Sub250

DollyFly

Instruction Manual

v1.0

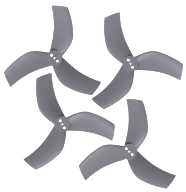
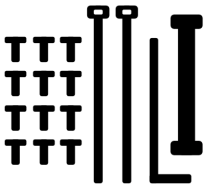
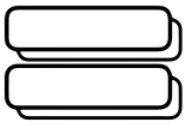
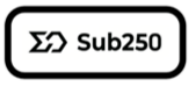
Table of Contents

Specifications

Length	165mm
Width	174mm
Height	73mm
Wheelbase Size	120mm
Body Weight	180g ±3g

Motor	Sub250 1404 4500kv
Propeller	HQ DT63MMX3 V2
FC	Redfox A3 35A
Battery	Sub250 4S 720mAh
VTX & Camera	DJI O3 Air Unit

Components

				
DollyFly *1	Additional Propeller CW*2 CCW*2	Additional Battery Securing Straps *1	Additional Battery Anti-Slip Pad *1	Spare Screw Accessory Pack *1
				
Replaceable GPS Mounting Bracket *1	Replaceable Universal Mounting Bracket *1	O3 Air Unit UV Filter *1	DJI O3 Air Unit Manual *1	Sub250 Brand Stickers *1

Required Equipment

- Remote Controller (DJI FPV Remote Controller 2 or an ELRS/TBS controller compatible with the product)
- Sub250 4S 720mAh Battery
- Compatible charger specifically for model aircraft lithium-polymer batteries
- Maintenance Tools

Complete Safety Guidelines and Compliance Information

General Safety Precautions and Warnings

- **Maintain a Safe Distance:** Ensure a safe perimeter around the drone to prevent collisions and injuries. Be aware that radio signals are subject to interference, which can lead to temporary loss of control.
- **Operate in Open Spaces:** Use the drone in areas away from people, vehicles, and traffic.
- **Follow Instructions Carefully:** Heed all directions and warnings for the drone and any related equipment, such as chargers and batteries.
- **Child Safety:** Keep all chemicals, small parts, and electrical components out of children's reach.
- **Water Exposure:** Avoid exposing any part of the drone or its components to moisture as it can cause damage.
- **Choking Hazard:** Do not place any part of the drone in your mouth.
- **Battery Management:** Ensure the transmitter batteries are fully charged for uninterrupted control.

Operational Safety and Compliance

- **Constant Visual Contact:** Always keep the drone within your line of sight and under control.
- **Emergency Protocols:** Know and use the throttle hold in case of rotor strike or emergencies.
- **Battery Care:** Use fully charged batteries, keep the transmitter powered when the drone is on, and remove batteries before disassembly.
- **Maintenance and Care:** Regularly clean and dry moving parts, and let them cool after use before handling.
- **Post-Use Battery Removal:** Remove batteries after each use to prevent potential hazards.
- **Inspect Wiring:** Do not operate the drone with damaged wiring.
- **Avoid Moving Parts:** Never touch moving parts of the drone.

Legal Compliance and Privacy

- **Local Regulations:** Comply with all local drone operation laws and regulations.
- **No-Fly Zones:** Avoid flying in restricted or sensitive areas.
- **Respect Privacy:** Do not capture images or videos in private areas without consent.

Emergency Response and User Conduct

- **Emergency Situations:** Provide detailed guidelines for responding to various emergencies, such as loss of control or battery failure.
- User Conduct: Encourage adherence to a code of conduct for flying etiquette and good relationships **among** drone operators.
- **Training and Qualifications:** Highlight the need for additional training or certification for advanced operations or commercial use.

Environmental Considerations

- **Environmental Impact:** Avoid flying in environmentally sensitive areas to protect wildlife and habitat.
- **Spectrum Use:** Ensure the drone's frequency band is legal in your area and be aware of potential radio interference.

Additional Guidelines

- **Flight Preparation:** Conduct a pre-flight inspection to ensure all systems are functional.
- **Environmental Awareness:** Do not fly in adverse weather conditions like high winds or rain.
- **Storage and Transportation:** Store and transport the drone securely to prevent damage.

