

SVTECH

SV-T10

Tethered UAV System

English technical reference prepared from the Chinese product document. Legacy contact details have been removed. Numeric values marked [verify] require confirmation before ordering or operation.

****SV-T10 Tethered UAV System - Product Manual****

****1. SV-T10 Tethered UAV****

****2. Aircraft Specifications****

Parameter	Content
Wheelbase	1240 mm
Open Dimensions	1380 × 1380 × 740 mm
Folded Dimensions	630 × 630 × 700 mm
Number of Motors	4
Max Output Power (Single Motor)	1500 W
Max Thrust (Single Motor)	10 kg
Rated Payload	6 kg
Rated Current	6 A
Rated Voltage	DC 380–400 V
Material	Carbon Fiber Composite
Propeller Diameter/Pitch	28 × 8 inch

****2.2 Power System****

****2.3 Electronic Speed Controller (ESC)****

****2.4 Propeller****

****2.5 Remote Control Stick Definitions****

****3. SV-T10 Remote Controller****

- **Control Sticks (Yaw, Throttle, Roll, Pitch):** Default: left stick throttle (throttle auto-centering), Mode 2 (American hand).
- **Carabiner Ring:** For securing mobile device holder and connecting remote control strap.
- **Power Switch:** Turn remote control on/off. Press and hold both switches simultaneously for 2 seconds to turn on/off.
- **Flight Mode Switch:** 2-position, self-locking (non-return), long lever. Up/Down positions correspond to: GPS Position Mode (default), Attitude Mode.
- **Return-to-Home (RTH) Mode Switch:** 2-position, self-locking (non-return), long lever. Up/Down positions correspond to: RTH Off (default), RTH On.
- **Handle:** For convenient carrying.
- **Battery Cover:** Prevents battery from sliding out.

****2.6 Arming and Disarming****

The T10 has only one arming method. Regardless of Mode 1 (Japanese hand) or Mode 2 (American hand), perform the operation shown in Figure 2-12 to arm, and the operation shown in Figure 2-13 to disarm.

After landing, keep the throttle stick at the lowest position for at least 3 seconds; the aircraft will automatically disarm. After the flight controller calibrates the ESCs, upon arming, the motors will start in sequence. Once motor No. 1 starts, advancing the throttle will cause all motors to start simultaneously.

- Figure 2-12: Arming
- Figure 2-13: Disarming

****2.7 Compass Calibration****

Compass calibration procedure:

1. Push the throttle stick to the lowest position.

2. Quickly toggle the flight mode switch between the lowest and highest positions approximately 6–10 times until the status LED shows a solid blue light.
3. Point the aircraft nose forward, place it horizontally, and slowly rotate it clockwise at least one full turn until the status LED shows a solid green light.
4. Point the aircraft nose downward, keep the fuselage vertical, and slowly rotate it clockwise at least one full turn until the status LED shows a solid white light for 4 seconds.

If the status LED shows a solid red light for 4 seconds, calibration has failed. Repeat steps 2–4 until successful.

Operation diagram is shown in Figure 2-15.

****2.8 Level Calibration****

Level calibration procedure:

1. Place the aircraft on a level surface, ensuring the fuselage is horizontal and free from vibration.
2. On the remote control, perform the outward "V" disarm stick movement and hold for more than 10 seconds until the status LED begins alternating between blue and green.
3. Release the remote control sticks. After approximately 10 seconds, the status LED will change to a single blue flash. After about 15 seconds, the status LED will flash normally.

Operation diagram is shown in Figure 2-16.

If during subsequent flights, after taking off in Attitude Mode, the aircraft still drifts significantly sideways, it is recommended to repeat the level calibration.

