



GLM Professional

100-25 C

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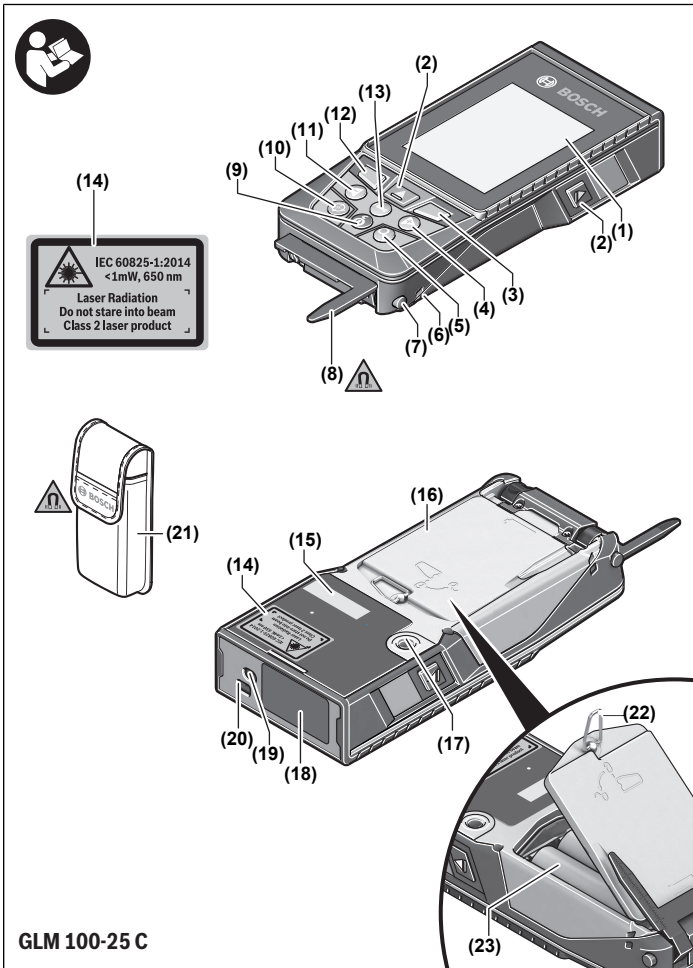
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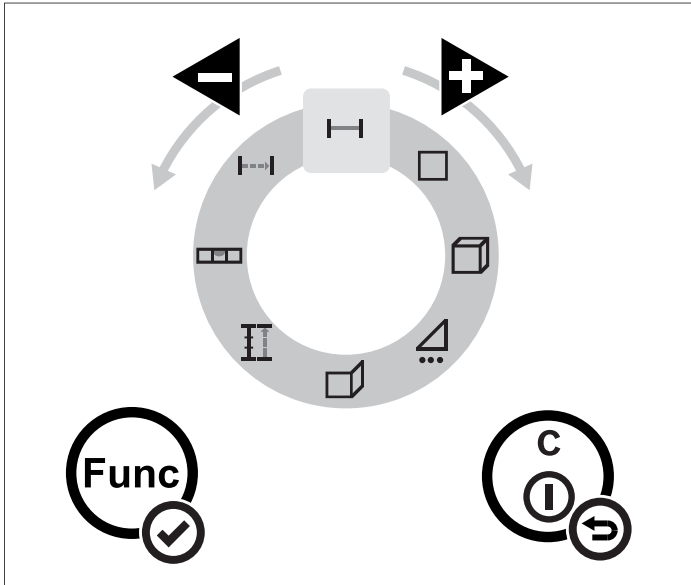
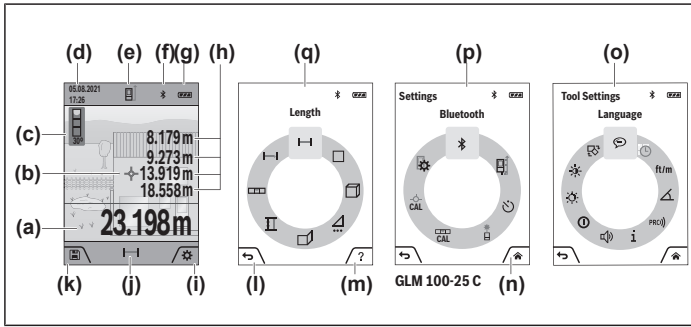


- en Original instructions
- zh 原始使用說明書
- ko 사용 설명서 원본
- th หนังสือคู่มือการใช้งานฉบับต้นแบบ
- id Petunjuk-Petunjuk untuk Penggunaan Orisinal
- vi Bản gốc hướng dẫn sử dụng



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English

Safety Instructions



All instructions must be read and observed in order for the measuring tool to function safely. The safeguards integrated into the measuring tool may be compromised if the measuring tool is not used in accordance with these instructions. Never make warning signs on the measuring tool unrecognisable. **SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE AND INCLUDE THEM WITH THE MEASURING TOOL WHEN TRANSFERRING IT TO A THIRD PARTY.**

- ▶ **Warning!** If operating or adjustment devices other than those specified here are used or other procedures are carried out, this can lead to dangerous exposure to radiation.
- ▶ The measuring tool is delivered with a laser warning sign (marked in the illustration of the measuring tool on the graphics page).
- ▶ If the text of the laser warning label is not in your national language, stick the provided warning label in your national language over it before operating for the first time.



Do not direct the laser beam at persons or animals and do not stare into the direct or reflected laser beam yourself. You could blind somebody, cause accidents or damage your eyes.

- ▶ If laser radiation hits your eye, you must close your eyes and immediately turn your head away from the beam.
- ▶ Do not make any modifications to the laser equipment.
- ▶ Do not use the laser goggles (accessory) as protective goggles. The laser goggles make the laser beam easier to see; they do not protect you against laser radiation.
- ▶ Do not use the laser goggles (accessory) as sunglasses or while driving. The laser goggles do not provide full UV protection and impair your ability to see colours.
- ▶ Have the measuring tool serviced only by a qualified specialist using only original replacement parts. This will ensure that the safety of the measuring tool is maintained.

- ▶ **Do not let children use the laser measuring tool unsupervised.** They could unintentionally blind themselves or other persons.
- ▶ **Do not use the measuring tool in explosive atmospheres which contain flammable liquids, gases or dust.** Sparks may be produced inside the measuring tool, which can ignite dust or fumes.
- ▶ **The measuring tool is equipped with a wireless interface. Local operating restrictions, e.g. in aeroplanes or hospitals, must be observed.**

The *Bluetooth*[®] word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Robert Bosch Power Tools GmbH is under license.

- ▶ **Caution! When using the measuring tool with *Bluetooth*[®], a fault may occur in other devices and systems, aeroplanes and medical devices (e.g. pacemakers, hearing aids). Also, damage to people and animals in the immediate vicinity cannot be completely excluded. Do not use the measuring tool with *Bluetooth*[®] in the vicinity of medical devices, petrol stations, chemical plants, areas with a potentially explosive atmosphere and in blasting areas. Do not use the measuring tool with *Bluetooth*[®] on aeroplanes. Avoid using the product near your body for extended periods.**
- ▶ **Do not use the measuring tool to photograph any people or animals, as this can involve the laser beam being continuously switched on.** You could blind somebody or cause accidents or eye damage with the laser beam switched on.
- ▶ **Do not use the measuring tool if the display glass is visibly damaged (e.g. cracks in the surface, etc.).** This poses a risk of injury.



Keep the measuring tool and the magnetic accessories away from implants and other medical devices, e.g. pacemakers or insulin pumps. The magnets inside the measuring tool and accessories generate a field that can impair the function of implants and medical devices.

- ▶ **Keep the measuring tool and the magnetic accessories away from magnetic data storage media and magnetically sensitive devices.** The effect of the magnets inside the measuring tool and accessories can lead to irreversible data loss.

Product Description and Specifications

Please unfold the fold-out page with the diagram of the measuring tool and leave it open while reading the instruction manual.

Intended Use

The measuring tool is intended for measuring distances, lengths, heights, clearances and inclines, and for calculating areas and volumes.

The measuring tool is suitable for indoor and outdoor use.

The measuring results can be transferred to other devices via *Bluetooth*®.

Product Features

The numbering of the product features refers to the representation of the measuring tool in the images.

- (1) Display
- (2) ▲ Measuring button
- (3) ▀ Right soft button
- (4) ▶ Plus button
- (5) 🔍 Zoom button
- (6) Carrying strap mount
- (7) Stop pin release button
- (8) Stop pin
- (9) Ⓞ On/off button
- (10) ⊕ Target display button
- (11) ◀ Minus button
- (12) ▄ Left soft button
- (13) Func Function button
- (14) Laser warning label
- (15) Serial number
- (16) Battery compartment cover
- (17) 1/4" tripod thread
- (18) Reception lens
- (19) Laser beam output

- (20) Camera
- (21) Protective bag
- (22) Screw cap
- (23) Non-rechargeable batteries
- (24) Laser target plate^{A)}
- (25) Laser viewing glasses^{A)}
- (26) Tripod^{A)}

A) **Accessories shown or described are not included with the product as standard. You can find the complete selection of accessories in our accessories range.**

Display elements

- (a) Result line
- (b) Target display (crosshairs)
- (c) Slope angle display
- (d) Date/time
- (e) Reference level of measurement
- (f) *Bluetooth*[®] status
 - ✖ *Bluetooth*[®] not activated
 - ✱ *Bluetooth*[®] activated, connection established
- (g) Battery charge indicator
- (h) Measured value lines
- (i) Basic settings
- (j) Measuring function display
- (k) Internal Memory
- (l) Back
- (m) Integrated help function
- (n) Start screen
- (o) Further basic settings menu
- (p) Basic settings menu
- (q) Measuring functions menu

Technical data

| Digital laser measure | GLM 100-25 C |
|--|-------------------------------|
| Article number | 3 601 K72 Y.. |
| Measuring range ^{A)} | 0.08–100 m |
| Measuring range (unfavourable conditions) ^{B)} | 0.08–60 m |
| Measuring accuracy ^{A)} | ± 1.5 mm |
| Measuring accuracy (unfavourable conditions) ^{B)} | ± 3.0 mm |
| Smallest display unit | 0.5 mm |
| Indirect distance measurement and spirit level | |
| Measuring range | 0°–360° (4 × 90°) |
| Grade measurement | |
| Measuring range | 0°–360° (4 × 90°) |
| Measuring accuracy ^{C)D)} | ± 0.2° |
| Smallest display unit | 0.1° |
| General | |
| Operating temperature ^{E)} | –10 °C to +45 °C |
| Storage temperature | –20 °C to +70 °C |
| Relative air humidity max. | 90 % |
| Max. altitude | 2000 m |
| Pollution degree according to IEC 61010-1 | 2 ^{F)} |
| Laser class | 2 |
| Laser type | 650 nm, < 1 mW |
| Divergence of the laser beam | < 1.5 mrad (full angle) |
| Automatic switch-off after approx. | |
| – Laser | 20 s |
| – Measuring tool (without measurement) | 5 min |
| Non-rechargeable batteries | 3 × 1.5 V LR6 (AA) |
| Weight according to EPTA-Procedure 01:2014 | 0.23 kg |
| Protection rating | IP 54 (dust and splash-proof) |
| Dimensions | 142 (176) × 64 × 28 mm |

Data transmission

| | |
|---------------------------|---|
| Bluetooth® | Bluetooth® 4.2 Low Energy ⁽¹⁾ |
| Operating frequency range | 2402–2480 MHz |
| Max. transmission power | 8 mW |

- A) When measuring from the front edge of the measuring tool, this applies for high reflectivity of the target (e.g. a wall painted white), weak background lighting and a 25 °C operating temperature; a distance-dependent deviation of ± 0.05 mm/m must additionally be factored in.
- B) When measuring from the front edge of the measuring tool, this applies for high reflectivity of the target (e.g. a wall painted white), strong background lighting, 25 °C operating temperature and large altitudes. In addition, a deviation of ± 0.15 mm/m must be taken into account, depending on the distance.
- C) At an operating temperature of 25 °C
- D) After user calibration at 0° and 90°; An additional grade error of $\pm 0.01^\circ/\text{degree}$ to 45° (max.) has to be taken into account. The left-hand side of the measuring tool serves as the reference level for grade measurement.
- E) In continuous measurement mode, the max. operating temperature is +40 °C.
- F) Only non-conductive deposits occur, whereby occasional temporary conductivity caused by condensation is expected.
- G) When using Bluetooth® Low Energy devices, it may not be possible to establish a connection depending on the model and operating system. Bluetooth® tools must support the GATT profile.



The serial number **(15)** on the type plate is used to clearly identify your measuring tool.

Inserting/Changing the Battery

Using alkali-manganese or nickel metal hydride rechargeable batteries (especially at low operating temperatures) is recommended for operation of the measuring tool.

With 1.2 V rechargeable batteries, more measurements may be possible than with 1.5 V batteries, depending on the capacity.

- » Press the release button **(7)** and swing out the stop pin **(8)** by 180°.
- » To open the battery compartment cover **(16)**, flip the screw cap **(23)** up and turn it a quarter rotation anticlockwise.
- » Lift the battery compartment cover **(16)** on the screw cap **(23)**.
- » Insert the batteries or rechargeable batteries.

-  Always replace all the batteries/rechargeable batteries at the same time. Only use batteries/rechargeable batteries from the same manufacturer and which have the same capacity.
-  When inserting the batteries, ensure that the polarity is correct according to the illustration on the inside of the battery compartment.

When the empty battery symbol first appears on the display, only a limited number of measurements are still possible.

When the battery symbol is empty and flashes red, no further measurements are possible. Replace the batteries or rechargeable batteries.

- ▶ **Take the batteries out of the measuring tool when you are not using it for a prolonged period of time.** The batteries can corrode and self-discharge during prolonged storage.


Operation

Start-Up

- ▶ **Never leave the measuring tool unattended when switched on, and ensure the measuring tool is switched off after use.** Others may be dazzled by the laser beam.
- ▶ **Protect the measuring tool from moisture and direct sunlight.**
- ▶ **Do not expose the measuring tool to any extreme temperatures or variations in temperature.** For example, do not leave it in a car for extended periods of time. In case of large variations in temperature, allow the measuring tool to adjust to the ambient temperature before putting it into operation. The precision of the measuring tool may be compromised if exposed to extreme temperatures or variations in temperature.
- ▶ **Avoid substantial knocks to the measuring tool and avoid dropping it.** After strong external influences on the measuring tool, you should always carry out an accuracy check (see "Accuracy Check", page 36) before further work.

Switching On and Off

- » Press the  button to switch the measuring tool and the laser on.

You can also switch on the measuring tool without the laser by pressing the  button.

- » Press and hold the  button to switch off the measuring tool.

The measured values and device settings in the memory are retained.

Camera



Press the  button to switch the camera on or off.

The selected setting remains saved after you switch off the measuring tool.

For larger distances (approx. > 5 m), a target marking is additionally shown for marking the measuring point.

Optimisation of the Visibility of the Laser Point


Especially when using the measuring tool outdoors in direct sunlight, but also for long stretches indoors, it may be that the laser point is not visible. Switch the camera on. The visibility of the laser point/measurement target can additionally be improved by:

- Setting the display brightness (see "Setting Display Brightness ", page 20)
- Use of zoom with the button 

Measuring Process

Once switched on, the measuring tool is in the length measurement function.

Once the measuring tool has been switched on, the rear edge of the measuring tool is selected as the reference level for measurement. You can change the reference level. (see "Selecting the Reference Level", page 13)


- » Apply the measuring tool to the point at which you want to start the measurement (e.g. wall).
- » Press the  button to start the measurement.


Once the measurement process is complete, the laser beam will switch off. For a further measurement, repeat this process.


Measured values or end results can be added or subtracted.


The measured value typically appears within 0.5 s and at the latest after approx. 4 s.

The duration of the measurement depends on the distance, the lighting conditions and the reflective properties of the target surface. Once the measurement process is complete, the laser beam will automatically switch off.

With a switched-on permanent laser beam and in the continuous measurement function, the measurement begins immediately after the first press of the  button.

The switched-on permanent laser beam is not switched off after the measurement (see "Permanent Laser Beam ", page 16).

 The measuring tool must not be moved during a measurement. Therefore, place the measuring tool, as far as this is possible, against or on a firm stop or supporting surface.

-  The reception lens **(18)**, the laser beam output **(19)** and the camera **(20)** must not be covered during the measuring process.

Influences on the Measuring Range

The measuring range depends on the lighting conditions and the reflective properties of the target surface.

For better visibility of the laser beam in strong foreign light, use the integrated camera **(20)**, the laser viewing glasses **(26)** (accessory) and the laser target plate **(25)** (accessory), or shade the target surface.

Influences on the measurement result

Due to physical effects, incorrect measurements are possible when measuring on various surfaces. These include:



- Transparent surfaces (e.g. glass, water)
- Reflective surfaces (e.g. polished metal, glass)
- Porous surfaces (e.g. insulation materials)
- Structured surfaces (e.g. roughcast, natural stone)

If necessary, use the laser target plate **(25)** (accessory) on these surfaces.

Incorrect measurements are also possible on slanted target surfaces.

Likewise, layers of air with different temperatures or indirectly received reflections can influence the measured value.

Navigation in the Menu

In the menu, you can switch to the right with the  button and to the left with the  button.

To confirm a selection, press the  button or the  button.

Press the  button to exit the menu.

Selecting the Reference Level

For the measurement, you can select from various reference levels:



The rear edge of the measuring tool (e.g. when placing against walls)



The tip of the stop plate folded by 180° (e.g. for measurements from corners)



The front edge of the measuring tool (e.g. when measuring from a table edge)




The centre of the tripod thread **(17)** (e.g. for tripod measurements)

» Press the soft button  to open the **Basic settings** menu.

» Select .















» Use the  button or  button to select the required reference level.













» To confirm the selection, press the  button.

Swinging the stop pin **(8)** in and out by 180° is automatically detected and the corresponding reference level suggested. To confirm the selection, press the  button. The rear edge of the measuring tool is preset as the reference level every time the measuring tool is switched on.











Basic Settings Menu

In the **Basic settings** menu, you can find the following basic settings:

-  Switching on and off *Bluetooth*[®]
-  Changing the reference level (see "Selecting the Reference Level", page 13)
-  Timer
-  Switching on and off permanent laser beam
-  Grade measurement calibration (see "Accuracy Check", page 36)
-  Target display calibration
-  Setting the language
-  Setting Date & Time
-  Changing the unit of measurement
-  Changing the Unit of Measurement of an Angle
-  PRO) Activating PRO360
-  Calling up Device Information
-  Switching audio signals on and off
-  Adjusting the Cut-Off Time









-  Adjusting the Dimming Time
 -  Setting display brightness
 -  Switching automatic screen rotation on and off
- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
 - » Use the  button or  button to select the required setting.
 - » To confirm a selection, press the  button.
 - » To exit the **Basic settings**  menu, press the  button or the  button.

Switching On and Off Bluetooth®

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select .
- » To change the selection, press the  button or the  button.
- » To confirm the selection, press the  button.
- » To exit the **Basic settings**  menu, press the  button or the  button.

Timer


The timer function helps, for instance, with measuring at difficult-to-access points, or should measuring tool movements be prevented during the measurement.




- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select .
- » Select the required time span from release to measurement and confirm with the  button or the  button.
- » Press the  button to switch on the laser beam and aim for the target point.
- » Press the  button again to start the measurement.

Measurement follows after the selected time span. The measured value is displayed in the result line **(a)**. The time span from release to measurement is displayed in the status bar at the top.



Continuous measurement and minimum/maximum measurement are not possible when the timer function is set. The timer stays set until the measuring tool is switched off or until the timer is switched off in the "Settings" menu.

Permanent Laser Beam




The laser beam can be set to be permanently switched on. In this setting, the laser beam also remains switched on between measurements. Just a single brief press of the  button is necessary for measuring.

» Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.

» Select .




» To change the selection, press the  button or the  button.

» To confirm the selection, press the .



» To exit the **Basic settings**  menu, press the  button or the .



The continuous laser beam can be switched off again in the settings or automatically when the measuring tool is switched off.

Setting the Language




» Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.

» Select the **Tool settings**  menu.










» Select  and confirm the selection with the .

» To change the selection, press the  button or the .

» To confirm the selection, press the .











» To exit the **Basic settings**  menu, press the  button or the .

Date & time

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the Tool settings menu .
- » Select .
- » Set the date and time according to the instructions on the display and confirm with the .
- » To exit the **Basic settings**  menu, press the  button or the .

Changing the Unit of Measurement ft/m








The default unit of measurement is "m" (metres).

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select ft/m.
- » To change the selection, press the  button or the  button.
- » To confirm a selection, press the .
- » To exit the **Basic settings**  menu, press the  button or the .

The selected device setting remains saved after you switch off the measuring tool.

Changing the Unit of Measurement of an Angle

Basic setting is the angle unit ^{nom} (degrees).

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the **Tool settings** .
- » Select .
- » To change the selection, press the  button or the .








- » To confirm the selection, press the **Func** button.
 - » To exit the **Basic settings**  menu, press the **C** button or the  button.
- The selected device setting remains saved after you switch off the measuring tool.

PRO360 PRO)

Initial activation is required. Data can only be transferred using a suitable app or computer program. PRO360 can be deactivated again at any time.






GLM 100-25 C: After changing the battery, the measuring tool must be switched on once to restart PRO360.

You can find additional information about PRO360 at www.pro360.com.












- » Briefly press the  button or press and hold the **Func** button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select PRO).
- » To change the selection, press the  button or the  button.
- » To confirm a selection, press the **Func** button.
- » To exit the **Basic settings**  menu, press the **C** button or the  button.

Device Information

Here you will find information about the measuring tool, such as the serial number, software version and licences.












- » Briefly press the  button or press and hold the **Func** button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select **i** .
- » To exit the **Basic settings**  menu, press the **C** button or the  button.

Switching audio signals on and off

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select .
- » To change the selection, press the  button or the  button.
- » To confirm a selection, press the .
- » To exit the **Basic settings**  menu, press the  button or the  button.






Adjusting the Cut-Off Time

The automatic cut-off time is adjustable: 2, 5, 10 minutes or never.

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select .
- » To change the selection, press the  button or the  button.
- » To confirm the selection, press the .
- » To exit the **Basic settings**  menu, press the  button or the .

Adjusting the Dimming Time












The display illumination is continuously switched on. If no button is pressed, the display lighting is dimmed after approx. 30 seconds to preserve the rechargeable battery. The time until the start of dimming is adjustable.

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select .

- » To change the selection, press the  button or the  button.
- » To confirm the selection, press the  button.
- » To exit the **Basic settings**  menu, press the  button or the  button.












Setting Display Brightness

The brightness of the display can be adjusted to the environmental conditions with several settings.

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select .
- » To change the selection, press the  button or the  button.
- » To confirm the selection, press the  button.
- » To exit the **Basic settings**  menu, press the  button or the  button.

Switching Automatic Screen Rotation On and Off













When automatic screen rotation is switched on, the display on the screen rotates automatically when you turn the measuring tool.


- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select the **Tool settings**  menu.
- » Select .
- » To change the selection, press the  button or the  button.
- » To confirm the selection, press the  button.
- » To exit the **Basic settings**  menu, press the  button or the  button.

Measuring functions



Selecting/Changing Measuring Function

You will find the following functions in the Functions menu:

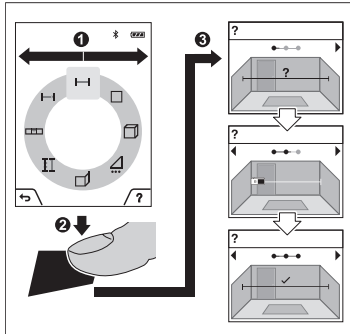
-  Length measurement
-  Area measurement
-  Volume measurement
-  Indirect distance measurement
 -  Indirect height measurement
 -  Double indirect height measurement
 -  Indirect length measurement
 -  Trapezoid measurement
-  Wall area measurement
-  Stake-out function
-  Grade measurement/digital spirit level
-  Continuous measurement

» Press the  button to open the **Functions** menu.

» Use button  or button  to select the required measuring function.

» To confirm the selection, press the  button or the  button.

Integrated help function ?



The help function integrated in the measuring tool offers detailed animations for individual measuring functions/measuring processes.

- » Open the **Functions** menu.
 - » Select the required function with the **▶** button or with the **◀** button and press the **■** button.
- The animation shows the detailed procedure for the selected measuring function.
- » Press the **■** button to stop the anima-

tion or to continue the animation.

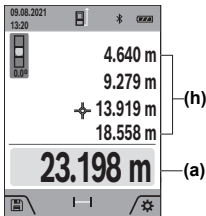
- » Press the **▶** button or the **◀** button to display the next or the previous step.

Length measurement **↔**

- » Press the **Func** button to open the **Functions** menu.
- » Select the length measurement **↔** and confirm the selection with the **Func** button.
- » Briefly press the **▲** button to switch on the laser.
- » Press the **▲** button to start the measurement.

The measured value is displayed in the result line **(a)** at the bottom of the display.

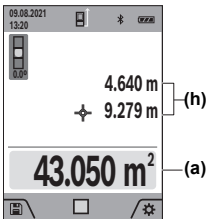
- » Repeat the above-mentioned steps for each subsequent measurement.



If several length measurements are taken in a row, the results of the last measurements are displayed in the measured value lines **(h)**. The last measured value is at the bottom of the display, the penultimate measured value is above it, and so on.

Area measurement


- » Press the **Func** button to open the **Functions** menu.
- » Select area measurement and confirm the selection with the **Func** button.
- » Briefly press the **▲** button to switch on the laser.
- » Press the **▲** button to start the first measurement, e.g. the length of a room.
- » Press the **▲** button to start the second measurement, e.g. the width of a room.




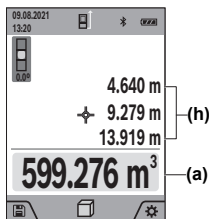
After the second measurement has been completed, the area will be automatically calculated and displayed. The result is displayed in the result line **(a)**. The individual measured values are in the measured value lines **(h)**.

Volume measurement

- » Press the **Func** button to open the **Functions** menu.
- » Select volume measurement and confirm the selection with the **Func** button.
- » Briefly press the **▲** button to switch on the laser.
- » Press the **▲** button to start the first measurement, e.g. the length of a room.

» Press the  button to start the second measurement, e.g. the width of a room.

» Press the  button to start the third measurement, e.g. the height of a room.




After the third measurement has been completed, the volume will be automatically calculated and displayed. The result is displayed in the result line **(a)**. The individual measured values are in the measured value lines **(h)**.

Indirect distance measurement





Indirect distance measurement is used to measure distances that cannot be measured directly because an obstacle would obstruct the laser beam or no target surface is available as a reflector. This measuring procedure can only be used in a vertical direction. Any deviation in a horizontal direction leads to measuring errors.

Indirect distance measurement is always less accurate than direct distance measurement. For application-related reasons, measuring errors can be greater than with direct distance measurement. To improve measuring accuracy, the use of a tripod (accessory) is recommended.

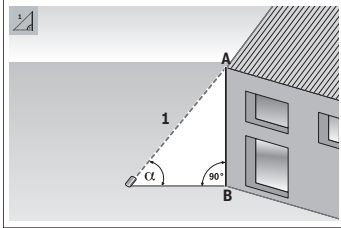
 When using a tripod, observe the set reference level. (see "Selecting the Reference Level", page 13)

The laser beam remains switched on between the individual measurements.

For indirect distance measurement, **4** measuring functions are available, with which different sections can be respectively determined:








-  Indirect height measurement
-  Double indirect height measurement
-  Indirect length measurement
-  Trapezoid measurement

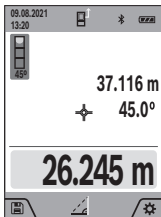
Indirect Height Measurement



With indirect height measurement, you can determine distance **AB** by measuring distance **1**. The measuring tool calculates the required height **AB** from angle α and distance **1**.

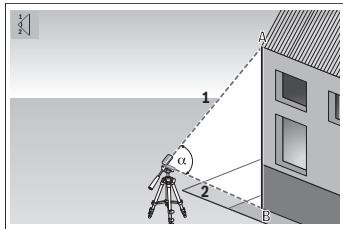
Correct results are achieved only when the right angle required for the respective measurement is exactly adhered to.

- » Press the  button to open the **Functions** menu.
- » Select indirect distance measurement  and confirm the selection with the  button.
- » Select indirect height measurement  and confirm the selection with the  button.
- » Briefly press the  button to switch on the laser.
- » Place the measuring tool at the height of the lower measuring point **B**.
- » Tilt the measuring tool so that the laser is pointed at the upper measuring point **A**.
- » Press the  button to start the measurement.





After the measurement has been completed, the height will be automatically calculated and displayed in the result line **(a)**. The measured values for section **1** and angle α are in the measured value lines **(h)**.

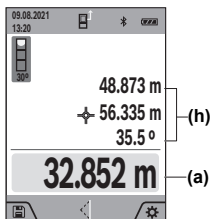
Double Indirect Height Measurement



With double indirect height measurement, you can determine distance **AB** by measuring distances **1** and **2**. The measuring tool calculates the required height **AB** from angle α and distances **1** and **2**.







The use of a tripod is recommended for this measurement.

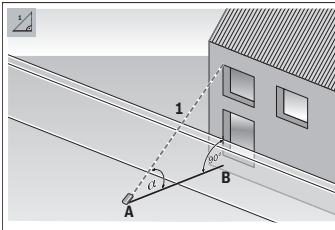
- » Press the **Func** button to open the **Functions** menu.
- » Select indirect distance measurement  and confirm the selection with the **Func** button.
- » Select double indirect height measurement  and confirm the selection with the **Func** button.
- » Briefly press the **▲** button to switch on the laser.
- » Tilt the measuring tool so that the laser is pointed at the upper measuring point **A**.
- » Press the **▲** button to start the first measurement.
- » Tilt the measuring tool so that the laser is pointed at the lower measuring point **B**. Do not change the position of the measuring tool when doing so.
- » Press the **▲** button to start the second measurement.



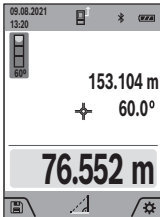
After the measurement has been completed, the height will be automatically calculated and displayed in the result line **(a)**. The measured values for section **1**, section **2** and angle α are in the measured value lines **(h)**.

Indirect Length Measurement

- » Press the  button to open the **Functions** menu.
- » Select indirect distance measurement  and confirm the selection with the  button.
- » Select indirect length measurement  and confirm the selection with the  button.
- » Put the measuring tool on the starting point **A** of the required distance **AB**.
- » Tilt the measuring tool so that the laser is aligned with the level of end point **B**.
- » Press the  button to start the measurement.

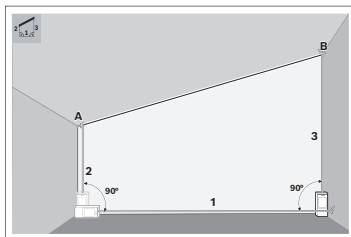


With indirect length measurement, you can determine distance **AB** by measuring distance **1**. The measuring tool calculates the required length **AB** from angle α and distance **1**.



After the measurement has been completed, the length will be automatically calculated and displayed in the result line **(a)**. The measured values for section **1** and angle α are in the measured value lines **(h)**.










Trapezoid Measurement

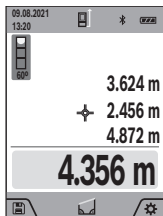


With trapezoid measurement, the length of a sloping roof can, for instance, be determined. You can determine section **AB** by measuring sections **1**, **2** and **3** in this order. The measuring tool calculates the required section **AB** from sections **1**, **2** and **3**.



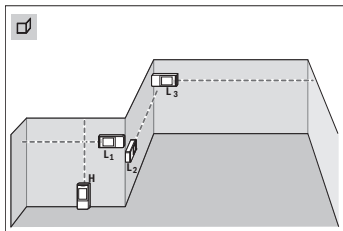
Ensure that the measurement of distance **3** begins exactly at the point where distance **1** ends that there is a right angle between both distances **1** and **2** and distances **1** and **3**.

- » Press the  button to open the **Functions** menu.
- » Select indirect distance measurement  and confirm the selection with the  button.
- » Select trapezoid measurement  and confirm the selection with the  button.
- » Briefly press the  button to switch on the laser.
- » Measure section **1** with the  button.
- » Measure section **2** with the  button.
- » Measure section **3** with the  button.






After the measurement has been completed, section **AB** will be automatically calculated and displayed in the result line **(a)**. The measured values for sections **1**, **2** and **3** are in the measured value lines **(h)**.

Wall Area Measurement



The wall area measurement is used to determine the sum of multiple individual areas with a common height. The requirement for a correct area calculation is that the first measured length (for example the ceiling height **H**) is identical for all sub-areas. In the illustrated example, the total area of several walls that have the same ceiling height **H** but different lengths **L** is to be determined.

- » Press the  button to open the **Functions** menu.
- » Select wall area measurement  and confirm the selection with the  button.
- » Measure the ceiling height **H** as for a length measurement.

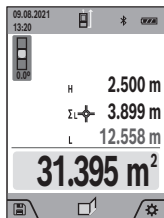
The measured value is displayed in the top measured value line. The laser remains switched on.

- » Afterwards measure the length **L1** of the first wall.

The area is automatically calculated and displayed in the result line. The last measured value for length can be found in the bottom measured value line. The laser remains switched on.


- » Now measure the length **L2** of the second wall.

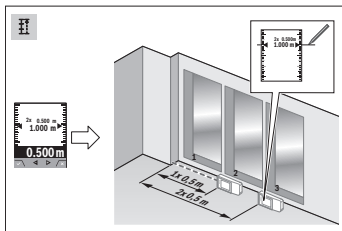
You can measure any number of lengths **LX**, which will be automatically added and multiplied by the height **H**.



