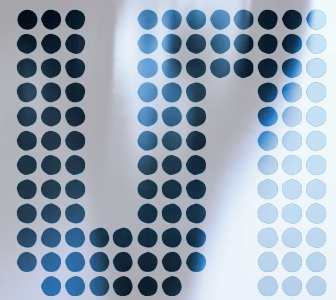


# Product Document

# Magnetic Position Sensor

[www.ams.com/AS5161](http://www.ams.com/AS5161)



## AS5161 – Magnetic Position Sensor

- Precise angle measurements
- Immune to stray magnetic fields
- Enabling functional safety

We provide innovative analog solutions to the most challenging applications in sensor and sensor interfaces, power management, and wireless.

## General Description

The AS5161 is a contactless Hall-based magnetic position sensor for very accurate angular measurement over a full turn of 360°. A sub range can be programmed to achieve the best output characteristic for the application. A simple diametrical 2-pole magnet rotating on the center of the IC is required: the magnet may be placed above or below the IC. The AS5161 is a compact integrated solution which provides the absolute angle measurement with a resolution of 0.09° over a full revolution as PWM output signal. The internal 14-bit core of the AS5161 enables a fine programming

of the start and stop positions with a resolution of 0.02° to allow the finest system mechanical adjustments. High level of flexibility is guaranteed by the programmability through the UART interface shared with the output pin, to reduce the number of pins in the application. The angular output data can be linearized in the final production to further increase the precision of the measurement. With embedded overvoltage protection and reverse battery protection the AS5161 can fulfill the most demanding automotive safety standard.

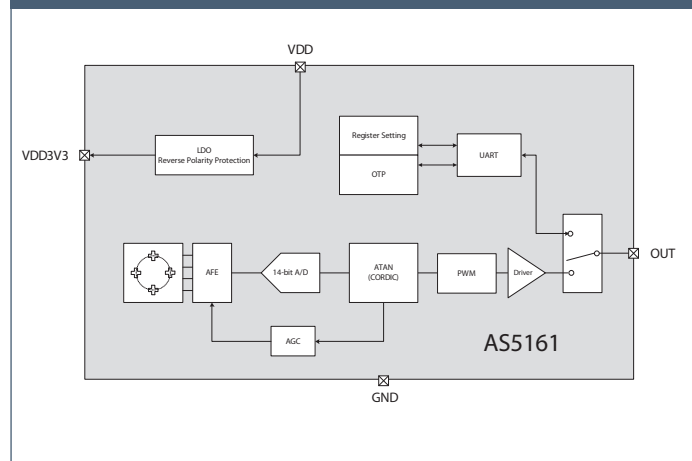
### Applications

- Height control in chassis ride
- Pedal position sensing
- Throttle position sensing
- Tumble-flaps
- Transmission gearbox position sensor
- Valve position sensing
- Contactless potentiometers

### Features

- 14-bit core resolution for fine user programming of the start and stop position
- 12-bit resolution PWM output signal
- User programmable clamping, diagnostic levels and transition point
- Multiple slope output characteristic
- Overvoltage, short-circuit and reverse battery protections
- High driving capability of resistive and capacitive loads
- Broken GND and VDD detection over a wide range of different load conditions
- Simple programming by provided programming hardware and software
- Failure detection mode for magnet placement monitoring and loss of power supply, indication of high voltage condition
- Wide temperature range: -40°C to +150°C
- SOIC8 package

### AS5161 Block Diagram



### Benefits

- Increased robustness through stray field immunity
- Fast angle conversion at low noise output signal
- Enhanced safety through self-diagnostic
- Low BOM through no need of shield
- Precise angle measurement
- Capability to resolve small angle excursions