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PSN-1
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INNOVATE

INNOVATE MOTORSPORTS
POWER SAFE
NITROUS GAUGE

TECH REVIEW

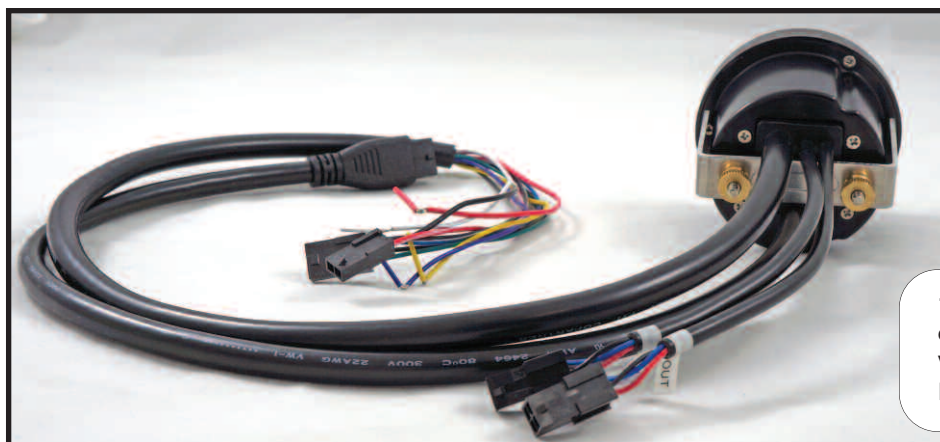# INNOVATE MOTORSPORTS
POWER SAFE NITROUS GAUGE

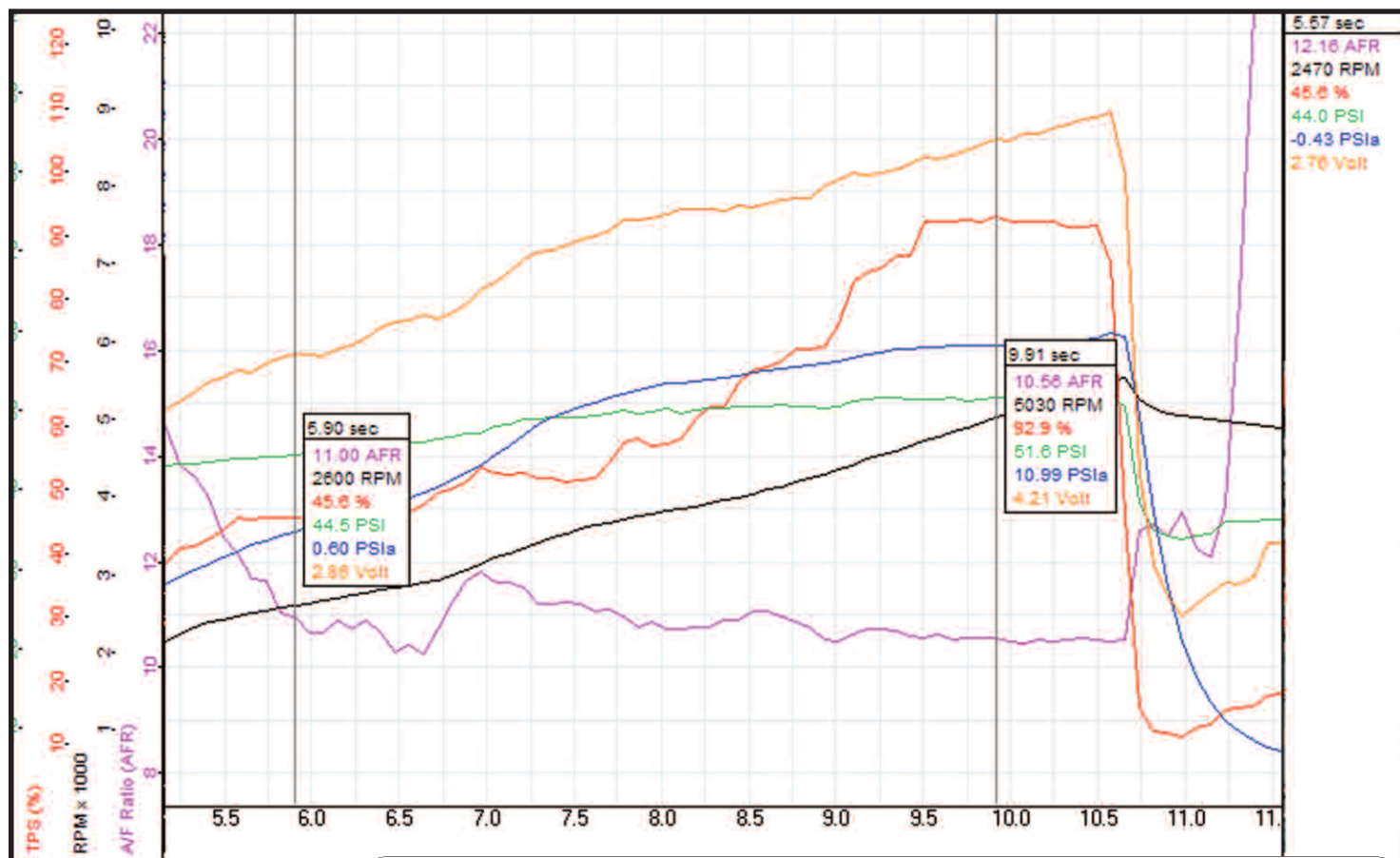BY **GREG ACOSTA**
PHOTOS **COURTESY OF INNOVATE MOTORSPORTS**

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.

