OSM-100

NON-TSO

OIL STATUS MONITOR

USER'S MANUAL

Adaptive Interfaces, Inc.

2012

The OSM-100 is not certified by the FAA and is intended for use only in Homebuilt, Experimental or Ultralight aircraft. Any questions pertaining to the use of this instrument in a particular aircraft should be addressed to your local aviation authorities. It is the responsibility of the aircraft pilot to be thoroughly familiar with the operation of the OSM-100 and know its limitations. Correct installation of this instrument should be verified by a qualified avionics facility.

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONT.)

INTRODUCTION

SCOPE

This manual provides specifications, operating instructions and installation instructions for the OSM-100 Oil Status Monitor. This manual is for use by persons who are familiar with aircraft, aircraft avionics, and general electronic principles.

DESCRIPTION

The OSM-100 Oil Status Monitor is a solid state instrument that displays engine oil temperature and oil pressure on a 3-digit over 3-digit LED display. Temperature and pressure can be displayed in english units (Degrees Fahrenheit and Pounds Per Square Inch (PSI)) or metric units (Degrees Celcius and Kilo Pascals (kPa)). The OSM-100 can be used with a large variety of sensors for both temperature and pressure. Both high and low temperature and high and low pressure alarm levels can be set to warn the pilot of any dangerous engine conditions. The LED display brightness and internal backlighting can be controlled by the user.

Control of the OSM-100 is by a set of 4 buttons on the front panel of the instrument. The OSM-100 is a standard 2-1/4 inch instrument and is designed to be mounted in a standard 2-1/4 inch aircraft panel cut-out.

SPECIFICATIONS

Supply Voltage:	10 Vdc - 30 Vdc
Maximum Supply Current:	350 mA
Temperature Display Range:	0 - 999 Degrees F or C
English Pressure Display Range:	0 - 99.9 PSI
Metric Pressure Display Range:	0 - 999 kPa
Temperature Sensor Types:	Resistor, 0-5V, LM335
Pressure Sensor Types:	Resistor, 0-5V, 4-20mA Current Loop
Resistor Sensor Range:	0 - 30000 Ohms
Dimensions:	H 2.40" x W 2.50" x D 1.50"
Weight:	4 Oz. (114 g.)
Mounting Screws:	4 ea. 6-32 x L 0.5" (Max.)
Upper Connector:	15-Pin DSUB Female 4-40
Lower Connector:	9-Pin DSUB Female 4-40

BUTTON FUNCTIONS

FUNC

This button is used to select and advance instrument functions for each menu level. Holding this button in for 5 seconds will cause the instrument to advance to the next menu level.

▲

▼

When the instrument is in the MAIN MENU mode, these buttons are used to adjust the brightness of the digital display when the DISPLAY BRIGHTNESS function is set to FP (Front Panel). Otherwise, in Main Menu mode, these buttons perform no operations. In functions of MENU LEVEL 1, MENU LEVEL 2 and MENU LEVEL 3, these buttons are used to select options or to increase or decrease values of the selected function.

ALM

When the instrument is in the MAIN MENU mode, this button is used to deactivate the instrument's ALARM for a period of 2 minutes.

In all other cases, the button is used as an "Enter" button to select and retain the value or setting of the displayed function.

INDICATORS

F

The F indicator is lit when the instrument is displaying Oil Temperature in Fahrenheit or English mode.

C

The C indicator is lit when the instrument is displaying Oil Temperature in Celcius or Metric mode.

PSI

The PSI indicator is lit when the instrument is displaying Oil Pressure in Pounds per Square Inch or English mode.

kPa

The kPa indicator is lit when the instrument is displaying Oil Pressure in Kilo-Pascals or Metric mode.

MENUS OVERVIEW

The OSM-100 is controlled through a series of menus and functions.

MAIN MENU

The MAIN MENU (MENU LEVEL 0) allows the pilot to view Oil Temperature and Oil Pressure in either English or Metric units.

MENU LEVEL 1 - INSTRUMENT SETTINGS

MENU LEVEL 1 (L1) is entered from MENU LEVEL 0 by pressing and holding the FUNC button for 5 seconds.

When the OSM-100 is in MENU LEVEL 1, the user can change the instrument's optional settings. These settings include the digital display's BRIGHTNESS CONTROL mode, the AUTO DIM function, the display UPDATE PERIOD, the TEMPERATURE SENSOR type, and the PRESSURE SENSOR type. The RETURN TO MAIN function brings the OSM-100 back to its normal operation mode, MAIN MENU.

MENU LEVEL 2 - ALARMS

MENU LEVEL 2 (L2) is entered from MENU LEVEL 1 by pressing and holding the FUNC button for 5 seconds.

When the OSM-100 is in MENU LEVEL 2, the user can set the high-level and low-level alarms for OIL TEMPERATURE and OIL PRESSURE. Alarms can be set to OFF or to values within the range of the instrument. Alarm values are set in ENGLISH units.

The BACK ONE LEVEL function brings the OSM-100 to MENU LEVEL 1. The RETURN TO MAIN brings the OSM-100 back to its normal operation mode, MAIN MENU.

MENU LEVEL 3 - SENSOR DATA POINT SETTINGS

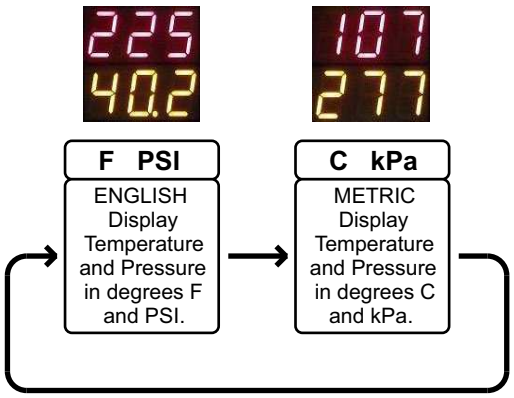
MENU LEVEL 3 (L3) is entered from MENU LEVEL 2 by pressing and holding the FUNC button for 5 seconds.

When the OSM-100 is in MENU LEVEL 3, the user can set data points for the type of sensor used. RESISTIVE sensors for OIL TEMPERATURE and OIL PRESSURE require two data points, each having a resistor value in ohms and an associated temperature or pressure. VOLTAGE (0V-5V) type sensors also require two data points, each having a value between 0 and 5 volts and an associated temperature or pressure. An LM335 type TEMPERATURE sensor requires no data points. A (4mA - 20 mA) CURRENT type PRESSURE sensor requires two data points, each having a value between 1mA and 30mA and an associated pressure.

The BACK ONE LEVEL function brings the OSM-100 to MENU LEVEL 2. The RETURN TO MAIN brings the OSM-100 back to its normal operation mode, MAIN MENU.

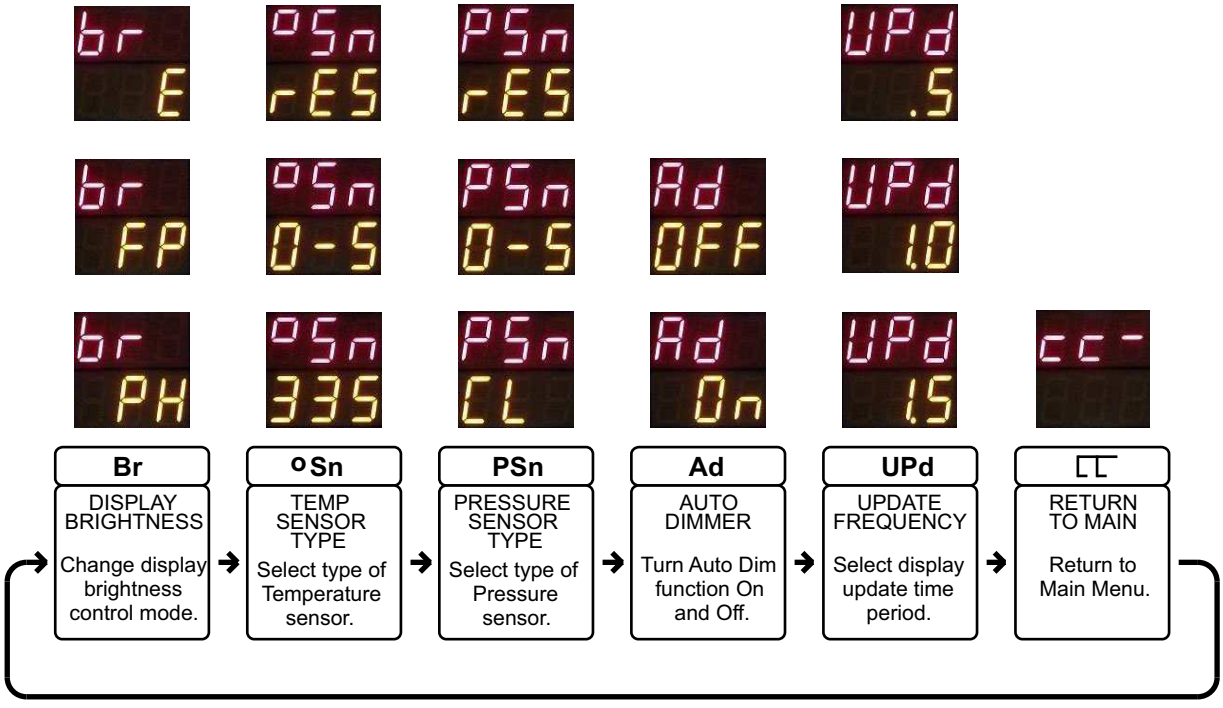
MENU QUICK REFERENCE

MAIN MENU (MENU LEVEL 0)



