QUICK REFERENCE · TK70

Linear Hall Sensor

lonely binary
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How strong a magnetic field is, and which pole: an analog voltage around half of VCC.

VCC is your board's logic voltage

The output scales with VCC and reaches about 0.8 of it in a strong field. **On an ESP32, ESP32-S3 or Pico wire VCC to 3V3**: from 5 V a magnet near the chip takes SIGNAL to about 4 V, over what a 3.3 V pin takes. Only an Uno takes 5V.

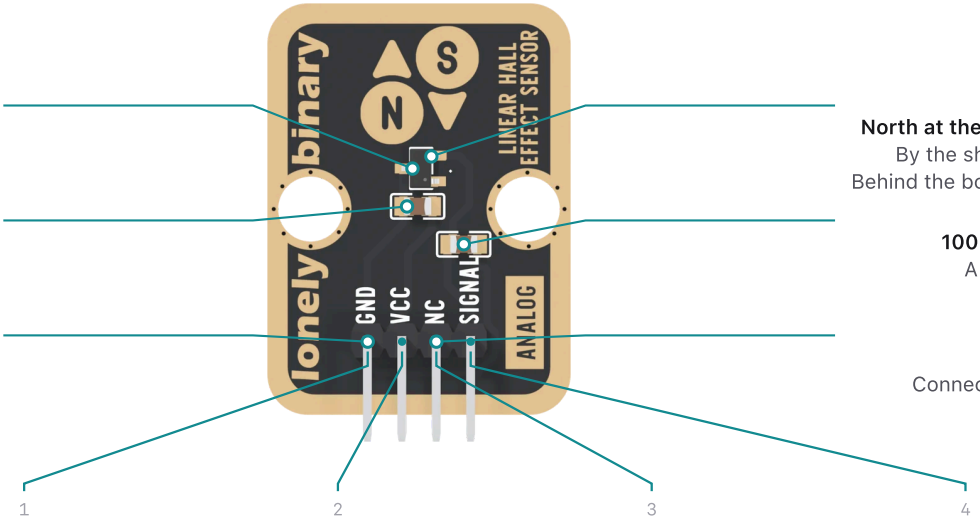
Pins, and which to wire

Parts up, header at the bottom. Wire GND, VCC and SIGNAL to an analog pin; NC is connected to nothing on the board. There is no LED.

SLSS49E-3 Hall chip
Hold a magnet's face over it, not edge-on.

100 nF across VCC
Steadies the chip's supply. No LED here.

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



North at the front raises it
By the sheet's drawing. Behind the board: swapped.

100 nF on SIGNAL
A filter far faster than any hand.

NC
Connected to nothing on the board.

Front	GND	VCC	NC	SIGNAL
Read it	GND	VCC	●	SIGNAL

No field reads half scale, not 0

SIGNAL rests at half of VCC, about 512 on an Uno. A field moves it up for one pole and down for the other. Chips differ by up to ±77 G at rest, so measure the zero at start-up, with no magnet near.

What a gauss is worth, by supply

No field

½ of VCC

2.25 to 2.75 V at 5 V, about 1.65 at 3.3 V.

VCC on 5V

3.25 mV per gauss

2.95 to 3.55. Linear to ±460 G, 1 to 4 V.

VCC on 3V3

2.1 mV per gauss, about

Read off the sheet's typical curve. The output scales with VCC.

One count is about 1.5 G on an Uno or a Pico and about 0.36 G on an ESP32 on paper, where the ADC jitters by several counts. Average readings. A wire carrying 5 A makes about 1 G at 1 cm: this is not a current sensor on its own.

Figures from Slkor's SLSS49E-3 data sheet at 25 °C: 3 to 12 V supply, 5 mA typical at 5 V, 3 µs response. Its drawings of which pole raises the output differ between packages; check yours with a compass. The sketch compiles for an ESP32-S3 and an Uno; the block has not been bench-tested for this sheet.

The first reading, on an ESP32-S3

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

```
// The analog pin SIGNAL is wired to.
// Uno: A0. ESP32: 34. ESP32-S3: 4. Pico: 26.
const int HALL_PIN = 4;
const float MV_PER_GAUSS = 2.1;  // VCC on 3V3; 3.25 on 5V
const bool NORTH_RAISES = true;   // the sheet's SOT-23 drawing

float zeroMv;

float averageMv(int n) {
  float sum = 0;
  for (int i = 0; i < n; i++) {
    sum += analogReadMilliVolts(HALL_PIN);
  }
  return sum / n;
}

void setup() {
  Serial.begin(115200);
  delay(500);
  zeroMv = averageMv(64);   // no magnet near, please
}

void loop() {
  float gauss = (averageMv(16) - zeroMv) / MV_PER_GAUSS;
  Serial.print(gauss, 0);
  Serial.print(" G");
  if (fabs(gauss) >= 5) {
    bool north = (gauss > 0) == NORTH_RAISES;
    Serial.print(north ? "  north" : "  south");
  }
  Serial.println();
  delay(250);
}
```

```
0 G
212 G north
```

Serial Monitor at 115200, four lines a second: near 0 G with nothing near, a signed field with the pole's name as a magnet comes to the chip.

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 analog pin, ADC1 on the ESP32s.

Naming the pole, without flicker

A pole finder names north or south once the field passes 20 G and lets go only below 10 G, so a magnet held at the edge does not flicker. A magnet behind the board swaps the names. Past ±460 G the reading says strong, not how strong.

When it does not work

Near 0 all the time

No power, or SIGNAL on another pin or on NC. Count from the square pad.

Stuck near half scale

Working, no field on the chip. Hold a magnet's face over it.

Full scale with no magnet

ESP32 in MicroPython with no atten line: set ATTN_11DB.

A field from nothing

Zero taken with a magnet or steel near. Clear it and press reset.

North and south swapped

Magnet behind the board, or flip NORTH_RAISES after a compass test.

Jumps by a few gauss

ESP32 ADC jitter. Average more readings; stay on ADC1.

Specifications

Chip	SLSS49E-3, SS49E-type, SOT-23	**No field**	Half of VCC; 2.25 to 2.75 V at 5 V
Sensitivity	3.25 mV/G at 5 V; about 2.1 at 3.3 V	**Linear range**	±460 G: 1 V to 4 V at 5 V
Response	3 µs typical	**Supply**	3 to 12 V; use your logic voltage
Current	3 to 8 mA at 5 V, always on	**SIGNAL**	Chip output, 100 nF to GND