ΩΞ OMEGA™

User's Guide

Differential (Dual-Port)

Standard (Single-Port)

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DPG509 Series

Configurable Digital Pressure Gauge

ΩΞ OMEGA™

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Table of Contents

1 Notes, Cautions, and Warnings

If the equipment is used in a manner not specified in this manual, the protection of the equipment may be impaired.

Do not operate the equipment in flammable or explosive environments.

It is important to read and follow all precautions and instructions in this manual before operating or commissioning this device as it contains important information relating to safety and EMC. Failure to follow all the safety precautions may result in injury and/or damage to the equipment.

The following labels identify information that is especially important to note:

Note: Provides information that is important to successfully set up and use the DPG509.

Caution or Warning: Informs about the risk of electrical shock.

Caution, Warning, or Important: Informs of circumstances that can affect the functionality of the instruments and must refer to accompanying documents.

1.1 Battery Installation Note

Please note that this unit ships without batteries installed. For battery-powered units, batteries will need to be installed before using the unit. The installation process is simple and is shown in section **2.3 Battery Replacement and Installation**.

1.2 Precautions

- This device has not been designed, tested, or approved for use in any medical or nuclear applications.
- Never operate this device in flammable or explosive environments. Never operate with a power source other than the one recommended in this manual.
- Never operate this device outside of the recommended use outlined in this manual.
- There are no user-serviceable parts inside your device. Attempting to repair or service your unit may void your warranty.

2   Setup

2.1   General Dimensions

STANDARD (SINGLE-POINT) PRESSURE 0.3 TO 1000 PSI (LOW AND MID RANGE) 0.08% ACCURACY

1/4-18 NPT MALE PRESSURE PORT
STANDARD (ORDER CODE C)

INQUIRE FOR OTHER MALE AND FEMALE
PRESSURE PORTS:
  1/8-27 NPT (ORDER CODES A & B)
  1/4-18 NPT FEMALE (ORDER CODE D)
  BSPP 1/8 B (ORDER CODES MA & MB)
  BSPP 1/4 B (ORDER CODES MC & MD)
  7/16-20 UNJF (ORDER CODES J & K)
  9/16-18 UNF (ORDER CODES L & M)
  M12X1.5 (ORDER CODES ME & MF)
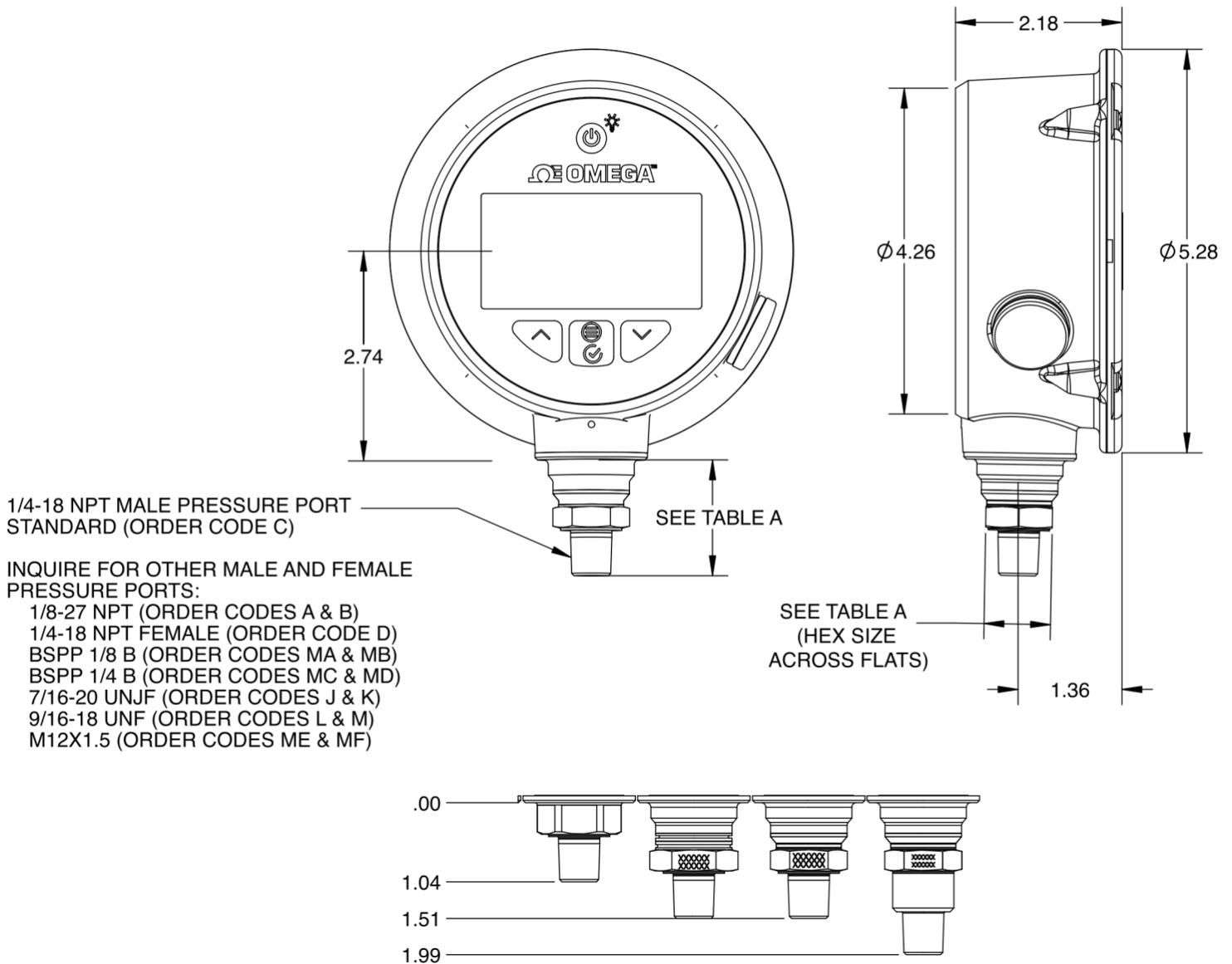
Figure 1: DPG509 Standard (Single-Point) device dimensions

Table A				
Pressure Ranges (PSI)	0 to 500	0 to 15	30 to 1000	1500 to 5000
Accuracy	±0.25%	±0.08%		
Hex Size Across Flats	1.0		0.87	

