

AS5304

Integrated Hall ICs for
Linear and Off-Axis Rotary Motion Detection

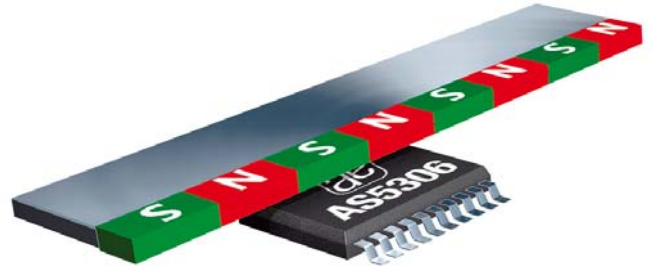
AS5304-AB-2.0 Adapterboard
OPERATION MANUAL

1 General Description

The AS5304 is a single-chip IC's with integrated Hall elements for measuring linear motion using multi-pole magnetic strips.

The AS5304 is mounted off-axis underneath a multi-pole magnetized strip and provides a quadrature incremental output with 40 pulses per pole period (resolution of 25µm per step) at speeds of up to 20 meters/sec.

A single index pulse is generated once for every pole pair at the Index output. The pole pair length is 4mm (2mm north pole / 2mm south pole). The chip accepts a magnetic field strength down to 5mT (peak).



2 The AS5304 Adapterboard

2.1 Board description

The AS5304 adapter board is a simple circuit allowing to test and evaluate the AS5304 linear encoder quickly without having to build a test fixture or PCB.

The normal operation requires only a 5V power supply, the quadrature AB outputs are attached to a microcontroller of quadrature counter.