Press and hold FUNC button 5 seconds to advance to MENU LEVEL 1

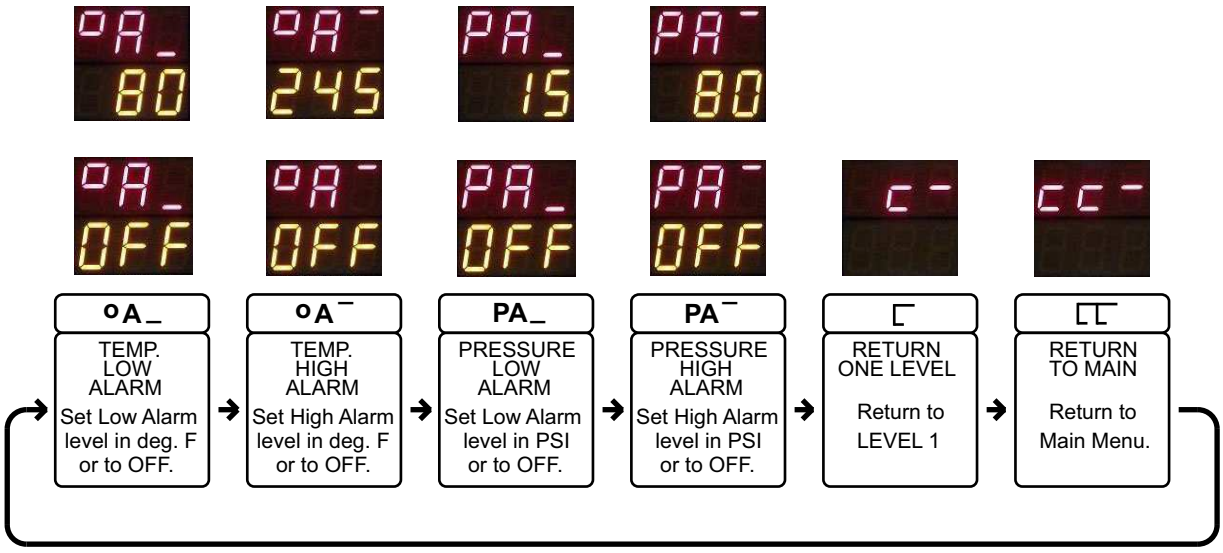
MENU LEVEL 1



Press and hold FUNC button 5 seconds to advance to MENU LEVEL 2

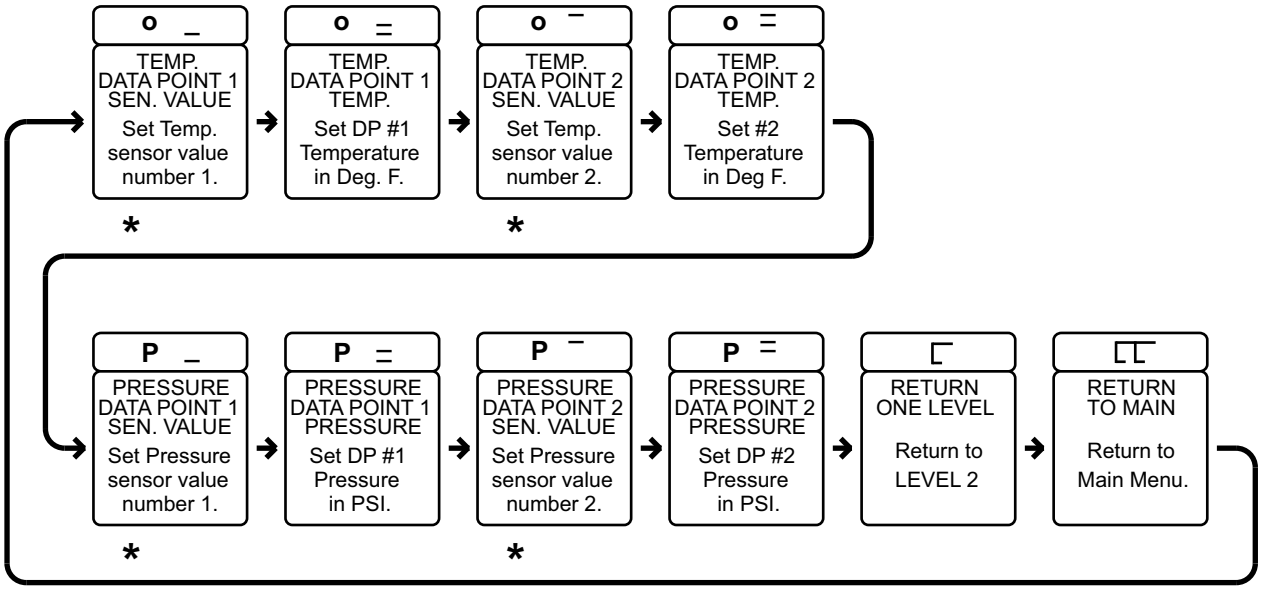
MENU QUICK REFERENCE (CONT.)

MENU LEVEL 2 - ALARMS



Press and hold FUNC button 5 seconds to advance to MENU LEVEL 3

MENU LEVEL 3 - DATA POINTS



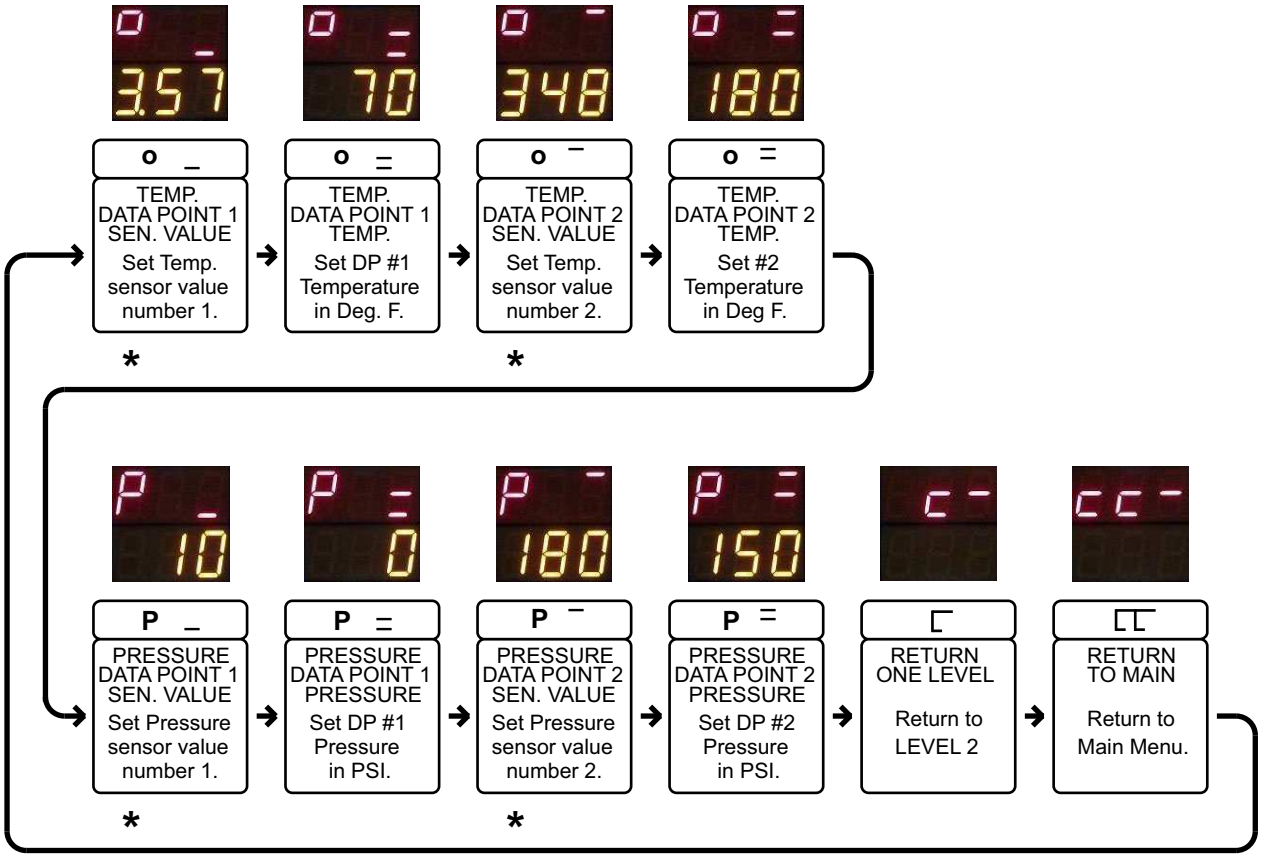
* **Temperature and Pressure sensor values will depand on the type of sensors selected in Menu Level 1.**

MENU QUICK REFERENCE (CONT.)

MENU LEVEL 3 - SENSOR DATA POINTS

RESISTIVE TYPE TEMPERATURE SENSOR

RESISTIVE TYPE PRESSURE SENSOR



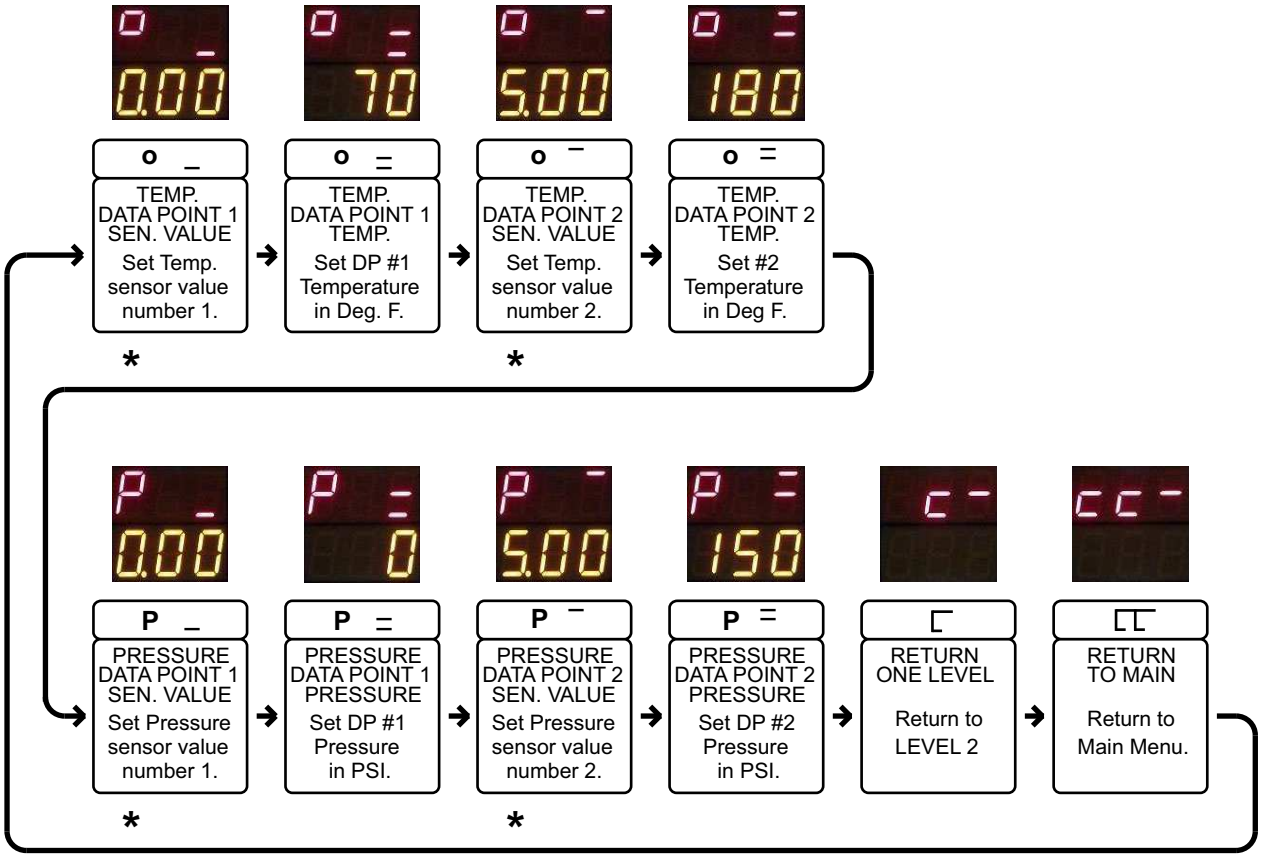
* **Temperature and Pressure sensor values are in ohms.**