DC INPUT / ANALOG OUTPUT OPTIONS ONLY

CONNECTOR, 8 PIN
M12X1 mm THREAD

2.64

63°

1.21
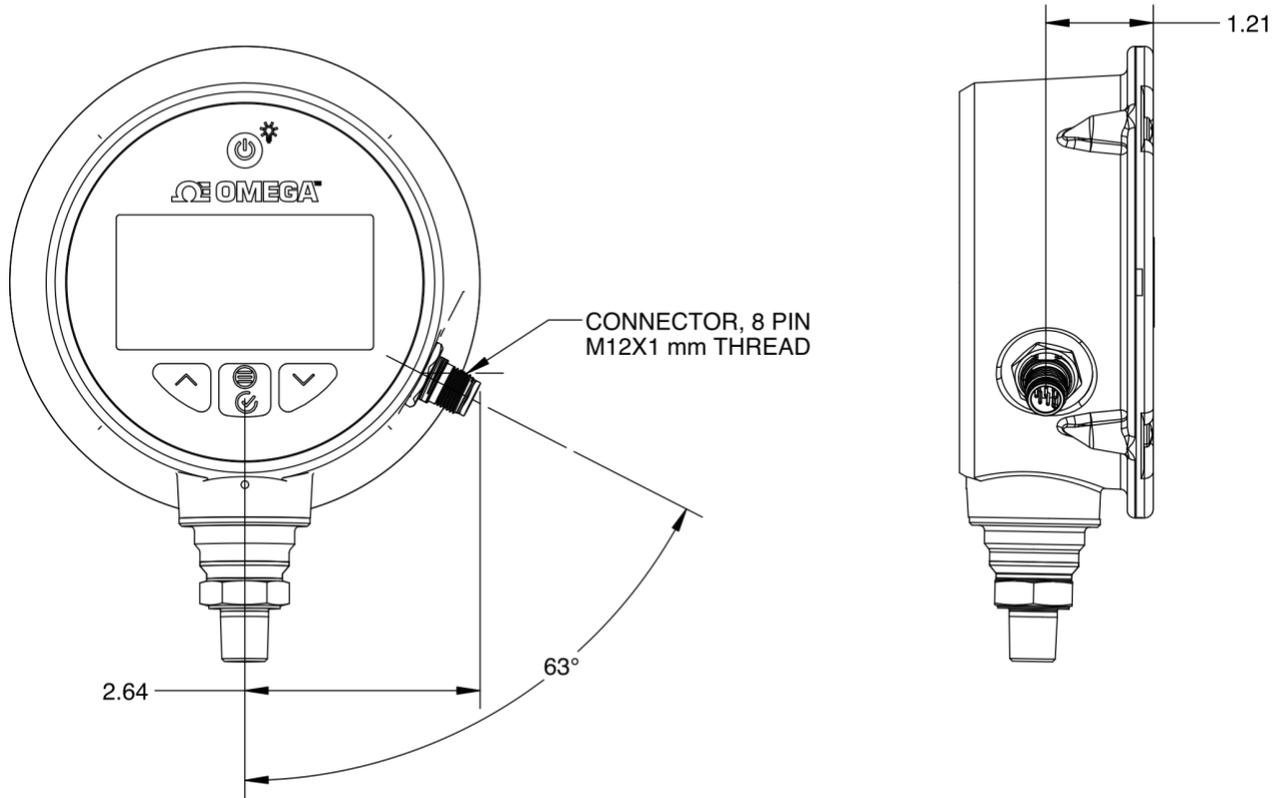
Figure 2: DPG509 DC Analog Output option dimensions

PROTECTIVE BOOT OPTION - ENCLOSURE DIMENSIONS

2.74

2.32

$\varnothing$ 4.36

$\varnothing$ 5.44
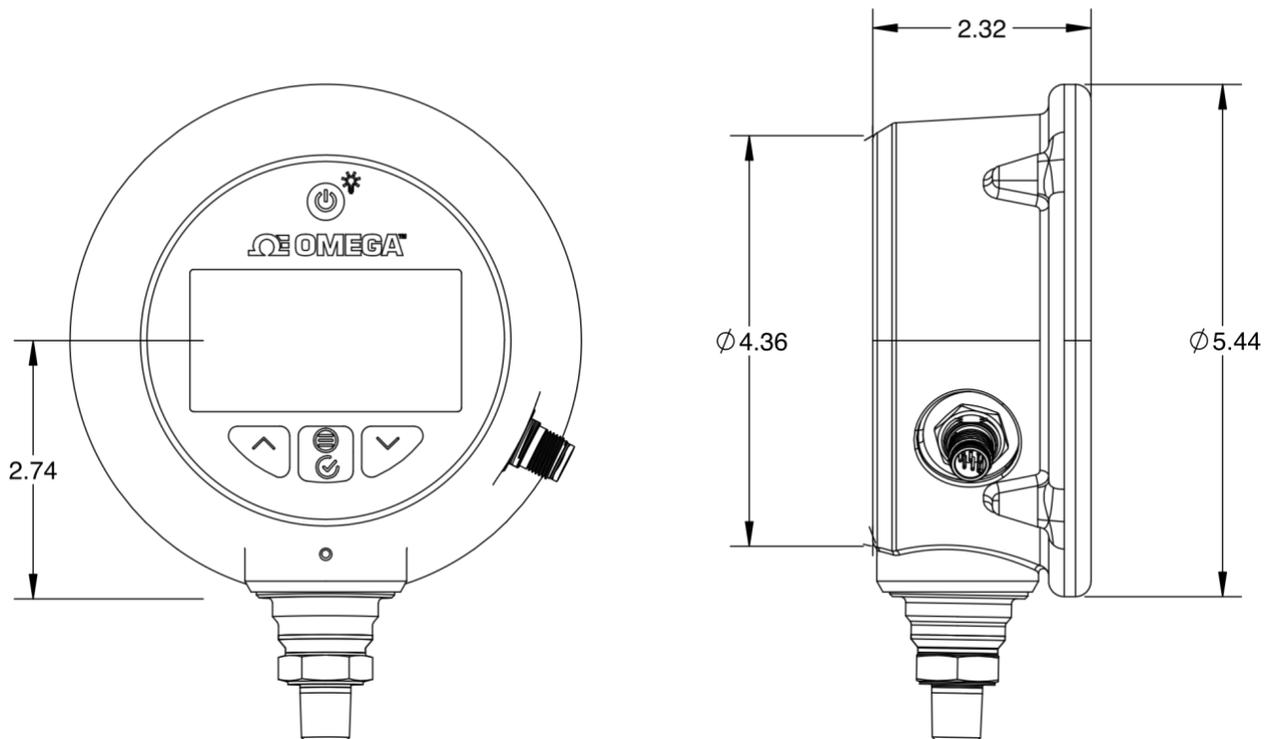
Figure 3: DPG509 DC Analog Output option with boot dimension

