

MEDUSA RESEARCH

# Electronic Speed Controls

by Thayer Syme

Feature-packed ESCs for brushed motors



The engineers at Medusa Research, Inc. have developed a full line of electronic speed controls (ESCs) for brushed motors. These controls offer a wide range of features and programming capabilities to maximize the performance of your models. Medusa offers ESCs for power systems with operating voltages from 5 to 24 volts and 10 to 50-amp continuous current draws. The units all have a 50% overhead for peak current draws to provide a reliable safety net for systems with higher momentary demands.

## CHOICES

Medusa ESCs are divided into two product lines. The Spectrum controllers will easily handle the needs of most sport modelers. For those with power systems that demand a high capacity BEC, the Fusion line offers all the features of the Spectrum ESCs, along with an onboard switching-regulator BEC. This BEC is capable of handling up to 24 volts input while powering four servos, and is designed to accommodate higher cell-count batteries and more servos for those specialized applications where a separate receiver battery pack is undesirable.

## FEATURES AT A GLANCE

**Auto cell count** Automatically detects number of battery cells

**Low battery detection** for NiMH, NiCd, and Lithium batteries

**Auto-scaling throttle range** or customizable fixed points

**User programmable options**—Set and forget 2 kHz output switching frequency

**Active freewheeling**—For superior efficiency

**Remote arming switch**—Shuts off ESC without requiring battery removal

**Lost/bad signal detection**—Automatically shuts off motor

**Safe start**—Will not enable motor without first setting throttle at off position

**Current peak limiting**—Smoothly reduces output, no abrupt shutdowns

**Output short circuit protection**

**Over temperature protection**—Smoothly reduces output, no abrupt shutdowns

**3 programmable brake modes**—Hard, soft and off

**BEC circuit** runs receiver and servos off your main battery

**24V switching BEC**—Up to 24 volts input, 2 amps output

**High voltage range**—Up to 42 volts

**Onboard Opto-Isolator**—Isolates potentially harmful interference that may affect your receiver

## USER PROGRAMMABLE OPTIONS

- Brake behavior
- Throttle behavior including linear and exponential profiles
- Throttle range
- Throttle ramp speed
- Battery type
- Adjusted with throttle stick

## PRACTICAL INNOVATION

Most of the Medusa ESCs include a remote arming switch. This switch has an innovative feature. Medusa's remote power switch shuts off all power to the ESC, stopping battery drainage. Many ESC power switches will only disable the output or the BEC. This can be a problem if you leave your battery in the model and forget to disconnect it, as the ESC will continue to run and draw power. By cutting off all current flow, the Medusa switch will help prevent unexpected discharging, and the potential permanent damage that can come from over discharging Li-Poly batteries. The 10-amp Spectrum MR-ESC-1210BB, Medusa's smallest ESC, does not include a switch in order to reduce weight to a minimum.

Speaking of weight, I weighed the three sample ESCs shown and found some interesting results. Both the 50-amp 2450 and 18-amp 1218 units were within half a gram of their rated weights. I was very pleased to see this level of data accuracy from a manufacturer. Even more surprising was the weight of the 10-amp

## MEDUSA ELECTRONIC SPEED CONTROLS



Spectrum. Medusa lists the weight of this controller as 11 grams. It weighed in at 7.5 grams, a pleasant surprise indeed. (All of these weights included wiring.)

The Medusa controls come with four inches of high strand count, high quality silicone insulated wire for both input and output leads. For gram critical missions, trimming these wires to the minimum required lengths will result in lower weights still.

### CONCLUSION

The Medusa Spectrum and Fusion speed controls offer a lot of performance for the electric modeler. They have 250 discrete throttle positions, and provide a very fine touch on the throttle. Are you

### MEDUSA RESEARCH PRODUCT LINE

ESC	Max Amps	Voltage Range	Retail Price
<b>SPECTRUM</b>			
MR-ESC-1210	10	5-12	\$33.95
MR-ESC-1218	18	5-12	\$39.95
MR-ESC-1430	30	5-14.4	\$49.95
MR-ESC-1440	40	5-14.4	\$55.95
MR-ESC-1450	50	5-14.4	\$60.95

### FUSION

MR-ESC-2430	30	24	\$75.95
MR-ESC-2440	40	24	\$79.95
MR-ESC-1450	50	24	\$84.95

about to start a new electric model? Check out the Medusa Research web site for a full description and feature list on these well made speed controls. You won't be disappointed.

### Links

**Medusa Research, Inc.**, [www.medusaresearch.com](http://www.medusaresearch.com), (508) 675-0200.

For more information, please see our source guide on pg. \_\_\_\_.