MENU QUICK REFERENCE (CONT.)

MENU LEVEL 3 - SENSOR DATA POINTS

0V TO 5V TYPE TEMPERATURE SENSOR **

0V TO 5V TYPE PRESSURE SENSOR



* **Temperature and Pressure sensor values are in volts.**

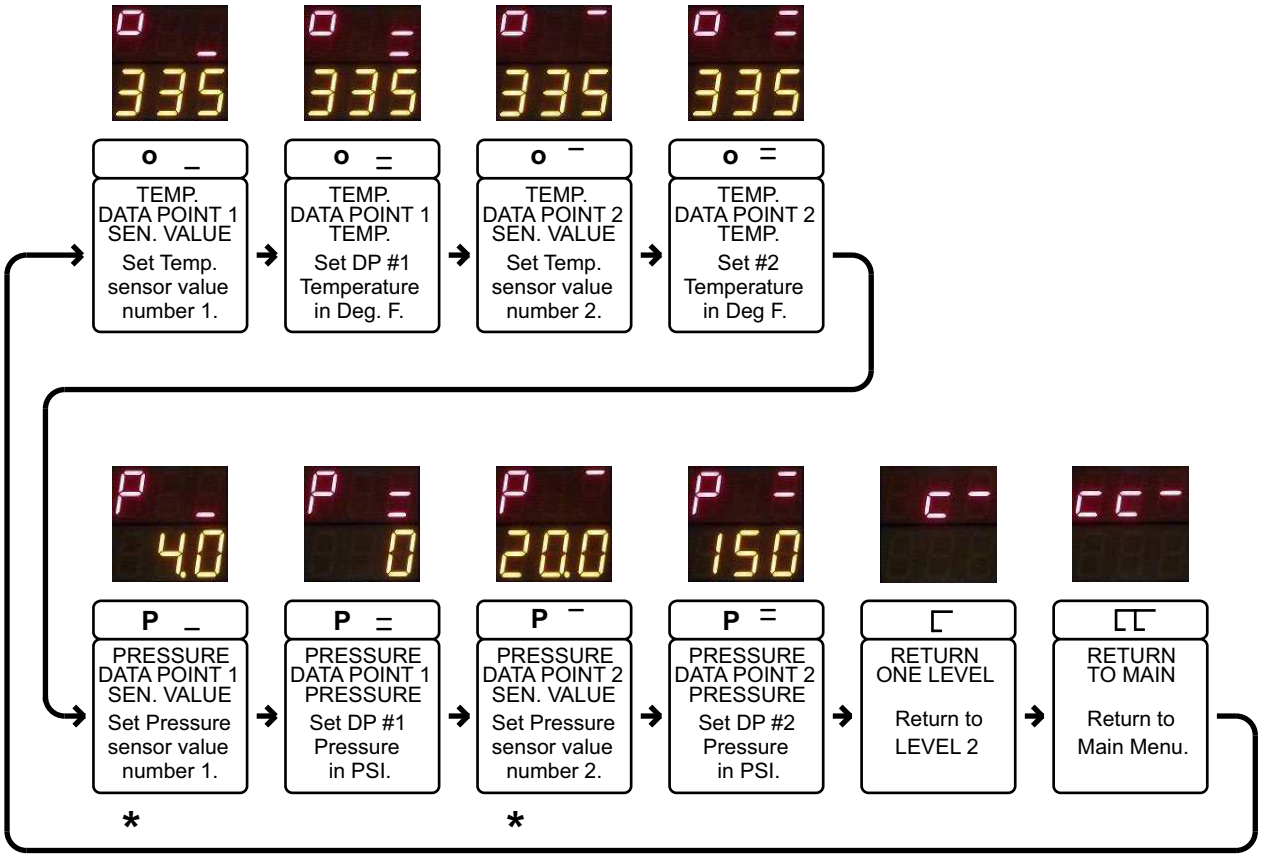
** **This also applies to 0V to 15V sensors. Display is sensor voltage / 3.**

MENU QUICK REFERENCE (CONT.)

MENU LEVEL 3 - SENSOR DATA POINTS

LM335 TYPE TEMPERATURE SENSOR **

4mA TO 20 mA TYPE PRESSURE SENSOR



* **Pressure sensor values are in milliamperes for a current loop type sensor.**

** **The LM335 does not use data points. Data point values can not be set.**

FUNCTIONS

MAIN MENU (MENU LEVEL 0) FUNCTIONS

F and PSI

In this mode, Oil Temperature and Oil Pressure are displayed in ENGLISH units. Oil Temperature is displayed in dergees Fahrenheit and Oil Pressure is displayed in Pounds Per Square Inch (PSI).

C and kPa

In this mode, Oil Temperature and Oil Pressure are displayed in METRIC units. Oil Temperature is displayed in dergees Celcius and Oil Pressure is displayed in Kilo-Pascals (kPa).

FUNC

Press and release
FUNC
to change from
F/PSI to C/kPa

MENU LEVEL 1 FUNCTIONS

br (DISPLAY BRIGHTNESS CONTROL)

FUNC	▲ ▼	**ALM**	**FUNC**	**ALM**
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Use Up and Down buttons to select the brightness control mode.	Press ALM button to set and store the mode.	Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The brightness of the digital display and the indicator LEDs can be set to 16 different levels and be controlled in 3 different modes. These modes are as follows:

E (EXTERNAL CONTROL VOLTAGE)

An external control voltage ranging from 0V to the supply voltage is applied to pin 3 of the Lower Electrical Connector. This voltage is sampled by the OSM-100 and its ratio to the Supply Voltage is calculated into 16 levels. This allows a single potentiometer to be connected between ground and the instrument power input and used as a brightness control, its center tap used as the pin 3 input. See the ELECTRICAL CONNECTIONS section of this manual for details of the control circuit.

FP (FRONT PANEL)

When the OSM-100 is operating in the ALT or MC mode, the UP and DOWN buttons are used to set the display brightness. Also see the AUTO DIMMER function.

PH (PHOTOCELL)

The display brightness is controlled automatically by the amount of ambient light seen by the photocell on the front of the instrument.

MENU LEVEL 1 FUNCTIONS - CONT.

Ad (AUTO DIMMER FUNCTION)

FUNC	**FUNC**	▲ ▼	**ALM**	**FUNC**	**ALM**
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and release FUNC button until the Ad function appears on the display.	Use Up and Down buttons to turn the Ad function ON and OFF.	Press ALM button to set and store the selection.	Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

When the display brightness mode of the OSM-100 is set to FP (Front Panel) control, the photocell on the front panel can be used to automatically change the brightness of the digital display when lighting conditions change. When flying from low light (ie. clouds, dawn) to bright sunlight, the AUTO DIMMER function will raise the brightness of the digital display to a set level without the need to press the UP/DOWN buttons. When flying from bright light to low light (ie. dusk), the AUTO DIMMER function will lower the brightness of digital display to a set level. After the display brightness is changed with the AUTO DIMMER function, the display brightness can still be adjusted manually with the UP and DOWN buttons.

The 2 AUTO DIMMER modes are as follows:

Ad OFF — The display brightness will stay at the level selected by the UP/DOWN buttons and will not change as lighting conditions change.

Ad On — The display brightness will raise or lower to set levels when lighting conditions change.

MENU LEVEL 1 FUNCTIONS - CONT.

UPd (Display Update Period)

DEFAULT

FUNC	**FUNC**	▲ ▼	**ALM**	**FUNC**	**ALM**
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and release FUNC button until the UPd function appears on the display.	Use Up and Down buttons to set the Display Update Period in seconds.	Press ALM button to set and store the selection.	Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

Engine Oil Temperature and Oil Pressure tend to stabilize at a steady cruising altitude and airspeed but they may still vary slightly. The OSM-100 samples Oil Temperature and Oil Pressure 250 times a second and displays a running average of their values. As the running averages of these values change, the new running averages are immediately available to the LED digital display. A digital display that updates with different values 250 times a second can be a distraction to a pilot. Therefore, the OSM-100 has a default setting to update its display once every 1.0 seconds. This update period can be modified from 0.5 seconds to 5.0 seconds in 0.5 second steps using the UPd function.

MENU LEVEL 1 FUNCTIONS - CONT.

oSn (Temperature Sensor Select)

FUNC	FUNC	▲ ▼	ALM	FUNC	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and release FUNC button until the oSn function appears on the display.	Use Up and Down buttons to select the type of temperature sensor.	Press ALM button to set and store the selection.	Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The OSM-100 is designed for use with three types of Temperature Sensors:

1) RESISTIVE (rES)

This sensor type of sensor is the most common and contains an element that changes electrical resistance, in ohms, with temperature.

