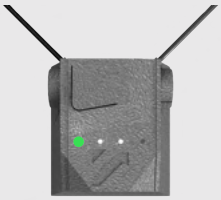
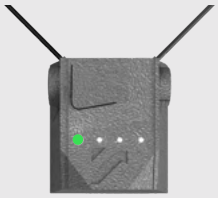



Battery charged

# SIGNAL
## states

*Four LEDs let you check the status of the link between the Klick trigger remote control and your Kronos MVC4 conversion kit. The signal level is represented by the number of lights on: the more lights, the more stable the connection.*

## *The different LED states*

| Lost signal | Low signal | Medium signal | Strong signal |
|---|---|---|---|
|  |  |  |  |
| FIXED LED<br>LONG BEEP | FIXED LED<br>DOUBLE SHORT BEEP | FIXED LED | FIXED LED |

## *Warning*

***If the signal is lost, the manual release of the Parachute Recovery System and the Flight Termination System will become inoperative. Move closer to the drone to re-establish the link with the Klick remote control.***

# INSTALLATION
*of the parachute system*

*The Kronos MVC4 Parachute Recovery System can be installed in just a few minutes. To install it, please follow the instructions below in order:*

## *Skills & tools required*

Designed to be quick and easy to use, the Parachute Recovery System can be installed without the need for special tools or technical skills.

## *Warning*

***For reasons of operational safety and to prevent inadvertent deployment, the MVC4 Parachute Recovery System incorporates an automatic lock that prevents deployment at altitudes below 20 metres. This limitation ensures that the parachute system can only be activated in conditions that guarantee the minimum effectiveness of the system. However, manual deployment of the parachute via the Klick trigger remote control remains possible. Be cautious when handling the powered-on parachute to avoid any unintentional ground deployment, which could cause physical injury or material damage.***

## *Instructions*

1 The parachute system mounting bracket is already pre-installed on your DJI Mavic 4 drone. Unscrew the tightening knobs, reposition the bracket above the battery compartment, and then insert the battery into the drone.




# INSTALLATION
*of the parachute system*

## *Warning*

***The parachute mounting bracket must be unscrewed using the tightening knobs and then reinstalled when replacing the battery. The bracket can remain in place during transport in its dedicated carrying case.***

2 Leave the parachute mounting bracket in place, then position the parachute module on it before inserting it into its mounting clip. Gently push until the parachute module is fully locked in place.

3 Lower the parachute mounting bracket in front of the drone's battery compartment, then tighten the locking knobs.



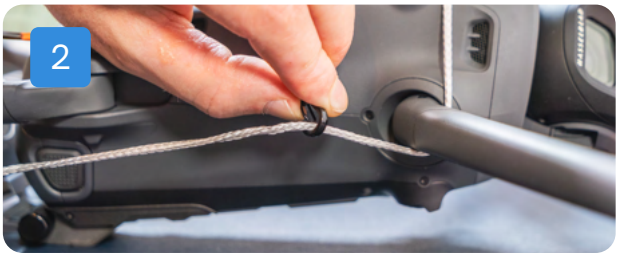

# INSTALLATION
*of the parachute system*

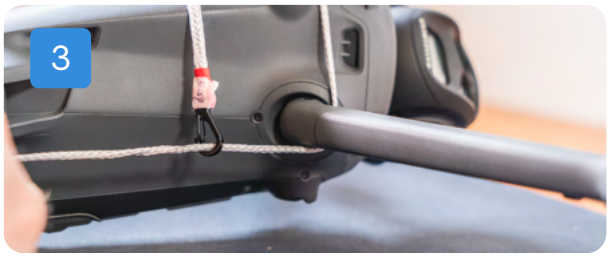
4 Pass the main parachute sling under the right front arm of the drone, making sure it is completely clear and free of any twists.

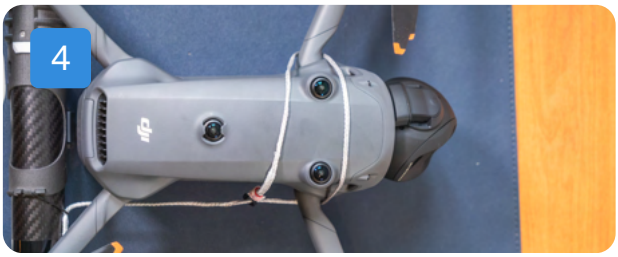
5 Pass the main parachute sling under the left front arm of the drone, making sure it is completely clear and free of any twists.

# INSTALLATION
*of the parachute system*

6 Hook the carabiner to the main sling by passing it over the drone. Then loop the elastic around both the tube and the main sling. Slide the elastic forward until the main sling is tight.


## *Warning*

***Make sure that the main parachute attachment sling is correctly positioned on the drone's body and does not have any play that could cause contact with the propellers.***

7 Connect the USB-C cable of your parachute to your drone. The red connector of the USB-C cable must be connected to the drone.

# INSTALLATION
of the parachute system

## Warning

*Make sure to disconnect the USB-C cable before folding the arms of the DJI Mavic 4 drone.*

8 *Your Kronos MVC4 parachute is now operational.*

9 *Each installation must be entered in the 'List of installations and de-installations and maintenance operations' section on page 54.*

# INITIALIZATION
*of the parachute system*

*To initialize the Kronos MVC4 Parachute Recovery System, follow these instructions in order:*

## Warning

***For safety reasons, activation of the Kronos MVC4 Parachute Recovery System is fully automatic. No manual intervention is necessary or possible to activate the system.***

## Instructions

1 Switch on the DJI Mavic 4 drone, and the Kronos MVC4 Parachute Recovery System will automatically switch on. The parachute LED signals ignition with a sequence of colours, while the audible alarm emits three beeps to confirm correct operation. The LED then indicates the battery level, and a flashing yellow LED indicates that the parachute is powered up and ready for use.

