

Main features

- adjustable forward/brake/reverse
- adjustable pwm frequency
- easy to use and configure
- compact dimensions
- working with AM, FM and DSM (Spektrum, Kopropo, ..)

Introduction

ALREG is a high performance electronic speed controlled for use with brushed DC motors. It can be used in various RC models, but it's mainly developed for RC cars, where you can enjoy all the features. The controller is fully programmable. There are red and green LED light used for op. indication and setting.

Specifications

	light	standard	turbo ???
Input power (Cells)	4NiMh/NiCd (max. 5.5V)	4-8NiMh, 2-3S LiPo (max. 16V)	
ON resistance	0,023 Ω	0,023 Ω	0,011 Ω
Max current	12 A (peak 60A)	12 A (peak 60A)	24 A (peak 120A)
BEC	x	5V/1A (current limit, thermal protection, short-circuit protection)	
Dimensions	21 x 14 x 7 mm ???	28 x 16 x 15 mm ???	28 x 16 x 22 mm ???

Precautions

- Turn-on transmitter first to avoid undefined or fail-save operation. For more it will speed up DSM pairing.
- **Do not connect battery incorrectly, the controller hasn't reverse voltage protection !**
- Disconnect battery from controller when not in use.
- Do not operate controller in or around water.
- When you feel the motor is lazy, you should stop and charge battery. There is no undervoltage protection.

Power-up

After connecting battery, controller power-ups and red LED lights on for 2s. This delay is due to pairing DSM radio. Then the controller can immediately switch to normal operation or you can activate radio calibration or parameters setting.

Before power-up don't forget to turn-on transmitter !

Be careful on correct battery polarity, reverse voltage will damage you controller !

Normal operation

Controller is ready to work 2s after power-up. During normal operation one of the LEDs blinks (once per 1,5s). When the green LED blinks, everything looks fine. When the red LED blinks, there is some trouble with parameters (some parameter is out of range) and controller works with default ones. In this case you should make radio calibration and check all parameters.

Throttle, brake and reverse has linear characteristic. When the transmitter trigger is in throttle position, you go forward, when you move the trigger to the reverse position it brakes until you move the trigger to neutral position and stay here minimal time (parameter #6) – then when you move again in reverse position you go reverse.

Radio calibration

1. Turn-on the transmitter, set all trim adjustment to the middle, ensure that your throttle direction is set to “normal”, deactivate all advanced functions that can affect throttle/brake (like ABS etc.).
2. Move the transmitter trigger to the full brake position and hold
3. Power-up the controller and wait until the green LED lights on (about 5s – first 2s red is on, then 3s red blinks fast).
4. When the green LED is on, set trigger to the full brake position, after the position is identified and saved, both LEDs blinks and red LED stays on.
5. When the red LED is on, set trigger to the full throttle position, after the position is identified and saved, both LEDs blinks and both LEDs stays off.
6. When the both LEDs are off, set trigger to the neutral position, after the position is identified and saved, both LEDs blinks and green LED stays on.
7. All positions are now saved, you can do it again (step 4) or you can exit calibration with power-off the controller

Parameters setting

Entering setting mode:

1. At the first you have to perform radio calibration.
2. Prepare you **programming cable** and connect it between receiver and regulator
3. Turn-on the transmitter.
4. Push the button on the programming cable and hold.
5. Power-up controller and wait about 5s (first 2s red is on, then 3s red blinks fast) until the LED(s) will blink slowly. Release the button. Now you are in setting mode.

LEDs meaning:

The red LED blinks number of parameter we are setting now and the green LED blinks its value. The blinking is a cyclic. For example: red blinks 2times then green blink 3times. It means the parameter number 2 has value 3 – from the table below we can find that maximal brake is set to 20%.

When some parameter has zero value, then only red blinks with delay between repeating.

Setting:

Handling is realized by the transmitter trigger.

When you move the transmitter trigger from the neutral to the brake position, you move to the next parameter. At this moment the red LED blinks fast and then LEDs will start blinks number and value of the actual parameter. From the last parameter it goes to the first parameter. Thus you can cyclically inspect all parameters and their values.

The value of the current parameter you can change by moving the trigger from the neutral to the throttle position. At this moment the green LED blinks fast and the value changes +1 (if it has maximum value it changes to minimum) and then LEDs will start blinks number and value of the actual parameter. The new value is not saved immediately, it will be saved when you switch to the next parameter.

Leaving setting mode:

1. Power-off the controller.
2. Remove programming cable.

Parameters table:

num.	range	meaning	default
1	0-10 [*10%]	minimal brake	0
2	0-10 [*10%]	maximal brake	10
3	0-1	brake in neutral position (0-no, 1-yes)	0
4	0-10 [*10%]	maximal reverse power	5
5	0-10 [*10%]	maximal forward power	10
6	0-10 [*60ms]	Minimal time you have to stay in neutral position to switch from brake to reverse. Mentioned time is rough, exact time depends on radio set. Value 0 has a special meaning, when set, then switch from brake to reverse occurs in maximal brake position – immediately without delay.	3
7	0-2	PWM Frequency: 0 – 488Hz, 1 – 1960Hz, 2 – 3900Hz	1

Tested on radio sets

HobbyKing HK-GT2

Spektrum DX3.0

Kopropo EX-10 Helios + FM RF-501F

Kopropo EX-10 Helios + Spektrum SM1000

Kopropo EX-10 Helios + Spektrum SM1001 Pro

Known issues

- When using controller with some radio sets (we observed that with Kopropo transceiver), the blinking of LEDs is a little slowly. It doesn't have impact on normal operation, only setting the parameters is more slowly than it could be.

WARNING

Controller hasn't reverse voltage protection either short-circuit (current limit) protection.

When you find some fault or malfunction, be so kind and let us know about it. You can contact us at info@rmicrocars.eu.

This project is in the prototype state, so any feedback is helpful for further development and improving our product.