

YGE brushless speed controller Manual for RC setup.

Features:

- Timing adjustable in 6 steps or auto for automatic timing adjustment.
- Lipo (auto) / NiMh adjustable.
- Adjustable brake. Hardness and speed is proportional to the soft start.
- Full use of stick travel by programming the RC Setup
- PWM clock frequency of 8KHz-16KHz in 1KHz increments!
- Set PWM frequency as little as possible and as much as necessary. High frequency for low inductance motors, low frequency for less switching losses.
- RPM control with PI controller.
- Active freewheeling. This can also be deactivated By ProgCard II.
- Active free-wheel reduces the losses at part load significantly, but can in rare cases cause problems. In connection with the rpm control it may be too harsh on transitions from part to full load, therefore avoid in the rpm control mode.

General:

Tone sequences of the RC-Setup:

Constant monotone beep signals the programming mode and/or the deletion of stored errors. The automatic controller recognizes a full power signal.
A descending tone sequence indicates the recognition of a receiver signal.
An ascending tone sequence indicates that the controller has detected a stop position and is armed from now! Caution!

After the descending tone, further tones follow, which are a reference to the detected or selected types of supply battery.

The correct settings are particularly important in Lipo and BEC-operation, therefore an audible check takes place after each power on of the controller.

With Lipo-setting (lipo auto-mode 2-6 (14) cells):

- 2 identical tones => 2 Lipos detected 🎵🎵
- 3 identical tones => 3 Lipos detected 🎵🎵🎵
- etc. ..

In order for the reliable recognition with more than 3 cells, the cells should always be fully charged! Otherwise it is possible that at high cell numbers a cell is not recognized, and the regulation would use the wrong starting point.

With the optionally available YGE ProgCard II, the number of cells can also be fixed.

With more than 6 cells, the sequence of notes  is issued because taking a count no longer makes sense. Such cell counts should not be operated in automatic mode. We then have to set the number of cells with the ProgCard II.

Slowdown / Shutdown at 3.1V/cell is a conservative value but preferential for a long Lipo life! It is important to recognize the cell numbers to avoid false shutdown! A hard shutdown can only be programmed by ProgCard II. Likewise you can also set LiFePo4 batteries using ProgCard II.

For Ni-based batteries (NiCd / NiMh)

- 2 different high / low tones => NiMh mode: 
Slowdown is at approximately 0.65 x open circuit voltage of a cell.
So for example at 1.3 V at idle before the flight then at 0.91 V / cell

In general, for all types of batteries, sufficiently charged batteries should be connected before the flight so that the system works reliably.

Freely programmable voltage activated:

- 2x2 different low / high / low / high => programmed control point voltage used (default 12V for future PC setup) 

Running the basic setup:

The basic setup functions relatively quickly. It should be read fully and then executed. Otherwise you cannot possibly keep pace with the sequence!

1. Switch on the transmitter, set the throttle stick at full throttle to ensure that the controller is off.
2. Hold the model, connect the ESC => a monotonous continuous beep should be heard! ...: Programming mode active!
Full throttle position detected!
3. Set the stick to the desired **neutral position**. If no brake is required this is the "fully back" position. If a brake is required, place the stick in the bottom quarter (ie not fully back). Thus the stick positions are stored.

Acknowledgement: 

4. Now the selection of a **soft start** takes place. For extremely fast response times to simply move the stick to full throttle and wait for confirmation, then stick back and the controller is armed. If that is too hard, or when the motor accelerates out of step, set the stick further back and wait for

acknowledgment signal. **Acknowledgement:** 🎵

=> soft start stored.

=> Soft brake if activated is also based on this value!

It should be noted that very fast response times for brushless motors leads to many times the current consumption of stationary operation! Therefore, this adjustment should be made with care. Only as much as necessary to achieve the desired speed. A happy medium is just to place the stick in the middle. For geared applications the stick should be placed below the centre. This is especially true for the use of soft start in a helicopter!

Attention helicopter pilots:

For helicopters the stick is best set fully back (neutral position)!

It is important that with Autorotation the motor is not taken fully back to 0!

Otherwise, there is at the breakout from the Autorotation an extremely slow normal start - maybe an unwanted Autorotation. The motor therefore needs a certain residual speed, so that the controller does not evaluate the run-up as a start. This speed should be chosen so that the helicopter can not quite take off. If it is too small it may lead to an overload of the motor during acceleration. Nevertheless, the motor can be engaged after Autorotation breakout but not with full force but just softly. Therefore, an appropriate security level should always be maintained

Advanced Setup:

For the Advanced setup the basic setup must have been done first!

1. Switch on the transmitter, set the throttle stick at full throttle to ensure that the controller is off.
2. Hold the model, connect the ESC => a monotonous continuous beep should be heard! 🎵...:
after about 20 tones it is shifted into the advanced setup provided the basic setup was completed.

