



Master Car Speed Controller

Congratulations,

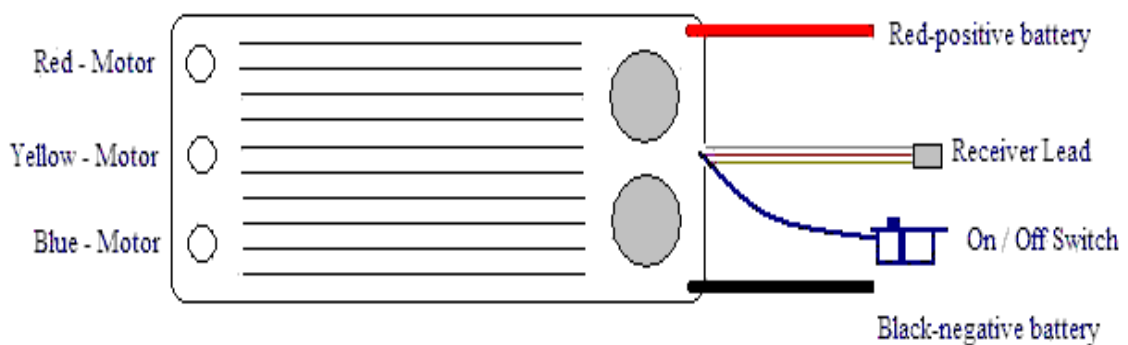
You have just purchased the latest generation Hacker sensorless speed controller, designed in conjunction with JETI to provide you with maximum performance from your hacker Brushless motor. By setting different modes this speed controller may also be used with other brands of brushless motors. To achieve maximum performance from your Brushless motor it is recommended that you read the following instructions.

Warning Notes:

Hacker speed controllers are designed for use in model applications only and should not be used for any other than intended purposes. The manufacturer takes no responsibility for damage occurring from any misuse of the speed controller from its intended purpose.

- Never leave the battery connected to your speed controller while unattended. Failure while unattended may cause fire and damage to model and surroundings.
- Take care to avoid incorrect connection of wires, reverse polarity will cause damage to unit. Different connector systems may be connected to the speed controller without voiding warranty.

Layout:



Check Receiver lead for correct connection

Receiver	Futaba	JR/Graupner	KO	Airtronics/Sanwa
Signal Wire	White	Orange	White	Blue
Positive Wire	Red	Red	Red	Red
Negative Wire	Black	Brown	Black	Black

Installation Notes:

- No use of crimped connections or terminals on the battery or motor wires. All connectors used should be soldered.
- Battery wires should be as short as possible, no longer than 15cm at most.
- Pay attention to polarity of battery wires, Reverse polarity will lead to damage of the speed controller.
- Never use a mains power supply unit as a power source, this may lead to damage of power supply and speed controller.
- Motor wires should be short as possible, however not as important as battery wire length and should be terminated with gold contact plugs.
- Receiver should be mounted away from power cables to reduce interference
- Test range of model on test bench before operating.
- Insulate all motor wires, as short circuit of motor wires will lead to damage of speed controller.
- Reverse the direction of motor rotation by swapping any 2 of the 3 motor wires

Specifications:

Model	Dimensions(mm)	Weight	Current(A)	Cells	Servos
Master Sport	66 x 31.5 x 29	77	66	6-12	2

Note that micro servos (in particular digital micro servos) have very high current draw and the BEC may not be able to support number of servos stated.

Installation:

- Use suitable screws to mount the motor into model paying attention that the screws do not penetrate too far into motor, otherwise damage may occur to motor.
- **Maximum depth of motor screws for C40 motor is 5mm**
- **Maximum depth of motor screws for B50 motor is 6mm**
- Connect required wire and connectors to speed controller and motor.
- Mount speed controller in well ventilated area and connect motor to speed controller. Connect receiver lead to receiver, checking polarity.

Start-up:

- Switch on Radio transmitter and set all throttle end points and travel adjustments to $\pm 100\%$.
- Set the throttle trim to centre.
- Check polarity of battery and speed controller wires. Make sure speed controller switch is off.
- Connect battery to speed controller and switch on. Avoid repeated connecting and disconnecting battery from speed controller. For speed controller without BEC connect power to receiver. Wait for beep from speed controller. While waiting for beep do not move the throttle on radio. If you do not hear a beep, switch off speed controller, disconnect battery and repeat procedure.

