T3500

Tethered Power System for Drones

User Manual

V1.0 2019.05

FOXTECH

Product List:

- One set of 4KW tethered boxes.
- 3.5KW onboard power supply (except optional or customized)
- One 220Vac input cable, default 16A plug (if using 16A to 10A socket, please note that the socket is full power only 2.2KW)

- This device does not support working in the rain, otherwise it will lead to burn the motherboard, for all the consequences arising from your own!
- The onboard power supply of this equipment is burned due to overload or failure to follow the operating instructions, and is not covered by the warranty.
- This device is forbidden to be used in the sun. The operation panel will absorb heat and cause heat dissipation problem. And this is not covered by the warranty.

Warning

1. The onboard power supply module must first connect the cable connector to the battery interface and then plug in the battery to prevent the ignition of the onboard power chip.
2. When the aircraft uses the backup battery to take off to 5m height, then turn on the cable power switch. When the aircraft is lowered to 5m height, the cable power supply should be turned off in time.
3. The cable force and retraction speed is controlled at 3-4 gear. When the cable is taken up, the cable needs to be tightened to prevent the winch from being entangled. The raising and falling speed of the aircraft is 1m/s.
4. It is forbidden to directly touch the cable (with insulated gloves) by hand when the cable power is turned on, and the high voltage 400vdc is injured, and the consequences are at your own risk.
5. The on-board power supply module must be equipped with backup batteries, fully charged before each flight to prevent aircraft from being forced to drop due to power-off, which will damage the equipment.
6. This equipment is forbidden to be powered for a long time without flying, to prevent the cable from being overheated and burned, requiring a 100m height flying state.
7. Please do not change the cable power voltage value setting, and burn the onboard power supply module is at your own risk.
8. Cable power supply: Long press 3s to turn on, long press 3s to turn off; short press 1s to enter the voltage setting interface, long press 3s to confirm the value.

The first step (preparation):

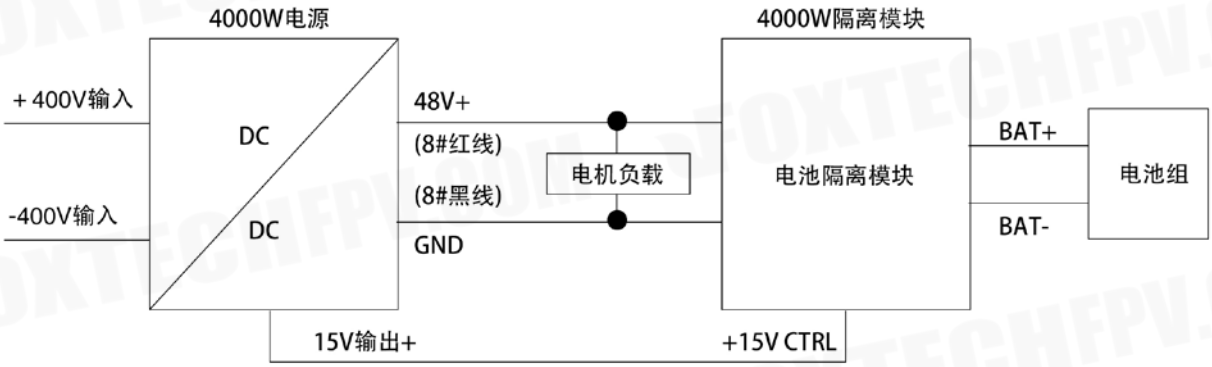
Open the ground station cover, plug in the 220vac input cable, connect the 220vac input source (main supply or equipment power ≥ 5KW, if it is a generator, please turn the generator on for 3~5 minutes) the operation panel is as follows:

- Please know the device on the operating surface to read the following steps.
- The operation panel and the chassis of the device are made of anti-disassembly mechanical structure. Once the breakage is found, customer no longer enjoys the 1-year warranty and technical after-sales service by default.

The second step (joining work):

A) Check if the winch control button is in the 0 position. If it is not, please adjust it to the 0 position. Otherwise, the winch will be pulled and the cable will not be pulled out. In severe cases, it will alarm.
If you forget to check, the system will alarm and then please release the winch control knob to 0.

B) Turn on the main switch, the display will light up, the winch is energized, the cable is in no power state, (the cable outlet count starts from the power-on state of the winch). Insert the 400vdc cable connector into the onboard power input interface, and the onboard power supply Connected to the battery in parallel and connect it with the ESC (motor), as shown in the figure, the actual on-board supply power max3.5kw, the battery isolation module and 15V power supply are eliminated, 2 black points are the output ports, and the hooks are hung on the carbon plate or other fixed positions.
Remark: The onboard power input and output terminals have been distinguished. The cable plug can only match the onboard input end, and will not cause reverse insertion, except for the products that not belong to our company.



Air Unit Internal Wiring Diagram

1. Pull out the cable 3~5m, suitable for aircraft distance
2.Connect the cable jack-plug to the onboard power input port.
3. The cable hook is hung on the reserved port of the air unit carbon plate or other stable place.
4. The onboard power output terminal is connected to the internal battery interface of the aircraft.

