



E-mail: info@sparkletech.hk
E-shop: <http://www.drones-mart.com/>

About us

Company profile

Sparkle Tech is one of the leading designers and manufacturers of Unmanned Aerial Vehicle (UAV) for industrial application for a decade. We have office based in Hong Kong and production facilities located in Dong Guan City of China. As such, we are able to amalgamate advanced design technology and modern business operation in Hong Kong with world renowned efficient and cost-effective production in China.

We began to design and produce industrial UAV well before many others. Over the years, we have built up an archive of hundreds of on-line video footages showing our UAV in action under various demanding situations like high altitude and strong winds. This is an indisputable evidence of our breadth and depth of expertise in this field. Our Vertical Take-Off and Landing (VTOL) vehicles can carry a huge payload of 5kg or cruise up to 500km to suit the wide-ranging professional missions of our clients.

Technology

Sparkle Tech is one of the few VTOL drone manufacturers in the world that can perform computer-aided design, verify using 3D modelling and prototyping, make the molds, test fly, mass produce and integrate mission specific systems with VTOL airframes according to client specification, all with our in-house capabilities. As the final step of a turnkey solution, we provide a well-established comprehensive user training program using the product just received by the client. For clients who prefer to do system integration themselves, we are equally happy to supply the airframes only.

Built for Tough Missions

Our products are built to carry out professional missions not just over easier terrains, but also over high mountains, open seas, hot deserts, wet swamps, in day and night under windy, rainy and cold conditions. The breadth and depth of our experience is hard to be matched. We are well-equipped and confident to provide the best possible UAV solutions to challenging missions of clients all over the world.

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No	Code	Description	Qty
1	S1050G	Tiger Shark VTOL gasoline - 3.5m wingspan - 5L fuel tank - MTOW 22kg - Full composite - Carrying case	1
2	S1050-Power	Power system - C6215 x 4 - ESC80-HV-Q ESC x 4 - 17*10 Propeller x 1 - 1905-07 carbon propeller x 2 Pair (4 pcs) - X10 digital servo x 5 - PZ-15906 retract undercarriage x 1	1
3	3W-28iCS with starter	3W28iCS engine - Ignition - Auto starter - Module PnP engine mount	1
4	Service-Avionics	Installation of avionics and tuning	1
5	S40-V1	Flight controller support VTOL	1
6	D04	Telemetry 900mMhz - Control radius <50km - Built in battery 6000mAh for 6 hours - Sbus x 1, Serial x 1 - Wifi, bluetooth	1
7	Service-autopilot	Flight controller installation Field test flight 30 mins	1
8	PL-18	Flysky radio control - 18 channel - Used for ground setting - Manual control of drone	1
9	Ant-900	1.8m fiberglass antenna, 2 section 10db, 902 - 928 mHz	1
10	GCS-dual	Portable professional ground control system GCS screen x 1 Gimbal screen x 1	1

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No	Code	Description	Qty
11	12S8000	Li-po battery 12S, 8000mAh, XT-90 weight 2.3kg	1
12	1200W-12S	Dual output charger 6-12S x 2 1200w	2
13	Ping20Si	ADS-B transponder Model SiReplies to Mode S radar interrogations from ATC	1
14	EFP	Electric fuel pump	1
15	12S8000	Li-po battery, 12S, 8000mAh, XT-90, weight 2.3kg	1
16	1950-07JXF	JXF carbon propeller 19.5 x 5.7 Set of 2 (2pcs)	1
17	AS-WP	17 x 10 wooden propeller	1
18	ANTENNA	10m Antenna cable with N plug	1
19	SP-30	COFDM video link 10-30km SDI HD video input x1 FVP video input x1 1.8m receiver antenna system USB video recording Frequency 500-600mH	1

Hybrid VTOL UAV

SparkleTech

S1050

Tiger Shark VTOL





Hybrid VTOL Drone

Tiger Shark VTOL Hybrid system

We designed the Tiger Shark VTOL based on the success platform of Eagle Hero which carry forward the most efficient of its kind.