2 ***Your Kronos MVC4 parachute is initialization started.***

## The different LED states

System initialisation

RAPID FLASHING AUDIBLE BEEP



Parachute on, waiting to be activated

SLOW FLASHING

# ACTIVATION
*of the parachute system*

*To activate the Kronos MVC4 Parachute Recovery System, follow the instructions below in order:*

## *Warning*

***For reasons of operational safety and to prevent inadvertent deployment, the MVC4 Parachute Recovery System incorporates an automatic lock that prevents deployment at altitudes below 20 metres. This limitation ensures that the parachute can only be activated in conditions that guarantee the minimum effectiveness of the system.***

## *Instructions*

1. The Kronos MVC4 Parachute Recovery System automatically detects when your drone is ready to take off. During this phase, the LEDs on the parachute module and on the Klick remote control flash purple, and double beeps are emitted.

2. When the drone reaches an altitude of 20 metres, two distinct beeps confirm that the minimum threshold required to activate the autonomous parachute deployment function has been reached. The LEDs on the parachute module and on the Klick remote control then flash dark blue.

3. ***Your Kronos MVC4 Parachute Recovery System is active with the autonomous deployment function.***

## *Warning*

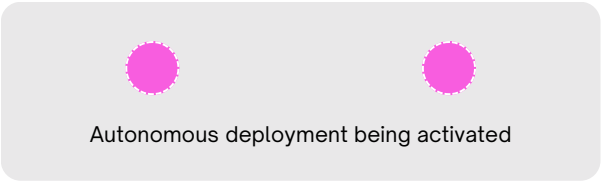
***If there is no audible signal or dark blue LED, it is likely that the autonomous deployment function has not yet been activated due to insufficient altitude. To activate the autonomous deployment function, a minimum altitude of 20 metres is required.***

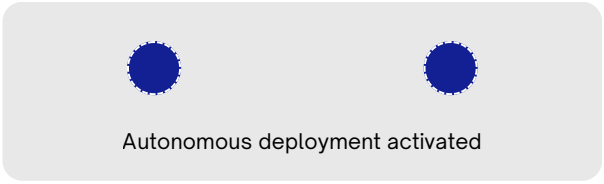
# ACTIVATION

*of the parachute system*

## *The different LED states*





# DEACTIVATION
*of the parachute system*

*To deactivate the Kronos MVC4 Parachute Recovery System, follow the instructions below in order:*

## *Instructions*

1 The Kronos MVC4 Parachute Recovery System automatically detects the landing of the DJI Mavic 4 drone. Approximately 5 seconds after detection, a beep is emitted and the LED stops glowing dark blue. The take-off detection module is then automatically deactivated. It will reactivate on the next flight, as soon as the drone reaches a minimum altitude of 20 metres.

## *Warning*

***If the dark blue LED on the Kronos MVC4 Parachute Recovery System remains lit, this indicates that the autonomous deployment function is still active. Do not manipulate the drone to avoid any risk of involuntary deployment. Wait a further 5 seconds for the automatic deactivation.***

2 The autonomous deployment of the Kronos MVC4 Parachute Recovery System is deactivated, but your parachute remains active and can be deployed using the Klick trigger remote control.

3 To completely deactivate your Kronos MVC4 Parachute Recovery System, switch off the DJI Mavic 4 drone.

## *Warning*

***Do not perform any ground handling until the parachute system (PRS) has fully powered down.***

# DEACTIVATION

*of the parachute system*

## *The different LED states*


CLIGNOTEMENT LENT BIP SONORE


CLIGNOTEMENT LENT BIP SONORE


YOUR PARACHUTE
IS OPERATIONAL &
ACTIVE!

# DEPLOYMENT
*of the parachute system*

*To deploy the Kronos MVC4 Parachute Recovery System (with autonomous deployment or manually), observe the following safety instructions:*

## *Warning*

1. Never attempt to deploy the MVC4 Parachute Recovery System on the ground.

2. The Kronos MVC4 Parachute Recovery System is designed to be deployed at a minimum height of 20 metres from the ground in standard atmospheric conditions.

3. For a fall from a height of 20 metres, the impact on the ground is less than 9 joules with the Kronos MVC4 Parachute Recovery System, compared with 338 joules without any device.

## *Warnings*

***This data may vary depending on altitude above sea level, relative wind and many other external factors. That's why we recommend a minimum height of 20 m above ground level to deploy the Kronos MVC4 Parachute Recovery System and sufficiently limit the impact of your drone on the ground.***

***For reasons of operational safety and to prevent inadvertent deployment, the MVC4 Parachute Recovery System incorporates an automatic lock that prevents deployment at altitudes below 20 metres. This limitation ensures that the parachute can only be activated in conditions that guarantee the minimum effectiveness of the system.***

# AUTONOMOUS

*deployment of the parachute system*

## *Instructions*

1 When autonomous deployment is activated, the parachute system analyses the flight parameters (altitude, acceleration, inclination, angular velocity) in real time. If any abnormal behaviour is detected, indicating a loss of control, the MVC4 Parachute Recovery System is automatically triggered, without pilot intervention.

