



SAFEAIR

Mavic Parachute Manual
ASTM Version



PARAZERO
DRONE SAFETY SYSTEMS

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Important Notice

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Congratulations on your purchase of the SafeAir Mavic Safety System!

This manual explains how the SafeAir Mavic system works and how to properly operate the system on the ground and in the air. Be sure to take the time to read this manual carefully in order to increase your safety and the safety of those around you.

The SafeAir Mavic system is a smart-parachute system that deploys autonomously after detecting a critical failure in your drone. The parachute slows the descent rate of your drone and reduces the kinetic energy upon impact.

Note – Using the SafeAir Mavic System does not eliminate all risk of drone operation. Please fly responsibly and in accordance with the rules and regulations defined by authorities in the area where you are operating.

Visit the ParaZero website (www.parazero.com) on a regular basis for the latest information and updates.

General

ParaZero's SafeAir Mavic is a low altitude, autonomous parachute-based safety system.

The SafeAir Mavic System and the ASTM Professional Kit is compatible with the Mavic 2 Pro, Mavic 2 Zoom and Mavic 2 Enterprise series (without modular accessories).

The average measured descent rate of the Mavic with an open parachute is **3.9** meters per second (**12.8** feet per second).

The Minimum Flight Altitude as defined by ASTM F3322-18 is **19.11** meters (**62.7** feet).

Main Features

- Unique parachute deployment system that opens in a fraction of a second, even at zero speed.
- Autonomous emergency identification and activation capabilities.
- Electro-mechanic flight termination system.
- Audio-warning buzzer to alert bystanders of falling drone.
- Remote control manual triggering capabilities.
- Access data logs from black box via the desktop application.

Safety Instructions

The ParaZero SafeAir Mavic is a drone safety system, designed to deploy instantaneously by using a powerful spring-based mechanism.

Be careful not to lean against, press or drop the system.

It is imperative to perform system updates on a regular basis through the desktop application. **The current version number is found on the product webpage: www.parazero.com/mavic under the software tab. A new device must be updated before first flight.**

Warning



Do not move the drone or system while the system is armed (green LED).

An angle breach may cause the system to deploy. The parachute and cover will be projected at high speed and may cause injuries.

Turn the system off immediately after landing.

Caution



The SafeAir Mavic System is not intended for use in **Sport mode**.

The **CSC function** (Combination Stick Command) is not supported.

SafeAir System Package Content

A. SafeAir Mavic System
and connected safety catch



B. Safety insert C. Placement stamp x 3



D. Placement tool



E. USB-C cable



F. Mavic Pro adapter
(not for use with ASTM version)



G. Alcohol pad



Professional Kit and RC System Package Content



1. ASTM Add-on



3. DANGER stickers



2. Dual Lock placement stamp



4. Placement (for SafeAir Phantom only)



6. Antenna



5. Remote controller

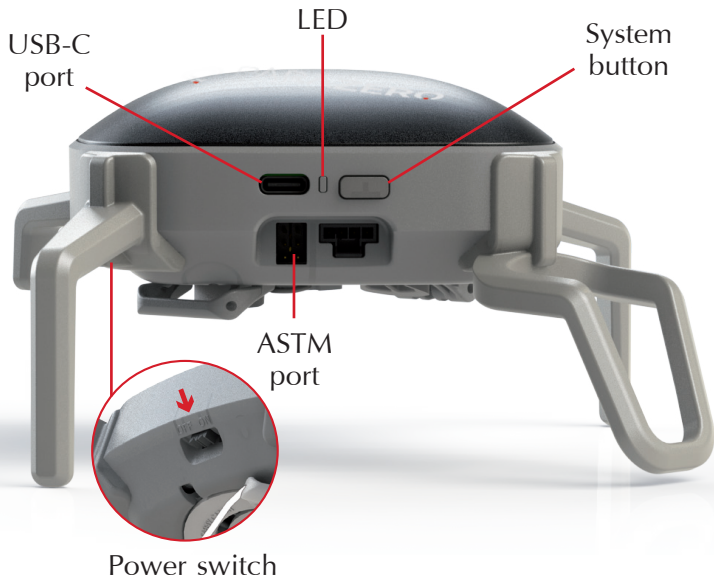


7. Receiver



8. Micro USB cable

SafeAir System Ports & Switches



RC System Ports & Switches



Installation Step 1

Before you start the installation, make sure to update your device using the desktop application. Place the drone with the battery facing towards you and unfold its arms, but don't attach the propellers yet. Unfold the placement tool and place it on the drone, so that the camera side arrow is placed above the camera and the motors' pins are inserted into the marked holes. Use the "Mavic 2" holes.