2.9 Flight Modes and Corresponding Responses

The T10 has multiple flight modes. Aircraft behavior varies by mode. Stick inputs and corresponding aircraft responses are shown in Table 3-1.

| Control Mode | Roll/Pitch | Yaw | Throttle |

|-----|-----|----|-----|

| GPS Mode | Roll/Pitch tilt angle proportional to stick input magnitude. Horizontal flight speed limited to max 2 m/s in the corresponding direction. | Yaw rate corresponds to yaw stick input magnitude. | Throttle neutral position maintains altitude. Throttle up/down amplitude corresponds to ascent/descent speed. Motor average output corresponds to current throttle value; throttle input has highest priority. |

| Attitude Mode | Roll/Pitch tilt angle proportional to stick input magnitude. | Yaw rate corresponds to yaw stick input magnitude. | Motor average output corresponds to current throttle value; throttle input has highest priority. |

2.10 LED Indicator Description

- In the table: R = Red, G = Green, B = Blue, Y = Yellow, P = Purple, C = Cyan, W = White.

- The three primary colors are RGB; other colors are synthesized from them. At equal brightness: R+G = Y, R+B = P, G+B = C, R+G+B = W.

- Numbers in the color definition boxes indicate the duration of that color state.

- The "Count" column indicates how many times the state repeats; "—" indicates continuous flashing.

| Color | Frequency | Count | Duration | Meaning | Description |

|-----|-----|-----|-----|-----|-----|

| R2Y1 | Alternating | — | — | Attitude Mode, GPS satellites < 7 | |

| R2 | Solid | — | — | Attitude Mode, GPS satellites <= 7 (poor accuracy) | |

| G1Y1 | Alternating | — | — | Attitude Mode, GPS satellites >= 7 (good accuracy) | |

| R1P1 | Alternating | — | — | GPS Mode, GPS satellites <= 7 (poor accuracy) | |

| G1P1 | Alternating | — | — | GPS Mode, GPS satellites >= 7 (good accuracy) | |

| R1B1 | Alternating | — | — | System initialization complete | |

| Y1B1 | Alternating | — | — | Remote control signal lost | |

| Y1G1 | Alternating | — | — | Compass data abnormal | |

| G0 | Solid | — | — | First-level low voltage alarm | |

| White | Solid | — | 4 s | Second-level low voltage alarm | |

| 0.2 | Flash | — | — | Start compass horizontal calibration | |

| 0.6 | Flash | — | — | Start compass vertical calibration | |

| Solid | — | 4 s | — | Compass calibration successful | |

| Solid | — | 4 s | — | Compass calibration failed | |

****2.11 First Flight****

For the first flight, follow these steps for pre-flight inspection and flight.

****Pre-flight Inspection:****

Check the following to avoid flight accidents:

- 1. Aircraft nose direction.**
- 2. GPS/compass module orientation.**
- 3. Main controller installation direction.**
- 4. Correct rotation direction of each rotor.**
- 5. All electrical connections are secure.**
- 6. Ensure flight safety.**

7. The tether cable receives 380 V AC. Open the winch switch on the ground station and pull out the tether cable.
8. Connect the aviation connector on the aircraft to the aviation connector on the ground station. Secure the strain relief buckle to the aircraft.

****Power-On Self-Test:****

Power-on check procedure (refer to "LED Indicator Description" for LED status meanings):

1. Turn on the remote control first, then connect the main flight controller power.

2. After the main controller is powered on, avoid shaking the aircraft until the [verify] combination flashing is complete, otherwise poor flight attitude may result.
3. Observe the LED status indicator. Wait until the GPS/compass module signal is normal and positioning is possible before proceeding.
4. Toggle the flight mode switch back and forth and observe if the LED flight mode indication matches the switch position.
5. Place the aircraft at least 20 meters away from the operator and wait for the flight controller to acquire satellites normally (red flashing light turns to green flashing light).
6. Turn on the aircraft's backup power switch. Ensure the backup power is connected to the aircraft, then turn on the 500 V [verify] switch on the ground station.
7. In Attitude Mode, move both remote control sticks to the lower right corner simultaneously to arm the motors. Motors will start sequentially from motor No. 1. If the throttle stick exceeds 20% during the sequential start, all motors will start immediately.
8. After all motors have started, gently push the throttle stick to about 30% and hold. Slightly move the roll and pitch sticks and observe if the motor acceleration trend matches the stick input. If consistent, return roll and pitch to center, continue advancing throttle until the aircraft lifts off.
9. At altitudes below 2 meters, test the feel of each control channel. If response is normal, you may continue to explore the flight controller's maximum potential.