DIFFERENTIAL (DUAL-POINT) PRESSURE OPTION

LOW PRESS
PORT MARK
BOTH SIDES

HIGH PRESS
PORT MARK
BOTH SIDES

1/4-18 NPT MALE PRESSURE PORT
STANDARD (ORDER CODE C)
BOTH ENDS

HEX 1.00
SHOWN
0.3 TO 15 PSID

HEX .87
30 TO 1000 PSID
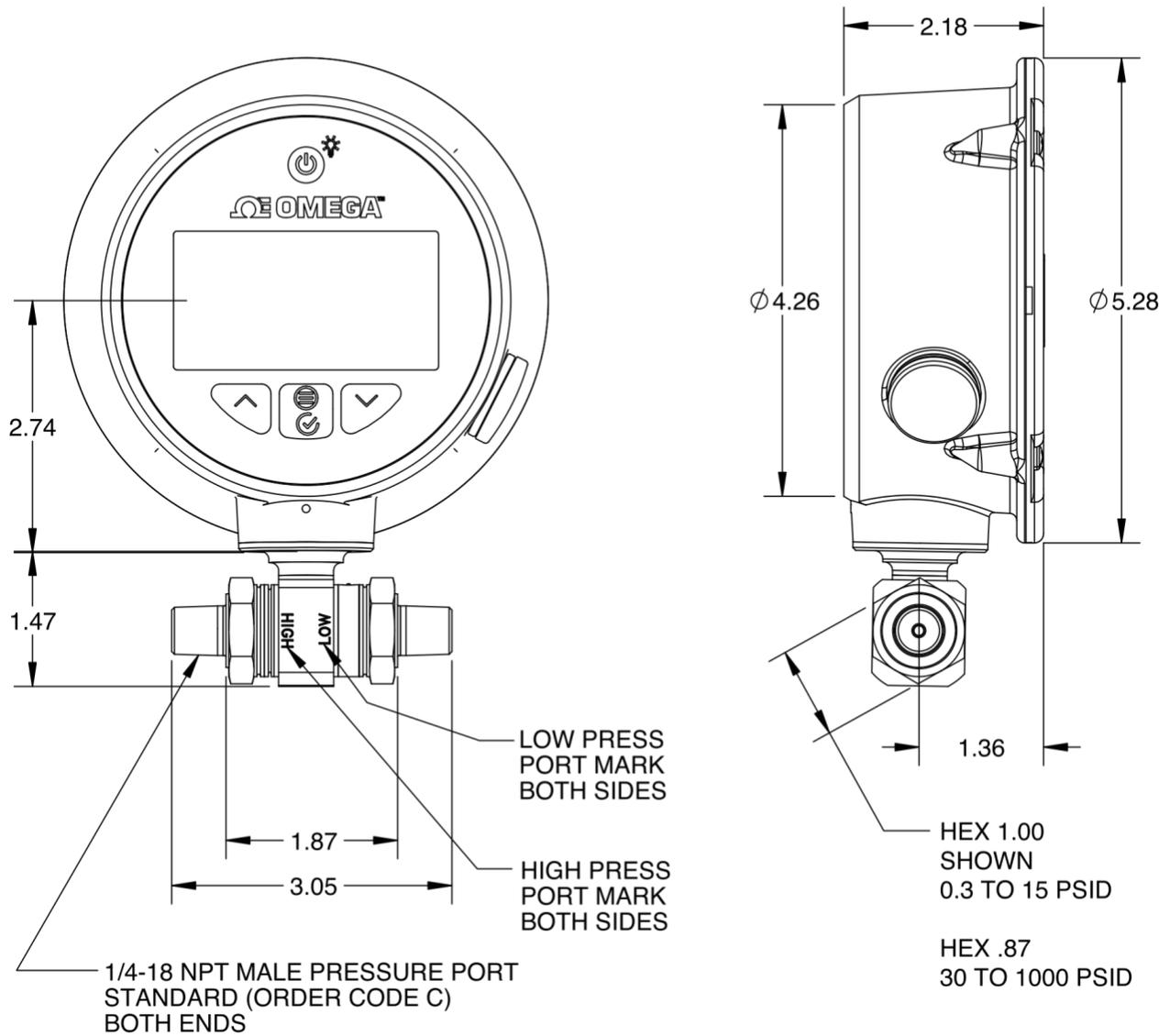
Figure 4: DPG509 Differential (dual-point) option dimensions

2.2 Installation

Verify the transducer pressure range exceeds the expected fluid pressure to be measured. Transducer damage may occur if fluid pressure exceeds the maximum pressure range marked on the transducer. Follow the steps below to complete the physical installation of the DPG509. If the unit has NPT threads, apply Teflon, PTFE thread sealant tape, otherwise, install an appropriate fluid seal (o-ring, etc).

Step 1: Install the DPG509 into mating threads until finger tight.

Step 2: Use an open-end wrench on the connection hex to continue rotating an additional ¼ to ½ turn beyond finger tight. Alternatively, apply a wrench torque of 16 in-lbs to the connection hex.

⚠ **Caution:** During installation, do not rotate the gauge housing to tighten the connection. Always use a wrench on the hex that is between the threads and housing.

Note ▽ **Note:** For differential transducers, the two (2) pressure ports are labeled either High or Low. Connect the ports to the appropriate high- or low-pressure fluid side and align to the corresponding high/low port.

Step 3: Test the connection for leaks.

Step 4: Once the connection is complete, the housing may be rotated ± 150° to allow for different LCD viewing orientations. Internal "stops" will limit the enclosure housing rotation.

⚠ **Caution:** When changing the viewing orientation, do not apply excessive torque to the enclosure housing once the internal stop is reached.

Step 5: *External Power Supply Input (if equipped):* Connect a regulated/filtered DC power supply (12-28V DC) between Pin 2 (positive) and pin 5 (negative)
Analog output (if equipped): 4-20mA: connect current loop between M12 pins 1 (positive) and 6 (negative).
Maximum Loop Ω: (V Supply-4) x 50
±5 or 10 V DC: Measure output voltage between pins 1 (positive) and 6 (negative)
Analog output must be enabled through DPG509 device menu.

2.3 Battery Replacement and Installation

PRY SLOTS
(FLAT BLADE SCREWDRIVER
TO AID LID REMOVAL)
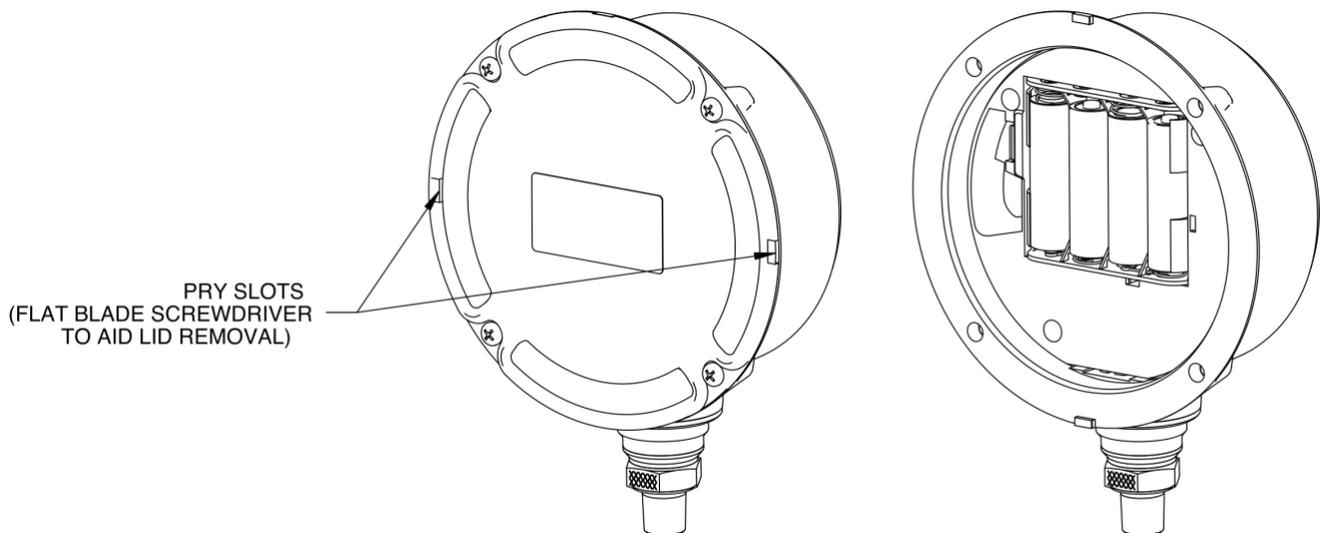
Figure 5: DPG509 Battery Compartment

The DPG509 is shipped with 4 AA batteries outside of the unit. To install or replace batteries, first remove the four screws. Then remove the lid using a flathead screwdriver and the two pry slots (shown above), as needed. Screws are captive and will be retained in the lid.

> ⚠️ **Caution:** Do not apply force to the keypad area on the front of the device when replacing the lid. Force should only be applied on the outer perimeter of the front panel (areas that do not contain keypad buttons or the screen).

> 📝 **Note:** User Settings (except for password protection settings and user calibration settings) will be lost in the event of a hard power cycle (such as replacing the batteries). User settings can be retained by first connecting the USB port to a 5V power source such as a computer or cell phone charger, or connecting power to the M12 connector (if equipped). See the figure in section **4.5.2 DATA - Data Logging Activation** to identify the USB port location.

> Battery operating and storage temperatures can vary by manufacturer. The temperature rating of the replacement batteries you choose may limit the temperature to a narrower range than specified for the DPG509. Please consult the battery manufacturer for temperature limitations.

