

BENNING

Operating manual

Translation of the German original version

BENNING LD 40

5243 / 12/2022 en



Legal notice

Notes concerning the documentation

Ensure that the applicable documentation is used for this product. For safe handling, knowledge that is provided in these instructions is required.

The product may only be handled while following this documentation, particularly the safety instructions and warnings it contains. The personnel must be qualified for the respective task and have the capability to recognise risks and prevent possible dangers.

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Disclaimer

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General non-discrimination

Benning is aware of the importance of language with regard to the gender equality and endeavors to take this into account at all times. To improve readability, we have refrained from consistently using differentiating formulations.

Table of contents

1	Introduction	6
1.1	General notes	6
1.2	History	7
1.3	Service & support	8
2	Safety	9
2.1	Warning system	9
2.2	Standards applied	9
2.3	Symbols used	10
2.4	Intended use	10
2.5	Special types of risks	11
3	Scope of delivery	12
4	Device description	13
4.1	Device structure	13
4.2	Functions	14
4.2.1	Reference plane	15
4.2.2	Measuring units	15
4.2.3	Error messages	15
4.3	Measuring ranges	15
5	Operation	16
5.1	Requirements for measuring	16
5.2	Length measurement (single measurement)	16
5.3	Length measurement (continuous measurement)	17
5.4	Area calculation	18
5.5	Volume calculation	19
5.6	Indirect length calculation	20
6	Maintenance	21
6.1	Maintenance schedule	21
6.2	Cleaning the device	21
6.3	Replacing the batteries	22
7	Technical data	23
8	Disposal and environmental protection	24
	Index	25

Table of figures

Figure 1	BENNING LD 40 device structure	13
Figure 2	Digital display.....	13
Figure 3	Length measurement (single measurement, exemplary)	16
Figure 4	Length measurement (continuous measurement, exemplary)	17
Figure 5	Area calculation (exemplary)	18
Figure 6	Volume calculation (exemplary).....	19
Figure 7	Indirect length calculation (exemplary)	20

List of tables

Table 1	History	7
Table 2	Symbols on the device.....	10
Table 3	Symbols used in the operating manual.....	10
Table 4	Key functions	14
Table 5	Measuring functions and menus.....	14
Table 6	Measuring units	15
Table 7	Error messages.....	15
Table 8	Length measuring ranges	15
Table 9	Maintenance schedule.....	21
Table 10	Technical data	23

1 Introduction

The laser distance meter BENNING LD 40 described here (in the following only referred to as "device") enables you to perform the following measurements and calculations.

- Length measurement (single measurement and continuous measurement)
- Area calculation
- Volume calculation
- Indirect length calculation (Pythagoras)

Further information

<http://tms.benning.de/ld40-ld60>



On the Internet, you will find the following additional information directly at the specified link or at www.benning.de (product search):

- Operating manual of the device in several languages
- Further information depending on the device (e. g. brochures, technical reports, FAQs)

1.1 General notes

Target group

This operating manual is intended for the following groups of people:

- Professional users, craftspeople and do-it-yourselfers

Required basic knowledge

To understand these operating manual, you will need general knowledge of testing and measuring equipment. Moreover, you will need basic knowledge of the following issues:

- Length measurement, area and volume calculation as well as trigonometric functions

Purpose of the operating manual

This operating manual describes the device and provides you information about how to handle it.

Keep this operating manual in a safe place for later use. Read this operating manual before handling the device and follow the instructions.

NOTE

Disclaimer of liability

Please make sure that any person using the device has read and understood the instructions of this operating manual before handling the device and that the instructions are adhered to in all points. Non-observance of this operating manual might result in product damage, property damage and/or personal injury.

Benning assumes no liability for damage and malfunctions resulting from the failure to observe the instructions in this operating manual.

The devices are subject to continuous further development. Benning reserves the right to make changes to the device's design, configuration and technology. The information in this operating manual corresponds to the state of technical knowledge at the time of printing. For this reason, no claims for certain device characteristics can be derived from the contents of this operating manual.

Information in this operating manual can be changed at any time without prior notice. Benning is not obligated to make amendments to this operating manual or to keep it up to date.

Direct any technical questions to Technical Support [▶ page 8].