## *The different LED states*

Parachute deployed with autonomous deployment function

AUDIBLE BEEP | RAPID FLASHING

# MANUAL

*deployment of the parachute system*

*To manually deploy the Kronos MVC4 Parachute Recovery System, follow the instructions below in order:*

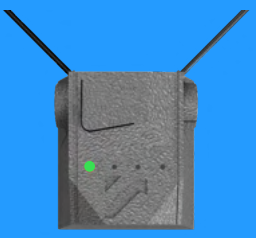
## *Instructions*

1. Find out how to deploy your Kronos MVC4 Parachute Recovery System manually with the help of our user and instruction manual for the Klick remote activation system.

# KLICK

*Manual activation of the Flight Termination System*

CONSULT THE KLICK USER MANUAL



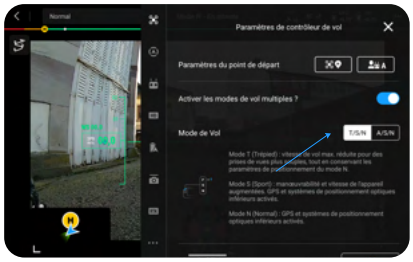
# LOW-SPEED
mode

*European EASA regulations require the inclusion of a low-speed mode that can be selected on the drone and activated manually by the drone operator. When the low-speed mode is activated, the drone cannot exceed a speed of 5 m/s. To activate the low-speed mode (Mode T), follow the instructions below in order:*

## *Instructions*

1 Switch on your DJI remote control.

2 Access the camera view, then click on the menu represented by the 3 dots at the top right of the screen. Check that the T/S/N flight mode is selected.




3 Switch the flight mode selector on the DJI RC Plus radio control from mode N to mode F. Mode F corresponds to mode T.

# SPORT
mode

*The use of mode S (Sport) is prohibited when the C5 conversion kit is installed on the DJI Mavic 4 drone. All validation tests on the Kronos MVC4 system were carried out exclusively in N (Normal) mode, guaranteeing behaviour that complies with safety requirements.*

## Warning

***When using SPORT mode, Dronavia accepts no responsibility for non-deployment, partial or delayed deployment of the parachute system, due to flight dynamics incompatible with the system's deployment parameters.***

# STATES

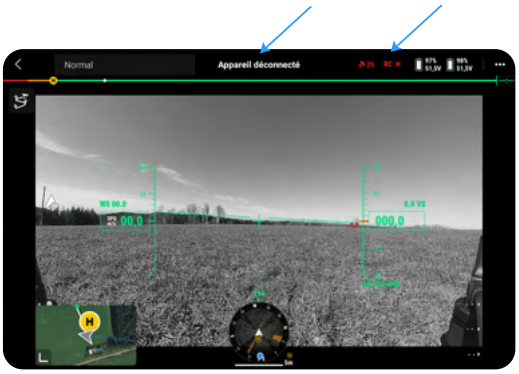
*of DJI remote controller*

*Indicators on the DJI remote controller allow you to check the signal status between the DJI Mavic 4 drone and the DJI remote controller during a flight.*

*Strong signal*


*Low signal*


*Lost signal*

# STOP
## of the parachute system

*To stop the Kronos MVC4 Parachute Recovery System, follow the instructions below in order:*

### Warning

***If the dark blue LED on the Kronos MVC4 Parachute Recovery System remains lit, this indicates that the autonomous deployment function is still active. Do not manipulate the drone to avoid any risk of involuntary deployment. Wait a further 5 seconds for the automatic deactivation.***

### Instructions

1. Switch off the DJI Mavic 4 drone and the Kronos MVC4 Parachute Recovery System will shut down automatically.

2. Remember to turn off your Klick trigger remote control.

3. ***Your Kronos MVC4 parachute system has been shut down.***

### Warning

***Do not perform any ground handling until the parachute system (PRS) has fully powered down.***

# DISMANTLING
## of the parachute system

*To dismantle the entire Kronos MVC4 Parachute Recovery System, follow the installation instructions in reverse order.*

### Instructions

1 ***Each de-installation must be entered in the 'List of installations, de-installations and maintenance operations' section on page 54.***

### Warning

***Make sure to disconnect the USB-C cable before folding the arms of the DJI Mavic 4 drone.***

# ANNUAL *maintenance*

TO BE READ CAREFULLY

Like all rescue parachute systems (rescue parachutes for paragliders or parachutists, avalanche airbags, etc.) Dronavia parachutes must undergo preventive maintenance to be kept in optimum working order. The only preventive maintenance operation is to replace the POD. It's a quick and easy operation, which means that pilots never have to leave their drone standing idle.

A use-by date is set for each POD. Dronavia disclaims all liability and cancels the warranty if your POD has exceeded this use-by date.

