Instruction Manual

RACETRONIX

AFRG1
WIDE-BAND AFR DIGITAL GAUGE
W/ Wide-Band Sensor

The 52mm (2-1/16") ***Racetronix*** Wide-band Air Fuel Ratio (AFR) Digital Gauge features a four digit central readout and sweeping 30-color-coded LED display, providing immediate reference to the engine air fuel ratio (or lambda) in real-time. The ***Racetronix*** gauge is ideal for all vehicles including carbureted applications and engine dynamometers.

Parts Included:
(1) 52mm Wide-band AFR Digital Gauge, (1) Power /IO wiring Harness, (1) AFRG1 sensor harness , (1) Wide-band Sensor, (1) Weld In Oxygen Sensor Bung, (1) Bung Plug, (1) Sun Shade (hood) (2) Mounting Bracket Threaded Extension,
(2) Washers, (2) Nuts, (1) Mounting Bracket

Gauge Connections
The Digital AFRG1 gauge is supplied with a Power/IO wiring harness (A) and a AFRG1 sensor harness (B), see Figure 1.; the harnesses are connected to the gauge as shown below. The AFRG1 sensor harness simply needs to be routed to the AFRG1 sensor(C), whereas the Power/IO harness will require further integration into the vehicle. The minimum Power/IO connections required to operate the gauge are switched 12V (5A fuse) and ground. Please reference the diagrams and information on the provided for further detail.

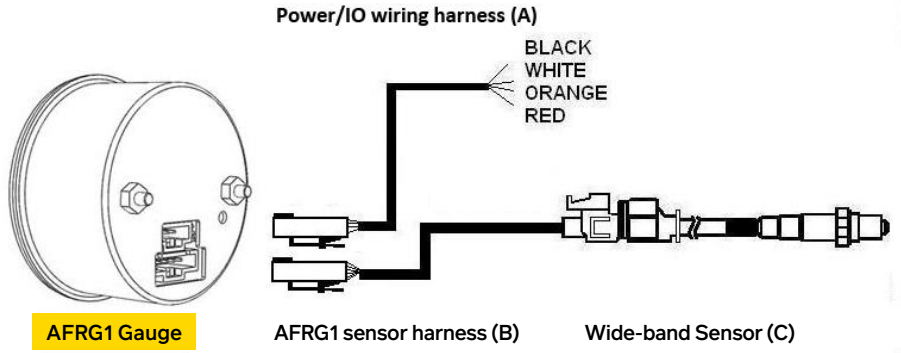


FIGURE 1.

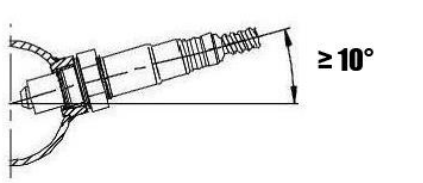
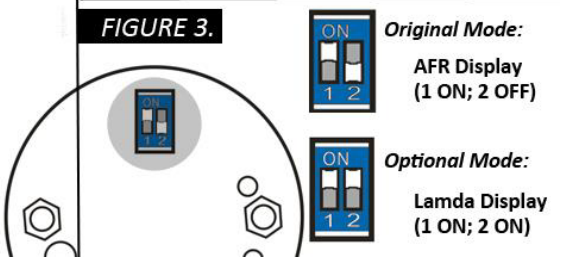


FIGURE 2.

FIGURE 3.



Important Notes on Wiring

- Route harnesses carefully to avoid chafing or undue strain.
- Secure wiring to vehicle with wire ties paying special attention to the sensor harness routing beneath the vehicle and/or in the engine compartment.
- Take care when routing sensor harness near hot exhaust components.
- Apply strain reliefs and wire coverings as necessary.
- Use a 5A inline fuse on the switched 12V power supply line (Power/IO).
- Avoid cutting or extending the sensor harness.
- Use appropriate gauge wire (20 AWG or thicker) when extending wires, especially wire Red(Switched 12V) or Black(Ground) of the Power/IO harness.
- Ensure all connections are secure and insulated from shorts to adjacent wires and the vehicle structure. Utilize proper crimping and solder/heat shrink techniques.

