



Flying Skydio X10D





What You'll Learn

01

Global Settings

Apply limitations and define mission specific drone behaviors and controls

02

Launching

Discover launch techniques and describe the launch process

03

Flight Deck

Explore telemetry items and controller functions

04

Map Capture Missions

Collecting imagery for creating maps, GRGs, etc...

05

Returning & Landing

Identify and understand safe practices when recovering your X10D

06

Night Operations

Identify and understand safe practices when flying your Skydio X10D in Low Light environments

07

Flight in Inclement Weather

Help determine the proper response to non-typical behaviors and emergencies

08

Contingencies & Troubleshooting

Help determine the proper response to non-typical behaviors and emergencies



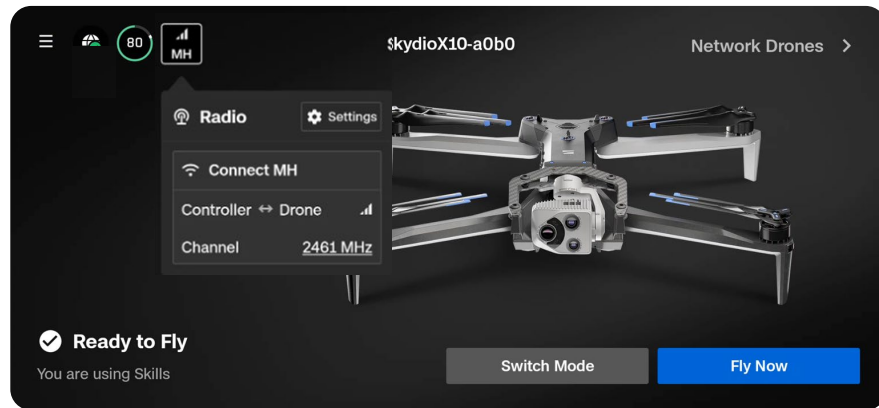
01

Global Settings



Global Settings | Gate Screen

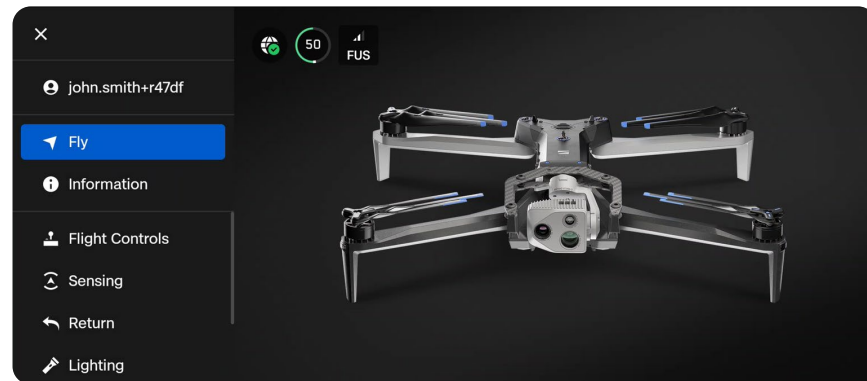
- Switch Flight Modes
 - Skills
 - 3D Scan
- Verify settings
- Review radio information
- “Fly Now” to enter Flight Deck (does not launch the drone)





Global Settings | Global Settings

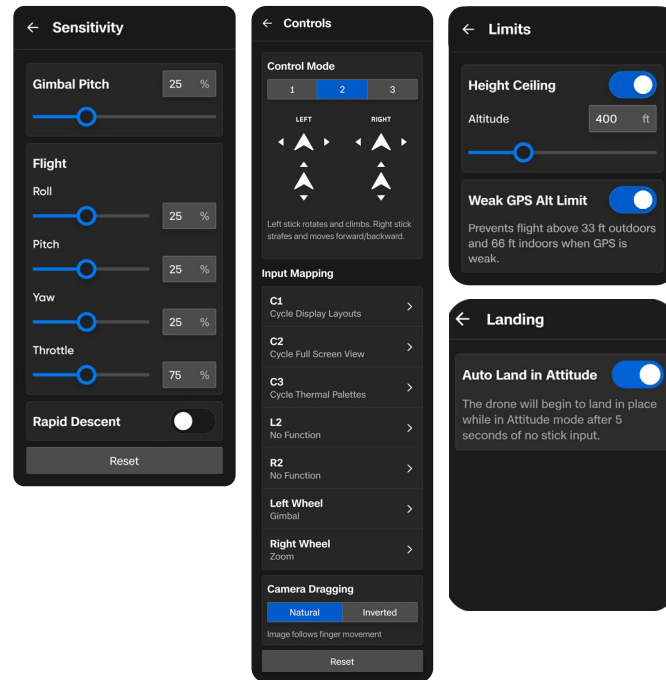
- Located in the top left corner of the screen
- Access all X10 D or controller settings prior to flight or in flight
- Access from the gate screen or Flight Deck





Global Settings | Flight Controls

- **Sensitivity** | Aircraft Speed
- **Controls** | Joystick and button behavior
- **Limits** | Impose altitude limits for added safety
- **Launch** | Enable low launch (not pictured)
- **Landing** | X10D lands after 5 seconds of no joystick input in Attitude mode





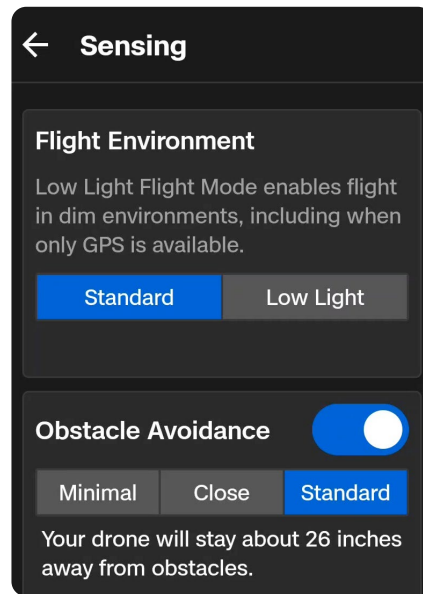
Global Settings | Sensing

Flight Environment

- Standard | Select when flying during the day
- Low Light | Select when flying at night

Obstacle Avoidance

- Toggle OA on/off or between different margins
 - Standard
 - Close
 - Minimal
 - Off





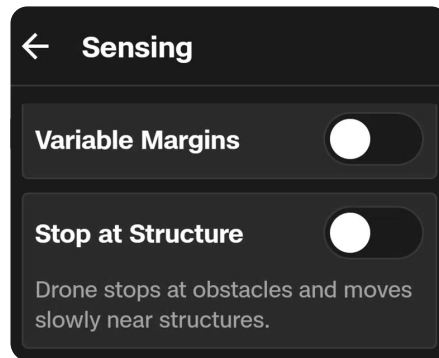
Global Settings | Sensing

Variable Margins

- X10 will dynamically and temporarily reduce OA margins when moving through narrow spaces
- Margins may expand if environmental dangers are detected (i.e. wind)

Stop at Structure

- Stops the X10 D as it approaches a structure
- Can adjust speed near obstacles for greater control when close to obstacles





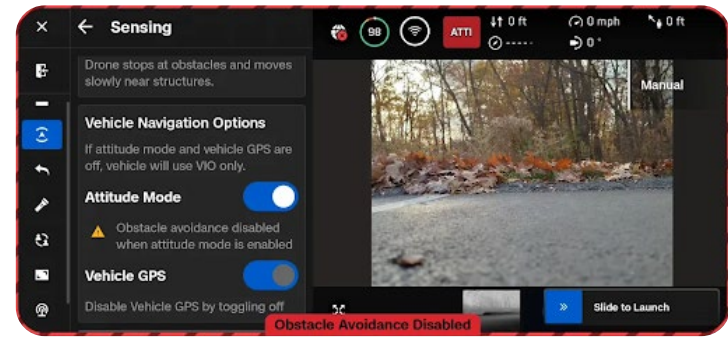
Global Settings | Sensing

Attitude Mode

- Launch and fly in attitude mode
- No OA, GPS, or VIO

Vehicle GPS

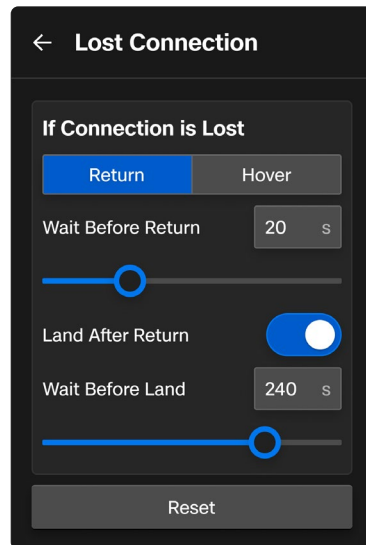
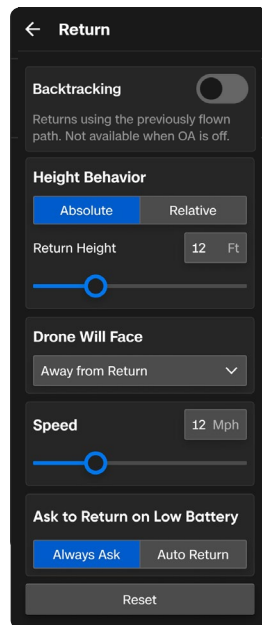
- If toggled off, X10 D uses VIO to navigate
- Features that require GPS are disabled
- Disable to set Anchor Point
- Persists across power cycles or flights





