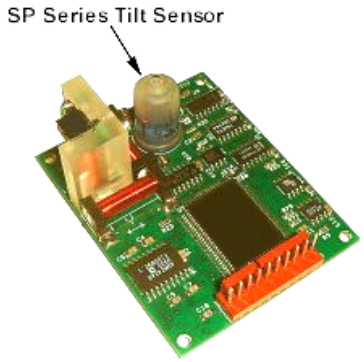
Compass Compensation

Compasses have been in existence for thousands of years. Like most other mechanical based instruments, they evolved (along with technology) through the electromechanical phase, and finally into the digital compasses of today. These digital compasses use magnetic transducer based sensors, to measure the earth's low level magnetic field, and provide a directional output reading or 'heading'.

There are various types of sensors available, which can be used to measure the earth's magnetic field. This field, which is three dimensional, consists of two horizontal (X and Y axes) and one vertical (Z axis) component. One inherent characteristic with this measurement technique is that in order for the heading indication to remain true, the X and Y axis sensors must remain level. If not, the Z component is induced into the X and Y sensors, which translates into a heading error.

Electronic tilt compensation readily solves this problem. This involves measuring the pitch and roll of the system, and mathematically compensating within the systems processor. The angular measurement range required for pitch and roll compensation typically falls between +/-20 to +/-45 degrees maximum. This is an excellent application for a dual axis tilt sensor.



Typical digital compass module containing a Spectron Tilt Sensor for compensation

Spectron currently serves this market with the *SP Series Dual Axis Electrolytic Tilt Sensor.* The choice of angular ranges, compact design, low cost, high reliability and long-term stability make this sensor a perfect choice. In addition, with the ability to vary the viscosity of the fluid (electrolyte) inside the sensor, the effects of vibration and acceleration can be severely reduced in dynamic environments.