Trademarks

All trademarks used are the property of their respective owners, even if they are not separately marked as such.

1.2 History

Release number	Amendments
12/2022	• Initial release

Table 1: History

1.3 Service & support

Please contact your specialty retailer or the BENNING Service Center for any repair or service work that might be required.

Technical Support

Please contact our Technical support for technical questions on handling the device.

Phone:	+49 2871 93-555
Fax:	+49 2871 93-6555
E-Mail:	helpdesk@benning.de
Internet:	www.benning.de

Returns management

Easily and conveniently use the BENNING returns portal for a quick and smooth returns processing:

<https://www.benning.de/service-de/retourenabwicklung.html>

Phone:	+49 2871 93-554
E-Mail:	returns@benning.de

Return address

BENNING Elektrotechnik und Elektronik GmbH & Co. KG
Retourenmanagement
Robert-Bosch-Str. 20
D - 46397 Bocholt

2 Safety

2.1 Warning system

This operating manual contains notes that must be taken into consideration for your personal safety and in order to avoid injuries and damage to property. Warnings about your personal safety and to prevent personal injuries are marked with a warning triangle. Warnings on sole prevention of material damage are shown without a warning triangle. The warnings are shown in descending order depending on the hazard level as follows.



DANGER

Extremely dangerous situation for humans

If you do not pay attention to this warning, irreversible or deadly injuries will occur.



WARNING

Hazard to humans

If you do not pay attention to this warning, irreversible or deadly injuries could occur.



CAUTION

Minor hazard to humans

If you do not pay attention to this warning, minor or moderate injuries could occur.



NOTICE

Danger to property, not to persons

If you do not pay attention to this warning, material damage could occur.

If multiple hazard levels occur, the warning for the highest respective hazard level will be used. In addition, a warning about personal injuries can also include a warning about material damage.

2.2 Standards applied

The device has been built and tested in compliance with the following standards and has left the factory in perfectly safe condition.

- DIN EN 50689
- IEC / DIN EN 60825-1

2.3 Symbols used

Symbols on the device

Symbol	Meaning
	Warning of laser beam! Please observe the information provided in this operating manual in order to avoid dangers.
	The device complies with EU directives.
	The device complies with UK directives.
	At the end of product life, dispose of the unserviceable device via appropriate collecting facilities provided in your community.
	Please observe the operating manual.
	This symbol indicates the inserted batteries.

Table 2: Symbols on the device

Symbols used in the operating manual

Symbol	Meaning
	General warning
	Warning of laser beam!

Table 3: Symbols used in the operating manual

2.4 Intended use

Only use the device within the framework of the corresponding technical data. Any operating conditions that deviate from this shall be considered as improper use. Solely the user of the device shall be liable for any resulting damage.

Please note the following:

- In case of improper use, the liability and warranty claims become void. Solely the user of the device shall be liable for any damage resulting from improper use. Uses not complying with the intended use include e. g.:
 - Use of components, accessories, spare or replacement parts that have not been released and approved for the respective application by Benning
 - Non-observance, manipulation, changes or misuse of the operating manual or the instructions and notes contained therein
 - Any form of misuse of the device
 - Any use other than or beyond that described in this operating manual
- Warranty and liability claims are generally excluded if the damage is the result of force majeure.
- If any prescribed services are not performed regularly or not on time, according to the manufacturer's specifications during the warranty period, a decision about a warranty claim can only be made once the findings are available.

Direct any questions to Technical Support [▶ page 8].

Using the device

Please observe the following basic obligations when using the device:

- The device may only be used in a technically perfect and safe condition. Always check the device for damages before using it.
- The personnel must be qualified for the respective task.
- Observe relevant regulations on occupational safety and health as well as those on environmental protection.
- The device may only be used in dry environments.
- Do not use the device in potentially explosive environments.



⚠ WARNING

Opening the device

Eye damage or risk of accident due to glare are possible in case of eye contact with the laser beam when opening the device.

- Do not open the device (except for the battery compartment).
- Please contact your specialty retailer or the returns management for any repairs [▶ page 8].

Securing the device

If the device is not in a technically perfect and operationally safe condition, safe operation is no longer guaranteed. Make sure that the following measures are taken:

- Switch off the device.

