NVE CORPORATION

Sensor and Isolator NEWS

November 2015 *Electrifying News From NVE*

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Spin Back

Daylight Saving Time ends Sunday, November 1. "Rotate" your clocks back an hour.

Holidays

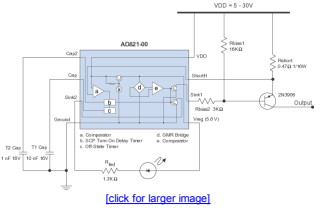
NVE will be **closed** Thursday and Friday, November 26 and 27 for the Thanksgiving holiday.

We will be **open** Veterans' Day (November 11).

Cylinder Position Sensors

NVE AD8xx/AD9xx GMR Switches are complete Cylinder Position (CPS) sensor solutions, including voltage regulators, LED drivers, and short-circuit protection.

Here's a reference circuit:



[click for larger image]

When the magnet is detected, the sensor bridge activates, the LED turns ON, and the load is powered.

If the output is shorted, the voltage across this shunt resistor exceeds the circuit's 145 mV short-circuit threshold. With a 0.47 ohm shunt resistor, the threshold is about 300 mA.

The output will cycle as long as the short circuit persists, preventing damage to the part. Short-circuit cycle times are set by external capacitors.

Here's a demonstration:

Halloween Application Corner

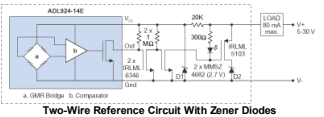
2-Wire Interfaces Don't Have to Be Scary

Two-wire sensor interfaces are right up there with bats, ghosts, and goblins as things we'd rather not deal with.

Two-wire interfaces need to operate over a wide power supply range.
With the sensor off, the circuit must draw a minimal residual current, typically in the range of 1.5 mA. With the sensor on, the circuit must provide enough current to drive a significant load such as a motor or solenoid.

NVE's ADL-Series sensors take the scare out of two-wire, because their low supply voltage and low quiescent current provide plenty of design margin.

Here's a simple **reference circuit**:

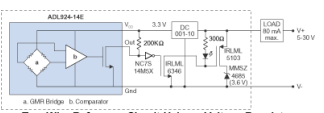


Two-Wire Reference Circuit With Zener Diodes

In this circuit, when a magnetic field is applied to the sensor, the MOSFETs turn on, turning on the LED and powering the load. With no magnetic field and the sensor off, the residual current of the circuit is the D1 Zener diode bias current plus the sensor quiescent current. The ADL924 quiescent current is negligible, so the residual current is dominated by the Zener current, which is less than 1.5 mA. D1 should be a low-current Zener to allow a higher series resistor for minimal residual current. When a magnetic field is applied, the MOSFETs turn on, turning on the LED and powering the load.

Zener diode D1 limits the ADL925 supply voltage with the load unpowered; Zener diode D2 provides enough voltage to power the circuitry when the load is powered.

This circuit uses an NVE DC001-10 regulator instead of a Zener diode (D1) to provides better regulation and operating latitude over the input voltage range:



Two-Wire Reference Circuit Using a Voltage Regulator

The residual current is dominated by the regulator's quiescent current, which is less than 1 mA and relatively constant over input voltage. This circuit also uses an "TinyLogic" invertor instead of a MOSFET, which eliminates a resistor.

2-Wire Interface video (03:30) >