

# PLS OPERATING MANUAL

## PLS HDR 1000



**PACIFIC LASER  
SYSTEMS**

The Professional Standard



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# INTRODUCTION

The PLS HDR 1000 is a self-leveling programmable digital slope laser used for exterior horizontal layout. The rechargeable NIMH battery pack contains micro-controlled charging technology. The HDR 1000 may also be used with alkaline batteries.

**CAUTION: DO NOT ATTEMPT TO CHARGE STANDARD ALKALINE BATTERIES OR WARRANTY WILL BE VOIDED.**

The HDR 1000 may be controlled by the PLS DRC 1000 remote control.

The instrument is water resistant and may be used in light rain, if necessary. Unit may not be submerged in water.



# SAFTEY INSTRUCTIONS

## Safety Instructions

### Laser Safety

The PLS HDR 1000 is a class III R laser according to 21CFR1040. Follow the instructions on the warning labels which are shown in the following illustrations:



PLS HDR 1000  
Laser Power:  
635 nm  
<5mW  
Laser Class III R

Do not remove the attached warning labels. The manufacturer and its dealers are not liable for any defects and the consequences from this removal.

**! Attention !** The internal laser sources comply with laser classes II and III. Do not disassemble the instrument. In case of inappropriate repairs, laser radiation may arise in excess amounts of the marked labels and liability may be incurred if there is damage. In cases of inappropriate processing, malfunctions are possible without external visible damage.

## DO NOT ATTEMPT TO CHARGE STANDARD ALKALINE BATTERIES.

Attention: This instrument contains NIMH rechargeable batteries. Batteries must be recycled or disposed of properly.

WEEE-Reg.: DE23874031



## BATTERIES

The PLS HDR 1000 uses rechargeable NIMH batteries.

For on-board chargeable battery, insert the battery re-charger receptacle plug in the charging panel outlet of the battery cover back.

Insert converter's AC receptacle plug in an AC outlet and insert the converter's DC receptacle plug in the charging panel's DC outlet.

When the charging lamp is on, charging is in process.

When the charging lamp is green, charging is completed.

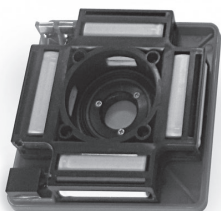
NOTE: The charging process takes approximately 7 hours to complete for rechargeable batteries.

AC/DC converter's suitable power range: 50-60Hz; voltage 85V-265V.

If it is necessary to replace the NIMH battery, the battery chamber may be removed by turning the lock washer on the battery chamber. Purchase replacement battery chamber from

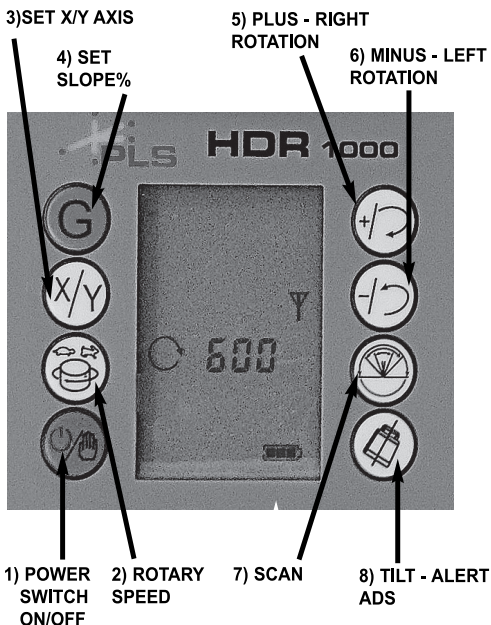


an authorized PLS dealer.



Use PLS HDR 1000 with caution in humid or wet weather conditions. Do not put the laser back into the case unless it is thoroughly dry. Condensation may corrode the battery connections and/or cause distortion of beams in lighthouse.

# KEYPAD OPERATION FUNCTIONS AND INDICATORS




- 1) Power switch: turn on or off unit.
- 2) Adjust rotation speed up to 600 RPM
- 3) Selection axis for grade %
- 4) Set program for grade
- 5) Adjust % of grade for X axis
- 6) Adjust % of grade for Y axis
- 7) Scan mode for less than 360 degree full rotation
- 8) Position disturbance alarm



# FUNCTIONS

## Power Switch

Press 1  (See keypad chart) The unit is self-leveling and power light is lit. Press the key again and the unit will turn off.

## Rotation Mode

After laser has automatically leveled, the laser beam stops blinking. The laser will rotate at 1000 r.p.m. If the gradient exceeds  $\pm 5^\circ$ , the manual indicator will blink.

