



Name: **Easy Motor Controller V2**
Code: **MR001-003.2**

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

Its use is very simple and the input type can be selected just pressing a button as explained in the instructions below. To optimize the response to RC commands you also have the calibration function on the receiver signals.

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 Controller* on the same serial line, and then controlling them by a single external controller.

In completing the functions on the board, there is also the possibility of using two limit microswitches, that will act as a protection, by stopping the movement of the motor in the two possible directions when the pressure of the microswitch is detected.

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

INSTRUCTIONS

As soon as the board is turned on, the led will flash 1, 2 or 3 times to indicate the input type selected, according to the model of Table 1.

If you need to change input type, it will be enough to keep pressed PRG button for a while; as long as the button is pressed down, the led will flash 1, 2, 3, or 4 times and then it will cyclically restart with 1 flash and so on.

Depending on the moment when PRG button is released, you can set the input mode. If you release the PRG button after 1, 2 or 3 flashes, the board will be setted respectively on analogic input

mode, I2C communication or RC signal. The selected input mode will be permanently saved and, at the next board restart, the last setting will be automatically selected; of course, this value can be overwritten making a new selection.

Flash number	Input selected
1	Analogic (potentiometer)
2	I2C
3	RC

Tab.1 – Input Selection

If PRG button is released after 4 flashes, RC signal calibration function will be activated; in this way, instead of using standard parameters, the characteristics of the receiver connected to the board will be measured.

As soon as the calibration phase is selected, you have to move the joystick of the remote control to its maximum position and press the PRG button for a moment; the board flashes 1 time to indicate that the reading has been saved. After these operations, you have to set the joystick at its lowest position and press PRG button again: the board flashes one more time to indicate that the reading has been saved. Finally, you must turn the joystick to its center position and press PRG for the last time: the led on the board flashes again to indicate that the reading has been detected and saved.

Now the calibration is finished and the board starts in RC mode being able to take advantage of the complete swing of your receiver RC signal. From this moment on, if you use this board in RC mode, the last calibration values will be used. Of course, making a new RC calibration, the last values will be overwritten.

I2C COMMUNICATION

The *Easy Motor Controller* can be controlled via I2C commands and it operates 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	I2C Address
open	0x0C
close	0x0D

Tab.2 – I2C Address

The communication is extremely simple and does not need any configuration, it is enough to write 1 byte to the slave address setted by the jumper; that single byte sent contains both the information on the rotation: the speed and the direction.

There are 127 different speeds for each of the two directions; values from 0 to 127 represent the velocity in one direction (0 is the maximum speed, 127 is the minimum one), while values from 129 to 255 represent the speed in the other direction (255 is the maximum speed, 129 is the minimum

one); the 128 value will stop the motor.

LIMIT SWITCH

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

Their functioning is extremely simple: 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 if you want to limit the movement of actuations within demarcated areas to prevent damage to things or the injury to people.

When the pressure of a microswitch is detected, the motor is stopped and the led on the board flashes to give warning to the user of this event. In these cases, to unlock the motor it is enough to reverse the direction of rotation.

The microswitches state can be read by I2C communication; the reading of 1 byte provides a reading in which the two less significative bits indicate the microswitch state; if S1 (or S2) bit is setted, this means that the corresponding limit microswitch is not pressed; instead, if S1 (or S2) bit value is 0, the corresponding microswitch is pressed.

MSB (0 0 0 0 0 S2 S1) LSB

BOARD RESET

It is possible to reset *Easy Motor Controller* to default settings. If you proceed with resetting operations, calibration data will be deleted and the board will be resetted in analogic input mode (potentiometer).

To reset the board you have to turn it off and, while pressing PRG button, turn it on again. Keeping pressed PRG button for about 2 seconds, the led will start flashing to indicate that the reset is going on; now you can release PRG button. At the end of this operation, the board restarts itself in analogic input mode.

CHARACTERISTICS

Parameter	Value
Supply voltage	7 - 24V
Supply current (logic)	8mA typ.
Output current	2A (6A peak)
I/O Logic level	TTL standard
Dimensions	33x33mm
Weight	0.30oz / 8.6g
Temperatura di esercizio	0 - 85°C

Tab.3 – Characteristics

