

Working with the Leica Disto



The Leica Disto Pro 4 is a laser measuring device. It is used to take the measurements of objects that would otherwise be difficult to measure with a tape.

This publication is a guide to the functions that will be used most commonly by University of Oregon architecture students recording urban streetscapes. The Disto has many additional capabilities which are described in the online manual for the Disto Pro 4, available at

http://www.disto.com/download/manuals/pro/index_en.pdf.

<picture of using at correct height, hand-held or on tripod OUTDOOR>

Safety

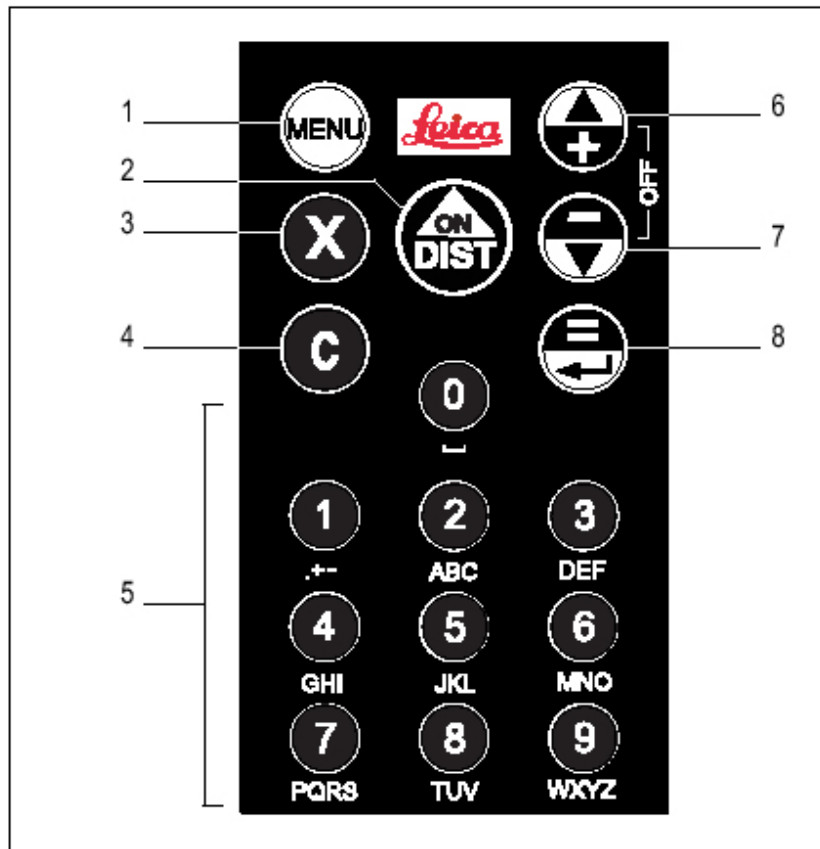
The Disto uses a laser class II to measure. Lasers are harmful to your eyes if you look at their source. Therefore:

- Don't look in the barrel of the Disto while the laser measurer is on. Don't let other people do it, either.
- Don't measure distances from **reflective surfaces** (such as mirrors or windows) that will reflect the laser into your eyes or another person's eyes.
- Don't aim the device into the sun, as the equipment may heat up and melt itself.
- If there are people nearby, **take all measurements below or above eye-level.**
- Don't use near strong magnetic fields such as transformers, as they will affect the accuracy of the readings.
- When measuring vertical surfaces, the end of the laser can be hard to see. Be careful not to allow the beam of the Disto to run through a window.

<picture showing beam moving up and to the side>

Setting Up the Disto

Parts of the Disto



- | | |
|---------------------------------------|--------------------------------|
| 1 Menu key | 6 Plus / navigation key, up |
| 2 Power on and measuring key | 7 Minus / navigation key, down |
| 3 Multiplication / time delay release | 8 Result / Enter key |
| 4 Clear key | |
| 5 Alphanumeric keypad 0-9 | |

Turning Off the Disto

- The Disto will turn itself off after 90 seconds of inactivity.
- To turn it off by hand, press and hold both the arrow keys simultaneously. If it doesn't turn off when you press these buttons, it might be waiting for input onscreen. To cancel the waiting, press C until the main screen appears.

