

# User's Guide



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# **LDP63100** **Extra Large Display**



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M44 5BD United Kingdom  
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Toll Free in United Kingdom: 0800-488-488  
e-mail: sales@omega.co.uk

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It is the policy of OMEGA Engineering, Inc. to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING : These products are not designed for use in, and should not be used for, human applications.



- LARGE LED DISPLAY READABLE TO 180 FEET
- VARIOUS ANALOG INPUT MODULES;  
DC VOLTAGE AND CURRENT  
PROCESS SIGNALS  
TRUE RMS VOLTAGE AND CURRENT  
THERMOCOUPLE OR RTD  
STRAIN GAGE/BRIDGE
- ALARMS, ANALOG OUTPUT, AND COMMUNICATION
- PROGRAMMABLE USER INPUTS
- UNIVERSAL AC POWERED (85 to 250 VAC)
- PROGRAMMING SOFTWARE
- NEMA 4X/IP65

### GENERAL DESCRIPTION

The LDP63100 is a versatile display that can increase productivity by offering the plant floor or production area a large visual display of their current status. Whether your measurement is voltage, current, process, temperature, or strain gage, the LDP63100 can satisfy your requirement. Plug-in option cards can add alarms, analog output, and communication/bus capabilities, making the LDP63100 a truly Intelligent Panel Meter.

### SAFETY SUMMARY

All safety regulations, local codes and instructions that appear in this and corresponding literature, or on equipment, must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

 <b>CAUTION: Risk of Danger</b> Read complete instructions prior to installation and operation of the unit.	 <b>CAUTION: Risk of electric shock.</b>
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### SPECIFICATIONS

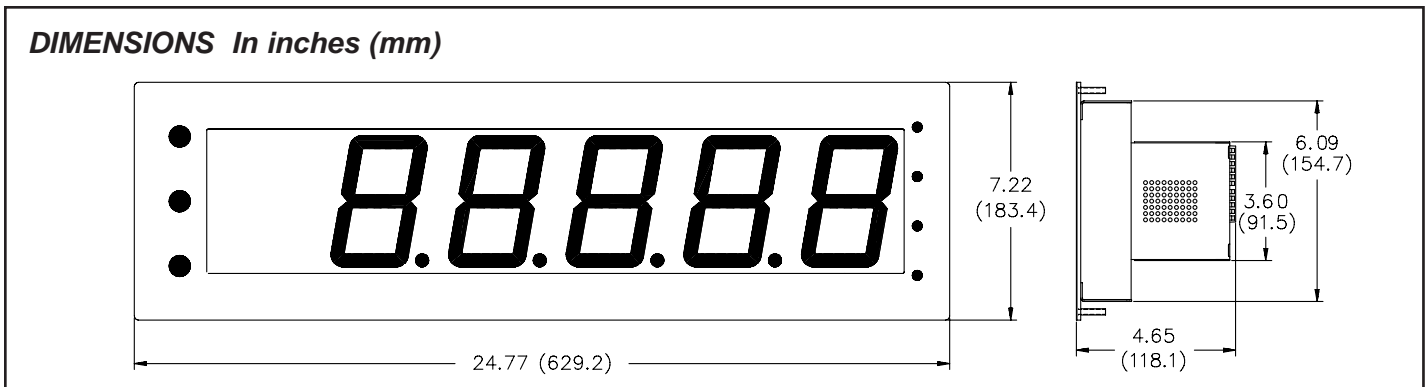
*Input specifications, wiring, and programming information is contained in the corresponding literature shipped with the ordered model.*

- DISPLAY:** 4" (101 mm) Red LED  
5-Digit: -19999 to 99999
- POWER REQUIREMENTS:**  
AC Input Modules: 85 to 250 VAC, 50/60 Hz, 18 VA  
LDP63100 Display: 85 to 250 VAC, 50/60 Hz, 10 VA
- ANNUNCIATORS:**  
**Display Indication:** Three vertical dots on the left side of the unit identify the displays for the following modes:

TOP	Maximum
MIDDLE	Minimum
BOTTOM	Total

**Setpoint Indication:** Four vertical dots on the right side of the unit identify the setpoint "ON" condition, with SP 1 being the top position through SP 4 at the bottom.

- LDP63100 Programming:** The unit is a large display, designed to be remotely mounted. Therefore, the unit does not have a programming keypad. Unit programming should be accomplished by one of the following methods:  
**Rear Terminal Block:** External switches can be wired via the terminal block to allow unit programming. A minimum of 3 switches would be required.  
**Optional Programming Remote (LDP6-PGM):** This option provides a 10 foot interconnecting cable and programming box. The Programming Remote contains buttons allowing easy programming of the display.  
**Optional Serial Programming:** You can purchase an RS232 or RS485 Comms Card and program the unit via Crimson, a Windows® based software program.



