

10-Bit Low-Latency Sin/Cos Interpolator With Auto-Calibration And Line Driver

A built-in LED controller allows controlling the intensity of an optical sensor's LED to maintain optimum input signal amplitudes despite ageing or changes in operational conditions. Complete status monitoring and fault detection capabilities with a dedicated LED driver or interrupt request pin for implementing safety functions are provided. In hosted applications, a 14-bit multicycle counter is available which can be extended using a host processor. A capture register allows coded index and touch-probe applications.

- Easy to use – built-in line driver, EEPROM, and oscillator
- Push-button automatic calibration for fast commissioning
- 3.3 V operation from $-40 \dots 125\text{ }^{\circ}\text{C}$ for rugged applications
- Complete status and fault monitoring capabilities
- Encoder Link interface for field diagnostics and configuration

- Rotary and linear encoders
- Magnetic or optical sin/cos sensor modules
- High-output magnetic sensor (GMR, TMR) encoder
- Brushless motor commutation (2 ... 64 poles)
- Fast imbedded motion controller

iC-TW28

The diagram illustrates the functional architecture of the iC-TW28 encoder IC. It is divided into several main sections:

- Inputs:** SIN, COS, and ZERO signals are provided to the Amplifier section.
- Amplifier and Offset:** Each input signal passes through an amplifier and an offset block before being converted by an ADC.
- Processing:** The ADC outputs feed into Sin/Cos Error Correction, ZERO Error Correction, and a Comparator. The Sin/Cos Error Correction block also feeds into the ATAN block.
- Filter and Output Generation:** The ATAN block output goes through a Filter, which then feeds into the ABZ and UVW Generator, Multicycle Counter, and Position Capture blocks.
- Outputs:** The ABZ and UVW Generator outputs are sent to an RS422 interface, which produces the Z, B, and A output signals.
- Control and Configuration:** A central Control block contains EEPROM, Signal Quality Monitor, Sin/Cos Adaption, ZERO Adaption, Filter Adaption, LED Intensity Control, Push-button Auto-calibration, and Fault Handling IRQ Generation. It interfaces with an Encoder Link Interface, SPI, and Pin Configuration blocks.
- External Components:** A 50 MHz Oscillator, References (VC, VREF), and Power-on Reset (xRST) are connected to the system. The LED, xCALIB, and xIRQ pins are also shown.