That means low stall speeds, high max efficiency, a large payload capacity and hot swap features, retract nose gear, built in component compartment and the long endurance gasoline engine power system.

This equates to less energy expended and more time in the air.

Product Introduction

- Ideal combination of high energy density gasoline and high efficiency electric motor
- Complete composite construction using carbon fibre and Kevlar on a rigid honeycomb core structure
- New fuselage design concept that conceals all avionics cables
- Robust structure engineered to industrial quality
- Redundant power system for flight controller to maximize safety
- Compatible with PC-based, full-featured, open source autopilot system
- High durability gasoline engine from Germany
- Built in 5.2 L fuel tank
- Easy to assemble in the field, no need for expert skill
- VTOL to suit virtually any mission

<http://www.sparkletech.hk/>



WING (Forward swept wing)

The forward swept wing means its leading edge and trailing edge are swept forward, that is, the sweep angle is an acute angle.

The tip string is in front of the root string, and the left and right wings are projected in a plan view to form a V shape.

Since the airflow on the forward swept wing points to the wing root, the airflow is first split from the wing root at high angle of attack, which fundamentally overcomes the wing tip stall problem, so the low speed performance is excellent, the lift being increased and at the same time improving the aerodynamic efficiency of the wing panel.

Compared to the swept wing, the forward swept wing has four main advantages:

1) **Structural advantages.** The forward swept wing structure ensures a better connection between the wing and the fuselage and reasonably distributes the pressure by the wing and the nose landing gear. These advantages are difficult or impossible to achieve by other methods, which greatly improve the aerodynamic performance of the maneuvering, especially at low speeds.

2) **Maneuverability advantage.** The forward swept wing technology allows the aircraft to have very good aerodynamic performance at subsonic flight, greatly improving its maneuverability while high pitch flight.

3) **Takeoff and landing advantage.** Compared with the normal swept-wing aircraft of the same wing area, the forward-swept aircraft has a higher lift and a 30% increase in payload capacity, thus reducing the wing area and size, reducing the drag and aircraft structural weight; reducing the weight for balancing, improves the low-speed maneuverability, shortens the take-off landing distance. According to USA aviation specialist calculation, if the F-16 fighter uses the forward swept wing structure, it can increase the turning velocity by 14%, increase the combat radius by 34%, and shorten the takeoff and landing distance by 35%.

4) **Controllable advantages.** The use of the forward swept wing structure can improve the controllability of the aircraft at low speeds, improve the aerodynamic performance in all flight conditions, reduce the stall speed, and ensure that the aircraft is not easy to enter the tail spin, thus greatly improving the safety and reliability of the aircraft.



FUSELAGE

The trapezoidal shape of the fuselage minimizes the fuselage to wing interaction, drag and interference.

It was designed with a high pressure region in the nose and a low pressure region behind the wing, on top and below the motor mounting area.

This acts to create a pressure differential, essentially "pulling" air through the fuselage. The layout allows for smarter cooling, by cooling off lower temperature components towards the front, and higher temperature components in the rear (motor).

The cooling exhaust placement was purposely in an area with turbulent airflow, so as to not disturb the otherwise laminar airflow over the rest of the fuselage.

VTOL FEATURES

Implement the mature quad motor concept achieve vertical takeoff and landing eliminating the restriction of the runway requirement in the field.

