TruPulse® L2

User's Manual

LASER TECH

1.303.649.1000

ServiceCenter@LaserTech.com

6912 S. Quentin St, Suite A
Centennial, CO 80112

@LaserTechnologyInc

@LaserTechnologyInc

@LaserTechInc_

@LaserTechPro

@Laser-Technology

LTI TruPulse L2 User's Manual
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Patents:
This product is covered by patents and pending patent applications, refer to the following website for more details: https://lasertech.com/lti-legal/

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LTI Contact Information:

Customer Support / Service:
Phone: 1.303.649.1000
1.877.696.2584 (North America)
Fax: 1.303.649.9710
Email: servicecenter@lasertech.com

Corporate Address:
Laser Technology, Inc.
6912 South Quentin Street, Suite A
Centennial, CO 80112 USA

Support, FAQ & Tech Documents:
https://lasertech.com/software-solutions

RMA Request:
www.lasertech.com/customer-service

TruPulse L2 Reference Information:
Record information about your TruPulse L2 in the table below.

	You can find this value:	Value
Serial Number	On the serial number sticker affixed to the TruPulse L2 or on packaging.	
Firmware Revision Number	See Page 11 for information.	

Table of Contents

Introduction

- The safety instructions and the user manual should be read through carefully before the product is used for the first time.
- The person responsible for the product must ensure that all users understand these directions and adhere to them.
- Pulse Technology calculates distance by measuring the time of flight of very short pulses of infrared light. Time of flight sensors derive range from the time it takes light to travel from the sensor to the target and return.

Precautions

- Avoid staring directly at the laser beam for prolonged periods.

  ⓘ CLASS 1 LASER PRODUCT: Product complies with IEC60825-1 Ed. 3:2014-5 and 21CFR1040.10/11 per Notice 50:2007.

  The TruPulse® L2 is designed to meet FDA eye safety requirements and is classified as eye-safe to Class 1 limits, which means that virtually no hazard is associated with directly viewing the laser output under normal conditions. As with any laser device, however, reasonable precautions should be taken in its operation. It is recommended that you avoid staring into the transmit aperture while firing the laser. The use of optical instruments with this product may increase eye hazard.

- Never attempt to view the sun through the scope.

  Looking at sun through the scope may permanently damage your eyes.

- Never point the unit directly at the sun.

  Exposing the lens system to direct sunlight, even for a brief period, may permanently damage the internal components.

- Avoid direct sun exposure on the eyepiece.

  Exposing the eyepiece to direct sunlight can damage the internal display.

- Do not expose the instrument to extreme temperatures.

  TruPulse® L2 components are rated for Storage Temperature range of -25 to 60° C (-13 to 140° F) and Operating temperature range of -5 to 60° C (23 to 140° F). Do not expose the instrument to temperatures outside these ranges.

Regulatory Certifications

- FDA
- FCC
- CE
- IEC
- ROHS
- REACH
- WEEE

Section 1 - Introducing the LTI TruPulse L2

Congratulations on the purchase of your TruPulse L2, a cost-effective professional rangefinder. This compact and lightweight laser is a flexible tool for your measurement needs. Laser Tech's mission is equipping professionals with smart measurement solutions to create a safer world.

Features of the TruPulse L2:

- New dual display makes it easy to use.
- Crystal clear optics and the heads-up display lets you keep your eye on the target.
- The laser sensor and integrated tilt sensor measure slope distance and inclination values and the unit calculates horizontal distance, and vertical distance.
- The Target Modes allow you to select or eliminate targets; which helps you take the most accurate measurement possible in a variety of field conditions.
- On board functions: 3-point height and 2-dimensional vertical missing line routine with auto sequencing.

Operating Modes

Measurement Modes	Target Modes	System Setup Modes
Slope Distance	Standard	Targeting Modes
Vertical Distance	Continuous	Reticle Options
Horizontal Distance	Closest	Units of Measurement
Inclination	Farthest	Pulse On/Off
3-Point Height Routine	Filter	
2D Missing Line Routine		

Unpacking the TruPulse L2

When you unpack the TruPulse L2, check to make sure that you received everything that you ordered, and that it all arrived undamaged.

Basic Package:

- TruPulse L2
- Carrying Case
- Neck Strap
- User Manual QR Code

Compatible Accessories:

- Mechanical Receive Foliage Filter
- Mounting Bracket
- Tripod

ⓘ
- This manual is available for download from Laser Tech's Website.
- To learn more about any of the items listed above, please contact your LTI Sales Representative or an Authorized LTI Partner.

Understanding How the TruPulse L2 Works

The TruPulse L2 consists of a laser range sensor, an integrated accelerometer tilt sensor, and a digital processor. The TruPulse L2 has four buttons that access the unit's internal firmware, which controls the integrated sensors.

PLCD Display: Automatic Brightness Display

A Polymer Dispersed Liquid Crystal (PLCD) is mounted within the optical system and when activated, displays a reticle for targeting and the display indicators.

The TruPulse L2 is equipped with a built-in light sensor that reads ambient light. The internal software adjusts the red brightness intensity based on the measured light reading. This allows for the right amount of red brightness for the surrounding conditions.

NOTE The brightness display is 100% automatic no need to adjust brightness manually.

Laser Range Sensor

The laser range sensor emits invisible, eye safe, infrared energy pulses. The TruPulse L2 determines distance by measuring the time it takes for each pulse to travel from the rangefinder to the target, and back. The laser indicator is displayed whenever the laser is being transmitted. The laser may be active for a maximum of 10 seconds. Once the target is acquired or the laser has timed out, you can release the FIRE button. The TruPulse L2 has a broad spectrum of sensitivity and can work with both reflective and non-reflective targets.

TruTargeting

The TruPulse automatically provides the best accuracy and acquisition distance to a given target. Maximum measurement distance varies with target quality and environmental conditions. When shooting to a target, the maximum measurement distance is approximately 2,195 m (7,200 ft) to reflective targets.

When selecting a target, you should consider the following:

- *Color*: The brighter the color, the longer the range.
- *Finish*: Shiny finishes provide longer range than dull finishes.
- *Angle*: Shooting perpendicular to a target provides better range than shooting to a target at a sharp angle.
- *Lighting Conditions*: Overcast skies will increase the unit's maximum range, and sunny skies will decrease the unit's maximum range.

Target quality has an effect on the precision of measurements:

- A high quality target will result in a measurement that includes one decimal place (tenths).
- A low quality target will result in a Measurement that is a whole number.

ⓘ Examples:

- 120 meters (feet) indicates a measurement was made to a low-quality target.
  - Accuracy: ±1 m (±3 ft).
- 120.0 meters (feet) indicates a measurement was made to a high-quality target.
  - Feet are shown in half-unit increments (.0 or 0.5).
  - Meters and Yards are shown in tenth-unit increments (.0 - 0.9).
  - Accuracy: ±0.5 m (±1.6 ft).

Tilt Sensor

The integrated tilt sensor measures vertical angles that the TruPulse L2 uses to calculate height and elevation, and also to determine slope-reduced horizontal distances. The instrument is held level at 0°, and is rotated up through +90° and down through -90°.

Section 2 - Getting Started

Parts of the TruPulse L2

A. FIRE Button
B. Diopter Focus
C. Eyepiece Lens
D. Laser Receive Lens
E. Laser Transmit Lens
F. Up Arrow Button
G. DISPLAY MENU Button
H. Down Arrow Button
I. Tripod Mount
J. Attachment Point
K. Battery Door
L. Battery CR2

Figure 1

Battery

Your TruPulse L2 rangefinder comes with a battery already installed.

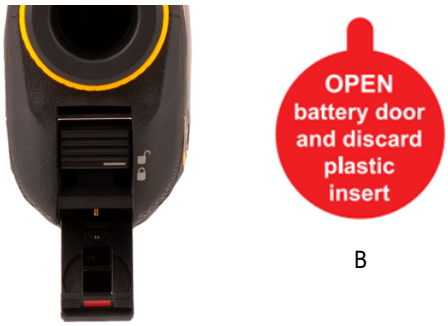
Before Using:

1. Open the battery door by releasing the latch and pushing the door down (Figure 2A).

   NOTE The CR2 battery is already in place.

2. Remove and discard the plastic insert that is on top of the battery (Figure 2B).

3. Push the battery door up and latch back into place.



B

A

Figure 2

Powering Up

Once the battery is installed and the 4 steps are completed, press and release the FIRE button. The display will light up to show the unit is on and ready for ranging.

NOTE The unit will power down automatically after 30 seconds of non-use.

Focus

Adjust the diopter focus until the image is sharp ("B" in Figure 1 above).

