Leica DISTO™ plus

THE ORIGINAL LASER DISTANCEMETER

Leica Geosystems

User Manual

Version 1.0

English

1 **The Safety Instructions (738266) in a separate brochure form a part of this User Manual.**

Carefully read the Safety Instructions and the User Manual before using this product.

Contents

Leica DISTO™ plus hand-held laser meter

Congratulations on your purchase of a Leica DISTO™ plus.

Product identification

The identification label for your product is fitted on the front. The serial number is under the endpiece. Enter model and serial number in your User Manual, and always refer to this information when you need to contact your agency or service center.

Model: Leica DISTO™ plus .....

Serial no.: .....

Date of purchase: .....

International Manufacturer's Warranty

Leica Geosystems offers its customers a two (2) year warranty on Leica DISTO™ plus instruments. For more information, refer to *www.disto.com*.

In case of a defect, please contact the dealership near you.

Symbols used

The symbols used in the User Manual 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 in appreciable material, financial and environmental damage.

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

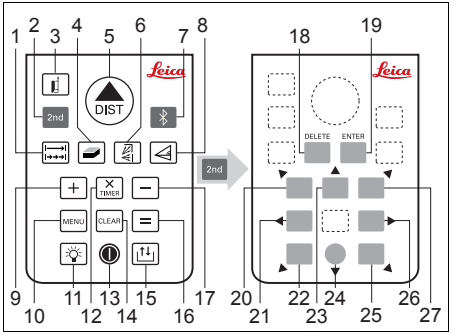
GB

Keypad

The Leica DISTO™ plus has two function levels. The first level contains direct functions like ON/OFF, +/- etc. The second level is for data transfer functions and software control.

2nd Press to switch between the function levels.

2nd Is displayed on the screen.



D5-Z1

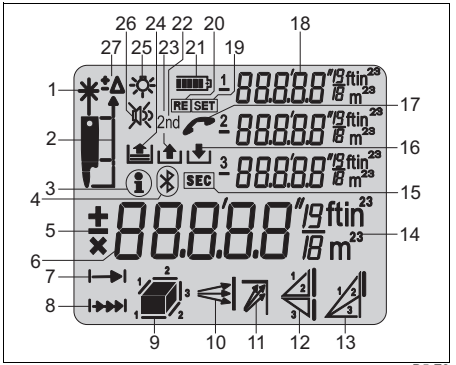
1st function level

1 Distance measuring, Tracking
2 2nd - function level 1 or 2
3 Meas. reference
4 Areas, Volumes
5 Measuring
6 min. / max. Tracking
7 BLUETOOTH® ON/OFF
8 Pythagoras functions
9 Plus [+]
10 Menu
11 Illumination
12 Multiply [x]/ Timer Release
13 ON/OFF key
14 Clear
15 Mermory, Stack
16 Equals, Enter
17 Minus [-]

2nd function level

18 delete
19 enter
20 direction left upward
21 direction left
22 direction left downward
23 direction upward
24 direction downward
25 direction right downward
26 direction right
27 direction right upward

Display



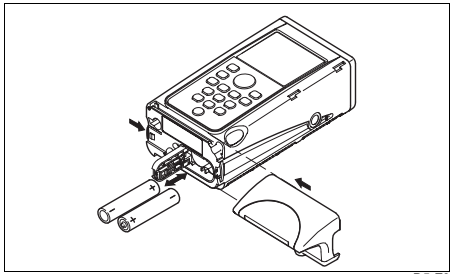
D5-Z2

1 Laser "on"
2 Measurement reference (front/ tripod/ rear)
3 Information
4 BLUETOOTH® ON/OFF
5 Display of the mathematical signs/operations
6 Main display (e.g. measured distance)
7 Distance measurement
8 Tracking
9 Area/ Volume
10 min. Tracking
11 max. Tracking
12 Pythagoras function
13 Pythagoras function with partial height
14 Units with exponents (²/ ³)
15 Time symbol for time delay release
16 Save constant
17 Contact customer service
18 3 auxiliary displays (e.g. previous values)
19 SET
20 RESET
21 Battery display
22 2nd function level
23 Recall stored constant (max. 10)
24 Recall last 15 values
25 Illumination (on/ off)
26 Beep (on/ off)
27 Offset setting

How to Use the Instrument

Inserting / replacing the batteries

1 Depress the locking clip and slide end piece to the right.



D5-Z3

2 Remove battery cover. Replace batteries.

Appears on the display if battery voltage is too low.

