

TRAXXAS EVX-2



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Electronic Speed Control Instructions

Covers Part #3019R



Thank you for purchasing the Traxxas EVX-2 electronic speed control. The EVX-2 delivers smooth, precise, full-proportional control over your speed in forward and reverse. EZ-Set® push-button setup, multi-color LED, and three easy-to-program drive profiles provide convenient, customized operation. Low Voltage Detection enables the EVX-2 to be used with LiPo batteries. The EVX-2

comes with the peace-of-mind of the Traxxas Lifetime Electronics Warranty and unmatched Traxxas customer support. The EVX-2 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 EVX-2. If you have questions or need assistance call us at 1-888-TRAXXAS.

Specifications:	
Input Voltage.....	6 to 14-cells; 2S to 4S LiPo
Case Size.....	2.27"W x 2.00"D x 1.05"H
Weight (heat sinks/no heat sinks).....	4.1oz / 3.6 oz
Motor Limit (550 Size).....	12-turns
On-Resistance-Forward (@Trans).....	0.004 Ohms
On-Resistance-Reverse (@Trans).....	0.004 Ohms
Rated Current - Forward.....	180 amps
Rated Current - Reverse.....	180 amps
Braking Current.....	360 amps
Continuous Current (@100°F amb.).....	30 Amps
BEC Voltage.....	6.0 volts DC
BEC Current.....	2.5 amps
Power Wire.....	14 Gauge / 3"
Input Harness Wire.....	26 Gauge / 9.5"
Transistor Type.....	MOSFET
PWM Frequency.....	1700 Hertz
Protection.....	Thermal Shutdown
Single Button Setup.....	Yes
* Must be properly geared.	
Profile Selection:	
Profile #1 (Sport Mode):	100% Forward, 100% Brakes, 100% Reverse
Profile #2 (Race Mode):	100% Forward, 100% Brakes, No Reverse
Profile #3 (Training Mode):	50% Forward, 100% Brakes, 50% Reverse

Important Precautions

Your EVX-2 is an extremely powerful electronic device capable of delivering high current. Please closely follow these precautions to prevent damage to the speed control or other components.

EVX-2 General Precautions

- **Disconnect the Batteries:** Always disconnect the battery packs 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 transistor tabs and the heat sinks can get extremely hot, so be careful not to touch them until they cool. Supply adequate airflow for cooling.
- **Always Use Heat Sinks:** Three heat sinks are factory-installed on the speed control and must be used for maximum cooling and performance.
- **6 to 14-cells; 2S to 4S LiPo Only:** Always adhere to the minimum and maximum limitations of the EVX-2 as stated in the specifications table. Do not mix battery types (NiMH or NiCad), brands or capacities. Use the same voltage and capacity for both batteries. Using mismatched battery packs could damage the batteries and electronic speed control.



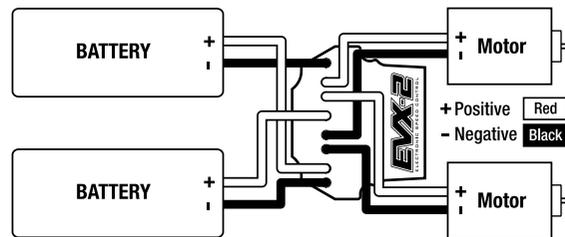
Do not mix battery capacities. Use two batteries with the same capacity.



Use batteries that are exactly the same cell type, brand, voltage and capacity.

- **Connectors:** If you decide to change the battery or motor connectors, only change one battery or motor connector at a time. This will prevent accidentally mis-wiring the speed control. If the EVX-2 is not wired exactly as shown in the diagram below, it can be damaged! Please note that modified speed controls can be subject to a rewiring fee when returned for service.
- **No Reverse Voltage:** The speed control is not protected against reverse polarity voltage. When changing the battery and/or motor, be sure to install the same type of connectors to avoid reverse polarity damage to the speed control. Removing the battery connectors on the speed control or using the same-gender connectors on the speed control will void the product's warranty.
- **Do Not Let the Transistor Tabs Touch:** Never allow the three separate transistor banks to touch each other or any exposed metal. This will create a short circuit and damage the speed control. (For example, laying a metal tool across the heat sinks can damage the speed control.)

