User Manual
(Boat Brushless ESC)

Thank you for purchasing our brushless electronic speed controller (ESC). Any improper operation may cause personal injury and equipment damage. This high power system for RC model can be dangerous, we strongly suggest you read the instruction carefully and completely. We will not assume any responsibility for personal injury, property damage, or any consequential damages resulting from our product.

01 Main features
- Use powerful & high performance MCU. Users can set functions as their demand, fully embody intelligent characteristics. Unique circuit design, strong anti-interference.
- Waterproof design (Note: if there is water in the ESC, Please dry the water at the connectors).
- Start mode can be set, throttle response fast, and it has a very smooth speed control linearity. Compatible with scale boat & racing boat.
- Multi-protection functions: input voltage abnormal protection/low voltage cutoff protection, over-thermal protection and throttle signal loss protection, make the ESC more reliable.
- High power safety performance: wherever the throttle lever is, the motor will not start immediately.
- Over-thermal protection: when ESC temperature is over 100°C, output power will automatically reduce. When it’s lower than 80°C output power will return to normal.
- Cycle menu setting, simple operation. Support setting with program box and transmitter.

02 Specification

<table>
<thead>
<tr>
<th>Model</th>
<th>A-SW050006</th>
<th>A-SW070006</th>
<th>A-SW090006</th>
<th>A-SW120006</th>
<th>A-SW150006</th>
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</thead>
<tbody>
<tr>
<td>Cont. Current</td>
<td>50A</td>
<td>70A</td>
<td>90A</td>
<td>120A</td>
<td>150A</td>
</tr>
<tr>
<td>Burst Current</td>
<td>300A</td>
<td>420A</td>
<td>540A</td>
<td>720A</td>
<td>900A</td>
</tr>
<tr>
<td>LiPo Cella</td>
<td>2-6S</td>
<td>2-6S</td>
<td>2-6S</td>
<td>2-6S</td>
<td>2-6S</td>
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<tr>
<td>BEC Output</td>
<td>5.5V/5A</td>
<td>5.5V/5A</td>
<td>5.5V/5A</td>
<td>5.5V/5A</td>
<td>5.5V/5A</td>
</tr>
<tr>
<td>Weight</td>
<td>90g</td>
<td>110g</td>
<td>120g</td>
<td>155g</td>
<td>163g</td>
</tr>
<tr>
<td>(baffle water)</td>
<td>57<em>49</em>18mm</td>
<td>57<em>49</em>18mm</td>
<td>57<em>49</em>18mm</td>
<td>76<em>58</em>25mm</td>
<td>76<em>58</em>25mm</td>
</tr>
<tr>
<td>Boat length</td>
<td>50cm</td>
<td>75cm</td>
<td>100cm</td>
<td>120cm</td>
<td>135cm</td>
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</table>

Note: We strongly advise the use of battery connections that do not allow reverse polarity, or ESC will be damaged.

03 Wiring Diagrams

*Please ensure all solder joints are insulated with heat shrink where necessary.

04 Operation Instruction

1. Set throttle range
   Adhere set throttle range when first time to use Flycolor ESC. The feature of Flycolor ESC is that set the best throttle range according to different transmitter, then ESC can get the most smoothly linear through throttle range of transmitter. To make ESC get and memorize throttle output signal. The process only do once, you need do this process again after changing transmitter.

   Operation procedure with Pistol Transmitter:
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER”, move trigger to neutral position in 5 seconds, the full throttle position is memorized.
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER” twice, move trigger to neutral position in 5 seconds, the full throttle position is memorized.

   Operation procedure with Stick Transmitter:
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER” twice, move stick to neutral position in 5 seconds, the full throttle position is memorized.
   - Wait for 1 second, motor emits short “BEER” few times, sound times is Lipo battery cells. Then waits for 1 second, motor emits 1 long “BEER” and 1 short “BEER”, the zero throttle position is memorized.

2. Normal working mode

   Operation procedure with Pistol Transmitter:
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER”, move trigger to neutral position in 5 seconds, the full throttle position is memorized.
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER” twice, move trigger to neutral position in 5 seconds, the full throttle position is memorized.
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER” twice, move stick to neutral position in 5 seconds, the full throttle position is memorized.

