

## **Should I ever put an Encoder on the back of a step motor?**

By John Walewander, Compumotor

The easiest answer to this question is no! In the past encoders were common on step motor applications and were present in as many as 25% of the total step motor axes being used for precise positioning applications. The reasons they were used in the past are:

### Stall Detection/Peace of Mind

In the past, an encoder was used to make sure that the step motor has not stalled. New patented advancements in Compumotor's step motor technology have allowed the drive to detect a stall without the presence of an encoder. Peace of mind can be maintained at much lower cost and greater simplicity.

### Position Maintenance.

In the past, encoders were used on step motor systems to create a low bandwidth position loop. In this mode, extra pulses were sent to the step motor to move to a specific encoder position or to return to a position if an external force displaced the motor. Today, these applications are almost always better served by a servo solution. When the cost of the encoder is added to the step motor system, the cost difference between servo and stepper is greatly diminished. At the same relative price level, the servo provides better closed loop performance.

### Exception: Linear Positioning

The one important exception is applications that use linear encoders. There are several application types, such as microscope inspection, that require very high accuracy of the load and a great deal of stability at rest. Most of the time these are solved with a mechanical positioning system using a leadscrew or ballscrew to convert rotary motion to linear motion. When applying a servo in these situations, the controller must be able to close dual position loops because it is impractical to close the primary servo position loop "around" the mechanical system. Step motor systems are perfect for these applications and provide the best application solution at the lowest cost.