Caution



Follow installation instructions carefully. Systems that are not installed correctly may interfere with the spinning rotors.

Installation **Step 2**

Clean the area of the hole in the placement tool using the alcohol pad, remove the sticker cover from the placement stamp and stick it, by placing it carefully through the hole in the placement tool.

Remove the placement tool and verify that the placement stamp is still securely in place.



Installation Step 3

Unbox your Professional Kit and RC package and place it next to the drone together with the SafeAir Mavic.



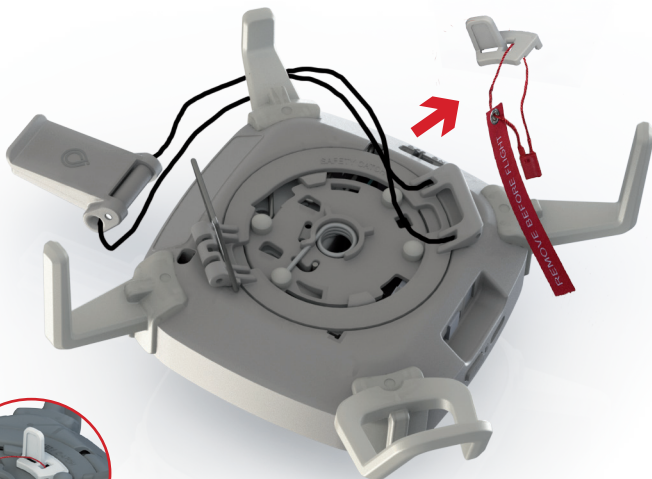
Installation Step 4

Remove the sticker cover from the Dual Lock placement stamp and stick it just below the battery to the left side of the Mavic.



Installation Step 5

Remove the safety catch from the bottom of the system and store it in a safe place for reuse during transport.



Installation Step 6

Preflight note: Turn the Mavic on now, as the SafeAir Mavic is placed on top of the power button. Place the harness cord under the center of the drone with the SafeAir Mavic System placed upside-down to the left of the drone, while the string holder is adjacent to the drone.



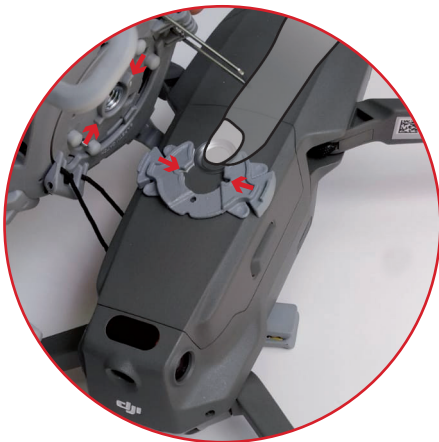
Installation Step 7

Slide the metal hook away from the base and place the SafeAir Mavic System by matching the three plugs at the bottom of the system inside the corresponding sockets of the placement stamp, (See close-up on the next page).



Installation Step 8

Match plugs to sockets.



Installation **Step 9**

Hang the harness on the metal hook and lock the handle upwards, **but don't over – tighten it**. Watch your fingers while doing so.



Installation Step 10

Position the string at the bottom part of the drone as shown in the illustration to avoid sensors interference.



Installation **Step 11**

Gently wiggle the system to confirm that it is securely in place.

If the harness cord is not tight enough, repeat the last step while placing the harness in a higher position.

Caution



Over tightening the harness cord might harm the system.

Caution



Do not lift the drone from the SafeAir System as this may cause the system to deploy unintentionally.

Installation Step 12

Verify that the cord is placed within the Dual Lock fibers.



Installation **Step 13**

Unhook the elastic band on the Add-on device.



Installation Step 14

Place your receiver unit on the Add-on device, while maintaining the orientation shown in the photo.



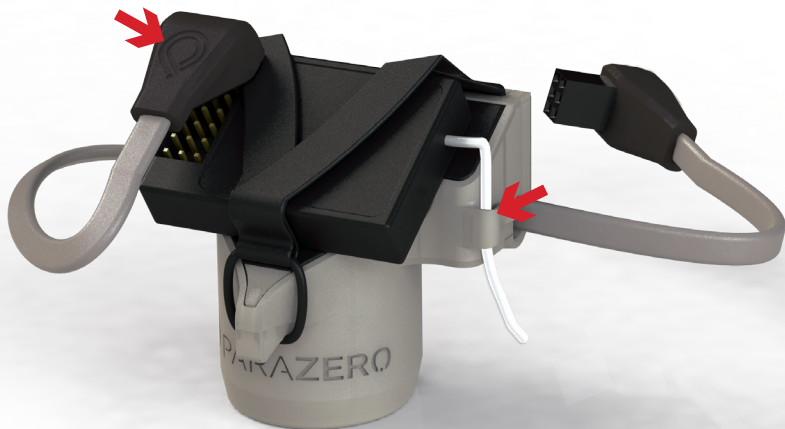
Installation **Step 15**

Fasten the elastic band to keep the receiver unit in place, verify it is secured.



