

## General Description

The AS5046 is a contactless magnetic angle encoder for accurate measurement up to 360°.

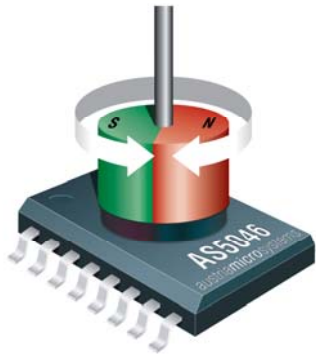
It is a system-on-chip, combining integrated Hall elements, analog front end and digital signal processing in a single device.

The AS5046 provides a digital serial 12-bit as well as a programmable 10-bit ratiometric analog output that is directly proportional to the angle of a magnet, rotating over the chip.

In addition, the serial interface enables a user configurable arrangement of the Hall array and allows access to each individual Sensor of the Hall Array.

The AS5046 also provides high resolution information of the magnetic field strength, respectively the vertical distance of the magnet, thus adding excellent state-of-health information of the overall system.

An internal voltage regulator allows operation of the AS5046 from 3.3V or 5.0V supplies.



Typical arrangement of AS5046 and magnet

## Benefits

- Complete system-on-chip
- High reliability due to non-contact sensing
- Bi-directional 2-wire interface
- Programmable ratiometric analog output
- Ideal for applications in harsh environments
- Robust system, tolerant to magnet misalignment, airgap variations, temperature variations and external magnetic fields

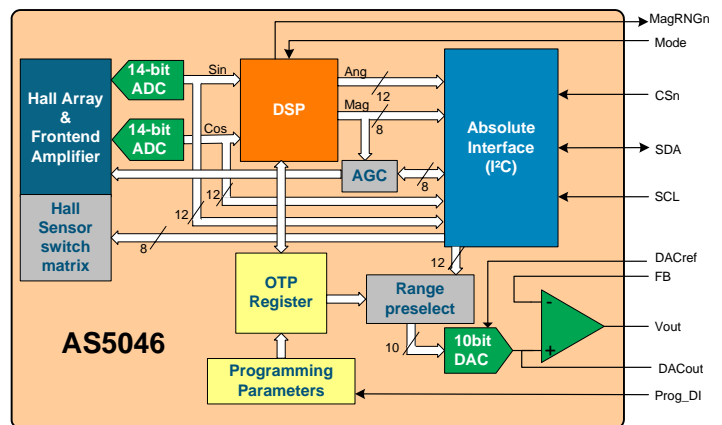
## Key Features

- 360° contactless high resolution angular position encoding
- User programmable zero position
- 12-bit 2-wire serial interface
- Versatile analog output
  - programmable angular range up to 360°
  - programmable ratiometric output voltage range
- High resolution magnet distance indication
  - 256 steps within recommended range (-0.5 to 1.8mm)
  - 256 steps over extended range (-0 to 5mm)
- Mode input for optimizing noise vs. speed
- Alignment mode for magnet placement guidance
- Wide temperature range: - 40°C to + 125°C
- Small package: SSOP 16 (5.3mm x 6.2mm)

## Applications

The AS5046 is ideal for applications that require high resolution, a minimum of wires between controller and sensor and where the vertical distance of the magnet is of importance:

- Remote sensors
- Rotate-and-push manual input devices
- Joysticks
- Applications with extended safety requirements regarding magnet distance



AS5046 block diagram

## Contact

### Headquarters

austriamicrosystems AG

A 8141 Schloss Premstätten, **Austria**

Phone: +43 3136 500 0                      Fax: +43 3136 525 01

[www.austriamicrosystems.com](http://www.austriamicrosystems.com)

## Copyright

Devices sold by austriamicrosystems are covered by the warranty and patent indemnification provisions appearing in its Term of Sale. austriamicrosystems makes no warranty, express, statutory, implied, or by description regarding the information set forth herein or regarding the freedom of the described devices from patent infringement. austriamicrosystems reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with austriamicrosystems for current information. This product is intended for use in normal commercial applications.

Copyright © 2007 austriamicrosystems. Trademarks registered ®. All rights reserved. The material herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner. To the best of its knowledge, austriamicrosystems asserts that the information contained in this publication is accurate and correct. However, austriamicrosystems shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interruption of business or indirect, special, incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of austriamicrosystems rendering of technical or other services.