For type of battery, refer to Technical Data.

Fit batteries the right way round.

Use only Alkaline batteries.

3 Push in end piece and listen for locking click sound.

1st Function level

Leica DISTO™ plus switching ON/OFF

Briefly press.

The illumination, Battery and Beep symbols are displayed until the first key press.

The instrument can be switched off from any menu point.

The instrument switches off automatically after 90 seconds if no key is pressed.

An unwanted switching off of the BLUETOOTH®-dataconnection is blocked by special precautions. Please refer to page 11.

Clear key

CLEAR The clear key may be pressed before or after a measurement/ calculation.

In Menu Mode it resets to Normal Mode.

During a function (area, volume or Pythagoras) the single measurements can be deleted step by step and remeasured.

In the menu settings, the program is terminated if the Equal (=) and Enter keys are not pressed.

Illumination

Press briefly.

Illumination is switched ON/OFF with a key press.

Illumination switches off after 30 seconds if no key is pressed.

Reference setting

Press until desired reference setting appears.

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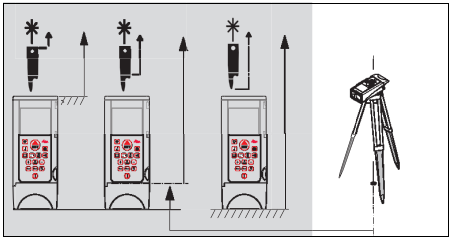
Possible settings



D5-Z4

front tripod rear

At the back of the instrument is a 1/4" camera thread for the tripod.

Settings remain valid until the reference level is changed or the instrument is automatically or manually switched off.

Basic setting: rear reference

Measuring

Distance measurement

DIST Press and the laser is switched on, the instrument is in **"Pointing Mode"**.

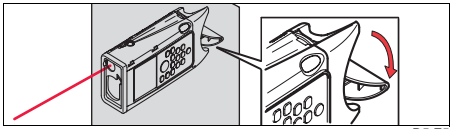
DIST A second press starts the **distance measurement**.

The result is displayed immediately in the selected unit.

With the instrument on and the laser off, it is in **"Normal Mode"**.

With the laser on, it is in **"Pointing Mode"**.

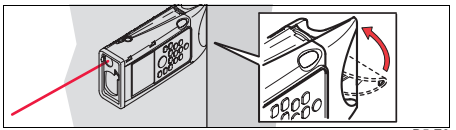
Measuring from flat planes



D5-Z5

For stable measuring turn endpiece 90°.

Measuring from corners



D5-Z6

Continuous measurement (Tracking)

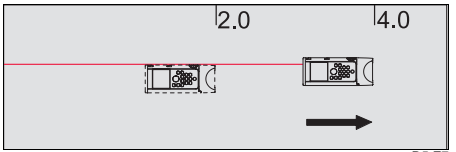
Press until

appears on the display.

DIST Continuous measurement is started and the result is displayed.

DIST Press to end Tracking Mode. Last result is shown in the display.

Example: Stake off distance



D5-Z7

Laser in continous operation

DIST Press until a long "beep" is heard. Now the laser is activated permanently.

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

CLEAR Press to end continuous laser operation.

Time delay release

Instrument must be in Pointing Mode.

TIMER — Press and hold until desired time delay has been reached (max. 60 seconds).

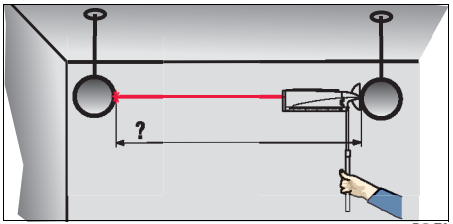
SEC appears on the display.

Once the key is released, the remaining seconds (e.g. 59, 58, 57...) are displayed, until measuring.

The last 5 seconds are counted down with a "beep".

After the last "beep", the measurement is made and the value displayed.

Example: Measuring without any key activation.



D5-Z8

Calculations

Area

Press until

appears on the display.
The side to be measured blinks.

Make 2 measurements (l x w).

The result and the two partial results appear on the display.

Volume

Press until

appears on the display.
The side to be measured blinks.

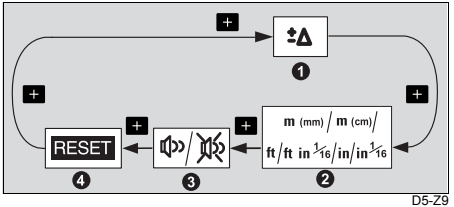
Make 3 measurements (l x w x h).

