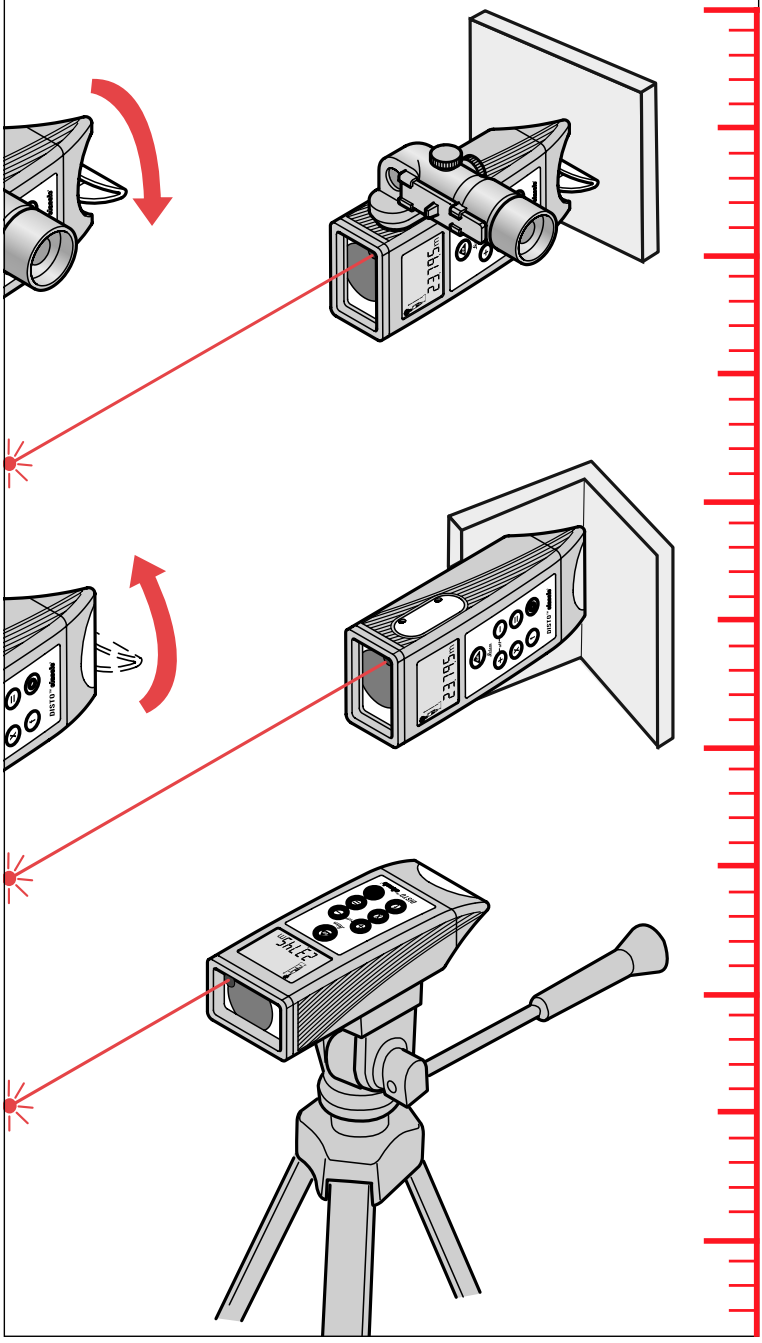
40 50

DISTO™ classic³

User Manual



DISTO™
THE ORIGINAL

Leica
Geosystems

Congratulations on your purchase of a DISTO.

This User Manual contains important safety instructions (see section "Safety Instructions") as well as instructions on use of the instrument.
Read carefully through the User Manual before you switch on the instrument.

Product identification

The identification label for your product is fitted on the back. The serial number is in the battery compartment. Enter model and serial number in your User Manual, and **always refer to this information** when you need to contact your **agency or service** centre.

Model: DISTO.....

Serial no.: .....

DISTO classic
Hand-held laser meter

Symbols Used

The symbols used in this User Manual have the following meanings:

DANGER:
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

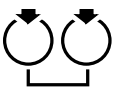
WARNING:
Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.

CAUTION:
Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor injury and/or in 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.

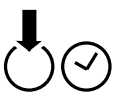
Symbols Used

Press a key briefly
(press/release!)

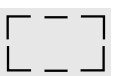


Press two keys simultaneously

"Double-Click"
(Press the same key twice)



Press for a certain period



Display, e.g. "Set"