Global Settings | Return

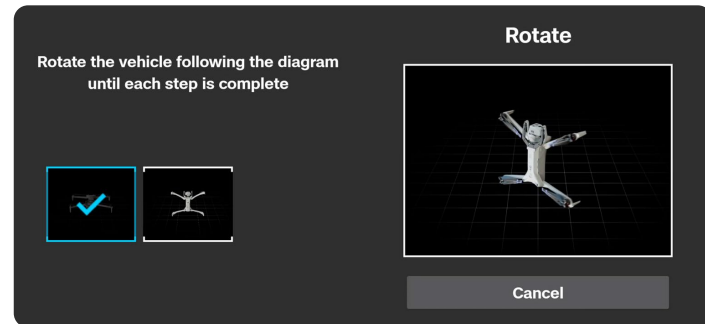
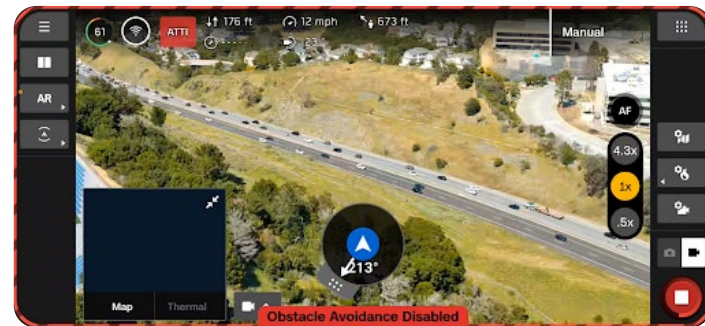
- Determine how the aircraft returns upon command and lost connection
- **Return** | How the X10 D returns when commanded
 - Height Behavior
 - Speed
 - Drone Will Face
 - Backtrack
 - Low Battery
- **Lost Connection** | Additional return behavior during a link loss
 - Return vs Hover
 - Land After Return
 - Wait Before Return
 - Wait Before Land





Global Settings | Heading Return

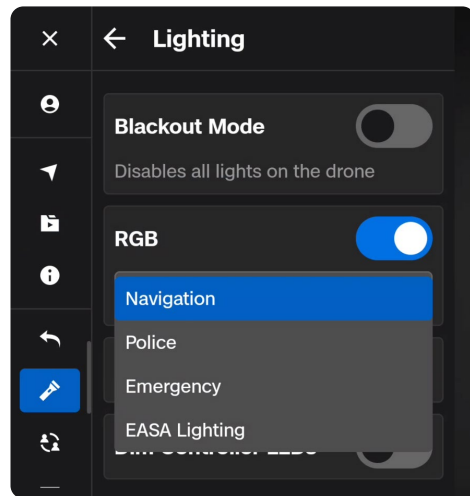
- Return using a compass heading when communications and navigation are lost
- Global Settings > Return > Lost Connection > Advanced Settings
- Select the behavior (Land vs Return)
- Set the return altitude
- Must calibrate the magnetometer prior





Global Settings | Lighting

- **Blackout Mode** | Disables all lights on X10 D (Vis & IR)
- **Strobe** | Disable for launch and land
- **Infrared** | Solid IR light
- **RGB** | Navigation, Police, Emergency, EASA (MH only)
- **Dim Controller LEDs** | Dim s blue LEDs on controller
- Cannot enable IR and Strobe lights together

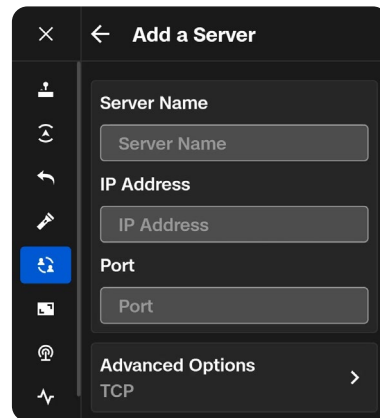
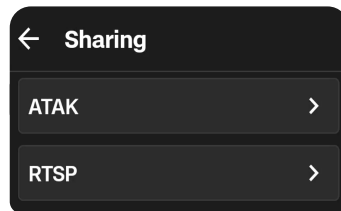




Global Settings | Sharing

Android Team Awareness Kit (ATAK)

- Start the ATAK app
- Select Network Connections and add a server
- Enter the Server Name, IP Address, Port number
- Select Advanced Options to configure your security protocol
 - **TCP** | Anyone connected to server can view
 - **SSL** | Requires security certificates
- Return to the ATAK menu and select Publish Telemetry
 - Assign a Vehicle Call Sign and Operator Call Sign
 - Ensure Publish Telemetry is toggled on

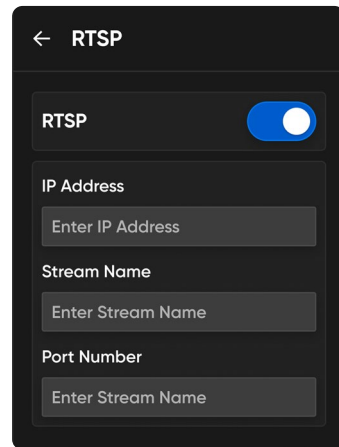
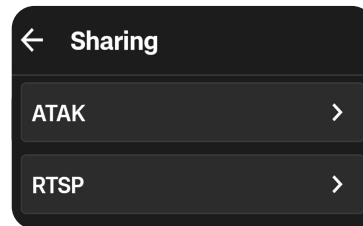




Global Settings | Sharing

Real-Time Streaming Protocol (RTSP)

- Decide between an Internal or External RTSP server
 - **Internal** | The server is hosted internally
 - Provide the IP Address and Port number to viewers
 - Name the stream
 - **External** | Connect to an external server via the internet
 - Enter the IP Address and port number of the desired server
 - Name the stream

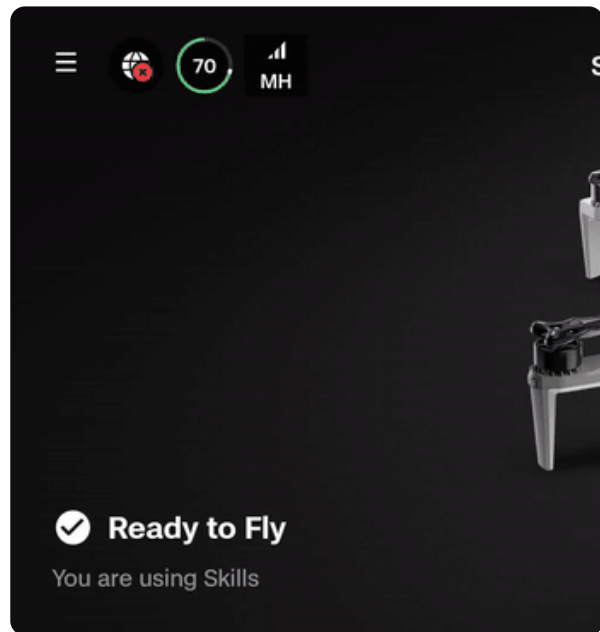




Global Settings | Sharing

USB Networking

- **USB-C Mode**
 - **Standard**
 - Allows pairing between X10 D and controller
 - **USB Hub**
 - Allows power and data transfer between controller and Nett Warrior Hub
- **DHCP**
 - Disable to manually assign an IP address, Subnet Mask, Gateway, DNS

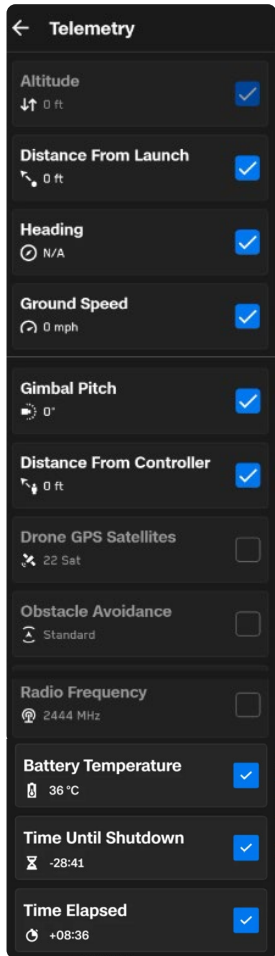
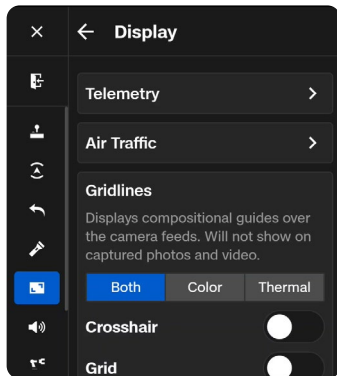




Global Settings | Display

Telemetry

- Choose which telemetry items are displayed on the flight screen (display up to 6)
- Altitude cannot be removed
- Recommend
 - Altitude
 - Heading
 - Ground Speed
 - Gimbal Pitch
 - Distance From Controller
 - Radio Frequency

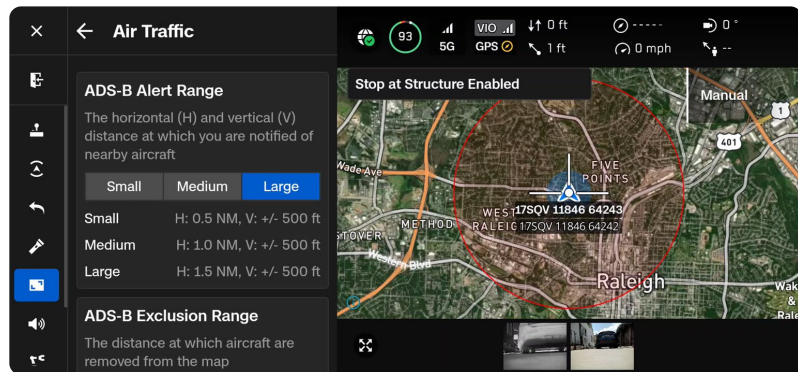




Global Settings | Display

Air Traffic

- **ADS-B Alert Range** | Range at which you will receive air traffic alerts
 - **Small** | .5 NM or +/- 500 ft (0,9 km +/- 150 m)
 - **Medium** | 1NM or +/- 500 ft (1,9 km +/- 150 m)
 - **Large** | 1.5 NM or +/- 500 ft (2,8 km +/- 150 m)
- **ADS-B Exclusion Range** | Aircraft outside of this range will disappear from the map
 - 6 NM and +/- 3000 ft (11km +/- 0.9 km)