Battery life will vary based on the quality of batteries installed and the combination of selected settings. Below are general guidelines to maximize battery life:

- Keep the backlight off or rarely use
- Select a low sampling rate
- Avoid prolonged exposure to extreme temperatures

2.4 M12 Connector Pinout

M12 connector pinout is shown in Figure 6. Note the following:
V Supply: 12 to 28 V DC (24 V DC Nominal)
Pin 5 and Pin 6 are connected internally together.
DNC = Do Not Connect

> ⚠️ **Important:** The use of analog signals requires an external power supply to be connected to Pin 2 and Pin 5 as shown in the pin layout.
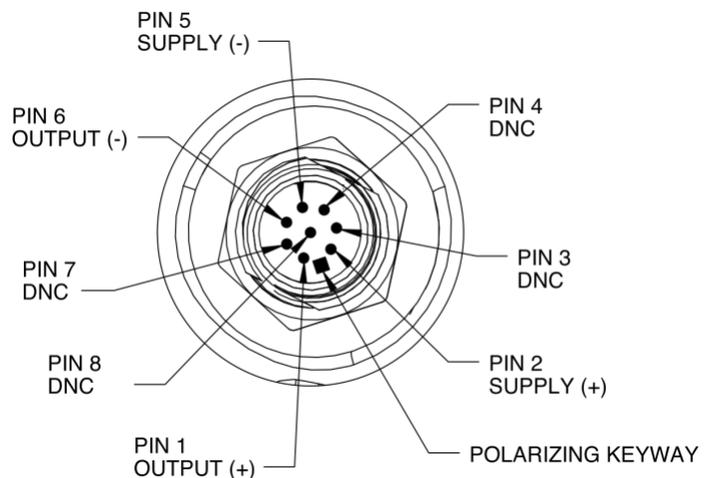

Figure 6: DPG509 M12 connector pinout

3   Menu and Configuration

Display Features
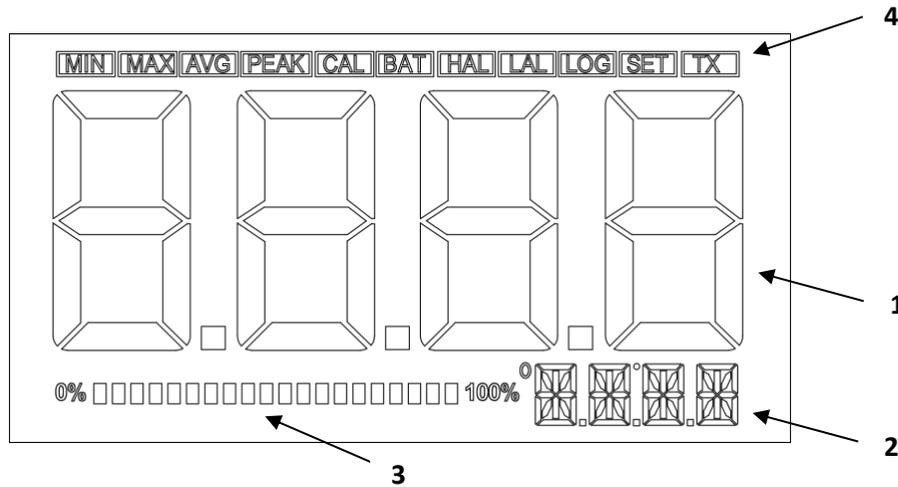
Figure 7: DPG509 device display

1. Primary Display / Process Reading
2. Secondary Display / Pressure Units
3. Pressure Plot Bar Graph
4. Status Icon

Button Functionality

Figure 8: DPG509 front panel buttons

	Power/Backlight	Powers the device on (*long press*); power on/off the device backlight display (*short press*)
	Max/Scroll Up	Displays maximum reading; Scroll up in the menu navigation
	Menu/Enter	Enter; Access the menu; Exit the menu
	Min/Scroll Down	Displays minimum reading; Scroll down in the menu navigation
Long Press		Defined by pressing and holding any button down for longer than 1.5 seconds
Short Press		Defined by pressing any button down for less than 1.5 seconds
Hard Power Cycle		Defined by removing all sources of power from the DPG509 and reapplying the power source afterwards (batteries, external M12 connector)
Power Button Cycle		Defined by long pressing the Power/Backlight button twice

Unless otherwise noted, all key presses in this document refer to short key presses. Within the user menu, if a key press is not detected within 30 seconds, the menu will exit with no changes applied.

4 Menu Structure

Main Menu	Sub-Menu	Options/Function
Dark blue options are only available for advanced menu configured orders		
UNIT	See Sect 4.1	15 selectable pressure units and 5 custom unit slots (custom units only available with advanced menu configuration option)
AOUT	OFF	Turns off analog output
	20mA	Outputs a 4 to 20 mA signal
	10V	Outputs a 0 to 10V signal
	5V	Outputs a 0 to 5V signal
CAL	ZERO	Zero-scale user adjustment
	RSET	Reverts to the factory default calibration
	FULL	Full-scale user adjustment
MODE	NORM	Displays current pressure
	TARE	Tares unit using current pressure reading
	MAX	Displays maximum pressure recorded
	MIN	Displays minimum pressure recorded
OPTN	PLOT	Toggles the pressure plot display (default is ON)
	SET	Menu for setting the time/date
	BOOT	Places the device in bootloader mode for system updates
	TIME	Select display shutoff timer interval
	RATE	Select sampling rate
	DATA	Toggles data logging mode
	BKLT	Sets the backlight on time with a keypad press
	CUST	Set custom unit calibration constant
	PASS	Set and activate unit password
	DAMP	Toggles the data filter on the pressure output

Note: User Settings (except for password protection settings and user calibration settings) will be lost in the event of a hard power cycle (such as replacing the batteries). User settings can be retained by first connecting the USB port to a 5V power source such as a computer or cell phone charger, or connecting power to the M12 connector (if equipped). See the figure in section **4.5.2 DATA - Data Logging Activation** to identify the USB port location.

4.1 UNIT - Display Pressure Units

Menu	Scroll through menu	Highlight "UNIT"	Select	Scroll through menu And highlight the unit

Select the preferred unit
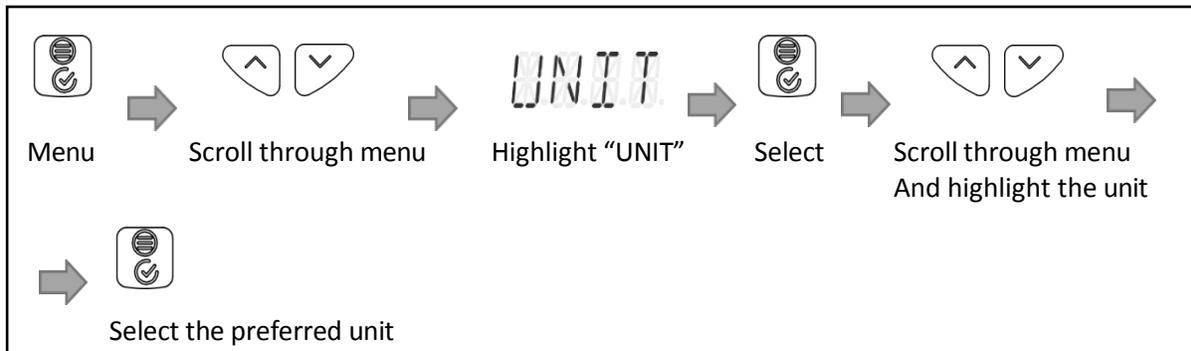
The DPG509 is pre-programmed to allow users to choose from 15 different pressure units. Consult the Units Conversion Table in Appendix A to ensure that an appropriate pressure unit is selected for the pressure range of the DPG509 being used.