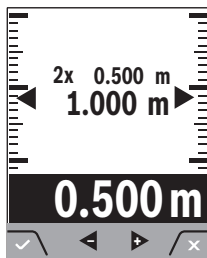
The individual measured value displayed in the measured value line (**h**) is added to the length **L1**. The sum of the two lengths (displayed in the middle measured value line (**h**)) is multiplied by the saved height **H**. The total area value is shown in the result line (**a**) at the bottom of the display.







Stake-Out Function



-  In the stake-out function, the reference level is the marking shown in the display. The reference level is not the edge of the measuring tool.




The stake-out function repeatedly measures a defined length (distance). These lengths can be transferred to a surface, for example to enable material to be cut into pieces of equal length or to install stud walls in a dry-wall construction. The minimum adjustable length is 0.1 m and the maximum length is 50 m.




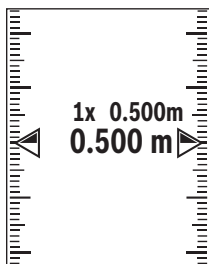
- » Press the  button to open the **Functions** menu.
- » Select stake-out function  and confirm the selection with the  button.
- » Press the  button to set the required length.
- » Use the  button or the  button to set the required length.

Press and hold the  button or the  button to change the length by larger increments.

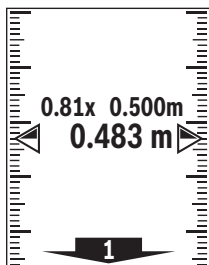
- » Press the  button to start the stake-out function and distance yourself slowly from the starting point.

The measuring tool continuously measures the distance to the starting point. The defined length and the current measured value are thereby displayed. The lower or upper arrow displays the shortest distance to the next or previous marking.

With continuous measurement, you can also establish a measured value as a defined length by pressing and holding the  button.






The left factor specifies how many times the defined length has already been reached. The green arrows on either side of the display indicate the reaching of a length for marking purposes.

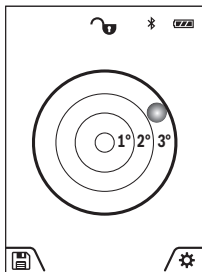


Red arrows and red text indicate the actual value when the reference is outside the display.

Grade Measurement/Digital Spirit Level

The digital spirit level is used to check the horizontal or vertical alignment of an object (e.g. washing machine, refrigerator, etc.). Grade measurement is used to measure a slope or incline (e.g. of stairs, railings, when fitting furniture, laying pipes, etc.). The measuring tool automatically switches between the two functions when you change the position of the measuring tool.

- » Press the  button to open the **Functions** menu.
- » Select grade measurement/digital spirit level  and confirm the selection with the .

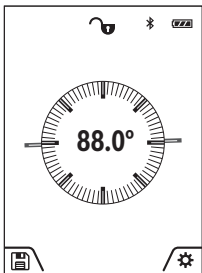


The bottom of the measuring tool is used as the reference level for the digital spirit level.

» To use the digital spirit level, place the measuring tool with the rear side on the surface to be measured.

You can freeze the measured value by pressing the ▲ button.

» When the inclination exceeds 3°, the ball in the display lights up red.



The left-hand side of the measuring tool serves as the reference level for grade measurement. If the display flashes during measurement, the measuring tool has been tipped too heavily to the side.

» To use the grade measurement, place the measuring tool with one side on the object to be measured.

You can freeze the measured value by pressing the ▲ button.

Continuous Measurement \rightarrow

During continuous measurement, the measured value is continually updated. You can, for example, move a required distance away from a wall while reading off the current distance at all times.

» Press the **Func** button to open the **Functions** menu.

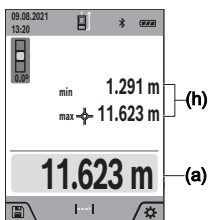
» Select continuous measurement \rightarrow and confirm the selection with the **Func** button.

» Briefly press the ▲ button to switch on the laser.

» Move the measuring tool until the required distance is displayed in the result line.

You can interrupt the continuous measurement by briefly pressing the ▲ button.

» Press the ▲ button again to continue the continuous measurement.



The current measured value is displayed in the result line **(a)**, and the maximum and the minimum measured value in the measured value lines **(h)**.

Continuous measurement switches off automatically after **5 min**.

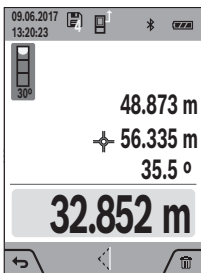
Memory Function

The value or end result of each completed measurement is automatically saved. The last **50** values (measured values or end results) are saved. If the memory is full, the oldest value will be overwritten. The oldest value is at position 1 in the memory, the newest value at position **50** (for **50** available memory values).

» To open the memory function, press the  button.


The last value will be displayed.

» Press the  button or  button to scroll through the saved values.



The number of the memory value is shown at the top of the display, and the symbol of the corresponding measuring function is shown on the left. If there is no value available in the memory, "0.000" is shown at the bottom of the display and "0" at the top.

Deleting Memory Values


» To delete the displayed value, press the  button.

» Confirm with the  button.

To delete all saved values, select the **Delete memory** menu item in the **Basic settings**  menu. Deleting Memory


Adding/Subtracting Values

Adding Values During Length Measurement


- » Select the length measurement function.
- » Take the first measurement.
- » Press the  button.
- » Take the second measurement.

As soon as the second measurement has been completed, the result of the second measurement is displayed in the measured value lines (**h**) and the end result in the result line (**a**).

Adding Values During Area and Volume Measurement


- » Select the area measurement or volume measurement function.
- » Take the first area measurement or volume measurement.
- » Press the  button.
- » Take the second area measurement or volume measurement.

As soon as the second or third measurement has been completed, the area or volume is automatically calculated and displayed. The result is displayed in the result line (**a**). The individual measured values are in the measured value lines (**h**).

- » Press the  button to show the end result of the addition.

The end result is displayed in the result line (**a**). The results of the individual area or volume measurements are in the measured value lines (**h**).

Subtracting Values

- » Press the  button to subtract values. The subsequent steps are the same as for the section on "adding values".

Deleting Measured Values

You can delete the most recently recorded measured value in all measuring functions by briefly pressing button **(c)**.

By pressing the **(c)** button briefly multiple times, the measured values are deleted in reverse order.

Bluetooth® interface

Transmitting data to other devices

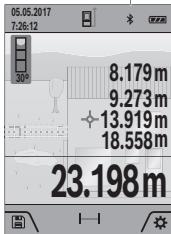
The measuring tool is fitted with a *Bluetooth*® module which enables wireless data transfer to certain mobile devices with a *Bluetooth*® interface (e.g. smartphone, tablet).

Information about the system requirements for a *Bluetooth*® connection can be found on the Bosch website at www.bosch-pt.com

► Further information can be found on the Bosch product page.

When transmitting data by means of *Bluetooth*®, time lags may occur between the mobile device and the measuring tool. This can be due to the distance between the two devices or the measurement object itself.

Activating the *Bluetooth*® interface for transmitting data to a mobile device



✓ Ensure that the *Bluetooth*® interface is activated on your mobile device.

» Briefly press the **(f)** button or press and hold the **(Func)** button to open the **Basic settings** menu.

» Select .

» Press the **(▶)** button or the **(◀)** button to select .









» To confirm the selection, press the **(Func)** button.

The *Bluetooth*® symbol is shown on the display in white **(f)**.

Bosch apps are available to expand the range of functions. These can be downloaded in the respective app stores, depending on the device.

The connection between mobile device and measuring tool is established after the Bosch application has started. If multiple active measuring tools are found, select the appropriate measuring tool using the serial number. You can find the serial number **(15)** on your measuring tool's type plate.

Deactivating the *Bluetooth*® interface

- » Briefly press the  button or press and hold the  button to open the **Basic settings**  menu.
- » Select .
- » Press the  button or the  button to select .
- » To confirm the selection, press the .

The *Bluetooth*® symbol is shown on the display in grey.




Accuracy Check


Regularly check the accuracy of the grade measurement and distance measurement.

Accuracy Check and Calibration of the Grade Measurement

- » To do this, lay the measuring tool on a table and measure the inclination.
- » Turn the measuring tool by 180° and measure the inclination again.

The difference between the displayed values must not exceed 0.3°. In case of greater deviation, the measuring tool must be recalibrated.

- » Press and hold the  button to call up the **Basic functions** menu.
- » Select  and confirm the selection with the .
- » Follow the instructions on the display.

 After strong temperature changes and after knocks, we recommend an accuracy check and, if necessary, calibration of the measuring tool. After a temperature variation, the measuring tool must adjust to the ambient temperature for a while before calibration is performed.

Accuracy check of the distance measurement

For the accuracy check, the measurement should be taken under favourable conditions, i.e. the measuring section should be indoors and the target surface for the measurement should be smooth and reflect well (e.g. a white-painted wall).

- » Select a measuring section of approx. **3 to 10 m** long, the length of which you know exactly (e.g. room width, doorway).

- » Measure the section 10 times in succession.




The deviation of individual measurements from the average may be maximum ± 2 mm throughout the entire measuring section under favourable conditions. Log the measurements, so that you can compare their accuracy at a later point of time.

Checking accuracy and calibrating the target indicator (crosshairs)

Regularly check the accuracy of alignment of laser and target display.

- » To do so, select a light surface with lighting as weak as possible (e.g. a white wall) at a distance of at least 5 m as a target.
- » On the display, check whether the laser point is within the target display.
If the laser point is not within the target display, you must recalibrate the target display.

Recalibrating Target Display

- » Press and hold the  button to get to the **Basic functions** menu.
- » Select  and confirm the selection with the .
- » Follow the instructions on the display.

Working with the tripod (accessory)

The use of a tripod is helpful, particularly for greater distances.

- » Place the measuring tool with the 1/4" thread **(17)** on the quick-release plate of the tripod **(27)** or of a commercially available camera tripod.
- » Tighten the measuring tool with the quick-release plate locking screw.
- » Set the reference level for measurements with a tripod (see "Selecting the Reference Level", page 13).

Error Message



The measuring tool monitors correct operation in every measurement. If a defect is detected, the display will indicate only the symbol shown opposite and the measuring tool switches itself off. In this case, have the measuring tool checked by an after-sales service agent for Bosch power tools.

Troubleshooting

Temperature Warning

Temperature warning flashes, measurement not possible

Cause: Measuring tool is outside the operating temperature of -10°C to $+45^{\circ}\text{C}$ (in the continuous measurement function up to $+40^{\circ}\text{C}$)

Corrective measure: Wait until the measuring tool reaches the operating temperature

"ERROR" in the Display

"ERROR" indicator in the display

Cause: Addition/subtraction of measured values with different units of measurement

Corrective measure: Add/subtract only measured values with the same units of measurement

Cause: Angle between laser beam and target is too sharp

Corrective measure: Increase the angle between the laser beam and target

Cause: Target surface is reflecting too strongly (e.g. mirror) or too weakly (e.g. black material), or ambient light is too strong

Corrective measure: Use a laser target plate (accessory)

Cause: Laser beam output **(19)** or reception lens **(18)** is fogged up (e.g. due to rapid temperature change)

Corrective measure: Rub the laser beam output **(19)** or the reception lens **(18)** dry with a soft cloth

Cause: Calculated value is larger than 1 999 999 or smaller than $-999\,999\text{ m}^2/\text{m}^3$

Corrective measure: Split the calculation into intermediate steps

Calibration

"CAL" indicator and "ERROR" indicator in the display

Cause: The calibration of the grade measurement was not carried out in the correct order or in the correct positions

Corrective measure: Repeat the calibration according to the instructions on the display and in the operating manual

Cause: The surfaces used for calibration were not exactly aligned on a horizontal or vertical level

Corrective measure: Repeat the calibration on a horizontal or vertical surface and check the surfaces beforehand, if necessary, using a spirit level

Cause: The measuring tool was moved or tilted when pressing the button

Corrective measure: Repeat the calibration and hold the measuring tool still on the surface while pressing the button

Measurement Result

Measurement result unreliable

Cause: Target surface is not reflecting clearly (e.g. water, glass)

Corrective measure: Cover the target surface

Cause: Laser beam output (19) or reception lens (18) is concealed

Corrective measure: Always keep the laser beam output (19) and the reception lens (18) clear

Measurement result implausible

Cause: Obstacle in the course of the laser beam

Corrective measure: Ensure that the laser point is fully on the target surface

Cause: Incorrect reference level set

Corrective measure: Select the reference level appropriate to the measurement

Bluetooth®

Bluetooth® cannot be activated

Cause: Non-rechargeable batteries or rechargeable batteries are too weak

Corrective measure: Replace the non-rechargeable batteries or charge the rechargeable battery of the measuring tool

No Bluetooth® connection

No Bluetooth® connection, "ERROR" indicator in the display

Cause: Disruption of the Bluetooth® connection

Corrective measure:

- Check whether *Bluetooth*® is activated (both on the measuring tool and on your mobile device)
- Switch *Bluetooth*® off and on again (both on the measuring tool and on your mobile device)
- Check the application on your mobile device
- Check your mobile device for overload
- Decrease the distance between the measuring tool and your mobile device
- Avoid obstacles (e.g. reinforced concrete, metal doors) between the measuring tool and your mobile device; keep your distance from electromagnetic sources of interference (e.g. Wi-Fi transmitters)

Maintenance and Service

Maintenance and Cleaning

Only store and transport the measuring tool in the protective bag provided.

Keep the measuring tool clean at all times.

Never immerse the measuring tool in water or other liquids.

Wipe off any dirt using a damp, soft cloth. Do not use any detergents or solvents.

Particularly clean the reception lens **(18)**, the laser outlet aperture **(19)** and the camera **(20)** very carefully. Ensure that no dirt is on the reception lens, the laser outlet aperture and the camera. Clean the reception lens, the laser outlet aperture and the camera only with means that are also suitable for lenses of photographic equipment. Do not try to remove dirt from or wipe the reception lens, the laser outlet aperture or the camera with sharp objects (danger of scratching).

If the measuring tool needs to be repaired, send it off in the protective bag **(21)**.

After-Sales Service and Application Service

Our after-sales service responds to your questions concerning maintenance and repair of your product as well as spare parts. You can find explosion drawings and information on spare parts at: **www.bosch-pt.com**

The Bosch product use advice team will be happy to help you with any questions about our products and their accessories.

In all correspondence and spare parts orders, please always include the 10-digit article number given on the nameplate of the product.

Malaysia

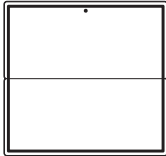
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Tel.: (03) 79663194
Toll-Free: 1800 880188
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E-Mail: kiathoe.chong@my.bosch.com
www.bosch-pt.com.my

You can find further service addresses at:

www.bosch-pt.com/serviceaddresses

Accessories

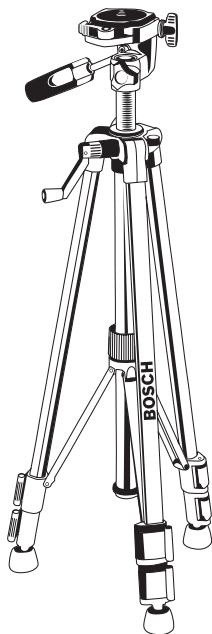
You can find the accessory on the Bosch website via the link given



Laser target plate **(24)**
2 607 001 391



Laser viewing glasses (red) **(25)**
1 608 M00 05B



BT 150 tripod (26)
0 601 096 B00

繁體中文

安全注意事項



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- ▶ 本測量工具出貨時皆有附掛雷射警示牌（即測量工具詳解圖中的標示處）。
- ▶ 雷射警示牌上的內容若不是以貴國語言書寫，則請於第一次使用前將隨附的當地語言說明貼紙貼覆於其上。



請勿將雷射光束對準人員或動物，您本人亦不可直視雷射光束或使雷射光束反射。因為這樣做可能會對他人眼睛產生眩光，進而引發意外事故或使眼睛受到傷害。

- ▶ 萬一雷射光不小心掃向眼睛，應立刻閉上眼睛並立刻將頭轉離光束範圍。
- ▶ 請勿對本雷射裝備進行任何改造。
- ▶ 請勿將雷射眼鏡當作護目鏡（配件）使用。雷射眼鏡是用來讓您看清楚雷射光束；但它對於雷射光照射並沒有保護作用。
- ▶ 請勿將雷射眼鏡當作護目鏡（配件）使用，或在道路上行進間使用。雷射眼鏡無法完全阻隔紫外線，而且還會降低您對於色差的感知能力。
- ▶ 本測量工具僅可交由合格的專業技師以原廠替換零件進行維修。如此才能夠確保本測量工具的安全性能。
- ▶ 不可放任兒童在無人監督之下使用本雷射測量工具。他們可能會不小心對他人或自己的眼睛造生眩光。
- ▶ 請不要在存有易燃液體、氣體或粉塵等易爆環境下操作本測量工具。測量工具內部產生的火花會點燃粉塵或氣體。
- ▶ 本測量工具配備無線介面。請您務必遵守不同場所的使用限制條件，例如在飛機或醫院內。

Bluetooth® 一詞及其標誌（商標）為 Bluetooth SIG, Inc. 所擁有之註冊商標。Robert Bosch Power Tools GmbH 對於此詞彙/標誌之任何使用均已取得授權。

- ▶ **小心！** 使用測量工具時若開啟 藍牙®（藍牙）功能，將可能對其他裝置或設備、飛機以及醫療器材（例如心律調節器、助聽器等）產生干擾。同樣亦無法完全排除對鄰近之人員或動物造成身體危害的可能性。請勿在醫療器材、加油站、化學設備、爆炸危險場所以及易爆環境等處附近，使用測量工具的 藍牙® 功能。請勿在飛機上使用測量工具的 藍牙® 功能。應避免直接貼靠在身體部位旁長時間持續操作。

- ▶ 請勿使用本測量工具對著人員或動物拍攝，因此雷射光束可能會全程啟動。雷射光束啟動時，可能會對眼睛產生眩光，進而引發意外事故或使眼睛受到傷害。
- ▶ 如果發現螢幕玻璃有受損跡象（例如表面裂痕等），請勿使用測量工具。人員有受傷之虞。



測量工具與磁性配件不得接近植入裝置以及諸如心律調節器或胰島素幫浦等其他醫療器材。測量工具和配件中含有磁鐵，形成的磁場可能干擾植入裝置和醫療器材運作。

- ▶ 請讓測量工具與磁性配件遠離磁性資料儲存裝置和易受磁場干擾的高靈敏器材。測量工具與配件內的磁鐵，形成的磁場可能造成無法挽救的資料遺失。

產品和規格

請翻開有顯示測量工具的折疊頁，在您閱讀操作說明書期間，保持此頁開啟。

依規定使用機器

該測量工具是用來測量距離、長度、高度、間距、傾角，並具有計算面積及體積之功能。






本測量工具可同時適用於室內及戶外應用。

測量結果可透過 藍牙®功能傳送至其他裝置。

插圖上的機件

機件的編號和儀器圖示上的編號一致。

- (1) 顯示器
- (2) ▲ 測量按鈕
- (3) ■ 右側螢幕按鈕
- (4) ▶ 加號按鈕
- (5) 🔍 縮放按鈕
- (6) 腕帶繫座
- (7) 止動銷壓解扣鈕

- (8) 止動銷
- (9)  電源開關
- (10)  標靶指示按鈕
- (11)  減號按鈕
- (12)  左側螢幕按鈕
- (13)  功能按鈕
- (14) 雷射警示牌
- (15) 序號
- (16) 電池盒蓋
- (17) 供三腳架使用的 1/4" 螺紋孔
- (18) 接收點
- (19) 雷射光束出口
- (20) 攝影機
- (21) 保護布袋
- (22) 轉鎖
- (23) 電池
- (24) 雷射標靶^{A)}
- (25) 雷射辨識鏡^{A)}
- (26) 三腳架^{A)}

A) 圖表或說明上提到的配件，並不包含在基本的供貨範圍中。本公司的配件清單中有完整的配件供應項目。

指示元件

- (a) 測量結果顯示列
- (b) 標靶指示 (十字交叉線)
- (c) 傾角指示器
- (d) 日期/時間
- (e) 測量基準點
- (f) 藍牙[®] 狀態

✱ 藍牙® 功能未啟用

✱)) 藍牙® 功能已啟用，已成功連線

- (g) 充電電量指示燈
- (h) 測量值顯示列
- (i) 基本設定
- (j) 測量功能指示器
- (k) 內部記憶體
- (l) 返回
- (m) 整合式輔助說明功能
- (n) 起始畫面
- (o) 進階基本設定選單
- (p) 基本設定選單
- (q) 測量功能功能表

技術性數據

| 數位雷射測距儀 | GLM 100-25 C |
|-----------------------------|-------------------|
| 產品機號 | 3 601 K72 Y.. |
| 測量範圍 ^{A)} | 0.08–100 m |
| 測量範圍（在不利條件下） ^{B)} | 0.08–60 m |
| 測量精度 ^{A)} | ±1.5 mm |
| 測量準確度（在不利條件下） ^{B)} | ±3.0 mm |
| 最小顯示單位 | 0.5 mm |
| 間接距離測量和水平儀 | |
| 測量範圍 | 0°–360° (4 × 90°) |
| 傾角測量 | |
| 測量範圍 | 0°–360° (4 × 90°) |
| 測量精度 ^{C)D)} | ±0.2° |
| 最小顯示單位 | 0.1° |
| 一般資訊 | |
| 操作溫度 ^{E)} | -10 °C ... +45 °C |
| 儲藏溫度 | -20 °C ... +70 °C |

| 數位雷射測距儀 | GLM 100-25 C |
|-----------------------------|------------------------------|
| 空氣相對濕度最大值 | 90 % |
| 最高適用海拔 | 2000 m |
| 根據 IEC 61010-1 之污染等級 | 2 ^F |
| 雷射等級 | 2 |
| 雷射種類 | 650 nm, < 1 mW |
| 雷射光束發散角 | < 1.5 mrad (全角度) |
| 自動關機的執行時間點 | |
| - 雷射 | 20 秒 |
| - 測量工具 (未進行測量) | 5 分 |
| 電池 | 3 × 1.5 V LR6 (AA) |
| 重量符合 EPTA-Procedure 01:2014 | 0.23 kg |
| 防護等級 | IP 54 (防塵防潑濺) |
| 尺寸 | 142 (176) × 64 × 28 mm |
| 資料傳輸 | |
| 藍牙® | 藍牙® 4.2 低功耗 ⁶⁾ |
| 工作頻率範圍 | 2402-2480 MHz |
| 最大發射功率 | 8 mW |

- A) 以測量工具前緣為測量起點、目標物反射率高 (例如白漆牆)、背景照明微弱、操作溫度為 25 °C；應額外再依距離誤差 ±0.05 mm / m 列入計算。
- B) 以測量工具前緣為測量起點、目標物反射率高 (例如白漆牆)、背景照明強烈、操作溫度為 25 °C 和高海拔。應額外再依距離誤差 ±0.15 mm/m 列入計算。
- C) 在操作溫度 25 °C 下
- D) 使用者在進行 0° 與 90° 校正後，45° (最大值) 以下必須另外加上每度 ±0.01° 的螺距誤差。測量工具的左側為傾角測量的基準點。
- E) 使用連續測量功能時的操作溫度最高為 +40 °C。
- F) 只產生非傳導性污染，但應預期偶爾因水氣凝結而導致暫時性導電。
- G) 具有 Bluetooth® 低功耗功能之工具裝置，視其機型和作業系統，可能會有無法建立連線之情形。Bluetooth® 裝置必須支援 GATT 模式。

從產品銘牌的序號 (15) 即可確定您的測量工具機型。

裝入／更換電池

建議使用鹼性錳電池或鎳氫充電電池做為測量工具的電源（尤其是操作溫度偏低時）。

視電池容量而定，使用 1.2 伏特充電電池時的可測量次數可能會比使用 1.5 伏特電池來得少。

- » 按壓解扣鈕 (7)，然後將止動銷 (8) 旋轉 180° 翻出。
- » 若要打開電池盒蓋 (16)，請將轉鎖 (23) 往上翻，接著將它逆時針旋轉四分之一圈。
- » 從轉鎖處 (23) 掀開電池盒蓋 (16)。
- » 裝入電池或充電電池。

i 務必同時更換所有的拋棄式電池或充電電池。請使用同一製造廠商、容量相同的拋棄式電池或充電電池。

i 此時請您注意是否有依照電池盒內側上的電極標示正確放入。

螢幕中的電池符號一變成無格數後，您還可以進行少數幾次測量。

當電池符號處於無格數並呈紅色閃爍狀態時，則無法再進行測量。請您更換拋棄式電池或充電電池。

- ▶ **長時間不使用時，請將測量工具裡的拋棄式電池或充電電池取出。**經過長期存放，電池會腐蝕或自行放電。


操作

操作機器

- ▶ **不可放任啟動的測量工具無人看管，使用完畢後請關閉測量工具電源。**雷射可能會對旁人的眼睛產生眩光。
- ▶ **不可以讓濕氣滲入儀器中，也不可以讓陽光直接照射在儀器上。**
- ▶ **勿讓測量工具暴露於極端溫度或溫度劇烈變化的環境。**例如請勿將它長時間放在車內。測量工具歷經較大溫度起伏時，請先讓它回溫後再使用。如果儀器曝露在極端溫度下或溫差較大的環境中，會影響儀器的測量準確度。
- ▶ **測量工具須避免猛力碰撞或翻倒。**測量工具遭受外力衝擊後，一律必須先檢查其精準度（參見「準確度測試」，頁 71）並進行校正，然後才能繼續使用。

啟動／關閉

» 按一下按鈕 ，即可開啟測量工具和雷射功能。

您也可以透過按下按鈕  在沒有雷射的情況下開啟測量工具。

» 按住按鈕 ，即可關閉測量工具。

記憶體中的測量值及裝置設定將繼續留存。

攝影機


按一下按鈕 ，即可開啟 / 關閉攝影鏡頭。

測量工具開機後，所選狀態仍將保留。

當測量目標位於遠處時（約 > 5 m）會另外出現標靶記號，即可標示測量點位置。

將雷射點調至最佳能見度

尤其是在空曠處、陽光照射環境下使用測量工具，或是在室內測量距離相隔較長時，您可能會看不到雷射點。請啟動攝影鏡頭。可透過以下方式提高雷射點／測量目標的能見度：


- 設定螢幕亮度（參見「設定顯示器亮度 」，頁 56）
- 使用按鈕進行縮放 

探測程序

測量工具開機後的模式為長度測量功能。

啟動後，測量工具後緣即被選取做為測量基準點。您可以更改基準點。（參見「選擇基準點」，頁 50）

» 將測量工具置於所需的測量起點上（例如：牆壁）。

» 按一下按鈕 ，即可開啟測量程序。


測量過程結束後，雷射光束隨即關閉。若要進行另一次測量，請重複此程序。



測量值或最後的計算結果可進行加減。

原則上 0.5 秒鐘內就會出現測量值，最遲約 4 秒。

測量時間取決於距離、光線情況和目標物表面的反射特性。測量過程結束後，雷射光束隨即自動關閉。

測距儀設為雷射光束常亮並使用連續測量功能時，只需在按鈕 。

結束測量後，常亮狀態下的雷射光束並不會關閉（參見「雷射光束常亮」，頁 53）。

-  進行測量期間，測量工具不得有任何移動。因此，請將測量工具儘可能放置在固定的擋塊或托架平面上。
-  測量時，接收點 **(18)**、雷射光束出口 **(19)** 以及攝影鏡頭 **(20)** 不得有遮蓋物。

影響測量範圍的因素

測量範圍取決於光線情況和目標物表面的反射特性。

有強烈外來燈光影響時，使用內建攝影鏡頭 **(20)**、雷射眼鏡 **(26)**（配件）和雷射標靶 **(25)**（配件）可提高雷射光束的能見度，或遮掉目標物表面的光線。

影響測量結果的因素

由於物理作用之故，無法排除在不同類型表面上進行測量時出現誤差的狀況。表面的類型可分為：

- 透明表面（例如玻璃、水）
- 反射表面（例如拋光金屬、玻璃）
- 多孔狀表面（例如具有阻隔特性的材料）、
- 結構性表面（例如毛胚、天然石材）。



必要時請將雷射標靶 **(25)**（配件）放到表面上。


如果未正確地瞄準好目標物表面，也可能會出現測量誤差。

此外有溫差的空氣層和間接反射都可能影響測量值。

功能表導覽


在功能表中，您可以使用按鈕  切換到右側，使用按鈕  切換到左側。

如需確定選擇，請按下按鈕  或按鈕 。

若要離開功能表，請按一下按鈕 。

選擇基準點

測量時有不同基準點供您選擇：

 測量工具後緣（例如貼靠在牆面上時）








旋轉 180° 後翻出的止動板尖端 (例如：從角落測量)




測量工具前緣 (例如：以桌緣做為測量起點)



三腳架螺紋孔 (17) 的中心 (例如使用三腳架測量時)












- » 按一下螢幕按鈕 ，即可開啟 **基本設定** 功能表。
- » 請選擇 。
- » 請利用按鈕  或按鈕  選擇所需基準點。
- » 請按一下按鈕 ，以確定選擇。






系統會自動偵測止動鎖 (8) 是旋轉 180° 翻出或為收回狀態，並建議相關基準點。請按一下按鈕 ，以確定選擇。

測量工具每次啟動之後一律以測量工具後緣為預設基準點。



基本設定選單

在 **基本設定** 功能表可找到以下基本設定：




-  啟動／關閉 藍牙®
-  切換基準點 (參見「選擇基準點」，頁 50)
-  定時器
-  啟動／關閉雷射光束常亮
-  校正傾角測量 (參見「準確度測試」，頁 71)
-  校正標靶指示
-  設定語言
-  設定日期 & 時間
-  ft/m 切換尺寸單位
-  切換角度單位
-  PRO360 啟用 PRO360

- **i** 開啟裝置資訊
-  啟動 / 關閉聲音訊號
-  設定關閉時間
-  設定調光時間
-  設定顯示器亮度
-  啟動 / 關閉螢幕自動旋轉

» 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。


» 請利用按鈕  或按鈕  選擇所需設定。

» 請按一下按鈕 ，以確定選擇。

» 若要離開**基本設定**  功能表，請按一下按鈕  或按鈕 。

開啟 / 關閉 藍牙®

» 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。

» 請選擇 。



» 按下按鈕  或按鈕 ，即可變更選擇。


» 請按一下按鈕 ，以確定選擇。

» 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。


定時器

例如當您在難以觸及的位置上進行測量時或想避免測量工具在測量期間晃動，此一定時功能就可發揮很大的功效。

» 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。

» 請選擇 。

» 請選取觸發測量前的所需時間間隔，然後按一下按鈕  或按鈕 。


» 按一下按鈕 ，以便啟動雷射光束並確認計時時間。











» 重新按下按鈕 ，即可開啟測量程序。

將於所選的時間間隔之後，開始進行測量。測量值將出現在測量結果顯示列 (a)。觸發至真正開始執行測量之間的這段時間，狀態列中的上方將顯示時間間隔。

設定了定時功能之後，便無法進行連續測量以及最小值測量/最大值測量。關閉測量工具電源或到設定功能表裡關閉定時器之前，定時器將保有原來的設定。













雷射光束常亮

您可以將雷射光束設定為永久開啟。在此設定中，雷射光束在兩次測量之間保持開啟狀態。只需短按一次測量按鈕  即可進行測量。


- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。






若需關閉「雷射光束常亮」，請回到該項設定，或者關閉測量工具電源時此項功能也會自動關閉。

設定語言

- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇  並利用按鈕  確定選擇。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開 **基本設定** 功能表 ，請按一下按鈕  或螢幕按鈕 。











日期 & 時間

- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇裝置設定  功能表。

- » 請選擇 .
- » 請依照螢幕上的指示設定時間與日期，並按一下按鈕  以確認您的設定。
- » 若要離開**基本設定**  功能表，請按一下按鈕  或按鈕 .











