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Service Bulletin	

Release Notes for Cayley Tactical UKR 4

Products affected by this update
Skydio X10D & Skydio Controller

Overview

Skydio X10D 43.152.76
Skydio Controller 46.46.82

This release improves radio link range and stability, corrects the attitude return heading when GPS is spoofed, removes a false visual navigation failure at high altitude, and adds battery percentage, voltage alerts, and voltage-triggered return for non-Skydio battery packs. It also raises the waypoint and home point limit to 25 km.

IMPORTANT: *Read the Known Limitations and Pre-flight Checklist at the end of this document before flying UKR 4.*

Extended Radio Range and Link Stability

The radio link has been updated to hold the connection better at long range:

- **Extended range.** Radio timing now supports ranges up to 40 km (previously 15 km).
- **More robust transmission.** The aircraft transmits in a single-stream mode that holds the link better through signal fades over flat terrain.
- **Adaptive video bitrate.** The video encoder follows the bitrate the link can carry, for steadier video at long range.
- **Radio logging.** Radio statistics are now recorded in flight logs to help diagnose link issues.

In testing in open terrain without jamming, X10D repeatedly reached 15 km at 180 m AGL with an elevated ground antenna. Range depends heavily on flight altitude, antenna height, terrain, and interference.

How to set up the ground antenna for long range

1. Mount the ground antenna as high as practical, with a clear line of sight toward the operating area.
2. Separate the two antenna panels vertically by at least 60 cm (2 ft).
3. Use the wider horizontal spacing between panels.
4. Pull an elevation profile along the planned route and confirm that terrain stays clear of the radio path, not only the direct line of sight. The clear zone around the line of sight widens with distance.

How to select DCS channels

1. Open Settings and select Radio.
2. Select Generate DCS Channels.
3. Select bands so that all six DCS channels are filled. Do not select 2.4 GHz.
4. Where possible, choose channels spaced about 100 MHz apart.

NOTE: *Selecting more DCS channels, spaced farther apart, gives the aircraft the best chance to avoid jamming and interference. On a previous flight only two channels were selected, so the aircraft could not move away from the jammed frequencies. 2.4 GHz conflicts with other systems in use.*

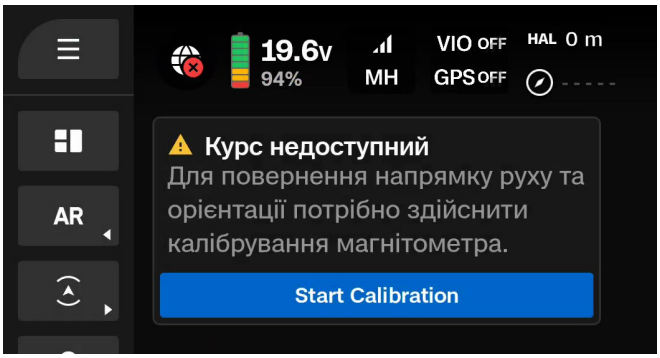
NOTE: *Altitude is the biggest factor in range. Fly as high as the mission and visual navigation allow, and hold altitude at long range. In 15 km testing, the link dropped as soon as the aircraft descended 10–20 m.*

Attitude Return Heading Correction

GPS spoofing could corrupt the aircraft's compass reference, which caused attitude returns to fly in the wrong direction. GPS no longer sets the compass reference when it is spoofed or turned off.

When no anchor point is set, X10D uses default magnetic values for eastern Ukraine (48.0°N, 36.5°E). These values are within about ±1° of anywhere along the front line. An anchor point or a valid GPS fix replaces the default values.

Operator action: *Calibrate the compass after every reboot, and set an anchor point before takeoff when flying with GPS off.*



Compass calibration prompt shown when heading is unavailable. Select Start Calibration.

How to prepare for an attitude return

1. Before going to the field, download offline maps for the operating area. Offline maps are required to set an anchor point.
2. After every reboot, calibrate the compass away from vehicles, generators, and metal structures.
3. Before takeoff, set the anchor point (location and heading). The anchor point is cleared on every reboot.
4. Set the lost-link return altitude to relative, with a climb of at least 50 m.

NOTE: *Attitude return is not available without a compass calibration. Calibrating near power equipment caused an 11° heading error in testing. Outside eastern Ukraine, always set an anchor point so the default values are not used.*

Visual Navigation Health Check Improvement

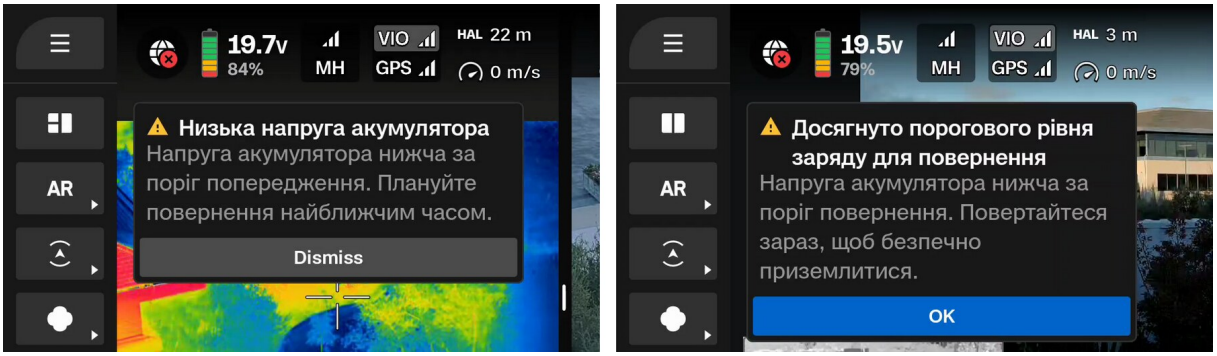
A more robust visual navigation (VIO) health check removes a false failure that could make X10D report a VIO failure near 280–300 m AGL while VIO was still healthy.

