User's Guide

CE

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LDP-124, LDP-126, LDP-144 AND LDP-146

OPERATOR´S MANUAL FOR CLOCK MODELS

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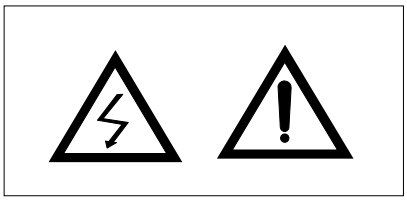
CONTENTS

1.- IMPORTANT SAFETY CONSIDERATIONS

INSTALLATION

PRECAUTIONS.-



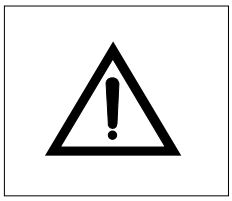
The installation and the future use of this unit must be done by suitable qualified personnel. The unit has not AC (mains) switch, it will be in operation as soon as power is connected. The installation must incorporate an external main switch.
The unit has a protection fuse incorporated on the AC socket, if it is necessary to change or replace, use the time lag fuse according IEC 127/2 and the values indicated below.

200 mA when the unit is operating at 230 Vac
400 mA when the unit is operating at 115 Vac.

Install also the necessary devices to protect the operator and the process when using the unit to control a machine or process where injury to personnel or damage to equipment or process, may occur as a result of failure of the unit.
See paragraph 8, WIRING and paragraph 10, CONFIGURATION and check that all jumpers are on the correct position.

SAFETY PRESCRIPTIONS.-

The unit has been designed and tested under EN-61010-1 rules and is delivered in good condition. This operator's manual contains useful information for electrical connections. Do not make wiring signal changes or connections when power is
applied to the unit. Make signal connections before power is applied and, if reconnection is required, disconnect the AC (mains) power before such wiring is attempted.



Install the unit in places with a good ventilation to avoid the excessive heating. And far from electrical noise source or magnetic field generators such as power relays, electrical motors, speed controls etc...
The unit cannot be installed in open places. Do not use until the installation is finished.

POWER SUPPLY.-
The power supply must be connected to the adequate terminals (see the connection instructions). The characteristics of the power supply are showed on the label on the rear part. Please make sure that the unit is correctly connected to a power supply of the correct voltage and frequency.
Do not use other power supply otherwise permanent damage may be caused to the unit.
Do not connect the unit to power sources heavily loaded or to circuits which power loads in cycle ON-OFF or to circuits which power inductive loads.

SIGNAL WIRING.-
Certain considerations must be given when install the signal input and control wires. If the wires are longs can act like an antenna and introduce the electrical noise to the unit, therefore :

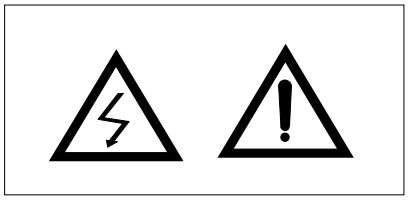
Do not install the signal input or control wires in the same conduit with power lines, heaters, solenoids, SCR controls etc....and always far from these elements.

When shielded wires are used, connect the shield to the common terminal and leave unconnected the other end of the shield and do not connect to the machine ground.

SAFETY CONSIDERATIONS

PRESCRIPTIONS.-

Before starting any operation of adjustment, replacement, maintenance or repair, the unit must be disconnected from any kind of power supply.
Keep the unit clean , to assure good functioning and performance. Use for it a clean and humid rag. Do not use for the frontal lens abrasive products, solvents, alcohol, etc... because its transparence could be damaged and this may cause difficulty for a correct vision of the reading.

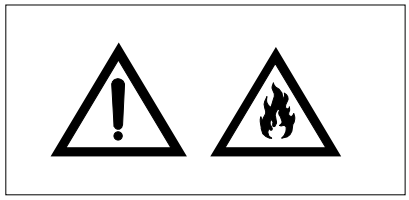


To prevent electrical or fire hazard, do not expose the unit to excessive moisture.
Do not operate the unit in the presence of flammable gases or fumes, such as environment constitutes a definite safety hazard. The unit is designed to be mounted in a metal panel.

If the unit shows signs of damage, or is not able to show the expected measures, or has been stored in a bad conditions or a protection failure can occur, then do not attempt to operate and keep the unit out of service.

IN CASE OF FIRE

1.- Disconnect the unit from the power supply.
2.- Give the alarm according to the local rules.



3.- Switch off all the air conditioning devices.
4.- Attack the fire with carbonic snow, do not use water in any case.
WARNING : In closed areas do not use systems with vaporized liquids.

CONNECTIONS

All wiring connections are made using push-in and Sub-D cable connectors.
There is a separate connector block for power supply and input&control signal. Please make sure that each connector block is connected on the adequate place.
The wire cross section recommended for power supply is 2.5 mm^2.

PANEL MOUNTING

Verify that the panel cut-out is correctly according to the dimensions indicated on page 13 with a minimum depth of 150 mm. (5.9").
Install the fixation pieces in the lateral guides of the unit by its rear part and then turn the screw firmly against the panel, until the unit is totally hold on.
See paragraph 12 on page 13.

2.- UNPACKING AND INSPECTION

It is advisable to do a detailed reading of this Manual before mounting the instrument. This Operator's Manual contains all the technical specifications : electricals as well as mechanics, both necessary to do a correct installation and also a good use of the instrument.
At the same time the user will acquire the knowledge needed to obtain the best performances of the product.

Check that inside the present cardboard box, there are the following :

- ☐ 1 Instrument Model LDP-1XX-C0, C1 or C2.
- ☐ 1 Operator's Manual.
- ☐ 1 Connector for Power Supply.
- ☐ 1 Screw-clamp connectors, 4 pins female for alarm output.
- ☐ 1 Sub-D male connector of 9 pins and 1Sub-D female connector of 15 pins
- ☐ 2 Pieces for fixing the unit against the panel.

If there are some doubts or inquiries about the present instrument, please contact **OMEGA ENGINEERING´S customer service department.**

When the shipment arrives remove the Packing List and verify that you have received all equipment.
Then inspect the box and the instrument, and if there is evidence of damage caused by bad handling during the transport, it is advisable to make a careful inspection of all damages making a note of all of them and to pass on this information directly to the Transport Company.
If this occurs but with insured material, ask the Transport Company for instructions about submitting a claim

3.- MAIN FEATURES

The Large Displays for real time clock (12 or 24 hours) or run up or run down clock are made up of four different series.
The clock accepts inputs from contact closure and other sensor inputs to start, stop and reset the run time clock.
Transducer excitation of 15 Vdc nominal is available. The units feature a run time alarm with optically isolated transistor switch output, and RS422 level two wire transmission of the displayed time.

The main features of each serie are the following :

Serie LDP-124-XX : 4 digits type LED, seven segments, red or green colour with 57 mm (2.3") height.

Serie LDP-126-XX : 6 digits type LED, seven segments, red or green colour with 57 mm (2.3") height.

Serie LDP-144-XX : 4 digits type LED, seven segments, red or green colour with 100 mm (4") height.

Serie LDP-146-XX : 6 digits type LED, seven segments, red or green colour with 100 mm (4") height.

The complete reference for each instrument is obtained replacing the ""XX" by the corresponding references for every Model (C0, C1 & C2). See paragraph 4.

The common features for all series are the following:

MECHANICAL.- Housed in a rugged extruded aluminium profile housing for panel mounting or free standing. Finished in anodized black colour. The frontal lens is mounted with a special rubber profile which provides the front part of the unit with an IP-65 protection.

CONTROL SIGNALS .- Three inputs, sharing one common return. The operating mode depends on interlinking of the three control lines

CONNECTIONS.- For output alarm are made using one screw-clamp connector of 4 terminals located on the rear part of the unit.
For control signals are made using one Sub-D connector of 15 terminals located on the rear part of the unit.
For serial data output are made using one Sub-D connector of 9 terminals located on the rear part of the unit.
The recommended wire cross section is 0.5 mm^2.
For Power Supply uses a push-in cable connector with 2 terminals for power and 1 terminal for earth ground.
The recommended wire cross section is 2.5 mm^2.
The fuse is located in the Power Supply socket, as well as the spare fuse.

MEMORY.- Non volatile static RAM type, to maintain the real time clock running in power down or in case of power failure during two years. It allows 100,000 cycles ON/OFF.
On the run time clock the data and alarm value will be stored also for a maximum of 2 years.

RESET.- By remote push-button using the connector of 15 terminals on the rear part.
Only for run time clock.

4.- MODELS

4.1.- MODEL LDP-1XX-C0. Display time using the format MM: SS
Real time clock : 59 minutes, 59 seconds.
Run time clock : 99 minutes 59 seconds.
Real time clock or run time clock is internally DIP switch selectable.
Run up or run down controlled by internal dip switch.

4.2.- MODEL LDP-1XX-C1. Display time using the format HH : MM
Real time clock : 12 or 24 hours selectable.
Run time clock : 99 hours 59 minutes.
Real time clock or run time clock is internally DIP switch selectable.
Run up or run down controlled by internal dip switch.

4.3.- MODEL LDP-1XX-C2. Display time using the format HH : MM : SS
Real time clock : 12 or 24 hours.
Run time clock : 99 hours, 59 minutes, 59 seconds.
Real time clock or run time clock is internally DIP switch selectable.
Run up or run down controlled by internal dip switch.

5.- GENERAL SPECIFICATIONS

DISPLAY

Type . . . . . 4 or 6 digits, 7 segments, red or green LED.
Height digit . . . . . 57 (2.3") or 100 mm. (4")
Range máx. . . . . 99 : 59 or 99 :59 : 59
Brightness . . . . . Set by switch for 25%, 50%, 75% or 100% (normal).

REAL TIME CLOCK.

Type . . . . . 59 mm 59 ss (model C0) 12/24 hours selectable
Time setting . . . . . By volt free contact closure inputs seconds reset, minutes advance and hours advance.
Time accuracy . . . . . ±1 minute per month.
Power down . . . . . Maintains time for minimum 2 years without mains power.

RUN TIME CLOCK

Type . . . . . 99 mm 59 ss, 99 hh 59 mm or 99 hh 59 mm 59 ss
Timer resolution . . . . . 1 second.
Timer uncertainty . . . . . 1 second max. per start/stop sequence.
Timer memory . . . . . Run time maintained for 2 years minimum but not updated with mains removed.
Alarm . . . . . One minute or one second resolution (one minute only on model C2) set by external closure inputs.
Alarm enable . . . . . Controlled by internal switch.
Alarm output . . . . . Optically isolates transistor switch 30 V / 30 mA capacity.
Alarm indication . . . . . Clock stop, display flashes and alarm output activates.
Initialization . . . . . By operation of one or more the control inputs.

CONTROL LINES

Type . . . . . Three inputs sharing one common return.
Threshold . . . . . Rising : +2.3 V min., +3.6 V max. Falling : +0.9 V min., +2.5 V max.
Signal hysteresis . . . . . 0.4 V minimum.
Maximum signal . . . . . ±30 V.
Loading . . . . . 100 KΩ to common for +5 V signal 18 KΩ loading beyond +5/-0.6V.
Load . . . . . 1 KΩ ±5% load may be internally jumpered to common or to the excitation supply for each control line.
Response time . . . . . 200 mS maximum: internally debounced for contact closure inputs.
Active level . . . . . Internally jumpered to be active either with low level/falling edge or high level/rising edge inputs independently for each control line.

CONTROL MODES

Type . . . . . The operating mode depends on interlinking of the three control lines.
One control . . . . . To reset and run when active and stop when inactive.
Two controls . . . . . One to run when active and stop when inactive and the other to reset.
Two controls . . . . . One to alternately start and stop and the other to reset.
Three controls . . . . . One to start, one to stop and one to reset.

OUTPUTS

SERIAL OUTPUT . . . . . . Output intended for transmission to the remote display fitted with a clock display as a slave clock display.
Signal . . . . . RS422 level 1200 baud fixed rate. One transmission each second while showing real time or run time.
String . . . . . Transmits --NUL--(CR) or --NUL--NUL--(CR) when setting time or entering alarm state.
Data string
Standard mode . . . . . HH.MM.SS for 6 decade version. HH.MM or MM.SS for 4 decade version.
Newport mode . . . . . HHM.MS.S for 6 decade version. HHM.M or MMS.S for 4 decade version.
Character length . . . . . One start bit, 8 data bits no parity and one stop bit.
Handshake . . . . . No handshake : one data string transmitted each second.

EXCITATION VOLTAGE OUTPUT

Vexc . . . . . +15 Vdc ±20%. @100 mA. max.
Ripple . . . . . 100 mVac 50/60 Hz.

ENVIRONMENTAL

Temperature
Operating . . . . 0 to +50 ºC (32 to 122 ºF).
Storage . . . . . -20 to +85 º C (-4 to 185 ºF).
Relative humidity . . . . . 0 to 85 % not condensed.
Protection . . . . . IP65. (Front part only).

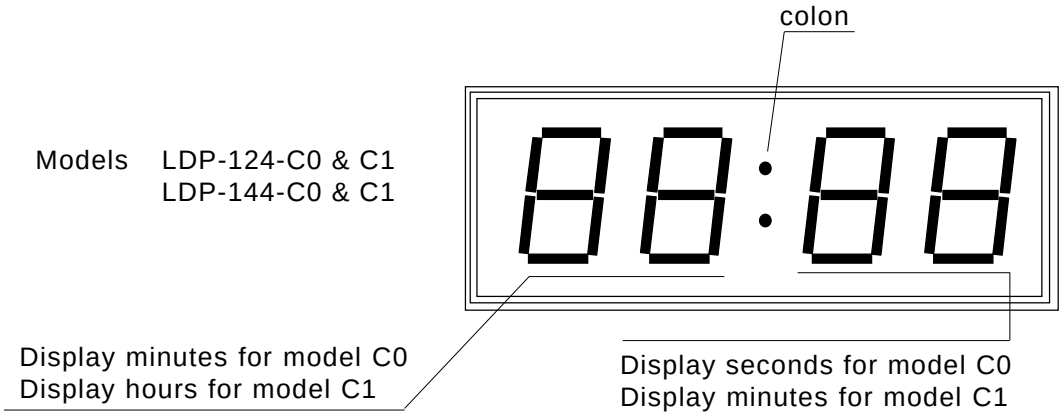
MECHANICAL

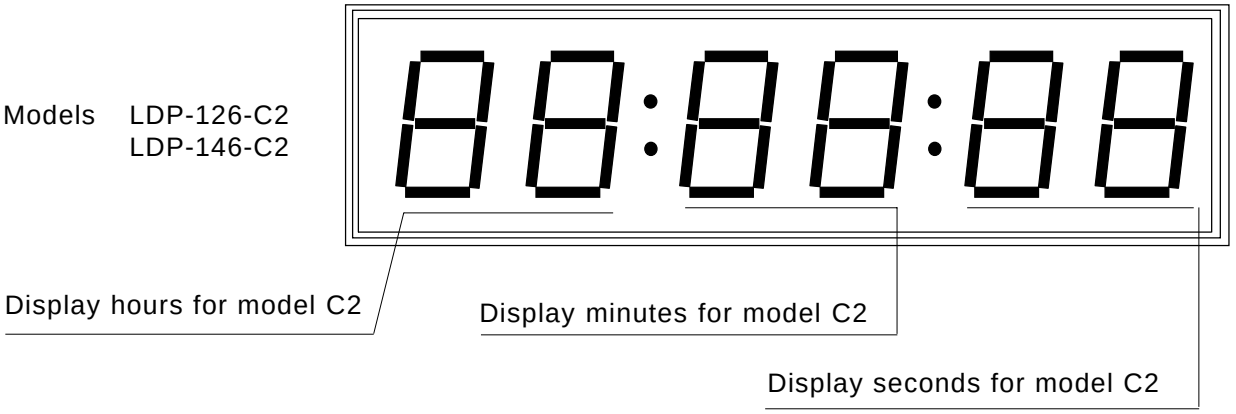
Dimensions . . . . . See table in page 13.
Panel cut out . . . . . See table in page 13.
Depth . . . . . See table in page 13.
Weight . . . . . See table in page 13.
Case material . . . . . Aluminium extruded.
Finished . . . . . Anodized, black colour.

ELECTRICAL

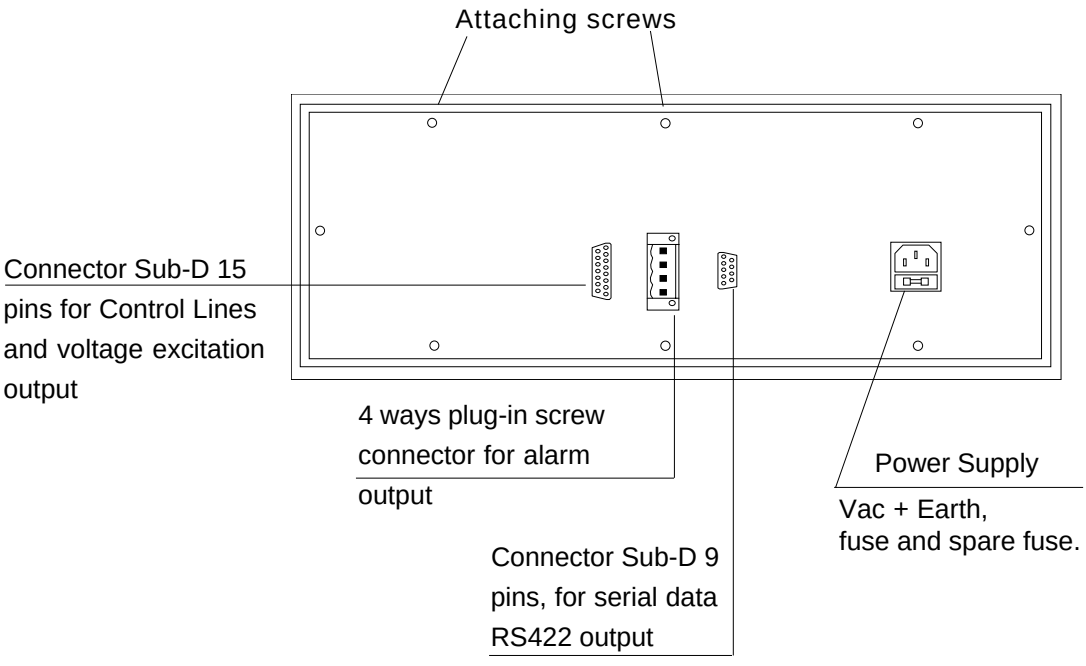
Standard power supply . . . 115 Vac. ±10% 50 / 60 Hz. (230 Vac optionally)
Consumption . . . . . See table in page 13.

6.- FRONT VIEW, DESCRIPTION



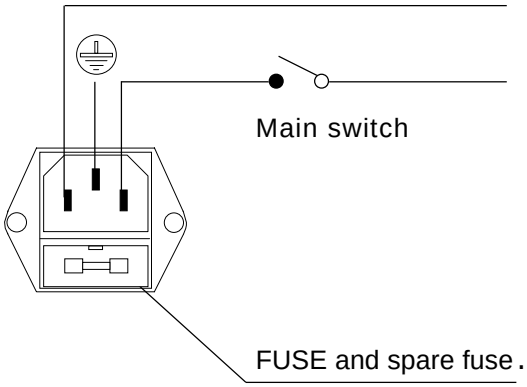


7.- REAR VIEW, DESCRIPTION for all series



8.- WIRING

8.1.- POWER SUPPLY, RECOMMENDED WIRING



POWER SUPPLY
115 Vac (230 Vac Optional).

8.2.- PROTECTION FUSES

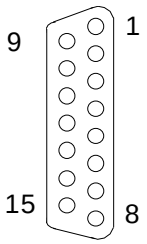
The unit has a protection fuse located on the power supply socket. If this fuse must be replaced or changed because the power supply is changed, use the time-lag fuse according to IEC 127/2 with the values indicated on the table.

Power Supply	Fuse value
230 Vac	0.2 A
115 Vac	0.4 A

TABLE 4

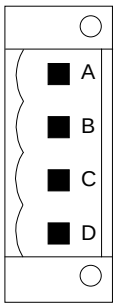
8.3.- CONTROL LINES, ALARM AND SERIAL OUTPUT

Control lines connector



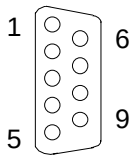
1.- Vexc.
2.- Vexc.
3.- Start
4.- GND
5.- GND
6.- Minutes
7.- GND
8.- No connection
9.- Vexc.
10.- Stop
11.- Reset
12.- GND
13.- Seconds
14.- Hours
15.- GND

Alarm connector



A : + Alarm
B : No connection
C : No connection
D : - Alarm

Serial RS422 connector



1.- Serial A.
2.- Serial B.
3.- No connection
4.- No connection
5.- GND
6.- No connection
7.- No connection
8.- No connection
9.- No connection.

8.4.- NOTES

The HOURS, MINUTES & SECONDS inputs are for contact closure to GND, and are pulled up to the auxiliary 15 volt rail through 4.7 KΩ.
The STOP, START and RESET inputs are normally configured to be pulled up to the auxiliary 15 volt rail through 1 KΩ, but may be internally jumpered to be pulled to GND through 1 KΩ, or pulled to GND through a high resistance of 100 kΩ.
Debouncing for 200 mS time constant is normally incorporated on the three control inputs, but may be disabled by removing internal jumpers.
Vexc is the Excitation Voltage for sensors supplied by the instrument (pins 1, 2 & 9).
The connections to Serial A, Serial B and GND are for the RS422 data output.

Run time uncertainty
The control inputs are sensed eight times per second, but the actual run time clock is incremented or decremented in synchronism with the built in real time clock once per second.
This means that each start/stop condition may be inaccurate by up to one second.

8.5.- EXCITATION VOLTAGE FOR SENSORS

The unit supplies the Excitation Voltage for sensors, through control lines connector.
If the current required for the sensors installed is more than 100 mA then do not use this terminal. Install other external power supply. See paragraph 5 for technical specifications

9.- POWER-UP AND OPERATION

9.1.- REAL TIME CLOCK

At power-up, the unit displays the message **MAStEr** for 6 decade version or **MASt** for 4 decade version and will start to operate.
If a failure occurs then will display the messages **CHIP** or **SET**. The message **CHIP** means that the failure is the internal hardware and the message **SET** means that the data stored in the memory is damaged and it must be restored.
The restore data operation can be made while the instrument is in normal operation or while the error message **SET** is on the display using the control lines HOURS, MINUTES & SECONDS.

Terminal	Function
14 Hours	Increment hours
6 Minutes	Increment minutes
13 Seconds	Reset seconds

Reaction to the control lines is once per second.
To obtain a complete reset in a real time clock configuration, connect terminals 14 & 13 to GND simultaneously.
The display can be switched in to Run Time Clock mode by inputting an active signal on to any of the three control lines START, STOP or RESET.

9.2.- RUN TIME CLOCK

At power-up, the unit displays the message **MAStEr** for 6 decade version or **MASt** for 4 decade version and will start to operate.
If a failure occurs then will display the messages **CHIP** or **SET**. The message **CHIP** means that the failure is the internal hardware and the message **SET** means that the alarm value stored in the memory is damaged and it must be restored.
Use the control lines RESET, START & STOP to control the timer. Once the unit is displaying the run time clock the three control lines operate as show in the table.

An active signal applied to pin :	Function
11 Reset	Resets/Preset the timer
3 Start	Starts the timer
10 Stop	Stops the timer running
	Starts the timer if not running

An active signal can be either active high or active low depending upon the internal configuration of the unit as shown in paragraph 10.2.4.
The factory default settings are for contact closures to GND for all three inputs. Reaction to the control lines is once per second.
Note on the 4 decade clock the run time clock may be either for hours and minutes or for minutes and seconds. During run time hours and minutes, the colon will flash on and off every second while the clock is running to indicate the clock is running.

9.2.1.- UP / DOWN TIMING

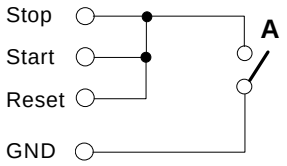
The run time clock has two basic modes of operation; a run up clock or a run down clock. These modes are controlled by a internal DIP switch (See DIP SWITCH CONFIGURATION in paragraph 10.2.3).

Run up clock
Reset will clear the clock to zero. When the alarm point is reached, if the alarm is enabled, the clock will stop and the whole display will flash and the alarm output will be activated, until the clock is reset. If the alarm is disabled, the clock will run up to 99 minutes 59 seconds (or 99 hours 59 minutes) and then roll over zero.

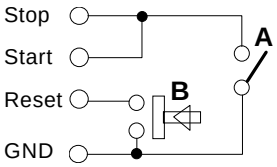
Run down clock
Reset will preset the clock to the alarm point. When zero is reached, if the alarm is enabled, the clock will stop and the whole display will flash and the alarm output will be activated, until the clock is reset. If the alarm is disabled, the clock will run down to zero and then underflow to 99 : 59.

9.2.2.- CONNECTION EXAMPLES

Different interlinking of the three control lines will produce different operating modes:

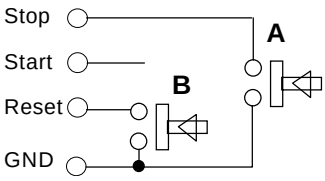


Close contact A = reset and run
Open contact A = stop

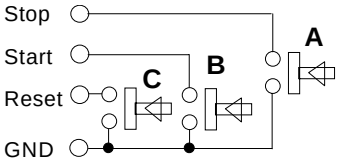


With contact B opened
close contact A = run
open contact A = stop

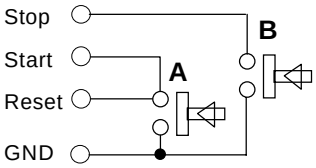
push contact B = reset



Push A = start
Push A = stop
Push B = reset



Push B = start
Push A = stop
Push C = reset
note A may close while B is shut
B may open while A is shut



Push A = reset and start
Push B = stop
(push B again = start)

9.3.- RUN TIME ALARM SETTING

The alarm is a 4 decade alarm only. On the 6 decade clock, the alarm setting is for hours and minutes only and on the 4 decade clock the alarm point can be for either hours and minutes or minutes and seconds.
Displaying or setting of the alarm point can only be done when the unit is displaying the run time and is not running.
The same three contact inputs are used for setting the alarm point and for adjusting the real time clock, but their functions are different.
To display the alarm set point, hold the SECONDS input (pin 13) to GND. Once the alarm point is displayed, the value can be changed by contact closure between GND and the following terminals :

Seconds ..... view/adjust alarm point (hold to GND).
Minutes ..... increment seconds (or minutes).
Hours ..... increment minutes (or hours).
Hours and Minutes ..... together reset alarm to zero

9.4.- SERIAL DATA OUTPUT

The unit incorporates and RS422 level serial ASCII output to allow master/slave clock setups in conjunction with serial ASCII remote displays.
Details of the serial output to be found in paragraph 5.
Note the line should be terminated to prevent noise pickup if the clock is not transmitting data.

10.- CONFIGURATION

10.1.- POWER SELECTION

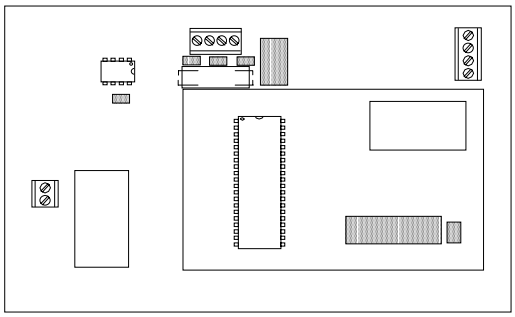
See the rear label for power requirements. Power supply selection must be done by suitable qualified personnel or by the local distributor. Contact factory or your local distributor for instructions.

10.2.- INSTRUMENT CONFIGURATION

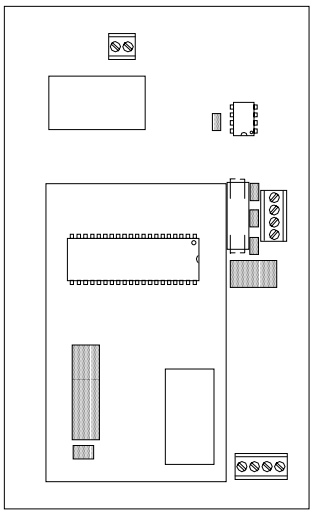
To change the instrument configuration, the rear panel of the instrument needs only to be removed to gain access to the internal DIP switches and jumpers located on the control board.
Be sure that the instrument is disconnected from any power supply before removing the rear panel.

10.2.1- CONTROL BOARD POSITION

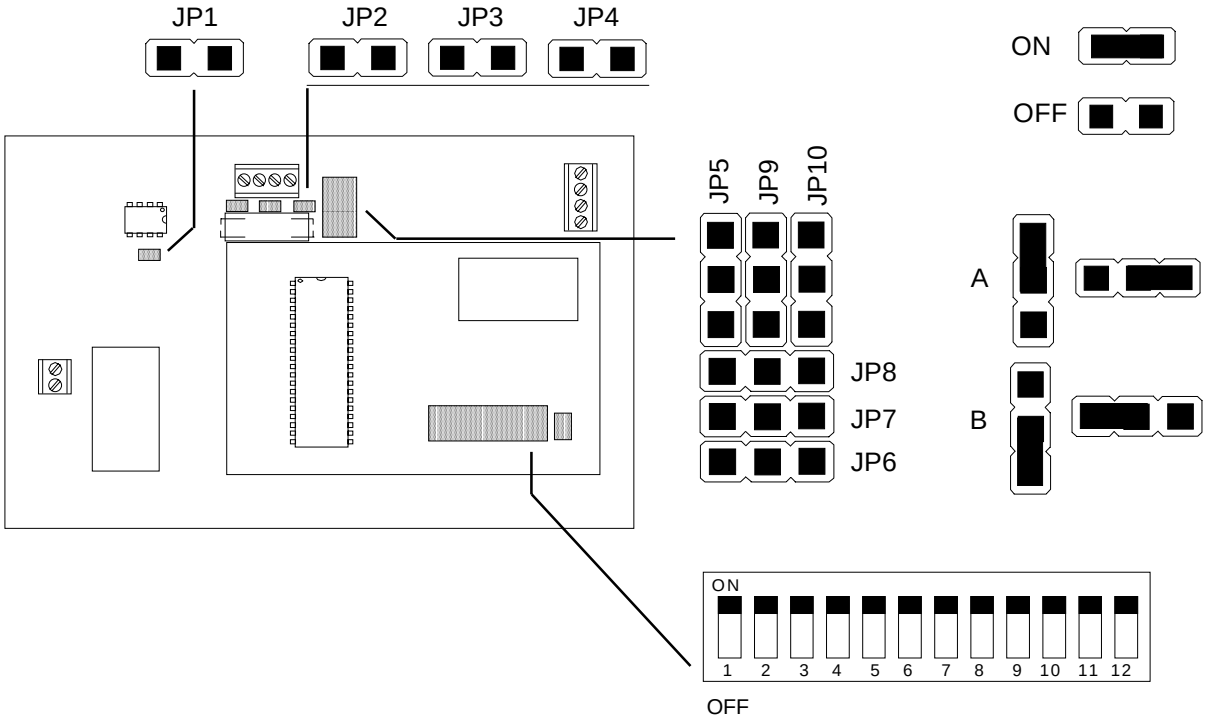
Control board position for instruments series LDP-2X-CX



Control board position for instruments series LDP-4X-CX



10.2.2- DIP SWITCH AND JUMPERS LOCATION



10.2.3- DIP SWITCH CONFIGURATION

Switch number	Function	Switch position OFF	ON
1	Alarm	Disable	Enable*
2	Run time	Up*	Down
3	Display brightness	See brightness table	
4	Display brightness	See brightness table	
5	Clock range	MM :SS	HH :MM
6	Clock range	12 hours	24 hours*
7	Serial data output	See serial data output configuration	
8	Function selection	Real time*	Run time

Display brightness table	
DIPswitch 3 4	brightness %
OFF OFF	25
OFF ON	50
ON OFF	75
ON ON	100*

* = Factory set-up

10.2.4- JUMPERS CONFIGURATION

Function	Close Jumper
220 Ω terminator resistor for the RS422	JP1 (By default opened)
switch debounce of 5 Hz for the STOP line	JP2* (By default closed)
switch debounce of 5 Hz for the START line	JP3* (By default closed)
switch debounce of 5 Hz for the RESET line	JP4* (By default closed)

Jumper	Application	A Jumper position B	
JP5	for STOP line	1 KΩ pull-up *	1 KΩ pull-down
JP6	for START line	falling edge/low level active*	rising edge/high level active
JP7	for STOP line	falling edge/low level active*	rising edge/high level active
JP8	for RESET line	falling edge/low level active*	rising edge/high level active
JP9	for START line	1 KΩ pull-up*	1 KΩ pull-down
JP10	for RESET line	1 KΩ pull-up*	1 KΩ pull-down

* = Factory set-up

10.2.5- SERIAL DATA OUTPUT CONFIGURATION

Instrument reference	Data output format with DIP switch 7 in position ON (NEWPORT mode)	Data output format with DIP switch 7 in position OFF Standard mode	Transmission during time adjust or in alarm status
C2	HHM.MS.S(CR)	HH.MM.SS(CR)	--(NUL)--(NUL)--(CR)
C1	HHM.M(CR)	HH.MM(CR) * HH(NUL)MM(CR)**	--(NUL)--(CR)
C0	MMS.S(CR)	MM.SS(CR)	--(NUL)--(CR)

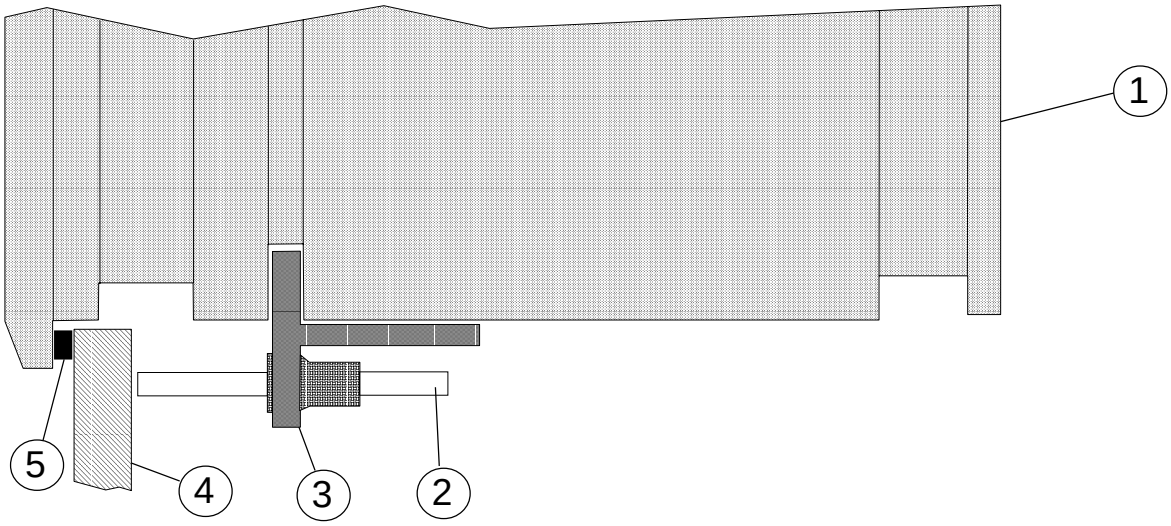
* = Data output format only when the colon is lighted.
** = Data output format only when the colon is NOT lighted.

H = Character from "0" to "9" which represent one number of hours.
M = Character from "0" to "9" which represent one number of minutes.
S = Character from "0" to "9" which represent one number of seconds.

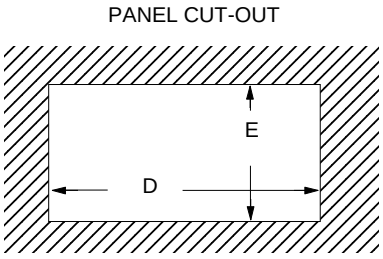
Character "." = 02E hex.
Character "-" = 02D hex.
Character "(NUL)" = 0 hex.
Character "(CR)" = 0D hex.

11.- INSTALLATION

1.- Prepare a panel cut-out with the dimensions indicated on paragraph 12.
2.- Slide the instrument (1) into the cut-out.
3.- Slide the two fixation pieces (3) with T shape by both lateral sides of the instrument, such as it is shown on the drawing below.
4.- Turn the screw bolt until it is pressed firmly against the panel (4) and the instrument (1) remains totally fixed.
5.- The front part of the instrument has the necessary elements to provide an IP 65 protection. If the panel where this instrument must be installed, it must to comply some protection standards against water splashes, then a rubber profile must be installed with a rectangular or round shape (5) on the place indicated and shown on the drawing below.



12.- MECHANICAL DIMENSIONS mm (inches)



Panel thickness : Max. 14 (0.55)
Min. 2.5 (0.10)

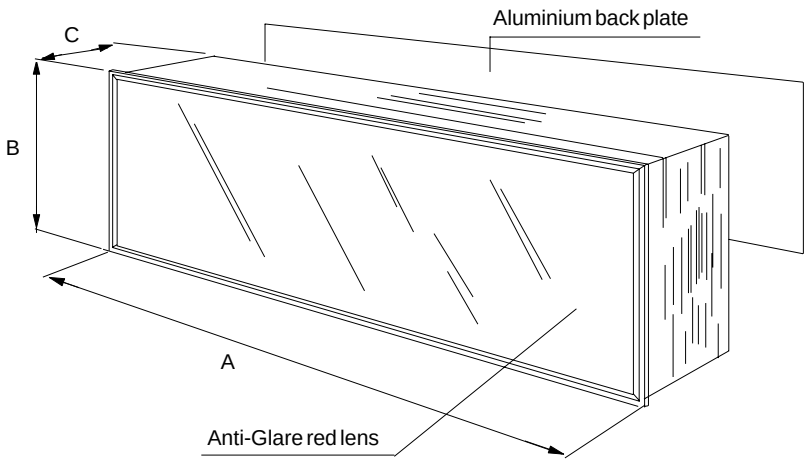


Table 5

		DIMENSIONS			PANEL CUT-OUT		WEIGHT	POWER
Digits	Height	A	B	C	D	E		
4	57 (2.3)	264 (10.4)	120 (4.75)	112 (4.41)	256 (10.07)	112 (4.4)	2.3 Kg (5 lbs)	6 VA
4	100 (4)	480 (18.9)	180 (7.09)	112 (4.41)	472 (18.58)	172 (6.77)	5 Kg (11 lbs)	12 VA
6	57 (2.3)	384 (15.12)	120 (4.75)	112 (4.41)	376 (14.8)	112 (4.4)	2.7 Kg (6 lbs)	6 VA
6	100 (4)	688 (27.1)	180 (7.09)	112 (4.41)	680 (26.77)	172 (6.77)	5.7 Kg (12.5 lbs)	12 VA

Dimensions in mm. Parenthesis are in inches or pounds.
Add 27 mm to the dimension C for power connector.

APPENDIX 1: MODEL LDP-1XX-CX AS SLAVE REPEATER.

FUNCTIONAL DESCRIPTION:

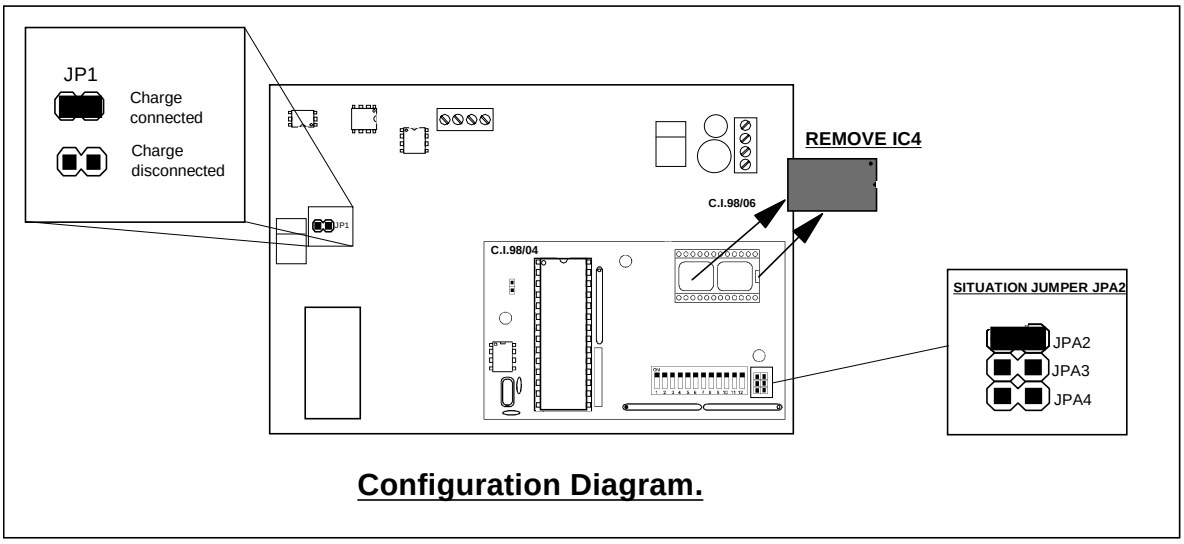
Special configuration of Models **LDP-1XX-CX** for serial **RS-422** repeater, to be used as slaves.
The Serial port connection which is the only that keeps in operation, it is used to enter the data coming from the Master.
The rest of functions and connections of these Models, remain disabled.

CONFIGURATION OF A SLAVE MODEL, STARTING FROM A MASTER MODEL LDP-1XX-CX:

- Remove the integrated circuit "IC4" placed on the PCB "98/04" and close jumper JPA2.

CONFIGURATION OPTIONS:

Jumper JP1 placed on PCB "98/06", connects the **RS-422** line termination (220 Ohm.).
The rest of the Mini-dips and Jumpers are disabled on this Mode.



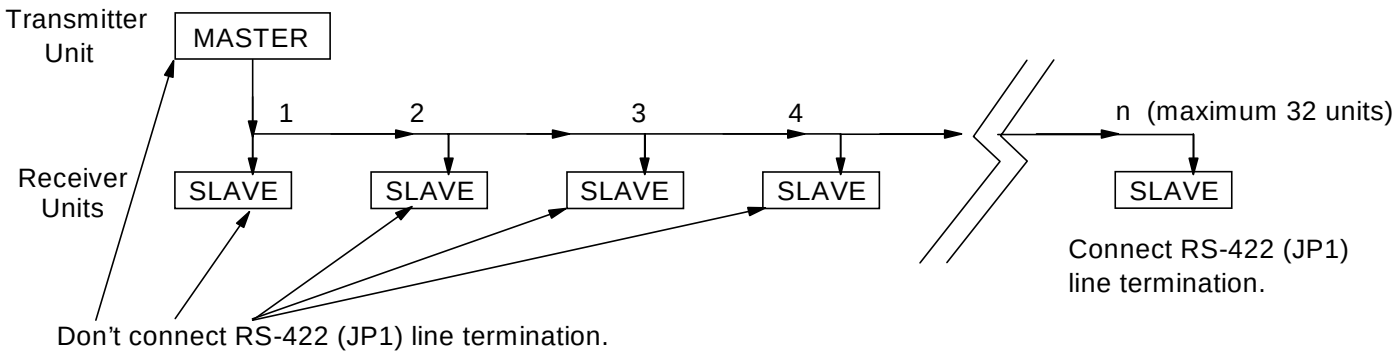
Configuration Diagram.

OPERATION:

After powered up the unit, the 4 digit Models will display **"SLU"** and the 6 digit Models will display **"SLAUE".**
These above indications will remain on the Display, until to receive valid data through **RS-422** channel.

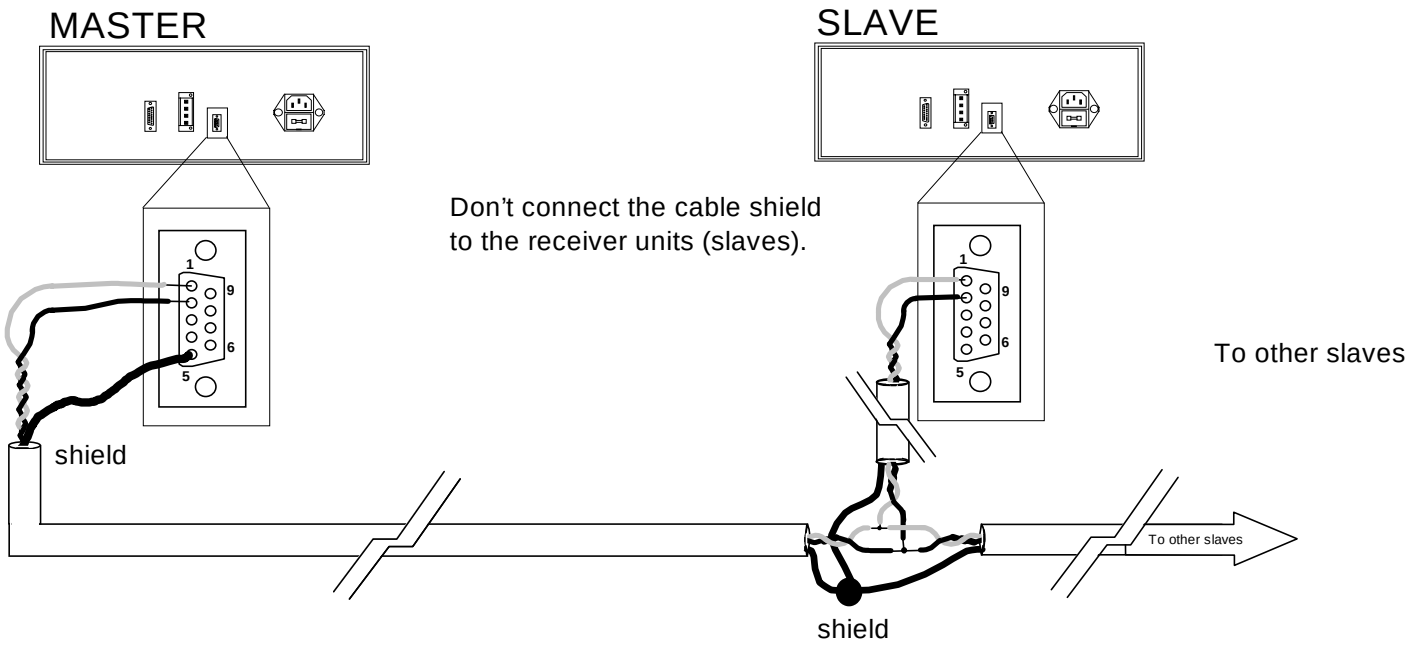
APPENDIX 2: TIME-NET CONFIGURATION AND CONNECTIONS.

It is advisable to make the TIME-NET connections as follows:



Note

Shielded twisted-pair cable, must be used for connections.



COMPATIBILITY TABLE AMONG MASTER-SLAVE

master / slave	124-C0 124-C1	126-C2	144-C0 144-C1	146-C2
LDP-124-C	YES	NO	YES	NO
LDP-126-C	NO	YES	NO	YES
LDP-144-C	YES	NO	YES	NO
LDP-146-C	NO	YES	NO	YES

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 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 malfunction, 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 which wear are not warranted, including but 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 OMEGAS'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the 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.

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