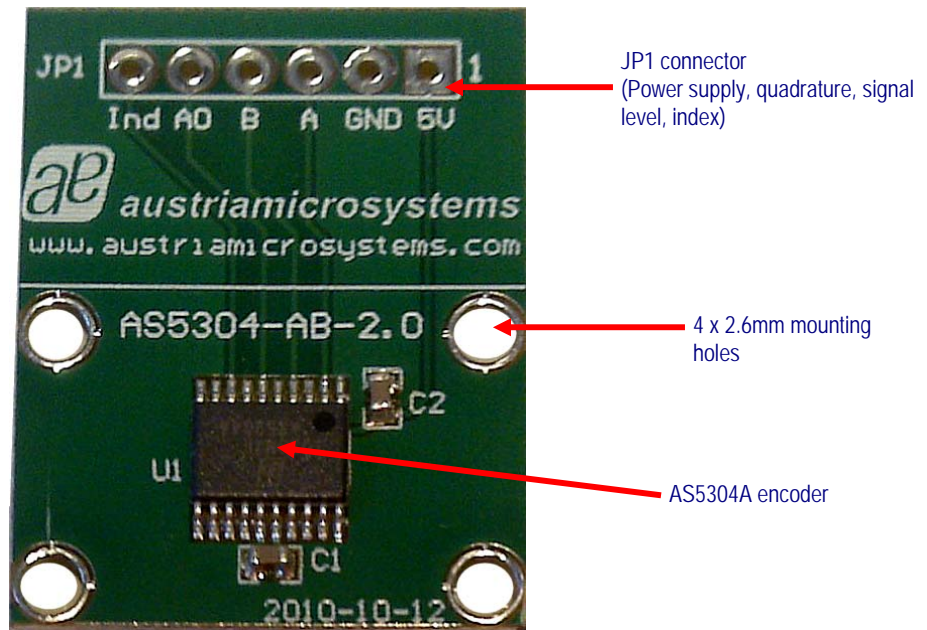


Figure 1: AS5304 Adapterboard

2.2 Mounting the AS5304 adapter board

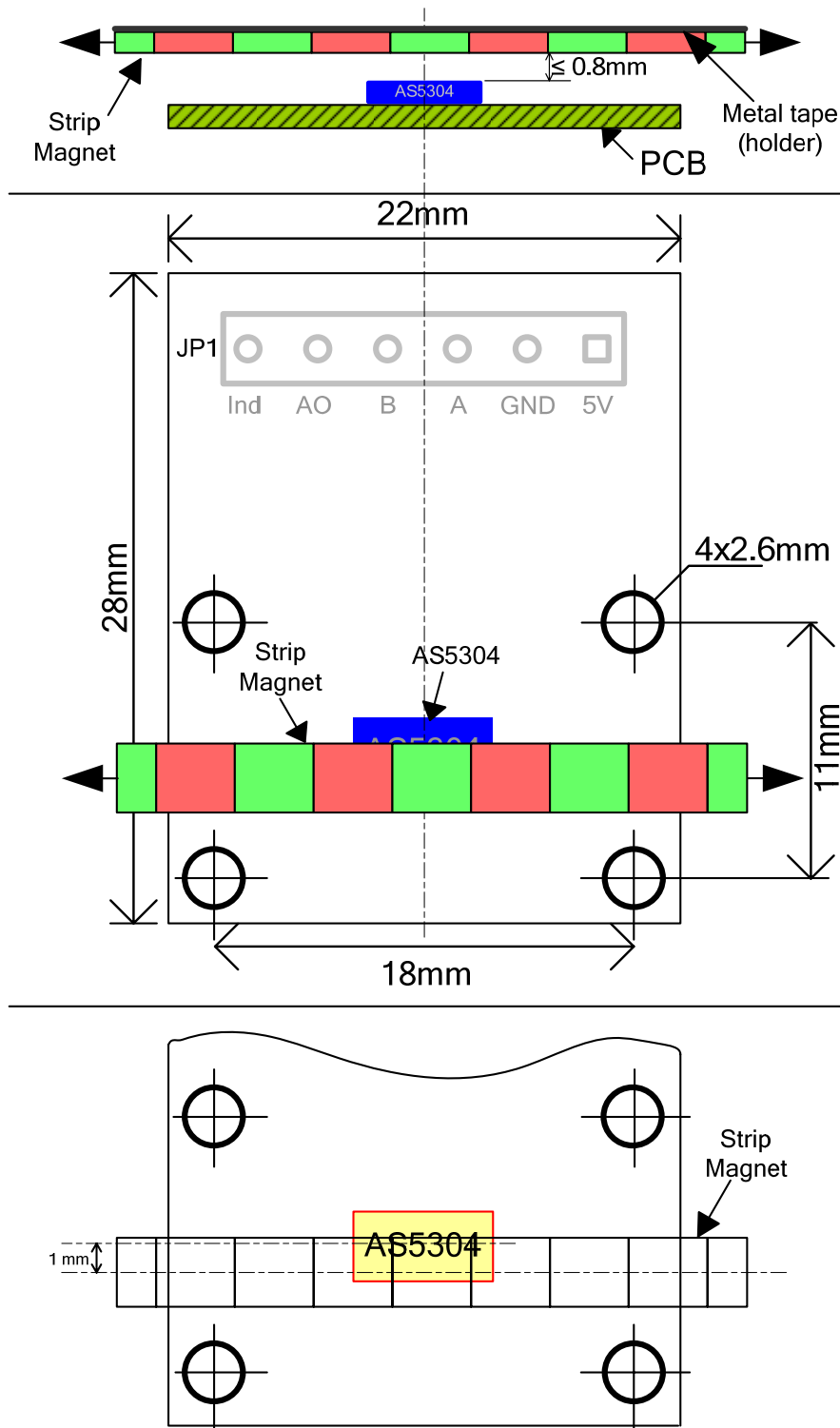


Figure 2: Magnet mounting and board dimension

A multipole magnetic strip, pole pair length = 4mm must be placed over the AS5304 as shown on Figure 2. The middle axis of the strip and of the AS5304 IC are shifted by 1mm.

The airgap between the magnet and the AS5304 casing should be maintained below 0.8mm. Note that the strip side facing the AS5304 IC is the opposite side of the metallic tape.

The magnet holder must not be ferromagnetic. Materials as brass, copper, aluminum, stainless steel are the best choices to make this part.