2) 0V - 5V ELECTRONIC (0-5)

This type of sensor is powered externally and outputs a voltage between 0V and 5V that corresponds to temperature.

3) LM335 (335)

This type of sensor is based on National Instruments' LM335 Temperature Sensor chip. This sensor is powered externally and has a voltage output of 10mV per degree Kelvin.

See the ELECTRICAL CONNECTIONS section of this manual for sensor details.

MENU LEVEL 1 FUNCTIONS - CONT.

PSn (Pressure Sensor Select)

DEFAULT

FUNC	FUNC	▲ ▼	ALM	FUNC	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and release FUNC button until the PSn function appears on the display.	Use Up and Down buttons to select the type of pressure sensor.	Press ALM button to set and store the selection.	Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The OSM-100 is designed for use with three types of Pressure Sensors:

1) RESISTIVE (rES)

This sensor type of sensor is the most common and contains an element that changes electrical resistance, in ohms, with pressure.

2) 0V - 5V ELECTRONIC (0-5)

This type of sensor is powered externally and outputs a voltage between 0V and 5V that corresponds to pressure.

3) CURRENT LOOP (CL)

This type of standard sensor controls a current (usually 4mA to 20mA) that corresponds to pressure.

See the ELECTRICAL CONNECTIONS section of this manual for sensor details.

MENU LEVEL 2 - TEMPERATURE ALARM SETTINGS

°A_ (Low Temperature Alarm)

FUNC	FUNC	▲ ▼	ALM	FUNC	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** and **°A_** appear on the display, then release.	Use Up and Down buttons to select the Low Temperature Alarm value.	Press ALM button to set and store the selection.	Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The LOW TEMPERATURE ALARM can be cycled from OFF to 300 °F in 5 °F steps.

°A¯ (High Temperature Alarm)

FUNC	FUNC	FUNC	▲ ▼	ALM	FUNC
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and release FUNC button until the **°A¯** function appears on the display.	Use Up and Down buttons to select the High Temperature Alarm value.	Press ALM button to set and store the selection.	Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.

ALM
Press the ALM button to return to the MAIN MENU.

The HIGH TEMPERATURE ALARM can be cycled from OFF to 300 °F in 5 °F steps.

MENU LEVEL 2 - PRESSURE ALARM SETTINGS

PA_ (Low Pressure Alarm)

FUNC
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.

FUNC
Press and release FUNC button until the **PA_** function appears on the display.

▲ ▼
Use Up and Down buttons to select the Low Pressure Alarm Value.

ALM
Press ALM button to set and store the selection.

FUNC
Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.

ALM
Press the ALM button to return to the MAIN MENU.

The LOW PRESSURE ALARM can be cycled from OFF to 100 PSI in 5 PSI steps.

PA‾ (High Pressure Alarm)

FUNC
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.

FUNC
Press and release FUNC button until the **PA‾** function appears on the display.

▲ ▼
Use Up and Down buttons to select the High Pressure Alarm value.

ALM
Press ALM button to set and store the value.

FUNC
Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.

ALM
Press the ALM button to return to the MAIN MENU.

The HIGH PRESSURE ALARM can be cycled from OFF to 100 PSI in 5 PSI steps.

MENU LEVEL 3 - (RESISTIVE) TEMPERATURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR RESISTANCE IN OHMS

FUNC
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L2** and appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L3** and ^{o} - appear on the display, then release.

▲ ▼
Use Up and Down buttons to select the Sensor Resistance Value.

ALM
Press ALM button to set and store the selection.

*
FUNC
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.

*
ALM
Press the ALM button to return to the MAIN MENU.

The Resistance Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

When the Lower Display shows a decimal point, the value is in kilohms (R x 1000). No decimal point indicates a value in ohms (R x 1).

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (RESISTIVE) TEMPERATURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR TEMPERATURE IN °F

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the °F function appears on the display.	Use Up and Down buttons to select the Sensor Temperature Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		The Temperature Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (RESISTIVE) TEMPERATURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR RESISTANCE IN OHMS

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the o - function appears on the display.	Use Up and Down buttons to select the Sensor Resistance Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Resistance Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

When the Lower Display shows a decimal point, the value is in kilohms (R x 1000). No decimal point indicates a value in ohms (R x 1).

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (RESISTIVE) TEMPERATURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR TEMPERATURE IN °F

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the °= function appears on the display.	Use Up and Down buttons to select the Sensor Temperature Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		The Temperature Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) TEMPERATURE SENSOR DATA POINTS

Valid when a 0v to 5V type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR OUTPUT IN VOLTS

FUNC
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L2** and appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L3** and ^{o} - appear on the display, then release.

▲ ▼
Use Up and Down buttons to select the Sensor Output Voltage Value.

ALM
Press ALM button to set and store the selection.

*
FUNC
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.

*
ALM
Press the ALM button to return to the MAIN MENU.

The Output Voltage Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

The Output Voltage Value can adjusted between 0.00 V and 5.00 V in 0.01 V steps.

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) TEMPERATURE SENSOR DATA POINTS

Valid when a 0V to 5V type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR TEMPERATURE IN °F

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the °F function appears on the display.	Use Up and Down buttons to select the Sensor Temperature Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Temperature Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*****
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) TEMPERATURE SENSOR DATA POINTS

Valid when a 0V to 5V type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR OUTPUT IN VOLTS

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the o - function appears on the display.	Use Up and Down buttons to select the Sensor Output Voltage Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Voltage Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

The Output Voltage Value can adjusted between 0.00 V and 5.00 V in 0.01 V steps.

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) TEMPERATURE SENSOR DATA POINTS

Valid when a 0V to 5V type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR TEMPERATURE IN °F

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the °= function appears on the display.	Use Up and Down buttons to select the Sensor Temperature Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		The Temperature Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (LM335) TEMPERATURE SENSOR DATA POINTS

Valid when an LM335 type sensor has been selected in Menu 1.

The LM335 temperature sensor has a set output function of 10mV/^{O}K. Data points are not used with this type of sensor. The OSM-100 will display the following when an LM335 sensor is selected in Menu 1:

Data Point 1 Sensor Output

Data Point 1 Sensor Temperature

Data Point 2 Sensor Output

Data Point 2 Sensor Temperature

MENU LEVEL 3 - (RESISTIVE) PRESSURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR RESISTANCE IN OHMS

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P -** function appears on the display.	Use Up and Down buttons to select the Sensor Resistance Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Resistance Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

When the Lower Display shows a decimal point, the value is in kilohms (R x 1000). No decimal point indicates a value in ohms (R x 1).

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (RESISTIVE) PRESSURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR PRESSURE IN PSI

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P =** function appears on the display.	Use Up and Down buttons to select the Sensor Pressure Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		The Pressure Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*****
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (RESISTIVE) PRESSURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR RESISTANCE IN OHMS

FUNC
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.

FUNC
Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.

FUNC
Press and release FUNC button until the **P -** function appears on the display.

▲ ▼
Use Up and Down buttons to select the Sensor Resistance Value.

ALM
Press ALM button to set and store the selection.

* **FUNC**
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.

* **ALM**
Press the ALM button to return to the MAIN MENU.

The Resistance Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

When the Lower Display shows a decimal point, the value is in kilohms (R x 1000). No decimal point indicates a value in ohms (R x 1).

* The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (RESISTIVE) PRESSURE SENSOR DATA POINTS

Valid when a RESISTIVE type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR PRESSURE IN PSI

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P =** function appears on the display.	Use Up and Down buttons to select the Sensor Pressure Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		The Pressure Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) PRESSURE SENSOR DATA POINTS

Valid when a 0V to 5V type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR OUTPUT IN VOLTS

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P -** function appears on the display.	Use Up and Down buttons to select the Sensor Output Voltage Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Voltage Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

The Output Voltage Value can adjusted between 0.00 V and 5.00 V in 0.01 V steps.

* The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) PRESSURE SENSOR DATA POINTS

Valid when a 0V to 5V type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR PRESSURE IN PSI

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P =** function appears on the display.	Use Up and Down buttons to select the Sensor Pressure Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		
Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		The Pressure Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*****
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) PRESSURE SENSOR DATA POINTS

Valid when a 0V to 5V type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR OUTPUT IN VOLTS

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P -** function appears on the display.	Use Up and Down buttons to select the Sensor Output Voltage Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊏ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Voltage Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

The Output Voltage Value can adjusted between 0.00 V and 5.00 V in 0.01 V steps.

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (0V to 5V) PRESSURE SENSOR DATA POINTS

Valid when a 0V to 5V type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR PRESSURE IN PSI

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P =** function appears on the display.	Use Up and Down buttons to select the Sensor Pressure Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		The Pressure Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*****
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (4mA to 20mA CURRENT LOOP) PRESSURE SENSOR DATA POINTS

Valid when a Current Loop type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR OUTPUT IN MILLIAMPERES

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P -** function appears on the display.	Use Up and Down buttons to select the Sensor Output Current Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Current Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

The Output Current Value can adjusted between 1.0 mA and 30.0 mA in 0.1 mA steps.

* The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (4 mA to 20 mA) CURRENT LOOP PRESSURE SENSOR DATA POINTS

Valid when a Current Loop type sensor has been selected in Menu 1.

DATA POINT 1 - SENSOR PRESSURE IN PSI

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P =** function appears on the display.	Use Up and Down buttons to select the Sensor Pressure Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		The Pressure Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (4 mA to 20 mA) CURRENT LOOP PRESSURE SENSOR DATA POINTS

Valid when a Current Loop type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR OUTPUT IN MILLIAMPERES

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P -** function appears on the display.	Use Up and Down buttons to select the Sensor Output Current Value.	Press ALM button to set and store the selection.

* FUNC	* ALM
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.

The Current Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

The Output Current Value can adjusted between 1.0 mA and 30.0 mA in 0.1 mA steps.

* The OSM-100 can remain in Menu Level 3 if other data points need to be set.

MENU LEVEL 3 - (4 mA to 20 mA) CURRENT LOOP PRESSURE SENSOR DATA POINTS

Valid when a Current Loop type sensor has been selected in Menu 1.

