

WBX AFR Guide for DYNertia3



Overview-

Economical Air Fuel Ratio (AFR) meter & display Interfaces to DYNertia3 or data loggers, It can also be used as a professional 'stand-alone' unit (or easily mounted within an instrument cluster). A perfect tool for displaying AFR or Lambda, for both tuning and diagnostics.

The WBX AFR includes the latest Bosch LSU4.9 wideband oxygen sensor for reliable and accurate operation.

The red LED digital display is bright even in direct sunlight and the coloured LED's around the face give the appearance of an analogue gauge for easy reading under rapidly changing conditions.

With a few button presses the meter displays either Lambda or Air Fuel Ratio (AFR).

High accuracy and fast response are key design features of the WBX AFR/Lambda meter and wide range ($\lambda = 0.55$ to 2.00 or Gasoline AFR: 8 to 20) ensures compatibility with different fuel types.

0-5V analogue linear output voltage is generated with '10 bit' precision and 500Hz speed, not a cheap filtered PWM signal like many competitors. Serial RS232 data and CAN output for data loggers (optional use if required).

Kit Contents-

- Compact AFR/Lambda meter with built-in bright LED digital and analogue display. Bezel mounted.
- Bosch LSU 4.9 Lambda (Oxygen) sensor (0.5m wiring)
- Sensor harness (3.6m)
- Power supply harness (1.6m)
- Sensor 'weld-in' bung (M18 x 1.5 thread)

WBX Technical Specifications-

Power supply- Input voltage range: DC 10V to 18 V (12V Typical)

Sensor- Bosch LSU 4.9 (pumped reference)
Free air calibration possible (inbuilt calibration resistor recommended)

Display- 4 digit LED display, 2 digit floating numbers (3 or 4 digit display selectable)
AFR, lambda (switchable)

Range- Lambda 0.55-2.00 (digital display), 0.55-1.40 (analogue LEDs), 0.58-1.23 (analogue voltage output)
AFR (14.65) 8-20 (digital display), 8-20 (analogue LEDs), 8.5-18 (analogue voltage output)

Outputs- Analogue output: 0 to 5V linear (0.50V = λ 0.58, 4.50V = λ 1.23)
RS232 or CAN

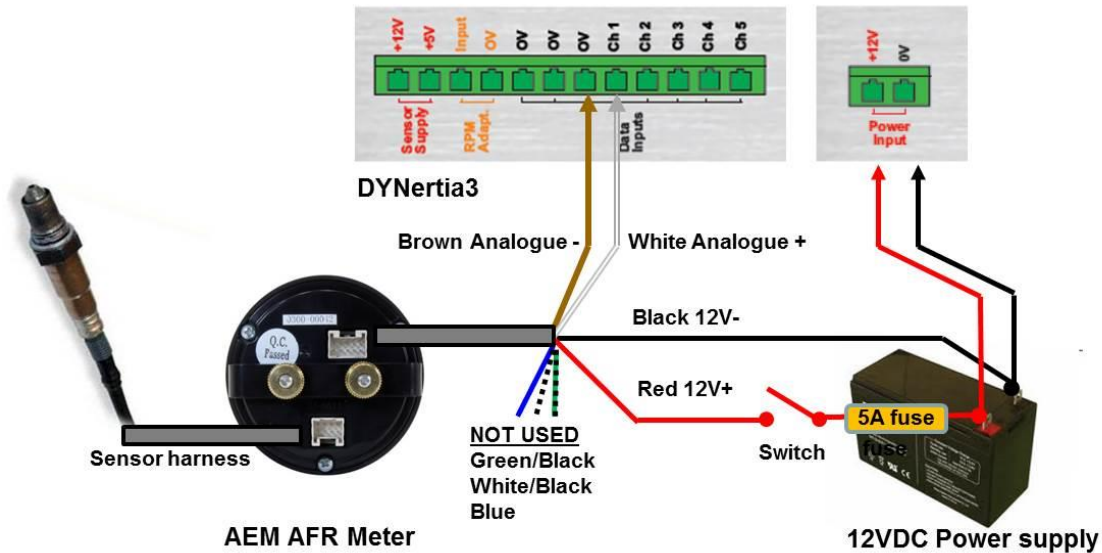
Dimensions- 2.40" (61mm) diameter bezel
2-1/16 (52mm) diameter cup
0.825 (21mm) depth including bezel
0.200 (5mm) depth cup only

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Connecting to DYNertia3-

We suggest you connect into channel1 of DYNertia3 as this is the default for AFR meters.



With an AFR meter connected the current draw from battery is higher (Lambda sensor heater can draw up to 2 Amps), so keep an eye on battery voltage!

General Tips-

Note: Read the full documentation in the box, it contains all of the general operating, mounting and setup details.

The meters LED display can be changed from 'AFR' to 'Lambda' units by pressing the 'MODE' button until a screen below is shown, pressing 'SEL' will change it (toggles it).