For units ordered / equipped with Advanced Menus, an additional 5 custom unit slots are available (CTM1, CTM2, CTM3, CTM4, CTM5). The CTM parameters set a calibration constant that can be applied to the base pressure (PSI) readings of the DPG509. Refer to section **4.5.4 CUST - Custom Units** for details.

Pressure Units	Menu Option
Inches of mercury	INHG
Inches of water	INWC
Feet of water	FTWC
Pounds per square inch	PSI
Millimeters of water	mmWC
Millimeters of mercury	mmHG
Centimeters of mercury	cmHG
Millibar	mBAR
Bar	BAR
Pascal	PA
Hectopascal	hPA
Kilopascal	KPA
Megapascal	MPA
Torr	TORR
Standard Atmosphere	ATM

4.2 AOUT - Analog Output Operation

Menu	Scroll through menu	Highlight "AOUT"	Select	Scroll through menu to select reference voltage

The DPG509 can be configured to provide analog output signals by selecting the Analog Output (**AOUT**) menu option. The physical signal output can be accessed through the DPG509's M12 8-pin connector using the supplied interface cable.

Menu Option	Output
OFF	Analog output off
5V	-5 V to 5 V
10V	-10 V to 10 V
20mA	4 to 20 mA

The display will show either 5V, 10V, or 20mA, depending on the DPD509 configuration. An option to disable the signal output is also available as an **OFF** submenu option. When a selection has been made, the DPG509 menu will auto-exit and return to the current mode of operation. The analog output that was selected immediately becomes active.

⚠ **Important:** The use of analog signals requires an external power supply to be connected to Pin 2 and Pin 5 as shown in the pin layout. There is no display icon to indicate the analog output (AOUT) is active, however, the user should confirm the AOUT signal is provided by measuring the signals across Pin 1 and Pin 6. Refer to to the figure in section **2.4 M12 Connector Pinout**.

4.3 CAL - User Calibration – ZERO, FULL, RSET

Menu	Scroll through menu	Highlight "CAL"	Select ZERO, FULL, or RSET

User calibration of the DPG509 can be performed by setting the Zero Adjustment (**ZERO**) and the Full-Scale Adjustment (**FULL**) in the CAL menu option. From the **CAL** submenu, the user will be presented with the following options: ZERO, FULL, and RSET. User Calibration settings are maintained through a hard power cycle.

Note: Zero and Full-Scale adjustments are calibrated within 0.25% accuracy.

4.3.1 ZERO - Zero Adjustment

The DPG509 must not be pressurized for this process. The user can calibrate the $ADC_{LOW\ VALUE}$ to read zero by navigating to and entering the ZERO submenu option from the CAL menu option. The device will then perform the zero-adjustment function to calibrate a pressure reading of zero.

Important: The DPG509 has a fail-safe that only allows the zero-adjustment function to occur if the current pressure reading is within 5% of the full-scale pressure value. If the device is reading a pressure greater than 5% of the full-scale pressure value, an E8 error will flash on the DPG509 display. (Example: For a 30 PSI gauge, the current pressure reading would need to read no more than 1.5 PSI to complete the zero adjustment, or else the E8 error will occur)

4.3.2 FULL - Full-Scale Adjustment

The DPG509 must be at full-scale pressure for this process. The user can calibrate the $ADC_{HIGH\ VALUE}$ to read the full-scale pressure reading value by navigating to and entering the **FULL** submenu option from the CAL menu option. The device will then perform the full-scale adjustment function to calibrate the full-scale value.

Important: The DPG509 has a fail-safe that only allows the full-scale adjustment function to occur if the current pressure reading is within 95-105% of the full-scale pressure value. If the device reading is not within 95-100% of the full-scale pressure value, an E8 error will flash on the DPG509 display. (Example: For a 30 PSI gauge, the current pressure reading would need to read at least 28.5 PSI to complete the full-scale adjustment, or else the E8 error will occur)

4.3.3 RSET - Reset (Factory Default)

The zero and full-scale calibration can be set back to the factory default by navigating to and entering the **RSET** submenu from the CAL menu option.

4.4   MODE – Unit Mode Settings

4.4.1   NORM - Normal

Menu   Scroll through menu   Highlight "MODE"   Select   Scroll through menu

Highlight "NORM"   Select
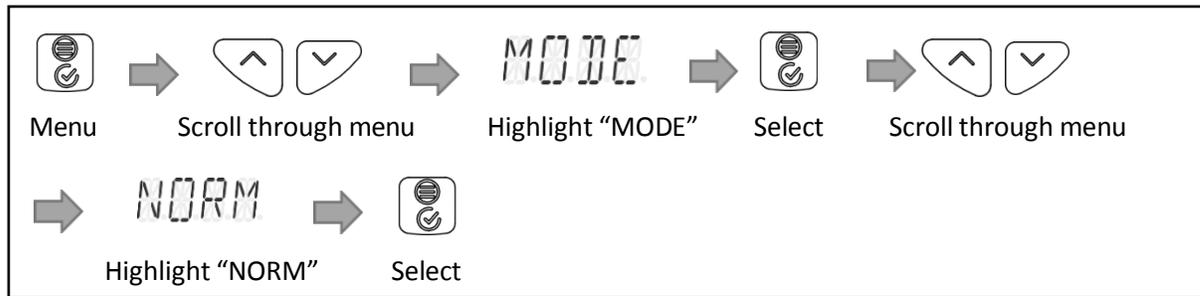
In normal mode, the DPG509 will always display the current pressure applied to the device. The primary display can also show the min and max recorded pressure while in **NORM** mode by pressing the min or max buttons ⌃⌄. When this happens, the min/max recorded pressure is then temporarily displayed for 10 seconds before returning to the most recent pressure reading. Stored values can be reset with long presses (1.5 seconds or more) of the up/down buttons. Stored values will not be kept if power is lost.

4.4.2   TARE

Menu   Scroll through menu   Highlight "MODE"   Select   Scroll through menu

Highlight "TARE"   Select
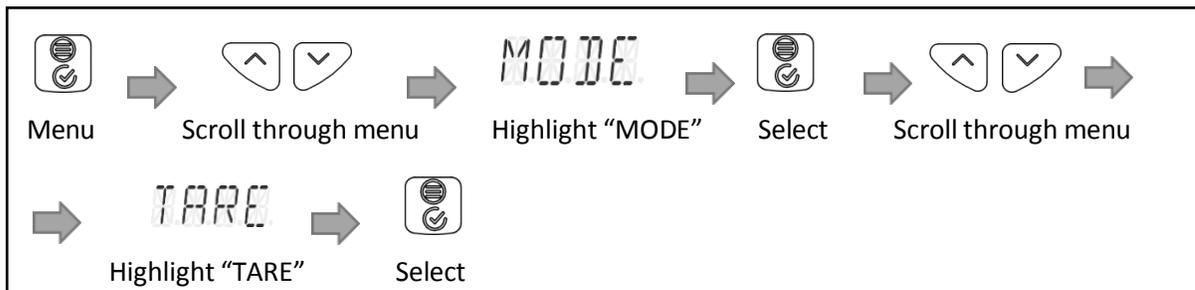
Tare mode zeroes the unit at an applied pressure. When tare mode is selected, the current pressure applied to the DPG509 will be used as the tared pressure. For instance, if the currently applied pressure is 5 PSI, and the DPG509 enters TARE mode, the primary display will then go from displaying 5 PSI (current pressure) to 0 PSI (tared pressure @5 PSI). To indicate that the unit is in tare mode and has been re-zeroed at some value, the secondary display will alternate between the engineering pressure units and the word **TARE**.