The following characteristics indicate that safe operation is no longer guaranteed:

- The device shows visible damage.
- The device does not work properly in compliance with regulations (e. g. errors during measurements).
- The device shows recognisable consequences of prolonged storage under inadmissible conditions.
- The device shows recognisable consequences of extraordinary stress due to transport.

2.5 Special types of risks



⚠ WARNING

Laser beam

Eye damage or risk of accident due to glare are possible in case of eye contact with the laser beam.

- Never look directly into a laser beam or its reflections!
- If the laser beam hits your eye, close your eyes and immediately turn your face away from the laser beam. Normally, eyes close automatically due to the blink reflex and aversion responses take place.
- Do not point the laser beam at persons or animals.
- Do not leave the unit switched on unnecessarily.

3 Scope of delivery

The scope of delivery of the device includes the following components:

- 1 x laser distance meter BENNING LD 40
- 2 x 1.5 V micro batteries (AAA / IEC LR03)

4 Device description

4.1 Device structure

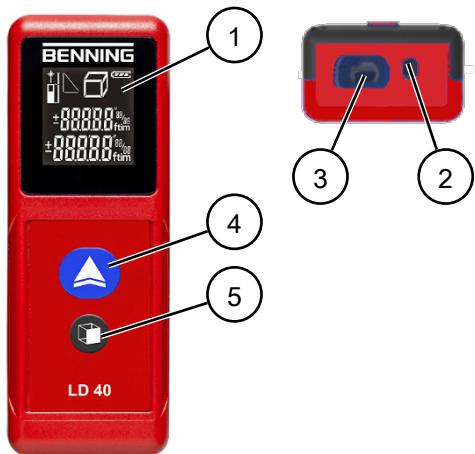


Figure 1: BENNING LD 40 device structure

1	Digital display	2	Laser beam outlet
3	Receiving lens	4	"Measurement" key
5	"Menu" key		

Rear panel of the device

- Battery compartment
The device is powered by two 1.5 V micro batteries (AAA).
- Notes and information about the device

Digital display

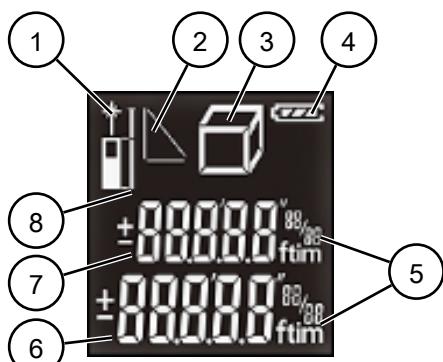


Figure 2: Digital display

1	Laser status (active / inactive)	2	Notes on the measuring function "Indirect length calculation"
3	Notes on the measuring functions "Area calculation" and "Volume calculation"	4	Battery status
5	Selected unit	6	Currently measured value
7	Last measured value or menu designation	8	Selected reference plane

4.2 Functions

Key functions

Function	Key
Switch the device ON	
Switch the device OFF	 (>2 seconds)
Change the measuring function or menu	
Start measurement	
Change the setting	

Table 4: Key functions

Measuring functions and menus

After switching the device ON, the measuring function “Length measurement (single measurement)” is set automatically. Press the “Menu” key to toggle between the following measuring functions and menus.

Symbol	Measuring function / menu
-	Length measurement (single measurement)
	Area calculation
	Volume calculation
	Indirect length calculation
Cont	Length measurement (continuous measurement)
Unit	Measuring units
REF	Reference plane

Table 5: Measuring functions and menus

Helpful functions for general operation

- Please note that for the measuring functions “Area calculation”, “Volume calculation” and “Indirect length calculation”, the length to be measured or the measured value determined and displayed is indicated on the digital display by the respective part of the measuring function symbol flashing.

4.2.1 Reference plane

The zero point of the length measurements is located on the set reference plane. This reference plane is perpendicular to the laser beam and, depending on the setting, either on the upper or lower edge of the device. In the “REF” menu (reference plane), you can change the reference plane. The currently set reference plane is shown on the digital display.

4.2.2 Measuring units

The device can display the measuring results and determined values in different units. You can set these units in the “Unit” menu (measuring units).