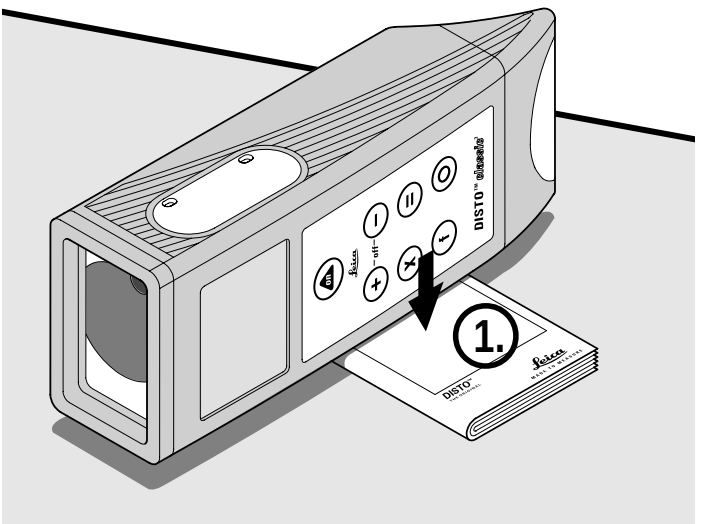
Contents

Contents

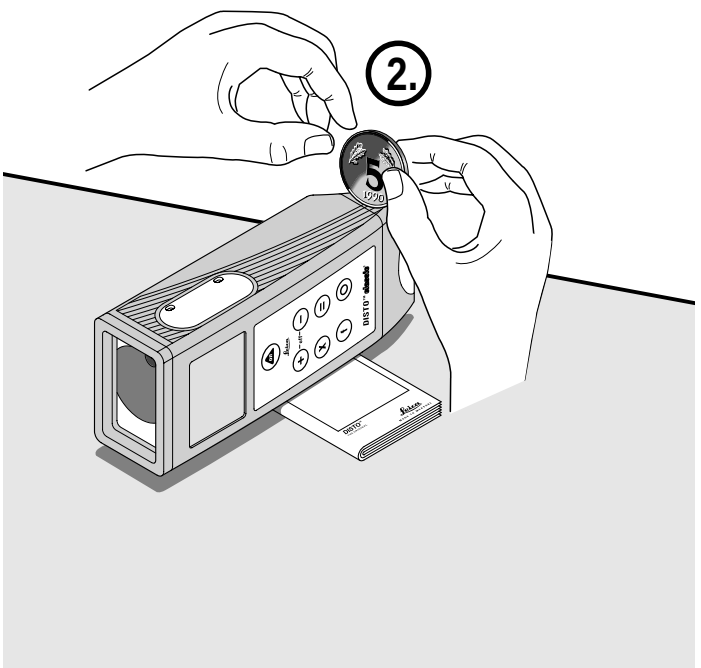
Contents

Open Instrument

1. Lay the DISTO onto the User Manual, as shown below.

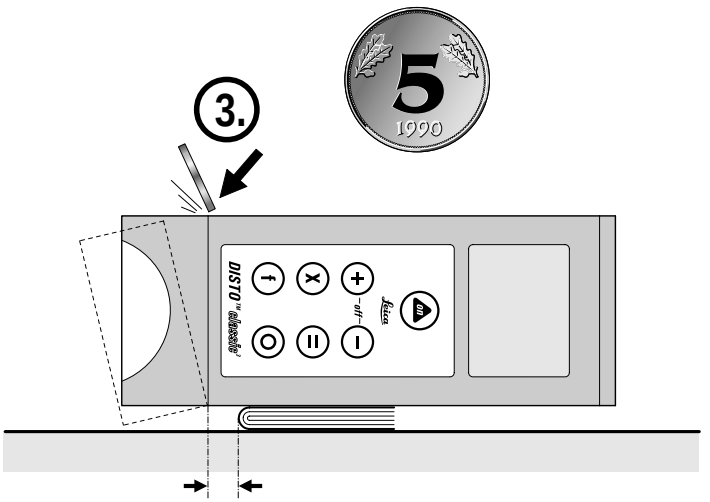


2. Hold a large coin between both thumbs.

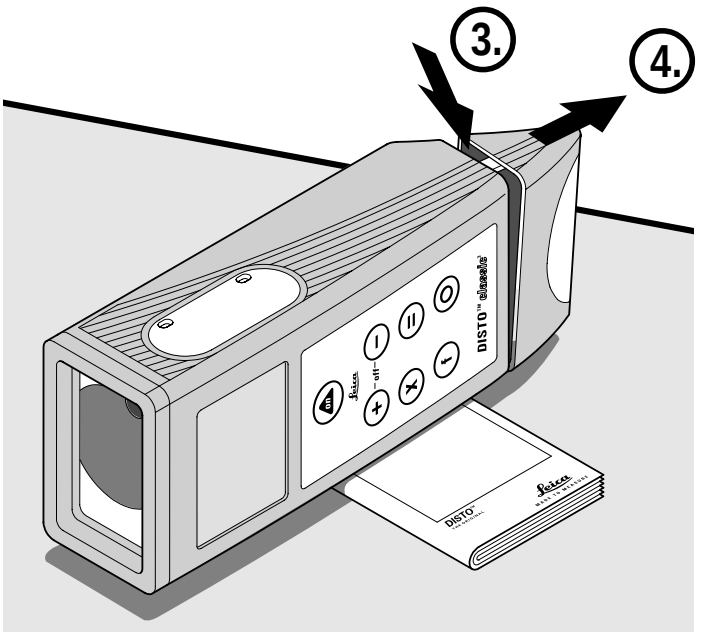


Open Instrument

3. Press coin downwards at an angle against the last notch.

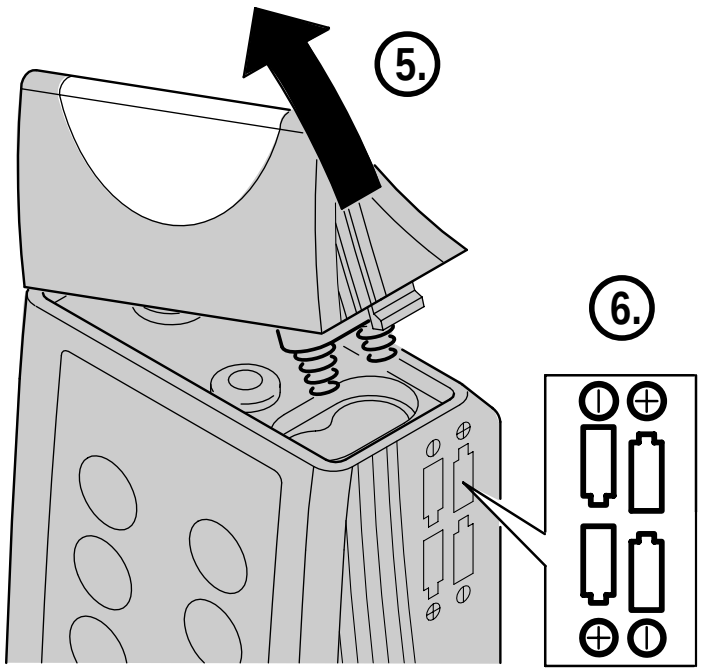


4. By pressing downwards at an angle and to the front simultaneously, the battery compartment can be easily opened.



Insert Batteries

5. Remove end cover.
6. Replace batteries.



If battery voltage is too low the battery symbol appears on the display. Fit new batteries.

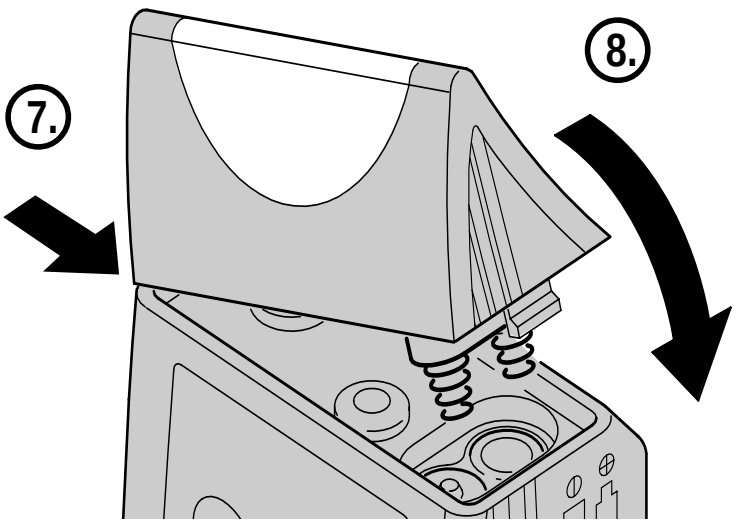
Always replace the complete battery set!

- Do not use old and new batteries together.
- Do not use batteries from different manufacturers or batteries of different types.
- For type of battery, refer to Technical Data.

Insert Batteries

Fit batteries the right way round.

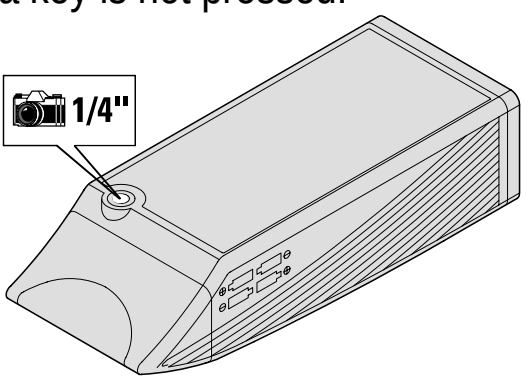
7. Insert end cover **as shown below.**



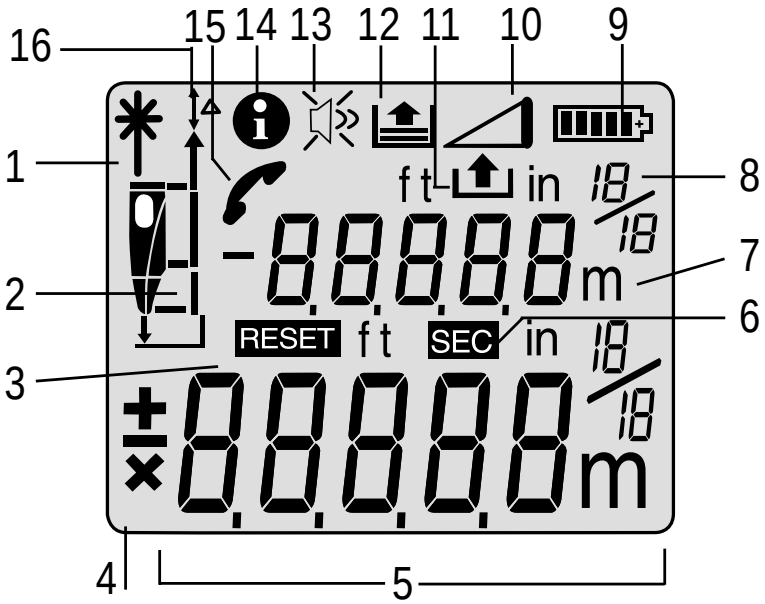
8. Close end cover carefully.
   Must click into place.

Never intentionally hit the end cover against a hard object - the battery compartment may be forced open!

To save power, the DISTO switches off automatically after 90 seconds if a key is not pressed.

