

# Leica DISTO™ D410

The original laser distance meter



- when it has to be **right**

*Leica*  
Geosystems

<b>Instrument Set-up</b> .....	2
Introduction .....	2
Overview .....	2
Basic measuring screen .....	3
Selection screen .....	3
Pointfinder (Viewscreen) .....	4
Insert batteries .....	4
<b>Operations</b> .....	5
Switching ON/OFF .....	5
Clear .....	5
Message Codes .....	5
Multifunctional endpiece .....	5
Permanent / Minimum-Maximum measuring .....	5
Add / Subtract .....	6
Pointfinder (Viewscreen) .....	6
<b>Settings</b> .....	7
Overview .....	7
Distance units .....	8
Beep ON/OFF .....	8
De-/Activate keylock .....	8
Switch on with keylock .....	8
Calibration of tilt sensor (Tilt Calibration) .....	9
Personalized favorites .....	10
Illumination .....	10
Offset .....	11
Reset .....	11
<b>Functions</b> .....	12
Overview .....	12
Timer .....	12
Adjusting measuring reference/tripod .....	13
Memory .....	14
Measuring single distance .....	14
Smart Horizontal Mode .....	14
Area .....	15

Volume .....	16
Stake out .....	17
Pythagoras (2-point) .....	18

## **Technical Data** .....

## **Message Codes** .....


## **Care** .....


## **Warranty** .....

## **Safety Instructions** .....

Areas of responsibility .....	20
Permitted use .....	21
Prohibited use .....	21
Hazards in use .....	21
Limits of use .....	21
Disposal .....	21
Electromagnetic Compatibility (EMC) .....	22
Laser classification .....	22
Labelling .....	22

## 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.


The symbols used have the following meanings:

### **WARNING**

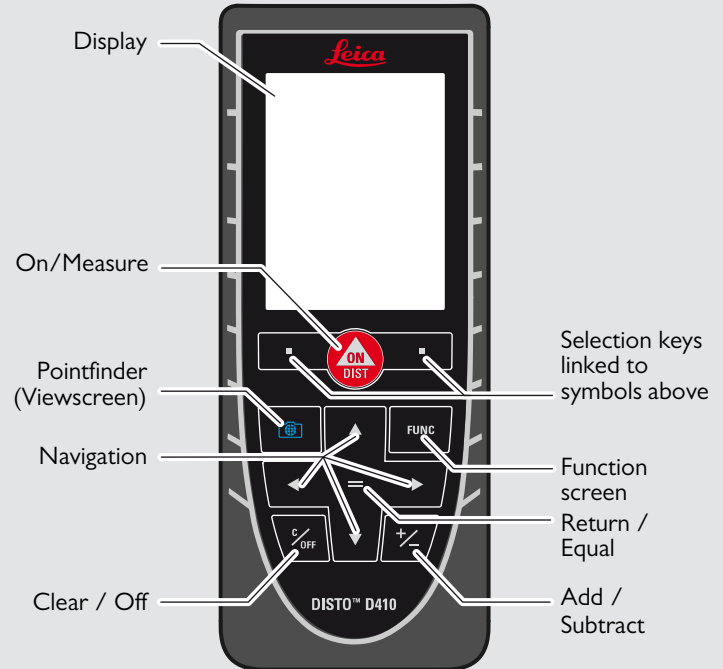
Indicates a potentially hazardous situation or an unintended use which, if not avoided, will result in death or serious injury.

### **CAUTION**

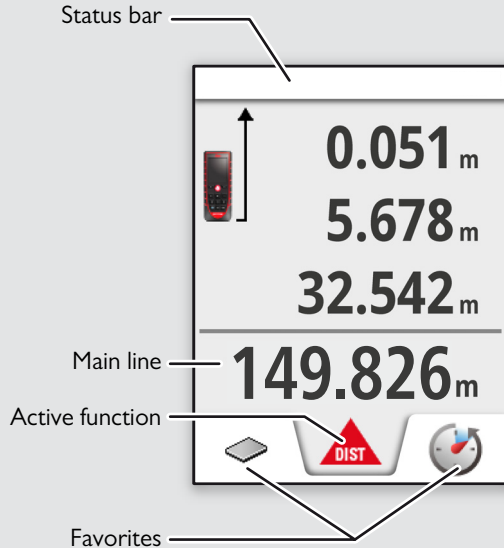
Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor injury and/or appreciable material, financial and environmental damage.

 Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

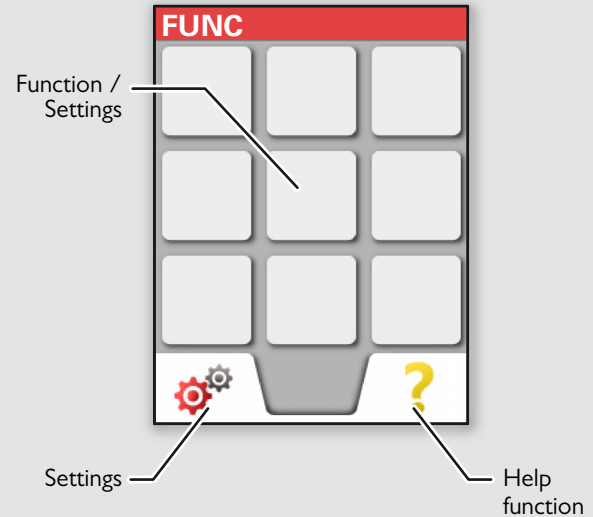
## Overview



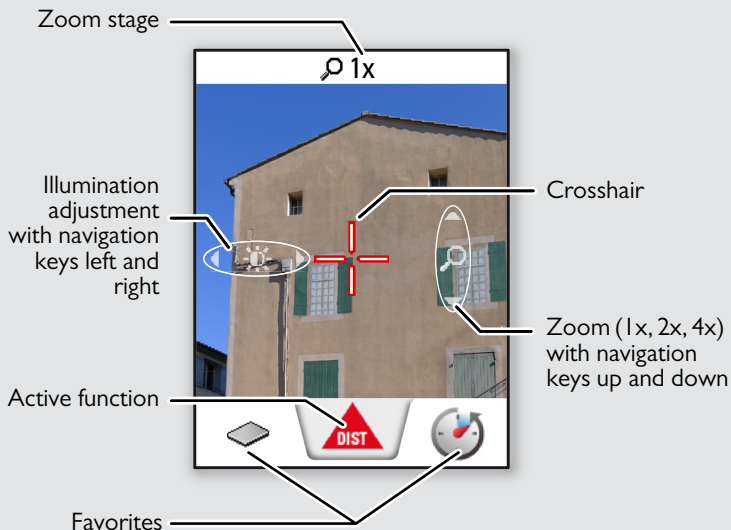
## Basic measuring screen



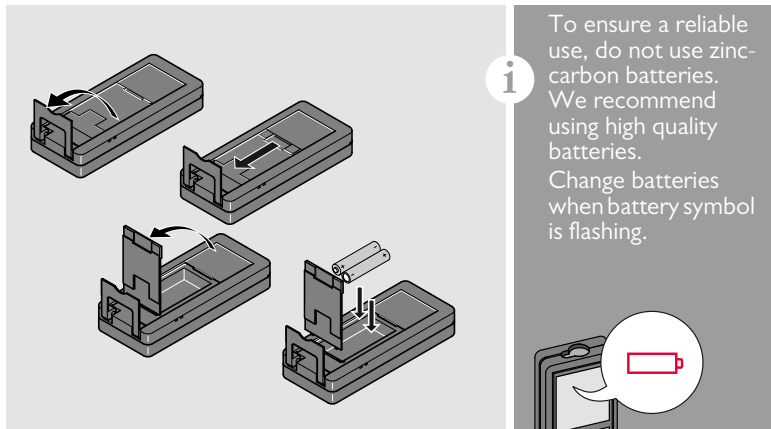
## Selection screen



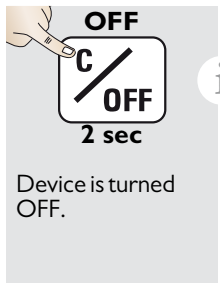
## Pointfinder (Viewscreen)



## Insert batteries



Switching ON/OFF



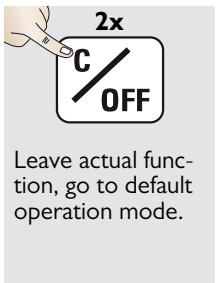
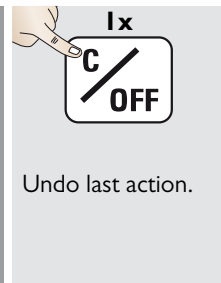
**ON**  
ON DIST

**OFF**  
C / OFF  
2 sec

**i** If no key is pressed for 180 sec, the device switches off automatically.

Device is turned OFF.

Clear

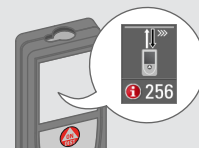


Undo last action.

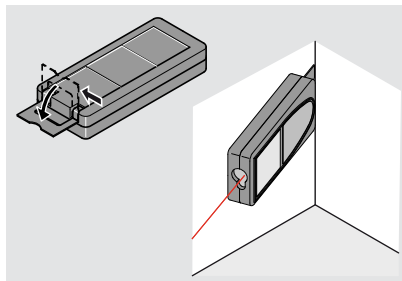
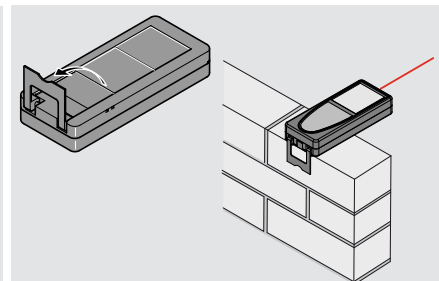
Leave actual function, go to default operation mode.

Message Codes

If the info icon appears with a number, observe the instructions in section "Message Codes".  
Example:

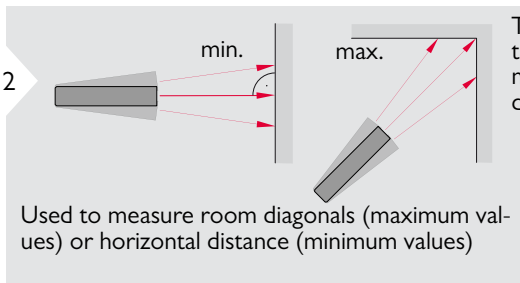


Multifunctional endpiece

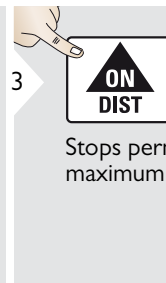


**i** The orientation of the endpiece is automatically detected and the zero point is accordingly adjusted.

Permanent / Minimum-Maximum measuring



The minimum and maximum distance measured is displayed (min, max.). The last value measured is displayed in the main line.



Stops permanent / minimum-maximum measuring.

## Add / Subtract

1 **ON DIST**  
7.332 m

2 **+ / -**  
The next measurement is **added** to the previous one.

