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MXL-6s Electronic Speed Control Instructions

Covers Part #3377

Thank you for purchasing the Traxxas MXL-6s™ electronic speed control. The MXL-6s forward/reverse/brake electronic speed control simplifies brushless technology with easy and intuitive programming. The MXL-6s uses advanced circuit design that allows sensorless brushless motors to operate with the smoothness and precision of the best brushed systems. The MXL-6s comes with the peace-of-mind of the Traxxas Lifetime Electronics Warranty and unmatched Traxxas customer support. The MXL-6s is not a toy. It is a sophisticated electronic device capable of delivering large amounts of current. Children under 14 years of age require adult supervision for use of the MXL-6s. If you have questions or need assistance call us at 1-888-TRAXXAS*.

Specifications:

Input voltage	18 NiCad/NiMH / 6S LiPo (Max 25.2 Volts)
Supported motors	Brushed / Brushless / Sensorless Brushless
On-resistance	0.0003 ohms per phase
Battery connector	Traxxas High-Current Connector
Motor connectors	TRX 6.5mm bullet connectors
Motor/battery wiring	10-gauge Maxx® Cable
Case size (l/w/h)	56mm (2.2")/ 48mm (1.9")/ 36mm (1.4")
Weight	121g (4.27oz)

Important Precautions

MXL-6s Speed Control

- **Water and Electronics Do Not Mix:** Your MXL-6s brushless power system is waterproof for use in mud, snow, puddles and other wet conditions. Make certain the other components of your model are waterproof or have sufficient water resistance before driving in wet conditions.
- **Disconnect the Batteries:** Always disconnect the battery pack from the speed control when not in use.
- **Transmitter on First:** Switch on your transmitter first before switching on the speed control to prevent runaways and erratic performance.
- **Don't Get Burned:** The heat sink can get extremely hot, so be careful not to touch it until it is cool. Supply adequate airflow for cooling.
- **Use Stock Connectors:** If you decide to change the battery or motor connectors, only change one battery or motor connector at a time. This will prevent damage from accidentally mis-wiring the speed control. Please note that modified speed controls can be subject to a rewiring fee when returned for service. Removing the battery connector on the speed control or using the same-gender connectors on the speed control will void the product's warranty.
- **Insulate the Wires:** Always insulate exposed or damaged wiring with heat shrink tubing to prevent short circuits

Batteries and Battery Charging

The MXL-6s Power System uses rechargeable batteries that must be handled with care for safety and long battery life. Make sure to read and follow all instructions and precautions that were provided with your battery packs and your charger. It is your responsibility to charge and care for your battery backs properly. In addition to your battery and charger instructions, here are some more tips to keep in mind.

- Never leave batteries to charge unattended.
- Remove the batteries from the model while charging.
- Allow the battery packs to cool off between runs (before charging).
- Always unplug the battery from the electronic speed control when the model is not in use and when it is being stored or transported.
- Do not use battery packs that have been damaged in any way.
- Do not use battery packs that have damaged wiring, exposed wiring, or a damaged connector.
- Children should have responsible adult supervision when charging and handling batteries.

LiPo Batteries

Lithium Polymer (LiPo) batteries are becoming popular for use in R/C models due to their compact size, high energy density, and high-current output. However, these types of batteries require special care and handling procedures for long life and safe operation. **WARNING:** LiPo batteries are intended only for advanced users that are educated on the risks associated with LiPo battery use. **Traxxas does not recommend that anyone under the age of 14 use or handle LiPo battery packs without the supervision of a knowledgeable and responsible adult.**

The MXL-6s electronic speed control is able to use LiPo batteries with nominal voltage not to exceed 11.1 volts (3S packs) for each battery (6S total). LiPo batteries have a minimum safe discharge voltage threshold that should not be exceeded. The MXL-6s electronic speed control is equipped with built-in Low-Voltage Detection that alerts the driver when LiPo batteries have reached their minimum voltage (discharge) threshold. **It is the driver's responsibility to stop immediately to prevent the battery pack from being discharged below its safe minimum threshold.**

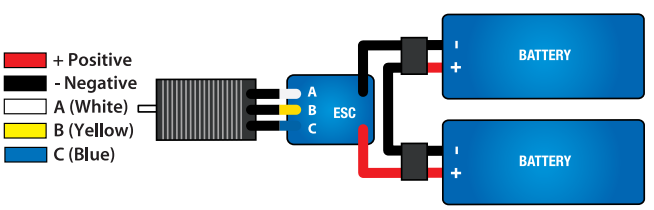
Low-Voltage Detection on the speed control is just one part of a comprehensive plan for safe LiPo battery use. **It is critical for you, the user, to follow all other instructions supplied by the battery manufacturer and the charger manufacturer for proper charging, use, and storage of LiPo batteries.** Make sure you understand how to use your LiPo batteries. Be aware that Traxxas shall not be liable for any special, indirect, incidental, or consequential damages arising out of the installation and/or use of LiPo batteries in Traxxas products.

