



Operating Instructions for the Laser Rangefinder/Hypsometer

100LHA / 400LHA

The Opti-Logic LHA-series Laser Rangefinder/Hypsometer height measurement system combines a pulsed laser rangefinder and a vertical angle sensor in a lightweight, easy-to-use package. Incorporating an internal electronic tilt sensor, the Laser Rangefinder/Hypsometer makes vertical angle measurements with better than 1 degree resolution to remotely determine object heights. Applications of the hypsometer measurement system include tree height measurements, construction, utilities, architectural measurements, landscaping, real estate appraisal, and much more. The system is ideal for applications where surveying quality measurements are not required and higher instrument cost is not justifiable. This product is designed for years of trouble-free operation and is proudly Made in the USA.

1.0) Product Description and Features

Viewfinder: Look through the viewfinder window and aim the Red Dot at an object.

Range Button: Press the "Range" button to take distance or height measurements, or to select modes.

Display: The Opti-Logic Rangefinder/Hypsometer is User Programmable to read in either Feet, Meters, or Yards.

Low Battery: Replace the battery when the Low Battery symbol is displayed constantly.

Automatic Rain Mode: For range accuracy in light rain conditions.

Automatic Timeout: To save batteries, the instrument will automatically "time out" after about 7 seconds.

2.0) Basic Operation

A. Hold the instrument an inch or two from your eye and aim at the object through the viewfinder.

B. Press and hold the "Range" button. A "Red Dot" will appear in the viewfinder. Place the Red Dot on the target.

C. Release the button and maintain aim on the target momentarily. The "clicking" sounds indicate that the laser is hitting the target. Like a Geiger counter, stronger signals produce more rapid clicking. The laser does not fire until the button is RELEASED.

D. Read the distance after the audible tone is heard and the Red Dot turns off.

2.1) Distance Measuring w/ Time-of-Flight Rangefinders

The Opti-Logic Laser Rangefinder/Hypsometer emits invisible, eye-safe pulses of infrared light. Distances are determined by reflecting the laser beam off an object and measuring the round-trip time-of-flight of the laser beam to and from the object. The laser beam emitted by the Rangefinder is in the form of a vertical stripe of invisible light, which enhances the Rangefinder's ability to hit thin vertical targets. The Opti-Logic Laser Rangefinder/Hypsometer incorporates a unique "Lock and Load" feature that simplifies the task of hitting targets in the presence of background objects. Simply depress the "Range" button and aim the Rangefinder using the Red Dot aiming aid in the viewfinder. The laser is fired **AFTER** the button is released, which provides time to properly aim the Rangefinder and minimizes the chance of hitting unintended objects. When the Rangefinder laser beam hits

a target, a clicking sound is produced to provide audible feedback to make it easier to home in on your target. The rate of clicking is faster for brighter, closer objects, much like a Geiger counter. To improve the accuracy of the instrument, an onboard computer averages several readings from the object. After the Rangefinder has received enough information, the audible clicking and Red Dot turn off and the distance is shown in the display. A tone or "beep" will sound when the distance is displayed.

The maximum distance measurable by any laser rangefinder is determined by several factors including the size, shape, reflectivity, and orientation of the object as well as atmospheric conditions. Color and surface finish of the target also affect the reflectivity and therefore can influence the range as well. A good quality target is a non-gloss object that is light in color and has enough surface area for the laser beam to efficiently reflect back to the Rangefinder. Vertical objects tend to make better targets than horizontal ones. White objects tend to range farther than black objects. Target surfaces that are perpendicular to the laser beam are better than surfaces tilted away from the Rangefinder. Targets made of "retroreflectors" provide the greatest range capability. Retroreflectors are made of special materials designed to reflect light back toward the light source, for example, stop signs, street signs, license plates, and specially made Opti-Logic reflectors. Contrary to expectation, extremely glossy surfaces like windows and mirrors do not make good targets, because they tend to reflect light away from the instrument.

