SAMO

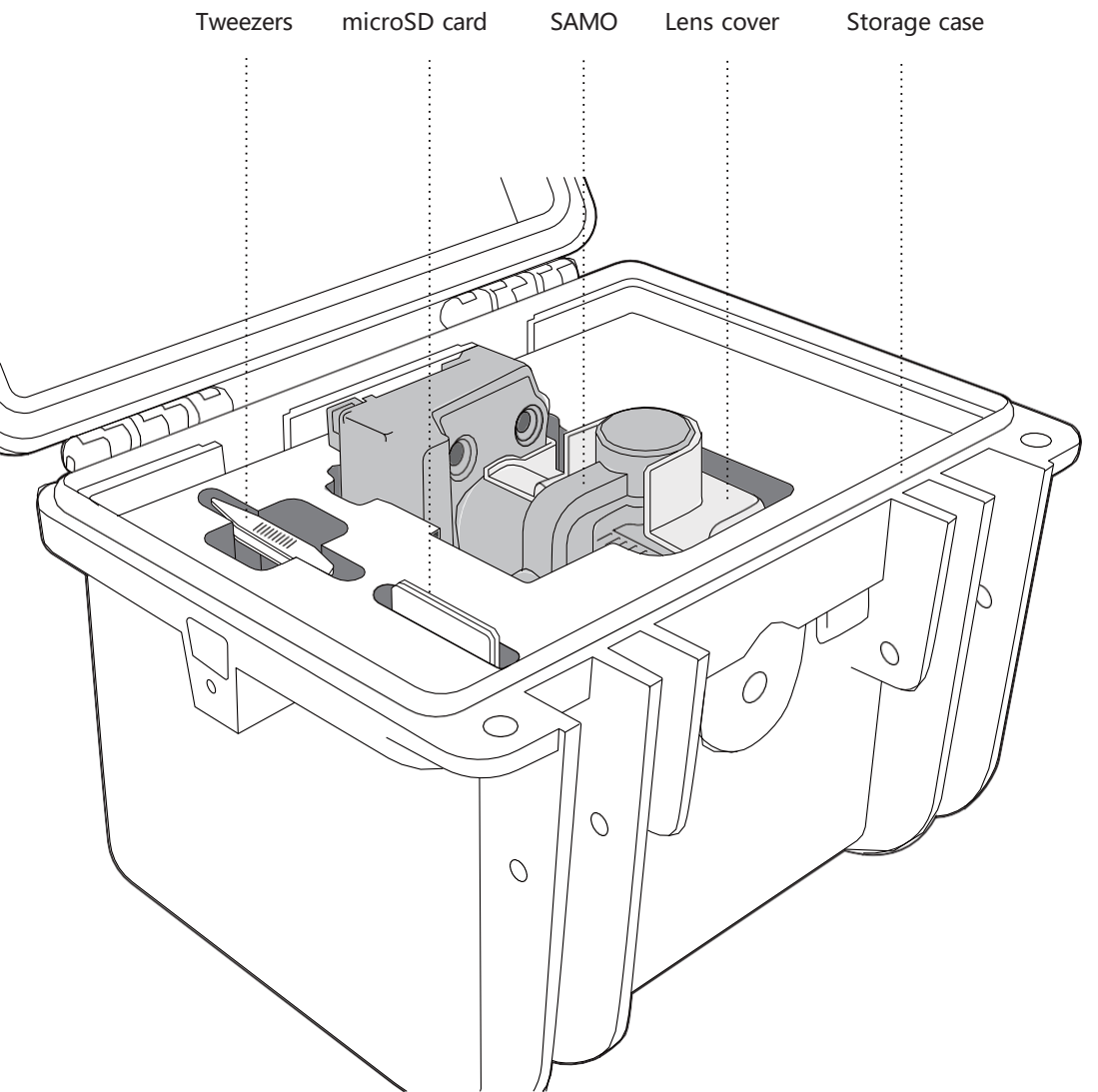
GIMBAL CAMERA

USER MANUAL

v1.0

ACSL

In the box

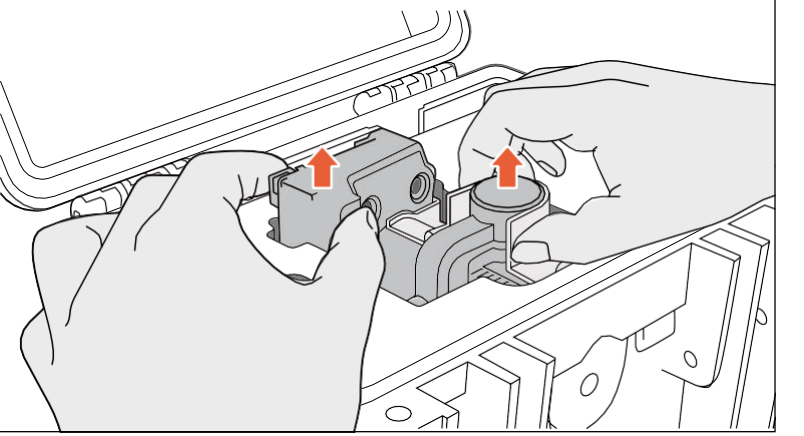


The steps to remove the SAMO are as follows:

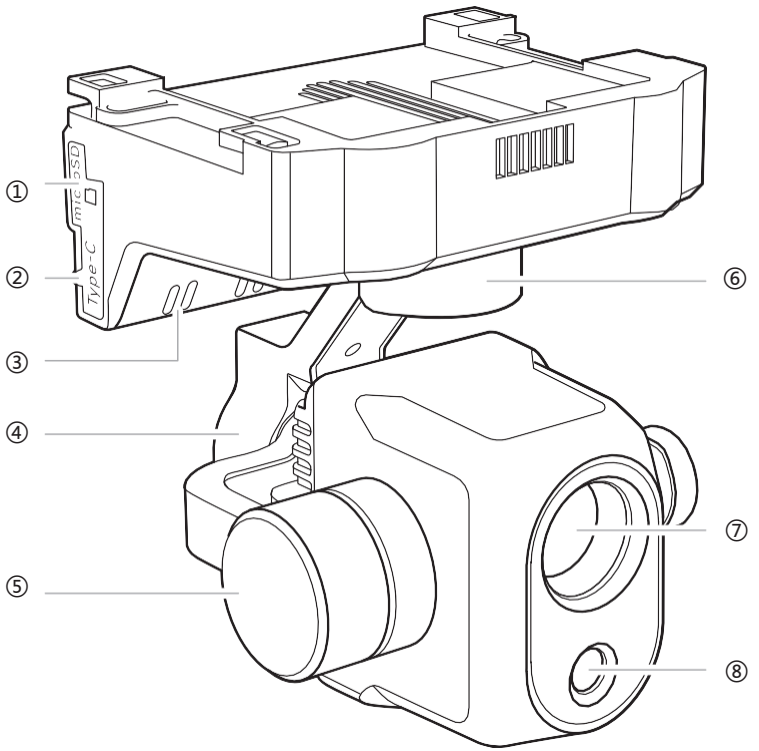
1) Take the SAMO out of the box.
2) Remove the lens cover.

To return the SAMO to the case, please follow these steps in reverse order.

NOTE: For ease of removal, please hold and take out the SAMO with both hands as shown in the illustration.



Overview



① microSD card slot	③ LED	⑤ Pitch motor	⑦ IR camera
② Type-C port	④ Roll motor	⑥ Yaw motor	⑧ RGB camera