Remember, safe and responsible drone operation is your responsibility.
Refer to this manual for complete guidelines to enjoy a safe flying experience.

Charging Warnings for Li-Po Batteries

Safety Precautions for Charging

- **Supervised Charging:** NEVER leave charging batteries unattended. Always monitor the charging process to prevent any incidents.
- **Charging Duration:** NEVER charge batteries overnight. Set a timer to remind you to check the battery frequently.
- **Assumption of Risks:** By handling, charging, or using the included Li-Po battery, you acknowledge and accept all risks associated with lithium batteries.
- **Battery Condition Monitoring:** Immediately stop using and charging the battery if it starts to balloon or swell. Continued use in this condition can lead to fire.
- **Storage Conditions:** Always store batteries at room temperature in a dry area. Extreme temperatures can damage the battery.
- **Transportation and Temporary Storage:** Store and transport the battery within a temperature range of 40–120°F (5–49°C). Avoid leaving the battery in a car or under direct sunlight.
- **Charging Location:** Always charge batteries away from flammable materials and inspect the battery before charging. After charging, disconnect the battery and allow the charger to cool before the next use.
- **Temperature Monitoring:** Constantly monitor the battery pack's temperature during charging to prevent overheating.

Charger Specifications and Use

- **Charger Compatibility:** ONLY use a charger specifically designed for charging Li-Po batteries. Using an incompatible charger may lead to fire, causing personal injury and/or property damage.
- **Battery Discharge Limits:** Never discharge Li-Po cells below 3.3V under load.
- **Battery Care:** Never cover warning labels with hook and loop strips. Charge batteries within recommended levels and never charge damaged batteries.
- **Charger Handling:** Never attempt to dismantle or alter the charger. Only adults should charge battery packs, and never allow minors to handle the charging process.
- **Charging Environment:** Charge batteries in a temperature-controlled environment (recommended between 40–120°F or 5–49°C). Avoid charging in extremely hot or cold conditions or placing the battery in direct sunlight.

CAUTION:

All instructions and warnings must be followed exactly. Mishandling of Li-Po batteries can result in a fire, personal injury, and/or property damage.

Be cautious and follow all safety guidelines to ensure safe use.

Charging Parameter Settings for Sub250 4S 720mAh LiHV

Battery Specifications

- **Charger Selection:** Use a charger that is compatible with LiHV batteries and capable of charging 4S Type: LiHV (Lithium High Voltage)
- **Configuration:** 4S (4 cells in series)
- **Capacity:** 720mAh

Charging Setup

- **Charger Selection:** Use a charger that is compatible with LiHV batteries and capable of charging 4S configurations.
- **Charging Mode:** Set your charger to **LiHV** mode. This is critical as LiHV batteries have different charging requirements compared to standard Li-Po batteries.
- **Charging Current:** Set the charging current to **2.0A.** This is a safe rate that balances charging speed and battery health. It's recommended not to exceed this current to prevent overheating and reduce the risk of damage.
- **Voltage Settings:** Ensure that the charger is set to charge each cell to the appropriate high voltage limit for LiHV batteries, which is typically 4.35V per cell. For a 4S battery, the total voltage should be 17.4V when fully charged.

Safety Precautions

- **Monitoring:** Always monitor the battery while it’s charging. Do not leave it unattended.
- **Temperature Check:** Regularly check the battery temperature during charging. If the battery becomes too hot, stop charging immediately.
- **Post-Charge Inspection:** After charging, inspect the battery for any signs of damage, such as swelling or heat damage.
- **Storage:** If the battery is not going to be used immediately, store it in a safe, fireproof location and avoid leaving it fully charged for extended periods.

Charging Environment

- Charge in a well-ventilated area away from flammable materials.
- Use a fireproof charging bag or container as an additional safety measure.

