

# SKYCAT PARACHUTE SYSTEM

USER MANUAL v2.1 - 1/2018

DJI INSPIRE 2



*Thank you for choosing Skycat.pro!*

*We want to offer uncompromised customer service to all our old and new customers. Our team has years of experience in various fields of the UAV industry and based on this experience and feedback from our clients, we recognize the importance of customer-oriented approach. Our first goal is to stand out from the crowd, in a positive way.*

*Please read and follow the instructions carefully. This manual is updated regularly. In case you have any questions, ideas or feedback, please don't hesitate to contact us at [www.skycat.pro/contact](http://www.skycat.pro/contact)*

***Fly safe!***

*Skycat team*

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## Introduction and important knowledge

*Please read and follow these instructions carefully to ensure successful operation and to stay within warranty limits.*

*This user manual aims to describe how to operate and maintain the pre-assembled Inspire 2 bundle package. Not all steps of assembly are included.*

*We recommend launching your Skycat system a few times as an exercise, before using in-flight. Careful installation is essential in order to achieve best possible performance.*

*In case of any uncertainty, please don't hesitate to contact us for assistance.*

*Latest manuals and videos are available at: [www.skycat.pro/downloads-1](http://www.skycat.pro/downloads-1)*



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## How does Skycat.pro parachute system work?

*Parachute is folded into a compact package and slid into the Skycat launcher.*

*Skycat Trigger connects the launcher to power and control sources. Trigger is controlled via the PWM channel of Skycat Rescue Radio receiver, or any other standard RC PWM source.*

*Launcher's spring-loaded piston is armed with a wire fuse. After the trigger receives a launch signal, it allows current flow to the fuse.*

*The fuse heats and snaps in a fraction of a second, releasing the piston and ejecting the parachute away from the propellers.*



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# Safety

## General safety

- *Only launch Skycat towards free airspace. Never point or launch towards people or animals.*
- *Do not expose Skycat system to rain or use near flammable materials.*
- *Don't try to repair damaged components. Contact Skycat for repair and spare part services.*
- *Only use to protect stable aircraft. Not suitable for aerobatic flying.*
- *Use reliable, digital RC control systems to reduce risk of unwanted eject.*
- *Use of excessive force should not be required at any point of arming, loading and installation process.*



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## Skycat launcher unit

- *Do not trigger Skycat launcher empty. Piston may slide out and break.*
- *Do not eject on grass, sand or other loose materials. Airflow generated by the piston can lift debris into the launcher.*
- *Only use Skycat launcher to eject a parachute and not other items.*
- *Use of safety goggles is recommended while arming the launcher.*
- *If launcher stays loaded over two months without launching, it is recommended to open and refold the parachute. This may decrease deployment time in an emergency .*
- *Do not swing loaded launcher around. G-forces can slide the parachute out accidentally.*
- *Only use original Skycat cloth for parachute folding.*
- *Mount Skycat launcher without applying pressure to the launcher tube to avoid jamming of the piston.*
- *Use high leverage pliers to squeeze Fuse locks properly. Incorrectly squeezed fuse can cause an unwanted launch!*

## Skycat trigger unit

- *Do not connect a fuse directly to the trigger output.*
- *Only use trigger to conduct current through an armed Skycat launcher.*
- *Handle and mount trigger carefully, components are not protected against mechanical impact.*
- *Incorrect connections may damage the trigger (wrong polarity).*

# Everyday operation

## Powering on the parachute system

1. Power on Skycat Rescue radio.



2. Connect battery to the parachute system. Close battery compartment lid securely. System is now ready to use. Yellow LED indicates system status (page 17).



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## Charging the battery

Follow charger instructions. Supplied charger is a common, balancing LIPO charger. Charger type may vary.

Rescues Radio and launcher batteries are typical LIPO batteries and can be charged with any LIPO charger.

### Stock battery specifications

Aircraft battery: LIPO 3 cell 800 mAh. XT60 connector.

Skycat Rescue Radio: LIPO 3 cell 800 mAh. JST connector.



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# Preparing the parachute system

## Creating a fuse

1. Measure and cut fuse wire. X48-CF launcher: 120 mm long fuse wire.
2. Loop both ends of the wire through the fuse locks. Leave 3mm gap between wire ends!
3. Carefully squeeze fuse locks in place, using high leverage pliers.

Two correctly crimped locks offer required strength to operate in any condition. However, our recommendation is to use four locks, when parachute system is used in-flight.

