

1 YEAR
WARRANTY



Ω OMEGA™ **User's Guide**

***Shop online at
omega.com***

e-mail: info@omega.com

***For latest product manuals:
omega.com/en-us/pdf-manuals***

PSW1110

Digital, Miniature Pressure Switch with Display



omega.com info@omega.com

Servicing North America:

**U.S.A.
Headquarters:**

Omega Engineering, Inc.
800 Connecticut Ave. Suite 5N01, Norwalk, CT 06854
Toll-Free: 1-800-826-6342 (USA & Canada only)
Customer Service: 1-800-622-2378 (USA & Canada only)
Engineering Service: 1-800-872-9436 (USA & Canada only)
Tel: (203) 359-1660 Fax: (203) 359-7700
e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide

	Page
Section 1 - Introduction	1-1
1.1 Product Overview.....	1-1
1.2 Specifications.....	1-2
1.3 Precautions	1-3
Section 2 - Setup	2-1
2.1 General Dimensions	2-1
2.2 Pressure Port Configuration	2-2
2.3 Electrical Connections	2-3
Section 3 - Operating Instruction.....	3-1
3.1 Display and Button Functionality	3-1
3.2 Menu Options	3-2
3.2.1 Lock/Unlock Keys	3-2-1
3.2.2 Setting Zero Pressure	3-2-2
3.2.3 Parameter Setting Mode	3-2-3
3.2.4 Setting Pressure Units	3-2-4
3.2.5 Setting Temperature Units	3-2-5
3.2.6 Output One Mode and Setpoints	3-2-6
3.2.7 Output Two Mode and Setpoints	3-2-7
3.2.8 Display Colors	3-2-8
3.2.9 Update Time	3-2-9
3.2.10 Loading All Parameters	3-2-10
Section 4 - Accessories	4-1
4.1 Mounting Brackets	4-1
4.2 Panel Mounts	4-2

Section 1 – Introduction

1.1 Product Overview

The PSW-1110 series are cost-effective, digital pressure switches that are easy to read, easy to program, and perfect for small spaces.

These miniature pressure switches provide PNP output switch control for non-corrosive gasses. The PSW-1110 features a bright 4-digit, 7-segment display that makes it easy to see the current pressure. The display can also be programmed to turn red or green, based on the switch state, and there are two LED indicator lights to show when outputs are activated. In short, this miniature pressure switch has several visual indicators that can quickly show the status at a glance.

The ultra-compact size and multiple pressure port orientations make this unit easy to install practically anywhere. There are both a horizontally and vertically oriented pressure ports so that the most convenient orientation can be used, and the unused port is plugged with the included setscrew. As an added bonus, the switch also measures the media temperature and can be set to measure in either Celsius or Fahrenheit. There is a keypad locking function, to secure against unwanted button presses or changes made by those unfamiliar with the unit.

The PNP outputs are fully programmable, and the user can also select one of eight pressure units: psi, bar, kg/cm², KPa, MPa, inHg, cmHg, and Atm. There are four options for output modes. The main options are hysteresis and window modes, and each of those have high and low methods of actuation. See the Operation Modes section below for more details and the product manual for operation instructions.

The PSW-1110 is also available with the following options: additional pressure ranges, NPN outputs, alternate pressure port thread types, and with liquid media compatibility. If you would like to learn more about these options or require further customization of this design, contact us by phone or by emailing us at pressure@omega.com.

1.2 Specifications

Accuracy	± 1% FS
Repeatability	± 1% FS
Response Time	135 ms
Burst Pressure	300 psi
Compatible Media	Non-Corrosive Gasses
Supply Voltage	10-30 Vdc
Electrical Connection	20" Cable with Flying Leads
Current Consumption	≤80 mA
Output	PNP
Media Temperature Range	0 to 100°C (32 to 212°F)
Temperature Accuracy	± 2°C (± 4°F)
Operating Temperature	-10 to 60°C (14 to 140°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Operating & Storage Humidity	35 to 85% RH
Process Connection Material	Zinc Alloy
Enclosure Materials	ABS
Weight	80g
Shock	100g (980 m/s ²)
Acceleration	10g (98 m/s ²)
Vibration	10 to 500 Hz freq., 0.06" (1.5 mm) amplitude

