

BRUSHLESS INSTALLATION TIPS

Motors, yes motors first!

- Ensure mounting screws are not too long. M2 x 3mm long is plenty of length to mount a motor. Any contact with the windings of the stator will damage the motor and can be fatal for the ESC. Interestingly, often hurting the input side of the electronics where overvoltage protection components live. Even if your setup runs fine to begin with, pressure on the windings may cause the insulation to break down soon after you begin, hundreds of laps later when you think all is well.
- Ensure mounting screws are not too long. Just making sure you read the first part properly.
- Among all the interesting specifications of brushless motors please take note of the "S" rating as well as the kV. Often the motors are listed as being 1-2S or 2-3S etc. In their native world (drones, not slot cars) this refers to the number of cells in the battery pack. Those cells are usually 3.6 volts each.
- Hurt motors hurt the ESC. So, consider that a 2-3S rated motor is a specification that is rated for 7.2-11.1 volts. And here we are all running 12-16.5 volts (looking at you drag racers.....). So understandably we are in a risky trade, and much is compromised.
- You can sometimes see when a stator winding has overheated just like a cooked armature in a brushed motor where one stack might be a darker colour. If you have a meter and know how to check resistance, you may be able to identify a shorted winding (lower resistance than the other two) or a blown winding (open circuit compared to the other two). In any case, all three readings being very close, if not the same, is a good indication that the motor is electrically OK.
- Gear mesh. Super free! Although these motors have lots of power, startup resistance can be a big deal. A damaged tooth on a spur or crown gear can ruin the party. Balloons popped and beer spilt.

The ESC.

- Isolate/insulate mounting of the ESC into your chassis to ensure no wiring connections touch any metal parts of the chassis. The WestRock ESC is single sided to make this easier (components all on one face leaving a flat face for mounting). Double sided tape is OK but be mindful of future need to remove again. This is a delicate piece of electronics!
- Consider wrapping or skinning the mounting face with something that can be more easily removed than double sided tape. I have used mylar tape on the face of the board then double sided. It offers a safe protective layer to the board and components.
- Soldering the connections. Don't be too proud to ask for help! The connections are small, the ESC is small. Excessive heat can potentially dislodge other components. There is the possibility of creating unwanted solder bridges to other components.
- If you don't count yourself a soldering master then please ask someone to make those connections for you. There is no way to safeguard the product from misadventure with a soldering iron.
- HINT, if you want future use to be simpler, then add a thicker header wire to the solder pads first and make your connections to those headers (so a few millimeters away from the actual ESC board).

IN SUMMARY HERE ARE THE THREE BIGGEST FAULTS and they can be avoided....

- * Do not fit motors with screws that are long enough to touch the stator windings.
- * Do not allow solder connections to bridge to any other nearby components.
- * Avoid excessive heat. If you are struggling to get the job done ask for help!