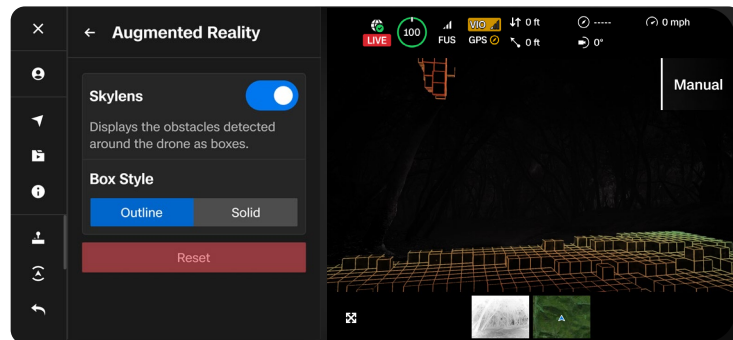




Global Settings | Display

Augmented Reality

- **Skylens** | Displays obstacles detected around the X10 D
- **Box Style** | Defines the AR voxel behavior
 - Outline
 - Solid

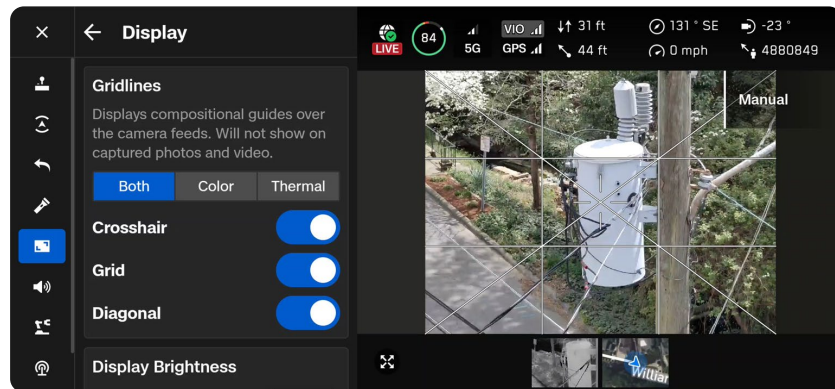




Global Settings | Display

Gridlines

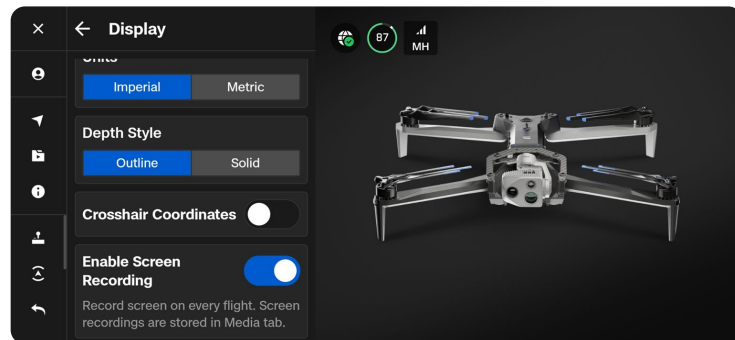
- Displays lines over video feed for compositional guide
 - **Centerpoint** | Center crosshairs
 - **Grid** | Vertical and Horizontal lines
 - **Diagonal** | Creates an “X” on the screen
- Choose which sensor to display the gridlines over





Global Settings | Display

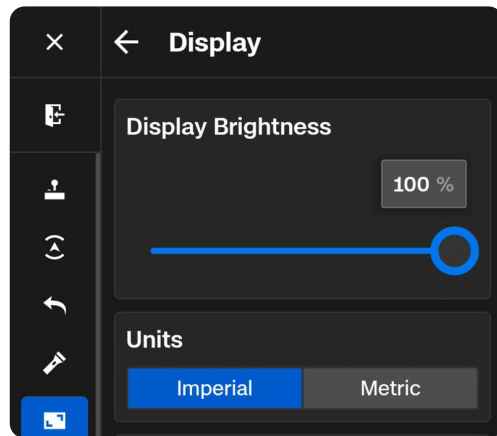
- **Crosshair Coordinates** | Enables MGRS coordinate display at video crosshairs
- **Enable Screen Recording** | Capture screen recordings or screen shots
 - Not encrypted
 - Global Settings > Media > Recordings/Screenshots
 - To screenshot, Hold R2 for 6 seconds
 - Export via USB-C, Export > Done
 - Wait 30 seconds before ejecting the USB-C drive to ensure media is exported





Global Settings | Display

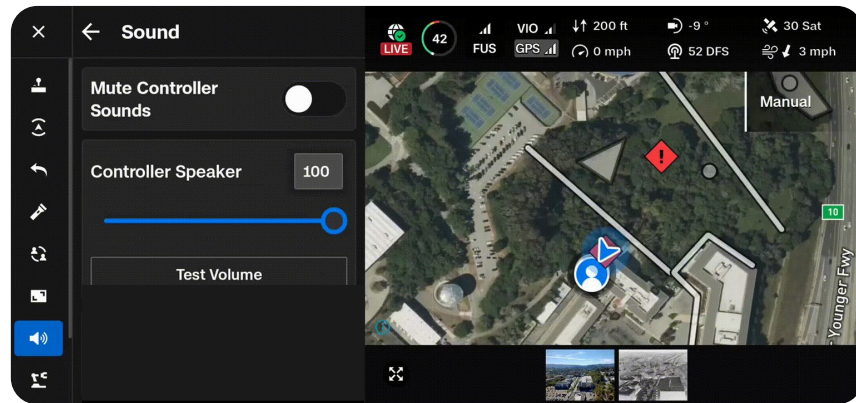
- **Display Brightness** | Controls screen brightness
- **Units** | Adjusts the unit of measure
- **Depth Style** | Determines how the Skylens AR overlay is displayed
- **Crosshair Coordinates** | Displays grid coordinates at video centerpoint/crosshairs





Global Settings | Sound

- Mute or allow audible alerts on the controller
- Control the volume of alerts
 - Low Battery
 - Photo Shutter
 - ADS-B





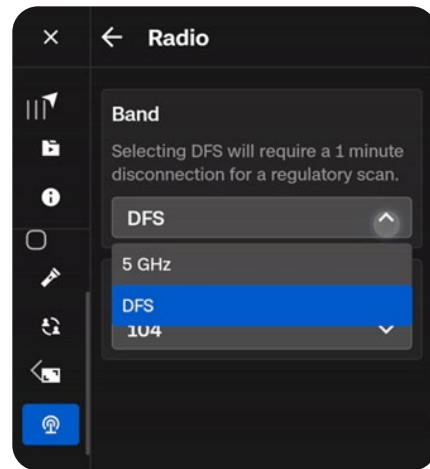
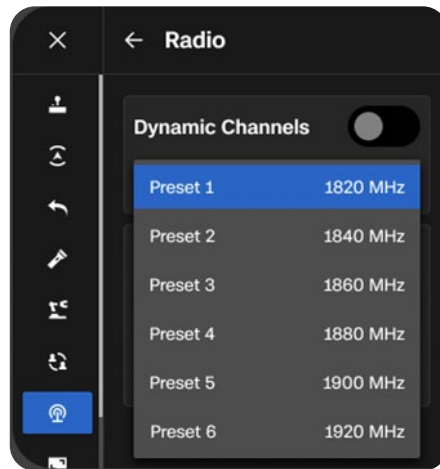
Global Settings | Radio

Microhard (MH) Radio

- Enable Dynamic Channel Selection
- Select your 6 presets
- Manually switch between preset frequencies

SL Radio

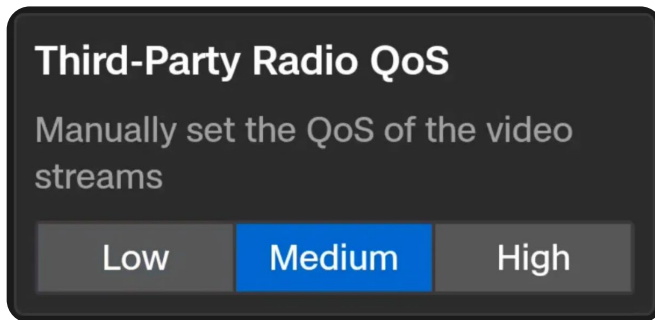
- Choose between 5GHz and DFS in flight or on the ground
- DFS allows access to additional 5GHz channels meant for radar systems





Global Settings | Quality of Stream (QoS)

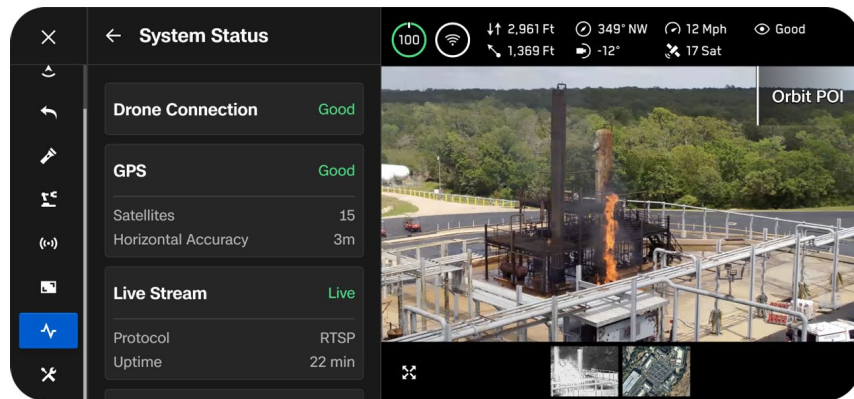
- Allows users to set the video streaming bitrate (quality)
- Lower bitrate when range/distance is required
- Requires the X10D to ingest a JSON file
- Only available when 3rd party radios are attached





