# MsMot Mini-shield for two 3 - 5V motors

If you have a 5V 10 Ohm (o.5W) motor, you do not need a large motor driver board. You can use 2 grove modules using the CNxx

The minishield is connected only to the pins it uses. Use it whith your proto shield and you control 2 motors in addition to the sensors being tested. As most motor shields, pins 4,5,6,7 control the motor, with PWM on pin 5 and 6. The drivers are the Si9986, 3 to 6V, 1A max, 300 mA with only 0.2V loss (compare with the L293).

The great thing about this small module is that bicolor Leds are provided to show the motor contro signals, and a switch desable the power on the motors when they have no reason to spin during software development. Bicolor leds feedback provide direction and approximate speed. Let's develop with leds and not noisy motors !
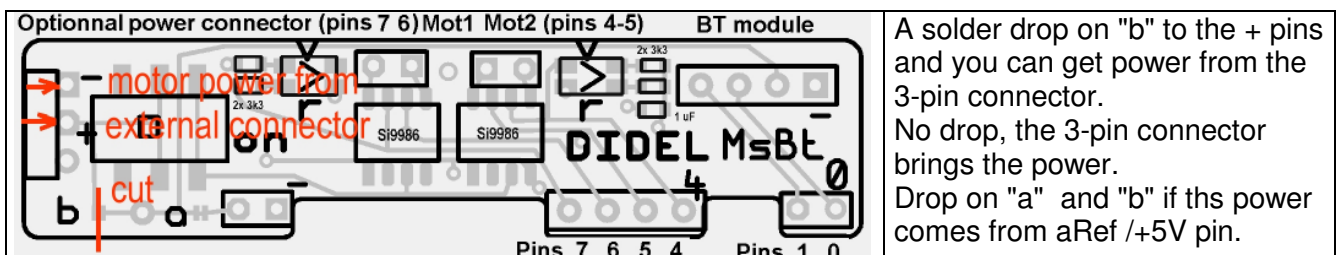
MsMot is not suited for cheap toy motors, but nice 10 to 30 Ohm motors are easy to find, and less noisy. When batteries are required, e.g. for a mobile robot, a connector is provided and will also power the Arduino board.
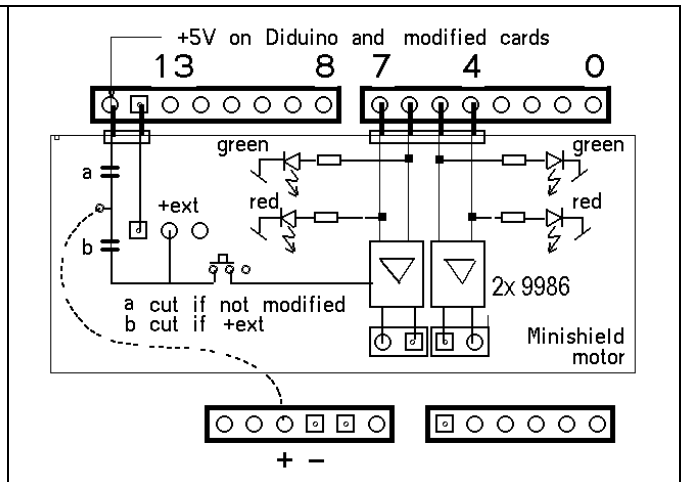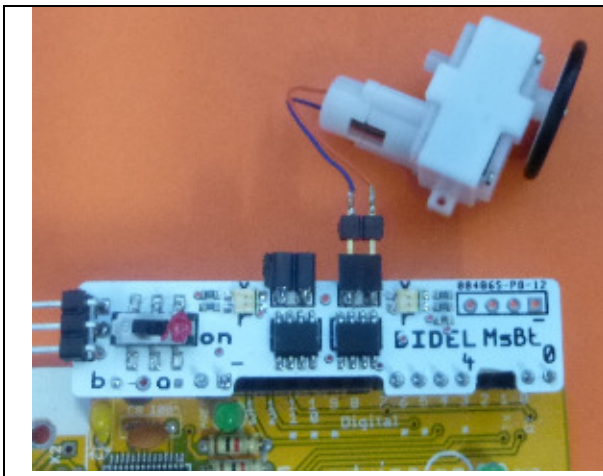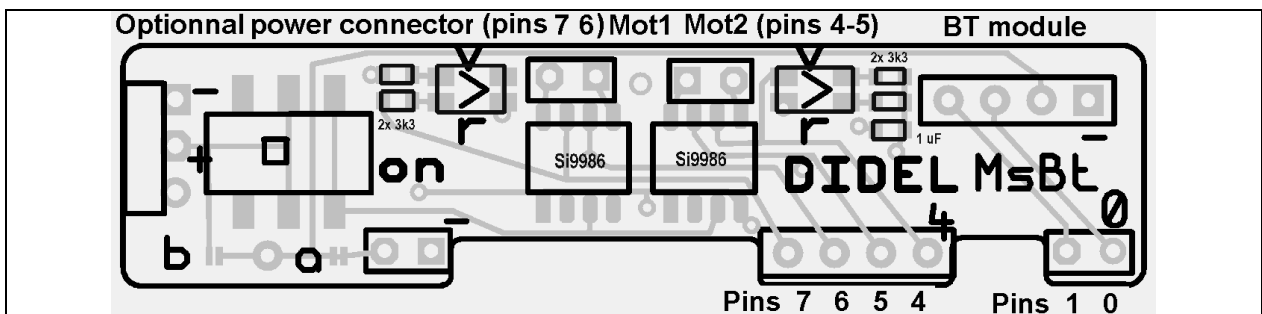
Power source

By default, +5V is taken from upper left pin of the Diduino board. This pin is the +ref pin of Arduino and several boards supply a limited amout of power on that pin. The Diduino board is not compatible for that pin: A + 5V is really convenient at that place.

If you need to power from the usual +pin, a 50mm wire with a 0.7mm pin at the end must be added and bridge "a" must be open. If the power cannot be taken from USB, brige "b" must be open, and power is coming from the "ext" pin on the "Gabriel" 3-pin connector. Voltage can be lower than the 5V or 3.3V of the card, but it must not exceed it.

A solder drop on "b" to the + pins and you can get power from the 3-pin connector.
No drop, the 3-pin connector brings the power.
Drop on "a" and "b" if ths power comes from aRef /+5V pin.

There are many Arduino motor shields out there and then there is the Diduino MsMot Shield featuring two Si9986 driver IC and fitting perfectly on the Diduino Board but also on all other Arduino compatible boards with little modifications.

The LM293 is frequently used for small motors, but its voltage must be higher than 5V, and due to its old technology, there is a significant power loss at 5V. The Si9986 driver has an equivalent internal resistance of less than 1 Ohm at 5 Volts, this means that if the motors need 200mA, the voltage drop will be lower than 0.2 V.

On the MsMot Shield two bicolor LEDs show the voltage status on the motor control pins. Green means motor moves forward, red means motor moves backward. However the motors can be cut off from power supply with an onboard switch so that you can debug your sketch only with the help of the LED indicators and without actually turning your noisy motors.

The Diduino MsMot Shield is narrow and uses only the pin it needs. The other pins are accessible for breadboarding. If you use 90 degree headers you might even save more space.

14x55mm