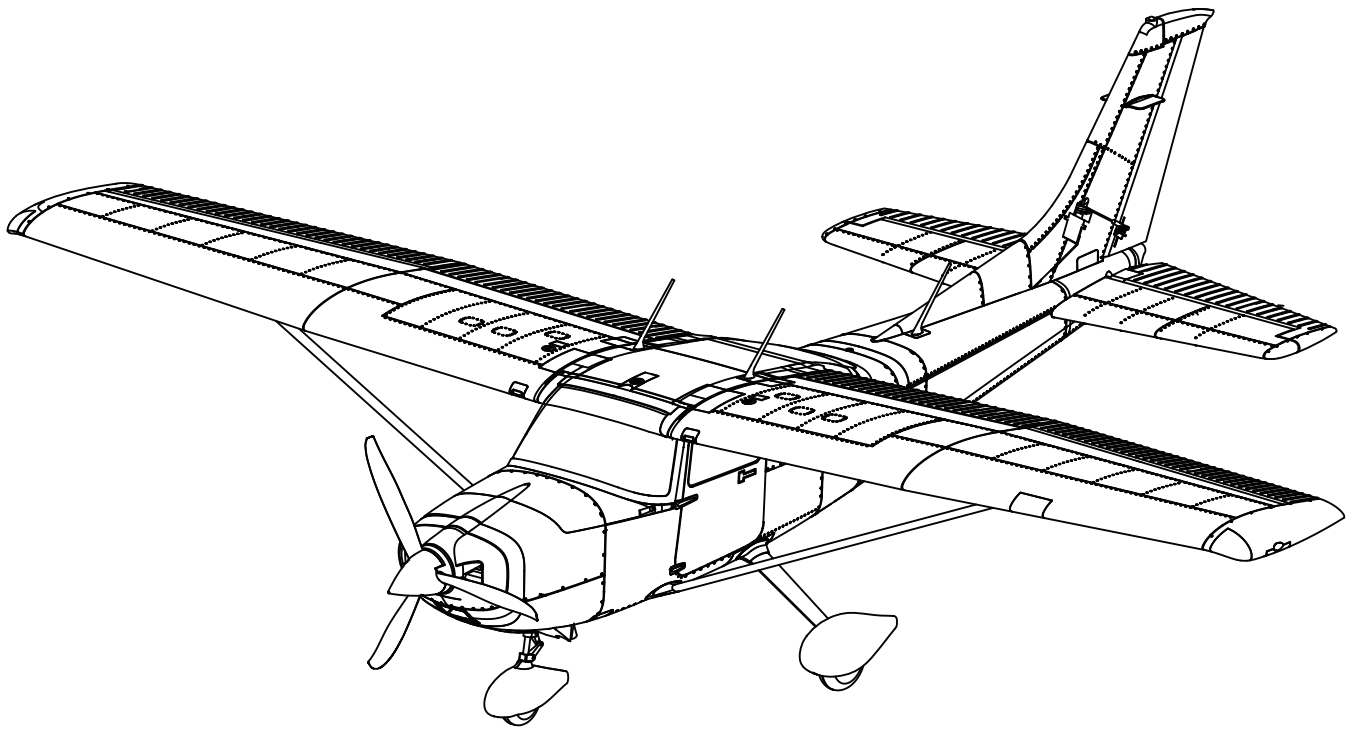




1500mm  
Cessna 182



Instruction Manual  
Bedienungsanleitung  
Manuel d'utilisation  
操作手册

MAN-G0273

POWERFUL  
动力强劲

RIGID  
高强度EPO泡沫

STABLE  
高安定性

[FMShobby.com](http://FMShobby.com)

**WARNING**

**WARNING:** Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product and NOT a toy. It must be operated with caution and common sense and failure to do so could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision.

This manual contains instructions for safety operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual prior to assembly, setup or use, in order to operate and avoid damage or serious injury.

**Safety precautions and warnings**

As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the product or the property of others. This model is controlled by a radio signal subject to interference from many sources outside your control. This interference can cause momentary loss of control so it is advisable to always keep a safe distance in all directions around your model, as this margin will help avoid collisions or injury.

Age Recommendation: Not for children under 14 years. This is not a toy.

- Never operate your model with low transmitter batteries.
- Always operate your model in an open area away from cars, traffic or people.
- Avoid operating your model in the street where injury or damage can occur.
- Never operate the model in populated areas for any reason.
- Carefully follow the directions and warnings for this and any optional support equipment you use (chargers, rechargeable battery packs, etc.)
- Keep all chemicals, small parts and anything electrical out of the reach of children.
- Moisture causes damage to electronics. Avoid water exposure to all equipment not specifically designed and protected for this purpose.
- Never lick or any place of any your model in your mouth as it could cause serious injury or even death.

**Safety****Lithium Polymer (Li-Po) Battery Warning**

**CAUTION:** Always follow the manufacturer's instructions for safe use and disposal of batteries. Fire, property damage, or serious injury can result from the mishandling of Li-Po batteries.

- By handling, charging or using a Li-Po Battery you assume all risks associated with lithium batteries.
    - If at any time the batteries begin to swell or balloon, discontinue use immediately!
  - Always store the batteries at room temperature in a dry area to extend the life of the battery. Always transport or temporarily store the battery in a temperature range of 40-120F. Do not store the battery or model in a car or in direct sunlight. If stored in a hot car, the battery can be damaged or even catch fire.
  - Never use a Ni-Mh Charger to charge Li-Po Batteries. Failure to charge the battery with a Li-Po compatible charger may cause fire resulting in personal injury and property damage.
  - Never discharge Li-Po Cells below 3V.
  - Never leave charging batteries unattended.
  - Never charge damaged batteries.
- Charging the Flight Battery Warning**
- Use a battery charger that is designed to safely charge the Li-Po Battery. Read the charger instructions carefully before use. When charging the battery, make certain the battery is on a heat resistant surface. It is also highly recommended to place the Li-Po Battery inside a fire resistant charging bag readily available at hobby shops or online.

## Introduction

The Cessna 182 is a popular small single-engine propeller aircraft that first appeared in 1956, with its development rooted in the Cessna 180. The Cessna 182 plays a significant role in general aviation due to its excellent stability, reliability, versatility, flexibility, and ease of operation. It is used in various fields such as private flying, flight training, business cruising, aerial photography, aerial patrols, geographical surveyance, and emergency medical rescue.

Authorized by Textron Innovations Inc., the FMS Cessna 182, with a wingspan of 1500mm, adheres to FMS's long-standing product philosophy of "perfect appearance, excellent performance." While painstakingly reproducing the appearance, it also replicates the flight characteristics of the Cessna 182.

**Perfect appearance:** The FMS 1500mm Cessna 182 breaks the limits of degree of realism that aircraft of the same size and type can achieve, meticulously replicating exterior details, from cockpit windows and cabin interiors to skin lines, antennas, exhaust ports, propellers, navigation lights, and more.

**Excellent performance:** With high-rigidity lightweight EPO material and a high-wing structure with a large wing area, the aircraft exhibits low wing-loading and high lift-drag ratio. Activating the flaps, the FMS 1500mm Cessna 182 performs admirably in low-speed control and short takeoff and landing (STOL)—taking off within three meters on the ground and easily flying with half throttle in the air. The aircraft features a tricycle metal shock-absorbing landing gear set and large wear-resistant tires to resist violent landings, eliminating concerns for novice pilots practicing takeoffs and landings. Following international navigation light standards, high-intensity LED lights are equipped on both wings, the tail of the fuselage, and the top of the vertical stabilizer—allowing worry-free takeoffs and landings in low-light conditions, enhancing realism and adding to the joy of flying. Robust plastic struts give extra strength to the wings during aerobatic maneuvers.