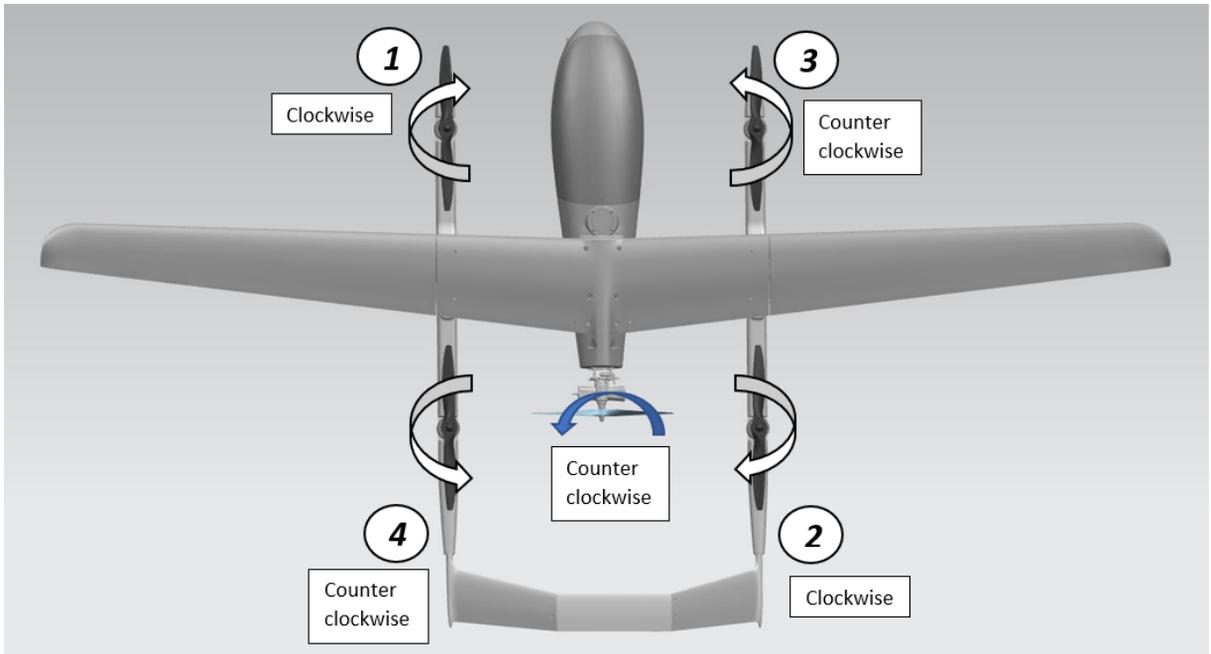
The quad motor also provide the maximum fail safe protection against any malfunctions situation during the mission.

ENGINE

3W-28i engine being used which made in Germany provided the maximum reliability for the long run of UAV application.

Factory grant a 36 months warranty from the date of purchase or 1200 operation hours.

Awesome VTOL system eliminate the restriction of take off and landing condition. This system being well proved for the reliability of thousands hour flight. Simple, reliable and easy of maintenance is the goal at anytime.



3W-28iCS



Cylinder capacity	28.5 ccm
Power	3.4 HP / 2.5 KW
Bore diameter	36.00 mm
Stroke	28.00 mm
Rpm range	1.500 – 8.500 U/min-1
Weight incl. ignition	1.210 kg
Crankshaft	3 ball bearing
Oil/gasoline ratio	1:50 / 2% Mix
Ignition	6.0 – 8.4 V DC
	18x8 Wood part No 10.101.501
2-Blade propeller	18x10 Wood part No 10.101.505
	20x8 Wood part No 10.101.513
3-Blade propeller	17x10 CFK part number 10.101.701

SparkleTech

Customize Auto starter



Unique modular engine mount for plug and play in field.

VERSATILITY

Our transformative design allows for dynamic use, making each system truly unique.

You can use the Tier Shark VTOL for search and rescue missions, inspections of pipelines, photography, filmmaking, thermal imaging, 3D terrain mapping, precision agriculture, surveillance, reconnaissance, FPV, live video links, humanitarian aid, fun and much, much more.

CAPABILITY

We are committed to integrating efficient design with modern technology in a robust, entirely composite platform.

The Tiger Shark fly for over 4 hours, reach speeds of up to 120 km/h and travel for over 400km.

The Shark allow you to fly autonomously, capture stunning HD photos and video, complete aerial surveys, monitor crop health, and wirelessly transmit live video.

This is all achieved with incredible accuracy of an on board autopilot system.

TELEMETRY SYSTEM

Microhard P400 telemetry module being used for data linkage.

Range up to 60km at line of sight in open area with 1.8m fiberglass antenna setting up at 2m tripod.



AUTOPILOT SYSTEM S40

S40 is the full autonomous flight controller and navigation system specifically designed for compound UAVs VTOL (vertical takeoff and landing fixed wing), which is also suitable for an air with the conventional fixed wing & quadrotor configuration.

It internally integrates the flight control computer and micro-assembly navigation system(GPS/INS).

Simply one-key action, it is capable of enabling automatic takeoff, landing, hovering, circling, homing, altitude holding and parachute opening. Meanwhile, it is also capable of various autonomous cruise functions based on the pre-set route.

Besides, S60 has the flight status monitoring & alarm functions and a sophisticated emergency protection mechanism, to ensure operational safety of the system.

SCOPE OF APPLICATION

Hybrid UAV with fixed-wing + quadrotor configuration, including the fixed wing aircraft with conventional tail and V-tail and flying wing and the quad rotor aircraft with “X” configuration.

Conventional fixed-wing(plane) UAV, with conventional tail, V-tail and flying wing;





AUTOPILOT SYSTEM S40

System features

Sensor configuration:

- GPS/MINS combined navigation integrated micro-system provides the navigation and control information covering 3D position, three-axis attitude, three-axis velocity and three-axis acceleration.
- Integrated pneumatic altimeter, with resolution ratio of 0.1m and range of - 500~10,000m;
- Integrated difference-pressure air speedometer, with resolution ratio of 1m/s and range of 0~100m/s;
- 2-circuit pulse-width engine speed measurement, with resolution ratio of 1rpm;
- Dedicated voltage/current measurement module, with voltage range of 0~52V and current range of 0~200A;

Flight control:

- It supports three types of UAVs: fixed-wing(plane), multi-rotor and hybrid(vertical takeoff and landing) UAVs;
- For control of hybrid UAV, the flight mode can be switched by the RC remotely or automatically;
- Flight control modes: manual (by the RC remote controller), semi-auto (attitude and throttle lever are controlled by the RC remote controller) and full-auto(flight in the preset route);
- It is suited for aileron, elevator, rudder, throttle, parachute opening, shutter and other servo control, with refresh frequency of 50Hz;
- It is suited for quad rotor and other conventional multi-rotor UAVs power motor control, with refresh frequency of 200Hz;
- With one-key action, it can enable takeoff, landing, hovering, circling, altitude hold, parachute opening and other functions, for easy operation of the user;
- When a fix-wing UAV swerves, the elevator enables feed-forward compensation to avoid altitude decrease;
- When a multi-rotor UAV hovers, it automatically maintains its nose heading (or the course angle can be changed remotely); during flight in a route, the aircraft nose is automatically aligned with the route direction;
- Sophisticated flight status monitoring and automatic protection;



AUTOPILOT SYSTEM S40

System features

Mission navigation:

- It provides 8 user routes and each route can contain 800 way points;
- It can automatically generate the circling route and the circling point, circling radius and circling rounds are programmable;
- It can automatically generate the homing route; or the user may plot the homing route and homing is automatically executed in the route plotted by users;
- The longitude, latitude, altitude, speed and mission of flight segment are programmable;
- For altitude control modes of the flight segment, normal control, gradient control, circling ascension/descension before arrival and circling ascension/descension after arrival, etc. can be selected.
- After reaching a way point, it can automatically switch to circling, homing or landing mode;
- It can enable parachute opening and camera shutter control upon arrival at a way point;
- It can execute regular-interval photographing mission in a flight segment;

Protection:

- Protection against low voltage, low oil level and low rotation speed;
- Protection against abnormal attitude;
- Protection against abnormal altitude;
- Protection against low accuracy of GPS positioning;
- Protection against failure of combined navigation system;
- Protection against breach of maximum control radius;
- Protection against breach of safety limit of the route;
- Protection against overtime communication outage;
- 100 emergency landing points can be preset so that the aircraft can land at the nearest landing point in case of an emergency;
- Protection can be executed as automatic homing, automatic landing or parachute opening;

Remote Controller:

- It is compatible with the conventional Sbus interfaced RC remote controller and receiver;
- The manual/autonomous modes can be switched by the RC remote controller;
- The fixed-wing and multi-rotor modes can be switched by the RC remote controller;
- The FailSafe status of the RC remote controller is under monitoring;
- The RC remote controller can be used for registration of the control surfaces;
- The RC remote controller can execute unlocking, to prevent mis operation of the motor;

AUTOPILOT SYSTEM S40

System features



Airborne data recording:

- Flight information and mission information are recorded and downloaded separately;
- The recording frequency and downloading frequency are selectable in the range of 1Hz~10Hz;
- Flight information recording time can be 9 hours;
- 7000 mission information logs can be recorded (on photographing locations);

Ground station software:

- Supporting multisource online electronic map with error compensation, MAPX and background pictures;
- Complete and practical preflight check process prompt;
- Irregular multi-monitoring area automatic mapping route planning function;
- Legible and comprehensible flight instruments;
- Easy execution of key commands; protection against mis operation;
- Adjustment of integrated control parameters, calibration of sensors, protection configuration, etc. ;
- Display, alerting, recording and playback of telemetry data; the formats of the log files are compatible with Office;
- The ground station software is capable of fine adjustment of the horizontal position, altitude and course of multi-rotor UAV, without remote control of the RC remote controller;

Data link interface:

- Electrical standard: RS-232C;
- Baud rate: several optional Baud rates, default 115200, N, 8, 1;

Physical parameter:

- Dimensions: 109mm*56mm*53mm (L*W*H);
- Weight: 130g
- Power supply: 300mA@4.5V~9.0VDC.
- Working temperature: -20~55 degrees Celsius

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TRANSPORTATION

Compact and light weight composite material carrying case providing the flexible mobility. Carrying case measurement is 1270mm x 360mm x 460mm.

Weight 5Kg.

Total weight of system < 20kg



Full composite, Carbon fiber, Kevlar / Honeycomb core structure
Gasoline engine for fix wing cruise, battery power for VTOL system
Tough structure achieve industrial standard
Dual battery power maximize the safety goal
Compatible with full-featured PC-base, open source autopilot system
Easy for assemble in the field, no need for expert skill
VTOL suit for any mission



22Kg

MTOW

20:1 ~ 23:1

Glide ratio (L/D)

3500mm

Wing Span

1940mm

Length

2 to 5 Kg

Payload

60Km

Control Radius

4.2Ltr

Gasoline Fuel Tank

14,800Ft

Maximum Ceiling

>4Hrs

Endurance
(at 2Kg Payload)

