Micro Modules

MicroMotorDual

V 1.05 / August 2014

Not suitable for children under the age of 14 !

Neuhaus Electronics

General:

•Amount of motors (selection + outlets):

•Program Motor 1:

•Frequency:

Settings of the individual motors:

•Curved

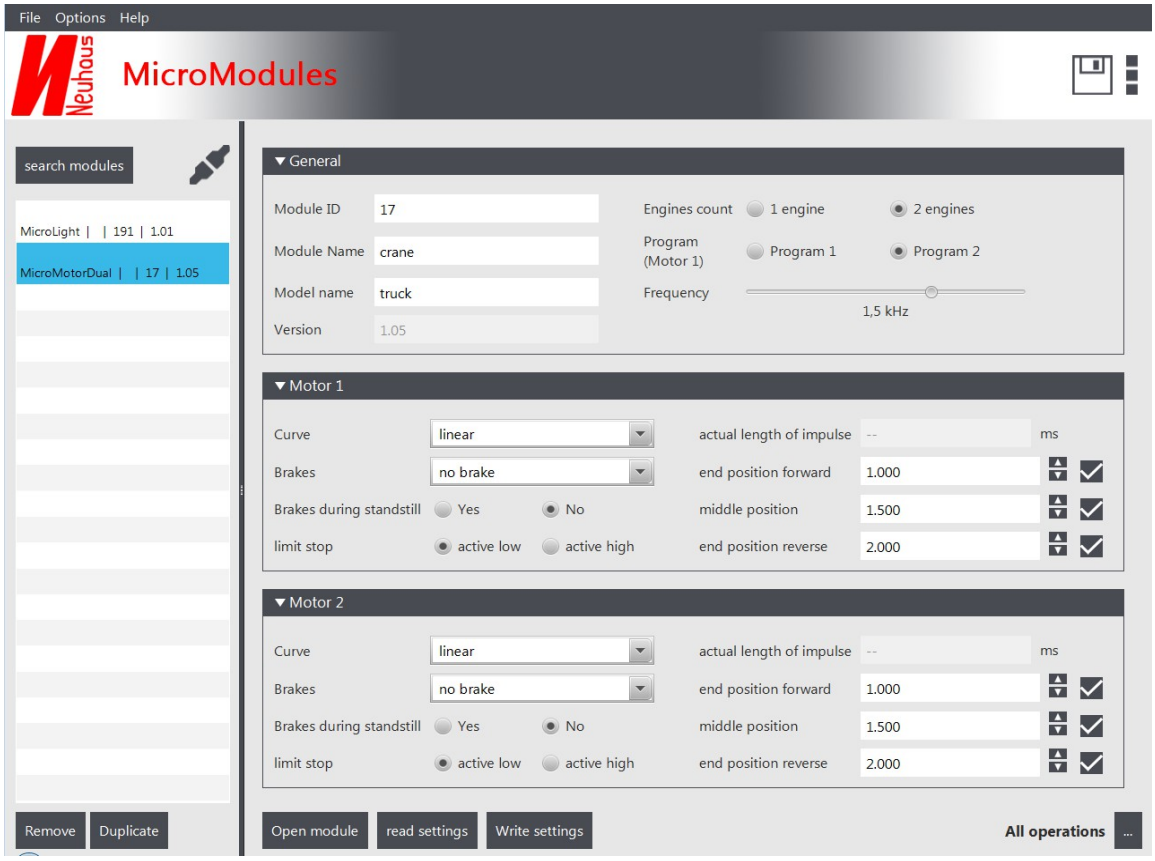
•Brake configuration

•Limit switch mode

•Set middle and final positions

Connection Schemes
Technical Data
Appendix
(Beeper, LED, Notes on soldering …)

View Motor Settings



The **MicroMotorDual** drive control is especially well suited for micro models and everywhere there is little space, yet a finely tuned and at the same time stable motor selection is required. Furthermore, many special functions are supported.

Features:

- small dimensions: 14.5 x 15.5mm
- 2 motors featuring 1.5A constant current each or 1 motor featuring up to 3A constant current (up to 4A short term)
- short circuit proof motor outlets as well as thermal overload protection
- beeper outlet for reverse (also indicates a short circuit/overload at a high frequency)
- reverse and brake light (up to 500mA / outlet, not short circuit proof)
- both motors feature separate inputs for optional end stop switches
- channel 1 offers a turnaround function, the direction of the stick on the remote device stays the same
- 3 different modes of EMK brake (independent for both channels)
- 4 different selection curves from linear to square (independent for both channels)
- 19 cycle frequencies can be selected from 50HZ to 32kHZ, especially for bell-type armature motors
- 256 levels forward and reverse
- final and middle stick positions can be programmed separately for both channels
- all parameters programmed via the IR interface
- voltage range motor: 2.8 – 10.5V (from 1 LiPo cell), receiver unit: 2.8–8.5V(up to 2 LiPo)