切換尺寸單位 ft/m

基本設定中的計量單位為「m」（公尺）。

- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 .
- » 請選擇 **裝置設定** 功能表 .
- » 請選擇 ft/m。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。
測量工具關機後，所選之裝置設定仍將保留。

切換角度單位 \angle

基本設定中的角度單位是「°」（度）。











- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 .
- » 請選擇 **裝置設定** 功能表 .
- » 請選擇 \angle 。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。
測量工具關機後，所選之裝置設定仍將保留。

PRO360 (PRO)

必須進行初次啟用。僅能透過 App 或電腦程式進行資料傳輸。PRO360 可隨時重新停用。

GLM 100-25 C：測量工具更換電池後一定會開機，這是為了啟動 PRO360。

如需 PRO360 的其他相關資訊，請至：www.pro360.com。












- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇 **PRO**。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。

裝置資訊

此處將為您提供測量工具的序號、軟體版本和授權等相關資訊。












- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇 **i**。
- » 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。

啟動／關閉聲音訊號

- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇 。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。












設定關閉時間

可調整自動關機時間：2、5、10 分鐘或永不。

- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇 。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開 **基本設定** 功能表 ，請按一下按鈕  或按鈕 。












設定調光時間

螢幕照明的設定為持續亮起。若未操作按鈕，螢幕照明會在約 30 秒鐘後變暗，以維護充電電池壽命。調暗之前的靜候時間可進行調整。

- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇 。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開 **基本設定** 功能表 ，請按一下按鈕  或按鈕 。












設定顯示器亮度

螢幕可配合環境條件調成不同的亮度等級。

- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇 。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開 **基本設定**  功能表，請按一下按鈕  或按鈕 。

啟動／關閉螢幕自動旋轉













若開啟自動螢幕旋轉，則當旋轉測量工具時，螢幕會自動旋轉。






- » 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。
- » 請選擇 **裝置設定** 功能表 。
- » 請選擇 。
- » 按下按鈕  或按鈕 ，即可變更選擇。
- » 請按一下按鈕 ，以確定選擇。
- » 若要離開**基本設定** 功能表 ，請按一下按鈕  或按鈕 。

測量功能

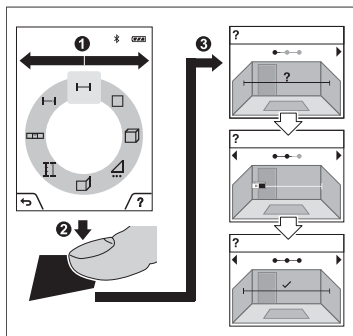
選擇／更改測量功能

您可在功能選單中找到以下功能：

-  長度測量
-  面積測量
-  體積測量
-  間接長度測量
 -  間接高度測量
 -  雙重間接高度測量
 -  間接長度測量
 -  梯形測量
-  牆壁面積測量
-  定樁
-  傾角測量／數位水平儀
-  連續測量

- » 按一下按鈕 ，即可開啟 **功能** 功能表。
- » 請利用按鈕  或按鈕  選擇測量功能。
- » 如需確定選擇，請按下按鈕  或按鈕 。

整合式輔助說明功能？



測量工具中的整合式輔助說明功能為各個測量功能／測量流程提供了詳細的動畫。

- » 請打開 **功能** 功能表。
- » 請利用按鈕 或按鈕 並按下按鈕 選擇所需的**功能**。
動畫將告訴您所選測量功能的詳細操作方式。
- » 按一下按鈕 ，即可暫停動畫或繼續動畫。
- » 按一下 或 按鈕，即可顯示

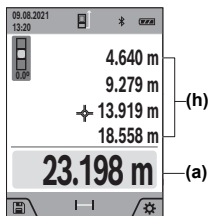
下一步或上一步。

長度測量

- » 按一下按鈕 ，即可開啟 **功能** 功能表。
- » 請選擇長度測量 並利用按鈕 確定選擇。
- » 請短按按鈕 ，即可開啟雷射功能。
- » 按一下按鈕 ，即可開啟測量程序。







測量值將出現在螢幕下方測量結果顯示列 **(a)**。

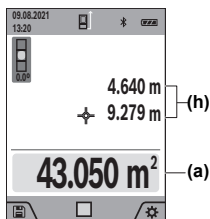
- » 每一次想要重新進行測量時，請重複上述步驟。



連續進行多次長度測量時，最新的測量結果將出現在測量值顯示列 **(h)** 中。最新測量值將出現在螢幕下方，而前一次的測量值則位於其上，依此類推。








面積測量

- » 按一下按鈕 ，即可開啟 **功能** 功能表。
- » 請選擇面積測量  並利用按鈕  確定選擇。
- » 請短按按鈕 ，即可開啟雷射功能。
- » 按一下按鈕 ，即可開啟第一次測量程序，例如空間長度。
- » 按一下按鈕 ，即可開啟第二次測量程序，例如空間寬度。

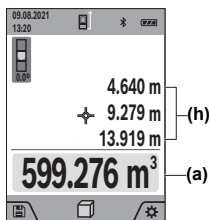


完成第二次測量後，將自動計算出面積並於畫面中顯示該值。結果將顯示於測量結果顯示列 **(a)** 中。測量值顯示列 **(h)** 中將詳列出每一個測量值。

體積測量

- » 按一下按鈕 ，即可開啟 **功能** 功能表。
- » 請選擇體積測量  並利用按鈕  確定選擇。
- » 請短按按鈕 ，即可開啟雷射功能。
- » 按一下按鈕 ，即可開啟第一次測量程序，例如空間長度。
- » 按一下按鈕 ，即可開啟第二次測量程序，例如空間寬度。
- » 按一下按鈕 ，即可開啟第三次測量程序，例如空間長度。

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完成第三次測量後，測量工具將自動計算出體積並於畫面中顯示該值。結果將顯示於測量結果顯示列 **(a)** 中。測量值顯示列 **(h)** 中將詳列出每一個測量值。

間接長度測量





無法進行直接測量時（例如有障礙物會阻擋雷射，或者沒有目標物可充當反射體時），則必須以間接的方式測量。此一測量方式僅適用於垂直方向。任何水平方向的偏差都會導致測量誤差。

間接距離測量的精準度永遠不如直接距離測量。視運用方式而定，其測量誤差可能大於直接距離測量。為改善測量準確度，建議您使用三腳架（配件）。

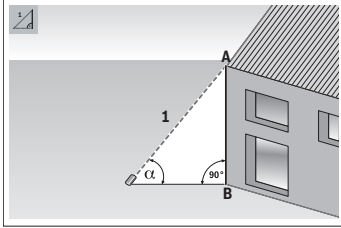
 使用三腳架時，請注意所設定的基準點。（參見「選擇基準點」，頁 50）

雷射將在各次單一測量之間的空檔保持開啟。

間接距離測量共分為 **4**種測量功能供您選用，它們分別可用來量測不同類型的距離。



-  間接高度測量
-  雙重間接高度測量
-  間接長度測量
-  梯形測量

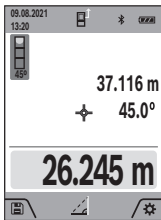
間接高度測量



利用間接高度測量，您可藉由測量線段 **1** 來測得線段 **AB**。測量工具根據角度 α 和線段 **1** 計算所需的高度 **AB**。

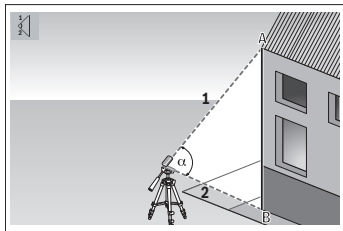
進行每一次測量時，雷射與待測量線段必須一直保持直角，這樣測量結果才正確。

- » 按一下按鈕 **Func**，即可開啟 **功能** 功能表。
- » 請選擇間接距離測量  並利用按鈕 **Func** 確定選擇。
- » 請選擇高度距離  並利用按鈕 **Func** 確定選擇。
- » 請短按按鈕 **▲**，即可開啟雷射功能。
- » 將測量工具放在下方測量點 **B** 的高度上。
- » 傾斜測量工具，使雷射對準上方測量點 **A**。
- » 按一下按鈕 **▲**，即可開啟測量程序。











完成測量後，將自動計算出高度並於測量結果顯示列 **(a)** 中顯示該值。**1** 線段及 α 角的測量值則是位於測量值顯示列 **(h)** 中。

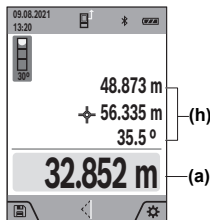
雙重間接高度測量



利用雙重間接高度測量，您可藉由測量線段 **1** 和 **2** 來測得線段 **AB**。測量工具根據角度 α 和線段 **1** 和 **2** 計算所需的高度 **AB**。




建議使用三腳架進行此測量。



- » 按一下按鈕 ，即可開啟 **功能** 功能表。
- » 請選擇間接距離測量  並利用按鈕  確定選擇。
- » 請選擇雙重間接高度測量  並利用按鈕  確定選擇。
- » 請短按按鈕 ，即可開啟雷射功能。
- » 傾斜測量工具，使雷射對準上方測量點 **A**。
- » 按一下按鈕 ，即可開啟第一次測量程序。
- » 傾斜測量工具，使雷射對準下方測量點 **A**。不要改變測量工具的位置。
- » 按一下按鈕 ，即可開啟第二次測量程序。

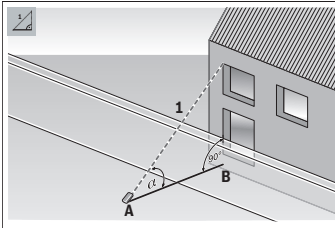


完成測量後，將自動計算出高度並於測量結果顯示列 **(a)** 中顯示該值。**1**、**2** 線段及 α 角的測量值則是位於測量值顯示列 **(h)** 中。

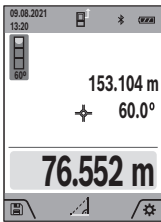
間接長度測量

- » 按一下按鈕 ，即可開啟 **功能** 功能表。
- » 請選擇間接距離測量  並利用按鈕  確定選擇。

- » 請選擇長度測量  並利用按鈕 **Func** 確定選擇。
- » 將測量工具放在所求線段 **AB** 的起點 **A** 上。
- » 傾斜測量工具，以使雷射對準終點 **B** 所在的平面。
- » 按一下按鈕 ，即可開啟測量程序。

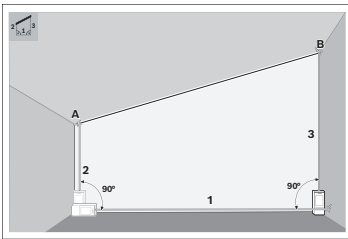


利用間接長度測量，您可藉由測量線段 **1** 來測得線段 **AB**。測量工具根據角度 α 和線段 **1** 計算所需的長度 **AB**。



完成測量後，將自動計算出長度並於測量結果顯示列 **(a)** 中顯示該值。**1** 線段及 α 角的測量值則是位於測量值顯示列 **(h)** 中。

梯形測量









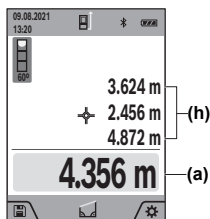
舉例來說，利用梯形測量可量測斜面屋頂的長度。您可以透過按此順序測量線段 **1**、**2** 和 **3** 來找到線段 **AB**。測量工具根據線段 **1**、**2** 和 **3** 計算所需的線段 **AB**。

(i)

請注意：線段 **3** 的測量起點正是線段 **1** 的終點，線段 **1** 與 **2** 之間以及 **1** 與 **3** 之間應呈垂直。

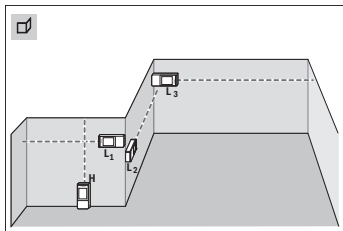
- » 按一下按鈕 **Func**，即可開啟 **功能** 功能表。

- » 請選擇間接距離測量  並利用按鈕 **Func** 確定選擇。
- » 請選擇梯形測量  並利用按鈕 **Func** 確定選擇。
- » 請短按按鈕 , 即可開啟雷射功能。
- » 利用按鈕  測量線段 **1**。
- » 利用按鈕  測量線段 **2**。
- » 利用按鈕  測量線段 **3**。




完成測量後，將自動計算出線段 **AB** 並於測量結果顯示列 **(a)** 中顯示該值。線段 **1**、線段 **2** 及 **3** 角的測量值則是位於測量值顯示列 **(h)** 中。

牆壁面積測量



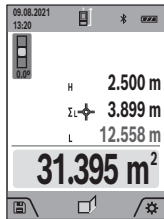
牆壁面積測量是用來計算相同高度之數個單一牆面的總面積。為求正確計算面積，其前提是：所有區塊面積的第一個測量長度要一致（在本範例中即為空間高度 **H**）。插圖範例中所測量的是：空間高度 **H** 相同但長度不同 **L** 之多個牆面加總起來的總面積。

- » 按一下按鈕 **Func**，即可開啟 **功能** 功能表。
- » 請選擇牆壁面積測量  並利用按鈕 **Func** 確定選擇。
- » 依照進行長度測量之方式來測量空間高度 **H**。
測量值將顯示於上方測量值列。雷射功能將保持開啟。
- » 隨後請測量第一面牆的長度 **L1**。

將自動計算出面積並於測量結果顯示列中顯示該值。最新得出的長度測量值位於下方測量值列。雷射功能將保持開啟。

» 現在請您測量第二面牆的長度 **L2**。

您可以繼續測量任意多個長度 **LX**，系統會自動相加這些值後再乘以高度 **H**。

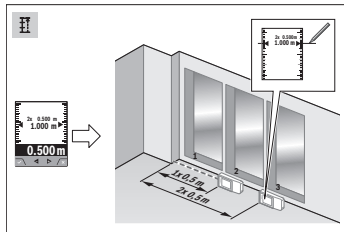


測量值列 **(h)** 中所顯示的單次測量值將累加於長度 **L1** 中。兩個長度（顯示於中間測量值列 **(h)**）加總後再乘以前儲存的高度 **H**。所得的總面積值將顯示於螢幕下方測量結果顯示列 **(a)**。

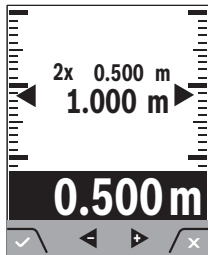
定檔



在放樣功能中，基準點是螢幕中顯示的標記。基準點不是測量工具的邊緣。



放樣功能可重複測量一個自訂長度（距離）。您可將此長度移植到任一表面上，以便將材料切成相同長度或建構石膏隔間牆等等。可設定的最小長度為 0.1 m，可設定的最大長度為 50 m。



» 按一下按鈕 ，即可開啟 **功能** 功能表。

» 請選擇放樣功能 並利用按鈕 確定選擇。


» 按一下按鈕 ，即可設定所需長度。

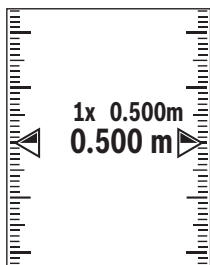
» 請利用按鈕 或按鈕 設定所需長度。

按住按鈕 或按鈕 ，即可以更大幅度更改長度。

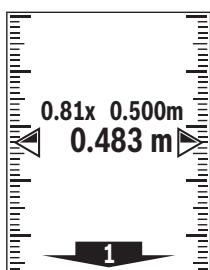
» 按一下按鈕 ，即可啟動放樣功能並慢慢遠離起始點。

測量工具將持續測量目前與起點之間的間距。此時將同時顯示您的自訂長度以及目前測量值。向下或向上箭頭表示：到下一個或上一個記號的最短距離。

持續測量時，只要按住按鈕 ，亦可將目前測得的數值設為自訂長度。



位於左邊的系數代表目前可換算成幾個完整自訂長度。螢幕兩旁的綠色箭頭則是告知還有多長距離就應標設下一個記號。





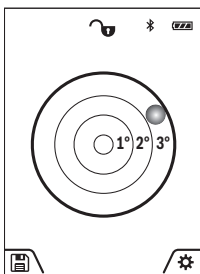
當參照值不在螢幕範圍上，則紅色箭頭所指位置和紅色字樣代表實際值。

傾角測量／數位水平儀

數位水平儀是用來檢查某一物體的水平和垂直定位（例如洗衣機、冰箱等等）。傾角測量則是用來測量坡度或傾斜度（例如用於樓梯、欄杆、家具樺接、管路鋪設等等）。當您改變測量工具的位置時，測量工具會自動在兩種功能之間切換。

» 按一下按鈕 ，即可開啟 **功能** 功能表。

» 請選擇傾角測量／數位水平儀  並利用按鈕  確定選擇。

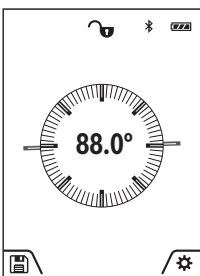


數位水平儀的基準點為測量工具底部。

» 若要使用數位水平儀，請將測量工具的背面放在待測量的表面上。

您可按下按鈕 **▲** 來凍結測量值。

» 傾斜度若超過 3°，螢幕上的圓球將以紅色顯示。



測量工具的左側為傾角測量的基準點。測量中途如果此符號開始閃爍，代表測量工具過度側傾。

» 若要使用傾角測量，請將測量工具的側面放在待測量傾角的物體上。

您可按下按鈕 **▲** 來凍結測量值。

連續測量 \leftrightarrow

在連續測量的情況下，測量值會不斷更新。舉例來說，您可從某一個牆面離開，走到相隔所需距離的位置，期間可隨時看到當下的實際距離。

» 按一下按鈕 **Func**，即可開啟 **功能** 功能表。

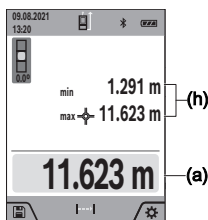
» 請選擇連續測量 \leftrightarrow 並利用按鈕 **Func** 確定選擇。

» 請短按按鈕 **▲**，即可開啟雷射功能。

» 移動測量工具，直至所需距離出現在測量結果顯示列為止。

您可以透過短按按鈕 **▲** 來中斷連續測量。

» 重新按下按鈕 **▲**，即可繼續連續測量。



最新的測量值會顯示在測量結果顯示列 **(a)** 中，最大和最小測量值會顯示在測量值顯示列 **(h)** 中。

連續測量功能將於 5 分鐘後自動關閉。

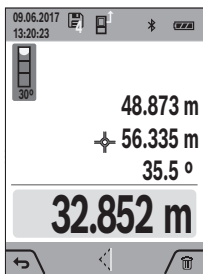
儲存功能

每次完成測量後，將自動儲存測量值或最後的計算結果。最後的 **50** 值會被儲存（測量值或最終結果）。若記憶體已滿，則會覆寫最舊的值。最舊數值位於記憶體中的第 1 筆資料；最新數值則是位於第 **50** 筆資料（儲存值達 **50** 筆時）。

» 請按一下按鈕 ，以開啟儲存功能。


其將顯示最後一個值。

» 請按一下按鈕  或按鈕 ，即可翻頁至其他儲存值。



螢幕上方所顯示的是所儲存之數值的編號，相關測量功能的符號則顯示在左側。如果記憶體中沒有數值，螢幕下方將出現「0.000」而上方則是出現「0」。

刪除儲存值


» 若要刪除所顯示的數值，按一下按鈕 。

» 按一下按鈕  以確認。

若要刪除所有儲存值，請在 **基本設定**  功能表中選擇 **刪除所有記憶** 選項項目。


數值相加／相減

長度測量時相加數值

- » 請選擇長度測量功能。
- » 進行第一次測量。
- » 按一下按鈕 。
- » 進行第二次測量。

第二次測量完成後，第二次測量的結果將顯示在測量值顯示列 **(h)**，最終結果顯示在測量結果顯示列 **(a)** 中。

面積和體積測量時相加數值

- » 請選擇面積測量或體積測量的功能。
- » 進行第一次面積測量或體積測量。
- » 按一下按鈕 。
- » 進行第二次面積測量或體積測量。

一旦完成第二次或第三次測量，就會自動計算並顯示面積或體積。結果將顯示於測量結果顯示列 **(a)** 中。測量值顯示列 **(h)** 中將詳列出每一個測量值。


- » 按一下按鈕 ，即可顯示加總的最終結果。

最終結果將顯示於測量結果顯示列 **(a)** 中。各面積或體積測量的結果顯示在測量值顯示列 **(h)** 中。

數值相減

- » 若要將數值相減，請按一下按鈕 。後續步驟請比照「數值相加」。

刪除測量值

所有測量功能均可透過短按  按鈕刪除最後測得的測量值。

多次短按該按鈕 ，即能反序刪除測量值。

藍牙® 介面

將資料傳輸至其他裝置

本測量工具配備藍牙® 模組，透過此一無線技術即可與具有藍牙® 介面的特定行動終端裝置進行資料傳輸（例如智慧型手機、平板電腦）。

如需藍牙® 連線的最低系統需求相關資訊，請至博世網站：
www.bosch-pt.com。

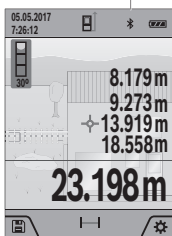
► 如需其他資訊，請參考博世產品說明頁。




透過藍牙® 進行資料傳輸時，行動終端裝置與測量工具之間可能有時間遲滯的現象。問題可能是出在兩個裝置之間的距離或是出在測量目標物本身。


啟用行動終端裝置的藍牙® 介面，以便進行資料傳輸




(f)

✓ 請確認：行動終端裝置上的藍牙® 介面已啟用。



» 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。

» 請選擇 。

» 按下按鈕  或按鈕 ，即可選擇 。

» 請按一下按鈕 ，以確定選擇。


藍牙® 符號在顯示器上顯示為白色 (f)。



本公司提供博世應用程式，可為您擴充本電動工具的功能。您可到相關 App 商店按照所使用的終端裝置下載該程式。

博世應用程式啟動之後，將為您在終端行動裝置與測量工具之間自動建立連線。萬一同時找到多個啟用的測量工具，請您根據序號選擇相符的那一個測量工具。序號 (15) 位於測量工具的產品銘牌上。

停用藍牙® 介面

» 請短按按鈕  或按住按鈕  不放，即可開啟 **基本設定** 功能表 。

» 請選擇 。

» 按下按鈕  或按鈕 ，即可選擇 。

» 請按一下按鈕 ，以確定選擇。

藍牙® 符號在顯示器上顯示為灰色。

準確度測試

請定期檢查傾角測量和距離測量的準確度。

傾角測量準確度檢查

- » 請將測量工具放到桌上，然後進行傾角測量。
- » 將測量工具旋轉 180°，然後再測量一次傾角。
顯示值最多可相差 0.3°。

如果差距超出規定則必須重新校正測量工具。

- » 請按住按鈕 **Func** 不放，即可開啟 **基本功能** 功能表。
- » 請選擇 **CAL** 並利用按鈕 **Func** 確定選擇。
- » 並遵照螢幕上的指示。

i 本測試工具經歷溫度劇烈變化或碰撞之後，建議您進行準確度測試，並視需要執行校正。本測試工具經歷溫度劇烈變化或碰撞之後，必須先回溫一段時間然後才進行校正。

檢查距離測量準確度

該準確度檢查應在有利條件下進行，亦即該測量長度位於室內、測量目標物的表面光滑且具有良好反射性（例如白漆牆）。

- » 選擇一條您本人非常熟悉、長度在 **3 至 10 m** 之間的測量線段（例如房間的寬度，門口等）。
- » 連續測量該線段 10 次。
在有利的測量條件下，每一次的測量結果與平均值的不得相差超過 ± 2 mm。請做好測量記錄，以便日後充當檢查儀器準確度的根據。

標靶指示的準確度及校正（十字交叉線）

請定期檢查雷射與標靶指示的定位準確度。

- » 請為此選擇淺色但照明儘可能微弱的表面（例如白牆）做為測量目標，並相距至少 5 m。
- » 請確認雷射點是否位於螢幕上的標靶指示內。
如果雷射點並沒有在標靶指示之內，則必須重新校正標靶指示。

重新校正標靶指示

- » 請按住按鈕  不放，以便進入 **基本功能** 功能表。
- » 請選擇  並利用按鈕  確定選擇。
- » 並遵照螢幕上的指示。

使用三腳架（配件）進行測量

當測量目標位於遠處時，三腳架非常實用。

- » 請利用 1/4" 螺紋孔 **(17)** 將測量工具安裝到三腳架 **(27)** 或一般市售相機三腳架的快拆座上。
- » 擰緊快速更換盤上的固定螺絲以便固定好測量儀器。
- » 選好使用三腳架時的測量基準點（參見「選擇基準點」，頁 50）。

故障訊息



測量工具在進行每次測量時會監控功能是否正常。若確認出現故障，螢幕上僅會出現左側符號，隨後測量工具將自動關機。發生這種情況時，請將該測量工具交由您的經銷商轉送至博世顧客服務處。

故障排除

溫度警示燈

溫度警告 閃爍時，無法進行測量

原因：測量工具已超出 $-10\text{ }^{\circ}\text{C}$ 至 $+45\text{ }^{\circ}\text{C}$ 的操作溫度之外（使用連續測量功能時須在 $+40\text{ }^{\circ}\text{C}$ 以下）

補救措施：請稍候靜待測量儀的溫度回到工作溫度範圍內

顯示器上出現「ERROR」

顯示器上的「ERROR」指示燈

原因：相加／相減不同尺寸單位的測量值

補救措施：只能相加／相減相同測量單位的測量值

原因：雷射與目標物之間的夾角太小

補救措施：加大雷射與目標物之間的夾角

原因：目標物表面的反射性太強（例如鏡子）或太弱（例如黑色材料），或是環境光線過強

補救措施：請使用雷射標靶（配件）

原因：雷射光束出口 (19) 或接收點 (18) 起霧（例如因溫度變化過快）。

補救措施：用軟布擦拭雷射光束出口 (19) 或接收點 (18)

原因：計算出來的數值大於 1 999 999 或小於 -999 999 m/m²/m³

補救措施：進行測量時把待計算的長度再細分成多段

校正

螢幕上出現「CAL」和「ERROR」

原因：未按照正確順序或未在正確位置上進行傾角測量的校正作業

補救措施：根據螢幕和使用說明書上的指示再做一次校正

原因：進行校正時使用的平面並非準確位於水平位置或垂直位置

補救措施：在水平平面或垂直平面上再做一次校正。必要時可先用水平儀檢查該平面

原因：按下按鈕時移動了或翻倒了測量工具

補救措施：再做一次校正，按壓按鈕時不要觸動測量工具

測量結果

測量結果不可靠

原因：目標物表面的反射影像有變（例如水、玻璃）

補救措施：蓋住目標平面

原因：雷射光束出口 (19) 或接收點 (18) 被擋住。

補救措施：保持雷射光束出口 (19) 和接收點 (18) 的暢通

測量結果不可靠

原因：有障礙物擋住雷射光束的線條

補救措施：請注意，投射在目標物表面上的雷射點必須完整。

原因：設定了錯誤的基準點

補救措施：選擇適合測量的基準點

藍牙®

無法啟用 藍牙® 功能

原因：一般電池／充電電池電力不足

補救措施：請更換電池或為測量工具的充電電池充電

沒有 藍牙® 連線

沒有 藍牙® 連線，顯示器上出現「ERROR」

原因：藍牙® 連線被干擾

補救措施：

- 請確認 藍牙® 已啟用（在測量工具和行動終端裝置上）
- 請關掉並重新開啟 藍牙®（在測量工具和行動終端裝置上）
- 請檢查行動終端裝置上的應用程式
- 請檢查您的行動終端裝置是否已過載
- 請縮短本測量工具與行動終端裝置之間的距離
- 請排除本測量工具與行動終端裝置之間的障礙物（例如鋼筋混凝土、金屬門扇）；遠離電磁干擾源（例如無線區域網路發射器）

維修和服務

保養與清潔

儲放和搬運測量工具時，一定要將它放置在隨附的保護套袋內。

測量儀器必須隨時保持清潔。

不可以把儀器放入水或其它的液體中。

使用柔軟濕布擦除儀器上的污垢。切勿使用清潔劑或溶液。

尤其是在清潔接收點 (18)、雷射出口處 (19) 以及攝影鏡頭 (20) 時必須格外小心：請注意，接收點、雷射出口處或攝影鏡頭不得有任何髒污。接收點、雷射出口處和攝影鏡頭等位置，僅可使用攝影鏡頭專用清潔工具來進行清潔。請勿試圖用尖銳物品去除接收點、雷射出口處或攝影鏡頭上的髒污，亦不可直接擦拭（可能造成細微刮痕）。

如需送修，請將測量工具放入保護套袋 (21) 內後，再轉交給相關單位。

顧客服務處和顧客諮詢中心

本公司顧客服務處負責回答有關本公司產品的維修、維護和備用零件的問題。以下的網頁中有分解圖和備用零件相關資料：www.bosch-pt.com
如果對本公司產品及其配件有任何疑問，博世應用諮詢小組很樂意為您提供協助。

當您需要諮詢或訂購備用零件時，請務必提供本產品型號銘牌上 10 位數的產品機號。

台灣

台灣羅伯特博世股份有限公司
建國北路一段90 號6 樓
台北市10491
電話: (02) 7734 2588
傳真: (02) 2516 1176
www.bosch-pt.com.tw

製造商地址:

Robert Bosch Power Tools GmbH
羅伯特· 博世電動工具有限公司
70538 Stuttgart / GERMANY
70538 斯圖加特/ 德國

以下更多客戶服務處地址：

www.bosch-pt.com/serviceaddresses

有關台灣的更多資訊

NCC 警語

低功率射頻器材管理辦法:

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自自變更頻率、加大功率或變更原設計之特性及功能。

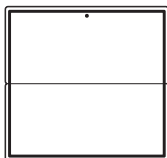
低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前述合法通信，指依電信管理法規定作業之無線電通信。

低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

配件

您可以使用提供的連結在博世網站上找到配件



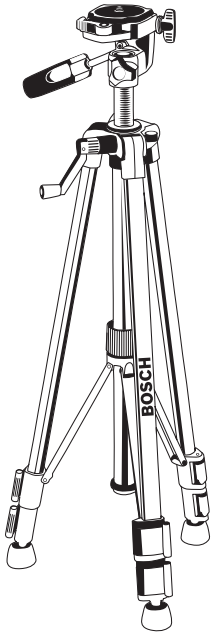
雷射標靶 (24)

2 607 001 391



雷射辨識鏡 (紅色) (25)

1 608 M00 05B



三脚架 BT 150 (26)
0 601 096 B00

한국어

안전 수칙



측정공구의 안전한 사용을 위해 모든 수칙들을 숙지하고 이에 유의하여 작업하시기 바랍니다. 측정공구를 해당 지침에 따라 사용하지 않으면, 측정공구에 내장되어 있는 안전장치에 안 좋은 영향을 미칠 수

있습니다. 측정공구의 경고판을 절대로 가려서는 안 됩니다. 안전 수칙을 잘 보관하고 공구 양도 시 측정공구와 함께 전달하십시오.

- ▶ 주의 - 여기에 제시된 조작 장치 또는 조정 장치 외의 용도로 사용하거나 다른 방식으로 작업을 진행하는 경우, 광선으로 인해 폭발될 위험이 있습니다.
- ▶ 본 측정공구는 레이저 경고 스티커가 함께 공급됩니다(그림에 측정공구의 주요 명칭 표시).
- ▶ 처음 사용하기 전에 함께 공급되는 한국어로 된 레이저 경고 스티커를 독문 경고판 위에 붙이십시오.



사람이나 동물에게 레이저 광선을 비추거나, 광선을 직접 또는 반사시켜 보지 마십시오. 이로 인해 눈이 부시게 만들어 사고를 유발하거나 눈에 손상을 입을 수 있습니다.

- ▶ 눈으로 레이저 광선을 쳐다본 경우, 의식적으로 눈을 감고 곧바로 고개를 돌려 광선을 피하십시오.
- ▶ 레이저 장치를 개조하지 마십시오.
- ▶ 레이저 보안경(액세서리)을 일반 보안경으로 사용하지 마십시오. 레이저 보안경은 레이저 광선을 보다 잘 감지하지만, 그렇다고 해서 레이저 광선으로부터 보호해주는 것은 아닙니다.
- ▶ 레이저 보안경(액세서리)을 선글라스 용도 또는 도로에서 사용하지 마십시오. 레이저 보안경은 자외선을 완벽하게 차단하지 못하며, 색상 분별력을 떨어뜨립니다.
- ▶ 측정공구의 수리는 해당 자격을 갖춘 전문 인력에게 맡기고, 수리 정비 시 순정 부품만 사용하십시오. 이 경우에만 측정공구의 안전성을 오래 유지할 수 있습니다.
- ▶ 어린이가 무감독 상태로 레이저 측정공구를 사용하는 일이 없도록 하십시오. 의도치 않게 타인 또는 자신의 눈이 부시게 할 수 있습니다.
- ▶ 가연성 유체나 가스 혹은 분진 등 폭발 위험이 있는 곳에서 측정공구를 사용하지 마십시오. 측정공구에 분진이나 증기를 점화하는 스파크가 생길 수 있습니다.
- ▶ 해당 무선설비는 전파혼신 가능성이 있으므로 인명안전 과 관련된 서비스는 할 수 없습니다.
- ▶ 측정공구에는 무선 인터페이스가 장착되어 있습니다. 비행기나 병원 등 장소에 따른 제약에 주의하십시오.

블루투스® 워드마크와 그림(로고)은 Bluetooth SIG, Inc.의 등록상표입니다. Robert Bosch Power Tools GmbH는 허가를 받아 이를 사용하고 있습니다.

- ▶ **주의!** 측정공구의 블루투스® 사용은 다른 기기나 설비, 비행기 및 의료 기기(예: 심박 조정기,보청기) 등에 장애를 가져올 수 있습니다. 마찬가지로 근처에 있는 동물이나 사람에게도 좋지 않은 영향을 미칠 수 있습니다. 측정공구의 블루투스® 사용은 의료 기기, 주유소, 화학설비 및 폭발 위험이 있는 주변에서는 삼가하십시오. 비행기에서 측정공구의 블루투스® 사용은 삼가하십시오. 오랜 시간 신체에 직접 접촉하여 작동하는 것을 삼가하십시오.
- ▶ 본 측정공구를 이용해 사람이나 동물의 사진을 찍지 마십시오. 레이저빔이 지속적으로 쬐여 있을 수 있습니다. 레이저빔이 쬐진 상태에서는 눈이 부시게 만들어 사고를 유발하거나 눈에 손상을 입을 수 있습니다.
- ▶ (표면의 균열 등) 디스플레이 유리가 손상된 것이 발견되면, 측정공구를 사용하지 마십시오. 부상의 위험이 있습니다.



측정공구 및 자성 액세서리를 심장 박동 조절장치 또는 인슐린 펌프와 같은 삽입물 및 기타 의학 기기 근처로 가져오지 마십시오. 측정공구 및 액세서리의 자석으로 인해 자기장이 형성되어 삽입물 및 의학 기기의 기능에 장애를 일으킬 수 있습니다.

- ▶ 측정공구와 자성 액세서리를 자기 데이터 매체나 자력에 예민한 기기에서 멀리 두십시오. 측정공구 및 액세서리의 자석으로 인해 데이터가 손실되어 복구되지 않을 수 있습니다.

제품 및 성능 설명

측정공구 그림이 나와 있는 면을 펼치고 사용 설명서를 읽는 동안 이 면을 펼친 상태로 두십시오.

규정에 따른 사용

본 측정공구는 거리, 길이, 높이, 간격, 경사도를 측정하고 면적 및 체적을 계산하는 데 사용됩니다.

측정공구는 실내 및 실외에서 모두 사용할 수 있습니다.









측정 결과는 블루투스®를 통해 다른 장치로 전송할 수 있습니다.

제품의 주요 명칭

제품의 주요 명칭에 표기되어 있는 번호는 측정공구의 그림이 나와있는 면을 참고하십시오.