1.3 Precautions

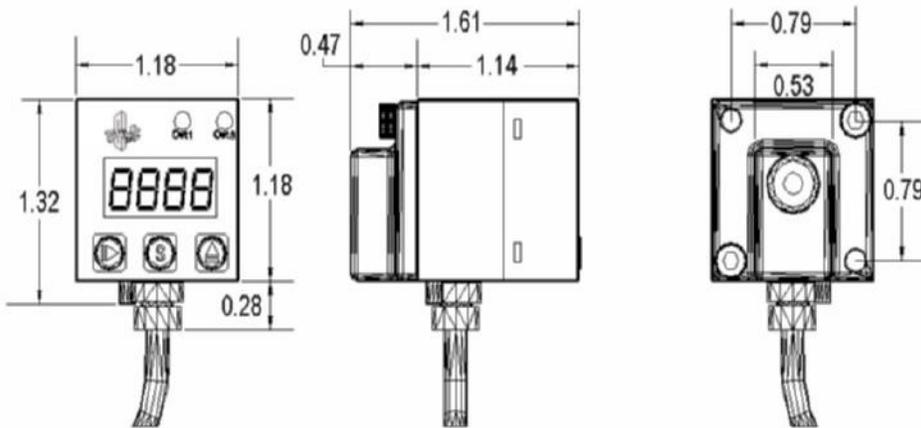
- This device has not been designed, tested, or approved for use in any medical or nuclear applications.
- Never operate this device in flammable or explosive environments.
- Never operate with a power source other than the one recommended in this manual.
- Never operate this device outside of the recommended 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.

There are two pressure ports – ensure the unused port is sealed before operation. A set screw (provided) is used to block the unused port. **It is advised to use thread sealant when installing the set screw.** For more information, see section 2.2.

Section 2 – Setup

2.1 General Dimensions

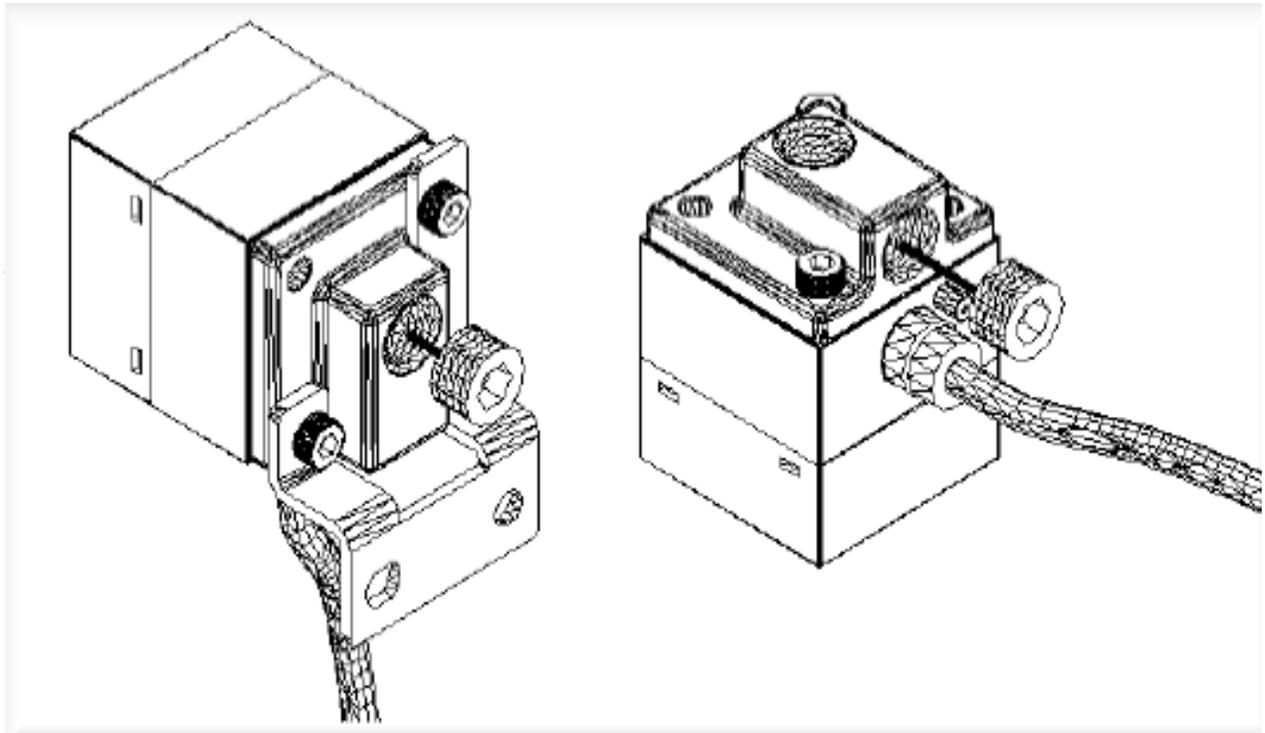
All dimensions shown in inches.