Installation Step 16

Connect the RC cable (the smaller connector) to the receiver's socket and gently secure the antenna, while maintaining the orientation shown in the photo.



Installation **Step 17**

Fold the ASTM cable (the bigger connector) to pass between the two right rubber bands.

✓ Correct

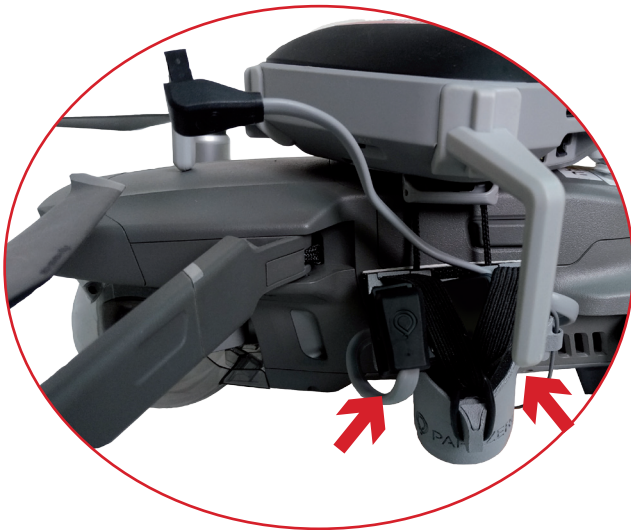


✗ Incorrect



Installation **Step 18**

Firmly attach the Add-on device to the placement stamp.



Installation Step 19

Connect the ASTM cable of the Add-on device to the SafeAir Mavic's ASTM port. Maintain the orientation on the drone as seen in the photo. Verify that the cable isn't placed between the SafeAir Mavic and the drone.



Installation Step 20

Place the DANGER sticker in the orientation shown below, so that it covers the ParaZero logo. Verify that the rotors can rotate freely.



System Operation Step 1



Verify that the batteries are charged before each flight. To charge the SafeAir's battery, use the USB-C port. The minimum charging time before first flight is one hour.

Caution



Batteries that are not fully charged may not be able to operate towards the end of a long flight. If the LED turns orange on initialization, charge the system for at least **30** minutes before take-off.

System Operation **Step 2**

Before first use:

1. Charge the RC using the provided USB cable for at least one hour
2. Connect the antenna to the RC

The Add-on device and the receiver operate seamlessly once connected to the SafeAir system.

Warning



Make sure the Add-on device is firmly connected to the drone, and its cable are connected to both the SafeAir system and the receiver unit before flight

Warning



When the RC is turned off or there is no link between the RC and the receiver, manual triggering is not available

Caution



Charge the RC while it is turned off

System Operation Step 3

Prior to takeoff, verify that the system is placed firmly in the center of the drone and that the drone's propellers can spin freely without touching the system.



System Operation **Step 4**

To activate the system, verify that the system is on a level surface and turn the power switch to the ON position. If it is already ON, turn it OFF and then ON again. A starting sequence initiates, and the LED turns green and then yellow for about 20 seconds. If the yellow LED is flashing, then the system is not on a level surface. After the system is on and ready in Standby mode, a blue LED appears.



System Operation Step 5

The system is now ready for flight. After first installation and when required, perform Mavic compass calibration. The system autonomously detects takeoff (~3m above takeoff level), switches to Armed mode and the LED turns green. Once it's armed, a single beep will sound. Note: Systems that are configured for manual RC triggering will not switch to Standby/ Armed mode unless an RC receiver is properly connected and configured.

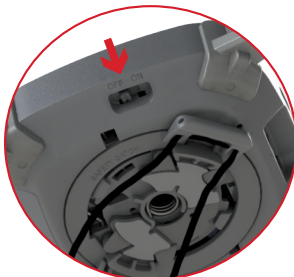


System Operation Step 6

After landing, the system autonomously disarms, the LED turns blue a few seconds after rotors stop and two beeps will sound.

Turn off the rotors and switch the SafeAir's power switch to the OFF position before moving the drone.