# PROCEDURES

*maintenance requirements*

*To be kept in optimum working order, each parachute system must undergo preventive or post-deployment maintenance. Here is a summary table of the mandatory maintenance operations:*

| FREQUENCY | OPERATION | CAN BE MADE BY |
|---|---|---|
| **Every year** | *Replacement of the canopy* | *Final user* **or** *DRONAVIA ou revendeur certifié* |
| **Every 5 years** | *Mandatory manufacturer global maintenance* | *Manufacturer* |
| **After every deployment** | *Rearming of the parachute system* | *Final user* **or** *DRONAVIA or any certified reseller* |
| **After every deployment** | *Replacement of the canopy* **or** *Repackaging of the canopy* | *Final user* **or** *DRONAVIA or any certified reseller* |
| **After 30 deployments** | *Mandatory manufacturer global maintenance* | *Dronavia* |

## *Warning*

***If you wish to carry out global maintenance yourself, Dronavia will disengage its responsibility for the system, in addition to cancelling the warranty.***

# LISTING

## *parachute deployment failures*

*If the deployment of the Kronos MVC4 Parachute Recovery System fails during flight, record the following:*

| Drone affected by activation failure | Flight hours accumulated at the time of activation failure | Distance between the control unit and the drone during the activation attempt | Location of the operation | Presence of a high-power transmitter in the operational volume |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

# LISTING

## *voluntary and untimely deployment of the parachute*

*If the Kronos MVC4 Parachute Recovery System is deployed during flight, record the following:*

| Drone concerned by activation | Flight hours accumulated at the time of activation | Distance between the control unit and the drone during the activation attempt | Location of the operation | Was the activation commanded or uncommanded? | Presence of a high-power transmitter in the operational volume |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

### *Warning*

*If the probability of failure observed in service is greater than 10-2/FH (taking into account the statistical uncertainty), the operator must inform the competent authority.*

# LISTING

*monitoring of installations / de-installations & maintenance operations*

*To be maintained in optimum working order, each Parachute Recovery System must be monitored for installation, de-installation, firmware updates, preventive or post-deployment maintenance. Here is a table summarising the operations to be listed:*

| Date | Operation | Problems | Operator and signature |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# POD use-by date

*Each POD has a use-by date to ensure that it remains in optimum working order:*

The optimum life of a POD is 1 year. The use-by date is shown on the label on the back of the parachute.

A new expiry date label is supplied inside the POD to replace the original label on the parachute.

## *Warning*

***If a POD is used after its use-by date, Dronavia accepts no responsibility for partial or slower deployment of the Parachute Recovery System.***

# PROCEDURE

*of return of the POD for maintenance*

*There are several options for exchanging your POD that is past (or close to) its use-by date:*

## *Buy* 99€

1 Buy a POD in advance from your dealer. You'll be able to continue flying during the annual maintenance of your first POD.

## *Exchange* 49€

2 Return your POD to a reseller and receive a new one at a preferential price.

## *Warning*

***Please plan in advance how long it will take to contact your reseller (order, delivery time, etc.) so as not to exceed the use-by date and jeopardise your flight missions.***

# DISMANTLING
## *of the POD system for maintenance*

*To dismantling the POD from the MVC4 Parachute Recovery System, follow the instructions below in order:*

## *Instructions*

1 Turn off your DJI Mavic 4 drone.

2 Remove the carabiner, then detach the main sling from around the two front arms of the drone. Next, remove the parachute from its mounting bracket.




# DISMANTLING
*of the POD system for maintenance*

3 Remove the adhesive tape from the back of the parachute, then remove the capsule.

4 Remove the canopy from the ejector tube.

5 Send the used POD to Dronavia or your reseller.

# REARMING
## of the Kronos Parachute

TO BE READ CAREFULLY

Once the Parachute Recovery System has been deployed, Kronos systems have been designed to be rearmed quickly, enabling telepilots to resume their missions without undue delay.

Simple reactivation procedures should be followed. As some of them may present risks, it is imperative that you read the instructions in this section carefully.

A use-by date is defined for each POD. Dronavia disclaims all liability and voids the warranty if your POD has exceeded this use-by date.

# REARMING
## of the parachute system

*To rearm your MVC4 Parachute Recovery System, follow the instructions below in order:*

### Warning

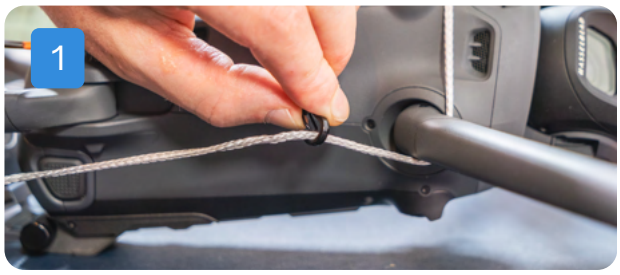
***For reasons of operational safety and to prevent inadvertent deployment, the MVC4 Parachute Recovery System incorporates an automatic lock that prevents deployment at altitudes below 20 metres. This limitation ensures that the parachute system can only be activated in conditions that guarantee the minimum effectiveness of the system. However, manual deployment of the parachute via the Klick trigger remote control remains possible. Be cautious when handling the powered-on parachute to avoid any unintentional ground deployment, which could cause physical injury or material damage.***

### Instructions

1 Switch off your DJI Mavic 4 drone.

# REARMING
*of the parachute system*

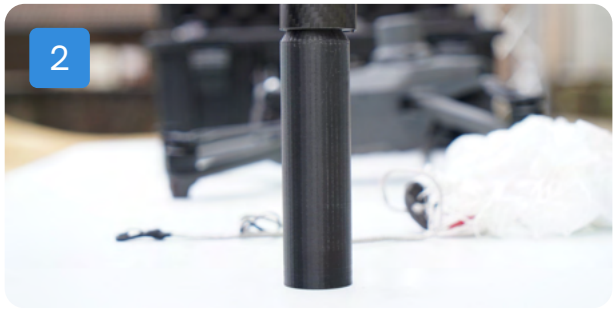
2 Remove the carabiner, then detach the main sling from around the two front arms of the drone. Next, remove the parachute from its mounting bracket.







