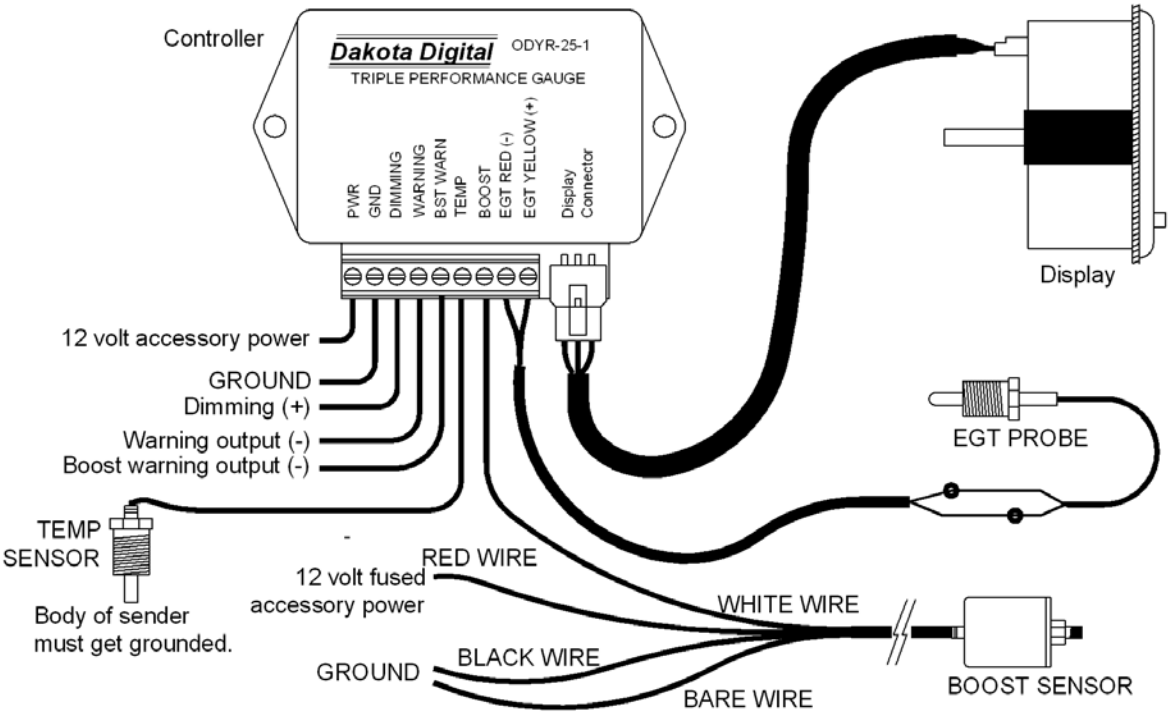
Odyssey

Manufactured by Dakota Digital

ODYR-25-1 & SLX-25-1 rev. A
VACUUM/BOOST PRESSURE, TEMP, and EGT GAUGE



SENSOR CONNECTION:

The vac./boost sensor has 1/8" NPT on the end which can be treaded into the intake track, or into a pipe adapter with a barbed fitting and vacuum line to T-into a convenient vac./boost lines. The sensor should be connected to the control unit as follows:

RED - Connect to control unit PWR terminal
WHITE - Connect to control unit BOOST terminal
BLACK - Connect to control unit GND terminal

The temperature sensor is 1/8" NPT. Senders can be mounted into the oil pan (a nut or collar may need to be welded to the pan) or T'd into an oil cooler line. These senders have a tapered self-sealing thread. The threads should all be cleaned before installation and no tape or thread sealant should be used on the threads. Make sure that the sender tip can get into the coolant flow. If the sender cannot ground through its threads then a ground will have to be connected to the sender case. Connect the supplied spade terminal to the top of the sensor and wire to the control unit TEMP terminal.

The EGT sensor will need to be mounted in the exhaust system close to the engine. Drill and weld the supplied bung to the exhaust. Connect the red wire to the control unit EGT RED terminal. Connect the yellow wire to the control unit EGT YEL terminal. Be careful to route the sensor cable away from any power or spark plug wires. Wires routed along side the sensor cable can cause interference and incorrect readings. Do NOT extend the EGT wires with normal wire, this will also cause incorrect readings and operation.

Only use Dakota Digital sensors, sending units from other manufacturers may cause incorrect readings.

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”. Gauge depth including the mounting studs is 1-7/8”.

The controller can be mounted to wood, metal, or plastic using screws with the two mounting holes, double sided tape, or hook and loop fasteners.

GAUGE SETUP:

There are user selectable boost, EGT, and temperature warn points. There is a boost calibration routine to compensate for atmospheric pressure differences due to elevation or weather. There is also a boost update menu that controls how frequently the boost reading will update. Temperature unit can also be selected, Fahrenheit or Celsius.

The setup menus are entered by holding the switch on the front of the gauge while turning the key on. The menus are as follows:

Main Menu	Sub Menu	Description	
SET MODE			start of the setup menus, indicates setup mode
BOOST	BOST CAL		auto calibrate the boost sensor to current conditions
		AUTO CAL	automatically select a “zero” point
		MANL CAL	manually adjust the zero point from a table or based off current conditions.
	HI WARN		set boost warning point
	HI WARN2		set the special boost warning point
	UPDATE		set the gauge update speed
		AVERAGE	average, slower updating, of the display.
		FAST	fast updating, about 8 times per second.
		PEAKHOLD	brief ½ second hold of the peak value, similar to averaging.
TEMP	UNIT		Fahrenheit or Celsius temperature readings
	HI WARN		set temperature warning point
EGT	UNIT		Fahrenheit or Celsius temperature readings
	HI WARN		set temperature warning point
SETUP DONE			restart the system with the new settings

BOOST SETUP

Press and hold the switch while turning the key on, DO NOT start the engine. Once the “SET MODE” message is displayed release the switch. Press and release the switch to toggle through the following “BOOST” menus: “BST CAL”, “HI WARN”, “HI WARN2”, and “UPDATE” menus.

BOOST CALIBRATION

When “BST CAL” is displayed press and hold the button until the display dims, then release the button. Now the two calibration menus can be accessed. The supplied boost sensor measures atmospheric pressure. The controller then calculates appropriate boost or vacuum readings. The “zero” point that all of the calculations are based on can be adjusted to insure appropriate boost reading at various elevations and weather conditions. There are two methods for setting the calibration point, auto and manual, either one can be used. For the auto cal it is very important that the engine is off because the gauge samples the sensor and saves the current pressure reading as “zero” psi. For the manual cal, the pressure can be selected from a table or calculated from current conditions.

AUTO CAL

When “AUTO CAL” is displayed, press and hold the switch until the display dims, then release the switch. The gauge will display “WAIT” and then “DONE” once calibration is complete. Press and release the switch to go on with setup.

MANUAL CAL

When “MANL CAL” is displayed, press and hold the switch until the gauge dims, then release the switch. The current calibration value will be displayed. This value is the atmospheric pressure. A table is found on page 6 of the manual that provides the appropriate atmospheric pressure at different elevations. The atmospheric pressure can also be converted to PSIA from a known barometer reading measured in *inHg*. The following formula can be used to convert inHg to PSIA:

$$PSIA = inHg / 2$$

Press and release the switch to select the appropriate PSIA reading. Press and hold the button until the gauge dims to save the new calibration value and continue with setup.

BOOST WARINING SETUP

There are two boost warnings that can be set from 7 – 69 psi. Press and hold the switch when “HI WARN” is displayed. Once the display dims release the switch and the current warn value will be displayed. Press and release the switch to select the desired warn value. Once the desired value is displayed, press and hold the switch until the display dims, then release the switch to continue with setup. If the warn point is reached/exceeded the display will flash and the Warning output will be switched to ground.

The “HI WARN2” is setup the same as the “HI WARN”. This boost value will activate the Bst Warn terminal only if the “HI WARN2” value is reached or exceeded by switching that output to ground. This output is the special boost output which can be used to trigger events based upon boost levels.

BOOST UPDATE SETUP

The update controls the speed at which the boost reading will change or be displayed. There are three update speeds to choose from. To set the update speed press and hold the switch when the “UPDATE” message is displayed until the display dims then release the button. Press and release the button to toggle through the three speeds, “AVERAGE”, “FAST”, and “PEAKHOLD”. When the desired speed is displayed, press and hold the switch until the display dims to save the current value, then release the switch to continue with setup.

TEMP SETUP

The supplied temperature sensor is a 0 – 400 ºF sender. The gauge can be setup to read Fahrenheit or Celsius temperatures.

TEMP UNIT

The temp unit is set by holding the switch when the “TEMP UNIT” message is displayed until the display dims and is released. The current unit will be displayed, F or C. Press and release the switch to toggle the unit. When the desired unit is displayed, press and hold the switch until the display dims to save the value. Release the switch to continue with setup.

TEMP WARNING SETUP

The temp warning point can be set from 229 – 312 ºF. Press and hold the switch when “HI WARN” is displayed. Once the display dims release the switch and the current warn value will be displayed. Press and release the switch to select the desired warn value. Once the desired value is displayed press and hold the switch until the display dims, then release the switch to continue with setup. If the warn point is reached/exceeded the display will flash and the Warning output will be switched to ground.

EGT SETUP

The EGT setup is similar to the Temp setup. The reading can be either Fahrenheit or Celsius.

EGT UNIT

The temp unit is set by holding the switch when the “TEMP UNIT” message is displayed until the display dims and the button is released. The current unit will be displayed, F or C. Press and release the switch to toggle the unit. When the desired unit is displayed, press and hold the switch until the display dims to save the value. Release the switch to continue with setup.

EGT WARNING SETUP

The temp warning point can be set from 1150 – 1770 ºF (620 – 1770 ºC). Press and hold the switch when “HI WARN” is displayed. Once the display dims release the switch and the current warn value will be displayed. Press and release the switch to select the desired warn value. Once the desired value is displayed, press and hold the switch until the display dims, then release the switch to continue with setup. If the warn point is reached/exceeded the display will flash and the Warning output will be switched to ground.

SETUP DONE

When setup is complete, press and hold the switch when “SETUP DONE” is displayed, then release when the display dims. The gauge will return to normal operation mode using the new setup values.

Returning the gauge to factory presets can also be done. To do this the dim terminal will be used.

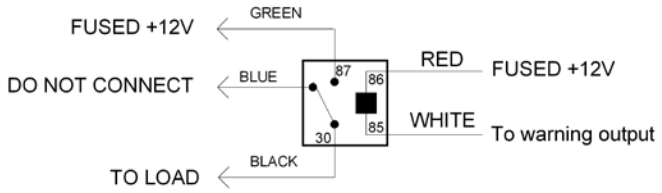
1.) Start with the gauge off.
2.) Disconnect the wire from the dim terminal.
3.) Hold the switch while you turn the key on, but DO NOT start the engine. The display should light up and show “SET MODE”.
4.) Release the switch.
5.) Now apply 12 volts to the dim terminal for the rest of the set up.
6.) Press and release the switch to toggle through the following menus: “BOOST” “BOST CAL”, “HI WARN”, “HI WARN2”, “UP DATE”; “TEMP” “UNIT”,”HI WARN”;”EGT””UNIT”, “HI WARN”.
7.) The next menu will say “PRESET”.
8.) Press and hold the switch until the display dims, then release the switch and “SETUP” ”DONE” will be displayed. The factory presets are now loaded and saved.
9.) Press and hold the switch until the display dims to return to normal gauge operation.

Using external warning indicators:

The WRN1 terminal provides a ground trigger whenever any of the senders are outside the set limits. Low current indicators (less than 250 mA) can be activated directly by connecting their power wire to 12 volts and connecting their ground wire to the WRN1 terminal.

The WRN2 terminal also provides a ground trigger whenever the second boost warning point is outside the set limit. Low current indicators (less than 250 mA) can be activated directly by connecting their power wire to 12 volts and connecting their ground wire to the WRN2 terminal.

For higher current buzzers, lights, or solenoids, a relay will need to be used to switch the indicator on. Dakota Digital's RLY-1 30A relay may be used for this. One of the coil wires should be connected to 12 volts and the other coil wire connected to the WRN1 terminal. When the gauge is outside its limits, the relay will turn on. The relay contact wires can be used to switch the higher current device.



WARNING! - CONNECTING A HIGH CURRENT INDICATOR DIRECTLY TO THE WARNING OUTPUT WILL DAMAGE THE UNIT.

Features:

- Provides vacuum/boost pressure, exhaust gas temp, and temperature readings.
- Boost calibration routine to compensate for atmospheric pressure changes due to weather/elevation.
- High boost readings, up to 85 psi.
- Two warn outputs for an external warning light or buzzer.
- A warning feature that flashes the gauge readout when outside operating limits.
- User adjustable warning points.
- Microprocessor stabilized readings.
- Automatic Night dimming.
- High Visibility, full character VFD display.

OPERATION:

The gauge needs only the PWR and GND terminals connected to light up. When the DIM terminal has 12 volts, it will dim the display for night viewing. The gauge connects to the control module with the supplied cable with appropriate connectors on either end.

The display will show readings of --- and EEE until the sensors are connected to the control module. If a sensor goes out of range during operation you will also so EEE or ---.

The display will flash and the respective warning outputs will be activated whenever the pressure or temperature is out of the warning set limits. The WRN1 will activate for any one of the readings. The WRN2 is a special boost output and will only be activated if the "HI WARN2" is out of its set warn limit.

GAUGE RANGE AND DISPLAY:

The vac/boost reading will display pressures from 22 inHg to 85 psi at sea level. There is a separate boost warning output, WRN2, that is adjustable and can be used to trigger events based on boost pressure. The boost warning levels are adjustable along with the update rate. A negative sign indicates vacuum and the decimal point is also absent, below are some sample readouts.

zero pres.	15 psi boost	20 inHg vacuum
0.0	15.0	-20

The temperature gauge is designed to operate from about 32 to 400 degrees Fahrenheit and is intended for transmission, water, or oil temps. The sending unit required is SEN-04-3 a 32-400 ºF (0-200 ºC) range sensor. Because of the wide temperature span, the gauge may not be as accurate below 100º F (38ºC).

The EGT gauge uses a thermocouple sensor to measure the temperature. The thermocouple consists of a screw-in exhaust sensor and the cable which connects it to the gauge control unit. The EGT gauge will operate and read correctly between the temperature range of 150 – 1750 ºF(65 – 955 ºC). Because of the nature of the sensor used, the gauge will not read cold temperatures.

TABLE 1: Atmospheric Pressures

Feet above sea level	inHg	psia
-1000	30.9	**15.2**
-656	30.5	**15.1**
-500	30.4	**15**
-328	30.2	**14.9**
0	29.9	**14.7**
328	29.5	**14.5**
500	29.4	**14.4**
656	29.2	**14.3**
1000	28.9	**14.2**
1312	28.5	**14**
1500	28.3	**13.9**
2000	27.8	**13.7**
2500	27.3	**13.4**
3000	26.8	**13.2**
3500	26.3	**12.9**
4000	25.8	**12.7**
4500	25.4	**12.4**
5000	24.9	**12.2**
5500	24.4	**12**
6000	24	**11.8**
6500	23.5	**11.5**
7000	23.1	**11.3**
7500	22.7	**11.1**
8000	22.2	**10.9**
8500	21.8	**10.7**

Troubleshooting guide.

Problem	Possible cause	Solution
Gauge will not light up	PWR terminal does not have power.	Connect to a location that has power.
	GND terminal is not getting a good ground.	Connect ground to a different location.
	Display harness is unplugged.	Seat connectors in tightly at both ends.
	Gauge is damaged.	Return gauge for repair. (see instructions)
Gauge lights up, but displays "---".	Sensors are not connected.	Check sensor connections at control unit and sensor.
	Sensor is damaged.	Call for replacement. (contact factory)
	Sensor is out of range.	Make sure pressures and temps are not exceeding sensor limits.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Gauge lights up, but displays "EEE".	Sensors are not connected.	Check sensor connections at control unit and sensor.
	Sensor is damaged.	Call for replacement. (contact factory)
	Sensor is out of range.	Make sure pressures and temps are not exceeding sensor limits.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Gauge lights up, but does not read correctly.	Loose connection on power wire.	Reconnect wire going to PWR terminal.
	Poor sender connection.	Make sure sender is connected to control unit.
	Poor ground connection.	Move ground to different location
	Incorrect sender type.	Make sure sender has been replaced with the correct type
	Temperature unit is not set correctly (F or C)	See "Setting temperature setup" in the manual.
	Voltage or wiring problem in vehicle wiring harness.	Check wiring harness for loose or damaged wires.
	Calibration value is incorrect.	Check setup and adjust.
	Sensor is not installed properly.	Check instructions and wiring.
Gauge flashes constantly.	Warning limits are not set properly.	Reset warning limits.
External warning indicator does not work.	Indicator not connected properly.	Check indicator wiring connections.
	Indicator does not work.	Repair or replace indicator.
	Gauge output has been damaged.	Return gauge for repair. (see instructions)
	External relay could be damaged.	Check relay or replace.
Gauge will not dim.	DIM terminal is not connected correctly.	Check wiring connections.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Gauge remains dim at all times.	DIM terminal is getting power all of the time.	Connect DIM terminal to location that only has power when the headlights are on.
	Battery is very low.	Recharge or replace vehicle battery.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Gauge lights and displays SETUP	(pressing and releasing the switch will allow the gauge to function but values displayed may be incorrect)	
ERROR	Multiple errors in setup menu	Go through setup menu
ERROR1	Temp unit error	Reset Temp unit in setup menu
ERROR2	Warning point error Temp, EGT, or Boost	Reset warning points in setup
ERROR3	Warning poring error Boost2	Reset the BST2 Warn value
ERROR4	Atmospheric pressure zero point error	Try the auto cal in BST CAL
ERROR5	Gauge calibration off	Send gauge in
ERROR6	Display mode is corrupted	Change UPDATE speed in Setup

Technical specifications

Minimum operating voltage	-	7 volts
Maximum operating voltage	-	18 volts
(operating at or near maximum rating for an extended time can damage unit)		
Maximum pressure reading	-	85 psi (boost)
Minimum pressure reading	-	29 inHg (vacuum)
Pressure Resolution	-	1 inHg / 0.2 psi
Pressure Accuracy	-	2 psi
Maximum temp reading	-	395°F (200°C)
Temp Resolution	-	1°F (1°C)
Temp accuracy	-	±7°F (±4°C)
Maximum EGT reading	-	1750-1850°F (955-999°C) *dependent on gauge temp.
EGT Resolution	-	10°F (4-5°C)
EGT accuracy	-	±15°F (±9°C)
Typical current draw (@ 13.8V)	-	0.1 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 products. Please read through the Troubleshooting Guide. There, you will find the solution to most problems.

Should you ever need to send the unit back for repairs, please call our technical support line, (605) 332-6513, to request a Return Merchandise Authorization number. 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 the RMA number on the package, and include a complete description of the problem with RMA number, your full name and address (street address preferred), and a telephone number where you can be reached during the day. Any returns for warranty work must include a copy of the dated sales receipt from your place of purchase. Send no money. We will bill you after repair.

Dakota Digital 24 Month Warranty

DAKOTA DIGITAL 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 Dakota Digital's option.

This warranty does not cover nor extend to damage to the vehicle's systems, and does not cover removal or reinstallation of the product. 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 expressed 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. No person or representative is authorized to assume, for Dakota Digital, any liability other than expressed herein in connection with the sale of this product.

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