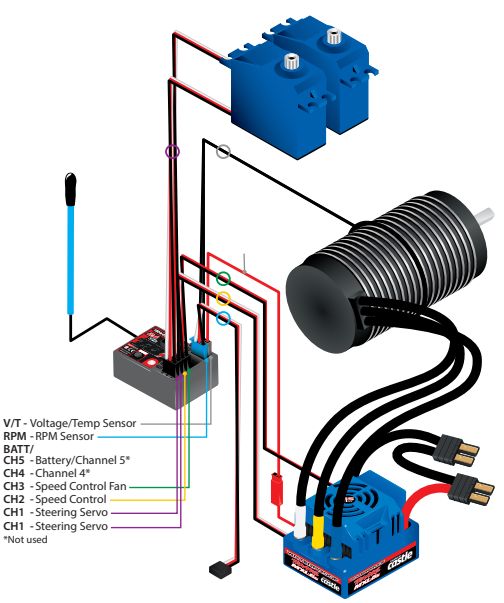
If you have questions about LiPo battery usage, please consult with your local hobby dealer or contact the battery manufacturer.

Installation

Attach the MXL-6s speed control to the chassis in the original speed control location using the included double-sided servo tape and mounting bracket.

MXL-6s Wiring Diagram





*U.S. Customers Only

Traxxas, 6200 Traxxas Way, McKinney, TX 75070, Phone: 972-265-8000, Fax: 972-265-8011, e-mail: support@Traxxas.com

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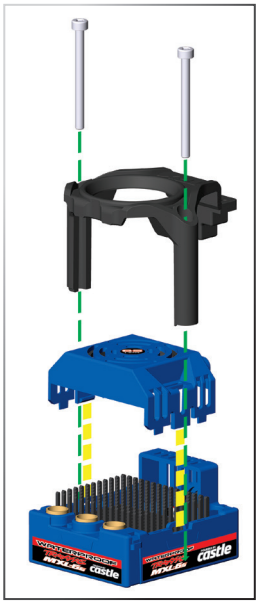
MXL-6s Cooling Fan

The cooling fan on the MXL-6s ESC is not water resistant. To avoid damaging the fan, it must be removed prior to driving your model in wet conditions. To remove the cooling fan:

1. Remove the cover from the receiver box and unplug the connector.
2. Reinstall the receiver box cover.

Note: When reinstalling the receiver box cover, ensure that the O-ring is properly seated in the groove around the receiver box (for more information, see "Receiver Box: Maintaining a Watertight Seal" in your Owner's Manual).

3. Remove the two 3x35mm cap screws from the ESC mount. Remove the ESC mount.
4. Release the two tabs on the side of the fan shroud to remove it from the ESC.
5. Remove the fan from the shroud.
6. Reinstall the shroud on the ESC.
7. Reinstall the ESC mount over the ESC. Secure the mount with the two 3x35mm cap screws.



Transmitter Setup

Before attempting to program your MXL-6s, it is important to make sure your TQi transmitter is properly adjusted (set back to the factory defaults). Otherwise, you may not get the best performance from your speed control.

The transmitter should be adjusted as follows:

1. Set the throttle neutral switch to the 50/50 setting. This adjusts the transmitter's throttle trigger throw to 50% for throttle and 50% for braking and reverse. Experienced users may wish to use the 70/30 setting if more broad proportional control is desired in forward than with braking and reverse. This might be desirable in a racing environment where reverse is disabled.
2. Set the throttle trim control to the middle 0 setting.
3. Set the Channel 2 servo reversing switch to the left position. Do not change the position of any of the servo reversing switches after programming the MXL-6s.
4. You are now ready to program your speed control.

Low-Voltage Detection Setting

The MXL-6s is optimized to operate out of the box with these battery configurations:

- 7-cell (8.4v) NiMH batteries (2)
- 2S (8.4v) LiPo batteries (2)
- 3S (11.1v) LiPo batteries (2)

Note: The low-voltage detection (LiPo mode) does NOT need to be disabled when using 7-cell (8.4v) NiMH batteries (2).

