LHR 1000 Hypsometer/rangefinder USER MANUAL

HYPSOMETER/



Stock Number 91180

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Introduction

Thank you for purchasing the Jim-Gem LHR 1000 Laser Hypsometer. The LHR 1000 has been engineered to provide you with years of accurate distance, height, and angle measurements in the field. Please read and follow all safety and operating instructions before using the LHR 1000. Keep these instructions with the LHR 1000 and refer to as needed.

Safety and Operating Precautions

The Jim-Gem LHR 1000 employs an eye safe IEC Class 1 laser. Even so, there are a few precautions that are important to remember:

Warning: Do not press the **POWER** button while aiming at persons or while looking into the optics from the objective side.

Do not leave the instrument within the reach of small children.

Do not disassemble the instrument, as this could cause an electric shock and void any warranty.

Do not use a power source other than a CR2 battery or equivalent. The LHR 1000 is designed to prohibit accessing an external power supply.

Take precautions to ensure the laser beam does not strike highly-reflective surfaces.

Do not aim the instrument directly at the sun. This may cause damage to the unit's internal components and could cause permanent eye damage.

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation.

Read this instruction manual in its entirety before using this rangefinder. If the product is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

When you see the display through the eyepiece, be aware that the product is active and may be emitting an invisible laser. The laser aperture should always be pointed in a safe direction.

The laser safety label includes specifications about transmitting power:

| Maximum Output | <2.69*10 ⁻⁷ J |
|--------------------|--------------------------|
| Pulse Width | <50ns |
| Emitted Wavelength | 905nm |
| _aser Class | Class 1 |
| | |

Regulatory Certifications CE, ISED, FCC, RCM-EMC, RoHS 2.0



Unboxing

When unboxing the LHR 1000 make sure that you have the following items:

- Jim-Gem LHR 1000
- 1 CR2 Lithium Battery
- Carry Case
- Neck Lanyard
- Cleaning Cloth
- Instruction Manual Download Instructions



Features at a Glance

Laser Classification Optics Measurement Range 6 Measurement Modes

Scan Mode Measuring Time Power Battery Life Environment IEC Class 1 6x Monocular objective 5 yards – 1,000 yards 3-Point Height, 2-Point Height/Missing Line, Vertical Distance/ Slope Distance, Horizontal Distance/Slope Distance, Degree Slope/Slope Distance, Percent Slope/Slope Distance Available in all measuring modes Less than 0.8 second CR2 battery or equivalent Approximately 3,000 measurements IP67 waterproof

Inserting the Battery

Remove the CR2 battery from its packaging. Open the battery door by lifting the battery door tab and gently turning the battery door counter-clockwise. Insert the negative end (–) of the battery into the unit. The positive end (+) will be facing the battery door. Place the battery door back into position and gently turn clockwise. Do not over tighten. Push battery door tab down.



Neck Lanyard

Insert the small loop located at the end of the neck lanyard through one of the lanyard eyelets and run the opposite end of the lanyard through the small loop and gently pull tight.

LCD Display Indicators and Layout



Basic Operation

Powering Unit On

Make sure battery is installed. Press and release the **Power** button. The display will come on and the unit is ready to take a measurement. The unit will automatically power off after 30 seconds of inactivity.

If the status bar is empty and no data is displayed, replace the battery.

Focusing the Eyepiece

With the unit powered on, rotate the diopter focus knob left or right until the display image becomes sharp.

Changing Measurement Modes

The unit has 6 measurement modes. To toggle between measurement modes, make sure the unit is powered on, look through the eyepiece at the display, and press and release the mode button until you see the measurement mode you would like to use. Also note, the unit will stay in the selected measurement mode until another measurement mode is selected.

Changing the Distance Units of Measure

The LHR 1000 is capable of measuring in Feet, Meters, and Yards. The default unit of measure is Feet. To change the distance units of measure, make sure the unit is powered on, look through the eyepiece at the lower right corner of the display and hold the mode button down until the unit of measure changes. Once the unit of measure changes, release the mode button. Repeat process until the unit of measure you would like to use is seen in the lower righthand corner.

SCAN mode

The LHR 1000 has a **SCAN** mode feature that will allow for a rolling measurement of height, distance, and angles. See **Measurement Modes** section for details.

Measurement Modes 3-Point Height

This mode is often used for determining the height of objects that do not have lean or for targets without a clear line of sight to the top or bottom. It requires a distance measurement to the target, an angle measurement to the top of the target, and an angle measurement to the bottom of the target. When the unit is taking the angle measurements for the top and bottom it is not using the laser for distance, so if you do not have clear line of sight to the top or bottom of the target you can estimate where they are located. The LCD display has a tree graphic to help illustrate which measurement step needs to be taken to complete the routine.