Global Settings | System Status

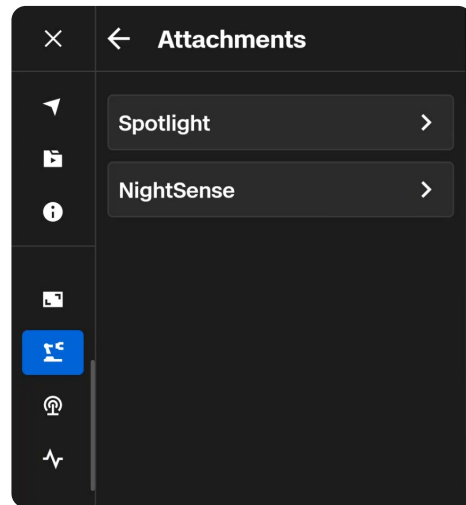
- Displays aircraft serial number
- Displays operating frequency
- GPS health, satellites, horizontal accuracy
- ATAK status
- Live streaming status





Global Settings | Attachments

- Appears only when attachments are installed
- Some functions extend to Quick Action bar
- Can be accessed in flight as needed





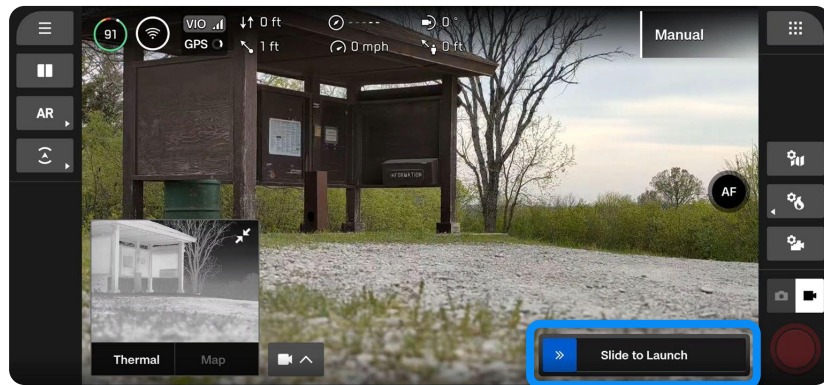
02

Launching



Launching | Ground Launching

- Clear a launch area around and above the X10D
- Ensure aircraft is level and propellers are unobstructed
- Press and hold the Launch button or use the launch slider
- X10D climbs to 10ft and rotates 360° to calibrate the IMU
- Can set launch height to 3 ft
- Cancel at any time before the X10D lifts off





Launching | Hand Launching

- Clear area around and above the X10 D
- Turn your back to the wind
- Extend your arm shoulder level or above
- Launch using controller or battery button (quick launch)
- X10 D climbs to 10 ft and rotates 360°
- Slowly release as X10 starts to leave your hand
- Do not push or toss the aircraft