In addition, the assembly structure of the Cessna 182 reflects FMS's consistent attitude towards product development—rigor-

ous and meticulous. The model utilizes a convenient snapper assembly structure, integrated servo-connector design, and ball head control surface linkage. These measures, while ensuring the strength and stability of the aircraft, greatly simplify the assembly steps, allowing players to enjoy the fun of flying in the shortest possible time. The PNP configuration includes a 3541-KV840 brushless motor, 40A brushless ESC, and seven 9g digital servos, with high-precision digital servos controlling ailerons, flaps, nosewheel steering, rudder, and elevator, accurately executing input commands.

Most pleasingly, the 1500mm Cessna 182 can be equipped with the Reflex V3 (sold separately), which can be connected via Bluetooth and unlocks custom tuning functions. After downloading the app, players can choose standard or custom modes based on their preferences and synchronize the desired flight parameters.

Go with FMS and challenge the vast skies.

Features:

1. Authorized by Textron Innovations Inc.
2. High-Performance Power System: Powerful 3541-KV840 brushless motor, 40A brushless ESC.
3. Rich in realistic details, such as cockpit interior (instrument panel, steering wheel, pilot), antenna, navigation lights, etc.
4. Metal shock-absorbing landing gear set, adding strong adhesion damping silicone oil, more smooth travel, more even cushioning force
5. Pre-installed high-intensity LED navigation lights.
6. Simple assembly structure (snappers+screws).
7. Superior low-speed maneuverability.
8. Ultra-short takeoff distance.
9. Integrated servo connectors.
10. Large-size battery compartment.
11. Ball head control surface linkage to reduce surface vibrations and achieve smooth steering.
12. Tough and efficient nylon and fiber-reinforced three-blade propeller.
13. Functional flaps.

## Kit contents

Before assembly, please inspect the contents of the kit. The photo below details the contents of the kit with labels. If any parts are missing or defective, please identify the name or part number (refer to the spare parts list near the end of the manual) then contact your local shop or email us: support@fmsmodel.com.

### Specifications

**Wingspan: 1500mm /59 in**

**Overall length: 1250mm /49.2 in**

**Flying weight: ~2000g**

**Motor size: 3541-KV840**

**Wing load: 60 g/dm<sup>2</sup> ( 0.12oz/in<sup>2</sup>)**

**Wing area: 33.3 dm<sup>2</sup> ( 515.7 sq.in)**

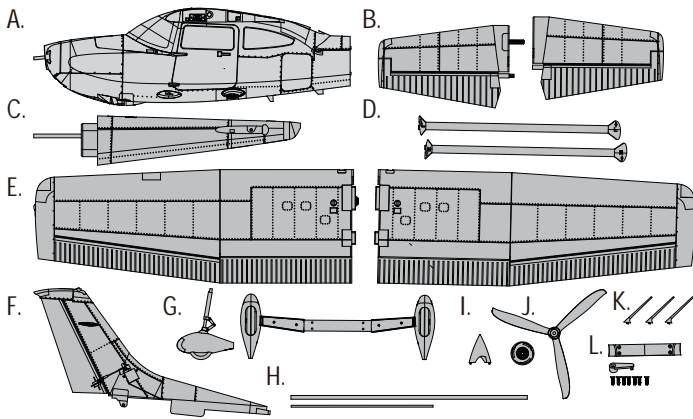
**ESC: 40A**

**Prop Size: 11\*6, 3-blade**

**Servo: 9g Servo x 7**

**Recommended battery: 14.8V2200mAh-3200mAh 25C**

## Kit contents

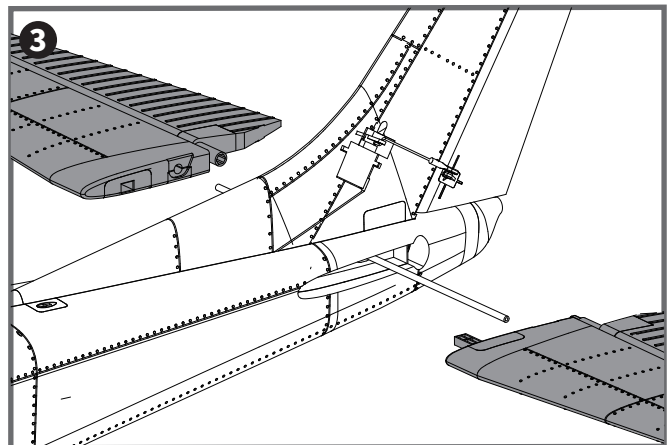
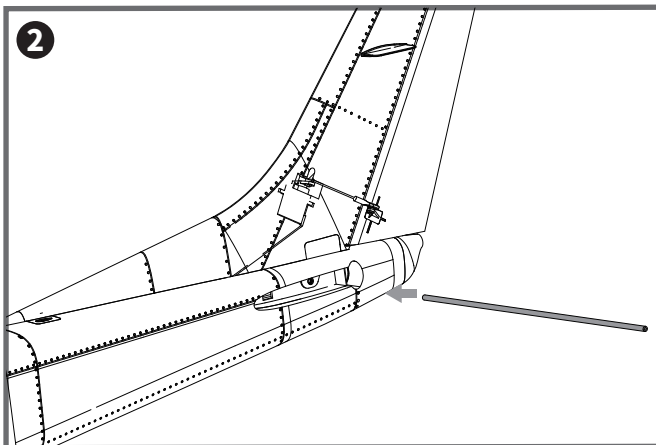
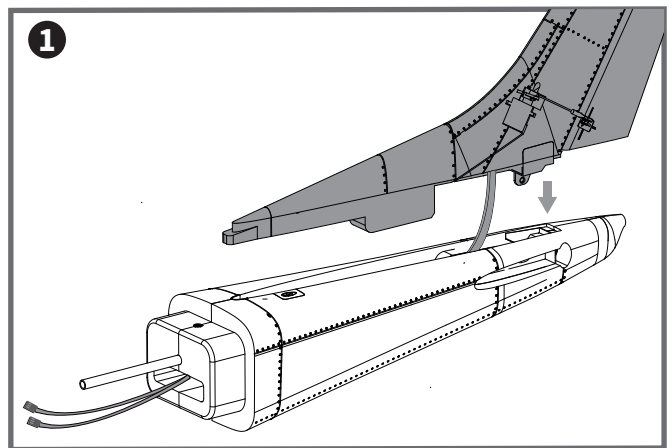


- A: Front fuselage
- B: Horizontal Stabilizer
- C: Rear fuselage
- D: Supporting Struts
- E: Main wing set
- F: Vertical Stabilizer
- G: Landing gear set
- H: Spars
- I: Spinner
- J: Propeller set
- K: Scale antennas
- L: Landing gear insert ,landing gear rocker arm and screw set (HKM 3.0\*10 x 7)

## Model assembly

### Tail wing installation

1. Thread the vertical tail servo wire and LED light wire through the rear fuselage as shown, and install the vertical tail to the slot at the rear of the fuselage.
2. Insert the horizontal tail connecting spar to the slot at the rear of the fuselage, ensuring that the spar passes through the hole of the plastic fastener at the bottom of the vertical tail.
3. Install the left and right horizontal tails onto the connecting spar, align them, and push them into the slot at the rear of the fuselage. When there is a "click" sound, it indicates that they are properly installed.

