

## Technical data:

( YPG 7A- 150A )

( YPG HV60A,HV100A ) 4-12s LiPo, 12-36 NiMH

( YPG HV120,HV180HV ) 4-14s LiPo, 5-15s (LiFePO4), 12-42 NiMH,

- ESC with SBEC :5.5V,6A (HV ESC without BEC)

- The specified current is the maximum continuous full power current with adequate cooling
- 2-6s Lipo (or 6-18s NiMH), with under voltage protection
- Under voltage detection can be turned off
- Switching BEC output: 5.5V/6A
- Governor mode for RC Helicopters
- Soft start-up
- Active free-wheel, allowing unlimited part-load operation
- Automatic or 6 step adjustable timing
- Continuously adjustable F3A brake
- 3 steps adjustable regular back EMF brake.
- Switching rate: 8 to 16 kHz
- Speed limit: 240,000 RPM (for 2-Pole motors)
- Temperature and overload warning.
- Anti- sparkle circuit: reduces connection sparkles (only for HV ESC) .
- Programmable by the YPG ProgCard II

## Initial setup:

Connect the Motor to the ESC to hear the beeps. After connecting the battery (red = plus, black = minus) you hear 3 descending tones. Subsequently, follows a number of beeps according to the cell number of Lipo battery. In case the transmitter stick is in throttle off, you hear now 3 ascending tones.

## --- The ESC is ready to 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 motor and battery.

Pay attention for the battery connector to choose a polarity safe system. Exchange low-friction or oxidized plugs and sockets. Because only tight sitting contacts will ensure a high current flow, protect the speed controller against dangerous voltage peaks and avoid disturbances.

Here the motor wires are usually shortened to the minimum and soldered directly to the motor. On the other side, with all ESC types, the entire wire length, from the controller to the battery, may not exceed 20cm. If longer wires are needed, a Low ESR switching capacitor should be soldered between plus and minus wires every 20cm. Then please twist the 3 lines, in order to minimize interference emission

**Note: wrong battery polarity will lead to heavy damage and the loss of warranty!!!**

## General Settings:

The speed controller has a fixed throttle curve setting, so that with all usual transmitters the stop and full power points are linearly connected. With all programmable transmitters, the throttle range should be set to default ( $\pm 100\%$ ), the center point set to zero and throttle trim enabled. Nevertheless, with some transmitter types the range needs to be adjusted. For that the throttle endpoints have to be set so that one notch before lowest stick position the motor is stopped and that one notch before full power the motor is actually at full power. Full power is indicated by the LED that is completely turned off.

On delivery the Timing is adjusted to 18°, brake is set to middle 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 setting value. Eventually try a cutoff voltage of 2.9V or 3.0V per cell. If there is still no improvement, then 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 windmill position. This is the small range on the throttle stick between brake and motor start. You can reach this position with 2 notches or with a high trim and a short gas start.

If no automatic timing is wished, it can be adjusted according to the following guideline.

Inrunner 0 to 12°

Outrunner 18 to 30°

If your motor manufacturer indicates a timing recommendation, it is of course preferable to use it.

Basic rule: the higher the timing the higher the full power rpm.

The easiest to make these changes is the ProgCard II. There is also the possibility to perform the setup with the transmitter; please refer to the RC-setup manual.

Please note that the complete features set can only be reached by the ProgCard II.

In case you get inadvertently in the programming mode during a normal start-up (throttle stick at full power), simply disconnect the battery, lower the stick to stop, and connect the battery again. Thus you won't modify the adjustments.

## Helicopter settings

For helicopters in governor mode, the full throttle range (100%) must be calibrated once. For some transmitters, this range is indicated in the helicopter menu, throttle curve 0-100% and some other transmitters -100 - +100. Please refer the RC-Setup manual or the ProgCard.

When activating one of the governor modes, all relevant heli parameters are set to default. This default will fit nearly all setups. You don't need to program further at a first step.

Here a listing 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 can modify the settings of P-Gain, I-Gain and PWM frequency (by ProgCard II), only if you don't satisfy with the default settings, and if you are sure of the correct setting of all other components.

## **Lipo protection / under-voltage protection:**

Because of the tension driven load adjustment it is possible to fly further with low power, since the battery recovers with smaller load. However, if the tension continues to break in, the motor is switched off.

## **Active free-wheel:**

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

## **Temperature / overload warning:**

If the speed controller's temperature exceeds its limit, because of overloading or lack of cooling, after landing and/or motor stop, a warning signal is issued (3 Beeps in the interval). But the motor is not switched off in flight unless the temperature becomes extremely critical, then the motor 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 it should come to repeated temperature warnings, better cooling should be provided or current should be reduced. These warnings are to be regarded as overload warnings and not as normal operating condition. Because at high temperature the components are strongly stressed, this leads to a decreased life time.

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 4 cell NiCd/NiMH 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.

Do not use discharged receiver battery, 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.

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. Please only use the ESC 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 can only be powered by batteries, 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

Any error that happens during flight is signaled by the ESC after motor stop (flashing LED and beeps).

Errors 2 and 3 are signaled after motor stop, but won't be stored as long as the ESC not cut off completely (low voltage/temperature warning).

## YPG brushless Electronic Speed Controller (ESC)



If the error causes a complete cut-off, the error cannot be cleared by a RESET. To delete the error store, please connect the battery with the stick at full power and/ or with 100% throttle pre-selection (throttle curve), and disconnect it after the interval beep. Please leave the stick at full power while disconnecting, or you would activate the RC-Setup.

Likewise, the errors can also be cleared by Prog-card.

With an activated brake, the error is only signaled after a RESET or in wind milling position.

### Setup for YPG ESC with External governor (VBar) and Programming Card

The ESC features a soft start-up with short response time for efficient external governor.

#### Programming:

1. Pull out the ESC signal cable from the receiver/ VBar.
2. Connect the signal cable to the ProgCard connector (ESC), brown wire to the right.
3. Connect the patch cable to the ProgCard connector (Rx), brown wire to the right.
4. Connect the opposite end of the patch cable to the throttle channel of the receiver/ VBar (For Futaba activate "analog")
5. Turn on the transmitter (For Futaba reverse the servo of the gas channel)
6. Never use a power supply over 6.5V, recommend a 4s NiMh battery
7. Connect the main battery
8. LED blinking to indicate the ESC been read out and can be programmed now
9. Program every parameters as usual, except for start-up speed
10. Select instance start-up speed to Heli Middle and press ENTER to confirm
11. Select Gov off and confirm 3 times by ENTER
12. Select instance start-up speed to Plane Middle and press ENTER to confirm  
You will hear acknowledge sound as usual to confirm
13. Finish programming, disconnect the main battery, ProgCard and patch cables

#### Operation:

- Connect the ESC signal cable to the throttle channel of the external governor (Orange = speed signal, brown = battery minus)
- Connect the ESC short cable to the speed sensor input of the external governor (Orange = speed signal, brown = battery minus)
- Turn on the transmitter

Connect the main battery

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