

## 1 General Description

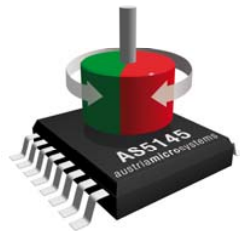
The AS5145 is a contactless magnetic rotary encoder for accurate angular measurement over a full turn of 360°. It is a system-on-chip, combining integrated Hall elements, analog front end and digital signal processing in a single device.

To measure the angle, only a simple two-pole magnet, rotating over the center of the chip, is required. The magnet may be placed above or below the IC.

The absolute angle measurement provides instant indication of the magnet's angular position with a resolution of  $0.0879^\circ = 4096$  positions per revolution. This digital data is available as a serial bit stream and as a PWM signal.

An internal voltage regulator allows the AS5145 to operate at either 3.3 V or 5 V supplies.

Figure 1: Arrangement of AS5145 and magnet



## 2 Key Features

- Contactless high resolution rotational position encoding over a full turn of 360 degrees
- Two digital 12bit absolute outputs:
  - Serial interface
  - Pulse width modulated (PWM) output
- Three incremental outputs
- Quadratur A/B ( 10- or 12-bit) and Index output signal
- User programmable zero position
- Failure detection mode for magnet placement monitoring and loss of power supply
- “red-yellow-green” indicators display placement of magnet in Z-axis
- Serial read-out of multiple interconnected AS5145 devices using Daisy Chain mode
- Tolerant to magnet misalignment and airgap variations
- Wide temperature range: - 40°C to + 150°C
- Small Pb-free package: SSOP 16 (5.3mm x 6.2mm)

## 3 Applications

The device is ideal for motor controls like encoder feedback or current sense, motion control such as robotics, sonar, or for any other radio frequency identification.

Figure 2: Block Diagramm