4.4.3   MAX - Maximum

Menu   Scroll through menu   Highlight "MODE"   Select   Scroll through menu

Highlight "MAX"   Select
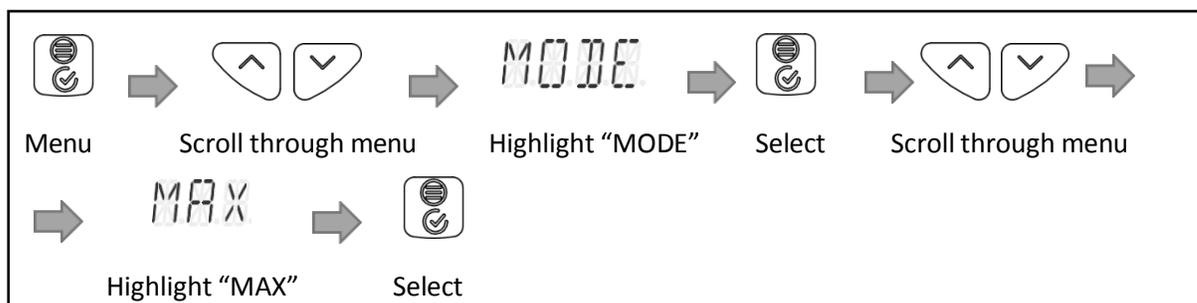
In maximum mode, the DPG509 will always display the maximum pressure recorded from the moment power is applied to the device or the batteries were installed. The **MAX** icon will be illuminated while in this mode to alert the user. The min button ⌄ can also be pressed in this mode to temporarily display for ten seconds the minimum pressure recorded. To reset the maximum pressure value, press the max button ⌃ for approximately 1.5 seconds. The LCD screen will quickly flash a blank screen and then display the new maximum value.

4.4.4 MIN - Minimum

| | | | | | |
| Menu | Scroll through menu | Highlight "MODE" | Select | Scroll through menu |

| | |
| Highlight "MIN" | Select |
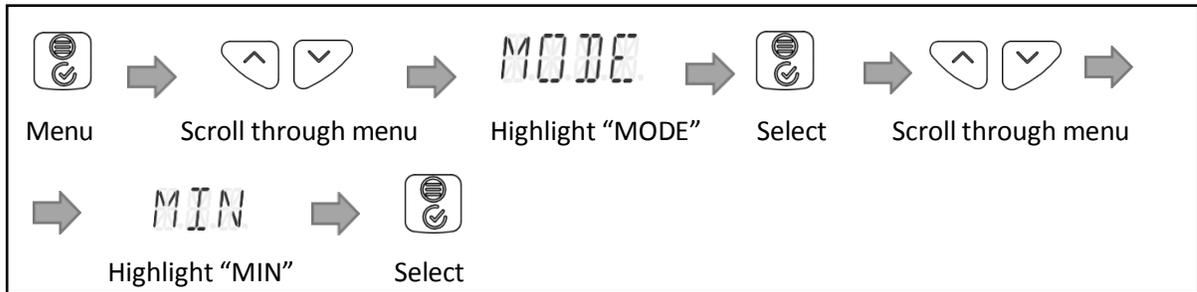
In minimum mode, the DPG509 will always display the minimum pressure that has been recorded from the moment power is applied to the device or the batteries were installed. The **MIN** icon will be illuminated while in this mode to alert the user. The max button ⌃ can also be pressed in this mode to temporarily (for 10 seconds) display the maximum pressure recorded. To reset the minimum pressure value, press the min button ⌄ for approximately 1.5 seconds. The LCD screen will quickly flash a blank screen and then display the new minimum value.

4.5 OPTN – User Option Settings

4.5.1 PLOT - Pressure Plot Bar Graph

| | | | | | |
| Menu | Scroll through menu | Highlight "OPTN" | Select | Scroll through menu |

| | |
| Highlight "PLOT" | Select to toggle on/off depending on previous state |
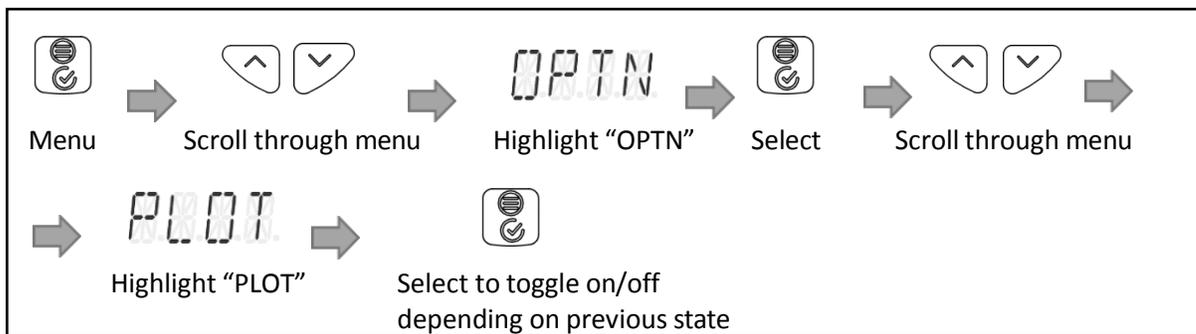
The DPG509 **plot** is a 20-segment bar graph display at the bottom of the screen that will plot the current LCD pressure as a function of the full-scale range of the DPG. It can be toggled on and off. For example, in normal mode with an applied pressure of 25 PSI on a 50 PSI unit, the DPG509 will illuminate 10 segments (half of 20). If Min or Max buttons are pressed to temporarily display these pressures, the plot will also change accordingly. In tare mode, the gauge's tared value will be plotted against the full-scale range.

4.5.2 SET - Clock Configuration

Menu	Scroll through menu	Highlight "OPTN"	Select	Scroll and select "SET"

The DPG509's clock can be configured through the Options Menu (OPTN) under the **SET** submenu. Setting the date and time can be useful, especially when logging data to an SD card per section **4.5.2 DATA - Data Logging Activation**. The user will then be able to choose from the options listed in the accompanying table.

Date Parameter	Menu Option
Day of the month	DATE
Current Month	MON
Current Year	YEAR
Current Hour (24-Hour Format)	HOUR
Current Minute	MIN

The SET sub-menu will not auto-exit when a configuration has been made to allow the user to set all data and time parameters without having to re-enter the menu 5 times. Once the user is finished setting the date, a long press (longer than 1.5 seconds) of the MENU button will exit the submenu. The DPG509 clock will maintain the configured date and time so long as there is not a hard power cycle. A hard power cycle will reset the clock to the default values and will require the user to re-enter the current date and time.

4.5.3 BOOT - Bootloader – System Updates

Menu	Scroll through menu	Highlight "OPTN"	Select	Scroll and select "BOOT"
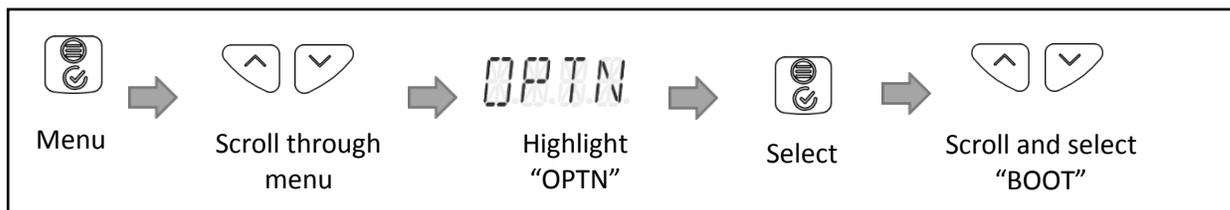
The system of the DPG509 can be updated when the device is set to Boot Mode (**BOOT**) and is connected directly through a micro-USB cable to a PC running the custom software interface. Once the device is set to Boot Mode, all segments of the display will illuminate and the device will not respond until the update is complete.