Specification

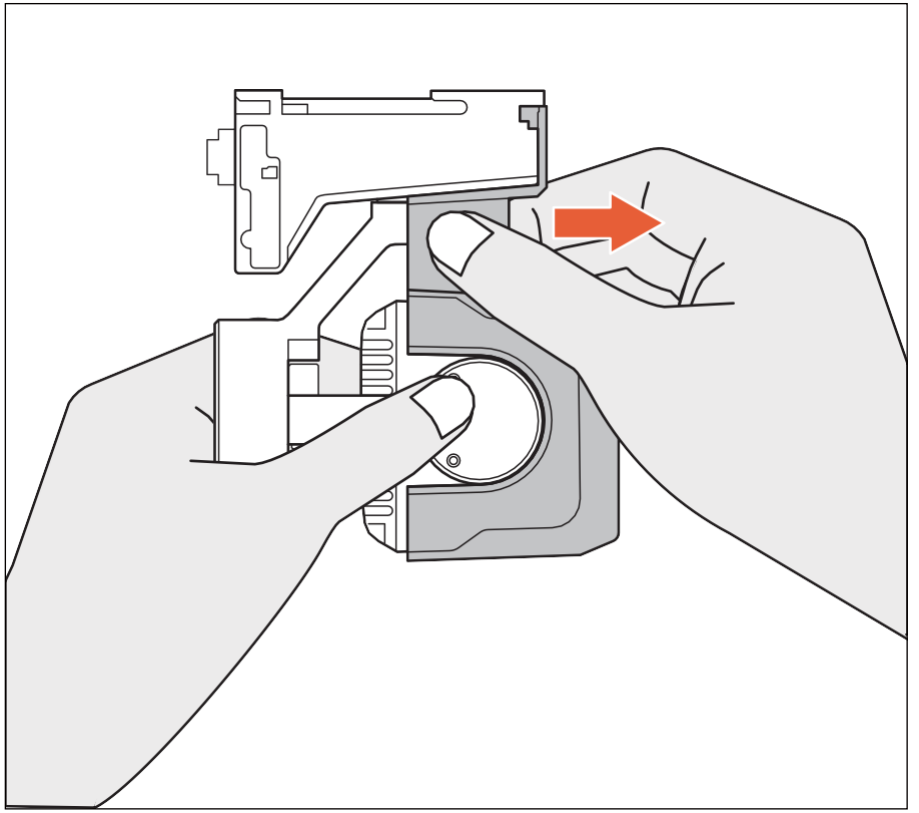
General	**Dimension**	W 78mm x H 87mm x D 81mm (3.1" x 3.4" x 3.2")	
	Weight	220g (7.8 oz)	
	IP rating	IP44	
	Power input	12V / 2A	
	Operating temperature	-10℃ to 50℃* (14°F to 122°F*)	
	Operating humidity	10% to 90%	
	Camera	RGB Electro-optical (EO)	Longwave Infrared (LWIR)
	Resolution	64MP (1/2" sensor size)	640 x 512
	Field of view (FOV)	67° HFOV	32° HFOV
	Effective focal length (EFL)	4.8mm	13.6mm
	F value/#	F/2.3	F1.0
	Picture size	64MP (9248 x 6944) 16MP (4624 x 3472)	640 x 512
	Digital zoom	20x	
	Picture format	JPEG	RJPEG
	Video size	4K (3840x2160) at 60 fps or 30 fps FHD (1920x1080) at 60 fps or 30 fps	640 x 512 at 30 fps
	Video format	MP4 with H.264 encoding	
	Live video stream	H.264, 1280 x 720 at 30 fps	
	IR image display	Side-by-side and picture-in-picture	
	IR color modes	White hot, Black hot, Rainbow, RainHC, Ironbow, Lava, Arctic, Glowbow, Graded Fire, Hottest	
	Recommended microSD cards	Kingston® Canvas Go! Plus - microSDXC™ (128GB or larger) Lexar® Professional GOLD - microSDXC™ UHS-II (128GB or larger)	
	Supported file format	exFAT (64GB or higher)	
Gimbal	**Pitch (Tilt)**	-90° to +10° controllable	
	Yaw (Pan)	±90° controllable	
	Roll	±45° (not user controllable)	
	Vibration angle	±0.02°	
Interface	**I/F protocol**	USB (UVC, camera control), CAN (DroneCAN, gimbal control)	
	HW connector	SOTEN connector	

*The maximum temperature limit of SAMO may differ from that of SOTEN. Refer to the SOTEN manual for details.