	Metre	Foot	Inch
Length	m	ft	in
Area	m^2	ft^2	ft^2
Volume	m^3	ft^3	ft^3

Table 6: Measuring units

4.2.3 Error messages

Code	Description	Remedial measure
Err01	Measured value outside measuring range	Carry out the measurement within the measuring range.
Err02	Reflected signal too weak	Carry out the measurement at a measuring point with a different surface.
Err03	Measured value outside of display range (max. 99 999)	Divide the measurement into smaller subsections.
Err04	Pythagoras calculation failed	Check whether the measured values are correct and the correct measuring sequence has been observed.
Err05	Low battery	Replace the batteries of the device.
Err06	Ambient temperature outside the operating temperature	Carry out the measurement at a permissible ambient temperature.
Err07	Ambient light too bright	Carry out the measurement in a darker environment.

Table 7: Error messages

4.3 Measuring ranges

Length measuring ranges

Measuring range	Resolution	Measuring accuracy
0.05 ... 40 m	0.001 m	±3 mm
Unfavourable conditions: 0.05 ... 28 m	0.001 m	±7 mm

Table 8: Length measuring ranges

5 Operation

The device enables you to carry out various measurements and calculations.

5.1 Requirements for measuring

- Please consider the brightness of the surrounding light conditions:
 - The ambient light must not be too bright.
 - Avoid measuring in direct sunlight.
- Avoid measuring towards reflective, transparent or very porous surfaces.
- Make sure that the laser beam outlet and the receiving lens are not covered.
- Make sure that the device does not move during the measurement (exception: continuous measurement).
- Select the reference plane according to the application.



⚠ WARNING

Laser beam

Eye damage or risk of accident due to glare are possible in case of eye contact with the laser beam.

- Never look directly into a laser beam or its reflections!
- If the laser beam hits your eye, close your eyes and immediately turn your face away from the laser beam. Normally, eyes close automatically due to the blink reflex and aversion responses take place.
- Do not point the laser beam at persons or animals.
- Do not leave the unit switched on unnecessarily.

5.2 Length measurement (single measurement)

The length measurement (single measurement) is intended for measuring a distance between the device and an opposite surface. After being switched on, the device is automatically in this measuring function.

Requirements

- Please observe the requirements for measuring [▶ page 16].
- Selected measuring function: length measurement (single measurement)

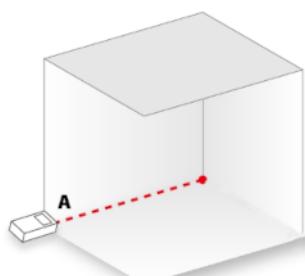


Figure 3: Length measurement (single measurement, exemplary)

Procedure

1. Point the laser beam at the measuring point (A).
2. Press the "Measurement" key.
The measurement is started and the measured value will be shown on the digital display.

5.3 Length measurement (continuous measurement)

Length measurement (continuous measurement) is intended for continuously measuring a changing distance.

Requirements

- Please observe the requirements for measuring [▶ page 16].
- Selected measuring function: length measurement (continuous measurement)
"Cont"

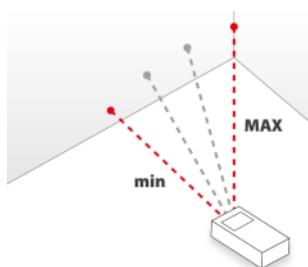


Figure 4: Length measurement (continuous measurement, exemplary)

Procedure

1. Point the laser beam at the measuring point.
The measured value will be shown on the digital display and updated when the distance changes.

5.4 Area calculation

The area calculation function is intended for determining the area of a rectangular surface by measuring two measured lengths that are perpendicular to each other.

Requirements

- Please observe the requirements for measuring [▶ page 16].
- Selected measuring function: area calculation

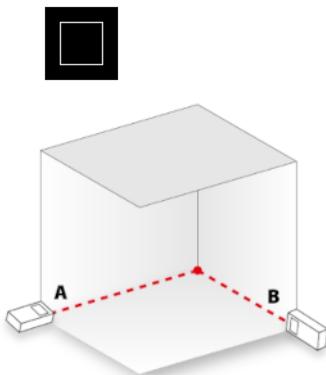


Figure 5: Area calculation (exemplary)

Procedure

1. Point the laser beam at the first measuring point (A).
The measurement is started and the measured value will be shown on the digital display.
2. Press the “Measurement” key.
The measurement is started and the measured value will be shown on the digital display.
3. Point the laser beam at the second measuring point (B).
The measurement is started and the measured value will be shown on the digital display.
4. Press the “Measurement” key.
The device calculates the area from the two measurements and the determined value will be shown on the digital display.

