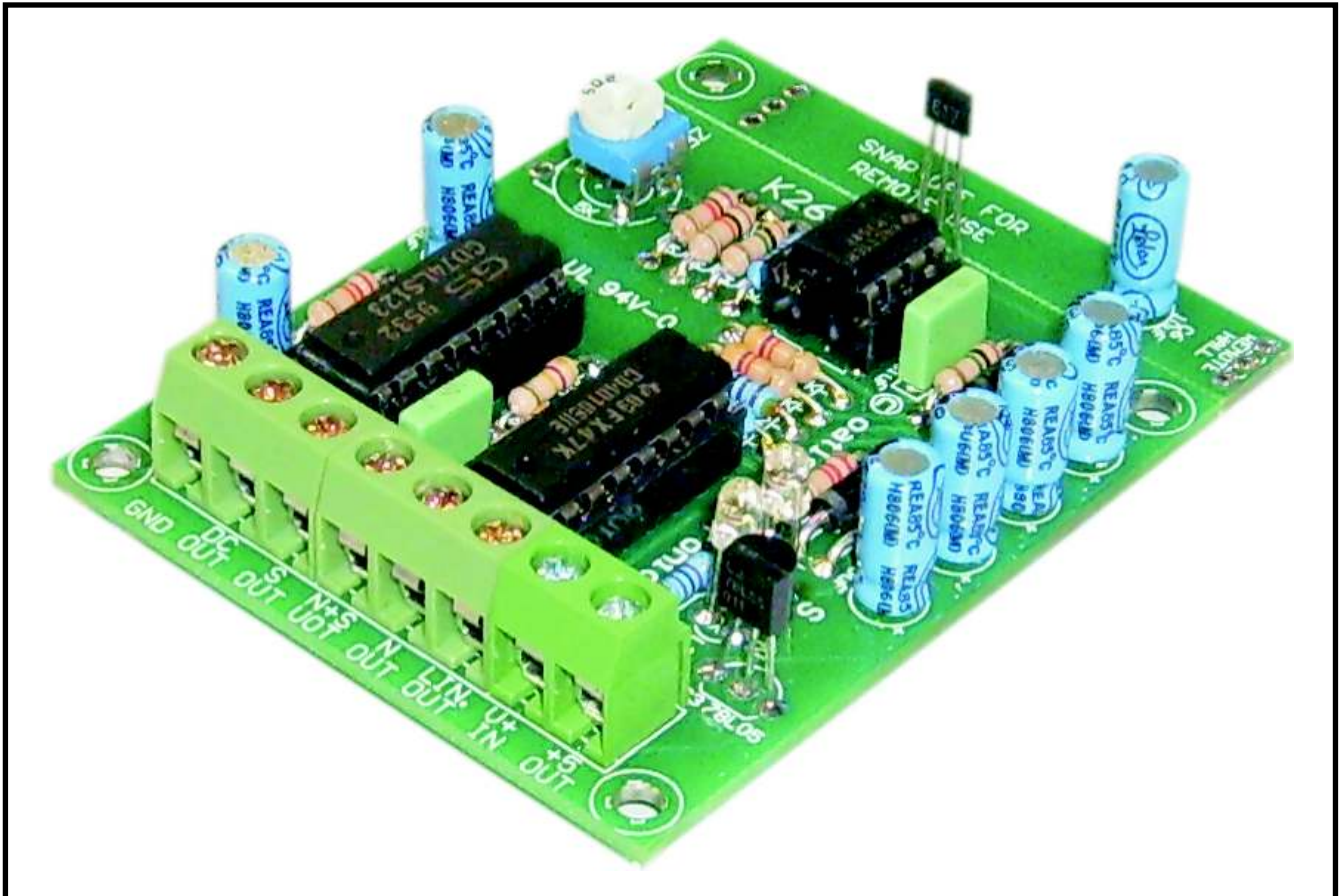


K269 MULTIPURPOSE HALL EFFECT INTERFACE KIT



NOTE: Make sure that you read and understand these notes before starting any assembly of the kit.