## 5. CERTIFICATIONS AND COMPLIANCES:

### SAFETY

UL Recognized Component, File #E313607, UL61010A-1, CSA C22.2 No. 1010-1

Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.

UL Listed, File #E313547, UL508, CSA C22.2 No. 14-M95

LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards

Type 4X Indoor Enclosure rating (Face only), UL50

IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.

IP65 Enclosure rating (Face only), IEC 529

### ELECTROMAGNETIC COMPATIBILITY

EMC specifications determined by the model.

## 6. ENVIRONMENTAL CONDITIONS:

Operating Temperature Range: Determined by the model

Storage Temperature Range: -40 to 60°C

Operating and Storage Humidity: 0 to 85% max. RH (non-condensing)

Altitude: Up to 2000 meters

## 7. MOUNTING REQUIREMENTS:

Max. panel thickness is 0.375" (9.5 mm)

Min. panel thickness for NEMA 4/IP65 sealing is 0.060" (1.52 mm)

## 8. MODULE INSTALLATION:

24-pin shrouded connector on LDP63100 engages connector on input module upon installation. Shroud ensures proper alignment by providing a lead-in for the module connector.

## 9. CONNECTIONS:

Wiring connections are made to the LDP63100 terminal block and input module via high compression cage-clamp terminal blocks.

**Input Module Wiring:** Instructions are provided in the included bulletin.

### LDP63100 Terminal Block Wiring:

Wire Strip Length: 0.3" (7.5 mm)

Wire Gauge: 30-12 AWG copper wire

Maximum Torque: 5-7 inch-lbs (0.58-0.81 N-m)



**CAUTION: DISCONNECT ALL POWER BEFORE INSTALLING OR REMOVING MODULE**

10. **CONSTRUCTION:** Aluminum front panel, enclosure, and rear cover with textured black polyurethane paint for scratch and corrosion resistance protection. Sealed front panel meets NEMA 4X/IP65 specifications for indoor use when properly installed. Installation Category II, Pollution Degree 2. Panel gasket and keps nuts included.

11. **WEIGHT:** 5 lbs (2.25 kg) (*less module*)

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## OPTIONAL PLUG-IN CARDS AND ACCESSORIES



**WARNING: Disconnect all power to the unit before installing Plug-in cards.**

### Adding Option Cards

The LDP63100 series meters can be fitted with up to three optional plug-in cards. The details for each plug-in card can be reviewed in the specification section of the included manual. Only one card from each function type can be installed at one time. The function types include Setpoint Alarms (LDP6-CDS), Communications (LDP6-CDC), and Analog Output (LDP6-CDL). The plug-in cards can be installed initially or at a later date.

### SETPOINT ALARMS PLUG-IN CARDS (LDP6-CDS)

The LDP63100 series has 4 available setpoint alarm output plug-in cards. Only one of these cards can be installed at a time. (Logic state of the outputs can be reversed in the programming.) These plug-in cards include:

LDP6-CDS10 - Dual Relay, FORM-C, Normally open & closed

LDP6-CDS20 - Quad Relay, FORM-A, Normally open only

LDP6-CDS30 - Isolated quad sinking NPN open collector

LDP6-CDS40 - Isolated quad sourcing PNP open collector

### ANALOG OUTPUT PLUG-IN CARD (LDP6-CDL)

Either a 0(4)-20 mA or 0-10 V retransmitted linear DC output is available from the analog output plug-in card. The programmable output low and high scaling can be based on various display values. Reverse slopes output is possible by reversing the scaling point positions.

LDP6-CDL10 - Retransmitted Analog Output Card

### COMMUNICATION PLUG-IN CARDS (LDP6-CDC)

A variety of communication protocols are available for the LDP63100 series. Only one of these cards can be installed at a time. When programming the unit via Crimson, the RS232 or RS485 Cards must be used.

LDP6-CDC10 - RS485 Serial (Terminal) LDP6-CDC1C - RS485 Serial (Connector)

LDP6-CDC20 - RS232 Serial (Terminal) LDP6-CDC2C - RS232 Serial (Connector)

LDP6-CDC40 - Modbus (Terminal) LDP6-CDC4C - Modbus (Connector)

### PROGRAMMING SOFTWARE

DP6-SOFT is a Windows® based program that allows configuration of the LDP63100 meter from a PC. This software offers standard drop-down menu commands, that make it easy to program the LDP63100 meter. The program can then be saved in a PC file for future use. A serial plug-in card is required to program the meter using the software.

# 1.0 ASSEMBLING THE DISPLAY



**CAUTION:** The input module main circuit board and the option cards contain static sensitive components. Before handling the module or the cards, discharge static charges from your body by touching a grounded bare metal object. Handle the module by the rear plastic cover only, and the option cards by the board edges. Dirt, oil or other contaminants that contact the circuit boards or components can adversely affect circuit operation.



