



# 80-Amp Pro Switch-Mode BEC Brushless ESC Instructions

## Notice

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, Inc. For up-to-date product literature, visit <http://www.horizonhobby.com> and click on the support tab for this product.

## Meaning of Special Language

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

**NOTICE:** Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.

**CAUTION:** Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.

**WARNING:** Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.



**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 requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner 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. Do not attempt disassembly, use with incompatible components or augment product in any way without the approval of Horizon Hobby, Inc. 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 correctly and avoid damage or serious injury.

## Introduction

Thank you for purchasing the E-flite® 80-Amp Pro Switch-Mode BEC Brushless ESC. This is a lightweight, high-quality, efficient sensorless brushless electronic speed control with an integrated switch-mode BEC. It can operate without the need for a separate receiver battery to power your servos and receivers, saving you weight and complication. It is capable of up to 80 amps continuous current when using 3- to 6-series Li-Po battery packs. You can drive up to 7 analog or 6 digital standard-sized servos with the BEC on any recommended input voltage. This ESC also features safe power arming along with advanced programmable features such as low voltage cutoff, braking, timing, throttle input range, and more, making this truly a 'pro series' speed control.



**CAUTION:** Product may become hot when in use.

## Features

- Up to 80 amps continuous current with proper air flow and 100 amps burst current (15 seconds)
- 5V switch-mode BEC capable of 2.5 amps continuous current on any recommended input voltage
- Drive up to 7 analog or 6 digital standard-sized servos with the BEC on any recommended input voltage
- 3- to 6-cell Li-Po, 9- to 18-cell Ni-MH/Ni-Cd input voltage
- Programmable motor braking
- Safe power-arm mode prevents accidental starts
- Programmable low voltage cutoff with settings for 3-cell Li-Po (9.2V), 4-cell Li-Po (12V), 5-cell Li-Po (15V), 6-cell Li-Po (18V), or 74% of battery starting voltage
- Programmable throttle input range (1.1ms–1.9ms or 1.2ms–1.8ms)
- Programmable soft start-up rate - .25 second or 1 second
- Auto motor shut down if signal is lost or there is interference
- Programmable timing—5 user-selectable ranges—use with a large variety of brushless motors
- Two operating modes—Airplane or Heli
- Pre-wired connectors—E-flite EC5 on battery input and 4.0mm female gold bullets on motor output leads

## Specifications

Continuous Current:	80A*
Max Burst Current:	100A (15 sec)*
Length:	77mm (3.0 in)
Width:	41mm (1.60 in)
Height:	15.5mm (0.62 in)
Weight:	106 g (3.75 oz)
Cells:	3-6S Li-Po or 9-18 Ni-MH/Ni-Cd
Battery Input Leads:	10 AWG with E-flite EC5™ Connector
Motor Output Leads:	12 AWG with 4.0mm Female Gold Bullet Connectors

\* Proper cooling required

## Servo Ratings with BEC Enabled

Normal recommendation is the ESC drives up to 7 analog or 6 digital standard-sized servos with the BEC on any recommended input voltage.

Some servo combinations we have tested in various models include:

- 7 JR® MC35 (JSP20030) analog micro servos ,1 JR DS368 (JRPS368BB) digital micro servo, 3 EFL 15-25 size retracts —EFL Habu 32
- 6 JR 537 (JRPS537) analog standard servos—Hangar 9® Ultra Stick 40 ARF
- 5 JR DS811 (JRPS811)/JR DS821 (JRPS821) digital standard servos—Seagull Harrier 46 3D
- 4 JR DS811 (JRPS811)/JR DS821 (JRPS821) digital standard servos and 1 JR 791 (JRPS791) retract servo—Hangar 9 60-sized warbirds

- 5 JR DS811 (JRPS811)/JR DS821 (JRPS821) digital standard servos and 1 JR 791 (JRPS791) retract servo—Hangar 9 Spitfire 60
- 4 JR SPORT™ MN48 (JSP20040) analog mini servos— E-flite Diamante 25e ARF
- 4 JR DS3421 (JRPSDS3421) digital mini servos—E-flite Eratix 3D 25e ARF
- 7 JR MC35 (JSP20030) analog micro servos and 1 JR RT88 (JSP20080) retract servo—25-sized warbird

*Some other brands and models of servos may have significantly higher current draw. Digital servos and binding servos of any kind typically have higher current draw. As a general rule, micro and sub-micro servos draw less current which may affect your servo usage as shown in the examples above with different servo combinations and electric retracts. We recommend the use of a Hangar 9 Servo and Receiver Current Meter (HAN172), installed between the throttle lead of the ESC and receiver, to confirm current draw of the actual servos and electric retracts used. Also, always be sure to position the ESC for maximum airflow since cooling can significantly aid in the performance of the BEC. The ESC is rated for at least 2.5-Amp continuous current and 4-Amp short bursts.*

Before first use, please refer to “Servo Ratings with BEC Enabled” notes for BEC usage guidelines. You must follow these guidelines for safe operation. If you are using more than 7 analog standard servos, more than 6 digital standard servos, or servos with higher current draw than the BEC can deliver, you may need to disable the BEC. If you wish to disable the BEC, you must remove the red receiver wire lead and connector from the receiver lead housing, and then insulate it properly to prevent shorting. When operating with the BEC disabled, E-flite recommends the use of a separate, high-power, external BEC (like the Ultimate BEC), or receiver pack and switch using the following items to ensure trouble-free operation:

1. JR 1100mAh 4.8V Ni-MH receiver battery (JRPB4240), or similar
2. JR Switch Harness (JRPA003), or similar

## Please read these instructions in their entirety before use

Before you connect your ESC and begin flying, take a moment to look it over. The input power side has a black (negative) and red (positive) wire along with an E-flite EC5 Male Device Connector. The motor side has three 12-gauge wires (blue, red, and black) with 4.0mm female gold bullet connectors on the ends.

The black and red wires with the EC5 Device (DEV) Connector will connect to your power battery. The red wire connects to the red wire on your battery pack, the black wire connects to the black wire on your battery pack. If the wires are reversed, the ESC may be damaged. **YOU MUST ENSURE THAT YOU CONNECT THE BATTERY POLARITY PROPERLY TO PREVENT DAMAGE TO THE ESC.** Reversing polarity will void your warranty, so always double-check this connection. Use only a genuine E-flite EC5 Battery (BATT) connector on the battery so it matches the EC5 Device (DEV) connector on the speed control. The throttle lead connects to the throttle channel on your radio receiver.



**WARNING:** For your safety, when checking the startup function of the ESC or making programming changes, please remove the propeller to prevent any potential injury. You should always treat the motor and propeller as live and dangerous, remembering it could start at any time, and keep any body parts, clothing and tools clear of the propeller arc.



**WARNING:** NEVER LEAVE THE BATTERY CONNECTED WHEN NOT FLYING THE AIRCRAFT AND ALWAYS REMOVE THE BATTERY FROM THE MODEL BEFORE CHARGING AND WHEN FINISHED FLYING.

When flying in hot weather, we recommend checking on the condition of the ESC, battery, and motor after each flight. You may want to consider letting the electronic components cool to near ambient temperature between flights. We also recommend throttle management when running near maximum levels of current draw during extreme conditions. It is not recommended you fly an entire flight at full throttle. If this is done, it is possible to cause permanent damage to your motor, battery, and ESC.

### **Using the 80-Amp Pro Switch-mode BEC Brushless Controller**

This controller is very simple to use, and for safety, will not arm the motor until the throttle stick has been held in the Idle/Off position for more than 1 second. The controller will indicate the soft cutoff voltage setting every time you plug the battery in by first emitting a low, long tone, to indicate startup. Depending on the selected cutoff voltage (default is 74%), you will then hear the respective number of medium length mid tones to indicate the cell count or a musical tone for the 74% cutoff, helping you to confirm the setting before every flight. Proper air cooling is required during flights so the ESC should be placed in an area where air flows over the controller. **We recommend you change your cutoff voltage to match the cell count of your battery.**

### **Connecting the ESC to the Motor**

The three wires from your motor connect to the three female gold bullet connectors on the ESC. The order of connection to the motor is not important; you can plug any motor wire into any connector. When you test the system, the motor runs backwards, you can simply unplug and switch any two of the motor wire plugs connected to the ESC.

### **Mounting the ESC**

Choose a location that has good airflow and offers good protection. Do not cover the side with the flat heat shield with hook and loop or tape as this will greatly reduce its effectiveness. Mount the ESC with a combination of hook and loop, two-sided foam tape, and/or tie wraps.

### **Starting Your Power System**

1. Turn on your transmitter and ensure the position of the throttle stick is set to Idle/Off.
2. Plug the battery pack into the controller. You will hear 1 low long tone to indicate startup, then the respective number of medium-length mid tones to indicate the cell count or a musical tone for the 74% cutoff, followed by 3 rising tones to indicate the controller is armed.
3. When you move the throttle stick upward, the motor will run. If you continue to move the throttle stick upward to the full throttle (high position), the motor will run faster. If you lower the throttle stick below the start-up position, the motor will stop running.
4. Check servo motion as part of your preflight check. It is very important to make sure linkages are free-moving with no binding.

Remember, when in the programming mode:

**Full Throttle = Stick Up  
Idle = Stick Down**

The default settings (from the package) for your E-flite 80-Amp Pro ESC are as follows:

- Voltage cutoff set at 74%\*
- Brake set to Off
- Timing set at 15 degrees
- Throttle Input Range set at 1.2ms to 1.8ms
- Start-up Rate (Acceleration Delay) set at 0.25 seconds
- PWM Frequency set at 8KHz

- Operating Mode set to normal (airplane)
  - \* **Note: We recommend changing the cutoff voltage to match the cell count of your battery.**

### **Entering the Programming Mode**

1. With the battery disconnected from the controller, and the transmitter turned on, first move the throttle stick to full throttle (>1.7ms) position. Leave it in this position and then connect the battery to the controller.
2. Wait for 5 seconds, and the ESC will give two sets of fast ringing tones to indicate you have successfully entered the programming mode.
3. Once you hear these tones, move the stick to center (between 1.4 and 1.7ms) for 5 seconds, and the controller will beep 1 time, indicating you are now in Menu 1.
4. The controller will now wait 5 seconds for you to make your selection; your programming options are either full throttle (>1.7ms) or idle (<1.3ms).
5. When you have made a valid selection, the control will beep once with a lower tone, and you can move the stick back to center for the next menu item (2 beeps, 3 beeps and so on). If you do not make a selection within 5 seconds, the controller will move to the next menu item.
6. If you want to make changes in the programming menus (see specific instructions below) move the throttle stick to full throttle (>1.7ms) position. You will have 5 seconds to make your selection.
7. If you want to advance to the next menu, allow the programming to skip to the next menu after the 5 seconds have expired.

### **Programming Menu 1 – Voltage Cutoff**

Use this option to set the voltage at which the controller will shut down the motor to prevent damage to your battery when it reaches the cutoff voltage. You will know your battery pack has reached auto cutoff when you hear the motor “pulse” repeatedly. We recommend you change your cutoff voltage to match the cell count of your battery.

1. Move the throttle stick to full throttle (>1.7ms) position to make changes to the voltage cutoff programming.
  - a. To select 3-cell low voltage cutoff – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - b. To select 4-cell low voltage cutoff – You will hear 4 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - c. To select 5-cell low voltage cutoff – You will hear 5 shortbeeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - d. To select 6-cell low voltage cutoff – You will hear 6 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - e. To select 74% cutoff – You will hear 7 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

*IMPORTANT NOTE ABOUT 74% CUTOFF: Your battery pack should be fully charged in this voltage cutoff setting because it bases the cutoff on the start up voltage of the pack. This*

*option will activate the soft cutoff at 74% of startup voltage or 9.2V, whichever is lower. For example, if your pack measures 16.8 volts at startup, then the soft cut will occur at 12.4 volts. The 74% cutoff option will check the startup voltage every time you plug the battery into the controller, so beware of using partially charged packs, as the system cannot protect your Li-Po batteries if you are using the 74% cutoff and connect a partially charged pack. You will know your battery pack has reached soft auto cutoff when you hear the motor “pulse” repeatedly. We recommend you land your model as soon as you hear the motor pulse (indicating the pack voltage has dropped to the cutoff voltage level) to prevent over-discharge of the Li-Po battery pack, and to prevent sudden power loss.*

### **Programming Menu 2 – Brake Type**

The default setting is Brake Off. This option gives you the choice to have the ESC stop the propeller during flight (Brake On) or allow it to windmill (Brake Off). Use the Brake On options for folding propellers.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 2 times, indicating you are now in Menu 2.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Brake Type programming.
  - a. To select No Brake/Brake Off – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - b. To select Soft Brake – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - c. To select Medium Brake – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - d. To select Hard Brake – You will hear 4 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

### **Programming Menu 3 – Timing**

The default setting is 15 degrees. As a general rule, lower pole count motors use lower timing and higher pole count motors use higher timing. Please refer to your motor instructions and specifications for an indication of the number of poles.

#### **Low Timing Advance**

Timing Degrees – 5 & 10

Motor Poles – 2 to 4

Expected Performance – Good balance of power and efficiency

Motor Poles – 6 or more

Expected Performance – Best efficiency and run time (lowest power)

#### **Standard Timing Advance**

Timing Degrees – 15 & 20

Motor Poles – 6 to 12

Expected Performance – Good balance of power and efficiency

Motor Poles – 14 or more

Expected Performance – Best efficiency and run time (lowest power)

#### **High Timing Advance**

Timing Degrees – 25

Motor Poles – 12

Expected Performance – Highest power, less efficiency

Motor Poles – 14 or more

Expected Performance – Good balance of power and efficiency

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 3 times, indicating you are now in Menu 3.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Timing programming.
  - a. To select 5 Degrees – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - b. To select 10 Degrees – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - c. To select 15 Degrees – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - d. To select 20 Degrees – You will hear 4 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - e. To select 25 Degrees – You will hear 5 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

### Programming Menu 4 – Throttle Input Range (PWM)

The default setting is 1.2ms to 1.8ms and should work with most radio systems. This option allows for proper throttle input with many different radio systems. However, some radios have a wider output range, and may give a more linear response with the 1.1ms to 1.9ms range. If you feel there is too much “dead” area in the stick movement near full throttle, try adjusting the end points in your radio, or change to the wider input range. Be aware that if these settings are not correct, it may be impossible to arm the controller.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 4 times, indicating you are now in Menu 4.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Throttle Input Range programming.
  - a. To select 1.2ms to 1.8ms – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - b. To select 1.1ms to 1.9ms – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

### Programming Menu 5 – Start-Up Rate

The default setting is 0.25 seconds. The start-up rate is the time it takes to reach maximum motor speed. Changing the setting to 1 second can be useful with power-fragile gear boxes.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 5 times, indicating you are now in Menu 3.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Start-up Rate programming.

- a. To select .25 second – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
- b. To select 1 second – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

### Programming Menu 6 – PWM Switching Frequency

The default setting is 8KHz, which should be acceptable for most motors. If you have a low or very low inductance motor and know you need to use a higher PWM Frequency (refer to the manual included with the motor), then you can change the setting. Otherwise, we recommend leaving the default setting.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 6 times, indicating you are now in Menu 6.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the PWM Switching Frequency programming.
  - a. To select 8KHz PWM Frequency – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - b. To select 16KHz PWM Frequency – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - c. To select 32KHz PWM Frequency – You will hear 3 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

### Programming Menu 7 – Operating Mode

The default setting is set to Normal (airplane) Mode, which is limited to a start-up rate of 0.25 or 1 second. Alternatively, the Heli Mode can be selected which reduces the start-up rate to 5 seconds for the first start-up and any start-up after the motor/ESC has been stopped for more than 5 seconds. This helps to prevent damaging the motor, gears or any other components from an abrupt start-up when none of the parts are moving. Any time the motor/ESC has been stopped for less than 5 seconds in Heli Mode, the start-up will be immediate. This allows power to be applied immediately, such as when aborting an auto-rotation attempt or for any other reason, to help prevent a crash. Remember, you must wait more than 5 seconds after stopping the motor/ESC in order for the 5-second start-up to occur again.

1. Move the stick to center (between 1.4 and 1.6ms) for 5 seconds, and the controller will beep 7 times, indicating you are now in Menu 7.
2. Move the throttle stick to full throttle (>1.7ms) position to make changes to the Operating Mode programming.
  - a. To select Normal Mode – You will hear 1 short beep. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the next selection.
  - b. To select Heli Mode – You will hear 2 short beeps. Move the throttle stick to center (between 1.4 and 1.6ms). The controller will beep 2 times, indicating you have set the program selection or leave in full throttle for 5 seconds to advance to the first selection again.

### Troubleshooting

The controller will beep more quietly than normal if the input voltage is below the cutoff voltage when the battery is connected. Check the voltage of the battery pack to see if it is correct (charged), or the programmed cutoff setting if the input voltage is set incorrectly for the voltage of the pack being used.

If you have trouble arming the controller (and the throttle trim has been set to minimum), enter the programming mode and try changing the setting to 1.1ms–1.9ms in Programming Menu 4 to see if it helps correct the problem. If it is a computer radio, you may alternatively increase high and low throttle ATV (endpoint) percentages.

Note: Increasing the high ATV will not have a consequence on arming issues, only low ATV.

Some transmitters, including all Futaba transmitters, will require the throttle channel to be “reversed” for proper operation.

### Warranty and Repair Policy

Exclusive Warranty- Horizon Hobby, Inc., (Horizon) warranties that the Products purchased (the “Product”) will be free from defects in materials and workmanship for a period of 1 year from the date of purchase by the Purchaser.

#### 1 Year Limited Warranty

**Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.**

(a) This warranty is limited to the original Purchaser (“Purchaser”) and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for all warranty claims.

(b) Limitations- HORIZON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER’S INTENDED USE.

(c) Purchaser Remedy- Horizon’s sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser’s exclusive remedies. Horizon reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Horizon. Return of any Product by Purchaser must be approved in writing by Horizon before shipment.

#### Damage Limits

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.



If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

## Warranty Services

### Questions, Assistance, and Repairs

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the Product has been started, you must contact Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please direct your email to [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com), or call 877.504.0233 toll free to speak to a Product Support representative. You may also find information on our website at [www.horizonhobby.com](http://www.horizonhobby.com).

### Inspection or Repairs

If this Product needs to be inspected or repaired, please use the Horizon Online Repair Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. An Online Repair Request is available at <http://www.horizonhobby.com> under the Repairs tab. If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for repair. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

**Notice: Do not ship batteries to Horizon. If you have any issue with a battery, please contact the appropriate Horizon Product Support office.**

### Warranty Inspection and Repairs

**To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date.** Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon.

### Non-Warranty Repairs

**Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost.** By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for inspection or repair, you are agreeing to Horizon's Terms and Conditions found on our website under the Repairs tab.

## UNITED STATES

*(Electronics and engines)*

Horizon Service Center  
4105 Fieldstone Rd  
Champaign, Illinois  
61822 USA  
[productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com)  
877-504-0233  
Online Repair Request visit:  
[www.horizonhobby.com/repairs](http://www.horizonhobby.com/repairs)

*(All other products)*

Horizon Product Support  
4105 Fieldstone Rd  
Champaign, Illinois  
61822 USA  
[productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com)  
877-504-0233

## UNITED KINGDOM

Horizon Hobby Limited  
Units 1-4 Ployters Rd  
Staple Tye  
Harlow, Essex  
CM18 7NS  
United Kingdom  
[sales@horizonhobby.co.uk](mailto:sales@horizonhobby.co.uk)  
+44 (0) 1279 641 097

## GERMANY

Horizon Technischer Service  
Hamburger Str. 10  
25335 Elmshorn  
Germany  
[service@horizonhobby.de](mailto:service@horizonhobby.de)  
+49 4121 46199 66

## FRANCE

Horizon Hobby SAS  
14 Rue Gustave Eiffel  
Zone d'Activité du Réveil Matin  
91230 Montgeron  
[infofrance@horizonhobby.com](mailto:infofrance@horizonhobby.com)  
+33 (0) 1 60 47 44 70

## Compliance Information for the European Union

### INSTRUCTIONS FOR DISPOSAL OF WEEE BY USERS IN THE EUROPEAN UNION

This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

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