

ASSEMBLY DIFFICULTY



The system shuts off power to the DC motor when the current consumption increases above the monitored value. Thus, the device can act as a limit switch.

Characteristics

- 3-15 V DC motor power supply
- load current < 1A
- stepless adjustment of the tripping current in the range of 0.1-1 A
- control button
- dual-mode operation
- option to expand the system
- 5 V DC power supply

Circuit description

The circuit, the schematic of which is shown in Figure 1, shuts off power to the DC motor if the current draw increases above the monitored value. This allows the system to act as a limit switch for a DC motor drive. Pressing the button starts the engine in the conventional "first" direction, for example, to the right. At this time, the value of the current drawn by the motor is compared with the set value using potentiometer PR1. When the motor axis is braked or stopped, the current drawn by the motor will increase significantly. Such an event will immediately cause the system to react – the power supply to the motor will be disconnected. Another press of the button will restart the entire cycle, but the difference will be that the polarity of the power supply to the motor will be changed, that is, the motor will operate

rotating in the opposite direction, for example, to the left. If the motor axis is not stopped, the motor will automatically shut down after about 20 s. Pressing and holding the button will start the cycle in force mode. It relies on the fact that when the power supply to the motor is automatically disconnected, but the button is still pressed, restart attempts will be made at intervals of about 0.5 s until the button is released. Such a feature will eliminate a possible jamming of the mechanism.

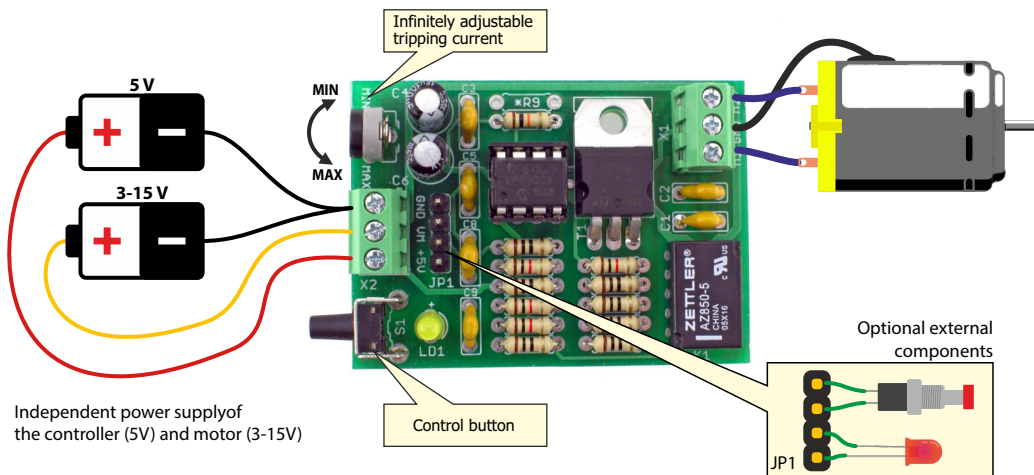


Figure 4. An example of connection to an independent power supply

List of elements

Resistors:

R1, R2, R5, R10-R13:10 Ω (brown-black-gold)
 R3, R4, R7, R8:1 k Ω (brown-black-red-gold)
 R6:10 k Ω (brown-black-orange-gold)
 R9:do not solder
 PR1:10 k Ω potentiometer, vertical

Capacitors:

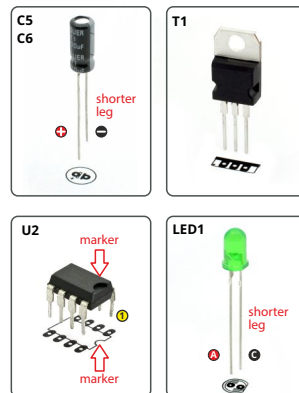
C1-C3, C5, C8, C9:100 nF (may be labeled 104)
 C4, C6:100 μ F!

Semiconductors:

T1:BUZ11 or similar!
 US1:PIC12F675!
 LD1:LED!

Other:

PK1:AZ850-5 or similar
 X1, X2:DG381-3.5/3
 JP1:goldpin 1 \times 4
 S1:button



We begin the assembly by soldering the components onto the board in order of size, from the smallest to the largest. When installing components marked with an exclamation mark, pay attention to their polarity. Frames with pinout drawings and symbols of these components on the circuit board, as well as photographs of the assembled kit, can be helpful. To access high-resolution images as links, download the PDF.