First Flight Preparation

Before the First Flight

- **Firmware and Configuration Check:** Confirm all settings are correctly configured according to your drone's specifications.
- **Hardware Inspection:** Conduct a thorough inspection of the drone. Check for any loose components, ensure propellers are securely fastened, and inspect the frame for any cracks or damage.
- **Battery Inspection:** Check the condition of the Li-Po battery. Ensure it is fully charged and shows no signs of swelling or damage.
- **Transmitter Setup:** Verify that your transmitter is correctly bound to the drone and all controls function as expected. Perform a range check to ensure reliable control at a distance.
- **FPV Gear Check:** If your drone is equipped with an FPV system, confirm that the camera, transmitter, and goggles/display are functioning correctly and are properly configured.
- **Flight Controller Calibration:** Calibrate the drone's flight controller and sensors, including the accelerometer and gyro, using Betaflight.
- **Fail-Safe Settings:** Confirm the fail-safe settings are correctly configured in Betaflight to ensure the drone will respond safely in case of signal loss.

Pre-Flight Checklist

- **Environment Check:** Assess the flying area for any potential hazards such as power lines, trees, or water bodies.
- **Weather Conditions:** Ensure the weather is suitable for flying, avoiding windy or rainy conditions.
- **Drone Inspection:** Perform a quick visual check of the drone, including propeller security and battery connection.
- **System Check:** Power up the drone and transmitter and check for any error messages or warnings in Betaflight.
- **FPV System Check:** Verify that the FPV system is functioning and provides a clear image.

Post-Flight Checklist

- **Battery Care:** Disconnect and inspect the battery for any signs of damage or overheating.
- **Drone Inspection:** Check the drone for any new damage or loose parts.
- **Maintenance:** Perform any necessary maintenance or cleaning to keep your drone in optimal condition.

First Flight Tips

- Start with a short, low-altitude flight in a controlled environment.
- Test basic maneuvers and the responsiveness of controls.
- Gradually increase flight complexity as you become more comfortable with the drone's performance.

Binding with DJI FPV Remote Controller 2 (PNP Version)

- **To prioritize safety, it is highly advised to take off the propellers and switch off the power of both the transmitter and flight controller before commencing the binding process.**
- **Before using the DJI O3 Air Unit, it needs to be activated and updated. Connect it to your computer using a USB-C cable and use DJI Assistant 2 (Consumer Drone Series) for activation and updating the firmware.**

Binding DJI O3 Air Unit with Goggles

- Power On Devices: Turn on your DJI goggles and the DJI O3 Air Unit.
- Enter Linking Mode (Goggles): Press the link button on the goggles. The goggles will start to beep, indicating they have entered the linking state.
- Linking Air Unit: Press the link button on the DJI O3 Air Unit. When the linking is successful, the live view will appear on the goggles.
- The status indicator of the air unit changes from green to red when linking and will turn solid green once the linking is successful.