5.5 Volume calculation

The volume calculation function is intended for determining the volume of a rectangular space by measuring three measured lengths that are perpendicular to each other.

Requirements

- Please observe the requirements for measuring [▶ page 16].
- Selected measuring function: volume calculation

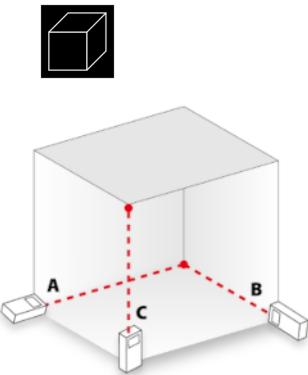


Figure 6: Volume calculation (exemplary)

Procedure

1. Point the laser beam at the first measuring point (A).
The measurement is started and the measured value will be shown on the digital display.
2. Press the “Measurement” key.
The measurement is started and the measured value will be shown on the digital display.
3. Point the laser beam at the second measuring point (B).
The measurement is started and the measured value will be shown on the digital display.
4. Press the “Measurement” key.
The measurement is started and the measured value will be shown on the digital display.
5. Point the laser beam at the third measuring point (C).
The measurement is started and the measured value will be shown on the digital display.
The device calculates the volume from the three measurements and the determined value will be shown on the digital display.

5.6 Indirect length calculation

The indirect length calculation is intended for determining certain distances using length measurements to various points.

Requirements

- Please observe the requirements for measuring [▶ page 16].
- Selected measuring function: indirect length calculation

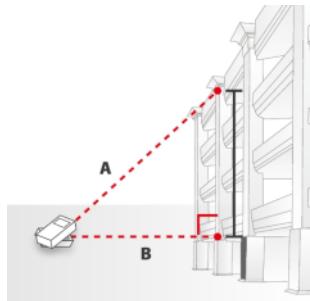


Figure 7: Indirect length calculation (exemplary)

Procedure

1. Point the laser beam at the first measuring point (A).
The measurement is started and the measured value will be shown on the digital display.
2. Press the “Measurement” key.
The measurement is started and the second measured value will be shown on the digital display.
3. Point the laser beam perpendicularly to the surface at the second measuring point (B).
The measurement is started and the second measured value will be shown on the digital display.
4. Press the “Measurement” key.
The device calculates the distance between the two measuring points from the measurements and the determined value will be shown on the digital display.

6 Maintenance

The battery compartment may be opened for maintenance work. Apart from that, there are no components in the device that you can replace.



⚠ WARNING

Opening the device

Eye damage or risk of accident due to glare are possible in case of eye contact with the laser beam when opening the device.

- Do not open the device (except for the battery compartment).
- Please contact your specialty retailer or the returns management for any repairs [▶ page 8].

6.1 Maintenance schedule

The following table provides an overview of all maintenance and servicing work that you must carry out permanently or at regular intervals.

Interval	Measures
Regularly, as needed	<ul style="list-style-type: none">• Cleaning the device [▶ page 21]
As needed	<ul style="list-style-type: none">• Replacing the batteries [▶ page 22]

Table 9: Maintenance schedule

6.2 Cleaning the device

Clean the device regularly and as the need arises. Make sure that the battery compartment and the battery contacts are not contaminated by leaking battery electrolyte.

Requirements

- A clean and dry cloth or special cleaning cloth



NOTICE

Wrong cleaning agents

Using the wrong cleaning agents can damage the device.

- Do not use any solvents, abrasives or polishing agents.

