# MDL LaserAce 300 laser rangefinder
Essentials

Characteristics

- Pretty easy to use in either handheld or pole-mounted.
- Interfaces with the GPS with Bluetooth, allowing an efficient one-person operation for GPS with offsets.
- Range up to 300 m, but I've never gotten farther than 200 m.

Basic use:

1. Turn on with red fire button (on top)

2. After initial display of two numbers (software version and something else), Mode 1 will be displayed.

3. **Tilt calibration** – *must be done every time you turn the unit on.* Go to setup by pressing ■ and at the first setup, **Tilt**, click ■ again to change 'no' to 'yes' in the. Get the unit approximately horizontal and *stable – not handheld*, either on a tripod or nestled on a jacket on a stable surface. Then press fire and wait 5 or so seconds for it to do the calibration – *do not disturb it* – and if this works it will go to the second calibration (compass calibration) which you can usually skip.

4. Press fire to get to the '5 Auto' setting which you should change to 'no' to avoid the thing turning off too frequently. Press fire to accept this setup change.

5. Press ● & ■ to exit the menu to Mode 1, and you're ready to go.

6. Sight on target and press fire button... wait for second beep that shows the reading is complete. Slope distance, vertical angle and azimuth are then shown.

7. Press ▲ to toggle display to vertical and horizontal distances.

8. Record values in a notebook. *Note that the unit sends out text strings of information for each reading. The format is explained in the full manual. If you can receive this data string in a data collector or laptop, you can thus save all readings without recording in a notebook.*

9. To turn the unit off, first set Auto to 'yes' so it's ok if it turns back accidentally, then turn it off by holding ● & ■ down together, and waiting for the countdown.
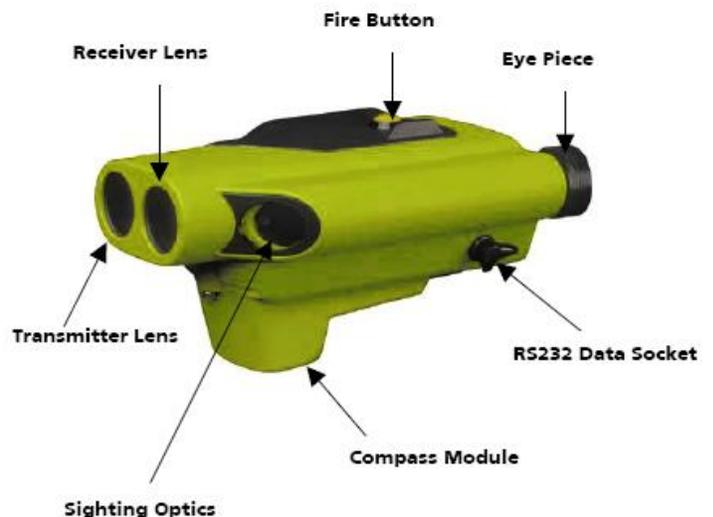
Measuring tree heights

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 uses Mode 5.

1. With the instrument on and tilt-calibrated, press ▲ a few times to get to Mode 5.

2. Press **Fire** to start the routine. A **1** will be displayed at the bottom, telling you it's ready to measure the horizontal distance.

3. Focus on any good spot on the trunk (doesn't have to be horizontal), and press **Fire** to measure all the normal readings, which will then be displayed, with a **2** at the bottom, indicating it's ready to shoot the inclination to the base of the tree.

4. 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. A **3** will be displayed, indicating it's ready to go to the top of the tree.

5. Aim to the top of the tree and press **Fire**. Again you're only measuring the angle.

6. The tree height will be displayed.

7. Press **Fire** again to do another, or exit the routine with ● & ■ simultaneously.

Setup

In Mode 1, press ■ for Setup, then press the Fire button to go through the various parameters to change. After changing a setting, you must press the Fire button again to save it. To exit, press ● & ■ simultaneously. Some useful settings are:

