FIRMA™

SMART™

TECHNOLOGY

Spektrum FIRMA SMART ESC Series

Spektrum FIRMA SMART Geschwindigkeitsreglerserie

Série de variateurs ESC Spektrum FIRMA SMART

SMART ESC SPEKTRUM FIRMA

HORIZON® HOBBY

SPEKTRUM®

NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, LLC. For up-to-date product literature, visit horizonhobby.com or towerhobbies.com and click on the support or resources 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:

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.

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

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

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

NOTICE: This product is only intended for use with unmanned, hobby-grade, remote-controlled vehicles and aircraft. Horizon Hobby disclaims all liability outside of the intended purpose and will not provide warranty service related thereto.

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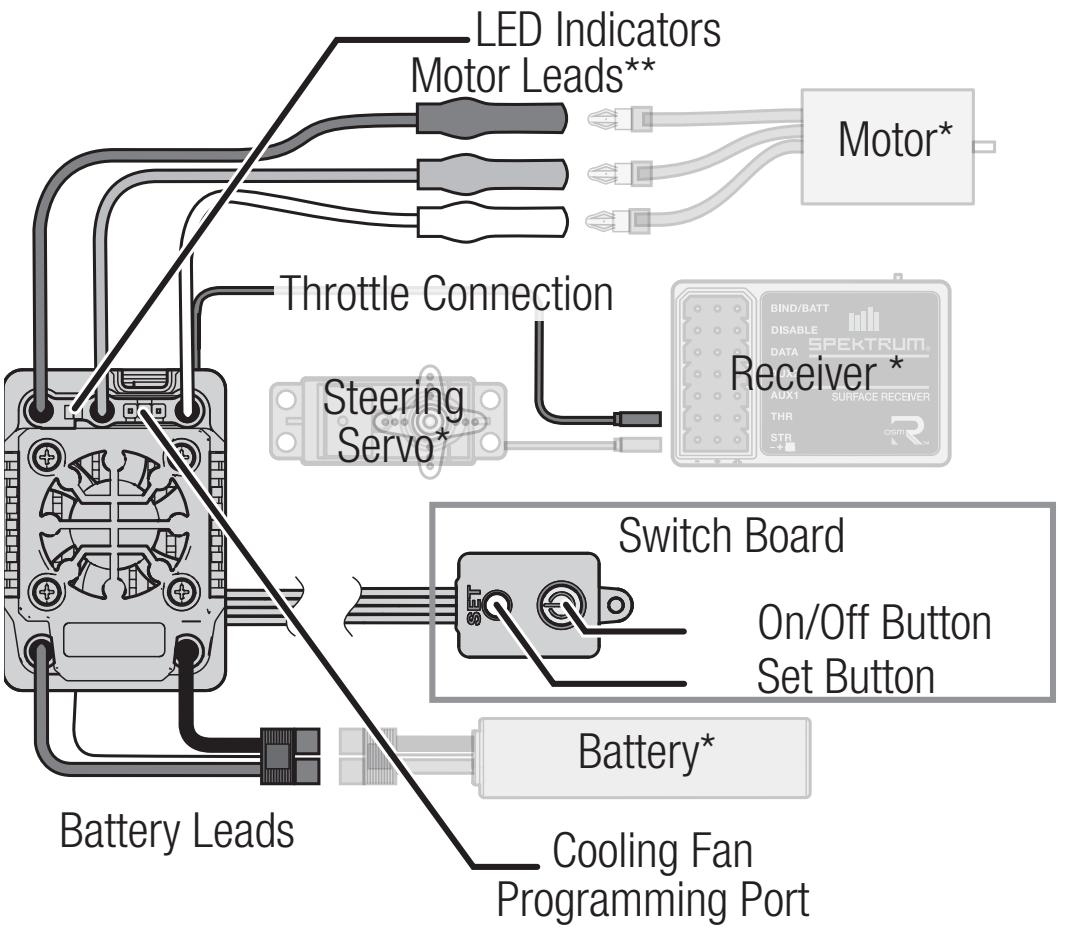
Spektrum Surface Firma ESCs