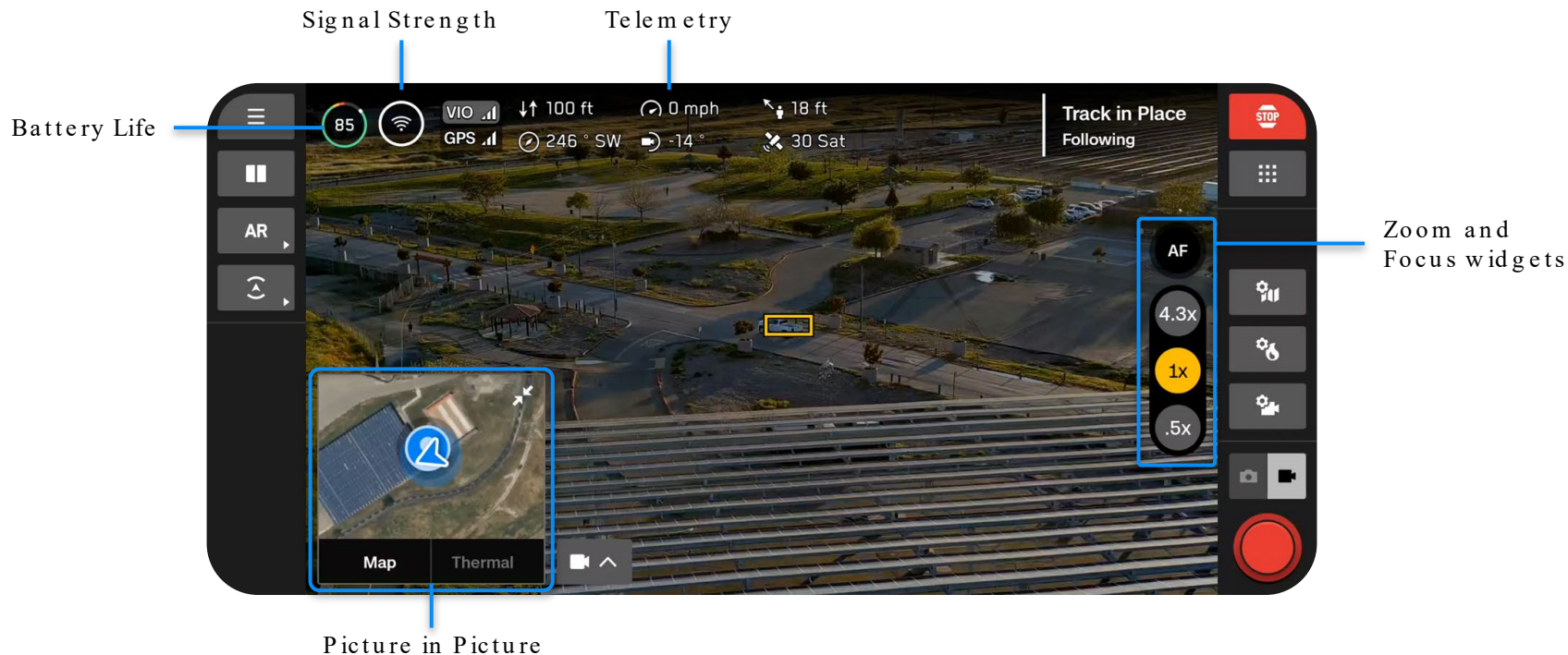


03

Skydio Flight Deck

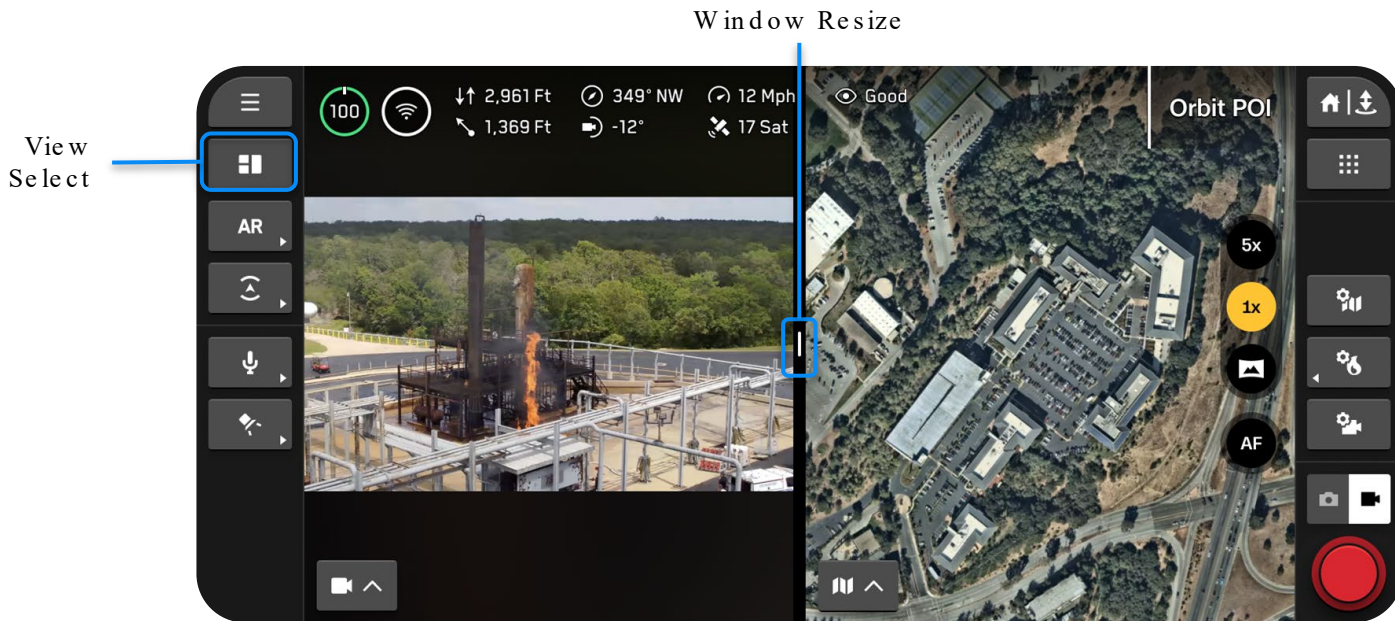


Skydio Flight Deck | Single Layout





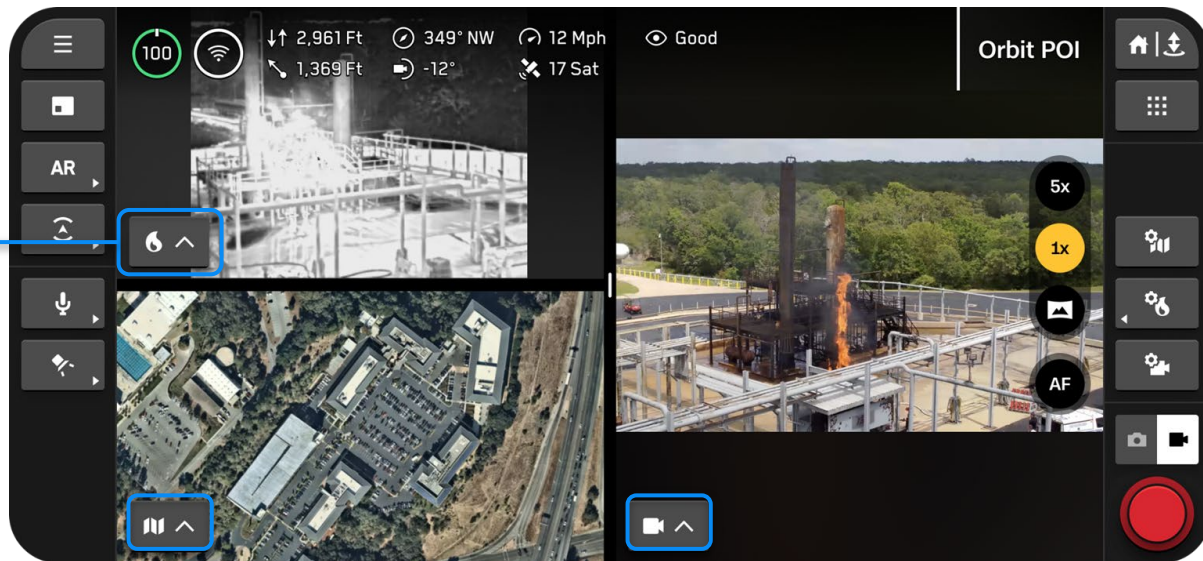
Skydio Flight Deck | Split Layout





Skydio Flight Deck | Grid Layout

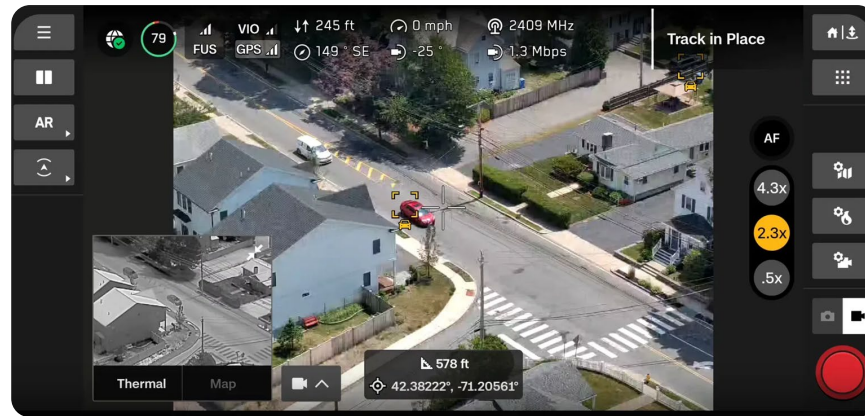
Display Select





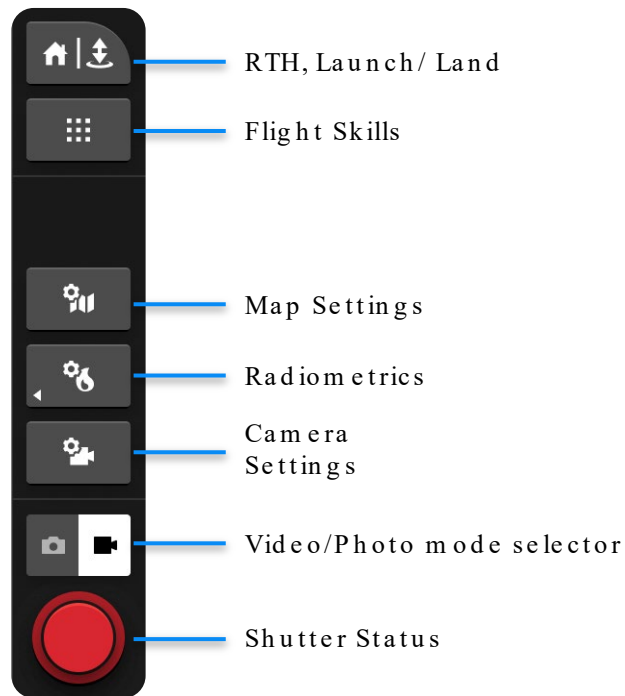
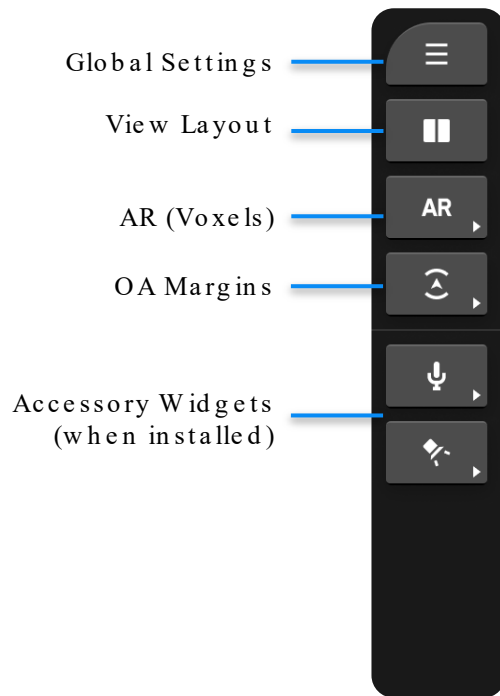
Skydio Flight Deck | Crosshair Coordinates

- Displays slant range and MGRS coords at the crosshair location
- Requires DTED to be loaded
- Crosshair coordinates must be enabled in display menu





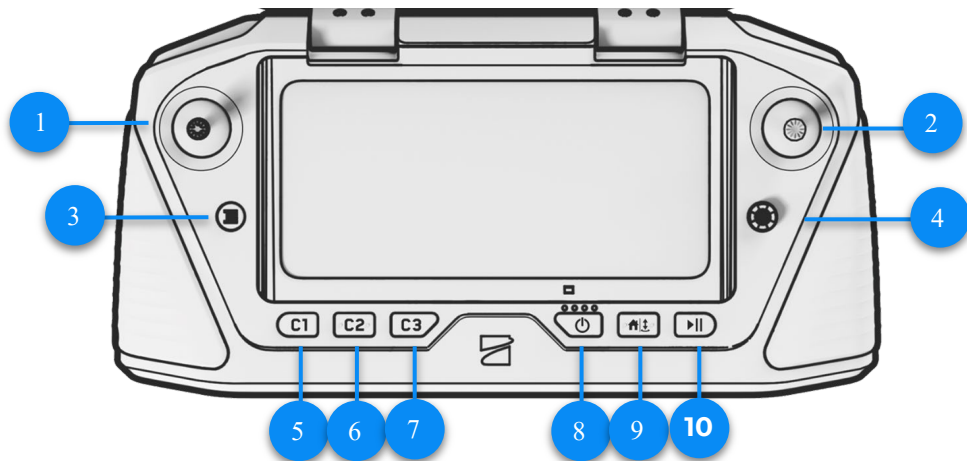
Skydio Flight Deck | Quick Actions





Skydio Flight Deck | Flight Controls

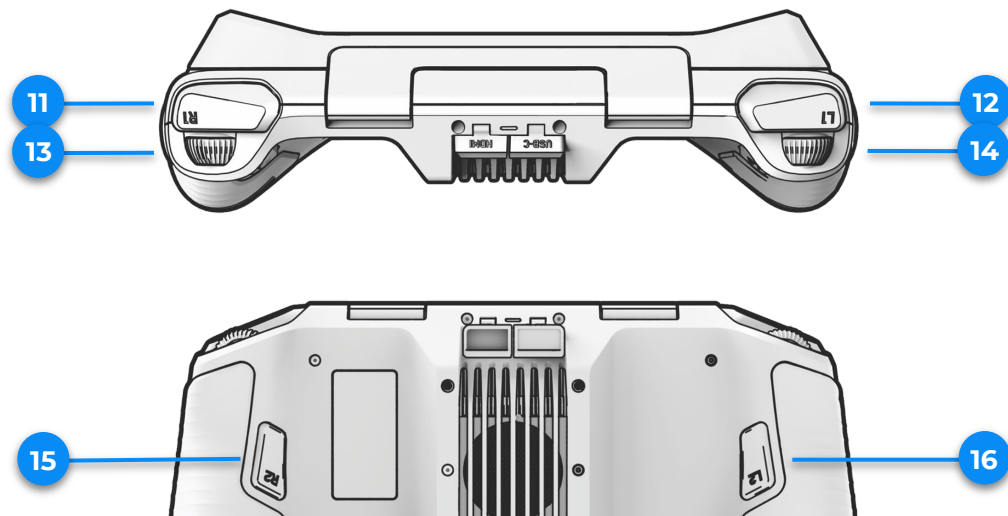
1. Height & Rotation (default)
2. Lateral Movement (default)
3. Menu Back
4. D-Pad | Limited Function
5. Customizable
6. Customizable
7. Customizable
8. Power On/Off
9. Launch/Land
10. Pause Autonomous Action





Skydio Flight Deck | Flight Controls

- 11. Shutter / Record
- 12. Boost (fly at max speed)
- 13. Customizable / Zoom
- 14. Camera / Gimbal tilt
- 15. Customizable
- 16. Customizable





Skydio Flight Deck | Manual

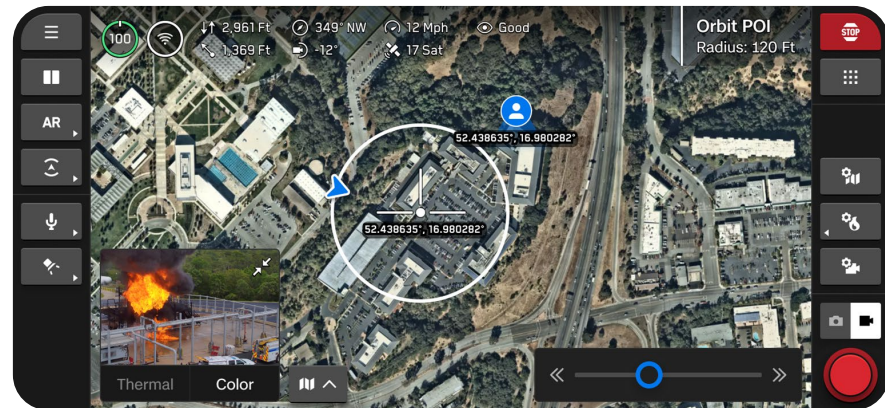
- Default flight skill
- Allows most control of X10 D in flight (with Attitude mode)
- OA active (with Attitude mode off)





