Megacraft Enterprises Pvt. Ltd.
16, Electronic Sadan II, MIDC Bhosari, Pune 411026, Maharashtra, India
Mob No :- 8669617184/8669617186/8669617185
Email: mail@megacraft.net | Website: www.megacraft.net

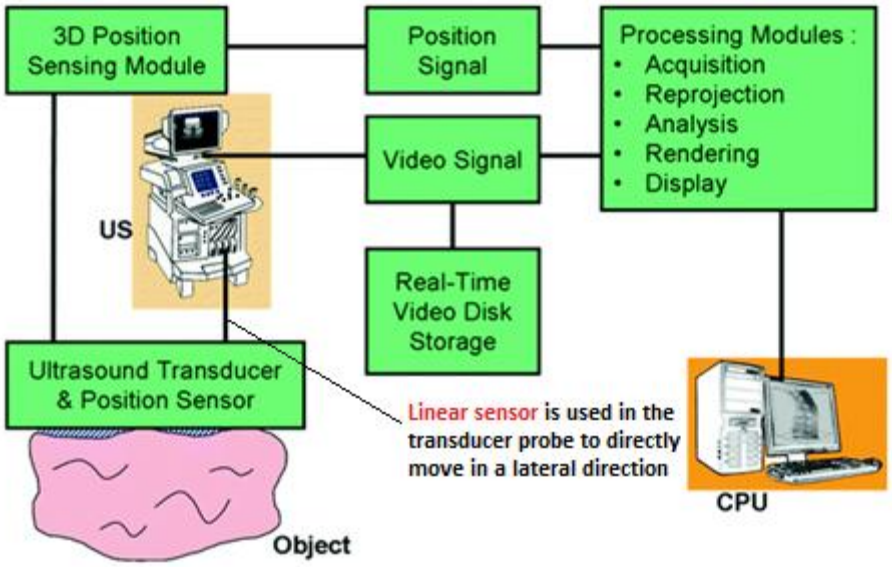
Application of Linear Sensor in Diagnostic Ultrasound Probes

Diagnostic ultrasound is a non-invasive diagnostic technique used to image inside the body. Ultrasound probes, called transducers, produce sound waves that have frequencies above the threshold of human hearing (above 20KHz), but most transducers in current use operate at much higher frequencies (in the megahertz (MHz) range).

Working Principle :

Ultrasound waves are produced by a transducer, which can both emit ultrasound waves, as well as detect the ultrasound echoes reflected back. In most cases, the active elements in ultrasound transducers are made of special ceramic crystal materials called piezoelectrics. These materials are able to produce sound waves when an electric field is applied to them, but can also work in reverse, producing an electric field when a sound wave hits them. When used in an ultrasound scanner, the transducer sends out a beam of sound waves into the body. The sound waves are reflected back to the transducer by boundaries between tissues in the path of the beam (e.g. the boundary between fluid and soft tissue or tissue and bone). When these echoes hit the transducer, they generate electrical signals that are sent to the ultrasound scanner. Using the speed of sound and the time of each echo's return, the scanner calculates the distance from the transducer to the tissue boundary. These distances are then used to generate two-dimensional images of tissues and organs. During an ultrasound exam, the technician will apply a gel to the skin. This keeps air pockets from forming between the transducer and the skin, which can block ultrasound waves from passing into the body. For scanning they use probes or transducers which have Linear Sensor in it and this allows the built-in probe to directly move in a lateral direction. Compared to the traditional arc scanning, this linear scanning provides higher lateral resolution of diagnostic images. The probe also has a flat surface that touches the target part of the human body (the surface that sends and receives ultrasonic waves). This geometry allows the probe to ensure more uniform contact with the irregular surface of the human body.

Continued on Page 2


3D Position Sensing Module
Position Signal
Processing Modules :
• Acquisition
• Reprojection
• Analysis
• Rendering
• Display
Video Signal
US
Real-Time Video Disk Storage
Ultrasound Transducer & Position Sensor
Linear sensor is used in the transducer probe to directly move in a lateral direction
CPU
Object