Warning As a precaution, always turn the system off before moving it. Failure to do so could initiate system deployment. Inspect your system. Verify that the system is not damaged and that the rotor stoppers are intact.



Deployment

The SafeAir Mavic includes an Autonomous Triggering System (ATS) that identifies most of the known critical failures and triggers the system autonomously. Should an emergency situation occur, the system deploys the parachute, stops the rotors and sounds an audio-warning buzzer to alert bystanders of the falling drone.

In addition to the ATS, the SafeAir system may also be triggered manually by the RC signal through the receiver unit installed on the Add-on device. In order to manually trigger the system, press and hold the RC Trigger switch until the RC LED turns solid red accompanied by 3 short repeating beeps. The RC keeps sending a trigger signal for 3 seconds after the release of the Trigger switch.

The system can only deploy when it is in Armed mode (green LED). Following a deployment, the LED turns red. To switch to Standby mode, reset the system by turning the power switch OFF and then ON again. The LED should turn blue after approximately 20 seconds.

Repacking

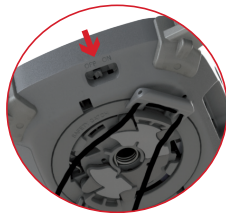
Caution



For professional SafeAir Mavic Systems that comply with ASTM F3322-18 and are intended for flight over people, parachutes must be packed and repacked by ParaZero (or by an entity that has been certified by ParaZero).

After the system has deployed, make sure to turn the power switch to the OFF position. Contact us at support@parazero.com for the deployment analysis and repack procedures.

Important – The SafeAir Mavic System withstands significant force during deployment. Systems that have been deployed five times must not be repacked and reused, and should be replaced.



System Removal **Step 1**

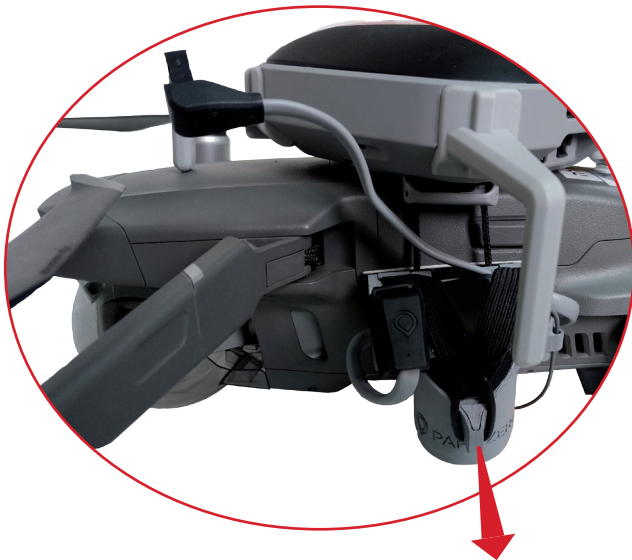
Unplug the ASTM cable from the SafeAir Mavic.

Warning Verify that the SafeAir Mavic System is off before removing it from the drone.



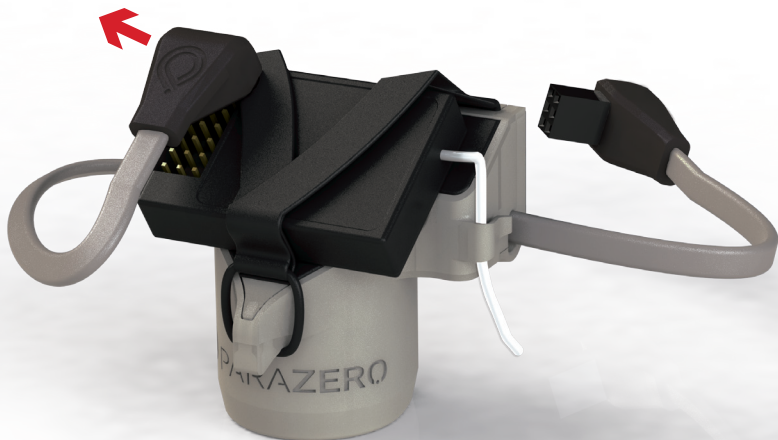
System Removal **Step 2**

Remove the Add-on device from the drone.



System Removal **Step 3**

Unplug the RC cable from the receiver.



