

Integrated Electronic Speed Control/RPM Meter Specification

This specification details a small integrated electronic speed control (ESC) and tachometer for small sensorless, brushless and brushed DC motors, such as those in R/C cars/planes.

- Power Switches:
 - Analog switch to turn unit on and off
 - Digital push button switch to control power to the aux 2.1mm DC power jack.
- DC 2.1mm female power jacks (5-18v @ 5 amps max):
 - Main 2.1mm **input** power jack supporting 5-18v
 - Aux 2.1mm **output** power jack to provide PWM 5-18v (depending on input voltage) output to brushed DC motors.
- Female [3.5mm TSR phone connector](#) for connecting brushless DC motor.
- 3 pin connector for connecting to an external [ESC](#).
- Built-in 10 amp brushless electronic speed control such as [this](#), which should be able to run the brushless motor at lowest rpm possible.
- Built-in 2 amp PWM speed control such as [this](#), to controlled small brushed DC motor, or lights. This will connect to the Aux 2.1mm output jack.
- Analog control knob to control the speed of both brushless motor connected to the 3.5mm TRS phone connector, or brushed motor the 2.1mm aux power output.
- "up/down" push buttons to control the speed of both brushless motor connected to the 3.5mm TRS phone connector, or brushed motor the 2.1mm aux power output. When in preset mode, the up arrow will move to the high preset value, while the down arrow moves to the low preset value.
- "Pause" push button pause the brushless motor at the given speed and resume that same speed when pushed again.
- "Preset" push button sets the high, or low preset values and store them into memory.
- "Mode" push button selects between analog control (use analog knob), digital control (use up down buttons), and preset control (motor speed will either be low or high value) of motor speed. It will also be used to select control of brushed, or brushless motors when used in conjunction with the up/down push buttons.
- "aux on-off" push button switch turns PWM power on and off to the aux 2.1mm output jack.

- Multi-line LCD display similar in size and functionality of the following [product](#). It will display current mode, rpm, kv, volts, and which type of motor is being currently adjusted.
- “# motor poles” push button selects the numbers of poles of the brushless motor in order to correctly calculated RPMs.
- “display mode” push button selects which value (rpm, kv, volts, motor selected, mode) is the most prominent on the display.
- Both the PWM and brushless ESC can be used at the same time, but the speed can only be adjusted one at a time by using the “mode” button to select which one.
- Open-source firmware and user programmable using an internal access port to connect to a computer. The access point can be any low cost interface (i.e. serial port)
- Unit must fit in an enclosure that’s no more than 3”L x 4”W 1”H.