### **Important**

Only use genuine Skycat FUSE® wire. Using other wire may damage the system.



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## Launcher arming

*Always detach launcher from the aircraft while arming.*

*Hold the launcher firmly, launcher spring is strong. Use of safety goggles is recommended.*

*Make sure that the fuse contacts the pins at both ends, before sliding in the folded parachute.*

*Arming Demonstration: [www.tinyurl.com/skycat-launcher-arming](http://www.tinyurl.com/skycat-launcher-arming)*



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## Parachute folding

- *Always fold on a clean and dry surface. Wrap Skycat parachute cloth around the parachute so that **black side faces out**.*
- *If launcher stays loaded for over two months, it is recommended to refold the parachute. This can decrease deployment distance in an emergency.*
- *Opale Paramodels parachutes can come with a red bag attached. The bag is not needed with Skycat parachute launcher and **should be removed**.*

*Fruity Chutes IFC-48-SUL with shock cord (extension cord)*

[www.tinyurl.com/skycat-demo-48sul](http://www.tinyurl.com/skycat-demo-48sul)

*Opale Paramodels 1.8sqm without shock cord (extension cord)*

[www.tinyurl.com/skycat-demo-opale1-8](http://www.tinyurl.com/skycat-demo-opale1-8)

## Extension cord and parachute shroud lines

*Optional extension cord (also called “shock cord”) can be added in between parachute and copter. It reduces the risk of parachute entanglement and stabilizes descent.*

*Fruity Chutes IFC-48-SUL allows parachute shroud lines to be folded securely between the parachute folds, reducing the risk of entangling. Extension cord is folded into the launcher, below the parachute.*

*When using an Opale Paramodels parachute, parachute shroud lines cannot be folded between the parachute folds. Shroud lines and extension cord are folded into the launcher, below the parachute package.*

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## Mounting to Inspire 2

Video demonstration: [www.tinyurl.com/skycat-inspire2](http://www.tinyurl.com/skycat-inspire2)

Attach the launcher to the mount using supplied thumb screws. Check screw tightness regularly. Do not use thread-locker.



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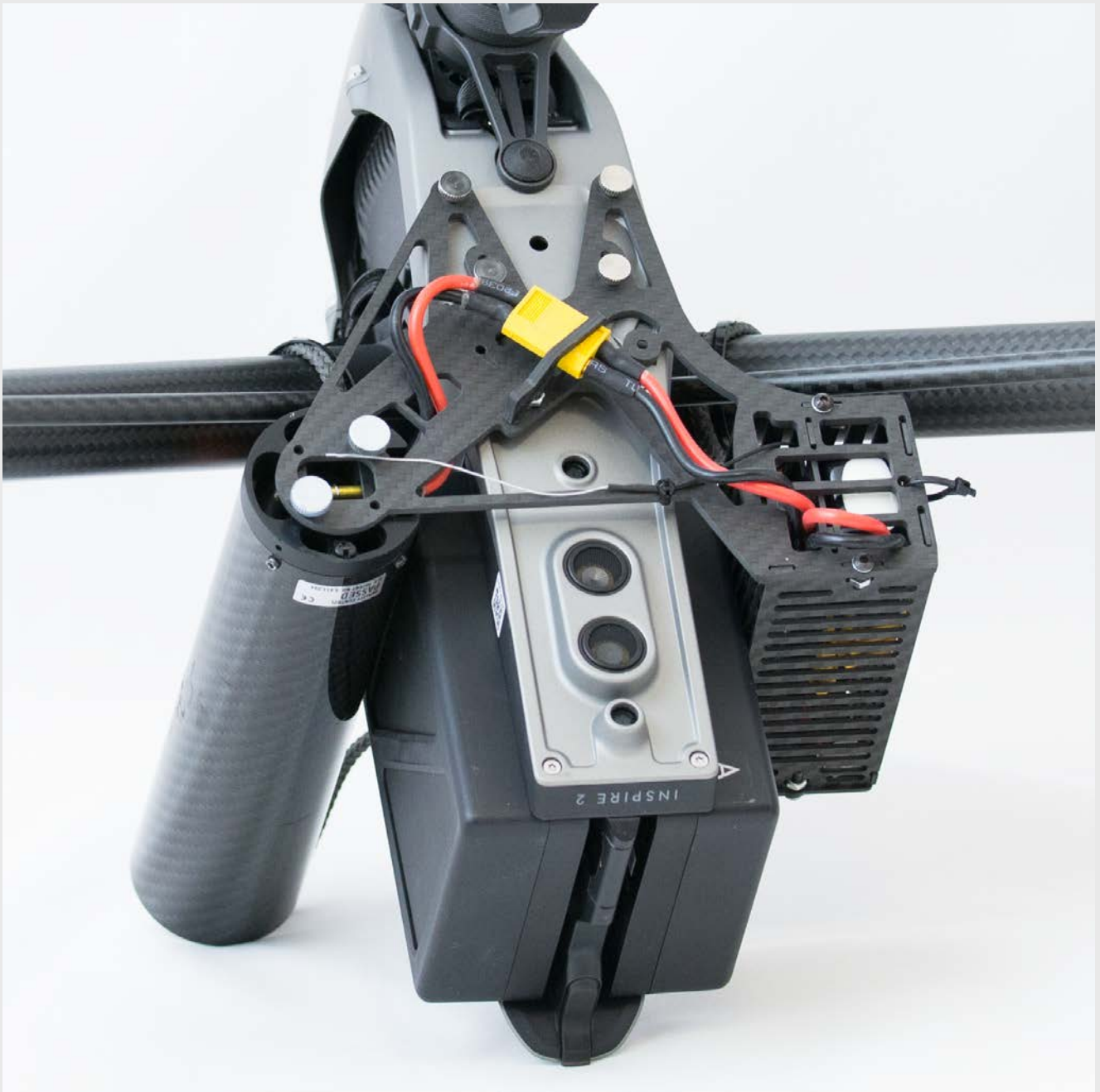
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## Parachute system