Acknowledged 🎵 => **Advanced Setup**

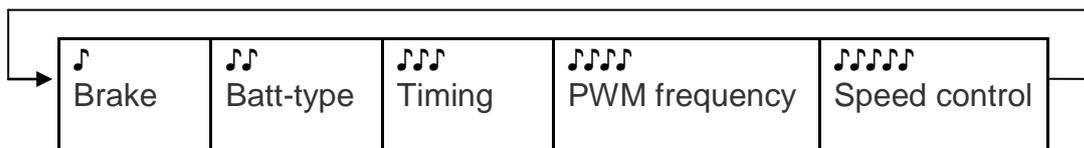
If the continuous beep is not heard, please immediately disconnect the battery from the automatic controller and check everything again. Place the transmitter in good range of the receiver if the antenna has been taken off!

Important!

In the Extended Setup each time only **ONE** menu point can be selected, therefore first a menu choice must take place:

Again throttle stick back into off position for the parameter selection :

Menu Options Overview:



Set stick to full power at the desired selection.

Acknowledgement: ♪

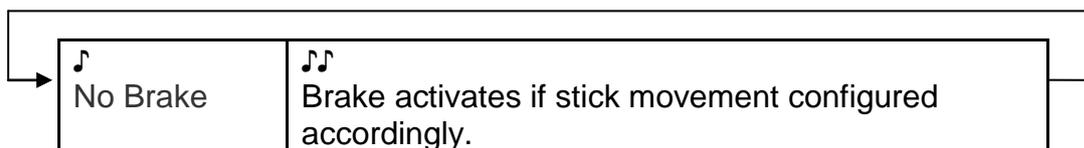
Note: If no selection is made the menu begins again with brake etc.

Depending upon choice the setting of **one** parameter now takes place.

Possible (under) menus:

Brake (♪)

Move the Stick again into the off position:



Set stick to full power at the desired selection.

Acknowledgement: ♪

After the acknowledgement the menu option is programmed!

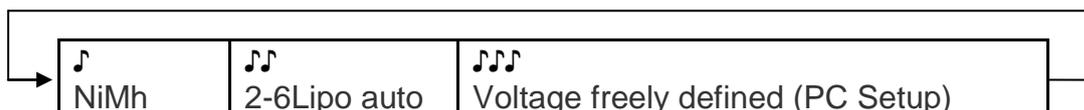
If the stick is taken back into the off position, the controller is ready for operation when the Unlock Signal sounds. This applies to any programming step.

If no selection is made, all of these selection menus will begin again until a selection takes place.

Batt-type (♪♪)

Battery Selection (Battery type):

Move the Stick again into the off position:



Set stick to full power at the desired selection.

Acknowledgement: ♪

Setting completed.

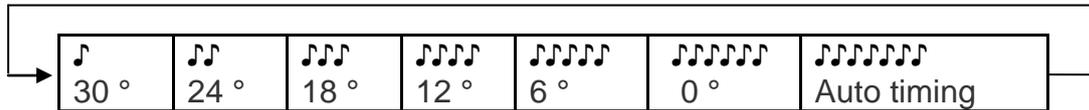
Timing (♪♪♪)

Timing Adjustment:

Move the Stick again into the off position:

The controller starts with a one tone (30 °) and continues until 7 tones (auto timing).

Example: 18 ° required set stick to full power at the third beep signal.



Set stick to full power at the desired selection.

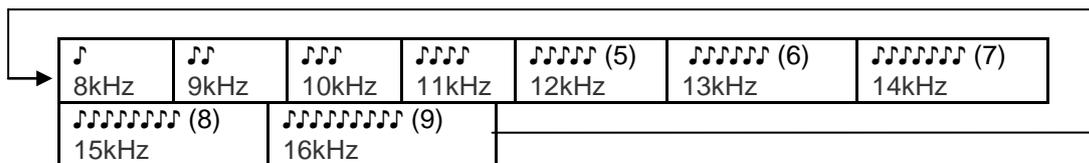
Acknowledgement: ♪

Setting completed.

PWM frequency (♪♪♪♪)

Clock frequency setting:

Move the Stick again into the off position:



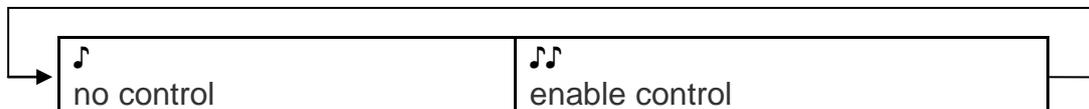
Set stick to full power at the desired selection.

Acknowledgement: ♪

Setting completed.

Speed control (♪♪♪♪♪)

Move the Stick again into the off position:



Set stick to full power at the desired selection.

Acknowledgement: ♪

Setting completed.

After activating speed control the automatic controller will learn the operating speed at the next start. It is therefore important to wait until after the acceleration a small leap in rpm signals the use of speed regulation.

If no selection is made, all of the above selection menus will begin again until a selection takes place.

Translated by R.Whitehead 23-1-2012 for my own use
(No liability can be accepted for the result of any errors!)

Tip:

It is always started with the previously set value. Thus, the user can read the settings too!

Upon completion of any of these parameters move the stick back to neutral and the controller is armed. Alternatively also the supply can be disconnected and by reconnecting a further parameter can be adjusted etc.