DATA POINT 2 - SENSOR PRESSURE IN PSI

FUNC	FUNC	FUNC	FUNC	▲ ▼	ALM
Press and Hold FUNC button for 5 seconds until **L1** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L2** appears on the display, then release.	Press and Hold FUNC button for 5 seconds until **L3** appears on the display, then release.	Press and release FUNC button until the **P =** function appears on the display.	Use Up and Down buttons to select the Sensor Pressure Value.	Press ALM button to set and store the selection.

* FUNC	* ALM		
Press and release FUNC button until the Return To Main ⊏⊐ symbol appears on the display.	Press the ALM button to return to the MAIN MENU.		The Pressure Value can be increased or decreased quickly by pressing and holding the UP or DOWN buttons.

*
The OSM-100 can remain in Menu Level 3 if other data points need to be set.

SPECIAL FUNCTION

Lo E (Low Voltage Warning)

The OSM-100 is designed to operate from a supply voltage of 10V to 30V. Most aircraft operate on a 12V electrical system (voltage is typically around 14V). When the supply voltage to the OSM-100 drops to 11V or lower, the instruments digital display will flash "Lo E" for 1 second every 8 seconds. This function is designed to give a pilot warning that there may be a problem with the aircraft's electrical system. The "Lo E" function is hardwired into the design of the instrument an can not be disabled.

ELECTRICAL CONNECTIONS

POWER INPUT

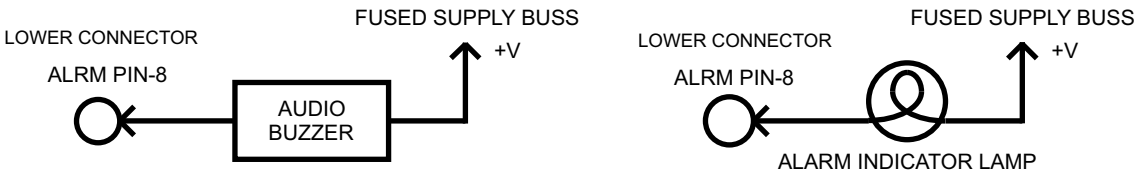
The OSM-100 is designed to operate from a supply voltage of 10V to 30V with a maximum current draw of 350 mA. Power is supplied to the instrument through Pin-9 of the Lower Connector. The MCD-100 uses an internal switching voltage regulator so so no external components are needed when changing from a 12V to a 28V electrical system.

GROUNDS

The case of the OSM-100 is connected to the electrical ground of the instrument. Electrical ground connections are provided to the MCD-100 on pin 4 and pins 8-15 of the Upper Connector and pins 5, 6 and 7 of the Lower Connector. These pins are all connected internally on the OSM-100.

ALARM OUTPUT

The Alarm Output is on Pin-8 of the Lower Connector. This output is used with the Alarm function to drive a warning lamp or audio alarm. The output uses an open collector transistor that can sink up to 300 mA. The pull-up voltage of the load can be 40 Vdc or less. The output is decoupled by a 100 pF capacitor to ground.



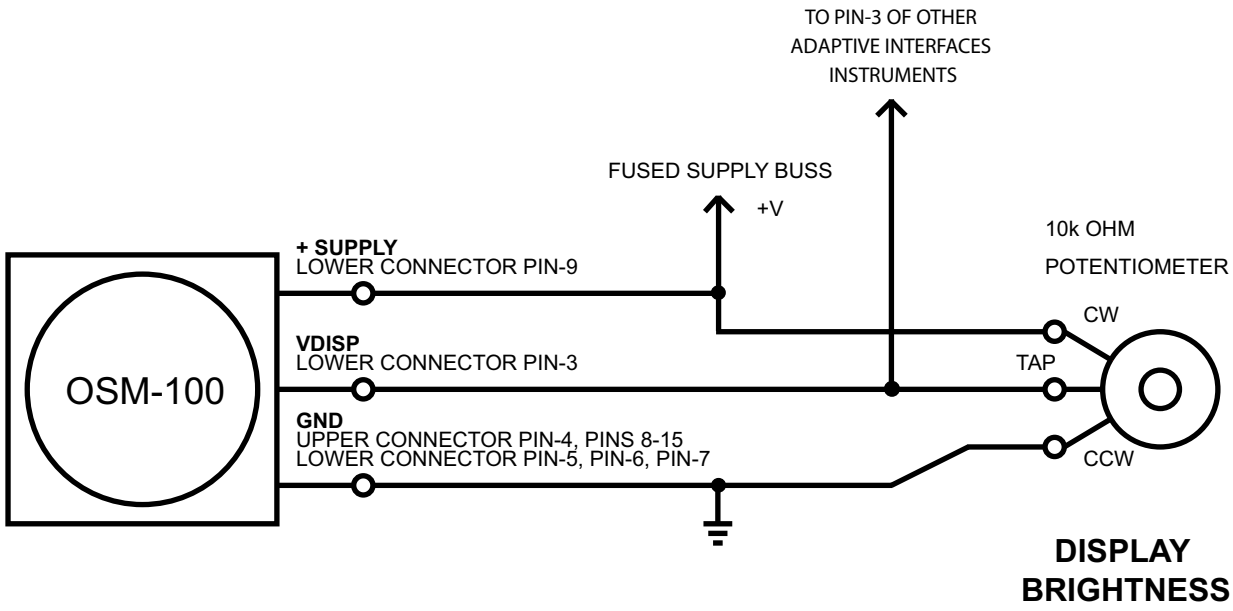
ELECTRICAL CONNECTIONS - CONT.

DISPLAY BRIGHTNESS CONTROL INPUT (VDISP)

The brightness of the digital display and indicator LEDs can be contolled by an external voltage applied to Pin-3 of the Lower Connector when the brightness control mode is set to "E" (See MENU LEVEL 1 FUNCTIONS). In this mode, the display brightness is set by ratio of the voltage at VDISP to the Supply Voltage. This way, a single potentiometer can be placed between ground and the supply voltage with its center tap wired to the VDISP input. Changes or fluctuations of the supply voltage (as can happen when lights and avionics are switched on and off) will not affect the brightness of the display. The display brightness can be set to 16 different levels. The display brightness is limited to 16 levels by the instrument's display driver chip.

To use this function, a linear potentiometer, valued between 10k ohms and 20k ohms, is placed between the instrument supply and ground. The center tap of the potentiometer is wired directly to Pin-3 of the Lower Connector. The input resistance of this input is 200k ohms and the input is protected by Schottky diodes. A single potentiometer can be used to control several Adaptive Interfaces instruments. It is suggested that this input not be connected to existing dimmer controls on the panel as the display brightness is usually the opposite of that desired for nighttime instrument lighting (bright in sunlight - dim at night).

WIRING EXAMPLE



ELECTRICAL CONNECTIONS - CONT.

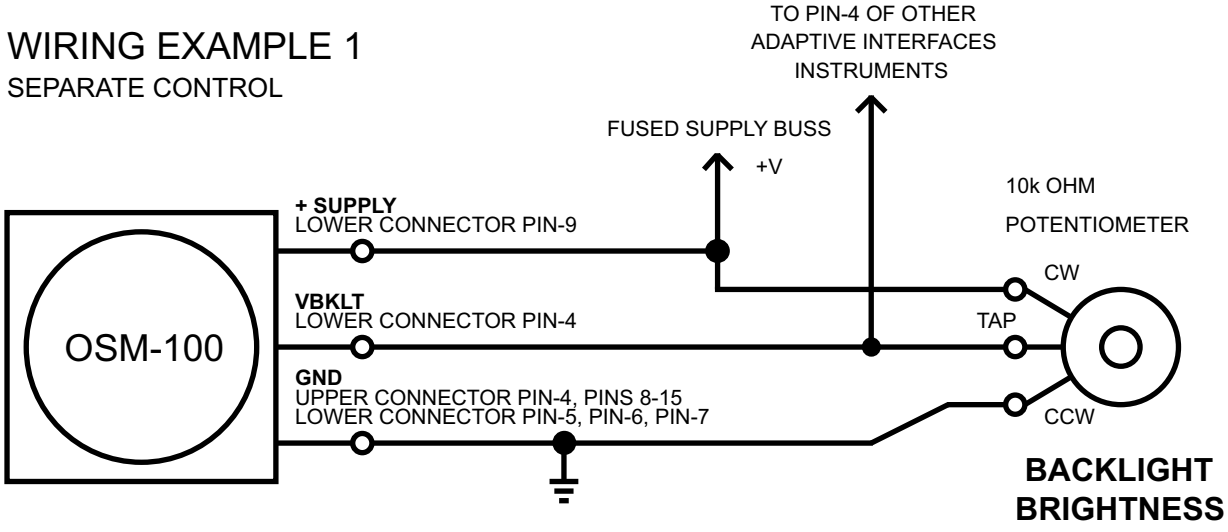
BACKLIGHT BRIGHTNESS CONTROL INPUT (VBKLT)

The OSM-100 has an integrated, white LED, backlight for its front panel graphics. The only way to control the brightness of the backlight is to apply a control voltage to Pin-4 of the Lower Connector (VBKLT). The backlight brightness can be set to 256 levels by the ratio of the voltage at VBKLT to the Supply Voltage. This way, a single potentiometer can be placed between ground and the supply voltage with its center tap wired to the VBKLT input. Changes or fluctuations of the supply voltage (as can happen when lights and avionics are switched on and off) will not affect the brightness of the backlight.

To use this function, a linear potentiometer, valued between 10k ohms and 20k ohms, is placed between the instrument supply and ground. The center tap of the potentiometer is wired directly to Pin-4 of the Lower Connector. The input resistance of this input is 200k ohms and the input is protected by Schottky diodes. A single potentiometer can be used to control several Adaptive Interfaces instruments. The VBKLT input can also be wired into the existing panel lighting circuit.

