SBL-Micro Controller for brushless and sensor less Model Motors

Operating instructions - RC Setup

The CONTROLLER has a mode orientated setup program. The throw of the Throttle is being used for setup and to save the changes.

There is also a possibility to change the settings through a PC with an optional Cable and Software, you can set the changes and upgrade the software.

To change the direction of motor rotation, just swap any two of the three cables connecting the ESC and motor. Transmitter with "Servoreverse" must be so adjusted that full power corresponds to the longest pulse. Stick travel should be set to +/- 100%.

When switching on the ESC, an acoustic sign of life will be heard: (beep tones)
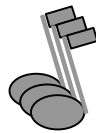
If still no setup is started, continous periodic beep tones will be heard.

The setup is initiated, if the ESC receives a valid signal 5 sec. long, and width greater than 1.5ms.
When ESC is setup with a transmitter, the PC-cable may not be attached.
There is a safety feature however, when the CONTROLLER is restarted during the flight by moving the throttle stick to full power, the setup program is not initiated (refer, undervoltage cutt-off).

When the ESC receives a correct signal from the receiver and the transmitter has the throttle in the "off" position, an activation signal will be heared.
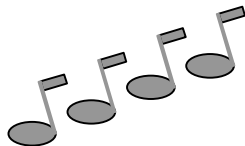
Ready for use!

Setup

The Setup is mode-oriented and can be accomplished easily on the airfield.

Mode 1 (test mode): no brake, no low voltage identification, no temperature monitoring.

Mode 2 (sailplane): brake (medium), soft start, temperature monitoring and throttle down during undervoltage.

Mode 3 (powered flight): no brake, soft start, temperature monitoring and throttle down during low voltage.

Mode 4 (heli mode): no brake, soft start, temperature monitoring, no low voltage identification, RPM control.

Mode 5 (competition): brake (hard), no soft start, temperature monitoring, no low voltage identification.

Mode 6 (Car mode): brake (medium), no soft start, temperature monitoring, low voltage identification and reverse gear.

In all above modes, Motor Lock Protection and RPM limitation are, for the time being, deactivated with this test version, but can be activated with the PC setup however.
After RC setup the timing is adjusted to "auto" but may be changed with PC setup to prefixed values.

Brief description of Setup

- ♣ switch on Transmitter, stick at full throttle.
- ♣ Switch on receiver and ESC.
- ♣ After 5 seconds a fading 3 beeps will be heard.
- ♣ Move throttle stick to off position.
- ♣ Wait until you hear the mode you want to select.
  When you want to use Mode3 wait untill you hear 3 beeps.
- ♣ Move stick again to full power position and wait for storing settings, 1 beep.
- ♣ If no separate neutral position is wished, take off battery from ESC, finished.
- ♣ Else put stick in neutral position (refer, Wind-milling or reverse gear) wait for signal storage beep, take off the battery, finished and ready.

Programming Mode 1 (Test mode):

• Switch on Transmitter, stick at full throttle • Attach Battery	Power on Beep wait 5 seconds Setup-beep (Full throttle recognized)

• Stick at zero throttle	Mode 1?

• Stick at full throttle	Save settings Acknowledge Mode 1

Remove Battery, Ready!

Programming Mode 2 (Sailplane Mode):

• Switch on Transmitter, stick at full throttle • Attach Battery Power on Beep	wait 5 seconds Setup-beep (Full throttle recognized)

• Stick at zero throttle	… Mode 1? Mode 2?

• Stick at full throttle	Save settings Acknowledge Mode 2

If one does not wish a larger neutral zone for Wind-milling, setup is finished and the battery can be taken off. Otherwise move the stick to the desired neutral position and wait for the save signal beep.

Remove Battery, Ready!

Programming Mode 3 (Motor Models):

Likewise Mode 1, wait for the 3 beeps after moving the stick to zero throttle position. Move stick to full throttle position, take off battery or move stick to desired neutral position.

Programming Mode 4 (Helicopter Mode):

Likewise Mode 1, wait for the 4 beeps after moving the stick to zero throttle position. Move stick to full throttle position, take off battery or move stick to desired neutral position.

In this mode, a desired RPM is set at a desired stick position. The ESC needs to know maximum RPM under load. This information is gathered during the first initial run after setup. The ESC now knows the maximum RPM and will save this settings. Half of the throttle is now half of the RPM etc.

Programming Mode 5 (Competition Mode):

Likewise Mode 1, wait for the 5 beeps after moving the stick to zero throttle position. Move stick to full throttle position, take off battery or move stick to desired neutral position.

Programming Mode 6 (Car mode):

Likewise Mode 1, wait for the 6 beeps after moving the stick to zero throttle position. If no reverse control is desired move stick to full throttle position, take off the battery or move stick to desired neutral position. After the save setting beep tone, the battery can to be taken off.

Here note that the throttle zero position on the joystick means "full return".
It is best to keep approx.. 1/3 to 1/2 stick displacement difference between "stop" (full return) and "neutral" (Motor off).

Mode Memory settings takeover:

The SBL-Micro, in addition to the main memory, has two model memory settings.

The desired settings for these models can be saved during PC setup.

Then it is possible on the airfield to activate one of these memories without the PC. When a standard RC setup is done, do not remove the battery after setup immediately, but wait 10 seconds and a beep tone will be heard. That is the signal for overtaking of the first memory.

To activate the second memory, wait 5 sec. more (second beep tone).

Specifications:

Operating Voltage:	6 – 10 Cells (2 – 3 Lithium polymer-Cells),
Maximum Current:	approx. 10A with proper cooling.

Comments:

The developping cost of this speed controller was(and is) enormously high. Actually it is not possible for such a complex project to be released error free and in optimal form in the first version. I therefore ask for user inputs if there still exists a need for something to be improved here or there. Regardless that many different motors and configurations were tested, a usage in practice is naturally something else.

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