# Laser Technologies Impulse Rangefinder
Essentials

- Long distance range: up to 500 m to a rock face or building.
- Azimuth requires an attached MapStar compass module.
- Does not have Bluetooth, so the GPS cannot interface with it, so you need to record data, either in a notebook or entering offset values using the Options button in the Terrasync Data collection screen.
- An alternative to taking the compass module would be to use a handheld **compass** like a Suunto. In that case, you need to use either Terrasync or your own computation to deal with magnetic declination. Take two readings to check for errors and be careful to avoid reading blunders.

Basic Use:
- **On:** press right rear button.
- **Off**: press two left forward buttons.
- **To take a reading**, first make sure you are in the correct window, displaying something like:

```
RIGHT        HD


_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ M
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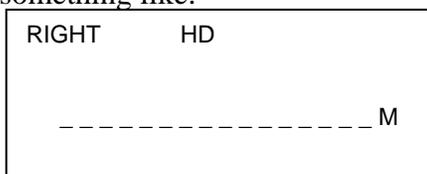
  o **RIGHT** means it responds to the right side buttons (you can configure it to respond to the left), **HD** horizontal distance is the correct starting mode, and we're measuring in meters (**M**).
  o You may need to cycle through the other displays with the middle or forward button to get here.
- Focusing on the target, press the right rear button, and if it takes the reading correctly you'll hear two quick beeps and the **HD** will be displayed.
- Cycle through the various displays using the middle button (forward button goes back):
  o **VD** (vertical distance),
  o **SD** (slope distance),
  o **INC** (inclination in degrees).
- *Return to HD for a new reading.*
- Depending on what you've specified in Terrasync Setup/Units, enter either SD & INC or HD & VD, along with azimuth from the compass.
- Remove the AA batteries when stored.
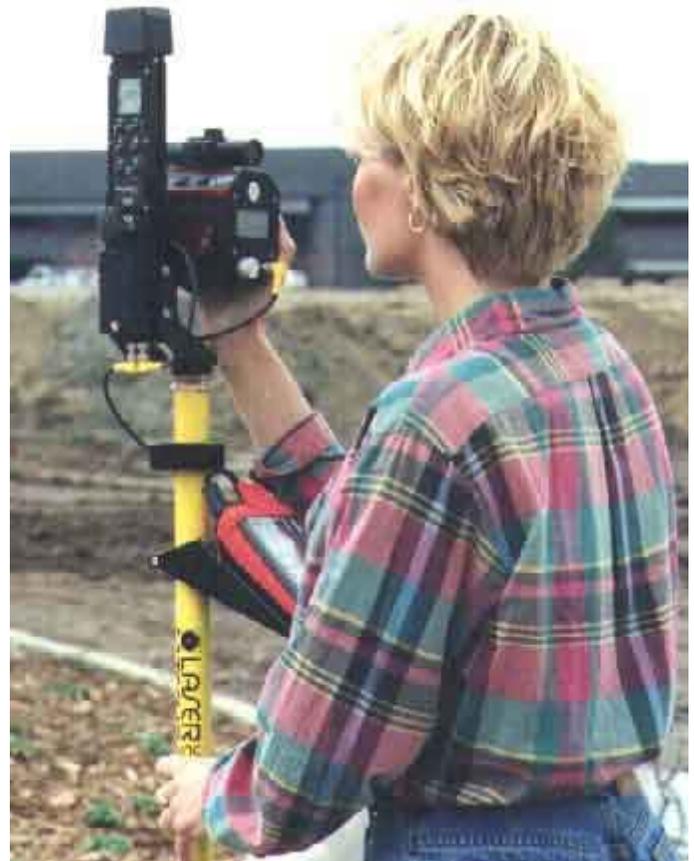
MapStar Compass Module

Compass module attaches to the rangefinder, allowing you to get azimuth in addition to distance and vertical angle. The connection allows for rotating the rangefinder through vertical angles while the compass is maintained vertical. It can be mounted on a rangepole or handheld.

Basic use of the compass module:

There are six buttons, arranged in three rows of two buttons each.

- **On** is lower right.