- (1) 디스플레이
- (2) ▲ 측정 버튼

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- (3)  우측 소프트 버튼
- (4)  플러스 버튼
- (5)  확대 버튼
- (6) 운반 고리 삽입부
- (7) 측정 핀 작동 버튼
- (8) 측정 핀
- (9)  전원 버튼
- (10)  표적물 표시 버튼
- (11)  마이너스 버튼
- (12)  좌측 소프트 버튼
- (13)  Func 기능 버튼
- (14) 레이저 경고판
- (15) 일련 번호
- (16) 배터리 케이스 덮개
- (17) 1/4" 삼각대 소켓
- (18) 수신 렌즈
- (19) 레이저빔 발사구
- (20) 카메라
- (21) 보호 가방
- (22) 스크루 캡
- (23) 배터리
- (24) 레이저 표적판^{A)}
- (25) 레이저용 안경^{A)}
- (26) 삼각대^{A)}

A) 도면이나 설명서에 나와있는 액세서리는 표준 공급부품에 속하지 않습니다. 전체 액세서리는 저희 액세서리 프로그램을 참고하십시오.

표시 요소

- (a) 결과 표시열
- (b) 표적물 표시(십자선)
- (c) 경사각도 표시
- (d) 날짜/시간
- (e) 측정 기준점
- (f) 블루투스® 상태
 - ✳ 블루투스® 활성화되지 않음
 - ✳) 블루투스® 작동, 연결됨
- (g) 충전상태 표시기
- (h) 측정값 표시열
- (i) 기본 설정
- (j) 측정 기능 표시
- (k) 내부 메모리
- (l) 뒤로
- (m) 내장된 도움말 기능
- (n) 시작화면
- (o) 세부 기본 설정 메뉴
- (p) 기본 설정 메뉴
- (q) 측정 기능 메뉴

제품 사양

| 디지털 레이저 거리 측정기 | GLM 100-25 C |
|-------------------------------|-------------------|
| 품번 | 3 601 K72 Y.. |
| 측정 영역 ^{A)} | 0.08-100 m |
| 측정 영역(부적절한 조건) ^{B)} | 0.08-60 m |
| 측정 정확도 ^{A)} | ±1.5 mm |
| 측정 정확도(부적절한 조건) ^{B)} | ±3.0 mm |
| 최소 표시 단위 | 0.5 mm |
| 간접 거리 측정 및 수준기 | |
| 측정 영역 | 0°-360° (4 × 90°) |
| 경사 측정 | |

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| 디지털 레이저 거리 측정기 | GLM 100-25 C |
|-------------------------------|---------------------------------------|
| 측정 영역 | 0°-360° (4 × 90°) |
| 측정 정확도 ^{C)D)} | ±0.2° |
| 최소 표시 단위 | 0.1° |
| 일반 사항 | |
| 작동 온도 ^{E)} | -10 °C ... +45 °C |
| 보관 온도 | -20 °C ... +70 °C |
| 상대 습도 최대 | 90 % |
| 기준 높이를 초과한 최대 사용 높이 | 2000 m |
| IEC 61010-1에 따른 오염도 | 2 ^{F)} |
| 레이저 등급 | 2 |
| 레이저 유형 | 650 nm, < 1 mW |
| 레이저빔의 편차 | < 1.5 mrad(전체 각도) |
| 자동 꺼짐 기능이 활성화되는 대략적인 시간 | |
| - 레이저 | 20초 |
| - 측정공구(측정 미포함) | 5분 |
| 배터리 | 3 × 1.5 V LR6 (AA) |
| EPTA-Procedure 01:2014에 따른 중량 | 0.23 kg |
| 보호 등급 | IP 54 (먼지 및 분무수 침투 방지) |
| 제품 치수 | 142 (176) × 64 × 28 mm |
| 데이터 전송 | |
| 블루투스® | 블루투스® 4.2 Low Energy ^{G)} |
| 작동 주파수 범위 | 2402-2480 MHz |

디지털 레이저 거리 측정기

GLM 100-25 C

최대 송신 출력

8 mW

- A) 측정공구의 앞 모서리부터 측정할 경우, 표적물(예: 흰색으로 칠한 벽)의 반사율을 높게, 배경 조명을 약하게 조성해야 합니다. 작동 온도는 25 °C입니다. 그 외에도 거리에 따라 ± 0.05 mm/m 정도 차이가 있을 수 있음을 고려해야 합니다.
- B) 측정공구의 앞 모서리부터 측정할 경우, 표적물(예: 흰색으로 칠한 벽)의 반사율을 높게, 배경 조명을 강하게 조성해야 합니다. 작동 온도는 25 °C이며, 높이가 높습니다. 그 외에도 거리에 따라 ± 0.15 mm/m 정도 차이가 있을 수 있음을 고려해야 합니다.
- C) 작동 온도 25 °C
- D) 0° 및 90°에서 사용자가 캘리브레이션한 후 ± 0.01 /도 - 45°(최대) 정도의 경사 오류가 추가로 있을 수 있음을 고려해야 합니다. 측정공구의 좌측은 경사 측정을 위한 기준점 역할을 합니다.
- E) 연속 측정 기능의 경우 최고 작동 온도는 +40 °C입니다.
- F) 비전도성 오염만 발생하지만, 가끔씩 이슬이 맺히면 임시로 전도성이 생기기도 합니다.
- G) Bluetooth® 저 에너지 기기의 경우, 모델과 작동 시스템에 따라 연결 구성이 불가능할 수 있습니다. Bluetooth® 기기가 GATT 프로필을 지원해야 합니다.
- 측정공구를 확실하게 구분할 수 있도록 타입 표시판에 일련 번호 (15) 가 적혀 있습니다.

배터리 삽입하기/교환하기

측정공구 작동에는 알칼리 망간 배터리 또는 니켈 수소 배터리(특히 낮은 작동 온도에서)를 사용할 것을 권장합니다.

1.2 V 충전용 배터리를 사용할 경우 1.5 V 배터리를 사용할 때보다 용량에 따라 측정 가능 횟수가 줄어들 수 있습니다.

» 작동 버튼 (7) 을 누르고, 측정 핀 (8) 을 180° 정도 펼치십시오.

» 배터리 케이스 덮개 (16) 를 열려면, 스크루 캡 (23) 을 위쪽으로 젖힌 후 시계 반대 방향으로 1/4 바퀴 돌리십시오.

» 스크루 캡 (23) 에서 배터리 케이스 덮개 (16) 를 당겨 여십시오.

» 배터리 또는 충전용 배터리를 끼우십시오.

i 항상 배터리나 충전용 배터리는 모두 동시에 교환해 주십시오. 한 제조사의 동일한 용량의 배터리나 충전용 배터리만을 사용하십시오.

i 이때 전극이 배터리 케이스 안쪽에 나와있는 것처럼 올바르게 끼워야 합니다.

비어 있는 배터리 기호가 처음 디스플레이에 나타난 경우, 적은 횟수의 측정만 가능합니다.

비어 있는 배터리 기호가 적색으로 깜박이는 경우, 더 이상 측정할 수 없습니다. 배터리나 충전용 배터리 팩을 교체하십시오.



- ▶ 측정공구를 장기간 사용하지 않을 경우에는 배터리 또는 충전용 배터리를 측정공구에서 분리하십시오. 장기간 보관할 경우 배터리나 충전용 배터리가 부식되거나 저절로 방전될 수 있습니다.

작동


기계 시동

- ▶ 측정공구가 켜져 있는 상태에서 자리를 비우지 말고, 사용 후에는 측정공구의 스위치를 끄십시오. 레이저빔으로 인해 다른 사람의 눈을 일시적으로 안 보이게 할 수 있습니다.
- ▶ 측정공구가 물에 젖거나 직사광선에 노출되지 않도록 하십시오.
- ▶ 극한의 온도 또는 온도 변화가 심한 환경에 측정공구를 노출시키지 마십시오. 예를 들어 장시간 차량 안에 측정공구를 두지 마십시오. 온도 변화가 심한 경우 측정공구를 작동시키기 전에 먼저 온도에 적응할 수 있게 하십시오. 극심한 온도에서나 온도 변화가 심한 환경에서 사용하면 측정공구의 정확도가 떨어질 수 있습니다.
- ▶ 측정공구가 외부와 세계 부딪히거나 떨어지지 않도록 주의하십시오. 측정공구에 외부 영향이 심하게 가해진 후에는 계속 작업하기 전에 항상 정확도 점검 (참조 „정확도 점검“, 페이지 109) 을 해야 합니다.

전원 켜기/끄기



- » 버튼 ▲을 누르면, 측정공구 및 레이저의 전원이 켜집니다.
 버튼 을 누르면, 레이저를 켜지 않은 채로 측정공구의 전원을 켤 수 있습니다.
- » 버튼 을 계속 누르고 있으면, 측정공구의 전원이 꺼집니다.
 메모리에 저장된 값들과 장치 설정은 그대로 유지됩니다.

카메라

버튼 을 누르면, 카메라의 전원이 켜지거나 꺼집니다. 측정공구의 전원을 끄면 선택한 상태는 그대로 저장됩니다. 거리가 (약 5 m 이상) 멀어지는 경우 측정 지점 표시를 위해 추가적으로 표적을 표시 화면이 나타납니다.

레이저 포인트의 가시성 최적화

특히 야외, 직사광선이 비치는 곳에서 측정공구 사용 시 그리고 실내 먼 거리에서 사용하는 경우에도 레이저 포인트가 잘 보이지 않을 수 있습니다. 카메라를 켜십시오. 그 외에도 다음과 같이 레이저 포인트/측정 대상의 가시성을 높일 수 있습니다.


- 디스플레이 밝기 조정 (참조 „디스플레이 밝기 설정 “, 페이지 93)
- 버튼을 눌러 확대 기능 사용 

측정 과정

전원을 켜면 측정공구는 길이 측정 기능에 위치합니다.

전원을 켜면 측정 기준점으로 측정공구의 뒷 모서리가 사전 설정되어 있습니다. 측정 기준점을 변경할 수 있습니다. (참조 „측정 기준점 선택하기“, 페이지 86)

» 측정공구를 원하는 측정 시작점(예: 벽)에 두십시오.

» 측정을 진행하려면, 버튼 을 누르십시오.


측정을 진행한 후에는 레이저빔이 꺼집니다. 다시 측정하려면 상기 과정을 반복하십시오.


측정값 또는 최종 결과는 더하거나 뺄 수 있습니다.


측정값은 타입별로 0.5 초 내에, 늦어도 4 초 정도 후에 디스플레이됩니다.


측정 시간은 거리, 조명 상태 그리고 표적면의 반사 정도에 따라 좌우됩니다.

측정을 진행한 후에는 레이저빔이 자동으로 꺼집니다.

레이저빔이 지속적으로 켜져 있고 연속 측정 기능이 켜진 상태에서는  버튼을 한 번 누르면 이미 측정이 시작됩니다.

레이저빔이 지속적으로 켜져 있으면 측정 후에 꺼지지 않습니다 (참조 „지속적인 레이저빔 “, 페이지 89).

 측정하는 동안 본 측정공구를 움직여서는 안 됩니다. 따라서 측정공구는 최대한 단단한 고정면 또는 설치면에 올려 두십시오.

 측정 시 수신 렌즈 (18), 레이저빔 발사구 (19) 및 카메라 (20) 가 가려지지 않도록 하십시오.

측정 영역에 미치는 영향

측정 영역은 조명 상태 그리고 표적면의 반사 정도에 따라 달라집니다.

외부 라이트가 강렬할 때 레이저빔의 가시성을 높이려면, 내장된 카메라 (20), 레이저용 안경 (26) (액세서리) 및 레이저 표적판 (25) (액세서리) 을 사용하거나 또는 표적면을 어둡게 만드십시오.

측정 결과에 미치는 영향



물리적 효과로 인해 서로 다른 표면에서 측정 시 측정 오류가 발생할 수도 있습니다. 예:

- 투명한 표면(예: 유리, 물),
- 반사 표면(예: 광택 처리된 금속, 유리),
- 다공질 표면(예: 방음재),
- 구조화된 표면(예: 초박질, 자연석).


이러한 표면에서는 필요에 따라 레이저 표적판 (25) (액세서리)을 사용하십시오.

그 외 비스듬하게 조준된 표적면에서도 측정 오류가 발생할 수 있습니다. 온도가 서로 다른 공기층 또는 간접적으로 수신된 반사로 인해라도 측정값이 영향을 받을 수 있습니다.

메뉴 탐색

메뉴에서 버튼  을 눌러 우측으로 이동하거나 버튼  을 눌러 좌측으로 이동할 수 있습니다.

선택한 사항을 승인하려면, 버튼  또는 버튼  을 누르십시오.

메뉴 화면에서 벗어나려면, 버튼  을 누르십시오.

측정 기준점 선택하기

측정할 경우 다양한 측정 기준점 중에 선택할 수 있습니다:



측정공구의 뒷 모서리(예: 벽면에 설치할 경우)




180° 젖혀진 고정 플레이트 의 끝 부위(예: 모서리에서 측정하는 경우)






측정공구의 앞 모서리(예: 책상 가장자리에서부터 측정할 경우)





삼각대 나사부 (17) 의 중간(예: 삼각대를 이용하여 측정할 경우)

» 소프트 버튼  을 누르면, 기본 설정 메뉴가 열립니다.

»  을 선택하십시오.

» 버튼  또는 버튼  을 눌러 원하는 측정 기준점을 선택하십시오.


















» 선택한 사항을 승인하려면, 버튼  을 누르십시오.










측정 핀 (8) 을 180° 정도 빼내거나 접는 움직임이 자동으로 감지되어, 상황에 맞춰 측정 기준점을 제한합니다. 선택한 사항을 승인하려면, 버튼  을 누르십시오.

측정공구를 켜면 항상 측정공구의 뒷 모서리가 측정 기준점으로 사전 설정되어 있습니다.











기본 설정 메뉴

기본 설정 메뉴에서 다음과 같은 기본 설정을 확인할 수 있습니다:

-  블루투스® 켜기/끄기
-  측정 기준점 변경하기 (참조 „측정 기준점 선택하기“, 페이지 86)
-  타이머
-  지속적인 레이저빔 켜기/끄기
-  경사 측정 캘리브레이션 (참조 „정확도 점검“, 페이지 109)
-  표적물 표시 캘리브레이션
-  언어 설정
-  날짜 & 시간 설정
-  단위 변경하기
-  각도 단위 변경하기
-  PRO360 활성화
-  장치 정보 불러오기
-  음향 신호 켜기/끄기
-  꺼짐 시간 설정
-  감광 시간 설정
-  디스플레이 밝기 설정
-  자동 화면 회전 켜기/끄기









- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- » 버튼  또는 버튼  을 눌러 원하는 설정을 선택하십시오.
- » 선택한 사항을 승인하려면, 버튼  을 누르십시오.
- » **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 버튼  을 누르십시오.

블루투스® 키기/끄기

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- »  을 선택하십시오.
- » 버튼  또는 버튼  을 누르면, 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼  을 누르십시오.
- » **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 버튼  을 누르십시오.


타이머

타이머 기능은 예를 들어 접근하기 힘든 곳에서 측정을 하는 경우 또는 측정하는 도중 측정공구의 움직임을 방지해야 하는 경우에 도움이 됩니다.


- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- »  을 선택하십시오.
- » 작동 시작에서부터 측정에 이르기까지 원하는 시간을 선택하고, 버튼  또는 버튼  을 눌러 승인하십시오.
- » 버튼  을 누르면, 레이저빔이 켜지고 목표점을 조준할 수 있습니다.
- » 버튼  을 다시 누르면, 측정을 진행할 수 있습니다.
선택한 시간이 지나면 측정이 진행됩니다. 결과 표시열 (a) 에 측정값이 표시됩니다. 상태 표시줄 상단에 작동 시작부터 측정까지의 시간이 표시됩니다.



타이머 기능이 설정된 경우에는 연속 측정 및 최소/최대 측정은 진행할 수 없습니다. 타이머는 측정공구의 전원이 꺼지기 전까지 또는 "설정" 메뉴에서 타이머 기능이 꺼지기 전까지 설정된 상태 그대로 유지됩니다.

지속적인 레이저빔




레이저빔이 지속적으로 켜져 있도록 설정할 수 있습니다. 지속적인 레이저빔이 설정된 경우 여러 번 측정을 하는 사이에도 레이저빔이 계속 켜져 있습니다. 측정을 하려면, 버튼  을 짧게 한 번만 누르면 됩니다.

» 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.

»  을 선택하십시오.

» 버튼  또는 버튼  을 누르면, 선택한 사항을 변경할 수 있습니다.

» 선택한 사항을 승인하려면, 버튼  을 누르십시오.



» **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 버튼  을 누르십시오.



지속적인 레이저빔은 설정에서 다시 끄거나 측정공구의 전원을 끄면 자동으로 꺼집니다.


언어 설정




» 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.

» **장치 설정** 메뉴  를 선택하십시오.










»  을 선택한 후 버튼  을 눌러 선택한 사항을 승인하십시오.

» 버튼  또는 버튼  을 누르면, 선택한 사항을 변경할 수 있습니다.

» 선택한 사항을 승인하려면, 버튼  을 누르십시오.











» **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 소프트 버튼  을 누르십시오.

날짜 & 시간

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- » **장치 설정** 메뉴  를 선택하십시오.
- »  을 선택하십시오.
- » 디스플레이의 지침에 맞춰 날짜 및 시간을 설정한 후 버튼  을 눌러 승인하십시오.
- » **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 버튼  을 누르십시오.






단위 변경하기 ft/m







기본 설정의 측정 단위는 "m" (미터)입니다.

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- » **장치 설정** 메뉴  를 선택하십시오.
- » **ft/m**을 선택하십시오.
- » 버튼  또는 버튼  을 누르면, 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼  을 누르십시오.
- » **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 버튼  을 누르십시오.
측정공구를 끄면 선택한 기본 설정은 그대로 저장됩니다.

각도 단위 변경하기

기본 설정의 각도 단위는 "°" (도)입니다.

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- » **장치 설정** 메뉴  를 선택하십시오.
- »  을 선택하십시오.











- » 버튼  또는 버튼 을 누르면 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼 을 누르십시오.
- » **기본 설정** 메뉴 에서 벗어나려면, 버튼  또는 버튼 을 누르십시오. 측정공구를 끄면 선택한 기본 설정은 그대로 저장됩니다.

PRO360 PRO)

첫 사용 시에는 활성화해야 합니다. 데이터는 해당 앱 또는 PC 프로그램을 통해서만 전송할 수 있습니다. PRO360은 언제든지 다시 비활성화할 수 있습니다.








GLM 100-25 C: 배터리 교체 후 PRO360을 다시 시작하려면 측정공구의 전원을 켜야 합니다.

PRO360에 대한 세부 정보는 www.pro360.com에서 확인할 수 있습니다.












- » 버튼 을 짧게 누르거나 또는 버튼 을 누르고 있으면, **기본 설정** 메뉴 가 열립니다.
- » **장치 설정** 메뉴 를 선택하십시오.
- » **PRO**)을 선택하십시오.
- » 버튼  또는 버튼 을 누르면 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼 을 누르십시오.
- » **기본 설정** 메뉴 에서 벗어나려면, 버튼  또는 버튼 을 누르십시오.

장치 정보 **i**

여기에서는 일련 번호, 소프트웨어 버전 및 라이선스와 같은 측정공구 관련 정보를 확인할 수 있습니다.












- » 버튼 을 짧게 누르거나 또는 버튼 을 누르고 있으면, **기본 설정** 메뉴 가 열립니다.
- » **장치 설정** 메뉴 를 선택하십시오.
- » **i**을 선택하십시오.
- » **기본 설정** 메뉴 에서 벗어나려면, 버튼  또는 버튼 을 누르십시오.

음향 신호 켜기/끄기

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- » **장치 설정** 메뉴  를 선택하십시오.
- »  을 선택하십시오.
- » 버튼  또는 버튼  을 누르면, 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼  을 누르십시오.
- » **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 버튼  을 누르십시오.





꺼짐 시간 설정








자동 꺼짐 시간을 2분, 5분, 10분 또는 설정 안 함 중에서 원하는 대로 설정할 수 있습니다.

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- » **장치 설정** 메뉴  를 선택하십시오.
- »  을 선택하십시오.
- » 버튼  또는 버튼  을 누르면, 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼  을 누르십시오.
- » **기본 설정** 메뉴  에서 벗어나려면, 버튼  또는 버튼  을 누르십시오.

감광 시간 설정












디스플레이 조명은 계속 켜져 있습니다. 버튼을 누르지 않으면, 디스플레이 조명은 약 30 초 후 배터리 절약을 위해 어두워집니다. 어두워지기 시작하는 시간을 설정할 수 있습니다.

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, **기본 설정** 메뉴  가 열립니다.
- » **장치 설정** 메뉴  를 선택하십시오.

- » 를 선택하십시오.
- » 버튼  또는 버튼 을 누르면, 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼 을 누르십시오.
- » **기본 설정** 메뉴 에서 벗어나려면, 버튼  또는 버튼 을 누르십시오.












디스플레이 밝기 설정

디스플레이 밝기는 주변 조건에 맞춰 여러 단계로 조정할 수 있습니다.

- » 버튼 을 짧게 누르거나 또는 버튼 을 누르고 있으면, **기본 설정** 메뉴 가 열립니다.
- » **장치 설정** 메뉴 를 선택하십시오.
- » 를 선택하십시오.
- » 버튼  또는 버튼 을 누르면, 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼 을 누르십시오.
- » **기본 설정** 메뉴 에서 벗어나려면, 버튼  또는 버튼 을 누르십시오.

자동 화면 회전 켜기/끄기













자동 화면 회전이 켜져 있으면, 측정공구가 돌아갈 때 화면의 표시 내용이 자동으로 회전됩니다.


- » 버튼 을 짧게 누르거나 또는 버튼 을 누르고 있으면, **기본 설정** 메뉴 가 열립니다.
- » **장치 설정** 메뉴 를 선택하십시오.
- » 을 선택하십시오.
- » 버튼  또는 버튼 을 누르면 선택한 사항을 변경할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼 을 누르십시오.
- » **기본 설정** 메뉴 에서 벗어나려면, 버튼  또는 버튼 을 누르십시오.

측정 기능

측정 기능 선택하기/변경하기

기능 메뉴에서 다음과 같은 기능을 확인할 수 있습니다:

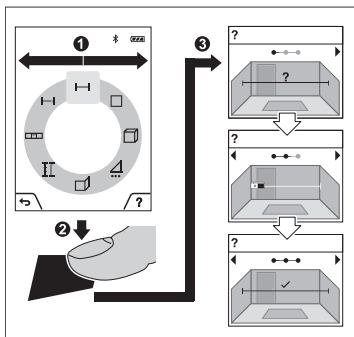
-  길이 측정
-  면적 측정
-  체적 측정
-  간접 거리 측정
 -  간접 높이 측정
 -  이중 간접 높이 측정
 -  간접 길이 측정
 -  사다리꼴 측정
-  벽 면적 측정
-  분리 기능
-  경사 측정/디지털 수준기
-  연속 측정

» 버튼  을 누르면, **기능** 메뉴가 열립니다.

» 버튼  또는 버튼  을 눌러 원하는 측정 기능을 선택하십시오.

» 선택한 사항을 변경하려면, 버튼  또는 버튼  을 누르십시오.

내장된 도움말 기능 ?



측정 공구에 내장된 도움말 기능은 개별 측정 기능/측정 과정에 대한 세부 동영상을 제공합니다.

» 기능 메뉴를 여십시오.

» 버튼 또는 버튼 을 눌러 원하는 기능을 선택한 후 버튼 을 누르십시오.

동영상은 선택한 측정 기능에 대한 세부적인 작업 절차를 알려줍니다.

» 버튼 을 누르면, 동영상이 정지되거나 동영상이 이어서 재생

됩니다.

» 버튼 또는 를 누르면, 다음 단계 또는 이전 단계가 표시됩니다.

길이 측정

» 버튼 을 누르면, 기능 메뉴가 열립니다.

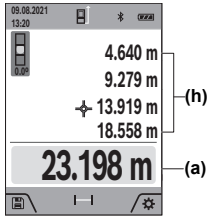
» 길이 측정 을 선택한 후 버튼 을 눌러 선택한 사항을 승인하십시오.

» 버튼 을 짧게 누르면, 레이저의 전원이 켜집니다.

» 측정을 진행하려면, 버튼 을 누르십시오.

디스플레이 하단 결과 표시열 (a) 에 측정값이 표시됩니다.

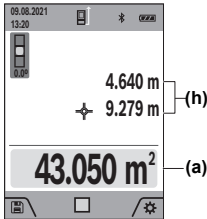
» 다시 측정할 때마다 상기 제시된 과정을 반복하십시오.



길이 측정이 여러 번 연이어 진행된 경우 결과 표시열 **(h)**에 마지막 측정 결과가 표시됩니다. 마지막 측정값이 디스플레이 하단에, 마지막에서 두 번째 측정값이 그 위에 차례로 표시됩니다.

면적 측정

- » 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.
- » 면적 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 버튼 **▲**을 짧게 누르면, 레이저의 전원이 켜집니다.
- » 버튼 **▲**을 누르면, 공간의 길이 등 첫 번째 측정이 진행됩니다.
- » 버튼 **▲**을 누르면, 공간의 너비 등 두 번째 측정이 진행됩니다.



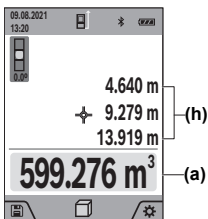
두 번째 측정을 하고 나면 면적이 자동으로 계산되어 표시됩니다. 결과 표시열 **(a)**에 결과가 표시됩니다. 개별 측정값이 결과 표시열 **(h)**에 표시됩니다.

체적 측정

- » 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.
- » 체적 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 버튼 **▲**을 짧게 누르면, 레이저의 전원이 켜집니다.
- » 버튼 **▲**을 누르면, 공간의 길이 등 첫 번째 측정이 진행됩니다.

» 버튼 ▲를 누르면, 공간의 너비 등 두 번째 측정이 진행됩니다.

» 버튼 ▲를 누르면, 공간의 높이 등 세 번째 측정이 진행됩니다.




세번째 측정을 하고 나면 체적이 자동으로 계산되어 표시됩니다. 결과 표시열 (a)에 결과가 표시됩니다. 개별 측정값이 측정값 표시열 (h)에 표시됩니다.

간접 거리 측정





간접 거리 측정 기능은 장애물이 있어 레이저빔 측정이 불가능하거나 표적면을 반사체로 이용할 수 없어 거리를 직접 측정할 수 없을 경우 사용할 수 있습니다. 이 측정방법은 수직 방향으로만 사용할 수 있습니다. 수평 방향으로 사용하면 측정 오류가 발생할 수 있습니다.

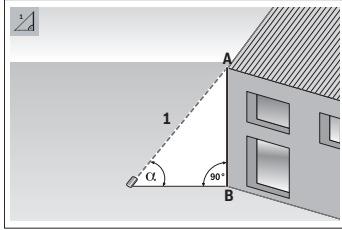

간접 거리 측정은 항상 직접 거리 측정보다 정확도가 떨어집니다. 측정 오류는 사용에 따라 직접 거리 측정 시보다 점점 더 커집니다. 측정 정확도를 높이기 위해 삼각대(액세서리)를 사용하면 좋습니다.

 삼각대를 사용하는 경우 설정한 측정 기준점에 유의하십시오. (참조 „측정 기준점 선택하기“, 페이지 86)

개별 측정을 하는 동안 레이저빔은 켜져 있습니다.



간접 거리 측정의 경우 각각 다양한 구간을 측정할 수 있는 4 가지 측정 기능이 있습니다.

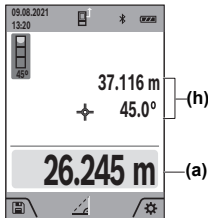
-  간접 높이 측정
-  이중 간접 높이 측정
-  간접 길이 측정
-  사다리꼴 측정

간접 높이 측정 

간접 높이 측정 기능을 이용해 구간 **1**을 측정하여 구간 **AB**를 산출할 수 있습니다. 측정공구는 각도 α 및 구간 **1**로부터 구하고자 하는 높이 **AB**를 계산합니다.

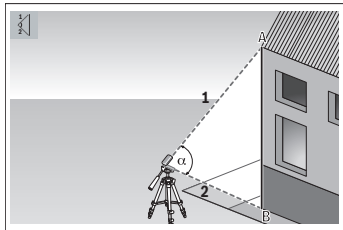
개별 측정 시 요구되는 직각이 정확하게 유지되는 경우에만 정확한 결과도 출력됩니다.

- » 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.
- » 간접 거리 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 간접 높이 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 버튼 **▲**을 짧게 누르면, 레이저의 전원이 켜집니다.
- » 측정공구를 아래 측정점 **B**의 높이에 맞춰 세우십시오.
- » 레이저가 위 측정점 **A**에 맞춰 정렬될 수 있도록 측정공구를 기울이십시오.
- » 측정을 진행하려면, 버튼 **▲**을 누르십시오.



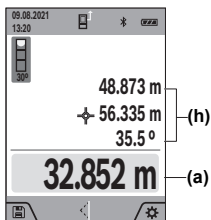
측정을 하고 나면 높이가 자동으로 계산되어 결과 표시열 **(a)**에 표시됩니다. 구간 **1**에 대한 측정값 및 각도 α 는 측정값 표시열 **(h)**에 표시됩니다.

이중 간접 높이 측정 ◀






이중 간접 높이 측정 기능을 이용해 구간 **1** 및 **2**를 측정하여 구간 **AB**를 산출할 수 있습니다. 본 측정공구는 각도 α 및 구간 **1** 및 **2**로부터 구하고자 하는 높이 **AB**를 계산합니다. 본 측정 진행 시 삼각대 사용을 권장합니다.

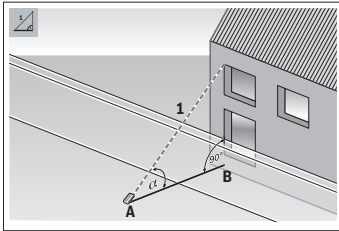
- » 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.
- » 간접 거리 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 이중 간접 높이 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 버튼 **▲**을 짧게 누르면, 레이저가 켜집니다.
- » 레이저가 위 측정점 **A**에 맞춰 정렬될 수 있도록 측정공구를 기울이십시오.
- » 첫 번째 측정을 진행하려면, 버튼 **▲**을 누르십시오.
- » 레이저가 아래 측정점 **B**에 맞춰 정렬될 수 있도록 측정공구를 기울이십시오. 이때 측정공구의 위치를 변경하지 마십시오.
- » 버튼 **▲**을 누르면, 두 번째 측정이 진행됩니다.



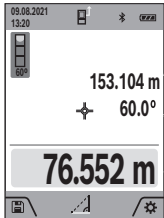
측정을 하고 나면 높이가 자동으로 계산되어 결과 표시열 **(a)**에 표시됩니다. 구간 **1, 2** 및 각도 α 에 대한 측정값이 측정값 표시열 **(h)**에 표시됩니다.

간접 길이 측정

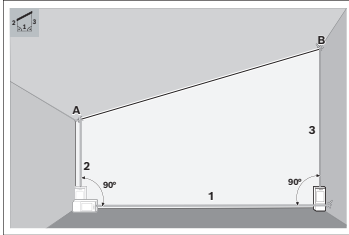
- » 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.
- » 간접 거리 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 간접 길이 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 측정공구를 구하고자 하는 구간 **AB**의 시작점 **A**에 올려 두십시오.
- » 레이저가 종료점 **B**가 있는 레벨에 맞춰 정렬될 수 있도록 측정공구를 기울이십시오.
- » 측정을 진행하려면, 버튼 을 누르십시오.



간접 길이 측정 기능을 이용해 구간 **1**을 측정하여 구간 **AB**를 산출할 수 있습니다. 측정공구는 각도 α 및 구간 **1**로부터 구하고자 하는 길이 **AB**를 계산합니다.












측정을 하고 나면 길이가 자동으로 계산되어 결과 표시열 **(a)**에 표시됩니다. 구간 **1**에 대한 측정값 및 각도 α 는 측정값 표시열 **(h)**에 표시됩니다.

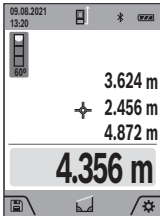
사다리꼴 측정 

사다리꼴 측정 기능을 이용해 지붕 기울기의 길이 등을 산출할 수 있습니다. 구간 **1**, **2** 및 **3**을 순서대로 측정하여 구간 **AB**를 산출할 수 있습니다. 본 측정공구는 구간 **1**, **2** 및 **3**으로부터 구하고자 하는 구간 **AB**를 계산합니다.



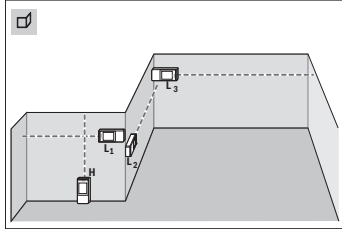
구간 **3**의 측정은 정확하게 구간 **1**의 종료점에서 시작하고, 구간 **1**과 **2** 사이 및 **1**과 **3** 사이에서 직각을 유지해야 함에 유의하십시오.

- » 버튼 을 누르면, **기능** 메뉴가 열립니다.
- » 간접 거리 측정 을 선택한 후 버튼 을 눌러 선택한 사항을 승인하십시오.
- » 사다리꼴 측정 을 선택한 후 버튼 을 눌러 선택한 사항을 승인하십시오.
- » 버튼 를 짧게 누르면, 레이저의 전원이 켜집니다.
- » 버튼 을 눌러 구간 **1**을 측정하십시오.
- » 버튼 을 눌러 구간 **2**를 측정하십시오.
- » 버튼 을 눌러 구간 **3**을 측정하십시오.