Settings factory:	**Motor 1**	**Motor 2**
Middle position of stick	**1.5ms**	**1.5ms**
End stop each	**+/- 0.6ms**	**+/- 0.6ms**
Curve	**linear**	**linear**
Brake	**none**	**none**
Cycle	**1,5 kHz**	**1,5 kHz**
Amount of Motors	**2**	
Brake at standstill	**none**	**none**
Program	**1**	
End stop	**active LOW**	**active LOW**

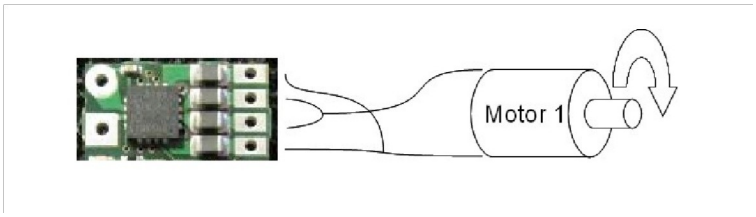
General Motor Settings

Amount of motors:

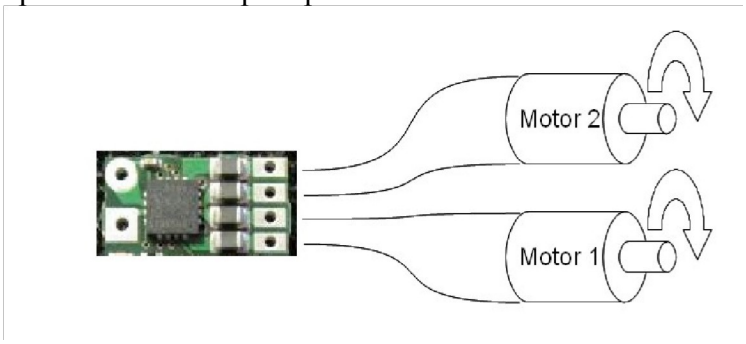
Select 1 or 2 motors.

1 motor:

both outlets are switched parallel, max.4 Ampere, the card of the second motor is deactivated.



2 motors:
up to a max. 2 Ampere per outlet



The beeper will emit high frequency tone during overload, short circuit or excess temperature.

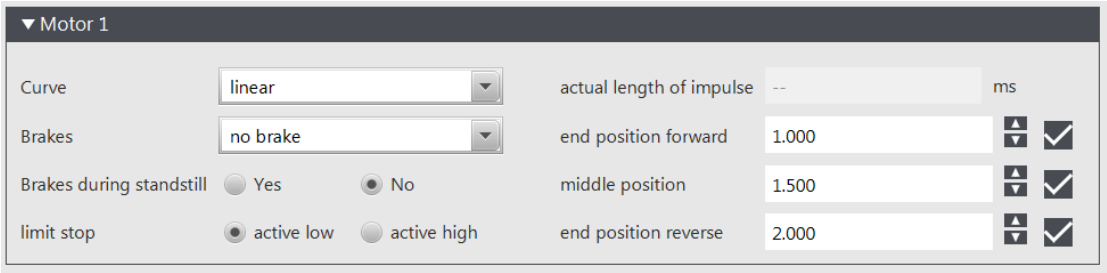
Program selection for Motor 1:

Program 1:
If this pin is pulled to minus, the rotating direction of the motor will be turned around, whereas the stick stop collar “forward” and “backward” will remain identical. This function was especially implemented for construction vehicles, which may be able to change their forward movement based on given requirements.

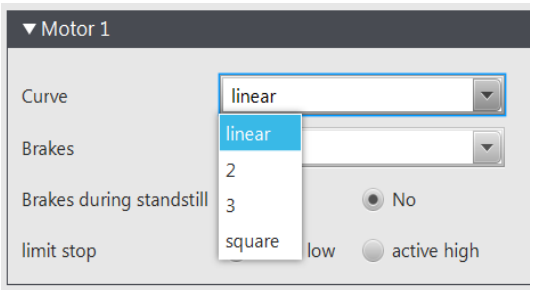
Program 2:
As for motor 2 these pins serve as inputs of the limit switch.

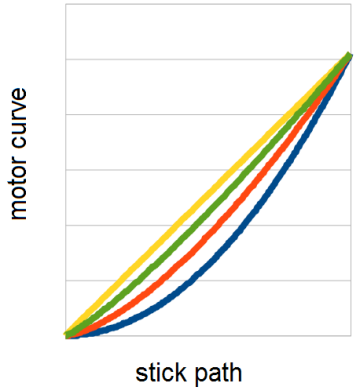
Frequency selection:
The frequency works for both motors. The cycle can be adjusted to fine increments of 50Hz to 32kHZ. Adaptation to every motor becomes easily possible. For iron-type armature motors a lower frequency range and for bell-type armature motors a higher range is recommended. Frequency is set directly via the display bar by holding down the left mouse button at the point and sliding it to the desired position.

