

SVTECH

SV-T2

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-T2 Tethered UAV System - Product Manual

1. Product Description and Operation Guide

2. T2 Tethered Aircraft

2.1 Aircraft Specifications

Parameter Value
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Wheelbase 67 [verify]
Open Dimensions 74 x 7" x 40 [verify]
Folded Dimensions 43 x 43" x 40 [verify]
Number of Motors 4
Max Output Power (Single Motor) 2.4 kg [verify]
Max Thrust (Single Motor) [verify]
Rated Payload [verify]
Rated Current 6 A
Rated Voltage DC 24 V
Material Carbon Fiber
Propeller Diameter/Pitch 15 x 5 inch

2.2 Power System

2.3 Electronic Speed Controller (ESC)

2.4 Propeller

2.5 Remote Control Stick Definitions

****SV-T2 Tethered Aircraft Remote Controller****

- ****Control Sticks (Yaw, Throttle, Roll, Pitch):**** Default is Mode 2 (left-hand throttle, throttle auto-centering), American hand.
- ****Carabiner Ring:**** Used to secure a mobile device holder and connect the remote controller lanyard.
- ****Power Switch:**** Turns the remote controller on/off. Press and hold both switches for 2 seconds to turn on/off.
- ****Flight Mode Switch:**** 2-position, self-locking (non-return), long lever. Up/Down positions correspond to: GPS Positioning Mode (default), Attitude Mode.
- ****Return-to-Home (RTH) Mode Switch:**** 2-position, self-locking (non-return), long lever. Up/Down positions correspond to: RTH Mode Off (default), RTH Mode On.
- ****Handle:**** For convenient carrying outdoors.
- ****Battery Cover:**** Prevents the battery from sliding out.

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

The T2 has only one arming method. Regardless of whether using Japanese hand or American hand, perform the operation in Figure 2.12 to arm, and the operation in Figure 2.13 to disarm.

After the aircraft lands, hold the throttle stick at the lowest position for at least 3 seconds; the aircraft will automatically disarm. After the flight controller calibrates the ESCs, when arming, the motors will start sequentially. Once motor 1 starts, pushing the throttle will start all motors simultaneously. (Note: Different flight controllers may have different arming methods. For details, please consult Zhuhai Shuangjie Technology Co., Ltd.)

- ****Figure 2.12: Arm****
- ****Figure 2.13: Disarm****

****2.7 Compass Calibration****

Compass calibration steps:

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 indicator LED lights solid blue.
3. Point the aircraft nose forward, hold it level, and slowly rotate it clockwise at least one full turn until the status indicator LED lights solid green.
4. Point the aircraft nose down, hold the fuselage vertically, and slowly rotate it clockwise at least one full turn until the status indicator LED lights solid white for 4 seconds.

If the status indicator LED lights solid red for 4 seconds, calibration has failed. Repeat steps 2-4 until successful.

- **Figure 2.15: Compass Calibration**

2.8 Level Calibration

Level calibration steps:

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

- **Figure 2.16: Level Calibration**

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

2.9 Flight Modes and Corresponding Responses

The T2 has multiple usage modes. Aircraft behavior varies depending on the mode. Stick input and corresponding aircraft actions for different modes are shown in Table 3.1.

Table 3.1: T2 Aircraft Control Mode Description

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

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

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

| Attitude Mode | Roll/Pitch tilt angle is proportional to stick input, but the corresponding directional flight speed is limited to a maximum horizontal speed (12 m/s). | Yaw rate corresponds to yaw stick input. | Yes, throttle neutral position corresponds to altitude hold; throttle up/down amplitude corresponds to ascent/descent speed. |

2.10 LED Indicator Description

In the table: R=Red, G=Green, B=Blue, Y=Yellow, P=Purple, C=Cyan, W=White. The primary colors of light are RGB; other colors are synthesized from them. At the same brightness: RG synthesizes Y, RB synthesizes P, GB synthesizes C, RGB synthesizes W. The number in the color definition box indicates the duration of that color state. The "Times" column indicates how many times the state repeats; "∞" indicates continuous flashing.

| Definition | Flight Indication | Color | Frequency (times/sec) | Times | Meaning |

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

| Cycle | | R2Y1 | 2 | ∞ | Attitude Mode, GPS satellites [verify] |

		R2Y1	2	∞	Attitude Mode, GPS satellites <= 7 (poor accuracy)
		G01	1.6	∞	Attitude Mode, GPS satellites >= 7 (good accuracy)
		R1P1	2	∞	GPS Mode, GPS satellites <= 7 (poor accuracy)
		G1P1	2	∞	GPS Mode, GPS satellites >= 7 (good accuracy)
		R1B1	2	10	System initialization complete
		Y1B1	2	∞	Remote controller signal lost
		Y1G1	2	∞	Compass data abnormal
		R1	0	Steady on	First level low voltage alarm
		G0	0	Steady on	Second level low voltage alarm
		R1	2	4S	Start compass horizontal calibration
		G0	0	4S	Start compass vertical calibration
		R1	2	4S	Compass calibration successful
		G0	0	4S	Compass calibration failed

****2.11 First Flight****

For the first flight, it is recommended to follow these steps for pre-flight inspection and flight.

