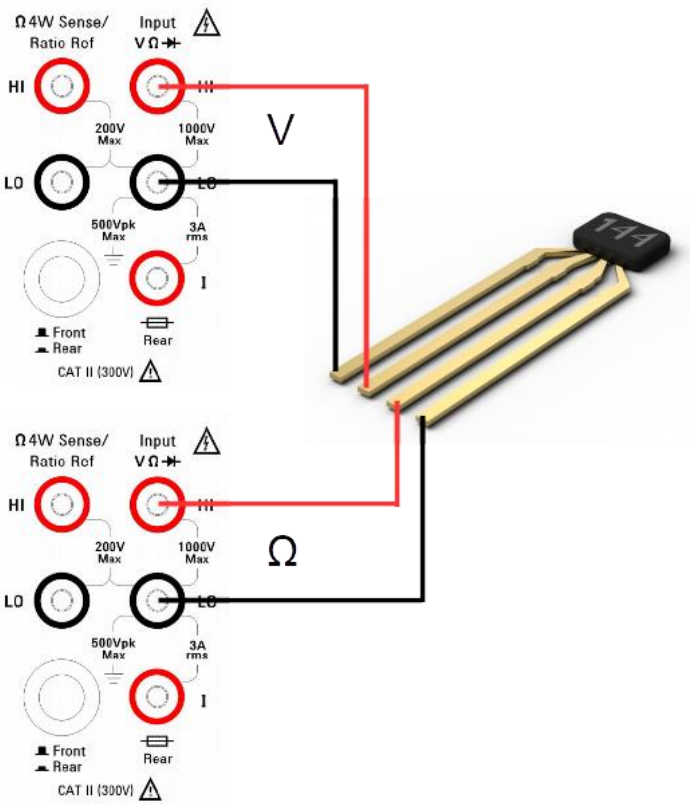
APPLICATION NOTE

An easy way to do Hall measurements

Quick but certainly not dirty

You have an analog Hall sensor sample and want to see what the sensor actually does before you start building your application? Well, all you need is two good multimeters.

Measuring with the Asensor Technology AB Hall sensors requires a precise constant current source and a precise voltmeter. You might already have them in your company! The Keysight® 34465A, but also the older, famous 34401A, the Keithley® 2000 and 2001 and many other 6.5 and 7.5 digit multimeters have a precise current source onboard. Simply: in the resistance meter. These multimeters send a constant current through the resistor and then measure the voltage. That translates into the resistance. We are talking about ppm precision here. You can use it to do your first Hall measurements. If you are not sure what current is supplied by your multimeter: you can easily measure that with another multimeter. Or check the datasheet.



Connecting the Hall sensors

Connect one multimeter (the bottom one in the picture) to the sensor inputs with the +/HI/positive/red terminal to pin 2 of the Hall sensor. Connect the -/LO/zero/black terminal to pin 1. Set this multimeter to resistance measurement and set it to a range of 1 kOhm. This gives a

precise 1 mA current. Connect the other multimeter to the Hall sensor output pins 3 and 4 and set this multimeter to voltage measurement. If you want you can compensate the offset by pressing the "Null" button.

Start measuring

You can expect approximately 200 mV/Tesla for the HE144 sensor, and 100 mV/Tesla for the HE244. You can use different resistance ranges for different sensor currents (check the datasheet of your multimeter, or just measure it).

But notice that at a certain point the current source of the multimeter will saturate against its maximum voltage. For example: a multimeter will not be able to run the 1 mA through a 10 Megaohm resistor, that is why the multimeter will not show measurements when you try to measure that resistor in the 1 kOhm range.

How good is this?

This test setup is actually very good. It is not fast, only a few measurements per second. For manual measurements and low speed automated measuring using a GPIB or USB bus this works very well. The measurement is really differential as these multimeters have floating, differential inputs. You can even filter more (limiting the bandwidth more but also suppressing noise more) with the internal filters of the multimeter that measures the output voltage.

Pieter Hoeben, CTO, +31 651590081

Asensor Technology AB
Maskinvägen 6
746 30 Bålsta
Sweden
www.asensor.eu

Phone (SE, Sales): (+46) 8 590 755 10
Fax: (+46) 8 36 64 46
Phone (NL, Tech support): (+31) 6 515 900 81
E-mail: hallsensor@asensor.eu