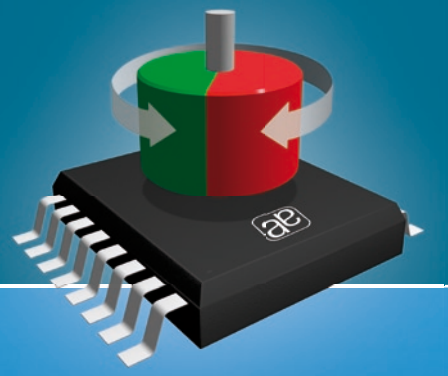
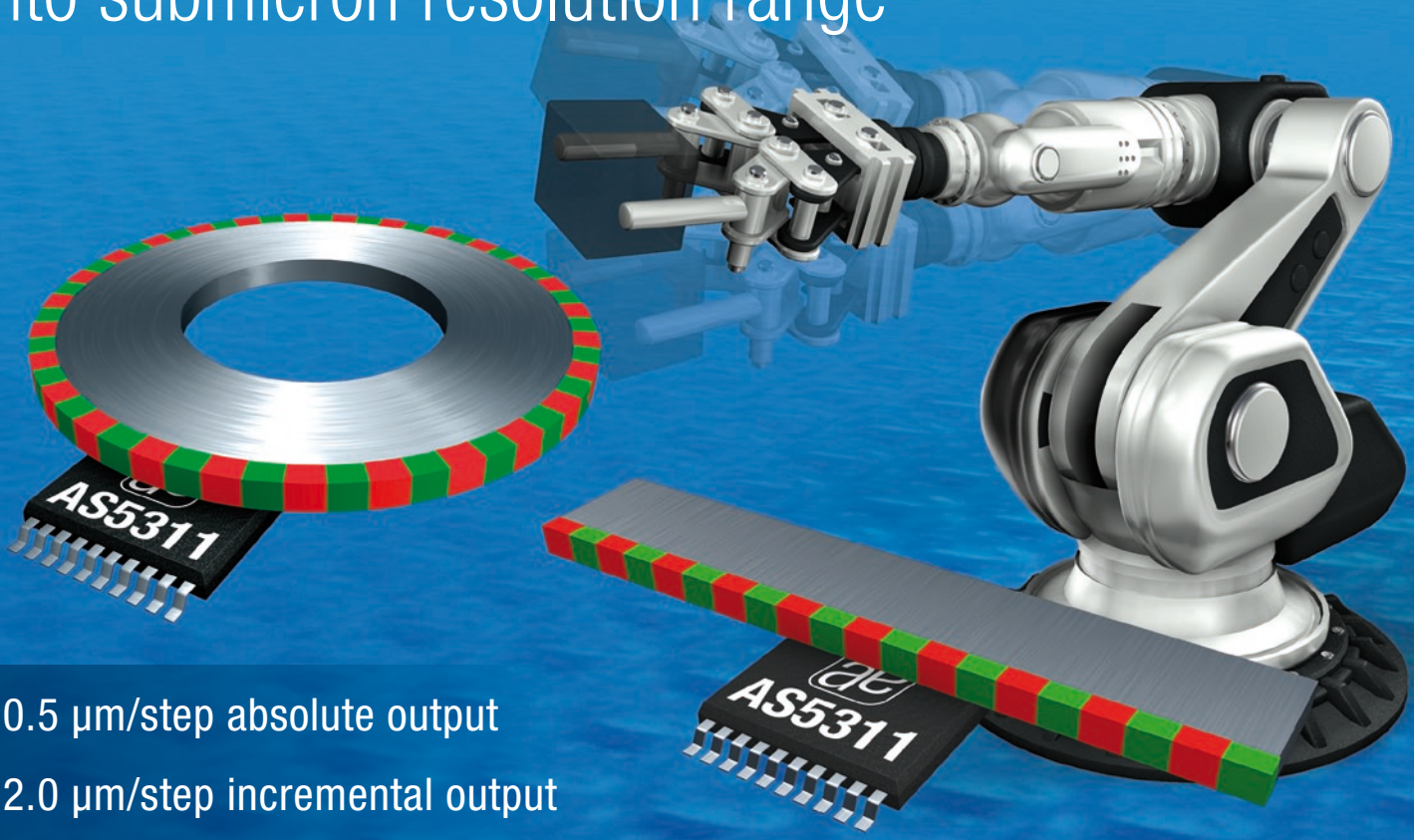
High Resolution Linear Hall Encoder



AS5311 First magnetic encoder to break into submicron resolution range



- 0.5 µm/step absolute output
- 2.0 µm/step incremental output
- 650 mm/s linear speed

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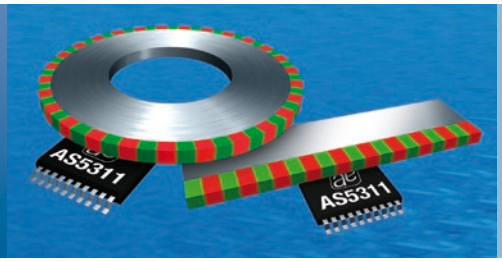
a leap ahead in magnetic encoders



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General Description

The AS5311 is a contactless high resolution magnetic linear encoder for accurate linear motion and off-axis rotary sensing with a resolution down to <0.5µm. It is a system-on-chip, combining integrated Hall elements, analog front end and digital signal processing on a single chip, packaged in a small 20-pin TSSOP package.

A multi-pole magnetic strip or ring with a pole length of 1.0mm is required to sense the rotational or linear motion. The magnetic strip is placed above the IC at a distance of typical 0.3mm.

The absolute measurement provides instant indication of the magnet position within one pole pair with a resolution of 488 nanometers per step (12 bit over 2.0mm). This digital data is available as a serial bit stream and as a PWM signal.

Furthermore, an incremental output is available with a resolution of 1.95 µm per step. An index pulse is generated once for every pole pair (once per 2.0mm).

The travelling speed in incremental mode is up to 650mm/second.

An internal voltage regulator allows the AS5311 to operate at either 3.3 V or 5 V supplies.

Depending on the application the AS5311 accepts multi-pole strip magnets as well as multi-pole ring magnets, both radial and axial magnetized.

The AS5311 is available in a Pb-free TSSOP-20 package and qualified for an ambient temperature range from -40°C to +125°C.

Key Features

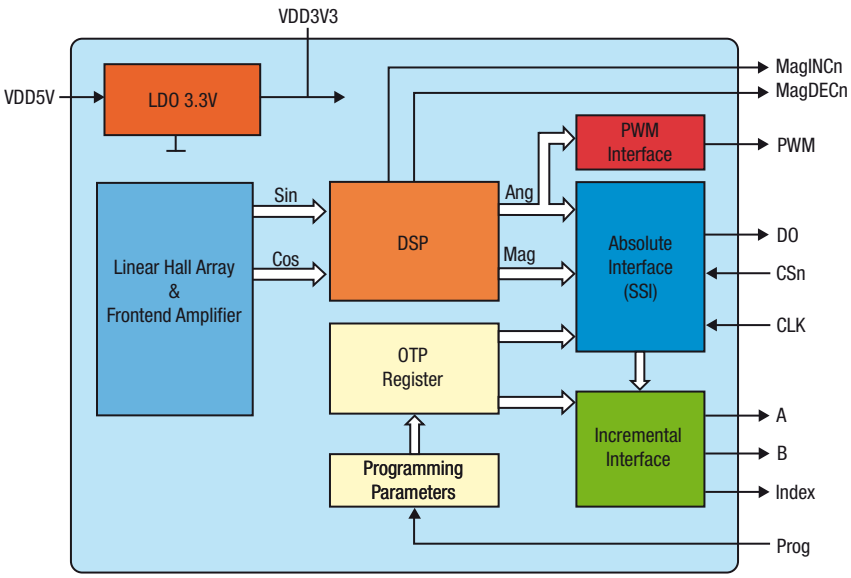
- Two 12-bit digital absolute outputs:
  - · Serial interface and
  - · Pulse Width Modulated (PWM) output
- Incremental output with Index
- Extended diagnostic features for monitoring magnet placement over the chip

Benefits

- Complete system-on-chip
- Flexible system solution provides absolute, PWM and incremental outputs simultaneously
- Ideal for applications in harsh environments due to contactless position sensing
- No calibration required
- High resolution:
  - · 0.488 µm absolute
  - · 1.95 µm incremental

Applications

- Micro-Actuator feedback
- Servo drive feedback
- Robotics
- Replacement of optical encoders



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