- **Off** is by pushing the top two buttons together.
- It will turn on in the same mode it was turned off in. Press SELECT (upper left) to cycle through modes.
- For compass azimuths, press SELECT until you see a north arrow ('N' with a hat) in the upper left. The numbers will change as you move it around.
- If using a range pole, the compass is mounted on the bracket, with the rangefinder to its side able to swivel through vertical angles.
- If handheld, you are holding the rangefinder, and will need to swivel the compass to keep it vertical. If not vertical enough, will display an error.
- To hold a compass reading while focusing on a point, press the HOLD button (upper right). After recording the value, release the hold by pressing EXIT (middle left).

Magnetic Declination Entry. If desired, correct the magnetic declination by
- From the SEL mode, press EDIT (upper right) to get to window to change this and other settings. Declination is the first, and displays a 'd' in the lower left.
- The hundreds digit is for either positive (leave as zero) or negative (change to '-').
- Press ENTER (upper left) to go to the next digit, then increase (center right) or decrease (lower right) the value.
- Repeat for the next digit.
- Press SEL to go to the next setting, with an 'A' at the bottom left. Leave it and others set to all zeros.

See the manuals for more complete instructions on both the rangefinder and compass. As with the rangefinder, remove the AA batteries when stored.

Measuring tree heights

This procedure has the advantage over clinometer methods in the instrument's ability to measure distance accurately and easily. It uses the instrument to first measure horizontal distance, then a vertical angle to the base and top of the feature. The procedure is described in the manual, page 27-29:

1. Turn the instrument on.

2. Back one screen (with the right front button) to display **HT**.

3. Press **Fire** (right back button) to start the routine. A blinking **HD** will then be displayed, telling you that it's ready to measure the horizontal distance.

4. Focus on any good spot on the trunk (doesn't have to be horizontal), and press **Fire** to measure the HD. A blinking **INC** then will be displayed with a down arrow, indicating it's ready to shoot the inclination to the base of the tree.

5. Aim to the base of the tree and press **Fire**. Note that you're only measuring the angle, so a good surface is not needed. Then an up arrow will be displayed under the blinking **INC**.

6. Aim to the top of the tree and press **Fire**. Again you're only measuring the angle. **HT** will blink.

7. Press **Fire** one last time to display the tree height.

8. **HD** will be blinking, indicating it's ready to take another tree height. You can exit by going forward with the middle button.

Laser Technologies Impulse 200 Laser Rangefinder:
Hardware Specifications:
- Weight: 2.2 lbs. (1 kg)
- Size: 6 x 2.5 x 5 in. (15.2 x 6.4 x 12.7 cm)
- Power Supply:(2) AA batteries (20 hours of use)
- Accuracy (Typical): 0.1 - 0.2 ft. (3 - 5 cm)
- Accuracy (Max): 0.5 ft. (15 cm)
- Overhead cable / Stake: 165 ft. (50 m)
- Phone pole / Stockpile: 330 ft. (100 m)
- Tree / Tower: 495 ft. (150 m)
- Rock Face / Building: 820 ft. (250 m)
- Max Distance: 1885 ft. (575 m)
- Range Resolution: 0.01 ft. (0.01 m)
- Inclination Limits: +/- 90 deg.
- Inclination Accuracy: +/- 0.1 deg.
- Temperature: - 22 to + 140 F (-30 to + 60 C)
- Environment: Waterproof to IP 67 and NEMA 6

* Hardware Specifications show typical target accuracy & range. Max distances are approximate.

Key Features:
- Custom backlit LCD display
- Audible and visual indicators
- RS232 serial output for electronic data storage
- Selective range gating for positive target acquisition
- Built-in tilt sensor
- Filter system to discriminate reflective targets
- Cumulative distance capability
- Determines the distance between two in-line objects
- Integrates with GPS

Basic Package Includes:
- Impulse laser
- Red-dot scope
- Hand strap
- Tripod / monopod mounting bracket
- Operator's manual
- (2) AA batteries
- Padded carrying case

Optional Accessories:
- 1.5 to 4 X zoom scope
- Yoke and staff
- Remote trigger data cable