

## Application of Rotary & Linear Sensors in CNC Machines

Computer numerical control (CNC) machines use directions from a computer to complete machining processes. Machining equipment takes a stock piece of material and cuts away parts of it to achieve the specified results. CNC machining counts as a subtractive manufacturing process, or a technique that removes layers of material to create the desired shape. The different types of CNC machines includes Milling machines, Drills, Lathes, Waterjet, laser and plasma cutters.

### Working Principle:

A CNC machine follows directions from a pre-programmed computer software. This program specifies the machine's speed, movement and position to achieve a specific material shape. The CNC machining process features the following steps:

- **Working in CAD:** The designer creates a 2D or 3D drawing in computer-aided design (CAD) software. This file includes specifications such as the structure and dimensions that will tell the CNC machine how to create the part.
- **Converting the CAD file to CNC code:** Since CAD files find use in many applications, the designer needs to convert the CAD drawing into a CNC-compatible file. They can change the CAD format to a CNC format with a program such as computer-aided manufacturing (CAM) software.
- **Machine preparation:** Once the operator has a readable file, they can set up the machine itself. They attach the appropriate work pieces and tooling for the program to execute correctly.
- **Process execution:** With the files and machine prepared, the CNC operator can execute the final process. They start the program, which then guides the machine through the entire process.

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Rotary sensors are used in servomotors and servomotors used in CNC machine for positioning the tool magazine, closing and opening the door. As the CNC machine are used to make various components or parts such as crankshaft, knuckle of automobile etc, their dimensions must be accurate. For this purpose precise position is important and this is done by linear sensor. Rotary sensors sense the exact position of the tool and send it to the controller and controller controls the position of the tool by servo motor hence machine works as per program.