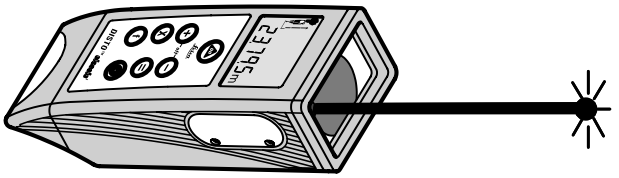


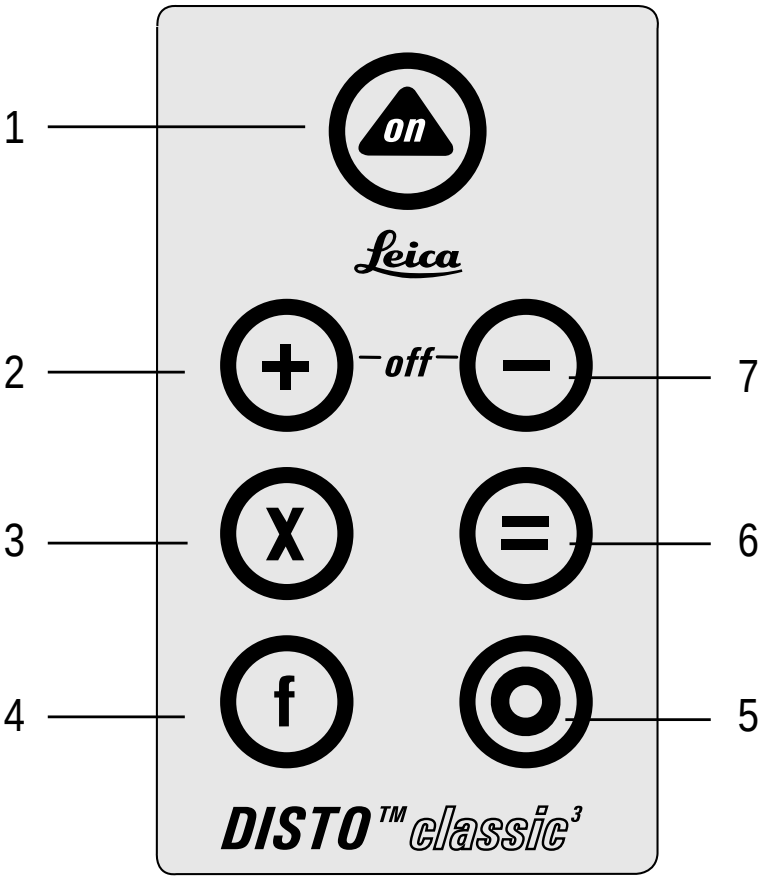
Display



1 Laser "on"
2 Measurement reference (rear, front, stand)
3 Reset the instrument to factory settings
4 Display of the mathematical operators
5 Main display (e.g. measured distance)
6 Time symbol for time delay release
7 Units (m / ft / ft in)
8 Auxiliary display, (e.g. area)
9 Battery display
10 Pythagoras function
11 Constant function
12 Recall last 20 values
13 Beep (on/off)
14 Information
15 Contact customer service
16 Offset adjustment (≠ 0)

Keypad



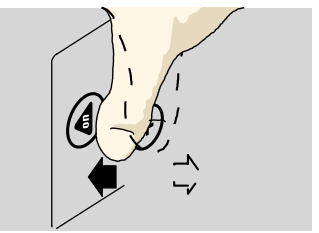


1 On key and measurement key
2 Plus, forwards
3 Multiply
4 Functions
5 Menu, normal mode
6 Equals, enter
7 Minus, back

ON Key and Measurement Key

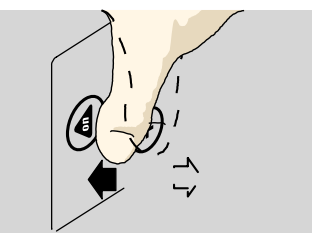
Measuring

Switch on DISTO.
In general for all keys:
Press and then release (basic function).



Switch on laser, the ✳ symbol flashes on the display (automatic switch off after 30 sec).

A second press starts the **distance measurement, "diSt"** appears briefly on the display.



ON Key and Measurement Key

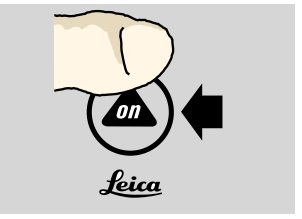
Continuous measurement (Tracking)

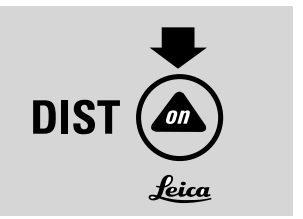
A second, long press (approx. 1 sec) initiates **continuous measurement** (tracking) mode. **"trc"** appears on the display. The measurements are repeated in a fraction of a second.

; ; Stop.

Laser in continuous operation

In normal mode, press key until the ✳ symbol is continuously illuminated and a long "beep" is heard.

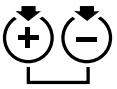




A distance measurement is triggered each time the key is pressed.

Plus/Minus Key

Quick switching off



Press simultaneously –
= Quick switch off of the DISTO.

In roll mode

In roll mode ⊕, ⊖ have the function of a cursor in the memory. (See page 19, 20)

Partial heights, chain values

Measurement **+** measurement = **sum** / e.g. of partial heights

 Measurement

 Addition

 Measurement

 = Sum

Measurement – measurement = difference

 Measurement

 Subtraction

 Measurement

 = Difference

In the same way **chain values**.

Multiplication Key

Area

Measurement x measurement = **area**

 Measurement

 Multiplication

 Measurement

 = **Area**

Volume

Measurement x measurement x measurement
= **Volume**

Sum of areas
In the same way, areas/volumes can be added together.

Multiplication Key

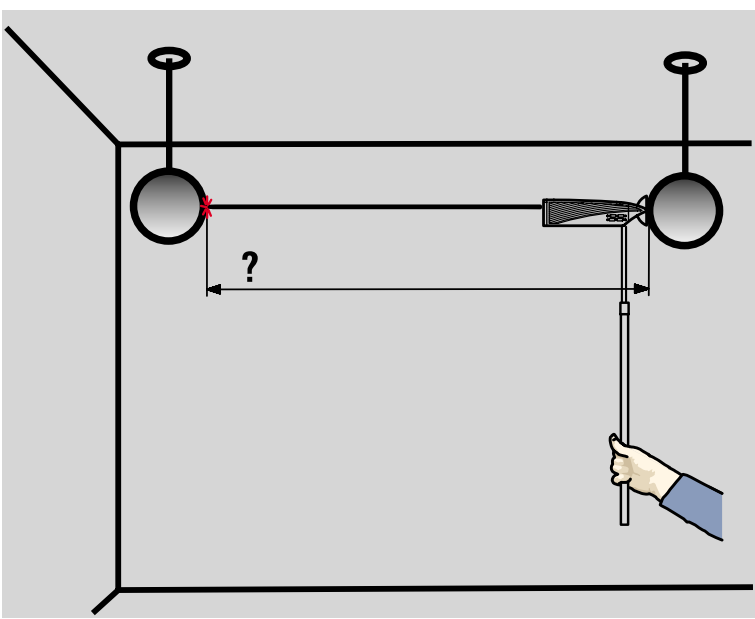
Time delay release

Switch on

Keep pressed

On the screen it shows "SEC" (delay) and a number (delay in seconds) appear on the display.
As long as the key is kept pressed, the delay is increased.

Once the key is released, the seconds 59, 58, 57 ... remaining until the reading is made are displayed. The last 5 secs. are counted down with a "beep".
After the last "beep", the measurement is made, the measured value can be read on the display.



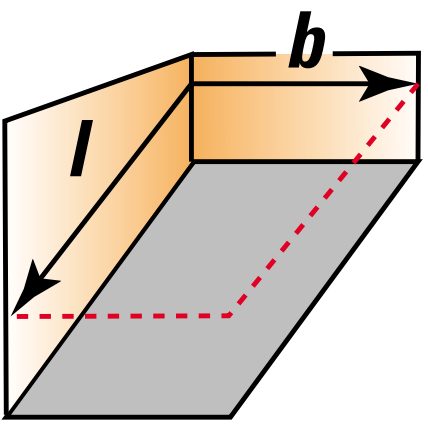
Equal Key

Provides the **results of mathematical operations**, such as areas, volumes...

Settings are confirmed, in the same way as **"enter"** is used on a PC.
Use selected setting or continue with computing using called value.

Doubling a measured value

Using =, a measured value can be very easily doubled, e.g. for determining the length of the walls in a room:
Using ▲ ▲ measure + measure ▲ ▲ = half the length of the walls, then + and again = and the length of the walls is calculated.

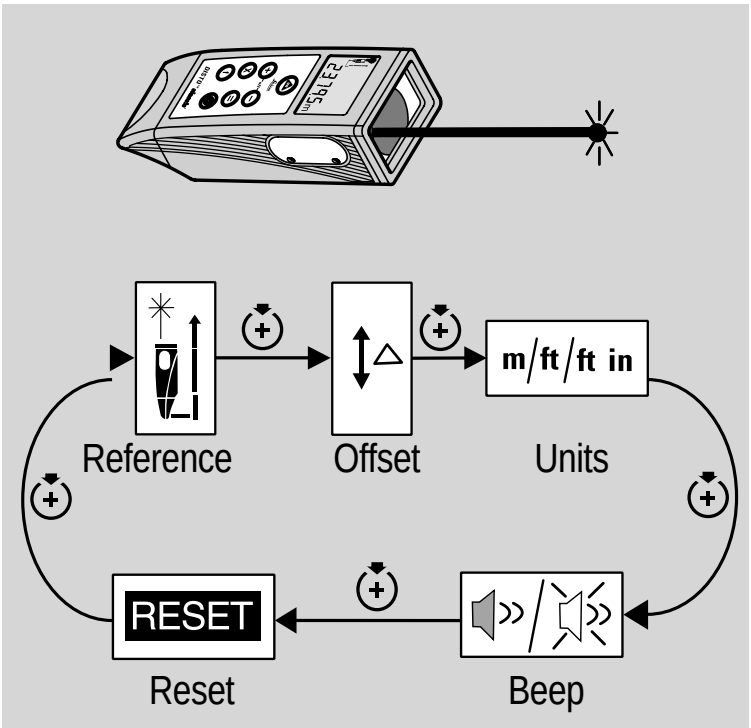


Setting Key

The Setting key places the DISTO in the normal mode. This key has the same function as "Clear" on a PC.