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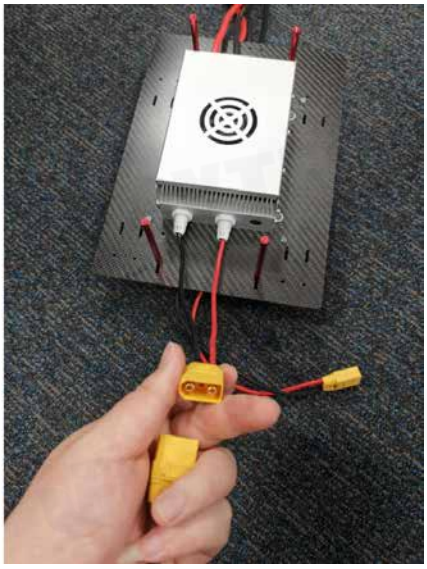

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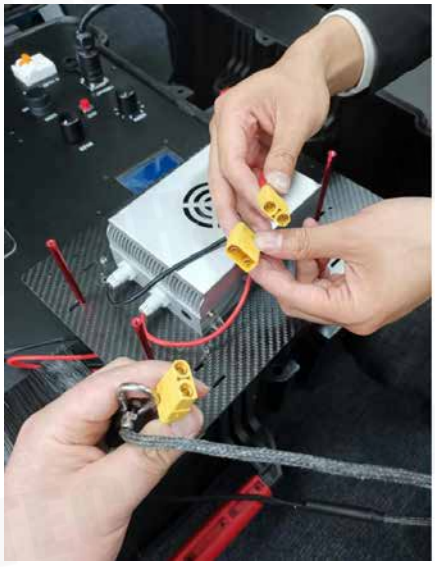

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The third step (flight work):

A) Connect the aircraft battery (usually 2 6S series) to power on, check the aircraft status, take off and at 5m above the ground then hover, press the cable power button for 3s, the cable starts to be energized, the initial voltage is 395Vdc, and the maximum voltage is 430Vdc. Pay attention to whether the aircraft battery voltage is within the reasonable range of 46.5~49vdc. The recommended voltage is between 47.3vdc and 48.3vdc.

B) When the aircraft flies at 20m above the ground, adjust the winch control knob to 3rd or 3.5th gear to make the cable straight(slowly rotate, prevent the winch from pulling the cable too fast, pull the aircraft or break the cable). Let the aircraft descend 2~5m to see if the winch automatically retracts the cable to

achieve the purpose of the automatic winch later. The different aircraft has different load capacity, the torque is also different, normally does not exceed 4 gears, and the factory setting is 600r/min.

C) When the aircraft flies to 50m, 80m, 95m, 100m, please observe the stability of the system and the aircraft. If all goes well, continue to fly for a long time.

D) 90m and 100m display alarm and buzzer scream (lightly press the cable power button to cancel the alarm)is set in this system, because the scene environment is noisy, it may not be well recognized. Please pay attention to avoid flying over 110m, the length is strictly controlled within 100m, which prevents the cable from breaking and beyond repair, which is not covered by the warranty.

1.Current voltage: power off means the cable is not energized.

2. Current voltage: the ground terminal output voltage is 395V, indicating that the cable is energized.

The fourth step (recycling work):

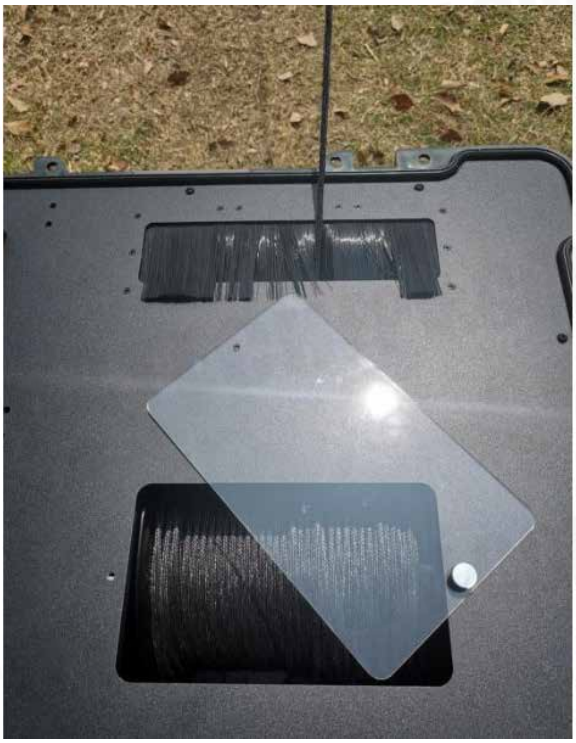
A) The aircraft starts to descend at a speed of 1m/s, and the cable needs to be in a straight state. According to the actual factors such as wind speed and descending speed, the winch control knob can be switched to 4 gears or above while retracting the cable. Pay attention to the winch window to prevent the overwinding of the cable.

B) When the airplane descends to 5m above the ground, the winch control knob is adjusted to 0 gear to turn off, long press the cable power button for 3s to turn off the ground power, prevent the high-voltage cable from hurting the valuables and the human body, the aircraft lands at the ground, and after the propeller stopping power off the drone.