Specifications	Cont. Current	LiPo Cells	BEC Output	Size/Weight
SPMXSE1130	130A	2-4S LiPo	6V@ 4A	57.5x46x38mm/ 154g
SPMXSE1150	150A	3-6S LiPo	6V@ 5A	60x56x42mm/ 250g
SPMXSE1160	160A	3-8S LiPo	6V/ 8.4V@ 5A	70x77x44mm/ 280g

Wiring Diagram



* Not Included
**160A ESC features female bullet connectors directly on the ESC case

Throttle Signal

SMART Throttle:

The Spektrum Firma™ ESC is compatible with SMART Throttle. SMART Throttle combines throttle signals with telemetry data from the ESC on one normal three wire servo connector. SMART Throttle compatible receivers will detect a SMART Throttle ESC and automatically begin to send telemetry information to your transmitter.

Using the SMART Throttle connection this ESC can send voltage, current, and other telemetry data. It can also pass along battery data from compatible Spektrum SMART batteries. A Spektrum SMART battery with IC3™ or IC5™ connector is required for battery data. EC3™ connectors are compatible for basic operation, but will not provide SMART battery data.

Only certain Spektrum telemetry receivers include SMART Throttle, check your receiver manual for more information. If the ESC is not connected to a SMART Throttle compatible receiver no telemetry data from the ESC will be available, but the ESC will operate normally with a common servo signal (PWM).

Normal Servo Signal (PWM):

The Firma ESCs are fully compatible with common RC receivers and will use a conventional PWM signal for basic operation.

Installation and Wiring

1. Mount the ESC and power button with double sided tape or hook and loop material. Select a location to mount the ESC with good ventilation for cooling. The ESC mounting tabs can also be used to secure the ESC to the vehicle‘s chassis.

2. Connect the three motor wires from the ESC to the motor wires in any order.
   In the event the motor spins the wrong direction, reverse any two wires.

3. Connect the throttle servo lead to the throttle port on your receiver.

4. Secure all wiring so it is protected from damage or being caught by moving parts.

NOTICE: Do not connect a dedicated receiver battery to the receiver along with the ESC. When the ESC is turned On it will provide the receiver with 6V regulated power from the main battery through the throttle connection. The ESC may be damaged if the receiver is also connected to a dedicated receiver battery.

ESC and Transmitter Calibration

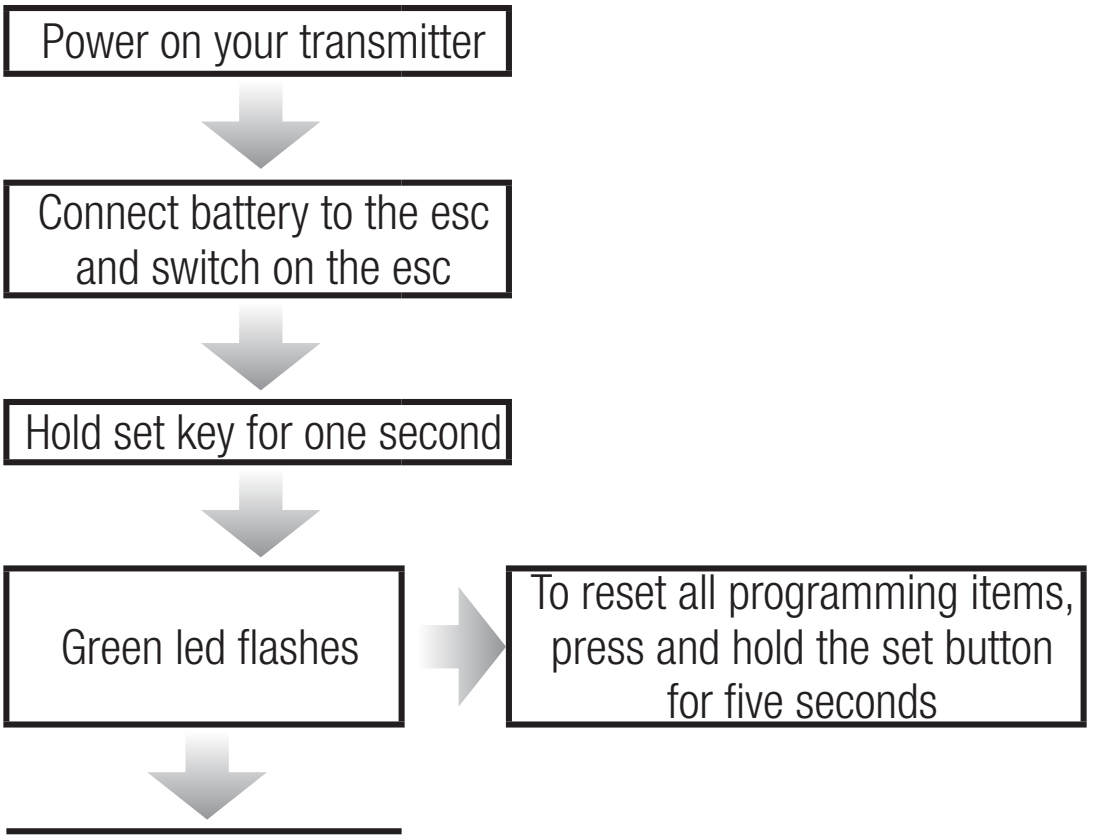
1. Begin with the transmitter and receiver binding complete.
2. Set your transmitter's throttle channel to 100% travel and trim to neutral.
3. Turn on your transmitter and connect a battery to the ESC but don't power it on.
4. Press and hold the Set button while turning on the ESC. When the red LED begins to flash, release the Set button. The ESC will enter programming mode if the button is pressed for more than three seconds.

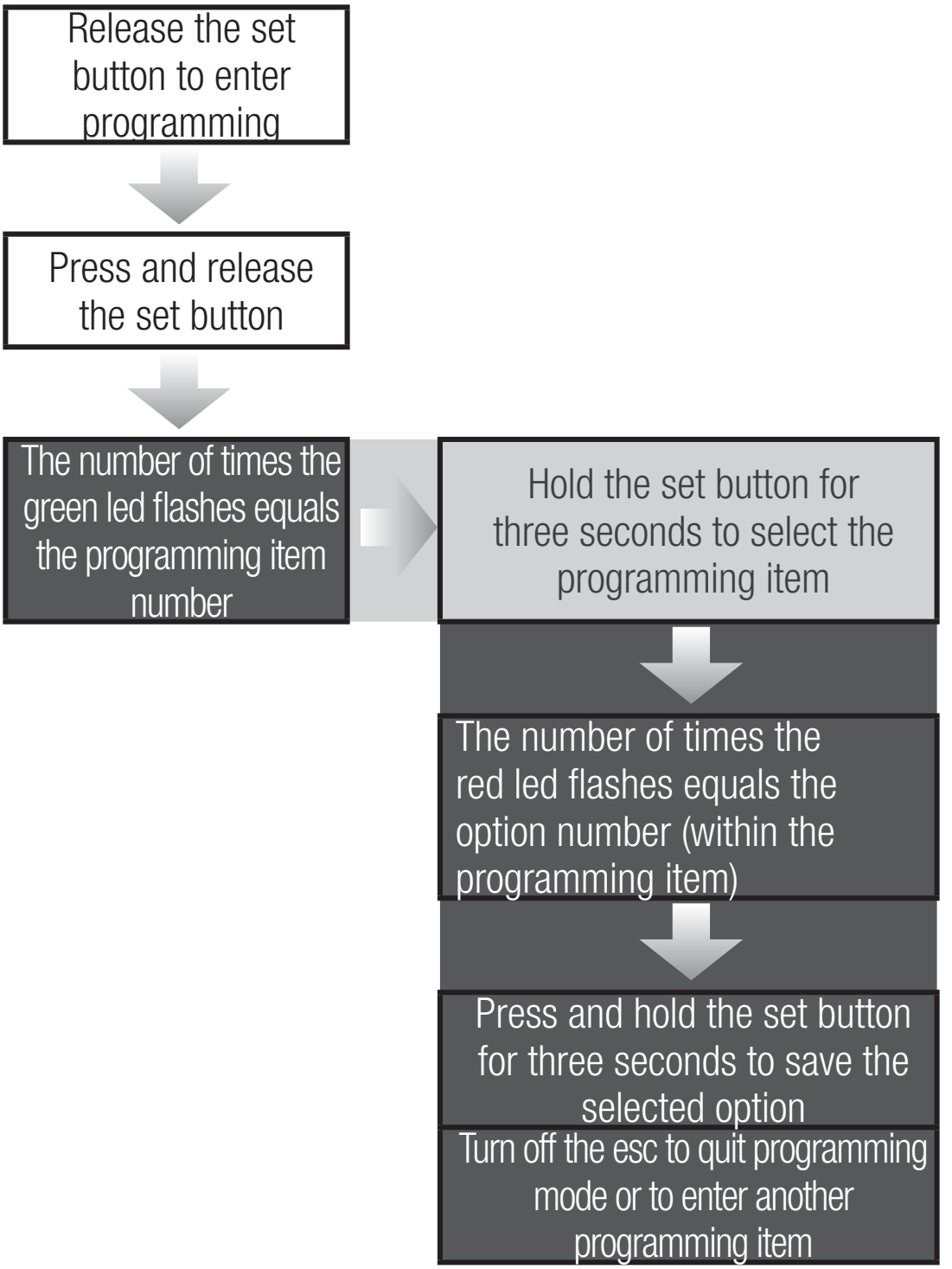
TIP: The red LED should be flashing when the ESC enters calibration mode. If the green LED is flashing the ESC is in programming mode.

5. Leave the throttle trigger at the neutral position, then press and release the Set button. The red LED will stop flashing, the green LED will flash one time and the motor will make a tone to indicate the neutral position has been accepted.
6. Hold the throttle trigger at the full throttle position then press and release the Set button. The green LED will flash twice and the motor will make two tones to indicate the full throttle position has been accepted.
7. Hold the throttle trigger at the full brake position then press and release the Set button. The green LED will flash three times and the motor will make three tones to indicate the full brake position has been accepted.

The motor will operate normally after calibration is completed.

Button Programming





More Programming Options

Other programming options include the SPMXCA200 Smart Firma ESC Programming Box and the SmartLink USB Updating and Programmer application. See SpektrumRC.com for more details about Firma ESCs.

130A and 150A Programmable Options

Program-mable Items	Parameter Options								
	1	2	3	4	5	6	7	8	9
1. Running Mode	For-ward w/ Brake	For-ward/ Re-verse w/ Brake	For-ward and Re-verse						
2. Drag Brake Force	0%	5%	10%	20%	40%	60%	80%	100%	
3. LVC Cutoff Voltage	Dis-abled	2.6V/ Cell	2.8V/ Cell	3.0V/ Cell	3.2V/ Cell	3.4V/ Cell			
4. Start Mode (Level)	1	2	3	4	5	6	7	8	9
5. Max Brake Force	25%	50%	75%	100%	Dis-abled				
6. Max Reverse Force*	25%	50%	75%	100%					
7. Initial Brake Force*	=Drag Brake	0%	20%	40%					
8. Neutral Range*	6%	9%	12%						
9. Timing (degree)*	0.0	3.75	7.5	11.25	15.0	18.75	22.5	26.25	
10. Motor Rotation*	CCW	CW							
11. LiPo Cells*	Auto Calc.	2S	3S	4S					

* SPMXSE1130

160A Programmable Options

Program-mable Items	Parameter Options								
	1	2	3	4	5	6	7	8	9
1. Running Mode	Forward w/ Brake	**Forward/ Reverse w/ Brake**							
2. Motor Rotation	**CCW**	CW							
3. LiPo Cells	**Auto Calc.**	3S	3S	5S	6S	8S			
4. LVC Cutoff Voltage	Auto - High	**Auto - Med**	Auto - Low						
5. BEC Voltage	**6.0V**	8.4V							
6. Max Brake Force	25%	**50%**	75%	100%					
7. Max Reverse Force	**25%**	50%							
8. Start (Punch) Level	1	2	**3**	4	5				
9. Timing (degree)	**0.0**	3.75	7.5	11.25	15.0				

* The blacked out cells with white text are the default settings.

Programming with the SPMXCA200 SMART Programmer Box

1. Unplug the fan and connect the programming lead to the fan port.
2. Connect a battery to the ESC.
3. Power on the box and select the parameter with the SELECT button.
4. Change the values of the selected parameter with the EDIT button
5. Press the SAVE button to save the changes. The ESC requires a power cycle to implement the saved changes.

Operation

1. Connect a battery to the ESC.
2. Leave the transmitter throttle at neutral and press the On/Off button on the ESC to turn it on. The ESC will cause the motor to make several tones.
   The number of tones indicates (1) the ESC is in operation (2) the LiPo cell count detected and (3) the ESC is in a ready-to-use state.
3. Press the On/Off button or unplug the battery to turn off the ESC.

NOTICE: Do not leave a battery connected with the ESC turned off for extended periods of time. Always unplug the battery for storage or the battery may be damaged.

LED Indicator	LED Code
ESC turned On, LED indicator is Off	Throttle trigger is in the neutral zone
Red LED illuminated	ESC is operating in forward, reverse or brake
Red and Green LED illuminated	ESC is at full throttle, full brake, or full reverese
LED flashes red with short single pulses	LVC protection activated
LED flashes green with short single pulses	The ESC is in thermal shutoff mode
LED flashes green with three short pulses repeating	The ESC has exceeded the continuous current limit
LED flashes green with four short pulses repeating	The ESC has failed the self test
LED flashes green with five short pulses repeating	Capacitor temp has been exceeded

Troubleshooting Guide

Problem and LED Indicator	Error Mode	Possible Causes	Solution
Motor won't operate. LED flashes red with short single pulses.	LVC has been activated.	Battery voltage is below the LVC setting.	Verify the battery is charged.
		ESC settings are incorrect for your battery.	Verify the ESC settings are correct for your battery.
Motor won't operate. LED flashes green with short single pulses.	The ESC is in thermal shutoff mode.	The ESC is not getting adequate airflow.	Turn off the ESC and allow it to cool before resuming operation. Consider making changes to improve airflow to the ESC.
		There is too much load on the drive system for the ESC to support.	Consider changing the battery, motor, gearing, or tires to reduce the load on the ESC, or change your driving habits to reduce the load.
Motor won't operate. LED flashes green with three short pulses repeating.	The ESC has exceeded the continuous current limit.	The ESC is not getting adequate airflow.	Verify the motor is not damaged; If a motor is damaged it may still function but draw excessive current, resulting in over current protection.
		There is too much load on the drive system for the ESC to support.	Reduce the load on the motor
			Change to an ESC with higher current capabilities if the chosen ESC cannot handle the load demands for your model.

Motor won't operate. LED flashes green with four short pulses repeating.	The ESC has failed the self test.	The ESC is damaged.	Send the ESC to a Horizon Hobby service center for service.
Motor won't operate. LED flashes green with five short pulses repeating.	Capacitor temp has been exceeded	The ESC is not getting adequate airflow.	Turn off the ESC and allow it to cool before resuming operation. Consider making changes to improve airflow to the ESC.
		There is too much load on the drive system for the ESC to support.	Consider changing the battery, motor, gearing, or tires to reduce the load on the ESC, or change your driving habits to reduce the load.
Motor stutters at start-up.	N/A	Poor wiring connection between the ESC and motor.	Verify all wiring connections are solid and well insulated, re-flow any cold solder joints.
		Excessive drag on drive system.	Check for parts rubbing, bent shafts, rusted bearings, tight gears, or anything that could cause extra drag on the drive system.

1-YEAR LIMITED WARRANTY

What this Warranty Covers - Horizon Hobby, LLC, (Horizon) warrants to the original purchaser that the product purchased (the "Product") will be free from defects in materials and workmanship for a period of 1 year from the date of purchase.

What is Not Covered

This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, (v) Product not purchased from an authorized Horizon dealer, (vi) Product not compliant with applicable technical regulations, or (vii) use that violates any applicable laws, rules, or regulations.

OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

Purchaser's Remedy

Horizon's sole obligation and purchaser's sole and exclusive remedy shall be that Horizon will, at its option, either (i) service, or (ii) replace, any Product determined by Horizon to be defective. Horizon reserves the right to inspect any and all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of Horizon. Proof of purchase is required for all warranty claims. SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY.

Limitation of Liability

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF HORIZON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. 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 the Product, purchaser is advised to return the 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). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Horizon reserves the right to change or modify this warranty at any time without notice.

WARRANTY SERVICES

Questions, Assistance, and Services

Your local hobby store and/or place of purchase cannot provide warranty support or service. Once assembly, setup or use of the Product has been started, you must contact your local distributor or 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 visit our website at www.horizonhobby.com, submit a Product Support Inquiry, or call the toll free telephone number referenced in the Warranty and Service Contact Information section to speak with a Product Support representative.

Inspection or Services

If this Product needs to be inspected or serviced and is compliant in the country you live and use the Product in, please use the Horizon Online Service 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 Service Request is available at http://www.horizonhobby.com/content/service-center_render-service-center. 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 service. 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 LiPo batteries to Horizon. If you have any issue with a LiPo battery, please contact the appropriate Horizon Product Support office.

Warranty Requirements

For Warranty consideration, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be serviced or replaced free of charge. Service or replacement decisions are at the sole discretion of Horizon.

Non-Warranty Service

Should your service not be covered by warranty, service 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 service you are agreeing to payment of the service without notification. Service estimates are available upon request. You must include this request with your item submitted for service. Non-warranty service 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 cashier's checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for service, you are agreeing to Horizon's Terms and Conditions found on our website http://www.horizonhobby.com/content/service-center_render-service-center.

ATTENTION: Horizon service is limited to Product compliant in the country of use and ownership. If received, a non-compliant Product will not be serviced. Further, the sender will be responsible for arranging return shipment of the un-serviced Product, through a carrier of the sender's choice and at the sender's expense. Horizon will hold non-compliant Product for a period of 60 days from notification, after which it will be discarded. 10/15

Warranty and Service Contact Information

Country of Purchase	Horizon Hobby	Contact Information	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	servicecenter.horizonhobby.com/RequestForm/	2904 Research Rd. Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	productsupport@horizonhobby.com.	
		877-504-0233	
	Sales	websales@horizonhobby.com	
		800-338-4639	

FCC Information

Supplier's Declaration of Conformity

Firma 130 Amp ESC– SPMXSE1130
Firma 150 Amp ESC– SPMXSE1150
Firma 160 Amp ESC– SPMXSE1160

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and

used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Horizon Hobby, LLC
2904 Research Rd.,
Champaign, IL 61822
Email: compliance@horizonhobby.com
Web: HorizonHobby.com

Compliance Information for Canada

CAN ICES-3 (B)/NMB-3(B)

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

(1)this device may not cause interference,

(2)this device must accept any interference, including interference that may cause undesired operation of the device.

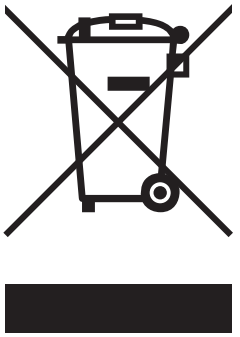
Compliance Information for the European Union

EU Compliance Statement: SPMXSE1130, SPMXSE1150, SPMXSE1160

Horizon Hobby, LLC hereby declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.

A copy of the EU Declaration of Conformity is available online at:
http://www.horizonhobby.com/content/support-render-compliance.

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 collections 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 make sure 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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SPMXSE1130, SPMXSE1150, SPMXSE1160

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