

Quadrature Encoder Overview

Quadrature Encoders are a common type of incremental encoders that use two output channels (A and B) to sense position. Using two code tracks with sectors positioned 90° out of phase (Fig. 5), the two output channels of the quadrature encoder indicate both position and direction of rotation.

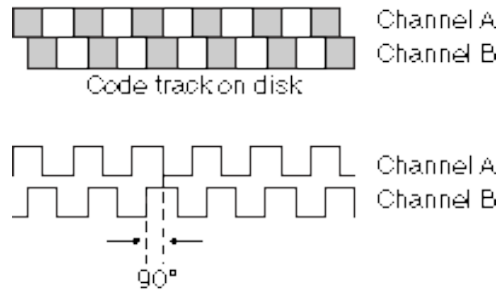


Fig. 5 Quadrature Encoder Output Channels A and B

The major advantage offered by incremental encoders is their high resolution. Precision quadrature encoders are available that produce over 10,000 pulses per revolution at speeds exceeding 5000 RPM. Their high resolutions, extreme durability and ease of installation make Quadrature Encoders ideal for a wide variety of applications:

- Motor drive control systems use quadrature encoders to provide closed loop feedback for position and velocity controlled applications.
- Printers, fax machines and copy machines use quadrature encoders to synchronize various moving parts for trouble free operation.
- Elevators use quadrature encoders to maintain velocity and acceleration and for correct door alignment.
- Automated blood analyzers use quadrature encoders to ensure the exact position of vials containing blood samples while performing automated tests.

High speed and precision applications that utilize these quadrature encoders for velocity and acceleration control require hardware that can deterministically process quadrature encoder signals to estimate velocity and acceleration and instantaneously output controls signals at hardware-timed precision.