3 AS5304 and adapter board pinout

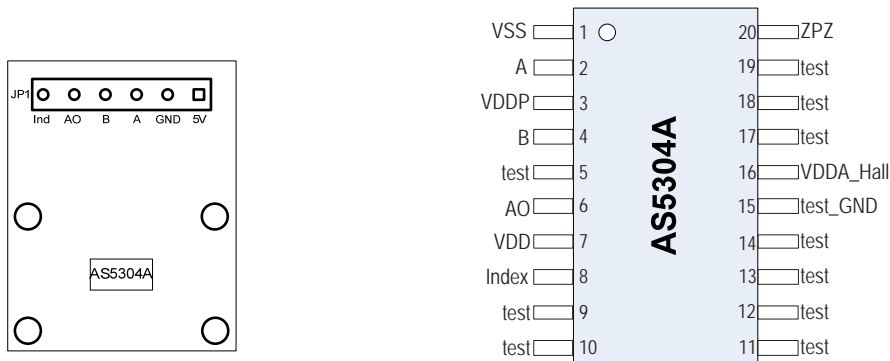


Figure 3: AS5304 adapter board connectors and encoder pinout

JP1 Pin# Board	Pin# AS5304	Symbol	Type	Description
1	3, 7, 16	5V	S	Supply ground
2	1	GND	S	Positive supply voltage, 4.5V to 5.5V
3	2	A	DO	Clock Input of Synchronous Serial Interface; Schmitt-Trigger input
4	4	B	DO	Chip Select for serial data transmission, active high; Schmitt-Trigger input, external pull-down resistor (~50kΩ) required in read-only mode
5	6	AO	AO	Data output / command input for digital serial interface
6	8	INDEX	DO	Command input for digital serial interface. Connect to GND if not used.

Table 1: Pin description

Pin types: S: supply pin
AO: analog output
DO: digital output

4 Operation use cases

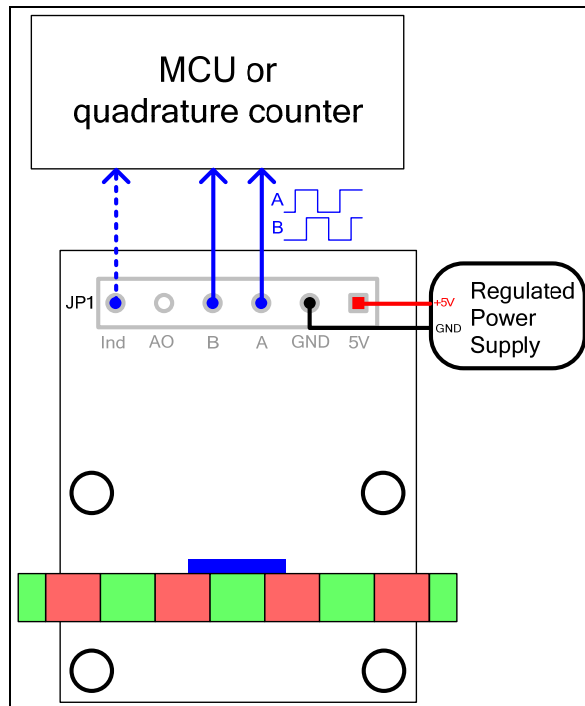


Figure 4: Using the analog output with the adapter board

Connect a regulated power supply on 5V (pin #1) and GND (pin #2).

Connect the A and B outputs to a quadrature counter or microcontroller inputs. The index output is optional, if a pulse is needed at each magnet pole pair transition, every 4mm.

For more information, please read the AS5304 Datasheet.