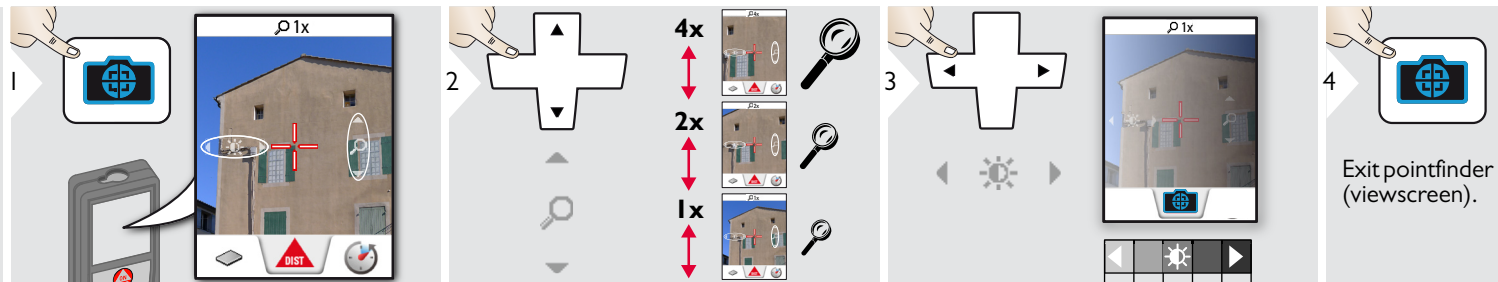
3 **2x**  
**+ / -**  
The next measurement is **subtracted** from the previous one.  
7.332 m  
12.847 m

4 **+**  
20.179 m

**i**

This process can be repeated as required. The same process can be used for adding or subtracting areas or volumes.

## Pointfinder (Viewscreen)



1 **Pointfinder**  
1x

2 **+**  
4x  
2x  
1x

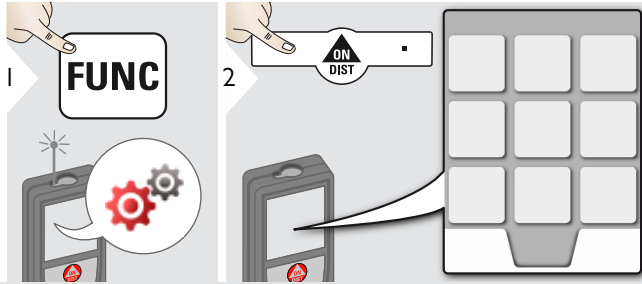
3 **+**  
1x










4 **Pointfinder**  
Exit pointfinder (viewscreen).

**i**

This is a great help for outdoor measuring. The integrated pointfinder (viewscreen) shows the target on the display. The device measures in the middle of the cross hair, even if the laser dot is not visible. Parallax errors occur when the pointfinder camera is used on close targets, with the effect that the laser appears displaced in the crosshair. In this case rely on the real laser dot.

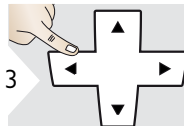
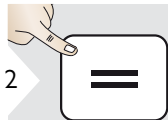
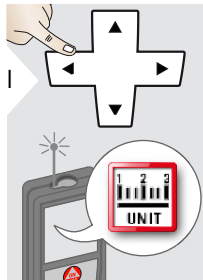
Overview



	Distance units
	Beep
	Keypad lock
	Tilt calibration
	Favorites
	Illumination
	Offset
	Reset
	Information

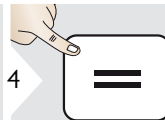


## Distance units

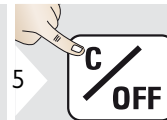


Switch between the following units:

0.00 m	0.00 ft
0.000 m	0.00 in
0.0000 m	0 1/32 in
0.0 mm	0'00" 1/32

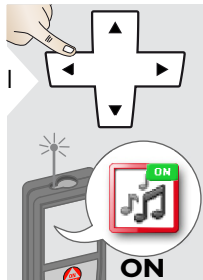


Confirm setting.

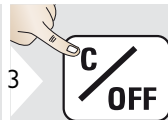


Exit settings.

## Beep ON/OFF

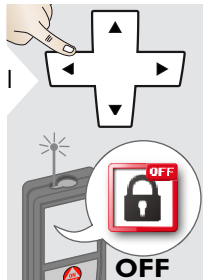


To switch ON, repeat procedure.



Exit settings.

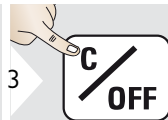
## De-/Activate keylock



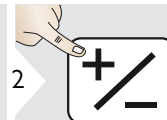
To deactivate, repeat procedure. The keylock is active if device is switched off.



## Switch on with keylock



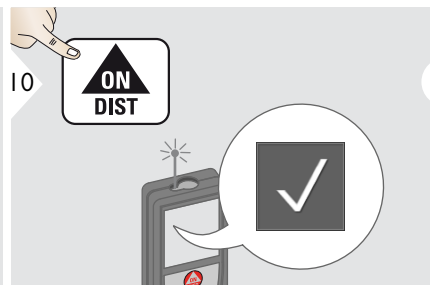
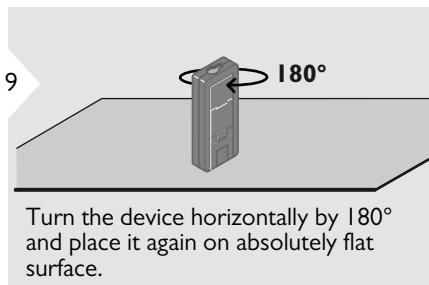
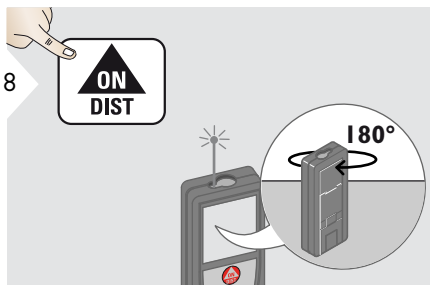
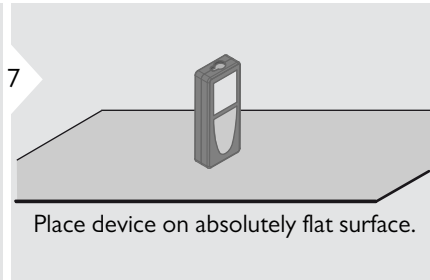
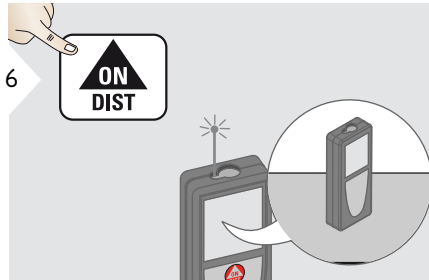
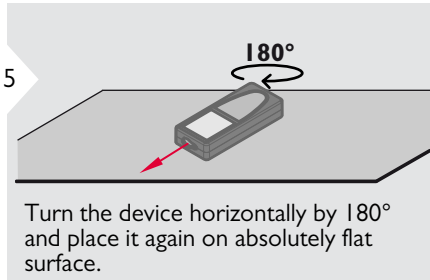
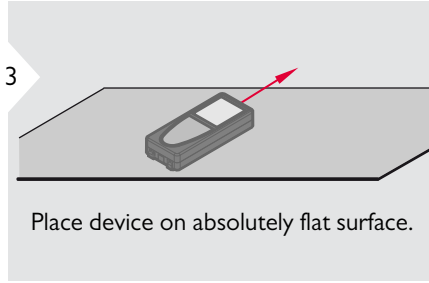
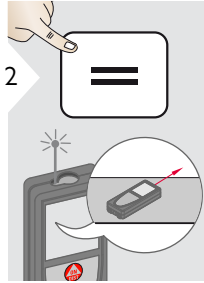
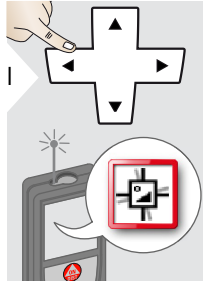
Exit settings.



within 2 sec

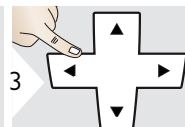
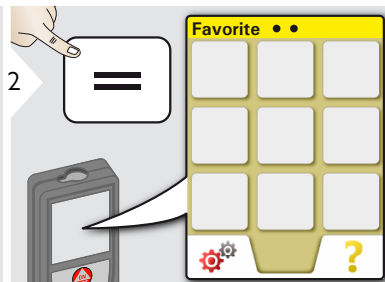
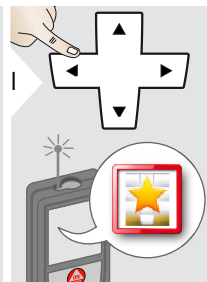


Calibration of tilt sensor (Tilt Calibration)



**i** After 2 sec the device goes back to the basic mode.

Personalized favorites



Select favorite function.



Press selection key left or right. Function is set as favorite above the corresponding selection key.



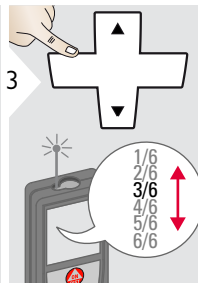
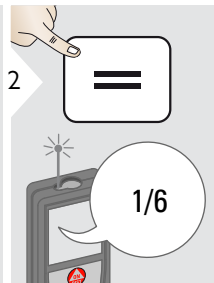
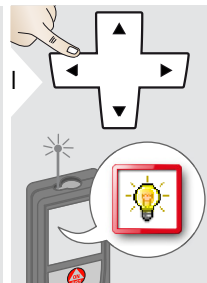
Exit settings.



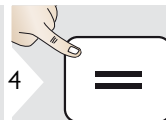
Select your favorite functions for quick access.

Short cut: Press 2 sec on a selection-key in the measuring mode.

Illumination



Select brightness.



Confirm setting.



Exit settings.



To save power reduce brightness if not necessary.

## Offset

1

2

3 Select digit.

4 Adjust digit.

5 Approve value.

6

Exit settings.

**i** An offset adds or subtracts a specified value automatically to or from all measurements. This function allows tolerances to be taken into account. The offset icon is displayed.

## Reset

1

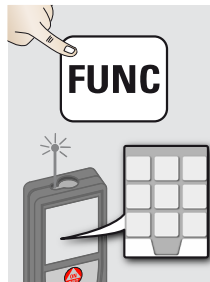
2

3 Second confirmation with selection keys:  
Refuse: Confirm:

4 Exit settings.

**i** Reset returns the instrument to the factory settings. All customized settings and memories are lost.

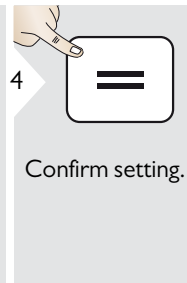
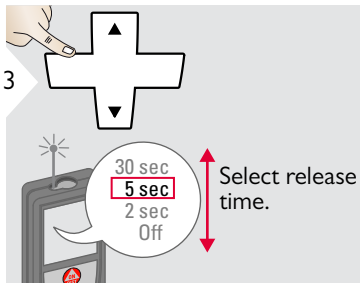
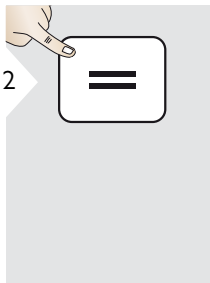
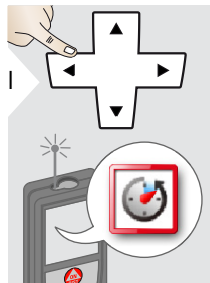
Overview



	Timer
	Adjusting measuring reference
	Memory
	Single Distance Measurement
	Smart Horizontal Mode
	Area

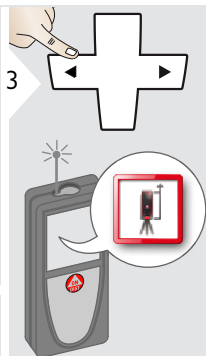
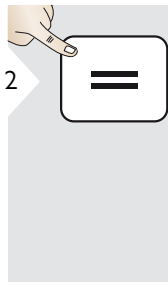
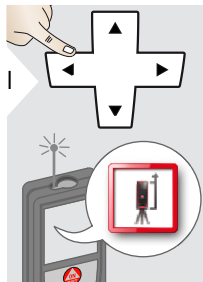
	Volume
	Stake out
	Pythagoras I

Timer



**i** The self release starts if ON/Measure key is pressed.

## Adjusting measuring reference/tripod



Distance is measured from the rear of the device (standard setting).



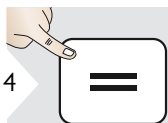
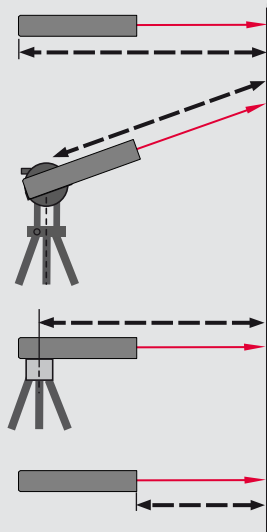
Distance is measured from a Leica DISTO Adapter FTA 360 (lock symbol = permanently)



Distance is measured from the tripod thread permanently.



Distance is measured from the front of the device (lock symbol = permanently).



Confirm setting.



If device is switched off, reference goes back to standard setting (rear of the device).

If you use an original Leica DISTO adapter, the reference does not need to be adapted to tripod thread!

**Memory**

1

2

3

4

Switch between measurements.

Delete memory.

Take over value for further actions.

Use Up/Down navigation keys to show more detailed results of the specific measurement.

Short cut

**Measuring single distance**

1

2

3

4

Aim active laser at target.

8.532 m

Target surfaces:  
Measuring errors can occur when measuring to colourless liquids, glass, styrofoam or semi-permeable surfaces or when aiming at high gloss surfaces. Against dark surfaces the measuring time increases.

**Smart Horizontal Mode**

1

2

3

4

Aim laser at target.

40.8° —  $\alpha$

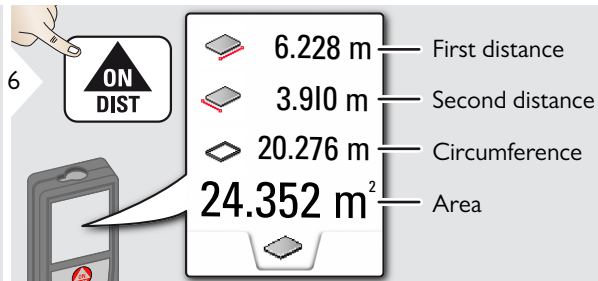
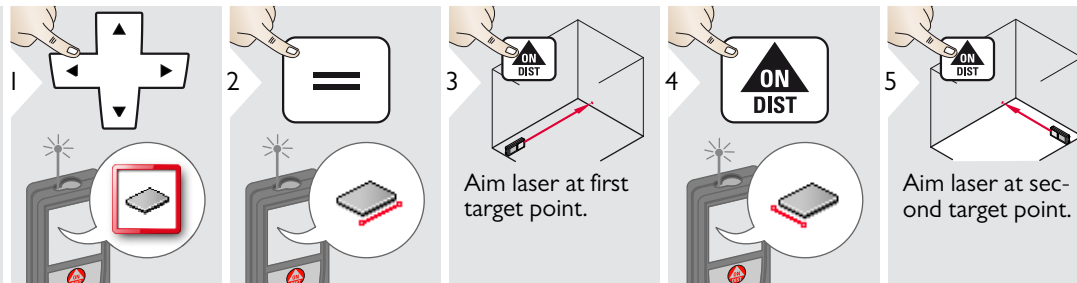
5.204 m — x

0.032 m — y

4.827 m — z

(up to 360° and a transverse tilt of  $\pm 10^\circ$ )

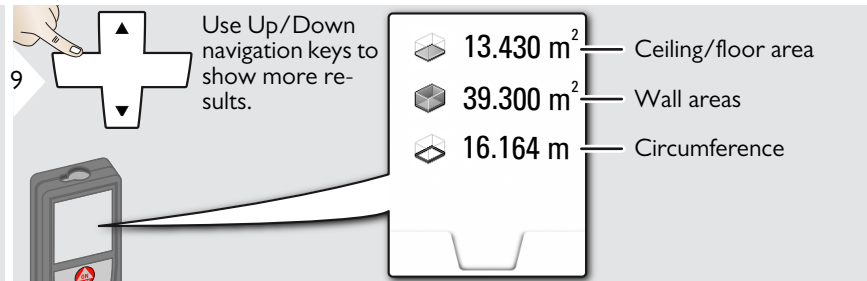
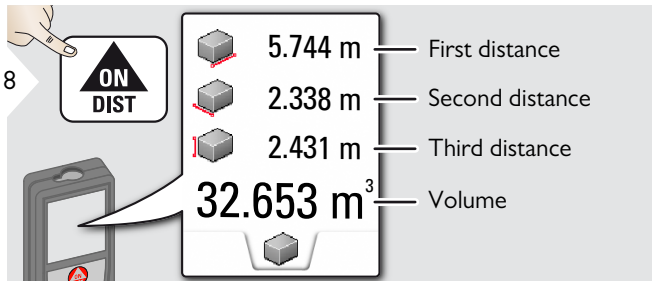
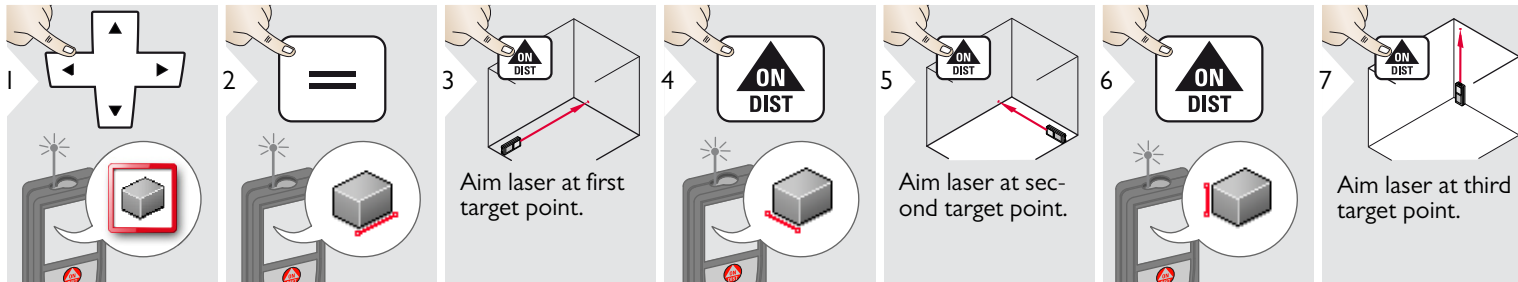
◆ Area



**i** The result is shown in the main line and the measured value above.  
 Partial Measurements / Painter function:  
 Press + or - before starting the first measurement. Measure and add or subtract distances. Finish with =. Measure 2nd length.



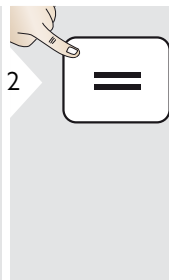
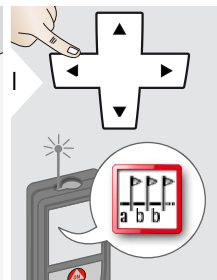
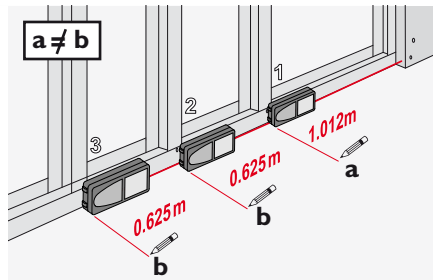
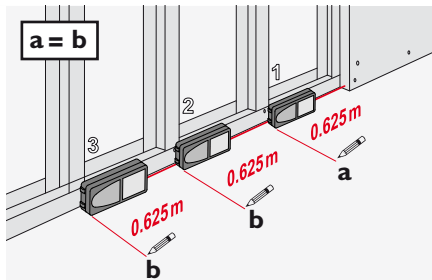
**Volume**



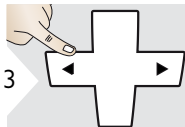
**Stake out**

1

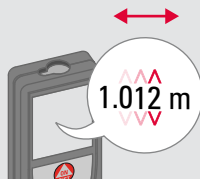
Two different distances (a and b) can be entered to mark off defined measured lengths.



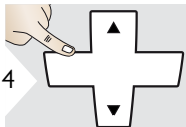
3



Select digit.



4



Adjust digit.

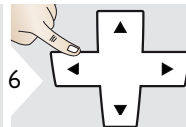


5



Approve value "a".

6



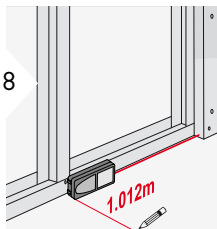
Adjust value "b".



7

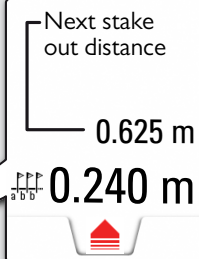


Approve value "b" and start measurement.



Move device slowly along the stake-out line. The distance to the next stake out point is displayed.

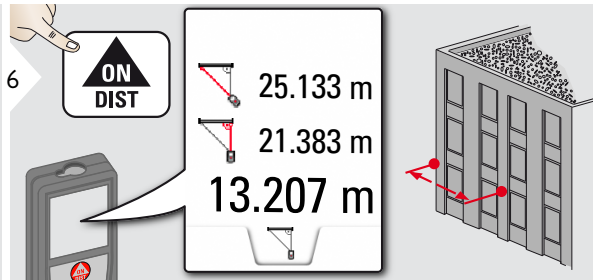
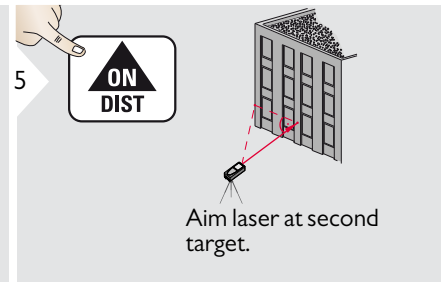
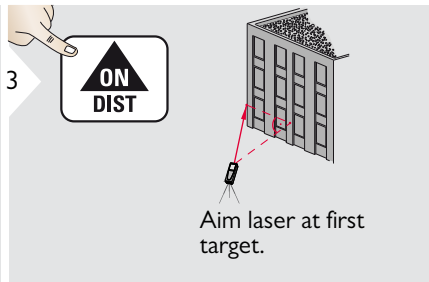
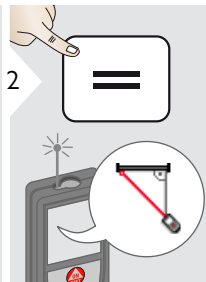
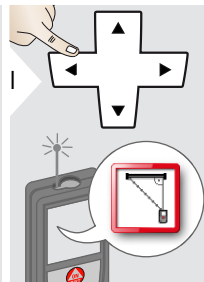
0.240 m is missing up to next 0.625 m distance.



1

When approaching a stake out point to less than 0.1 m the instrument starts to beep. The function can be stopped by pressing the CLEAR/OFF button.

**Pythagoras (2-point)**



**i** The result is shown in the main line.  
Pressing the measuring key for 2 sec in the function activates automatically Minimum or Maximum measurement.

We recommend to use the pythagoras only for indirect horizontal measuring.  
For height measuring (vertical) it is more precise to use a function with the inclination measuring.

Distance measurement	
<b>Typical Measuring Tolerance*</b>	$\pm 1.0 \text{ mm} / \sim 1/16''$ ***
<b>Maximum Measuring Tolerance**</b>	$\pm 2.0 \text{ mm} / 0.08 \text{ in}$ ***
<b>Typical Range*</b>	150 m / 500 ft
<b>Range at unfavourable condition ****</b>	80 m / 260 ft
<b>Smallest unit displayed</b>	0.1 mm / 1/32 in
<b>Power Range Technology™</b>	yes
<b>∅ laser point at distances</b>	6 / 30 / 60 mm (10 / 50 / 100 m)
Smart Horizontal Mode	
<b>Measuring tolerance*****</b>	$\pm 0.2^\circ$
<b>Range</b>	360°
General	
<b>Laser class</b>	2
<b>Laser type</b>	635 nm, < 1 mW
<b>Protection class</b>	IP65 (dust tight and jet water protected)
<b>Autom. laser switch off</b>	after 90 s
<b>Autom. power switch-off</b>	after 180 s
<b>Battery durability (2 x AA)</b>	up to 5000 measurements
<b>Dimension (H x D x W)</b>	143 x 58 x 29 mm 5.6 x 2.28 x 1.14 in
<b>Weight (with batteries)</b>	198 g / 6.37 oz
<b>Temperature range:</b>	
- Storage	-25 to 70 °C -13 to 158 °F
- Operation	-10 to 50 °C 14 to 122 °F


\* applies for 100 % target reflectivity (white painted wall), low background illumination, 25 °C

\*\* applies for 10 to 100 % target reflectivity, high background illumination, - 10 °C to + 50 °C

\*\*\* Tolerances apply from 0.05 m to 10 m with a confidence level of 95%. The maximum tolerance may deteriorate to 0.1 mm/m between 10 m to 30 m, to 0.20 mm/m between 30 m to 100 m and to 0.30 mm/m for distances above 100 m

\*\*\*\* applies for 100 % target reflectivity, background illumination of approximately 30'000 lux

\*\*\*\*\* after user calibration. Additional angle related deviation of +/- 0.01° per degree up to +/- 45° in each quadrant. Applies at room temperature. For the whole operating temperature range the maximum deviation increases by +/- 0.1°.

 For accurate indirect results, the use of a tripod is recommended. For accurate tilt measurements a transverse tilt should be avoided.

Functions	
<b>Distance measuring</b>	yes
<b>Min/Max measuring</b>	yes
<b>Permanent measuring</b>	yes
<b>Stake-out</b>	yes
<b>Addition/Subtraction</b>	yes
<b>Area</b>	yes
<b>Volume</b>	yes
<b>Painter function (area with partial measurement.)</b>	yes
<b>Pythagoras</b>	2-point
<b>Smart Horizontal Mode / Indirect height</b>	yes
<b>Memory</b>	30 displays
<b>Beep</b>	yes
<b>Illuminated colour display</b>	yes
<b>Multifunctional endpiece</b>	yes
<b>Pointfinder (Viewscreen)</b>	4xZoom
<b>Personalized Favorites</b>	yes
<b>Timer</b>	yes

If the message **Error** does not disappear after switching on the device repeatedly, contact the dealer.

If the message **InFo** appears with a number, press the Clear button and observe the following instructions:

No.	Cause	Correction
156	Transverse tilt greater than 10°	Hold the instrument without any transverse tilt.
162	Calibration mistake	Make sure, the device is placed on a absolutely horizontal and flat surface. Repeat the calibration procedure. If the mistake still occurs, contact your dealer.
204	Calculation error	Perform measurement again.
252	Temperature too high	Let device cool down.
253	Temperature too low	Warm device up.
255	Received signal too weak, measuring time too long	Change target surface (e.g. white paper).
256	Received signal too high	Change target surface (e.g. white paper).
257	Too much background light	Shadow target area.
258	Measurement outside of measuring range	Correct range.
260	Laser beam interrupted	Repeat measurement.

- Clean the device with a damp, soft cloth.
- Never immerse the device in water.
- Never use aggressive cleaning agents or solvents.

## Warranty

### Lifetime Manufacturer's Warranty

Warranty coverage for the entire usage time of the product according to Leica Geosystems International Limited Warranty. Free of charge repair or replacement for all products that suffer defects as a result of faults in materials or manufacturing, for the entire life of the product.

### 3 Years no Cost

Guaranteed service should the product become defective and require servicing under normal conditions of use, as described in the user manual, at no additional charge.

To receive the "3 years no cost" period, the product must be registered at [www.leica-geosystems.com/registration](http://www.leica-geosystems.com/registration) within 8 weeks of the purchase date. If the product is not registered, a "2 years no cost" period applies.

The person responsible for the instrument must ensure that all users understand these directions and adhere to them.

### Areas of responsibility

#### Responsibilities of the manufacturer of the original equipment:

Leica Geosystems AG  
Heinrich-Wild-Strasse  
CH-9435 Heerbrugg  
Internet: [www.disto.com](http://www.disto.com)

The company above is responsible for supplying the product, including the User Manual in a completely safe condition.

The company above is not responsible for third party accessories.

#### Responsibilities of the person in charge of the instrument:

- To understand the safety instructions on the product and the instructions in the User Manual.
- To be familiar with local safety regulations relating to accident prevention.
- Always prevent access to the product by unauthorised personnel.

## Permitted use

- Measuring distances
- Tilt measurement

## Prohibited use

- Using the product without instruction
- Using outside the stated limits
- Deactivation of safety systems and removal of explanatory and hazard labels
- Opening of the equipment by using tools (screwdrivers, etc.)
- Carrying out modification or conversion of the product
- Use of accessories from other manufacturers without express approval
- Deliberate dazzling of third parties; also in the dark
- Inadequate safeguards at the surveying site (e.g. when measuring on roads, construction sites, etc.)
- Deliberate or irresponsible behaviour on scaffolding, when using ladders, when measuring near machines which are running or near parts of machines or installations which are unprotected
- Aiming directly in the sun

## Hazards in use

### **WARNING**

Watch out for erroneous measurements if the instrument is defective or if it has been dropped or has been misused or modified. Carry out periodic test measurements. Particularly after the instrument has been subject to abnormal use, and before, during and after important measurements.


### **CAUTION**

Never attempt to repair the product yourself. In case of damage, contact a local dealer.

### **WARNING**

Changes or modifications not expressly approved could void the user's authority to operate the equipment.

## Limits of use

-  Refer to section "Technical data".
- The device is designed for use in areas permanently habitable by humans. Do not use the product in explosion hazardous areas or in aggressive environments.

## Disposal

### **CAUTION**

Flat batteries must not be disposed of with household waste. Care for the environment and take them to the collection points provided in accordance with national or local regulations.

The product must not be disposed with household waste.

Dispose of the product appropriately in accordance with the national regulations in force in your country.



Adhere to the national and country specific regulations.

Product specific treatment and waste management can be downloaded from our homepage.

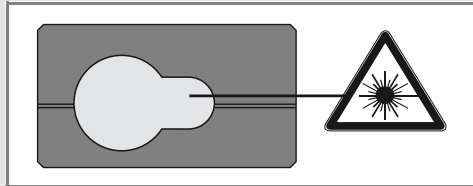
## Electromagnetic Compatibility (EMC)

### WARNING

The device conforms to the most stringent requirements of the relevant standards and regulations.

Yet, the possibility of causing interference in other devices cannot be totally excluded.

## Laser classification



The device produces visible laser beams, which are emitted from the instrument:  
It is a Class 2 laser product in accordance with:

- IEC60825-1 : 2014 „Radiation safety of laser products“

## Laser Class 2 products:

Do not stare into the laser beam or direct it towards other people unnecessarily. Eye protection is normally afforded by aversion responses including the blink reflex.

### WARNING

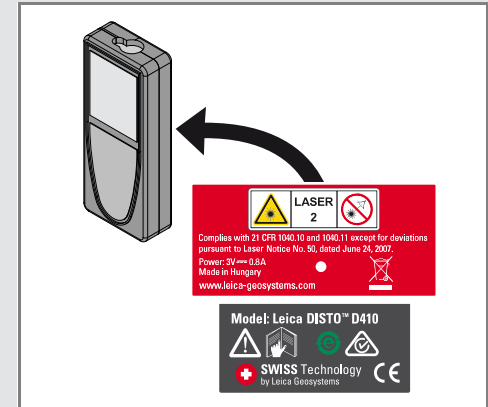
Looking directly into the beam with optical aids (e.g. binoculars, telescopes) can be hazardous.

### CAUTION

Looking into the laser beam may be hazardous to the eyes.

Description	Value
Wavelength	635 nm
Maximum radiant output power for classification	0.95 mW
Pulse repetition frequency	320 MHz
Pulse duration	> 400 ps
Beam divergence	0.16 x 0.6 mrad

## Labelling



Subject to change (drawings, descriptions and technical data) without prior notice.

Leica Geosystems AG, Heerbrugg, Switzerland has been certified as being equipped with a quality system which meets the International Standards of Quality Management and Quality Systems (ISO standard 9001) and Environmental Management Systems (ISO standard 14001).

Copyright Leica Geosystems AG, Heerbrugg,  
Switzerland 2014  
Original text (820691 EN)

Pat. No.: WO 9427164, WO 9818019, WO 0244754, WO 0216964,  
US 5949531, EP 1195617, US 7030969, US 8279421 B2

Leica Geosystems AG  
CH-9435 Heerbrugg  
(Switzerland)  
[www.disto.com](http://www.disto.com)

- when it has to be **right**

**Leica**  
Geosystems