

COMMON SENSE RC

THE "GO TO" GUYS IN ELECTRIC POWER

Z-SERIES BRUSHLESS SPEED CONTROLLER

Dear customer,

Thanks you for purchasing a Common Sense RC Z-series Controller. As with all Common Sense RC products, we are always happy to help you figure out how to use your new gear, so if you have any questions that these instructions don't answer, give us a call at 866-405-8811. We've worked pretty hard on them, so take a look and see if they help you through the process first!

Specifications:

Model Number	Dimensions	Weight	Operating Range	BEC Current
Z-5 (5 amp)	20 x 22 x 4mm	6.8g (0.24oz)	2-3 LiPo/5-10 NiXX	500mA
Z-8 (8 amp)	21 x 22 x 5mm	9g (0.32oz)	2-3 LiPo/5-10 NiXX	750mA
Z-12 (12 amp)	38 x 24 x 7mm	18g (0.63oz)	2-3 LiPo/5-10 NiXX	1.5A
Z-20 (20 amp)	38 x 24 x 7mm	20g (0.70oz)	2-3 LiPo/5-10 NiXX	1.5A
Z-35 (35 amp)	44 x 24 x 7mm	25g (0.88oz)	2-3 LiPo/5-10 NiXX	1.5A
Z-45 (45 amp)	60 x 28 x 8mm	38g (1.34oz)	2-3 LiPo/6-12 NiXX	2.2A
Z-45-OPTO (45 amp)	60 x 28 x 8mm	35g (1.24oz)	2-3 LiPo/6-12 NiXX	No
Z-55 (55 amp)	60 x 28 x 8mm	42g (1.48oz)	3-3 LiPo/6-12 NiXX	2.2A
Z-75 (75 amp)	60 x 28 x 12mm	50g (1.76oz)	2-3 LiPo/6-12 NiXX	2.2A
Z-75-OPTO (75 amp)	60 x 28 x 11mm	46g (1.62oz)	2-5 LiPo/6-16 NiXX	No
Z-80-HV (80 amp)	60 x 28 x 9mm	62g (2.19oz)	5-10 LiPo/14-32 NiXX	No
Z-90PRO (90 amp)	52 x 56 x 17mm	117g (4.1oz)	6-12 LiPo/16-36 NiXX	No

Instructions for use:

1. Connect the Speed Control to your motor

If you're using your ESC with a CSRC E-series motor, this is really easy! Just plug the connectors on the motor into the connectors on the ESC. Don't worry about wire order (which goes to which) – even if your motor ends up wired for reverse rotation, you can reverse it with the programming. Also, should you want to reverse the motor without programming, you can always swap any two wires.

Instructions for use:

2. Installing the Controller

Remember that this is a piece of digital electronics – be sure to treat it as such. Make provisions for isolating it from excessive vibration and shock (gluing it to the landing gear is a good example of an INCORRECT INSTALLATION). But don't wrap it in foam rubber, either. Your speed control needs cooling air. Velcro-ing the controller somewhere where air can flow over it (either externally or in an area with cooling vents) is usually the best option. Once you've got the ESC mounted, connect the servo lead from the controller to the throttle channel on your receiver.

3. Programming your Controller.

The Z-series controllers can be programmed for the following options:

Brake: When brake is active, the controller causes the motor to act as a brake on the prop, stopping it from freewheeling. When inactive, the prop will spin freely in the oncoming airflow.

Battery type and cell count: Allows you select whether you are using NiCd/NiMH or Lipo batteries. If you are using Lipos, then you can set the number of cells you are flying with, for the purpose of determining the appropriate low-voltage cutoff (LVC).

Cutoff type: Determines how the ESC behaves when the battery voltage drops below LVC.

Soft Start: When active, the ESC limits the speed at which the motor will spool up, preventing damage to gears or excessive torque on the airframe.

Timing: (ADVANCED): Allows you to set the timing advance used with the motor. Usually, Auto works best. Only mess with this setting if you know what you're doing!

Frequency (ADVANCED): Allows you to set the switching frequency of the motor. The default setting of 8kHz works best in most cases. Only mess with this setting if you know what you're doing!

Governor: When Governor mode is active, the speed controller manages its own throttle setting to maintain a constant RPM at the motor. Your throttle-channel inputs determine this RPM level. This is usually used with helicopters.

