Laser Measurement for the Vertical Jumps

Laser measurement for the vertical jumps is becoming more common, particularly at USATF championship meets. It’s relatively quick & easy to use and produces very accurate measurements.

- The Lieca Disto D5 model laser is a good choice – it has a built in camera screen which makes targeting the bar easy. While you can use a laser without a camera screen, it’s more difficult to spot the laser beam on the bar especially at high heights with a bright sun background.
- Buy or make a stand for the laser to attach to the laser. You want the laser camera screen at eye level so it’s easy to see. Also, you don’t want to be on your knees looking at the laser from the ground. Gill makes a stand specifically for this purpose.

Entering an Offset for the Crossbar & Stand

Calibrate the laser so that the distance you measure is accurate from the ground to the top of the crossbar.

1. Turn on laser. Leave the laser off the stand for now.
2. Press and hold “menu” key
   a. Press + or – to navigate through menu to find the “offset” function.
   b. Press “menu” key briefly to enter the “offset” submenu.
   c. Adjust offset value up or down to reach zero by using the + or - key.
   d. Set zero value by pressing and holding “menu” key again. To clear offset press “off” for longer.
3. Now, measure the height of a control object with the laser on the ground. You can measure the height of a door jamb, or the distance between two baseboards. Call this “Distance A”.
4. Put the laser on the stand, and measure the height of the control object again. Call this “Distance B”.
5. Calculate the difference between the two measurements. “A” – “B” = “C”
6. Add .030 meters to this calculation “C” to account for the diameter of the crossbar.
7. Go back to the “offset” menu and do as follows:
   a. Press and hold “menu” key
   b. Press + or – to navigate through menu. Select “offset” function in the menu.
   c. Press “menu” key briefly to enter the “offset” submenu.
   d. Enter calculation “C” as an offset in laser by pressing the + key to desired offset.
8. Set desired value by pressing and holding “menu” key again. To clear offset press “off” for longer. The laser is now ready.

Setting the Measurement to Metric

1. Press and hold the “menu” key to enter the setup menu.
2. Press + or – to navigate through the keys.
3. Press “menu” briefly to enter the menu sub menu
4. Press + or – to make alterations to the submenu.
5. Press and hold “menu” to accept the settings.
6. Press the “clear/off” key for longer to quit the settings function.

Verifying Laser Accuracy

At the beginning of every meet check the accuracy of the laser.

1. Lay out a certified steel tape on the runway or apron. You can use any distance you want for the measurement; we’ll say 5.00 meters for this example.
2. Lay the laser and stand on the tape with zero at base of stand.
3. Place a target at exactly 4.97 meters. Any small, stable object will work as the target.
4. Shoot the laser at the target. The reading should be 5.00 because we’ve included .03 meters in the offset for the thickness of the crossbar. Remember it’s the top of the bar you’re trying to measure.
5. Recalibrate the offset if necessary.

**Laser Operating Instructions**

The laser must bounce off a bar that is neither too dark nor too reflective. If either situation occurs you will get an error message as shown on bottom table. Experiment to see if you get a reading. I create a target to ensure I measure form the exact center of the bar each measurement.

1. Create a target in the exact middle of the bar by wrapping black tape on both sides of a white tape strip center section. Make the black tape ends about 6 inches apart. The black lets you see the bar against a bright background.
2. Draw a cross target on the ground facing side of the white tape strip.
3. Turn on laser unit: Press “on” button
   a. Zoom in: Press “target” up to 4X to zoom in.
   b. Adjust brightness: Press + or – to adjust brightness.
5. Ensure laser is activated: Press “on” button (indicator shows 0.00). Check beam with hand.
7. Clear reading: Press “on” to remove result.
8. Turn off: Press “clear/off” slowly. Always turn the laser off and place under a white towel when not using it outdoors.

You may have to repeat some of the above steps in warm weather or when the bar color is not perfect, and repeat steps 5 & 6 if you miss hitting the target.

**Disto D5 Error Codes**

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>Transverse tilt greater than 10 degrees</td>
<td>Hold the instrument without any transverse tilt. Standards on 0.</td>
</tr>
<tr>
<td>160</td>
<td>Main tilt direction, angle too high &gt; 45 degrees</td>
<td>Measure angle up to max +/- 45 degrees</td>
</tr>
<tr>
<td>162</td>
<td>The calibration has not been accomplished on a leveled surface and the calibration value is respectively within an ineligible area</td>
<td>Calibrate the device on an absolute horizontal leveled surface.</td>
</tr>
<tr>
<td>204</td>
<td>Calculation error</td>
<td>Repeat procedure</td>
</tr>
<tr>
<td>252</td>
<td>Temperature too high, above 122 F</td>
<td>Cool down instrument</td>
</tr>
<tr>
<td>253</td>
<td>Temperature too low, below 32 F</td>
<td>Warm up instrument</td>
</tr>
<tr>
<td>255</td>
<td>Receiver signal too weak. Measurement time too long. Distance too long, &gt; 100m</td>
<td>Use white or grey target color.</td>
</tr>
<tr>
<td>256</td>
<td>Received signal too strong. Target too reflective</td>
<td>Use white or grey target color.</td>
</tr>
<tr>
<td>257</td>
<td>Erroneous measurement. Too much backlight.</td>
<td>Darken target (measure in different lighting conditions)</td>
</tr>
<tr>
<td>260</td>
<td>Laser beam interrupted</td>
<td>Repeat measurement</td>
</tr>
<tr>
<td>Error</td>
<td>Hardware error</td>
<td>Switch on/off the device several times. If the symbol still appears, then your instrument is defective.</td>
</tr>
</tbody>
</table>