Product Manual

TP-T4



1.1 System Overview

The TP-T4 portable automatic tethered cable pay-in/pay-out system mainly consists of a cable winch, tethered ground power housing, integrated tether cable, and integrated ground power supply.

It provides wired power supply, data transmission, and automatic cable management for tethered UAVs.

The winch assembly includes the enclosure, main frame, cable drum, and control circuitry.

1.2 Main Technical Parameters

No.	Item	Technical Specification
1	System enclosure dimensions	375 mm × 345 mm × 225 mm (L × W × H)
2	Enclosure with handle & panel	420 mm × 345 mm × 225 mm (L × W × H)
3	Single cable length	110 m
4	Weight	13.5 kg ± 0.5 kg
5	Input voltage	AC 220 V
6	Maximum cable reeling speed	≤2 m/s
7	Operating mode	Passive pay-out / Active pay-in
8	Power output voltage	400 VDC (+30 V compensation)
9	Maximum output power	4000 W

Nominal input: 220 VAC, 50 Hz. 230 VAC, 50 Hz grids are within the normal input range. Standard maximum rewind speed is ≤2 m/s; faster rewind requires a custom configuration.

1.3 Operating Instructions

1.3.1 Tethered Ground Station Front Panel Description

1. **Main power circuit breaker:**
   Master switch for all electrical power, including the control power of the ground station and the main power for tethered output.

2. **Main power ON/OFF push button:**
   Switch used to supply propulsion power to the UAV.
   After pressing, the system outputs high-voltage DC (400VDC) to power the airborne power module.
3. **Main power indicator (ring LED around the push button):**
   Indicates the operating status of the tethered ground station power supply.
4. **Torque adjustment knob:**
   Used to control the cable reeling torque.
5. **Transparent viewing panel:**
   Allows intuitive observation of the winch cable length and status.
6. **LCD information display:**

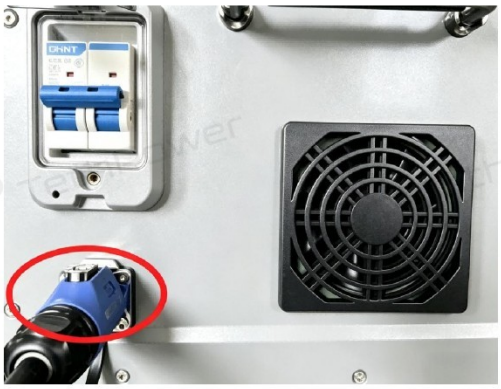
- **Output voltage** — shows current DC output voltage of the ground power supply
- **Output current** — shows current DC output current
- **Output power** — shows current power output
- **Input voltage** — shows current DC input voltage
- **Power temperature** — shows current operating temperature of the ground power supply



1.3.2 Wiring Instructions

1. Use the supplied power cable to connect the mains power or generator to the tethered ground station.

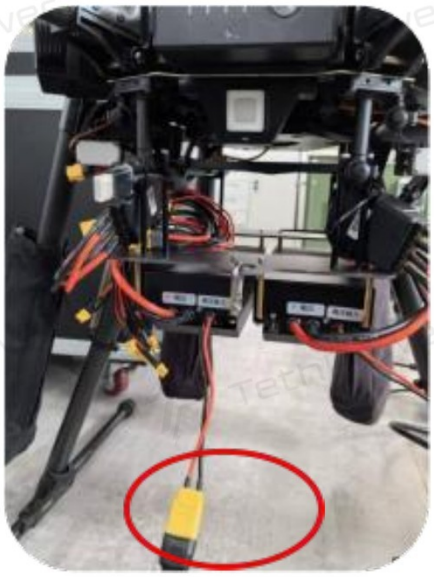
The aviation-connector end plugs directly into the aviation socket on the ground station, and the plug end can be connected to a power strip with a **power rating of no less than 4000 W**.



2.The high-voltage output cable of the tethered ground station is equipped with an **XT90 connector** by default,

which connects to the UAV's airborne power module, as shown in the figure.

Secure the **load-bearing hook**, which serves as the primary mechanical load-bearing point.





2 Operating Instructions

1. During operation, first turn the torque adjustment knob to the lowest setting, then switch on the main circuit breaker.
   The system will power on, and the display screen on the front panel will light up.
2. When power supply to the UAV is required, press the **"Main Power"** button.
   At this moment, the cooling fan of the tethered ground station starts operating, the **"Main Power Running"** indicator remains on, and the display shows the current output voltage, output current, and output power of the main tether cable.
   Once the system is under load and current begins to flow, the indicator changes to a breathing flash, meaning the UAV is now being powered.
3. Before the UAV takes off, set the torque knob to the lowest position or slightly increase torque (during windy conditions).
   The UAV will pull the cable out during ascent.
   When reeling in, gradually adjust the torque knob from low to high to synchronize with the UAV's descending speed.
   Alternatively, you may preset the torque to an appropriate value at startup so that the cable maintains constant tension:
   the UAV forcibly pulls the cable out while hovering, and during landing, the cable is automatically reeled in due to the preset tension.
4. After completing the mission, first turn off the **Main Power** button to disconnect the high-voltage DC.
   Then reel in the remaining cable to prevent accidental electric shock.
   Finally, switch off the main power circuit breaker and unplug the power cable.

3 Cautions

1. Before starting use, place the equipment on a level surface as much as possible to keep it in a balanced state.
2. Operators must wear insulating gloves to prevent accidental electric shock.
3. When adjusting the torque/speed knob, rotate it slowly from low to high—do **not** turn it to maximum suddenly.
4. After cable pay-out/pay-in operations, coil the power cable properly and store it inside the enclosure. Do not let the cable drag on the ground.
5. During operation, avoid dragging the tether cable on the ground to prevent fraying. Check whether stones or sharp objects are present to avoid cutting or damaging the cable.