omega.com™
OMEGA®

OMEGAnet® Online Service omega.com	Internet e-mail info@omega.com

Servicing North America:

U.S.A.: ISO 9001 Certified
Omega Engineering, Inc., One Omega Drive, P.O. Box 4047
Stamford, CT 06907-0047
Toll-Free: 1-800-826-6342 Tel: (203) 359-1660
FAX: (203) 359-7700 e-mail: info@omega.com

Canada:
976 Bergar
Laval (Quebec), Canada H7L 5A1
Toll-Free: 1-800-826-6342 TEL: (514) 856-6928
FAX: (514) 856-6886 e-mail: info@omega.ca

For immediate technical or application assistance:

U.S.A. and Canada: Sales Service: 1-800-826-6342/1-800-TC-OMEGA®
Customer Service: 1-800-622-2378/1-800-622-BEST®
Engineering Service: 1-800-872-9436/1-800-USA-WHEN®

Mexico: En Español: 001 (203) 359-7803 FAX: (001) 203-359-7807
info@omega.com.mx e-mail:espanol@omega.com

Servicing Europe:

Benelux: Managed by the United Kingdom Office
Toll-Free: 0800 099 3344 TEL: +31 20 347 21 21
FAX: +31 20 643 46 43 e-mail: sales@omega.nl

Czech Republic: Frystatska 184
733 01 Karviná, Czech Republic
Toll-Free: 0800-1-66342 TEL: +420-59-6311899
FAX: +420-59-6311114 e-mail: info@omegashop.cz

France: Managed by the United Kingdom Office
Toll-Free: 0800 466 342 TEL: +33 (0) 161 37 29 00
FAX: +33 (0) 130 57 54 27 e-mail: sales@omega.fr

Germany/Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Toll-Free: 0 800 6397678 TEL: +49 (0) 7059 9398-0
FAX: +49 (0) 7056 9398-29 e-mail: info@omega.de

United Kingdom: ISO 9001 Certified
OMEGA Engineering Ltd.
One Omega Drive, River Bend Technology Centre, Northbank
Irlam, Manchester M44 5BD England
Toll-Free: 0800-488-488 TEL: +44 (0)161 777-6611
FAX: +44 (0)161 777-6622 e-mail: sales@omega.co.uk

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 registered trademark of OMEGA ENGINEERING, INC.

omega.com™
OMEGA®

PX5100

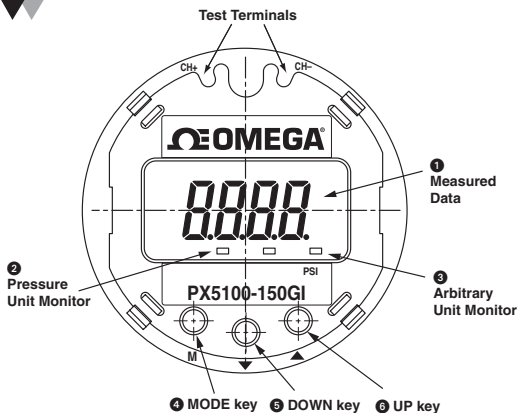
Differential Pressure Transmitter

INSTRUCTION SHEET

M5090/0112

Quick Start Function Summary Instructions for Omega® PX5100
Version 6.03
(See Complete I&M Manual for Further Detail)

DISPLAY OVERVIEW



Designation	Function
❶ Measured Data Display	Pressure, linear scaling value, hold value (max./ min), are displayed.
❷ Pressure unit monitor	When either indicator is ON, the display is reading in PSI.
❸ Arbitrary unit monitor	When this indicator is ON, the linear scaling value of an arbitrary unit is indicated on the display.
❹ MODE button Ⓜ	Used to switch the setting mode, the measurement mode and the setting item.
❺ DOWN button ▼	Used to change (decrease) and select the set value and to zero-reset the hold function.
❻ UP button ▲	Used to change (increase) and select the set value and to shift from the measurement mode to the zero adjustment mode.

1. **Upon Power-Up** the unit enters “Measure Mode” – displaying applied pressure.
2. **Four functions available** to the user in “Measure Mode”.

A. Zero Adjustment Mode: Hold the UP ▲ button for more than 3 seconds. This is not to be used for scaling of the output.

- If the zero point adjustment is performed correctly the message “ADJ” will be displayed for 2 seconds, and the display will return to the measurement mode.

