Hobbywing 30120402

HOBBYWING Quicrun Fusion PRO 2300KV FOC System 2in1 User Manual

Integrated ESC & Motor for RC Crawlers

1. Introduction

Thank you for choosing the HOBBYWING Quicrun Fusion PRO 2300KV FOC System 2in1. This integrated motor and Electronic Speed Controller (ESC) unit is designed to provide superior performance and reliability for your RC crawler. Its advanced features ensure smooth, precise control and durability in various conditions.

Key Features:

- **Integrated Design:** ESC and motor combined for reduced volume and weight, simplifying car frame layout and wiring.
- **FOC Driving Mode:** Strong low-speed torque and smooth operation, superior to common sensored brushless systems.
- **High Efficiency:** Sine wave driving mode ensures high efficiency, low heat, and extended endurance.
- **IP67 Waterproof & Dustproof:** Excellent protection for various weather and road conditions.
- **Intelligent Control:** Torque output and speed closed-loop control for cruise control and steep slope slow descent.
- **Adjustable Drag Brake:** Active drag brake force adjustment for superior parking capability on slopes.
- **Powerful BEC:** Built-in 6A continuous current, adjustable 6V/7.4V switch mode BEC for powerful steering servos.
- **Multiple Protections:** Battery low voltage, overheat, throttle lost, and lock-up protection.
- **Parameter Setting:** Supports HOBBYWING LED program box for convenient parameter adjustments.



Figure 1: The HOBBYWING Quicrun Fusion PRO 2300KV FOC System 2in1 unit.

2. Safety Precautions

Always operate your RC vehicle in a safe manner. Failure to follow safety guidelines can result in personal injury, property damage, or damage to the product. Keep the unit away from moisture and extreme temperatures. Ensure all connections are secure before operation.

3. Package Contents

The HOBBYWING Quicrun Fusion PRO 2300KV FOC System 2in1 package includes the following items:

- HOBBYWING Quicrun Fusion PRO 2300KV FOC System 2in1 motor/ESC unit
- LED Program Card sticker (for attaching to your LED Program Card)
- Double-ended harness (for connecting the programming card)

- Zip ties (for cable management)
- Mounting tape (for the on/off button)
- User Manual
- HOBBYWING Decals



Figure 2: Contents of the HOBBYWING Quicrun Fusion PRO 2300KV FOC System 2in1 package.

4. Product Overview

The Quicrun Fusion PRO 2300KV is an innovative 2-in-1 unit combining a brushless motor and an ESC. This design minimizes wiring and simplifies installation in your RC vehicle.

Dimensions:

- **Length:** Approximately 57.5 mm (2.26 inches)
- **Diameter:** Approximately 36.2 mm (1.42 inches)

- **Shaft Length:** Approximately 15.5 mm (0.61 inches)



Figure 3: Top view of the Fusion PRO unit, highlighting the integrated design.



Figure 4: Side view of the Fusion PRO unit, showing FOC technology branding.



Figure 5: Side view of the Fusion PRO unit, indicating 2300KV 540spec.

5. Setup

5.1 Connecting the System

1. Connect the motor/ESC unit to your battery pack using the appropriate connector.
2. Connect the signal wire from the ESC to the throttle channel of your receiver.
3. Ensure all connections are secure and properly insulated.

5.2 Automatic Motor Pairing (Sensor Reset)

This process is crucial for FOC systems to ensure optimal performance and motor longevity. It calibrates the motor's sensors with the ESC.

1. Ensure the motor/ESC unit is connected to a battery.
2. Press and hold the on/off button on the unit.

3. The LED will flash green, then turn red. Continue holding until it flashes green again.
4. Release the button. The motor will beep, cycle for a moment, and then beep your LiPo cell count.
5. The unit is now paired and ready for operation.

> **Note:**
> If your motor starts overheating or acting abnormally, performing this automatic motor pairing (sensor reset) often resolves the issue.

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Video 1: HOBBYWING North America's 'Fusion Pro Unboxing & Settings' video, demonstrating the automatic motor pairing process.

5.3 Programming Parameters

The Quicrun Fusion PRO offers 13 adjustable parameters. Use a HOBBYWING LED Program Card (sold separately) and the provided sticker/manual to adjust these settings. The sticker provides a quick reference for parameter values.

