QUICK REFERENCE · TK41

Reed Switch

A magnet closes it and SIGNAL reads HIGH. Either pole, no power to sense.

VCC is your board's logic voltage

A closed switch joins SIGNAL straight to VCC, with no resistor between. **On an ESP32, ESP32-S3 or Pico wire VCC to 3V3**: 5 V there puts 5 V on a 3.3 V pin each time a magnet comes near. Only an Uno takes 5V.

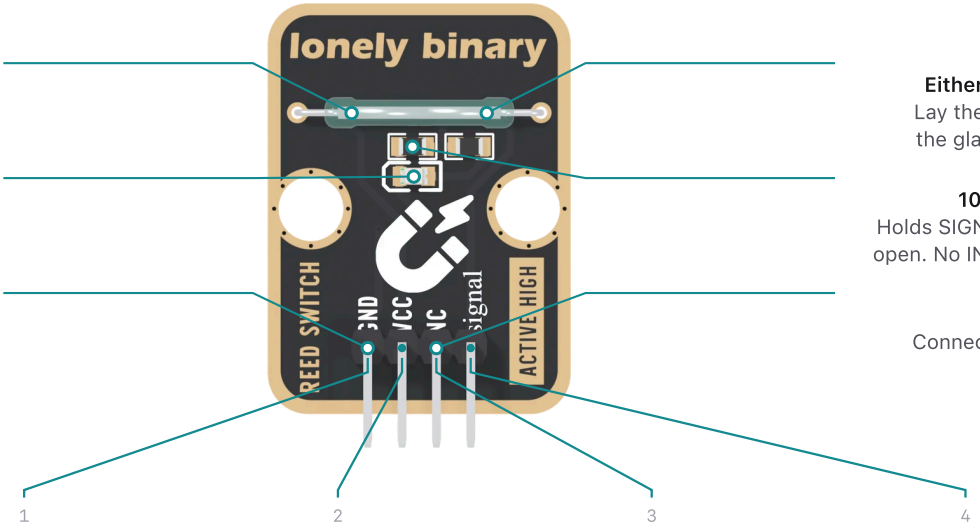
Pins, and which to wire

Parts up, header at the bottom. Wire GND, VCC and SIGNAL; NC is connected to nothing on the board. Read SIGNAL with INPUT.

MKA-14103 reed switch
Glass, Ø2.3 × 14 mm.
Do not press or bend it.

Red LED, 1 kΩ
Lit while closed, from VCC. Needs no sketch.

GND is the square pad
Count from it. The back prints no pin names.



Either pole closes it
Lay the magnet along the glass, not across.

10 kΩ pull-down
Holds SIGNAL LOW when open. No INPUT_PULLUP.

NC
Connected to nothing on the board.

Front	GND	VCC	NC	SIGNAL
Read it	GND	VCC	●	SIGNAL

It lets go farther out than it closes

The switch releases once the field falls to 35 to 90 % of what closed it: the magnet can be up to about 42 % farther away before SIGNAL goes LOW. Test a mounting both ways.

What it draws, and when

Open, no magnet

0 mA

VCC reaches only the switch. Nothing on the block runs while it waits.

Closed, VCC on 3V3

1.6 mA, worked out

0.33 mA in the pull-down, about 1.3 mA in the LED.

Closed, VCC on 5V

3.5 mA, worked out

Uno only. 0.5 mA in the pull-down, about 3 mA in the LED.

None of it comes from your pin, which only reads the voltage. On a battery, mount it so the state that lasts longest is the open one.

Arithmetic on the net list and a red LED's usual 2 V drop, not measured. Switch figures from RMCIP's MKA-14103 data sheet: 15 to 18 AT as ordered, 1 ms to close and 0.4 ms to open, bounce included, 100 operations a second. The sketch compiles for an ESP32-S3 and an Uno; the block has not been bench-tested for this sheet.

The first read, on an ESP32-S3

Arduino IDE · Board: ESP32S3 Dev Module · USB CDC On Boot: Enabled · No library

```
// The pin SIGNAL is wired to.
// Uno: 2. ESP32: 25. ESP32-S3: 4. Pico: 15.
const int REED_PIN = 4;

int last = -1;   // nothing read yet

void setup() {
  Serial.begin(115200);

  // INPUT, not INPUT_PULLUP: the board has its own 10k pull-down.
  pinMode(REED_PIN, INPUT);
}

void loop() {
  int level = digitalRead(REED_PIN);

  if (level != last) {
    if (level == HIGH) {
      Serial.println("magnet: switch closed");
    } else {
      Serial.println("no magnet: switch open");
    }
    last = level;
  }

  delay(10);
}
```

```
no magnet: switch open
magnet: switch closed
```

Serial Monitor at 115200, one line each time a magnet arrives or leaves, with the red LED lit while it is there.

Wiring

	FRONT	S3	UNO	ESP32	PICO
1	GND	GND	GND	GND	GND
2	VCC	3V3	5V	3V3	3V3
3	NC				
4	SIGNAL	GPIO 4	D2	GPIO 25	GP15

Hole 1 is the square pad. VCC is each board's own logic voltage: 3V3 on the ESP32 boards and the Pico, 5V on the Uno. The pins are the Push Button and Hall Effect blocks' pins.

Counting, and the pin to avoid

Each closing bounces for well under a millisecond, so count a change only once SIGNAL has held it for 20 ms. The switch is rated to 100 operations a second. On an ESP32-S3 avoid GPIO 0: with no magnet the pull-down holds it at about 1.65 V against the BOOT button's pull-up, and the chip may start in its download mode.

When it does not work

LED dark with a magnet on it
Lay the magnet along the glass, then check VCC and GND from the square pad.

LED lit, but reads LOW
SIGNAL is on another pin, or on NC. Check REED_PIN.

Always HIGH, or wanders
INPUT_PULLUP fights the pull-down, or GND is off. Use INPUT.

Counts two or three for one
Bounce. Count a change only after 20 ms of steady level.

Stays closed as the door opens
It lets go farther out than it closes. Mount the magnet closer.

Stopped after a knock
The glass may be cracked. The LED shows if it still closes.

Specifications

Switch	MKA-14103, normally open, glass	**Closes at**	15 to 18 AT, either pole
Lets go at	35 to 90 % of that field	**Timing**	1 ms close, 0.4 ms open, with bounce
Rate	100 operations a second, max	**SIGNAL**	Switch to VCC, 10 kΩ pull-down
Current	0 open; 1.6 mA closed at 3.3 V	**Supply**	Your board's logic voltage