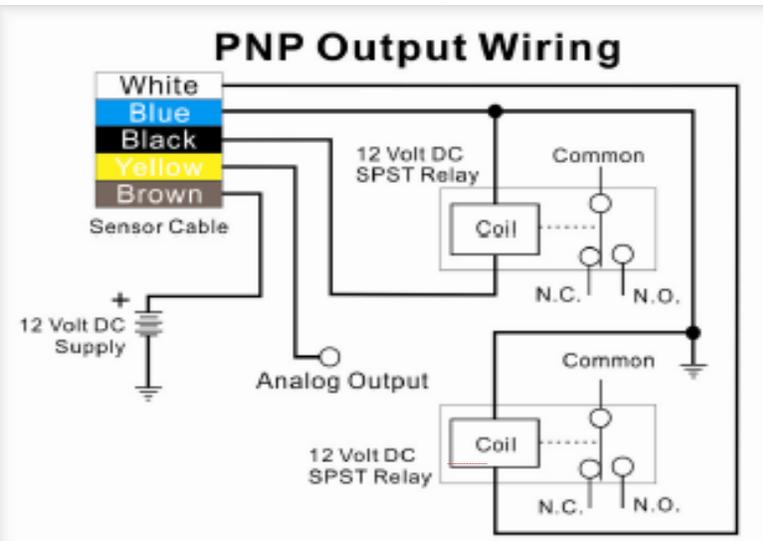
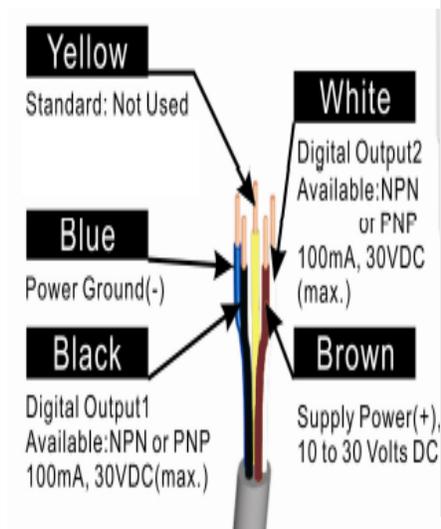
2.2 Pressure Port Configuration

For convenience, the sensor has two pressure port locations that are 90° apart from each other. Depending on the application, it is sometimes advantageous to use one port over another.

As shown in the image on the next page, once a port has been chosen, the other port must be blocked. A set screw (provided) is used to block the unused port. **It is advised to use thread sealant when installing the set screw.**

