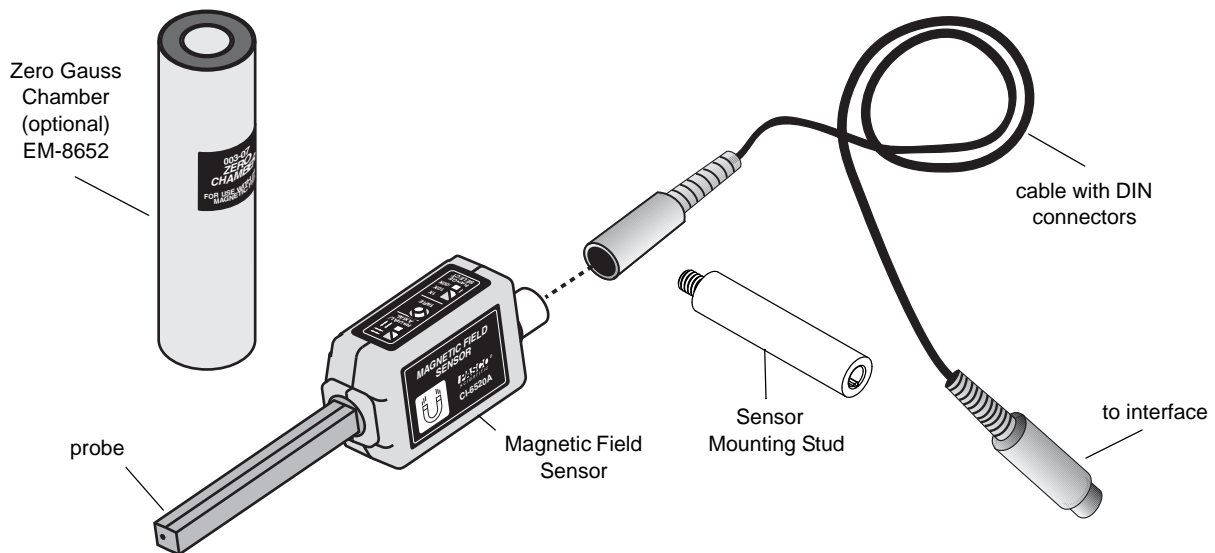




Magnetic Field Sensor

CI-6520A



Introduction

The PASCO CI-6520A Magnetic Field Sensor is used with a PASCO computer interface. The sensor can connect directly to an analog channel on the PASCO *Universal Interface* (US-5000) or a *ScienceWorkshop* interface (such as the *ScienceWorkshop 750*), or it can connect to the interface through the included DIN-plug-to-DIN-plug cable. It can also be used with the PS-2158 Analog Adapter to connect to a PASPORT interface. The sensor has three magnetic field ranges, selectable by the RANGE SELECT switch on the top of the sensor box. The ranges are 1X (± 1000 gauss), 10X (± 100 gauss), and 100X (± 10 gauss). The three ranges allow the sensor to be used for measuring small magnetic fields such as the earth's magnetic field, medium strength fields created by current-carrying wires, or stronger fields around permanent magnets.

The sensor uses Hall Effect devices as sensing elements. There are two of these devices oriented perpendicularly to one another located at the end of the probe. One device is sensitive to axial field lines that are parallel to the length of the probe and the other device is sensitive to radial field lines that are perpendicular to the probe. A small white dot on the probe end indicates the plane of each sensing device. The RADIAL/AXIAL switch on the top of the sensor selects the sensor orientation. NOTE: It is not possible to measure magnetic fields in both directions simultaneously.

In addition, the top of the sensor has a TARE button. The TARE button allows the output of the sensor to be set at zero. Typically, the sensor is "zeroed" (by pressing the TARE button) when the Hall Effect devices in the probe are not exposed to any magnetic fields. The optional EM-8652 Zero Gauss Chamber is available for removing the effects of the earth's magnetic field when "zeroing" the sensor at the 100X (± 10 gauss) range.

Equipment

Included	Included	Included
Magnetic Field Sensor CI-6520A	DIN plug cable	Sensor Mounting Stud

Additional Required*	Additional Required*
PASCO interface or datalogger	PASCO data acquisition software

(*See the PASCO catalog or web site at www.pasco.com for more information.)

Recommended

Zero Gauss Chamber EM-8652

Operation

Set up the Equipment

Connect the Magnetic Field Sensor to an analog channel on the *Universal Interface 850* or the *ScienceWorkshop Interface 750* using the DIN plug cable, or plug the sensor directly into the interface. (For a PASPORT Interface or SPARK Science Learning System (SLS), connect the sensor to a PS-2158 Analog Adapter and then connect the adapter to the interface or SLS.)

Choose Radial or Axial

Move the RADIAL/AXIAL slide switch on the top of the sensor to either the radial (perpendicular) or axial (parallel) orientation. The position of the axial sensor is at the front end of the probe and the position of the radial sensor is on the side of the probe very near to the front end of the probe.