Independent Motor Settings



Forms of curves:

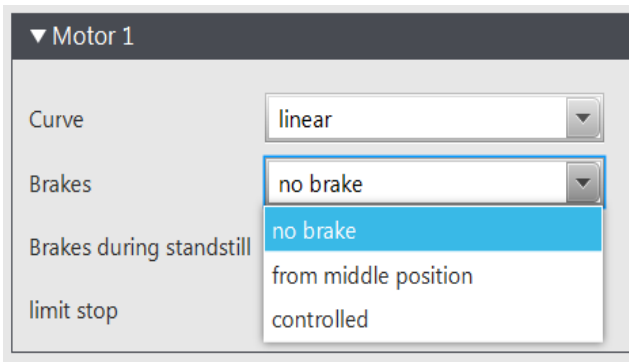




Curve 1 = linear (yellow)
Curve 4 = square(x^2) (blue)

4 different curves are available in order to maneuver very precisely in the area of the zero point.

Brake mode:



"Brake None":
When "decelerating" the motor will run on freely. If the neutral position is crossed, the motor will immediately turn in the other direction.

“Start Center“:

When “decelerating” the motor will run on freely. If the neutral position is crossed, the brake is activated until the central position has been reached again. The braking action is greatest at the stop collar of the stick and weaker towards the neutral position. In this way the braking action can be metered.

“Controlled“:

Controlled mode. When “decelerating” the motor will already be braking, therefore it cannot “run away”. Once the neutral position has been exceeded the motor will immediately turn in the other direction.

Brake at standstill:

Activated: brake will be pulled when the motor is at a standstill, prevents rolling away

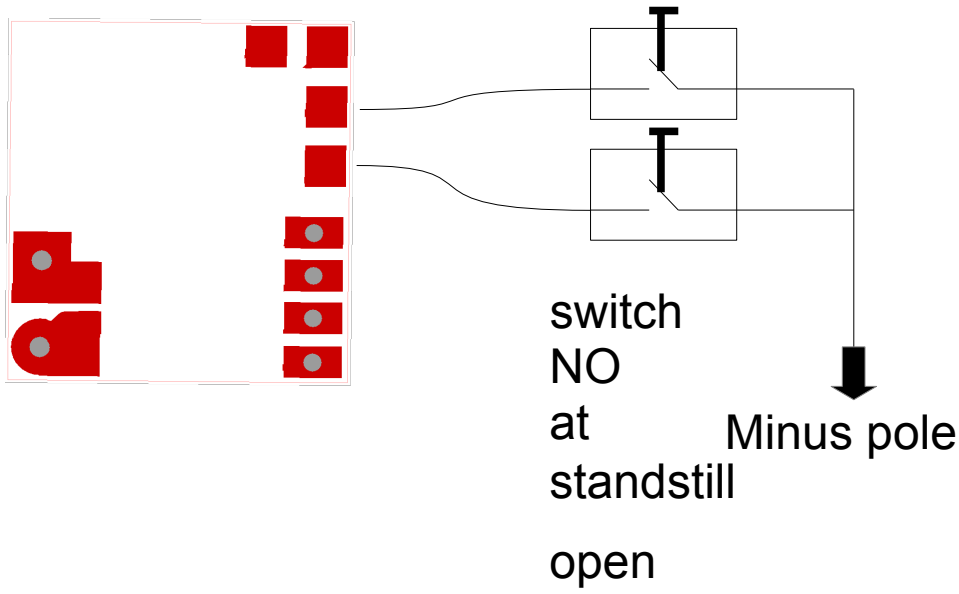
Not activated: the motionless motor can be spun.

End stop mode:

