Magnetic Field Sensor

The Magnetic Field Sensor can be used in a number of experiments and investigations involving magnetic fields. Examples include:
- investigating the field in and around a solenoid.
- determining the relationship between field strength and distance.
- studying the magnetic field near a permanent magnet.
- looking at the field strength of different types of magnets.
- measuring the field near a current carrying wire.

Connecting the Magnetic Field Sensor to the ALBA Interface
Switch on the power to the ALBA Interface and connect the serial cable from the interface to your PC.
Connect your Magnetic Field Sensor to channel 3 or 4 of the ALBA Interface – that's it.

Software
There are two Applications that support the use of the Magnetic Field Sensor:
1. The Investigator
2. Analogue Snapshot on Disk 2.

The Investigator can be used to log against time or the Meters option may be selected for large displays that are time independent.
The analogue snapshot takes readings that are independent of time i.e. you are in charge of the x-axis (independent variable) and the sensor value is on the y-axis value. This is ideal if you wish to determine the relationship between field strength and distance.
Sample screen shots are shown on the website (select *Physics*, *Electricity* and then scroll to the Magnetic Field Sensor). The Magnetic Field Sensor requires version 1.86 or greater of the ALBA Core – free download available from the website.

Calibrating the Sensor
Version 1.86 of the ALBA Core has a default calibration for the Magnetic Field Sensor. This will be satisfactory for most lab work but if you wish to perform a new calibration then this should be carried out in the normal way as indicated in the ALBA manual and in the ALBA Help. To obtain a reference value you could pass a known current through a solenoid with a known number of turns per unit length.

How the Magnetic Field Sensor Works
The sensor uses a Hall effect transducer which produces a voltage that varies linearly with the magnetic field strength. You can see the sensor at the end of the probe. The sensor measures the component of the field that is in the direction the probe is pointing. The maximum positive output occurs when the white writing on the sensor points towards a magnetic south pole.
If you require to zero the sensor then:

- Place the probe in the plane that it will be operating in during your experiment.
- Select the Meter display in the Investigator.
- Use a fine screwdriver and adjust the zero on the top right hand side of the sensor box until the voltage on the meter is zero.
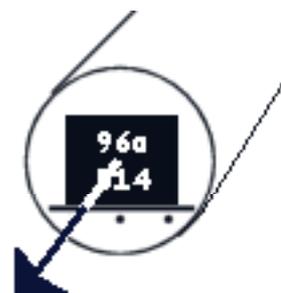
component of magnetic field in this direction is measured

Ranges
The switch on the left hand side of the sensor box enables you to select between weak and strong fields.
Select Weak for fields in the range ±19mT.
Select Strong for fields in the range ±190mT.

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