

TPP-00001 WIDEBAND w/ SENSOR



1. System Overview

The purpose of this overview is to provide the user with some basic information regarding the functional operation, installation and configuration of the Air/Fuel Ratio Mini-Controller.

WARNING! DO NOT plug in the sensor until you have configured the wideband for the correct sensor or you will damage it.

1.1 Wideband AFR Power Input

Connect the controller's white wire to a switched accessory power source that will be ON when the engine is running. Connect the black wire to the chassis ground point that the ECU is grounded to. The controller will add 5 amps to the load so make sure that the fuse rating is sufficient to power both. (The power and ground need to be "clean" in order to obtain the best performance from your wideband AFR so avoid connecting it to the same source as your ignition system).

Note: The controller should be on if the engine is running to avoid damage to the sensor.

1.2 AFR Analog Output

The GRAY and TAN are AFR voltage signals that can be connected to your ECU, or a data-logger. The GRAY wire outputs a 0v out = 7.35:1 a/f 5v out = 22.37:1 a/f Linear Output.

The TAN wire outputs a 0.5-4.5 volt curve. 10-20 air fuel ratio.

1.3 Digital Expansion Port: Twisted yellow leads

This port can be used to connect to the optional Black Series P or V digital gauge.

1.3.1 Connecting a PC

This will require you have some type of tuning software with a translator box with analog input provisions. This is where you will connect the GRAY or TAN wire depending on application.

1.4 Oxygen Sensor Port

This port connects directly to the NTK or the Bosch sensor. Optional sensor extension cables are available if the controller cannot be mounted close enough to the sensor. (18inch = IWS3001, 4ft = IWS3004, 8ft = IWS3008, 12ft = IWS3012).

1.4.1 Setting the Sensor Type

The controller has a short brown wire loop, which sets the sensor type.

LOOP CUT => NTK

LOOP NOT CUT => Bosch

WARNING! DO NOT plug in the sensor until you have configured the wideband for the correct sensor or you will damage it.

1.4.2 Oxygen Sensor

This controller supports the Trick-NTK or the Trick-Bosch sensors only. Any other sensor used will damage the controller.

It is recommended that the Oxygen Sensor be installed at least 450 mm [18 inches] downstream from the exhaust valves and before the catalytic converter. In the case of a turbocharged engine, it is recommended that the Oxygen Sensor be installed downstream from the turbo outlet and before the catalytic converter. When installing a single sensor on an engine equipped with individual exhaust runners (headers), the collector area is the preferred mounting location. If the engine was originally equipped with an oxygen sensor, this location may also be used. The sensor requires an M18 X 1.5 threaded boss for installation. A small amount of an anti-seizing compound is recommended on the threads of the sensor, being careful not to get any on the sensor area. Always install the sensor so that the tip (the part in the exhaust stream) is **lower** than the body (the part where the wires exit). The mounting position should be chosen such that the sensor will never become submerged. Tighten the sensor to 45 N-m [33 lbf-ft].

Over tightening or cross threading during installation will cause irreparable damage to the sensor – if the sensor does not thread in easily and smoothly DO NOT FORCE IT – check the threads as they may need to be cleaned or re-tapped. The black sensor harness should be routed away from sources of extreme heat and fastened securely to prevent damage.

Note: DO NOT run the engine with an unpowered sensor in the exhaust stream. This will cause premature sensor failure.

1.7 Status LED

This LED shows the status of the controller.

ON – the controller has power and has a sensor connected.

STEADY FLASH – the controller has power but has a sensor fault

DOUBLE FLASH – one of the other controllers connected on the Digital Data Bus is reporting a sensor fault

1.4.3 Status Messages on the Gauge

When the unit is first activated, the gauge will run through a “self-test” which lasts approximately 2 seconds. It will, in sequence, display “8.8.8.”. At this point it will begin to display status messages from the controller. While the sensor is warming, the display will show “bH#” or “nH#” depending on the sensor type configured. Once the sensor is ready, the gauge will begin to display the air/fuel ratio numbers.

