What is Electronic Compass Sensor?

Electronic Compass Sensor is also called E-compass, which is usually based on a magnetometer **sensor** which provides mobile phones with an orientation in relation to the Earth's magnetic field. ... An eCompass is a tilt compensated **electronic compass** utilizing accelerometers and magnetometers.

SkyMEMS is a leading manufacturer of 3-axis electronic compass using 3-axis magneto-inductive sensors, 3-axis MEMS accelerometer and central processing unit.

SkyMEMS digital compass is a high-performance, low-power consumption, tilt-compensated electronic compass module that provides industry-leading heading accuracy. Our electronic compass adopts hard and soft magnetic calibration algorithm, uses special calibration technology and provides high accuracy inclination signal, and it has perfect cross connect performance.

We will continue to provide the best solution through development of the compact, low-voltage and high-performance electronic compass and advanced software to our customers in the future.

Types of Electronic Compass Sensor

There are many types of electronic compass sensor according to different standards.

According to the axis number, the electronic compass sensor sensor includes two types:

- Single axis electronic compass sensor

- 2 axis electronic compass sensor

- Triple axis electronic compass sensor

According to the output interface, the electronic compass sensor sensor includes the following types:

- RS232 output electronic compass sensor

- RS485 output electronic compass sensor

Applications of Electronic Compass Sensor

SkyMEMS has different types of series Electronic Compass Sensor, from tiny digital compass module with high precision to super high precision electronic

compass sensor, which has been widely used in the following fields:

- Satellite Antenna Pointing
- Antenna Servo System
- Boat Control System
- Unmanned Aircraft
- Infrared Imager

What Is True North?

It is well known that the earth's magnetic poles and its axis of rotation are not at the same geographical location. They are about 11.5Â° rotation from each other. This creates a difference between the true north, or grid north, and the magnetic north, or direction a magnetic compass will point. Simply it is the angular difference between the magnetic and true north expressed as an Easterly or Westerly variation. This difference is defined as the variation angle and is dependent on the compass short duration, making a magnetic compass a useful navigation tool.

Compass Calibration

Each calibration method is associated with a specified physical movement of the compass platform in order to sample the magnetic space surrounding the compass. The Hard and Soft iron distortions will vary from location to location within the same platform. The compass has to be mounted permanently to its platform to get a valid calibration.

A particular calibration is only valid for that location of the compass. If the compass is re-oriented in the same location, then a new calibration is required. It is possible to use a compass without any calibration if the need is only for repeatability and not accuracy.

Compass Installation

The performance of a compass will greatly depend on its installation location. A compass relies on the earth's magnetic field to provide heading. Any distortions of earth's magnetic field by other sources such as a car massive iron components should be compensated for in order to determine an accurate heading. Sources of magnetic fields in any automobile include permanent magnets mostly in its audio speakers, motors, electric currents flowing in its wiring-either dc or ac, and ferro-magnetic metals such as steel or iron. The influence of these sources of interference on an electronic compass accuracy can be greatly reduced by placing

the compass far away from them.

Some of the field effects can be compensated by way of calibrating the compass for a defined location in terms of magnetic interference. However, it is not always possible to compensate for time varying magnetic fields; for example, disturbances generated by the motion of magnetic metals, or unpredictable electrical current in a nearby power lines. Magnetic shielding can be used for large field disturbances from motors or audio speakers. The best way to reduce disturbances is distance. Also, never enclose the compass in a magnetically shielded metallic housing.

Compass Tilt Errors

Heading errors due to a tilt depend somewhat on geographic location. At the equator, tilt errors are less critical since the earth's field is strictly in the horizontal plane. This provides larger X and Y readings and little of the Z component correction near the magnetic poles, tilt errors are extremely important, since there is less X,Y field and more of the Z component. Tilt errors are also dependent on the heading.