B. Key Lock

Function	Key Manual	Indicator
Setting of key lock	MODE+▲ one second	LoC (Key invalidity)
Release of key lock	MODE+▲ one second	UnL (Key invalidity)

Operation during keylock

Function	Key Manual	Indicator
Zero adjust. mode	▲ key greater than 3 sec	LoC (Key invalidity)
Hold value reset	▼ key greater than 3 sec	LoC (Key invalidity)
Setting mode	**M** key greater than 3 sec	LoC (Key invalidity)
Peak indicator	▲ one push	Peak indicator
Bottom indicator	▼ one push	Bottom indicator

C. Minimum Value “Capture”*: Press DOWN ▼ button to display the minimum value. The letter “L” will follow the reading indicating this is the minimum value. Press the DOWN button again to return to Measurement Mode.

Note: Press the button and release, do not “hold” the button down (will reset the values).

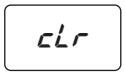
D. Maximum Value “Capture”*: Press UP ▲ button to display the maximum value. The letter “H” will follow the reading indicating this is the maximum value. Press the UP ▲ button again to return to Measurement Mode.

Note: If the button is held for 3 seconds it will go into zero adjustment mode.

Minimum/Maximum Reset

The Minimum/Maximum values can be reset when in either Minimum/ Maximum display by holding the DOWN ▼ button for more than three seconds, “clr” will appear on the display for two seconds and the Minimum and Maximum values will be removed.

Note: Values are maintained even if unit is powered OFF.

Hold reset message 

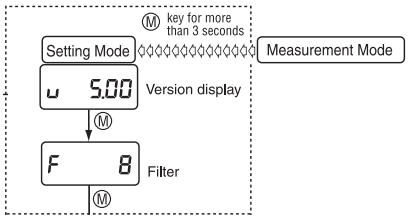
- When first using unit be sure to Reset values to clear values in memory from the factory calibration process.
- Values are captured starting one minute after Reset, thus if unit is powered OFF during the one minute the values during that period will not be kept in memory.

3. **Four functions available** to the User via “Setting Mode”. To enter the “Setting Mode” hold “M” key for more than 3 seconds. (See last page for complete Setting Mode menu.)

A. Filter (Damping)
The filter is based on the moving average of the pressure data to decrease display “bounce” and to smooth the analog output due to system pressure fluctuations at the user’s discretion.

Five selections: 0, 2, 4, 8 and 16 where 0=30ms (and in this case the filter is not active), 2=60ms, 4=120ms, 8=240ms, 16=480ms, use ▲ ▼ keys to change value.

B. Re-scaling in “psi” units: “Pressure Display Mode” allows for zero (4mA) and span (20ma) adjustment of –10 to +110% Span respectively.



Note: **1.** See menu schematic on last page for detail.

2. Must be in “Pressure Display Mode” option within “Setting Mode,” this is noted on the screen by

Use ▲ ▼ keys to move between “Pressure Display Mode” and “Linear Display Mode” which is for re-scaling in “Arbitrary” units.

3. To adjust Output Zero Point (4mA) and Output Span Point (20mA) must be in the functional area as noted below and then adjustment is via ▲ ▼ keys. The value shown is a percentage of the pressure range (span) as noted on the product label (ex. If product was supplied as a 0-100psi range and the user desired the Output Zero Point to be "moved" from 0 psi to 50 psi then Output Zero Point would be 50.0 which is 50%.

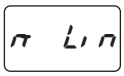
Notes shown below are from I&M manual.

Setting Item	LCD Display	Setting Description	Setting Range
Display mode	n non	Selection of pressure display mode : non	non:pressure display mode Lin: linear display mode
Output zero point	A 10.0	Analog output zero point (4mA) : 10.0 (%Span)	Pressure range:–10 to 110% Span
Output span point	A 90.0	Analog output span point (20mA) : 90.0 (%Span)	Pressure range:–10 to 110% Span

Note: For setting of zero point and span point in the analog output, input the percent value over the pressure range.

C. Re-scaling in "Arbitrary" units: "Linear Display Mode". This function allows the user to establish a linear relationship from the standard "psi" unit to any user defined unit.

Note: See menu schematic at end, must be in "Linear Display Mode" option within "Setting Mode", this is noted on the screen by



Use ▲ ▼ keys to move between "Linear Display Mode" and "Pressure Display Mode."