Before Use

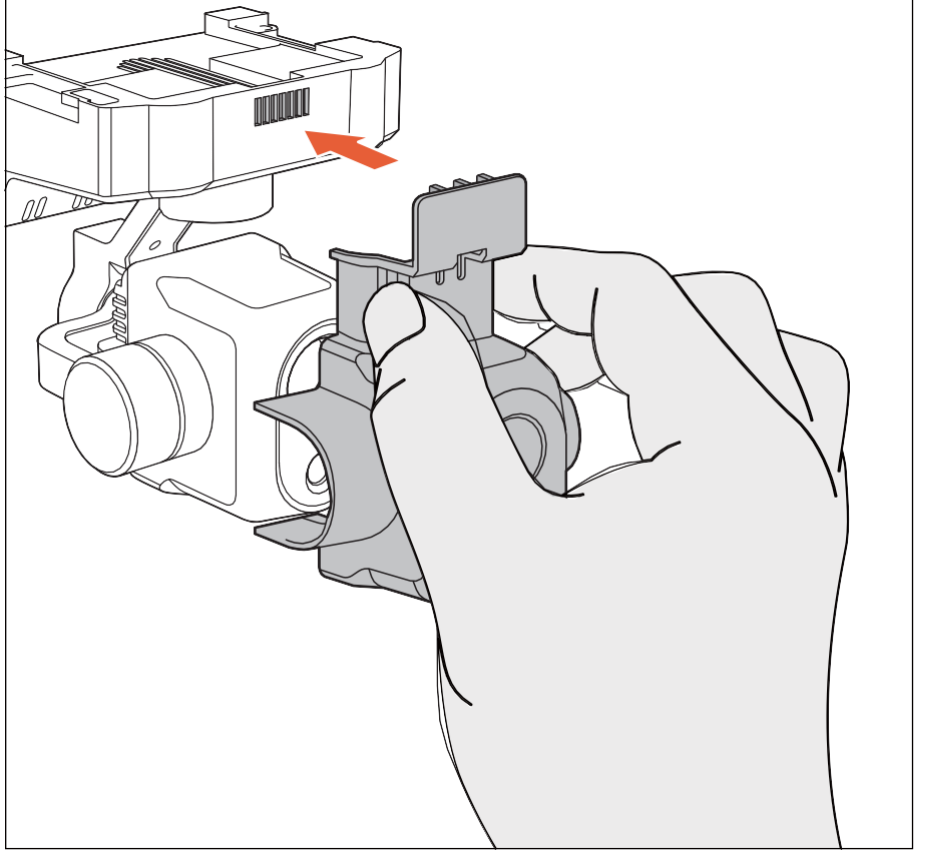
1. Remove the lens cover

The lens cover is for transportation and storage purposes. Please remove the lens cover as shown below.
Hold the U-shaped arm or mounting box of the gimbal with one hand, and pull the lens cover outward in the direction of the arrow with the other hand.



Tips: How to install the lens cover

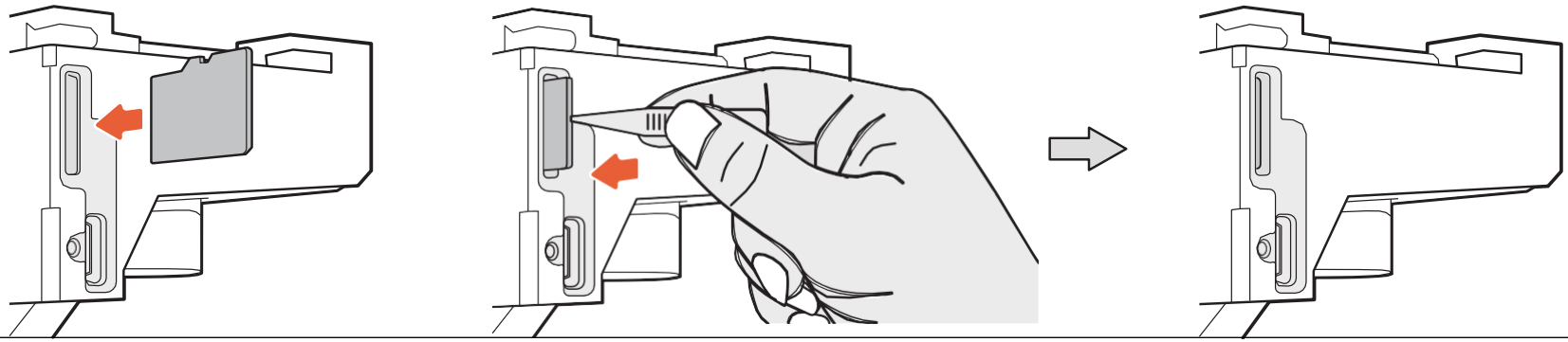
Return the gimbal to its initial position, insert the top of the lens cover into the fan slot, and press the lens cover into the motors on both sides of the gimbal until you hear a locking sound.



