NVE CORPORATION

Sensor and Isolator NEWS

October 2011

Electrifying News From NVE

In This Issue

Quick Links

NVE People

Tim Hazelton has been appointed Vice President of Distributor Sales.

In his new role, he will lead NVE's distributor network support for the company's award-winning Sensor and Isolator product lines.

A 15-year NVE veteran, Tim has assumed increasingly responsible positions in sensor and isolator engineering, customer service, and sales.

Fun Facts

Really Sensitive...

NVE has demonstrated magnetometers with sensitivity of approximately 0.0001 Gauss or one-five thousandth of the earth's field. This is sensitive enough to detect the decrease in the earth's field over the years as the magnetic north pole slowly drifts. According to NASA, the north and south magnetic poles have completely switched in the past 780,000 years.

<More Fun Facts>

Background Music

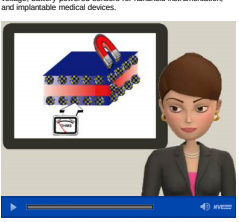
"*Sensitivity*" by Ralph Tresvant is NVE's current telephone background music.

This issue highlights the unmatched sensitivity of NVE magnetic sensors.

Featured Product

Analog Magnetic Sensors

NVE's analog GMR and TMR sensors have high sensitivity, excellent temperature stability, low power consumption, and small size. Their unmatched versatility make them an excellent choice for a wide range of analog sensing applications from rugged industrial and automotive position, speed, and current sensors to low voltage, battery-powered sensors for handheld instrumentation, and implantable medical devices.



AA-Series sensors use NVE's patented spintronic materials to provide a directionally-sensitive output. These sensors are sensitive in one direction in the plane of the IC, with a cosine-scaled fall-off in sensitivity as the sensor is rotated away from the sensitive direction. These devices provide omnipolar output, that is the same output for magnetic fields in the positive or negative direction along the axis of sensitivity. All sensors use a temperature compensating Wheatstone bridge configuration. The sensors are offered in SOIC8, MSOP8, and TDFN8 packages, and in die form by special order.

Five families of NVE's AA-Series sensors are available: the standard AA-Series; the AAH-Series; AAL-Series; the AAT-Series, and the AAV-Series. Their key characteristics are summarized in the following table:

	Analog Sensor Series				
	AA	**AA**	**AAL**	**AAT**	**AAV**
Field Sensitivity	High	Very High	High	Very, Very High	High
Operating Field Range	High	Low	Med.	Low	Low
Hysteresis	Med.	High	Low	Very Low	Very Low
Max. Temp.	High	Very High	Very High	High	Med.

AAV-Series sensors are used as current sensors because of their very low hysteresis. AAT-Series sensors are run in saturation as angle sensors because of their very low hysteresis and high sensitivity.

AB-Series sensors are differential devices, or gradiometers, utilizing the high sensitivity of NVE's GMR materials. Two families of AB sensors are offered: the standard AB-Series and the high-sensitivity ABH-Series. They have operational characteristics similar to the AA and AAH sensors described above, but with the bipolar linear output characteristics of a differential sensor.

<Reference Guide>

Buy Online
$9.95 shipping

Upcoming Exhibitions

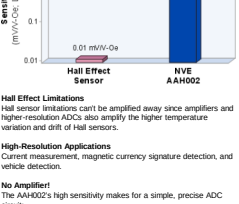
IsoLoop distributor HY LINE Power Components is exhibiting at the Digital Power Congress October 11 to 12 in the Munich Conference Center. IsoLoop isolators are very popular in digital power control applications.

Rhopoint Components will be exhibiting at Renewable UK, October 25 to 27 in Manchester, England. Best-in-class quiescent power consumption, extraordinary high-voltage endurance and available CAN transceivers makes IsoLoop Isolators ideal for battery management systems. Ultra-precise GMR magnetic sensors will also be featured.

Application Corner

High-Sensitivity Magnetic Sensors

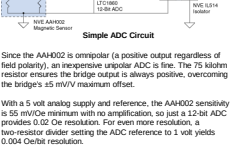
AAH-Series high-sensitivity magnetic sensors have a minimum sensitivity of an amazing 11 mV/V-Oe—more than one thousand times better than a typical Hall-effect sensor:



Hall Effect Limitations
Hall sensor limitations can't be amplified away since amplifiers and higher-resolution ADCs also amplify the higher temperature variation and drift of Hall sensors.

High-Resolution Applications
Current measurement, magnetic currency signature detection, and vehicle detection.

No Amplifier!
The AAH002's high sensitivity makes for a simple, precise ADC circuit:



Simple ADC Circuit

Since the AAH002 is omnipolar (a positive output regardless of field polarity), an inexpensive unipolar ADC is fine. The 75 kilohm resistor ensures the bridge output is always positive, overcoming the bridge's ±5 mV/V maximum offset.

With a 5 volt analog supply and reference, the AAH002 sensitivity is 55 mV/Oe minimum with no amplification, so just a 12-bit ADC provides 0.02 Oe resolution. For even more resolution, a two-resistor divider setting the ADC reference to 1 volt yields 0.004 Oe/bit resolution.

AC Coupling
These types of analog magnetic sensors are often AC coupled, but a simple discrete-time high-pass filter can be implemented in software to eliminate the need for additional components.

Isolation Reduces System Noise
Adding isolation reduces noise by allowing separate digital and analog ground current paths. The IL514 three-channel isolator is specifically designed for this type of three-wire SPI interface.

The isolator can also level shift between 3.3 volt digital and 5 volt analog supplies, and IsoLoop Isolators' low EMC footprint avoids additional noise.

Buy Online
$9.95 shipping