   Operation procedure with Stick Transmitter:
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER” twice, move stick to neutral position in 5 seconds, the full throttle position is memorized.
   - Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER” twice, move stick to neutral position in 5 seconds, the full throttle position is memorized.

05 Programming

1. Programming with transmitter
   1. 1 Turn on transmitter, move throttle to the full forward position.
   1. 2. Connect ESC with battery, wait for 2 seconds, motor emits short “BEER-BEER” twice, move trigger to neutral position in 5 seconds, the full throttle position is memorized.
   1. 3. Wait for 5 seconds, motor emits special tone “12321”, it has entered programming mode.
   2. Select setting options:
      After entering programming mode, you will hear 5 groups tone which emits in a loop as following sequence. After motor emits a group of tone, move the throttle to the neutral (pistol transmitter) / the full down throttle position (the stick transmitter). It enters this option.
      2.1 Running Mode
         2.2 Motor direction adj.
         2.3 Low-voltage protection
         2.4 Start Mode (Punch)
         2.5 Timing
      3. Select parameter:
      3.1 Enter some one setting option, motor will emit tone in a loop, move the throttle to the forward full position after a certain tone, so the parameter of this option has selected, then motor emits special tone “1212”, this parameter has stored (if don't select other options, move throttle to the nature position in 3 seconds, then motor emits special tone “76765765”, exit the program mode. If go on selecting other options, please return to procedure 2, and select other options).
      3.2 Setting parts are factory default value.

   Note: Usually 1 long tone “beep-beep-beep” equals to 5 short tone “beep”, for example 1 long tone “beep-beep-beep” and 1 short tone “beep” to 6beep.

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Motor direction adj.</td>
<td>CW</td>
<td>CW</td>
<td>CW</td>
<td>CW</td>
<td>CW</td>
<td>CW</td>
<td>CW</td>
<td>CW</td>
<td>CW</td>
</tr>
<tr>
<td>Low voltage protection</td>
<td>2.5V</td>
<td>2.8V</td>
<td>3.0V</td>
<td>3.2V</td>
<td>3.4V</td>
<td>3.6V</td>
<td>3.8V</td>
<td>4.0V</td>
<td>4.2V</td>
</tr>
<tr>
<td>Start Mode (Punch)</td>
<td>Level 1</td>
<td>Level 2</td>
<td>Level 3</td>
<td>Level 4</td>
<td>Level 5</td>
<td>Level 6</td>
<td>Level 7</td>
<td>Level 8</td>
<td>Level 9</td>
</tr>
<tr>
<td>Timing</td>
<td>0°</td>
<td>3.75°</td>
<td>7.5°</td>
<td>11.25°</td>
<td>15°</td>
<td>18.75°</td>
<td>22.5°</td>
<td>26.25°</td>
<td>30°</td>
</tr>
</tbody>
</table>
1. **Running Mode**
   - (1) **Forward Only** (Unidirectional)
     - This mode is mainly used for special application, such as competition.
   - (2) **Forward & Reverse** (Bidirectional)
     - When pushing the throttle into reverse, the RC boat will run in reverse after the motor stops running. This mode is mainly used for most of the application, such as training etc.

2. **Motor direction adjustment**
   - (1) **CW**
   - (2) **CCW**
     - Motor direction adjustment, convenient users change motor rotation without changing motor wire.

3. **Low voltage protection**
   - (1) **Protection**
     - 2.6V, 3.2V, 3.6V, 4.0V, 5.2V, 6.3V
     - The low voltage protection is mainly for LiPO battery; For NiMH, we advise you select non-protection.

4. **Start Mode (Punch)**
   - (1) **Level 1**
   - (2) **Level 2**
   - (3) **Level 3**
   - (4) **Level 4**
   - (5) **Level 5**
     - 5 levels linear throttle acceleration startup, the lever higher, the speed faster.