Skydio Flight Deck | Orbit

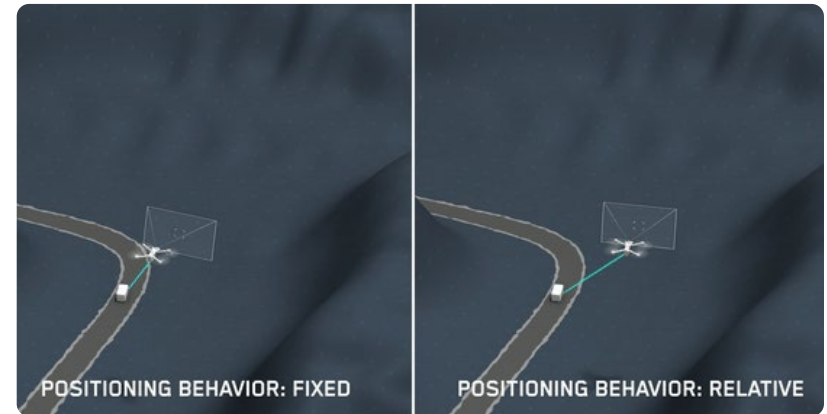
- GPS based
- Orbit manually or autonomously
- Adjust orbit as necessary without interrupting flight
- View Orbit ground track in augmented reality





Skydio Flight Deck | Scout

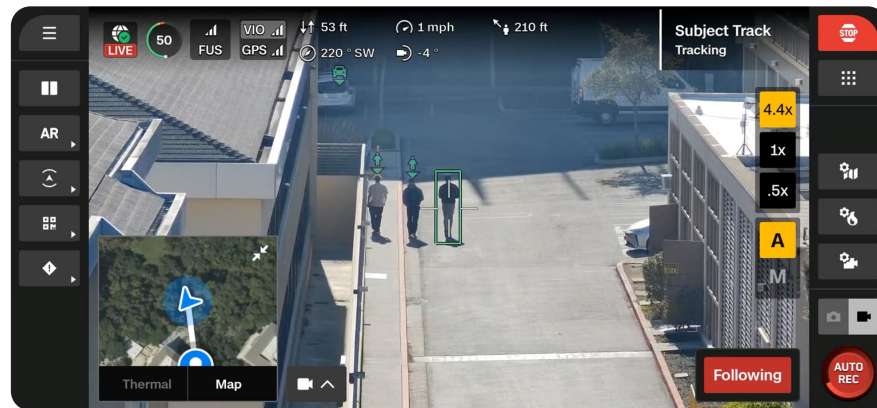
- Wirelessly tethers the X10D to the controller's GPS position
- Pilot maintains manual control and adjust and reposition the aircraft as necessary
- Set a range limit, Fixed or Relative behavior, and other settings
- Great for vehicle convoys, foot patrols, etc...





Skydio Flight Deck | Subject Track & Follow

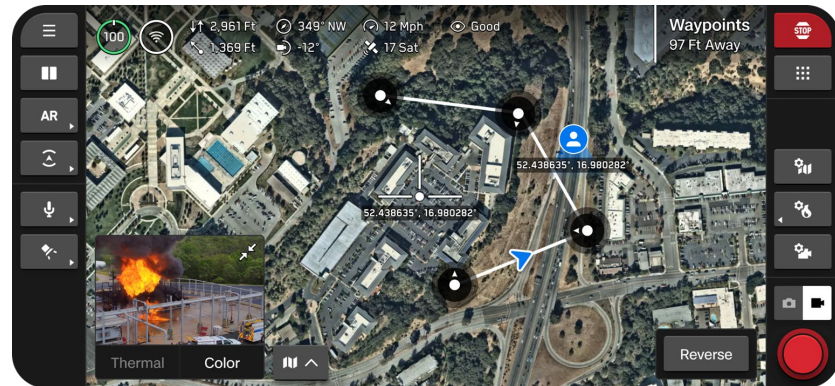
- Enables autonomous subject tracking
- **Track** | X10 D maintains visual while hovering in place
- **Follow** | Tracks and follows selected moving subjects
 - Aircraft must be at 60 ft or above with OA on





Skydio Flight Deck | Waypoint Missions

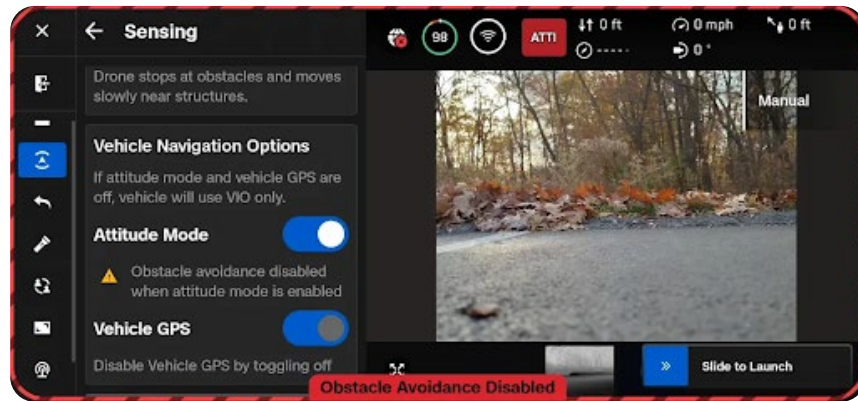
- Repeatable GPS based flight plans/missions
- Edit live
- Pause/resume missions
- Manual or autonomous control of the sensor
- Create up to 256 waypoints
- Set an Anchor Point to allow waypoint missions in GPS-denied environments





Skydio Flight Deck | Attitude Flight Mode

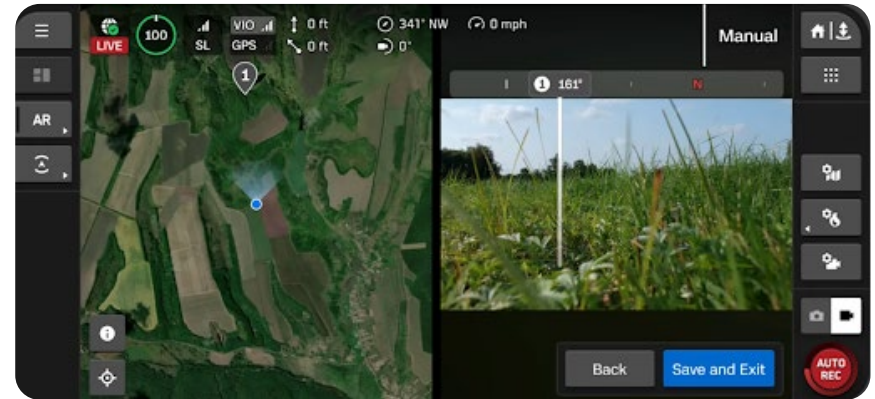
- Launch and navigate in GPS denied environments and without VIO
- Global Settings > Sensing > Attitude Mode
- To launch, throttle down for 1 second
- Hold L2 button for temporary Atti Mode





Skydio Flight Deck | Anchor Point Navigation

- Navigate on the Map without GPS
- Fly Now > Map settings > Set Anchor Point
- Drag map to set anchor point on drones position
- Long press visible feature on map
- Rotate drone until heading point is in FOV





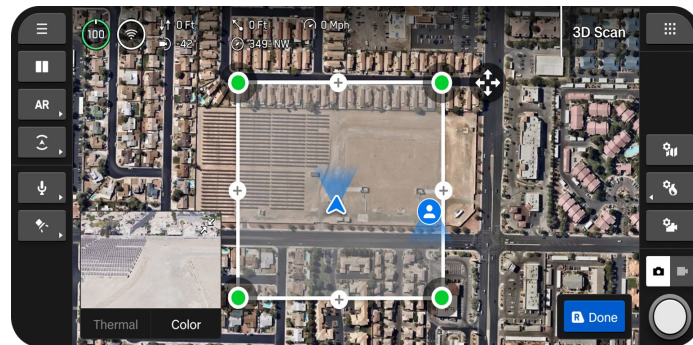
04

Map Capture



Map Capture | Overview

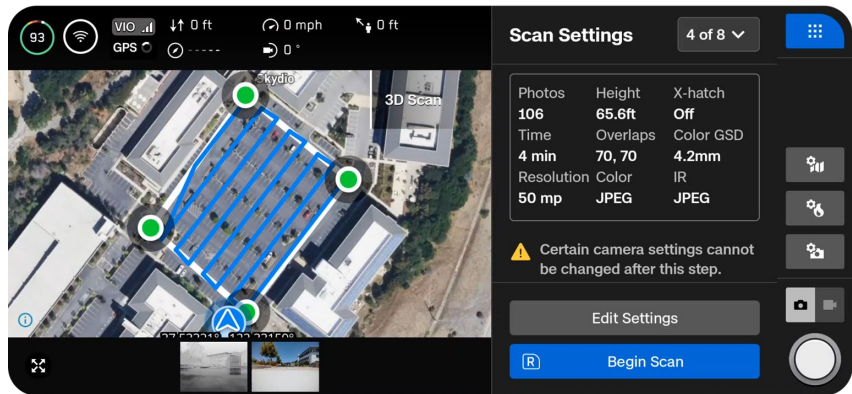
- Must switch into 3D Scan flight mode
- Build the mission on your controller or in Fleet Manager
- Settings optimized for capture with color camera
- Can run Map Capture at night with or without NightSense
- Save mission for repeatability





Map Capture | Settings

- Scan results can vary based on settings
 - Height
 - Overlap/Sidelap
 - Diagonal
 - Perimeter
 - Crosshatch
 - Perpendicular Camera Heading
 - Custom Flight Direction
- View projected photo count, flight time, and GSD based on your configured settings





Map Capture | Environmental Factors

- Cloudy or overcast conditions are ideal
- Too much or too little lighting can negatively affect your orthomosaic
- Avoid reflective surfaces/structures
- Remove images that contain
 - Too much sky
 - Wide, open, featureless backgrounds
 - Smooth/textureless surfaces
 - Bodies of water