EVX-2 Wiring Diagram



EVX-2 Advanced Precautions

- **Motor Limit:** EVX-2 has a 12-turn 550 modified motor limit when the motor is properly geared. If the motor or speed control is overheating, try a smaller pinion gear. Do not attempt to use a more powerful motor (fewer turns) than the above mentioned motor limits or you could experience frequent thermal shutdown.
- **Insulate the Wires:** Always insulate exposed wiring with heat shrink tubing to prevent short circuits.
- **Use Neutrally Timed Motors:** For reverse use, the motors must have 0° timing. Modified motors (with adjustable end bells) timed to 0° or Johnson/ Mabuchi (closed end bell) motors are recommended. Using motors with other than 0° timing will draw excess current in reverse, and can result in the speed control overheating and premature motor wear.
- **Motor Capacitors Required:** Ceramic capacitors should be properly installed on every motor to prevent radio interference. These are already installed on the factory Titan motor.
- **No Schottky Diodes:** External schottky diodes are not compatible with reversing speed controls. Using a schottky diode with the EVX-2 will damage the ESC and void the 30-day warranty.
- **Note:** This speed control is not intended for marine use.

Installation

Here are some tips for choosing a location for the speed control:

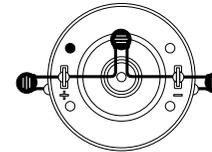
- The EVX-2 does not use a conventional on/off switch. Pressing the EZ-Set button on the speed control turns it on and off. It is not necessary to install an on/off switch into the wiring harness.
- Make sure there is adequate ventilation for the heat sink. If you are planning to operate the speed control at the higher limits of its capabilities, cut ventilation holes into the body for the heat sinks. Proper ventilation and cooling will prevent premature thermal shutdown.
- Mount the speed control where it will be protected from crash damage. Protect the heat sinks from coming in contact with metal that could short the banks of transistors. Also protect the speed control from dirt and debris kicked up by the tires.
- Mount the speed control where you will have easy access to the plugs and the on/off (EZ-Set) button without having to remove the body.

Mount the speed control so that none of the power components (wiring, motor, ESC) contacts any part of the radio system, particularly the antenna wire. The receiver should be mounted so the antenna wire can be extended as far away from the speed control as possible. The antenna wire should be extended vertically in the mast and not wrapped on the chassis under the body. Excess antenna wire should not be coiled on the chassis. Servo cables and the antenna wire should not cross or come in contact with any of the motor or battery wires. These steps will help reduce the possibility of radio interference.

Graphite or metal chassis have been known to transmit radio noise generated by the motor. If the receiver is to be mounted on the chassis, position it so the crystal and antenna are as far away from the chassis as possible. This may require you to mount the receiver on its side. This will reduce the chance of picking up radio interference from the motor.

When mounting the speed control with double-sided servo tape, clean both application surfaces thoroughly with alcohol to remove any grease, dirt, oil, fingerprints, etc. The surfaces must be perfectly clean for maximum adhesion.

The motors require capacitors to reduce the possibility of radio interference. If your motors are not equipped with capacitors, install the capacitors supplied with the EVX-2 as shown in the diagram below.



Transmitter Setup

Traxxas TQ Radio Systems

Before attempting to program your EVX-2, it is important to make sure your TQ 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 EVX-2.
4. You are now ready to program your speed control.

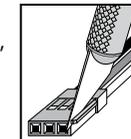
Aftermarket (Non-Traxxas) Transmitters

The following instructions are provided as a general reference only for those who are using non-Traxxas transmitters. Consult your transmitter's instructions for information on how to change the settings.