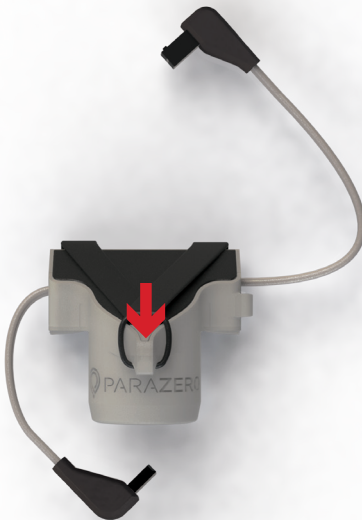
System Removal **Step 4**

Remove the receiver unit.



System Removal **Step 5**

Refasten the elastic band back and store the Add-on unit in a safe place.



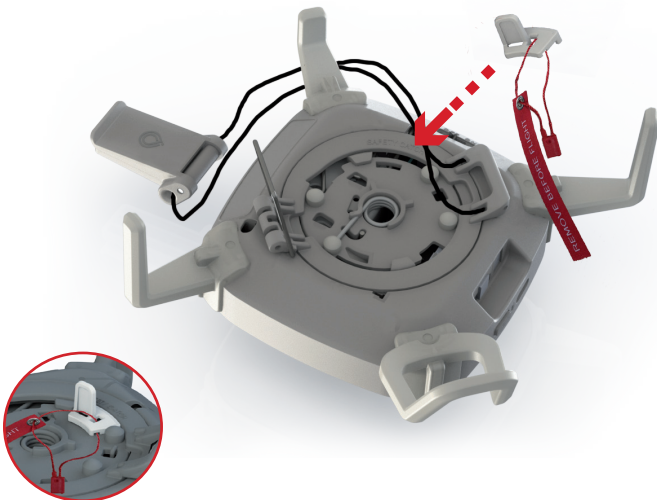
System Removal **Step 6**

Unlock the harness by lowering the handle and unhook the harness from the metal hook.













System Removal Step 7


Remove the system from the drone. Insert the safety catch and store the system in a dry and clean place for reuse.



SafeAir System Status and Troubleshooting

	LED	System Status	Corrective Action	
1	Green	Power up		 5 sec
2	Orange	Power up	Should charge battery	 5 sec
3	Red	Power up	Low battery, must charge battery	 5 sec
4	Steady Yellow	System initialization sequence		
5	Blue	Standby mode		
6	Steady Green	Armed mode		
7	Steady Red	System has deployed	Turn the power switch to the OFF position and follow the repacking instructions	
8	Flashing Red	Low battery	A one-hour charge gives an hour of flight time. (The red flashing LED may be accompanied by other colors)	
9	Flashing Yellow once	Remote Control (RC) error	Make sure the RC cable is connected to the predefined RC channel	
10	Flashing Yellow 2 times	System not level during initiation sequence	Ensure that the system is level	 twice

SafeAir System Status and Troubleshooting

	LED	System Status	Corrective Action	
11	Flashing Yellow 3 times	Onboard storage error	Erase onboard storage using the ParaZero Desktop Application	 3 times

Other Specifications

Service Life (before repack required)	2 years
Maximum Altitude Above Sea Level	6000 meters (19,700 feet)
Maximum Speed	72 kilometers per hour (43.5 miles per hour)
Maximum Wind Speed	10 meters per second (19.5 knots)
Weight	205 grams (0.45 lbs.)
Average Descent Rate	3.9 meters per second (12.8 fps)
Minimum Flight Altitude	19.11 meters (62.7 feet)
Average Expected Kinetic Energy	6.9 Joules (5.1 foot-pounds)

Normal operating temperature range is 0°C - 40°C. When the system is fully charged and kept above 15°C, flight is permissible at temperatures as low as -10°C.

RC System Status and Troubleshooting

	LED & buzzer	System status	Corrective action/ explanation
1	Green	System ready	
2	Blue	System charges	
3	Sequence of solid blue accompanied by flashing blue	Charge complete	
4	3x Red flashes + beeps	No link	SafeAir might be turned off, or the RC is too far from the receiver
5	Yellow + beep every 20 seconds	RC battery low	The RC will have enough power for 15 minutes. It is advisable to end mission and charge the RC
6	Magenta flashes	Trigger switch problem	Try to manually release the Trigger switch and then turn the RC off and on again

Receiver status

	LED	System status	Corrective action
1	Green	System ready	
2	Red	No link	RC might be turned off, or the SafeAir is too far from the RC

Contact customer service at support@parazero.com if required

RC System Specifications

Range	1 km or line of sight
Battery capacity	1.5 hours

CE and FCC Compliance Information

FCC Compliance Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The FCC Compliance Statement is available online at parazero.com/FCC-compliance

EU Compliance Statement

The EU Declaration of Conformity is available online at parazero.com/EU-compliance