**WARNING:** Exposed line voltage exists on the input module main circuit board and the option cards. **DO NOT** apply power to the module OR load circuits until the module is properly installed in the LDP63100 case.



**NOTE:** All module and option card labels must be installed as shown for safety purposes.

## Installing the Option Cards

Prior to installing the LDP63100 Display, it is recommended that the option cards be assembled first. This will allow you the opportunity to insure all the boards are fitted properly into their connectors. Refer to the literature enclosed with the option cards for installation instruction.

## Removing The Input Module

To remove the input module from the LDP63100 Display, first remove all power and load circuits. Then insert a flat screwdriver blade ( $\frac{3}{16}$ " or  $\frac{1}{4}$ " ) into the narrow slot between the LDP63100 rear cover plate and the module's plastic cover as illustrated in Figure 1. Twist the screwdriver in the direction shown to disengage the internal connectors while firmly squeezing and pulling back on the rear finger tabs (top and bottom). Carefully slide the module out of the case, keeping it properly aligned with the case opening.

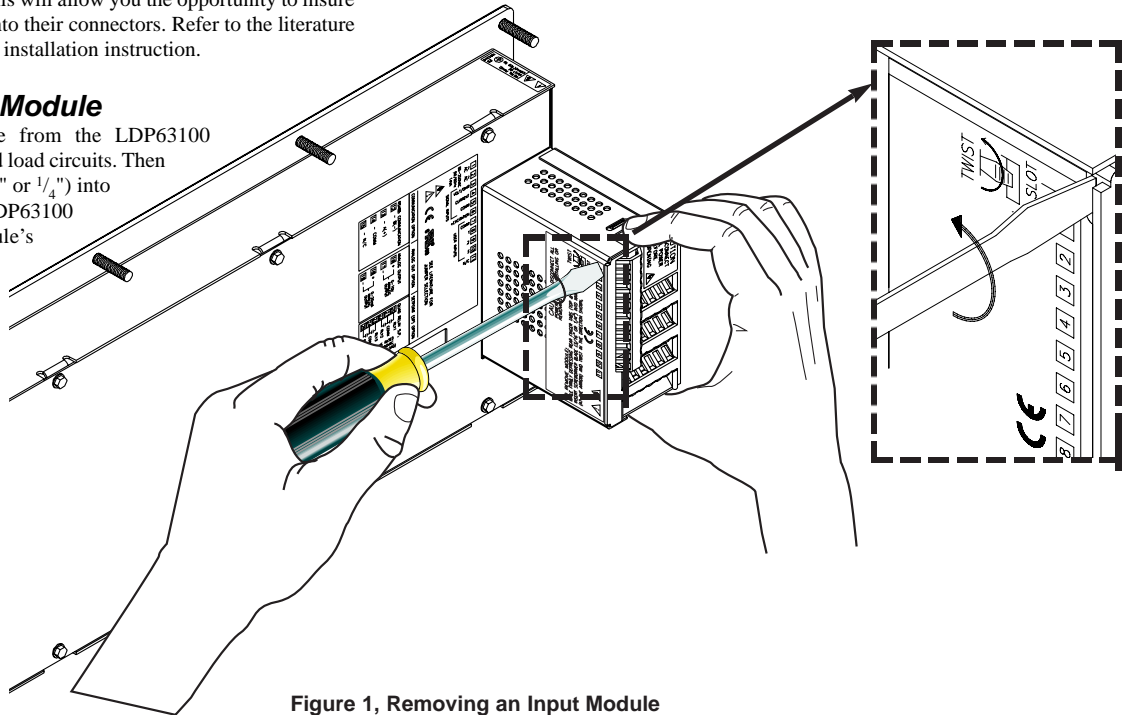


Figure 1, Removing an Input Module

## Reinstalling the Input Module

To reinstall the Input Module, align the module with the opening in the LDP63100 case, as illustrated. The module must be oriented as shown, with terminal #1 toward the top of the LDP63100 case. Carefully slide the module into the LDP63100 case. The LDP63100 and input module connectors will begin to engage about  $\frac{1}{4}$ " from the bottom. At this point, apply a small amount of pressure to the rear of the input module to fully engage the connection. Be sure the module fully snaps into the slots at the rear of the LDP63100 case. The input module holder can be removed with a  $\frac{1}{4}$ " nut driver to make inserting the module easier. The display is ready for installation.

## Installing the Labels

Each option card and the input module are shipped with a connection label. These labels must be applied to the rear of the LDP63100 in the positions shown in the drawing.