3 Push the parachute piston back into the bottom of the tube using the tool provided.



# REARMING
*of the parachute system*

4 Take your new POD and remove the adhesive tape to gain access to the canopy.

5 Remove the adhesive from the new POD, then pull the canvas out of the new POD.

# REARMING
## of the parachute system

6 Press the new canopy into the bottom of the tube of your Kronos MVC4 parachute.



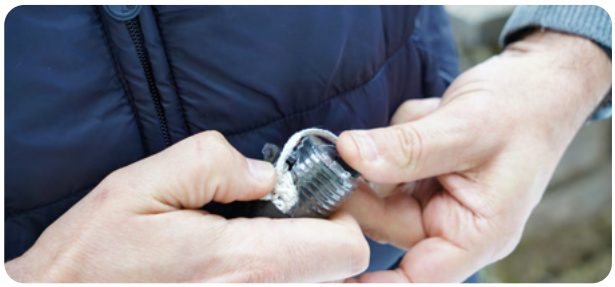

### *Warning*

*Be sure to keep the main sling in line with the canopy when inserting it.*

# REARMING
*of the parachute system*

7 Maintain pressure while pulling the main sling out of the parachute.

8 Press down on the top part of the new POD to exert additional pressure and free up space for your thumb.



## *Warning*

*Remember to maintain firm pressure throughout.*

# REARMING
*of the parachute system*

9 Remove the plastic sleeve surrounding the new canopy by pulling it outwards.

10 While continuing to exert pressure on the inserted cloth, remove the top part of the new POD.

# REARMING
## of the parachute system

11 Position the capsule and close the parachute with it.

### Warning

*Check that none of the canopy lines are blocked by the capsule.*

12 Stick the adhesive tape provided around the flat edge of the capsule.

### Warning

*Position the adhesive tape only on the flat edge of the capsule. If the adhesive tape supplied covers too much of the capsule, there is a risk that the parachute will not deploy or will deploy more slowly.*

# REARMING
## *of the parachute system*

13 The parachute system mounting bracket is already pre-installed on your DJI Mavic 4 drone. Unscrew the tightening knobs, reposition the bracket above the battery compartment, and then insert the battery into the drone.





### *Warning*

***The parachute mounting bracket must be unscrewed using the tightening knobs and then reinstalled when replacing the battery. The bracket can remain in place during transport in its dedicated carrying case.***

14 Leave the parachute mounting bracket in place, then position the parachute module on it before inserting it into its mounting clip. Gently push until the parachute module is fully locked in place.

# REARMING
*of the parachute system*

15 Lower the parachute mounting bracket in front of the drone's battery compartment, then tighten the locking knobs.



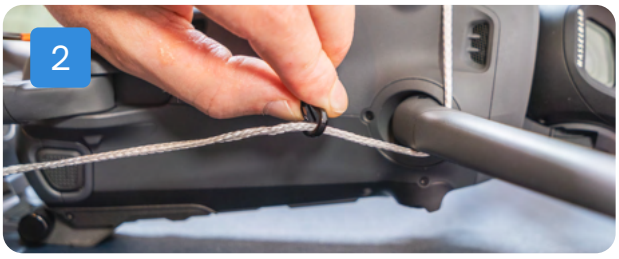


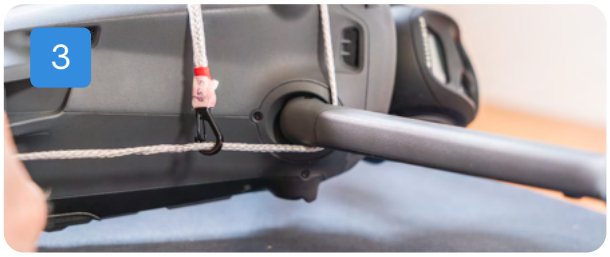
16 Pass the main parachute sling under the right front arm of the drone, making sure it is completely clear and free of any twists.

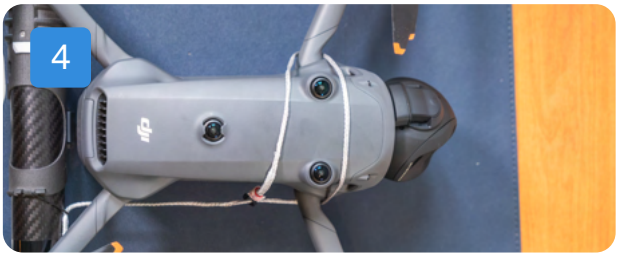
# REARMING
## *of the parachute system*

17 Pass the main parachute sling under the left front arm of the drone, making sure it is completely clear and free of any twists.

18 Hook the carabiner to the main sling by passing it over the drone. Then loop the elastic around both the tube and the main sling. Slide the elastic forward until the main sling is tight.


### *Warning*

*Make sure that the main parachute attachment sling is correctly positioned on the drone's body and does not have any play that could cause contact with the propellers.*

# REARMING
## *of the parachute system*

19 Connect the USB-C cable of your parachute to your drone. The red connector of the USB-C cable must be connected to the drone.

20 ***Each time the POD system is replaced, the information must be entered in the 'List of installations, de-installations and maintenance operations' section on page 54.***

21 ***Your Kronos MVC4 Parachute Recovery System is rearmed.***


YOUR PARACHUTE IS
REARMED!