After flight, check if the temperatures of clockwise and counterclockwise motors are consistent. If temperatures differ, the aircraft may have an unbalanced load. Calibrate the propeller plane to ensure all propellers are in the same plane.

2.12 Failsafe Protection

When the remote control signal is lost, the LED indicator first shows [verify]. After hovering for 5 seconds, the aircraft will return to above the takeoff point, land, and disarm. If the remote control signal is restored during this process, the aircraft will continue the automatic return. To interrupt the return action, toggle the flight mode switch at least once.

2.13 Power Loss Protection

If the generator fails or the ground station fails to supply power to the aircraft, the aircraft activates power loss protection and will land in place.

4. Ground Station System

4.1 Ground Station Specifications

Parameter	Content
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| Weight | 45 kg |

| Generator Powered Flight Time | 4 hours |

| Ground Station Dimensions | [verify] |

| Rated Input Voltage | 380 V AC, 50–60 Hz |

| Rated Output Voltage | 400 V DC |

| Rated Output Power | 15 kW |

| Tether Cable Length | 100 m |

| Automatic Tether Reel Speed | [verify] |

4.2 Ground Station External Features Diagram

No.	Name	Function
1	Rotary Switch	Locks ground station top cover
2	[verify]	Ground station cooling
3	Voltage Display	Shows current ground station output voltage
4	Current Display	Shows current ground station output current
5	400 V Power Switch	Press button; ground station outputs 400 V DC to power the aircraft
6	Automatic Tether Reel System Switch	Activates automatic tether reel system
7	Tether Length Display	Shows how many meters of tether have been deployed
8	Main Power Switch	Ground station main power switch
9	Protective Cover	Protects aviation connector. Turn clockwise to open, counterclockwise to lock.

4.3 Ground Station Operation Sequence

1. Connect the ground station to the 380 V AC mains power supply.

2. Press the main power switch on the ground station.

3. Press the automatic tether reel system switch.

4. Pull out the tether cable. Connect the aviation connector on the tether cable to the aviation connector on the tethered UAV.

5. Ensure the aviation connectors are properly connected, then press the 400 V DC power switch. Check that the current and voltage displays show normal values.

6. Once everything is normal, the aircraft is ready for takeoff.

Disclaimer

If you have any doubts about the safety of this product, please contact our company for a technical inspection.

Users must read this manual carefully before using the product. Use of this product implies acceptance of all terms in this disclaimer.

This product is intended for use by persons aged 18 years and older. Under normal power supply and correct connections, it can provide excellent flight performance. When debugging parameters or upgrading firmware for this aircraft system, we strongly recommend removing the propellers and ensuring normal power supply and correct wiring of relevant functional modules. Always keep away from people, hazardous objects, and fragile items during use.

Shuangjie Technology assumes no liability for personal injury or property damage caused directly or indirectly by the following:

1. Failure to assemble and use the product according to this manual.

2. Operating the aircraft under the influence of alcohol, drugs, fatigue, or other impaired physical or mental conditions.

3. Intentionally or maliciously operating the aircraft to cause harm.

4. Disassembling the product or modifying it with non-Shuangjie accessories, rendering the aircraft inoperable.

5. Injury caused by operator error or misjudgment.

6. Injury caused by abnormal aircraft operation due to natural wear, circuit aging, etc.

7. Injury caused by operating the aircraft while knowingly it is in an abnormal condition.

8. Operating the aircraft in severe weather conditions such as typhoons, hail, or heavy fog.

9. Flying in areas with magnetic interference, radio interference, or government no-fly zones.

10. Flying in low visibility conditions or when the line of sight is obstructed.

11. Infringement arising from any data, images, or materials obtained using this product.

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Zhuhai Shuangjie Technology Co., Ltd.

ADDRESS

35 Jinzhou Road, Jinding, Xiangzhou District, Zhuhai, Guangdong, China

CONTACT

Mr. Liu

PHONE

+86 18688194199

EMAIL

lhc1983@gmail.com