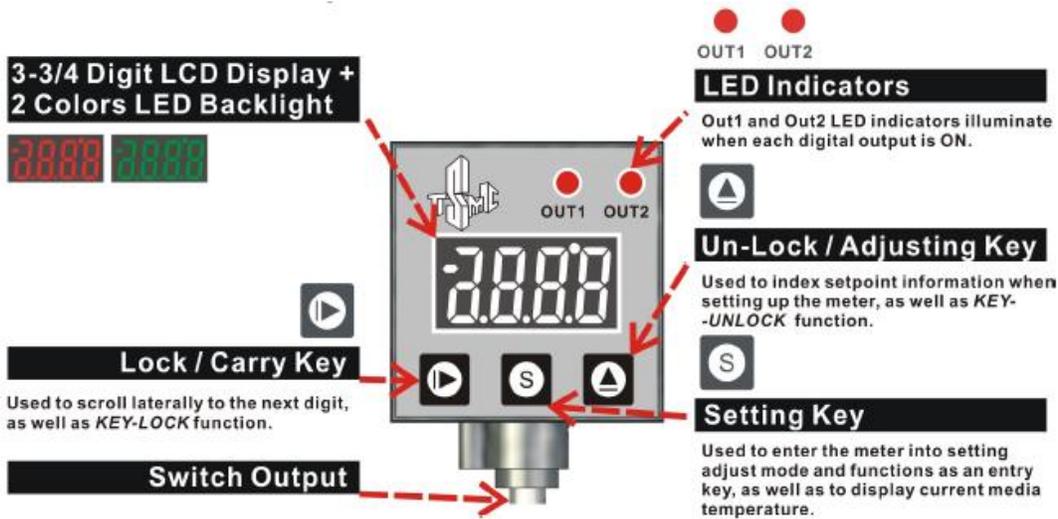


2.3 Electrical Connections



Section 3 – Operating Instructions

3.1 Display and Button Functionality



Once power is applied, the display will show the current pressure (factory default units: psi). To display the current temperature, tap the **setting key**  (factory default units: °F). After 5 seconds, the display will automatically return to pressure mode.

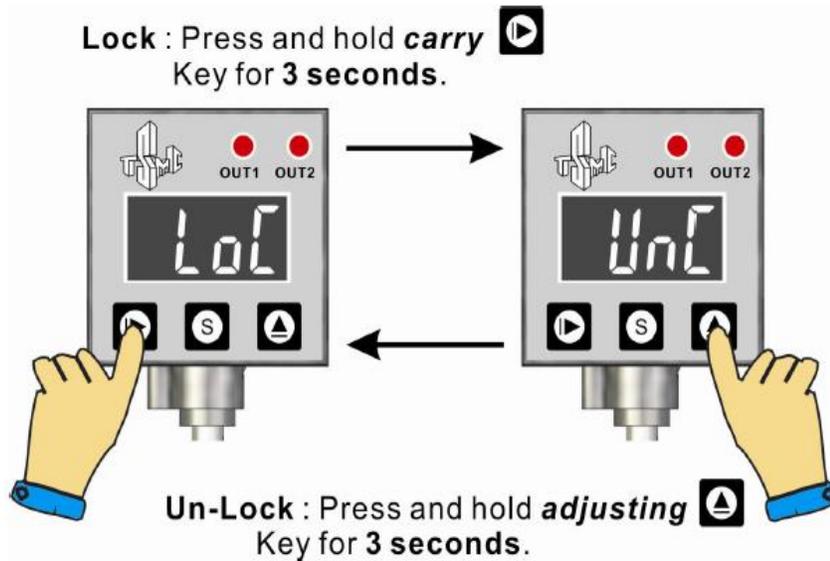
3.2 Menu Options

The first two menu options, lock/unlock, and setting zero pressure can be adjusted independently of other parameters. To change the other parameters, it is necessary to enter the parameter setting menu to step through each parameter, providing the user with the option to change the parameter or skip to the next one.

3.2.1 Lock/Unlock Keys

Lock: Press and hold the **carry Key**  for 3 seconds, then all key functions will be LOCKED, (except the un-lock function). The display will show "LoC" for 2 seconds then return to normal display.

Unlock: Press and hold the **adjusting key**  for 3 seconds, all key function will be Un-LOCKED. The display will show "UnC" for 2 seconds than return to normal display.



3.2.2 Setting Zero Pressure

Without any external pressure applied (open to the atmosphere) simultaneously press and hold the **adjusting** key  and the **carry** key  for more than 3 seconds. This captures the pressure and resets the display to read zero at this pressure.