2.2) Changing the 9 Volt Battery

A. Slide the locking tab on the side of the instrument forward (toward the lenses).

B. Using your thumbnail, gently pry out the battery door using the locking tab.

C. Pull on the cloth ribbon and the battery will pop out.

D. Replace battery. The battery direction is shown in the battery compartment. Replace and lock battery door using slide lock.

2.3) Mode Selection

The Opti-Logic Rangefinder/Hypsometer provides user-selectable display units and four operational modes allowing the user to (1) determine range to an object, (2) determine horizontal range to an object even when the aim point is at an angle, (3) determine the height of an object, and (4) determine the vertical angle to an object. In Modes 1, 2, and 3, the user may select units of feet, yards, or meters. To enable the mode selection process, hold the firing button down for approximately 6-8 seconds until a double-beep is heard. Immediately release the button, then repeatedly press and release the button to scroll through menu options: **Mode 1:** Meters (Reflective), Meters (Non-reflective), Feet (Reflective), Feet (Non-reflective), Yards (Reflective), Yards (Non-reflective); **Mode 2:** Meters, Feet, Yards; **Mode 3:** Meters, Feet, Yards; **Mode 4:** Degrees, % Grade (with no icon). About 5 seconds after the desired menu option is selected, the instrument will beep, return to operational mode, AND IMMEDIATELY TAKE A READING.

Mode 1: Line-of-Sight Distance. Press the range button to activate the Red Dot aiming device and place the Red Dot on your target. Release the button and wait for the beep. When the beep sounds, read the distance in the external LCD.

Mode 2: Tilt-Compensated Horizontal Distance. Press the range button to activate the Red Dot aiming device. Put the Red Dot on your target. Release the button and wait for a single beep followed by a double beep. **DO NOT MOVE THE UNIT UNTIL THE SECOND BEEP SOUNDS:** after the unit takes its distance measurement, it must take an angle measurement. When the double beep sounds, read the distance in the LCD.

Mode 3: Height Measurement. This mode requires three measurements: 1) Center, 2) Top, and 3) Bottom in that order. The first measurement to the object being measured can be to any point presenting a clear line-of-sight. Press the button and "CEN" appears in the LCD. Aim the Red Dot at the Target, release the button and wait for the beep. The LCD will then display "TOP". Aim the unit at the top of the object to be measured; press and release the button, wait for the beep. The LCD will then display "BOT". Aim the unit at the bottom of the object to be measured; press and release the button; wait for a double beep. The LCD will then display the height measurement of the object. It is not necessary to be able to see either the top or the bottom of the object being measured, since the TOP and BOT measurements are angle measurements, not the distance measurements.

Mode 4: Angle Measurement. To determine the angle or slope, press and hold the range button, place the Red Dot on the point to be measured, release the button, wait for the beep to sound before lowering the unit, and read the angle (deg icon) or percent grade (no icon) in the LCD.

3.0) General Care

The Opti-Logic Laser Rangefinder/Hypsometer is a sophisticated electronic and optical instrument, built to withstand a reasonable amount of handling with the same amount of care as any other optical or electronic device, such as a camera, binoculars, riflescope, telescope, etc. Keeping the lens clean will insure optimum operation and performance. Use a soft, clean non-abrasive cloth to clean the lenses. Cotton swabs work well. Never use paper or other abrasive materials. Dampen a cloth with either a very mild soap solution or clean water. Gently rub the lenses with a dampened cloth. **DO NOT SCRUB THE LENSES.** After cleaning the lenses, gently wipe the lenses off with a soft dry cloth. **NEVER** use petroleum products or chemicals to clean the lenses or any parts. Use the same procedure to clean the exterior. Although the Opti-Logic Laser Rangefinder/Hypsometer has been designed to withstand normal outdoor use, some common sense precautions should be observed. **NEVER** subject your laser rangefinder to shock, high temperature, or harmful chemicals or gases. If the Rangefinder is not going to be used for long periods of time, remove the battery and store in a cool, dry place. **DO NOT** use chemicals or solvents to clean the Rangefinder. Chemicals, insect repellents and solvents can damage the plastic housing and lenses of the Rangefinder.