K269- MULTIPURPOSE HALL EFFECT INTERFACE KIT

This Hall effect based kit should be suitable for many applications. The combination can be used to measure magnetic field strength, for shaft encoders, to measure rotational speed (RPM), etc. The kit includes 2 small rare earth (Neodymium) magnets. The sensing range for the pulse outputs with these magnets is around 2cm. A section of the PCB can be snapped off & wired to the main PCB for remote use.

There are 5 output terminals:
LINEAR OUTPUT:(LIN OUT)
This output provides a linear

output voltage, which is proportional to the field strength of the magnet. It goes positive when a North Pole and negative for a South Pole.

NORTH POLE:(N OUT)

This output provides a positive going pulse when a North Pole of a magnet passes the Hall Effect device.

SOUTH POLE:(S OUT)

This output provides a positive going pulse when a South Pole of a magnet passes the Hall Effect device.

NORTH AND SOUTH POLE: (N+S OUT)

This output provides a positive going pulse when either a North Pole or a South Pole of a magnet passes the Hall Effect device.

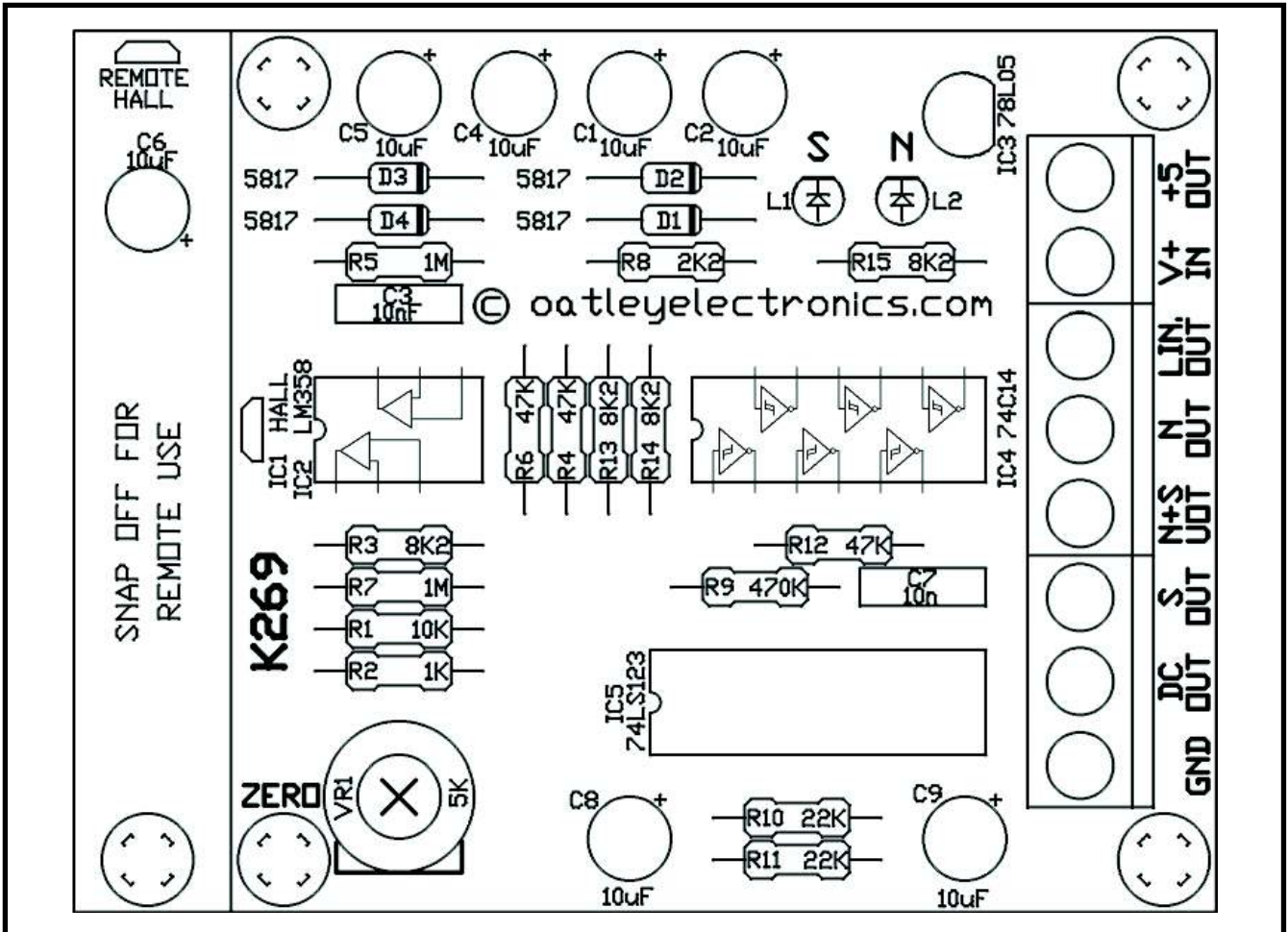
RPM/SPEED DC OUTPUT: (DC OUT)