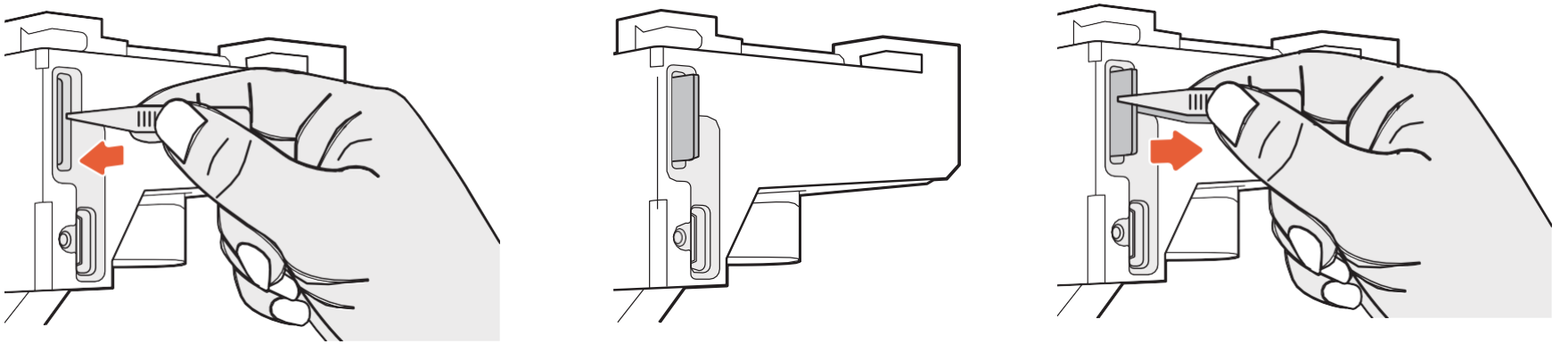
2. Insert the microSD card

Insert the microSD card into the slot and use tweezers to push it all the way in until you hear a locking sound.

NOTE: Use only exFAT-formatted microSD cards rated Class 10, UHS-I/ II, U3, V30, and A2.
Cards with write speeds below 90 MB/s are not supported and may result in data loss.



TIPS: How to remove the microSD card

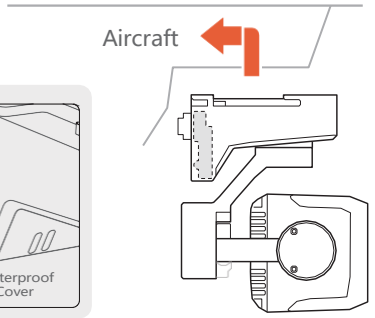


Use the tweezers to press the microSD card inward. After you hear the unlocking sound, the microSD card will pop out of the slot. Then use the tweezers to grasp and remove the microSD card.

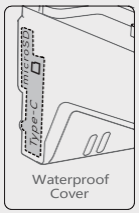
Power On

1. Installation

Attach the SAMO to the aircraft.



NOTE: Firmly press the waterproof cover with your fingers to ensure a secure fit with the edges flush against the gimbal body and free of any distortion. This will maintain its waterproof functionality and prevent installation problems.



⚠ WARNING: Ensure the SAMO is properly secured to the SOTEN before use.

2. Power on

Approximately 30 seconds after the aircraft is powered on, the SAMO stabilizes automatically, with the camera level and facing forward.