Binding DJI O3 Air Unit with DJI FPV Remote Controller 2

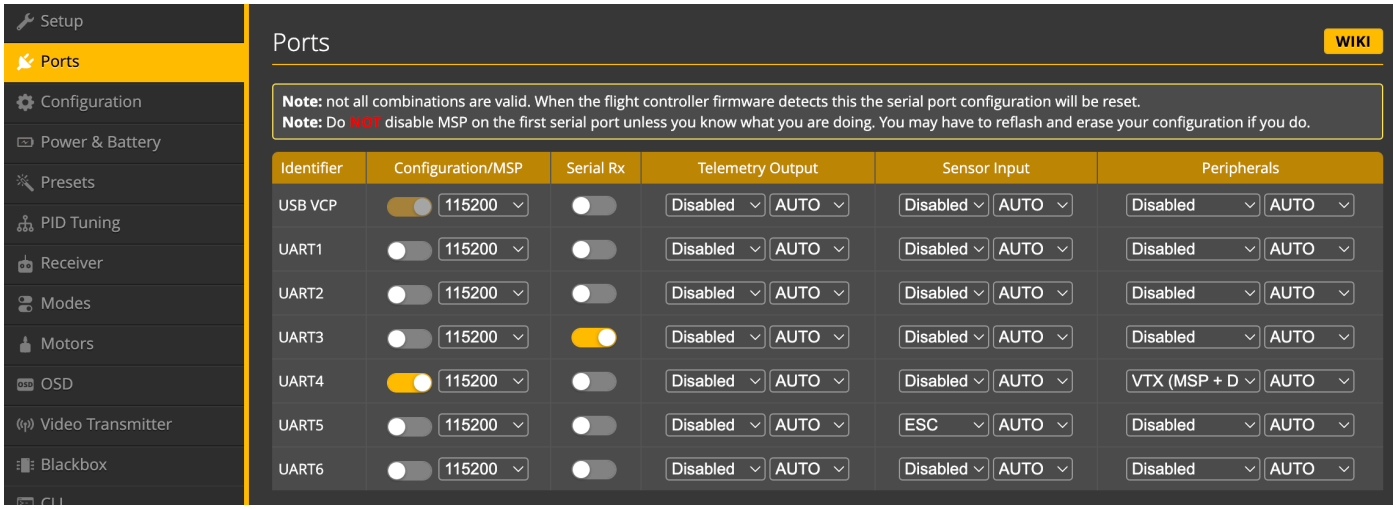
- Power On the Remote Controller: Turn on the DJI FPV Remote Controller 2.
- Enter Linking Mode (Remote Controller): Press and hold the power button again until the remote controller starts beeping, and its status indicator blinks quickly. This indicates the remote controller is in linking mode.
- Complete the Linking: Press the link button on the DJI O3 Air Unit. The status indicator will stop blinking and become solid green once the linking is successful.

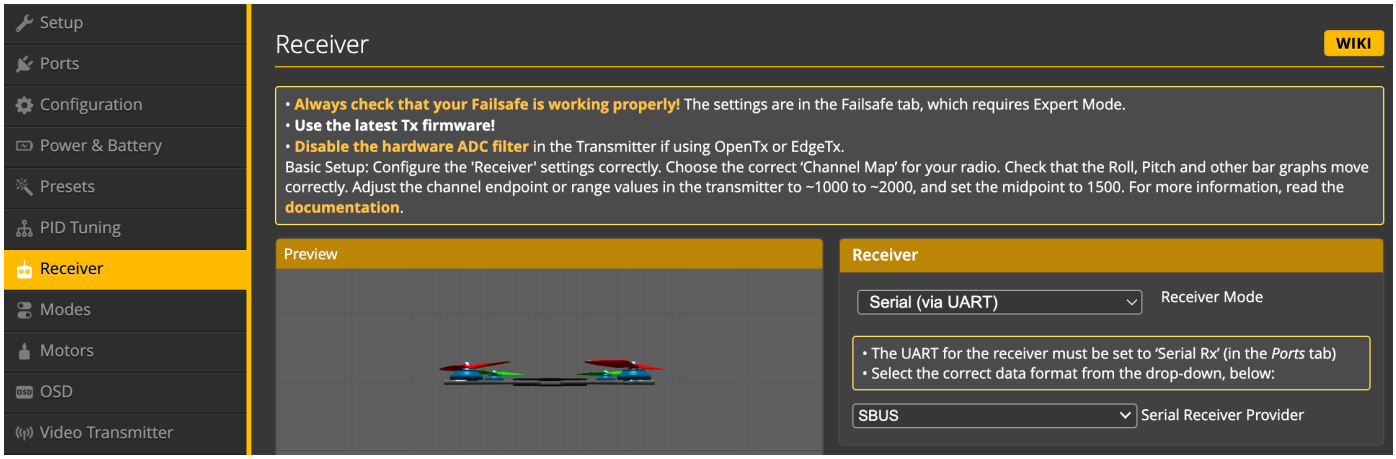
Additional Tips For PNP Version

- Check Compatibility: Ensure that all devices are compatible and have the latest firmware updates.
- No Obstructions: When flying, ensure that there are no obstructions between the aircraft, goggles, and remote controller.
- Memory of Binding: DJI devices can remember previous bindings, so if you have already linked these devices before, you might not need to repeat the process.

