

Spektrum SPMXSEM0502

Spektrum Firma Sensored BL Motor/ESC 2-in-1 Combo, 2800Kv (SPMXSEM0502) Instruction Manual

This manual provides detailed instructions for the setup, operation, and maintenance of your Spektrum Firma Sensored Brushless Motor and ESC 2-in-1 Combo, model SPMXSEM0502.

1. PRODUCT OVERVIEW

The Spektrum™ Firma™ 30-amp Sensored Brushless ESC and Motor 2-in-1 Combo is designed for specific RC applications, such as the Axial UTB18 Capra 4WS, 1/18 4WD. This unit integrates both the Electronic Speed Controller (ESC) and the brushless motor into a single, compact component. It features a high-precision magnetic encoder and rotor position sensor, which ensures precise control and responsiveness across all speed ranges.

This combo is an upgrade option for vehicles running 2S or 3S LiPo power, suitable for both trail adventuring and competitive use. The aluminum construction aids in heat dissipation, and the unit is ready to install without requiring soldering.

Key Features:

- Developed by Spektrum engineers in partnership with a leading ESC manufacturer.
- Integrated 30-amp Sensored Brushless ESC and 2800Kv Motor.
- Waterproof design (refer to instructions for details on waterproofing).
- Compact size for easy installation in various applications.
- Ready to install, no soldering required.
- Aluminum construction for enhanced heat dissipation.
- Adjustable high-power BEC.

What's Included:

- 1x Firma Sensored BL Motor/ESC 2-in-1 Combo, 2800Kv (SPMXSEM0502)



Figure 1: Front view of the Spektrum Firma Sensored BL Motor/ESC 2-in-1 Combo.



Figure 2: Rear view of the Spektrum Firma Sensored BL Motor/ESC 2-in-1 Combo, showing the Spektrum branding and model number.

2. SAFETY INFORMATION

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 use with incompatible components or alter this product in any way outside of the instructions provided by Horizon Hobby, LLC. The product 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.

Multi-point Protection Features:

- Over-current protection
- Automatic LiPo low-voltage cutoff
- Thermal protection
- Failsafe protection

3. SETUP AND INSTALLATION

The Spektrum Firma 2-in-1 Combo is designed for straightforward installation. Ensure your vehicle is powered off and the battery is disconnected before beginning any installation procedures.

Installation Steps:

1. **Prepare the Vehicle:** Remove the existing motor and ESC from your RC vehicle. Ensure all old wiring is safely disconnected.
2. **Mount the Combo Unit:** Securely mount the Spektrum Firma 2-in-1 Combo unit in the designated motor/ESC location of your vehicle. The compact design facilitates easy placement.
3. **Connect to Receiver:** Connect the signal wire from the ESC to the throttle channel on your RC receiver. Ensure the polarity is correct.
4. **Connect Battery:** Connect your 2S or 3S LiPo battery to the ESC's battery connector. Ensure the battery is fully charged and compatible with the ESC's voltage requirements.
5. **Secure Wiring:** Use cable ties or other securing methods to neatly route and secure all wiring, preventing interference with moving parts.

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Video 1: Installation guide for a motor/ESC combo in an RC vehicle. This video demonstrates the process of replacing and connecting the motor and ESC components within an RC car chassis, including wiring to the receiver and battery.



Figure 3: Close-up view of the motor/ESC combo showing the integrated wiring for connection to the receiver and battery.

4. OPERATING INSTRUCTIONS

The Spektrum Firma Sensored BL Motor/ESC 2-in-1 Combo offers precise control for your RC vehicle. Its sensored design provides smooth low-speed control and consistent power delivery.

Basic Operation:

1. **Power On:** Connect the battery and turn on your transmitter first, then the vehicle's power switch.
2. **Throttle Control:** Use the throttle trigger on your transmitter to control the vehicle's speed. The sensored motor provides excellent one-to-one control feel, allowing for fine adjustments at any speed.
3. **Steering:** Use the steering wheel on your transmitter to control the vehicle's direction.
4. **Low Voltage Cutoff:** The ESC features an automatic LiPo low-voltage cutoff to protect your battery. When the

battery voltage drops below a safe level, the ESC will reduce power or cut off completely.

- 5. **Thermal Protection:** The ESC is equipped with thermal protection to prevent overheating. If the unit reaches an unsafe temperature, power output will be reduced to prevent damage.
- 6. **Power Off:** Always turn off the vehicle's power switch first, then your transmitter, and finally disconnect the battery.

For optimal performance, ensure your transmitter is properly bound and calibrated with the receiver and ESC. Refer to your transmitter's manual for binding and calibration procedures.

5. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your Spektrum Firma 2-in-1 Combo.

General Maintenance Tips:

- **Cleaning:** After each use, especially in dusty or wet conditions, clean the motor and ESC with a soft brush or compressed air. Avoid using harsh chemicals or solvents.
- **Inspection:** Regularly inspect all wires and connectors for signs of wear, fraying, or corrosion. Ensure all connections are secure.
- **Motor Bearings:** Periodically check motor bearings for smooth operation. If they feel rough or noisy, they may need lubrication or replacement.
- **Heat Management:** Ensure adequate airflow around the motor and ESC during operation to prevent overheating. The aluminum casing helps with heat dissipation, but proper ventilation is still crucial.
- **Waterproofing:** While the unit is waterproof, it is important to follow the specific instructions provided by Spektrum regarding its use in wet conditions. Always dry the unit thoroughly after exposure to moisture.

6. TROUBLESHOOTING

This section provides solutions to common issues you might encounter with your Spektrum Firma 2-in-1 Combo.

Problem	Possible Cause	Solution
Motor not responding to throttle.	Battery not connected or discharged. ESC not powered on. Transmitter not bound or powered on. Signal wire disconnected or incorrect channel.	Check battery connection and charge level. Ensure ESC power switch is ON. Verify transmitter is ON and bound to receiver. Check signal wire connection to receiver (throttle channel).
Motor stutters or runs inconsistently.	Loose motor wires. Sensor wire issue. Low battery voltage.	Check all motor phase wire connections. Inspect sensor wire for damage and ensure secure connection. Charge or replace battery.
ESC or motor overheating.	Insufficient airflow. Overgearing. Excessive load.	Ensure proper ventilation around the unit. Adjust gearing (use a smaller pinion gear). Reduce load on the vehicle.

7. SPECIFICATIONS

Feature	Detail
Model Number	SPMXSEM0502
Kv Rating	2800Kv
ESC Amperage	30-amp
Input Voltage	2S or 3S LiPo
Product Dimensions	4.2 x 3 x 2 inches
Item Weight	4.6 ounces
Manufacturer	Horizon Hobby
Recommended Age	0 - 3 years <i>(Note: This age recommendation is typically for the toy category, not the user of the product. Adult supervision is required for operation.)</i>



Figure 4: Side profile of the motor/ESC combo, illustrating its compact form factor.

8. WARRANTY AND SUPPORT

For detailed warranty information, technical support, or service inquiries, please refer to the official Spektrum or Horizon Hobby website. Keep your proof of purchase for any warranty claims.

Manufacturer: Horizon Hobby, LLC