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

Check the following to avoid flight accidents:

1. Aircraft nose direction.

2. Compass module/GPS orientation.

3. Main controller installation direction.

4. Whether each rotor rotation direction matches.

5. Whether all electrical connections are secure.

6. After installing the battery, switch to Attitude Mode for a low-altitude test flight to ensure normal aircraft operation.

7. Connect the tether to 220V AC power. Turn on the tether box winch switch and pull out the tether cable.

8. Connect the aircraft's aviation connector to the tether box's aviation connector. Secure the strain relief clip to the aircraft.

****Power-On Self-Check****

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

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

2. After the main controller powers 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 has acquired sufficient satellites for positioning before proceeding.
4. Toggle the flight mode switch back and forth. Observe if the LED flight mode indication matches the switch position.
5. Place the aircraft at least 20 meters away from the pilot and wait for the flight control system to acquire satellites normally (red flashing LED turns to green flashing LED).
6. Turn on the aircraft's backup power switch. Ensure the backup power is connected to the aircraft, then turn on the DC switch on the tether box.
7. In Attitude Mode, move the right control stick to the bottom-right corner simultaneously. The motors will arm and start sequentially from motor 1. If the throttle stick exceeds 20% during sequential start, all motors will start immediately.
8. After all motors have started, gently push the throttle stick to approximately 30% and hold. Apply slight roll and pitch stick inputs. Observe if the motor speed increase corresponds to the stick input. If consistent, return the roll and pitch sticks to center and continue pushing the throttle until the aircraft lifts off.
9. Test the feel of each control channel below 2 meters altitude. If response is normal, proceed with normal flight.

After flight, check if the temperatures of the clockwise and counter-clockwise rotating motors are consistent. If temperatures differ, the aircraft may have an unbalanced load. Calibrate the propeller plane to ensure consistency.

2.12 Failsafe (Signal Loss)

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

2.13 Power Loss Protection

If the generator fails or the tether box stops supplying power to the aircraft, the aircraft will activate power loss protection and land in place.

3. Ground Tether Box System

3.1 Ground Tether Box Specifications

Parameter	Value
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Automatic Tether Box Weight	4 kg [verify]
Generator-Powered Flight Time (H)	9 [verify]
Tether Box Dimensions	550mm x 400mm x 300mm [verify]
Rated Input Voltage (V)	110-220, 50-60 Hz AC
Rated Output Voltage (V)	400 (DC) [verify]
Maximum Output Power	3000 [verify]
Tether Cable Length	50 m
Automatic Reel Speed	1 m/s

3.2 Ground Tether Box External Functions Diagram

No.	Name	Function
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1	Voltage Display Meter	Displays current tether box output voltage
2	Current Display Meter	Displays current tether box output current
3	Aviation Connector	Connects to UAV, provides power to T2 UAV
4	Fan	Reduces internal tether box temperature
5	Power Failure Alarm	Tether box power loss reminder
6	Automatic Reel System Switch	Activates the automatic reel system
7	400V Power Switch	Press button, tether box outputs 400V to power the aircraft
8	Fuse	Tether box short circuit protection
9	Main Switch	Tether box main power switch
10	220V AC Mains Input	Tether box 220V AC mains connection

3.3 Ground Tether Box Operation Sequence

1. Connect the tether box to 220V AC mains power.

2. Press the main switch button on the tether box.

3. Press the automatic reel system switch.

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

5. Ensure the aviation connector is properly connected, then press the 400V power switch. Check the current and voltage display meters for normal readings.

6. Once everything is normal, the aircraft can take off.

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

****Disclaimer****

- (1) The tethered UAV, tether box, and tether cable contain high voltage. Do not disassemble them to avoid electric shock.
- (2) Keep away from or do not touch motors or propellers when they are rotating to avoid cuts.
- (3) Ensure propellers are correctly installed on their corresponding motors.
- (4) Do not touch rotating parts with hands or fingers while powered on. This can easily cause injury; installers must be extremely careful.
- (5) Users must read this manual carefully before using this product. Use of this product implies acceptance of all terms in this disclaimer.
- (6) This product is suitable for persons aged 18 and above. With normal power supply and correct connections, it can provide an excellent flight experience. When debugging parameters or performing firmware updates, we strongly recommend removing the propellers and ensuring normal power supply and correct wiring of corresponding functional modules. Always keep away from crowds, dangerous objects, and fragile items during use. Shuangjie Technology assumes no liability for personal injury or property damage caused directly or indirectly by the following reasons:

1. User failure to assemble and use according to this manual.

2. User operating the aircraft under the influence of alcohol, drugs, fatigue, or other impaired physical or mental states.

3. User actively or intentionally operating the aircraft to cause harm.

4. User disassembling the product or modifying it with non-Shuangjie parts, rendering it inoperable.

5. Injury caused by user operational error or misjudgment.

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

7. Injury caused by user operating the aircraft while knowing it is in an abnormal state.
8. User operating the aircraft in severe weather conditions such as typhoons, hail, or heavy fog.
9. User flying in areas with magnetic interference, radio interference, or government no-fly zones.
10. User piloting the aircraft in poor visibility or when the line of sight is obstructed.

11. Infringement caused by data or images captured using this product.

12. Other losses not within Shuangjie Technology's liability scope.

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