Map Capture | Flight

- Launch, set rally point and begin scan
- Monitor the progress of the Map Capture
 - View photos taken and remaining
 - Flight path changes to blue when flown
 - Skip capture points
- Aircraft returns when complete or upon low battery
- If capturing thermal photos, increase overlap and sidelap to 80/80





Map Capture | Viewing Your Data

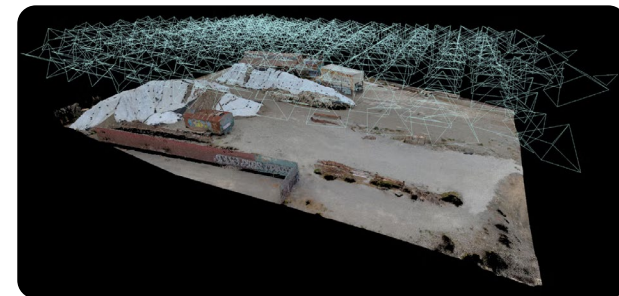
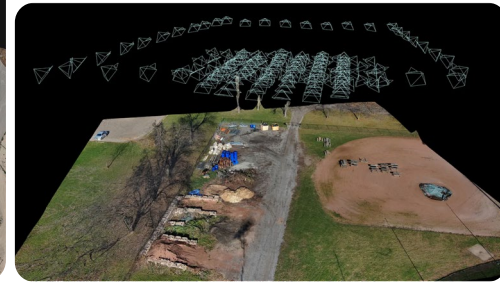
- Allow the task Queue to complete before powering down the X10 D
- Navigate to the Media tab to review captured images
- The X10 D can create an onboard model/orthomosaic of the scanned area
- A .gltf and .tiff file is rendered after the flight which can be uploaded to any 3D model viewer or photo viewer
 - Microsoft Model Viewer
 - MeshLab
 - MacOS Preview





Map Capture | Post Processing

- For a full resolution reconstruction/orthomosaic, use a photogrammetry engine
- Upload data to any photogrammetry engine
 - DroneDeploy
 - Pix4D (must upload geolocation file as well)
 - GNext
 - Bentley
 - More...





05

Returning & Landing



Returning & Landing | Low Battery

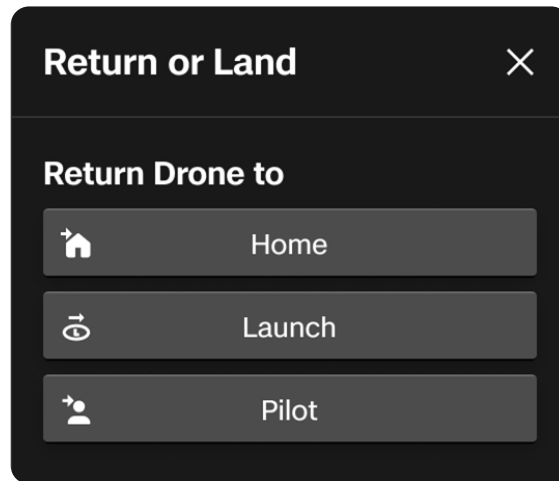
- Multiple low battery notifications
 - **Return Battery Capacity Reached** | X10 D has enough battery to return
 - **Land Soon** | 1 minute before X10 D lands in place
 - **Land Immediately** | Aircraft may power off in flight
- If X10 D is within 32 ft of the return location, no notification is given





Returning & Landing | Returning

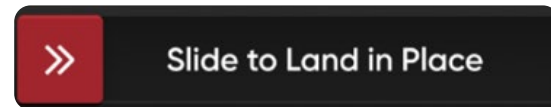
- Return to the launch location to prepare for landing
- Returns to home location if one is set
- Can also return to pilot (controller) location
- Lost Connection return settings apply only to lost connection/link loss





Returning & Landing | Landing

- On-screen button and slider or controller Launch/Land button
- Clear area below the X10 D
- OA shuts off 10 ft above landing surface **(during landing only)**
- Nudge aircraft into precise landing location
- Cancel any time prior to landing
- Do not approach until motors shut off
- Allow task queue to complete prior to shutting down X10 D
- Cannot land without commanding a landing





Returning & Landing | Hand Landing

- For areas where ground landing isn't suitable
- Clear area below the X10D and face it away from you
- Ensure the wind is at your back
- **Command the X10D to land**
- Do not grab until OA is disabled (lights on the drone will turn yellow)
- Grab by the battery and hold still until motors shut off





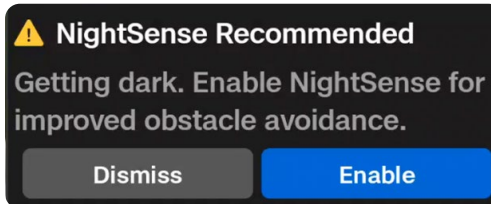
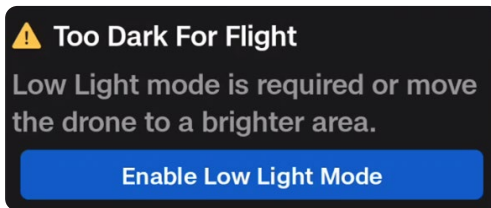
06

Night Operations



Night Operations | Notification

- Notification is generated when insufficient lighting is detected
- Must switch to Low Light Mode
- Can on ground or in air
- Option to auto enable NightSense in Low Light
- Do not artificially illuminate launch area





Night Operations | No NightSense

- Switch to Low Light Mode
- OA is disabled automatically
- No VIO
- Maintain separation from obstacles





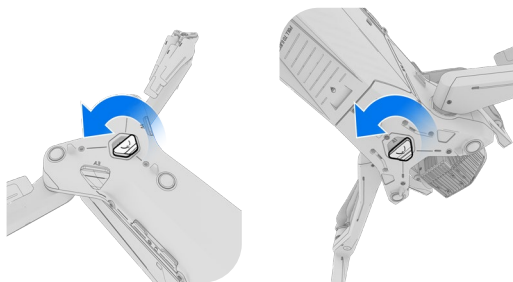
Night Operations | With NightSense

- Switch to Low Light Mode
- Can toggle on/off in flight
- Aircraft max speed is reduced to 18 mph (29 km/h)
- Recommended mission speed no greater than 9 mph (14 km/h)
- Descent speed 4.5 mph (7 km/h)



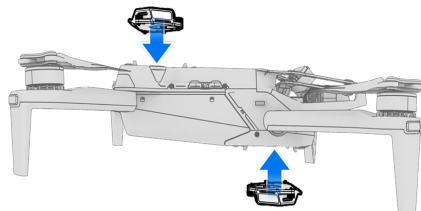


Night Operations | Installing NightSense



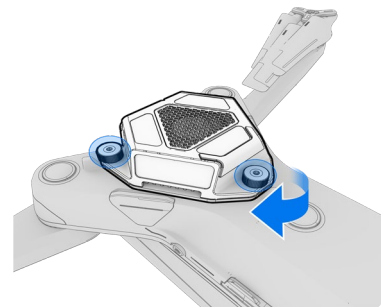
Rubber Gaskets

Locate top and bottom rubber USB-C gaskets. Gently lift and rotate 180 degrees. Do not pull off gasket.



NightSense Modules

Align and gently insert the NightSense USB into the port. Press firmly to secure.



Thumb Screws

Twist clockwise until you feel resistance. Hand tighten and ensure flush mount.



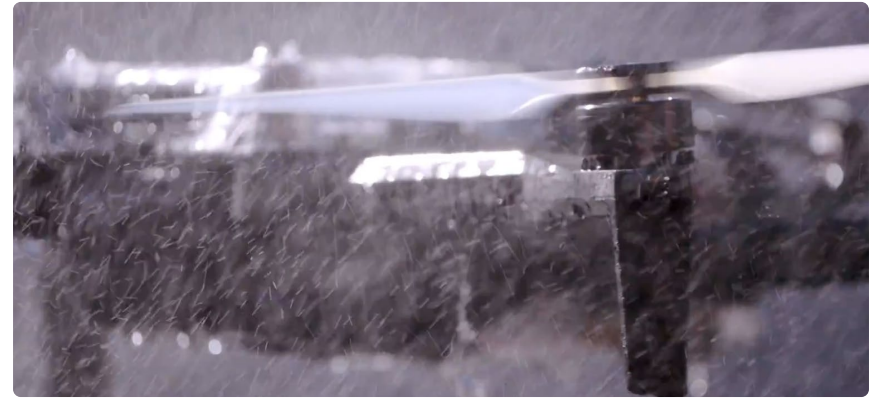
05

Flight in Inclement Weather



Flight in Inclement Weather | Precipitation

- IP55 rating
- Fly in light to moderate precipitation (trace to .3 in/hr)
- Disable OA and NightSense
- Enable Low Light mode at night





Flight in Inclement Weather | Visibility

- Part 107.51 requires 3SM visibility
- Remain 500 ft below and 2000 ft horizontally from clouds
- Disable OA and NightSense in fog or clouds
- Navigate out of those conditions (retrace steps, climb, descend)
- Return and land if necessary





Flight In Inclement Weather | Icing

- Ice formation on rotor blades reduces lift and stability
- Vehicle Icing Detection based on signs of reduced lift and increased drag
- Land as soon as possible



▲ Propeller Icing Possible
Icing may occur due to cold temperatures. Be cautious when flying near visible moisture in the air.

Dismiss

▲ Propeller Icing Likely
Flight performance is degraded. Land as soon as possible.