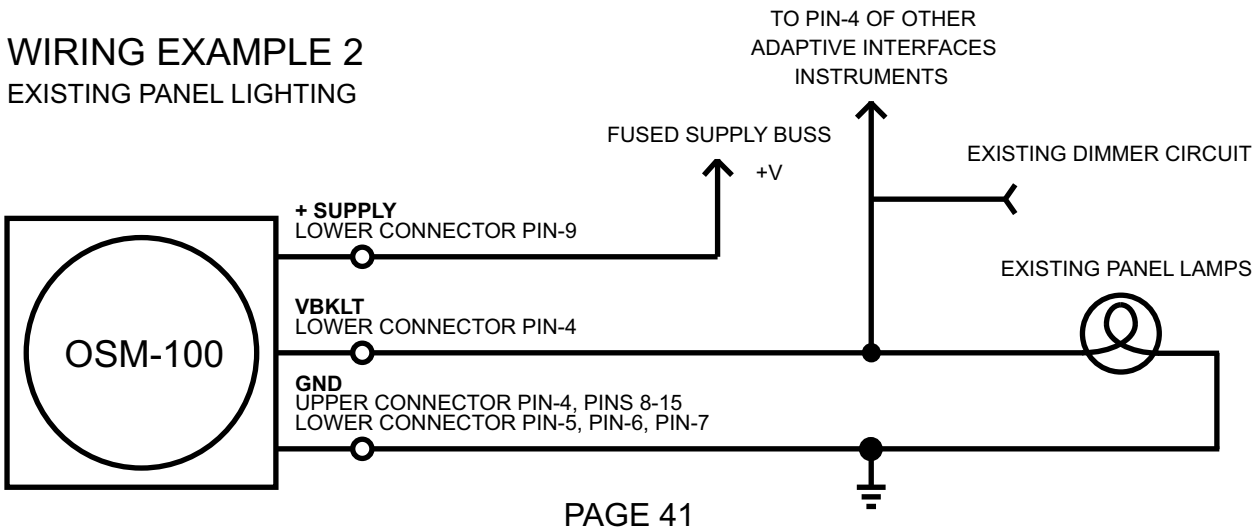
WIRING EXAMPLE 1

SEPARATE CONTROL



WIRING EXAMPLE 2

EXISTING PANEL LIGHTING



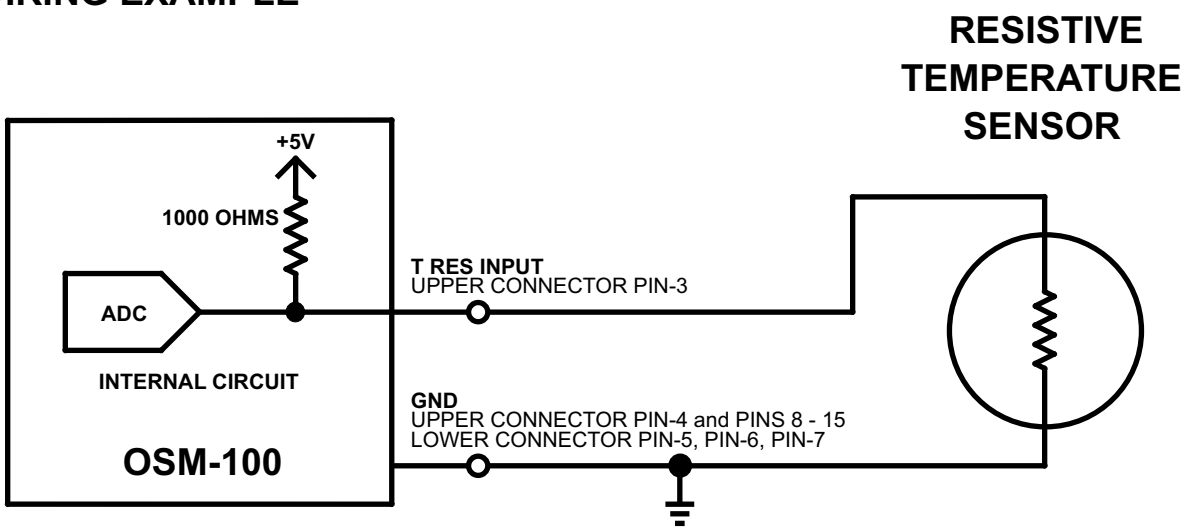
ELECTRICAL CONNECTIONS - CONT.

TEMPERATURE SENSOR - RESISTIVE TYPE

The most common type of sensor used to measure oil temperature is a resistive sensor. This type of sensor uses an element that changes its electrical resistance with temperature. To measure the electrical resistance of the sensor, the OSM-100 uses a voltage divider circuit. This circuit consists of an internal +5V source and an an internal 1000 ohm resistor that are connected to the sensor. To complete the circuit, the other side of the sensor is connected to the electrical ground. As the resistance of the sensor changes, the voltage between the sensor and the 1000 ohm resistor changes. This voltage is meassured by an analog to digital converter (ADC) within the instrument and converted to a temperature.

To convert the resistance to a temperature, the electrical resistance of the sensor must be known at two different temperatures. These temperatures and their associated electrical resistances are referred to as data points and must be entered into the OSM-100 in MENU LEVEL 3. By using a set of two data points, the OSM-100 can use a large variety of resistive sensors. Temperature and resistance values can be obtained from the sensor manufacturer or by measuring the sensor resistance at two known temperatures using a multimeter. Two good data points can be obtained by measuring the sensor resistance at room temperature (ie. 70 degrees F) and in boiling water (212 degrees F at Sea Level). When selecting temperatures, it is best to pick two that are as far apart as possible but within the range of the sensor. Also see the DATA POINTS section of this manual.

WIRING EXAMPLE



ELECTRICAL CONNECTIONS - CONT.

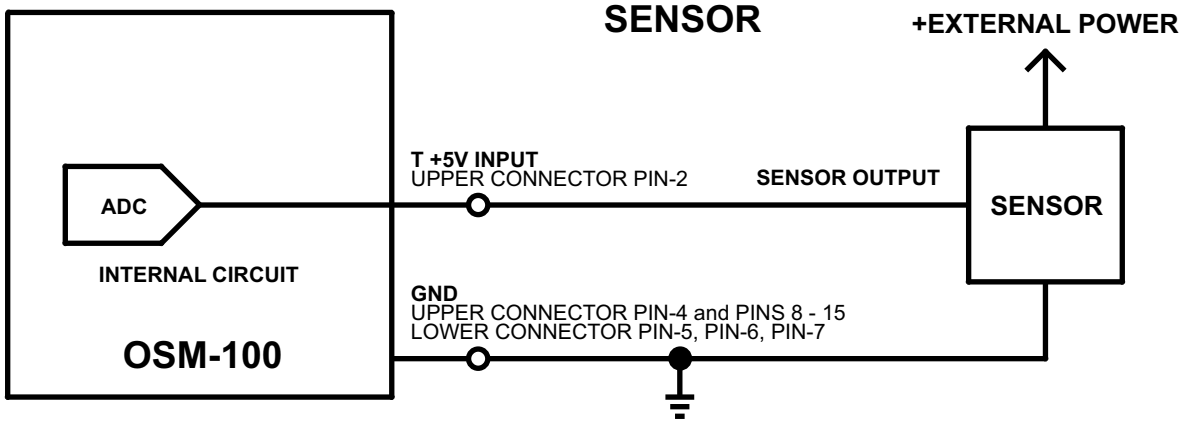
TEMPERATURE SENSOR - 0V TO 5V

The OSM-100 is designed to work with electronic temperature sensors that output a voltage between 0V and 5V. This type of sensor is powered by an external circuit and may use many different methods to convert a measured temperature to a voltage. When using this type of sensor, its output voltage is measured directly by an analog to digital convertor (ADC) in the OSM-100 and displayed as a calculated temperature.

To calculate the temperature, the OSM-100 needs to know the temperatures of two different sensor voltages. These temperatures and their associated voltages are referred to as data points and must be entered into the OSM-100 in MENU LEVEL 3. Temperature and voltage values can be obtained from the sensor manufacturer or by measuring the sensor output voltage at two known temperatures using a multimeter. Two good data points can be obtained by measuring the sensor voltage at room temperature (ie. ~70 degrees F) and in boiling water (212 degrees F at Sea Level). When selecting temperatures, it is best to pick two that are as far apart as possible but but within the range of the sensor. Also see the DATA POINTS section of this manual.

WIRING EXAMPLE

0V TO 5V TEMPERATURE SENSOR



ELECTRICAL CONNECTIONS - CONT.

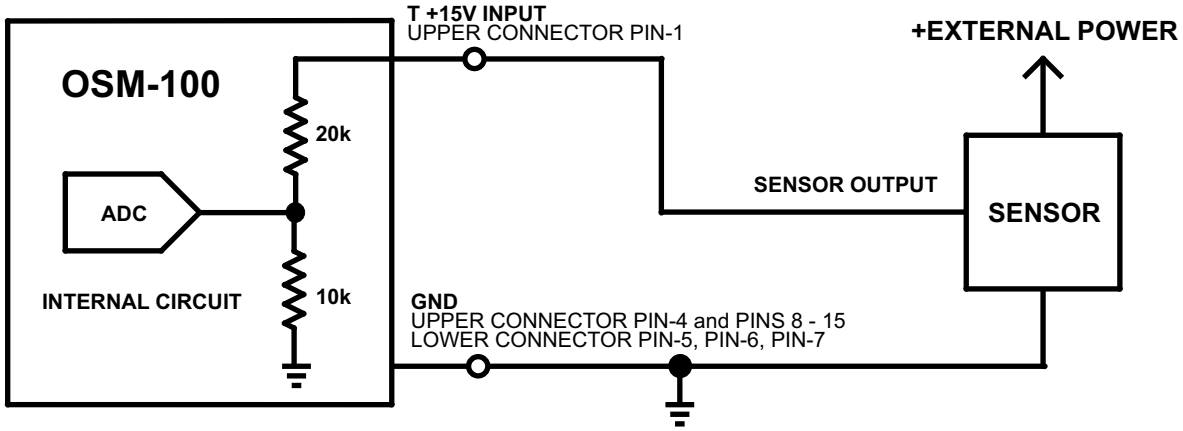
TEMPERATURE SENSOR - 0V TO +15V

The OSM-100 can operate with sensors that have output voltages greater than +5V by using the T +15V input. The operation of the OSM-100 is the same as for +5V sensors except the input voltage is divided by 3. When using the T +15V input, the OSM-100 is still set for 0V to +5V operation in MENU 1. When setting data points for the sensor, all voltages must be divided by 3 as well.