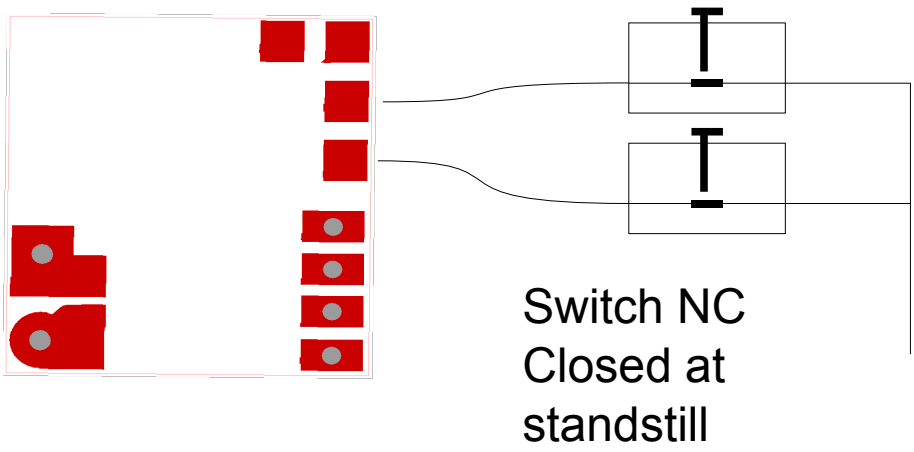
Select the active gauge for limit switch shutdown: if the limit switch shutdown is not used, the option **“active LOW“** has to be selected. This is also the factory setting. If the limit switch shutdown is needed, it would be possible to move the respective connection to ground (minus) via a maker, however a possible lead fracture or defective switch could no longer be detected immediately.
It might happen that the motor revs to the limit switch and damages, e.g., the gearbox. In this case we recommend the **“active HIGH“ option**. In this case a breaker has to be used. As soon as it opens the motor stops instantly. The motor also stops instantly in the event of a lead fracture or a defective switch. These settings can also be selected separately for both motors.

The following example of a connection shows both options for Motor 2.
For “active Low“ makers are used (NO = normally open) for “active High“ breakers are used (NC = normally closed)

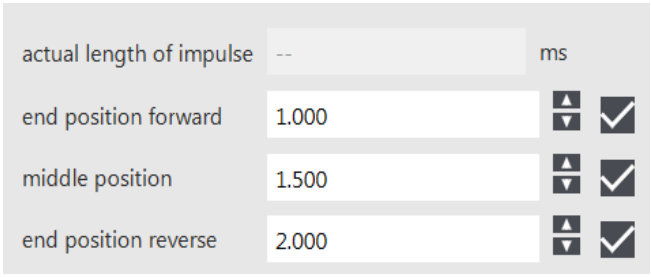
Limit switch outlets activated LOW



Limit switch outlets activated HIGH



Settings of middle and final positions of the stick:



When there is an active connection to the module, the current value of the stick position is displayed as digits in msec approx. every 0.25 secs under “actual length of impulse”.

By clicking the checkmark the current value is transferred to the respective line. The desired value can also be entered manually.

Creating settings by example of a vehicle:

Off-position:

Generally, the vehicle is stopped when the control stick is in the middle position. Leave the stick in the middle position and click the checkmark. Then this position will be defined as motor standstill.

Forward/Reverse:

Move the stick so the vehicle moves forward. When the stick reaches the stop collar click the checkmark in the “Stop Collar Fwd“ line. Proceed the same way to set reverse. Factory settings are between 1 and 2ms, central at 1.5ms

Tip:

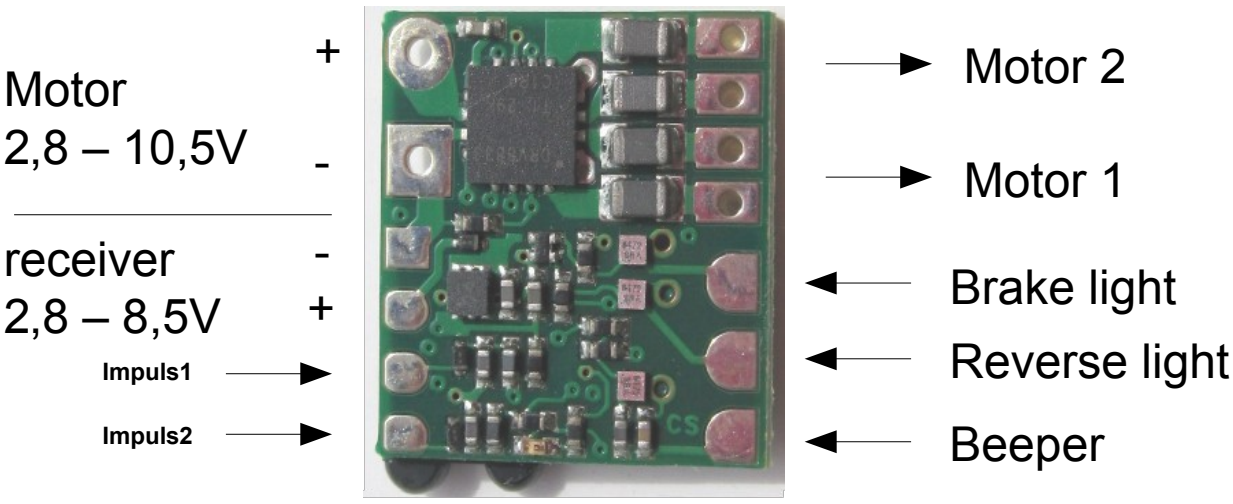
• To **turn around** the **rotation direction** of the motor simply switch the settings between stop collar forward and reverse.