# PROCEDURE

*for returning a used POD*

*There are several options for returning your used POD:*

## *Buy* 99€

1 Purchase a spare POD from your reseller in advance. This will allow you to continue flying during the annual maintenance of your first POD.

## *Exchange* 49€

2 Return your POD to a reseller and receive a new one, while benefiting from a preferential rate.

## *Warning*

***Please plan in advance how long it will take to contact your reseller (order, delivery time, etc.) so as not to exceed the use-by date and jeopardise your flight missions.***

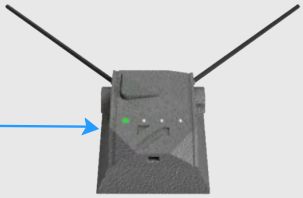

SECTION
KRONOS MVC4
FLIGHT TERMINATION SYSTEM FOR DJI MAVIC 4

# PRESENTATION

*of components*

*Internal FTS module inside the DJI Mavic 4 drone*

*Klick trigger remote control*



# KRONOS MVC4

## Technical specifications

| | |
|---|---|
| TOTAL WEIGHT | *3 GRAMMES* |
| COMMUNICATION WIRELESS RADIO | *SRD860 WITH ENCRYPTED KEY (869 MHZ / 100 MW)* |
| RANGE OF THE KLICK REMOTE CONTROL | *1500 METERS** |
| AUTONOMY KLICK REMOTE CONTROL | *30 HOURS* |
| OPERATING TEMPERATURE | *-5°C À 40°C* |

**The range can be up to 1.5 km, under optimum conditions and in an environment free of obstacles and interference.*

# DESCRIPTION
*of the Flight Termination System*

## Description

The Kronos MVC4 Flight Termination System, developed for the DJI Mavic 4, prevents a drone equipped with it from leaving its regulatory flight envelope by cutting (manually or automatically) the drone's power supply in less than a second.

## Installation

The Kronos MVC4 Flight Termination System is installed between the autopilot and the drone's ESCs. It enables the motor control signal to be switched off.

## Initialization

To start the Kronos MVC4 Flight Termination System, switch on your DJI Mavic 4 drone and the Flight Termination System will switch on automatically, then switch on your Klick trigger remote control by pressing and holding the start button. Activation is described in detail on page 81.

## Activation

In order to keep the possibility of activation at your fingertips and to be as reactive as possible, a simple gesture allows you to cut the drone's power supply and deploy your parachute (if your drone is equipped with one). Simply press the triangular button on the Klick trigger remote control for at least 1 second. Activation of the MVC4 Flight Termination System is described in detail in the Klick trigger remote control user manual.

# INITIALIZATION
*of the Flight Termination System*

*To switch on the MVC4 Flight Termination System, follow the instructions below in order:*

## *Instructions*

1 Switch on your DJI Mavic 4 drone. The MVC4 Flight Termination System will switch on automatically.

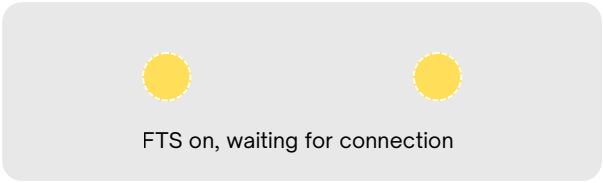
2 Switch on your Klick remote control. When the Flight Termination System is properly connected, a cyan blue LED flashes on the Klick trigger remote control.

3 ***Your FTS Kronos MVC4 is initialization started.***

# INITIALIZATION

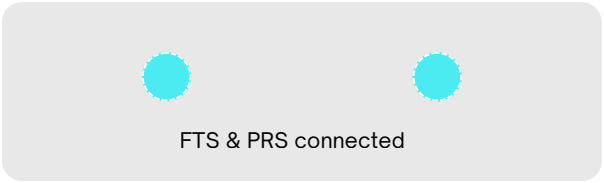
*of the Flight Termination System*

## *The different LED states*



FTS on, waiting for connection

SLOW FLASHING



FTS & PRS connected

SLOW FLASHING AUDIBLE BEEP


YOUR FTS IS ACTIVE
AND OPERATIONAL!

# MANUAL

*activation of Flight Termination System*

*To activate the MVC4 Flight Termination System, follow the instructions below in order:*

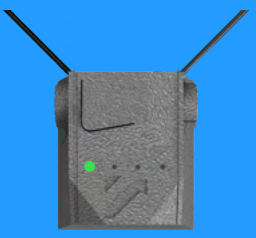
## *Instructions*

1. Find out how to activate your Kronos MVC4 Flight Termination System manually using our user and instruction manual for the Klick trigger remote control.

# KLICK

## *Manual activation of the Flight Termination System*

CONSULT THE KLICK USER MANUAL



# AUTONOMOUS

## *activation of Flight Termination System*

*To automatically activate your MVC4 Flight Termination System, follow these instructions in order*

## *Instructions*

1 Switch on your DJI Mavic 4 drone. The Flight Termination System will switch on automatically.

2 Switch on your Klick trigger remote control. When the MVC4 Flight Termination System is properly connected, a cyan blue LED flashes on the Klick trigger remote control.

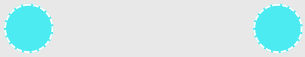
3 When the parachute is deployed, the Flight Termination System is automatically activated via a secure wireless link, established beforehand by Dronavia experts through precise pairing between the two modules.