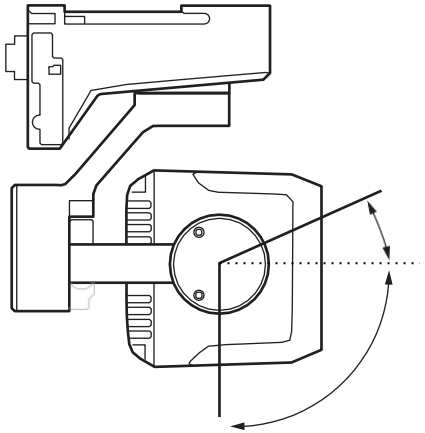
NOTE: When the aircraft is powered on, please keep the SAMO free of obstacles. In case any of the motors are stuck for more than 3 seconds during startup, the SAMO will enter a failsafe mode and the gimbal will no longer stabilize the camera. Restart the aircraft for the SAMO to re-stabilize.

LED Indicator

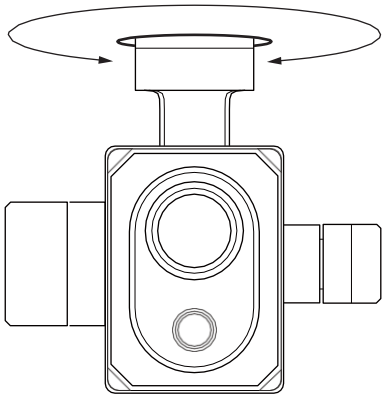
●	**Red**	While startup is ongoing or when the system has crashed.
●	**Green**	Flashes every 3 seconds after a successful startup.
●	**Purple**	While in the process of upgrading the firmware.
●	**Yellow**	Flashes yellow when no microSD card is detected during startup.
●	**Blue**	Briefly flashes when a photo is taken, then reverts to green.

Gimbal Control

The SAMO's gimbal supports angle control of ±90° of yaw (pan) and +10° to -90° of pitch (tilt).

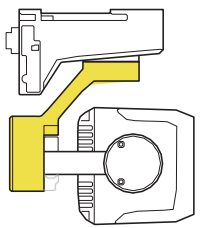


Pitch (Tilt):
-90°~+10°
Controllable



Yaw (Pan):
±90°
Controllable

⚠ WARNING:

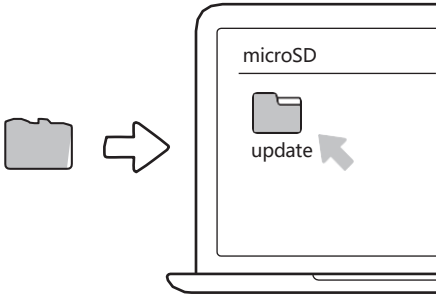


HOT SURFACE

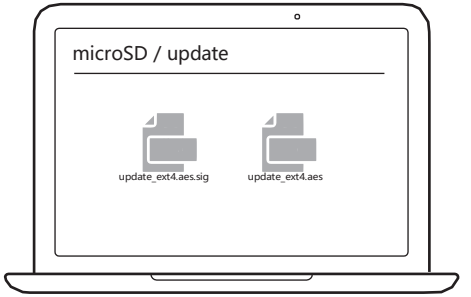
After extended use (approximately 50 minutes or more), the area marked in yellow in the diagram may become hot.

To prevent the risk of burns, avoid touching this area immediately after prolonged operation.

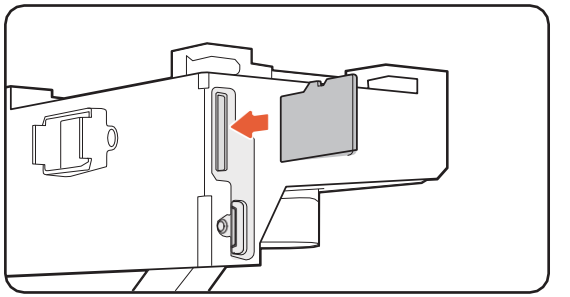
Firmware Update



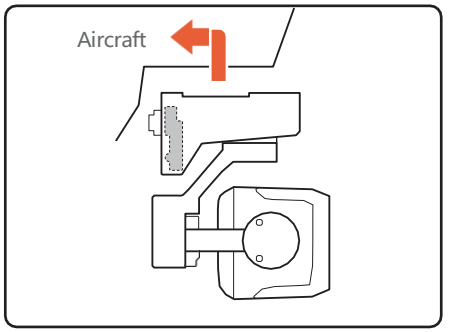
STEP 1. Insert the microSD card into the PC and create a new folder named "update" in the root directory of the microSD card.



