



Series II
ODYR-13-2 & SLX-13-2
AIR FUEL RATIO MONITOR

Introduction:

The Odyssey Series II gauges from Dakota Digital, Inc. incorporates the reliability and quality of our standard gauges, along with several unique features and easy mounting. These features include:

- Industry standard 2-1/16" gauge size.
- A warning feature that flashes the gauge readout when outside operating limits.
- User adjustable warning points.
- Microprocessor stabilized readings.
- Adjustable averaging to set how the gauge responds.
- Night dimming with lens label lighting.
- Non-Glare, high contrast lens.
- High Visibility VFD display for sunlight readability.

WIRING COLOR CODE FOR GAUGE:

RED	+12 volt power with key on
BLACK	ground for gauge and case (the ring terminal should attach to the top screw on the case.)
GRAY	oxygen sensor ground
WHITE/RED	setup input
GREEN	oxygen sensor signal
BLUE	night dimming

Operation:

The air/fuel mixture gauge will display the exhaust gas oxygen sensor output in mV. The range of the readout is from 000 – 999 with 999 indicating an input greater than 1.0 volts. An output voltage of 450mV – 500mV from the sensor is considered the $\lambda=1$ area. This is the ideal air/fuel mixture for reduced exhaust emissions and general engine operation. Best fuel economy will be slightly leaner than this and best power will be found with a richer mixture. A fuel injection computer monitors the oxygen sensor to maintain an average fuel mixture in this ideal range.

An output voltage that is higher (800 mV – 995mV) indicates a rich fuel mixture ($\lambda<1$). An output voltage that is lower (50mV – 200mV) indicates a lean fuel mixture ($\lambda>1$). A standard EGO sensor will only indicate 3 states; lean, rich, or $\lambda=1$. The transition area of the sensor is very sharp and does not convert into an exact air/fuel ratio except at $\lambda=1$; which is 14.7:1 for gasoline, 6.5:1 for alcohol, and 15.6:1 for propane. **The use of leaded fuel will seriously shorten sensor life.** If leaded fuel is being used, the sensor should only be installed during tuning and then removed and a plug placed into the hole.

On a carbureted engine, the engine will not automatically adjust the air/fuel mixture. This must be adjusted manually and can be optimized for economy or performance. The air/fuel mixture gauge will provide the information required for proper fuel mixture adjustment.

POWER

Connect the red wire from the main harness to accessory power from the ignition switch.

Never connect this to a battery charger alone. It needs to have a 12 volt battery connected to it. Battery chargers have an unregulated voltage output that will cause the system to not operate properly.

GROUND

The black wire is the main ground for the gauge. A poor ground connection can cause improper or erratic operation. The black wire loops over to the top screw on the back of the case. This ensures a good case ground connection.

EXHAUST GAS OXYGEN (EGO) SENSOR SIGNAL

The green wire connects to the EGO signal wire. This can be tapped into the ECM signal wire on most vehicles. You will need to consult a service manual to determine wire color code and location.

The gray wire connects to the EGO ground. For 1-wire and 3-wire sensors this should be connected to the engine block for a ground. On 4-wire sensors it will connect to the EGO signal return wire.

If you are using a Dakota Digital SEN-13-1, the color code is as follows:

BLACK - sensor signal, connect to gauge green

WHITE (there are two white wires)

- Connect one to accessory power and the other one to ground.

The sensor grounds back to the engine block through its mounting threads, connect the gauge gray wire to an engine block ground.

Setting the warning limits and averaging rate:

The white/red wire is used to enter and change the warning settings. You will need to momentarily ground the white/red wire to sequence through the steps. The headlights should be off or the blue wire unhooked so that it does not interfere with the setup.

1. To enter the set mode, turn the key on with the WHITE/RED wire grounded. The gauge will display "SEt". Release the WHITE/RED wire. The gauge will display "SPd".
2. Ground the WHITE/RED wire. The gauge will display a number between 1 and 3.
3. Release the WHITE/RED wire. "1" indicates a fast update, "2" indicates moderate averaging, and "3" indicates heavy averaging.
4. Each time you momentarily ground the WHITE/RED wire the number will increase by one.
5. When the desired value is displayed, keep the WHITE/RED wire grounded for about 2 seconds. The gauge will display " HI".
6. Release the WHITE/RED wire. The gauge will display the current high warning value.
7. Each time you momentarily ground the WHITE/RED wire the number will increase by 20.
8. When the desired high warning value is displayed, keep the WHITE/RED wire grounded for about 2 seconds. The gauge will display " LO".
9. Release the WHITE/RED wire. The gauge will display the current low warning value.
10. Each time you momentarily ground the WHITE/RED wire the number will increase by 20.
11. When the desired low warning value is displayed, keep the WHITE/RED wire grounded for about 2 seconds. The gauge will display "--".
12. Turn the key off.