Changing End Covers

There are two main end covers for the back end of the Disto. If you're using a tripod, you must use the adapter end cover. It can automatically detect which one is in use, except for the adapter end cover.

Whenever you install **adapter end cover**, you must also tell



Positioning bracket end cover



Adapter end cover

(Swivel end cover not shown)

the Disto that it's in use.

- **MENU>2>2>1**
- **MENU>end cover>adapter end cover>without add-on**

Note: after changing the end cover, you should double-check [calibrate the measurements](#). Each end cover is a slightly different length, which affects the accuracy of measurements taken from the rear.

Choosing the Unit of Measure

The Disto's default unit of measurement is the meter. To take measurements in architectural feet and inches, do either of the following:

- **Menu>3>3>1>4**
- **Menu>basic settings>units>0'00"/32**

This setting will remain in effect until you change it or until you [reset the Disto](#).

Calibrating

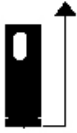
Start your measurements by making a **test measurement** to make sure the Disto is calibrated the way you think it's supposed to be. You can do this indoors or outdoors. You'll need a tape measure.

1. Set the Disto at least one foot away from a wall.
2. Measure from the back of the Disto to the wall. Make sure the screen shows the "measure from rear" icon as shown at left.
3. Take a measurement.

If the measurement doesn't match your tape, first look at the screen to make sure the measurement begins at the back of the Disto. If it shows the measurement beginning at the front of the Disto, or if it's off by $5 \frac{7}{8}$ ", you'll need to [change the measurement origin setting](#). If it's inaccurate by a different amount, and there's a picture of a triangle on the screen, the Disto may have been set to [add or subtract an amount from each measurement](#).



Checking the Disto's measurement settings



Disto set to take measurements from rear edge (adapter end cover shown)



Disto set to take measurements from front edge (swivel end cover shown)



Offset indicators (visible only when an offset value is in use)

Measurement Origin

The Disto can measure from the front of the unit or from the rear. Since the Disto itself is 5 7/8" long, this can affect the accuracy of the readings. For most measurements, it's easiest to use the Rear setting. The screen shows which setting is in use.

- **MENU>1>1>1** (for front) or **3** (for rear)
 - **MENU>measure settings>reference>front** or **rear**
- Do not choose STAND.

Offset Value

This number may have been changed by someone using the Disto with a tripod; if an offset value has been set, a triangle appears on the screen. To reset the value to zero (tell the Disto to measure exactly from its Measurement Origin):

- **MENU>1>2>3**
- **MENU>measure settings>offset>none**

The triangle symbol disappears.

If you are [using the Disto with a tripod](#), you'll need to change this value so that any vertical measurements are accurate.

- **MENU>1>2>1**
- **MENU>measure settings>offset>addition**

Then enter the amount of the offset:¹ To enter an amount less than one foot, press 0. Then press the 1 key twice quickly to display a period (.). Next type the number of inches XXXX <need remaining instructions; emailed Disto for answer to problem with manual > XXX
The triangle symbol appears.

Replacing Batteries

Battery replacement will be indicated either by the Disto failing to turn on, or by a hollow picture of a battery in the upper right-corner of the screen. The Disto requires four AAA batteries. The batteries are housed under the [end cover](#).



Empty battery indicator



¹ The manual is incomplete on this function with regard to units in feet and inches.

Clearing All Settings

Resetting is handy if the Disto is not exhibiting expected behavior. (Some data values will remain in memory, but these won't affect the behavior of the Disto.)

- **MENU>3>4**
- **MENU>basic settings>reset**

Note that once you reset the Disto, it will use meters until you then [choose a new unit of measure](#). If you are using the adapter end cover, you will also need to instruct the Disto to [use a new measuring position](#).

Basic Measuring

Suitable Surfaces and Weather Conditions

Surfaces that are **wet, reflective, transparent, or rough** may not give good readings. Have a partner hold a target plate (such as a notebook) in front of the surface to provide a good surface, or use a sticky note to reduce reflectivity.

Outdoor measurements may be tricky in bright **sunlight**. Both you and the Disto may have trouble seeing the end of the laser beam. Try to take measurements on a shaded portion of the building, or wait for the sun to move so that the side of the building you're interested in is in shade.

