Zt-3 Wideband Air/Fuel Ratio Meter and Datalogging System

Zt-3 Kit Items

Zt-3 Wideband AFR Controller
Bosch LSU Wideband Oxygen Sensor
Oxygen Sensor Harness (10' length)

Signal Harness (1' length)
Datalogging cable with RJ-12 to DB-9 converting plug
(ZR-1 Lambda Gauge and serial data splitter are included with bundled display kits)

Installation Instructions

Connect the 6-pin Oxygen Sensor Harness connector, the 4-pin Signal Connector and the Serial Cable to the Zt-3 Wideband Controller. Connect the Signal Harness RED wire to the switched power (+12V) and BLACK wire to the ground. The Wideband Controller has a built in auto-resettable 4A fuse, therefore, no additional in line fuse is required. The cold O2 sensor warm up time is about 15-30 seconds. Install ZDL software on a PC. Wait 6 seconds for the ZDL datalogger serial data activation once the Zt-3 is powered. The ZDL software will automatically detect the COM port used or USB to serial adapter. For manual setup press the **S** key on the keyboard.

The Wideband Oxygen sensor must be positioned after the turbocharger and before the catalytic converter. Recommended installation requires welding the O2 sensor bung in the down pipe at least 16" away from the turbo. A stock narrowband O2 sensor location is usually too hot for the wideband O2 sensor. The oxygen sensor must be positioned vertically (wires pointing upwards between 10 and 2 o'clock) to prevent damage to the sensor's ceramic heating element and protect sensor against water condensation.

The Zt-3 shall be mounted inside vehicle cabin. A small connector at the controller side of the Oxygen Sensor Harness allows for easy routing through the firewall. Make sure to not damage the connector when pulling through the firewall. Do not use pliers to pull the connector. Connect the larger 6 pin connector to the oxygen sensor. The O2 Harness is made from high temperature materials. However make sure the O2 Harness is secured and placed away from heat sources, specially the down pipe, catalytic converter, and hot engine parts. An overheated and internally shorted harness may damage the oxygen sensor and the Wideband Controller.

| Zt-3 Inputs/Outputs	Signal	Range
Bosch Wideband O2 sensor	Lambda	1.43 to 0.64 Wideband
Serial data output for Zeitronix ZR-1, ZR-2 or LCD Displays	AFR	21.0 to 9.5 Wideband
Serial data output for real-time datalogging (PC laptop or PDA required)		
Analog Wideband Output (configurable voltage vs. AFR)	Analog Output	0-5V
Simulated Narrowband Output Signal (configurable switching point)	NB O2	0-1V

Signal Harness

PIN #	WIRE COLOR	FUNCTION
1	RED	Switched Power (e.g. 12 Volt Ignition)
2	WHITE	Linear Wideband Analog Output
3	BLACK	Ground
4	PURPLE	Programmable Simulated Narrowband O2 Output