Measurement Display Layout

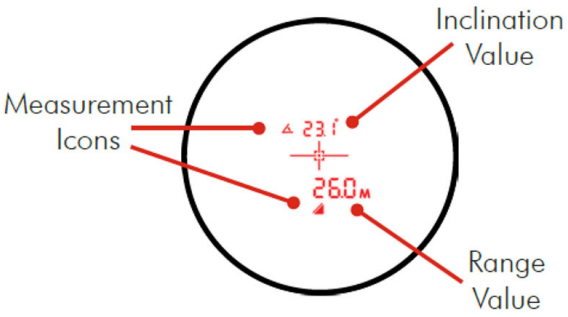


Figure 3

Section 3 - Basic Measurement

1. Press FIRE button to power ON the TruPulse L2. Select a target such as a tree or a building.
2. Look through the eyepiece and use the crosshair to aim to the target.
3. Press-and-hold the fire button. The Laser indicator is displayed while the laser is active measuring.
   - If a target is acquired, measurement results will be displayed, flash 3 times and laser indicator turns off.
   - If a target is not acquired immediately, the laser will remain active for a maximum of 10 seconds while acquiring data about the target.
   - If the target is not acquired, release and fire button and repeat steps.
4. Release FIRE button once the measurement results are displayed.

NOTE The measurement will be displayed steady until you press a button or the unit powers OFF.

Slope Distance Basic Measurement Workflow

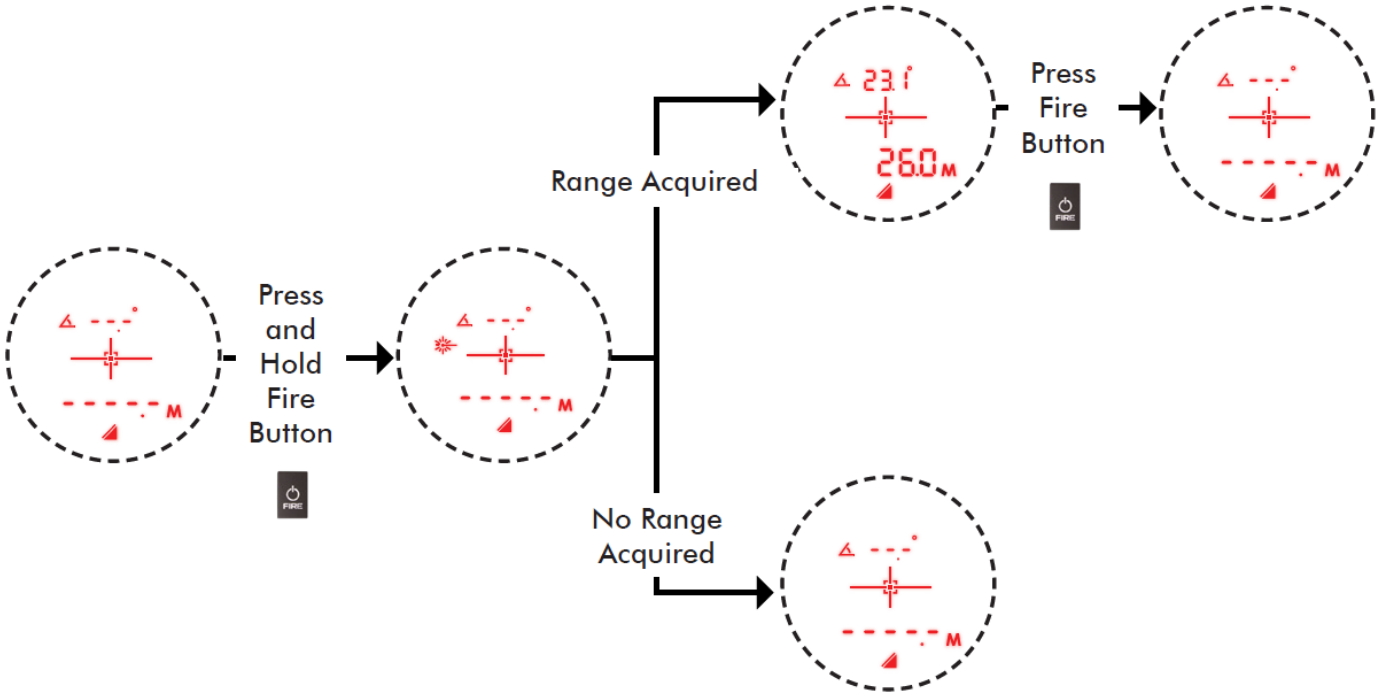


Figure 4

Section 4 - Basic Operations

Battery

The TruPulse L2 is powered by one CR2 battery.

Replacement

1. Open the battery door by gently sliding the latch up to the Unlocked symbol and pushing down the door (Figure 5A).
2. Install the battery. The battery must be oriented (+/-) with positive end facing down. NOTE: There is an indication sticker found inside the battery compartment.
3. Close the battery door and gently slide the latch down to the Locked symbol.

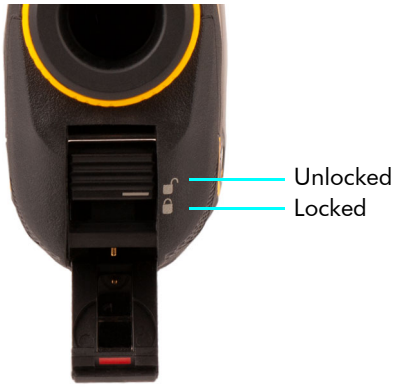


Figure 5

Low Battery Warning

The TruPulse L2 monitors the incoming battery voltage. Within the display, the Battery Life Indicator shows how much battery charge is remaining. The Battery Indicator will display the first time the POWER button is pressed and will also display in the MENU options.

- Full
- 2/3
- 1/3
- Battery Lock Out Screen

Button Navigation

The TruPulse L2 has four buttons. With the TruPulse L2 in your right hand and looking through the eyepiece, the fire button is located on top, near your index finger The Navigation and Up/Down buttons and are located on the left side of the instrument.

Figure 6

A. FIRE Button

- Powers ON the unit.
- Fires the lasers sensors to measure values.
- Short press in System Setup Menu to select option.

B. Up Navigation Button

- Press to scroll to measurement modes.
- Press to scroll to System Setup Menu options.

C. Display/Menu Button

- Short Press to toggle the Automatic brightness display.
- Long Press to enter the System Setup Menu options.

D. Down Navigation Button

- Press to scroll to measurement modes.
- Press to scroll to System Setup Menu options.

TruPulse L2 Display

The TruPulse L2 is equipped dual color display and can show information in Red or black. With a built-in light sensor that reads ambient light. The internal software adjusts the red brightness intensity based on the measured light reading.

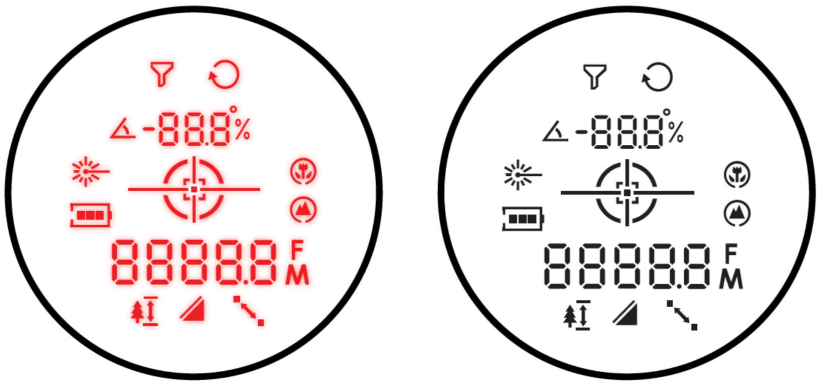
Change Display Options:

1. Press the DISP/MENU button to toggle the Automatic brightness display.
2. Short Press the button to change the display color from black to red.

NOTE For low light conditions, it is recommended to use the red display (Figure 7A), and in bright sunny conditions, the black display (Figure 7B).

Display Indicators:

The TruPulse L2's internal firmware is organized into options. Each option represents a specific measurement or setup function and has a corresponding display indicator. Refer to Figure 7 and table below for information about each indicator.



A B

Figure 7

NOTE Within this manual, when the scope ring is represented by a dashed line, the display indicators have been enlarged to show detail and are used for illustration only.

Display Icons	Description	Definition
8888.8 F M	Lower Main Display	Displays messages and distance measurement results.
-88.8%	Upper Main Display	Displays messages and inclination measurement results.
%	Percent Slope	Inclination measurement units.
O	Degrees	
F	Feet	Distance measurement units. Selection available in the System Setup Mode.
M	Meters	
	Battery Status	Battery life indicator.

