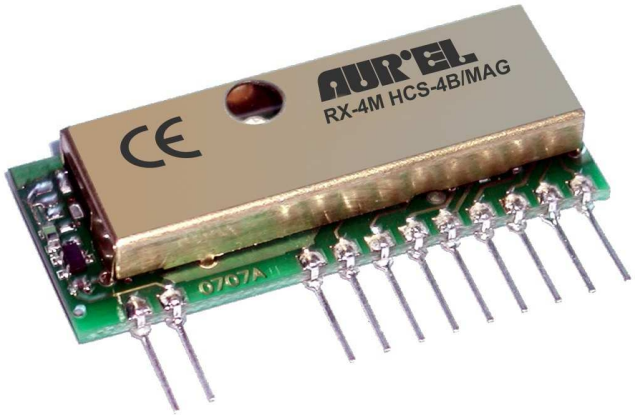
# RX-4M HCS-4B/MAG

## 433.92MHz OOK(AM) receiver
## 4bit digital decoding

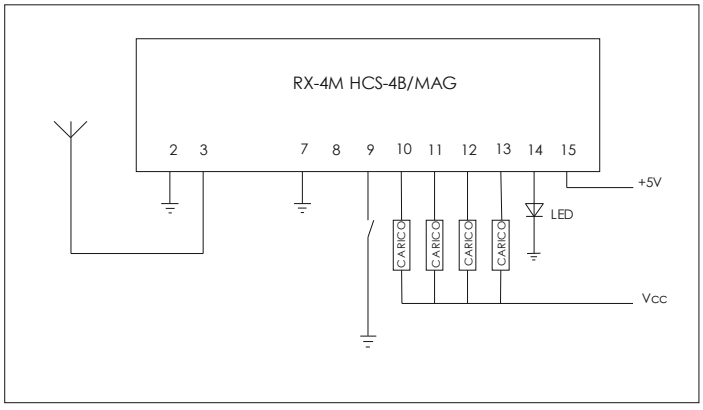


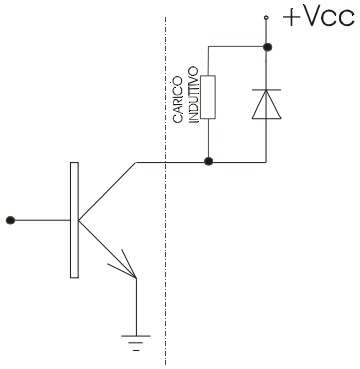

*Picture 1: RX-4M HCS-4B/MAG*

## Description

**Receiver RF with AM modulation, 433.92 MHz working frequency, high sensitivity and selectivity with integrated HCS decoding. HCS is a code variation technology of KEELOQ Microchip. The 4 output bit allow the digital decoding of HCS transmitters up to 12 channels.**

The module has open-collector outputs, actives with low logic level. Ideal in the applications where it requests all possible combinations of the 4 bit as coding of the channel. The code of the transmitter is memorized though auto learning procedure( see technical feature). Matchable with Aurel transmitters as: **HCS-TX-1/2/3 (OVO), TX1/2/3-HCS-433 (HCS), TX-2/4/6 M-HCS, TX-12 CH, MAG 4M HCS magnetic sensor.**



## Connection Pin out

2) GND
3) Antenna
7) GND
8) Test Point – RX analog output
9) Programming push button
10) Least significant bit - Open collector
11) Second significant bit - Open collector
12) Third significant bit - Open collector
13) Most significant bit - Open collector
14) LED output – Connected to anode of LED
15) Vcc (+5Volt)