Step 1: Press and release the **POWER** button to turn unit on. Press and release the **MODE** button until you see the following on the LCD display:



Step 2: Press and release the **POWER** button to display the **CIM** • **GEM** icon. Aim the cross hairs at the target and take a horizontal distance measurement by pressing and releasing the **POWER** button. You will see the horizontal distance across the top of the display. After the horizontal measurement has been taken the **Term** icon will appear.



Step 3: Aim at the base of the target and press and release the **POWER** button to take the bottom angle measurement. After the bottom angle measurement has been taken you will see the downward angle measurement appear at the top of the display and the ▲ icon will appear.



Step 4: Aim at the top of the target and press and release the **POWER** button to take the top angle measurement. After the top angle measurement has been taken you will see the top angle measurement appear at the top of the display and the see icon will appear. This means the 3P height routine is complete. The target's height will be displayed at the bottom of the display screen under the cross hairs.



Step 5: The LHR 1000 is equipped with a **SCAN** feature that will give you a rolling height measurement. If you press and hold the **POWER** button on Step 4 while taking your top angle measurement you can **SCAN** up and down the target to see the various heights of the target.



2-Point Height/Missing Line

This mode is often used when there is clear line of sight to the top and bottom of the target. It calculates the length of the missing line by using a slope distance and angle measurement to the bottom of the target, and a slope distance and angle measurement to the top of the target. This mode can be used to determine the length of a hillside, leaning tree, or void. The display screen has a tree graphic built in to help illustrate which measurement step needs to be taken to complete the routine.

TIP: When calculating the length of a leaning tree or object, take your measurements where the target is leaning directly toward you or directly away from you; never from the side.



1. Aim at B to obtain AB length and inclination angle;

2. Aim at C to obtain AC length and inclination angle.

The LHR 1000 measures the slope distance of the AB and AC dashed lines as well as the AB angle and the AC angle and uses those measurements to calculate the solid BC (missing) line.

Step 1: Press and release **POWER** button to turn unit on. Press and release the **MODE** button until you see the following on the LCD display:





Step 3: Aim at the base of the target and press and release the **POWER** button. After the bottom angle measurement has been taken you will see the downward angle measurement appear at the top of the LCD display and the ▲ icon will appear.



Step 4: Aim at the top of the target and press and release the **POWER** button. After the top angle measurement has been taken you will see the upward angle measurement appear at the top of the display and the see icon will appear, indicating the 2-Point Height routine is complete. The target's height will be displayed at the bottom of the LCD screen under the cross hairs.



Step 5: If you press and hold the **POWER** button on Step 4, you can scan the height of the target.



Vertical Distance (VD) and Slope Distance (SD)

Vertical distance (VD) is a measurement of length between two vertical points. The LHR 1000 calculates VD as the length of the target's vertical plane to the point where it intersects the hypsometer's horizontal plane. This mode requires a clear line of sight to the target. If the target is above the unit's horizontal plane it will give a positive VD reading. If the target is below the unit's horizontal plane it will give a negative VD reading. A target's total height can be obtained with one VD measurement to the top of the target and one VD measurement to the bottom of the target and adding or subtracting the readings. See 2-Point Height below for further explanation. Slope Distance (SD) is a measurement of straight-line distance between the unit and target.

Step 1: Press and release the **POWER** button to turn the unit on. Press the **MODE** button until the following screen appears.



Step 2: Aim at the target and press and release the **POWER** button. The Vertical Distance will be displayed across the top of the display and the Slope Distance will be displayed at the bottom of the display below the cross hairs. The **SCAN** mode can be used by holding down the **POWER** button while taking the measurement.



2-Point Height Using Vertical Distance Mode

Step 1: Press and release the **POWER** button to turn the unit on. Aim at the top of the target and press and release the **POWER** button. The VDt will be displayed across the top of the display. Record the measurement.

Step 2: Aim at the bottom of the target and press and release the **POWER** button. The VDb will be displayed across the top of the display. Record the measurement.

Step 3: On level ground, the VDt will be a +VD and the VDb will be a -VD. If you have a +VD measurement and a -VD measurement, then you add the two measurements together to obtain the target's height. For example:

VDt is +65 and VDb is -15 then 65+15 is 80

When taking VD upslope or downslope it is possible to have two +VD measurements or two -VD measurements. In the case of two +VD measurements or two -VD measurements, you subtract the two to get the target's height. For example:



VDt is +65 and VDb is +10 then 65-10 is 55 VDt is -15 and VDb is -65 then 65-15 is 50

Horizontal Distance (HD) and Slope Distance (SD)

Horizontal Distance is a level distance measurement between the unit and the target. Slope Distance (SD) is a measurement of straight-line distance between the unit and target. In this mode, the unit uses the laser to measure the slope distance and the angle, which is used to calculate the horizontal distance.

Step 1: Press and release the **POWER** button to turn the unit on. Press and release the **MODE** button until the following screen appears.