Display Icons	Description	Definition
	Reticle Crosshair	Serves as the aiming point reference, both horizontally and vertically.
	Laser Status	*Visible:* laser is firing. *Not Visible:* laser is not active.
	Continuous Target Mode	The unit continuously acquires targets and displays measurements while the FIRE button is held down.
	Inclination Measurement	The angle of inclination between the TruPulse L2 at level and the target.
	Slope Distance Measurement	Straight line distance between the TruPulse L2 and the target.
	Horizontal Distance Measurement	The level distance between the TruPulse L2 and the plane of the target.
	Vertical Distance Measurement	The distance between the target and the perpendicular to the path of the horizontal distance.
	2D Missing Line Measurement Routine	2D Missing Line Routine finds the connecting vector (or missing line) between two points.
	Height Measurement Routine	Three-step height routine. The final calculation represents the vertical distance between the points on the target represented by ANG1 and ANG2.
	Closest Target Mode	The unit logs multiple targets while the FIRE button is held down. The circle denotes that additional targets have been acquired. Of the targets acquired, the distance to the closest target displays.
	Farthest Target Mode	The unit logs multiple targets while the FIRE button is held down. The circle denotes that additional targets have been acquired. Of the targets acquired, the distance to the farthest target displays.
	Filter Mode	The laser's sensitivity is reduced so it only detects measurements returned from a reflector. The optional mechanical receive foliage filter must be used in conjunction with this mode.

Display Indicator Test

To verify that all display indicators are working properly:

1. Start with the TruPulse L2 powered OFF, press-and-hold fire button.
2. Compare the in-scope display to the to verify that all indicators are working properly (Figure 8).
3. Release FIRE button to start normal operation.

Figure 8

Firmware Revision Number

The firmware revision number provides Laser Tech Service Department information about your TruPulse L2. To display the firmware revision.

1. Start with the TruPulse L2 powered OFF, press-and-hold FIRE button.
   - While fire button is held down, press the Disp/MENU button.
   - Press the Down Arrow.
2. Looking through the eyepiece the firmware version will be displayed
   In Figure 9, F-06.0 is used as an example.
3. Release the FIRE button to start normal operation.

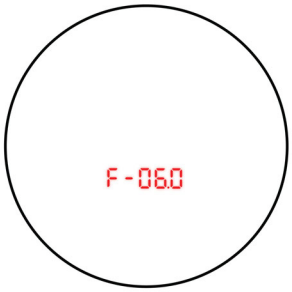


Figure 9

Factory Reset

It is possible to restore the TruPulse L2 factory default settings.
Restoring the default settings affects some of the system setup options.

1. Start with the TruPulse L2 powered OFF, press-and-hold fire button.
   - While fire button is held down, press the Disp/MENU button.
   - Press the Up Arrow.
2. The Display will change to "red" indicating the settings have been reset.
3. Release the FIRE button to start normal operation.

Factory Reset Workflow

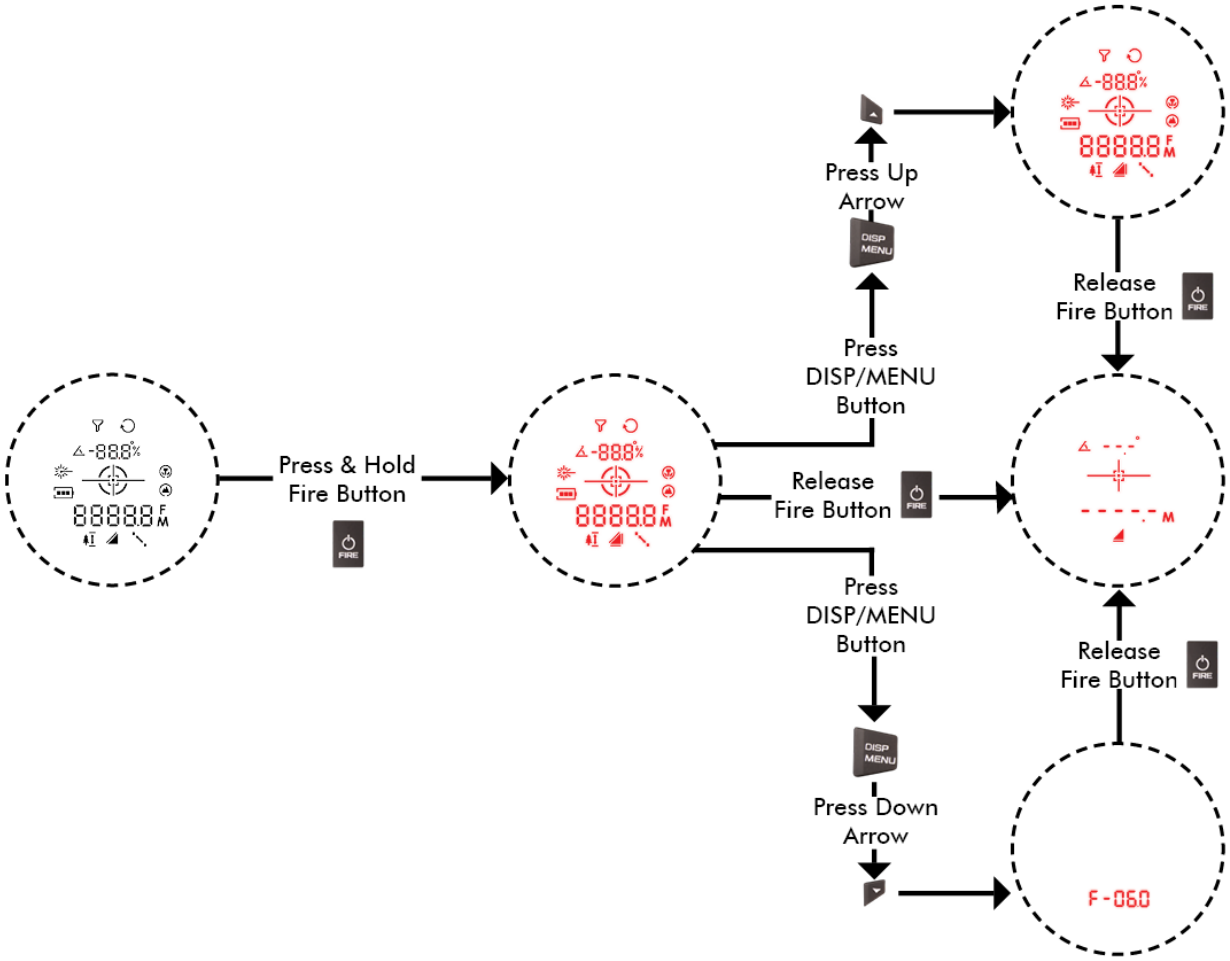


Figure 10

Factory Default Settings

Units of Measurement:

- Distance:Meters (M)
- Inclination: Degrees (°)

Targeting Mode:	Standard (STD)
Reticle Options:	Full
Pulse:	Off
Measurement Mode:	Horizontal Distance

Neck Strap

To attach the neck strap:

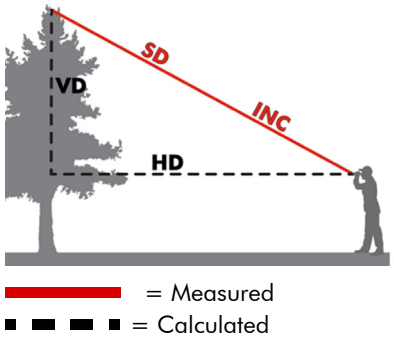
1. Disconnect the anchor end of the strap using the buckle.
2. Feed loop around metal bar.
3. Thread the neckstrap through the loop.
4. Gently tighten to secure (Figure 11A).
5. Reconnect anchor end of the strap using the buckle (Figure 11B).

A B

Figure 11

Section 5 - Measurement Modes

When you power ON the TruPulse L2, the last used Measurement Mode will be active. Press the Up or Down arrow to display other Measurement Modes. Figure 12 shows the four different types of measurements that the TruPulse L2 can take.



Abbreviation	Description	Display Icon
INC	Inclination	
SD	Slope Distance	
HD	Horizontal Distance	
VD	Vertical Distance	

Figure 12

Distance & Inclination Measurements

The laser sensor and inclinometer sensor will measure when the fire button is pressed in any measurement mode. In the Slope Distance Mode, the TruPulse L2 will automatically calculate Horizontal and Vertical Distance values. Measurements are from the ¼-20 tripod mount (center) of the laser to the target.

The basic steps for taking any distance measurement:

1. Press FIRE button to power ON the TruPulse L2. Select a target such as a tree or a building.
2. Look through the eyepiece and use the crosshair to aim to the target.
3. Press-and-hold the fire button. The Laser indicator is displayed while the laser is active measuring. If a target is acquired, measurement results will be displayed, flash 3 times and laser indicator turns off.
   - If a target is not acquired immediately, the laser will remain active for a maximum of 10 seconds while acquiring data about the target.
   - If the target is not acquired, release and fire button and repeat steps.
4. Release FIRE button once the measurement results are displayed.
5. Press Up or Down buttons to scroll though the other measurement values calculated.
6. Press FIRE button to clear measurements and repeat step 1 through 6.
   - The last measurement does not need to be cleared before acquiring your next target.
   - Each time the TruPulse L2 is powered ON, it will return to the same measurement mode that was last used.

NOTE See Distance and Inclination Measurements Workflow on Page 14.