1. Set the High ATV (adjustable travel volume) or EPA (end point adjustment) to the maximum setting. This is the amount of servo throw at full throttle.
2. Set the Low ATV, EPA or ATL (low side only trim adjustment) to the maximum setting. This is the amount of servo throw at full brakes or reverse.
3. Set the throttle trim to the middle (neutral setting).
4. Set the throttle channel reversing switch to either position. Do not change the switch position after programming.
5. Set the trigger throw adjustment to 50% throttle and 50% brake (either mechanical or electronic).
6. Set the exponential setting (if equipped) to the zero or fully linear setting.

Aftermarket Receivers

The EVX-2 is compatible with most aftermarket receivers. By removing the tab on the edge of the power connector, the EVX-2 can be plugged directly into some models of Futaba®, Airtronics®, Hitec® and JR® receivers. Please refer to the manufacturer's wiring diagrams that came with your receiver. On the EVX-2, the red wire is positive, the black wire is negative, and the white wire is the control wire. Warning: On some older Airtronics® radio systems, the positive and negative terminals are opposite of the EVX-2 and an adapter is required. Crossing the red (+) and black (-) wires could damage the receiver and the EVX-2. Study the manufacturer's wiring diagrams closely, or consult your hobby dealer.



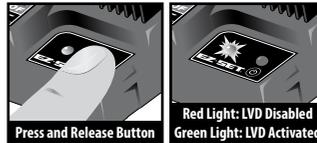
EVX-2 Battery Setting (Low-Voltage Detection Setting)

The Low-Voltage Detection circuitry constantly monitors the battery voltage. When the battery voltage begins to reach the minimum recommended discharge voltage threshold for LiPo battery packs, the EVX-2 will limit the power output to 50% throttle. When the battery voltage attempts to fall below the minimum threshold, the EVX-2 will shut down all motor output. The LED on the speed control will slowly blink red, indicating a low voltage shutdown. The EVX-2 will stay in this mode until a fully charged battery is connected.

Your model includes a Power Cell NiMH battery. The EVX-2 speed control's Low Voltage Detection has been disabled for best performance with this battery. The speed control's LED will glow red when it is turned on, indicating Low Voltage Detection is disabled. Be certain to activate Low-Voltage Detection if you install LiPo batteries in your model. **Never use LiPo batteries while Low-Voltage Detection is disabled.**

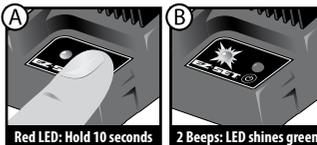
Verify that Low-Voltage Detection is DISABLED:

1. Turn on the transmitter (with the throttle at neutral).
2. Connect a fully charged battery pack to the EVX-2.
3. Press and release the EZ-Set button to turn the EVX-2 on. If the LED is solid red, then the Low-Voltage Detection is DISABLED (not safe to use LiPo batteries). If the LED is solid green, then Low-Voltage Detection is ACTIVATED.



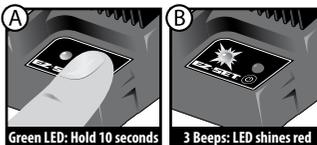
To activate Low-Voltage Detection (LiPo setting):

1. Make sure the LED on the EVX-2 is on and shines red.
2. Press and hold the EZ-Set® button (the LED will turn off) (A). After ten seconds, the motor will beep twice and the LED will shine green. Release the button (B).
3. Low-Voltage Detection is now ACTIVATED.



To disable Low-Voltage Detection (NiMH setting):

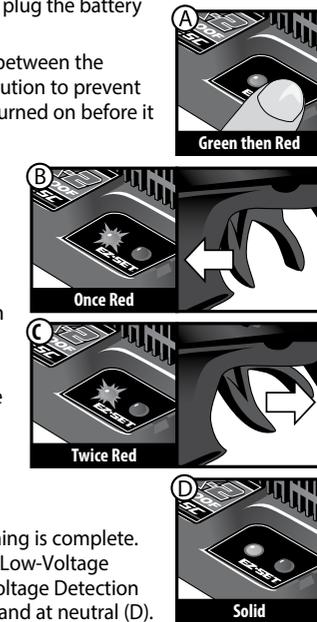
1. Make sure the LED on the EVX-2 is on and shines green.
2. Press and hold the EZ-Set® button (the LED will turn off) (A). After ten seconds, the motor will beep three times and the LED will shine red. Release the button (B).
3. Low-Voltage Detection is now DISABLED.