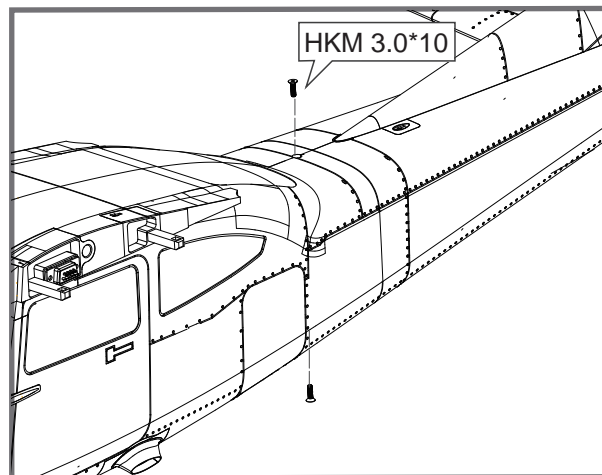
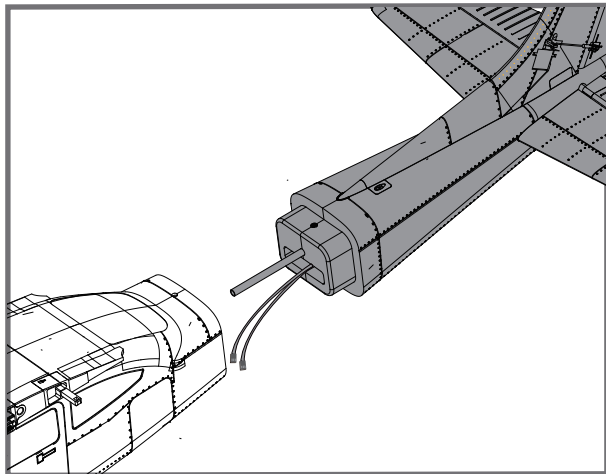




## Model assembly

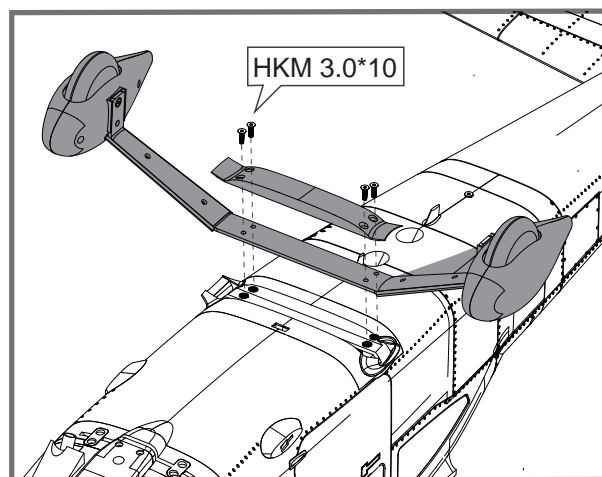
### Fuselage installation

1. Connect the servo wires of the rudder, elevator, and LED lights between the front and rear fuselages.
2. Use the attached screws (HKM3.0\*10 X 2) to secure the front and rear fuselage in place from the top and bottom directions.



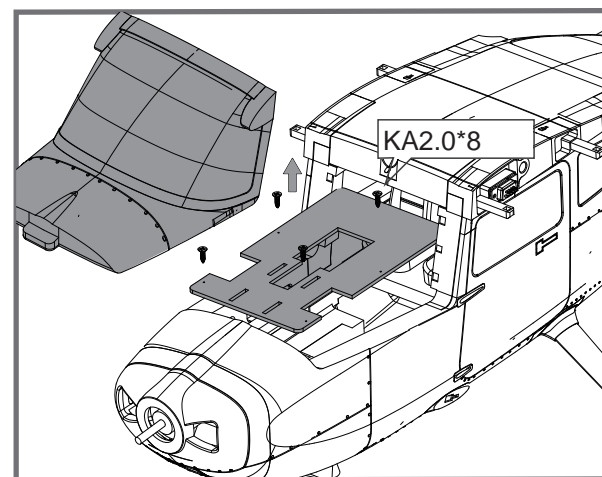
### Main Landing Gear installation

1. With the bottom of the fuselage facing up, install the landing gear set into the corresponding slot as shown.
2. Secure the landing gear set with the included screws (HKM3.0\*10 X 4) and inserts.



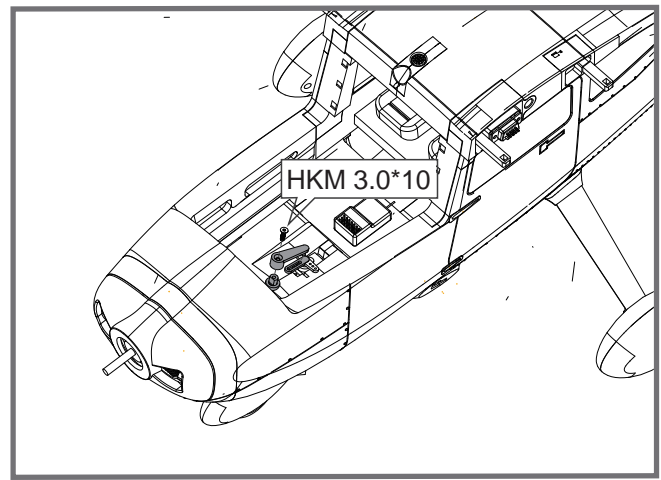
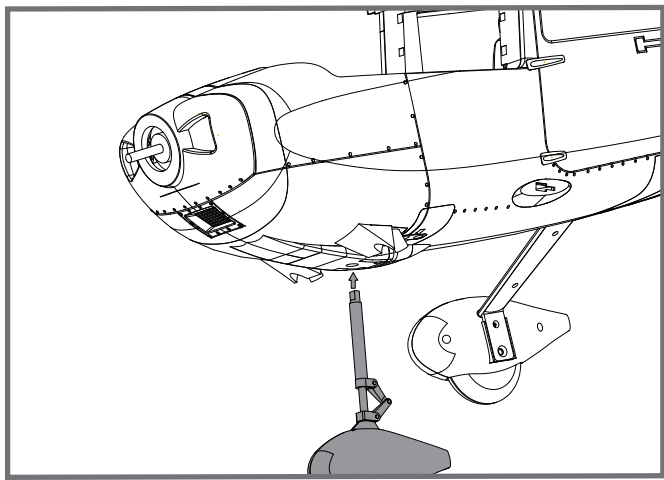
### Front Landing Gear installation

1. Unfasten the buckle to remove the cockpit, use a screwdriver to remove the screws and take out the battery tray.



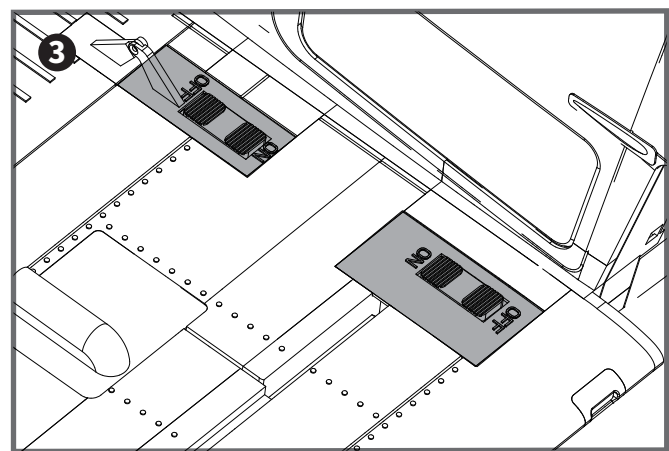
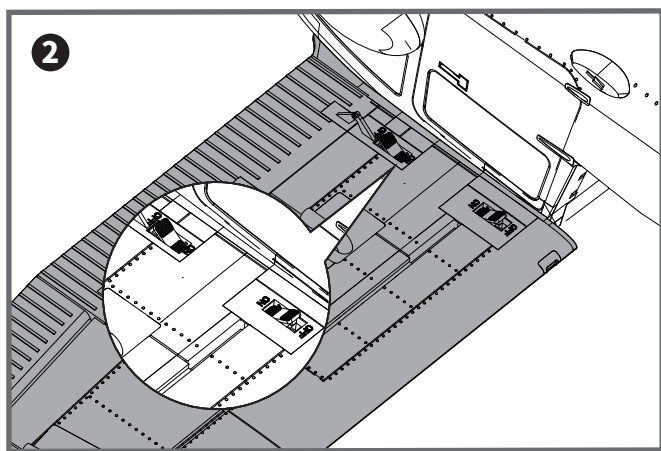
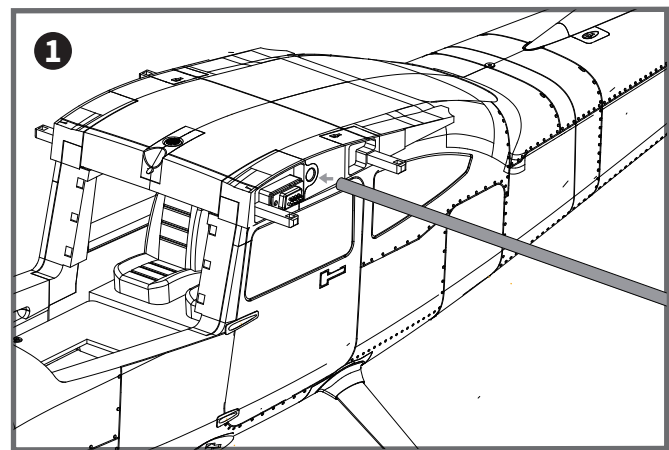
# Model assembly

2. Insert the front landing gear into the bottom hole of the fuselage, install the landing gear rocker arm into the servo rocker arm as shown, and secure it to the landing gear aluminum part using the attached screw(HKM3.0\*10 X 1).