If you want to disable Low-Voltage Detection while running NiMH batteries in your model, follow the steps below to access the programming mode. **Never use LiPo batteries while Low-Voltage Detection is disabled.**

1. Turn your transmitter on and hold full throttle.
2. While holding full throttle, plug a fully charged battery into the speed control. **Note :** You may need assistance to complete this step.
3. Continue to hold full throttle. After a few seconds, you will hear four consecutive beeps, signaling full-throttle calibration.
4. Continue to hold full throttle. Once you hear a second set of four beeps, release the throttle to neutral. You are now in programming mode.

Note : Low-Voltage Detection is the seventh programming mode. In order to skip Programming Modes 1–6, make sure you push the throttle trigger to REVERSE, then release to neutral, as indicated in the steps below. Failure to do so may cause unintended reprogramming of your speed control, resulting in poor performance of your vehicle.

5. Push the throttle trigger to the reverse position and hold until the speed control beeps quickly, then release. The speed control will beep once, pause, and then beep twice to signify that you are in Programming Mode 1, Option 2.
6. Continue to push reverse/release to neutral until you hear seven beeps, a pause, and then one beep, signaling you are in Programming Mode 7, Option 1.
7. Pull the trigger to full throttle and hold until the speed control beeps quickly, then release. This will disable Low-Voltage Detection. You should hear eight beeps, a pause, then one beep, signaling you have moved to the next programming mode.
8. At this point, you can power off the speed control; then, power it back on to return to normal operation, or you can continue to push reverse/release to neutral six more times, making sure that you hear the fast confirmation beeps for each action. After the sixth time, the speed control will emit a tone, indicating the end of the programming cycle and the return to normal operation.

Note: To enable Low-Voltage Detection for use with LiPo batteries, follow steps 1–5 above. For steps 6 and 7, continue to push reverse/release to neutral until you hear seven beeps, a pause, and then two beeps. Pull the trigger to full throttle and hold until the speed control beeps quickly, then release. This will enable Low-Voltage Detection. Complete step 8 to return to normal operation.

If you have questions or require technical assistance while performing this procedure, please contact Traxxas Technical Support at 1-888-TRAXXAS (1-888-872-9927). Outside of the US, call +1-972-265-8000.

MXL-6s Setup Programming (Calibrating your ESC and transmitter)

The MXL-6s speed control should not need reprogramming with normal use; however, if you install a different radio system in your model, or change the transmitter's throttle-neutral setting from 50/50 to 70/30, you will need to reprogram the speed control. Follow these instructions to reprogram the speed control:

1. Install the batteries into the battery compartments and plug the batteries into the speed control.
2. Switch on your transmitter.
3. Hold full throttle while you switch on the MXL-6s controller. After a few seconds, you will hear multiple tones and the RED LED will shine.
4. Hold full brake. After a few seconds, you will hear multiple tones and the YELLOW LED will shine.
5. Release the trigger to the neutral position. After a few seconds, you will hear multiple tones and ALL THE LEDs will shine.
6. Wait a few more seconds for the speed control to 'arm,' indicated by a double-tone. You are now ready to drive.

Disconnect Batteries After Use

Always disconnect the batteries from the speed control when you are finished using your vehicle. The switch on the speed control only shuts off power to the receiver and servos. The speed control continues to draw power as long as it is plugged in and may over-discharge your batteries if they are left connected to the speed control.

The Traxxas MXL-6s electronic speed control is powered by Castle. Additional features and instructions are available in the Castle Creations Driver's Ed Guide at Traxxas.com.

Traxxas High Current Connector

Your MXL-6s is equipped with the Traxxas High-Current Connector. Standard connectors restrict current flow and are not capable of delivering the power needed to maximize the output of the MXL-6s. The Traxxas connector's gold-plated terminals with a large contact surfaces ensure positive current flow with the least amount of resistance. Secure, long-lasting, and easy to grip, the Traxxas connector is engineered to extract all the power your battery has to give.

To run this system, your batteries must be equipped with Traxxas High-Current Connectors. Batteries can either be purchased new with Traxxas connectors installed or Traxxas connectors can be purchased to install on battery packs you already own. For best performance, your system requires NiMH battery packs that have cells rated for high discharge and use high-quality, low-resistance assembly techniques. Cheaply made battery packs do not retain their performance characteristics after repeated uses in high-powered electric applications. They will lose their punch and run time and may require frequent replacement. In addition, poor-quality, high-resistance cell connectors could fail, requiring disassembly and repair. The main goal is to reduce all sources of high resistance in the pack. This includes the connector, the wire, and the bars attaching the cells together. High pack resistance will create additional heat and rob you of the full power the cells are capable of producing.