This output provides a

positive DC voltage which is proportional to the pulse repetition rate.

BRIEF DESCRIPTION

IC3 regulates the DC supply voltage to +5V. The hall effect device is an AH49E which is a direct equivalent of an UGN3503. This device is connected across the 5V supply, and with no magnetic field being present its signal output is at +2.5V. IC1:A forms a Non Inverting amplifier with gain of around 20. The DC output at the output of this amplifier (which is connected to the Linear Output) is set to 0V by adjusting VR1. When a magnet approaches the sensor this voltage goes positive or negative when a North or a South Pole is present respectively. When this voltage rises above the threshold voltage of inverter



gate IC4:E its output goes low, and the output of the inverter gate IC4:D goes high. IC2:B forms an Inverting amplifier. In conjunction with IC4:B and IC4:C a positive going output is produced at the S OUT terminal when a South Pole is present. Isolation diodes D1 and D2 form an or gate so to combine the pulses from the N and or S outputs. These pulses are used to trigger the Monostable Multivibrator (IC5:A). The Multivibrators output is integrated by R10, R11, C8 and C9. A DC voltage which is proportional to the pulse rate is available at the DC OUT output. For example: with 2 magnets at 20,000 RPM the output will be 1.24 V The paralleled gates IC4:F and IC4:A in conjunction with R12 and C3, make up an oscillator with an

output frequency of around 1KHz. The oscillators output is connected to a cascade voltage doubler made up by C4, D3, D4 and C5. The voltage produced by the doubler is -3.8V and it is used to supply the - rail to the Operational Amplifier IC2.

PULSE INDICATOR

There are 2 LEDs and an extra 8K2 resistor provided in the kit, they can be wired to the N OUT and S OUT terminals as shown above. The north pole of a passing magnet will light one of the LEDs and the south pole will light the other.

PARTS LIST

Resistors

- 1 X 10K 1/4W
- 1 X 1K 1/4W
- 2 X 1M 1/4W
- 1 X 2K2 1/4W
- 2 X 22K 1/4W
- 3 X 47K 1/4W
- 1 X 470K 1/4W
- 4 X 8K2 1/4W
- 1 X 5K Potentiometer

Capacitors

- 7 X 10uF/16V Electrolytic
- 2 X 10nF MKT

Semi-conductors

- 1 78L05 Regulator
- 4 X 5817 Diodes
- 1 X LM358 + 8 pin socket
- 1 X 74C14 + 14 pin socket
- 1 X 74LS123 + 16 pin socket
- 1 X Hall Effect Sensor
- 2 X 3mm red LEDs

Misc.

- 1 X PCB labeled K269
- 2 X 3 Way Screw Terminals
- 1 X 2 Way Screw Terminals
- 2 X Neodymium Magnets

SCHEMATIC DIAGRAM SUPPLIED WITH THE KIT