Distance and Inclination Measurements Workflow

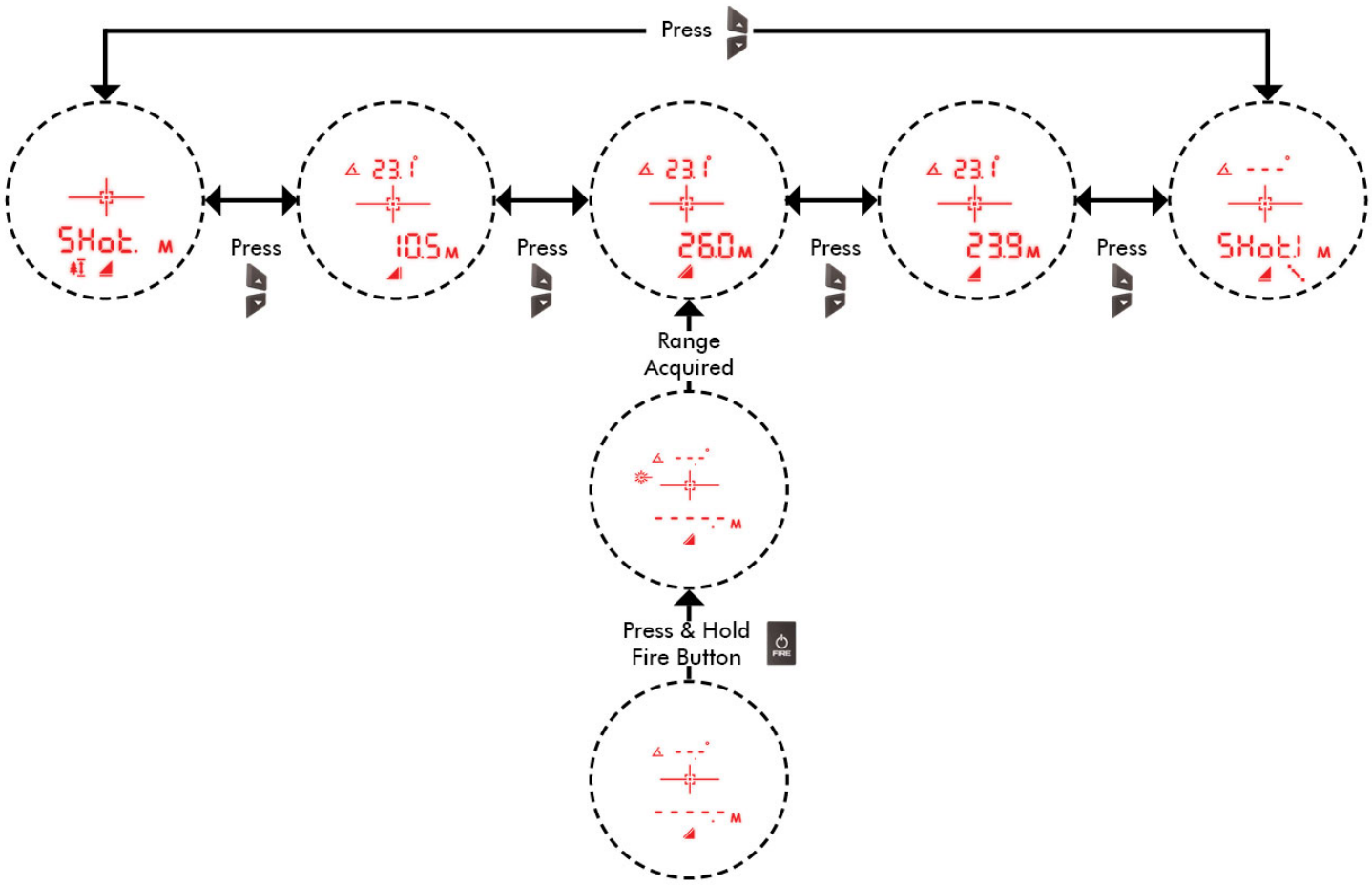


Figure 13

Inclination Percent Slope

Percent slope, indicated by the % indicator, is a calculation equal to 100 times the tangent of the inclination angle. It is a variant way of expressing the inclination. You can get percent slopes only in the basic measurement displays, never in the Height measurement displays. Note also that the instrument never downloads a percent slope. It always downloads the inclination angle.

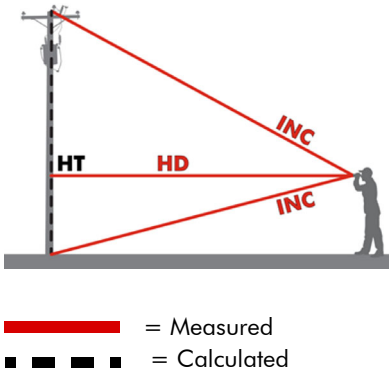
NOTE An inclination angle of 5 degrees for example is equal to a slope of about 8.7 percent.

Height Routine (3-Point Routine)

Height Measurements involve a simple routine that prompts you to take 3 shots to the target: Horizontal Distance, Inclination Angle_1 and Inclination Angle_2. The TruPulse L2 uses these results to calculate the height of the target.

In the routine, the next measurement required will auto sequence once the first measurement is acquired.

Figure 14 shows the three shots required for the height routine.



Abbreviation	Description	Display Icon
HD	Horizontal Distance	
INC	Inclination	
HT	Height	

Figure 14

1. Press Up or Down buttons to navigate to the Height routine.
   - "Shot", Height and Horizontal Distance icons are displayed.
2. Aim where you have a clear line of sight to the target and press-and-hold fire button.
   - The laser indicator will be displayed. The horizontal distance is acquired, flashes and displayed.
3. Unit auto sequence to "AnG_1" is displayed, aim to the bottom of the target, press-and-hold fire button.
   - The measured inclination appears in the Upper display segment and is updated as continue to hold the FIRE button. The measured inclination is "locked" when you release FIRE button.
   - The inclination Angle 1 is measured, flashes & displayed.
4. Unit auto sequence to "AnG_2"is displayed, Aim at the top of target, press-and-hold FIRE button,
   - The measured inclination appears in the Upper display segment and is updated as continue to hold the FIRE button. The measured inclination is "locked" when you release fire button.
   - The inclination angle_2 is measured, flashes & displayed.
5. Unit auto sequences to the calculated Height Measurement, display flashes then solid with calculated height value.
6. Height is displayed steady until you press any button or the unit powers OFF.

NOTE See Height Routine (3-Point Routine) Workflow on Page 16.

Height Routine Tips:

- This routine is ideal for flat, vertical objects that do not lean. To shoot through brush, use the filter mode, foliage filter and a reflector.
- The laser sensor does not measure when taking the two inclination angle measurements. You do not need a clear line of sight to the bottom or top of your target.
- The sequence of the two inclination angles shots does not matter: Bottom to Top OR Top to Bottom.
- Press the Down arrow during the Height routine to re-measure previous measurement (ANG_1 or ANG_2).
- Ideal for taking multiple height measurements on the same target..
- When the height result is displayed, press FIRE Button to start the routine and repeat the steps.

Height Routine (3-Point Routine) Workflow

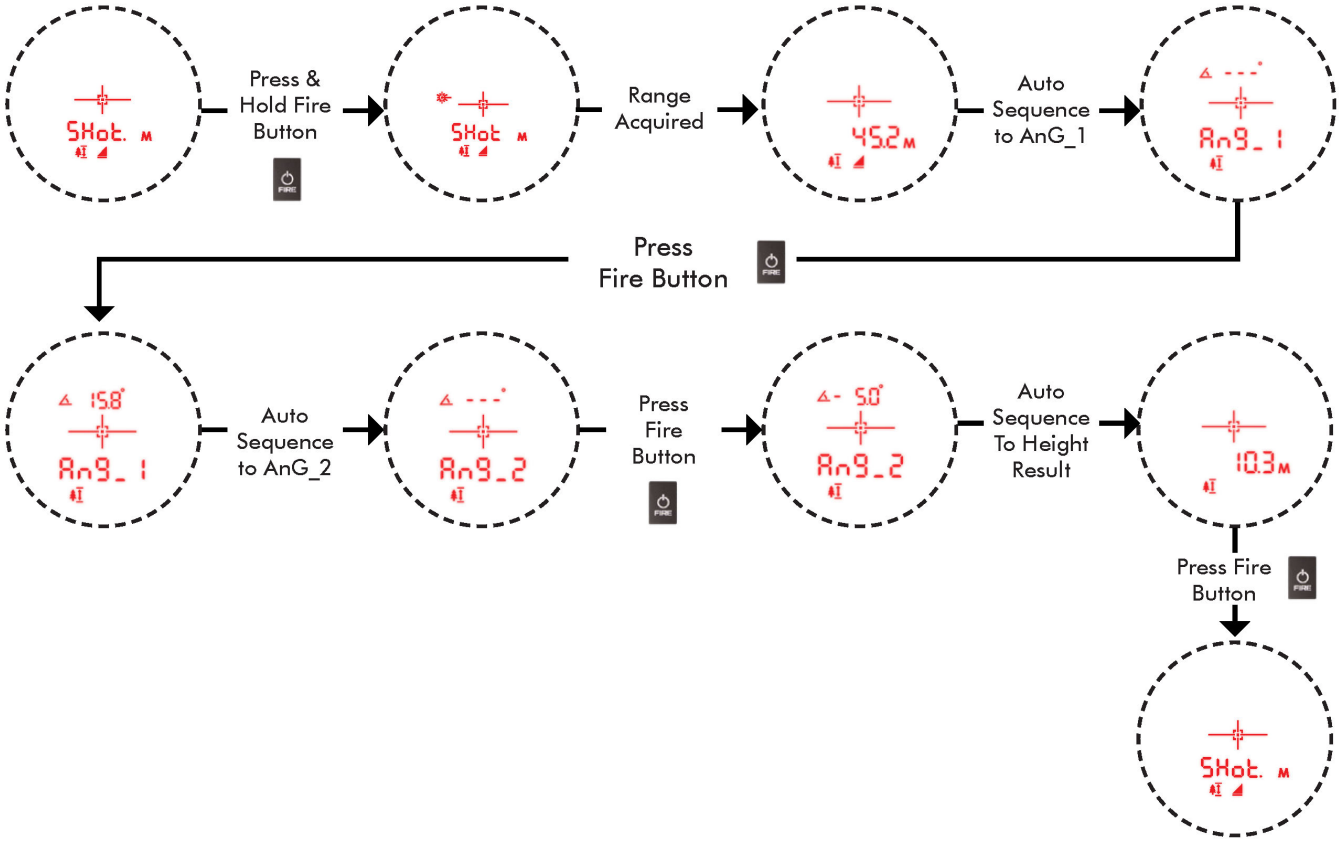
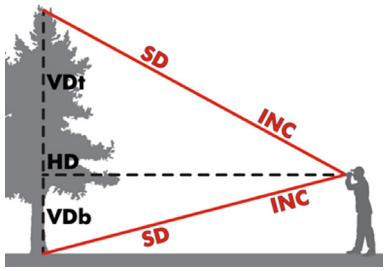