# AUTONOMOUS

*activation of Flight Termination System*

4 ***Your FTS Kronos MVC4 has been triggered.***

## *The different LED states*



FTS & Parachute connected

SLOW FLASHING AUDIBLE BEEP

FTS triggered & PRS deployed
with Autonomous Deployment

RAPID FLASHING AUDIBLE BEEP

# PROCEDURE

*of Flight Termination System Test*

*Before the flight or before the first flight of the day, you can test the MVC4 Flight Termination System. Follow the instructions below in order:*

## *Instructions*

1 Install the parachute system onto its bracket. Connect the parachute's USB-C cable to the DJI Mavic 4 drone.

## *Warning*

***The parachute must be installed and connected to the drone. Rest assured, an automatic lock prevents any deployment below 20 meters of altitude, ensuring optimal ground safety during the Flight Termination System test.***

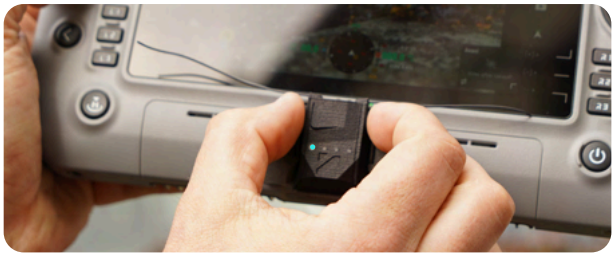
2 Insert the battery, then power on your DJI Mavic 4 drone. Next, switch on the DJI remote controller. Finally, turn on your Klick trigger remote. Make sure the LED on the Klick remote is flashing cyan blue.

# PROCEDURE
*of Flight Termination System Test*

3 Arm the motors and initiate rotation while keeping the DJI Mavic 4 drone firmly on the ground.

*If all four motors are running and no error message appears on the screen, proceed to test step 4. Otherwise, check the installation of the Flight Termination System.*

4 Stop the motor rotation by pressing the trigger button on the Klick remote control. Check that the motors stop correctly and that the cyan blue LED flashes rapidly on the Klick remote control and on the parachute.



5 Perform a final flight test with the Flight Termination System powered on, without triggering it. If the flight proceeds normally and no error messages appear, the FTS is operational.

## *Warning*

*This final flight test (step 5) does not involve triggering the Flight Termination System in flight. For this step, simply perform a flight with the drone and check if any error messages appear during the flight. Warning: activating the Flight Termination System in flight will inevitably cause the drone to fall.*

# STOP
## *of Flight Termination System*

*To stop, switch off and reset the MVC4 Flight Termination System, follow the instructions below in order:*

### *Instructions*

1 Switch off your DJI Mavic 4 drone and the MVC4 Flight Termination System will automatically shut down.

2 Switch off your Klick trigger remote control.

# DISMANTLING
## of Flight Termination System

*Dismantling the MVC4 Flight Termination System requires a workshop intervention, so that our qualified technicians can carry out this operation in complete safety.*

### Warning

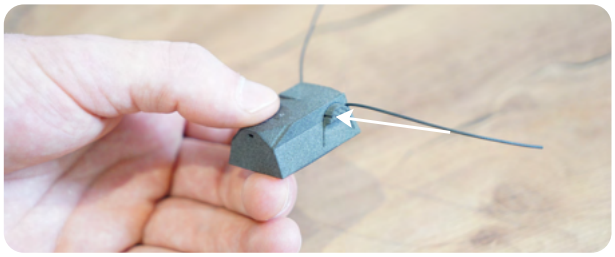
***If you dismantle or modify the MVC4 Flight Termination System yourself, Dronavia will not accept any responsibility and will void the warranty on your system.***

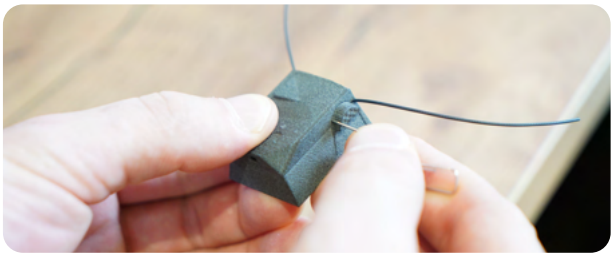
# RESET
## *of Flight Termination System*

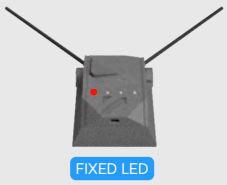
*In the event of a malfunction or any bug, follow these instructions in order:*

### *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 safety accessorie in a dry place, at a temperature between 10°C and 30°C, clean and protected from UV light.

## SPECIFIC MAINTENANCE

In the event of contact with moisture, chemicals or other substances, the POD must be replaced immediately.

## WARRANTY

Dronavia takes great care in the design and production of its products. We guarantee our C5 conversion kit for one year from the date of purchase against any defect or design fault that may arise during normal use of the product. Any abusive or incorrect use, or exposure to aggressive factors (high humidity, excessively high temperatures, etc.) that could lead to damage will invalidate this warranty. It is strictly forbidden to replace the batteries in the drone when it is switched on (Hot Swap), as this may damage the system and invalidate the warranty.

## NOTICE OF LIABILITY

Flying a drone, whether manual or automatic, is an activity that requires attention, specific knowledge and good judgement. Be cautious, get trained in appropriate structures, take out insurance and comply with the requirements defined by the DGAC decrees of 11 April 2012 and 17 December 2015 and the EASA.