DJI FPV Remote Controller 2 Betaflight Receiver Configuration

- For pilots using the DJI FPV Remote Controller 2, the Betaflight configuration typically involves setting up UART3 as the serial port for communication. This is commonly configured with the SBUS protocol, which is the standard communication method for many DJI products. Please refer to the following diagram to configure your DollyFly25 drone.
- The image show the 'Ports' tab in Betaflight, with UART3's Serial RX option enabled, and the 'Configuration' tab with the Receiver Mode set to 'Serial-based receiver' and SBUS selected as the Serial Receiver Provider.





Binding with ExpressLRS Controller (ELRS Version)

- **To prioritize safety, it is highly advised to take off the propellers and switch off the power of both the transmitter and flight controller before commencing the binding process.**
- **Before using the DJI O3 Air Unit, it needs to be activated and updated. Connect it to your computer using a USB-C cable and use DJI Assistant 2 (Consumer Drone Series) for activation and updating the firmware.**

Check Before Binding

- Ensure Firmware Compatibility
  - Pre-Installed Firmware: For ELRS kits, the receiver is typically pre-installed with ELRS 3.0 firmware.
  - Check Compatibility: Ensure that both the transmitter and receiver are running on compatible firmware versions. The first number in the version string should match between the TX module and the receiver.
  - Update Firmware if Necessary: If there's a mismatch in firmware versions, update them to ensure compatibility.
- Obtain and Save ELRS LUA Script: Ensure the ExpressLRS LUA script is on your radio for controlling ExpressLRS settings. Download it from the ExpressLRS website or via the configurator.
- For ELRS Kits with Pre-Connected Wiring: If you have an ELRS kit where the wiring is pre-connected, you're set to go. These kits are designed for plug-and-play convenience, reducing the hassle of manual wiring.
- Adding ELRS Receiver to PNP (Plug-N-Play) Versions: If you're integrating an ELRS receiver into a PNP version that does not include a receiver, carefully check the wiring connections. Make sure that the receiver is correctly connected to the flight controller.
  - Check in Betaflight: After physically connecting the receiver, verify the receiver and port configurations in Betaflight. This involves ensuring that the correct UART port is assigned for the receiver and that the Serial RX is enabled for that port.
  - Correct Configuration is Crucial: Proper configuration is essential for the receiver to communicate effectively with the flight controller. Incorrect settings can lead to issues like failure to receive signals or improper telemetry data.

Binding with a Binding Phrase

- Set Binding Phrase: Choose and set a unique binding phrase using the ExpressLRS Configurator.
- Flash Firmware: Flash both the transmitter and receiver with the firmware that includes the set binding phrase.
- Automatic Binding: Power on both devices. They should automatically bind, indicated by a solid LED on the receiver.

Binding without a Binding Phrase

- Activate Receiver's Bind Mode: Power cycle the receiver three times. The receiver enters bind mode when its LED starts double-flashing.
- Activate Transmitter's Bind Mode: Enter bind mode on your transmitter, typically through the ExpressLRS LUA script.
- Confirm Binding: Successful binding is indicated by a change in the LED behavior on the receiver and a confirmation on the transmitter's screen.

Binding with TBS Controller (TBS Version)

- **To prioritize safety, it is highly advised to take off the propellers and switch off the power of both the transmitter and flight controller before commencing the binding process.**
- **Before using the DJI O3 Air Unit, it needs to be activated and updated. Connect it to your computer using a USB-C cable and use DJI Assistant 2 (Consumer Drone Series) for activation and updating the firmware.**