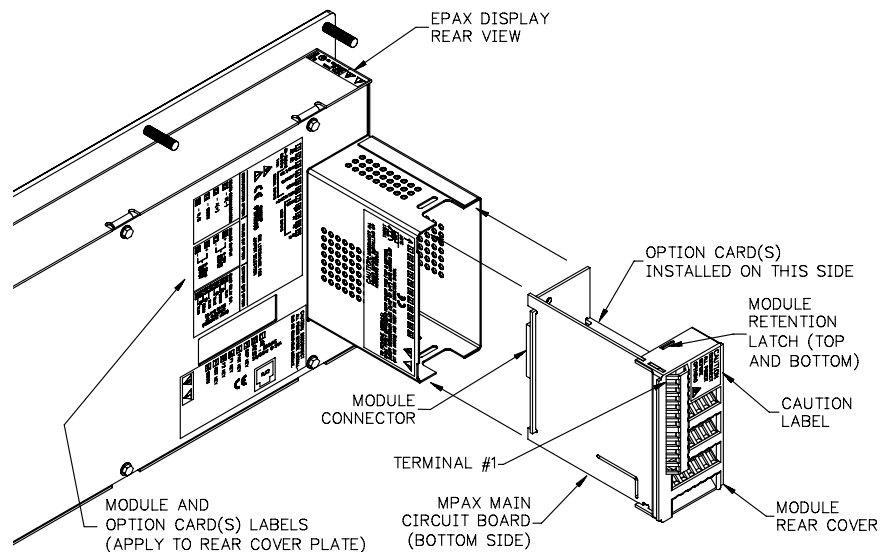


Figure 2, Reinstalling an Input Module and Option Cards

## 2.0 INSTALLING THE DISPLAY

### DISPLAY INSTALLATION

The LDP63100 display is intended to be mounted into a panel or enclosure. The display is provided with a gasket to provide a water-tight seal. The recommended minimum panel thickness for NEMA 4/IP65 sealing is 0.060" (1.57 mm).

For panel mounting, prepare the panel cut-out to the dimensions shown in Figure 3. The supplied template may be used to mark the cut-out and hole locations on the panel. After the panel cut-out has been deburred, slide the panel gasket over the rear of the display and onto the mounting studs. Insert the display into the panel cut-out as illustrated in Figure 4. Install 14 # 10-32 keps nuts (supplied) and tighten evenly for uniform gasket compression. Do not over-tighten the nuts.

By using additional mounting accessories, the LDP63100 can be surface-wall mounted, suspended, or bottom mounted. Separate installation instructions are provided with the mounting accessories.

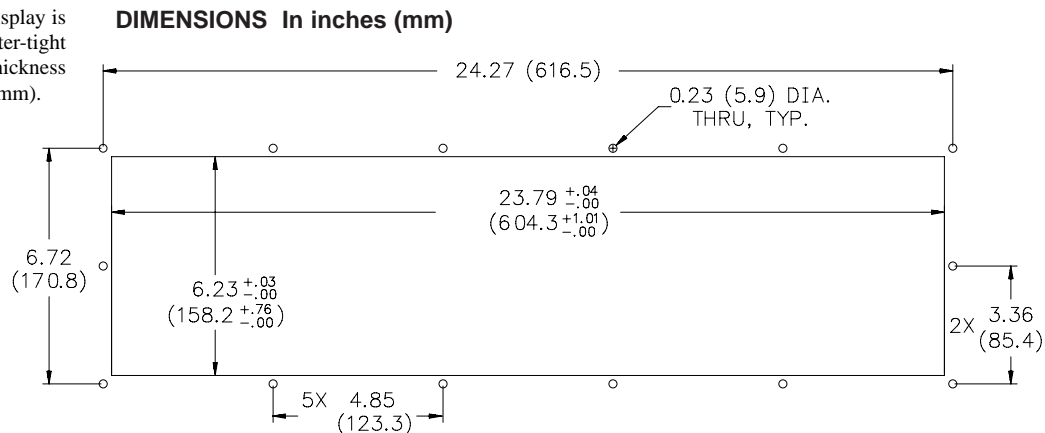


Figure 3, Panel Cut-out for the LDP63100

### Environment And Cleaning

The display should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the system near devices that generate excessive heat should be avoided.

The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.