C) Turn off the main power switch, unplug the of onboard unit power, turn on the main power, turn on the winch control switch, tighten the cable to the box, then turn off the main power.

D) Turn off the main switch of the equipment or generator, unplug the 220Vac input cable and lock the box.

- In order to reduce the risk of the retracting of the winch, it is required that the position of the cable outlet should be in the middle of the winch when the aircraft is hovering at a high altitude.
- When the cable is taken up, the cable is in a straight state. When takes up at the two ends, the position of the take-up cable and the take-up leading screw are in the vertical position to avoid the winding.



The outgoing line end stays in the middle of the winch, reducing the eccentric force of the winch.

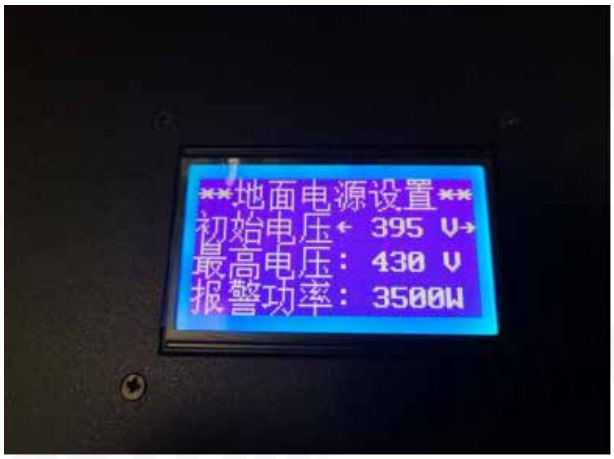
The retractable cable is in a straight state.

At both ends of the winch, while take-up the cable, the cable and the outgoing rail are at a vertical Angle. Observe both sides of the winch.

Tilting state is not allowed, stranded wire is not guaranteed.

Other configurations:

1. Press the power button of the cable to enter the ground station power setting interface. Press once again to enter the initial voltage setting stage. Rotate left and right to adjust the initial voltage: 380~400Vdc. Click "confirm" button then jump to the next row to the highest voltage setting. Factory default 400~430vdc (up to 450vdc, optional, it is suitable for large load voltage compensation), press once "confirm" button and jump directly to the next row of alarm power, the default value is 3500W, do not change it easily (ground station rated output is up to 4KW)



- The recommended initial voltage is 395v, the maximum voltage is 416V, which is suitable for 100m 5kg, ≥7kg and the maximum voltage is set to 430Vdc. The specific value can be judged according to the efficiency of the aircraft. The purpose is to keep the onboard battery within a reasonable voltage range. There is no absolute standard.

2. In order to protect the interests of agents and customers, this product has added the password function. If necessary, please inform in advance.
NJ1903C10A007 is the unique identification code of the product equipment. Please remember,only the identification code will be needed in the later warranty.

3.The operation panel and the chassis of the device adopt anti-disassembly mechanical structure. Once the breakage is found, customer no longer enjoys the 1-year warranty and technical after-sales service by default.

Hardware and Function Parts

1. Strong and weak electricity separation. At present, there is a switch to isolate the ground high-voltage power (400~500V), which can protect the operator from high-voltage electric shock when retracting the cable. Many manufacturers' cable directly output 400V~800V high-voltage while starting.)

2. The cable can realize the automatic cable retracting, can adjust the tension and speed of the cable retracting, to match the aircraft with different take-off weight, the cable retracting accuracy can reach 0.01m.

3. The ground station power supply starting voltage can be adjusted in the range of 380-400V, and the high-voltage compensation voltage can be adjusted in the range of 400-450V. It can automatically compensate the large load according to the set voltage range value, and enhance the load capacity of the aircraft. It can reach the parameter of 100m with 10kg load.

4. The product can be hauled and transported by one person, and the outer box is waterproof and salt-proof. The whole package has no outer hole and effectively protects the product.

5. The product adopts military-grade structure standards, can work in the strong vibration environment conditions.

Software and Functional Parts

1. Self-checking function: Judging the connection status of each module, you can find the problem in time to avoid the abnormal work of device;

2. Judgment function: Start to judge whether the position of the winch is normal, timely protect and remind, to avoid the winch being arbitrarily adjusted and rapidly take-up the cable and brings danger to the finger (the winch torque can reach 150kg);

3. Alarm function: The system can accurately record the length of the retractable cable, output voltage, output power, real-time temperature acquisition. If exceed the set value, the alarm will automatically started; when the winch is used,if the winch is not returned to 0 position, the system will automatically alarm and the aircraft will not be able to pull the cable in order to reduce hand injuries.
when the cable is pulled out 90m, 95m will automatically alarm, after cable disconnect alarm, it can resume work directly after continuation.

4, cable length display function: can be accurate to 0.1m (can be increased to 0.01m);

5. The secondary parameters of the system are displayed in sequence, mainly including the current voltage, power, current, cabinet and winch operating temperature;

6, the voltage automatic follow function: to ensure that the voltage is unchanged, automatic compensation, functional peripherals, the user can manually adjust the voltage according to the actual load.

This content is subject to change.

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