Setup Programming (Calibrating your ESC and transmitter)

Read through all of the following programming steps before you begin. If you get lost during programming or receive unexpected results, simply unplug the battery, wait a few seconds, plug the battery back in, and start over.

1. Disconnect each of the motor wires between the EVX-2 and the motors. This is a precaution to prevent runaway when the speed control is turned on before it is programmed.
2. Connect two fully charged battery packs to the EVX-2.
3. Turn on the transmitter (with the throttle at neutral).
4. Press and hold the EZ-Set button (A). The LED will first turn green and then red. Release the EZ-Set button.
5. When the LED blinks RED ONCE. Pull the throttle trigger to the full throttle position and hold it there (B).
6. When the LED blinks RED TWICE. Push the throttle trigger to the full reverse and hold it there (C).
7. When the LED turns solid, programming is complete. The LED will continuously shine red (Low-Voltage Detection disabled) or green (Low-Voltage Detection activated) indicating the EVX-2 is on and at neutral (D).



EVX-2 Operation

To operate the speed control and test the programming, reconnect the motor wires and place the vehicle on a stable block or stand so that all of the driven wheels are off the ground.

Note that in steps 1-8 below, Low-Voltage Detection is DISABLED (factory default) and the LED shines red. If Low-Voltage Detection is ACTIVATED, the LED will shine green instead of red in steps 1-8 below. **Never use LiPo batteries while Low-Voltage Detection is disabled.**

1. With the transmitter on, press and release the EZ-Set button. The LED will shine RED. This turns the EVX-2 on. If you press and release too quickly, you may hear the steering servo jump but the LED may not stay on. Simply press the button again until the LED shines RED and then release.
2. Apply forward throttle. The LED will turn off until full throttle power is reached. At full throttle, the led will shine RED.
3. Move the trigger forward to apply the brakes. Note that braking control is fully proportional. The LED will turn off until full braking power is reached. At full brakes, the LED will shine RED.
4. Return the throttle trigger to neutral. The LED will shine RED.
5. Move the throttle trigger forward again to engage reverse (Profile #1). The LED will turn off. Once full reverse power is reached, the LED will shine RED.
6. To stop, return the throttle trigger to neutral. Note that there is no programmed delay when changing from reverse to forward. Use caution to avoid slamming the speed control from reverse to forward. On high-traction surfaces, this could result in transmission or driveline damage.
7. To turn the EVX-2 off, press and hold the EZ-Set button for 1½ seconds or until the red LED turns off.
8. The EVX-2 is equipped with thermal shutdown protection to guard against overheating caused by excessive current flow. If the operating temperature exceeds safe limits, the EVX-2 will automatically shut down. The LED on the face of the EVX-2 will rapidly blink red, even if the throttle trigger is moved back and forth. Once the temperature returns to a safe level, the EVX-2 will once again function normally.

Throttle Neutral Protection

Your model's EVX-2 speed control also features Throttle Neutral Protection. If the transmitter's throttle trim setting is changed while the speed control is switched off, Throttle Neutral Protection prevents the speed control from activating the motor until the throttle trim is corrected. Throttle Neutral Protection also prevents the model from suddenly accelerating if the speed control is switched on while the transmitter's trigger is being held. When the trigger is returned to neutral, the EVX-2 will operate properly.

EVX-2 Profile Selection

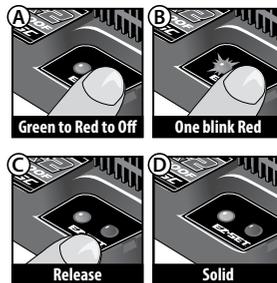
The speed control is factory set to Sport Mode (100% forward, brakes, and reverse). To disable reverse (Race Mode) or to allow 50% power (patent pending Training Mode), follow these steps. The speed control should be connected to the receiver and the transmitter adjusted as described previously. The profiles are selected by entering the programming mode.