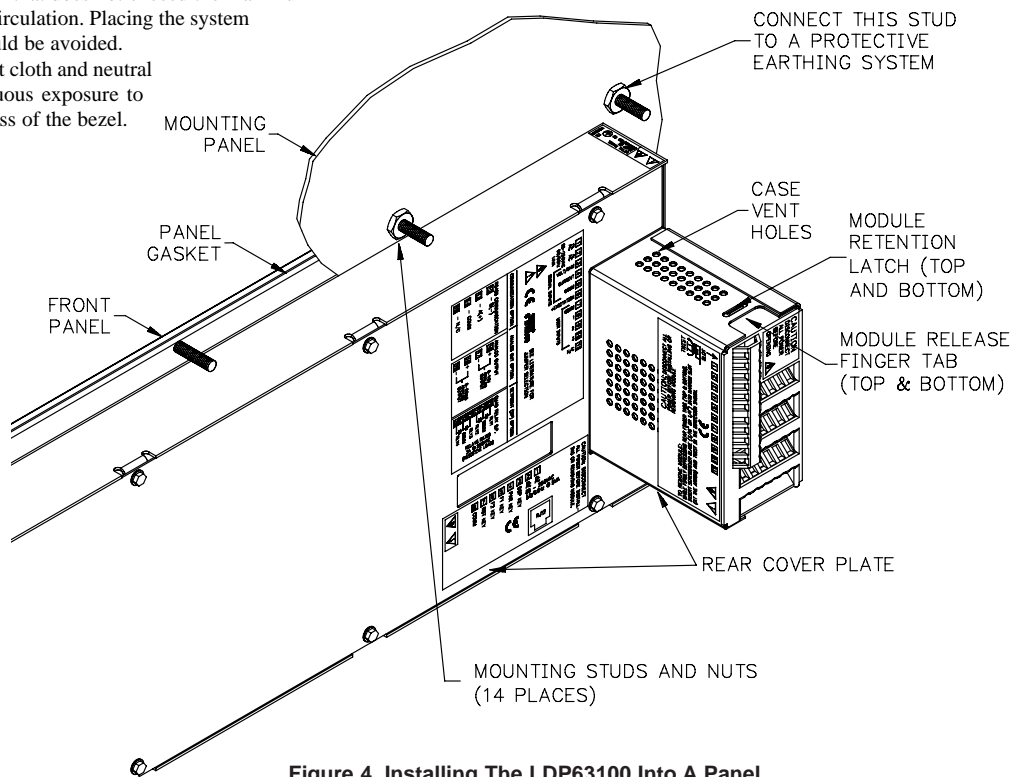
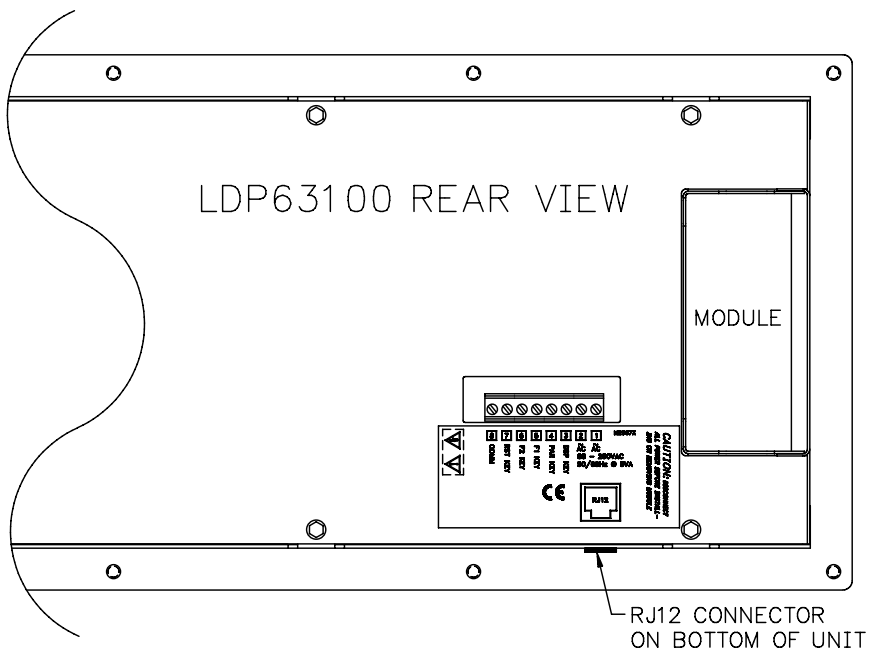


Figure 4, Installing The LDP63100 Into A Panel

# 3.0 WIRING AND PROGRAMMING THE DISPLAY

Once assembled, the LDP63100 has all the same functions and capabilities of our DP63500, DP63600, and DP63700 Series Intelligent Panel Meters. Therefore, you will find the appropriate meter information packed with the LDP63100. Simply follow the instructions to wire and program the display for your application.

*Note: Both the LDP63100 and the input module require power. It is recommended to connect the primary AC power to the LDP63100 terminal block, then jumper to the input module.*



## LDP63100 PROGRAMMING

The unit is a large display, designed to be remotely mounted. Therefore, the unit does not have a programming keypad. Unit programming must be accomplished by one of the following three methods:

### Optional Programming Remote (LDP6-PGM)

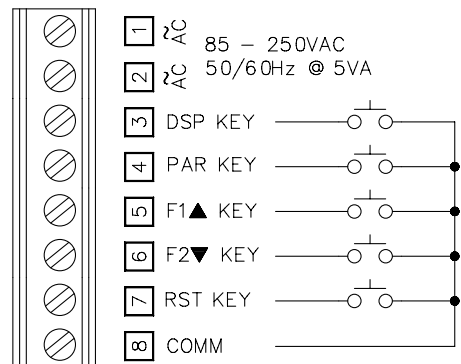
This optional programming remote plugs into the LDP63100 through an RJ12 connector and a 10 foot cable. The buttons on the programming box function the same as the DP63500, DP63600, and DP63700 meters. Simply program the LDP63100 exactly as the meter instructions indicate. The programming box can be left connected to the LDP63100 for future programming changes or can be disconnected and used to program additional LDP63100 units.