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.

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.
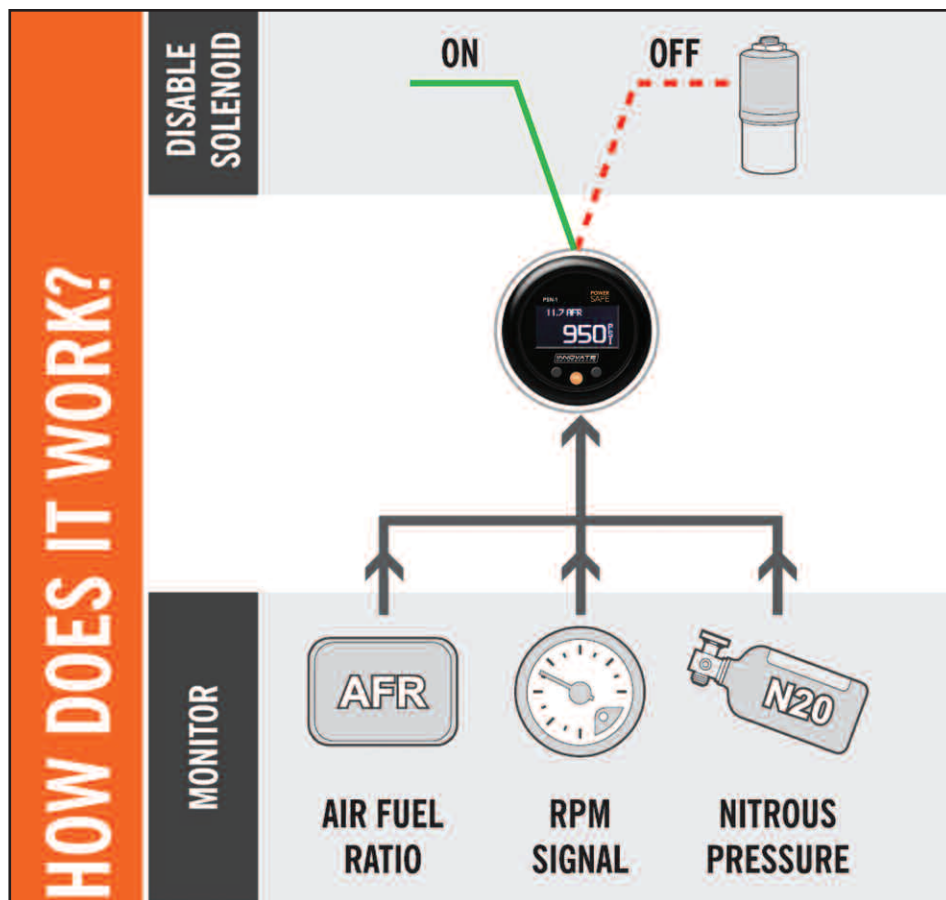
PLAYS WELL WITH OTHERS

With all those channels being monitored, it was easy enough for Innovate to include a provision for datalogging via the company's LogWorks software. With nothing more than the PSN-1 and a laptop, you can record engine-RPM, air-fuel ratio, your nitrous bottle pressure, and the condition of the nitrous solenoid (activated/deactivated). Or, if you prefer not to use a laptop in the car, the PSN-1 is Modular Tuning System (MTS) compatible, and will work with the PL-1 PocketLogger. If you already have a datalogging solution, no problem, as Innovate has built in a configurable 0-5v linear analog output so that the wideband oxygen sensor can be used with third-party dataloggers, piggy-back, and standalone ECU systems.

The PSN-1 is a complete all-in-one solution in all aspects. The gauge functions as several gauges, the software replaces what used to require several standalone boxes, 50 feet of wire and half a pound of solder, and the kit comes complete with everything you need to take advantage of all the features, right out of the box. Besides the gauge, you get the LSU 4.9 wideband oxygen sensor, an eight-foot sensor cable, a relay and harness to control the nitrous solenoid, a 1500 PSI nitrous pressure sensor, a weld-on bung for the oxygen sensor, and a serial programming cable. To top it all off, the gauge comes with both black and white face plates, and black and silver gauge bezels, so it can be configured to match your existing interior theme. No matter which way you look at it, there are a whole lot of powerful features crammed into a neat little package that if nothing else provides some inexpensive peace of mind when you use chemical horsepower. ∎

Included in the kit is a 1500-PSI nitrous bottle pressure sensor. Many know the cost of a nitrous pressure gauge and sensor by themselves. Including it in the package makes the PSN-1 a no-brainer deal.

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.

The PSN-1 includes the latest sensor offered by Innovate, a Bosch LSU 4.9 wideband oxygen sensor, which can be calibrated for extreme accuracy, and will work with both leaded and unleaded gasoline, diesel fuel, E-85 Ethanol, and more.

SOURCE