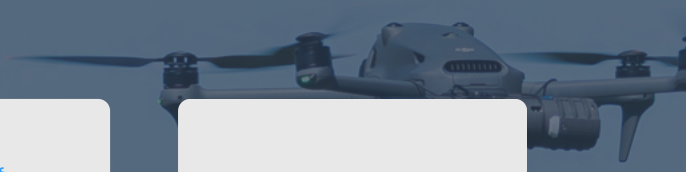
Ask our sales team your questions

# 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 class C5 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

# CONTACT US

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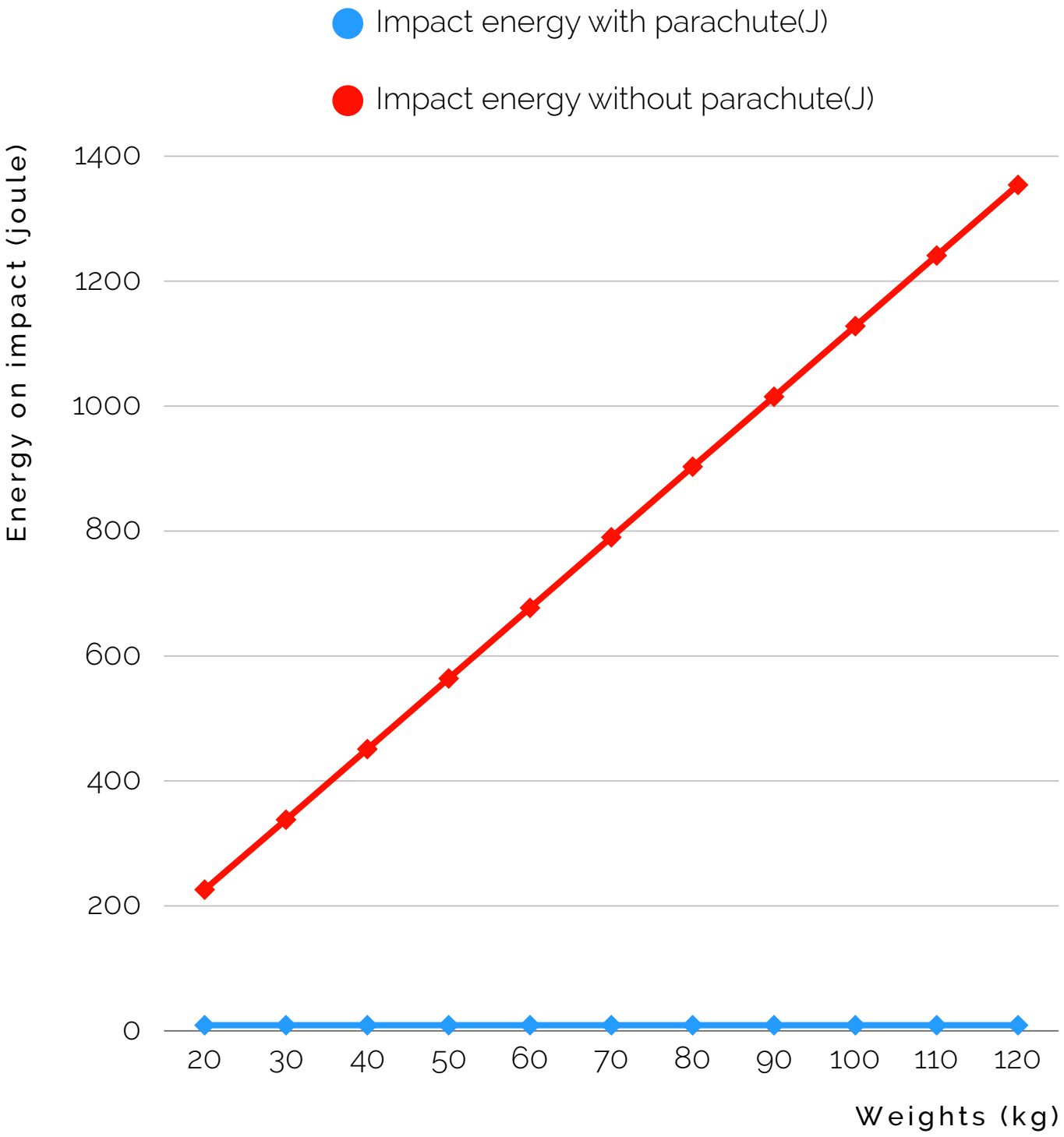
# APPENDICES

*Impact energy (joule) / Altitude (metres)*



# APPENDICES

*Falling speed (m/s) / Weight (kg)*

| Weight (kg) | Falling speed (m/s) | Fall speed without parachute (m/s) * (m/s) |
|---|---|---|
| *1.20 kg* | *3,86 m/s* | *25.8 m/s* |

*for a fall from a height of 20 metres

# APPENDICES

## Deployment height (m) / Minimum extent of buffer zone for ground-related risks (m)

| OPERATING VOLUME VERTICAL LIMIT | SOIL-RELATED RISK BUFFER ZONE |
|---|---|
| 30 | 140 |
| 40 | 182 |
| 50 | 223 |
| 60 | 265 |
| 70 | 306 |
| 80 | 348 |
| 90 | 389 |
| 100 | 431 |
| 110 | 472 |
| 120 | 514 |

*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.*

# DECLARATION

compliance with C2 class