Product Information

DIVA Automation

Innovation in Motion

DA2030

Brushless Motor Hall Sensor to Quadrature Converter

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Brushless Motor Hall Sensor to Quadrature Encoder Converter

The **DA2030** provides a low cost alternative to a separate position encoder when a brushless motor with Hall-effect commutation sensors is used. It converts the three-phase Hall sensor pattern to a two-phase quadrature pattern, as produced by incremental encoders. The output signal may then be used as feedback to closed loop controls for accurate control of speed or position.

The resolution of the **DA2030** is limited to that of the Hall sensor spacing, which is typically 12 states per revolution.

- Low cost encoder replacement
- Provides closed loop feedback to controller for velocity and positioning
- Available in through-hole and surface mount packages
- Commercial and industrial temperature ranges
- TTL level I/O

Hall-effect sensors are mounted internally in many brushless motors to provide rotor position feedback to an electronic commutation circuit. They are typically arranged so that they switch through a 12-state pattern, with a change of state every 30 degrees of rotation.

These signals are sufficient for commutation. In open loop control systems, nothing else is needed. For closed loop systems, where the cost of an additional component to provide incremental encoder signals to a controller is prohibitive, the **DA2030** generates simulated incremental encoder signals from the Hall signals.

Application

To apply the **DA2030** in a control system, it is only necessary to connect the Hall sensors and a clock to the inputs (together with Vcc @ +5V and ground). The quadrature output is then available at the pins labeled **Channel A** and **Channel B**.

The quadrature outputs may be used as feedback to a closed loop controller or may be connected to a display counter to show position or velocity.

The clock rate is non-critical. It is used to synchronize the input signals to prevent spurious output signals and affects only the time delay between a change of state of the input and the corresponding output change.

A brushless motor running at 12,000 RPM will generate 2400 Hall sensor state changes per second. Any clock rate above 100 KHz will provide comparable performance. Lower clock rates yield lower power dissipation.

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Fitting your budget and your needs with precision.

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