Figure 15

Height Routine (2-pt Routine)

This measurement routine is ideal for leaning objects and requires a clear line of sight for both shots.



= Measured

= Calculated

Figure 16

1. Press Up or Down buttons until the Vertical Distance (VD) indicator is displayed.
2. Aim where you have a clear line of sight to the base of the target and press-and-hold FIRE button.
   - The laser indicator will be displayed. When the measurement is acquired the result will be displayed.
     Note this value for the Vertical Distance (VDb) measurement.
3. Aim where you have a clear line of sight at the top of the target then press- and-hold the FIRE button.
4. The laser indicator will be displayed. When the measurement is acquired the result will be displayed.
   Note this value for the Vertical Distance top (VDt) value.
5. Add the two values to calculate the height VDb + VDt = Height.

   NOTE when adding the values, disregard the negative sign on the VDb.

   For example, using the measurement results shown in Figure 17, VDb 3.5 meters + VDt 8.5 meters = Height 12 meters

Height Routine (2-Point Routine) Workflow

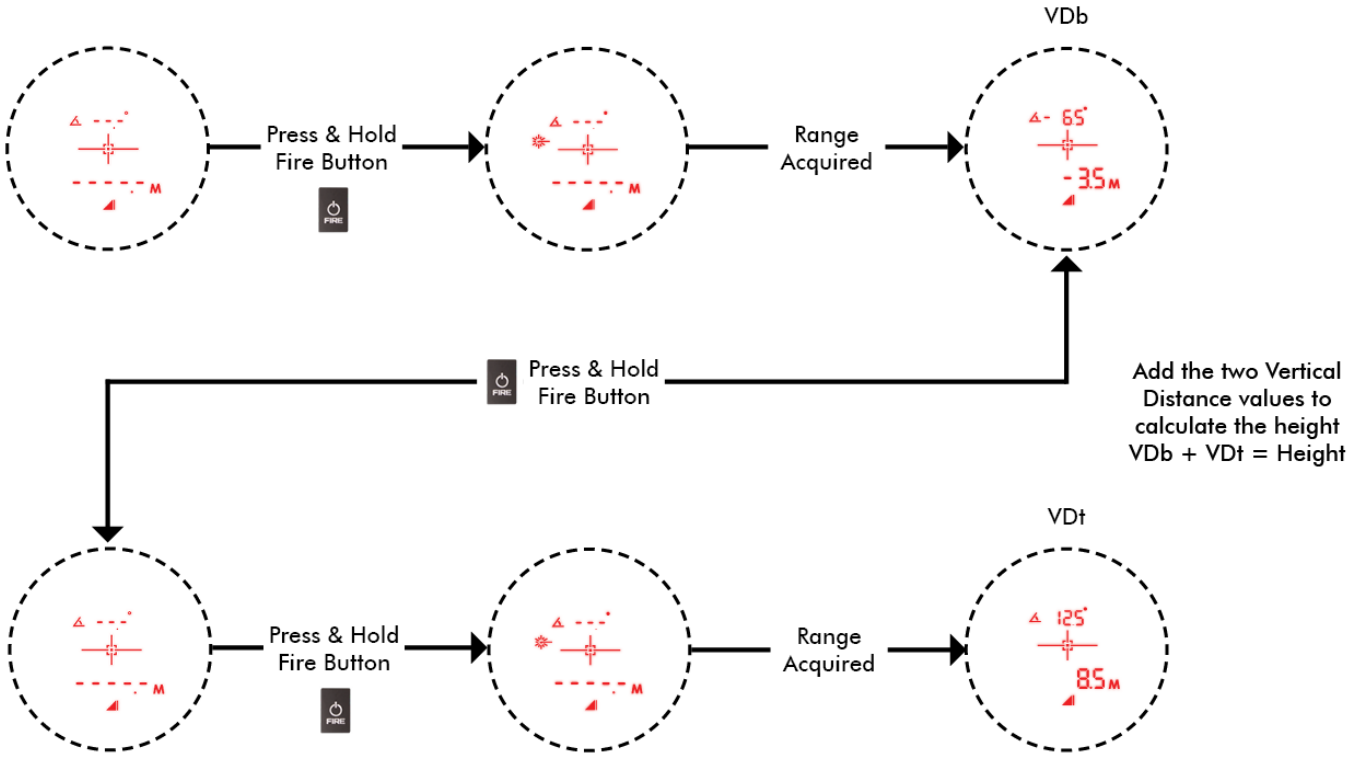


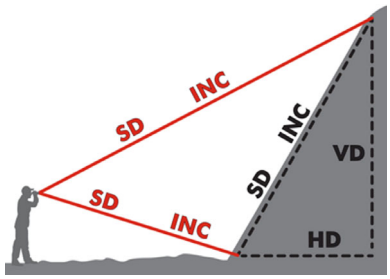
Figure 17

2D Missing Line Routine

The 2D Missing Line Routine calculates distances and angles to describe the relationship between two points in two-dimensional space (connecting vector). This routine is ideal for remote slope determinations and changes in elevation from one location.

The simple routine prompts you to take two shots to targets: "Shot 1" and "Shot 2". The TruPulse L2 uses the results to calculate values between the two points: slope distance, inclination, horizontal distance, and vertical distance from Shot 1 to Shot 2.

- Slope Distance: Length of the missing line.
- Inclination between point #1 and point #2.
- Horizontal Distance: Horizontal component of the missing line.
- Vertical Distance: Change in elevation between point #1 and point #2.



= Measured
= Calculated
Figure 18

1. Press Up or Down Buttons to navigate to the Missing Line routine.
   - "Shot.1", Missing Line, Inclination, and Horizontal Distance icons are displayed.
2. Aim where you have a clear line of sight at target, press-and-hold fire button.
   - The laser indicator will be displayed.
   - When the measurement is acquired the Shot.1 results will flash and be displayed.
3. Unit auto sequence to "Shot.2" displayed.
4. Aim where you have a clear line of sight at target to the seconds target, press-and-hold fire button.
   - The laser indicator will be displayed. When the measurement is acquired Shot.2 results will flash and be displayed.
5. Unit auto sequences to the calculated Horizontal Distance & Inclination values will flash and be displayed.
6. Press the Up arrow to scroll through the Slope and Vertical calculated values from shot 1 to shot 2. P
   - Press FIRE button to return to step 1.
   - Press Down arrow to re-measure the Shot.2,
   - Continue to press Down arrow to return to step 1.

NOTE See 2D Missing Line Routine Workflow on Page 19.

2D Missing Line Tips:

- Position yourself where shot 1 and 2 are made looking in the same direction with a clear line of site to both targets.
- The Vertical Distance Missing Line calculated value will always be accurate no matter which direction shot 1 and 2 are taken.
- If Shot 1 is longer and higher than Shot 2, the VD value will be negative.