3.2.3 Parameter Setting Mode

To enter the *parameter setting mode*, press and hold the **Setting key**  for more than 3 seconds when in default *pressure display mode*.

Note: Must be in pressure display mode for this keystroke to perform this function.

3.2.4 Setting Pressure Units

The first parameter encountered when entering the parameter setting mode is pressure units. To set the pressure unit, scroll through the options by pressing the **adjusting** key  until the setting that matches the desired unit is displayed. The table below shows the setting value for each pressure unit option. Once the desired setting is displayed, press the **setting** key . The displayed setting will be entered and the next parameter setting (temperature) will be displayed.

Setting	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8
Unit	psi	bar	kg/cm ²	KPa	MPa	inHg	cmHg	Atm

3.2.5 Setting Temperature Units

The next parameter encountered is for setting temperature units. To set the temperature unit, scroll through the options by pressing the **adjusting** key  until the setting matching the desired unit is displayed. The table below shows the setting value for each temperature unit option. Once the desired setting is displayed, press the **setting** key . The displayed setting will be entered and the next parameter setting, (output mode) will be displayed.

Setting	t-°C	t-°F
Unit	Celsius	Fahrenheit

3.2.6 Output One Mode and Setpoints

The next parameter encountered is for setting the digital output mode for **output 1**. There are two main types of output modes for the digital output - hysteresis mode and windowed mode.

Hysteresis mode has two types of actuations, active low and active high, as shown on the left side of the figure below.

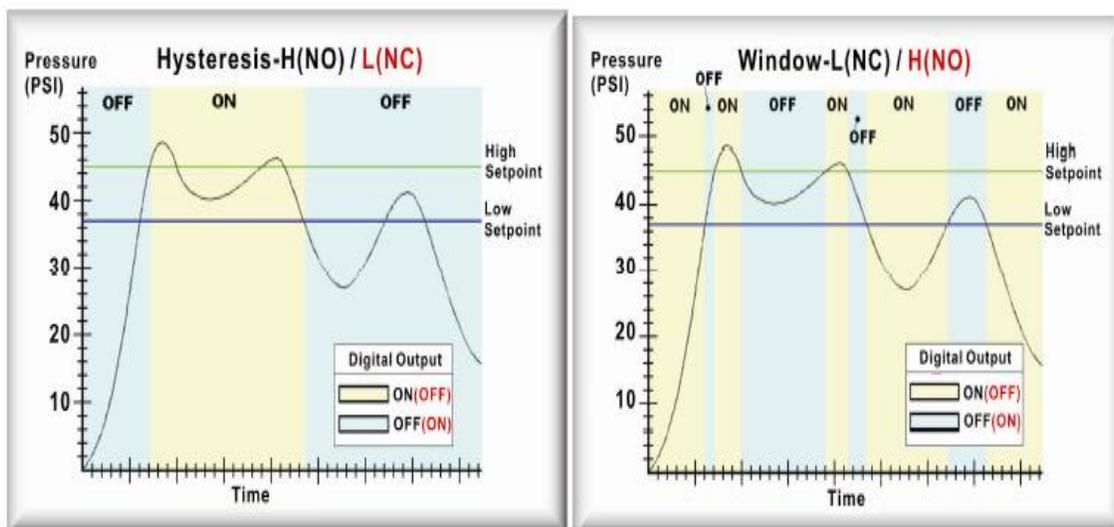
Active Low: Turns the output off when the pressure has reached the high setpoint (green line). The output remains off until the pressure has dropped below the low setpoint (blue line).

Active High: Turns the output on when the pressure has reached the high setpoint. The output remains on until the pressure has dropped below the low setpoint.

Windowed mode also has two types of actuations, active low and active high, as shown on the right side of the figure below.

Active Low: Turns the output off when the pressure is between the high setpoint (green line) and the pressure low setpoint (blue line).

Active High: Turns the output on when the pressure is between the high setpoint (green line) and the pressure low setpoint (blue line).



The display will show “1o-x”. To set the output mode, scroll through the options by pressing the **adjusting** key  until the setting matching the desired output is displayed. Use the following table to set the output mode of Out 1.