4.5.4 TIME - Display Shutoff Timer

Menu	Scroll through menu	Highlight "OPTN"	Select	Scroll through sub menu

Highlight "TIME" → Set the preferred amount of time
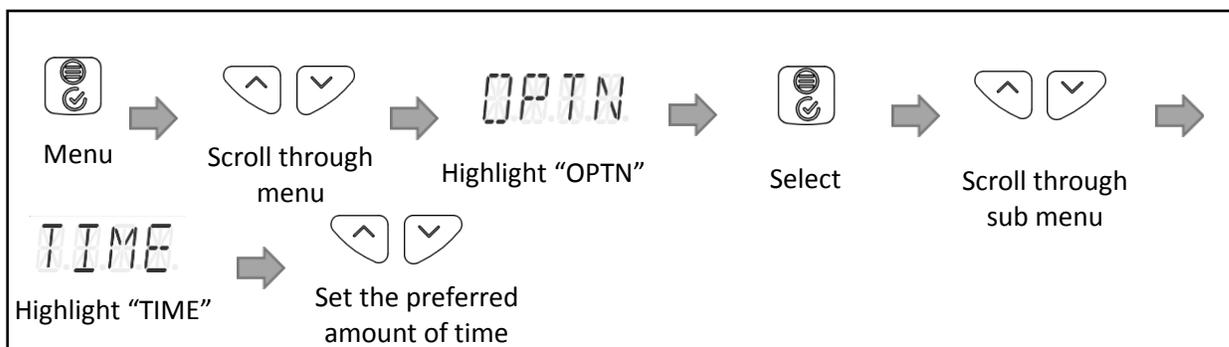
The DPG509 has a programmable display shutoff timer that allows the user to automatically shut off the display after a set amount of time. By shutting off the display, the DPG509 will consume less power. The DPG509 sleep timer can be set thr ough the OPTN menu and can be programmed up to 99 hours and 99 mm (hh:mm). The SET icon will appear on the display when the Shutoff Timer has been activated.

4.5.1 RATE - Sampling Rate

| Menu | Scroll through menu | Highlight "OPTN" | Select | Scroll through menu |

| Highlight "RATE" | Select | Scroll through menu to select sample rate | Select |
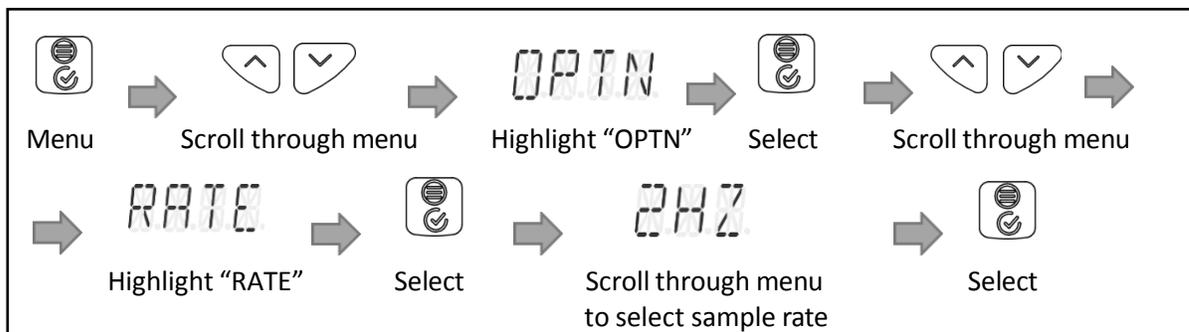
The DPG509 has 7 pre-set **sampling rates** that are used to determine how often the DPG509 takes a pressure reading. The default rate for the DPG509 is 0.50 Hz, equal to a sample every two seconds. Sample rates affect battery life. For maximum battery life, select a slow sample rate.

Sample Rate Options	
Sample Interval	**Menu Option**
0.1 seconds	10Hz
0.5 seconds	2HZ
1 second	1HZ
2 seconds	0.50HZ
5 seconds	0.2HZ
10 seconds	0.1HZ
1 minute	0.02HZ

4.5.2 DATA - Data Logging Activation

| Menu | Scroll through menu | Highlight "OPTN" | Select | Scroll and select "DATA" |

DPG509 devices that have b een commissioned with the Data Logging feature (**DATA**) can record the current pressure and temperature data on a micro SD card, supplied when the Data Logging Advanced Menu feature is ordered, with a timestamp in the HH:MM:SS format. To set the device date and time refer to section **4.5.2 SET - Clock Configuration**. The micro-SD card can be accessed from the inner partition near the battery holder. No external software is needed to use the feature. Logged data is saved as a .CSV file. The DPG509 will record data in the base unit that the device was calibrated for. The temperature units will be recorded in Celsius. The timestamp will utilize a 24-hour clock. The date will only be recorded at the beginning of a read, or when there is a date change. The data logging sampling rate is the same rate selected by the user through the RATE menu as shown in section **4.5.1 RATE - Sampling Rate**. When the data logging feature is deactivated and then reactivated, the new data is appended to the .CSV file.
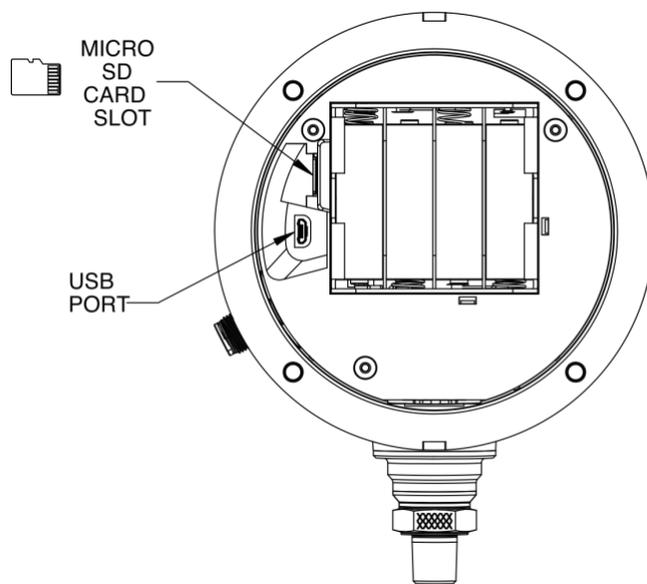
Figure 9: DPG509 micro SD card slot and USB port

Note: The data logging reaches a maximum of 3-4 samples per second when the fastest sampling rate of 10 Hz is selected.

An 8, 16, or 32 GB SD card can be used and must be formatted to FAT32. To install the SD Card, remove the rear lid and install the card into the slot as shown in Figure 9.

4.5.3   BKLT - Display Backlight Timer

| Menu	Scroll through menu	Highlight "OPTN"	Select	Scroll and select "BKLT"
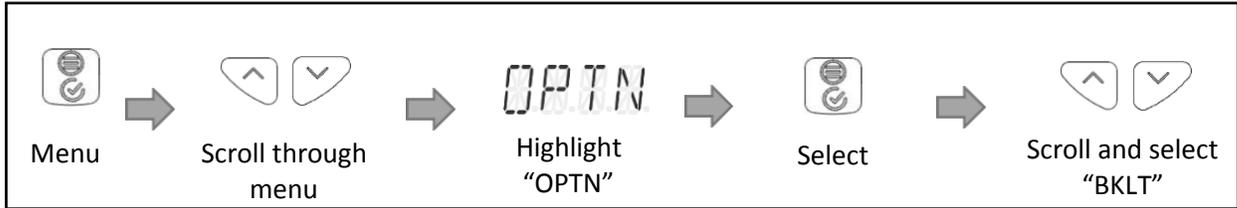
The DPG509 comes with an LED backlight that illuminates with a short press of the device power button. The Display Backlight Timer feature is only available when the DPG509 is configured/ordered with **Advanced Menus**. By default, the backlight will stay illuminated for 10 seconds before shutting off, however, the amount of time that the backlight stays illuminated can be configured in the Options Menu (OPTN) under the **BKLT** submenu.