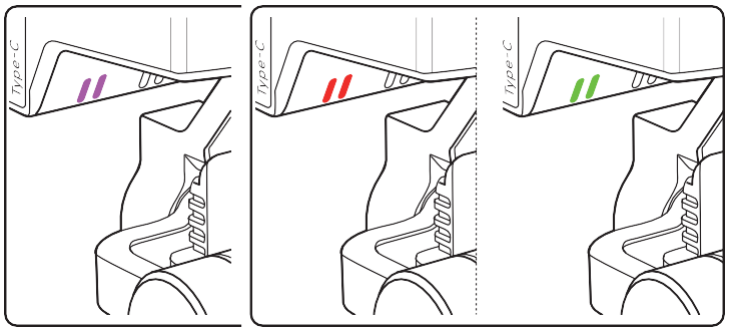
STEP 2. Extract the firmware zip file to the PC. Copy the files "update_ext4.aes.sig" and "update_ext4.aes" into the "update" folder.



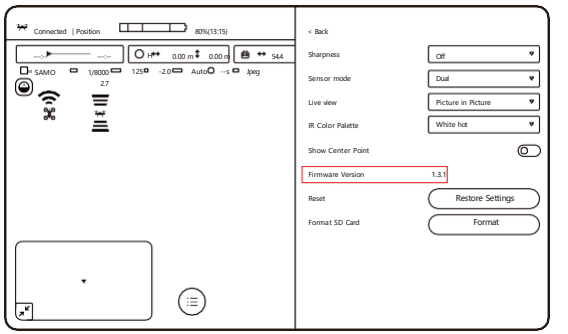
STEP 3. Remove the microSD card from the PC and insert it into the SAMO's microSD card slot.



STEP 4. Install the SAMO onto the aircraft. After the aircraft is powered on, the SAMO will automatically detect the new firmware and initiate the upgrade.



STEP 5. During the upgrade, the LED will flash purple. After the upgrade is completed, the SAMO will automatically restart. Wait until the LED transitions from red to green.



STEP 6. Please verify the firmware version via the ACSL TAKEOFF ground control application.

IMPORTANT NOTE: The microSD card storage might not display correctly in TAKEOFF, but photos and videos will still be saved if the card is inserted. This issue will be fixed in a future firmware update.

Troubleshooting

Unable to power on

- Make sure the LED stays solid red during the initial startup after powering on.
- Verify all power connections are intact.
- Check the battery level to ensure there is enough power to turn on the gimbal.

Gimbal stuck or not moving

- Check the gimbal motors for dirt, or other small objects.
- Ensure the camera module is free to move before powering on the SAMO.

Control response issues

- Reset the connection between the controller and aircraft.
- Reboot SAMO.

Unable to capture images or record video

- Check if the microSD card is compatible with the SAMO module.
- If LED flashes yellow, make sure the microSD card is inserted correctly.

Blurry or distorted images or videos

- Clean the camera lens carefully.
- Check if the lens is aligned and free from damage.

Camera not detected

- Ensure the SAMO is properly connected to the aircraft.

Inaccurate or missing SD card storage display on the ACSL TAKEOFF ground control application

- Reboot the SOTEN aircraft or remove and reinsert the microSD card to ensure it is properly seated.
  Note: In some cases, the storage may not be displayed, even though the microSD card is functioning correctly. This issue will be resolved in a future firmware update.

Revision history

V1.0 August 29, 2025

ACSL Inc.
710 Lakeway Drive Suite 200
Sunnyvale CA 94085
United States