YGE 40 and 60A electronic speed controller (V4)
BEC 5,5V
pre-programmed for Glider

Technical data:

- The specified current is the maximum continuous full power current with adequate cooling.
- 2 to 6s LiPo, with under voltage protection by power reduction.
- 6 to 18 cells NiMH, with under voltage protection in case of power reduction.
- disconnectable under voltage detection.
- switching BEC: 5,5V, 3A continuous, 5A peak.
- Speed regulation (Governor mode).
- Soft start.
- Active free-wheel, allowing unlimited part load operation.
- Automatic or 6 step adjustable timing.
- Infinitely adjustable F3A brake.
- 3 steps adjustable regular back EMF brake.
- Switching rate: 8 to 16 kHz
- Speed limit: 240,000 RPM (2-Pole motors)
- Temperature and overload warning.
- Anti sparkling circuit: reduces connection sparkles
- Programmable with the ProgCard II or III

Type	40A	60A
Overall dimensions in mm	62 x 25 x 8	62 x 25 x 8
Weight in g without/with wires	19 / 35	19 / 35
Cable diameter Battery/Motor	2.5 ²/2.5 ²	2.5 ²/2.5 ²

Initial setup:

Once you connected the battery (red = plus, black = minus) you will hear 3 descending tones. A number of beeps will follow corresponding to the cell number of the connected Lipo battery. In case the transmitter stick is on throttle off, you will now hear 3 ascending tones.
You have to connect the motor in order to hear the beeps; the motor itself will act as a speaker.

--- The ESC is ready for use. ---

If the motor turns in the wrong direction, simply exchange 2 of the 3 motor wires.

Use only clean and tight gold connectors for the motor and battery. Pay attention to the reverse current protection on the cables leading to the ESC between the jack and plug. Exchange low-friction or oxidized plugs and sockets. Only tight fitting contacts will ensure a high current flow, protect the speed controller against dangerous voltage peaks and avoid disturbances. With all ESC types, the entire wire length, from the controller to the battery, should not exceed 20cm. If you cannot avoid longer wires, a Low ESR switching capacitor of 330µF/25V should be soldered between plus and minus wires every 20cm. You might also consider using our capacitor module YGE Cap´s typ 5. The motor wires can also be extended. Please twist the 3 lines in order to minimize interference emission.

Note: Inverting the Battery polarity will cause severe damage and the loss of warranty!!!

General Settings:

The speed controller has a fixed throttle curve setting, so that the stop and full power points of all the established transmitters are connected in-line. The throttle range of all programmable transmitters should be set to the default value (±100%), the center point set to zero and throttle trim point to active. The range needs to be adjusted on some transmitter types. In order to do this the throttle endpoints need to be set in such a way that the motor stops one notch before the lowest stick position and the motor is at full power when it is

set one notch before the full power setting. For checking purposes the LED is off at full power.
As delivered, the Timing is adjusted to 18°, the brake is set to mid level, and the under voltage recognition adjusted to Lipo mode 3.1 V.

If during spin up rpm variations (wowing or erratic sound) are experienced, the timing must be increased. If no improvement can be obtained at 30°, then the motor is overloaded. Here a smaller propeller, a one cell smaller battery or a stronger motor will help. If after motor stop you hear 2 beeps repeating, it means that the battery voltage dropped down below the set value. If necessary try a cutoff voltage of 2.9 or 3.0V per cell. If there is still no improvement, the battery is discharged or too weak, the wires are too long or too small or a connector is out of order. With an active brake you can hear these warning tones only in the windmill position. This is the small range on the throttle stick between brake and motor start. You can get to this position with 2 notches or with a high trim and a short gas start.

If you do not want automatic timing, it can be adjusted according to the following guideline.

Inrunner	0 to 12°
Outrunner	18 to 30°

If your motor manufacturer recommends a timing, you should stick to it.
As a basic rule: the higher the timing, the higher the full power rpm.
The easy way to change something is to do it with the ProgCard. It is also possible to conduct the setup with the transmitter; however, we will not go into details here. You will find the details in the RC-setup manual under www.yge.de in the download area.
Please note that the entire feature set-up can only be accessed via the ProgCard.
In case you get into the programming mode by mistake during a normal start-up (throttle stick at full power), just disconnect the battery, lower the stick to stop, and reconnect the battery. That way you will not alter the adjustments.

