XAG Smart Battery -
Causes & Solutions for Over-Discharged Smart Battery

XAG Smart Battery has a Battery management system (BMS) for Battery protection, if the system detects that the battery is over-discharged, it will lock the battery automatically. For the purpose of safely and efficiently use of XAG smart battery,standardize the related matters in the use of smart batteries,provide user efficiency,and to avoid damage to the equipment caused by over-discharge of the battery, users must read and follow this document carefully.

01 Possible causes of Battery over-discharge and prevention Guide

- Use of highly attenuated batteries lead to Over-discharge

Lithium batteries are chemical batteries. Internal chemical substances will continuously attenuate leading to the gradual decrease of the overall capacity and performance of the battery. The main reasons for battery degradation mainly include three aspects: Service life, Number of cycles and Usage.

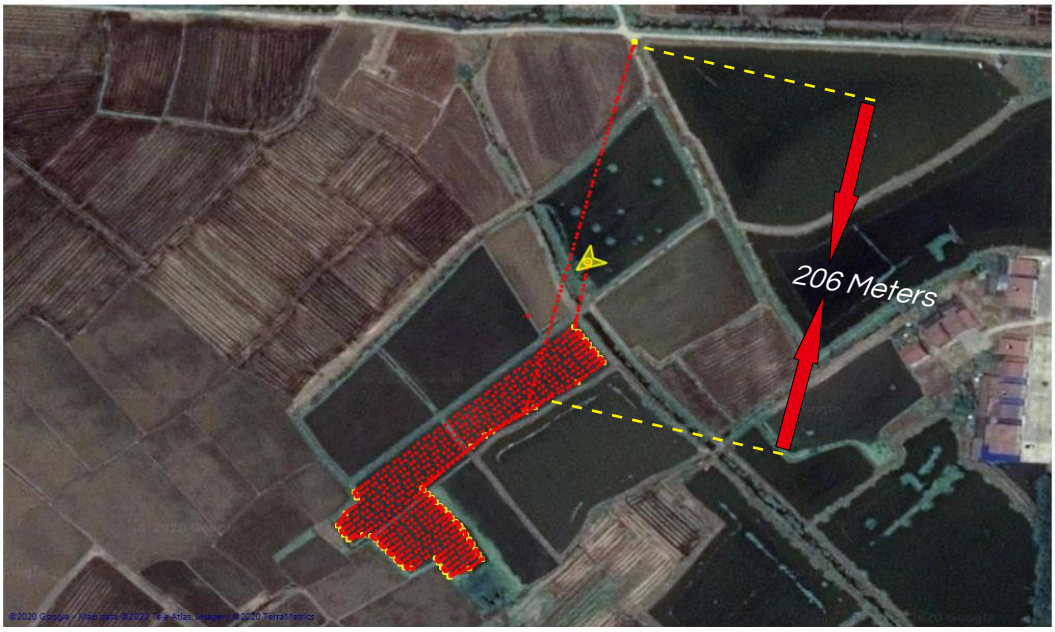
Service life: When the battery reaches a certain age, its performance will gradually decay until it fails. Aged batteries has high probability to causes overdischarge.

Number of Cycles: During the use of high-rate batteries, the internal chemical reaction decays rapidly. After reaching a certain number of uses, the performance of the battery will be reduced to the point where it cannot be used normally. Using a battery that exceeds the number of cycles for full-load operation may easily cause over-discharge.

Usage: The battery is stored for a long time in a high temperature environment, and it is charged in a low temperature environment. When the temperature of the battery is high, it does not dissipate in time, and it will cause the battery to decay prematurely and affect the service life of the battery.

Avoidance measures: Avoid using decayed batteries with severely degraded performance, do not work with heavy loads, and pay close attention to the battery voltage, and promptly return home when the voltage is low. Highly attenuated batteries need to be replaced as soon as possible.

- Unreasonable route setting where UAV entering routes requires UAV to fly with unreasonable distance with full Load, causing extra battery loss, triggering secondary low-power battery device protection, and causing the battery to over discharge.



The UAV in the above picture has an unreasonable round-trip route distance of more than 200 meters in the operating route setting. Excessively long distance setting of the UAV entering/ returning will cause additional lose of UAV Battery.

Avoidance measures: Before planning a flight segment for each sortie, careful consideration should be given to whether the actual power can meet the required load and the entire route operation to avoid additional power loss.

- Battery is still in fligt operation when the battery level is below 30%, the battery my over over discharge if the UAV does not RTH(Return to Home) in time.

Avoidance measures: Update the flight controller firmware to version 1.87.0.12 or above (In manual mode with ACS2, the system will execute the emergency landing protection if low battery warning is detected).

- Long-term storage without charging and Irregular discharging

Avoidance measures: Charge and discharge the battery every 3 months during long-term storage to maintain battery activity.

