Lithium-ion batteries require more attention than other types of batteries. Li-Ion batteries typically have 3.7V to 4.2V per cell. They have a fairly shallow discharge curve. If you hear and feel your drone start to struggle to hold its elevation and the motor starts to spin at a lower RPM, the cells may be damaged. Replacement of the battery is necessary. Charging your craft's batteries is safe and easy to do, but precautions are necessary.

Do not start charging your battery and then walk away from it. Don't leave Li-Ion batteries unattended while they are charging.

Inspect your battery every time before charging it. Check for possible damage especially if you see any cuts or punctures in the covering of your battery. If you are unsure about its safety, do not charge it.

IMPORTANT: In some rare cases, Li-Ion can become unstable. It is possible that the battery will have a rapid expansion followed by smoke billowing out of the battery pack. DO NOT inhale the smoke and gases escaping the battery. DO NOT attempt to move the battery. It has potential to cause severe harm or even death. Call emergency services such as 911 or the fire department and be sure they are aware that they will be dealing with a lithium battery.

Always check your batteries for any swelling. This is especially important when you're getting ready to charge a Li-Ion battery pack.

If the battery has been damaged or is leaking, place the battery in a Li-Ion charging bag. Contact your local battery recycling center to dispose of the battery. NEVER put a damaged battery in the trash. Handle your batteries with care. If you do puncture your batteries and the gel gets on your skin, don't panic; just wash the gel off with soap and water as soon as possible.

Do not drop your batteries as this can create a hole in the cell(s) and cause an explosion and/or a fire. Never leave your Li-Ion battery fully charged while storing them for more than 14 days. Leaving them stored at full charge will seriously decrease battery longevity and increase the chance of a short in the battery. Fully charged Li-Ion batteries are less stable than ones maintained at a safe storage voltage of 3.9 volts. A discharging device is essential to proper battery care.

Do not fly your UAV too long and completely discharge the battery. The rule of thumb is to never discharge your battery to below 20% of its capacity.

Store your batteries in a battery safety bag and put them in a cool, dry place.

How to Charge Flight Batteries

Warning: Never leave charging batteries unattended. Always inspect batteries before use.

Note: Both CH-1 and CH-2 can be used for charging.

1. Make sure the charging power cable is fully seated.
2. Flip the switch to the ON position and wait for the 4010 DUO to fully boot up.
3. With no errors on screen, proceed by pressing the STOP/START-1 to bring up the preset selection.
4. Using the center selector wheel, highlight 18AhFlight. Select by pressing down on the wheel.
5. Highlight "Charge" and press down on the wheel, then confirm YES
6. Charging will start and current will slowly rise to set value.
7. Once the charge has completed the 4010 DUO will beep and show "Done!" in green.
8. Proceed by pressing STOP/START-1 and unplugging the battery connectors in any order.

Note: if an error occurs during the charging process, the charge will stop, and an alarm will sound. Refer to Error Messages page with the error #.

How to Store Flight Batteries

Warning: A battery should not be left fully charged or discharged for more than 2 weeks. If planning to store for a longer period, the user should storage-charge the battery.

1. Connect the battery to the charger as described above in step 3-7.
2. If the battery is fully charged, use the Discharge preset to first discharge the battery.
3. Once the battery is discharged, or if it is already discharged, use the “Storage” preset to bring the battery up to the appropriate storage charge.

How to Dispose of Damaged Flight Batteries

Always inspect flight batteries for damage before use. If the flight batteries appear to be damaged or swollen, refer to your local recycling center for safe disposal in your area.

In case of immediate danger, such as damaged batteries spontaneously getting hot, arcing, swelling, etc., isolate the battery from other batteries and flammable materials and cover it with sand. The battery should be covered with enough sand to fully cover it. Wait at least two hours for the battery to cool down before disposing of the battery in accordance with local recycling regulations.

NOTE: In case of a battery fire, clear any surrounding materials and extinguish the fire with a class ABC dry chemical fire extinguisher. Do not use water unless directed to do so by your local fire department.

Battery Error Messages

#	MESSAGE	DESCRIPTION
02XX	“Input over voltage”	The input voltage is too high.
03XX	"Input under voltage"	The input voltage is too low.
04XX	“Output over voltage”	The output voltage is too high.
05XX	“Low battery voltage”	The voltage of the connected battery is too low.
06XX	“High battery voltage”	The voltage of the connected battery is too high.
07XX	“Output over current(+)”	Output over current (+).
08XX	"Output over current(-)”	Output over current (-).
09XX	“Input over current(+)”	Input over current (+).
10XX	"Input over current(-)”	Input over current (-).
11XX	"The internal temperature is too high"	The internal temperature is too high.
12XX	"The internal temperature is too low"	The internal temperature is too low.
13XX	" Connection check error"	Connection check error.
14XX	“CH1 & CH2 common-negative connection prohibited"	Common-negative connected to CH1 & CH2 is prohibited.

15XX	“Battery polarity reversed!”	Battery has been connected with polarity reversed.
16XX	"Internal control error"	Internal control checking error.
17XX	“Exceed safe time limit”	Safe time limit is exceeded.
18XX	“Exceed safe capacity limit”	Safe capacity limit is exceeded.
19XX	"Exceed safe temperature range”	Safe temperature range is exceeded.
20XX	“Output connection broken”	Output connection is broken.
21XX	“Balance port connection error”	Balance port connection has an error.
22XX	“Low cell voltage detected on balance port”	Low cell voltage is detected on balance port.
23XX	“High cell voltage detected on balance port”	High cell voltage is detected on balance port.
24XX	"Voltage match error. Balance port sum lower than output”	Voltage match error; balance port sum voltage lower than output.
25XX	"Voltage match error. Balance port sum higher than output”	Voltage match error; balance port sum voltage higher than output.
26XX	“Number of cells doesn’t match the setting”	Number of cells connected doesn’t match the setting.
27XX	“Number of cells setting appears low”	Number of cells setting appears low.
28XX	"Number of cells setting appears high”	Number of cells setting appears high.
29XX	"Balance not needed. Remove connection from balance port”	Balance port error. Ni-, Pb does not need balance port but voltage of balance port is detected.
30XX	"Balance required!"	Balance port is unplugged.
31XX	“Auto detect the number of cells failed, please connect balance or set cells”	Check connection or check balance port.
32XX	"AD watchdog error"	AD watchdog error.
33XX	“Synchronous mode: Channel outputs imbalance”	Channel outputs are not balanced in Synchronous mode.

This content is subject to change.

If you have any questions about this document, please contact Skyfish Customer Relations at support@skyfish.ai

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