6 PIN OXYGEN SENSOR CONNECTOR   6 PIN DATA CONNECTOR   4 PIN SIGNAL HARNESS
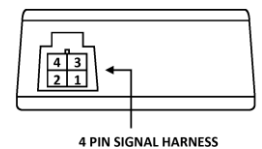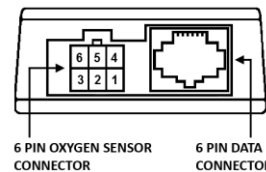
WHITE and BLACK wires can be used to provide a linear wideband signal and ground to a 3rd party engine management system. Data port is used to interface digitally with Zeitronix gauges, displays and third party loggers. For true plug and play, Zeitronix gauges and displays are powered directly from the Zt-3 Data port.
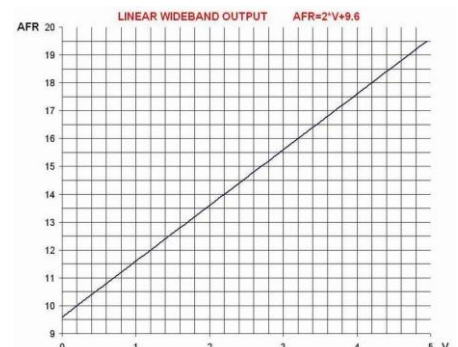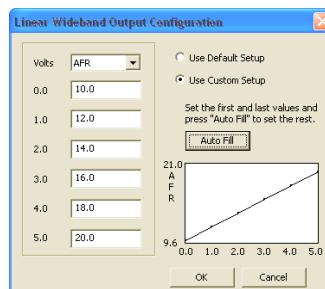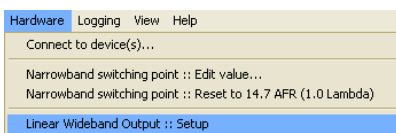
Connecting the Zt-3 and ZR-1 Display
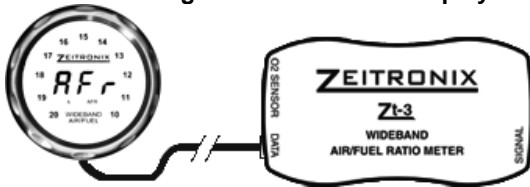
Connecting the Zt-3, PC and ZR-1 Display using the Serial Data Splitter
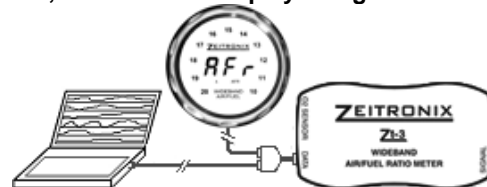
Linear Wideband Output (White Wire)

The Linear Wideband Output default setup is 9.6 AFR at 0 volts and 19.6 AFR at 5 volts.
Output voltage versus AFR can be customized in the Zeitronix Data Logger software.

Hardware Logging View Help
Connect to device(s)...
Narrowband switching point :: Edit value...
Narrowband switching point :: Reset to 14.7 AFR (1.0 Lambda)
Linear Wideband Output :: Setup

Linear Wideband Output Configuration

Volts	AFR
0.0	10.0
1.0	12.0
2.0	14.0
3.0	16.0
4.0	18.0
5.0	20.0

Use Default Setup
Use Custom Setup
Set the first and last values and press "Auto Fill" to set the rest.
Auto Fill
OK Cancel

LINEAR WIDEBAND OUTPUT   AFR=2*V+9.6

Applications

Narrowband Switching Point leaner than 14.7	Significant fuel savings
Narrowband Switching Point richer than 14.7	Help engine idle problems after major engine modifications (big cams)
Narrowband Switching Point at 14.7	Same as a stock narrowband O2 sensor

A stock narrowband O2 sensor switches at 14.7 AFR. The Simulated Narrowband Output switching point can be selected to force the ECU to maintain richer or leaner mixture than 14.7 AFR (Lambda 1) in closed loop operation. The ECU operates in a closed loop at idle and at low throttle (low engine load). The Zt-3 is reading the entire AFR range and is capable of shifting the narrowband switching point to a richer or leaner region. The default NBSP is the same as a stock narrowband O2 sensor, 14.7. You can program the Zt-3 to output as desired by the ECU curve anywhere from 9.5 to 21.0 AFR. This could be used for better or for worse. Your engine was designed for 14.7 AFR at closed loop. Most engines will idle and operate at a lean closed loop AFR 15.0-16.0. This leads to a significant fuel savings. You can also force the ECU to idle on the rich AFR side to cover up big cam idle problems.