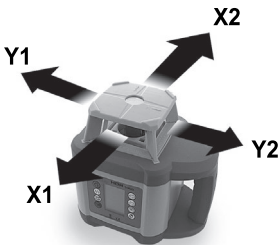
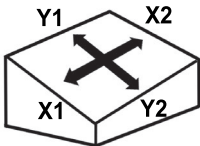
**NOTE:** If the unit does not level within 5 minutes, it will shut off.

## Automatic Drift System

Press 8. Press the TILT key, the power indicator blinks slowly. After the instrument has leveled automatically for about 3 seconds, the ADS function is activated. The power indicator will blink quickly, and automatic leveling function shuts off when the instrument is disturbed by external circumstances. At the same time, the laser module will stop scanning and start blinking.


## Setting Slope on Keypad

### Slope/Grade Mode




### Single Slope - Adjusting the Slope of Y-Axis

For single slope applications, the slope or grade can be as much as a positive or negative 10.00%, and set in reference to the Y axis of the instrument. Position Y1-beam in the direction of the slope requires.



When the instrument is set upright for horizontal rotation, the slope of the Y-axis can be adjusted. Press the Grade Mode button , the instrument will enter into the mode of manual grade adjustment.


First, the X% value on the display will begin to flash.


**Y 3.10%**

Press the  button to enter the Y-axis slope/grade menu. The Y% value on the display will begin to flash.


# APPLICATIONS

Press the  or  buttons to adjust the Y% grade value. Continue until the required value is set. The Y-axis slope/grade value can be set between +10.00% and -10.00%.

Once values are set, press the  button. After a few seconds the instrument will process the values and adjust the laser beam to the grade set. The laser beam will begin to rotate.



**If the instrument is disturbed during operation, an audible alarm will sound to indicate that the instrument has moved.** If disturbed, you need to reconfirm all references and benchmarks. If you determine that instrument has not shifted from original position, press the  button to re-start the instrument and return to grade mode.


## Dual Slope/Grade - Adjusting the Slope of Both Axis



When the instrument is set upright for horizontal rotation, the slope of X axis and Y-axis can be adjusted by entering the Slope-Grade Mode. Press the Grade Mode button.  The instrument will enter into the mode of manual grade adjustment.


First, the X% value on the display will begin to flash. 

<b>X</b> 5.25%
----------------


Press the  or  buttons to adjust the X% grade value. Continue until the required value is set. The X-axis slope/grade value can be set between +10.00% and -10.00%.

Press the  button to enter the Y-axis slope/grade menu. The Y% value on the display will begin to flash.

Press the  or  buttons to adjust the Y% grade value. Continue until the required value is set. The Y-axis slope/grade value can be set between +10.00% and -10.00%.

Once values are set, press  button. After a few seconds, the instrument will process the values and adjust the laser beam to the grade set. The laser beam will begin to rotate.

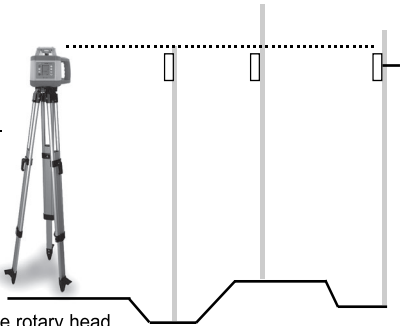
## Scanning

The scan mode is used when full rotation of the laser beam is not required. Press  and select % of rotation required.

# APPLICATIONS


## Height Transfer (Leveling)

Turn the instrument on. The leveling LED is flashing and the instrument is self leveling. If the LED lights



continuously the rotary head starts and the laser beam will be turned on. Attach the PLS HLD 1000 Detector at this reference point on a rod and move this height to zero. Now the respective difference in levels to the reference height can be measured on the ground. It is useful to use a flexible rod to measure positive and negative values simply.

## Bonus Function

The PLS HDR 1000 is also self leveling in a third axis (Z). Place the instrument on its side with keypad facing up. The plumb beams will level and the rotary will spin in a vertical axis. The rotation speed  $X/Y$  and the scan 

# REMOTE CONTROL

The PLS HDR 1000 may be used with the PLS DRC 1000 infrared remote control. Point the remote in the direction of the PLS HDR 1000 for remote operation. Remote distance is maximum 70 feet. There are 7 keys on the panel of the remote unit. The remote panel matches the keypad of the PLS HDR 1000. Pressing any key will make the indicator lamp blink once indicating remote signal is being sent. Remote does not power on the laser. Requires two AA alkaline batteries.

# CHECKING CALIBRATION

The PLS HDR 1000 should be checked, like all measuring instruments, before use. Set the PLS HDR 1000 on a stable surface. Turn the laser on and let it level. Mount the PLS HLD 1000 Detector at a fixed distance, e.g. at 90 feet, and move it onto the laser plane. Now turn the instrument around to each 90° point and let the instrument level. In each case, measure the difference to the first height. If the deviation is smaller than 1/8 inch, the instrument is within the specification. In the case of larger deviations the instrument has to be calibrated.