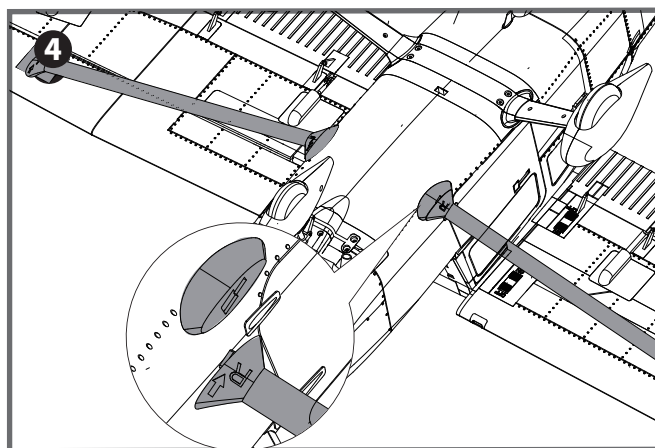
## Main wing installation

1. Install the main wing connecting spar into the corresponding slot on the fuselage. Attach the left and right wings to the fuselage, ensuring that both locks have the "ON" end position downward (the locks are open), so that the main wing could be installed in place.  
 2. Press down on the locks until you hear a "click" sound, indicating that the main wing is securely locked in place. Installation is now complete.



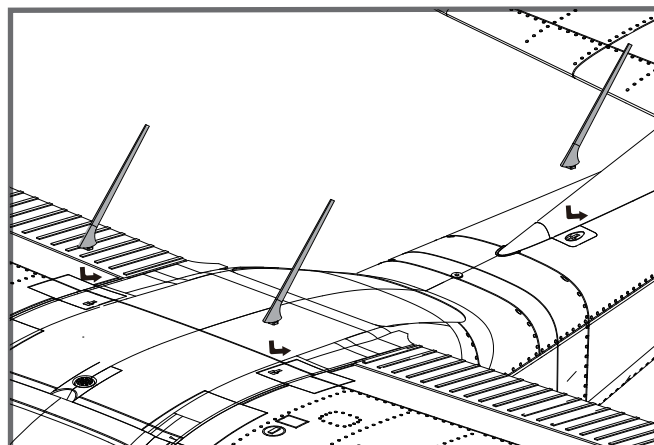
## Model assembly

3. Insert the two ends of the left and right wing struts into the corresponding plastic slots on the fuselage and main wing respectively, then slide them towards the tail to secure in place.



### Realistic antenna installation

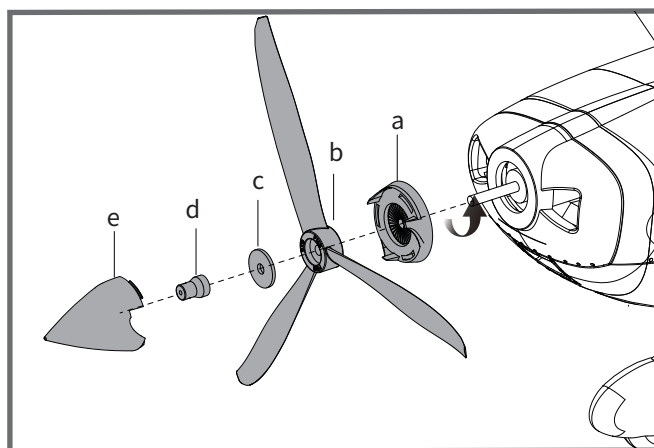
Insert the included realistic antenna into the respective slots on the fuselage and wings, then slide them towards the tail to secure in place.



### Propeller installation

1. Assemble the spinner and propeller as shown.

Note: the motor should rotate clockwise when viewing the plane from the rear.

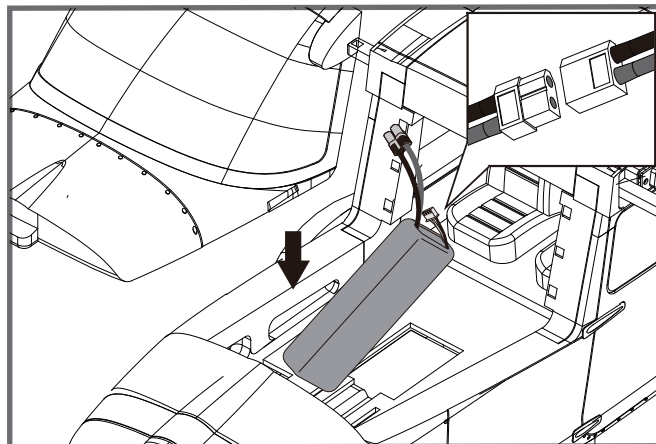


## Battery installation

1. Apply the hook tape to the cable end of the battery.
2. Slide the battery into the battery hatch with the power supply cable toward the rear end of the plane and the hook tape facing the bottom of the battery hatch.

Note: You may need to relocate the battery position to achieve the correct CG for your model.

Battery compartment size: 170\*105\*42mm



## Preflight check

### Important information

1. The ESC included with the model has a safe start. If the motor battery is connected to the ESC and the throttle stick is not in the low throttle or off position, the motor will not start until the throttle stick is moved to the low throttle or off position. Once the throttle stick is moved to the low throttle or off position, the motor will emit a series of beeps. Several beeps with the same tune means the ESC has detected the cells of the battery. The count of the beeps equals the cells of the battery. The motor is now armed and will start when the throttle is moved.
2. The motor and ESC come pre-connected and the motor rotation should be correct. If for any reason the motor is rotating in the wrong direction, simply reverse two of the three motor wires to change the direction of rotation.
3. Battery Selection and Installation. We recommend the 14.8V2200mAh-3200mAh 25C Li-Po battery. If using another battery, the battery must be at least a 14.8V2200mAh-3200mAh 25C battery. Your battery should be approximately the same capacity, dimension and weight as the 14.8V2200mAh-3200mAh 25c Li-Po battery to fit the fuselage without changing the center of gravity significantly.

## Receiver diagram

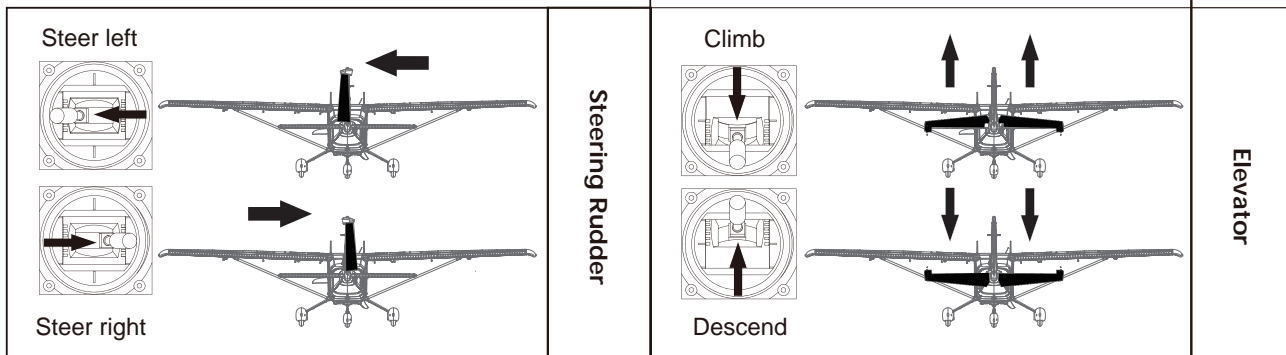
The cables from the servo connector board should be connected to your receiver in the order shown. Note that the LEDs can be powered by any spare channel on the receiver. Tuck the wire leads into the recessed cavity towards the rear of the battery hatch.

		Receiver
Gear	1	Channel-1 — Aile
Elevator	2	Channel-2 — Elev
Throttle	3	Channel-3 — Thro
Rudder	4	Channel-4 — Rudd
Gear	5	Channel-5 — Gear
Spare	6	Channel-6 — Spare

# Get your model ready to fly

## Transmitter and model setup

Before getting started, bind your receiver with your transmitter. Please refer to your transmitter manual for proper operation.  
**CAUTION:** To prevent personal injury, DO NOT install the propeller assembly onto the motor shaft while testing the control surfaces. DO NOT arm the ESC and do not turn on the transmitter until the Transmitter Manual instructs you to do so.  
 Tips: Make sure all control sticks on your radio are in the neutral position (rudder, elevator, ailerons) and the throttle is in the OFF position. Make sure both ailerons move up and down (travel) the same amount. This model tracks well when the left and right ailerons travel the same amount in response to the control stick. Move the controls on the transmitter to make sure the aircraft control surface moves correctly. See diagrams right.



## Control throws

The suggested control throw setting for this airplane are as follows (dual rate setting):

Tips: On the first flight, fly the model in low rate. The first time you use high rates, be sure to fly at low to medium speeds. High rate, as listed, is only for EXTREME maneuvering.

	High Rate	Low Rate
Elevator	24mm up / down	20mm up / down
Aileron	18mm up / down	16mm up / down
Rudder	24mm left / right	20mm left / right
Flaps	45mm up / down	40mm up / down

## Control horn and servo arm settings

The table shows the factory settings for the control horns and servo arms. Fly the aircraft at the factory settings before making changes. After flying, you may choose to adjust the linkage positions for the desired control response.

**Note:** Do not increase the flap angle or the flap travel of the remote control to prevent the servo from being blocked and burned.

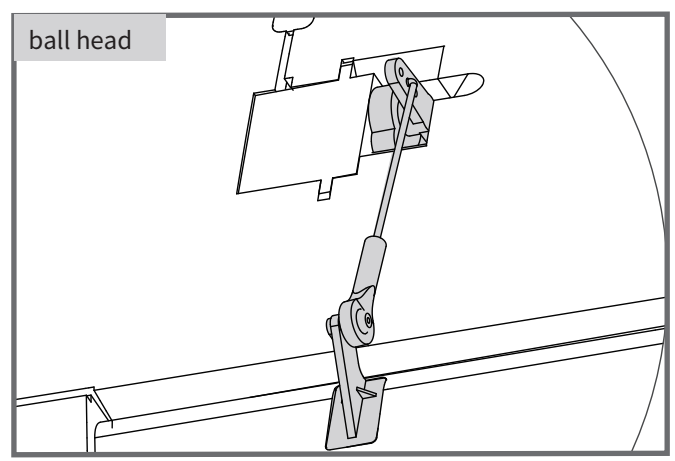
	Horns	Arms
Elevator		
Rudder		
Ailerons		
Flaps		

More control throw
Less control throw

## Linkage rods installation

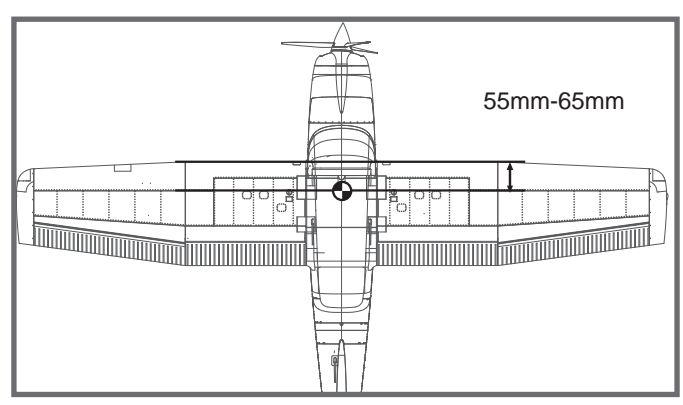
Before installing the main wing, horizontal tail and vertical tail, the linkage rods for ailerons, flaps, elevators and rudder should be installed in advance. Make sure the servos are in neutral position. Attach the “Z” bend end of aileron, flap, elevator and rudder linkage rods to the corresponding holes in the aileron, flap, elevator and rudder control arms from the outside as shown (Please refer to the control horn and servo arm settings and clevis installation sections in manual ). And then install the ball buckle at the other end of the linkage rods to ball head at each control horn on control surfaces.



## Check the C.G. (Center of gravity)

When balancing your model, adjust the battery as necessary so the model is level or slightly nose down. This is the correct balance point for your model. After the first flight, the CG position can be adjusted for your personal preference.

1. The recommended Center of Gravity (CG) location for your model is (55-65mm) from the leading edge of the main wing (as shown) with the battery pack installed. Mark the location of the CG on top of the wing.
2. When balancing your model, support the plane at the marks made on the bottom of the main wing with your fingers or a commercially available balancing stand. This is the correct balance point for your model. Make sure the model is assembled and ready for flight before balancing.



## Before flying the model

### Find a suitable flying site

Find a flying site clear of buildings, trees, power lines and other obstructions. Until you know how much area will be required and have mastered flying your plane in confined spaces, choose a site which is at least the size of two to three football fields - a flying field specifically for R/C planes is best. Never fly near people - especially children, who can wander unpredictably

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### Perform the range check for your plane

As a precaution, an operational ground range test should be performed before the first flight each time you go out. Performing a range test is a good way to detect problems that could cause loss of control such as low batteries, defective or damaged radio components, or radio interference. This usually requires an assistant and should be done at the actual flying site you will be using.

First turn on the transmitter, then install a fully-charged battery into the fuselage. Connect the battery and install the hatch. Remember, use care not to bump the throttle stick. Otherwise, the propeller/fan will turn and possibly cause damage or injury

Note: Please refer to your Transmitter Manual that came with your radio control system to perform a ground range check. If the controls are not working correctly or if anything seems wrong, do not fly the model until you correct the problem. Make certain all the servo wires are securely connected to the receiver and the transmitter batteries have a good connection.

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### Monitor your flight time

Monitor and limit your flight time using a timer (such as on a wristwatch or in your transmitter if available). When the batteries are getting low you will usually notice a performance drop before the ESC cuts off motor power, so when the plane starts flying slower you should land. Often (but not always) power can be briefly restored after the motor cuts off by holding the throttle stick all the way down for a few seconds.

To avoid an unexpected dead-stick landing on your first flight, set your timer to a conservative 4 minutes. When your alarm sounds you should land right away.

## Flying course

### Take off

While applying power, slowly steer to keep the model straight. The model should accelerate quickly.

As the model gains flight speed you will want to climb at a steady and even rate. It will climb out at a nice angle of attack (AOA).

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### Flying

Always choose a wide-open space for flying your plane. It is ideal for you to fly at a sanctioned flying field. If you are not flying at an approved site always avoid flying near houses, trees, wires and buildings. You should also be careful to avoid flying in areas where there are many people, such as busy parks, schoolyards, or soccer fields. Consult laws and ordinances before choosing a location to fly your aircraft. After takeoff, gain some altitude. Climb to a safe height before trying technical manoeuvres, including high speed passes, inverted flight, loops, and point rolls.

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### Maintenance

Repairs to the foam should be made with foam safe adhesives such as hot glue, foam safe CA, and 5min epoxy. When parts are not repairable, see the Spare Parts List for ordering by item number.

Always check to make sure all screws on the aircraft are tightened. Pay special attention to make sure the spinner is firmly in place before every flight.



## Flying course

### Landing

Land the model when you hear the motor pulsing (LVC) or if you notice a reduction in power. If using a transmitter with a timer, set the timer so you have enough flight time to make several landing approaches.

The model's three point landing gear allows the model to land on hard surfaces. Align model directly into the wind and fly down to the ground. Fly the airplane down to the ground using 1/4-1/3 throttle to keep enough energy for proper flare. Before the model touches down, always fully decrease the throttle to avoid damaging the propeller or other components. The key to a great landing is to manage the power and elevator all the way to the ground and set down lightly on the main landing gear. After a few flights you will find the model can be set down lightly on the mains and you can hold the nose wheel off balancing the model on the mains until it slows and gently settles the nose.

## Trouble shooting

Problem	Possible Cause	Solution
Aircraft will not respond to the throttle but responds to other controls.	-ESC is not armed. -Throttle channel is reversed.	-Lower throttle stick and throttle trim to lowest settings. -Reverse throttle channel on transmitter.
Extra propeller noise or extra vibration.	-Damaged spinner, propeller, motor or motor mount. -Loose propeller and spinner parts. -Propeller installed backwards.	-Replace damaged parts. -Tighten parts for propeller adapter, propeller and spinner. -Remove and install propeller correctly.
Reduced flight time or aircraft underpowered.	-Flight battery charge is low. -propeller installed backward. -Flight battery damaged.	-Completely recharge flight battery. -Replace flight battery and follow flight battery instructions.
Control surface does not move, or is slow to respond to control inputs.	-Control surface, control horn, linkage or servo damage. -Wire damaged or connections loose.	-Replace or repair damaged parts and adjust controls. -Do a check of connections for loose wiring.
Controls reversed.	Channels are reversed in the transmitter.	Do the control direction test and adjust controls for aircraft and transmitter.
-Motor loses power -Motor power pulses then motor loses power.	-Damage to motor, or battery. -Loss of power to aircraft. -ESC uses default soft Low Voltage Cutoff (LVC).	-Do a check of batteries, transmitter, receiver, ESC, motor and wiring for damage (replace as needed). -Land aircraft immediately and recharge flight battery.
LED on receiver flashes slowly.	Power loss to receiver.	-Check connection from ESC to receiver. -Check servos for damage. -Check linkages for binding.

## Spare parts list content

FMSET101BU	Fuselage	FMSPROP078	11x6 (3-blade) propeller
FMSET102BU	Main Wing Set	FMSDJX015	Motor Mount
FMSET103BU	Vertical Stabilizer	FMSBMX011	Motor Board
FMSET104BU	Horizontal Stabilizer	FMSDZX022	3541 motor shaft
FMSET105BU	Cowl	PRKVX840	3541 KV840 motor
FMSET106	Spinner	PRESC001	"40A ESC (With 200mm length input cable)"
FMSET107	LED set	FMSSE003	9g digital gear servo positive
FMSET108	Main Landing Gear Set	FMSPIlot020	Pilot
FMSET109	Linkage Rods	FMSCON021	Multi-connector set
FMSET110	Supporting Struts	FMSET101RD	Fuselage
FMSET111	Screws Set	FMSET102RD	Main Wing Set
FMSET112BU	Decal sheet	FMSET103RD	Vertical Stabilizer
FMSET113	Pipe	FMSET104RD	Horizontal Stabilizer
FMSET114	Front Landing Gear	FMSET105RD	Cowl
FMSET115BU	Lamp Cover	FMSET112RD	Decal sheet
FMSET116BU	Cockpit	FMSET115RD	Lamp Cover
FMSET117	Antenna	FMSET116RD	Cockpit
FMSFLT011	Float Set		

**Visit our website: [www.fmshobby.com](http://www.fmshobby.com) to see photo of this product. Enter the key word "ESC" in the search bar for the stock ESC instruction manual.**

# Brushless ESC Introduction

## Important warnings

- ZTW is not responsible for your use of this product, or any damage or injuries you may cause or sustain as a result of its usage.
- Always place safety as priority when you use the product.
- An electric motor that is connected in combination with a battery and/or ESC may start unexpectedly and cause serious damage and so should always be used with care and respect.
- We recommend you always remove the propeller when working on a model with the power source connected.
- Follow and observe all local laws and by-laws relating to model flying when flying RC planes.
- Never fly over others or near crowds.

## Key features

1. Utilizes powerful next generation MOSFET with a low thermal signature, high peak current threshold and reliability.
2. Features high performance 32bit microprocessor as standard. Stronger computing ability and faster processing rates.
3. Super smooth start up and throttle throughout the power range.
4. Higher driving efficiency and more energy-saving.
5. Adjustable SBEC output voltage, 5V/6V. (40A/50A/60A/80A/100A have SBEC adjustable)
6. Multiple protection protocols: start-up, over-heat, low-voltage cutoff, signal loss, phase loss etc.
7. Supports wide range of high RPM type motors commonly found in today's market.
8. Fully programmable via optional ZTW mobile app or ZTW LCD programming card.

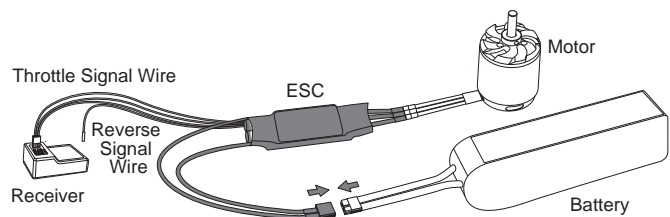
## Specification

Type	PN#Model	Cont./Burst Current(A)	Battery cell NiXX\Lipo	Weight (g)	BEC Output	Size(mm) L*W*H	User Program
Beatles 20A SBEC G2	3020211	20A/30A	5-12NC/2-4Lipo	25	5.5V/4A	60*25*10	Yes
Beatles 30A SBEC G2	3030211	30A/40A	5-12NC/2-4Lipo	25	5.5V/4A	60*25*10	Yes
Beatles 40A SBEC G2	3040211	40A/55A	5-12NC/2-4Lipo	37	5V/6V 4A	68*25*10	Yes
Beatles 50A SBEC G2	3050211	50A/65A	5-12NC/2-4Lipo	37	5V/6V 4A	68*25*10	Yes
Beatles 60A SBEC G2	3060211	60A/80A	5-18NC/2-6Lipo	50	5V/6V 8A	70*34*10	Yes
Beatles 80A SBEC G2	3080211	80A/100A	5-18NC/2-6Lipo	75	5V/6V 8A	90*37*10	Yes
Beatles 100A SBEC G2	30100211	100A/120A	5-18NC/2-6Lipo	80	5V/6V 8A	90*37*10	Yes

### Wires Connection:

The speed controller can be connected to the motor by soldering directly or with high quality connectors. Always use new connectors, which should be soldered carefully to the cables and insulated with heat shrink tube. The maximum length of the battery pack wires shall be within 6 inches.

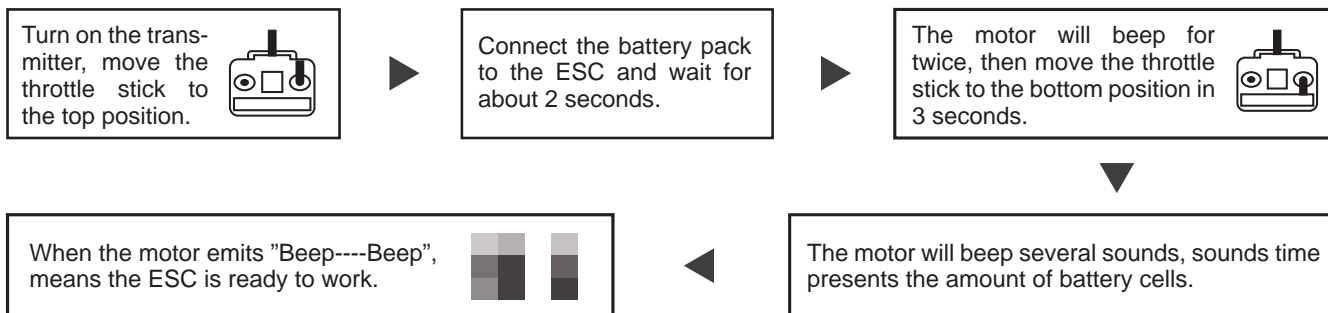
- Solder controller to the motor wires.
- Solder appropriate connectors to the battery wires.
- Insulate all solder connectors with heat shrink tubes.
- Plug the "JR" connector into the receiver throttle channel.
- Controller Red and Black wires connects to battery pack Red and Black wires respectively.



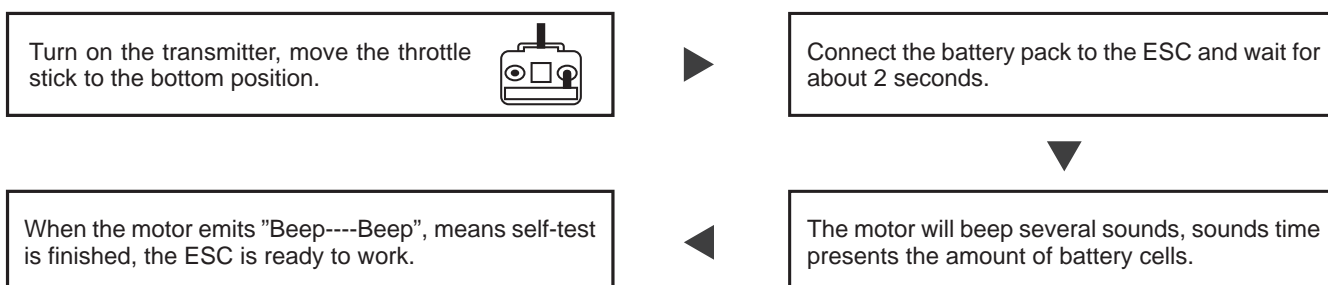
## Brushless ESC Introduction

### Throttle calibration

(Important: Please make the throttle calibration for the first time using ESC!!!)



### Normal startup procedure



### Programming items(the option written in bold font is the default setting)

#### 1. SMR Function: **OFF**/ON

This function supports switching the motor rotation to decelerate when the airplane landing to the ground. The factory default is OFF, the 1Pin signal wire is completely invalid at this time. If you need to turn it on, using Phone App or transmitter to program it "ON", plug the 3Pin signal wire into the throttle channel, and plug the 1Pin signal wire into any 2-stage switch channel of the receiver, then turn on the transmitter 2-stage switch. The SMR function is turned on now, you can change the forward and reverse directions of the motor by flipping the 2-stage switch of the transmitter.

**Warning:** This function can only be effective when the throttle is below 50%, and it is only allowed to be used when the airplane is landing on the ground, otherwise it may cause the ESC to burn!

#### 2. Brake Type: OFF/Soft/Mid/Hard

#### 3. Timing: Auto/Low/Mid/High(5°/15°/25°)

#### 4. Motor Rotation: CW/CCW

#### 5. SR function: ON/OFF

The synchronous rectification function makes ESC with higher driving efficiency and more energy-saving.

#### 6. Battery cells: Auto/2S/3S/4S/5S/6S

#### 7. Low Voltage Cutoff Threshold: OFF/NIMH50%/NIMH60%/3.0V/3.2V/3.4V/3.6V

For example: using 3 lithium batteries and setting 3.0V as the low voltage cutoff value, then the low voltage protection threshold is:  $3 \times 3.0 = 9.0V$

#### 8. Low Voltage Cutoff Type: Reduce Power/Cut Off Power

Reduced power: When the voltage drops to the set low-voltage protection threshold, the ESC will reduce power to 70%.

## Brushless ESC Introduction

Cut Off power: When the voltage drops to the set low-voltage protection threshold, the ESC will cut off the power immediately. 9.40A\50A\60A\80A\100A ESCs have adjustable SBEC 5V/6V, the default set is 5.0V.

10.Acceleration: Normal/Soft

### Entering the programming mode

1. Turn on the transmitter, move the throttle stick to the top position.
2. Connect the battery pack to ESC.
3. Wait for 2 seconds, the motor will emit special tone like "beep-beep beep"
4. Wait for another 3 seconds, the motor will emit special tone like "123", which means program mode entered.

### Programmable items

After entering program mode, you will hear 11 tones in a loop with the following sequence.

Tones	Programmable items	
1). "beep"	SMR Function	(1 short tone)
2). "beep.beep"	Brake Type	(2 short tone)
3). "beep.beep.beep"	Motor Timing	(3 short tone)
4). "beep.beep.beep.beep"	Motor Rotation	(4 short tone)
5). "beep- -"	SR Function	(1 long tone)
6). "beep- -.beep"	Battery cells	(1 long 1short)
7). "beep- -.beep.beep"	Low Voltage Cutoff Threshold	(1 long 2 short)
8). "beep- -.beep.beep.beep"	Low Voltage Cutoff Type	(1 long 3 short)
9). "beep- -.beep.beep.beep.beep"	BEC Voltage	(1 long 4 short)
10). "beep- -beep- -"	Acceleration	(2 long tone)
11). "beep- -beep- -.beep"	Restore Factory Setup Defaults	(2 long 1 short)

Note: 1 long "beep- -" = 5 short "beep"

### Set item value

Moving the throttle stick to the bottom position within 2 seconds after one kind of following tones, this item will be selected. After the programmable item selected, then you will hear several tones in loop as follows on each programmable item, set the value matching to a tone by moving throttle stick to top position when you hear the tone, then the motor will emit special tone like "123", means this value is set and saved.

For example: If you want to set the motor rotation, when you hear four short tones of "Beep", moving the throttle stick to the bottom position within 2 seconds, means you enter the motor rotation menu. One short tone of "Beep" is forward direction(CW), two short tones of "Beep" is reverse direction(CCW). If you want to set to reverse direction(CCW), moving the throttle stick to the top position when you hear the two short tones of "Beep", then you will hear a special confirmation tone like "123", which means the "CCW" is set and saved.

Keeping the throttle stick at top, you will go back to programming mode and you can select other items; or moving the stick to bottom within 2 seconds will exit program mode directly).

## Brushless ESC Introduction

### Programming tone reference table

Items \ Tones	"beep"	"beep.beep"	"beep.beep .beep"	"beep.beep .beep.beep"	"beep- -"	"beep- - beep"	"beep- - beep.beep"
	1 short tone	2 short tone	3 short tone	4 short tone	1 long	1 long 1 short	1 long 2 short
SMR Function	<b>*OFF</b>	ON					
Brake Type	<b>*OFF</b>	Soft Brake	Mid Brake	Mid Brake			
Motor Timing	<b>*Auto</b>	Low	Mid	Mid			
Motor Rotation	<b>*CW</b>	CCW					
SR Function	ON	<b>*OFF</b>					
Battery Cells	<b>*Auto</b>	2S	3S	4S	5S	6S	
Low voltage Cutoff Threshold	OFF	NIMH50%	NIMH60%	<b>*3.0V</b>	3.2V	3.4V	3.6V
Low Voltage Cutoff Type	<b>*Reduce Power</b>	Cut off Power					
SMR Function	<b>*5V</b>	6V					
Brake Type	<b>*Normal</b>	Soft					
Restore Factory Default Sets	Restore						

**Note: " \* " value means default settings.**

### Protection function

1. Start-up protection: If the motor fails to start normally within 2 seconds after pushing the throttle to start, the ESC will cut off the output power, and you need to make the throttle calibration again, then ESC can be restarted. Possible reasons: disconnection or poor connection between ESC and motor, the propeller or motor is blocked by other objects, the gearbox is damaged, etc.)
2. Over-heat protection: When the temperature of the ESC is over about 110℃, the ESC will automatically reduce the output power for protection, but will not fully shut down the power, reduce it to 70% of the full power at most to ensure the motor has enough power to avoid crashes.
3. Throttle signal loss protection: The ESC will reduce the output power if throttle signal is lost for 1 second, will cut off output to the motor if the throttle signal is lost over 2 seconds. If the throttle signal recovers during power down, the ESC will immediately resume throttle control. In this way, the ESC will not protect when the signal loss less than 2 seconds, only when the signal lost is over 2 seconds or longer time. And the ESC will reduce the output power gradually instead of cutting off it immediately, so the player has certain amount of time to save the plane, taking into account safety and practicality.
4. Over load protection: The ESC will cut off power or restart automatically when the load increased a lot suddenly, possible reason is the motor blocked.