The examples here illustrate the switching point being shifted from a stock 14.7 AFR into 13.4 AFR and 16.0 AFR. You can choose any AFR switching point between 9.6 AFR and 21.0 AFR. Most engines will not operate properly in closed loop leaner than 16.0 AFR. Most ECUs will not richen the mixture beyond 13.0 AFR at idle and will ignore the O2 sensor closed loop feedback.
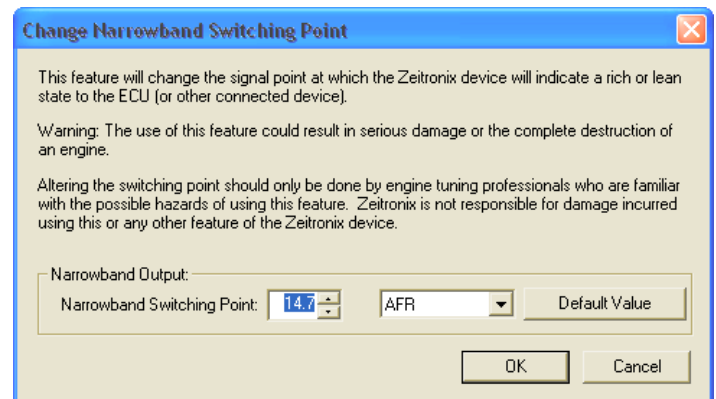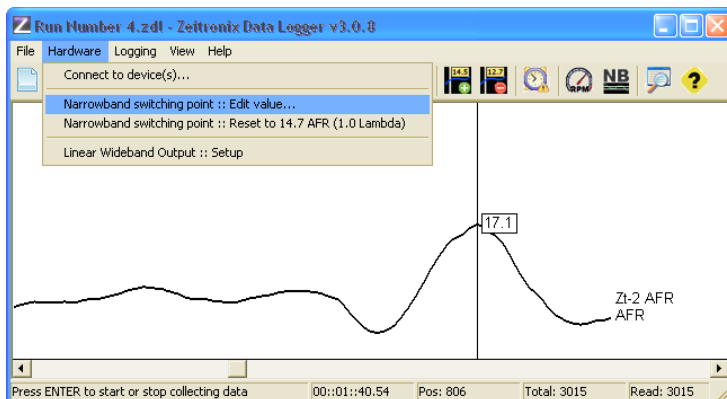
A switching point other than 14.7 AFR will increase the smog output and may harm your engine and catalytic converter.
A switching point other than 14.7 AFR may trigger a Check Engine light.
Use at your own risk and off road only.
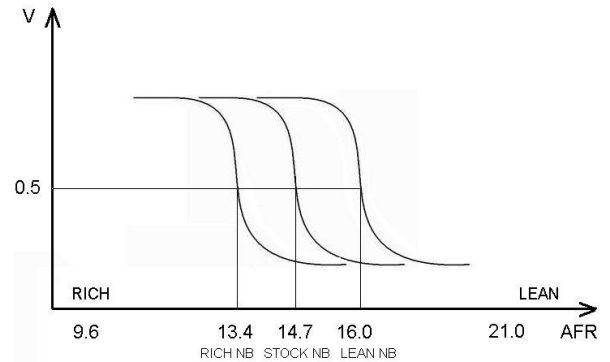
Software Setup

Please visit http://www.zeitronix.com/zdl/ for the latest Zeitronix Data Logger software.

Open the Zeitronix Logging Software. Connect the Zt-3 Wideband AFR Meter into a PC COM port or USB to serial adapter and power up the Zt-3. Make sure the log graphs are shown on the screen. Open the Narrowband Switching Point menu by selecting Settings/Narrowband Switching Point.

To Change the Narrowband Switching Point, adjust the number in the menu and click OK. The Narrowband Switching Point can be restored to a default value of 14.7 AFR by clicking on the Default Value, then OK.

Warning!

This product is for automotive use only and for off road use only. Never place the wideband controller or a display in a place which will obstruct your view or ability to operate the vehicle. Never tune the car while driving.

To be used with Bosch LSU wideband sensor only. Using the wideband oxygen sensor with leaded gasoline, two stroke or diesel engines will significantly shorten the sensor's life. Do not expose the oxygen sensor to moisture. Do not disassemble, modify or tamper with the oxygen sensor. The oxygen sensor controller must be powered and connected to the oxygen sensor while the sensor is in an active exhaust stream. Leaving an unpowered oxygen sensor in the exhaust will result in sensor damage. Never mount the oxygen sensor in stock factory location or closer than 16" from the cylinder head exhaust ports or a turbocharger. Exposing the sensor to the temperature above 800 C will cause sensor damage. Never position the oxygen sensor on the high-pressure side of the turbocharger.

Tune your engine responsibly. Zeitronix Inc. is not responsible for any damages.

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