Settings in roll mode

The instrument settings can be changed in roll mode.



Applies to all settings in roll mode:

Switch on DISTO.

Press once briefly (normal mode).

Setting Key

Press a second time and keep pressed until [_ _] appears and the settings are scrolled through in roll mode. At the required setting, release the key.

Are used to change between the different displays.

Confirmation of a selection made.

Press briefly: the selection made is undone and the instrument returns to normal mode.

Setting reference only for one measurement

Switch on

flashes on the display.

front , stand (rear).

start measurement.

Setting Key

Set desired reference to "Permanent"

Switch on.

Press once, briefly.

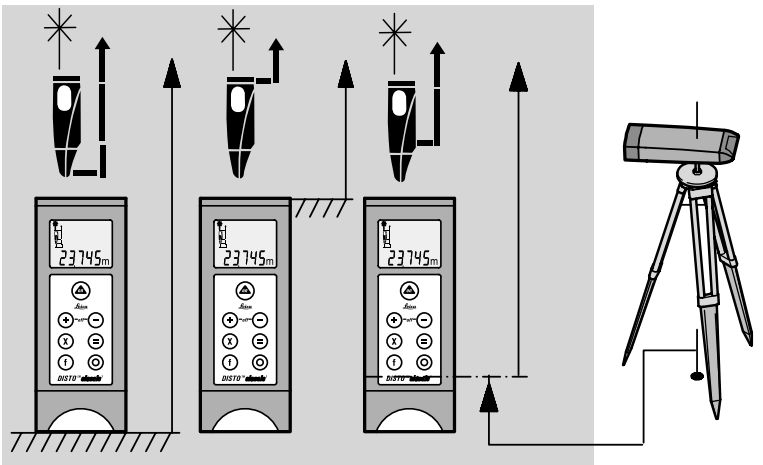
Press a second time and keep pressed until [ ] appears.

Press until  appears flashing on the display.

, set desired reference.

Confirm.

Possible settings:



rear front stand

After each setting of the reference to "Permanent" we recommend to reset again to measurement from rear edge! Please, make this a rule.

Measure with additional tolerance

It is possible to determine dimensions with additional tolerance e.g. by adding an offset to the rear reference

Switch on.

Press once, briefly.

Press a second time and keep pressed until [ ] and ↕△ appear.

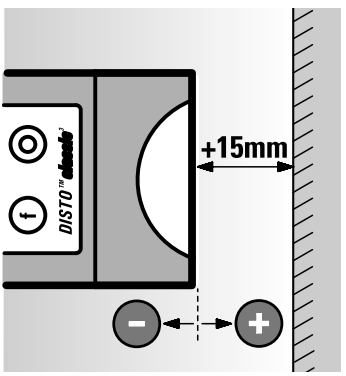
Press until ↕△ appears flashing on the display.

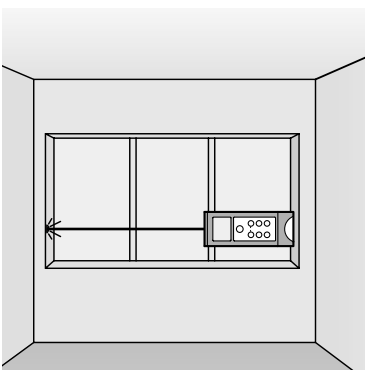
(+) , (−) Set required offset for the reference.

The setting can be changed quickly by holding down the (+) , (−) keys or the (x) key (fast setting).

Confirm setting.

To indicate that an offset has been set, the ↕△ symbol is displayed continuously.





Setting Key

After making or changing settings, it is imperative that a test measurement is performed.

Please make this a rule:
After termination of the rough size measurement always:
- set offset to 0.000 and
- set measurement from rear edge

Delete:

; ; → [ ] ; ;
; → 0.000m ;

Unit - metre / feet / feet inch

Switch on.

Press once, briefly.

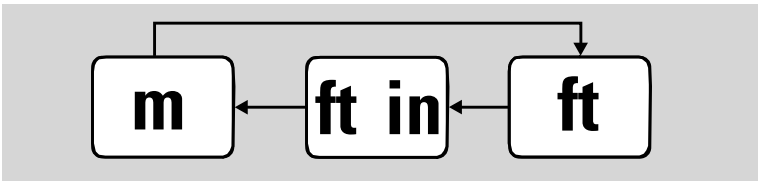
Press a second time and keep pressed until [ ] and the current unit (e.g.: **m**) appears.

Press until the current unit appears flashing on the display.

Setting Key

, Select unit **m** (m), **ft** (feet) or **ft in** (feet inch).

Confirm setting.



"Beep" during operation

Switch on.

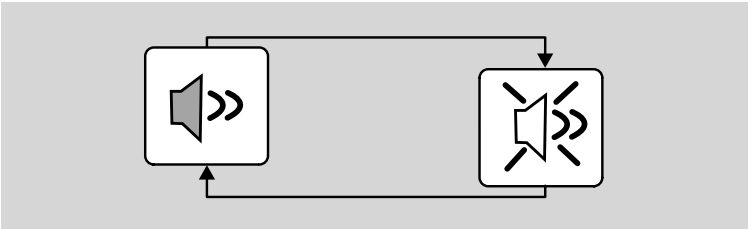
Press once, briefly.

Press a second time and keep pressed until and appear.

Press until appears flashing on the display.

, Select on ( ) / off ( ).

Confirm setting.



Setting Key

Resetting

Switch on.

Press once, briefly.

Press a second time and keep pressed until [ ] and RESET appear.

Press,

is displayed continuously and RESET flashes.

Stack is deleted **or with:**

Stack and constant displayed

deletes both **or with:**

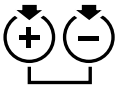
Activate all settings and with

reset to:

- Reference rear edge (normal setting),
- Offset,
- Beep (On),
- Stack and constant (are deleted)
- Unit **m** (metre)

Function Key

Wait until display indicates 0!

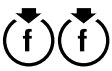


Only then switch off.

Recall last measured value (stack)

Switch on DISTO.

Always place instrument in normal mode.



Press twice, briefly.

The last value saved and the  symbol appear on the display.

The previous (older) values (max 19!) can be selected.

Page back.

Confirm selection for further use.

Function Key

Saving a constant (Fnc 1)

Measure required value (e.g. room height, area, volume).

Press until Fnc 1 and ⌴ appear on the display.

Confirm, ⌴ flashes.

(+,−) Modify value.

Save constant.

Recalling the constant

Switch on DISTO.

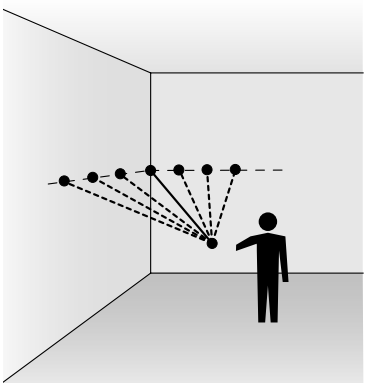
Place instrument in normal mode.

Press briefly, ⌴ and the constant (e.g. 1502m) appears on the display.

Confirm, value is available for further use (e.g. area calculation).

Any required function can be selected using +, − after "Fnc 1".

Continuous measurement (Tracking) Maximum (Fnc 2)



Determine maximum dimension, e.g. to determine the (room) diagonal.

Switch on DISTO.

Place instrument in normal mode.

Press until Fnc 2 and ⊢---⊣ appear on the display.

Confirm function. Laser is on.

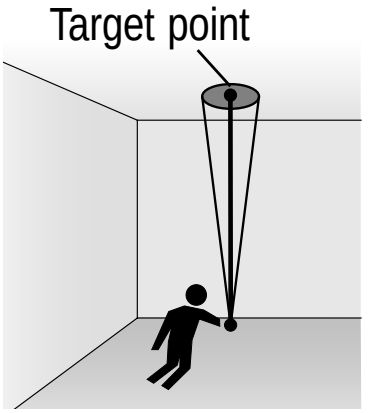
Aim with the DISTO at a point to the left of the corner.

Activate continuous measurement.

Slowly rotate the DISTO to the right past the corner.

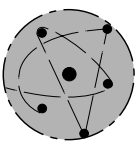
Stop continuous measurement. The room diagonal (e.g. 12.314m) is displayed.

Continuous measurement (Tracking) Minimum (Fnc 3)



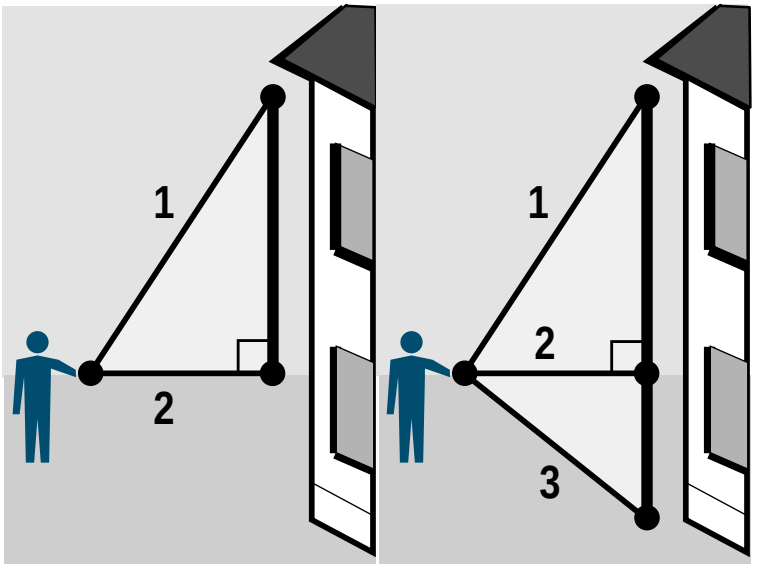
Determine the minimum dimension, e.g. ceiling height, without having to precisely align to the normal (both axes).

- Switch on DISTO.
- Place instrument in normal mode.
- Press until Fnc 3 and I-I appear on the display.
- Confirm function.
  Aim DISTO approximately at the target point.
- Move the DISTO a large amount around the target point. The instrument calculates the variations and determines the smallest value. The two surfaces (e.g. floor / ceiling) must be approximately parallel.



- Stop continuous measurement. The smallest distance (e.g. 15.382 m) is displayed.

Pythagoras, height measurement (Fnc 4)



For estimating the height of buildings. Very useful for making measurements from standing position (no bending) if the height is determined with three distances.
All three (two) points must lie on a vertical plane on the wall.

Please follow the sequence given:

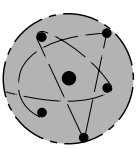
- Switch on DISTO.
- Press once (normal mode).
- Press until Fnc 4 and ◿ appear on the display.
- Confirm function.
  Aim carefully at the upper point.

Function Key

Trigger measurement; **do not move the instrument!**

Accept value, "2 ---" appears on the display. Point the DISTO approximately horizontally.

Long press, a minimum continuous measurement is initiated.



Move the DISTO a large amount around the ideal measurement point.

Press briefly, continuous measurement is stopped.

Accept value, "3 ---" appears on the display.

End function, the height and distance are displayed from **two measurements** (Pythagoras).

Or:

Aim at third point.

Trigger measurement.

End function, the height and distance are displayed from **three measurements** (Pythagoras).

For short distances, a good base behind the instrument is sufficient for mechanical alignment.
After "2 ---", align the DISTO approximately horizontally.

You will obtain the best results if the DISTO is rotated around a fixed point (rear edge, thread position) and the axis of the laser beam passes through this axis. So do not simply place on a camera tripod, in this case the axis of the laser beam is approx. 70 to 100mm **above** the centre of rotation, this can lead to significant variations in the height.

User Information

Range

In daylight (outdoors) always work with laser viewfinder. If necessary, shade the target.

Increased ranges:
At night, at dusk and when target area is in the shade.
Reduced range:
The range of the DISTO can be reduced by matt, green and blue surfaces (also by trees or plants)

Rough Surfaces

On a rough surface (e.g. coarse plaster) a mean value is indicated.
To avoid measuring to the bottom of plaster joints:
Use target plate, 3M "Post-it" or board.

When aiming through panes of glass, or if there are several objects in the line of sight, erroneous measurements can occur.

Transparent Surfaces

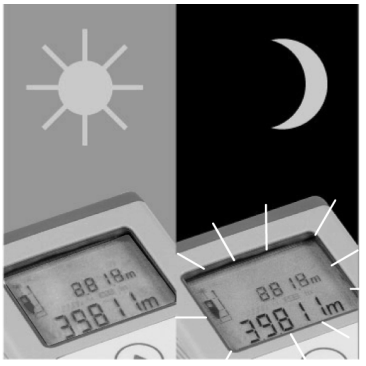
For reasons of safety and optics, never measure against a clear liquid (e.g. water) or clean glass (not dusty).
For materials and liquids unfamiliar to you always take a trial measurement.

Wet, Smooth or High-Gloss Surfaces

1. If aiming at an angle, the laser beam is reflected. The DISTO may receive a signal that is too weak (error message E 255).

2. If aiming at a right angle, the DISTO may receive a signal that is too strong (error message E 256).

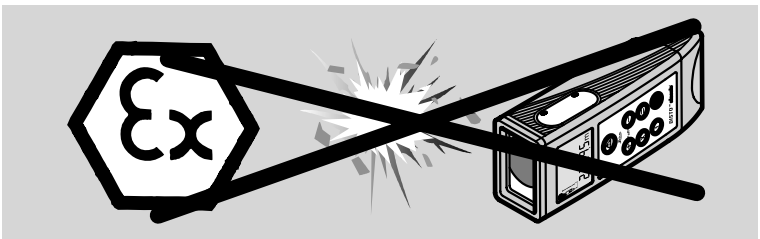
Illumination



Thanks to fluorescence, you can also see your result in the dark. If the display is placed under a light source (daylight, artificial light), it will illuminate for more than 15 minutes! Without consuming any power!

Environment

Suitable for use in an atmosphere appropriate for permanent human habitation. **Cannot be used in** an aggresive or **explosive environment.**
Use in rain is permissible for limited periods.
Please pay attention to our Safety Instruction.



Free-handed aiming

(approx. 20 - 40 m):
Produce target plate from cardboard etc. and stick 4 target plates 563 875 to it; or:

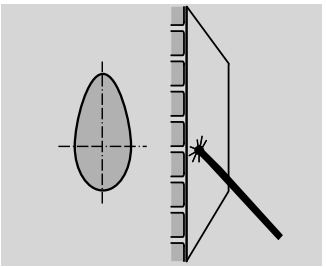
Make your own target plates of any size:

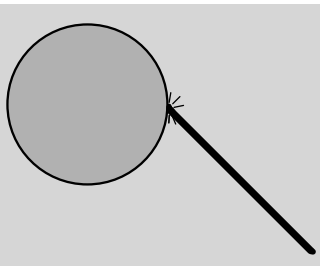
Distance:	Order:
to 30 m (white)	Scotch Cal*
30 - 100 m (brown)	Engineering-Grade 3279 (7502 99 61 036)*

* → Manufacturer 3MCompany

Inclined, Round Surfaces

Can be measured with the laser:
Requirement: There is enough area on the target surface for the laser spot.





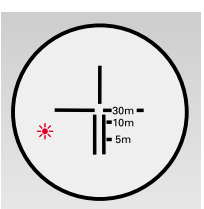
In the field

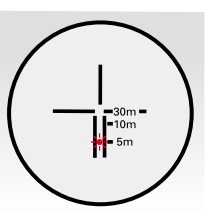
Attach the viewfinder, and check it is engaged by applying pressure from the side.

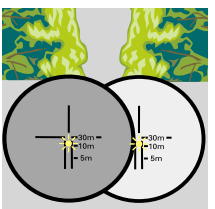
Setting the telescopic viewfinder

Keep pressed, laser on continously **(✳).**

Set up indoors, 5m, 10m or 30m from a wall. Turn eyepiece slowly until crosshair and laser spot are sharply focused.







In the Field

Use the two screws (side, height) to adjust the laser spot.

Example:
You are positioned exactly 5m in front of a wall (approx. ± 0.5m). The laser spot must be in the centre, exactly beside the 5m distance mark.
In the field check adjustment from time to time. (in the half-shade about 10-15m)

Aim with and without the red filter in position (visibility is increased).

Accessories

Telescopic viewer (667478)

For easier aiming in the open.
For high precision aiming at larger distances.
The laser spot on the object is particularly easy to see in shaded areas if the red filter is used.

Accessories

Wrist strap (667491)

- safeguard against dropping,
- prevents injury.

Attach to fastening thread (1/4").
Adjust loop:

- So that DISTO does not slip from the wrist,
- Loop does not need to be re-adjusted every time

Shoulder strap (563 879)

Fasten to hand loop clip; adjustable over a wide range.

Carrying pouch (667 169)

Black carrying pouch for protection against knocks and dust.
Compartments for user manual, data cable, telescopic viewfinder and palmtop computer.

Level (667 158)

For horizontal and vertical aiming, e.g. if floor or wall is highly uneven.
Aiming accuracy about 1°, corresponding to a measuring error of only about 5mm at 30m.
DISTO with this level is not a laser level.

Accessories

Target plate (563875)

For poorly reflecting surfaces,
white side up to 40 - 50m,
over this distance the brown side with the special reflection layer.
Up to over 100m
Combine several plates to one large target area.

Holster (667489)

For max. protection. Fitted to belt.
(Can be reordered separately).

Software

Is continuously updated. Ask your Leica Geosystems dealer or visit the DISTO web site in the internet at
www.disto.com

Safety Instructions

The following directions should enable the person responsible for the DISTO, and the person who actually uses the instrument, to anticipate and avoid operational hazards.
The person responsible for the instrument must ensure that all users understand these directions and adhere to them.

Use of the Instrument

Permitted use

The permitted uses of the DISTO are the following:
- Measuring distances
- Computing areas and volumes
- Storing measurements

Prohibited uses

- Using the instrument 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.), as far as not specifically permitted for certain cases.
- Carrying out modification or conversion of the product
- Use after misappropriation
- Use of accessories from other manufacturers without the express approval of Leica Geosystems.

Use of the Instrument

Prohibited uses *(contd.)*

- 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 into the sun
- Deliberate dazzling of third parties; also in the dark

WARNING:
Prohibited use can lead to injury, malfunction, and material damage.

It is the task of the person responsible for the instrument to inform the user about hazards and how to counteract them. The DISTO is not to be operated until the user has been instructed.

Limits to use

See section "Technical Data"

Environment:
Suitable for use in an atmosphere appropriate for permanent human habitation. Cannot be used in an aggresive or explosive environment.
Use in rain is permissible for limited periods.

Areas of Responsibility

Responsibilities of the manufacturer of the original equipment Leica Geosystems AG, CH-9435 Heerbrugg (Leica Geosystems):
Leica Geosystems is responsible for supplying the product, including the user manual and original accessories, in a completely safe condition.

Responsibilities of the manufacturer of non-Leica accessories:

The manufacturers of non-Leica Geosystems accessories for the DISTO are responsible for developing, implementing and communicating safety concepts for their products. They are also responsible for the effectiveness of these safety concepts in combination with the Leica Geosystems equipment.

Responsibilities of the person in charge of the instrument:

WARNING:
The person responsible for the instrument must ensure that the equipment is used in accordance with the instructions. This person is also accountable for the deployment of personnel and for their training and for the safety of the equipment when in use.

The person in charge of the instrument has the following duties:

- 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.
- To inform Leica Geosystems immediately if the equipment becomes unsafe.

Hazards in Use

Important hazards in use

WARNING:
The absence of instruction, or the inadequate imparting of instruction, can lead to incorrect or prohibited use, and can give rise to accidents with far-reaching human, material, financial and environmental consequences.

Precautions:
All users must follow the safety instructions given by the manufacturer and the directions of the person responsible for the instrument.

CAUTION:
Watch out for erroneous distance measurements if the instrument is defective or if it has been dropped or has been misused or modified.

Precautions:
Carry out periodic test measurements. Particularly after the instrument has been subject to abnormal use, and before, during and after important measurements.

CAUTION:
Take care when aiming the DISTO directly into the sun. The receiver lens acts as a magnifying glass and can thus cause damage to the instrument internals.

Precautions:
Do not aim the DISTO directly at the sun.

Hazards in Use

WARNING:
Insufficient securing or marking of your measurement site could cause a dangerous situation on the public highway, building site, or in the factory etc.

Precautions:
Always ensure your measurement site is appropriately secured. Obey the local accident prevention regulations, and road safety rules, at all times.

CAUTION:
On sending the instrument, or on the disposal of batteries that are not fully discharged, a fire could be caused by improper treatment.

Precautions:
Remove the batteries from their compartment before sending the instrument. Dispose of batteries only if they are completely discharged (operate the instrument in tracking mode, until batteries are completely discharged).

CAUTION:
If you do not intend using your instrument for a long time, the batteries may leak and damage your equipment!

Precautions:
Remove batteries if you are not going to use the instrument for an extended period.

Hazards in Use

WARNING:
If the equipment is improperly disposed of, the following can happen:

- If plastic parts are burnt, poisonous gases are produced which may impair health.

- If batteries are damaged or overheated, they can explode and cause poisoning, burning, corrosion or environmental contamination.

- By disposing of the equipment irresponsibly you may enable unauthorized persons to use it in contravention of the regulations, exposing themselves and third parties to the risk of severe injury and contaminating the environment.

Precautions:
Dispose of the equipment appropriately in accordance with the regulations in force in your country.
Always prevent access to the equipment by unauthorized personnel.

Laser Classification

The DISTO produces a visible laser beam which emerges from the front of the instrument.

It is a Class 2 laser product in accordance with:
- IEC825-1: 1993 "Radiation safety of laser products"
- EN60825-1: 1994 "Radiation safety of laser products"

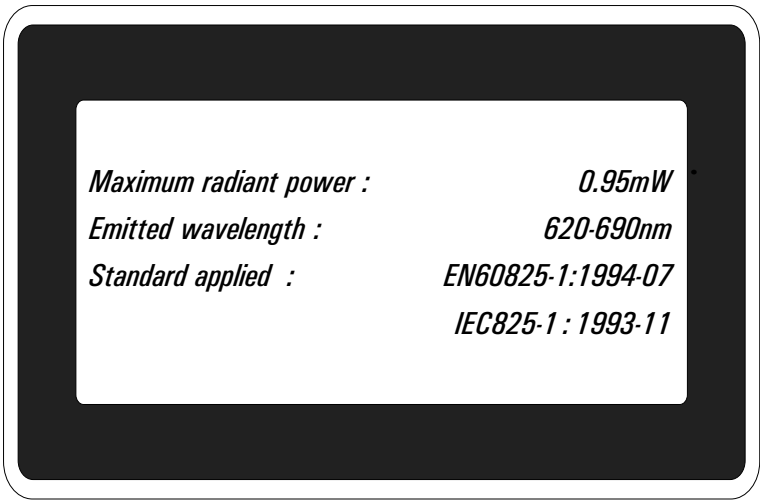
It is a Class II laser product in accordance with:
- FDA 21CFR Ch.I §1040: 1988 (US Department of Health and Human Service, Code of Federal Regulations)

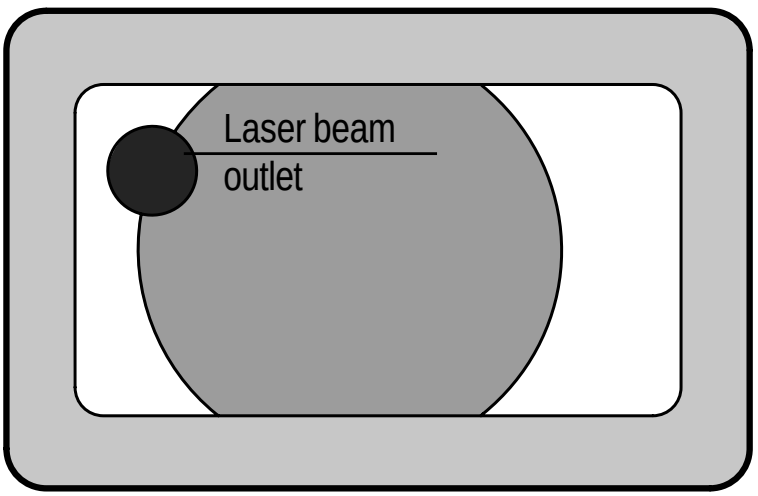
Laser Class 2/II products:
Do not stare into the laser beam or direct it towards other people unnecessarily. Eye protection is normally afforded by aversion responses including the blink reflex.

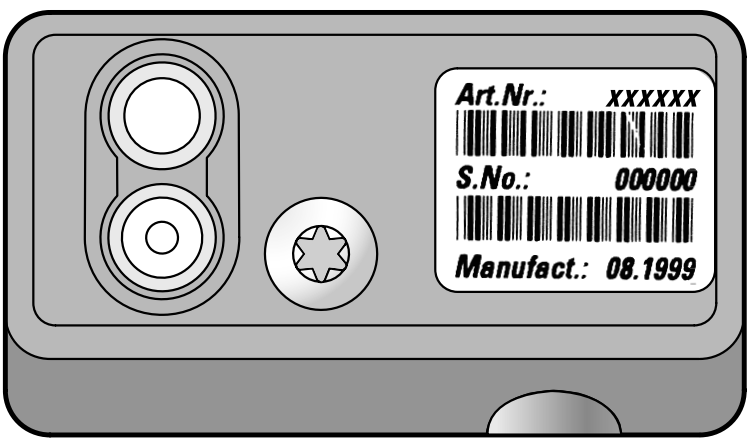
WARNING:
Looking directly into the beam with optical aids (e.g. binoculars, telescopes) can be hazardous.

Precautions:
Do not look directly into the beam with optical aids.

Labelling

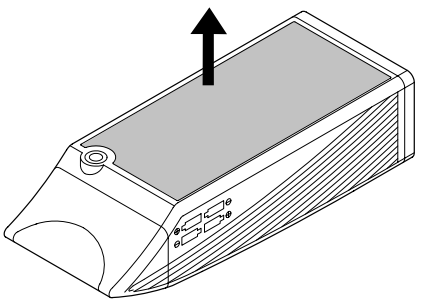

Maximum radiant power : 0.95mW
Emitted wavelength : 620-690nm
Standard applied : EN60825-1:1994-07
IEC825-1 : 1993-11


Laser beam
outlet


Art.Nr.: XXXXXX
S.No.: 000000
Manufact.: 08.1999

Labelling


inch
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
mm
AVOID EXPOSURE
Laser radiation is emitted
from this aperture
CAUTION
LASER RADIATION - DO NOT
STARE INTO BEAM
620-690nm/0.95mW max.
CLASS II LASER PRODUCT
This laser Product complies
with 21CFR 1040 as applicable
2
>1/4 s
This device complies with part 15 of
the FCC Rules. Operation is subject
to the following two conditions:
(1) This device may not cause harmful
interference, and (2) this device must
accept any interference received,
including interference that may cause
undesired operation.
Type: DISTO classic 3
Art. No.: xxxxxx
Power: 6V =
0.2A
Leica Geosystems AG
CH-9435 Heerbrugg
Made in Switzerland



Labelling

Beam divergence:	0.16 x 0.6 mrad
Pulse duration:	15×10^{-9} s
Maximum radiant power:	0.95 mW*
* Measurement uncertainty:	±5%
Maximum radiant power per pulse:	8 mW

CAUTION:
Allow only authorized Leica Geosystems service workshops to service the instruments.

DISTO with Telescopic Viewfinder

WARNING:
Looking right at the reflected laser beam in a DISTO operated with telescopic viewfinder could be dangerous when you aim at areas that reflect like a mirror, or emit reflections unexpectedly (e.g. a mirror, metallic surfaces, windows, prisms, liquids).

Precautions:
If you using a telescopic viewfinder, do not aim at areas that are reflective like a mirror, or which could produce unintended reflections (e.g. mirrors, metallic surfaces, windows, prisms).

Electromagnetic Compatibility (EMC)

The term "electromagnetic compatibility" is taken to mean the capability of the DISTO to function smoothly in an environment where electromagnetic radiation and electrostatic discharges are present, and without causing electromagnetic interference to other equipment.

WARNING:
Electromagnetic radiation can cause interference in other equipment.

Although the DISTO meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that interference may be caused to other equipment.

CAUTION:
Interference caused by electromagnetic radiation can result in the tolerance limits for measurements being exceeded.

Although the DISTO meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that interference may be caused to the DISTO by very intensive electromagnetic radiation, for instance near radio transmitters, walkie-talkies, diesel generators etc.
Under such conditions, check measurement results for their plausibility.

FCC Statement (applic. in U.S.)

WARNING:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

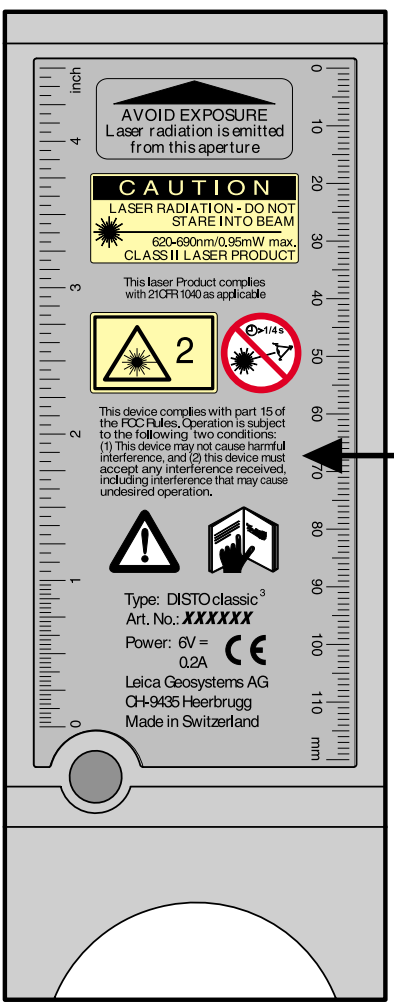
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Statement (applic. in U.S.)

WARNING:
Changes or modifications not expressly approved by Leica Geosystems for compliance could void the user's authority to operate the equipment.

Product labelling:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



Care and Storage

Care

Clean and dry

- Blow away dust from lenses.
- Do not touch glass with fingers.
- Only clean with a soft cloth; if necessary, damp with pure alcohol. Do not use other cleaning agents. Plastic parts could be affected.

Wipe off splashes of cement, plaster etc. as quickly as possible, using water and a damp cloth or sponge. Look after the optical surfaces with the same care that you would apply to spectacles, cameras and field glasses.

Storage

Please respect the temperature limits, specially during summer when storing the equipment inside a vehicle (-40°C to +70°C / -40°F to +158°F).

Unpack instruments and accessories that have become wet. Dry off the instrument, container and accessories (at maximum 40 ºC / 108 ºF) and clean. Only repack the equipment when it is completely dry.

After longer periods of storage or transport carry out a check measurement before using the equipment.

Storage

If the indoor and outdoor temperatures are very different, allow time for the instrument to adapt.

If the DISTO is removed from an air-conditioned room and exposed to warm damp air, the instrument and the optics will fog over. To reduce this effect, cover the instrument with a cloth and allow it to adapt slowly to the new conditions as you would for a camera or a video.

Transport

The Leica Geosystems holster protects the DISTO well against mechanical shock, but not against water or dust.

It is recommended that you always transport the DISTO in the Leica Geosystems holster or an equivalent protective container or packaging.

Do not exceed the temperature limits.
Before embarking on a flight, enquire whether you are permitted the DISTO as hand luggage.

Despatch

Always use the original Leica Geosystems packaging (holster and shipment box) for sending the instrument.

You must remove the batteries (send the instrument **without** batteries).

Message Codes

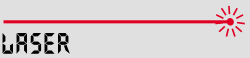
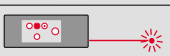
Message code	Cause	Remedy
203	Wrong entry	Repeat entry
204	Calculation error	Repeat procedure
252	Temperature above 50°C (measuring)	Cool down instrument
253	Temperature below -10°C (measuring)	Warm up instrument
255	Receiver signal too weak, Measurement time too long Distance < 250 mm	Use target plate Measurement time > 10 sec.
256	Receiver signal too powerful	Use target plate (correct side)
257	Wrong measurement; ambient brightness too high	Use target plate
	All other messages	Call service „System“

General rule:

In case of messages switch on/off instrument several times and check if message is still displayed. Then call service and specify the message displayed.

Reset message with or quick-switch off

Technical Data

	Measuring accuracy typ. max.	± 3 mm * ± 5 mm
	Smallest unit displayed mm	1
	Range	0.3m to over 100m**
	Time for a measurement dist	0.5...~ 4s
	trc	0.16...~1s
	visible	635nm
	∅ Laser-spot mm	6 / 30 / 60
	at Distance m	10 / 50 /100
	**Outdoor measurements** (adaption for viewfinder)	●
	Two line display	●
	Illumination (fluorescent display)	●
	Measure from corners	●
Fnc1	Constant (height)	●
Fnc2	Continuous measurement **max.** (room diagonals)	●
Fnc3	Continuous measurement **min.** (room diagonals)	●
Fnc4	Height (width) from two measurements (Pythagoras)	●
dly	Time delay release	●
	20 last values	●
	Over 3000 measurements	Type AAA, 4x1,5V
	Splash proof Dust proof	IP54 ; IEC529
		172 x 66x 42mm
		360 g
 °C	 °C	-10... +50
	 °C	-40... +70

Remarks on Measuring Accuracy

*The measuring accuracy corresponds to the ISO-recommendation ISO/R 1938-1971 with a statistical confidence level of 95% (i.e. ± twice the standard deviation, refer to diagram below).

The typical measuring accuracy relates to average conditions for measuring within the specified range. It is not valid for the user functions Fnc 2, 3, 4, and is not valid in the tracking mode.

The maximum measuring error relates to unfavourable conditions such as:

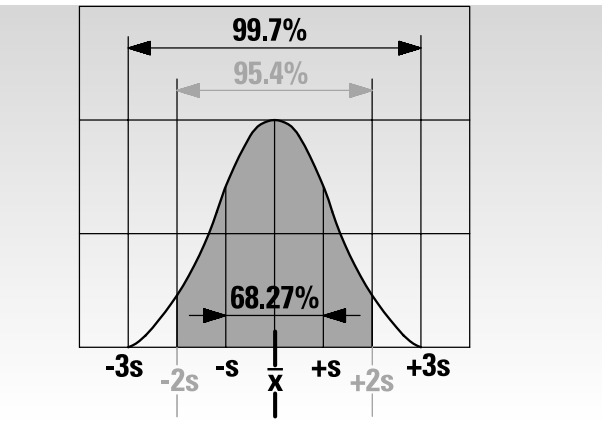
- highly-reflecting surfaces (e.g. reflector tapes),

- operating at the limits of the permitted temperature range, adaption to ambient temperature interrupted (page 54)

- very bright ambient conditions, strong heat shimmer and can be up to ± 5 mm (twice the standard deviation).

** At long range ± 30 ppm (± 3 mm/100 m) plus short range error. Range increases, the better the laserlight is reflected from the target area (diffuse, not reflective), and the brighter the laserpoint is compared to the surrounding luminosity (indoors, dawn).
From appr. 40 - 50 m use target plate, brown side (page 40)

Remarks on Measuring Accuracy



Possible method of calculating the standard deviation s:
When using a computer with a statistical function or if you use the program Excel, you can calculate the mean value $\bar{x}$ and the standard deviation **s** directly from the 10 measured values.

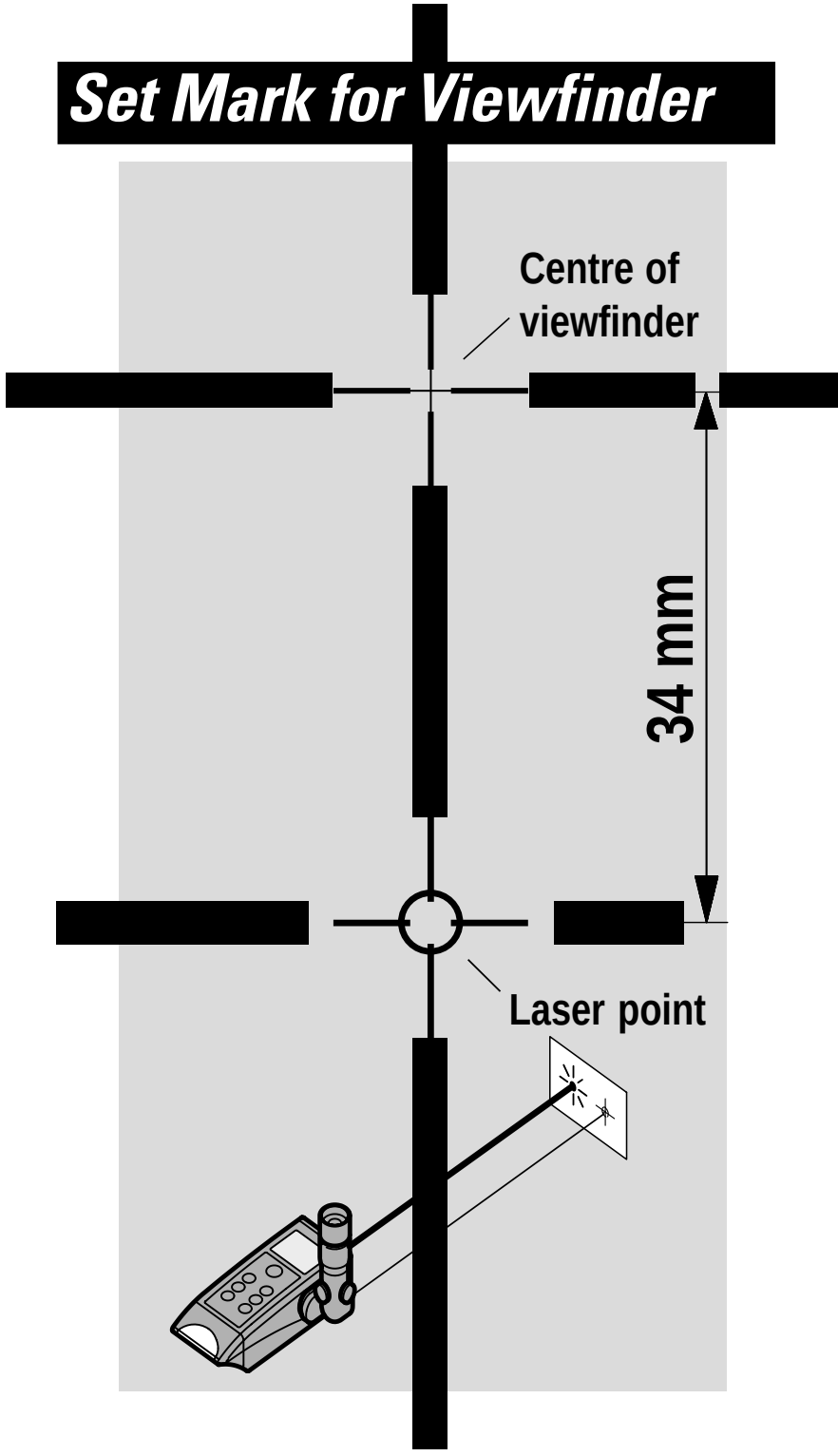
Formula for the standard deviation s:

$$s = \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2}$$

n ... number of measurements
x_i ... individual value of a series of measurements
$\bar{x}$ ... mean value of a series of measurements

Calculation using the program Excel:
On the **Insert** menu, choose **Functions**.
Select **category: Statistics and Function:STABW** within the **Function Assistant.**
Depending on the version of Excel and the language used, the names of the menu may vary.

Set Mark for Viewfinder



Setting mark for adjusting the telescopic viewfinder

see page 36, 37

Please copy the above diagram 1:1.

Accuracy Tests

Accuracy tests on the DISTO for users certified to ISO 900...:

You can perform your own accuracy tests on the DISTO to meet the requirements of ISO 900... for measuring equipment.

Take a fixed, invariable, and conveniently accessible distance of about 1m to 10m, such as the width of a window opening or of a room. Measure it ten times.

Determine the magnitude of this distance with a means of measurement that is monitored by a national, accredited calibration institute (traceability back to national standards).

Determine the amount that the measurements vary from the nominal distance, and compute the standard deviation (page 59).

Record the standard deviation and set a date for the next test. Repeat these tests at frequent and regular intervals, also before and after important measuring jobs.
Affix an adhesive label on the DISTO for accuracy tests of measuring equipment and keep a detailed record of the test procedure.

Your DISTO meets the specified accuracy if standard deviation remains smaller or equal to the typical specified value.

Accuracy Tests

A DISTO whose measuring accuracy has been tested over a test distance works within the specified tolerance over the entire distance and temperature range specified in the manual.

Please note the technical data and the description of measuring accuracy in the manual (page 59).

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

TQM

ISO 9001 / ISO 14001

Total Quality Management - Our commitment to total customer satisfaction

Ask your local Leica Geosystems agent for more information about our TQM program

Your dealer:

Leica Geosystems AG
CH-9435 Heerbrugg
(Switzerland)
www.leica-geosystems.com

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