The result and the three partial results appear on the display.

Menu/ Settings

The menus allow a free selection of the settings that are to remain valid after switching off the instrument. The functions follow each other endlessly (rollmode).

\+ Press to toggle between the functions.



D5-Z9

4 Measure with offset (add/reduce)
5 Selecting measuring units
6 Beep
7 Reset

Menü aufrufen:

MENU — Press until desired menu point appears or with key [+ / -] switch between the various menu points.

= Confirm selection, activate menu point.

MENU — or with key [+ / -] change setting as desired.

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Confirm selection, reset to Normal Mode.

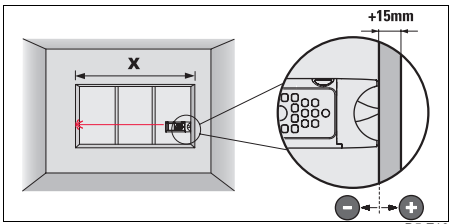
"Clear Entry" may also be used (e.g. to cancel a selection).

Selecting units (menu)

Selectable units:

- m (mm) = 0.000 m
- m (cm) = 0.00 m
- ft = 0.00 ft
- ft in 1/16 = 0.00 $^{1}/_{16}$ft in
- 14' 06'' 1/16 = ' '' $^{1}/_{16}$
- in = 0.0 in
- in 1/16 = 0 $^{1}/_{16}$in

Measure with offset (menu)



D5-Z10

Call up menu point.

blinks on the display.

With key [+ / -] set desired offset (=shifting reference) (e.g. 0,015m); quick set by keeping key pressed.

TIMER For larger steps hold additionally.

Offset can be positive (add) or negative (reduce)!

Confirm setting.

Is displayed continuously if offset ≠ 0.

Subject to set offset, the measured results are displayed.

Using this function you can measure with rough size, as an example!

Please make this a rule: After rough size measurement always set the Leica DISTO™ plus to offset 0.000: Call up function as described

CLEAR Press.

Confirm function.

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

Resetting (menu)

Call up menu point.

RE SET starts blinking on the display.

With key [+ / -] select components to be reset. To choose from:

Stack/ Mermory

Stack and Constant

If additional symbols e.g. units are shown in the display, the following values are reset:

- Offset (=0), Beep (On) and Units (meter)

Selected components are reset; back to Measuring Mode.

Save values (constants)

Measure/ calculate desired value (e.g. height of room, area, volume).

Press longer.

starts to blink on the display.

With key [+ / -] adjust value as desired (e.g. from 2.297m to 2.300m).

TIMER For larger steps press and hold additionally.

MENU Press to adjust unit (²/³).

The adjustment is for m, m² and m³ rsp. ft, ft² and ft³ only.

= Confirm.

and a number (=memory location) starts to blink.

With key [+ / -] select memory location (1-10).

= Save value.

Recalling the constant

Briefly press.

and the contents of the first constant memory location are displayed (e.g. 2.300m).

With key [+ / -] select desired mermory (1 to 10).

= Confirm; value is ready to be used for (e.g. calculating an area) or

Recall last measured value (Stack)

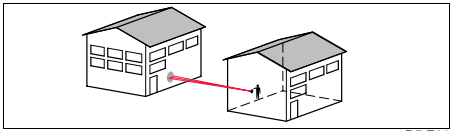
Briefly press twice

and the last value in the display is shown.

With key [+ / -] select desired value (max. 15!).

= Confirm; value is ready to be used for (e.g. calculating an area).

Tracking - Minimum



D5-Z11

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

Press until

appears on the display.

Aim Leica DISTO™ plus approximately at the target point.

DIST Activate continuos measurement with a brief press.

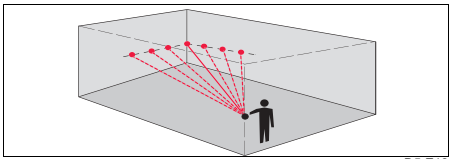
Move the Leica DISTO™ plus a large amount around the target point.

DIST Stop continuous measurement.

The smallest measurement is displayed (e.g. 3.215m = height of room).

Both planes (e.g. floor/ ceiling, walls) must be nearly parallel to each other.

Tracking - Maximum



D5-Z12

GB

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

Press until

appears on the display.

Move the Leica DISTO™ plus a large amount around the target point.

Activate continuous measurement with a brief press.

Slowly rotate the Leica DISTO™ plus to the right/ left past the corner.

Stop continuous measurement.

The largest measurement is displayed (e.g. 12.314m = diagonal of room).

Calculations

Partial heights, partial distances

Make measurement.

Add by [+] key/ Subtract by[-] key.

Make additional measurements.

= Result.

In the same way **chain values** (= any amount of distance measurements) and sums of areas/ volumes can be added up.

During calculations "Clear" is available as long as the function has not been executed!

Multiplication

Make measurement (e.g. 8.375m).

Multiplication by pressing [x] key.

Additional measurements (e.g. 8.375m).

= Area (e.g. 29.313m²)

The volume can be calculated by an additional multiplication following an area calculation.

This function can be used for calculating areas or volumes with individual partial heights/ partial distances.

Doubling a measured value

It is easy to double the measured values, e.g. to determine the length of walls in a room:

Make measurement.

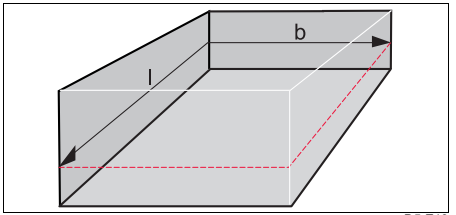
Add by [+] key.

Make additional measurements.

= Sum (=half circumference)

With key [+] repeat, double measured value.

= Sum (=circumference)



D5-Z13

Pythagoras, height/ width measurement

The measuring sequence must be adhered to in any case!

All three (two) points must be on a vertical or horizontal line in the plane of the wall!

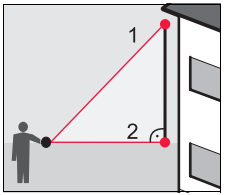
With each of the distance measurements you can use:

- a simple distance measurement,
- a value from stack/ mermory or
- a measurement with time delay release.

For short distances, a good base behind the instrument is sufficient for mechanical alignment.

You will obtain the best results if the Leica DISTO™ plus is rotated around a fixed point (rear edge, thread position) and the axis of the laser beam passes through this axis. The Leica DISTO™ plus should not be placed on a camera tripod without an adapter, as the axis of the laser beam would be 70 to 100 mm above the instrument's axis of rotation. Without the adapter this would lead to significant height deviations in the measurements.

Determination with two points



For estimating the height/ width of buildings. Very useful for making measurements from standing position (no bending) if the height is determined with two or three distances.

Press until

appears on the display; laser is activated and "1 ---" starts blinking.

Aim at the upper point (1).

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

Value is accepted.

appears on the display and "2 ---" starts blinking.

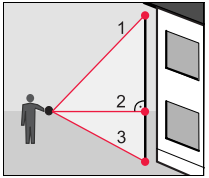
Point the Leica DISTO™ plus approximately horizontal (2).

Press, a continuous measurement is triggered.

Move the Leica DISTO™ plus a large amount around the ideal measurement point.

Stop of continuous measurement. The height and width are displayed from measurements (Pythagoras).

Detemination with 3 points



Press until

appears on the display; laser is activated and "1 ---" starts blinking.

Aim at the upper point (1).

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

Value is accepted.

appears on the display and "2 ---" starts blinking.

Point the Leica DISTO™ plus approximately horizontal (2).

Press, a continuous measurement is triggered.

GB

Move the Leica DISTO™ plus a large amount around the ideal measurement point.

Stop of continuous measurement.

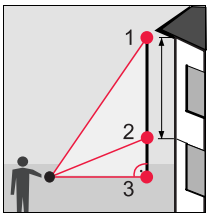
Value is accepted and and on the display "3 ---" starts blinking.

Aim at the lower point (3).

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

The height and width are displayed from three measurements (Pythagoras).

Determination of a partial height with 3 points



Height determination between point 1 and point 2 with three measured points.

Press until

appears on the display; laser is activated and "1 ---" starts blinking.

Aim at the upper point (1).

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

Value is accepted and on the display "2 ---" starts blinking.

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

Value is accepted.

appears on the display and "3 ---" starts blinking.

Press, a continuous measurement is triggered.

Move the Leica DISTO™ plus a large amount around the ideal measurement point.

Stop of continuous measurement. The height and width are displayed between point 1 and 2 (Pythagoras).

2nd Function level

Only in the second level can measured values be transferred or corrected with the Leica DISTO™ plus. The type and number of functions that can be activated in the second function level depend on the software used.

Switching on the BLUETOOTH®

Press briefly.

If BLUETOOTH® is switched on, this icon appears in the display.

The data connection must be built up by the application software on a Pocket PC or PC. As long as the connection is being built up, this icon will be blinking.

If during 120 seconds after switching on the BLUETOOTH® no connection is established with the Pocket PC or PC, then the BLUETOOTH® is switched off automatically.
If five minutes after the connection has been established, no data transfer has occurred, then the BLUETOOTH® is switched off automatically. After a further 90 seconds, the Leica DISTO™ plus is also switched off.

Switching off the BLUETOOTH®

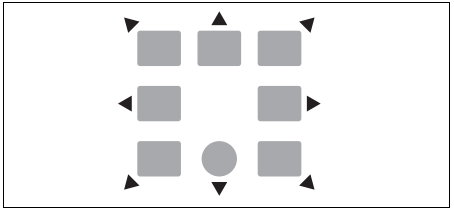
Before switching off the BLUETOOTH® , always change to the first function level

Press briefly.

BLUETOOTH® is switched off,when this icon is no longer visible

If still in the second function level, the BLUETOOTH® cannot be swictched off. This is a safety precaution to prevent an accidential interruption of the BLUETOOTH® connection.
Before the Leica DISTO™ plus can be switched off, the BLUETOOTH® function has to be switched off.

The direction arrows



D5-Z14

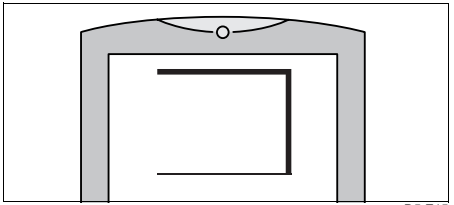
The eigth arrow keys in the lower part of the Leica DISTO™ plus keyboard are used to input directions (orthogonal and diagonal) when generating a spatial drawing.

Trigger a measurement in the usual way (even if the second level is active, these keys remain functional), the value appears in the display. Select the arrow key that corresponds to the direction needed for your spatial drawing. When this arrow key is pressed, the distance is transferred according to value and direction to the data receiver (Pocket PC or PC).

Depending on the software used, the arrow keys can also control the cursor (e.g. Excel).

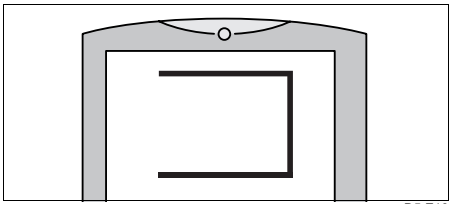
Transfer of the measured values

Press the arrow key briefly. A a thin line will be drawn to scale.



D5-Z15

Confirmation (or deletion) of a transferred measuring value



D5-Z16

GB

ENTER — Press briefly to confirm that the correct line was drawn. The line is then drawn thicker with the measurement dispayed.

DELETE — Press briefly to clear a wrong line.

Is the measurement is still displayed in the Leica DISTO™ plus, it can be transferred again by pressing the correct arrow key.

Other functions are described in the manual of the software used.

During data transfer

As long as there is no confirmation of a successful data transfer from the Pocket PC or PC, no new measurement can be triggered.

Appears and "240" blinks, if after 2 seconds no data transfer occurs.

CLEAR — Press briefly to acknowledge the display. Repeat measurement and data transfer.

Remark to the software

The two free software progams "PlusDraw" and "PlusXL" are included to demonstrate the basic applications of the Leica DISTO™ plus and are designed to perform simple tasks (spatial drawings with measurements , data transfer into an Excel table etc.)

Leica Geosystems gives no warranty on the free software nor on their functionality and does not offer any support. Leica Geosystems is not liable for any damage resulting from the use of the free software and is not obligated to make corrections on them or to develop additional functions for them (updates, upgrades etc.).

There are a number of commercially available software programs that provide the required functions. Please visit our homepage *www.disto.com* for details.

User Information

Range

In daylight (outdoors) always work with a laser viewfinder (see page 13). If neceesary, shade the target. If required, use a target plate.

Increased range:
At night, at dusk and when target area is in the shade.

Reduced range / increased measuring time:
Against mat and dark surfaces (also plants and trees) a reduction of the range may occurs as well as an increase in measuring time.

Rough surfaces

On a rough surface (e.g. coarse plaster) measure against the centre of the illuminated area.

To avoid measuring to the bottom of plaster joints:
Use target plate, 3M "Post-it" or board.