5 AS5304 adapterboard hardware

5.1 AS5304-AB-2.0 schematics

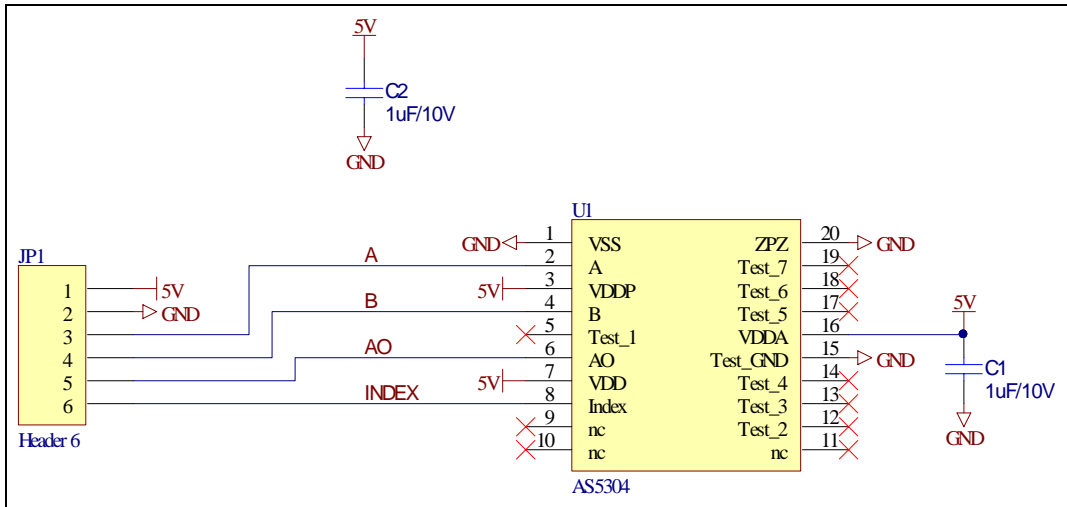


Figure 5: AS5304-AB-2.0 adapterboard schematics

5.2 AS5304-AB-2.0 PCB layout

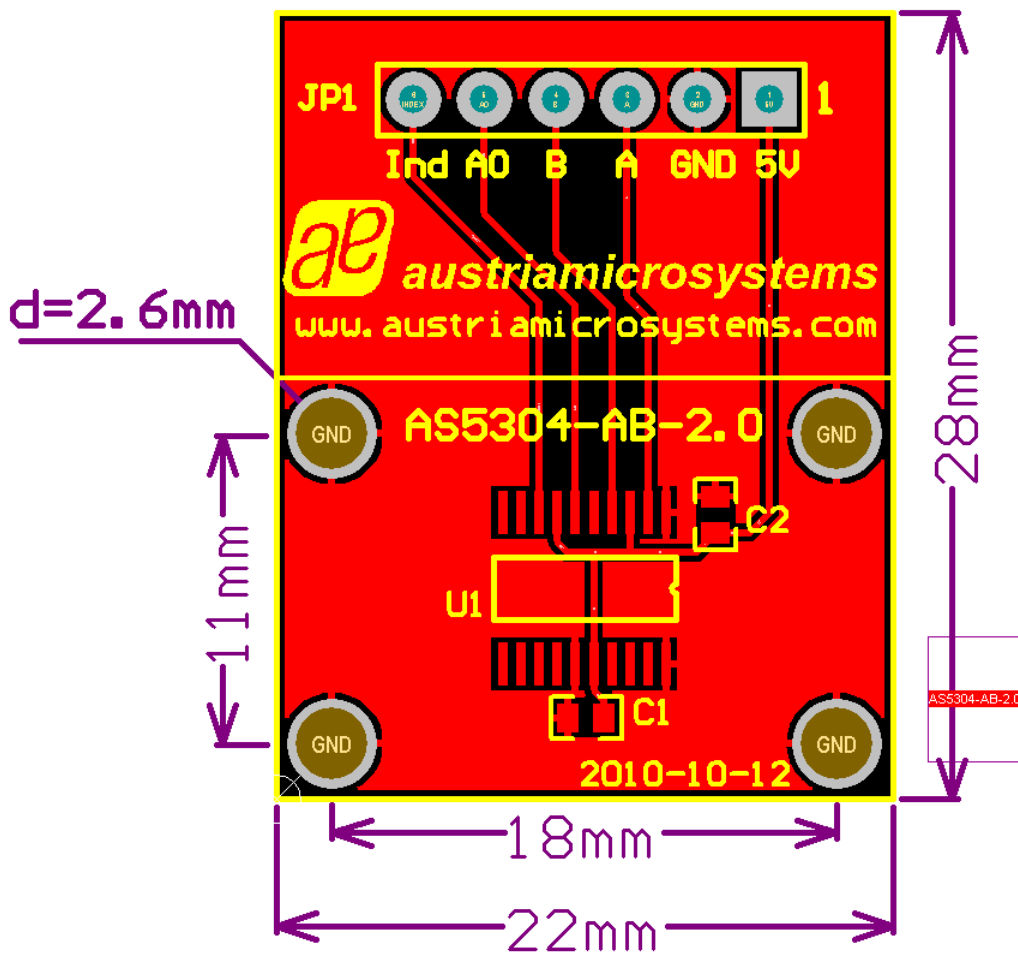


Figure 6: AS5304-AB-2.0 adapterboard layout

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