2D Missing Line Routine Workflow

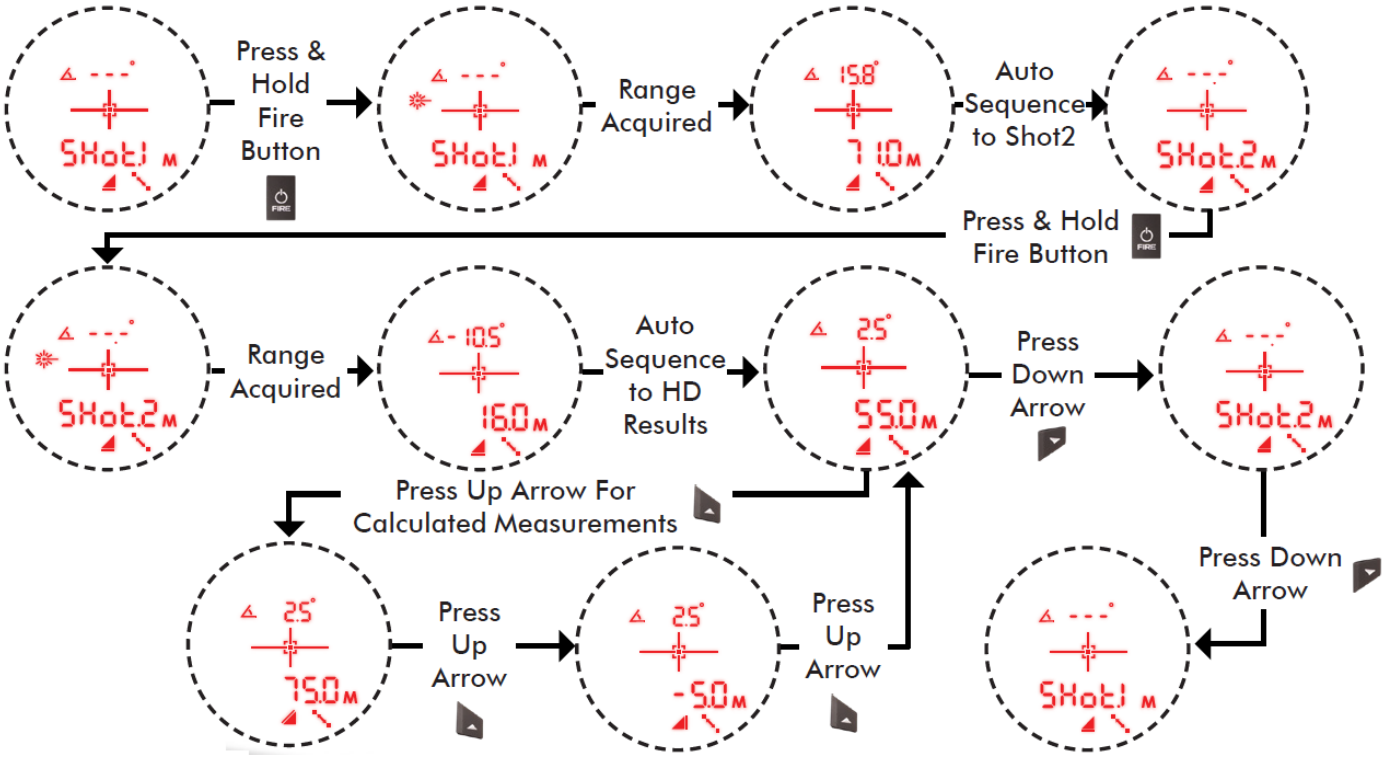


Figure 19

Section 6 - System Setting Menu

Targeting Modes

The TruPulse L2 has five Target Modes which allow you to select or eliminate targets and to take the most accurate measurements possible in various field conditions.

The selected Target Mode remains active until you select a different Target Mode.

Each time the TruPulse L2 is powered ON, it returns to the same Target Mode that was last used.

- **Std** = Standard. There is no icon in display when selected.
  Single shot mode.

- **Con** = Continuous 
  Press-and-hold the Fire button. Once the target is acquired, the TruPulse L2 can continuously acquire additional targets for a maximum of 10 seconds. The most recently acquired target appears in the Main Display.

- **CLO** = Closest  or Closest Multi 
  Press-and-hold Fire button. Once the initial target is acquired, the TruPulse L2 can acquire additional targets.
  The Closest Multi indicator denotes that additional targets have been acquired. The closest acquired target always appears in the Main Display.

- **FAr** = Farthest  or Farthest Multi 
  Press-and-hold Fire button. Once the initial target is acquired, the TruPulse L2 can acquire additional targets. The Farthest Multi indicator denotes that additional targets have been acquired. The farthest acquired target always appears in the Main Display.

- **FiL** = Filter  .
  In this mode the laser's sensitivity is reduced to only detect pulses returned from a reflector. The mechanical receive foliage filter must be used in conjunction with this mode. Typical maximum distance is 350 feet to a 3-inch reflector.

1. Press-and-hold Display/Menu button, then press Up or Down Arrow buttons to scroll until the Target Mode option screen is displayed. The last Mode option chosen will be displayed.
2. Press Display/Menu button to enter option selections, the icon will be display indicating the Target Mode menu. Then press the Up or Down buttons to scroll though options.
3. Press Fire button to select option.
4. Ready to take measurement with selected Target Mode option.
   - The icon of selected mode will be displayed.
   - Standard Mode does not have an icon displayed.
5. Repeat steps to change target mode option.

NOTE See Targeting Modes Workflow on Page 21.

Targeting Mode Tip:

In Closest and Farthest Modes, the minimum separation distance between targets is approximately 3 meters (10 ft).

Targeting Modes Workflow

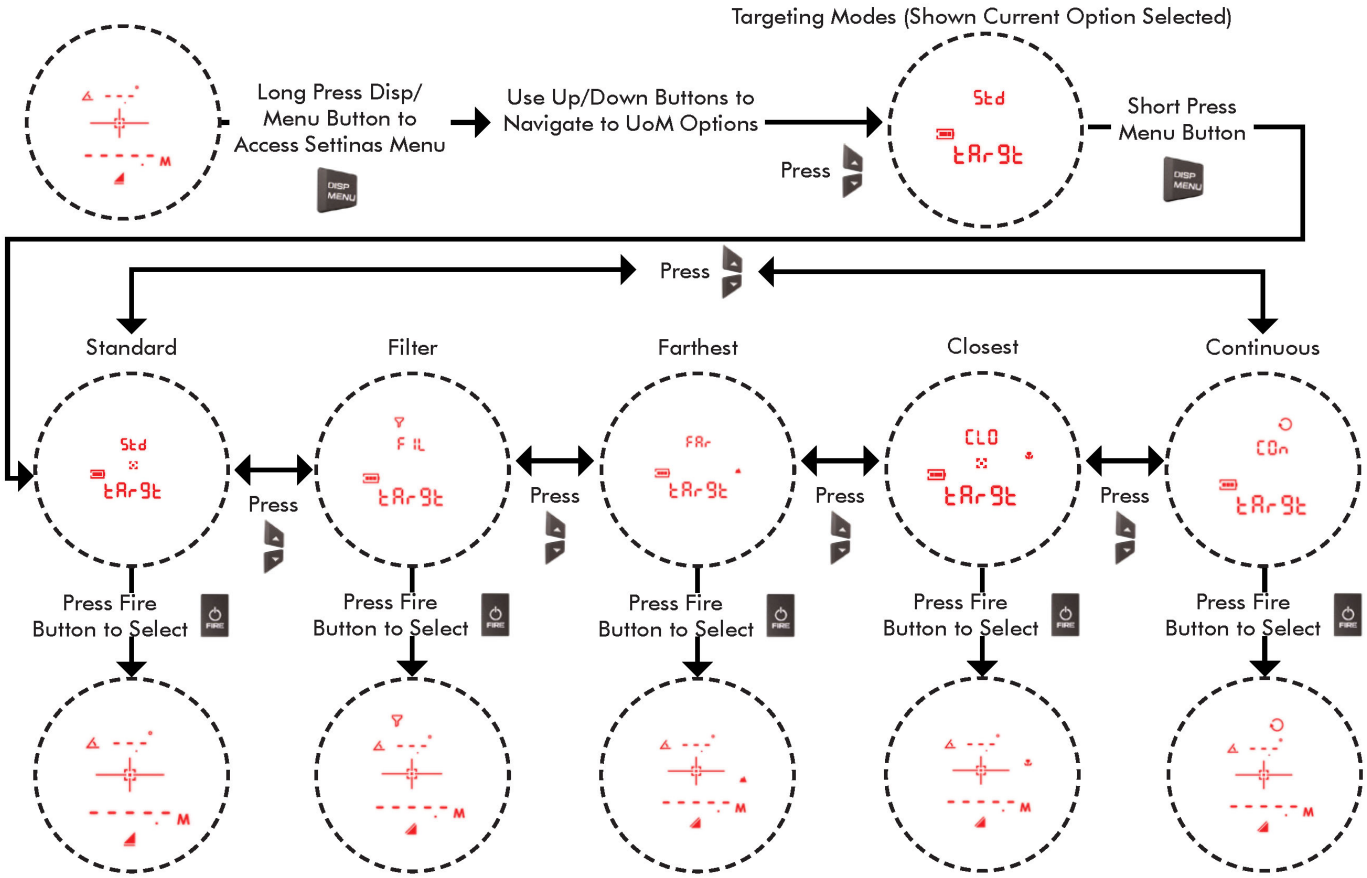


Figure 20

Aiming Reticle Options

Use the reticle to align over the target you would like to measure to. Choose from four reticle options:

Figure 21

To change Reticle:

1. Press-and-hold Display/Menu button, then press Up or Down Arrow.
2. Press Fire button to select option.
3. Ready to take measurement with selected Reticle option.
   - The Reticle option will be displayed.
4. Repeat steps to change Reticle option.