02 The harm of Battery over-discharge

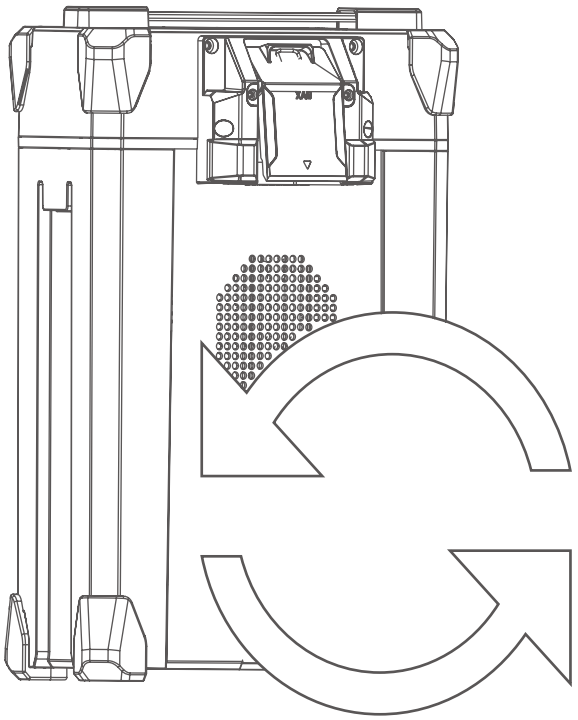
Overdischarge of the smart battery will increase the internal pressure of the battery and destroy the irreversibility of the positive and negative active materials. Even if it is charged, it can only be partially restored, and the capacity will be significantly attenuated.

⚠ Trigger the BMS battery management system to lock the battery and affect the operating efficiency.

⚠ Greatly reduce the service life of smart battery cells.

⚠ Trigger device protection resulting the UAV to force-land or crash, damaging equipments.

03 Handling method of Overdischarged battery



- Over-discharge of smart batteries will greatly affect battery performance. Do not work with heavy loads during use, and pay close attention to battery information. When the APP prompts a warning that the battery is too low, you need to return to the home in time or control the drone to land to a safe area.
- Smart batteries that have been over-discharged many times (more than 2 times) are recommended to be returned to the factory for repair and replacement or discarded as soon as possible.

04 Battery Maintenance

- DO NOT overdischarge the Battery

  If the battery is still in use after the battery voltage is low. Best case scenario is battery damage, worst case scenario will lead to UAV Crashing. Use smart batteries in strict accordance with the flight requirements. When the drone prompts a low-battery alarm, it is necessary to return or control the drone to land in a safe area in time.

- Storage

  When storing smart batteries, keep the warehouse dry, clean, and not crowded. The storage should be equipped with: fire-fighting sand, asbestos blankets, asbestos gloves, crucible tongs, and masks. For long-term storage of smart batteries, it is recommended that the ambient temperature be 10 ~ 25 degrees, dry & free of corrosive gases, and charge and discharge the battery every 3 months during long-term storage to maintain battery activity.

- Transportation

  Avoid violent collisions or vibrations to the battery during transportation. High vibrations or bumps may cause the smart battery cable to become loose and cause abnormal signals. At the same time, avoid short circuits caused by conductive materials contacting the positive and negative electrodes of smart batteries at the same time. If any abnormal features of the battery are found, such as a damaged shell, electrolyte smell, electrolyte leakage, etc., it is forbidden to continue using the battery.

- Keep away from pesticides to prevent corrosion of smart batteries

  Chemical is corrosive to the battery. User should check & ensure the battery socket is clean before charging. After charging, avoid chemical attaching to the socket during operation. After the operation, the smart battery must be placed away from the chemical.

- Battery Care

The main structure and the connector of the smart battery should be checked regularly whether the appearance is damaged, deformed, or corroded, and ensure the connector is clean and dry. After flight, clean the battery surface and the connector with a dry cloth to ensure that there is no chemical corrosion.

- Emergency Handling

If and when the battery is short-circuited during the charging process.
First cut off the power supply of the charging device, place the smart battery on the ground or a fire-fighting sand bucket, cover the fire of the smart battery on the ground with an asbestos blanket, and bury the fire-fighting sand on the asbestos blanket to isolate it from the air asphyxia.

If and when the battery is short-circuited during the flights (Under the premise of ensuring safety). Remove the smart battery from the drone and bury it in sand until the battery no longer emits smoke. If you need to dispose of a depleted smart battery, you should soak the battery in salt water for more than 72 hours to ensure the battery is fully discharged before drying and retiring.

⚠ DO NOT use dry powder to extinguish electrical fire, as large amount will be required and it has a corrosive effect on equipment and pollutes the space.

⚠ Oxidized carbon does not pollute the space and corrode the machine, but can only achieve instantaneous suppression of flames. It needs to be used in conjunction with sand and asbestos blankets.

⚠ Suffocation is the best way to deal with the burning of smart batteries.

⚠ Uncertified personnel are prohibited from disassembling, burning, and soaking the battery, otherwise it may cause an internal short circuit, causing gas and battery burning.

⚠ WARNING The related damage caused by over-discharge of the smart battery due to man-made reasons are not covered by warranty.

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TRANSLATION BY:

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