QUICK REFERENCE · TK15

IR Receiver

SIGNAL goes LOW while a remote sends.

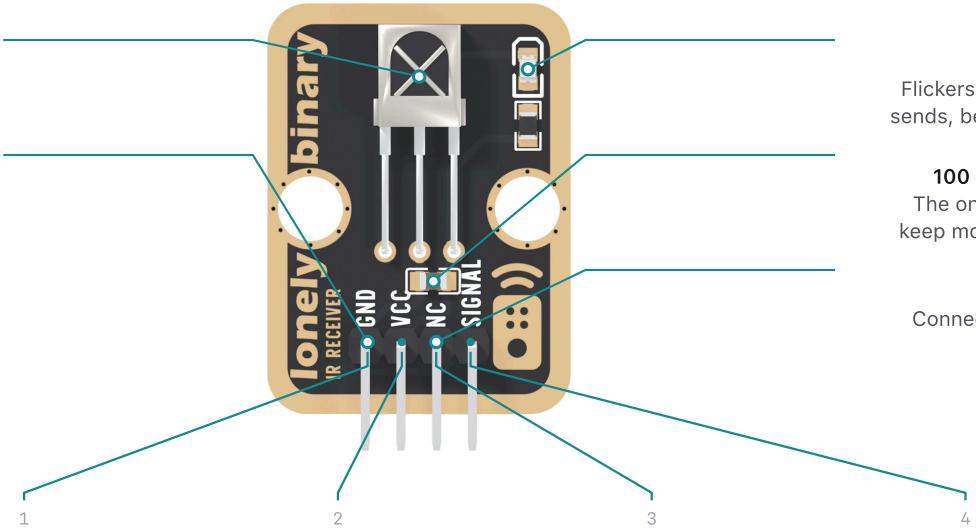
VCC sets the signal SIGNAL idles at VCC through 30 kΩ inside the receiver. **On an ESP32, ESP32-S3 or Pico, feed VCC from 3V3, never 5V**: 5 V would sit on a 3.3 V input all the time.

Pins, and which to wire

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

TSOP18138 receiver
Tuned to 38 kHz, in a steel shield. Face it to the remote.

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



Red LED, 1 kΩ
Flickers while a remote sends, before any code.

100 nF across VCC
The only supply filter: keep motors off its rail.

NC
Connected to nothing on the board.

Front	GND	VCC	NC	SIGNAL
Receive	GND	VCC	●	SIGNAL

LOW = a remote is sending The receiver is active low: HIGH at rest, LOW while a 38 kHz burst arrives. No pull-up needed; it is inside the chip.

What SIGNAL does

No remote

HIGH at VCC

Held there by 30 kΩ inside the chip. It can sink 5 mA and source almost nothing.

A burst arriving

LOW near 0 V

The red LED lights: about 2.9 mA on 5 V, a little dimmer on 3.3 V.

A held button

110 ms per repeat

One data frame, then a short repeat frame with no data, until you let go.

Your sketch never sees the 38 kHz carrier, only how long SIGNAL stays low and high. IRremote times that and hands you an address and a command. Neither is standard: they belong to the remote that sent them.

From Vishay's datasheet 82802: 2.0 to 5.5 V, 0.35 mA typical, ±45° half angle. Its 26 m distance was measured in the dark with an LED at 50 mA; indoors with the TK16, plan on two to five metres. The LED current is worked out, not measured.

Read key codes

Arduino IDE · Board: your board · ESP32-S3: USB CDC On Boot: Enabled

```
#include <IRremote.hpp>   // IRremote by shirriff, z3t0, ArminJo

// SIGNAL's pin. Uno: 2. ESP32: 23. ESP32-S3: 9. Pico: 16.
const int IR_RX_PIN = 2;

void setup() {
  Serial.begin(115200);
  IrReceiver.begin(IR_RX_PIN, DISABLE_LED_FEEDBACK);
}

void loop() {
  if (!IrReceiver.decode()) return;
  IRData &d = IrReceiver.decodedIRData;
  if (d.flags & IRDATA_FLAGS_IS_REPEAT) {
    Serial.println("[repeat]");          // a held button
  } else {
    Serial.print("address=0x");
    Serial.print(d.address, HEX);
    Serial.print("  command=0x");
    Serial.println(d.command, HEX);
  }
  IrReceiver.resume();   // nothing else decodes until this runs
}
```

```
address=0x4 command=0x16
[repeat]
```

Serial Monitor at 115200. Your remote's numbers will differ; write them down.

Wiring

	FRONT	UNO	ESP32	S3	PICO
1	GND	GND	GND	GND	GND
2	VCC	5V	3V3	3V3	3V3
3	NC				
4	SIGNAL	D2	GPIO 23	GPIO 9	GP16

Hole 1 is the square pad. VCC is your board's own logic voltage, because SIGNAL idles at VCC.

One press, or a held one

A held button sends one data frame and then a repeat frame every 110 ms, flagged IRDATA_FLAGS_IS_REPEAT. Skip repeats for anything that toggles; use them for volume or brightness. Under about 20 cm from a sender the receiver is swamped and prints UNKNOWN on a working link.

When it does not work

Nothing prints at all

Watch the red LED as you press a button. It flickers: check SIGNAL's wire and pin. It does not: check GND, VCC and the remote's batteries.

It decodes once, then goes silent

IrReceiver.resume() is missing. The library looks at nothing else until it runs.

Codes differ from the example

They belong to the remote that sent them. Print your own and use those.

digitalRead always returns 1

That is the idle level. Each low lasts 560 µs; the library samples on a timer. Use IRremote, not digitalRead.

One press prints several lines

A held button sends a repeat frame every 110 ms. Skip IRDATA_FLAGS_IS_REPEAT for anything that toggles.

analogWrite stopped on pins 3 and 11

On an Uno, receiving takes Timer2. Move that output to 5, 6, 9 or 10.

Specifications

Receiver	Vishay TSOP18138	**Carrier**	38 kHz
Supply	2.0 to 5.5 V, as your board	**Current**	0.35 mA typical
Output	Active LOW, 30 kΩ pull-up inside	**Half angle**	±45°
Header	4 pins, right-angle, 2.54 mm	**Size**	22.4 × 30.4 mm