### Rear Terminal Block

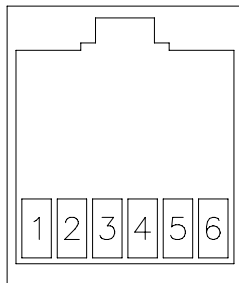
External normally open switches can be wired via the terminal block to allow unit programming. A minimum of 3 switches would be required. Each external switch must be wired between the key and the common terminal.

### LDP63100 TERMINAL BLOCK



### RJ12 CONNECTOR ON BOTTOM OF UNIT

RJ12 FEMALE	
PIN	NAME
1	DSP KEY
2	PAR KEY
3	F1 KEY
4	F2 KEY
5	RST KEY
6	COMM



# NEMA 4/IP65 LARGE DISPLAY ENCLOSURE & SHROUD FOR LDP63100



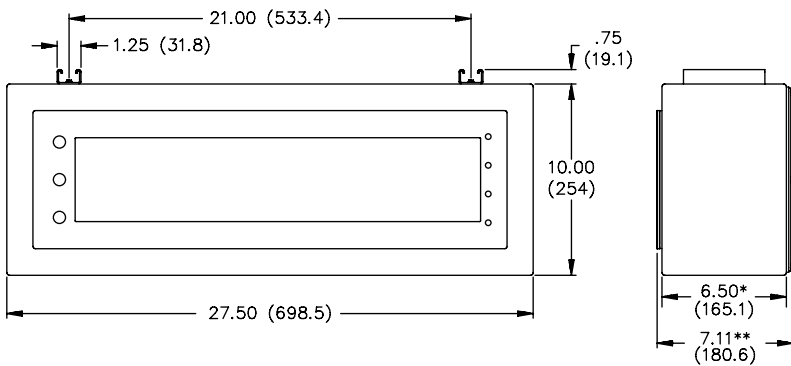
- LIGHT-WEIGHT ALUMINUM CONSTRUCTION
- COMPLETELY SEALED FOR WASH-DOWN
- MOUNTING CHANNELS FOR VERSATILE INSTALLATION

## DESCRIPTION

The NEMA 4/IP65 Large Display Enclosure is designed to protect the LDP63100 from dust and hose directed water, when properly installed. This light-weight all aluminum unit utilizes welded seams and neoprene gaskets to meet NEMA 4/IP65 requirements. A textured, polyurethane coating protects against corrosion and is scratch resistant. Figure 1 below shows the overall dimensions of the Enclosure. The Display Enclosure with Mounting Channels weighs 9 pounds (4.1 Kg).

Picture includes the LDP63100, NEMA Enclosure, and Shroud

## DIMENSIONS In inches (mm)



\* Housing Only

\*\* Overall Including Screwheads

Figure 1

## MOUNTING

Provided with the enclosure are two 1/4-20 UNC x 1" hex bolts, two 1/4-20 UNC "strut nuts", and two 1/4" washers. The "strut nuts" can be installed anywhere in the channel by inserting them, spring side down, into the channels, then rotating them 90 degrees clockwise until the notches engage with the lips of the channel. The bolts and washers provided allow mounting to surfaces 1/4" to 1/2" thick (6.4 to 12.7 mm). Use longer bolts for mounting to thicker surfaces. Bolts fabricated from materials other than steel are not recommended.

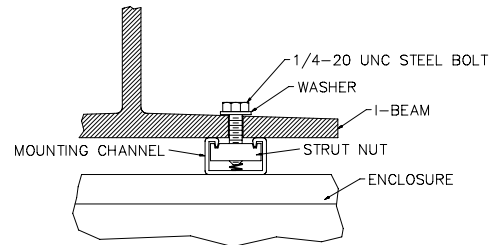
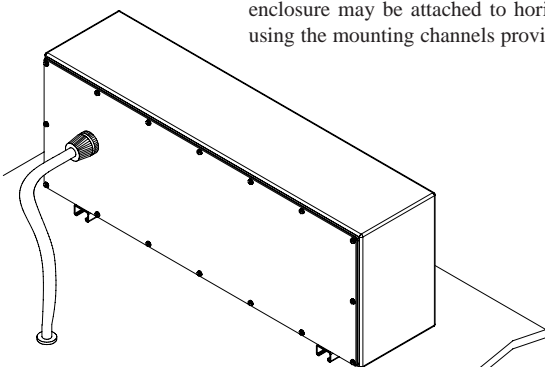


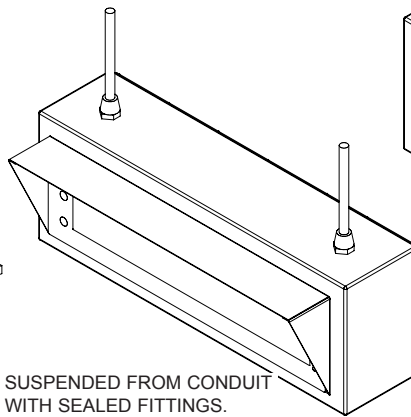
Figure 3

## TYPICAL INSTALLATIONS FOR NEMA 4/IP65 ENCLOSURE

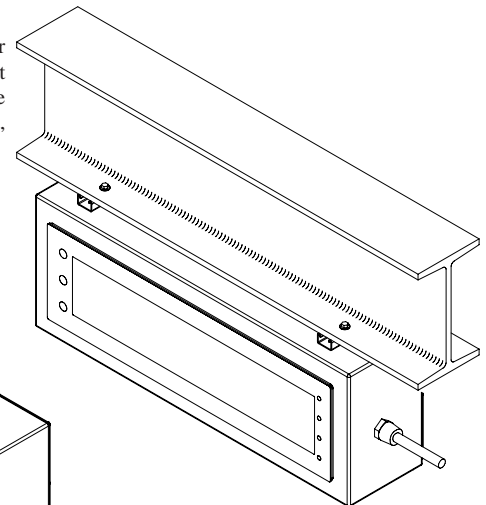
Removing the rear panel of the enclosure allows access to the Display for service. Either the rear panel or housing may be drilled to accept sealed conduit fittings, liquid-tight cable fittings or other types of wiring connectors. The enclosure may be attached to horizontal surfaces located above or below it, using the mounting channels provided.



BASEMOUNT WITH WATERTIGHT CABLE CONNECTOR ENTERING THROUGH REAR PANEL.



SUSPENDED FROM CONDUIT WITH SEALED FITTINGS. (SHOWN WITH SHROUD).



BEAM MOUNT WITH SEALED CONDUIT ENTERING FROM RIGHT SIDE.

Figure 2



## ASSEMBLY AND INSTALLATION PROCEDURE

1. Install the two mounting channels on the enclosure housing using the four #8-32 screws provided and then insert the strut nuts (*provided*). Invert enclosure if base mounting.
2. If the wiring is to be routed through the housing, make sure that the mounting channels are oriented properly before drilling, so the Display will be readable. Wiring is generally brought into the right side of the housing or rear panel, closest to the terminals of the input module. Drill the proper size hole in the housing or rear panel for the wiring connector or sealed conduit fitting and attach the fitting(s).
3. Before installing the Display into the housing, be sure that the mounting channels are oriented properly for the type of installation planned. Place the gasket that is supplied with the Display over the studs extending from the front panel of the display.
4. If using the shroud, refer to the Shroud Installation Procedure. Place the Display with gasket through the holes in the housing as shown at right. Working back and forth across the stud pattern, install the #10-32 keps nuts supplied with the Display on the studs. Tighten firmly.
5. Mount the housing, using the strut nuts and steel 1/4-20 UNC bolts and washers, as shown in figure 4.
6. Connect the wires to the Display per the instructions included with the personality board.
7. Remove the center section of the rear panel gasket. Apply the gasket to the rear panel of the enclosure by inserting the #8-32 screws through the panel and into the holes in the gasket. Position the panel on the housing, start all of the screws, then firmly tighten them in a pattern working back and forth across the rear panel.

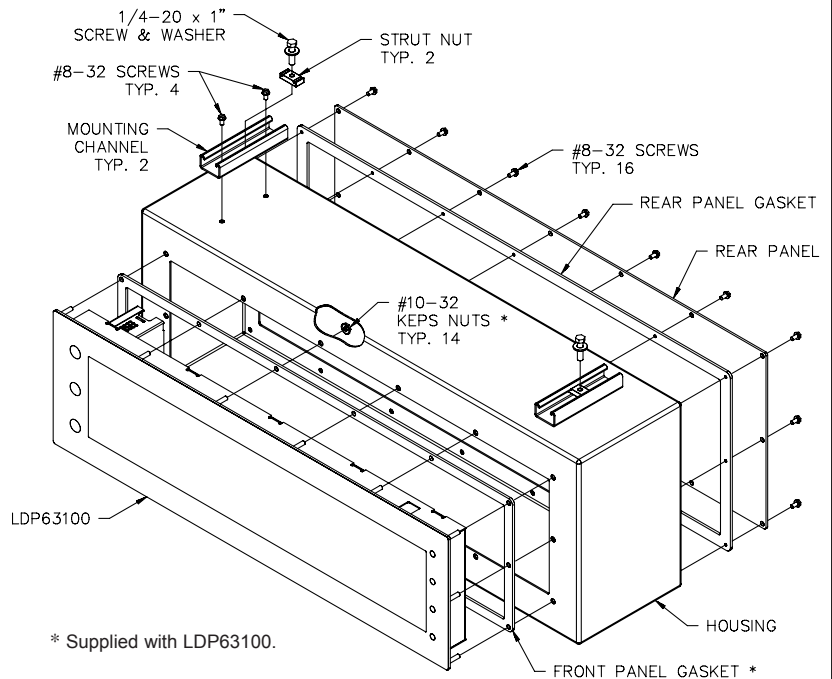


Figure 4

## DIMENSIONS FOR THE LDP63100 DISPLAY SHROUD

The optional LDP63100 Display Shroud enhances the readability of the Displays that are installed in areas with high intensity overhead light sources. The Shroud can be used with the LDP63100 Display in any installation, (panel mount, NEMA 4/IP65 Enclosure, or Universal Mounting Bracket). When properly assembled, the Shroud will not affect the integrity of a NEMA 4/IP65 installation. The Shroud weighs 1.0 pound (0.45 Kg).

### DIMENSIONS In inches (mm)

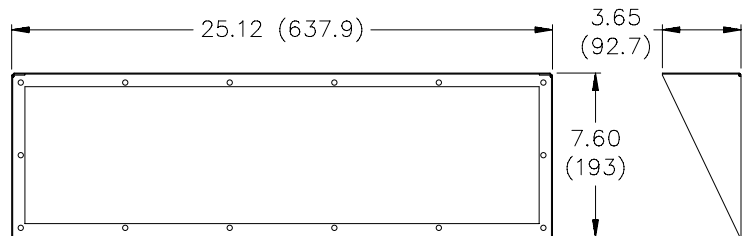


Figure 5

## SHROUD INSTALLATION PROCEDURE

### Installing The Shroud On An LDP63100 Display In A NEMA 4/IP65 Enclosure Or Panel

1. Place a gasket over the studs extending from the rear of the front panel of the Display.
2. Orient the shroud as shown in Figure 6, and place it over the display. The studs of the display should now be protruding through the rear of the shroud.
3. Place the other gasket over the studs.
4. Install the unit into the panel or enclosure using the #10-32 keps nuts that are supplied with the Display. Tighten the nuts firmly.

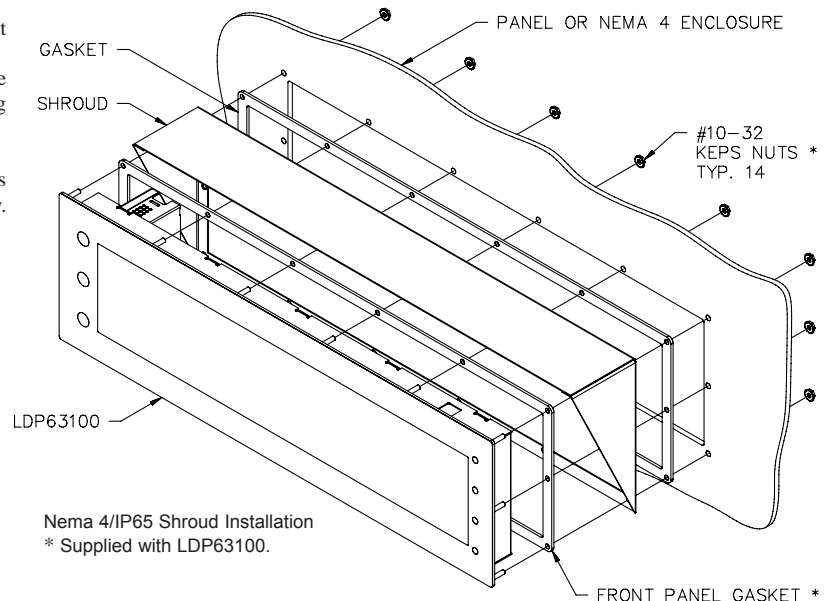


Figure 6

# PART NUMBER INFORMATION

DESCRIPTION	PART NUMBERS
Temperature Input, 85-250 VAC power	LDP63100-T
Universal DC Inputs, 85-250 VAC power	LDP63100-DC
True RMS AC Current and Volt Inputs, 85-250 VAC power	LDP63100-AC
Process Input, 85-250 VAC power	LDP63100-E
Strain Gage Input, 85-250 VAC power	LDP63100-S

## ACCESSORIES

DESCRIPTION	PART NUMBERS
NEMA 4 Enclosure	LDP6-ENC12
NEMA 4 Enclosure With Shroud	LDP6-EN/SH
Programming Remote	LDP6-PGM
Shroud	LDP631-SHR

## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **25 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **two (2) 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.

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## 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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## **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**

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

## **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