EXAMPLE:	DATA POINT 1	3.00 V = 80 ^{O}F	(0-5) SETTING = 1.00 V
	DATA POINT 2	12.6 V = 195 ^{O}F	(0-5) SETTING = 4.20 V

WIRING EXAMPLE

0V TO +15V TEMPERATURE SENSOR

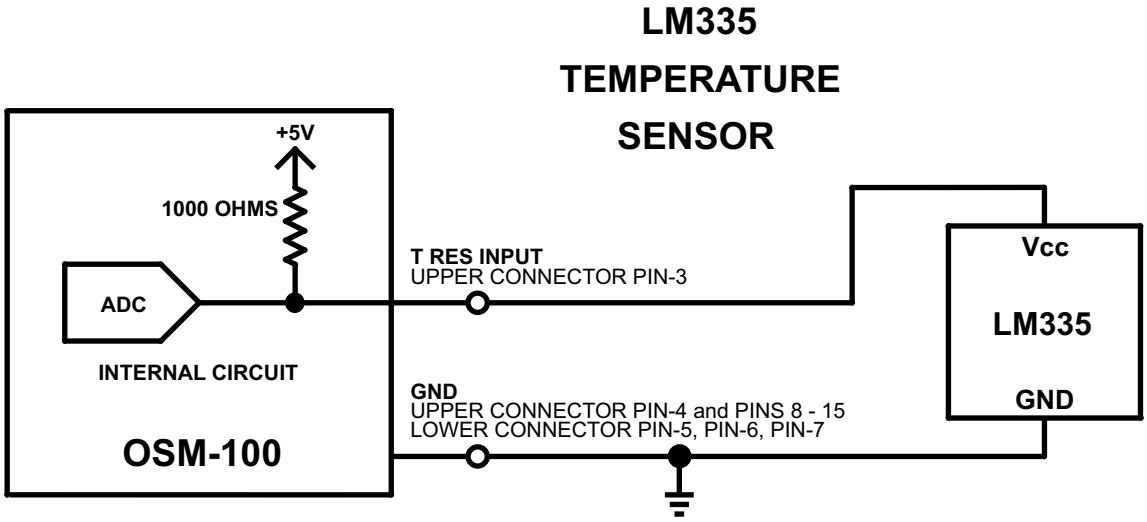


ELECTRICAL CONNECTIONS - CONT.

TEMPERATURE SENSOR - LM335

The OSM-100 is designed to operate with the LM335, a common solid state temperature sensor. The OSM-100 connects the LM335 to +5V through a 1000 ohm resistor, forming a type of voltage divider. The voltage across the LM335 is 10 mV per degree Kelvin of temperature. The OSM-100 converts this voltage to a temperature display. When using a LM335 sensor, the OSM-100 is set to 335 in MENU 1 and the sensor is connected to the T RES input. Data points do not need to be set when using the LM335.

WIRING EXAMPLE



ELECTRICAL CONNECTIONS - CONT.

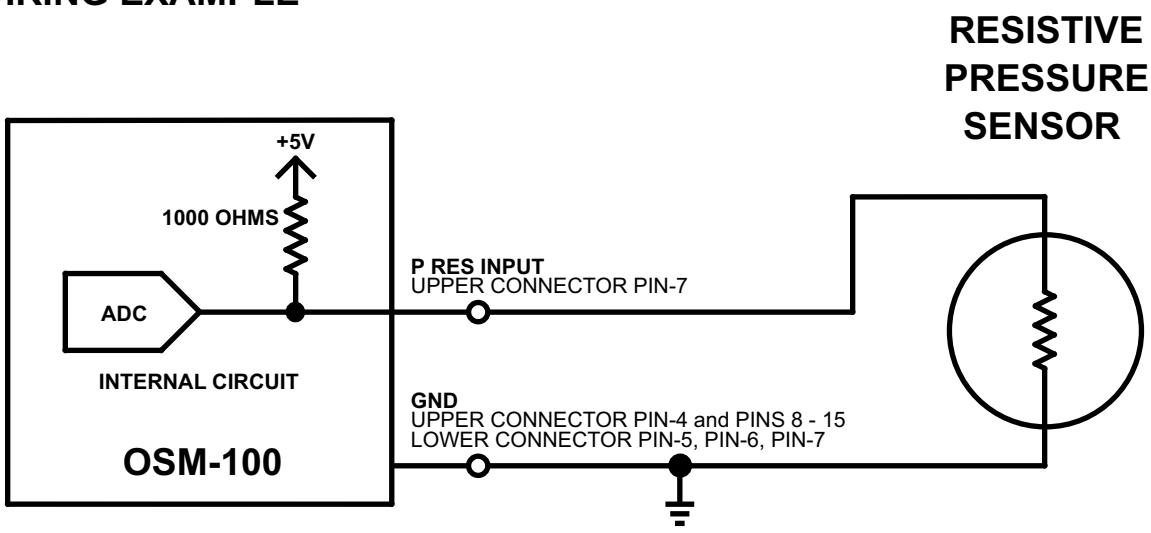
PRESSURE SENSOR - RESISTIVE TYPE

A common type of sensor used to measure oil pressure is a resistive sensor. This type of sensor uses an element that changes its electrical resistance with pressure. To measure the electrical resistance of the sensor, the OSM-100 uses a voltage divider divider circuit. This circuit consists of an internal +5V source and an an internal 1000 ohm resistor that are connected to the sensor. To complete the circuit, the other side of the sensor is connected to the electrical ground. As the resistance of the sensor changes, the voltage between the sensor and the 1000 ohm resistor changes. This voltage is meassured by an analog to digital converter (ADC) within the instrument and converted to a temperature.

To convert the voltage to a pressure, the electrical resistance of the sensor must be known at two different pressures. These pressures and their associated electrical resistances are referred to as data points and must be entered into the OSM-100 in MENU LEVEL 3. By using a set of two data points, the OSM-100 can use a large variety of resistive sensors. Pressure and resistance values can be obtained from the sensor manufacturer or by measuring the sensor resistance at two known pressures using a multimeter. Two good data points can be obtained by measuring the sensor resistance at 0 PSI and at a pressure near the top of the sensor's range using and air compressor and a good pressure gauge (calibrated, if possible).

Also see the DATA POINTS section of this manual.

WIRING EXAMPLE



ELECTRICAL CONNECTIONS - CONT.

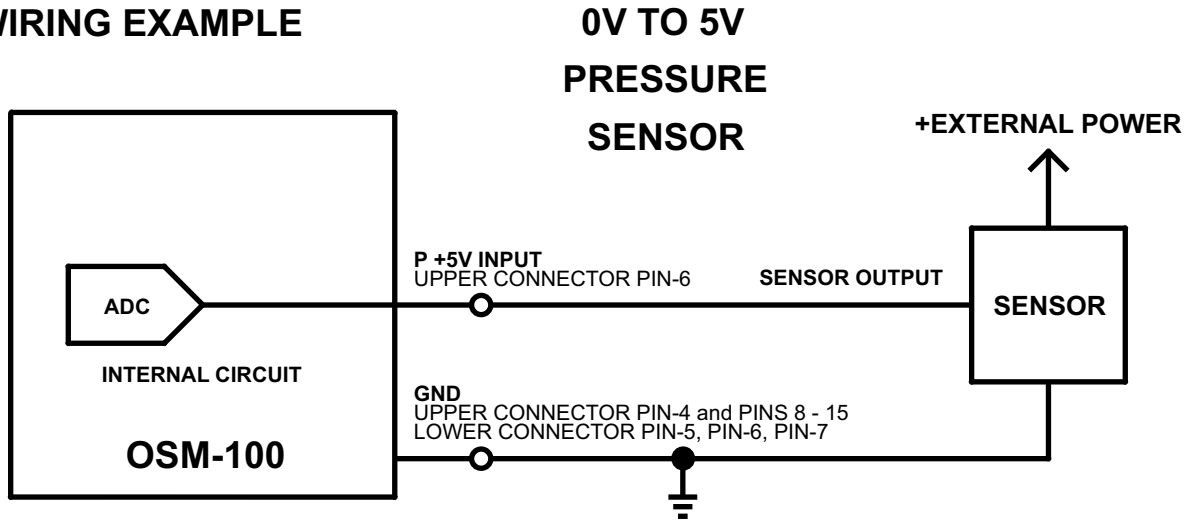
PRESSURE SENSOR - 0V TO 5V

The OSM-100 is designed to work with electronic pressure sensors that output a voltage between 0V and 5V. This type of sensor is powered by an external circuit and may use many different methods to convert a measured pressure to a voltage. When using this type of sensor, its output voltage is measured directly by an analog to digital convertor (ADC) in the OSM-100 and displayed as a calculated temperature.

To calculate the pressure, the OSM-100 needs to know the pressures of two different sensor voltages. These pressures and their associated voltages are referred to as data points and must be entered into the OSM-100 in MENU LEVEL 3. Pressure and voltage values can be obtained from the sensor manufacturer or by measuring the sensor output voltage at two known pressures using a multimeter. Two good data points can be obtained by measuring the sensor voltage at 0 PSI and at a pressure near the top range of the sensor using a an air compressor and a good (preferably calibrated) pressure gauge.

Also see the DATA POINTS section of this manual.

WIRING EXAMPLE



ELECTRICAL CONNECTIONS - CONT.