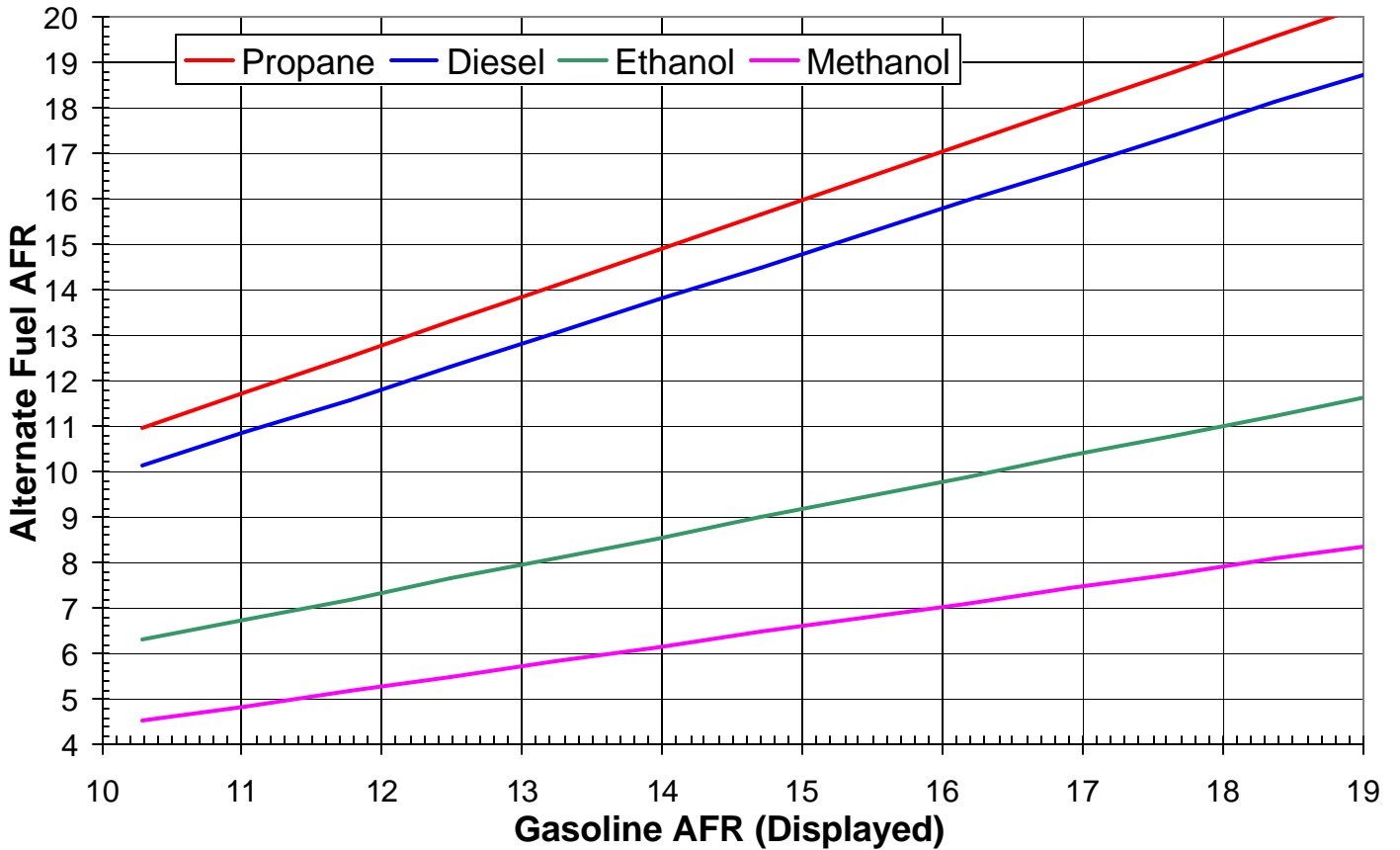
Status messages

8.8.8.	Gauge Self-test
bH#	Sensor warming – configured for Bosch sensor
nH#	Sensor warming – configured for NTK sensor
Slo	Sensor slow to reach operating temperature
Err	Sensor error
Hot	Sensor too hot
Cld	Sensor too cold
- - -	No data from controller
Exy	Number of controllers detected (y) is less than the number of controllers expected/configured (x)

3. Alternate Fuels

While the Wideband Analysis System has been designed for use with unleaded gasoline, it may be used with alternate fuels using the following conversion table.

Air/Fuel Ratio					
Gasoline	Lambda	Propane	Methanol	Ethanol	Diesel
10.3	0.70	11.0	4.5	6.3	10.2
11.0	0.75	11.8	4.9	6.8	10.9
11.8	0.80	12.5	5.2	7.2	11.6
12.5	0.85	13.3	5.5	7.7	12.3
13.2	0.90	14.1	5.8	8.1	13.1
14.0	0.95	14.9	6.1	8.6	13.8
14.7	1.00	15.7	6.5	9.0	14.5
15.4	1.05	16.5	6.8	9.5	15.2
16.2	1.10	17.2	7.1	9.9	16.0
16.9	1.15	18.0	7.4	10.4	16.7
17.6	1.20	18.8	7.8	10.8	17.4
18.4	1.25	19.6	8.1	11.3	18.1
19.1	1.30	20.4	8.4	11.7	18.9



TrickPerformanceProducts
gauge only

Match too
White/Green
LED Gauge

White/Green
LED Gauge

White - Power Samp

Gray - Analog Output 1

Tan - Analog Output 2

Black - Ground

Digital Expansion port, used with
Trick V and P gauges.

Bosch - NOT CUT

NTK - CUT

Optional extension
Cable.