*Skycat parachute system is mounted to the “Extended device mounting” bay of Inspire 2. For more information, please check page 9 in the DJI Inspire 2 manual.*

*Use four supplied thumb screws for fastening. Check screw tightness regularly and use soft thread-locker fluid if necessary.*



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## Harness

1. Loop harness around the arms and tighten.
2. To prevent sliding, secure harness with cable ties.



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*Harness lines and parachute cord are joined with a quick lock.*



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## Rescue radio

1. Mount Skycat Rescue Radio to the handle of DJI Lightbridge transmitter.
2. Mount external launch button onto a preferred location using double sided tape.
3. Secure the cable in place with a cable tie (near the launch button, to relieve strain and to prevent cable failure).



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# Trigger unit

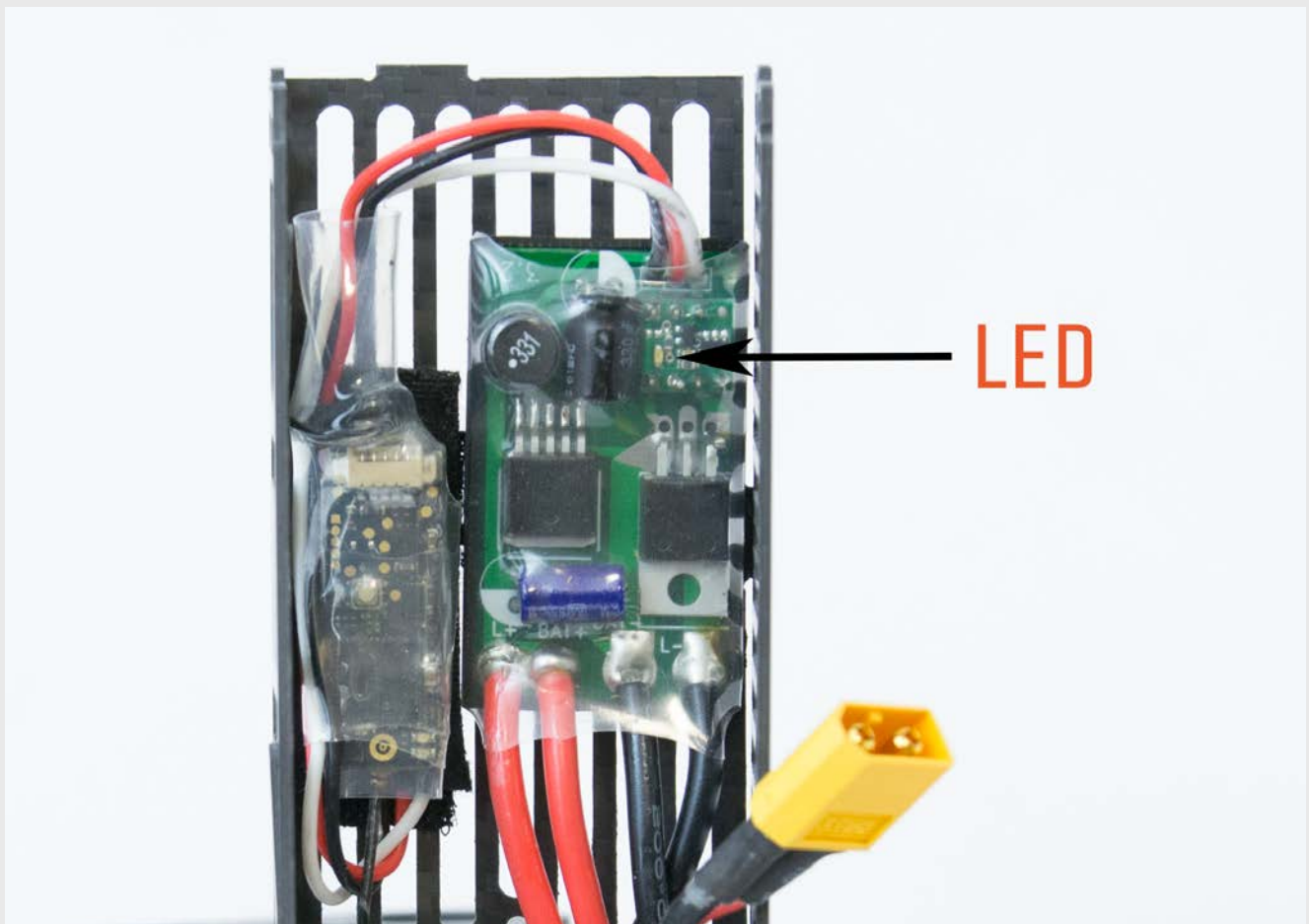
## LED explanation

- Short blink, long pause      Standby, waiting for launch signal.
- Nearly continuously lit      Launch activated.

## Errors

- Long blink, long pause      No signal from receiver.
- Double blink      Launch signal detected at power up\*

*\*If launch is activated when battery is connected, parachute will not be ejected. Trigger will not accept eject command until channel is toggled OFF and ON, i.e Rescue Radio is switched OFF and ON.*



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# Rescue Radio

Skycat Rescue Radio supports TBS Crossfire Micro TX (100mW) and TBS Crossfire TX (500mW) RC transmitter modules. Both versions come pre-configured to operate in non-limited adaptive power mode (outputs 100mW / 500mW if required).

Please check your country's regulations and re-configure if required. Do not operate using illegal power output. Please contact TBS or Skycat for more information.

TBS Crossfire Micro TX manual (100mW): [www.tinyurl.com/crossfire-micro-tx](http://www.tinyurl.com/crossfire-micro-tx)

TBS Crossfire TX manual (500mW): [www.tinyurl.com/crossfire-tx](http://www.tinyurl.com/crossfire-tx)

