QUICK REFERENCE · TK94

Five-Direction Joystick

Four tilts and a press on one analog pin, each its own fraction of VCC.

VCC is your board's logic voltage

A push to the right joins SIGNAL straight to VCC, so whatever VCC is reaches your pin. **On an ESP32, ESP32-S3 or Pico wire VCC to 3V3**, never 5V. On an Uno wire it to 5V: the sketch's lines assume VCC is what the ADC measures against.

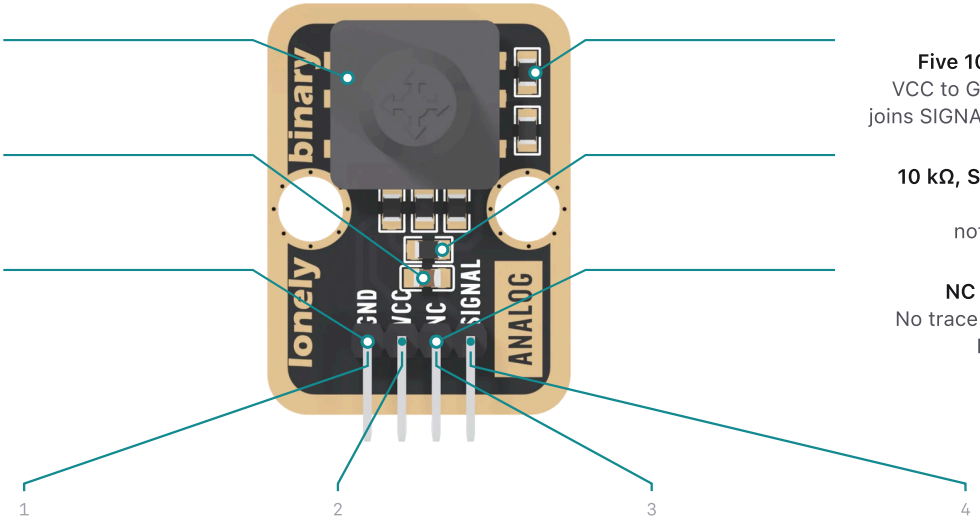
Pins, and which to wire

Parts up, header at the bottom. Wire three: GND, VCC, and SIGNAL to an analog pin. NC goes nowhere. The names below are for the block turned a quarter, header on the left.

Five-way switch, black cap
Four tilts and a press, each a different voltage.

100 nF on SIGNAL
Letting go takes about 3 ms to fall to 0.

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



Five 10 kΩ in a chain
VCC to GND. Each push joins SIGNAL to one point.

10 kΩ, SIGNAL to GND
It rests at 0 V, not in the middle.

NC goes nowhere
No trace leaves its pad. Leave it empty.

Front	GND	VCC	NC	SIGNAL
Read it	GND	VCC	●	SIGNAL

One analog wire, not five switches

SIGNAL is 0 V with nothing pressed. Each push joins it to its own point of a resistor ladder: up 0.37 V, press 0.60, left 0.90, down 1.47, right 3.30 at 3.3 V. Read it with analogRead; a digital pin sees only right.

Six levels, and room between them

At rest

0 V: 10 kΩ holds SIGNAL at GND

Not the middle of the scale. A reading near 0 is nothing pressed.

Five pushes

5 levels, as fractions of VCC

Up	0.11
Press	0.18
Left	0.27
Down	0.44
Right	1.00

Tightest pair

233 mV, up to press, at 3.3 V

72 counts on an Uno. The line halfway leaves half of it either side.

A sketch draws a line halfway between each pair of levels and names a reading by the lines it is above: 722, 359, 227, 146, 56 thousandths of VCC. 1 % resistors move a level by half a percent at most, far inside the room. Up and left held together read 200: a press.

Levels worked out from the ladder: five 10 kΩ from VCC to GND, a push joining SIGNAL to one join, 10 kΩ and 100 nF from SIGNAL to GND. They agree with the maker's own measured Uno readings. The switch is XUNPU's WS-1001-ACW09026: 250 ± 50 gf, 0.2 mm travel, 50,000 cycles. The chain draws 66 µA at 3.3 V. The sketch compiles for an ESP32-S3, an ESP32 and an Uno.

The first read, on an ESP32-S3

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

```
// Uno: A0. ESP32: 34. ESP32-S3: 4. Pico: 26.
const int SIGNAL_PIN = 4;

// Highest level first; the line under each, thousandths of VCC.
const char* NAME[] = {"right", "down", "left", "press", "up"};
const int LIMIT[] = {722, 359, 227, 146, 56};

int readPermille() {
#if defined(ARDUINO_ARCH_ESP32)
  return analogReadMilliVolts(SIGNAL_PIN) * 1000L / 3300;
#else
  return analogRead(SIGNAL_PIN) * 1000L / 1023;
#endif
}

int whichPush(int permille) {
  for (int i = 0; i < 5; i++) {
    if (permille > LIMIT[i]) return i;
  }
  return -1;
}

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

void loop() {
  int p = readPermille();
  int d = whichPush(p);
  Serial.print("SIGNAL ");
  Serial.print(p);
  Serial.print("/1000  ");
  Serial.println(d < 0 ? "none" : NAME[d]);
  delay(200);
}
```

```
SIGNAL 0/1000 none
SIGNAL 444/1000 down
```

Serial Monitor at 115200, five lines a second. Right prints a little under 1000 on an ESP32, the top of its ADC.

Wiring

	FRONT	S3	UNO	ESP32	PICO
1	GND	GND	GND	GND	GND
2	VCC	3V3	5V	3V3	3V3
3	NC				
4	SIGNAL	GPIO 4	A0	GPIO 34	GP26

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. SIGNAL goes to an ADC pin; on an ESP32 an ADC1 pin, which keeps reading with Wi-Fi on.

One push, one step

Letting go, SIGNAL falls through every lower level on its way to 0: about 3 ms, as 100 nF drains through 10 kΩ. A sketch that acts on every reading sees extra pushes. Believe a push only after it has read the same for 10 ms, and act only when it changes: the handbook's menu sketch does both.

When it does not work

Always reads 0

VCC not connected, or SIGNAL on NC, the third hole.

Pushes named as lower ones

VCC is not what the ADC measures against. Uno: 5V.

A press nobody made

Up and left held together read as a press.

Only right does anything

SIGNAL read with digitalRead, or on a pin with no ADC.

Extra moves on letting go

The fall after a release. Wait 10 ms for a steady reading.

Up reads as right

Held header-down. The names are for header on the left.

Specifications

Switch	XUNPU WS-1001-ACW09026, five-way	**Output**	One analog line, 0 V at rest
Levels	1/9, 2/11, 3/11, 4/9 and all of VCC	**Lines**	722, 359, 227, 146, 56 thousandths
Ladder	5 × 10 kΩ 1 %, 10 kΩ and 100 nF to GND	**Current**	66 µA at 3.3 V; 0.4 mA holding right
Supply	Your board's logic voltage on VCC	**Height**	12.8 mm, board bottom to cap