Troubleshooting Guide

This guide describes possible speed control problems, causes, and simple solutions. Check these items before contacting Traxxas.

Steering channel works but the motor will not run:
- The speed control has thermally shut down. Allow the speed control to cool down. Use a milder motor or a smaller pinion gear. Check the drive train for restrictions. Check the motor connections. Check the motor.
- Make sure the speed control is plugged into Channel 2 (the throttle channel) on the receiver. Check operation of the throttle channel with a servo.
- Bad battery or motor. Check the operation with known good battery and motor.
- MXL-6s: Possible internal damage. Return the MXL-6s to Traxxas for service.

Steering servo does not work:
- Check the wires, radio system, battery and motor connectors, and the battery pack.
- Possible internal damage. Test the servo on channel 2 of the receiver or in another model. Return the servo to Traxxas for service.

Motor runs backwards:
- Motor wired backwards - Check the wiring and correct.

Motor runs as soon as the battery is plugged in:
- Internal damage, return MXL-6s to Traxxas for service.

MXL-6s will not go into programming mode:
- Make sure the MXL-6s is plugged into Channel 2 (the throttle channel) on the receiver. If it is plugged into the battery terminal, it will not go into programming mode.
- Be sure the MXL-6s is turned off before trying to program or select a profile.
- Unplug battery, reconnect, and repeat programming instructions.
- Check if transmitter is turned on.

Receiver glitches/throttle stutters during acceleration:
- The receiver or antenna is too close to power wires or the batteries.
- Bad connections - Check the wiring and connectors.
- Motor worn - Replace the motor.
- Excessive current to motor (over-geared motor) - Use a smaller pinion gear.
- Battery voltage low. Recharge and/or verify charged status.
- Disconnected brushless motor lead. Reconnect according to appropriate wiring diagram.

Model runs slowly / slow acceleration:
- Check the motor and battery connectors.
- Bad battery or motor. Check the operation with known good battery and motor.
- Incorrect transmitter or speed control adjustment. Refer to the Transmitter Setup and MXL-6s Setup Programming sections.
- MXL-6s is in Thermal Shutdown Protection. Allow to cool and check for proper gearing.
- MXL-6s has entered Low-Voltage Protection.

Model will not go in reverse:
- Make sure the throttle trim is in the correct position (LED on MXL-6s should be lit solid at neutral throttle)
- If brushed motor is being used, verify proper connection to MXL-6s. Correct if necessary.

MXL-6s Warranty Information

Traxxas warrants your Traxxas electronic component to be free from defects in materials or workmanship for a period of thirty (30) days from the date of purchase. Before returning any product for warranty service, please contact our service department (**1-888-TRAXXAS**)* to discuss the problem you are having with the product. After contacting Traxxas, send the defective unit along with your proof of purchase indicating the date purchased, your return address, e-mail, a daytime phone number, and a brief description of the problem to:

Traxxas
6200 Traxxas Way
McKinney, TX 75070

If the component is found to be defective, it will be repaired or replaced at no charge. The warranty does not cover damage caused by the following:
- Allowing foreign material to enter speed control or get onto PC board.
- Using other than 18 NiCad/NiMH / 6S LiPo (Max 25.2 Volts) input voltage.
- Removing the stock battery connectors.
- Using the same gender connectors on the speed control's motor and battery connections.
- Cross-connection of the battery/motor(s).
- Reverse voltage application.
- Incorrect installation or wiring.
- Components worn by use.
- Short-circuiting the heat sinks.
- Use without the heat sinks.
- Splices to the input wire harness.
- Disassembling the case.
- Tampering with the internal electronics.
- Incorrect wiring of an FET servo.
- Allowing exposed wiring to short-circuit.
- Any damage caused by crash, flooding, or act of God.

In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice. All warranty claims will be handled by Traxxas. Because Traxxas has no control over the use and future installations of the MXL-6s, no liability may be assumed nor will be accepted for damage resulting from the use of this product. Every ESC is thoroughly tested and cycled before leaving the Traxxas facility and is, therefore, considered operational. By the act of operating/connecting speed control, the user accepts all resulting liability. Traxxas makes no other warranties expressed or implied. This warranty gives you specific legal rights which vary from state to state. After the expiration of the standard 30-day warranty, use the Traxxas Lifetime Electronics Warranty to cover service and repairs. Documents and forms are provided with your MXL-6s.

If you have questions or need technical assistance, call Traxxas at

1-888-TRAXXAS

(1-888-872-9927) (U.S. residents only)

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