## LED explanation

- |                    |                                          |
|--------------------|------------------------------------------|
| • Continuous green | Battery full.                            |
| • Blinking green   | Battery half full.                       |
| • Continuous red   | Battery almost empty, recharge required. |
| • Blinking red     | Launch activated. Power cycle to reset.  |



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# Recommended testing before first flight

*We recommend launching your Skycat system a few times as an exercise, before using in-flight. Careful installation is essential, to achieve best possible performance.*

*Do not launch on grass, sand, or other loose material. Airflow generated by the piston can suck debris into the launcher. Do not touch the fuse immediately after launch, it can remain hot for a while.*

- 1. Support the launcher against a clean surface and point towards free airspace at a 30 - 45 degree angle.*
- 2. Press Rescue Radio eject button.*

## **What should happen**

- Parachute should fly as far as the lines allow it to fly.*
- Lines should be untangled.*

## **What should not happen**

- Parachute should not get stuck or fall near the launcher.*



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# Check procedures

## Before-flight checklist

Confirm that:

- *All components are undamaged.*
- *Launcher is connected to the trigger unit.*
- *Trigger unit is in standby mode (short blink, long pause) after powering Rescue Radio and parachute system.*
- *Parachute cord is connected to the harness properly.*
- *All screws are tight.*
- *Battery compartment lid is securely closed.*

## After-launch checklist

Check components and functionality after every launch. Confirm that:

- *Parachute and harness lines are not damaged.*
- *Launcher spring is securely connected to the piston and base.*
- *Launcher tube and base are undamaged.*
- *Wires are securely fastened and undamaged.*
- *Trigger functions properly.*

## Trigger functionality

We recommend testing trigger functionality regularly.