1. Tilt calibration (see below)
2. Compass calibration (see below)
3. Units (meters/feet)
4. Angle (deg/gon – probably want degrees).
5. Auto power on/off. If Yes, will turn off after a minute. While using the unit for multiple readings, you should probably turn this off so you don't have to repeat the tilt calibration every time. It will also stay in communication with the GPS better if left on. You just want to avoid running down the battery, so turn it off when you're not using it for a while.
6. Input format (IF) can be set to 1, 2, 3, or 4. See the manual for the differences, but all seem to work for Terrasync.
7. Baud – transfer speed. Leave at 9600.
8. Magnetic deviation (declination) – increase with ▲, decrease with ■, change the increment with ●. Very important to check, since settings are retained after you turn the unit off, and the previous user may have set this (for the Bay Area, this is currently (2008) around +14.2. Look it up for a given location and date using an online NGDC calculator. Google 'magnetic declination' or go to http://www.ngdc.noaa.gov/geomagmodels/Declination.jsp.
9. ACAL – Auxiliary calibration. See the manual if you think you need to do this.

Compass Calibration (2 CAL in setup).

In the second SETUP (CAL), toggle to Yes, then press Fire to start the compass calibration.

- Start with the instrument level, pointing approximately north.
- The display now changes to a guidance frame that will guide the user through process.
- The first sequence number (00) will appear at the top left of the display and the guidance frame will bring the unit to a North facing horizontal position.
- The sequence has 12 positions that guide the operator in a clockwise direction. The routine below will end by the operator facing west.

Note: At each of the points of the compass calibration routine in the table, the unit will guide the operator to maintain azimuth alignment within a 15 degree corridor. If during tilt or roll guidance the unit goes out of this corridor, it will issue pan left or right instructions until again within the corridor. Don't press Fire or other buttons during the process.

Sequence	Azimuth	Vertical Angle (degrees)	Roll (degrees)	LaserAce Responses
00	North	0	0	Beeps and flashes lower bar
01	North	-80	0	Beeps and flashes upper bar
02	North	+30	0	Beeps and flashes lower bar
03	North	0	0	Flashes right bar
04	East	0	0	Beeps and flashes roll left
05	East	0	left 80	Beeps and flashes roll right
06	East	0	0	Flashes right bar
07	South	0	0	Beeps and flashes upper bar
08	South	+80	0	Beeps and flashes lower bar
09	South	0	0	Flashes right bar
10	West	0	0	Beeps and flashes roll right
11	West	0	right 80	Beeps and LCD displays continuous heading

Move the instrument slowly and steadily throughout the entire calibration routine. The whole routine should only take a few minutes. The flashing bars will guide you through the process, as long as you understand what it's telling you (turn right if the right bar blinks, tilt up if the top bar blinks, roll the top left if the upper left bar blinks, etc.).

A continuous display of the compass bearing or horizontal angle follows the calibration. This is useful to obtain the local magnetic deviation by observing the compass bearing along a line of known grid azimuth and a note made of the difference. To quit the continuous heading display that follows the calibration routine, press any key for a period. The unit then returns to the setup menu.

Connecting via Bluetooth to the Trimble GeoXH.

I have been trying to get the laserace 300 to connect to the 2008 geohx trimble and I think that I have the process figured out.

To connect go to the bluetooth menu under settings,
- Under 'devices' select 'add new device.' It will search for and find the rangefinder. It is called 'LA300'
- Select 'LA300' and hit 'next'
- Input the password, '0'. It will say that you are connected but the device will be under the 'disconnected' area on the next screen.
- To connect you have to adjust the 'COM ports' settings on the top menu bar
- Under COM ports the rangefinder will show up as its own port, (COM5)
- Select it and hit 'OK'
- Open terrasync and go to the 'setup' menu => external sensors and select 'laser'
- Open the properties
- Change 'port' to 'COM5: LA300"
- Select done and you should be ready to go!

Use on a range pole

There are two types of mounts, one that goes on top (shown here), the other allows you to mount the rangefinder on the *side* of the pole, which is handy when you want to use it with the GPS, which should be mounted on top.

LaserAce 300
- Uses 2 alkaline AA batteries

(Ignore this) Serial cable for connecting to data recorder or GPS
- Shown here connected by serial cable to Trimble Recon, but this probably won't work, since the GPS needs the only physical serial port.
- Instead use Bluetooth

L-shaped bracket

Adapter: push-button fitting to 5/8" screw

Range pole ("monopod") (Laser Technology pole shown)

Trimble Recon Data Recorder Connected via Bluetooth

Optional parts: a flat surface mounted on another range pole at the same height, to do point-to-point surveys when the features don't reflect well (e.g. in-stream features, soil sample locations).