Programmable Items Overview

No.	Item	Default Value	Description
1	Running Mode	Forward/Reverse with RPM Matching	Controls vehicle movement and throttle response. Options include: Forward/Reverse with RPM Matching (FOC style), Forward/Reverse with Brake (Normal Mode), and Forward/Reverse (Normal Mode). Normal modes offer a more 'brushed motor' feel by reducing throttle matching.
2	LiPo Cells	Auto Calculate	Automatically detects 2S or 3S LiPo. Can be manually set to 2S or 3S.
3	Voltage Cutoff	Low	Protects battery from over-discharge. Options: Disabled, Low (~3.3V/cell), Medium (~3.5V/cell), High (~3.7V/cell).
4	Thermal Protection	Low	Adjusts the temperature threshold for motor protection. Options: Low, High.
5	Motor Rotation	CCW	Sets the motor's rotation direction (Clockwise or Counter-Clockwise). Adjust if your vehicle moves backward when given forward throttle.
6	BEC Voltage	7.4V	Adjusts the output voltage for servos. Options: 6.0V, 7.4V. The BEC is a 6A switching type.
7	Drag Brake Force	Level 5 (50%)	Strength of the automatic brake applied when throttle is released. Options: Disabled, Level 1 (10%) to Level 8 (100%).
8	Drag Brake Rate	Level 5	How quickly the drag brake is applied. Options: Level 1 (slowest) to Level 9 (fastest).
9	Max Reverse Force	Level 5 (50%)	Maximum power in reverse. Options: Level 1 (10%) to Level 8 (100%).

No.	Item	Default Value	Description
10	Max Brake Force	Level 5 (50%)	Maximum braking strength when applying brake input. Options: Level 1 (10%) to Level 8 (100%).
11	RPM Decrease Rate	Level 5	Controls the amount of FOC throttle matching when decreasing RPM. Lower values provide a more 'organic' feel. Options: Level 1 (least FOC) to Level 9 (most FOC). Only applies in Normal Running Modes.
12	Punch	Level 5	Adjusts the initial throttle response and linearity. Higher values provide a more aggressive and linear response. Options: Level 1 (softest) to Level 9 (most aggressive).
13	Neutral Range	Level 5	Adjusts the dead zone around the neutral throttle position. Options: Level 1 (smallest) to Level 9 (largest). Useful for worn triggers or inconsistent throttle inputs.

6. Operating

Once the Fusion PRO unit is installed and configured, ensure your radio system is properly calibrated. Always start with a fully charged battery. For optimal performance, ensure your vehicle's drivetrain is free of binding and your gearing is appropriate for your driving style and terrain.

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Video 2: RC Crawler demonstrating the smooth low-speed control and torque of the HOBBYWING Fusion PRO.

7. Maintenance

The HOBBYWING Quicrun Fusion PRO is designed for durability with its IP67 rating. However, regular maintenance is recommended to ensure its longevity:

- **Cleaning:** After use, especially in wet or dusty conditions, clean the unit with a soft brush or compressed air.
- **Inspection:** Periodically check all wires and connectors for damage or loose connections.
- **Programming Port:** Always ensure the rubber cap on the programming port is securely in place when not in use to maintain its waterproof integrity.

8. Troubleshooting

If you encounter any issues with your Fusion PRO unit, refer to the following common troubleshooting steps:

- **Motor Overheating:** Ensure proper gearing for your vehicle and driving conditions. Perform the Automatic Motor Pairing (Section 5.2).
- **Abnormal Running/Inconsistent Performance:** Re-perform the Automatic Motor Pairing (Sensor Reset) as detailed in Section 5.2. This often resolves many performance-related issues.
- **Incorrect Motor Direction:** Adjust the 'Motor Rotation' parameter (Item 5) using the LED Program Card, rather than adjusting settings on your radio.
- **Inconsistent Drag Brake/Throttle Response:** Adjust 'Drag Brake Rate' (Item 8), 'Max Reverse Force' (Item 9), 'Max Brake Force' (Item 10), 'RPM Decrease Rate' (Item 11), 'Punch' (Item 12), and 'Neutral Range' (Item 13)

parameters to fine-tune the feel.

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Video 3: RC Truck with HOBBYWING Fusion PRO demonstrating its performance after motor upgrade.

9. Specifications

Specification	Value
Model Name	Fusion Pro
KV Rating	2300KV
Lipo Cells	2-3S LiPo, 6-9 Cells NiMH
BEC Output	6V/7.4V adjustable, 6A continuous (Switch Mode)
Protection Grade	IP67 (Waterproof & Dustproof)
Product Dimensions (L x W x H)	4.33 x 2.99 x 2.09 inches (approx. 110 x 76 x 53 mm)
Item Weight	9.42 ounces (approx. 267 grams)
Item Model Number	30120402
Manufacturer	Hobbywing Technology

10. Warranty & Support

HOBBYWING products are manufactured to the highest quality standards. For warranty claims or technical support, please contact HOBBYWING customer service directly through their official website or authorized distributors. Keep your purchase receipt as proof of purchase.

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