NVE CORPORATION

Sensor and Isolator NEWS

March 2018 *Electrifying News From NVE*

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Datasheet Updates

V-Series datasheets updated for VDE V 0884-11 certifications.

ADL-Series Nanopower Sensor Datasheet
Lower power consumption specifications (see story at right)

New on YouTube

GMR Sensor to ATtiny Interface

Isolated 4-20 mA to RS-485 Interfaces

AAL024 New Noncontact Current Sensor

Noncontact AC Current Sensing

A Digital Power Monitor IC and GMR Current Sensor

Arduino Noncontact GMR Current Sensing

Spring Forward

Daylight Saving Time begins Sunday, March 11. Set your clocks forward an hour.

Inexpensive Microcontroller Interfaces

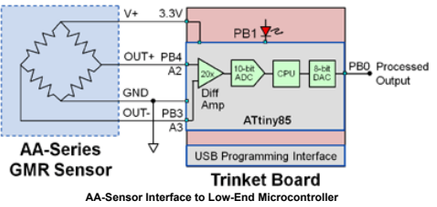
With their high output signals, GMR sensors are easy to interface to inexpensive eight-bit microcontrollers. The ATtiny85 is a popular choice because it has an available differential amplifier with a selectable gain of 20; has I2C, PWM, and digital I/O; it has an internal temperature sensor that can be used for temperature compensation in critical applications; and costs less than $1.00.

The gain of 20 is ideal for NVE GMR analog sensors. AALSeries sensors, for example, have a maximum output of 45 mV/V, so a gain of 20 provides 900 mV/V, or nearly full scale. That means all 10 bits of microcontroller ADC resolution are used.

The ATtiny85 only has eight pins microcontroller, but that's enough to interface to the sensor and provide digital and PWM outputs.

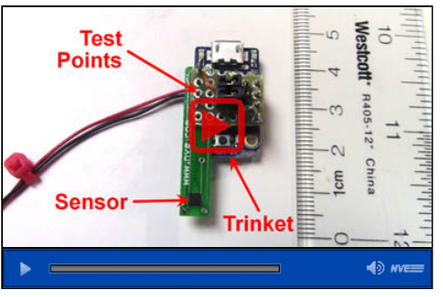
Microchip offers a development environment and evaluation kits, and there are several single-board computers such as *Trinket* and *Little Wire* boards.

Here's a typical interface using a *Trinket* board:



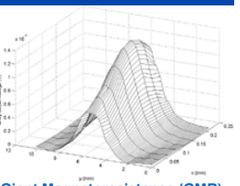
AA-Sensor Interface to Low-End Microcontroller

Here's a live demonstration of the circuit above, including a simple Arduino program to amplify, offset correct, and temperature compensate the outputs:



In the News: Nondestructive Evaluation

With their high sensitivity and low noise, NVE analog sensors are popular for nondestructive evaluation.



Here are some examples of publicly-available papers describing applications:

Eddy Current Testing with Giant Magnetoresistance (GMR) Sensors and a Pipe-Encircling Excitation for Evaluation of Corrosion under Insulation
Three perpendicularly-aligned AA004 sensors used in an eddy current nondestructive testing system for pipes.

Non-Destructive Detection of Wire Rope Discontinuities from Residual Magnetic Field Images Using the Hilbert-Huang Transform and Compressed Sensing (.pdf)
An array of 18 AAH002 sensors excited by small magnets placed end-to-end to form a magnetic strip are used to detect cable defects.

Flexible GMR Sensor Array for Magnetic Flux Leakage Testing of Steel Track Ropes (.pdf)
An array of 12 AA004-02 sensors on a flexible circuit board was wrapped around thick steel ropes for nondestructive testing of the ropes, and was demonstrated to effectively detect defects and provide spatial information for imaging.

Nondestructive Inspection (NDI) for Diffusion Bonded Components (.pdf)
An array of eight AAH002 sensors produces eddy current maps for nondestructive inspection.

Visit our "Case Studies" Webpage for More >

Download our Analog Sensor Datasheet >

Buy Online $9.95 shipping

Upcoming Exhibitions

embeddedworld2018 Exhibition&Conference ...it's a smarter world

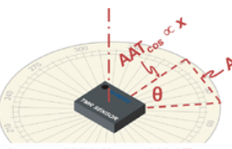
NVE distributor Hy-Line Power will display NVE products at ***Embedded World***, February 27 to March 1, at Halle 1/Stand 170, Messe Nürnberg, Germany.

Featured new products will include the IL3685-1E 40 Mbps Ultrahigh Speed QSOP Transceiver and IL2985E Low-Power Transceiver.

Pi Day Applications

HAPPY 03 14 PI DAY

In honor of ***Pi Day*** 3/14, here's a calculation for AAT-Series angle sensors:



theta = 180/pi*atan2(AATcos, AATsin)

The equation defines the angle, in degrees, from an AAT sensor's two outputs.

Since the arctangent is the ratio of the two outputs, power and temperature effects tend to cancel. The two-variable arctangent function provides a full 360-degree angle range.

Here's a video with more information.