If you want to use the factory default settings, you can skip to the next step. They are:

Factory default settings:

Brake		Off
Battery type and cell count		3 Li-Poly
Cutoff Type		Reduce power <i>(motor will still operate but power is reduced by approx. 50%)</i>
Soft start		Enabled
Timing		Auto
Frequency		8kHz
Governor		Off

Instructions for use:

If you want to change the programming settings, you can either use a CSRC programming card or the throttle stick. To use the programming card, follow the instructions that came with the programming card. To program from the throttle stick, you'll need to follow some additional instructions. While programming, you'll have to listen for specific tones. The symbols for these tones may look unintelligible to begin with, but trust us, once you start programming the controller, you'll probably get it. If not, check out our website for audio of the tones at www.commonserc.com/audio_tones.html. If you can't get to the web, or they still don't make sense, give us a call at 866-405-8811.

Programming Procedure:

- If you have a Futaba radio, make sure the Throttle channel is set to "reverse"
- If you have a computer radio, make sure that your ATV or end-point adjust is set to +/-100%
- Switch on the transmitter and push to the throttle stick to full throttle.
- Connect the motor battery pack and turn on the receiver (BEC) switch (if applicable).
- Wait for 5 sec, you'll hear tones. You are now in programming mode.
- When you hear the desired tones, pull the throttle down, then you'll hear two confirmation tones. The setting is now memorized.
- You can only change one setting at a time. If you need to change more settings, disconnect the battery pack, wait 5 seconds, and start over.
- You can exit the programming mode at any time if you pull out the battery connector from ESC.

1. Brake

If you pull the throttle stick down to idle within five seconds of entering the programming mode, the brake will change state. If it was on to begin with, it will turn off. If it was off to begin with, it will turn on.

2. Battery type

For programming battery type, there will be a set of tones made up of 5 sets of short beeps. The first will be For NiCd/NiMH, and will be 5 sets of one beep [.....]. Following will be tones for various Lipo cell counts, The cell count is represented by the number of beeps in each set. For example, for 3S Lipo, the tones will be [... ..]. The cell counts available will vary from controller to controller, so listen carefully and count the beeps.

3. Rotation reverse

If your motor is spinning the wrong way, program this, and it will switch to the opposite direction.

Reverse motor rotation: W W W W W

Instructions for use:

4. *Soft start (Acceleration)*

Enable: VV VV VV VV VV	Disable: V V V V V
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5. *Under voltage (low voltage cut-off LVC)*

Disable Cutoff: _ _ _ _ _	Reduce Power: _ _ _ _ _	Hard Cutoff: _ _ _ _ _
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6. *Timing (advance timing)*

Automatic: (7 ~ 30°) _ _ _ _ _	Soft: (7°) _ _ _ _ _	Hard (22 ~ 30°) _ _ _ _ _
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7. *Switching Frequency*

8 kHz: \ \ \ \ \	16 kHz / / / / /
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8. *Restore Factory Default Setting*

9. *Governor Mode*

Governor Off: _ . _ . _ . _ . _ .

Low speed: (up to 20.000 electrical rpm) _ . . . _ . . . _ . . . _ . . .	Medium speed: (up to 50.000 electrical rpm) _ _ _ _	High speed: (up to 100.000 electrical rpm) _ _ _ _
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4. *Go Fly!*

Normal start up procedures:

1. Switch on your Transmitter, and set your throttle to idle
2. Connect the battery to the ESC
3. Switch on the Receiver or BEC switch, if you have one.
4. You will hear one beep for Brake on or two tones for Brake off.
5. Your motor now is ready to run.

WARNING:

- Always connect the motor battery pack just before flight and disconnect it immediately after landing. Even when the receiver (BEC) switch is "OFF", please remember that the battery pack is still connected. Handle the model with extreme care and stay clear of the propeller! Also, remember that, when connected, the speed control is still drawing a small amount of power from the battery. If you leave it connected for a long period of time, it can drain your batteries, which will damage Lipo packs.
- Once the motor battery pack is connected, handle the model with extreme care! Ensure that you are well clear of the propeller at all times.
- Always fly at a sanctioned field. Never fly over or near spectators.
- Even though this controller is equipped with a safety arming program, you should still use caution when connecting the main battery
- Check polarity before connecting the battery. Connecting a battery with reverse polarity WILL cause damage to the speed control.