Aiming Reticle Option Workflow

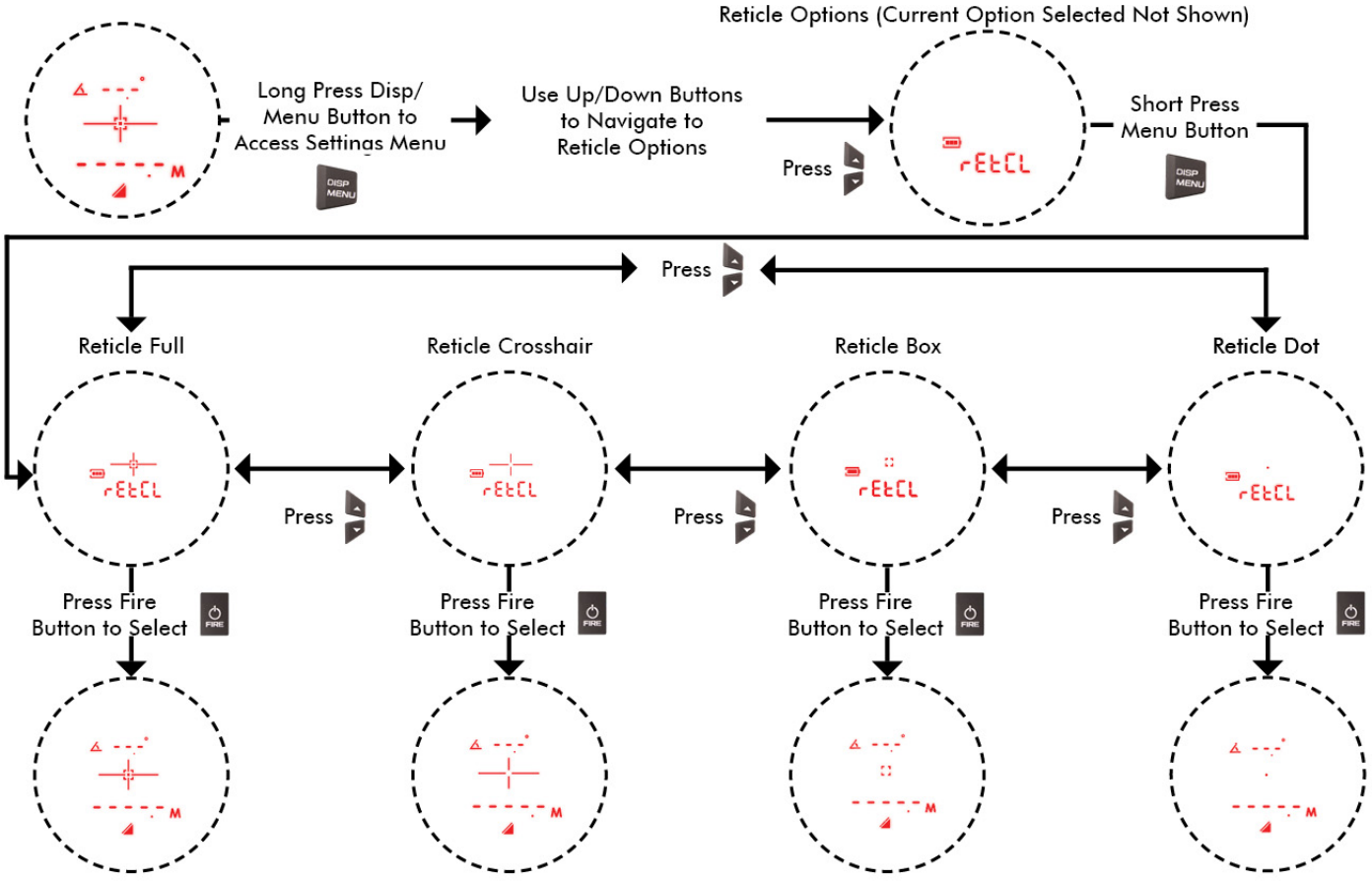


Figure 22

Units of Measurements (UoM)

The TruPulse L2 allows you to choose the units of measure. Distance: meters or feet. Inclination: Degrees or % Slope. To change the units of measurement option:

1. Press-and-hold Display/Menu button
2. Then press Up or Down Arrow buttons to scroll until the UoM option screen is displayed.
   - The last UoM options chosen will be displayed.
3. Press Display/Menu button to enter option selections, the icon will be displayed indicating the UoM option menu.
4. Then press the Up or Down buttons to scroll though UoM options.
5. Press the Fire button to select the UoM option and ready to measure.

NOTE Each time the TruPulse L2 is powered ON, it will return to the same unit setting that was last used.

Units of Measurements Workflow

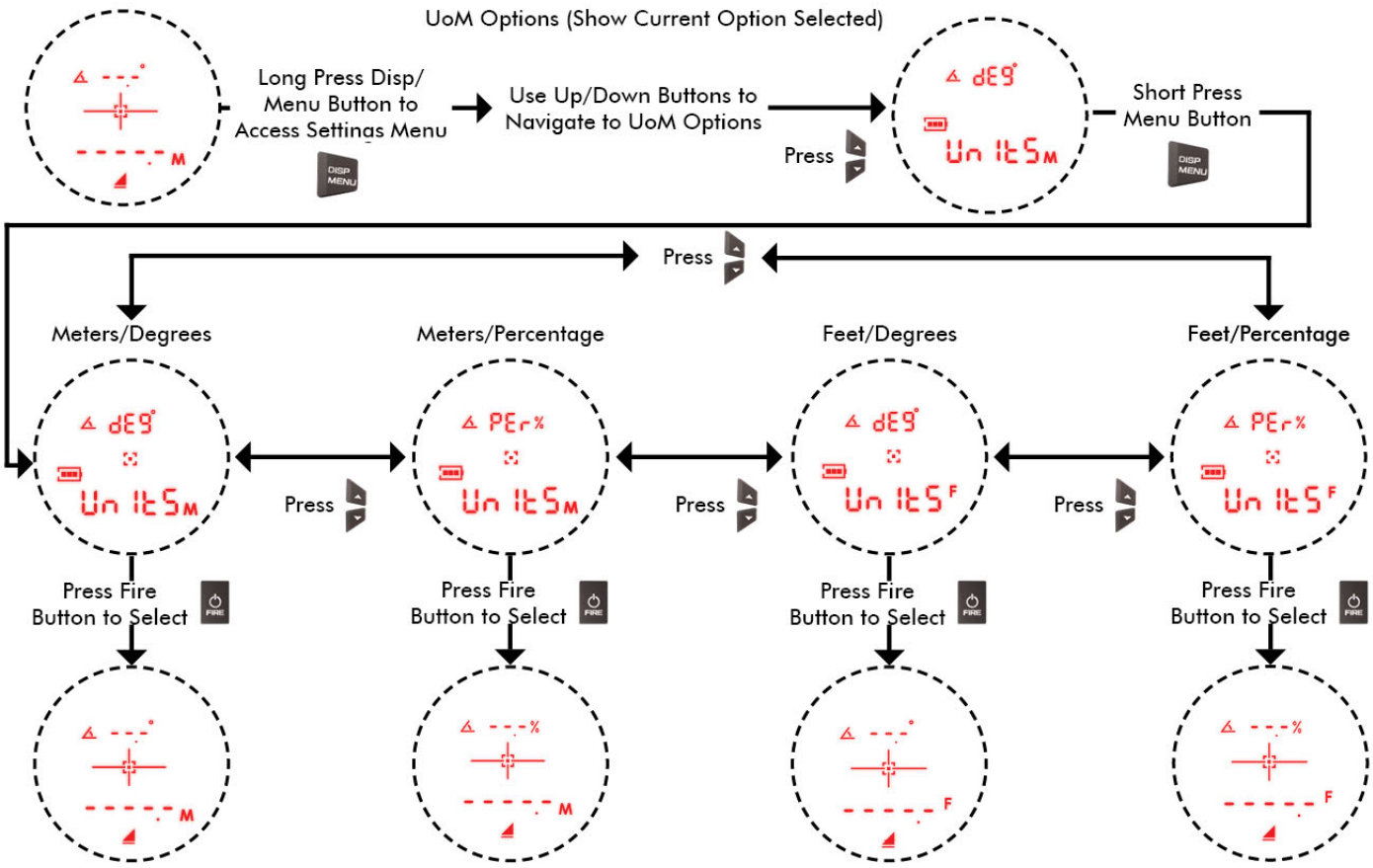


Figure 23

Pulse Settings

The TruPulse L2 has a Pulse Motor to help indicate the target has been acquired. This feature provides short vibrating pulses/bursts to give a tactile confirmation and to reinforce that the laser has locked on the target. A measurement will be displayed at the same time a vibration is felt along with a low audible vibration.

To change Pulse On/Off:

1. Press-and-hold Display/Menu button, then press Up or Down Arrow buttons to scroll until the Pulse option screen is displayed. The last option chosen will be displayed.
2. Press Display/Menu button to enter option selections, the icon will be display indicating the On or Off. Then press the Up or Down buttons to scroll though options.
3. Press FIRE button to select option.
4. Ready to take measurement with selected option.
   NOTE There is no icon for Pulse option.
5. Repeat steps to change option.

Pulse Settings Workflow

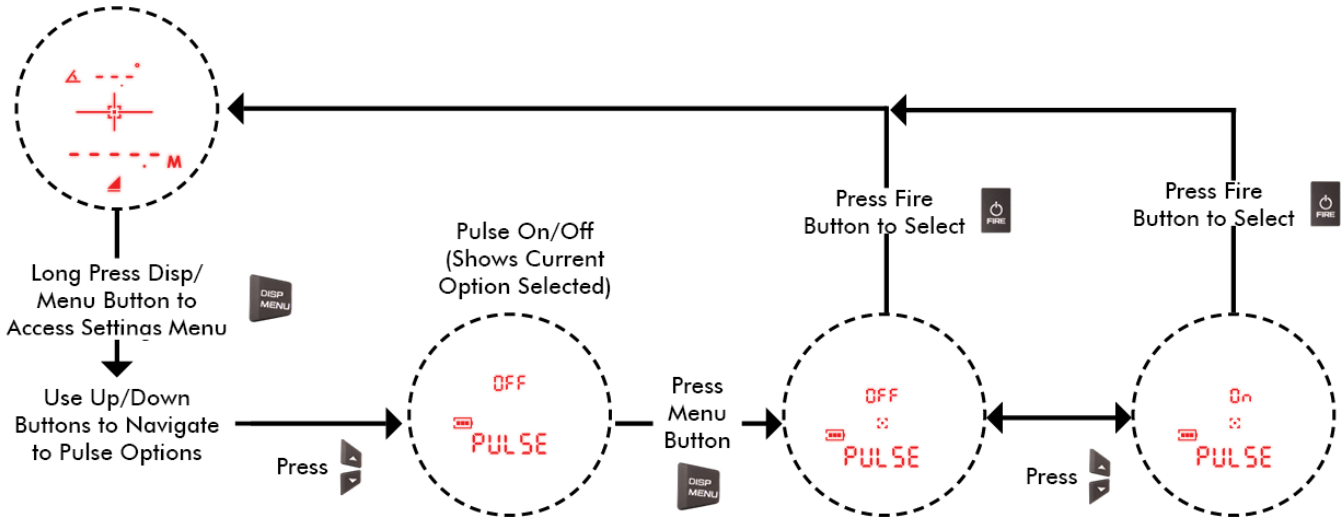


Figure 24

Section 7 - Care & Maintenance

The battery is the only user-replaceable parts in the TruPulse L2. Do not remove any screws. To do so will affect or void the LTI Limited Warranty.

- Temperature Range
  The instrument is rated for an operating temperature range of -5° to +60º C (23° to 140° F); Storage -25 to 60 degrees C (-13° to 140° degrees F). Do not expose the TruPulse L2 to temperatures outside this range.

- Protecting from Moisture and Dust
  The TruPulse L2 is sealed to provide protection from normally expected field conditions. It is protected from dust and rain, but will not withstand submersion.

  If water leakage is suspected:
  - Power OFF the TruPulse L2.
  - Remove the battery.
  - Air dry the TruPulse L2 at room temperature with the battery compartment open.

- Protecting from Shock
  The TruPulse L2 is a precision instrument and should be handled with care. It will withstand a reasonable drop shock. If the unit suffers from a severe drop shock, you may need to send the unit to LTI for service repair.

- Transporting
  When transporting the TruPulse L2, the unit should be secured in the provided carrying case. The provided neck strap can be used when carrying the TruPulse L2 in the field.

- Cleaning
  Clean the TruPulse L2 after each use, before returning to the carrying case. Check all of the following items:
  - *Excess moisture*. Towel off excess moisture, and air dry the instrument at room temperature with the battery removed and the battery compartment open.
  - *Exterior dirt*. Wipe exterior surfaces clean to prevent grit buildup in the carrying case. Isopropanol may be used to remove dirt and fingerprints from the exterior.
  - *Transmit and Receive Lenses*. Use the provided lens cloth to wipe the lenses. Failure to keep the lenses clean may damage them.

- Storing
  If you won't be using the TruPulse L2 again soon, remove the battery before storing the instrument.

Section 8 - Specifications

All specifications are subject to change without notice. Please refer to LTI's website for current specifications. I f you are not able to locate the information on the website or if you do not have internet access, please contact LTI via phone or fax.

Weight:	227 g (8 oz)
Size:	H = 75mm (3"), W = 47mm (1.9"), L = 100mm (4")
Max Range to Reflective Targets:	2195 m (7200 ft)
Max Range to Non-Reflective Targets:	1200 m (3900 ft) Typical
Minimum Range:	5 m (16 ft)
Range Accuracy to Typical Targets:	± 0.5 m (1.6 ft)
Range Accuracy to Weak Targets:	< ± 1 m (3 ft)
Range Resolution:	0.5 ft, 0.1m,
Range Units:	Feet and Meters
Inclination Limits:	±90 degrees
Inclination Accuracy:	± 0.5 degrees
Inclination Resolution:	0.5 degree, 1%
Inclination Units:	Degrees,% Slope
Power:	3.0 volts DC nominal; (1) CR2 battery
Battery Duration:	8 Hours Continuous Use
Eye Safety:	FDA Class 1 (CFR 21)
Environmental:	Water and Dust Proof; IP 67
Temperature:	-5 to +60° C (23 to 140° F)
Optics:	5X Magnification
Display:	Polymer Dispersed Liquid Crystal

Section 9 - LTI Limited Warranty

What is Covered?

Laser Technology, Inc. (LTI) warrants this product to be in good working order. Should the product fail to be in good working order at any time during the warranty period, LTI 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 LTI.

What is the Period of Coverage?

This warranty remains in force for two years from the date of purchase from LTI or an authorized LTI product dealer; unless otherwise noted by LTI at the time of sale. LTI reserves the right to require written verification of the date of the original purchase of any product.

What is Not Covered?

LTI has no obligation to modify or upgrade any product once sold. Any reproduction of software products is strictly forbidden. This limited warranty does not include service to repair damage to the product resulting from:

- Accident
- Disaster
- Misuse
- Abuse
- Non-LTI modification
- Batteries or damage caused by batteries used in our products.

In no event will LTI be liable to you for any damages, including any lost profits, lost savings, or other incidental or consequential damages arising out of the use or inability to use such product. Furthermore, LTI shall not be held responsible if an LTI authorized dealer has been advised of the possibility of such damage, or for any claim by any other party.

What Will We Do to Correct Problems?

If this product is not in good working order as warranted above, your sole remedy shall be repair or replacement as provided above.

How does State Law Relate to this Warranty?

LTI hereby disclaims all other express and implied warranties for the product, including the warranties of merchantability and fitness for a particular purpose. Some states do not allow the exclusion of implied warranties, so the above limitations may not apply to you.

How do You Get Service?

In the unlikely event that your LTI product should require warranty or repair 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. In addition, the shipping container or equivalent, will be sent prepaid and for door-to-door delivery.

Why Should You Complete and Return the Warranty Validation Card to LTI?

The Warranty Validation Card (shipped in the box with your TruPulse) must be completed and received by LTI in order to benefit from this limited warranty. If an LTI software product requires registration, this must also be completed to benefit from this limited warranty. Receipt of the warranty validation card not only activates the limited warranty, it also allows LTI to contact you directly when hardware or software upgrades become available.

If you prefer to register your LTI product electronically, please visit our website (www.lasertech.com/Warranty-Registration.aspx)

Section 10 - Main Display LCD Characters

The Main Display is used to convey messages and measurement results.

Upper Main Display

Lower Main Display

Numbers 0-9:

Alpha Characters:

Display	Alpha	Display	Alpha	Display	Alpha
	a		l		p
	b		n		r
	c		o		s
	d		p		t
	e		n		u
	f		o		

Due to the limited number of characters available, many messages have to be abbreviated.
The table below lists the messages that appear in the Main Display.

Display	Translation	Display	Alpha	Display	Alpha
	Angle One		Off		Shot One
	Angle Two		On		Shot Two
	Closest		Percent		Standard
	Continuous		Pulse		Target
	Degree		Reticle		Units
	Farthest		Shot		
	Filter				