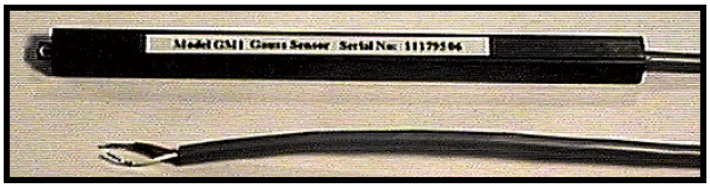
Not Recommended for New Installations.
Please contact Technical Support for more information.

Read Magnetic Fields Up To ±1000 Gauss @ 20KHz

Model GM1



B&B Electronics' Model GM1 is a linear Hall effect sensor that can be used to measure magnetic fields up to ±1000 gauss at frequencies up to 20KHz. The output signal is a linear voltage from 0 - 5V proportional to the strength of the magnetic field. B&B Electronics' SDA series of RS-232 Analog to Digital converters provide a simple, inexpensive method of logging the data to a computer. A data logging utility is provided with the GM1 for use with any of the SDA converter series (Models 232SDA10, 232SDA12, 485SDA10 and 485SDA12).

Connections and Operation

The GM1 should be connected to a regulated 5VDC power supply. Note that errors in the supply voltage will proportionally affect the sensitivity of the GM1. The red lead is the +5V connection, black is ground, and white wire is the signal output. The uninsulated conductor is the cable shield drain wire. The cable shield is not terminated on the sensor end. The sensor is sensitive to magnetic flux lines that are perpendicular to the flat face of the device as shown in Figure 1. The presence of a southpole magnetic field perpendicular to the sensors face (the printed surface) will increase the output voltage from its quiescent value toward the supply voltage rail by an amount proportional to the magnetic field applied. Conversely, the application of a north pole will decrease the output voltage from its quiescent value. If the unit is being used with one of B&B Electronics' SDA series of analog to digital converters, power may be derived from the 5V connection on the SDA unit. Note that if you are self-powering a 232SDA series unit from an RS-232 port, the power that can be drawn from the 232SDA is limited and in some cases a power supply may be required. Figure 2 illustrates a typical connection to B&B Electronics' 232SDA12 RS-232 data acquisition module.

Software

A 3.5-inch floppy disk is included with the GM1 and contains a data logging utility. The data logging utility was written for use with B&B Electronics' line of data acquisition modules. Run the file, DATALOG.EXE, to start the program. Use the up and down arrow keys to select the "232/485SDAxx with GM1 Sensor" module and press the space bar to choose it. Choose the parallel port where the module is connected. Enter the sampling interval, the output file name and the module address. The 232SDA10 and 232SDA12 have a fixed module address of 30h. The values for A/D Ref- and A/D Ref+ are the voltages connected to the A/D Ref- Input (pin 19) and A/D Ref+ Input (pin 18) of the SDA module. These are normally 0 and 5 Volts respectively. Enter the values for QV0 and mV/gauss. These values are different for each sensor and are found on the Analog Output Hall IC Calibration Report in row 2 (VCC = 5 Volts) under the columns "QV0 (Volts)" and "SEN (mV/G)". Select the channels to sample and then press the Enter key to begin sampling. The file, DATALOG.TXT, contains command line parameters that can be used with the data logging utility.

Specifications

Max. output range:	0-5V
Quiescent V_0:	2.5V nominal
Iout:	±1 mA
Output scale:	1.3 mV/G nominal
Output offset with temp.:	–40 to 85 ^{o}C: ±35G
Bandwidth:	20kHz
Power supply:	5VDC @ 10mA Max.
Operating temp.:	-20 to +85 ^{o}C
Dimensions:	7/16" x 7/16" x 6" wand
Cable:	6', 3 conductor, 24AWG, shielded with drain

This product is designed and manufactured in the USA using domestic and imported parts by

Phone: (815) 433-5100
Office Fax: (815) 433-5105
Tech Fax: (815) 433-5104
Sales Fax: (815) 433-5109

B&B electronics MANUFACTURING COMPANY
707 Dayton Road -- P.O. Box 1040 -- Ottawa, IL 61350 USA

Home Page: www.bb-elec.com
E-mail: orders@bb-elec.com
support@bb-elec.com
catrqst@bb-elec.com

Not Recommended for New Installations.
Please contact Technical Support for more information.

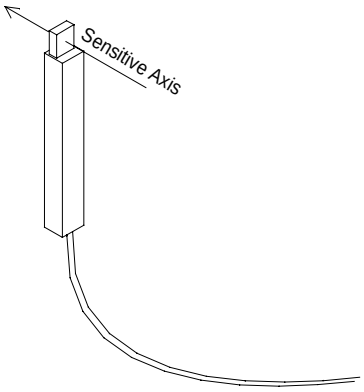


Figure 1.

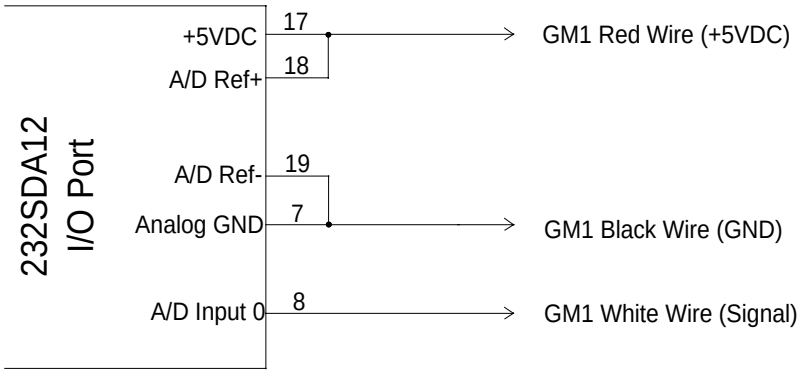


Figure 2. Typical Connection to 232SDA12 A/D module

Example 1. Magnetic Field Calculation

Assume a voltage reading of 2.125 Volts was taken from a GM1. In row 2 (VCC = 5V) of the sensor calibration report, the QV_0 is 2.543 Volts and the sensitivity is 1.307 mV/gauss.

Apply the following equation.

$$B = \frac{(V - QV_0) * 1000}{sensitivity}$$

Where B = magnetic flux density in gauss at the chip
V = output voltage in volts with field under study applied
QV_0 = output voltage in volts with zero gauss applied (taken from table)
Sensitivity = calibrated device sensitivity from -1000 to 1000G (mV/gauss)

Resulting in:

$$B = \frac{(2.125 - 2.543) * 1000}{1.307} = -318.82\text{Gauss}$$

This product is designed and manufactured in the USA using domestic and imported parts by
Phone: (815) 433-5100
Office Fax: (815) 433-5105
Tech Fax: (815) 433-5104
Sales Fax: (815) 433-5109
B&B electronics MANUFACTURING COMPANY
707 Dayton Road -- P.O. Box 1040 -- Ottawa, IL 61350 USA
Home Page: www.bb-elec.com
E-mail: orders@bb-elec.com
support@bb-elec.com
catrqst@bb-elec.com