Procedure

1. Clean the exterior of the device with a clean and dry cloth or a special cleaning cloth.
2. Clean the receiving lens and the outlet of the laser beam very carefully:
 - Make sure that there is no dirt on the receiving lens and on the outlet of the laser beam.
 - Clean the receiving lens and the outlet of the laser beam only with cleaning agents that are also suitable for camera lenses.
 - Do not try to remove dirt from the receiving lens or the outlet of the laser beam with pointed objects (risk of scratching).
3. Check the battery compartment. To open and close the battery compartment, follow the procedure given in the chapter “Replacing the batteries” [▶ page 22].
4. In case of electrolyte contamination or white deposits in the area of the battery or the battery compartment, clean the batteries and these areas by means of a clean and dry cloth. Replace the batteries, if necessary [▶ page 22].

6.3 Replacing the batteries

The device is powered by two 1.5 V micro batteries (AAA). Replace the batteries as soon as they are discharged.

Requirements

- Discharged batteries inside the device (all segments of the battery symbol on the digital display have disappeared and the battery symbol is flashing)
- 2 new 1.5 V micro batteries (AAA)

Procedure

1. Place the device face down (onto an anti-slip surface).
2. Lift the battery compartment cover off the device. To do this, hold the device with one hand, press the grooved surface of the battery compartment cover with the thumb of your other hand and at the same time use it to pull the battery compartment cover off the device to the lower side.
3. Remove the discharged batteries from the battery compartment and dispose of them properly [▶ page 24].
4. Insert the new batteries into the battery compartment observing correct polarity.
5. Place the battery compartment cover back onto the device. To do this, proceed as follows:
 - Slide the battery compartment cover completely onto the battery compartment from below.
 - Press the battery compartment cover onto the device from below until it clicks into place.

7 Technical data

Contamination level	2
Protection category (DIN VDE 0470-1, IEC / EN 60529)	IP 54 1st digit: 5 = complete protection against accidental contact and protection against dust in harmful quantity 2nd digit: 4 = protection against splashing water from all directions
Laser type	650 nm, Class II, <1 mW
Laser dot size	25 mm at a distance of 30 m
Measuring range	0.05 ... 40 m
Measuring speed	2 measurements per second
Housing dimensions (length x width x height)	98 mm x 36 mm x 23 mm
Weight (batteries included)	75.7 g
Battery life (alkaline batteries)	up to 10 000 measurements
Operation	
Operating temperature	-5 ... 40 °C (do not permanently expose the device to sunlight)
Max. relative air humidity	85 % RH
Operating conditions	To be used inside or outside buildings, in each case in dry environments
Storage (remove the batteries from the device)	
Ambient temperature	-20 ... 60 °C (do not permanently expose the device to sunlight)
Max. relative air humidity	85 % RH

Table 10: Technical data

8 Disposal and environmental protection



At the end of product life, dispose of the unserviceable device and the batteries via appropriate collecting facilities provided in your community.

Index

A

Area calculation	18
------------------	----

B

Basic knowledge	6
Battery	
Replacing	22
BENNING LD 60	6

C

Cleaning	21
Continuous measurement	17
Copyright	2

D

Device	
Cleaning	21
Securing	11
Digital display	13
Disclaimer	2, 10
Disposal	24
Documentation	2

E

Environmental protection	24
Error messages	15

F

Further information	6
---------------------	---

H

History	7
Holder of rights	2

I

Indirect length calculation	20
Intended use	10

K

Key functions	14
---------------	----

L

LD 60	6
Length measurement (continuous measurement)	17
Length measurement (single measurement)	16

M

Maintenance	21
Maintenance schedule	21
Manufacturer	2
Measurement	
Requirements	16
Measuring functions	14
Measuring ranges	
Length measuring ranges	15
Measuring units	15
Menus	14

N

Non-discrimination	2
--------------------	---

O

Operation	16
-----------	----

P

Purpose of the operating manual	7
---------------------------------	---

R

Rear panel of the device	13
Reference plane	15
Return address	8
Returns management	8

S

Scope of delivery	12
Securing	11
Service & Support	
Technical Support	8
Single measurement	16
Standards applied	9
Symbols	
Device	10
Operating manual	10

T

Target group	6
Technical data	23
Technical Support	8
Trademarks	7

V

Volume calculation	19
--------------------	----

W

Warning system	9
Warranty	10

The text and illustrations correspond to the state of technology at the time of printing. Subject to technical changes. No liability accepted for printing errors.



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