측정을 하고 나면 구간 **AB**가 자동으로 계산되어 결과 표시열 **(a)**에 표시됩니다. 구간 **1**, **2** 및 **3**에 대한 측정값은 측정값 표시열 **(h)**에 표시됩니다.

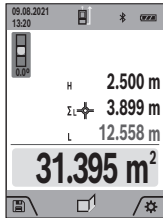
벽 면적 측정



벽 면적 측정은 높이가 동일한 여러 단면적의 합한 값을 구하는데 사용할 수 있습니다. 정확하게 면적을 산출하려면 첫 번째로 측정한 길이(예시에서는 공간 높이 **H**)가 모든 측정 부분에서 동일해야 합니다. 제시된 예시에서는 공간의 높이 **H**는 같지만, 길이 **L**이 서로 다른 여러 벽의 전체 면적을 산출해야 합니다.


- » 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.
- » 벽 면적 측정 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 길이 측정할 때와 같이 공간 높이 **H**를 측정하십시오.
상단 측정값행에 해당 측정값이 표시됩니다. 레이저는 켜진 상태입니다.
- » 그리고 나서 첫 번째 벽의 길이 **L1**을 측정하십시오.
면적이 자동으로 계산되어 결과 표시열에 표시됩니다. 마지막 길이 측정값은 하단 측정값 표시열에 표시됩니다. 레이저는 켜진 상태입니다.
- » 이제 두 번째 벽의 길이 **L2**를 측정하십시오.

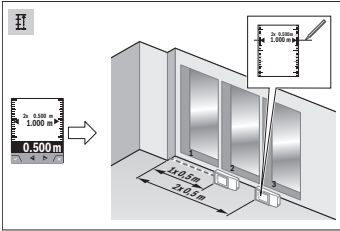
임의로 여러 개의 다른 길이 **LX**를 측정할 수 있으며, 측정된 값은 자동으로 합산되고 높이 **H**와 곱하여 계산됩니다.



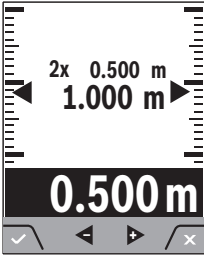
측정값 표시열 **(h)**에 표시된 개별 측정값은 길이 **L1**에 합산됩니다. 두 길이를 합한 값(중간 측정값 표시열 **(h)**에 표시)에 저장된 높이 **H**가 곱해집니다. 전체 면적값은 디스플레이 하단 결과 표시열 **(a)**에 측정값이 표시됩니다.

분리 기능

-  분리 기능에서 측정 기준점은 디스플레이에 표시된 마크에 해당됩니다. 측정공구의 모서리는 측정 기준점이 아닙니다.



분리 기능을 통해 반복하여 정해진 길이(구간)를 측정합니다. 한 표면에서 정해진 길이 전송이 가능하며, 작업 소재를 동일한 길이로 절단하거나 건축 벽에 스테드 윌을 설치할 때 등에 활용할 수 있습니다. 설정 가능한 최소 길이는 0.1 m이며, 최대 길이는 50 m입니다.



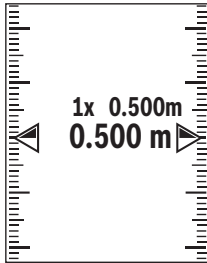
- » 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.
- » 분리 기능 **II**를 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.
- » 버튼 **▲**을 누르면, 원하는 길이를 설정할 수 있습니다.
- » 버튼 **▶** 또는 버튼 **◀**을 눌러 원하는 길이를 설정하십시오.

버튼 **▶** 또는 버튼 **◀**을 누르고 있으면, 해당 길이를 큰 범위의 단계별로 변경할 수 있습니다.

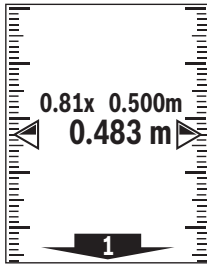
- » 버튼 **▲**을 누르면, 분리 기능이 시작됩니다. 시작점으로부터 서서히 벗어 나십시오.

측정공구는 계속해서 시작점과의 간격을 측정합니다. 이때 정의된 길이 및 현재 측정값이 표시됩니다. 하단 또는 상단의 화살표는 다음 표시 또는 이전 표시와의 최소 거리 간격을 표시합니다.

계속해서 측정을 진행할 경우, 버튼 **▲**을 누른 상태를 유지하여 측정된 값을 정의된 길이로 설정할 수도 있습니다.




좌측의 계수는 정의된 길이에 얼마나 도달했는지 알려줍니다. 디스플레이 측면의 녹색 화살표는 길이에 도달했음을 표시하기 위한 목적으로 표시됩니다.





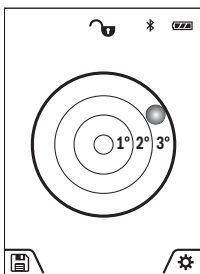
기준값이 디스플레이 영역을 벗어난 경우, 적색 화살표 및 적색 문자 표시가 실제값을 나타냅니다.

경사 측정/디지털 수준기

디지털 수준기는 (예를 들어 세탁기, 냉장고 등) 물체의 수평 또는 수직 방향을 점검하는 데 사용됩니다. 경사 측정은 (예를 들어 계단, 난간, 가구를 들어올 때, 파이프를 배선할 때 등) 경사 또는 기울기를 측정하는 데 사용됩니다. 측정공구는 측정공구의 위치를 바꾸면 두 가지 기능 사이에서 자동으로 전환됩니다.

» 버튼  을 누르면, **기능** 메뉴가 열립니다.

» 경사 측정/디지털 수준기  를 선택한 후 버튼  을 눌러 선택한 사항을 승인하십시오.

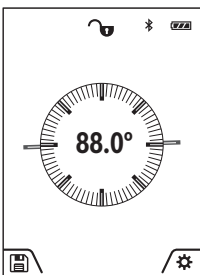


측정공구의 아래쪽은 디지털 수준기를 위한 측정 기준점 역할을 합니다.

» 디지털 수준기를 이용하려면, 측정공구의 뒷면이 측정해야 할 표면을 향하도록 두십시오.

버튼 ▲을 짧게 눌러 측정값이 바뀌지 않도록 설정할 수 있습니다.

» 경사가 3°를 초과하면, 디스플레이의 구가 적색으로 점등됩니다.



측정공구의 좌측은 경사 측정을 위한 기준점 역할을 합니다. 측정 과정 중에 표시기가 깜박이면, 측정공구가 지나치게 옆으로 기울어져기 때문입니다.

» 경사 측정을 이용하려면, 측정공구의 측면이 경사를 측정할 물체를 향하도록 두십시오.

버튼 ▲을 눌러 측정값이 바뀌지 않도록 설정할 수 있습니다.

연속 측정 \rightarrow

연속 측정 시에는 측정값이 계속해서 업데이트됩니다. 예를 들어 벽면에서 원하는 간격까지 움직일 수 있으며, 현재 거리는 항상 판독 가능합니다.

» 버튼 **Func**을 누르면, **기능** 메뉴가 열립니다.

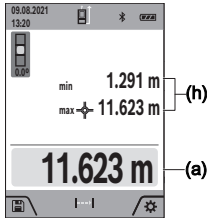
» 연속 측정 \rightarrow 을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.

» 버튼 ▲을 짧게 누르면, 레이저의 전원이 켜집니다.

» 결과 표시열에 원하는 거리값이 표시될 때까지 측정공구를 계속 움직입니다.

버튼 ▲을 짧게 눌러 연속 측정을 중단할 수 있습니다.

» 버튼 ▲을 다시 누르면, 연속 측정을 계속해서 진행할 수 있습니다.




현재 측정값이 결과 표시열 **(a)**에 표시되고, 근처대 및 최소 측정값은 측정값 표시열 **(h)**에 표시됩니다.



5 분이 지나면 자동으로 연속 측정이 꺼집니다.

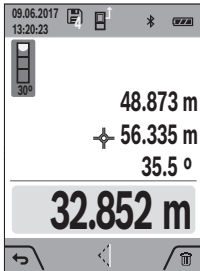
메모리 기능

측정이 종료될 때마다 해당 값 또는 최종 결과는 자동으로 저장됩니다. 마지막 **50** 개의 값(측정값 또는 최종 결과)이 저장됩니다. 메모리가 꽉 차면, 가장 오래된 값이 덮어쓰기 됩니다. (제공되는 **50** 개의 메모리 값 중에서) 가장 오래된 값은 메모리의 위치 1에, 마지막 값은 위치 **50**에 위치합니다.

» 버튼 을 누르면, 메모리 기능이 열립니다.

마지막 값이 표시됩니다.


» 버튼  또는 버튼 을 누르면, 저장된 값을 넘겨볼 수 있습니다.




디스플레이 상단에 메모리 값의 번호가 표시되고, 좌측에는 해당 측정 기능의 아이콘이 표시됩니다. 메모리에 저장된 값이 없으면, 디스플레이 하단에 "0.000" 및 상단에 "0"이 표시됩니다.

메모리 값 삭제하기

» 표시된 값을 삭제하려면, 버튼 을 누르십시오.

» 버튼 을 눌러 승인하십시오.

저장된 모든 값을 삭제하려면, **기본 설정** 메뉴 에서 메뉴항목 **메모리 삭제**를 선택하십시오.

값 더하기/빼기

길이 측정 시 값 더하기

» 길이 측정 기능을 선택하십시오.

» 첫 번째 측정을 진행하십시오.

» 버튼 을 누르십시오.

» 두 번째 측정을 진행하십시오.

두 번째 측정이 완료되면, 두 번째 측정의 결과가 측정값 표시열 **(h)**에 표시되고 최종 결과가 결과 표시열 **(a)**에 표시됩니다.

면적 및 체적 측정 시 값 더하기


» 면적 측정 또는 체적 측정 기능을 선택하십시오.

» 첫 번째 면적 측정 또는 체적 측정을 진행하십시오.

» 버튼 을 누르십시오.


» 두 번째 면적 측정 또는 체적 측정을 진행하십시오.

두 번째 또는 세 번째 측정을 하고 나면 면적 또는 체적이 자동으로 계산되어 표시됩니다. 결과 표시열 **(a)**에 결과가 표시됩니다. 개별 측정값이 측정값 표시열 **(h)**에 표시됩니다.


» 버튼 을 누르면, 최종 합산 결과가 표시됩니다.


결과 표시열 **(a)**에 최종 결과가 표시됩니다. 개별 면적 측정 또는 체적 측정 결과가 측정값 표시열 **(h)**에 표시됩니다.

값 빼기

» 값을 빼려면 버튼 을 누르십시오. 다른 작업 절차는 "값 더하기"와 동일하게 진행됩니다.

측정값 삭제하기

모든 측정 기능에서 버튼 을 짧게 눌러 마지막으로 산출된 측정값을 삭제할 수 있습니다.

버튼  을 여러 차례 짧게 누르면 측정값들이 역순으로 삭제됩니다.

블루투스® 인터페이스

다른 기기로의 데이터 전송

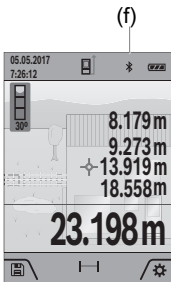
본 측정공구에는 블루투스® 모듈이 장착되어 있으며, 이 모듈은 무선 기술을 이용하여 블루투스® 인터페이스가 있는 특정한 모바일 단말기에 데이터를 전송합니다(예: 스마트폰, 태블릿).

블루투스® 연결에 필요한 시스템 전제조건에 관한 정보는 보쉬 인터넷 사이트 www.bosch-pt.com에서 확인할 수 있습니다.




▶ 보다 상세한 정보는 보쉬 제품 사이트에서 확인할 수 있습니다.


블루투스® 를 이용하여 데이터를 전송할 경우 모바일 단말기와 측정공구 간에 시간 지연이 있을 수 있습니다. 이는 두 기기 간의 거리 때문일 수도 있고, 측정 대상 자체에 원인이 있을 수도 있습니다.

모바일 단말기로 데이터를 전송하기 위해 블루투스® 인터페이스 활성화




✓ 모바일 단말기에 있는 블루투스® 인터페이스가 활성화되었는지 확인하십시오.

» 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, 기본 설정 메뉴  가 열립니다.

»  을 선택하십시오.

» 버튼  또는 버튼  을 누르면,  을 선택할 수 있습니다.









» 선택한 사항을 승인하려면, 버튼  을 누르십시오.

블루투스® 기호는 디스플레이에 흰색으로 표시됩니다 (f).

기능을 추가할 수 있도록 보쉬 앱이 제공됩니다. 단말기에 따라 해당 앱 스토어에서 다운로드할 수 있습니다.

보쉬 애플리케이션을 시작하면 모바일 단말기와 측정공구가 연결됩니다. 활성화된 여러 개의 측정공구 중에 일련 번호에 따라 적합한 것을 고르십시오. 일련 번호 (15) 는 측정공구의 타입 표시판에 적혀 있습니다.





블루투스® 인터페이스 비활성화

- » 버튼  을 짧게 누르거나 또는 버튼  을 누르고 있으면, 기본 설정 메뉴  가 열립니다.
- »  을 선택하십시오.
- » 버튼  또는 버튼  을 누르면,  을 선택할 수 있습니다.
- » 선택한 사항을 승인하려면, 버튼  을 누르십시오.
블루투스® 기호는 디스플레이에 회색으로 표시됩니다.

정확도 점검

경사 측정 및 거리 측정의 정확도를 정기적으로 점검하십시오.

정확도 점검 및 경사 측정 캘리브레이션

- » 우선 측정공구를 책상 위에 놓고 그 경사를 측정합니다.
 - » 측정공구를 180° 돌린 후 다시 경사를 측정합니다.
표시된 숫자의 편차가 최대 0.3° 이하여야 합니다.
편차가 클 경우 측정공구를 새로 캘리브레이션해야 합니다.
 - » 버튼  을 계속 누르고 있으면, 기본 기능 메뉴를 불러올 수 있습니다.
 - »  을 선택한 후 버튼  을 눌러 선택한 사항을 승인하십시오.
 - » 디스플레이에 나온 지침을 따르십시오.
-  심한 온도 변화를 겪었거나 충격을 받은 경우, 측정공구의 정확도를 점검해 본 후 필요에 따라 캘리브레이션하기를 권장합니다. 온도 변화 후 측정공구를 캘리브레이션하기 전에, 일정 시간동안 측정공구가 온도에 적응할 수 있도록 해야 합니다.

거리 측정 정확도 점검

정확도 점검을 위해 적절한 조건에서 측정을 진행해야 합니다. 즉, 측정 구간은 실내에 위치해야 하며, 측정하는 표적면은 매끄럽고 반사율이 높아야 합니다(예: 흰색으로 칠한 벽).

- » 그 길이가 정확하게 알려진 약 3~ 10 m 사이의 측정 구간을 선택하십시오(예: 공간 너비, 문 입구).

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» 해당 구간을 10회 연속으로 측정하십시오.

적절한 조건에서 개별 측정 시 평균값과의 편차가 전체 측정 구간에서 최대 ± 2 mm를 넘어서는 안 됩니다. 차후에 정확도를 비교할 수 있도록, 측정 한 값을 기록하십시오.

정확도 점검 및 표적물 표시(십자선) 캘리브레이션

레이저 및 표적물 표시 정렬의 정확도를 정기적으로 검사하십시오.

» 이를 위해 표적물과 최소 5 m 이상 거리가 있는 최대한 조명이 약한 밝은 표면(예: 흰색 벽)을 선택하십시오.

» 레이저 포인트가 디스플레이의 표적물 표시 내에 있는지 점검하십시오.

레이저 포인트가 표적물 표시 내에 있지 않으면, 표적물 표시를 다시 캘리브레이션해야 합니다.

표적물 표시 다시 캘리브레이션하기

» 버튼 **Func**을 계속 누르고 있으면, **기본 기능** 메뉴로 전환됩니다.

» **CAL**을 선택한 후 버튼 **Func**을 눌러 선택한 사항을 승인하십시오.

» 디스플레이에 나온 지침을 따르십시오.

삼각대(액세서리)를 이용해 작업하기

특히 먼거리를 측정할 때 삼각대를 사용하면 도움이 됩니다.

» 1/4" 나사부 **(17)**와 함께 측정공구를 삼각대 **(27)**의 순간 교환 플레이트 혹은 일반 카메라 삼각대 위에 놓습니다.

» 그리고 나서 측정공구를 순간 교환 플레이트의 고정 나사로 조이면 됩니다.

» 측정을 위한 기준점을 설정하십시오 (참조 „측정 기준점 선택하기“, 페이지 86).

오류 메시지



본 측정공구는 측정할 때마다 제대로 작동하는지 감시합니다. 결함이 확인되면, 디스플레이에 옆에 표시된 기호가 표시되고, 측정공구가 저절로 꺼집니다. 이 경우, 담당 딜러를 통해 측정공구를 보쉬 서비스 센터에 맡기십시오.

오류 해결

온도 경고 표시

온도 경고 가 깜박이고, 측정이 불가능한 경우

원인: 측정공구가 작동 온도 $-10\text{ }^{\circ}\text{C} \sim 45\text{ }^{\circ}\text{C}$ 를 벗어나 있습니다(연속 측정 기능 사용 시 최대 $+40\text{ }^{\circ}\text{C}$ 까지).

해결 방법: 측정공구가 작동 온도에 도달할 때까지 기다리십시오.

디스플레이의 "ERROR" 표시

디스플레이의 "Error" 표시

원인: 측정 단위가 서로 다른 측정값을 더하거나 뺀 경우입니다.

해결 방법: 동일한 측정 단위의 측정값만 더하거나 빼십시오.

원인: 레이저빔과 표적 간의 각도가 좁습니다.

해결 방법: 레이저빔과 표적 간의 각도를 넓히십시오.

원인: 표적면 반사가 너무 심하거나(예: 거울) 너무 약하거나(예: 검은색 소재) 또는 주변 조명이 너무 강합니다.

해결 방법: 레이저 표적판(액세서리)를 사용하십시오.

원인: 레이저빔 발사구 (19) 또는 수신 렌즈 (18) 에 김이 서렸습니니다(예: 급속한 온도 변경).

해결 방법: 레이저빔 발사구 (19) 또는 수신 렌즈 (18) 를 부드러운 천으로 닦아 건조시키십시오.

원인: 산출된 값이 $1\ 999\ 999\ \text{m}/\text{m}^2/\text{m}^3$ 보다 크거나 또는 $-999\ 999\ \text{m}/\text{m}^2/\text{m}^3$ 보다 큼니다.

해결 방법: 측정을 나누어서 진행하십시오.

캘리브레이션

디스플레이에 "CAL" 또는 "ERROR" 표시

원인: 경사 측정의 캘리브레이션이 정확한 순서대로 이루어지지 않았거나 올바른 위치에서 실시되지 않았습니다.

해결 방법: 디스플레이와 사용 설명서에 나온 대로 캘리브레이션을 반복하십시오.

원인: 캘리브레이션에 사용된 표면이 정확히 수직이나 수평으로 맞추어지지 않았습니니다.

해결 방법: 수직이나 수평의 표면에 다시 캘리브레이션하고, 경우에 따라 수 준기를 사용하여 먼저 표면을 확인해 보십시오.

원인: 버튼을 누를 때 측정공구가 움직이거나 기울어졌습니다.

해결 방법: 캘리브레이션을 반복하고 버튼을 누를 때 측정공구를 표면 위에서 가만히 잡은 채 유지하십시오.

측정 결과

측정 결과를 신뢰할 수 없음

원인: 표적면이 명확하게 반사되지 않습니다(예: 물, 유리).

해결 방법: 표적면을 가리십시오.

원인: 레이저빔 발사구 (19) 또는 수신 렌즈 (18) 가 가려져 있습니다.

해결 방법: 레이저빔 발사구 (19) 및 수신 렌즈 (18) 주변은 항상 비어있는 상태로 유지하십시오.

측정결과가 타당하지 않음

원인: 레이저빔 구간에 장애가 있습니다.

해결 방법: 레이저 포인트 전체가 표적면에 위치하는지 확인하십시오.

원인: 측정 기준점이 잘못 설정되었습니다.

해결 방법: 측정 기준점을 측정하려는 것에 맞춰 선택하십시오

블루투스®

블루투스® 활성화 불가능

원인: 배터리 또는 충전용 배터리가 너무 약합니다.

해결 방법: 배터리를 교체하거나 측정공구의 충전용 배터리를 충전하십시오.

블루투스® 연결되지 않음

블루투스® 연결되지 않음, 디스플레이에 "ERROR" 표시

원인: 블루투스® 연결 장애

해결 방법:

- (측정 공구 및 모바일 단말기에서 모두) 블루투스®가 활성화되었는지 확인하십시오.
- (측정 공구 및 모바일 단말기에서 모두) 블루투스®를 껐다가 다시 켜십시오.
- 모바일 단말기의 애플리케이션을 점검하십시오.
- 모바일 단말기가 과부하 상태인지 확인하십시오.
- 측정공구와 모바일 단말기 사이의 거리를 줄이십시오.
- 측정공구와 모바일 단말기 사이에 장애물(예: 철근 콘크리트, 금속문)이 없도록 하십시오. 전자기 간섭원(예: WLAN 송신기)과 간격을 유지하십시오.

보수 정비 및 서비스

보수 정비 및 유지

반드시 측정공구를 함께 공급된 안전 케이스에 넣어 보관하고 운반하십시오. 항상 측정공구를 깨끗이 유지하십시오.

측정공구를 물이나 다른 액체에 넣지 마십시오.

물기있는 부드러운 천으로 오염된 부위를 깨끗이 닦으십시오. 세척제 또는 용제를 사용하지 마십시오.

특히 수신 렌즈 (18), 레이저 발사구 (19) 및 카메라 (20) 를 매우 주의 깊게 청소하십시오. 수신 렌즈, 레이저 발사구 및 카메라에 오염물이 없어야 합니다. 수신 렌즈, 레이저 발사구 및 카메라는 사진기 렌즈에 적합한 도구로만 닦으십시오. 뾰족한 물건으로 수신 렌즈, 레이저 발사구 또는 카메라에 있는 오염물을 제거하려 하지 말고, 그 위쪽으로 닦아내지 마십시오(스크래치 위험).

수리하는 경우 측정공구를 안전 케이스 (21) 에 넣어 보내주십시오.

AS 센터 및 사용 문의

AS 센터에서는 귀하 제품의 수리 및 보수정비, 그리고 부품에 관한 문의를 받고 있습니다. 대체 부품에 관한 분해 조립도 및 정보는 인터넷에서도 찾아볼 수 있습니다 - www.bosch-pt.com

보수 사용 문의 팀에서는 보수의 제품 및 해당 액세서리에 관한 질문에 기꺼이 답변 드릴 것입니다.

문의나 대체 부품 주문 시에는 반드시 제품 네임 플레이트에 있는 10자리의 부품번호를 알려 주십시오.

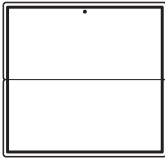
114 | 한국어

콜센터
080-955-0909

다른 AS 센터 주소는 아래 사이트에서 확인할 수 있습니다:
www.bosch-pt.com/serviceaddresses

액세서리

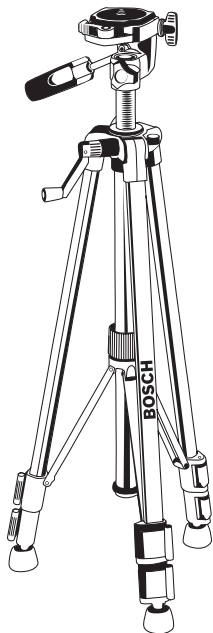
제시된 링크를 통해 보쉬 웹사이트에서 액세서리를 확인할 수 있습니다.



레이저 표적판 (24)
2 607 001 391



레이저용 안경(적색) (25)
1 608 M00 05B



삼각대 BT 150 (26)
0 601 096 B00

ไทย

กฎระเบียบเพื่อความปลอดภัย



ส่งเครื่องมือวัดให้ช่างผู้เชี่ยวชาญตรวจซ่อมและ ไขอะไหล่เปลี่ยนของแท้เท่านั้น หากไม่ใช่เครื่องมือวัดตามคำแนะนำเหล่านี้ ระบบป้องกันเบ็ดเสร็จในเครื่องมือวัดอาจได้รับผลกระทบ อย่าทำให้ป้ายเตือนที่อยู่บน

เครื่องมือวัดนี้เคลื่อน เก็บรักษาค่าแนะนำเหล่านี้ไว้ให้ดี และหากเครื่องมือวัดนี้ถูกส่งต่อไปยังผู้อื่น ให้ส่งมอบคำแนะนำเหล่านี้ไปด้วย

- ▶ ข้อควรระวัง - การใช้อุปกรณ์ทำงานหรืออุปกรณ์ปรับเปลี่ยนอื่นๆ นอกเหนือไปจากที่ระบุไว้ในที่นี้ หรือการใช้วิธีการอื่นๆ อาจนำไปสู่การสัมผัสกับรังสีอันตรายได้
- ▶ เครื่องมือวัดนี้จัดส่งมาพร้อมป้ายเตือนแสงเลเซอร์ (แสดงในหน้าภาพประกอบของเครื่องมือวัด)
- ▶ หากข้อความของป้ายเตือนแสงเลเซอร์ไม่ได้เป็นภาษาของท่าน ให้ติดสติ๊กเกอร์ที่จัดส่งมาที่พิมพ์เป็นภาษาของท่านทับลงบนข้อความก่อนใช้งานครั้งแรก



อย่าเล็งลำแสงเลเซอร์ไปยังคนหรือสัตว์ และตัวท่านเองอย่าจ้องมองเขาในลำแสงเลเซอร์โดยตรงหรือลำแสงเลเซอร์สะท้อน การกระทำดังกล่าวอาจทำให้คนตาบอด ทำให้เกิดอุบัติเหตุ หรือทำให้ดวงตาเสียหายได้

- ▶ ถ้าแสงเลเซอร์เข้าตา ต้องปิดตาและหันศีรษะออกจากลำแสงในทันที
- ▶ อย่าทำการเปลี่ยนแปลงใดๆ ที่อุปกรณ์เลเซอร์
- ▶ อย่าใช้แว่นสำหรับมองแสงเลเซอร์ (อุปกรณ์เสริม) เป็นแว่นนิรภัย แว่นสำหรับมองแสงเลเซอร์ใช้สำหรับมองลำแสงเลเซอร์ให้เห็นชัดเจนยิ่งขึ้น แต่ไม่ได้ช่วยป้องกันรังสีเลเซอร์
- ▶ อย่าใช้แว่นสำหรับมองแสงเลเซอร์ (อุปกรณ์เสริม) เป็นแว่นกันแดดหรือใส่ขั้วรถยนต์แว่นสำหรับมองแสงเลเซอร์ไม่สามารถป้องกันรังสีอัลตราไวโอเล็ต (UV) ได้ อย่างสมบูรณ์ และยังลดความสามารถในการมองเห็นสี

- ▶ **ส่งเครื่องมือวัดให้ช่างผู้เชี่ยวชาญตรวจสอบและใช้อะไหล่เปลี่ยนของแท้เท่านั้น** ทั้งนี้เพื่อให้มั่นใจได้ว่าจะสามารถใช้งานเครื่องมือวัดได้อย่างปลอดภัยเสมอ
- ▶ **อย่าให้เด็กใช้เครื่องมือวัดด้วยเลเซอร์โดยไม่ควบคุมดูแล** เด็กๆ อาจทำให้บุคคลอื่นหรือตนเองตาพร่าโดยไม่ตั้งใจ
- ▶ **อย่าใช้เครื่องมือวัดในสภาพแวดล้อมที่เสี่ยงต่อการระเบิด** ซึ่งเป็นที่ที่มีของเหลว แก๊ส หรือฝุ่นที่ติดไฟได้ ในเครื่องมือวัดสามารถเกิดประกายไฟซึ่งอาจจุดฝุ่นละอองหรือไอระเหยให้ติดไฟได้
- ▶ **เครื่องมือวัดมีอินเทอร์เฟซคลื่นวิทยุสำหรับเชื่อมโยงสื่อสารแบบไร้สายต้องปฏิบัติตามข้อจำกัดการทำงานในพื้นที่ ต. ย. เช่น ในเครื่องบิน หรือโรงพยาบาล**
เครื่องหมายข้อความ Bluetooth® และยี่ห้อเป็นเครื่องหมายการค้าจดทะเบียนและเป็นกรรมสิทธิ์ของ Bluetooth SIG, Inc. บริษัท Robert Bosch Power Tools GmbH ได้รับใบอนุญาตใช้งานเครื่องหมายข้อความ/โลโก้ดังกล่าว
- ▶ **ระวัง!** การใช้เครื่องมือไฟฟ้าที่มี Bluetooth® อาจรบกวนอุปกรณ์และเครื่องมืออื่นๆ เครื่องบิน และอุปกรณ์ทางการแพทย์ (ต. ย. เช่น เครื่องกระตุ้นหัวใจ เครื่องช่วยฟัง) นอกจากนี้ยังอาจเกิดความเสียหายต่อคนและสัตว์ในบริเวณใกล้เคียงด้วย **อย่าใช้เครื่องมือวัดที่มี Bluetooth® ใกล้ๆ อุปกรณ์ทางการแพทย์ สถานีบริการน้ำมัน โรงงานเคมี พื้นที่ที่เสี่ยงต่อการระเบิด และในพื้นที่ทำการระเบิด** **อย่าใช้เครื่องมือไฟฟ้าที่มี Bluetooth® ในเครื่องบิน หลีกเลี่ยงการใช้งานเป็นระยะเวลานานตรงบริเวณใกล้ร่างกายโดยตรง**
- ▶ **ห้ามถ่ายภาพคนหรือสัตว์ด้วยเครื่องมือวัด** เนื่องจากลำแสงเลเซอร์อาจเปิดใช้งานอย่างถาวร เมื่อเปิดลำแสงเลเซอร์อาจทำให้คนตาพร่า ทำให้เกิดอุบัติเหตุ หรือทำให้ดวงตาเสียหายได้
- ▶ **อย่าใช้เครื่องมือวัดหากคุณสังเกตเห็นความเสียหายบริเวณกระจกหน้าจอ (เช่น รอยร้าวบนพื้นผิว ฯลฯ)** มีความเสี่ยงต่อการบาดเจ็บ



ดังนั้นเครื่องมือวัดและอุปกรณ์ประกอบที่มีคุณสมบัติเป็นแม่เหล็กให้ห่างจากวัตถุปลูกถ่ายในร่างกายและอุปกรณ์ทางการแพทย์อื่นๆ เครื่องปรับจังหวะการเต้นของหัวใจด้วยไฟฟ้าหรือมีอินซูลิน แม่เหล็กของเครื่องมือวัดและอุปกรณ์ประกอบจะสร้างสนามแม่เหล็กซึ่งสามารถทำให้วัตถุปลูกถ่ายในร่างกายและอุปกรณ์ทางการแพทย์อื่นๆ ทำงานบกพร่องได้

- ▶ ต่อกันเครื่องมือวัดและอุปกรณ์ประกอบที่มีคุณสมบัติเป็นแม่เหล็กให้ห่างจากสื่อ นำ ข้อมูลที่มีคุณสมบัติเป็นแม่เหล็กและอุปกรณ์ที่ไวต่อแรงดึงดูดแม่เหล็ก แม่เหล็กของ เครื่องมือวัดและอุปกรณ์ประกอบสามารถทำให้ข้อมูลสูญหายอย่างเรียกกลับไม่ได้

รายละเอียดผลิตภัณฑ์และข้อมูลจำเพาะ

โปรดกางหน้าที่พับออกซึ่งแสดงให้เห็นเครื่องมือวัด และกางหน้านี้ไว้ขณะที่อ่านคู่มือการใช้งาน

ประโยชน์การใช้งาน





เครื่องมือวัดนี้ใช้สำหรับวัดระยะทาง ความยาว ความสูง ช่องว่าง ความลาดชัน และสำหรับ คำนวณพื้นที่และปริมาตร

เครื่องมือวัดนี้เหมาะสำหรับใช้งานทั้งภายในและภายนอกอาคาร

ผลจากการวัดสามารถถ่ายโอนไปยังอุปกรณ์อื่นๆ ผ่าน *Bluetooth*[®]

ส่วนประกอบที่แสดงภาพ

ลำดับเลขของส่วนประกอบผลิตภัณฑ์อ้างอิงถึงส่วนประกอบของเครื่องมือวัดที่แสดงในหน้า ภาพประกอบ

- (1) จอแสดงผล
- (2)  ปุ่มวัด
- (3)  ซอฟท์คีย์ขวา
- (4)  ปุ่มบวก
- (5)  ปุ่มซูม
- (6) ส่วนรองรับสายหัว
- (7) ปุ่มเปิดหมุดหยุด
- (8) หมุดหยุด
- (9)  ปุ่มเปิด-ปิด
- (10)  ปุ่มแสดงเป้าหมาย

- (11) ◀ปุ่มลบ
- (12) ◼ซอฟต์แวร์ถ่าย
- (13) Func ปุ่มฟังก์ชัน
- (14) ป้ายเตือนแสงเลเซอร์
- (15) หมายเลขเครื่อง
- (16) ฝาช่องใส่แบตเตอรี่
- (17) เกลียวขาตั้งแบบสามขา 1/4"
- (18) เลนส์รับแสง
- (19) ทางออกลำแสงเลเซอร์
- (20) กล้องถ่ายรูป
- (21) กระจ่างใส่เครื่องมือวัด
- (22) ล็อคบิด
- (23) แบตเตอรี่
- (24) ด้ามจับบนกระจก^{A)}
- (25) แวนตาสำหรับมองแสงเลเซอร์^{A)}
- (26) ขาตั้งแบบสามขา^{A)}

A) อุปกรณ์ประกอบที่แสดงภาพหรืออธิบายไม่รวมอยู่ในการจัดส่งมาตรฐาน
กรุณาดูอุปกรณ์ประกอบทั้งหมดในรายการแสดงอุปกรณ์ประกอบของเรา

