ZEITRONIX
YOUR ULTIMATE TUNING PARTNER

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

Zt-3 CAN Kit Items

Zt-3 CAN Wideband AFR Controller   Signal Harness (1' length)
Wideband Oxygen Sensor   Datalogging cable with RJ-12 to DB-9 converting plug
Oxygen Sensor Harness (10' length)

CAN BUS

Installation instructions

Connect the 6-pin Oxygen Sensor Harness connector, the 6-pin Signal connector and the Serial Cable to the Zt-3 Wideband Controller. Tap 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 10 seconds. Install ZDL software on a PC. Wait 7 seconds for the ZDL datalogger serial data activation once the Zt-3 is powered. The Zeitronix Data Logger software will automatically detect the COM port used. To manually set the COM port press **S** 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.
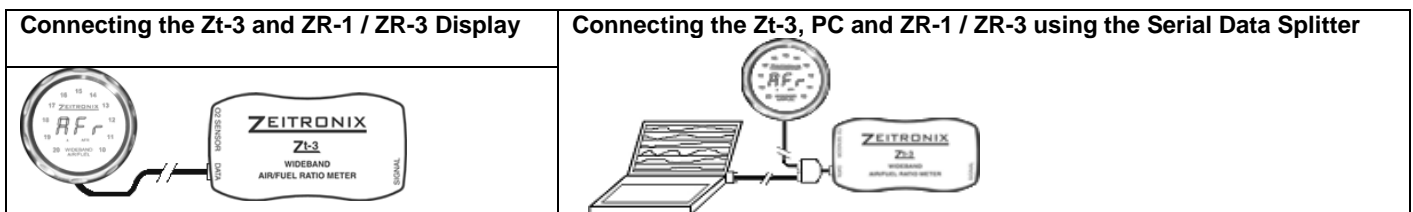
Zt-3 CAN Inputs / Outputs	Signal	Range
CAN Bus Lambda 16 bit	Lambda	4.000 to 0.625 Wideband
O2 Sensor Lambda (Serial and CAN Bus 8 bit)	Lambda	1.43 to 0.64 Wideband
Serial data output for Zeitronix ZR-1, ZR-2, ZR-3, nDash, nGauge or LCD	AFR	21.0 to 9.5 Wideband
Serial data output for real-time datalogging (PC laptop or Black Box 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	BLACK	Ground
2	WHITE/BLACK	CAN Bus - (Low)
3	WHITE	Linear Wideband Analog Output
4	RED	Switched power (e.g. 12 volt ignition)
5	WHITE/RED	CAN Bus + (High)
6	PURPLE	Programmable Simulated Narrowband O2 Output

6 PIN OXYGEN SENSOR CONNECTOR   6 PIN DATA CONNECTOR   6 PIN SIGNAL HARNESS
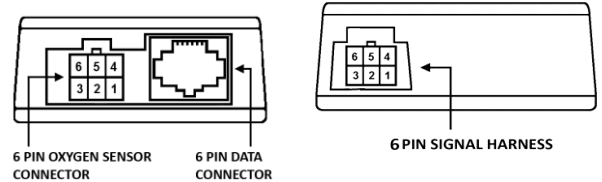
WHITE and BLACK wires can be used to provide a linear wideband signal and ground to a 3rd party engine management system.
Data port is used to interface digitally with Zeitronix gauges, displays and third party loggers. For true plug and play, Zeitronix gauges and displays are powered directly from the Zt-3 Data port.

Connecting the Zt-3 and ZR-1 / ZR-3 Display	**Connecting the Zt-3, PC and ZR-1 / ZR-3 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 or AFR = 2 * V + 9.6. The output voltage can be customized through the Linear Wideband Output Configuration dialog.

<table>
<tr><th>Supported Zt-3 CAN Bus Specifications:</th><th>Zt-3 CAN Bus Default Settings:</th></tr>
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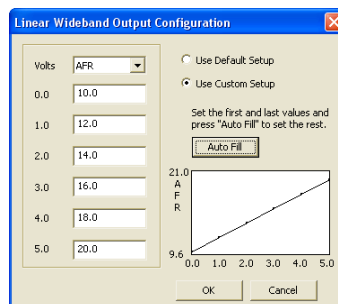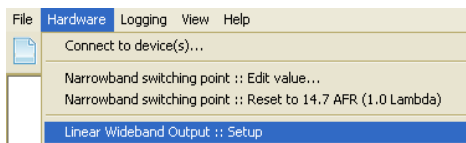
Supported Zt-3 CAN Bus Specifications:

User selectable **CAN Bus Speed:**
1Mbps, 500 Kbps, 250 Kbps, 125 Kbps

User selectable **CAN Bus ID:**
Standard (11 bit) and Extended (29 bit)

User selectable **CAN Bus address:**
0x0000 to 0x7FFF

User selectable **CAN Bus update rate:**
1ms (1000Hz) to 250ms (4 Hz)