Note: DYNertia3 software display is independent of meter display; it uses units based on sensor configuration chosen.

If you wish, the display face can be reversed so it displays the scale to match LED display units as shown below.

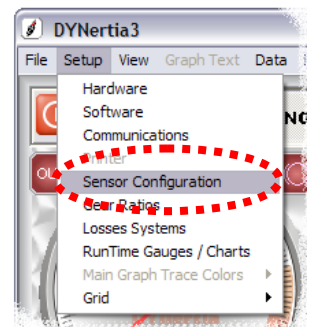


Configuring DYNertia3 input channel-

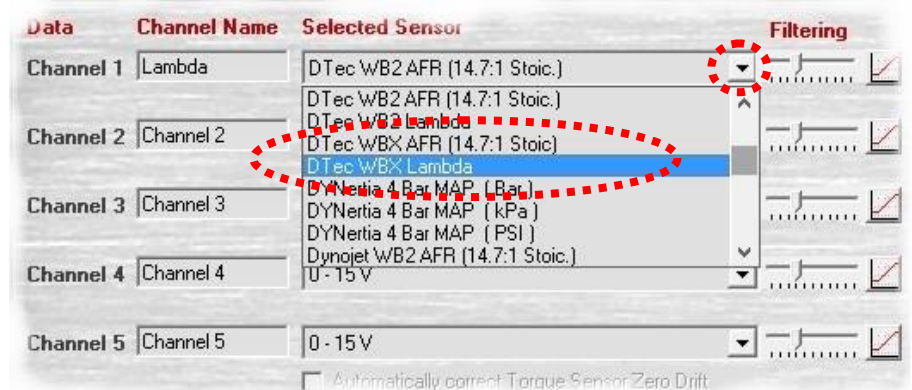
WBX AFR has already been configured as a sensor in DYNertia3 software; you only need to select the calibration range/units from the list. Please see the DYNertia3 manual chapter "Inputs- using" section titled "Sensor Configuration" for details on manual configuration if required.

Note: Software V3.4.6 (and greater) has the sensor included. If any issues please contact us for advice and free software update.

1. From within the menu option 'Setup'/Sensor Configuration'.



2. On the Left hand side of the 'Sensor Configuration' window, next to any input channel, you can use the drop down arrow to select the "DTec WBX" sensor in either Lambda or AFR units.



Note: Data and Settings are saved when the Window is closed.

Configuring 3rd party devices-

For setup of general data loggers and displays (or manual setup of DYNertia3 channels) use the settings below to correlate voltage output to units read on the equipment-

Units of AFR ratio (14.7:1):

500mV = 8.50

4500mV = 18.00

Units of Lambda:

500mV = 0.58

4500mV = 1.23

Sensor installation-

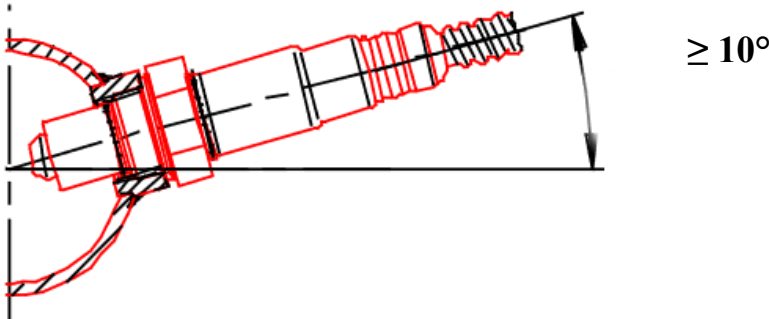
If a 'tail pipe' inserted probe is to be used then we recommend reviewing the technical document on our DTec website ("Design an accurate fuel mixture probe"), this can be found in the 'Tech Articles' section.



If mounting in the exhaust directly, then keep the sensor close to vertical (or worst case away from horizontal by at least 10°) to keep condensation from entering the sensor.

The sensor is best mounted before the catalytic converter and typically about 45cm from the engine, we suggest about 90cm for turbo applications (therefore after the turbo).

Approximately 40Nm tightening torque is recommended for the sensors.



Warnings-

- Do not disconnect the sensor whilst the controller is powered.
- Try not have the sensor already operating before the engine is started. Condensation may enter into the sensor and if at operating temperature the hot ceramic sensor internals can fracture (one of the most common failures).

When the sensor is in the exhaust it should be used with the controller within a short time period (after condensation phase). An unpowered sensor can build up carbon deposits and become unusable.

Suggested sequence is to start the vehicle first and then turn on the meter (after condensation has cleared). This will require the meter to have its own switched power supply.

- Operation with leaded fuels will limit the sensor life to 100-500 hrs and is therefore not recommended.
- Sensor gets hot. Avoid inflammable materials, especially if sensor operated outside of the exhaust system.