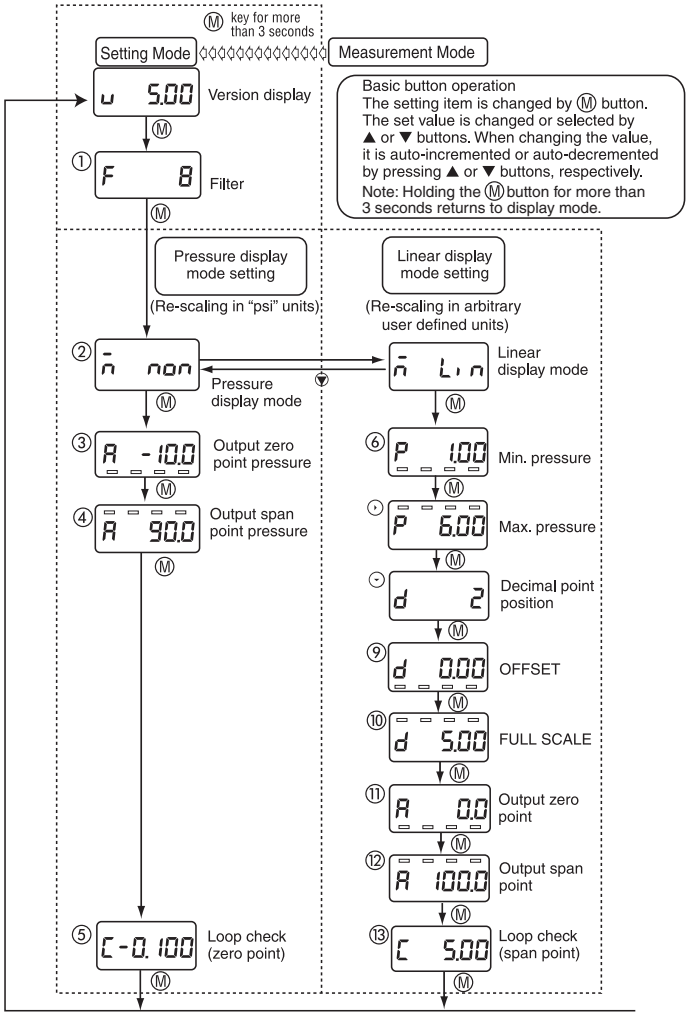
Setting Item	LCD Display	Setting Description	Setting Range
Display mode	n Lin	Selection of pressure display mode : Lin	non:pressure display mode Lin:Linear display mode
Minimum pressure	P 10.0	Min. pressure corresponding to OFFSET **9** : 10 (psi)	Pressure range 0 to 75% Span
Maximum pressure	P 60.0	Max. pressure corresponding to FULL SCALE **10** : 60 (psi)	Pressure range 25 to 100% Span
Decimal point position	d 2	Display after decimal point Number of digits	0,1,2,3 digit : 2 (digit)
OFFSET	d 0.00	OFFSET corresponding to min. pressure **6** : 0.00 (ton)	–1999 to 1999
FULL SCALE	d 5.00	FULL SCALE corresponding to mAX. pressure **7** : 5.00 (ton)	–1999 to 1999
Output zero point	A 0.0	Analog output zero point (4mA) : 0.0 (%Span)	Max. display span: –10 to 110% Span
Output span point	A 100.0	Analog output span point (20mA) : 100.0 (%Span)	Max. display span: –10 to 110% Span

Note: Values shows are from example in I&M manual.

D. Loop Check: Use to send a 4-20mA signal meant to simulate applied pressure, can be accessed either through Pressure Display Mode or Linear Display Mode. See "Complete Setting Mode Menu" at end. Loop Check is noted on the screen with a prefix "C". The display is indicating in actual units and starts at the zero (4mA) point.

If ▲ button continues to be pressed, the linear display will auto-increment by linkage between the linear display and the analog output. By continuing to press ▼ button, auto decrement will occur. Release the button at the desired indication.

Complete Setting Mode Menu



Notes: Actual values shown are based upon the examples shown in the I&M Manual.

Changes made within the Setting Mode are saved by returning to Measurement Mode before powering the unit "off."

4. Wiring

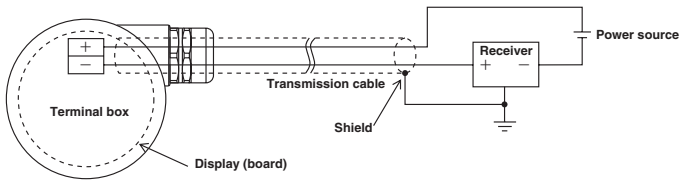
Power supply requirements, 12-36Vdc, note installation recommendations as follows:
Terminal Strip: SMKDSP1.5/2-5.08 Phoenix contact