Step 2: Aim at the target and press and release the **POWER** button. The Horizontal Distance (HD) will be displayed at the top of the display and the Slope Distance (SD) will be displayed across the bottom of the display below the cross hairs. The **SCAN** mode can be used by holding down the **POWER** button while taking the measurement.



Degree Slope (0-90°) and Slope Distance (SD)

Slope is the deviation of a line from true horizontal. It is usually expressed in degrees or percent. This mode will give the slope inclination in degrees of the line of sight to the target from horizontal.

Step 1: Press and release the **POWER** button to turn the unit on. Press and release the **MODE** button until the following screen appears.



Step 2: Aim at the target and press and release the **POWER** button. The Slope Degree will be displayed across the top of the display and the Slope Distance (SD) to the target will be displayed across the bottom of the display. The **SCAN** mode can be used by holding down the **POWER** button while taking the measurement.



Percent Slope and Slope Distance (SD)

Slope is the deviation of a line from true horizontal. It is usually expressed in degrees or percent. This mode will give the slope inclination in percent of the line of sight to the target from horizontal.

Step 1: Press and release the **POWER** button to turn the unit on. Press and release the **MODE** button until the following screen appears.



Step 2: Aim at the target and press and release the **POWER** button. The Percent Slope will be displayed across the top of the display and the Slope Distance (SD) to the target will be displayed across the bottom of the display. The **SCAN** mode can be used by holding down the **POWER** button while taking the measurement.



Care and Maintenance

Lenses

The unit has 3 lens surfaces (eyepiece lens, monocular objective lens, and laser detector lens) that will need to be cleaned periodically. Start by gently removing any dust and loose debris with compressed air. Once the dust and loose debris has been removed, use the provided lens cloth and start wiping at the center of the lens. Work in a circular pattern towards the outer edge of the lens. If this fails to remove any smudges on the lens you may use a cloth dampened with lens cleaner and repeat the steps above.

Storage

It is recommended that the unit be stored in its case in a cool and dry environment when not in use. For extended storage, it is recommended that the battery be removed from the unit. After using the unit in a high moisture environment, wipe all moisture from the housing and lenses and allow the unit to completely dry before placing it in its storage case.

Transporting

The provided neck lanyard can be used for transporting in the field. For non-field transport, use the provided case.

Cleaning

The exterior should be cleaned periodically to prevent any grime buildup. Dust and dirt can be removed from the exterior with a soft damp cloth. Allow the exterior to dry completely before placing the unit in the storage case.

Battery Compartment

Inspect battery cover O-ring periodically for wear and tear.

Specifications

Jim-Gem LHR 1000

| Magnification | 6x | Battery Life | >3,000 Measurements |
|-------------------------|-------------------------|--------------------------|----------------------------|
| Inclinometer | ±90° | Objective Lens Dia. (mm) | 23 |
| Inclinometer Resolution | 0.1°/0.1% | Exit Pupil Diameter (mm) | 3.83 |
| Inclination Accuracy | ±0.5° | Eye Relief (mm) | 15 |
| LCD Display | Yes | Operating Temperature | 14°F – 120°F (-10°C – 49°C |
| Range | 3000 ft./1000 y/914.5 m | Weight with battery | 5.91 oz. (167.5g) |
| Range Units of Measure | Feet/Yards/Meters | Dimensions (mm) | 123 x 74 x 40mm |
| Range Accuracy | ±1.5 ft. to <900 ft. | Battery Status Indicator | Yes |
| | ±0.5% 900 ft 3000 ft. | Warranty | 1 Year |
| Range Resolution | 0.1 | Waterproof | IP67 |
| Scan Mode | Yes | · · · | |

Limited Warranty

Forestry Suppliers, Inc. (FSI), warrants the LHR 1000 ("the product") to be in good working order, free of defects in materials and workmanship of the electronic components. Should the product fail to be in good working order at any time during the warranty period, FSI will, at its option, repair or replace this product at no additional charge. Parts and products that have been replaced as a result of a warranty claim become the property of FSI.

This warranty remains in force for a period of one year from the date of purchase from FSI or an authorized FSI dealer; unless otherwise noted by FSI at the time of sale. FSI reserves the right to require written verification of the date of original purchase.

FSI has no obligation to modify or upgrade the product once sold. This limited warranty does not include service to repair damage or replace the product resulting from accident, disaster, misuse, abuse, end-user modification, batteries or damage caused by batteries used in the product. In no event will FSI be liable to you for any damages, icluding any lost profits or savings, or other incidental or consequential damages arising out of the use or inability to use the product. Furthermore, FSI shall not be held responsible if an authorized FSI dealer has been advised of the possibility of such damage, or for any claim by any other party.

Warranty Claims

In the unlikely event that your LHR 1000 should require warranty service, contact us to receive a Return Merchandise Authorization (RMA) number before returning your product. If the product is delivered by mail, you agree to insure the product or assume the risk of loss or damage in transit.





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