Once the desired setting is displayed, press the **setting** key . The displayed setting will be entered and the next parameter setting, (high setpoint for out1 parameter) will be displayed.

	Mode	Output 1	Menu Selection	Actuation
1	Hysteresis	Active Low	1o-1	Turns the output off when the pressure has reached the high setpoint (green line). The output remains off until the pressure has dropped below the low setpoint (blue line).
2	Hysteresis	Active High	1o-2	Turns the output on when the pressure has reached the high setpoint. The output remains on until the pressure has dropped below the low setpoint.
3	Window	Active Low	1o-3	Turns the output off when the pressure is between the high setpoint (green line) and the pressure low setpoint (blue line).
4	Window	Active High	1o-4	Turns the output on when the pressure is between the high setpoint (green line) and the pressure low setpoint (blue line).

High Setpoint

The next parameter encountered is for setting the high setpoint (green line on above graph) for **output 1**. The display will quickly flash “1H” and then it will display the current value of the high setpoint.



To set the high setpoint, increment the current digit (flashing) by pressing the **adjusting** key  until the display matches the desired setpoint. The digit will reset to zero (roll over) after nine has been reached in case the desired number has been accidentally passed. To scroll to the next digit, press the **carry** key . Once the rightmost digit has been set, press the **setting** key  to go to the next parameter.

Low Setpoint

The next parameter encountered is for setting the low setpoint (blue line on the graphs) for **output 1**. The display will quickly flash “1L” and then it will display the current value of the low setpoint. This value is entered exactly like the high setpoint, discussed above.



Once the rightmost digit has been set, press the **setting** key  to go to the next parameter.

3.2.7 Output Two Mode and Setpoints

The next parameter encountered is for setting the digital output mode for **output 2**. **Output 2** operates similar to **output 1** but it has additional functionality; **Output 2** can either be controlled by either a pressure setpoint or a temperature setpoint. If modes 5-8 are selected, the high and low setpoints will have either °C or °F indicating that they are temperature setpoints



The display will show “2o-x”. To set the output mode, scroll through the options by pressing the **adjusting** key  until the setting matching the desired output is displayed. Use the following table to set the output mode of Out 2.

Once the desired setting is displayed, press the **setting** key . The displayed setting will be entered and the next parameter setting, (high setpoint for parameter 2), will be displayed.

Mode			Output 2	Menu Selection	Actuation
1	Pressure	Hysteresis	Active Low	1o-1	Turns the output off when the pressure has reached the high setpoint (green line). The output remains off until the pressure has dropped below the low setpoint (blue line).
2	Pressure	Hysteresis	Active High	1o-2	Turns the output on when the pressure has reached the high setpoint. The output remains on until the pressure has dropped below the low setpoint.
3	Pressure	Window	Active Low	1o-3	Turns the output off when the pressure is between the high setpoint (green line) and the pressure low setpoint (blue line).
4	Pressure	Window	Active High	1o-4	Turns the output on when the pressure is between the high setpoint (green line) and the pressure low setpoint (blue line).
5	Temperature	Hysteresis	Active Low	1o-5	Turns the output off when the temperature has reached the high setpoint (green line). The output remains off until the temperature has dropped below the low setpoint (blue line).
6	Temperature	Hysteresis	Active High	1o-6	Turns the output on when the temperature has reached the high setpoint. The output remains on until the temperature has dropped below the low setpoint.
7	Temperature	Window	Active Low	1o-7	Turns the output off when the temperature is between the high setpoint (green line) and the temperature low setpoint (blue line).
8	Temperature	Window	Active High	1o-8	Turns the output on when the temperature is between the high setpoint (green line) and the temperature low setpoint (blue line).

High Setpoint

The next parameter encountered is for setting the high setpoint for **output 2**. The display will quickly flash “2H” and then it will display the current value of the high setpoint.



To set the high setpoint, increment the current digit (flashing) by pressing the **adjusting** key  until the display matches the desired setpoint. The digit will reset to zero (roll over) after nine has been reached in case the desired number has been accidentally passed. To scroll to the next digit, press the **carry** key . Once the rightmost digit has been set, press the **setting** key  to go to the next parameter.