Transparent surfaces

To avoid measuring errors, do not measure towards colorless liquids (e.g. water) or (dust free) glass, styropor. or similar semi- permeable surfaces. For materials and liquids unfamiliar to you always take a trial measurement.

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

Wet, smooth or high-gloss surfaces

1 Aiming at a "obtuse" angle deflects the laser beam. The Leica DISTO™ plus may receive a signal that is too weak (error message 255).
2 If aiming at a right angle, the Leica DISTO™ plus may receive a signal that is too strong (error message 256).

Inclined, round surfaces

Can be measured with the laser.

Requirement: There is enough area on the target surface for the laser spot.

Using a target plate

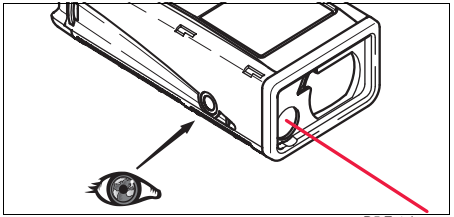
Use target plates 563875 (DIN C6) or 723385 (DIN A4'), if the signal is too weak (e 255), if the targeted surface is too rough, if the surface has poor reflection or during dayligh when measuring from more than 30 meters away.

- White surfaces: to up approx. 30 m
- Brown surfaces: from approx. 30m to 200 m

In the field

Leica DISTO™ plus is equipped with an integrated telescopic viewfinder (2x magnification).

With measurements from a distance of 25 m the laser spot is in the centre of the crosshairs. Below a distance of 25 m the laser spot moves to the edge of the crosshairs.



D5 Z_telescop

Technical Data

Measuring accuracy (2x standard deviation)	typ.: ± 1.5mm / max.: ± 3mm*
Smallest unit displayed	1mm**
Range (from about 30m, use target plate)	0.2m up to 200 m
Time for a measurement dist / trc	0.5...ca.4s / 0.16...ca.1s
∅ Laser spot (at distance)	6 / 30 / 60 mm (10 / 50 / 100 m)
Integrated telescopic viewfinder	✓
Illumination	✓
Multiline display	✓
Multifunctional endpiece	✓
Time delay release	✓
Pocket calculator	✓
BLUETOOTH®	✓
Tracking	✓
Constant	10 values
min./ max. Tracking.	✓
Pythagoras	✓
Mermory (Stack)	15 values
Battery, Type AA, 2x 1.5V	up to 10'000 measurements *** (only with Alkaline batteries!)
Splash and dustproof	IP54 acc. IEC529: splash and dustproof
Dimension and weight	172 x 73 x 45 mm, 335g
Measuring accuracy of bubble	1°
Temperature range Storage Operating	 -25°C to +70°C (-13°F to +158°F) -10°C to +50°C (-14°F to +122°F)

GB

* Maximum deviation occurs under unfavorable conditions, such as in bright sunlight or when measuring to inadequately reflecting surfaces. For distances over 30m-without using a target plate- themaximum deviation may increase by ±0.1mm/m to maximum ± 10mm. For more information, refer to *www.disto.com*.

** As of 100m the measuring units are displayed in cm.

*** Reduced when using the BLUETOOTH® function

Message Codes

Error message

appears beside the message number on the display.

Message Code	Cause	Remedy
203	Wrong sequence with Pythagoras meas.	Carry out measurement in correct sequence
204	Calculation error	Repeat procedure
240	Transmission error	Repeat procedure
252	Temperature too high, above 50°C (measuring)	Cool down instrument
253	Temperature too low, below -10°C (measuring)	Warm up instrument
255	Receiver signal too weak, measurement time too long, distance <200 mm	Use target plate measurement time >10 sec.
256	Received signal too powerful	Use target plate (correct side)
257	Wrong measurement, ambient brightness too high	Use target plate
260	Laser beam interrupted	Repeat measurement
	All other messages	Call service "System"

Please call your local dealership and specify the message code. Should the message continue to appear after several starts, then the instrument is defective.

Care

Look after the optical surfaces with the same care that you would apply to spectacles, cameras and field glasses.

The most current information can be found on our homepage:

www.disto.com

We publish the addresses of specialized software mannufacturers . However, we are not responsible for the correctness of their specifications or for the performance of their software.

For software developers, the Leica DISTO™ plus Online-Interface description is available.

All illustrations, descriptions and technical specifications are subject to change 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).

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.

Pat. No.

- **US 5,815,251**
- **US 5,949,531**
- **US 6,336,277**
- **US 6,463,393**
- **EP 0738 899**
- **EP 0932 835**

Leica
Geosystems

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

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