4.0) Low Battery Indicator

When the battery voltage becomes too low, the instrument may act erratically or cease to function. The low battery indicator will appear in the display before this occurs. The battery should be replaced as soon as possible after the indicator is displayed.

4.1) Errors / Troubleshooting

When a new battery is installed in the Opti-Logic Laser Rangefinder/Hypsometer, diagnostic checks are performed by the onboard computer. These tests check the basic operation of the Rangefinder. During the normal diagnostic the display cycles from "000" - "999" then the display clears and is followed by a single beep. If the unit is unable to obtain a range or angle measurement, seems to lock up, or appears to be operating incorrectly, there are a few steps you can take to correct this:

- A. If the unit 'locks up',** remove the battery for several seconds and press the range button with no battery installed, then reinstall the battery. If problem continues, try a new battery.
- B. If the Rangefinder displays an incorrect distance,** make sure that the "Red Dot" in the viewfinder is hitting the object. Try aiming the Rangefinder at a nearby reflective target such as a street sign or automobile license plate to verify alignment.
- C. If the Rangefinder shows a distance of "0",** the Rangefinder is hitting an object at a distance that is less than the minimum distance. Try aiming the Rangefinder at a more distant object to verify operation.
- D. Make sure the battery terminals are in contact with the metal battery clips when replacing old battery.**

4.2) Technical Support and Maintenance

For questions regarding the Opti-Logic Laser Hypsometer/Rangefinder or if problems persist, make a note of the instrument serial number and date of manufacture and call Opti-Logic Customer Service at **931-454-0897**, 8am to 5pm Monday thru Friday Central Time. If your rangefinder requires maintenance, your Customer Service Representative will assign you a Return Merchandise Authorization Number (RMA) and provide instructions for returning the instrument for repair. When returning merchandise for maintenance or repair, please be sure to include a brief written description of the problem with the unit. Return to:

US Mail:

**Opti-Logic Corporation
P.O. Box 2002
Tullahoma, TN 37388**

Commercial Carrier:

**Opti-Logic Corporation
201 Montclair Street
Tullahoma, TN 37388**

4.3) Warranty

Your Opti-Logic Laser Rangefinder is warranted to be free of defects for a period of one year after the date of purchase. This warranty does not cover defects caused by misuse or improper handling, installation or maintenance of the product. In the event of a defect under this warranty we will, at our option, repair or replace the product, provided that you return the product postage prepaid to your authorized Opti-Logic Technical Service Center including a check in the amount of \$15.00 to help cover the cost of handling. (This fee is waived if you discover a defect within the first 30 days after purchase.) Non-warranty repairs will be made at a cost of \$25.00 plus the cost of any plastic replacement parts.

5.0) Specifications

Approx. Size:	1.7" x 4" x 5.1"		
Weight:	11 oz		
Operational Range:	<u>Model</u>	<u>Passive</u>	<u>Reflective</u>
	100LHA:	4-200 yd	Up to 250 yd
	400LHA:	4-400 yd	Up to 650 yd
Range Accuracy:	+/- .5 yards (1 sigma to a neutral color target @ 50% diffuse reflectance)		
Height Accuracy:	+/- 18 inches (+/- 1 yards for very dark or very bright targets).		
Range Resolution:	1 foot / 0.5 yard / 0.1 meter		
Angle Resolution:	0.1 degrees.		
Readout:	Easy to read external LCD display.		
Units of Measure:	Selectable in either feet, meters, or yards.		
Viewfinder:	Monocular viewing port. Red LED aiming sight, +/- 0.1 degrees		
Battery:	Single 9 volt battery. Operates for approximately 1000 readings.		
Operational Temp:	0° - 40°C, 32°-104°F.		
	Relative Humidity 5-95% non-condensing.		
Laser Type:	Infrared Class 1, eye safe 905nm Laser.		