- If you still hear no beep, please check the following
 - Polarity of wires and connections.
 - Position of throttle stick on transmitter.
 - Charge of battery source
 - Power source for receiver on non BEC speed controls
- Beep is heard only once while switching on speed controller. This beep gives confirmation that your speed controller has calibrated to your transmitter.
- If you switch off the speed controller and switch back on without disconnecting the battery, you will not hear another calibration beep.

Setting Forward/Brake or Forward/Brake/Reverse Mode:

- The speed controller is supplied in Forward/Brake mode. If you wish to change to Forward/Brake/Reverse mode, use following procedure.
 - Switch on transmitter
 - Connect battery
 - Hold throttle at 100%
 - Switch on speed controller and receiver
 - Wait 5 seconds and you will hear a sequence of 4 tones
 - Immediately move the throttle into the neutral position and you will hear 2 tones
 - Forward/Brake/Reverse mode is now activated
- This mode is stored in the speed controller and is not changed by disconnecting the battery.
- When reconnecting battery and switching on speed controller, you will hear 1 confirmation beep for Forward/Brake mode and 2 beeps for Forward/Brake/Reverse mode.
- To switch between modes repeat above procedure again.

The Master Car speed controller can be adjusted to suit different types of brushless motors. Timing can be adjusted in 4 levels

- Timing 1
 - Factory setting
 - 2°- 5° of timing
 - Most effective setting for Hacker Brushless Motors
 - Also recommended for other 2 pole motors
- Timing 2
 - Corresponds to 10° of timing
 - Harder timing for 2 pole motors
 - Best suited for 4 pole motors
- Timing 3
 - Corresponds to 18° of timing
 - Best suited for 6 pole motors

- Timing 4
 - Corresponds to 30° of timing
 - Best suited for 6 pole and multi-pole motors

Setting Timing:

- Switch on transmitter
- Connect battery and hold throttle at full forward
- Switch on speed controller and wait 5 seconds
- You will hear 4 tones, wait for another 5 seconds
- You will hear single tone 5 times – Timing 1
- You will hear double tone 5 times – Timing 2
- You will hear triple tone 5 times – Timing 3
- You will hear quad tone 5 times – Timing 4
- Release the throttle to neutral during the above tones to set required timing (eg. release while listening to double tones to set controller to Timing 2)
- You will hear beep or double beep depending on forward/brake or forward/brake/reverse setting, configuration is now stored in speed controller

In addition to timing adjustment, the Master Car speed controller also offers switching frequency adjustments in 3 stages

Setting Switching Frequency:

- Procedure is the same as described for setting timing. Switching Frequency follows after timing 4.
- Keep throttle held after Timing 4
- You will hear Long tone 5 times – 8kHz
- You will hear Long & Short tones 5 times – 16kHz
- You will hear 2 Short tones 5 times – 32kHz
- Again release the throttle back to neutral during the required switching frequency
- You will hear confirmation beep(s)
- Switching frequency is programmed

Master Car controller also comes with a current limiter.

Setting Current limiter:

- Switch on transmitter
- Connect battery and hold throttle at full brake
- Switch on speed controller and wait for 5 seconds
- You will hear 4 tones, wait 5 seconds
- You will hear single tone 5 times – 30amps
- You will hear double tone 5 times – 45amps
- You will hear triple tone 5 times – 60 amps
- You will hear quad tone 5 times – open limit
- Release throttle to neutral during above tone to program required current limit.
- You will hear confirmation beep(s) depending on selected forward/Brake mode.
- Current limiter remains set until reprogrammed.

Master Car speed controller will switch off under the following circumstances

- If battery pack voltage drops below 5.3volts and/or 0.7volts per cell
- If operating temperature of speed controller reaches 110°C
- If proper radio signal is not received for more than 1 second

Warranty Terms and Conditions

In case of problems, read through instructions, contact place of purchase or distributor. Hobby shops are not authorized to replace speed controllers thought to be defective, all claims must be returned to distributor or factory.

Hacker Brushless Speed Controllers are covered by a 24-month warranty. Claims cover original customer only. Warranty does not cover the following: Suitability for specific operation, reverse or incorrect voltage, misuse like soldering inside of unit, poor installation, mechanical damage, or contact with water.

Warranty liability shall be limited to repairing speed controller to original specifications. We have no control over installation and use of this unit; therefore no liability shall be accepted for damage resulting from this unit. By installing and using this unit the user accepts all resulting liability.

Thank you for purchasing Hacker products. Enjoy!

Hacker Brushless Motors

Rainer Hacker

Thalbacher Str. 59

Tel.: 0049 (0) 8761-752 129

Fax.:0049 (0) 8761-754 314

EMAIL : info@hacker-motor.com

D-85368 Moosburg