

BY KJ JONES PHOTOS BY STEVE TURNER

Digital Air/Fuel Gauge



▲ Everything you see here makes up the entire Innovate Motorsports MTX-L digital wideband air/fuel gauge system. (Check out the cool interchangeable silver bezel and faceplate.) If you're thinking something is missing, you're wrong. A Lambda cable (PN LC-1) is not necessary for this digital gauge. Yes, it's new technology for Innovate, and we elaborate on it elsewhere in this report.

As the world that is our Mustang hobby continues to evolve and the methods by which we improve 'Stangs' engine performance become more dynamic, monitoring the mixture of air and fuel has mandatory status. While we admit we're guilty of making a big deal about an engine's air/fuel ratio, we certainly won't apologize for preaching that type of gospel, as the air/fuel value is critical to dialing-in maximum performance.

For today's typical high-performance applications, air/fuel measurements are made using wideband oxygen sensors, which are placed in a 'Stang's exhaust stream. When an engine is running at operating temperature, the O₂ sensors let the PCM know the amount of air that is necessary to fully oxidize residual fuel in the exhaust gas.

As we've explained in past tech



▲ Saul "The Surgeon" Gutierrez of Extreme Automotive threads the MTX-L's Bosch wideband O₂ sensor (PN LSU4.2; compatible with leaded, unleaded, and diesel fuels, as well as methanol and E85) into a bung that was previously welded into our test 'Stang's exhaust (a steel bung is included with the kit)...

reports, engine tuners typically have to manipulate a Mustang PCM's fuel and timing tables manually, to achieve desired air/fuel ratios for engines that have been upgraded with flow-altering gear. To make such changes, calibration software from the likes of DiabloSport and SCT is used in conjunction with analog or digital air/fuel gauges. As these wideband air/fuel gauges go, their speed—their ability to process exhaust samples quickly—is the one quality that basically separates the good from the not as good.

Most widebands are UEGO-type sensors, which read O₂ levels through a sensor-mounted pump (when there is no oxygen, the UEGO-sensor's internal pump determines the amount of air that's necessary for achieving Stoichiometric air/fuel;

14.7). Innovate Motorsports offers *digital* wideband devices, and the company's all-new, MTX-L Digital Air/Fuel Ratio Gauge (PN 3844; \$199) is an instrument that is well-suited for street and race 'Stangs that are dependent on custom calibrations for peak performance.

Here we focus on showing you how easy it is to install Innovate's new device. The gauge's speed and accuracy are two of its highlight qualities. However, its DirectDigital Wideband Controller, Innovate's latest technology, is the feature that really puts the MTX-L in a next-level position among other air/fuel gauges. Check it all out through these photos and captions, as Extreme Automotive's Saul "The Surgeon" Gutierrez sets up Innovate's unit in a supercharged New Edge Mustang.



▲ The Innovate digital air/fuel gauge can be calibrated for increased accuracy. Calibrating the sensor is done with "free" air, as opposed to exhaust, through an initial series of power-on/power-off applications while the O₂ sensor is disconnected from the gauge, and finally with the gauge actually linked to the sensor. The MTX-L's calibration is saved as long as the gauge is not powered-up without being connected to the sensor.



▲ ...And then passes the sensor cable into the Mustang's passenger area through a natural hole in the floorpan. We prefer routing wires into and out of a 'Stang's interior through factory-bored openings whenever possible, instead of drilling additional holes in the car.



▲ We're installing the Innovate gauge along the A-pillar of our test 'Stang. Auto Meter's single-gauge, A-pillar pod (PN 10121; \$26) is the part that facilitates this placement.



▲ Wiring the MTX-L is a simple three-wire proposition (12V power, ground, and headlight power). The only thing to be mindful of during this step is to tap the white wire into the headlights' power source and not the dimmer. A rheostat switch like a Mustang's dimmer will cause the gauge to malfunction. You'll also see a yellow wire in the harness, which is used for sending analog data from the gauge to an aftermarket/standalone PCM (in closed loop) or a datalogger.



▲ As you see, the gauge provides a large digital display of the air/fuel reading, and also includes a digital needle that sweeps around the perimeter of the unit; in-synch with the numerical data. The MTX-L features a DirectDigital wideband controller, a controller in the gauge itself, which eliminates the need for a Lambda cable that links an air/fuel gauge to the O₂ sensor. **5.0**

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