Check Before Binding

- Ensure Firmware Compatibility:
  - Make sure that both the transmitter and receiver are updated to the latest firmware available from TBS. The TBS Agent X software can be used for updates.
- For TBS Kits with Pre-Connected Wiring: If you have an TBS kit where the wiring is pre-connected, you're set to go. These kits are designed for plug-and-play convenience, reducing the hassle of manual wiring.
- Adding ELRS Receiver to PNP (Plug-N-Play) Versions: If you're integrating an TBS receiver into a PNP version that does not include a receiver, carefully check the wiring connections. Make sure that the receiver is correctly connected to the flight controller.
  - Check in Betaflight: After physically connecting the receiver, verify the receiver and port configurations in Betaflight. This involves ensuring that the correct UART port is assigned for the receiver and that the Serial RX is enabled for that port.
  - Correct Configuration is Crucial: Proper configuration is essential for the receiver to communicate effectively with the flight controller. Incorrect settings can lead to issues like failure to receive signals or improper telemetry data.

Binding Process

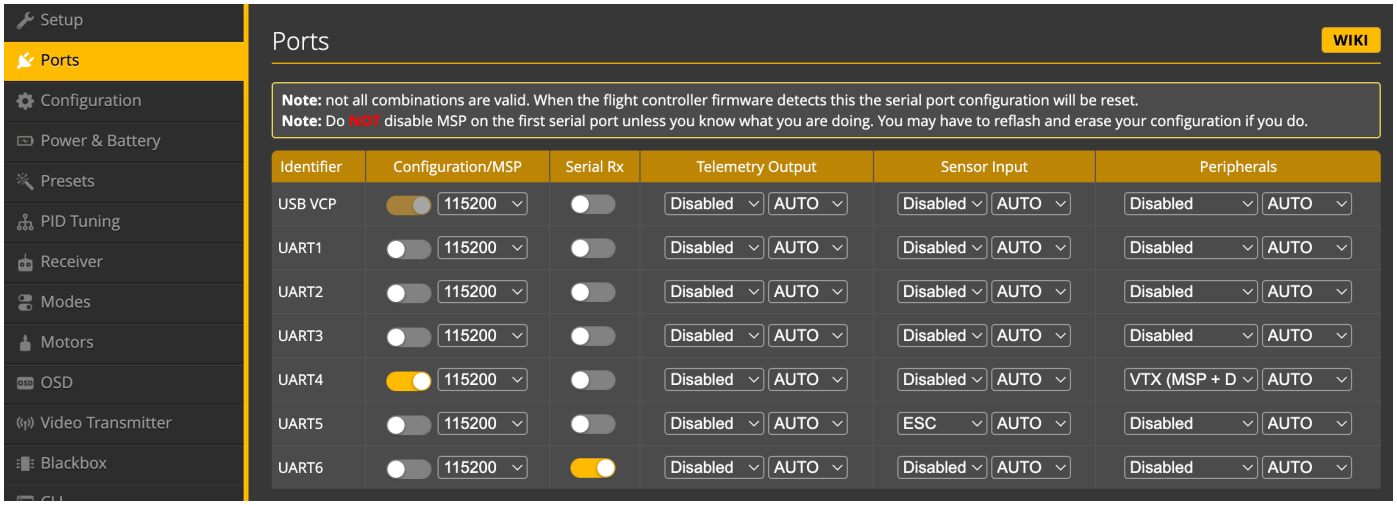
- Update Firmware: Ensure both devices have the latest TBS firmware.
- Power on Receiver: Connect the battery, then press the bind button to enter bind mode, indicated by a flashing green LED.
- Activate Bind on Transmitter: Use the Crossfire LUA script on your transmitter to select 'BIND'.
- Confirm Binding: A solid green LED on the receiver and a notification on the transmitter confirm successful binding.
- Test Connection: Power cycle and check for a solid green light on the receiver, and test the connection in your radio's setup or Betaflight.