• Full throttle: in order to always have “**full voltage**“ (100% PWM ON) available for the motor simply change the saved value of the third decimal place by 2–3 points towards the mean.

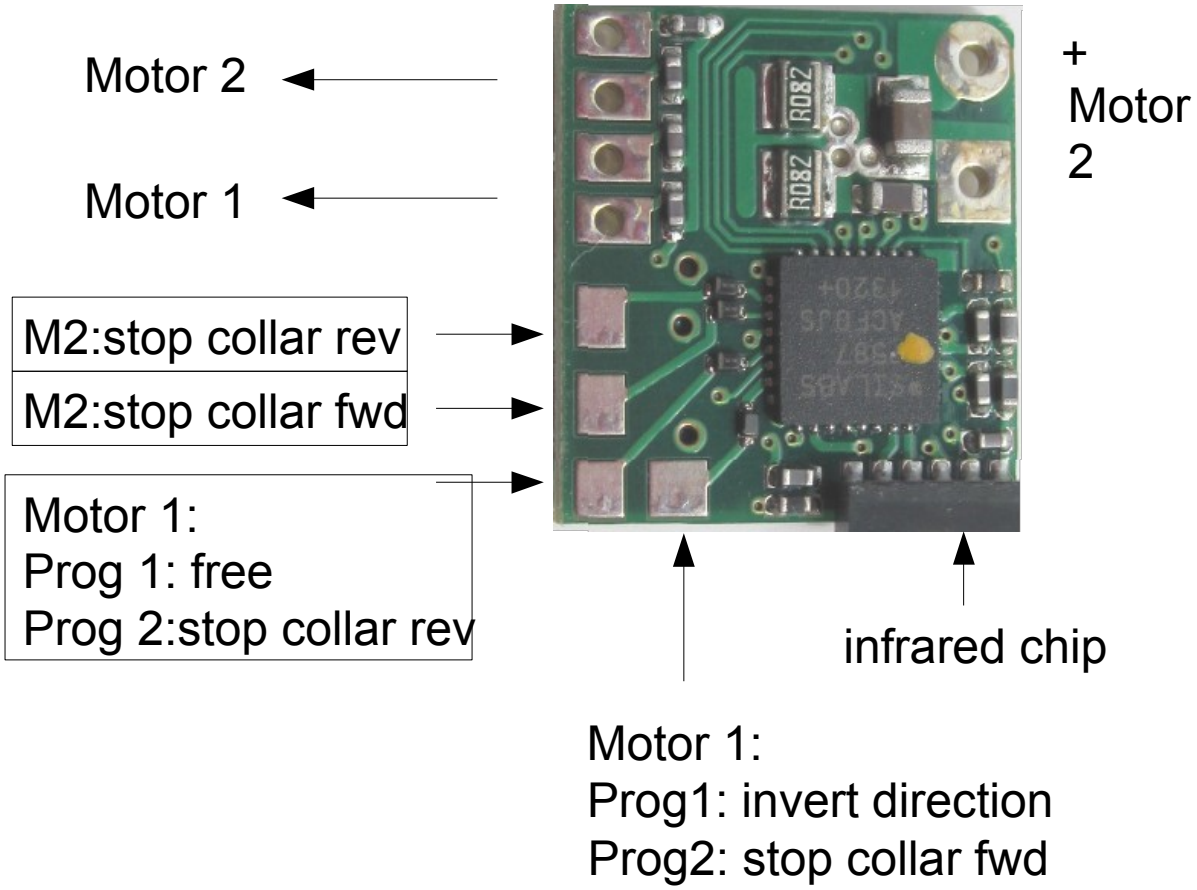
• The motor of an airplane will only rotate in one direction without a middle position: the full travel range of the stick can also be assigned to one rotation direction by seizing a central and end position (depending on the direction) with the same value.

Important note: the voltage supply of “Motor“ and “Receiver“ inputs (logic controller) are separated and can be conducted from various power sources when needed. The grounds (minus poles) are connected internally at the print. This also means that the logic controller at the receiver, as well as the motor selection, has to be supplied with power.