Power/IO wiring harness (A)	
RED	12V Switched FUSED POWER (+)
BLACK	Engine Ground
WHITE	Wide Band Analog Output 0 5V
ORANGE	Dimmer/ +12V to Dim (Connect to Headlight to Activate)

Installation Instructions:

A weld-in M18x1.5 oxygen sensor bung and cap are supplied for sensor installation. Mount the sensor in the exhaust system no less than 18 inches downstream from the closest exhaust port. If you anticipate high exhaust gas temperatures (over 1500F), if your car is equipped with a turbocharger, is operated at high RPM for extended periods of time or if leaded race fuel is used, the sensor must be

mounted no less than 36 inches downstream of the closest exhaust port as any/all of these factors can cause the sensor to overheat and read incorrectly. The sensor must be installed downstream of the turbo charger (if applicable) and upstream of any catalytic converters and/or auxiliary air pumps to ensure accurate readings. To prevent collection of any liquids between the sensor housing and sensor element caused by condensation during cold starts, the angle of the sensor should be inclined upwards at least 10° with the electrical connection facing up, see ***Figure 2***.

1. **CALIBRATION MODE:**
   Press the button on the controller for 3 seconds to calibrate the controller. When the LED screen displays **[2]**, the controller is calibrating.
2. **SENSOR ERROR DIAGNOSIS:**
   When the LED screen displays **[3]**, it is a sensor error code. Please check if the sensor is disconnected, damaged, or defective.
   ORIGINAL MANUFACTURE SETTING MODE:
3. Press and hold the button of the back of gauge for 8 seconds to operate the original manufacture setting of the gauge. The LED screen
   will display [2] first. After the LED screen displays **[4]**, the original manufacture setting is programmed.
   GAUGE OPENING CEREMONY
4. Turn on or turn off the engine: Green → Yellow → Red LED will scan once.
   SENSOR WARMING UP
5. AFRG1 sensor needs to warm up for 30 second every time when using the gauge. When AFRG1 sensor is warming up, the LED screen will display a scrolling oblong.
   AFR WARNING
6. If Air/Fuel Ratio is lower than 9.52 AFR or exceeds 20 AFR for 3 Sec or More, The digital Number will flashing for warning.
   DISPLAY MODE
   The gauge is original manufactured with AFR display mode; 14.65 AFR=1.00 Lambda; To switch to Lambda display mode,
7. disconnect the power and peel off the round sticker on the back of the gauge; Switch the Button **2** to "**ON**" position by using a tweezers, see ***Figure 3***.

0-5V Analog Output Scaling Table		
Volts	**Lambda**	**AFR(Gasoline)**
< 0.47	Sensor not ready	
0.50	0.65	9.52
0.68	0.683	10.00
0.81	0.705	10.32
0.92	0.725	10.62
1.04	0.747	10.94
1.16	0.768	11.24
1.28	0.790	11.56
1.40	0.811	11.80
1.52	0.832	12.18
1.64	0.854	12.50
1.75	0.874	12.80
1.87	0.896	13.12
2.00	0.918	13.44
2.11	0.939	13.74
2.23	0.960	14.06
2.35	0.981	14.36
2.47	1.003	14.68

0-5V Analog Output Scaling Table		
Volts	**Lambda**	**AFR(Gasoline)**
2.59	1.025	15.00
2.71	1.045	15.30
2.83	1.067	15.62
2.94	1.087	15.92
3.06	1.109	1.109
3.18	1.130	16.54
3.30	1.152	16.86
3.42	1.173	17.18
3.54	1.194	17.48
3.66	1.216	17.80
3.77	1.236	18.10
3.90	1.258	18.42
4.02	1.280	18.74
4.14	1.301	19.04
4.25	1.322	19.36
4.37	1.343	19.66
4.44	1.356	19.98
4.50	1.366	20.00
> 4.7	Sensor Error	

Limited Warranty:

We warrant all of our parts against defects in materials or workmanship under normal use and service after proper installation, (subject to the conditions and exclusions described below) for a period of one (1) year from the original consumer's date of purchase. During the warranty period, we will, at our option, repair or replace the defective part or refund your money. This warranty does not cover labor reimbursement. This warranty is non-transferrable. Replacement parts are warranted from the date of exchange for a period of one (1) year. The following is a non-exclusive list of examples that are not considered defects: failure due to accident or collision, chemical fallout, corrosion due to salt or other environmental conditions including natural disasters; improper installation, self-installation, or modification of the part; vehicles under manufacturer's recall for a related problem; and misuse or abuse, including off-road driving or racing. **Note:** The gauge is not water-proof and should not be installed in a location with exposure to water or snow. Damage caused by water ingress will not be covered under warranty.

*** NOTE: Wide-band Sensor is not covered under any warranty.**