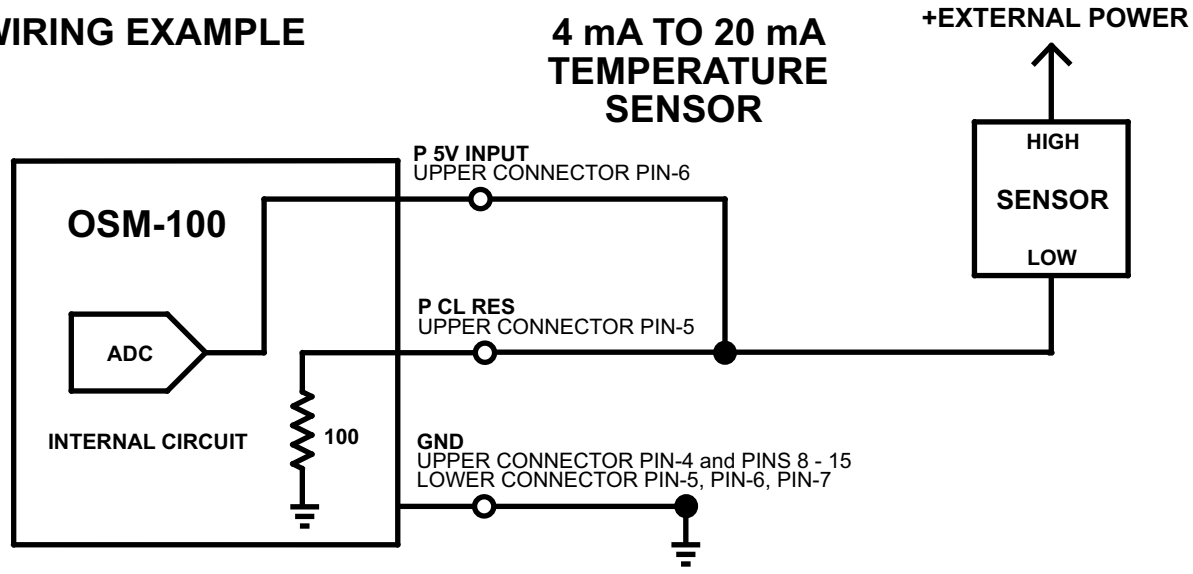
PRESSURE SENSOR - 4 mA TO 20 mA CURRENT LOOP

Current Loop pressure sensors control current flow in a circuit in proportion to measured pressure and are a common available sensor. A Current Loop sensor is powered externally and connected to ground through a resistor. The circuit current, controlled by the sensor, generates a voltage across the resistor. This voltage is measured by an analog to digital convertor (ADC) in the OSM-100 and displayed as a calculated pressure.

To calculate the pressure, the OSM-100 needs to know the pressures of two different sensor currents. These pressures and their associated currents are referred to as data points and must be entered into the OSM-100 in MENU LEVEL 3. Pressure and current values can be obtained from the sensor manufacturer or by measuring the sensor output current at two known pressures using a multimeter. Two good data points can be obtained by measuring the sensor current at 0 PSI and at a pressure near the top range of the sensor using a an air compressor and a good (preferably calibrated) pressure gauge. Although most available sensors work at 4 mA to 20 mA, the OSM-100 data points can be set to currents from 1 mA to 30 mA

Also see the DATA POINTS section of this manual.

WIRING EXAMPLE



DATA POINTS

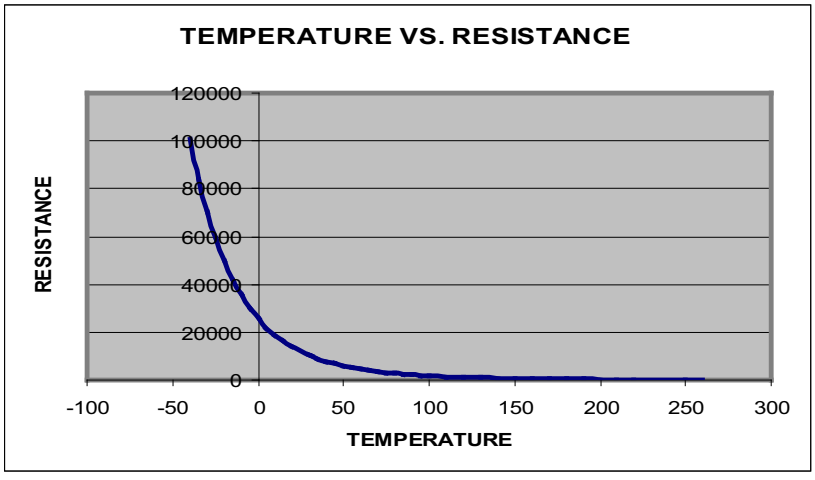
Oil temperature and oil pressure sensors are available in many forms from many different manufacturers. The OSM-100 has been designed to function with as many sensors as possible. This is done by defining a sensor within the OSM-100 and using that definition to calculate temperatures and pressures. The OSM-100 defines a sensor as a linear function between 2 DATA POINTS (in geometry, two points define a line). A A DATA POINT is a resistance, voltage or current and its associated temp./press..

In the case of a resistive temperature sensor, the sensor is further defined by exponential functions above the highest value and below the lowest value DATA POINTS.

The following example shows how DATA POINTS are entered for a resistive type temperature sensor. In this case, resistance and temperature data have been provided by the sensor manufacurer. If data is not provided, the sensor resisitance, voltage or current can be measured with a multimeter and a thermometer or pressure gauge.

RESISTIVE SENSOR EXAMPLE - MANUFACTURER'S SENSOR DATA

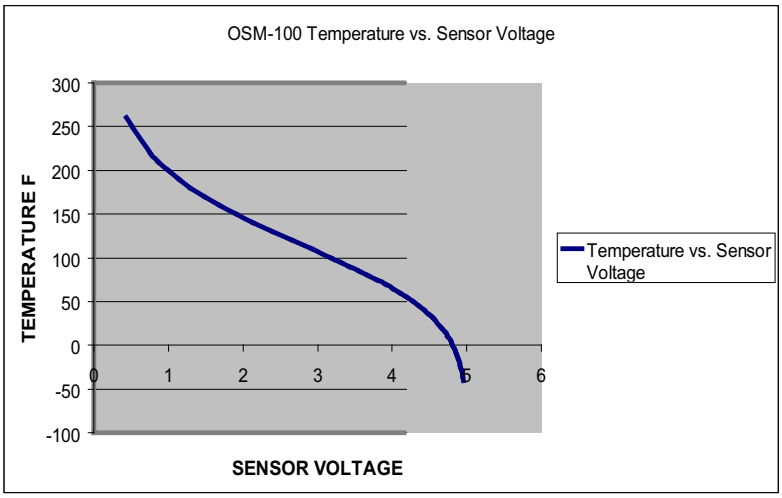
TEMP. F	RES. OHMS	TEMP. F	RES. OHMS	TEMP. F	RES. OHMS	TEMP. F	RES. OHMS
-40	100940	15	16200	70	3570	150	615
-35	83500	20	13800	75	3150	160	507
-30	70000	30	10370	80	2780	170	422
-25	58900	32	9800	85	2475	180	348
-20	49500	35	8980	90	2190	190	296
-15	41800	40	7840	95	1960	200	251
-10	35500	45	6840	100	1750	210	210
-5	30000	50	5970	110	1400	220	178
0	25500	55	5230	120	1130	250	113
5	21885	60	4600	130	915	260	96
10	18700	65	4040	140	745		



DATA POINTS (CONT.)

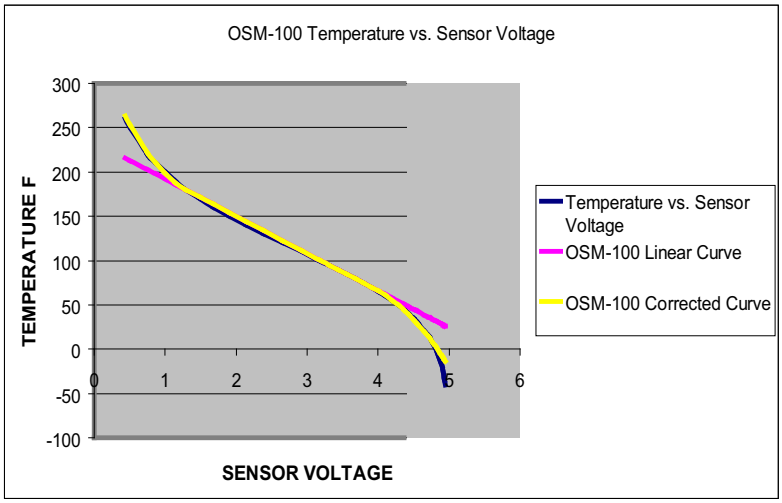
RESISTIVE SENSOR EXAMPLE (Cont.)

When connected to +5V through a 1000 ohm resistor, the voltage across the sensor varies as follows with temperature:



While the voltage to temperature function is not completely linear at its extremes, the center of the function, representing the temperature range that will occur during normal engine operation, is close to linear and can be modeled as a linear function. By adding exponential functions to both ends of the linear function, a Corrected Curve function within the OSM-100 provides more accurate high and low temperature readings.

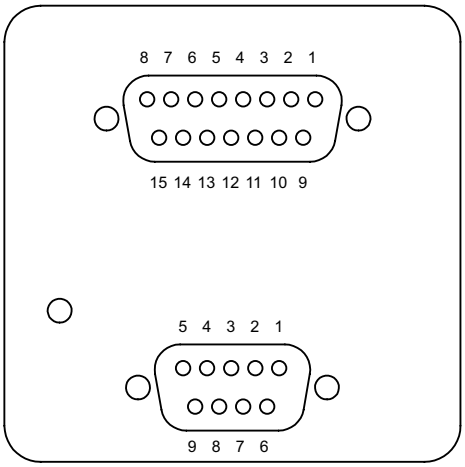
In this example, data points of 3570 ohms at 70 degrees Fahrenheit (DATA POINT 1) and 348 ohms at 180 degrees Fahrenheit (DATA POINT 2) are used to create a (linear + exponential) function in OSM-100 to closely model the temperature sensor.



OSM-100 BACK PANEL

UPPER CONNECTOR

1) T 12V INPUT
2) T 5V INPUT
3) T RES INPUT
   T LM335 INPUT
4) GND
5) P CL RES
6) P 5V INPUT
7) P RES INPUT
8) GND
9) GND
10) GND
11) GND
12) GND
13) GND
14) GND
15) GND



LOWER CONNECTOR

1) N/C
2) N/C
3) VDISP (DISPLAY BRIGHTNESS CONTROL VOLTAGE INPUT)
4) VBKLT (BACKLIGHT BRIGHTNESS CONTROL VOLTAGE INPUT)
5) GND (GROUND)
6) GND (GROUND)
7) GND (GROUND)
8) ALRM (ALARM OUTPUT - OPEN COLLECTOR)
9) + POWER INPUT