* HCS e KEELOQ are Microchip brand

## How it works

The voltage supply to the module (pin 15) shall be 5Vdc. Pin 9 shall be connected to the push button for programming the receiver, pin 14 shall be connected to the anode of LED to control that programming has been carried out (output current is internally limited to around 20 mA by a 180 ohm resistor). External antenna shall be connected, by utilizing for example a piece of wire 17 cm long and a surrounding widespread ground plane(see picture 1). Each outputs of the receiver RX-4M HCS-4B/MAG is driven by a transistor in open collector configuration, able to bear max current of 100 mA. In stand-by mode transistor is cut off while when triggered is in saturation region. The outputs are active all the time you press the corresponding button on the transmitter, releasing the button, output switches-off. If the output is connected to an inductive load (eg a relay), it is necessary to prevent voltage transients by putting a diode in parallel to the inductive load. The anode of the diode is connected to the output of the module. In order to receive, it will be necessary memorize the transmission codes of the matched transmitter in the RX-4M HCS-4B/MAG module. To carry out this operation is necessary to have the transmitter close to the receiver. By pressing a button (it doesn't matter which one) of a matchable keyfob during the auto-learning phase, RX-4M HCS-4B/MAG will recognize the pushed button and automatically also the other buttons will be recognize. Only transmitters with HCS coding and 'Aurel Standard Code' will be recognized by RX-4M HCS-4B/MAG receiver. Transmitters not parameterized or with a different manufactured code will not be matchable. Based on reasonable demand, Aurel is willing to program the receiver RX-4M HCS-4B/MAG per with specific manufacturer code indicated by the customer.

## Battery low signal

At the reception of the radio code, if the battery of the matched AUREL HCS transmitter is discharged, from receiver side the programming led will be on and it will switch-off when the outputs of the receiver , connected to the radio code (please see binary outputs decoding), will be disabled.

## Ground plane

The circuit must be double layer. Ground plane must surround at the best the welding area of the receiver.
For further info please refer to the user manuals of AUREL's receivers.

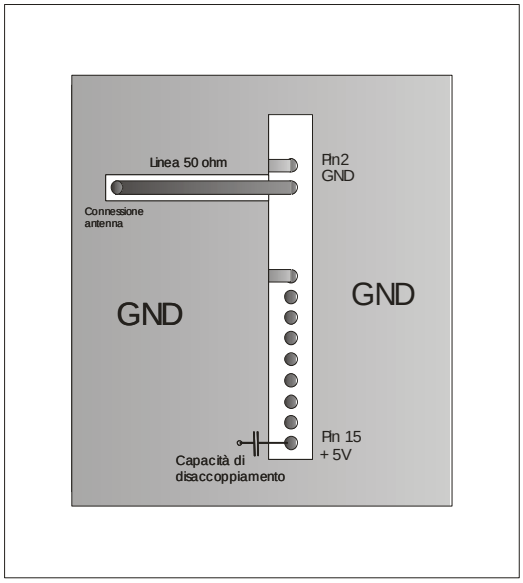



Fig. 1 – Ground plane

## Programmation

***Auto-learning procedure.***

Pushing and releasing the auto-learning button starts the auto-learning procedure. LED will quickly blink for ten seconds: during this time, each pushing of a button of a transmitter close to RX-4M HCS-4B/MAG allow the auto-learning of all buttons. LED will show the correct procedure by a blink a 1sec. It's possible repeat this procedure up to 10 transmitters.

**Erasing memory procedure**

In order to erase the memory of RX-4M HCS-4B/MAG, push and release immediately the button connected to the pin9, LED will start to blink. Pushing again the button for 3 seconds until the LED from a permanent light will switch-off, release the button and verify the five blinks to show the correct erasing. After the erasing procedure no transmitters with HCS coding will be recognized.

## Binary output decoding chart with MAG 4MHCS PN: 650201194G

| ALLARM | PIN10 | PIN11 | PIN12 | PIN13 |
|---|---|---|---|---|
| Reed | Off | Off | Off | On |
| Tamper allarm | Off | Off | On | Off |
| Tear allarm | Off | Off | On | Off |
| Aux In | On | Off | Off | Off |
| Radio Mode (1) | On (*) | On (*) | On (*) | On (*) |

Note1: At the reception of Radio mode code the four outputs will blink(pre-connected to leds)
(*) Blink period 240 msec.