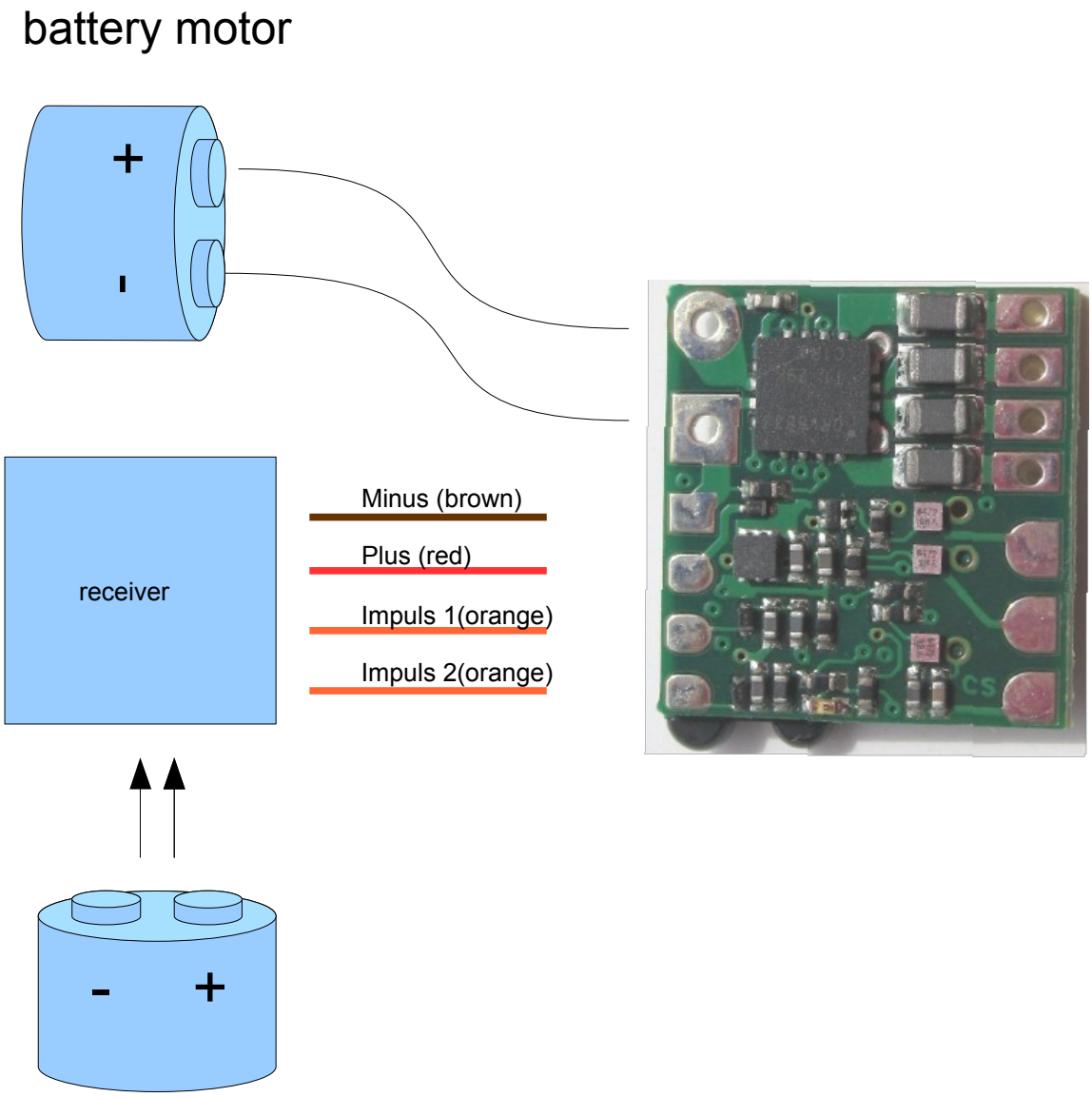
Outputs on top



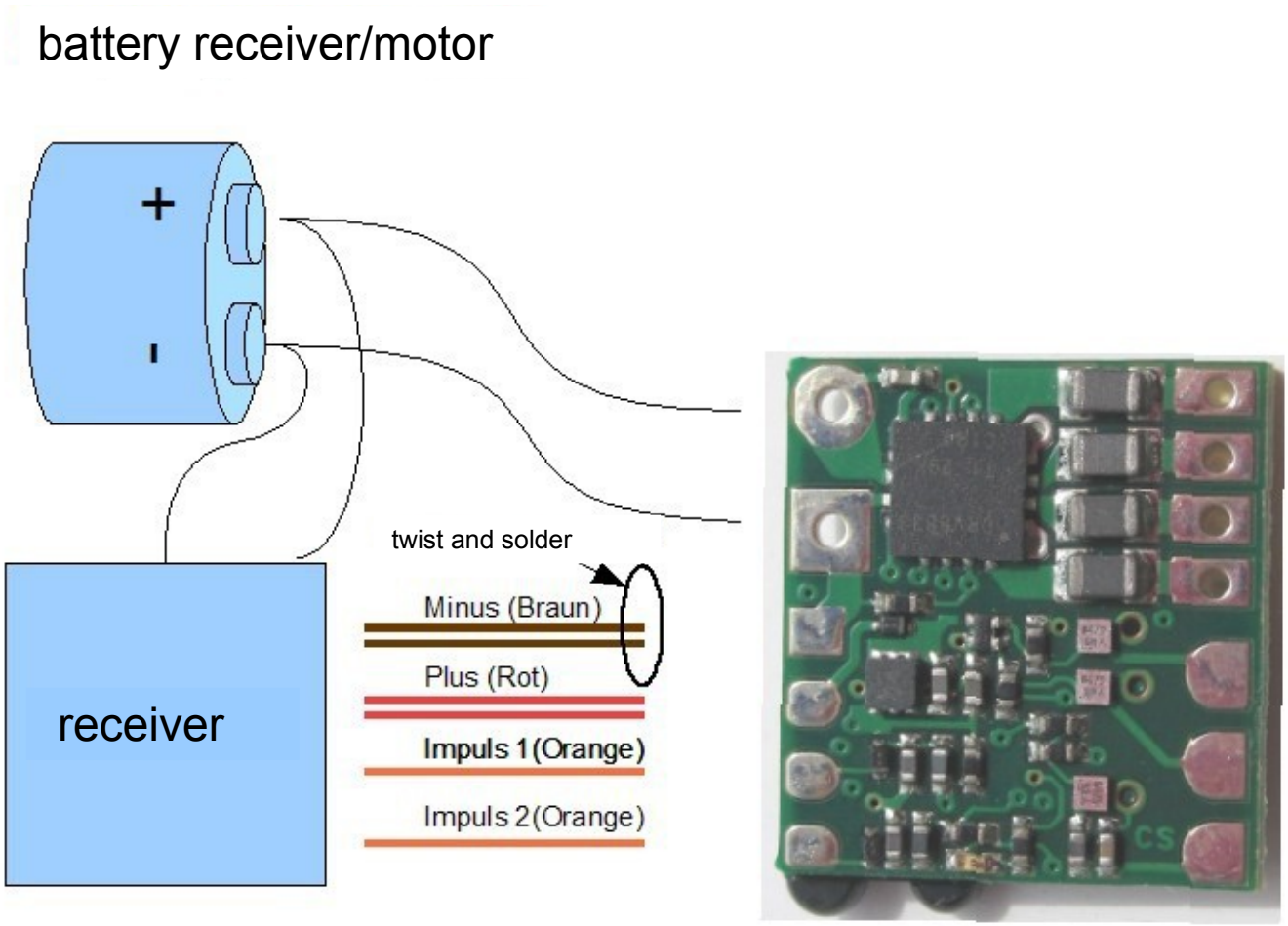
Outputs underneath



Power supply option 1: receiver and motor battery separately

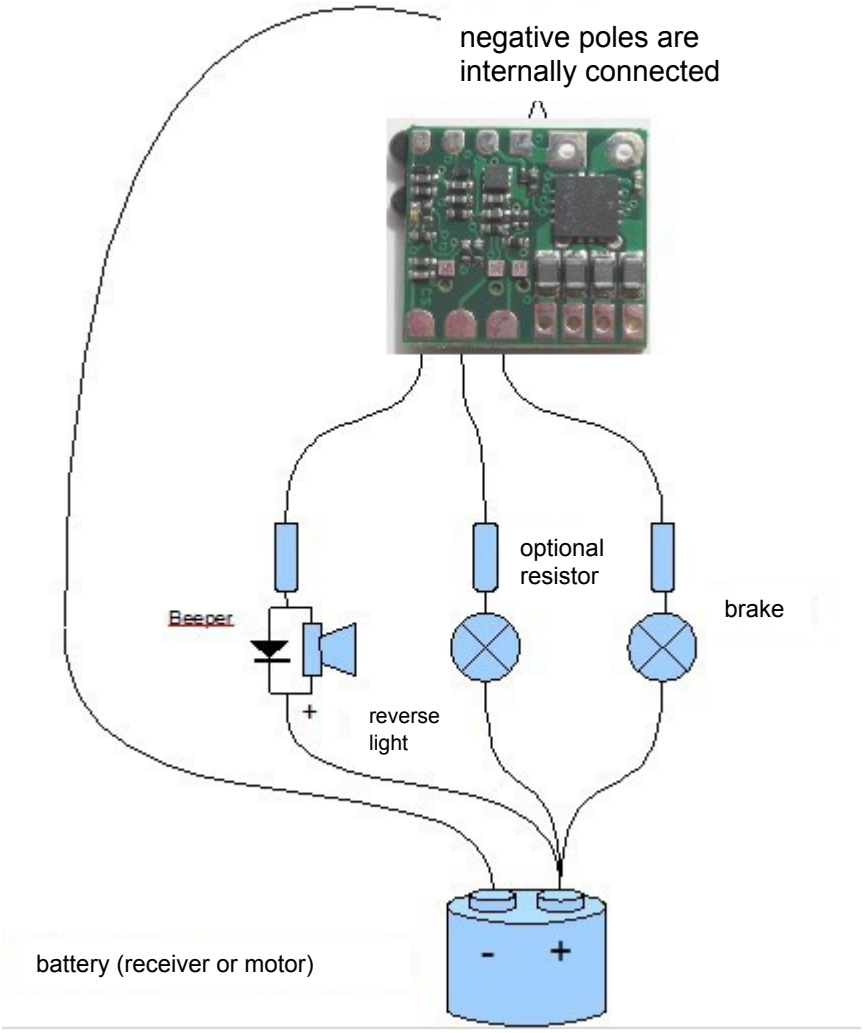


Option 2: only 1 battery for motor and receiver together



Important Note:
Due to the slightly protruding assembly the infrared chip is mechanically sensitive. Please avoid mechanical stresses.

Output lamps and beeper, the common output is the + pole



Appendix

Connecting LEDs:
LEDs usually require a resistor that depends on the amount of supply voltage.
Example to calculate the resistor:
System current: 7.2 V battery
LED: voltage/current 2 V, 10mA

Calculating the resistor:
resistor = 520 Ohm
Power is "burned" at the resistor, which is transformed into heat. The resistor has to be able to tolerate this loss of power during non-stop operation in order to prevent overheating. Resistors are produced in a wide range of categories.

Calculating the loss of power of the resistor:
Loss of power = voltage decreasing at the resistor x flowing current
Power loss = 5.2V x 0.01 A
Power loss = 0.052 Watt

The values of the resistor are:
520 Ohm, 0.052 Watts

As 0.052 Watts is not a standard value, a value of 0.1 Watts or more is used.
Easily attainable standard values: 470 or 560 Ohm, 0.1 , 0.25 or 0.5 Watts