120 ohm termination- None

CAN DATA:
Data 0, 1 : Lambda 16 bit (Big Endian / Motorola) x 0.001
Data 2 : Lambda 8 bit x 0.01
Data 3 : AFR 8 bit x0.1
Data 7: Lambda sensor status
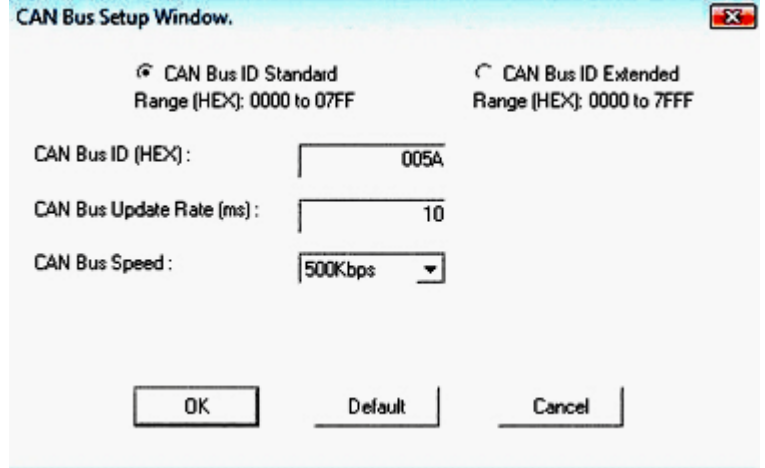0x00 Sensor OK
0x01 Sensor cold (warm up)
0x02 Sensor too hot
0x04 Sensor heater circuit open
0x08 Sensor heater circuit shorted
0x10 Sensor maxed at rich lambda

Zt-3 CAN Bus Default Settings:

CAN Bus Setup Window.

○ CAN Bus ID Standard
Range (HEX): 0000 to 07FF

○ CAN Bus ID Extended
Range (HEX): 0000 to 7FFF

CAN Bus ID (HEX) : 005A

CAN Bus Update Rate (ms) : 10

CAN Bus Speed : 500Kbps

OK   Default   Cancel

CAN Bus ID Standard (11 bit)
CAN Bus ID (HEX) 0x005A
CAN Bus Update Rate 10 ms (100 Hz)
CAN Bus Speed 500 Kbps
Use Zeitronix ZDL Software to change settings.

Selectable Simulated Narrowband Signal Switching Point


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
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. Example here illustrates 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. Some ECUs will not richen the mixture beyond 13.0 AFR at idle and will ignore the O2 sensor closed loop feedback.
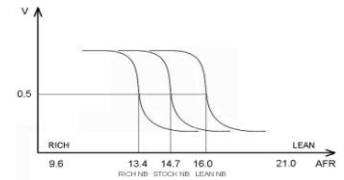
A different than 14.7 AFR Narrowband Output will increase the smog output and may harm your engine and catalytic converter.
A different than 14.7 AFR Narrowband Output may trigger a Check Engine light. Use at your own risk and off road only.

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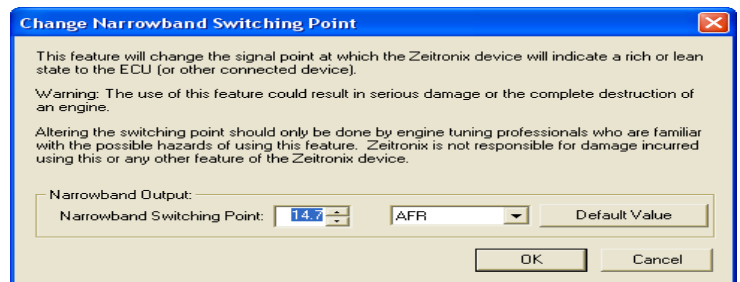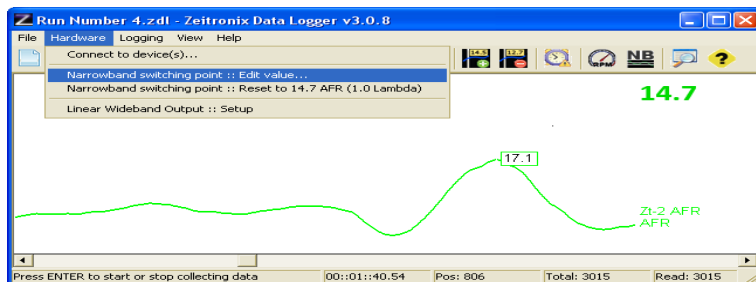
Open the Zeitronix Logging Software. Connect the Zt-3 Wideband AFR Meter into a PC COM port and power up the Zt-3. Make sure the log graphs are shown on the screen. Open the Narrowband Switching Point menu by selecting Settings/Narrowband Switching Point

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 while operating driving.

To be used with Bosch LSU 4.9 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.