



Name: **Easy Motor Controller**

Code: **MR001-003.1**

The *Easy Motor Controller* allows to control the speed and the direction of rotation of a DC motor through three different possible inputs: analog (potentiometer), radio control RC, I2C digital communication.

Its use is very simple and you do not have to do anything, the type of input used is detected automatically when the board is powered.

To optimize the response to RC commands you also have the calibration function on the receiver signals.

The *Easy Motor Controller* provides two separate power supplies, one for the motor and the other one for the logic part; the latter can be pulled out through a jumper directly from that of the motor or alternatively from the BEC circuit of the RC receiver.

For the I2C communication, there are two different slave addresses selectable through a jumper, and in this way it is possible to use two *Easy Motor Controllers* on the same serial line, and then control them by using a single external controller.

The possibility of using two limit microswitches that will act as a protection, interrupting the movement of the motor in the two possible directions when the pressure of the microswitch is detected, completes the functions on the board.

To fix the board there are 4 holes of 3.2 mm with a distance of 28mm from each other.

INSTRUCTIONS

As soon as the board is turned on the L led will start to flash rapidly to indicate that the recognition of the type of input is in progress.

This phase lasts for a maximum of 2 seconds, during which the board will wait for a valid I2C

communication or a signal from the RC connector. If neither the I2C communication nor the RC signal are detected, the board will use the analog signal of the potentiometer as input.

After this phase, the led will turn off and then will flash again much more slowly, taking only 1, 2 or 3 flashes to indicate the type of input detected, according to the model of Table 1.

flash number	Input type
1	I2C
2	RC
3	Analogic

Tab.1 – Input type

At this point, in the case of I2C or analog input, the L led will light steadily to indicate that the board is ready, and the motor will respond to your commands.

On the other hand, if you are using a RC receiver, the calibration phase useful to measure the characteristics of the receiver will start.

During the calibration phase it is important to start with the joystick on the remote control positioned approximately in the center. The L led will flash quickly and the board will wait until the user moves the joystick to its maximum position; once calculated this value, the board will turn off the led for about one second and then let it flash again at a lower speed waiting for the user to move the joystick in its lowest position.

Once calculated the signal range, to prevent the motor from starting to move at a high speed the L led will be made flash quickly again and the board will wait until the joystick is brought back to its central position; only then the led will turn on steadily to indicate that the board is ready and the motor will respond to your commands.

Now the calibration is finished and the board will be able to take advantage of the RC signal complete swing of your receiver.

I2C COMMUNICATION

The *Easy Motor Controller* can be controlled via I2C commands and will operate as a slave device with two possible addresses, selectable via the ADR jumper (see Table 2). In this way you can use two boards on the same serial line, and then control them using a single external controller.

ADR Jumper	Address
open	0x0C
close	0x10

Tab.2 – slave address

The communication is extremely simple and does not need any configuration, it is sufficient to write 1 byte to the slave address set by the jumper; that single byte sent will contain both the information on the direction of rotation and the speed information.

There are 127 possible different speeds for each of the two directions of rotation; values from 0 to 127 represent the velocity in a direction (0 is the maximum speed, 127 is the minimum), while

values from 128 to 255 represent the speed in the other direction (255 is the maximum speed, 128 is stopped).

LIMIT SWITCH

The *Easy Motor Controller* provides two inputs to be used for the connection of limit microswitches.

Their functioning is extremely simple, and when one of the two microswitches is pressed the board inhibits the movement of the motor in one of two directions.

This function is important in cases where you want to limit the movement of actuations within demarcated areas to prevent damage to things or the injury of people.

When the pressure of a microswitch is detected and the motor is stopped the board will make the L led flash to give warning to the user of this event. In these cases, to unblock the motor it is sufficient to reverse the direction of rotation.

CHARACTERISTICS

Supply voltage	7 - 30V
Supply current (logic)	12mA typ.
Output current	2A (6A peak)
I/O logic level	TTL standard
Dimensions	33x33mm
Weight	0.31oz / 8.7g
Temperature range	0 - 85°C