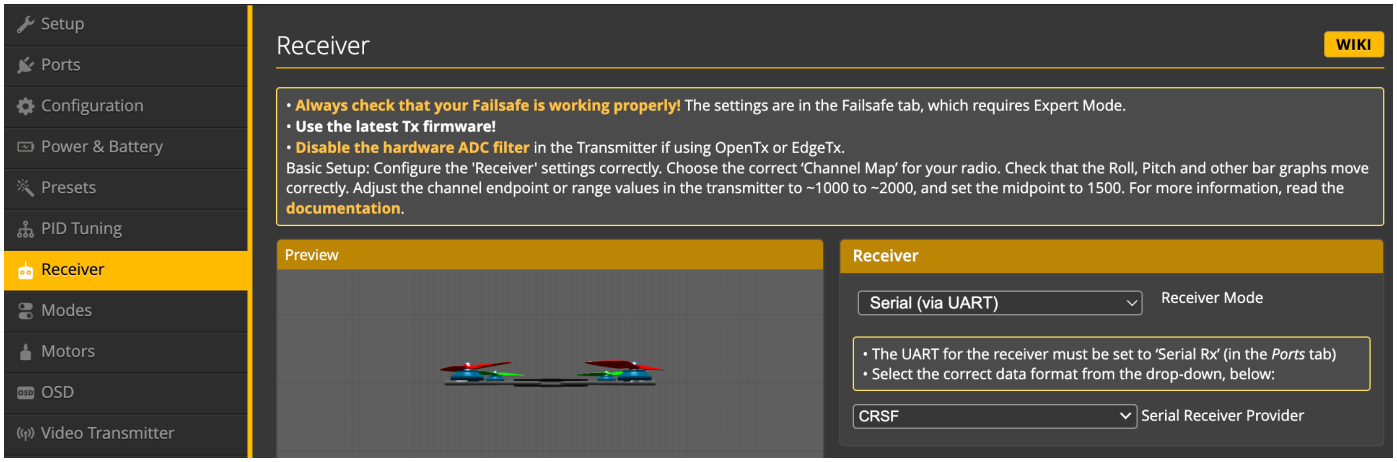
Additional Tips For ELRS/TBS Version

- Firmware Consistency: Regularly check and update the firmware to ensure both devices are on compatible versions.
- Understanding LED Signals: Familiarize yourself with the receiver's LED indicators to interpret its status correctly.
- Troubleshooting: If binding fails, recheck firmware compatibility and follow the correct binding procedure.
- Maintain proximity between the transmitter and receiver during binding.
- Check the connection in Betaflight by observing channel responses to control inputs.
- Set up failsafe settings immediately after binding.

ELRS/TBS Betaflight Receiver Configuration

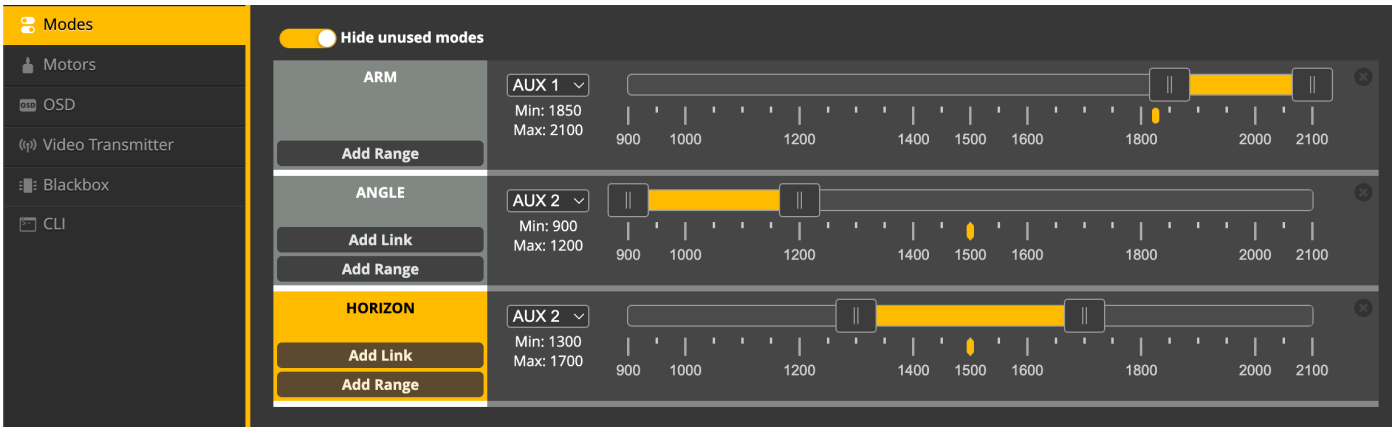
- For those utilizing ELRS (ExpressLRS) or CRSF (Crossfire) receivers, UART6 is often the designated port for their more robust communication protocols, which provide lower latency and longer range. Please refer to the following diagram to configure your DollyFly25 drone.
- The image illustrate UART6 enabled for Serial RX in the 'Ports' tab, while the 'Configuration' tab would show 'Serial-based receiver' with CRSF as the chosen protocol.





