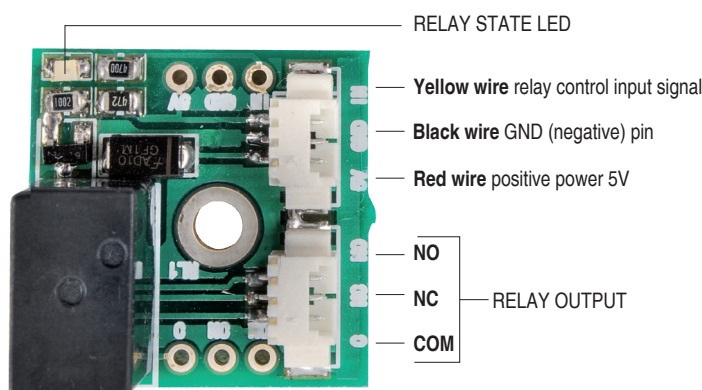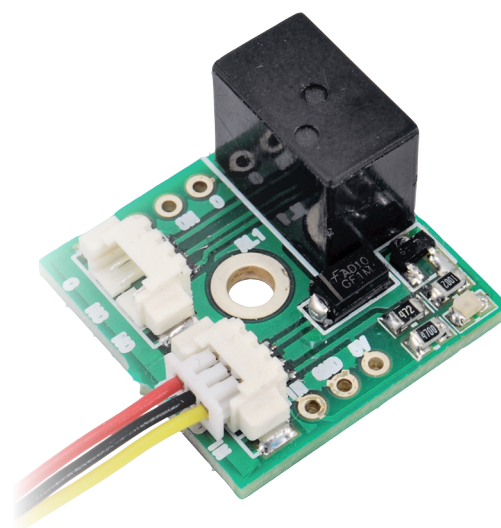# 5 V RELAY BOARD
## MM105

Mounted on this tiny circuit board, there is a single switch relays working at 5V. You can access to all the relay pins: COM, NC, NO. Each pin Is connected to one of the output terminals (that is the pin-strip) that allows the board to be connected to another circuit (this allows any board to have a relay output by simply installing this breakout board as a socket-component).
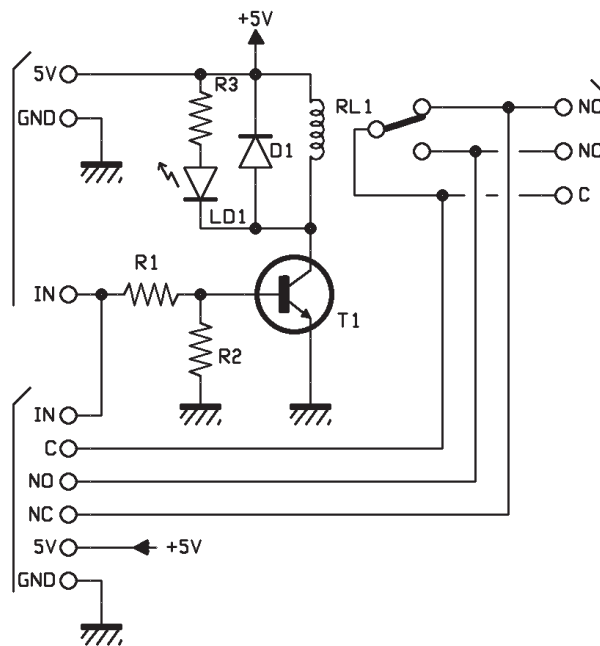
To operate, the board needs a 5V power supply connected to 5V (positive) and GND (negative) pins; Current absorption with relay energized is below 40mA. The command pin is IN, to which you have to apply a voltage (referred to GND) between 3 and 12 V. That means that we can trigger the relay with a TTL signal, with a 3,3V signal, or with 12V CMOS signals. The current dissipated by the input is about 0,6mA at 3,3V, 0,95mA at 5V and 2,5mA at 12V. It is extremely low, available from any logic port (even CMOS).The relay energized state is displayed by the switching on of LD1 LED that has been connected in parallel to RL1 coil and in series to the current-limiting R3 resistance.

RELAY STATE LED

**Yellow wire** relay control input signal

**Black wire** GND (negative) pin

**Red wire** positive power 5V

**NO**
**NC** — RELAY OUTPUT
**COM**

So LD1 is powered at the same moment the relay coil is energized. In parallel, D1 protection diode is connected as well, a necessary component to drop off the transient overvoltage from the inductive coil that can occur when the relay is disconnected (i.e. when the IN is floating or set to logic zero). This keeps the operating current stable. Without D1, when the coil is disconnected by the cutoff of T1, it causes a strong and impulsive inverse overvoltage that is directly applied to transistor junction that will be quickly damaged.

The relay mounted onboard is a miniaturized component, its switch can bear a 125Vca or a 60Vcc voltage with a 1A current. If you need higher loads, you must drive a dedicated external relay, suitable for your application, through the C and NO pins that will be connected in series to the external relay coil. This external relay must be connected with a pin to the 12V power supply and with the other to our board's relay C pin, while the NC is connected to ground (i.e. the negative pole of the external relay power supply).

Let's finish this description by saying that all the input and output pins (power supply, IN, switch) are available on the breakout board side and on a dedicated pin-strip.