Instructions for X89 Professional Racing Brushless Motor Controller

Thank you for purchasing the X89 Professional Brushless Motor Controller. This ESC has been specifically designed and programmed for Professional Road Racing.

Please read these instructions carefully before using the product to ensure safe and efficient operation.

Scope of delivery:	X89 Professional Racing Motor Controller for Brushless Motors
Dimensions:	27.7 x 18.7 mm / 1.09 x 0.74 inch / Weight only 2.46 g / 0.087 oz
Board colors used:	red
Intended use:	Slot Car Professional Road Racing
Board Identification:	X89 Pro ESC has a X89 Professional label on the back side of the board

Safety instructions:

- Age recommendation: **This product is a model construction item and not a toy** and is therefore not suitable for children under 14 years of age. Children only under expert supervision.
- CE marking and declaration of conformity: The X89 Pro Racing Brushless Motor Controller complies with the applicable safety standards and bears the CE mark.
- Product disposal: Dispose of this product in accordance with the local guidelines for electrical appliances. Do not dispose of in household waste but take it to a collection point.
- This product may only be passed on with this description and the original packaging. Please keep this information in a safe place.

Soldering work and soldering irons:

- Danger from soldering work: Working with a soldering iron can be dangerous and lead to injuries. Never touch the hot tip of the soldering iron or the hot shaft of the soldering iron. Always wear safety goggles.
- The 3 motor cables and the two wires for the power supply are connected by soldering.
  Take care not to heat the circuit board excessively !!!
- **The 3 motor cables must not be connected to each other.** Do NOT kink or bend the motor cables at the motor. The motor cables must also not be connected to the chassis or the power supply.
- Only use a model-making soldering iron and electronic solder.
- A large soldering iron is not permitted as it generates too much heat and damages the circuit board. The use of flux will also damage the circuit board.
- The positive pole is marked + (plus) on the circuit board. The negative pole is marked - (minus)

Installation:

- Connecting the motor cables and power supply: Connect the three motor cables of the brushless motor to the corresponding connections on the circuit board.
- Solder the two wires for the power supply (plus and minus) to the corresponding connections on the circuit board, observing the polarity of the power supply. The plus wire must be connected to the plus connection and the minus wire to the minus connection.

- The X89 Professional Racing ESC has reverse polarity protection on the input power.
- **The maximum permissible voltage for the power supply is 16.5 volts. Do not exceed this value to avoid damaging the product.**
- Motor compatibility: The controller is designed for Professional Road Racing with high Kv brushless motors from 9,000KV to 23,000KV. Note that this controller may not be compatible with some motors. In such cases, use a suitable motor.
- Mechanical blockage: If the motor is mechanically blocked, disconnect the power supply immediately to prevent overheating and damage.
- **IMPORTANT:** Motor fastening screws which are too long will destroy and block the motor. Take care not to use screws that are too long to secure the motor.
- Instructions for use: Only switch on the power supply when the brushless motor is correctly connected. **Never power the controller without a motor connected.** Make sure that the motor can move freely before switching on the power supply. Ensure that the voltage limit of 16.5 volts is NEVER exceeded. If the motor makes unusual noises or behaves abnormally, disconnect the power immediately and check the motor and connections.

Mechanical attachment:

- Make sure that the chassis of the vehicle is clean and dry to ensure optimum adhesion of the double-sided adhesive tape. Check the positioning of the control board on the chassis. Take into account the placement of the cables to ensure a proper connection. Cut the double-sided adhesive tape so that it covers the dimensions of the circuit board. Remove the protective film from one side of the double-sided adhesive tape and stick it carefully to the underside of the control board. Carefully position the circuit board on the chassis in the desired location. Make sure that no components come into contact with other parts of the vehicle. Press the circuit board firmly onto the chassis so that the double-sided adhesive tape, adheres properly.

ATTENTION: Motor turns the wrong way:

- Unsolder two of the three motor connection cables and swap them. Re-solder the cables, making sure they are positioned correctly.
- **Do not swap the power supply connection wires.** This will not change the direction of rotation of the motor.

Elimination of malfunctions:

- Motor does not rotate: Check the motor cables for secure and correct connections both on the motor and on the control board. Ensure that the power supply is switched on and has the correct polarity. Check whether the motor is mechanically blocked. Remove any obstructions or jamming.
- **Motor runs unevenly or stutters: The SUPPLY VOLTAGE IS TOO HIGH. Reduce the voltage,** otherwise the control unit will be destroyed. Check the motor cables for the correct connections, damage or poor soldering.
- Motor overheating: Ensure that the motor is sufficiently ventilated and is not blocked by obstacles. Check the voltage settings and ensure that the operating voltage is within the recommended limits.
- Uncontrolled behavior of the motor: Check for possible interference with other electronic devices that could affect the control system.
- Interference from other electronic devices: If other electronic devices are interfered, with in the power supply, use an EMC interference suppression filter in the supply line to the power supply.
- If so-called PWM controllers are used as controllers, the power supply unit may report an error and switch off when the vehicle brakes due to the voltage flowing back.
- General faults and malfunctions: Check the control board for visible damage, burnt components or soldered joints and make sure that all cables and connections are secure and tight.