ชิ้นส่วนแสดงผล

- (a) บรรทัดผลลัพธ์
- (b) ตัวแสดงเป้าหมาย (เป้ากากบาท)
- (c) สัญลักษณ์ มุมเอียง
- (d) วันที่/เวลา
- (e) ระบายอ้างอิงของการวัด
- (f) สถานะ Bluetooth[®]
 - ✖ Bluetooth[®] ไม่เรียกใช้งาน
 - ✖ » Bluetooth[®] ถูกเรียกใช้งาน มีการเชื่อมต่อ
- (g) ไฟแสดงสถานะการชาร์จ

- (h) บรรทัดแสดงค่าจากการวัด
- (i) การตั้งค่าพื้นฐาน
- (j) ไฟแสดงฟังก์ชันการวัด
- (k) ระบบกักเก็บพลังงานภายใน
- (l) กอนหน้า
- (m) ฟังก์ชันช่วยเหลือในระบบ
- (n) หน้าจอเริ่มต้น
- (o) เมนูการตั้งค่าพื้นฐานอื่นๆ
- (p) เมนูการตั้งค่าพื้นฐานต่างๆ
- (q) เมนูฟังก์ชันการวัด

ข้อมูลทางเทคนิค

| เครื่องวัดระยะด้วยเลเซอร์แบบดิจิทัล | GLM 100-25 C |
|---|-------------------|
| หมายเลขสินค้า | 3 601 K72 Y.. |
| ขอบเขตการวัด ^{A)} | 0.08–100 ม. |
| ช่วงการวัด (สภาวะที่ไม่เหมาะสม) ^{B)} | 0.08–60 ม. |
| ความแม่นยำการวัด ^{A)} | ± 1.5 มม. |
| ความแม่นยำการวัด (สภาวะที่ไม่เหมาะสม) ^{B)} | ± 3.0 มม. |
| หน่วยแสดงการวัดต่ำสุด | 0.5 มม. |
| การวัดระยะทางอ้อมและระดับน้ำ | |
| ขอบเขตการวัด | 0°–360° (4 × 90°) |
| การวัดความลาดชัน | |
| ขอบเขตการวัด | 0°–360° (4 × 90°) |
| ความแม่นยำการวัด ^{C)D)} | ± 0.2° |
| หน่วยแสดงการวัดต่ำสุด | 0.1° |
| ทั่วไป | |
| อุณหภูมิใช้งาน ^{E)} | -10 °C ... +45 °C |
| อุณหภูมิเก็บรักษา | -20 °C ... +70 °C |
| ความชื้นสัมพัทธ์ สูงสุด | 90 % |
| ความสูงใช้งานเหนือระดับอ้างอิง สูงสุด | 2000 ม. |
| ระดับมลพิษตาม IEC 61010-1 | 2 ^{F)} |

| เครื่องวัดระยะด้วยเลเซอร์แบบดิจิทัล | | GLM 100-25 C |
|---|--|--|
| ระดับเลเซอร์ | | 2 |
| ชนิดเลเซอร์ | | 650 นาโนเมตร, < 1 มิลลิวัตต์ |
| ความแตกต่างของลำแสงเลเซอร์ | | < 1.5 mrad (มุมเต็ม) |
| ระบบปิดสนิทชนิดไนมิตี ภายในประมาณ | | |
| - เลเซอร์ | | 20 วินาที |
| - เครื่องมือวัด (เมื่อไม่มีการวัด) | | 5 นาที |
| แบตเตอรี่ | | 3 × 1.5 โวลต์ LR6 (AA) |
| น้ำหนักตามระเบียบการ EPTA-Procedure 01:2014 | | 0.23 กก. |
| ระดับการคุ้มกัน | | IP 54 (ป้องกันฝุ่นและน้ำกระเด็นเปื้อน) |
| ขนาด | | 142 (176) × 64 × 28 มม. |
| การถ่ายโอนข้อมูล | | |
| Bluetooth® | | Bluetooth® 4.2 Low Energy ⁽⁶⁾ |
| ย่านความถี่ใช้งาน | | 2402–2480 เมกะเฮิรตซ์ |

กำลังสูงสุด

8 มิลลิวัตต์

- A) สำหรับการวัดจากขอบหน้าของเครื่องมือวัด ใช้ได้กับเป้าหมายที่มีการสะท้อนแสงมาก (เช่น ผนังทาสีขาว) แสงไฟพื้นหลังอ่อน และอุณหภูมิใช้งาน 25 °C นอกจากนี้ค่าเบี่ยงเบนที่ขึ้นกับระยะทางมีค่าเท่ากับ ± 0.05 มม./ม.
- B) สำหรับการวัดจากขอบหน้าของเครื่องมือวัด ใช้ได้กับเป้าหมายที่มีการสะท้อนแสงมาก (เช่น ผนังทาสีขาว) แสงไฟพื้นหลังเข้ม และอุณหภูมิใช้งาน 25 °C และระดับความสูงที่มีความสูงมาก นอกจากนี้ต้องนำส่วนเบี่ยงเบน ± 0.15 มม./ม. โดยขึ้นอยู่กับระยะทางมาพิจารณาด้วย
- C) ที่อุณหภูมิใช้งาน 25 °C
- D) หลังการสอบเทียบของผู้ใช้งานที่ 0° และ 90° ต้องนำข้อผิดพลาดความชื้นเพิ่มเติมจาก $\pm 0.01\%$ องศาถึง 45° (สูงสุด) มาพิจารณา สำหรับการวัดความลาดชัน ให้ใช้ด้านซ้ายของเครื่องมือวัดเป็นระนาบอ้างอิง
- E) ในฟังก์ชันการวัดต่อเนื่องอุณหภูมิใช้งานสูงสุดคือ +40 °C
- F) เกิดขึ้นเฉพาะมลพิษที่ไม่นำไฟฟ้า ยกเว้นบางครั้งนำไฟฟ้าได้ชั่วคราวที่มิสาเหตุจากการกลั่นตัวที่ใดก็ตามจะเกิดขึ้น
- G) สำหรับอุปกรณ์ Bluetooth® Low Energy อาจไม่มีการเชื่อมต่อ ทั้งนี้ขึ้นอยู่กับรุ่นและระบบปฏิบัติการ อุปกรณ์ Bluetooth® ต้องสนับสนุน GATT-Profile

หมายเลขเครื่อง (15) บนแผ่นป้ายรุ่นสามารถระบุเครื่องมือวัดของท่านได้อย่างชัดเจน

การใส่/การเปลี่ยนแบตเตอรี่

ขอแนะนำให้ใช้แบตเตอรี่อัลคาไลน์-แมงกานีสหรือแบตเตอรี่ที่ไม่ใช่อัลคาไลน์-แมงกานีสสำหรับการทำงานของเครื่องมือวัด (โดยเฉพาะอย่างยิ่งในอุณหภูมิการทำงานต่ำ) แบตเตอรี่แพ็ค 1.2 โวลต์ จะวัดได้น้อยกว่าแบตเตอรี่ 1.5 โวลต์ ทั้งนี้ขึ้นอยู่กับความจุของแบตเตอรี่

- » กดปุ่มปลดล๊อค (7) และกางหมุดหยุดออก (8) 180°
- » ในการเปิดฝาคอครอบช่องใส่แบตเตอรี่ (16) ให้พลิกตัวล๊อคแบบบิด (23) ขึ้น แล้วหมุนทวนเข็มนาฬิกาหนึ่งในสี่ส่วนรอบ
- » ดึงฝาคอครอบช่องใส่แบตเตอรี่ (16) ออกที่ตัวล๊อคแบบบิด (23)
- » ใส่แบตเตอรี่หรือแบตเตอรี่แพ็คเข้าไป

- ❶ เปลี่ยนแบตเตอรี่หรือแบตเตอรี่แพ็คทุกก้อนพร้อมกันเสมอ โดยใช้แบตเตอรี่หรือแบตเตอรี่แพ็คจากผู้ผลิตรายเดียวกันทั้งหมดและมีความจุเท่ากันทุกก้อน
- ❶ ขณะใส่แบตเตอรี่ต้องดูให้ขั้วแบตเตอรี่อยู่ในตำแหน่งที่ถูกต้องตามที่กำหนดไว้ที่ด้านในของใส่แบตเตอรี่

หากสัญลักษณ์แบตเตอรี่ที่ว่างเปล่าปรากฏบนจอแสดงผลเป็นครั้งแรก ยังสามารถวัดได้อีกประมาณไม่กี่ครั้งเท่านั้น

หากสัญลักษณ์แบตเตอรี่ที่ว่างเปล่าและกะพริบสีแดง ท่านไม่สามารถทำการวัดได้อีกต่อไป ให้เปลี่ยนแบตเตอรี่หรือแบตเตอรี่แพ็ค

- ▶ เมื่อไม่ใช้งานเป็นเวลานาน ให้ถอดแบตเตอรี่หรือแบตเตอรี่แพ็คออกจากเครื่องมือวัดเมื่อเก็บเป็นเวลานาน แบตเตอรี่หรือแบตเตอรี่แพ็คจะเกิดการกัดกร่อนและคายประจุไฟออกมาเอง



การปฏิบัติงาน

การเริ่มต้นปฏิบัติงาน

- ▶ อย่าวางเครื่องมือวัดที่เปิดสวิตช์ทิ้งไว้โดยไม่มีผู้ดูแลและปิดสวิตช์เครื่องมือวัดเมื่อเลิกใช้งาน คนอื่นอาจตาพร่าจากแสงเลเซอร์ได้
- ▶ บังกันไม่ให้เครื่องมือวัดได้รับความชื้นและโดนแสงแดดส่องโดยตรง
- ▶ อย่าให้เครื่องมือวัดได้รับอุณหภูมิที่สูงมาก หรือรับอุณหภูมิที่เปลี่ยนแปลงมาก ต. ย. เช่น อย่าปล่อยให้เครื่องมือวัดในรถยนต์เป็นเวลานาน ในกรณีที่อุณหภูมิมีการเปลี่ยนแปลงมาก ต้องปล่อยให้เครื่องมือวัดปรับตัวเข้ากับอุณหภูมิรอบด้านก่อนใช้งาน ในกรณีที่ได้รับอุณหภูมิที่สูงมากหรือรับอุณหภูมิที่เปลี่ยนแปลงมาก เครื่องมือวัดอาจมีความแม่นยำน้อยลง
- ▶ หลีกเลี่ยงอย่าให้เครื่องมือวัดตกหล่นหรือถูกกระแทกอย่างรุนแรง เมื่อเครื่องมือวัดถูกกระทบจากภายนอกอย่างแรง ขอแนะนำให้ทำการตรวจสอบความแม่นยำ ("การตรวจสอบความแม่นยำ", หน้า 148) ทุกครั้งก่อนนำมาใช้งานต่อ

การเปิด-ปิดเครื่อง

- » กดปุ่ม ▲ เพื่อเปิดเครื่องมือวัดและเลเซอร์

- คุณยังสามารถเปิดเครื่องมือวัดโดยไม่ต้องใช้เลเซอร์ได้โดยกดปุ่ม 
- » กดปุ่ม  ค้างไว้เพื่อปิดเครื่องมือวัด
- ค่าและการตั้งค่าอุปกรณ์ที่บันทึกไว้ในหน่วยความจำจะยังคงอยู่

กล้องถ่ายรูป



กดปุ่ม  เพื่อเปิดหรือปิดกล้อง

หลังจากปิดเครื่องมือวัดแล้ว สถานะที่เลือกจะคงบันทึกไว้

ที่ระยะห่างที่ไกลกว่า (ประมาณ > 5 ม.) เครื่องหมายเป้าหมายจะแสดงขึ้นเพื่อทำเครื่องหมายที่จุดวัดด้วยเช่นกัน

การเพิ่มประสิทธิภาพในการมองเห็นจุดเลเซอร์อย่างชัดเจนยิ่งขึ้น


อาจมองไม่เห็นจุดเลเซอร์เมื่อใช้เครื่องมือวัด โดยเฉพาะในที่กลางแจ้ง หากโดนแสงแดดโดยตรง และในระยะทางไกลภายในอาคาร เปิดใช้งานกล้อง สามารถปรับปรุงการมองเห็นจุดเลเซอร์/เป้าหมายการวัดได้โดย:

- การตั้งค่าความสว่างหน้าจอ (ดู "การตั้งค่าความสว่างหน้าจอ" , หน้า 132)
- การใช้การซูมด้วยปุ่ม 

วิธีดำเนินการวัด

เมื่อเปิดสวิตช์ เครื่องมือวัดจะอยู่ในฟังก์ชันการวัดความยาว

เมื่อเปิดสวิตช์ ขอบหลังของเครื่องมือวัดจะถูกเลือกเป็นระนาบอ้างอิงสำหรับการวัด คุณสามารถเปลี่ยนระนาบอ้างอิงได้ (ดู "เลือกระนาบอ้างอิง", หน้า 126)

- » วางเครื่องมือวัดที่จุดเริ่มต้นที่ต้องการวัด (ต. ย. เช่น มั่นห้อง)
- » กดปุ่ม  เพื่อเรียกการวัด

ลำแสงเลเซอร์จะปิดหลังกระบวนการวัด สำหรับการวัดต่อไปให้ทำซ้ำขั้นตอนนี้

ท่านสามารถเพิ่มหรือลดค่าจากการวัดหรือผลลัพธ์สุดท้ายได้

โดยทั่วไปค่าจากการวัดจะปรากฏภายใน 0.5 วินาที และหลังจากเวลาผ่านไปประมาณ 4 วินาทีเป็นอย่างช้าที่สุด

ระยะเวลาที่ใช้ในการวัดขึ้นอยู่กับระยะทาง สภาพแสง และคุณสมบัติการสะท้อนของพื้นผิวเป้าหมาย ลำแสงเลเซอร์จะปิดอัตโนมัติหลังกระบวนการวัด

หากเปิดลำแสงเลเซอร์ถาวรและในฟังก์ชันการวัดแบบต่อเนื่อง การวัดจะเริ่มขึ้นทันทีที่กดปุ่มในครั้งแรก ▲

ลำแสงเลเซอร์ถาวรที่เปิดอยู่จะไม่ถูกปิดหลังจากการวัด (ดู "ลำแสงเลเซอร์ถาวร" ๒๒๒, หน้า 128)

- ❶ ห้ามเคลื่อนย้ายเครื่องมือวัดในระหว่างการวัด หากเป็นไปได้ ให้วางเครื่องมือวัดไว้บนพื้นหรือพื้นผิวรองรับที่มั่นคง
- ❶ เลนส์รับ (18) ช่องปล่อยลำแสงเลเซอร์ (19) และกล้อง (20) ต้องไม่ถูกบดบังในระหว่างการวัด

อิทธิพลต่อช่วงการวัด

ช่วงการวัดขึ้นอยู่กับระยะทาง สภาพแสง และคุณสมบัติการสะท้อนของพื้นผิวเป้าหมาย คุณสมบัติการสะท้อนแสงของพื้นผิวชิ้นงาน เพื่อการมองเห็นที่ดีขึ้นของลำแสงเลเซอร์ในแสงภายนอกที่รุนแรง ให้ใช้กล้องในตัว (20) แวนดาเลเซอร์ (26) (อุปกรณ์เสริม) และแผ่นเป้าหมายเลเซอร์ (25) (อุปกรณ์เสริม) หรือแรงจูงใจพื้นผิวเป้าหมาย

อิทธิพลต่อผลลัพธ์จากการวัด

เนื่องจากผลกระทบทางกายภาพ จึงไม่สามารถบ่งบอกได้ว่าการวัดที่ไม่ถูกต้องจะเกิดขึ้นเมื่อทำการวัดบนพื้นผิวต่างๆ ซึ่งรวมถึง:

- พื้นผิวโปร่งใส (เช่น แก้ว น้ำ),
- พื้นผิวสะท้อนแสง (เช่น โลหะขัดเงา แก้ว),
- พื้นผิวที่มีรูพรุน (เช่น วัสดุฉนวน),
- พื้นผิวที่มีโครงสร้าง (เช่น ปูนฉาบหยาบ หินธรรมชาติ)

หากจำเป็น ให้ใช้แผ่นเป้าหมายเลเซอร์ (25) (อุปกรณ์เสริม) บนพื้นผิวเหล่านี้

นอกจากนี้ยังสามารถวัดค่าที่ไม่ถูกต้องในพื้นที่เป้าหมายที่ห้ามุมได้

ชั้นอากาศที่มีอุณหภูมิต่างกันหรือแสงสะท้อนที่ได้รับทางอ้อมอาจส่งผลต่อค่าที่วัดได้

การนำทางในเมนู

ในเมนู คุณสามารถสลับไปทางขวาด้วยปุ่ม ▶ และไปทางซ้ายได้ด้วยปุ่ม ◀

ยืนยันการเลือก โดยกดปุ่ม Func หรือปุ่ม ▲

ออกจากเมนูโดยกดปุ่ม 

เลือกกระนาบอ้างอิง

สำหรับการวัดท่านสามารถเลือกกระตบอ้างอิงได้หลายลักษณะ:



ขอบหลังของเครื่องมือวัด (เช่น เมื่อวางบนผนังห้อง)



ปลายแผ่นหยุดพับ 180° (เช่น สำหรับการวัดจากมุม)




ขอบหน้าของเครื่องมือวัด (เช่น เมื่อวัดจากขอบโต๊ะเริ่มต้นไป)



จุดศูนย์กลางเกลียวขาตั้งแบบสามขา (17) (เช่น สำหรับการวัดด้วยขาตั้งแบบสามขา)

» กดปุ่มซอฟต์แวร์เพื่อเปิดเมนู  เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ

» เลือก 

» เลือกกระนาบอ้างอิงที่ต้องการด้วยปุ่ม  หรือปุ่ม 

» เพื่อยืนยันการเลือก โดยกดปุ่ม 





ระบบจะรับรู้การพับหยุดออกและเข้า (8) 180° โดยอัตโนมัติและแนะนำ














อ้างอิงที่เกี่ยวข้อง เพื่อยืนยันการเลือก โดยกดปุ่ม 

ทุกครั้งที่เปิดสวิตช์เครื่องมือวัดระดับอ้างอิงจะปรับไปอยู่ที่ขอบหลังของเครื่องมือวัด

เมนูการตั้งค่าพื้นฐานต่างๆ

ในเมนู การตั้งค่าพื้นฐานต่างๆ จะพบการตั้งค่าพื้นฐานต่างๆ ต่อไปนี้:

-  การเปิด/ปิดใช้งาน Bluetooth®
-  การเลือกกระนาบอ้างอิง (ดู "เลือกกระนาบอ้างอิง", หน้า 126)
-  ฟังก์ชันจับเวลา
-  การเปิด/ปิดใช้งานลำแสงเลเซอร์ถาวร

-  การสอบเทียบการวัดความเอียง (ดู "การตรวจสอบความแม่นยำ", หน้า 148)
-  การสอบเทียบแม่หมายการสอบเทียบ
-  การกำหนดภาษา
-  การตั้งวันที่ & เวลา
-  การเปลี่ยนหน่วยของการวัด
-  การเปลี่ยนหน่วยมุม
-  การเปิดใช้งาน PRO360
-  การเรียกใช้งานข้อมูลอุปกรณ์
-  การเปิด/ปิดใช้งานสัญญาณเสียง
-  การตั้งเวลาปิดใช้งาน
-  การตั้งเวลาลดแสง
-  การตั้งค่าความสว่างหน้าจอ
-  การเปิด/ปิดใช้งานการทรมุนหน้าจอดีโมดี

» กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 

» เลือกการตั้งค่าที่คุณต้องการได้ด้วยปุ่ม  หรือปุ่ม 

» ยืนยันการเลือก โดยกดปุ่ม 

» ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 

การเปิด/ปิดใช้งาน Bluetooth® ✧

» กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 

» เลือก ✧








» กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก

» เพื่อยืนยันการเลือก โดยกดปุ่ม 

» ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 

ฟังก์ชันจับเวลา ☺


ฟังก์ชันจับเวลาช่วย เช่น เมื่อวัดในบริเวณที่เข้าถึงยากหรือเมื่อต้องป้องกันการเคลื่อนที่ของเครื่องมือวัดระหว่างการวัด











- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือก ☺
- » เลือกช่วงเวลาที่ต้องการตั้งแต่เริ่มเปิดใช้งานจนถึงการวัด และยืนยันด้วยปุ่ม  หรือปุ่ม 
- » กดปุ่ม  เพื่อเปิดลำแสงเลเซอร์และเล็งไปที่จุดเป้าหมาย
- » กดปุ่ม  อีกครั้งเพื่อเริ่มการวัด

การวัดจะเริ่มขึ้นตามช่วงเวลาที่คุณเลือก ค่าที่วัดได้จะแสดงในบรรทัดผลลัพธ์ (a) เวลาตั้งแต่เริ่มเปิดใช้งานจนถึงการวัดจะแสดงในแถบสถานะที่ด้านบน

ไม่สามารถดำเนินการวัดอย่างต่อเนื่องและการวัดค่าต่ำสุด/สูงสุดเมื่อตั้งค่าฟังก์ชันจับเวลาตัวจับเวลายังคงตั้งไว้จนกว่าเครื่องมือวัดจะปิดหรือจนกว่าตัวจับเวลาในเมนู "การตั้งค่า" จะปิดใช้งาน













ลำแสงเลเซอร์ถาวร

คุณสามารถตั้งค่าให้เปิดลำแสงเลเซอร์ได้อย่างถาวร ในการตั้งค่านี้ ลำแสงเลเซอร์จะยังคงเปิดอยู่ระหว่างการตรวจวัด ในการวัด คุณต้องกดปุ่ม  เพียงครั้งเดียวเท่านั้น










- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือก 
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » เพื่อยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 

ลำแสงเลเซอร์ถาวรจะปิดอีกครั้งในการตั้งค่าหรือโดยอัตโนมัติเมื่อปิดเครื่องมือวัด

การกำหนดภาษา











- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก  และยืนยันการเลือกด้วยปุ่ม 
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » เพื่อยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือซอฟต์แวร์ 

วันที่ & เวลา

- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนูการตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก 
- » ตั้งวันที่และเวลาตามคำแนะนำบนหน้าจอและยืนยันด้วยปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 












การเปลี่ยนหน่วยของการวัด ft/m

การตั้งค่าพื้นฐานคือหน่วยของการวัด "m" (เมตร)

- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
 - » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
 - » เลือก ft/m
 - » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
 - » ยืนยันการเลือก โดยกดปุ่ม 
 - » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 
- เมื่อปิดสวิตช์เครื่องมือวัดค่าอุปกรณ์ต่างๆ ที่เลือกจะยังคงถูกเก็บไว้

การเปลี่ยนหน่วยมุม

หน่วยมุม "๐" (องศา) เป็นการตั้งค่าพื้นฐาน











- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
 - » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
 - » เลือก 
 - » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
 - » เพื่อยืนยันการเลือก โดยกดปุ่ม 
 - » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 
- เมื่อปิดสวิตช์เครื่องมือวัดค่าอุปกรณ์ต่างๆ ที่เลือกจะยังคงถูกเก็บไว้

PRO360 PRO)

จำเป็นต้องทำการเรียกใช้งานครั้งแรก การถ่ายโอนข้อมูลทำได้เฉพาะเมื่อใช้ App ที่เกี่ยวข้องหรือโปรแกรมคอมพิวเตอร์เท่านั้น PRO360 สามารถปิดการใช้งานอีกครั้งได้ทุกเมื่อ








GLM 100-25 C: หลังจากเปลี่ยนแบตเตอรี่แล้ว ต้องเปิดเครื่องมือวัดหนึ่งครั้งเพื่อรีเซ็ต PRO360

สามารถดูข้อมูลเพิ่มเติมเกี่ยวกับ PRO360 ได้ที่ www.pro360.com












- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก PRO)
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » ยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 

ข้อมูลอุปกรณ์

ที่นี่คุณจะสามารถพบข้อมูลเกี่ยวกับเครื่องมือวัด เช่น หมายเลขซีเรียลและเวอร์ชันซอฟต์แวร์และใบอนุญาต












- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก **i**
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 

การเปิด/ปิดใช้งานสัญญาณเสียง

- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก 
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » ยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 












การตั้งเวลาปิดใช้งาน

สามารถตั้งเวลาปิดเครื่องอัตโนมัติได้: 2, 5, 10 นาทีหรือไม่ปิดเลย

- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก 
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » เพื่อยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 












การตั้งเวลาลดแสง

แสงสว่างหน้าจอแสดงผลจะติดขึ้นอย่างต่อเนื่อง ถ้าไม่มีการกดปุ่มใดๆ แสงสว่างหน้าจอบริเวณแสดงผลจะหรี่ลงภายใน 30 วินาที ทั้งนี้เพื่อประหยัดแบตเตอรี่แพ็ค สามารถตั้งเวลาเพื่อเริ่มต้นการลดแสงได้

- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก 
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » เพื่อยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 












การตั้งค่าความสว่างหน้าจอ

สามารถปรับความสว่างของจอแสดงผลให้เข้ากับสภาพแวดล้อมได้หลายระดับ

- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก 
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » ยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 

การเปิด/ปิดใช้งานการหมุนหน้าจออัตโนมัติ








หากเปิดการหมุนหน้าจออัตโนมัติ จอแสดงผลจะหมุนโดยอัตโนมัติเมื่อคุณหมุนเครื่องมือวัด

- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
- » เลือกเมนู การตั้งค่าอุปกรณ์ต่างๆ 
- » เลือก 
- » กดปุ่ม  หรือปุ่ม  เพื่อเปลี่ยนการเลือก
- » เพื่อยืนยันการเลือก โดยกดปุ่ม 
- » ออกจากเมนู การตั้งค่าพื้นฐานต่างๆ  โดยกดปุ่ม  หรือปุ่ม 

ฟังก์ชันการวัด

การเลือก/เปลี่ยนฟังก์ชันการวัดต่างๆ

ในเมนูฟังก์ชันคุณจะมีฟังก์ชันต่างๆ ดังนี้:

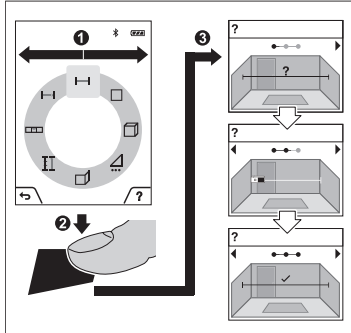
-  การวัดความยาว
- การวัดพื้นที่
- การวัดปริมาตร
- การวัดระยะทางทางอ้อม
 -  การวัดความสูงทางอ้อม
 -  การวัดความสูงทางอ้อมสองครั้ง
 -  การวัดความยาวทางอ้อม
 - การวัดสี่เหลี่ยมคางหมู
- การวัดพื้นที่ผิวผนัง
-  ฟังก์ชันการกำหนดเขต
-  การวัดความลาดชัน/ระดับน้ำดิจิตอล
-  การวัดต่อเนื่อง

» กดปุ่ม  เพื่อเปิดเมนู **ฟังก์ชันต่างๆ**

» เลือกการวัดที่ต้องการด้วยปุ่ม  หรือปุ่ม 

» ยืนยันการเลือก โดยกดปุ่ม  หรือปุ่ม 

ฟังก์ชันช่วยเหลือในระบบ ?



ฟังก์ชันความช่วยเหลือที่รวมอยู่ในเครื่องมือวัดจะนำเสนอภาพเคลื่อนไหวโดยละเอียดสำหรับการวัดแต่ละรายการ ฟังก์ชันต่างๆ/กระบวนการวัด

- » เปิดเมนู ฟังก์ชันต่างๆ
- » เลือกฟังก์ชันที่ต้องการด้วยปุ่ม **▶** หรือ **◀** และกดปุ่ม **■**
- ภาพเคลื่อนไหวแสดงขั้นตอนโดยละเอียดสำหรับฟังก์ชันการวัดที่เลือก
- » กดปุ่ม **■** เพื่อหยุดภาพเคลื่อนไหว

ชั่วคราวหรือเพื่อดำเนินการภาพเคลื่อนไหวต่อ

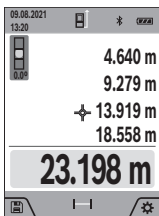
- » กดปุ่ม **▶** หรือ **◀** เพื่อแสดงขั้นตอนถัดไปหรือก่อนหน้า

การวัดความยาว —

- » กดปุ่ม **Func** เพื่อเปิดเมนู ฟังก์ชันต่างๆ
- » เลือกการวัดความยาว — และยืนยันการเลือกด้วยปุ่ม **Func**
- » กดปุ่ม **▲** เพื่อเปิดเลเซอร์
- » กดปุ่ม **▲** เพื่อเรียกการวัด

ค่าที่วัดได้จะแสดงในบรรทัดผลลัพธ์ด้านล่างในจอแสดงผล (a)

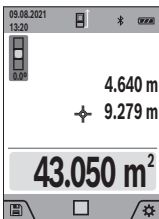
- » สำหรับการวัดเพิ่มเติมแต่ละครั้ง ให้ทำซ้ำขั้นตอนข้างต้น



ในกรณีของการวัดความยาวหลายครั้งต่อเนื่องกัน ผลลัพธ์ของการวัดล่าสุดจะแสดงในบรรทัดค่าที่วัดได้ **(h)** ค่าจากการวัดครั้งล่าสุดแสดงที่ด้านล่างของจอแสดงผล ค่าจากการวัดก่อนครั้งล่าสุดแสดงที่ด้านบน ฯลฯ

การวัดพื้นที่

- » กดปุ่ม **Func** เพื่อเปิดเมนู **ฟังก์ชันต่างๆ**
- » เลือกการวัดพื้นที่ และยืนยันการเลือกด้วยปุ่ม **Func**
- » กดปุ่ม **▲** เพื่อเปิดเลเซอร์
- » กดปุ่ม **▲** เพื่อเรียกการวัดครั้งแรก เช่น ความยาวของห้อง
- » กดปุ่ม **▲** เพื่อเรียกการวัดครั้งที่สอง เช่น ความกว้างของห้อง



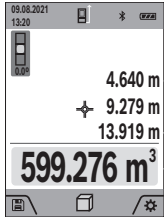
เมื่อการวัดค่าที่สองเสร็จสมบูรณ์ พื้นที่ผิวจะถูกคำนวณโดยอัตโนมัติและแสดงผล ผลลัพธ์จะปรากฏในบรรทัดผลลัพธ์ **(a)** ค่าที่วัดได้แต่ละรายการจะอยู่ในบรรทัดค่าที่วัดได้ **(h)**

การวัดปริมาตร

- » กดปุ่ม **Func** เพื่อเปิดเมนู **ฟังก์ชันต่างๆ**
- » เลือกการวัดปริมาตร และยืนยันการเลือกด้วยปุ่ม **Func**
- » กดปุ่ม **▲** เพื่อเปิดเลเซอร์
- » กดปุ่ม **▲** เพื่อเรียกการวัดครั้งแรก เช่น ความยาวของห้อง

» กดปุ่ม ▲ เพื่อเรียกการวัดครั้งที่สอง เช่น ความกว้างของห้อง

» กดปุ่ม ▲ เพื่อเรียกการวัดครั้งที่สาม เช่น ความสูงของห้อง



เมื่อการวัดค่าที่สามเสร็จสมบูรณ์ ปริมาตรจะถูกคำนวณโดยอัตโนมัติและแสดงผล ผลลัพธ์จะปรากฏในบรรทัดผลลัพธ์ (a) ค่าที่วัดได้แต่ละรายการจะอยู่ในบรรทัดค่าที่วัดได้ (h)

การวัดระยะทางทางอ้อม





การวัดระยะทางทางอ้อมใช้วัดระยะทางที่ไม่สามารถวัดได้โดยตรง เพราะมีสิ่งกีดขวางที่อาจขวางลำแสงเลเซอร์หรือไม่มีผิวเป้าหมายที่เป็นตัวสะท้อนแสง กระบวนการวัดนี้สามารถใช้ได้เฉพาะในทิศทางแนวตั้งเท่านั้น การเขียนเบนโคจ ในแนวนอนนำไปสู่ความผิดพลาดในการวัด

การวัดระยะทางทางอ้อมจะแม่นยำน้อยกว่าการวัดระยะทางทางตรงเสมอ ข้อผิดพลาดในการวัดอาจมีมากกว่าการวัดระยะทางตรง ทั้งนี้ขึ้นอยู่กับการใช้งาน เพื่อปรับปรุงความแม่นยำการวัด แนะนำให้ใช้ขาตั้งแบบสามขา (อุปกรณ์ประกอบ)

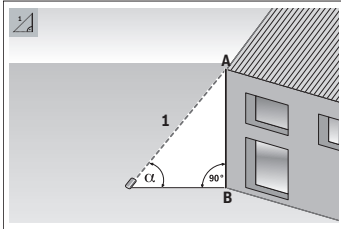
 เมื่อใช้ขาตั้งกล้อง ให้สังเกตระนาบอ้างอิงที่ตั้งไว้ (ดู "เลือกระนาบอ้างอิง", หน้า 126)

ระหว่างการวัดแต่ละครั้งลำแสงเลเซอร์ยังคงเปิดอยู่

สำหรับการวัดความยาวทางอ้อม มี 4 ฟังก์ชันการวัดต่างๆ แต่ละฟังก์ชันการวัดสามารถใช้หาระยะทางที่แตกต่างกัน:

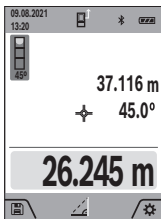
-  การวัดความสูงทางอ้อม
-  การวัดความสูงทางอ้อมสองครั้ง
-  การวัดความยาวทางอ้อม
-  การวัดสี่เหลี่ยมคางหมู