In **rain**, XXX

Lengths Shorter Than the Disto

Disto can't read measurements shorter than .3 meters (~1 foot). Use a tape measure for those lengths.

<need foto here of assistant
OUTDOOR>< also foto of
post-it note OUTDOOR>

Exterior Corners

If you are measuring the **outer edge of a building's exterior**, you'll need an assistant to hold a target plate (such as a notebook) for you to measure from, or put a large sticky note on the edge of the building <need better description here or drawing>. Be sure that each of you holds the Disto and the target plate above or below eye level. It's easy for the laser beam to slip off the edge and onto a surface behind the corner. As always, make sure the beam is below eye level so someone doesn't walk into it. If you are working alone, you can act as your own assistant. Use the [timed release function](#) to take the measurement while you hold the target plate.



Timed delay release indicator

Timed Release

The Disto can take a measurement when you're not holding it.

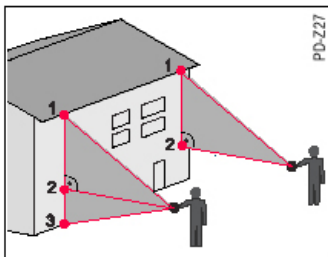
1. Aim the Disto at the target. Press the DIST button. Line up the laser with the target.
2. Press the X button. The Disto will count down from 10 seconds, and will beep in the final 5 seconds to warn you that it's about to register a measurement. (Press and hold the X button for longer and it will give more time.)



Correct attachment to tripod.
Adapter end cover attaches the Disto to the tripod



Incorrect attachment to tripod



Pythagoras function

Tripods

To accurately measure vertical surfaces using the built-in functions requires the use of a tripod. You'll need the following:

- Tripod
- Level
- Adapter end cover
- Short measuring tape or ruler

Set up the tripod so that its height is below eye-level and comfortable for you to read.

Set up the Disto:

1. Install the adapter end cover. [Tell the Disto which end cover is on it.](#)
2. Attach the back end of the Disto to the tripod. Don't use the attachment under the Disto, since that will give incorrect readings.
3. Unless your tripod rotates the Disto base exactly about a point, tell the Disto how much offset to add to all its measurements. If you don't change this setting, the vertical measurements you make can be off by as much as XXX.

- **MENU>1>2>1**

- **MENU>measure settings>offset>addition**

Then enter the amount of the offset:² To enter an amount less than one foot, press 0. Then press the 1 key twice quickly to display a period (.). Next type the number of inches XXXX <need remaining instructions; emailed Disto for answer to problem with manual > XXX

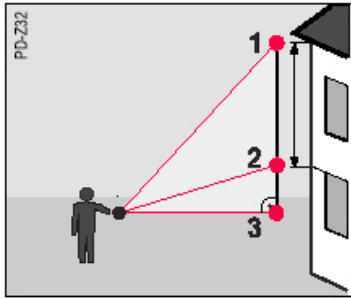
Overall Façade Heights

Disto has a built-in method for taking the height of a building when you can see from the top of the building to the base. Use this method if you have a clear vertical line of site from the top of the building to the bottom. If you can only see part of the façade from where you're standing, use the [Heights of Elements within Facades.](#)

- **MENU>4>4**

- **MENU>basic functions>pythagoras**

² The manual is incomplete on this function with regard to units in feet and inches.

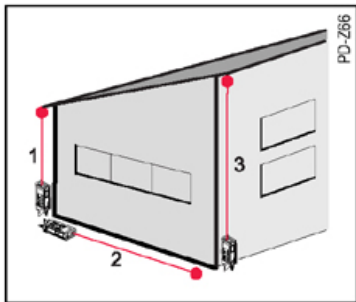


Height function

Heights of Elements within Facades

Use this technique for measuring either the height of a building for which you can't see the whole thing at once (you'll need to repeat these steps enough times to add up to the entire height). Or, use it for measuring elements such as window height within a facade.

- **MENU>4>5**
- **MENU>basic functions>height**



Trapezium function

Roof Slope

Use this function to get the roof slope angle, as well as its length. You'll need to be able to stand directly beneath the peak of the roof. Note that if the roof is gabled (unlike the picture shown at left), you must take measurement #2 from the halfway point of the façade.

- **MENU>5>3**
- **MENU>calculation>trapeze HSH**

Questions for Tech Support

2. how to store measured data with text?