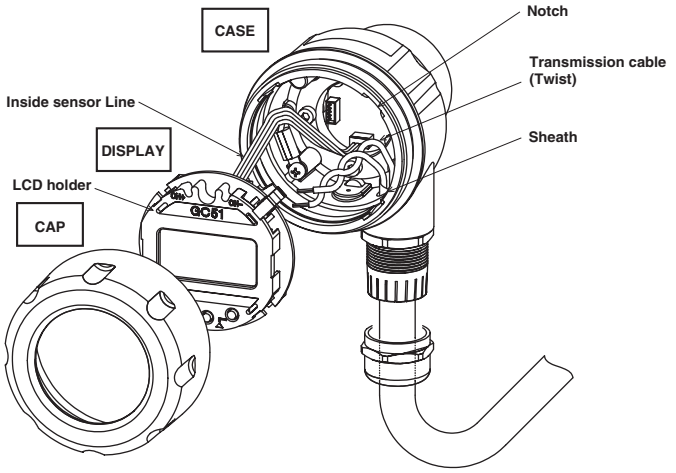
A. Cable Requirements

- Two core shielded cable
- Cable outer diameter: 0.35″ to 0.47″ (9-12mm)
  Required for proper installation with cable gland option
- Wire Gauge: 14-22 AWG (multi-strand or solid)

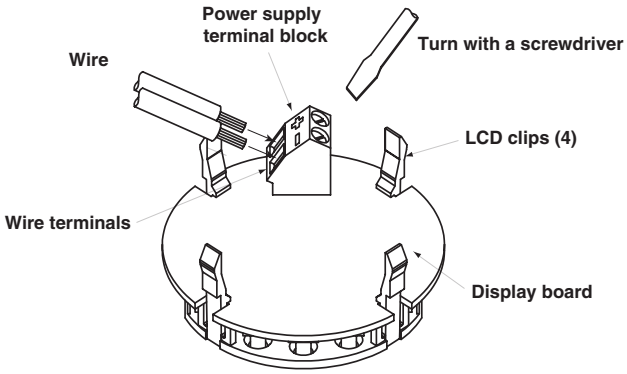
B. Wiring Instructions

- Do not run pressure transmitter cable / wires within the same conduit as high voltage (line power) line to reduce the potential for noise (interference). Use dedicated conduit on PX5100 cables / wires for optimum results.
- Cable diameter, specified above, must be maintained when using the Cable Gland termination to retain environmental ratings.
- When connecting shield / drain wire, only connect one end which should be at the received ground.
- Wire stripping instructions; remove cable jacket 2-3″ and strip wires 0.25″. Shield / drain wire should not be exposed at the pressure transmitter termination.





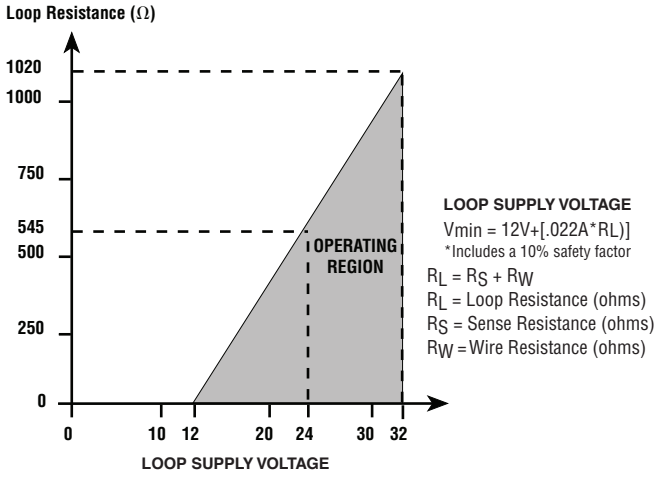
- Remove cover and carefully remove the display to access the terminal strip, take care not to mishandle the display and associated electronics.
- Turn display over to expose terminal strip, make positive and negative connections; insert wire equal to the recommended strip length (0.25″).
- After completing connections, align the retaining clips of the display with the housing's notches and carefully place into the housing. Be sure that the internal sensor ribbon cable does not cross the power supply lines just installed.
- Be sure to properly tighten the sealing grommet when using the Cable Gland before applying tension to the cable; the cable gland provides strain relief and environmental sealing.
- Tighten PX5100 cover to maintain environmental rating.
- Connect to power source and receiver, than apply power to confirm correct wiring.



Display

- Power Supply Requirements: Although the 4-20mA signal can travel over long distances, a very common issue to arise involves inadequate power at the pressure transmitter – this results in voltage drop across the loop. Be sure to review the accompanying table to determine whether the 12-36Vdc has been received at the pressure transmitter.

Load Limitations 4-20mA Output Only



LOOP SUPPLY VOLTAGE
$V_{min} = 12V+[.022A*RL)]$
*Includes a 10% safety factor
$R_L = R_S + R_W$
R_L = Loop Resistance (ohms)
R_S = Sense Resistance (ohms)
R_W = Wire Resistance (ohms)