

SPEEDMAX-40P

POT-CONTROLLED 40 AMP ELECTRONIC SPEED CONTROLLER

INTRODUCTION

SpeedMax-40P is the potentiometer controlled version of the SpeedMax-40, an advanced, compact and light-weight 40 Amp Electronic Speed Controller (ESC) driven by a powerful RISC microprocessor and employing the latest MOSFET driving techniques, including variable frequency PWM and reverse exponential power curve using real-time polynomial solving. These features make SpeedMax-40P one of the most efficient ESCs across the full power range and provide the user with linear power output with respect to throttle position.

FEATURES

Reduced RF interference	Passive interference counter-measures means no servo jitter!
Reverse exponential power curve	A smooth reverse exponential power curve is calculated in real-time to map propeller thrust linearly over the throttle range.
Variable frequency PWM	The PWM switching frequency is dynamically varied which significantly increases brush and winding life of the motor, as well as improve efficiency which results in increased running time.
Battery Elimination Circuit (BEC)	Power is supplied to the receiver from the ESC via the servo lead, which eliminates the need for a separate receiver battery pack.
False start protection	On power-up, the ESC waits for zero throttle to be applied before arming itself.

TECHNICAL INFORMATION

Continuous current rating¹	40 A	Typical on resistance	2.3 mΩ
LiPo cells	2 – 4	PWM Frequency (variable)	1.25 kHz to 2.5 kHz
Ni-Cd cells	5 – 12	PWM Resolution	160 steps
Lead-acid cells	1	Current consumption	< 10mA
Operating voltage	5.0 V – 16.0 V	Module size	25.6 x 17.6 x 6mm
BEC	1A, 5V	Weight with/out power leads	17g / 8g

INSTALLATION

Connect SpeedMax-40P to the motor using the power leads marked as M+ (positive) and M- (negative). Make sure the motor has RF interference suppression capacitors otherwise there may be sufficient interference to effect the SpeedMax's performance.

Connect a potentiometer with a resistance of between 2kΩ and 10kΩ to the 3-way connector. The potentiometer's supply voltage (5V) is provided by the brown (negative) and red (positive) wire on the ESC's 3-way connector. The sweep terminal of the pot must be connected to the orange wire of the 3-way connector. Generally with potentiometers, the centre connector is the sweep connector with the positive and negative on either end. Swapping the negative and positive wires supplying the pot will swap the direction that the pot is rotated in order to decrease and increase power. Note that accidentally connecting the sweep terminal to either positive or negative (red or brown wire, respectively) will result in damage to the potentiometer and may damage the controller. If the distance between the potentiometer and the controller is more than 30cm and if the cable passes by any equipment that generates electromagnetic noise, it is recommended to use a 3-way shielded cable, connecting the braided sheath to the brown (negative/ground) wire.

Next, connect the ESC to the battery using the B+ (positive) and B- (negative) power leads, trimming them to the minimum possible length (do not exceed 4.7in / 120mm) and paying careful attention to the polarity. If the distance between the battery and motor is large, rather increase the cable length between the ESC and motor, not the ESC and battery!

WARNING: SpeedMax-40P does not have reverse battery protection. Reversing the polarity of the battery may result in permanent damage to the ESC and the battery. ALWAYS follow the correct connection procedure and use polarised connectors, which cannot be connected the wrong way around.

OPERATION

With the battery, motor and pot correctly connected, rotate the pot in one direction to increase power and rotate it back to decrease power to the motor. The direction of pot rotation can be reversed by swapping the leads connected to the outer pints of the pot (not the sweep terminal!).

CONTACT

This product is designed and manufactured by FirmTronics. Visit us at www.firmtronics.com for more information, including troubleshooting, updated user manuals and other product information. If you have any suggestions, comments or general feedback, please email us at info@firmtronics.com.

¹ Requires airflow cooling above 35A continuous.