Low Setpoint

The next parameter encountered is for setting the low setpoint for **output 2**. The display will quickly flash “2L” and then it will display the current value of the low setpoint. This value is entered exactly like the high setpoint, discussed above. Once the rightmost digit has been set, press the **setting** key  to go to the next parameter.



3.2.8 Display Colors

The display color can be programmed to change based on **Output 1** high and **Output 1** low setpoints.



The next parameter encountered is display color based on **Out1** high setpoint. Using the table below, set the desired screen color based on the “bHx” number by using the **adjusting** key . Once completed, press the **setting** key  to go to the next parameter.

Number	bH-1	bH-2
	bL-1	bL-2
Color	Red	Green

The next parameter encountered is display color based on **Out1** low setpoint. Using the table above, set the desired screen color based on the “bLx” number by using the **adjusting** key . Once completed, press the **setting** key  to go to the next parameter.



3.2.9 Update Time

The next parameter encountered is display update time. The time setting can be from 0 (No Delay) to 9 seconds. To set display update time,



increment the latest digit (flashing) by pressing the **adjusting** key  until the display matches the desired Update Time. Once completed, press the **setting** key

 to load and save the parameter.

3.2.10 Loading All Parameters

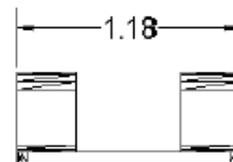
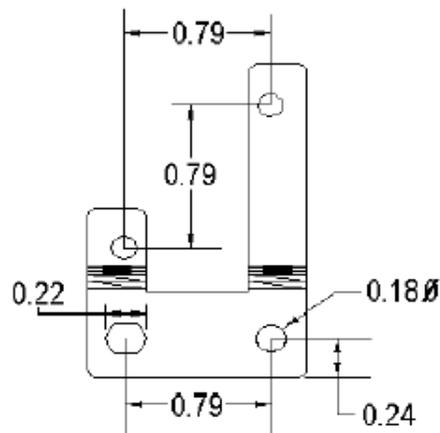
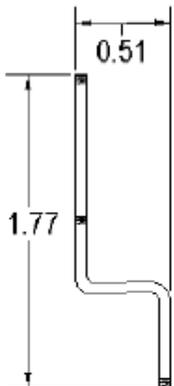
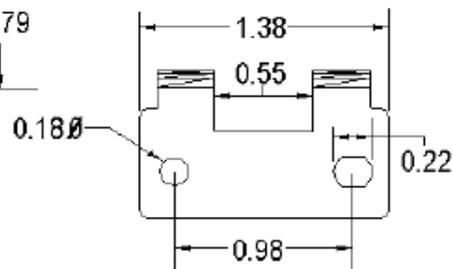
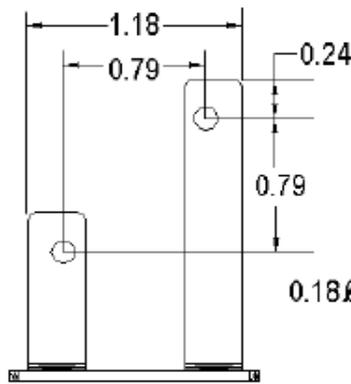
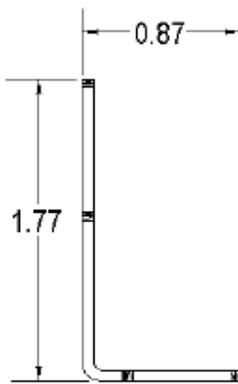
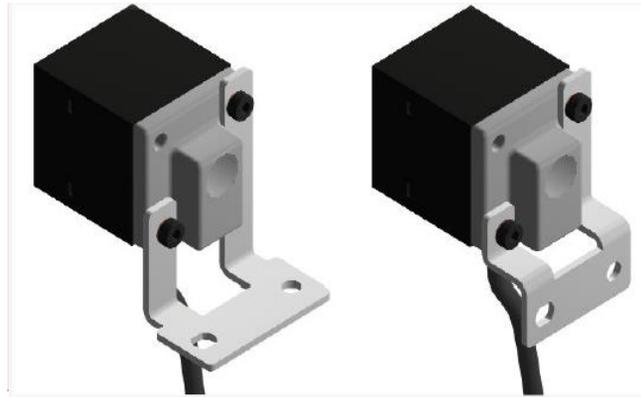
After adjusting or confirming all parameters, the display will read "loAd" for approximately 3 seconds. During this time, the parameters are saved and loaded. The sensor will return to pressure display mode automatically.



