

## High-Speed Inductive Position Sensor

# IPS2550 – A NEW ERA IN MOTOR COMMUTATION

The IPS2550 is an AEC-Q100 Grade 0 automotive-qualified, inductive position sensor IC that is capable of providing the absolute rotor position as sine and cosine. This IC uses the physical principle of Eddy currents to detect the position of a simple metallic target moving above a set of coils. The IPS2550 is developed according to ISO26262 to support, as a single IC, the most challenging functional safety critical applications, capable of supporting up to ASIL-C(D) system-level requirements. Based on Renesas' inductive position sensing technology, the magnet-free IPS2550 delivers speeds up to 600krpm (electrical) and is designed around the motor, accommodating both off-axis (through shaft and side shaft) and on-axis positioning

Stray field immunity, lower weight and smaller size, and a substantial BOM optimization make the IPS2550 the ideal candidate for resolver replacement.



### Target Applications

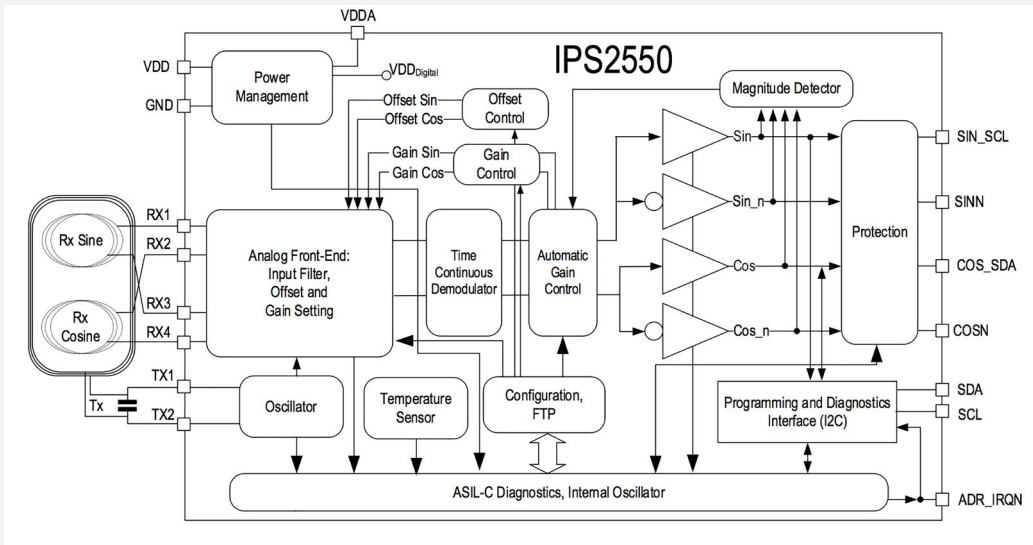
- Traction e-motors
- Electronic power steering
- Belt starter generator
- Park brake actuator
- Pumps

### Key Features

- Interface: Sine/Cosine single-ended or differential
- AEC-Q100 Grade 0 automotive qualified
- ISO 26262 up to ASIL-C (D) single
- Temperature range: -40 °C to +160 °C ambient
- Voltage supply: 3.3V  $\pm$ 10 % or 5.0V  $\pm$ 10 %
- Rotational speed: up to 600,000 rpm (electrical)
- Propagation delay: <5 $\mu$ s
- Sin/Cos gain mismatch and offset compensation
- Overvoltage, reverse polarity, short-circuit protected
- Digital programming interface: I2C through output pins
- 16-TSSOP package with exposed pad
- Embedded Automatic Gain Control (AGC) to compensate environmental variations

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## Block Diagram

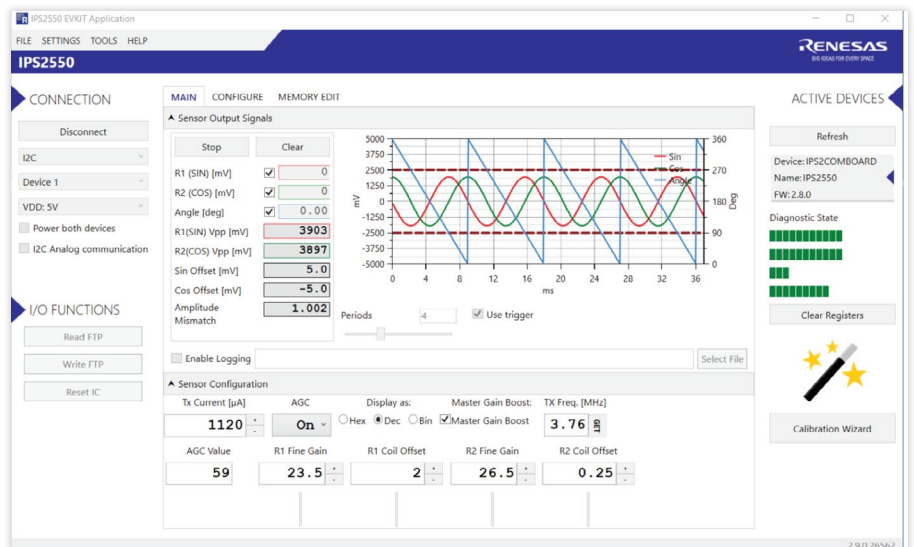
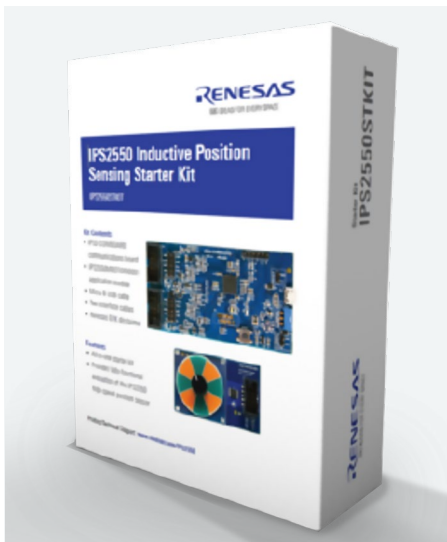


## Benefits

- Customized design of the sensing element to support on- and off-axis
- Improve the accuracy by matching the number of sectors to the pole pairs of the motor
- Significantly cost effective
- Reduced BOM because RDC is not needed
- Up to 10x thinner and 100x lighter than a resolver
- Best motor integration due to stray field immunity
- Less power consumption compared to resolvers
- Supports ultra high-speed applications

## IPS2550 Evaluation Kit: IPS2550STKIT

The IPS2550STKIT is a compact and intuitive evaluation kit that enables fast and easy evaluation of the IPS2550. This evaluation kit consists of a communication board and an application module. The communication board, which runs the IPS2550 GUI and is connected to the IPS2550 4×90° application module, can display the sine and cosine signals provided by the inductive position sensor.



Part Number	Description
IPS2550DE1R	IPS2550 Inductive Position Sensor IC (4000 units/rev)
IPS2550STKIT	IPS2550 Evaluation Kit