## Brushless ESC Introduction

### Trouble shooting

Trouble	Possible Reason	Action
After powering up, ESC emits the sound of battery cells, but motor can't run.	ESC doesn't set throttle range.	Set throttle range again.
After powering up, motor doesn't run and doesn't emit any sound.	<ol style="list-style-type: none"> <li>1.Bad connection between ESC and battery.</li> <li>2.Bad soldering cause bad contact.</li> <li>3.Low voltage of the battery.</li> <li>4.Quality problem of ESC.</li> </ol>	<ol style="list-style-type: none"> <li>1.Clean the connectors or replace them, check the connection polarity.</li> <li>2.Solder the wires again.</li> <li>3.Check battery pack, use full-charged battery.</li> <li>4.Change ESC.</li> </ol>
Motor does n't work and no audible tone emitted after connecting the battery. Servos are not working either.	<ol style="list-style-type: none"> <li>1. Poor/loose Connection between battery Pack and ESC.</li> <li>2. No power.</li> <li>3. Poor soldered connections.</li> <li>4. Wrong battery cable polarity.</li> <li>5. ESC throttle cable connected to receiver in the reverse polarity.</li> </ol>	Check all the connections make sure you are doing it right.
Motor does not work but servos do.	<ol style="list-style-type: none"> <li>1.Poor/loose connection between ESC and motor.</li> <li>2. Burnt motor coils.</li> <li>3. The battery pack voltage exceeds the acceptable range.</li> <li>4. Throttle stick is not at the lowest position.</li> <li>5. The ESC throttle calibration has not set up.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check all the connections make sure you are doing it right.</li> <li>2. Change a new motor.</li> <li>3. Solder the wires again.</li> <li>4. Check the battery pack, use full-charged battery.</li> <li>5. Set throttle range again.</li> </ol>
When the ESC is powered on, the motor does not work and an alarm sound (continuously beeping) will sound.	The throttle stick is not in the bottom position after power on.	Move the throttle stick to the bottom position.
Motor runs in reverse rotation.	Wrong cables polarity between the ESC and the motor.	Swap any two of the three cable connections between the ESC and the Motor or access the Motor Rotation function via the ESC programming mode and change the pre-set parameters.
Motor stops running in flight.	Lost throttle signal.	<p>Check proper operation of the radio equipment.</p> <p>Check the placement of the ESC and the Receiver and check the route of the receiver's aerial and ESC.</p>



## Warnhinweise



**WARNUNG:** Lesen Sie die GESAMTE Bedienungsanleitung, um sich vor der Inbetriebnahme mit den Funktionen des Produkts vertraut zu machen.

Wenn das Produkt nicht ordnungsgemäß bedient wird, kann dies zu Schäden am Produkt oder persönlichem Eigentum führen und schwere Verletzungen verursachen. Dieses Produkt ist kein Spielzeug! Es muss mit Vorsicht und gesundem Menschenverstand betrieben werden. Andernfalls kann es zu Verletzungen oder Schäden am Produkt oder anderen Sachwerten führen. Dieses Produkt ist nicht für den Betrieb durch Kinder ohne direkte Aufsicht von Erwachsenen vorgesehen.

Diese Anleitung enthält Hinweise zu Sicherheit und Wartung. Es ist wichtig, dass vor der Verwendung alle Anweisungen und Warnungen in der Anleitung gelesen und befolgt werden, um Schäden oder schwere Verletzungen zu vermeiden.

## Sicherheitsvorkehrungen

Als Benutzer dieses Produkts sind Sie allein dafür verantwortlich dieses Produkt so zu betreiben, dass weder Sie selbst noch andere gefährdet oder Schäden am Produkt oder Eigentum anderer verursacht werden.

Dieses Modell wird von einem Funksignal gesteuert, das von vielen Quellen außerhalb Ihrer Kontrolle gestört werden kann. Solche Störungen können zu einem vorübergehenden Kontrollverlust führen. Daher sollte immer einen Sicherheitsabstand zu Personen und Gebäuden eingehalten werden.

Altersempfehlung: Nicht für Kinder unter 14 Jahren. Dies ist kein Spielzeug.

- Betreiben Sie Ihr Modell niemals mit leeren Senderbatterien.
- Betreiben Sie Ihr Modell immer in einem offenen Bereich, abseits von Gebäuden, Verkehr oder Personen.
- Befolgen Sie die gesetzlichen Regelungen Ihres Landes zum Betrieb von ferngesteuerten Modellflugzeugen.
- Befolgen Sie sorgfältig die Anweisungen und Warnungen für dieses und alle unterstützenden Geräte, die Sie verwenden (Ladegeräte, wiederaufladbare Akkus usw.).
- Bewahren Sie alle Chemikalien, Kleinteile und elektrischen Geräte außerhalb der Reichweite von Kindern auf.
- Feuchtigkeit verursacht Schäden an der Elektronik. Vermeiden Sie, dass die Produkte Wasser ausgesetzt werden, die nicht speziell für diesen Zweck entworfen und geschützt sind.
- Nehmen Sie Teile des Produkts niemals in den Mund, da dies zu schweren Verletzungen oder sogar zum Tod führen kann.

## Hinweise zu LiPo-Akkus

**VORSICHT:** Befolgen Sie immer die Anweisungen des Herstellers zur sicheren Verwendung und Entsorgung von Batterien. Durch falsche Handhabung von Li-Po-Batterien können Feuer, Sachschäden oder schwere Verletzungen verursacht werden.

- Seien Sie sich über alle Risiken klar, die mit dem Umgang von Lithium Polymer (LiPo) Akkus verbunden sind. Wenn die Akkus zu irgendeinem Zeitpunkt anschwellen oder aufblähen, verwenden Sie diese auf keinen Fall mehr!
- Um die Lebensdauer des Akkus zu verlängern sollten dieser bei Zimmertemperatur in einem trockenen Bereich gelagert werden. Bewahren Sie den Akku oder das Modell nicht in einem Auto oder in direktem Sonnenlicht auf. Wenn der Akku über einen längeren Zeitraum zu hohen Temperaturen ausgesetzt wird kann dieser beschädigt werden oder sogar Feuer fangen.
- Verwenden Sie niemals ein NiMh-Ladegerät, um Li-Po-Akkus aufzuladen. Wenn der Akku nicht mit einem Li-Po-kompatiblen Ladegerät geladen wird, kann dies zu einem Brand führen, der zu Personen- und Sachschäden führen kann.
- Niemals Li-Po Zellen unter 3V entladen.
- Lassen Sie Akkus beim Laden niemals unbeaufsichtigt.
- Laden Sie niemals beschädigte Akkus auf.
- Aufladen des LiPo-Akkus: Verwenden Sie ein Ladegerät, das die Li-Po-Batterie sicher aufladen kann. Lesen Sie vor dem Gebrauch die Anweisungen des Ladegeräts sorgfältig durch. Achten Sie beim Laden des Akkus darauf, dass sich der Akku auf einer hitzebeständigen Oberfläche befindet. Es wird auch dringend empfohlen, den Li-Po Akku in einem feuerbeständigen LiPo-Koffer zu laden. LiPo Koffer finden Sie bei Ihrem Fachhändler oder im Internet.

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