- 1) *Disconnect launcher from the trigger unit.*
- 2) *Connect a multimeter or a suitable light bulb to the trigger output.*
- 3) *Power on your Rescue radio and parachute system.*
- 4) *Press the Rescue Radio eject button.*
- 5) *Check that trigger outputs voltage / bulb lights up. Remember to re-connect launcher before flying!*



## Basic maintenance

*We recommend a basic maintenance check after every 10 flights.*

*Confirm that:*

- *Parachute harness lines are undamaged and away from sharp edges.*
- *Wires are undamaged and away from sharp edges.*
- *Launch battery is in good state. Replace if:*
  - *Cell voltages show abnormal differences.*
  - *Battery is swollen or gets hot when charged.*
  - *You notice an abnormally long delay between launch command and launch during ground testing.*

*If launcher stays armed for more than two months without launching, take out and repack the parachute. This can decrease the opening distance in an emergency.*

### **IMPORTANT**

*Do not use or try to repair damaged parts! Skycat offers extensive repair and spare part services, don't hesitate to contact us.*

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## How and when to use skycat.pro parachute system

*Only use Skycat parachute system in the event of emergency or for testing, not for regular landings. Skycat is designed to reduce the impact energy of your aircraft. It does not remove the possibility of damage to people, surroundings or to your aircraft. Do not take unnecessary risks when planning your flights. Never fly above crowds!*

*In an emergency, seconds count. Eject parachute as soon as you're certain the aircraft is no longer in your control. Aircraft with no gliding surface can reach very high velocity after only a few seconds in a free fall.*

*We highly recommend regular training to improve reaction time and accuracy in emergency situations. Landings can be hard despite the use of Skycat.*

*All testing is conducted at your own risk. Skycat is not liable for any damages. For more detailed information, please read disclaimer (page 24).*



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# System specifications

**Operating temperature range:** -25°C to +40°C (-13°F to +104°F)

## **X48-CF launcher specifications**

- X48-CF launcher is made of carbon fiber combined with precision NC machined POM plastics.
- Diameter: 48 mm / 1.89 in.
- Length: 203 mm / 7.99 in.
- Weight 126 g / 4.44 oz.

## **Fruity Chutes IFC-48-SUL specifications**

- Weight: 75 g / 2.6 oz.
- Maximum payload: 9 kg / 19.7 lbs.
- Manufacturer's size data: Effective diameter when deployed 1,22 m / 48 in.

## **Opale Paramodels 1,8 m2 specifications**

- Weight: 80 g / 2.82 oz.
- Copter recommended weight 2 - 3 kg / 4.4 - 6.6 lbs.
- Copter max. weight 5,5 kg / 12.1 lbs.
- Manufacturer's size data: Canopy fabric area 1,8 sqm.

## **Battery specifications**

Supplied aircraft battery: LIPO 3 cell 800 mAh. XT60 connector.

Supplied Skycat Rescue Radio battery: LIPO 3 cell 800 mAh. JST connector.

## **Skycat V3 Pro trigger unit specifications**

- Min voltage: 3 cell Li-Po (11,1 V).
- Max voltage: 6 cell Li-Po (22,2 V).
- Required battery specs: Sufficient C value, able to provide 30A continuous and 70A peak current in all working temperatures.
- Voltage output: 5V / 500 mA.

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## **Skycat Rescue Radio Specifications**

- Operation voltage: 3 cell Li-Po (11.1V).
- Supported modules: TBS Crossfire TX / TBS Crossfire Micro TX.
- Supports binding to multiple receivers simultaneously.
- Pre-configuration: Unlimited adaptive mode. Check your country's regulations before operating. Re-configure if necessary. (page 18).

## **Disclaimer**

***Skycat is a backup system designed to help decrease the kinetic impact energy of your multicopter, UAV or radio-controlled model in the case of an emergency.***

*Skycat cannot prevent your multicopter, UAV or radio controlled model from causing damage or even death at impact. It is only designed to eject a parachute in order to decrease the velocity of your aircraft in an emergency situation. Skycat is strictly a backup device and does NOT replace proper training and timely execution of appropriate emergency procedures.*

*Skycat is an electromechanical device and as such, it can fail to work properly which can result in false activation or no activation at all. Such failure can cause injuries or death.*

*In the case of a false activation or inappropriately timed intended activation, the ejection of the parachute can cause your multicopter, UAV or radio controlled model to fly further and cause more damages, than it would have caused, had it crashed to the ground in a free fall.*

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