Betaflight Modes Configuration

- In the drone kit, the flight controller is pre-programmed to assign specific flight modes to the AUX1 and AUX2 switches for convenient control.
- AUX1 is usually configured for arming the drone, which is an essential safety feature. When the AUX1 switch is activated, it allows the motors to spin up and the drone to take off
- AUX2 is configured to toggle between different flight modes, enhancing the flight experience with varying levels of control assistance. The first position of the AUX2 switch typically engages 'ANGLE' mode, which restricts the pitch and roll angles for stable and level flight – perfect for beginners. The middle position often activates 'HORIZON' mode, allowing for more freedom of movement with some stabilization, ideal for intermediate maneuvers. Finally, the last position on AUX2 is reserved for 'ACRO' mode which gives the pilot full control over the drone with no self-leveling, offering an exhilarating experience for advanced pilots and freestyle flying.



DJI FPV Remote Controller 2 Switch Configs

- When configuring your RTF drone with a DJI FPV Remote Controller 2, the switches for AUX1 and AUX2 are typically set to correspond to the pre-configured flight modes. AUX1 is usually mapped to the arming function, which activates the motors, while AUX2 allows the pilot to switch between different flight modes: ANGLE, HORIZON, and ACRO, distributed across the three switch positions respectively.

ELRS/TBS Controller Switch Configs

- It's crucial to note that when using an ELRS or TBS controller, the switch assignments for AUX1 and AUX2 may not be pre-set and will likely require manual configuration. Each pilot should thoroughly check and configure the switches according to their preference and ensure they correspond correctly to the desired flight modes in the flight controller software before taking off.

CAUTION:

Always perform a pre-flight check to confirm that the switch positions on your controller match the expected flight modes on the drone. This step is vital to prevent unexpected behavior during flight, which could lead to accidents. Refer to the user manual of your specific controller and the documentation for your flight controller software for instructions on how to verify and modify these settings.

Important Safety and Usage Notice:

- Before operating your equipment, it's imperative to thoroughly read and understand all safety advisories and operational guidelines included in this manual. Your knowledge and adherence to these instructions are essential for the safe and enjoyable use of your product.

Seek Assistance When Needed:

- If you encounter any uncertainty or technical issues, do not hesitate to reach out for support at www.sub250.com. Our team is ready to assist you with any inquiries or concerns you may have.

Product Information:

- The DJI O3 Air Unit and DJI FPV Remote Controller 2 are products of DJI. For comprehensive details, updates, and support, please refer to the official DJI website. It is the best resource for the latest information related to these DJI products.

For ExpressLRS and TBS Devices:

- Please visit the respective official websites for in-depth usage information and support regarding ExpressLRS and TBS equipment. These sources provide valuable guidance and the latest updates pertinent to your devices.

Manual as a Guide:

- This manual is intended as a quick-start reference. It does not replace the need for comprehensive knowledge of your equipment, which can only be gained by reading the full product documentation and adhering to all manufacturer guidelines.
- Fly safely, responsibly, and within your capabilities, always respecting local regulations and privacy.

Enjoy Your Flight:

- We hope this guide assists you in taking the first step towards an exhilarating flying adventure. Should you need any further information, our dedicated support is just a click away. Remember, the sky is the limit when it comes to exploring the possibilities with your new equipment. We wish you countless hours of joy and safe flying. Clear skies and happy piloting!


Sub250