5. **Timing**
   - (1) **0°**
   - (2) **3.75°**
   - (3) **7.5°**
   - (4) **11.25°**
   - (5) **15°**
   - (6) **18.75°**
   - (7) **22.5°**
   - (8) **26.25°**
     - 1°~3° / 15°~30° --set for most inner rotor motor.
     - High (22.5°~26.25°) --set for 6 poles and more than 6 poles outer rotor motor.
     - In most cases, 15° timing is suitable for all types motor. But to improve efficiency, we advise to set low timing for 2 poles motor (most inner rotor motors); set high timing for 6 poles or more than 6 poles motors (most outer rotor motors). For high speed motor, set high timing. Some motors need specific timing setting, if you’re not sure, please use timing degree recommended by motor manufacturer or set 15°.

6. **Protection Functions**
   - **Startup**
     - After connecting with battery, if throttle is not in the zero throttle position, motor will emit urgent short tone for 2 seconds, you can not start motor until detect the zero throttle position.
   - **Low voltage protection**
     - If battery input voltage is lower than low voltage protection threshold, ESC will reduce output power (equal to 50% throttle), keep 5 seconds and motor stops. Move throttle to the zero throttle position to restart motor. This process can work repeated.
   - **Over heat protection**
     - When ESC temperature is higher than 105°C, it will reduce output power (threshold will be limited below 50%) for protection, leave some power for motor to land, when temperature is lower than 80 degree Celsius, ESC recover to normal running mode.
   - **Signal losing protection**
     - When motor running, if ESC detect throttle signal losing, ESC will cut off output to avoid damage caused by rotating propeller. Output power will return normal if throttle signal recover.

7. **Trouble Shooting**
   - **Troubles**
   - **Possible causes**
   - **Solutions**
     - After powering up, motor doesn’t run and doesn’t emit any sound.
     - Bad connection between ESC and battery.
     - Clean the connectors or replace them, check the connection polarity.
     - Signal wire connects with wrong polarity of receiver.
     - Check signal wire and make sure the right polarity.
     - Bad soldering cause bad contact.
     - Solder the wires again.
     - The wrong polarity connection between each battery.
     - Check battery pack, connect the wire again.
     - Quality problem of ESC.
     - Change ESC.
     - 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, ESC works, but motor can’t run and doesn’t emit any sound.
     - Bad connection between ESC and motor, or bad soldering.
     - Change the connectors or replace the connectors or solder the motor wire again.
     - After powering up, ESC emits warning tone “BEEP-BEEP”, (a short stop after “BEEP-”)
     - Bad motor. Battery voltage is lower than low-voltage protection threshold and low-voltage protection mode is cutoff output.
     - Change ESC.
     - After powering up, motor doesn’t work and emits continuous warning tone “BEEP-” (a short stop after “BEEP-”).
     - No output throttle signal from receiver.
     - Check the voltage of battery pack and use full-charged battery to replace.
     - After powering up, motor doesn’t work and emits continuous warning tone “BEEP-” (a short stop after “BEEP-”).
     - Throttle doesn’t in the zero position.
     - Push the throttle to the zero position, or set throttle range again.
     - After powering up, motor doesn’t work and ESC emits 2 long “BEEP” and 2 short “BEEP”.
     - The positive and negative of throttle channel is wrong. So ESC enters programming mode.
     - The wrong sequence of connection wires between motor and ESC.
     - Refer to the user instruction of transmitter, adjust the setting of throttle channel.

8. **Safety Cautions**
   - Please don’t remove or modify any components on ESC, or it may cause permanent damage or data losing.
   - Please test ESC and motor, if not sure of the setting of receiver is correct or not, please don’t install propeller and driving gear.
   - Please don’t use broken, short-circuited and overheated battery pack.
   - Please don’t use substandard cables and cords and connectors.
   - Battery cells and servos number can’t be exceed ESC standard.
   - Please mind battery polarity, wrong polarity connection will damage ESC.
   - Please don’t put ESC in a moist and glare place.
   - Please don’t remove battery when motor is rotating, it will cause the huge peak current and ESC burning.
   - Please install ESC in the ventilated place, don’t wrap anything around the ESC.

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**09 Trouble Shooting**

**08 Safety Cautions**

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**07 Protection Functions**

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**06 Programmable Items**

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**05 Safety Precautions**

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**04 Exit programming**

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**03 Programming with program card**

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**02 Check the connectors of battery pack, battery Throttle doesn’t in the zero position.**

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**01 Troubles**

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**Troubles**

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**Possible causes**

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**Solutions**

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