Zero the Sensor

Hold the sensor away from any magnetic source (other than the earth's field) and press the TARE button on the top of the sensor. To zero the sensor more completely, especially when using the 100X (± 10 gauss) range to record very small magnetic fields, place the probe of the sensor into a Zero Gauss Chamber (such as the EM-8652) and press the TARE button.

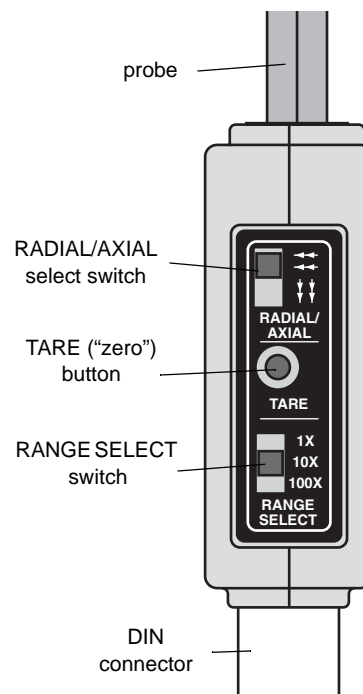
NOTE: The sensor needs to be zeroed after each change of the RADIAL/AXIAL switch.

Achieve Thermal Equilibrium

The Hall Effect sensing elements used in the sensor are temperature compensated. However, when measuring very small magnetic fields (100X (± 10 gauss)), some temperature dependent variation may be observed in the sensor output. The variation is on the order of a few gauss. For the best results with the 100X range, the sensor should be connected to the interface or datalogger for five to fifteen minutes before data are collected. This will allow the sensing elements to come to thermal equilibrium and will yield more stable results.

Select Range

The sensor has three switch selectable ranges: 1X, 10X, and 100 X. When using an interface, set the data acquisition software so that it matches the range selected and the units of measure desired.

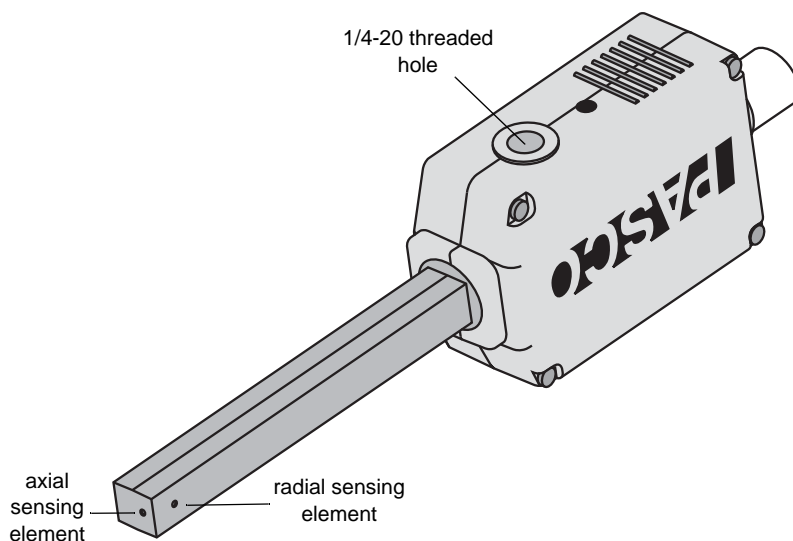


The RANGE SELECT slide switch on the top of the sensor selects the magnetic field range:

- 100X, range ± 10 gauss; resolution, 50 milligauss (0.050 G). Variations in the earth's magnetic field and small fields around power cords can be detected. (NOTE: Using the EM-8652 Zero Gauss Chamber when zeroing the sensor on this setting is recommended.)
- 10X, range ± 100 gauss; resolution, 50 milligauss (0.05 G). Use this range with current-carrying solenoids and Helmholtz coils.
- 1X, range ± 1000 gauss, resolution, 500 milligauss (0.5 G). Use this range for fields typically found around strong permanent magnets.

Mounting the Sensor

The included Sensor Mounting Stud can be screwed into the 1/4-20 threaded hole located on the bottom of the sensor. Use the Sensor Mounting Stud to mount the sensor to a support rod, for example.



Sensor Specifications

Range*	Gain	Resolution	Accuracy ¹	Calibration Factor
± 1000 gauss	1X	0.5 gauss	10% of reading	100 gauss/volt
± 100 gauss	10X	0.05 gauss	10% of reading	10 gauss/volt
± 10 gauss	100X	0.05 gauss	10% of reading	1 gauss/volt

(*1 gauss = 0.0001 tesla or 10^{-4} T)

¹For example, if the value reading on the ± 100 gauss range is 60 gauss, the accuracy is ± 6 gauss (10% of the reading).

Technical Support

For assistance with any PASCO product, contact PASCO at:

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800-772-8700 (U.S.)

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Web: www.pasco.com

Email: support@pasco.com

For the latest information about this product or the latest revision of this Instruction Sheet, visit the PASCO web site and enter CI-6520A in the Search window.

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The European Union WEEE (Waste Electronic and Electrical Equipment) symbol and on the product or its packaging indicates that this product **must not** be disposed of in a standard waste container.