Section 4 – Accessories

4.1 Mounting Brackets

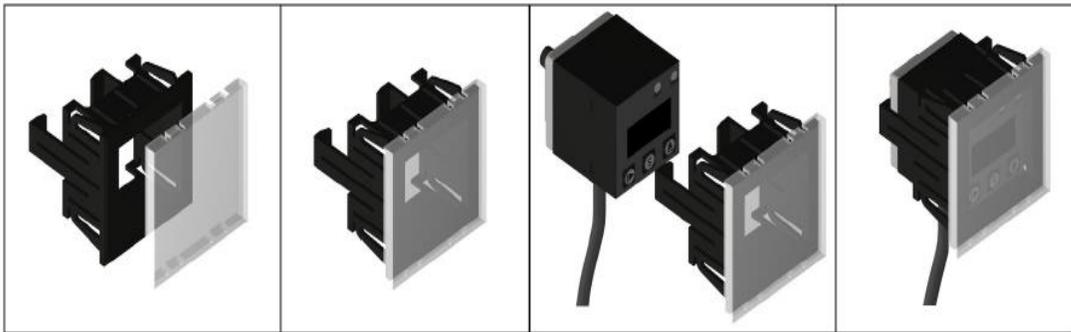
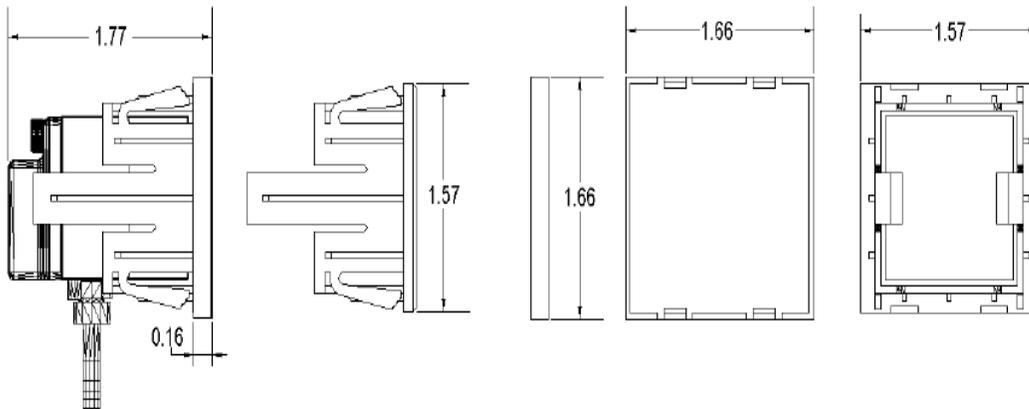
Two styles of mounting brackets are available. These brackets allow for mounting on either a vertical surface or a horizontal surface. The brackets are installed as shown below. The sensor has two threaded mounting holes on the back side that either bracket screws into.



4.2 Panel Mounts

An alternative to mounting the sensor with the brackets is to use the panel mount option. The panel mount assembly accepts a wide range for the panel cutout due to spring loaded clips molded into the housing. The following specifications gives the acceptable ranges for the panel cutout dimensions and panel thickness.

Panel Thickness Range	0.050" to 0.125"
Minimum Panel Cutout Dimensions	1.425" X 1.425"
Maximum Panel Cutout Dimensions	1.450" X 1.450"



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.

OMEGA is a trademark of OMEGA ENGINEERING, INC.

© Copyright 2019 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!** *Shop online at omega.com*

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gages
- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Communications-Based Acquisition Systems
- Data Logging Systems
- Wireless Sensors, Transmitters, & Receivers
- Signal Conditioners
- Data Acquisition Software

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments