Advancements in horsepower improvement and engine longevity are due in part to the implementation of wide-band oxygen sensors in racing applications. Innovate Motorsports has led the charge in the widespread adoption and improvement of wideband sensors, marketing one of the first widely-available and affordable wideband systems. Following that, the company has continually improved upon its systems and as the name implies, has brought about new and innovative products utilizing the latest in wideband technology. Such is the case with Innovate’s new PowerSafe nitrous bottle pressure and wideband air/fuel ratio gauge—the PSN-1.

**SMALL PACKAGE, BIG PUNCH**

First things first, the name is misleading—this is no simple gauge. While, it may look like it on the outside, the PSN-1 gauge is packed full of features that replace several more complicated systems of years past as an all-in-one nitrous system safety solution. Starting with its physical size, the whole thing fits in a standard 2-1/16 gauge package. It features a user-configurable OLED display, which will display an incredible amount of information for such a tiny space in whatever format best suits you. Obviously it will display Air-Fuel Ratio (AFR) in the traditional format or in the increasingly-popular Lambda format. It will display nitrous bottle pressure, in pounds per square inch (PSI), kiloPascals (kPa), inches-Mercury (inHg), or in Bar. It also features a built-in shift light, thanks to the integral RPM sensor. While you’re probably thinking that this is a great all in one gauge, remember that we said it was far more than just a gauge.

The back of the unit is sealed and consists of a group of pre-terminated leads for the various sensors, making it a truly easy, plug-and-play affair.
BENEATH THE SURFACE

Once you dive deeper into the capabilities of the PSN-1, you’ll really be impressed. As the ‘PowerSafe’ name implies, its function is to keep your engine safe during nitrous use by monitoring three key engine parameters that used to require three separate controllers to manage. The first parameter is a relatively simple one, as the PSN-1 has a built-in RPM window switch. It won’t allow the nitrous solenoid to activate unless engine-RPM is within the user-defined range, which is adjustable in 10 RPM increments. Secondly, it looks at your AFR. If the included LSU 4.9 wideband oxygen sensor reads a lean condition in excess of the programmed value, it cuts power to the nitrous solenoid to prevent detonation, catastrophic or otherwise. The sensor can be calibrated for maximum accuracy, and Innovate’s patented DirectDigital sensor control is 100-percent digital for the utmost in accuracy. The third value the unit monitors is nitrous bottle pressure, thanks to the included 1500 PSI sensor. If pressure drops below your preset parameter, the nitrous solenoid is shut off.

Using a laptop and Innovate’s LogWorks software, you can datalog four channels via the PSN-1; nitrous bottle pressure, engine-RPM, air-fuel ratio, and nitrous solenoid activation state.

If you look at the lead photo in the article, you’ll notice the differences in not only gauge/bezel color, but in AFR and bottle pressure units. That’s because in addition to offering two gauge faces, and two bezels, the display is configurable to multiple units of pressure and AFR.
The PSN-1 continuously monitors your AFR and nitrous bottle pressure. As long as they are within the user-defined “safe range” and engine-RPM is within the specified range, the nitrous solenoid will be activated. Should any parameter fall below a threshold, the nitrous cuts off, keeping the engine safe.