การวัดความสูงทางอ้อม



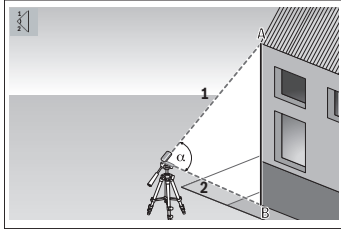
ด้วยการวัดความสูงทางอ้อม คุณสามารถกำหนดระยะห่าง **AB** ได้โดยการวัดระยะห่าง **1** เครื่องมือวัดจะคำนวณความสูง **AB** จากมุม α และระยะห่าง **1** จะได้ผลลัพธ์ที่ถูกต้องต่อเมื่อยึดมุมฉากที่จำเป็นสำหรับการวัดที่เกี่ยวข้องอย่างแม่นยำเท่านั้น

- » กดปุ่ม **Func** เพื่อเปิดเมนู **ฟังก์ชันต่างๆ**
- » เลือกการวัดระยะห่างโดยอ้อม และยืนยันการเลือกด้วยปุ่ม **Func**
- » เลือกการวัดความสูงโดยอ้อม และยืนยันการเลือกด้วยปุ่ม **Func**
- » กดปุ่ม **▲** เพื่อเปิดเลเซอร์
- » วางเครื่องมือวัดที่ระดับจุดวัดด้านล่าง **B**
- » เอียงเครื่องมือวัดเพื่อให้เลเซอร์มุ่งไปที่จุดวัดด้านบน **A**
- » กดปุ่ม **▲** เพื่อเรียกการวัด



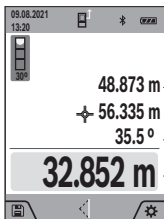
เมื่อการวัดค่าที่สองเสร็จสมบูรณ์ ความสูงจะถูกคำนวณโดยอัตโนมัติและแสดงผลในใบบรรทัดผลลัพธ์ **(a)** ค่าจากการวัดสำหรับระยะทาง **1** และมุม α จะแสดงในบรรทัดแสดงค่าจากการวัด **(h)**

การวัดความสูงทางอ้อมสองครั้ง ◀



ด้วยการวัดความสูงทางอ้อมสองครั้ง คุณสามารถกำหนดระยะห่าง **AB** ได้โดยการวัดระยะห่าง **1** และ **2** เครื่องมือวัดจะคำนวณความสูง **AB** จากมุม α และระยะห่าง **1** และ **2** สำหรับการวัดนี้ เราขอแนะนำให้ใช้ขาตั้งแบบสามขา




- » กดปุ่ม **Func** เพื่อเปิดเมนู ฟังก์ชันต่างๆ
- » เลือกการวัดระยะห่างโดยอ้อม \triangleleft และยืนยันการเลือกด้วยปุ่ม **Func**
- » เลือกการวัดความสูงโดยอ้อมสองรอบ \triangleleft และยืนยันการเลือกด้วยปุ่ม **Func**
- » กดปุ่ม \blacktriangle เพื่อเปิดเลเซอร์
- » เอียงเครื่องมือวัดเพื่อให้เลเซอร์มุ่งไปที่จุดวัดด้านบน **A**
- » กดปุ่ม \blacktriangle , เพื่อเรียกการวัดครั้งแรก
- » เอียงเครื่องมือวัดเพื่อให้เลเซอร์มุ่งไปที่จุดวัดด้านล่าง **B** กรุณาอย่าเปลี่ยนแปลงตำแหน่งเครื่องมือวัด
- » กดปุ่ม \blacktriangle เพื่อเรียกการวัดครั้งที่สอง

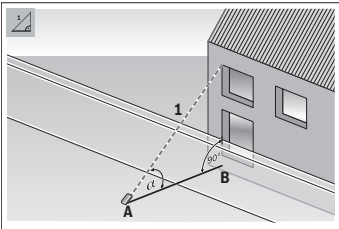


เมื่อการวัดค่าทั้งสองเสร็จสมบูรณ์ ความสูงจะถูกคำนวณโดยอัตโนมัติและแสดงผลในในบรรทัดผลลัพธ์ **(a)** ค่าจากการวัดสำหรับระยะทาง **1, 2** และมุม α จะแสดงในบรรทัดแสดงค่าจากการวัด **(h)**

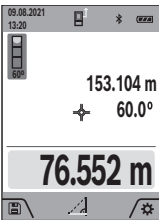
การวัดความยาวทางอ้อม ◀

- » กดปุ่ม **Func** เพื่อเปิดเมนู ฟังก์ชันต่างๆ

- » เลือกการวัดระยะห่างโดยอ้อม  และยืนยันการเลือกด้วยปุ่ม **Func**
- » เลือกการวัดความยาวโดยอ้อม  และยืนยันการเลือกด้วยปุ่ม **Func**
- » วางเครื่องมือวัดบนจุดเริ่มต้น **A** ของระยะห่างที่เลือก **AB**
- » เอียงเครื่องมือวัดเพื่อให้เลเซอร์มุ่งไปที่ระดับที่อยู่ ณ จุดสิ้นสุด **B**
- » กดปุ่ม  เพื่อเรียกการวัด

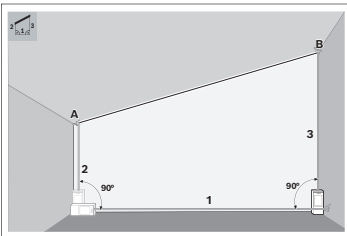


ด้วยการวัดความยาวทางอ้อม คุณสามารถกำหนดระยะห่าง **AB** ได้โดยการวัดระยะห่าง **1** เครื่องมือวัดจะคำนวณความยาวที่เลือก **AB** จากมุม α และระยะห่าง **1**



เมื่อการวัดค่าที่สองเสร็จสมบูรณ์ ความยาวจะถูกคำนวณโดยอัตโนมัติและแสดงผลในหน่วยวัดผลลัพธ์ **(a)** ค่าจากการวัดสำหรับระยะห่าง **1** และมุม α จะแสดงในบรรทัดแสดงค่าจากการวัด **(h)**

การวัดสี่เหลี่ยมคางหมู

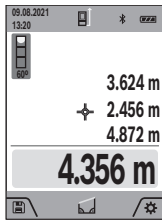


สามารถใช้การวัดสี่เหลี่ยมคางหมูเพื่อกำหนดความยาวของหลังคาลาดเอียงได้ คุณสามารถหาระยะทาง **AB** ได้โดยการวัดระยะทาง **1, 2** และ **3** ตามลำดับนี้ เครื่องมือวัดจะคำนวณเส้นทางที่ **AB** จากเส้นทาง **1, 2** และ **3**



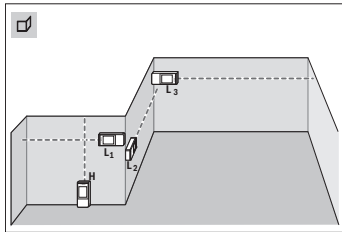
ตรวจสอบให้แน่ใจว่าการวัดระยะทาง **3** เริ่มต้นตรงที่จุดสิ้นสุดของระยะทาง **1** และมีมุมฉากระหว่างระยะทาง **1** และ **2** และระหว่าง **1** และ **3**

- » กดปุ่ม **Func** เพื่อเปิดเมนู ฟังก์ชันต่างๆ
- » เลือกการวัดระยะทางโดยอัตโนมัติ และยืนยันการเลือกด้วยปุ่ม **Func**
- » เลือกการวัดสี่เหลี่ยมคางหมู และยืนยันการเลือกด้วยปุ่ม **Func**
- » กดปุ่ม **▲** เพื่อเปิดเลเซอร์
- » วัดระยะทาง **1** ด้วยปุ่ม **▲**
- » วัดระยะทาง **2** ด้วยปุ่ม **▲**
- » วัดระยะทาง **3** ด้วยปุ่ม **▲**



เมื่อการวัดค่าที่สองเสร็จสมบูรณ์ ระยะทาง **AB** จะถูกคำนวณโดยอัตโนมัติและแสดงผลลงในบรรทัดผลลัพธ์ **(a)** ค่าจากการวัดสำหรับระยะทาง **1, 2** และ **3** จะแสดงในบรรทัดแสดงจากค่าวัด **(h)**


การวัดพื้นผิวผนัง



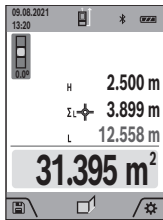
การวัดพื้นผิวผนังใช้สำหรับคำนวณผลรวมของพื้นผิวแต่ละด้านหลายๆ พื้นผิวที่มีความสูงเท่ากัน เงื่อนไขเบื้องต้นสำหรับการคำนวณพื้นที่อย่างถูกต้องคือความยาวที่วัดครั้งแรก (ในตัวอย่างคือความสูงห้อง **H**) ต้องเท่ากันในทุกๆ ด้าน ในตัวอย่างที่แสดงเราต้องการหาพื้นผิวทั้งหมดของผนังหลายด้านที่มีความสูงห้อง **H** เท่ากัน แต่ความยาว

L ต่างกัน

- » กดปุ่ม **Func** เพื่อเปิดเมนู ฟังก์ชันต่างๆ

- » เลือกการวัดพื้นผิวผนัง  และยืนยันการเลือกด้วยปุ่ม **Func**
- » วัดความสูงห้อง **H** ในลักษณะเดียวกับการวัดความยาว
ค่าจากการวัดแสดงในบรรทัดบนของบรรทัดแสดงค่าจากการวัด เลเซอร์ยังคงเปิดอยู่
- » จากนั้นให้วัดความยาว **L1** ของผนังแรก
พื้นที่ผิวจะถูกคำนวณโดยอัตโนมัติและแสดงในบรรทัดผลลัพธ์ ค่าความยาวจากการวัด
ครั้งล่าสุดแสดงในบรรทัดล่างของบรรทัดแสดงค่าจากการวัด เลเซอร์ยังคงเปิดอยู่
- » ต่อไปให้วัดความยาว **L2** ของผนังที่สอง

คุณสามารถวัดความยาว **LX** อื่นๆ อีกมากมาย ซึ่งความยาวจะถูกนำมารวมกันโดยอัตโนมัติ แล้วนำมาคูณกับความสูง **H**

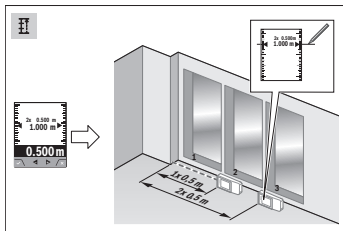


ค่าการวัดแต่ละครั้งที่แสดงในบรรทัดแสดงค่าจากการวัด (**h**) จะรวมกับความยาว **L1** ผลรวมของความยาวทั้งสอง (แสดงในบรรทัดกลางของบรรทัดแสดงค่าจากการวัด (**h**)) จะคูณกับความสูงที่เกี่ยวข้อง **H** ค่าพื้นผิวทั้งหมดจะแสดงในบรรทัดผลลัพธ์ (**a**) ด้านล่างในหน้าจอแสดงผล

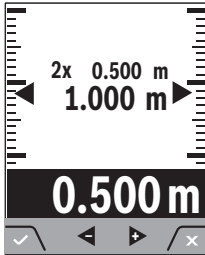
(a)

ฟังก์ชันการกำหนดเขต

- (i) ในฟังก์ชันการกำหนดเขต ระนาบอ้างอิงคือเครื่องหมายที่แสดงในจอแสดงผล ระนาบอ้างอิงไม่ใช่ขอบของเครื่องมือวัด



ฟังก์ชันการกำหนดเขตจะวัดเข้าความยาวที่กำหนดไว้แล้ว (ระยะทาง) ความยาวนี้สามารถถ่ายทอดลงบนพื้นผิว ต. ย. เช่น เพื่อได้ตัวสุดให้มีความยาวเท่าๆ กัน หรือติดตั้งผนังระบบโครงกร้าวในทรายวอลล์ ความยาวต่ำสุดที่สามารถปรับได้คือ 0.1 ม. ความยาวสูงสุดคือ 50 ม.

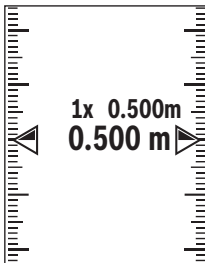


- » กดปุ่ม **Func** เพื่อเปิดเมนู **ฟังก์ชันต่างๆ**
- » เลือกฟังก์ชันการกำหนดเขต **II** และยืนยันการเลือกด้วยปุ่ม **Func**
- » กดปุ่ม **↵** เพื่อกำหนดความยาวที่ต้องการ
- » ตั้งค่าความยาวที่ต้องการด้วยปุ่ม **➡** หรือปุ่ม **⬅**
- กดปุ่ม **➡** หรือปุ่ม **⬅** ค้างไว้ เพื่อเปลี่ยนความยาวเพิ่มขึ้น
- » กดปุ่ม **▲** เพื่อเริ่มต้นฟังก์ชันการกำหนดเขตและถอยออก

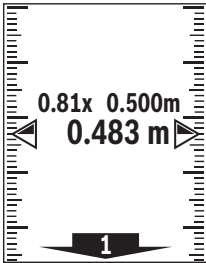
จากจุดเริ่มต้นอย่างช้าๆ

เครื่องมือวัดจะวัดระยะทางจากจุดเริ่มต้นอย่างต่อเนื่อง ความยาวที่กำหนดไว้รวมทั้งค่าจากการวัดปัจจุบันจะปรากฏขึ้น ลูกศรบนและล่างแสดงให้เห็นระยะทางที่สั้นที่สุดไปยังเครื่องหมายถัดไปหรือก่อนหน้า

เมื่อวัดอย่างต่อเนื่อง คุณสามารถตั้งค่าที่วัดได้เป็นความยาวที่กำหนดโดยกดปุ่ม **▲** ค้างไว้



ตัวคูณทางด้านซ้ายระบุจำนวนครั้งที่ถึงความยาวที่กำหนดแล้ว ลูกศรสีเขียวที่ด้านข้างของจอแสดงผลบ่งชี้การมาถึงความยาวเพื่อให้ท่านทำเครื่องหมาย



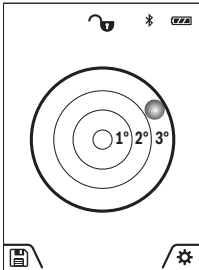
ลูกศรสีแดงหรือป้ายสีแดงบ่งบอกค่าที่แท้จริง หากค่าอ้างอิงอยู่นอกจอแสดงผล

การวัดความลาดชัน/ระดับน้ำดิจิตอล

ระดับน้ำดิจิตอลใช้สำหรับตรวจสอบการปรับระนาบแนวนอนหรือแนวตั้งของสิ่งของ (เช่น เครื่องจักร ทุ่น ฯลฯ) การวัดความลาดชันใช้สำหรับวัดความเอียงหรือความชัน (ต. ย. เช่น ของบันได ราวบันได สำหรับปรับเฟอร์นิเจอร์ให้เหมาะสม สำหรับติดตั้งท่อ ฯลฯ) เครื่องมือวัดจะสลับระหว่างฟังก์ชันต่างๆ โดยอัตโนมัติเมื่อคุณเปลี่ยนตำแหน่งเครื่องมือวัด


» กดปุ่ม  เพื่อเปิดเมนู **ฟังก์ชันต่างๆ**

» เลือกการวัดความเอียง/ระดับน้ำดิจิตอล  และยืนยันการเลือกด้วยปุ่ม 

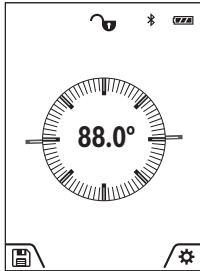


สำหรับระดับน้ำดิจิตอล ให้ใช้ด้านซ้ายของเครื่องมือวัดเป็นระนาบอ้างอิง

» ในการใช้ระดับน้ำแบบดิจิตอล ให้วางเครื่องมือวัดโดยให้หลังเครื่องมืออยู่บนพื้นผิวที่จะวัด

คุณสามารถหยุดการอ่านได้โดยกดปุ่ม 

» ถ้ามีความลาดชันเกินกว่า 3° ลูกกลมบนจอแสดงผลจะส่องสว่างสีแดง



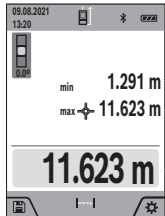
สำหรับการวัดความลาดชัน ให้ใช้ด้านซ้ายของเครื่องมือวัดเป็น
ระนาบอ้างอิง หากสัญลักษณ์กะพริบในระหว่างกระบวนการวัด
แสดงว่าเครื่องมือวัดเอียงไปทางด้านข้างมากเกินไป

- » ในการใช้การวัดความเอียง ให้วางเครื่องมือวัดที่มีพื้นผิว
ด้านหนึ่งบนวัตถุที่คุณต้องการวัดความเอียง
คุณสามารถหยุดการอ่านได้โดยกดปุ่ม ▲

การวัดต่อเนื่อง I---H

ในกรณีของการวัดอย่างต่อเนื่อง ค่าที่วัดได้จะได้รับการอัปเดตอย่างต่อเนื่อง ต. ย. เช่น
ท่านสามารถเดินออกจากผนังไปยังระยะห่างที่ต้องการในขณะที่สามารถอ่านระยะทางจริง
ได้เสมอ

- » กดปุ่ม Func เพื่อเปิดเมนู ฟังก์ชันต่างๆ
- » เลือกการวัดอย่างต่อเนื่อง I---H และยืนยันการเลือกด้วยปุ่ม Func
- » กดปุ่ม ▲ เพื่อเปิดเลเซอร์
- » เลื่อนเครื่องมือวัดจนกระทั่งต้องการแสดงที่ด้านล่างบรรทัดผลลัพธ์
คุณสามารถขัดจังหวะการวัดอย่างต่อเนื่องได้โดยกดปุ่ม ▲
- » กดปุ่ม ▲ อีกครั้ง เพื่อดำเนินการวัดอย่างต่อเนื่อง



ค่าที่วัดได้ในปัจจุบันจะแสดงในบรรทัดผลลัพธ์ (a) ค่าสูงสุด
และค่าต่ำสุดที่วัดได้ในบรรทัดค่าที่วัดได้ (h)

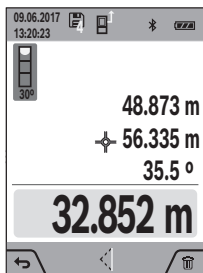
การวัดต่อเนื่องจะปิดสวิทช์โดยอัตโนมัติหลังจากผ่านไป 5 นาที

ฟังก์ชันหน่วยความจำ

ค่าและผลลัพธ์สุดท้ายของการวัดแต่ละครั้งที่เสร็จสมบูรณ์จะถูกบันทึกไว้โดยอัตโนมัติ 50 ค่าสุดท้าย (ค่าที่วัดหรือผลลัพธ์สุดท้าย) จะถูกบันทึกไว้ หากหน่วยความจำเต็ม ค่าที่เก่าที่สุดจะถูกเขียนทับ ค่าเก่าที่สุดจะอยู่ที่ตำแหน่งที่ 1 ในหน่วยความจำ ค่าล่าสุดอยู่ในตำแหน่ง 50 (สำหรับค่าในหน่วยความจำ 50 ค่าที่มีอยู่)

» กดปุ่ม  เพื่อใช้งานฟังก์ชันหน่วยความจำ
ค่าสุดท้ายจะปรากฏขึ้น

» กดปุ่ม  หรือปุ่ม  เพื่อเลื่อนดูค่าที่เก็บไว้




จำนวนของค่าหน่วยความจำจะปรากฏที่ด้านบนของจอแสดงผล ค่าหน่วยความจำที่สอดคล้องกันและสัญลักษณ์ของฟังก์ชันการวัดที่เกี่ยวข้องจะปรากฏทางด้านซ้าย หากไม่มีค่าในหน่วยความจำ "0.000" และจะแสดงในบรรทัดล่างของจอแสดงผล "0" ในบรรทัดบน

ลบค่าหน่วยความจำ

» กดปุ่ม  เพื่อลบค่าที่แสดง


» ยืนยันด้วยปุ่ม 

หากต้องการลบค่าที่เก็บไว้ทั้งหมด ให้เลือกในเมนู การตั้งค่าพื้นฐานต่างๆ  รายการเมนู หน่วยความจำ



การเพิ่ม/การลดค่า

เพิ่มค่าเมื่อวัดความยาว

» เลือกฟังก์ชันการวัดความยาว

- » ดำเนินการวัดครั้งแรก
- » กดปุ่ม 
- » ดำเนินการวัดครั้งที่สอง
ทันทีที่การวัดครั้งที่สองเสร็จสิ้น ผลลัพธ์ของการวัดที่สองจะแสดงในบรรทัดค่าที่วัดได้ (h) และผลลัพธ์สุดท้ายในบรรทัดผลลัพธ์ (a)



เพิ่มค่าเมื่อวัดพื้นที่และปริมาตร

- » เลือกฟังก์ชันการวัดพื้นที่และการวัดปริมาตร
- » ดำเนินการวัดพื้นที่และการวัดปริมาตรครั้งแรก
- » กดปุ่ม 
- » ดำเนินการวัดพื้นที่และการวัดปริมาตรครั้งที่สอง
ทันทีที่การวัดครั้งที่สองหรือสามเสร็จสิ้น พื้นที่หรือปริมาตรจะถูกคำนวณและแสดงผลโดยอัตโนมัติ ผลลัพธ์จะปรากฏในบรรทัดผลลัพธ์ (a) ค่าที่วัดได้แต่ละรายการจะอยู่ในบรรทัดค่าที่วัดได้ (h)
- » กดปุ่ม  เพื่อดูผลลัพธ์ของการเพิ่ม
ผลลัพธ์สุดท้ายจะปรากฏในบรรทัดผลลัพธ์ (a) ผลลัพธ์ของการวัดแต่ละพื้นที่หรือปริมาตรจะแสดงในบรรทัดค่าที่วัดได้ (h)

การลดค่า

- » เมื่อต้องการลดค่าให้กดปุ่ม  ขั้นตอนต่อไปจะเหมือนกับ "การเพิ่มค่า"

ลบค่าที่วัดได้

คุณสามารถลบค่าที่วัดล่าสุดในการวัดทั้งหมดออกได้โดยกดปุ่ม 
กดปุ่ม  ซ้ำๆ กัน จะลบทั้งค่าจากการวัดในลำดับย้อนกลับ

Bluetooth®-อินเตอร์เฟส

การถ่ายหอดข้อมูลไปยังอุปกรณ์อื่นๆ

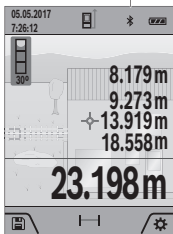
เครื่องมือวัดนี้ติดตั้งโมดูล Bluetooth® ที่ช่วยถ่ายหอดข้อมูลด้วยเทคโนโลยีคลื่นวิทยุ สำหรับเชื่อมโยงสื่อสารแบบไร้สายไปยังอุปกรณ์เคลื่อนที่ปลายทางบางอย่างที่มี Bluetooth® (เช่น สมาร์ทโฟน แท็บเล็ต)

กรุณาค้นหาข้อมูลเกี่ยวกับความต้องการของระบบที่จำเป็นสำหรับการเชื่อมต่อ Bluetooth® ได้ที่เว็บไซต์ของ บอช www.bosch-pt.com

► สำหรับข้อมูลเพิ่มเติม กรุณาดูหน้าผลิตภัณฑ์ของ บอช

ในระหว่างการถ่ายหอดข้อมูลผ่านทาง Bluetooth® อาจเกิดความล่าช้าในการรับสัญญาณระหว่างอุปกรณ์เคลื่อนที่ปลายทางและเครื่องมือวัด ทั้งนี้ขึ้นอยู่กับระยะห่างระหว่างอุปกรณ์ที่สื่อสารข้อมูลหรือวัตถุที่จะวัด

การเรียกใช้งาน Bluetooth®-อินเตอร์เฟสเพื่อถ่ายหอดข้อมูลไปยังอุปกรณ์เคลื่อนที่ปลายทาง



(f)

✓ ตรวจสอบให้แน่ใจว่า อินเตอร์เฟส Bluetooth® ที่อุปกรณ์เคลื่อนที่ปลายทางของท่านถูกเรียกใช้งาน

» กดปุ่ม หรือกดปุ่ม ค้างไว้ เพื่อเปิดเมนู การตั้งค่า พื้นฐานต่างๆ

» เลือก

» กดปุ่ม หรือปุ่ม เพื่อเลือก

» เพื่อยืนยันการเลือก โดยกดปุ่ม

สัญลักษณ์ Bluetooth® จะแสดงเป็นสีเขียวบนจอแสดง








ผล (f)

Bosch-Apps พร้อมใช้งานเพื่อขยายขอบเขตการทำงาน คุณสามารถดาวน์โหลดได้จาก App Stores ทั้งนี้ขึ้นอยู่กับอุปกรณ์

เมื่อเริ่มต้น Bosch แอปพลิเคชัน การเชื่อมต่อระหว่างอุปกรณ์เคลื่อนที่ปลายทางและเครื่องมือวัดจะเกิดขึ้น ถ้าพบเครื่องมือวัดที่ทำงานอยู่หลายเครื่อง ให้เลือกเครื่องมือวัดที่เหมาะสม

โดยดูจากหมายเลขเครื่อง ท่านสามารถค้นหาหมายเลขเครื่อง (15) จากแผ่นป้ายรุ่นของเครื่องมือวัดของท่าน

การปิดการเรียกใช้งาน Bluetooth®-อินเทอร์เฟส




- » กดปุ่ม  หรือกดปุ่ม  ค้างไว้ เพื่อเปิดเมนู การตั้งค่าพื้นฐานต่างๆ 
 - » เลือก 
 - » กดปุ่ม  หรือปุ่ม  เพื่อเลือก 
 - » เพื่อยืนยันการเลือก โดยกดปุ่ม 
- สัญลักษณ์ Bluetooth® จะแสดงเป็นสีเทาบนจอแสดงผล


การตรวจสอบความแม่นยำ

ตรวจสอบความแม่นยำของการวัดความลาดชันและการวัดระยะทางเป็นประจำ

การตรวจสอบความแม่นยำและการสอบเทียบของการวัดความลาดชัน

- » สำหรับการตรวจสอบ ให้วางเครื่องมือวัดบนโต๊ะและวัดความลาดชัน
 - » หมุนเครื่องมือวัดไป 180° และวัดความลาดชันอีกครั้งหนึ่ง
- ความแตกต่างของจำนวนเลขที่แสดงต้องไม่มากกว่า 0.3° (สูงสุด)
- ในกรณีที่มีส่วนเบี่ยงเบนมากกว่า จะต้องสอบเทียบเครื่องมือวัดใหม่

- » กดปุ่ม  ค้างไว้ เพื่อเปิดเมนู **ฟังก์ชันพื้นฐานต่างๆ**
- » เลือก  และยืนยันการเลือกด้วยปุ่ม 
- » ทำตามคำแนะนำบนจอแสดงผล

 เมื่ออุณหภูมิมีการเปลี่ยนแปลงมากและเครื่องมือวัดถูกกระแทก เราขอแนะนำให้ตรวจสอบความแม่นยำ และหากจำเป็นให้สอบเทียบเครื่องมือวัด เมื่ออุณหภูมิมีการเปลี่ยนแปลงมาก ต้องปล่อยให้เครื่องมือวัดปรับเข้ากับอุณหภูมิรอบด้านสักชั่วโมงก่อนสอบเทียบ

การตรวจสอบความแม่นยำของการวัดระยะทาง

ในการตรวจสอบความแม่นยำ การวัดควรดำเนินการภายใต้สภาวะที่เหมาะสม เช่น ระยะทางวัดควรอยู่ภายใน และพื้นผิวเป้าหมายของการวัดควรเรียบและสะท้อนแสงได้ดี (เช่น ผนังทาสีขาว)

- » เลือกระยะทางวัดประมาณ **3 ถึง 10 เมตร** ซึ่งมีความยาวที่คุ้มทราบแน่ชัด (เช่น ความกว้างของห้อง ระยะเปิดประตู)
- » วัดระยะทาง **10 ครั้งติดต่อกัน**
ความเบี่ยงเบนของการวัดแต่ละรายการจากค่าเฉลี่ยต้องไม่เกิน ± 2 มม. ตลอดช่วงการวัดทั้งหมดภายใต้สภาวะที่เอื้ออำนวย บันทึกการวัดเพื่อให้คุณสามารถเปรียบเทียบความถูกต้องได้ในภายหลัง

การตรวจสอบความแม่นยำและการสอบเทียบการแสดงผลเป้าหมาย (เป้ากากบาท)

ตรวจสอบความถูกต้องของการจัดตำแหน่งเลเซอร์และตัวบ่งชี้เป้าหมายอย่างสม่ำเสมอ

- » เลือกบริเวณที่สว่างและมีแสงน้อย (เช่น ผนังสีขาว) ที่ระยะห่างอย่างน้อย 5 เมตร เป็นเป้าหมาย
- » ตรวจสอบว่าจุดเลเซอร์อยู่ภายในตัวแสดงเป้าหมายในจอแสดงผลหรือไม่ หากจุดเลเซอร์ไม่อยู่ภายในตัวแสดงเป้าหมาย คุณจะต้องปรับเทียบตัวแสดงเป้าหมายใหม่

ปรับเทียบตัวแสดงเป้าหมายใหม่

- » กดปุ่ม **Func** ค้างไว้ เพื่อเปิดเมนู **ฟังก์ชันพื้นฐานต่างๆ**
- » เลือก **CAL** และยืนยันการเลือกด้วยปุ่ม **Func**
- » ทำตามคำแนะนำบนจอแสดงผล

การทำงานกับขาตั้งแบบสามขา (อุปกรณ์ประกอบ)

การใช้ขาตั้งแบบสามขาจะช่วยสำหรับการวัดระยะทางไกล

- » วางเครื่องมือวัดที่มีเกลียวขนาด $1/4$ นิ้ว (**17**) เข้าบนเพลตยึดแบบเปลี่ยนเร็วของขาตั้งแบบสามขา (**27**) หรือขาตั้งกล้องแบบสามขาทั่วไป

- » ยึดเครื่องมือวัดให้แน่นด้วยสกรูล็อคของเพลทชนิดเปลี่ยนเร็ว
- » ตั้งระนาบอ้างอิงสำหรับการวัดด้วยขาตั้งแบบสามขา (ดู "เลือกระนาบอ้างอิง", หน้า 126)

ข้อความแสดงข้อผิดพลาด



เครื่องมือวัดจะตรวจสอบการทำงานที่ถูกต้องของแต่ละการวัด หากพบข้อผิดพลาด จอแสดงผลจะแสดงเฉพาะสัญลักษณ์ที่อยู่ติดกัน และเครื่องมือวัดจะปิดตัวเอง ในกรณีเช่นนี้ ให้ส่งเครื่องมือวัดเข้ารับการตรวจสอบที่ศูนย์บริการหลังการขายสำหรับเครื่องมือไฟฟ้า Bosch ของคุณ

การแก้ไขปัญหา

การเตือนอุณหภูมิ

การเตือนอุณหภูมิ กะพริบ ทำการวัดไม่ได้

สาเหตุ: อุณหภูมิเครื่องมือวัดอยู่นอกช่วงอุณหภูมิใช้งาน -10 °C ถึง +45 °C (ในฟังก์ชันการวัดต่อเนื่องถึง +40 °C)

มาตรการแก้ไข: รอจนกว่าอุณหภูมิเครื่องมือวัดอยู่ในช่วงอุณหภูมิใช้งาน

"ERROR" ในจอแสดงผล

"ERROR" ปรากฏบนจอแสดงผล

สาเหตุ: การเพิ่ม/การลดค่าจากการวัดด้วยค่าที่มีหน่วยวัดต่างกัน

มาตรการแก้ไข: เพิ่ม/ลดค่าจากการวัดที่มีหน่วยวัดเดียวกันเท่านั้น

สาเหตุ: มุมระหว่างลำแสงเลเซอร์กับเป้าหมายแคบเกินไป

มาตรการแก้ไข: ขยายมุมระหว่างลำแสงเลเซอร์กับเป้าหมาย

สาเหตุ: พื้นผิวเป้าหมายสะท้อนมาก (เช่น กระจก) หรือสะท้อนไม่เพียงพอ (เช่น วัตถุสีดำ) หรือแสงรอบด้านสว่างมากเกินไป

มาตรการแก้ไข: ใช้เป้าหมายเลเซอร์ (อุปกรณ์เสริม)

สาเหตุ: ทางออกลำแสงเลเซอร์ (19) หรือเลนส์รับแสง (18) เป็นฝ้า (เช่น เนื่องจากอุณหภูมิเปลี่ยนแปลงรวดเร็ว)

มาตรการแก้ไข: เช็ดช่องปล่อยลำแสงเลเซอร์ (19) หรือเลนส์รับ (18) ให้แห้งด้วยผ้านุ่ม

สาเหตุ: ค่าที่คำนวณได้มากกว่า 1 999 999 หรือต่ำกว่า -999 999 m/m²/m³

มาตรการแก้ไข: แบ่งการคำนวณเป็นตอนๆ

การสอบเทียบ

"CAL" และ "ERROR" ปรากฏบนจอแสดงผล

สาเหตุ: การสอบเทียบของการวัดความลาดชันไม่ได้ดำเนินการในลำดับที่ถูกต้องหรือในตำแหน่งที่ถูกต้อง

มาตรการแก้ไข: สอบเทียบซ้ำตามคำแนะนำบนจอแสดงผลและในคู่มือการใช้งาน

สาเหตุ: พื้นผิวที่ใช้ในการสอบเทียบไม่ได้อยู่ในแนวนอนหรือแนวตั้งอย่างถูกต้อง

มาตรการแก้ไข: สอบเทียบซ้ำบนพื้นผิวในแนวนอนหรือแนวตั้ง และตรวจสอบพื้นผิวด้วยระดับน้ำก่อน หากจำเป็น

สาเหตุ: เครื่องมือวัดเคลื่อนที่หรือเอียงขณะกดปุ่ม

มาตรการแก้ไข: สอบเทียบซ้ำและจับเครื่องมือวัดให้นิ่งขณะกดปุ่ม

ผลลัพธ์จากการวัด

ผลลัพธ์จากการวัดไม่น่าเชื่อถือ

สาเหตุ: พื้นผิวเป้าหมายสะท้อนแสงอย่างไม่ถูกต้อง (เช่น น้ำ กระจก)