100Km/h

Cruising Speed

120Km/h

Maximum Speed

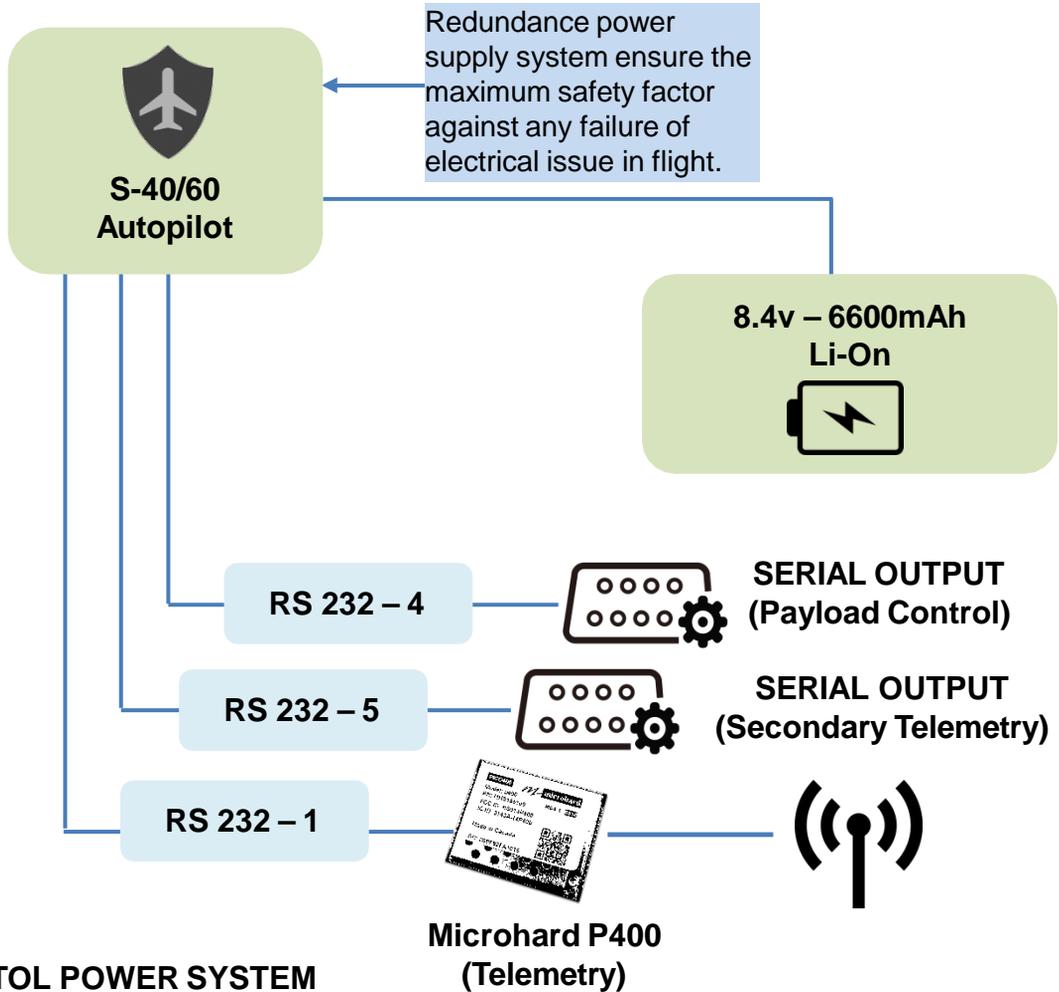
65Km/h

Stall speed

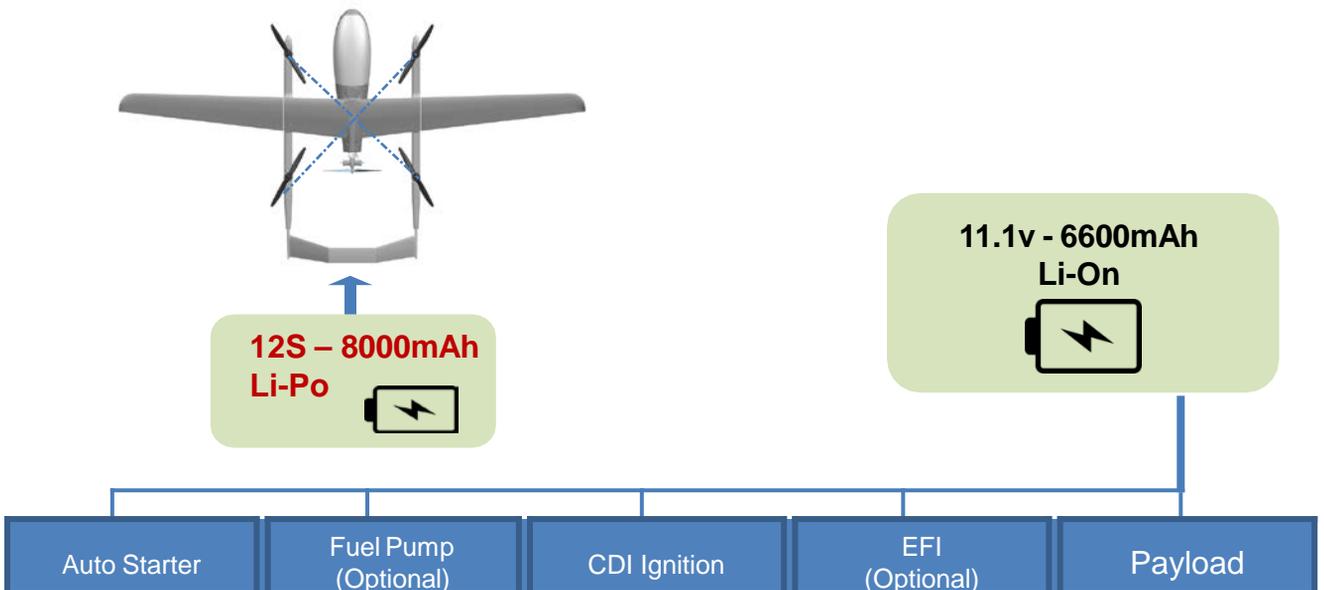
5x5

Runway

POWER SYSTEM (DIAGRAM)



VTOL POWER SYSTEM

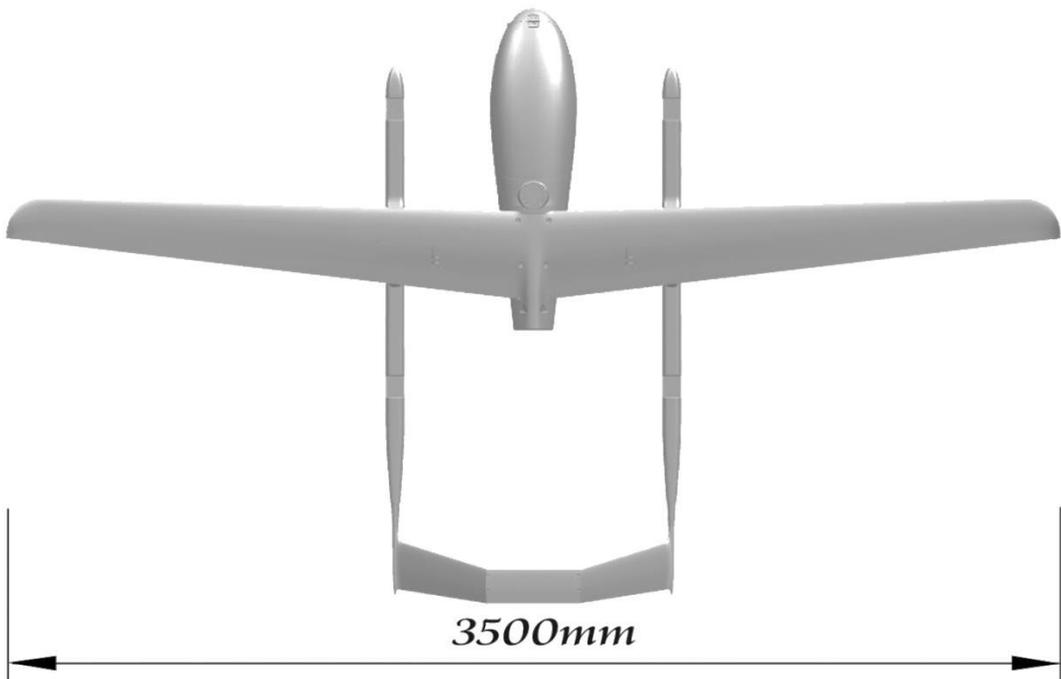
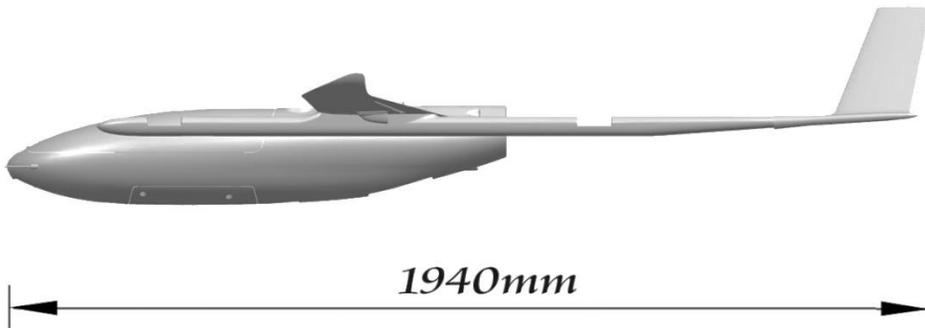


Special design of avionics arrangement eliminating the miss-operation by operator

The design improved the stall speed as well as higher lift and a 30% increase in payload capacity, thus reducing the drag and aircraft structural weight



TAIL: Inverted /---\ design improves efficiency while decreasing drag.