Helicopter settings

For helicopters in governor mode, the full throttle range (100%) has to be calibrated once. This range is listed on the helicopter menu (throttle curve 0-100%) on some transmitters. The throttle curve will then correspond to the controller throttle from 0 to 100%. Please also check the ProgCard or RC-Setup manual.

When activating one of the governor modes, all relevant heli parameters are set to default. This default will fit nearly all setups. **You do not have to program anything else for now.**

Here a list of the default settings.

- Timing = 18°
- Brake off
- Act. Freew. on
- P-Gain = 0,9
- I-Gain = 0,05
- Startup Speed = Heli middle
- PWM-Frequency = 8 kHz)
- Startup Power = Auto 1-32%

You should only alter the default settings of P-Gain, I-Gain and PWM frequency, if you do not achieve the desired success, and you are certain that the setting of all the other components are correct.

Lipo protection / under-voltage protection:

Due to the tension driven load adjustment, it is possible to fly further on with low power, because the battery picks up again with a smaller load. However, if the tension continues to cave in, the motor will be switched off.

Active free-wheel:

The unlimited partial load capability refers to the maximum full power current .

Temperature / overload warning:

If the speed controller's temperature exceeds its limit, on account of overloading or lack of cooling, after landing and/or motor stop, you will hear a warning signal (3 Beeps in the interval). But the motor will **not switch off** in mid-flight! Only when the temperature hits an extremely critical point, the motor will be switched off.
The partial load operation between half and nearly full power is the most difficult area for an ESC. In addition the running time becomes longer and longer with the Lipo technology. If repeated temperature warnings occur, improved cooling should be provided or the current should be reduced. These warnings should be seen as overload warnings and **not as normal operating conditions**. When the temperature is high the components are strongly stressed,; this will diminish the life span.

You achieve a better cooling not only through sufficiently dimensioned air intake, but even more efficiently through a larger air outtake, in order to avoid a heat accumulation. You achieve smaller currents by using a smaller propeller or a one cell smaller battery.

BEC:

Additionally to the use of the BEC a 2 cell LiFePo4 receiver buffer battery can be connected through a switch cable into a free plug of the receiver or a through Y-cable.
The buffer battery avoids tension drops on hard servo maneuvers, protecting the receiver's functionality.

Make sure that no discharged receiver battery is used, because this would load the BEC additionally by charging the battery. A half or fully loaded Battery will not be charged and is only discharged in extreme conditions. The plus (red) wire of the receiver cable does not need to be disconnected. Several YGE ESC's can be connected to a **single** receiver without any special precautions (Parallel use of all the BECs). The total maximum available load is the sum of the individual BECs.
A configuration without BEC and with galvanic separation is also possible. For that please use our opto coupler module.

Caution:

Fundamentally it is important to make sure that no objects are within the propeller circle when batteries are connected. The use of this speed controller is therefore allowed only in situations where damages and personal injuries are impossible. A damaged governor (e.g. broken, damaged by polarity inversion or humidity) must not be reused under any circumstances. Otherwise it can come to a later malfunctions or failures.
The ESC may only be powered from batteries, a use from power supplies is not allowed.

Trouble shooting:

1 Beeps/flashes: stick position and / or speed
   for Gov.-Store not taught correctly.
2 Beeps/flashes: Under-voltage identification
3 Beeps/flashes: Temperature rise warning
5 Beeps/flashes: Receiver signals failed
6 Beeps/flashes: start up failed

The ESC signals any error that happened during flight acoustically (motor) and optically with a blinking LED code.
Errors 2 and 3 are signaled after motor stop, but aren't stored as long as the ESC didn't cut off completely (low voltage / temperature warning). In case the error led to a complete cut off, then it is not cleared by a tension RESET. The deletion can take place only on purpose by connecting the battery with the stick at full power and/or with 100% throttle pre-selection (throttle curve), and disconnecting it again after the interval beep. Please you leave the stick at full power, while disconnecting, otherwise you activate the RC-Setup.
Likewise the errors can be cleared by activating the ProgCard.
With an activated brake, the error is only signaled after a tension reset or in wind milling position.

Warranty:

We give 6 months warranty on this speedcontroller. Any other requirements are excluded. That applies in particular to requirements for damage or injuries compensation due to malfunction or failure. For damages to property or personal injuries and their consequences, which developed from our supply or craftsmanship, we do not take any liability, since we have no control on handling and use.