NIGHT DIMMING

Your display system has a dimming feature that dims the display intensity. Normally the system is at full brightness for daytime viewing. When the blue wire has 12 volts the display intensity will be reduced. Connect this to a park light or tail light circuit, then whenever the headlights are on the display will dim. To have the system at full brightness all of the time, leave the blue wire disconnected.

MOUNTING:

The gauge requires a round hole 2-1/16" in diameter. It should be inserted into the opening from the front and the U-clamp will be installed from the back. Tighten the two nuts on the U-clamp so that the gauge is secure. Gauge depth to the back of the case is 1-1/2". Gauge depth including the mounting studs is 2-3/8".

Troubleshooting guide.

Problem

Gauge will not light up

Possible cause

Red wire does not have power.

Black wire is not getting a good ground.

Gauge is damaged.

Gauge is damaged.

Solution

Connect to a location that has power.

Connect ground to a different location.

Return gauge for repair.

Gauge must be returned for service. (see instructions)

Gauge must be recalibrated. (contact factory)

Gauge lights up, but displays "Er0".

Gauge lights up, but displays "Er3".

Gauge lights up, but displays "Er4".

Gauge lights up, but displays "Er5".

Gauge flashes constantly.

Gauge is not calibrated correctly.

Gauge averaging rate needs to be reset.

Gauge warning points need to be reset.

Warning limits are not set properly.

Sender is not operating.

Air fuel ratio is too high or too low.

SND terminal is not connected.

Blue wire is not connected correctly.

Blue wire is getting power all of the time.

See "Setting the warning limits" in the manual.

See "Setting the warning limits" in the manual.

Reset warning limits.

The EGO sensor must be heated up by the exhaust before it will operate. Check fuel adjustment.

Make sure SND terminal is connected properly.

Check wiring. Blue wire should have 12 volts with headlights on.

Connect blue wire to location that only has power when the headlights are on.

Gauge will not dim.

Gauge remains dim at all times.

Technical specifications

Minimum operating voltage - 7 volts

Maximum operating voltage - 17 volts

(operating at or near maximum voltage for an extended time can damage unit)

Gauge Resolution - 5 mV

Gauge accuracy - ± 15 mV

Typical current draw (@ 13.8V) - 0.2 A

SERVICE AND REPAIR

DAKOTA DIGITAL offers complete service and repair of its product line. In addition, technical consultation is available to help you work through any questions or problems you may be having installing one of our units.

Should you ever need to send the unit back for repairs, please package the product in a good quality box along with plenty of packing material. Ship the product by UPS or insured Parcel Post. Be sure to include a complete description of the problem, your full name and address (street address preferred), and a telephone number where you can be reached during the day. An authorization number for products being returned for repair is not needed. Do not send any money. We will bill you for the repair charges. Any returns for warranty work must include a copy of the dated invoice or bill of sale.

ODYSSEY SERIES DIGITAL GAUGE LIMITED WARRANTY

DAKOTA DIGITAL (the Company) warrants to the ORIGINAL PURCHASER of this product that should it, under normal use and condition, be proven defective in material or workmanship within 24 MONTHS FROM THE DATE OF PURCHASE, such defect(s) will be repaired or replaced (at the Company's option) without charge for parts or labor directly related to repairs of the defect(s).

To obtain repair or replacement within the terms of this Warranty, the product is to be delivered with proof of warranty coverage (e.g. dated bill of sale), name, address, phone number, and specification of defects, transportation prepaid, to the factory. This Warranty is valid for the original purchaser only and may not be transferred.

This warranty does not cover nor extend to damage to vehicle electrical system. This Warranty does not apply to any product or part thereof which in the opinion of the Company has been damaged through alteration, improper installation, mishandling, misuse, neglect, or accident.

This Warranty is in lieu of all other express warranties or liabilities. ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, SHALL BE LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. ANY ACTION FOR BREACH OF ANY WARRANTY HEREUNDER INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY MUST BE BROUGHT WITHIN A PERIOD OF 24 MONTHS FROM DATE OF ORIGINAL PURCHASE. IN NO CASE SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF THIS OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, WHATSOEVER. No person or representative is authorized to assume for the Company any liability other than that expressed herein in connection with the sale of this product.

The Company does not warrant that this product cannot be compromised or circumvented. THE EXTENT OF THE COMPANY'S LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT PROVIDED ABOVE AND, IN NO EVENT, SHALL THE COMPANY'S LIABILITY EXCEED THE PURCHASE PRICE PAID TO THE PURCHASER FOR THE PRODUCT.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation if incidental or consequential damage so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Dakota Digital

4510 W. 61ST St. N., Sioux Falls, SD 57107
Phone: (605) 332-6513 FAX: (605) 339-4106

www.dakotadigital.com

dakotasupport@dakotadigital.com