# ROTARY SPECIFICATIONS

## PLS HDR 1000:

Accuracy:	+/- 1/8 inch @100 feet 3mm @ 30meters
Leveling range:	± 5°
Operation range:	Radius +/- 1000 feet w/detector 304 meters
Rotation speed:	600 rpm
Light source:	laser diode, wavelength 635nm, <5mW
Operating Temp:	4° F (-15C) to 122° F (50° C)
Storage Temp:	-22° F(-30° C) to 140° F (60° C)
Laser Class:	III R
Power supply:	4 x C Size or NIMH Batteries
Operating time:	approximately 20 hours
Charging time:	maximum 7 hours (NIHM ONLY)
Protection grade:	IP54 (Water- resistant), not submersable
Size / Weight:	8 inch x 7 inch x 6 inch 200mm X 177mm X 152mm 4.7 lbs (unit only) 2.1 kg

## PLS DRC 1000 Remote Control:

Operating distance	+/- 70 feet
Charger LDG 2+2:	
Input:	100-240V AC / 47-63Hz
Output:	DC 5.6 v 700mA

Do not attempt to charge Alkaline Batteries.

Design and specifications are subject to change without prior notice.

## WARRANTY

In the event of a claim please contact your PLS dealer or PLS. Attempts at repair or detectable improper treatment will void any warranty claim. Please use the original transport case for shipment.

This product is warranted by PLS • Pacific Laser Systems to the original purchaser to be free from defects in material and workmanship under normal use for a period of three years from the date of purchase. During the warranty period and upon proof of purchase, the product will be repaired or replaced (with the same or similar model at our option) without charge for either parts or labor through PLS. The purchaser shall bear all shipping, packing and insurance costs. Upon completion of the repair or replacement, the unit will be returned to the customer, freight prepaid. The warranty will not apply to this product if it has been abused or altered. Without limiting the foregoing, battery leakage, dents or gouges to the plastic housing, broken optic windows, damage to the switch/LED membrane are presumed to result from misuse or abuse. Tampering with or removal of the caution or certifications labels voids this warranty.

Neither this warranty nor any other warranty, express or implied, including implied warranties of merchantability, shall extend beyond the warranty period. No responsibility is assumed for any incidental or consequential damages. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

# PLS HDR 1000 DETECTOR

## 1. SPECIFICATIONS

Available Distance: From rotary PLS HDR 1000 (2.0 ft.)

Accuracy: Precise detecting:  $\pm 1\text{mm}$  ( $\pm 0.04\text{in}$ )

Rough detecting:  $\pm 2\text{mm}$  ( $\pm 0.08\text{in}$ )

Detecting Indication: Bi-surface LCD, buzzer

Power: DC9V alkaline battery


Automatic Power-off Time: Approx. 20 minutes


Working Temperature:  $-20\text{C}^\circ$  to  $+50\text{C}^\circ$  ( $-4^\circ\text{F}$  to  $+122^\circ\text{F}$ )

Dimensions: 135 (L) X 65 (W) X 24.5 (H)mm  
6" x 2-3/4" x 1"

Weight: 0.15kg (0.44lbs) (with battery)

## 2. LCD

Precise Detecting  
Reference Position  
Display: 

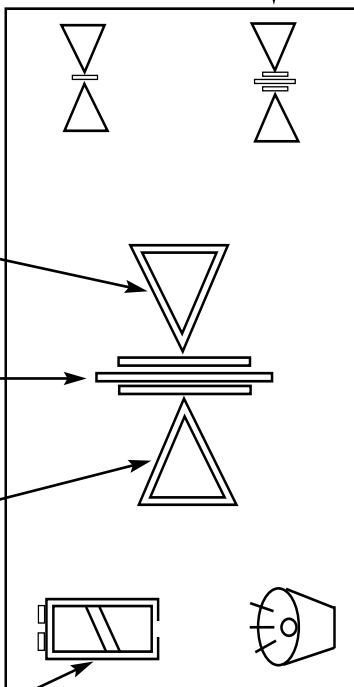
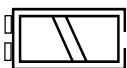
Rough Detecting  
Reference Position  
Display: 

Higher than  
reference  
(fast  
frequency  
beep)

In reference  
line (long  
beep)

Lower than  
reference  
(slow  
frequency  
beep)

Poor Power:



Buzzer On: 

Buzzer Off: 

### 3. PANEL

LCD (Both on Front Shell & Back Shell)

Buzzer ON/OFF  
Once power on, default of buzzer is on

44mm  
1 3/4 Inches

Mark

Laser Receptor

ON/OFF



Buzzer

Power Switch

Detecting Mode



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