Dismiss



06

Contingencies & Troubleshooting



Contingencies & Troubleshooting | Lost Connection

Main Causes

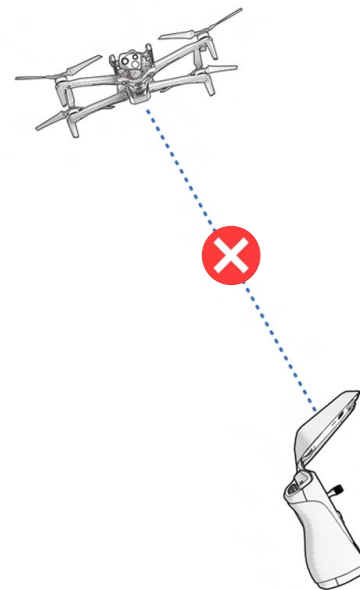
- RF interference

Identify

- Aircraft executes Return
- Lost Connection notification appears

Troubleshoot

- Change frequencies
- Orient antenna towards drone
- Ensure radio power is set to max (if applicable)





Contingencies & Troubleshooting | Controller Overheating

Main Causes

- Exposure to direct sunlight

Identify

- On-screen notification
- Launch prevented
- Controller may shut down if not cooled down

Troubleshoot

- Move to cool, shaded area and allow controller to cool
- If cooling fan is not operational, contact Skydio Support





Contingencies & Troubleshooting | Radio Interference Detection

Main Causes

- Interference from high-powered radios

Identify

- On-screen alert
- Loss of communications
- Video loss

Troubleshoot

- Maintain at least 12 inches (31cm) between transmitting radio antennas and the controller





Contingencies & Troubleshooting | Aircraft Overheating

Main Causes

- High ambient temps or low airflow

Identify

- 3 temperature warnings

Troubleshoot

- Disable OA to reduce temps immediately
- Land if aircraft temps do not return to normal
- Fly laterally to increase airflow over the aircraft

 **Drone is Heating Up**
Drone is approaching temperature limits. If possible, disable Obstacle Avoidance to reduce power draw and lower drone temperature.
[Dismiss](#)

 **Drone Temperature Critical**
Obstacle Avoidance is disabled to avoid overheating. Fly with caution.

 **Land Now**
Drone is too hot for safe flight. Obstacle Avoidance is disabled.



Contingencies & Troubleshooting | Lost GPS

Main Causes

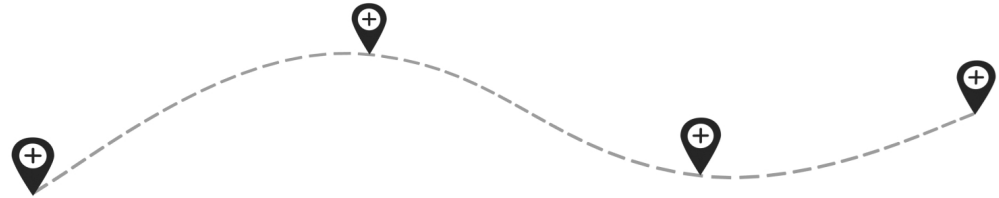
- GPS jamming or interference

Identify

- Lost GPS message appears on screen

Troubleshoot

- Ensure Vehicle GPS toggle is on
- Can continue flight with VIO only
- Use Anchor Point for map navigation





Contingencies & Troubleshooting | Emergency Landing

Main Causes

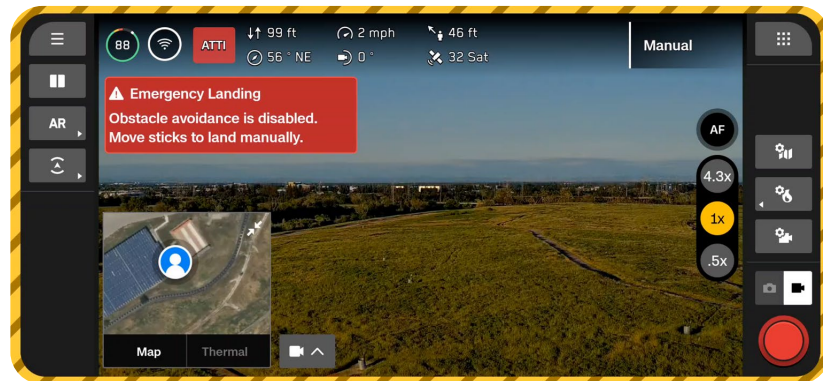
- Failure of GPS and VIO navigation

Identify

- An emergency landing notification will appear
- Yellow banner along the edges of the screen

Troubleshoot

- Assume manual control in Attitude mode by inputting joystick commands
- Leave the joysticks centered for 5 seconds in order to resume the e-land





Contingencies & Troubleshooting | Drone Stuck

Main Causes

- Degraded VIO or debris or moisture accumulation on the nav cam s

Identify

- “Drone Stuck” notification

Troubleshoot

- If debris or moisture buildup, disable OA and continue mission or return and clean the nav cam s
- If stuck in confined space, reduce OA to navigate out or recover by hand



Contingencies & Troubleshooting | Controller Unresponsive

Main Causes

- Controller left too long without activation
- Hardware failure

Identify

- Controller not responding to button presses

Troubleshoot

- Press and hold **C3 & Power** until LEDs shut off
- Charge controller





Contingencies & Troubleshooting | Controller Unresponsive (cont'd)

Troubleshoot

- Press and hold **Reset button** above power button > **Restart**
- Charge controller

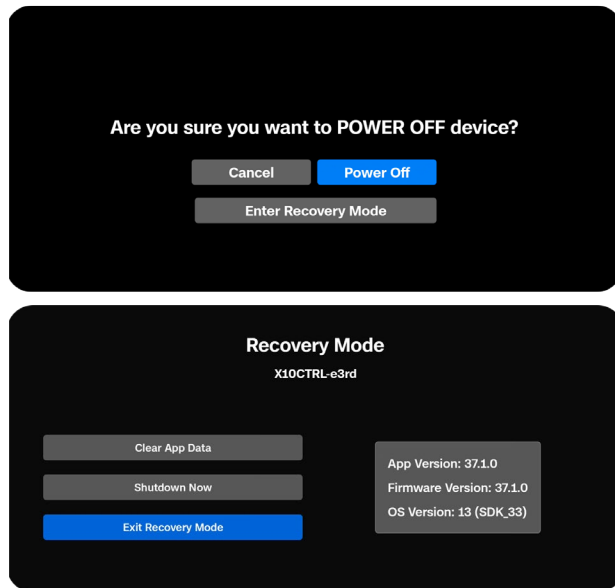




Contingencies & Troubleshooting | Controller Unresponsive (cont'd)

Troubleshoot

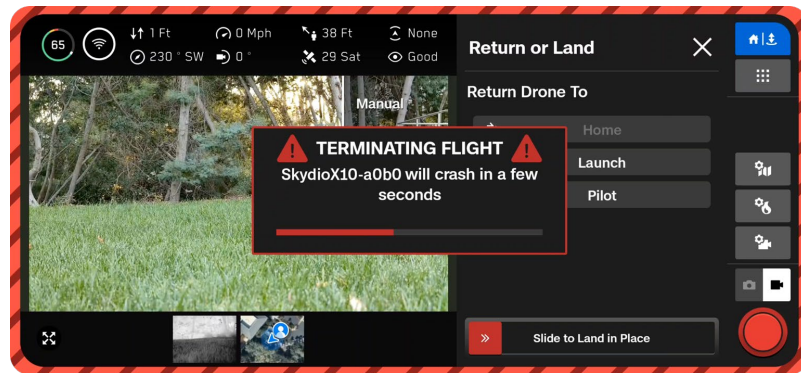
- Hold power button until prompted to power off
- Hold Pause, R1, and R2 to unlock Recovery Mode
- “Clear App Data” to factory reset
- Exit Recovery Mode when finished





Contingencies & Troubleshooting | Terminate Flight

- Cuts the motors
- Should be used as a last resort
- Press/ hold **C3** and **Land buttons** for **3 seconds**
- Motors cannot be restarted in flight
- Record aircraft's GPS location





Contingencies & Troubleshooting | Low Battery

- X10 D will issue battery warning relevant to return altitude, distance to, and speed of return
- **Always Ask** | X10 D will ask if you want to continue flying or return
- **Return to Home Point** | X10 D will automatically return
- If returning manually, descend en route to gain flight time



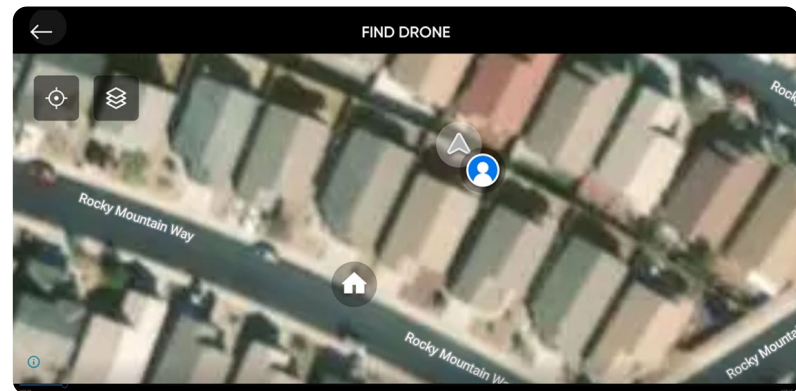
Land Immediately

Drone's height may soon exceed the battery's capacity to land.



Contingencies & Troubleshooting | After a Crash

- Can reference last known GPS location
 - Global Settings > Information > Skydio X10-xxxx > Find Skydio X10-xxxx
- “Review Last Flights” to assist in crash investigation or locating the aircraft
 - Global Settings > Information > Skydio X10-xxxx > View Last Flights
- If damage appears to be minimal, conduct an FCF
- Contact support
- Upload Flight Logs





You Learned

01

Global Settings

Apply limitations and define mission specific drone behaviors and controls

02

Launching

Discover launch techniques and describe the launch process

03

Flight Deck

Explore telemetry items and controller functions

04

Map Capture Missions

Collecting imagery for creating maps, GRGs, etc...

05

Returning & Landing

Identify and understand safe practices when recovering your X10D

06

Night Operations

Identify and understand safe practices when flying your Skydio X10D in Low Light environments

07

Flight in Inclement Weather

Help determine the proper response to non-typical behaviors and emergencies

08

Contingencies & Troubleshooting

Help determine the proper response to non-typical behaviors and emergencies



Questions