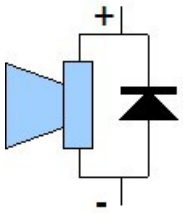
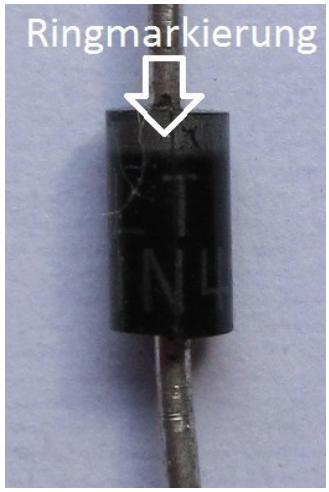
$$Resistor = operating\ voltage\ system - (voltage\ LED\ [V] \times current\ LED[A])$$

$$Resistor = 7.2V - 2V\ 0.01\ A$$

Beeper connection:
Electromagnetic elements are used as beepers. These act like coils and have to feature a flyback diode. Otherwise the selection transistor may be destroyed during shutdown by the induced voltage peaks. The diode has to be switched in the lock direction or it may melt off and possibly take the transistor with it. The beeper also requires a resistor, depending on the operating voltage. 5.6 Ohms have proven to be an adequate value for 2S LiPo. Here, the beeper will resound at a decent volume. A resistor is not required for 1S LiPo.
The beeper features poles. Beware of + and – during assembly. There are 2 different types of beepers. The ones used for modules features a functioning internal clock generator. The signal is produced through the processor and the other one produces its own cycle.

		
Front	Sound exit	Back

Diode:

	
Wiring chart diode connection at beeper	The “+“ pole of the diode has a ring

Tip: the diode should be mounted as close to the beeper as possible.

Technical data:

Motors:

Operating voltage of motors:	2.8 – 10.5V= **(12V are too much)**
Operating voltage of logic controller:	2.8 – 8.5 V= (1 – 2s LiPo)

Current motors:

2 motor operation each:	2 A
1 motor operation:	4 A

Inputs, outputs:

current brake light, reverse light, beeper. max. 0.5 A

voltage at the inputs (limit switch shutdowns) and outpus each max. 15V
activation of brake light, reverse light, beeper via ground fault to minus

Note on soldering:

It is highly recommended to use a very fine soldering tip. 10 Watts power is more than enough. Be meticulous about not creating short circuits to the components. It is best to solder under a magnifying glass.

Soldering the servo wire:

Remove the insulation of the servo wires at a length of approx. 5mm, then tin plate the ends. After 2 inputs have been created, the plus and minus wires are available twofold. It is best to twist them and then tin-plate them together. Thereafter, shorten the tin-plated parts to approx. 1 mm and solder these to the respective pad, which was previously equally tin-plated with a small amount. The result will be good contact and no protruding tin-plated wires.

Items included:

1 x motor module
2 x servo wires
1 x beeper
1 x Schottky diode
1 x resistor for the beeper during operations > 6V
1 x CD featuring user manual and software

Imprint

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