Profile Description

Profile #1 (Sport Mode): 100% Forward, 100% Brakes, 100% Reverse
Profile #2 (Race Mode): 100% Forward, 100% Brakes, No Reverse
Profile #3 (Training Mode): 50% Forward, 100% Brakes, 50% Reverse

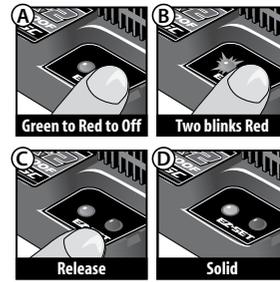
Selecting Sport Mode (Profile #1: 100% Forward, 100% Brakes, 100% Reverse)

1. Connect a fully charged battery pack to the EVX-2 and turn on your transmitter.
2. With the EVX-2 off, press and hold the EZ-Set button until the LED turns solid green, then solid red and then begins blinking red (indicating the Profile numbers).
3. When the LED blinks RED ONCE, release the EZ-Set button.
4. The LED will blink and then turn solid green (Low-Voltage Detection ACTIVE) or red (Low-Voltage Detection DISABLED). The model is ready to drive.



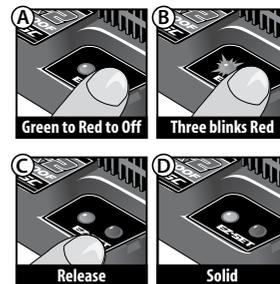
Selecting Race Mode (Profile #2: 100% Forward, 100% Brakes, No Reverse)

1. Connect a fully charged battery pack to the EVX-2 and turn on your transmitter.
2. With the EVX-2 off, press and hold the EZ-Set button until the LED turns solid green, then solid red and then begins blinking red (indicating the Profile numbers).
3. When the LED blinks RED TWICE, release the EZ-Set button.
4. The LED will blink and then turn solid green (Low-Voltage Detection ACTIVE) or red (Low-Voltage Detection DISABLED). The model is ready to drive.



Selecting Training Mode* (Profile #3: 50% Forward, 100% Brakes, 50% Reverse)

1. Connect a fully charged battery pack to the EVX-2 and turn on your transmitter.
2. With the EVX-2 off, press and hold the EZ-Set button until the LED turns solid green, then solid red and then begins blinking red (indicating the Profile numbers).
3. When the LED blinks RED THREE TIMES, release the EZ-Set button.
4. The LED will blink and then turn solid green (Low-Voltage Detection ACTIVE) or red (Low-Voltage Detection DISABLED). The model is ready to drive.



Note: If you missed the mode you wanted, keep the EZ-Set button pressed down and the blink cycle will repeat until the button is released and a Mode is selected.

LED Codes and Protection Modes

• **Solid Green:** EVX-2 power-on light. Low-Voltage Detection is ACTIVATED (LiPo setting).

• **Solid Red:** EVX-2 power-on light. Low-Voltage Detection is DISABLED (NiCad/NiMH setting). Never use LiPo batteries while Low-Voltage Detection is disabled.

• **Fast Blinking Red:** The EVX-2 is equipped with thermal shutdown protection to guard against overheating caused by excessive current flow. If the operating temperature exceeds safe limits, the EVX-2 will automatically shut down. Let the EVX-2 cool. Make sure your model is properly geared for the conditions.

• **Slow Blinking Red (with Low-Voltage Detection on):** The EVX-2 has entered Low-Voltage Protection. When the battery voltage begins to reach the minimum recommended discharge voltage threshold for LiPo battery packs, the EVX-2 will limit the power output to 50% throttle. When the battery voltage attempts to fall below the minimum threshold, the EVX-2 will shut down all motor output. The LED on the speed control will slowly blink red, indicating a low-voltage shutdown. The EVX-2 will stay in this mode until a fully charged battery is connected.

• **Fast Blinking Green:** The EVX-2's LED will blink fast green if Throttle Neutral Protection is activated, or if the speed control is not receiving a signal. Make certain the speed control is properly plugged into the receiver and the transmitter is switched on. If this does not restore normal operation, then the EVX-2 is indicating the transmitter's Throttle Trim is incorrectly set. Reset the throttle trim to the "0" position.

• **Flashing Red and Green:** The EVX-2 has entered Over Voltage Protection. If a battery with too high voltage (over 14.8 volts) is used, the EVX-2 will go into a failsafe mode.

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(s) will not run:

- The motor(s) could be bad or have a damaged brush. Check the motor(s) and motor connections by supplying power directly to the motor(s). **Note:** Disconnect the motor(s) from the ESC before testing. Remove the pinion gear from the motor(s) or elevate the driving wheels to avoid a runaway and damage to the vehicle.
- The speed control has thermally shut down (look for a solid green LED). Allow the speed control to cool down. See the overheating section.
- Make sure the EVX-2's power cable is plugged into the throttle channel of the receiver (Channel 2). Check the operation of the radio system's throttle channel with a servo.
- Possible internal damage. Return the EVX-2 to Traxxas for service.

Motor and steering servo do not work:

- Check the wires, radio system, crystals, battery and motor connectors, and the battery packs.
- Possible internal damage. Return the EVX-2 to Traxxas for service.

EVX-2 will not go into programming mode:

- Make sure the EVX-2 is plugged into Channel 2 (the throttle channel) on the receiver. If it is plugged into Channel 3 or the battery terminal, it will not go into programming mode.
- Be sure the EVX-2 is turned off before trying to program or select a profile.
- Unplug battery, reconnect, and repeat programming instructions.

Motor(s) run backwards:

- Motor(s) wired backwards: check the wiring and correct.
- Backwards motor timing: reverse the motor end bells.

EVX-2 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:

- Using other than 6 to 14-cells (7.2 to 16.8 volts DC) or 2S to 4S LiPo 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.
- Using motor(s) with fewer than 12-turns (550 size).
- Incorrect installation or wiring.
- Components worn by use.
- Short-circuiting the heat sinks.
- Use without the heat sinks.

Receiver glitches/throttle stutters during acceleration:

- Motor capacitors broken or missing: check and replace the capacitors.
- The receiver or antenna is too close to power wires or batteries.
- Bad connections: check the wiring and connectors.
- Motor worn: replace the motor.
- Excessive current to the motor: use a milder motor or a smaller pinion gear.

Model runs slowly/slow acceleration:

- Check the motor and battery connectors.
- Check to see if EVX-2 is in Profile #3 (50% throttle)
- Bad battery or motor: check the operation with known good batteries (freshly charged) and motor.
- Incorrect transmitter or speed control adjustment. Reprogram the EVX-2.
- Motor is improperly geared: use a milder motor or a smaller pinion gear.
- Check the drive train for binding or restrictions.

EVX-2 overheats and shuts down:

- Overloading the motor (running through tall grass, binding in the drivetrain).
- Insufficient ventilation for the heat sinks. Cut ventilation holes in the body or relocate the EVX-2.
- Motor may exceed maximum specification. The EVX-2 is limited to motors with no fewer than 19-turns (550 size) with molex connectors and 12-turns (550 size) with Traxxas High-Current Connectors.
- Motor is improperly geared. Use a milder motor or a smaller pinion gear.
- Check the drivetrain for restrictions.

- Removing the capacitors from the stock motor.
- Not installing capacitors on new motors (recommended: three 0.1µF [50V]).
- Splices to the input wire harness.
- Disassembling the case.
- Tampering with moisture seals.
- Excessive force when using the EZ-Set button.
- 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 EVX-2, 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 EVX-2.

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

1-888-TRAXXAS

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

TRAXXAS.COM

*patent pending