NOTE: *With GPS off, fly at or below 300 m AGL. VIO only reinitializes near 15 m AGL, so a VIO loss at higher altitude is unlikely to recover.*

Battery Estimation for Non-Skydio Battery Packs

X10D now provides battery information for non-Skydio battery packs:

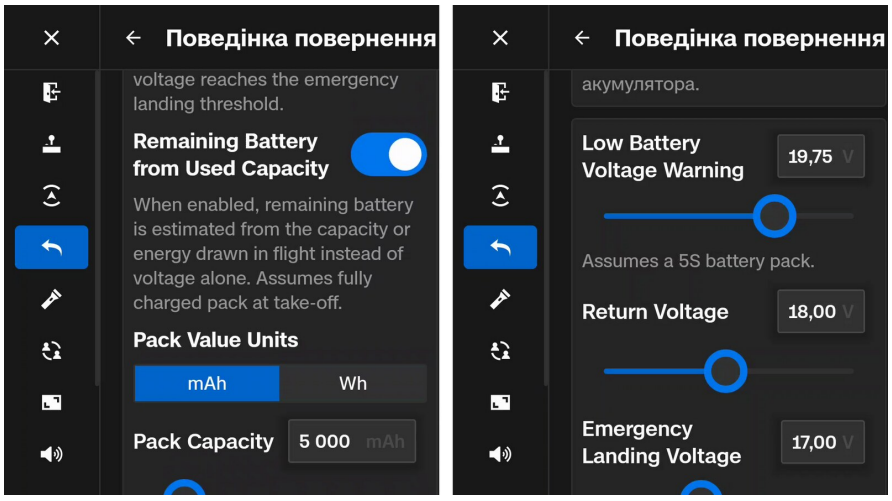
- **Battery percentage estimate.** The aircraft tracks the current used against the pack capacity and starting charge entered by the pilot. Measured error in testing was 1.6% on a 5 Ah pack.
- **New battery indicator.** A segmented percentage indicator replaces the battery icon that stayed full for the whole flight.
- **Custom voltage warning.** Set a whole-pack warning voltage and a custom warning message in your own language.
- **Voltage-triggered return.** Set a voltage that triggers a low-battery return, including when the controller is disconnected.



Segmented battery indicator with the low-voltage warning (left) and the return-threshold alert (right).

How to set up a non-Skydio battery pack

1. Open Settings and select Return. The Return Behavior page opens.
2. Turn on Remaining Battery from Used Capacity.
3. Under Pack Value Units, select mAh or Wh, then enter the Pack Capacity.
4. Set Low Battery Voltage Warning, Return Voltage, and Emergency Landing Voltage based on your own pack testing.



Return Behavior settings: pack capacity (left) and voltage thresholds (right).

NOTE: *The battery percentage is only as accurate as the capacity and starting charge you enter.*

NOTE: *Voltage settings assume a 5S battery pack. The percentage estimate assumes a fully charged pack at takeoff.*

Extended Navigation Limits

The waypoint and home point distance limit increases to 25 km, so remote home points and waypoints can be set for longer flights.

Other Improvements

- The DTED file list is restored.
- EO and IR zoom levels are kept independently.
- Unnecessary fault messages are suppressed.

Known Limitations

- **Range.** 15 km was demonstrated in open terrain without jamming. Expect less range with terrain obstruction, low altitude, a low antenna, or interference.
- **Jamming.** Performance under jamming has not yet been measured. Select all six DCS channels, spaced far apart, for the best chance to avoid jamming.
- **Attitude return.** Not available without a compass calibration. The default compass values assume eastern Ukraine. True-heading accuracy has not been verified in Ukraine conditions.
- **Visual navigation.** The VIO drift failure seen on 12 October has not been reproduced and is not specifically addressed in UKR 4. VIO only recovers near 15 m AGL after a loss at altitude.
- **Battery percentage.** Accuracy depends on the capacity and starting charge entered by the pilot.
- **Map display.** Aircraft coordinates may disappear during return-to-home, and the controller location marker may not update.

Pre-flight Checklist

1. **Confirm versions** on the aircraft and controller after updating.
2. **Download offline maps** for the operating area before going to the field.
3. **Calibrate the compass after every reboot,** away from vehicles, generators, and metal structures.
4. **Set the anchor point (location and heading) before takeoff** when flying with GPS off.
5. **Enter battery pack capacity and starting charge accurately,** then set the warning and return voltages from your own pack testing.
6. **Select all six DCS channels across bands.** Avoid 2.4 GHz and space channels about 100 MHz apart where possible.
7. **Set up the ground antenna** as high as practical, with at least 60 cm (2 ft) vertical separation between panels and the wider horizontal spacing.
8. **Plan flight altitude:** fly as high as the mission allows, and at or below 300 m AGL when GPS is off. Hold altitude at long range.
9. **Set the lost-link return altitude to relative,** with a climb of at least 50 m. With default settings, the aircraft may return at its current altitude and will not climb to recover the link.

Please keep sending flight logs, controller screen recordings, DCS channel lists, and antenna setup photos after each flight so we can continue improving.