Timer Length	Menu Option
10 seconds	10s
30 seconds	30s
1 minute	1min
5 minutes	5min
Always On	ON

Note: For maximum battery life, set the Backlight Timer to short lengths. Due to the power consumption involved with using the backlight, it is recommended that the **Always On** option only be used when the DPG509 device is being powered by an external power through the M12 connector.

4.5.4   CUST - Custom Units

Menu	Scroll through menu	Highlight "OPTN"	Select	Scroll through menu to select "CUST"

Select d1-d6 and/or dp to define the calibration constant
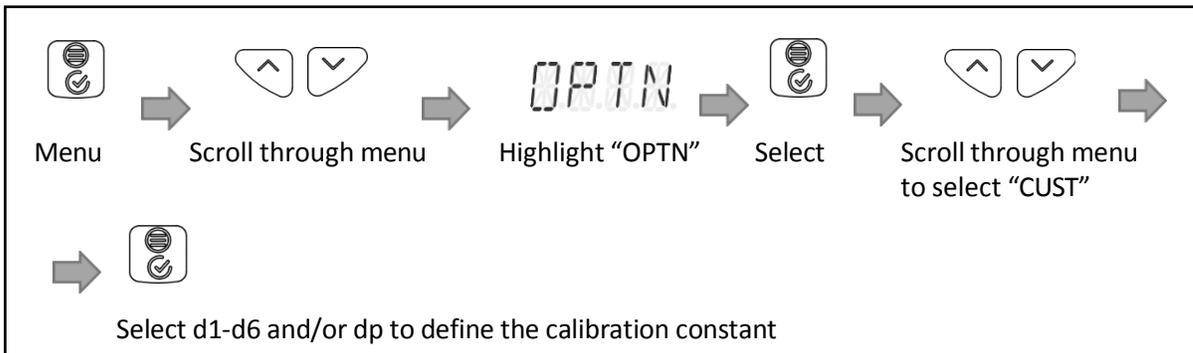
The Custom Units feature is only available when the DPG509 is configured/ordered with **Advanced Menus**. The custom calibration constants have a 6-digit resolution, represented on the DPG509 display as values **d1-d6**. Once a custom unit slot is selected, another sub-menu will appear with the following choices: **dp**, **d1**, **d2**, **d3**, **d4**, **d5**, and **d6**. d1 represents the most significant digit of the calibration constant, and d6 represents the least significant digit.

To set a decimal point and convert the calibration constant from a whole number to a float value, the user needs to select **dp** from the submenu options and input a value from 0 to 5 to define the position of the decimal point (Example: A dp value of 5 will apply a calibration constant value of 0.00001, meaning there will be 5 decimal digits and 1 integer digit). Custom unit configurations are maintained when the unit is powered off with the power button.

4.5.6   PASS - Password Protection

| Menu | Scroll through menu | Highlight "OPTN" | Select | Scroll and select "PASS" |

The DPG509 offers a password protection feature that will only allow authorized users to change any of the DPG509 settings. The Password Protection feature is only available when the DPG509 is configured/ordered with **Advanced Menus**. The feature ca n be accessed from the OPTN menu option under the **PASS** submenu. The user will then be able to choose SET to set a 4-digit password incrementally using the Up/Down buttons, or the user may choose OFF to disable the password protection after inputting the current password.

When the password is enabled, any user will still be able to view the low/high saved pressure using the MIN/MAX buttons respectively, any user will be able to toggle the DPG509 power, and any user will be able to adjust the LED backlight. Any other action will prompt a password input. The DPG509 will remain unlocked for a period of 30 seconds after the last key press. The user can lock the device immediately by performing a power button cycle of the device. Password configurations are maintained through power button and hard power cycle.

4.5.7   DAMP - Dampening Feature

| Menu | Scroll through menu | Highlight "OPTN" | Select | Scroll and select "DAMP" |

The DPG509 offers a dampening feature (**DAMP**) that can be enabled and disabled in the Options Menu (OPTN). The dampening feature is only available when the DPG509 is configured/ordered with **Advanced Menus**. The dampening feature allows the user to filter the DPG509 transducer raw data into a smoother output by recording and averaging the 5 most recent transducer readings. The user will be able alerted to this mode by the illumination of the AVG icon on the DPG509 display.

5 Troubleshooting / Error Codes

If you encounter an error code that does not resolve itself after a few seconds, a hard power cycle may resolve the issue. To perform a hard power cycle, remove the batteries and DC power (if equipped) and reapply power. If the error code is not resolved by a hard power cycle, contact Omega's Customer Service Department for further instructions.

Error Code	Error	Troubleshooting
E1	Error communicating with pressure sensor	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E2	Error communicating with pressure sensor	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E3	Error reading data	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E4	Error communicating with pressure sensor	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E5	Error communicating with LCD display	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E6	Error communicating with LED backlight	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E7	Error in zero attempt	Ensure the device is at zero pressure.
E8	Attempt to zero beyond 5% FS pressure range	Ensure the device is at zero pressure. Contact Omega Engineering if the device drifts beyond 5% FS pressure.
E9	MCU Error	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E10	Incorrect password entered	Enter the correct password; Use the bootloader to reflash the system or contact Omega Engineering.
E11	ADC error	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E12	EEPROM error	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E13	Error reading data	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E14	Error reading device temperature	Perform a hard power cycle. If the problem persists, contact Omega Engineering.
E15	No SD card detected	Insert SD card in the slot on the back of the DPG509.
E16	Not enough memory available on SD card	Ensure that the SD card has available memory for data logging.
E17	Output activation w/o external power	Apply external power. If the problem persists, contact Omega Engineering

6 Service and Calibration

Your DPG509 pressure gauge has been built, tested and factory calibrated to meet or exceed the specifications listed here in this manual.

If your DPG509 requires service or factory recalibration, please contact our Customer Service Department at one of the following options:

1-203-359-1660 (US & Canada)
1-888-826-6342 (International)
cservice@omega.com

Live Chat Chat live with an agent at https://www.omega.com/en-us/

7 Appendix A: Unit Conversion Table

Max decimal places = 3
Max decimal places = 2
Max decimal places = 1
Max decimal places = 0
Out of display range. Displays "OOR"

Convert From			Convert To				
Transducer Units (From)	Transducer Range 0 to …	Decimal Places	PSI	inH2O	inHg	bar	hPa mbar
inH2O	10	2	0.36	10.00	0.74	0.02	24.88
PSI	1	3	1.000	27.710	2.036	0.069	68.950
	2.5	3	2.500	69.275	5.090	0.172	172.375
	15	2	15.00	415.65	30.54	1.03	1034.25
	50	2	50.00	1385.50	101.80	3.45	3447.50
	100	1	100.0	2771.0	203.6	6.9	6895.0
	150	1	150.0	4156.5	305.4	10.3	10342.5
	250	1	250.0	6927.5	509.0	17.2	17237.5
	500	1	500.0	13855.0	1018.0	34.5	34475.0
	750	1	750.0	20782.5	1527.0	51.7	51712.5
	1000	0	1000	27710	2036	69	68950
	1500	0	1500	41565	3054	103	103425
	2500	0	2500	69275	5090	172	172375
	3500	0	3500	96985	7126	241	241325
	5000	0	5000	138550	10180	345	344750

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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