Flysky FS-PL18 Paladin 2.4G 18CH Radio Transmitter Receiver



Product Name: FS-PL18

Product color: black

Support Model: Glider Fixed Wing Helicopter Crossing Engineer Vehicle

Working current: 130 mA

Language: Chinese/English

Charging Interface: Micro USB/Wireless Charging

Low Voltage Alarm: <3.7V

Brand name: Flysky

Support for firmware updates: Yes

Simulator: Built-in USB simulator

Duration: More than 8 hours

Antenna type: dual antenna

Working temperature: - 15 C - + 60 C

Signal output: ibus/sbus/PPM/PWM signal output is optional

Frequency: 2.4 GHz

Model memory: 20

Working Voltage: 5V DC

Display screen: 3.5 inch TFT LCD, 320*480

Fuselage weight: 946g

Working humidity: 20-95%

Channel resolution: 4096

Power input: 1 * 3.7V 4300mAh Lipo battery

Wireless Protocol: AFHDS3

<http://www.sparkletech.hk/>

Flysky FS-PL18 Paladin 2.4G 18CH Radio Transmitter Receiver



Number of channels: 18

AFHDS 3 protocol: low delay (< 5ms), long distance, strong anti-jamming ability

Emission power: <20 dBm

Remote control distance: > 3000m

Size: 214*39*192mm

Receiver High Voltage Support: FTTr10 (3.5-12V) can directly return battery voltage to remote control display

Charging time: 6H@5V/2A (USB connection) 7H@5V/2A (wireless charging)

Data Interface: USB. Bluetooth Interface (USART). Headset Port (PPM)

Package includes:

PL18 remote control *1

FTTr10 receiver *1

FRM301 high frequency head *1

Fs-fttr16s receiver *1

Sunshade cap * 1

Hand glue * 2

Double handle *2

Micro USB cable * 1

Nub switch assembly *2

<http://www.sparklettech.hk/>

APPENDIX 1



Pre-flight Checking List

Ground Station _____ Maintenance _____ Flight Date _____

Flight Environment			
Weather _____	<input type="checkbox"/>	Wind Speed _____	<input type="checkbox"/>
		Wind Direction _____	<input type="checkbox"/>
UAV Inspection			
Are the connecting screws secure?	<input type="checkbox"/>	Is the wing locking pin secure?	<input type="checkbox"/>
Hover motor/propeller is good?	<input type="checkbox"/>	Is the motor mount secure?	<input type="checkbox"/>
Are the servo control surfaces being intact?	<input type="checkbox"/>	Is cruise fly propeller intact?	<input type="checkbox"/>
Is the centre of gravity normal?	<input type="checkbox"/>	Oil Level _____	<input type="checkbox"/>
Ground Station Inspection (without power)			
Whether the output of the remote control correct?	<input type="checkbox"/>	Whether the posture is correct?	<input type="checkbox"/>
Magnetic compass calibrated?	<input type="checkbox"/>	Whether the flight plan is correct?	<input type="checkbox"/>
Magnetic Inspection: _____、_____、_____、_____。		Compass	<input type="checkbox"/>
Ground Station Inspection (with power)			
Main Power _____ V		Autopilot Power _____ V	<input type="checkbox"/>
Hovering Power Supply _____ V			
No. of GPS satellite: _____	<input type="checkbox"/>		
Whether the manual radio control command correct?	<input type="checkbox"/>	Whether the hovering propeller and motor is oriented in the correct?	<input type="checkbox"/>
		Will the airspeed increase when pressing the pitot tube?	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>

END