มาตรการแก้ไข: ปิดคลุมพื้นที่เป้าหมาย

สาเหตุ: ช่องปล่อยลำแสงเลเซอร์ (19) หรือเลนส์รับแสง (18) ถูกบดบัง

มาตรการแก้ไข: ช่องปล่อยลำแสงเลเซอร์ (19) และเลนส์รับแสง (18) ต้องไม่ถูกบดบัง

ผลลัพธ์จากการวัดไม่น่าจะเป็นจริง

สาเหตุ: มีสิ่งกีดขวางในเส้นทางลำแสงเลเซอร์

มาตรการแก้ไข: ตรวจสอบให้แน่ใจว่าจุดเลเซอร์อยู่บนพื้นที่เป้าหมายอย่างสมบูรณ์

สาเหตุ: ตั้งระนาบอ้างอิงไม่ถูกต้อง

มาตรการแก้ไข: เลือกระนาบอ้างอิงที่สอดคล้องกับการวัด

Bluetooth®

ไม่สามารถเรียกใช้งาน **Bluetooth®** ได้

สาเหตุ: แบตเตอรี่หรือหน่วยประจุแบตเตอรี่อ่อนเกินไป

มาตรการแก้ไข: เปลี่ยนแบตเตอรี่หรือชาร์จแบตเตอรี่แพ็คของเครื่องมือวัด

ไม่มีการเชื่อมต่อ **Bluetooth®**

ไม่มีการเชื่อมต่อ **Bluetooth® "ERROR"** ปรากฏบนหน้าจอแสดงผล

สาเหตุ: ข้อผิดพลาดในการเชื่อมต่อ **Bluetooth®**

มาตรการแก้ไข:

- ตรวจสอบว่า **Bluetooth®** ถูกเรียกใช้งานหรือไม่ (ทั้งบนเครื่องมือวัดและอุปกรณ์เคลื่อนที่ปลายทางของคุณ)
- ปิด **Bluetooth®** และเปิดใหม่อีกครั้ง (ทั้งบนเครื่องมือวัดและอุปกรณ์เคลื่อนที่ปลายทางของคุณ)
- ตรวจสอบแอปพลิเคชันบนอุปกรณ์เคลื่อนที่ปลายทางของท่าน
- ตรวจสอบการระงับเกินกำลังที่อุปกรณ์เคลื่อนที่ปลายทางของท่าน
- ระยะเวลาห่างระหว่างเครื่องมือวัดและอุปกรณ์เคลื่อนที่ปลายทางของท่าน
- หลีกเลี่ยงสิ่งกีดขวาง (เช่น คอนกรีตเสริมเหล็ก ประตูโลหะ) ระหว่างเครื่องมือวัดกับอุปกรณ์เคลื่อนที่ปลายทางของคุณ รักษาระยะห่างจากแหล่งกำเนิดของการรบกวนทางแม่เหล็กไฟฟ้า (เช่น เครื่องส่งสัญญาณ WLAN)

การบำรุงรักษาและการบริการ

การบำรุงรักษาและการทำความสะอาด

เก็บรักษาและขนย้ายเครื่องมือวัดเฉพาะเมื่อบรรจุอยู่ในกระเป๋าใส่เครื่องมือวัดที่จัดมาให้เท่านั้น

รักษาเครื่องมือวัดให้สะอาดตลอดเวลา

อย่าจุ่มเครื่องมือวัดลงในน้ำหรือของเหลวอื่นๆ

เช็ดสิ่งสกปรกออกด้วยผ้านุ่มที่เปียกหมาดๆอย่าใช้สารซักฟอกหรือตัวทำละลาย

โดยเฉพาะอย่างยิ่ง ทำความสะอาดเลนส์รับ (18) และช่องปล่อยลำแสงเลเซอร์ (19)

และกล้อง (20) อย่างระมัดระวัง: ตรวจสอบให้แน่ใจว่าไม่มีสิ่งสกปรกบนเลนส์รับหรือช่องปล่อยลำแสงเลเซอร์และช่องกล้อง ทำความสะอาดเฉพาะเลนส์รับ ช่องปล่อยลำแสงเลเซอร์และกล้องด้วยสารทำความสะอาดที่เหมาะสมสำหรับเลนส์ของกล้องด้วย อย่าพยายามขจัดสิ่งสกปรกออกจากเลนส์ตัวรับ ช่องปล่อยลำแสงเลเซอร์ หรือกล้องที่มีข้อมมิคม และห้ามเช็ด (เสี่ยงต่อการเกิดรอยขีดข่วน)

ในกรณีข้อมแซม ให้ส่งเครื่องมือวัดโดยบรรจุลงในกระเป๋าใส่เครื่องมือวัด (21)

การบริการหลังการขายและการให้คำปรึกษาการใช้งาน

ศูนย์บริการหลังการขายของเรายินดีตอบคำถามของท่านที่เกี่ยวกับการบำรุงรักษาและการข้อมแซมผลิตภัณฑ์รวมทั้งเรื่องอะไหล่ ภาพเขียนแบบการประกอบและข้อมูลเกี่ยวกับอะไหล่ กรุณาดูใน: www.bosch-pt.com

ทีมงานที่ปรึกษาของ บอช อินดีให้ข้อมูลเกี่ยวกับผลิตภัณฑ์ของเราและอุปกรณ์ประกอบต่างๆ

เมื่อต้องการสอบถามและสั่งซื้ออะไหล่ กรุณาแจ้งหมายเลขสินค้า 10 หลักบนแผ่นป้ายรุ่นของผลิตภัณฑ์ทุกครั้ง

ไทย

ไทย บริษัท โรเบิร์ต บอช จำกัด

เอพวยไอ เซ็นเตอร์ อาคาร 1 ชั้น 5

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บ้านเลขที่ 10/11 หมู่ 16

ถนนศรีนครินทร์ ตำบลบางแก้ว อำเภอบางพลี

จังหวัดสมุทรปราการ 10540

ประเทศไทย

โทรศัพท์ 02 7587555

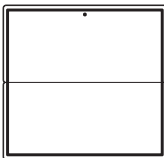
โทรสาร 02 7587525

สามารถดูที่อยู่ศูนย์บริการอื่นๆ ได้ที่:

www.bosch-pt.com/serviceaddresses

อุปกรณ์เสริม

คุณสามารถค้นหาอุปกรณ์เสริมได้จากลิ้งค์ของเว็บไซต์ Bosch



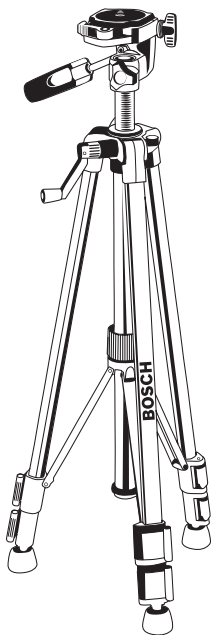
ด้ามจับอเนกประสงค์ (24)

2 607 001 391



แว่นตาสำหรับมองแสงเลเซอร์ (สีแดง) (25)

1 608 M00 05B



ขาตั้งแบบสามขา BT 150 (26)

0 601 096 B00

Bahasa Indonesia

Petunjuk Keselamatan



Petunjuk lengkap ini harus dibaca dan diperhatikan agar tidak terjadi bahaya dan Anda dapat bekerja dengan aman saat menggunakan alat ukur ini. Apabila alat ukur tidak digunakan sesuai dengan petunjuk yang disertakan, keamanan alat ukur dapat terganggu. Janganlah sekali-

kali menutupi atau melepas label keselamatan kerja yang ada pada alat ukur ini.
SIMPAN PETUNJUK INI DENGAN BAIK DAN BERIKAN KEPADA PEMILIK ALAT UKUR BERIKUTNYA.

- ▶ **Perhatian** – jika perangkat pengoperasian atau perangkat pengaturan atau prosedur lain selain yang dituliskan di sini digunakan, hal ini dapat menyebabkan terjadinya paparan radiasi yang berbahaya.
- ▶ Alat pengukur dikirim dengan tanda peringatan laser (ditandai dengan ilustrasi alat pengukur di halaman grafis).
- ▶ Jika teks pada tanda peringatan laser tidak tertulis dalam bahasa negara Anda, tempelkan label yang tersedia dalam bahasa negara Anda di atas label berbahasa Inggris sebelum Anda menggunakan alat untuk pertama kalinya.



Jangan melihat sinar laser ataupun mengarahkannya kepada orang lain atau hewan baik secara langsung maupun dari pantulan. Sinar laser dapat membutakan seseorang, menyebabkan kecelakaan atau merusak mata.

- ▶ **Jika radiasi laser mengenai mata, tutup mata Anda dan segera gerakkan kepala agar tidak terkena sorotan laser.**
- ▶ **Jangan mengubah peralatan laser.**
- ▶ **Jangan gunakan kacamata pelihat laser (aksesori) sebagai kacamata pelindung.** Kacamata pelihat laser digunakan untuk mendeteksi sinar laser dengan lebih baik, namun tidak melindungi dari sinar laser.
- ▶ **Jangan gunakan kacamata pelihat laser (aksesori) sebagai kacamata hitam atau di jalan raya.** Kacamata pelihat laser tidak menawarkan perlindungan penuh terhadap sinar UV dan mengurangi persepsi warna.
- ▶ **Perbaiki alat ukur hanya di teknisi ahli resmi dan gunakan hanya suku cadang asli.** Dengan demikian, keselamatan kerja dengan alat ukur ini selalu terjamin.

- ▶ **Jangan biarkan anak-anak menggunakan alat ukur laser tanpa pengawasan.** Hal ini dapat menyilaukan orang lain atau diri sendiri secara tidak sengaja.
- ▶ **Jangan mengoperasikan alat ukur di area yang berpotensi meledak yang di dalamnya terdapat cairan, gas, atau serbuk yang dapat terbakar.** Di dalam alat pengukur dapat terjadi bunga api, yang lalu menyulut debu atau uap.
- ▶ **Alat ukur dilengkapi dengan antarmuka nirkabel. Perhatikan batasan pengoperasian lokal, misalnya dalam pesawat terbang atau di rumah sakit.**

Istilah merek *Bluetooth®* serta gambar simbol (logo) merupakan merek dagang terdaftar dan kepemilikan dari Bluetooth SIG, Inc. Setiap penggunaan istilah merek/gambar simbol ini berada di bawah lisensi Robert Bosch Power Tools GmbH.

- ▶ **Waspada! Ketika menggunakan alat ukur dengan *Bluetooth®* dapat terjadi gangguan pada perangkat dan instalasi lain, pesawat terbang, dan perangkat medis (misalnya alat pacu jantung, alat bantu dengar).** Selain itu, cedera pada manusia dan binatang di area sekitar tidak dapat sepenuhnya dihindari. Jangan menggunakan alat ukur dengan *Bluetooth®* di dekat perangkat medis, pusat pengisian bahan bakar, instalasi kimia, area dengan bahaya ledakan. Jangan menggunakan alat ukur dengan *Bluetooth®* dalam pesawat terbang. Hindari pengoperasian di dekat tubuh secara langsung dalam waktu yang lama.
- ▶ **Jangan menggunakan alat ukur untuk membidik seseorang atau hewan karena saat digunakan, sinar laser pada alat dapat menyala permanen.** Sinar laser yang menyala dapat menyilaukan mata seseorang, menyebabkan kecelakaan, atau merusak mata.
- ▶ **Jangan menggunakan alat ukur jika kaca display terlihat rusak (misalnya retak di bagian permukaan, dsb.).** Terdapat risiko cedera.



- Jauhkan alat pengukur dan aksesoris magnetis dari alat implan dan perangkat medis semacamnya, seperti misalnya alat pacu jantung atau pompa insulin.** Magnet pada alat pengukur dan aksesoris menciptakan medan yang dapat memengaruhi fungsi alat implan dan perangkat medis.
- ▶ **Jauhkan alat pengukur dan aksesoris magnetis dari media penyimpanan data magnetis dan perangkat yang sensitif terhadap magnet.** Daya magnet dari perkakas listrik dan aksesoris dapat mengakibatkan data-data hilang secara permanen.

Spesifikasi produk dan performa

Harap buka halaman lipat yang berisi ilustrasi alat ukur dan tetap buka halaman tersebut selama membaca panduan pengoperasian.

Tujuan penggunaan

Alat pengukur merupakan instrumen untuk mengukur jarak, panjang, tinggi, celah dan untuk menghitung luas bidang dan volume.

Alat ukur ditujukan untuk digunakan di dalam maupun di luar ruangan.

Hasil ukur dapat dikirim melalui *Bluetooth*[®] ke perangkat lainnya.

Ilustrasi komponen

Penomoran ilustrasi komponen mengacu pada ilustrasi alat ukur pada halaman ilustrasi.

- (1) Display
- (2) ▲ Tombol pengukuran
- (3) ▀ Softkey kanan
- (4) ▶ Tombol plus
- (5) 🔍 Tombol zoom
- (6) Dudukan tali jinjing
- (7) Tombol rilis pin penahan
- (8) Pin penahan
- (9) ⏻ Tombol on/off
- (10) 🎯 Tombol display target
- (11) ◀ Tombol minus
- (12) ▀ Softkey kiri
- (13) Func Tombol fungsi
- (14) Label peringatan laser
- (15) Nomor seri
- (16) Tutup kompartemen baterai
- (17) Ulir tripod 1/4"
- (18) Lensa penerima
- (19) Outlet sinar laser
- (20) Kamera

- (21) Tas pelindung
- (22) Pengunci putar
- (23) Baterai
- (24) Reflektor sinar laser^{A)}
- (25) Kacamata laser^{A)}
- (26) Tripod^{A)}

A) **Aksesori yang ada pada gambar atau yang dijelaskan tidak termasuk dalam lingkup pengiriman standar. Semua aksesori yang ada dapat Anda lihat dalam program aksesori kami.**

Elemen pada display

- (a) Baris hasil
- (b) Display target (tanda bidik)
- (c) Tampilan sudut kemiringan
- (d) Tanggal/waktu
- (e) Bidang acuan pengukuran
- (f) Status *Bluetooth*[®]
 - ✖ *Bluetooth*[®] tidak diaktifkan
 - ✎ *Bluetooth*[®] diaktifkan, koneksi dibuat
- (g) Indikator level pengisian daya baterai
- (h) Baris nilai pengukuran
- (i) Pengaturan dasar
- (j) Display fungsi pengukuran
- (k) Memori internal
- (l) Kembali
- (m) Fungsi bantuan terintegrasi
- (n) Layar depan
- (o) Menu Pengaturan dasar selanjutnya
- (p) Menu Pengaturan dasar
- (q) Menu Fungsi pengukuran

Data teknis

| Laser pengukur jarak digital | GLM 100-25 C |
|--|---|
| Nomor seri | 3 601 K72 Y.. |
| Jangkauan pengukuran ^{A)} | 0,08–100 m |
| Jangkauan pengukuran (kondisi tidak menguntungkan) ^{B)} | 0,08–60 m |
| Akurasi pengukuran ^{A)} | ±1,5 mm |
| Akurasi pengukuran (kondisi tidak menguntungkan) ^{B)} | ±3,0 mm |
| Unit terkecil pada display | 0,5 mm |
| Pengukuran jarak tidak langsung dan waterpas | |
| Jangkauan pengukuran | 0°–360° (4 × 90°) |
| Pengukuran kemiringan | |
| Jangkauan pengukuran | 0°–360° (4 × 90°) |
| Akurasi pengukuran ^{C)D)} | ± 0,2° |
| Unit terkecil pada display | 0,1° |
| Umum | |
| Suhu pengoperasian ^{E)} | –10°C ... +45°C |
| Suhu penyimpanan | –20°C ... +70°C |
| Kelembapan relatif maks. | 90% |
| Tinggi penggunaan maks. di atas tinggi acuan | 2000 m |
| Tingkat polusi sesuai dengan IEC 61010-1 | 2 ^{F)} |
| Kelas laser | 2 |
| Jenis laser | 650 nm, < 1 mW |
| Divergensi sinar laser | < 1,5 mrad (sudut penuh) |
| Penonaktifan otomatis setelah sekitar | |
| – Laser | 20 s |
| – Alat ukur (tanpa pengukuran) | 5 min |
| Baterai | 3 × 1,5 V LR6 (AA) |
| Berat sesuai dengan EPTA-Procedure 01:2014 | 0,23 kg |
| Jenis perlindungan | IP 54 (terlindung dari debu dan percikan air) |
| Dimensi | 142 (176) × 64 × 28 mm |

Laser pengukur jarak digital**GLM 100-25 C****Pengiriman data**

| | |
|---------------------------------|--|
| <i>Bluetooth</i> [®] | <i>Bluetooth</i> [®] 4.2 Low Energy ⁽⁶⁾ |
| Rentang frekuensi pengoperasian | 2402–2480 MHz |
| Daya transmisi maks. | 8 mW |

- A) Saat mengukur dari tepi depan alat ukur, berlaku untuk daya pantul objek yang tinggi (misalnya dinding yang dicat putih), pencahayaan latar belakang yang lemah dan suhu pengoperasian sebesar 25°C; selain itu, penyimpangan bergantung jarak sebesar ±0,05 mm/m harus diperhitungkan.
- B) Saat mengukur dari tepi depan alat ukur, berlaku untuk daya pantul objek yang tinggi (misalnya dinding yang dicat putih), pencahayaan latar belakang yang kuat, suhu pengoperasian sebesar 25°C, dan alitudo yang besar. Selain itu, penyimpangan bergantung jarak sebesar ±0,15 mm/m harus diperhitungkan.
- C) Pada suhu pengoperasian 25°C
- D) Setelah kalibrasi pengguna pada suhu 0° dan 90°; tingkat kesalahan gradien tambahan sebesar ±0,01°/derajat hingga 45° (maks.) perlu diperhatikan. Sisi kiri alat pengukur digunakan sebagai bidang acuan untuk mengukur kemiringan.
- E) Suhu pengoperasian maksimal pada fungsi pengukuran kontinu yakni +40 °C.
- F) Hanya polusi nonkonduktif yang terjadi, namun terkadang muncul konduktivitas sementara yang disebabkan oleh kondensasi.
- G) Sambungan mungkin tidak dapat dibuat pada perangkat *Bluetooth*[®] Low Energy tergantung pada model dan sistem pengoperasian. Perangkat *Bluetooth*[®] harus mendukung profil GATT.



Untuk mengidentifikasi alat pengukur secara jelas terdapat nomor seri **(15)** pada label tipe.

Memasang/mengganti baterai

Direkomendasikan untuk menggunakan baterai mangan alkali atau baterai NiMH untuk pengoperasian alat ukur (terutama ketika suhu pengoperasian rendah).

Pengukuran dapat dilakukan lebih banyak dengan baterai 1,2 V daripada menggunakan baterai 1,5 V bergantung pada kapasitas baterai.

- » Tekan tombol rilis **(7)** dan buka pin penahan **(8)** sebesar 180°.
- » Untuk membuka penutup kompartemen baterai **(16)**, buka pengunci putar **(23)** ke atas dan putar seperempat putaran berlawanan arah jarum jam.
- » Tarik penutup kompartemen baterai **(16)** pada pengunci putarnya **(23)**.
- » Pasang baterai atau baterai isi ulang.

-  Selalu ganti semua baterai atau baterai isi ulang sekaligus. Hanya gunakan baterai atau baterai isi ulang dari produsen dan dengan kapasitas yang sama.
-  Pastikan baterai terpasang pada posisi kutub yang benar sesuai gambar di dalam kompartemen baterai.

Hanya sedikit pengukuran yang dapat dilakukan apabila muncul simbol baterai kosong pada display untuk kali pertama.

Jika simbol baterai kosong dan berkedip merah, pengukuran tidak dapat lagi dilakukan. Ganti baterai.

- ▶ **Lepaskan baterai atau baterai isi ulang dari alat pengukur jika alat pengukur tidak digunakan dalam waktu yang lama.** Jika baterai dan baterai isi ulang disimpan untuk waktu yang lama, baterai dan baterai isi ulang dapat berkarat dan dayanya akan habis dengan sendirinya.

Penggunaan

Cara penggunaan

- ▶ **Jangan biarkan alat ukur yang aktif berada di luar pengawasan dan matikan alat ukur setelah digunakan.** Sinar laser dapat menyilaukan mata orang lain.
- ▶ **Lindungilah alat ukur dari cairan dan sinar matahari langsung.**
- ▶ **Jauhkan alat ukur dari suhu atau perubahan suhu yang ekstrem.** Jangan biarkan alat ukur berada terlalu lama di dalam kendaraan. Biarkan alat ukur menyesuaikan suhu lingkungan sebelum dioperasikan saat terjadi perubahan suhu yang drastis. Pada suhu yang ekstrem atau terjadi perubahan suhu yang drastis, ketepatan alat ukur dapat terganggu.
- ▶ **Hindari guncangan atau benturan yang keras pada alat ukur.** Setelah terjadi guncangan atau benturan keras pada alat ukur, disarankan untuk selalu memeriksa akurasi alat (lihat „Pemeriksaan akurasi“, Halaman 187) sebelum menggunakan kembali.

Menghidupkan/mematikan

- » Tekan tombol  untuk menghidupkan alat ukur dan menyalakan laser.

Alat ukur juga dapat dihidupkan tanpa menyalakan laser dengan menekan tombol .

- » Tekan dan tahan tombol  untuk mematikan alat ukur.

Pengaturan alat dan nilai yang disimpan pada memori akan tetap tersimpan.

Kamera

Tekan tombol  untuk menghidupkan atau mematikan kamera.

Status yang dipilih akan tetap tersimpan setelah alat ukur dimatikan.

Pada jarak yang lebih lebar (sekitar > 5 m), penanda target juga akan ditampilkan untuk menandai titik pengukuran.

Mengoptimalkan visibilitas titik laser


Titik laser mungkin tidak dapat terlihat saat alat ukur digunakan khususnya di luar ruangan, saat berada di bawah sinar matahari langsung, dan juga pada jarak yang cukup jauh di dalam ruangan. Hidupkan kamera. Visibilitas titik laser/titik ukur juga dapat ditingkatkan dengan:

- Mengatur kecerahan display (lihat „Mengatur kecerahan display “, Halaman 171)
- Memperbesar dengan tombol 

Prosedur pengukuran

Setelah dihidupkan, alat ukur berada dalam fungsi pengukuran panjang.

Setelah dihidupkan, tepi belakang alat ukur telah dipilih sebagai bidang acuan untuk pengukuran. Bidang acuan dapat diubah. (lihat „Memilih bidang acuan“, Halaman 164)


- » Letakkan alat ukur pada titik awal pengukuran yang diinginkan (misalnya dinding).
- » Tekan tombol  untuk memulai pengukuran.


Sinar laser akan dimatikan setelah proses pengukuran selesai. Ulangi prosedur ini untuk pengukuran selanjutnya.


Nilai pengukuran atau hasil akhir dapat ditambah atau dikurangi.

Nilai pengukuran biasanya muncul dalam waktu 0,5 detik dan paling lambat setelah sekitar 4 detik.

Durasi pengukuran bergantung pada jarak, kondisi cahaya, dan karakter pantulan permukaan target. Sinar laser akan dimatikan secara otomatis setelah proses pengukuran selesai.

Saat sinar laser permanen dinyalakan dan fungsi pengukuran kontinu dipilih, pengukuran akan dimulai begitu tombol  ditekan untuk kali pertama.

Sinar laser permanen yang dinyalakan tidak akan dimatikan setelah pengukuran selesai (lihat „Sinar laser permanen “, Halaman 167).

 Alat ukur tidak boleh digerakkan selama pengukuran berlangsung. Oleh karena itu, sebisa mungkin letakkan alat ukur di atas permukaan atau dudukan yang kokoh dan stabil.

- i** Lensa penerima **(18)**, outlet sinar laser **(19)**, dan kamera **(20)** tidak boleh terhalang saat pengukuran dilakukan.

Hal-hal yang berpengaruh terhadap jangkauan pengukuran

Jangkauan pengukuran bergantung pada kondisi cahaya dan karakter pantulan permukaan target.

Agar sinar laser memiliki visibilitas yang lebih baik saat cahaya sekitar terlalu terang, gunakan kamera terintegrasi **(20)**, kacamata laser **(26)** (aksesori), dan reflektor sinar laser **(25)** (aksesori), atau naungi permukaan target.

Hal-hal yang memengaruhi hasil pengukuran



Faktor-faktor fisik yang menyebabkan ketidaktepatan pengukuran saat mengukur di berbagai permukaan tidak dapat diabaikan. Hal ini mencakup:

- Permukaan yang transparan (misalnya kaca, air),
- Permukaan yang memantul (misalnya logam yang dipoles, kaca),
- Permukaan yang berpori (material insulasi),
- Permukaan bertekstur (misalnya dinding plester, batu alam).

Jika diperlukan, gunakan reflektor sinar laser **(25)** (aksesori) pada permukaan tersebut. Ketidaktepatan pengukuran juga dapat terjadi pada permukaan target yang dibidik secara miring.

Lapisan udara dengan suhu yang berbeda atau pantulan yang diterima secara tidak langsung juga dapat memengaruhi nilai pengukuran.

Navigasi dalam menu

Gunakan tombol  untuk beralih ke kanan dan tombol  untuk beralih ke kiri dalam menu.

Untuk mengonfirmasi pilihan, tekan tombol  atau tombol .

Tekan tombol  untuk keluar dari menu.

Memilih bidang acuan

Untuk pengukuran, bidang acuan yang berbeda-beda dapat dipilih:



Tepi belakang alat ukur (misalnya saat diletakkan pada dinding),




Ujung dari stop plate yang dilipat 180° (misalnya untuk pengukuran dari sudut)





Tepi depan alat ukur (misalnya saat mengukur dari tepi meja)




Bagian tengah ulir tripod **(17)** (misalnya saat mengukur menggunakan tripod)

» Tekan softkey  untuk membuka menu **Pengaturan dasar**.

» Pilih .

» Pilih bidang acuan yang diinginkan dengan tombol  atau tombol .












» Tekan tombol  untuk mengonfirmasi pilihan.





Pin penahan **(8)** yang dibuka dan dilipat sebesar 180° akan terdeteksi secara otomatis dan akan muncul rekomendasi bidang acuan yang sesuai. Tekan tombol  untuk mengonfirmasi pilihan.


Setelah setiap alat ukur dihidupkan, tepi belakang alat ukur telah diatur sebelumnya sebagai bidang acuan.

Menu Pengaturan dasar


Pengaturan dasar berikut dapat ditemukan pada menu **Pengaturan dasar**:

-  Mengaktifkan/menonaktifkan *Bluetooth*[®]
-  Mengubah bidang acuan (lihat „Memilih bidang acuan“, Halaman 164)
-  Timer
-  Menyalakan/mematikan sinar laser permanen
-  Kalibrasi pengukuran kemiringan (lihat „Pemeriksaan akurasi“, Halaman 187)
-  Kalibrasi display target
-  Mengatur bahasa
-  Mengatur tanggal & waktu
- **ft/m** Mengubah satuan ukur
-  Mengubah satuan sudut
- **PRO** Mengaktifkan PRO360
-  Mengakses informasi alat
-  Menghidupkan/mematikan sinyal suara

-  Mengatur waktu nonaktif
-  Mengatur waktu redup
-  Mengatur kecerahan display
-  Mengaktifkan/menonaktifkan rotasi layar otomatis

» Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu

Pengaturan dasar .

» Pilih pengaturan yang diinginkan dengan tombol  atau tombol .

» Tekan tombol  untuk mengonfirmasi pilihan.

» Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .

Mengaktifkan/menonaktifkan Bluetooth®

» Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu

Pengaturan dasar .

» Pilih .

» Tekan tombol  atau tombol  untuk mengubah pilihan.

» Tekan tombol  untuk mengonfirmasi pilihan.

» Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .



Timer

Fungsi timer akan membantu misalnya saat mengukur di area yang sulit dijangkau atau saat menahan alat ukur agar tidak bergerak selama proses pengukuran.

» Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu

Pengaturan dasar .

» Pilih .

» Pilih jangka waktu yang diperlukan dari timer diaktifkan hingga dimulainya pengukuran dan konfirmasi dengan tombol  atau tombol .


» Tekan tombol  untuk menyalakan sinar laser dan membidik target.

- » Tekan kembali tombol  untuk memulai pengukuran.

Pengukuran akan dimulai setelah jangka waktu yang ditentukan. Nilai pengukuran akan ditunjukkan pada baris hasil **(a)**. Jangka waktu dari timer diaktifkan hingga dimulainya pengukuran akan ditampilkan di bilah status atas.








Pengukuran kontinu serta pengukuran minimal/maksimal tidak dapat dilakukan apabila fungsi timer diatur. Timer akan tetap aktif hingga alat ukur dimatikan atau hingga timer dinonaktifkan pada menu "Pengaturan".

Sinar laser permanen

Sinar laser dapat diatur untuk dinyalakan secara permanen. Pada pengaturan ini, sinar laser akan tetap menyala saat jeda di antara proses pengukuran. Untuk mengukur, cukup tekan singkat tombol  satu kali.












- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu

Pengaturan dasar










- » Pilih .
- » Tekan tombol  atau tombol  untuk mengubah pilihan.
- » Tekan tombol  untuk mengonfirmasi pilihan.
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .

Sinar laser permanen akan dimatikan kembali pada pengaturan atau dimatikan secara otomatis saat alat ukur dimatikan.

Mengatur bahasa











- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu
- #### **Pengaturan dasar**
- » Pilih menu **Pengaturan alat** .
 - » Pilih  dan konfirmasi pilihan dengan tombol .
 - » Tekan tombol  atau tombol  untuk mengubah pilihan.
 - » Tekan tombol  untuk mengonfirmasi pilihan.
 - » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau softkey .

Tanggal & waktu

- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu Pengaturan alat .
- » Pilih .
- » Atur tanggal dan waktu sesuai petunjuk pada display dan konfirmasi dengan tombol .
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .








Mengubah satuan ukur ft/m




Satuan ukur pada pengaturan dasar adalah "m" (meter).

- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
 - » Pilih menu **Pengaturan alat** .
 - » Pilih **ft/m**.
 - » Tekan tombol  atau tombol  untuk mengubah pilihan.
 - » Tekan tombol  untuk mengonfirmasi pilihan.
 - » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .
- Pengaturan alat yang dipilih akan tetap tersimpan setelah alat ukur dimatikan.

Mengubah satuan sudut

Satuan sudut pada pengaturan dasar adalah ^o (derajat).

- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih .
- » Tekan tombol  atau tombol  untuk mengubah pilihan.











- » Tekan tombol  untuk mengonfirmasi pilihan.
 - » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .
- Pengaturan alat yang dipilih akan tetap tersimpan setelah alat ukur dimatikan.

PRO360 PRO)

Aktivasi pertama harus dilakukan. Pengiriman data hanya dapat dilakukan dengan program PC atau aplikasi yang sesuai. PRO360 dapat dinonaktifkan kembali setiap saat.








GLM 100-25 C: Setelah baterai diganti, alat ukur harus dihidupkan sekali untuk memulai kembali PRO360.

Temukan informasi lebih lanjut mengenai PRO360 di www.pro360.com.












- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih PRO).
- » Tekan tombol  atau tombol  untuk mengubah pilihan.
- » Tekan tombol  untuk mengonfirmasi pilihan.
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .

Informasi perangkat **i**

Informasi mengenai alat ukur seperti misalnya nomor seri, versi perangkat lunak, dan lisensi dapat ditemukan di sini.












- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih **i** .
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .

Menghidupkan/mematikan sinyal suara

- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih .
- » Tekan tombol  atau tombol  untuk mengubah pilihan.
- » Tekan tombol  untuk mengonfirmasi pilihan.
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .






Mengatur waktu nonaktif







Waktu nonaktif otomatis dapat diatur: 2, 5, 10 menit atau tidak pernah.

- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih .
- » Tekan tombol  atau tombol  untuk mengubah pilihan.
- » Tekan tombol  untuk mengonfirmasi pilihan.
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .

Mengatur waktu redup












Pencahaya display diaktifkan permanen. Apabila tidak ada tombol yang ditekan, pencahaya display akan meredup setelah sekitar 30 detik untuk menghemat baterai. Waktu lainnya peredupan dapat diatur.

- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih .

- » Tekan tombol  atau tombol  untuk mengubah pilihan.
- » Tekan tombol  untuk mengonfirmasi pilihan.
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .












Mengatur kecerahan display

Kecerahan display dapat disesuaikan dengan kondisi sekitar dalam beberapa level.

- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih .
- » Tekan tombol  atau tombol  untuk mengubah pilihan.
- » Tekan tombol  untuk mengonfirmasi pilihan.
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .

Mengaktifkan/menonaktifkan rotasi layar otomatis













Apabila rotasi layar otomatis diaktifkan, tampilan pada layar akan berputar secara otomatis saat alat ukur diputar.


- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih menu **Pengaturan alat** .
- » Pilih .
- » Tekan tombol  atau tombol  untuk mengubah pilihan.
- » Tekan tombol  untuk mengonfirmasi pilihan.
- » Untuk keluar dari menu **Pengaturan dasar** , tekan tombol  atau tombol .


Fungsi pengukuran

Memilih/mengubah fungsi pengukuran

Temukan fungsi berikut pada menu fungsi:

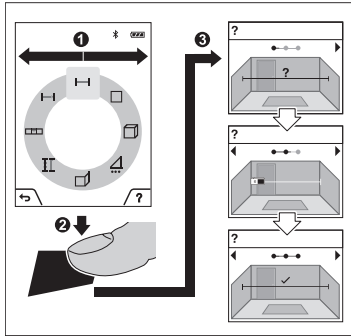
-  Pengukuran panjang
-  Pengukuran luas
-  Pengukuran volume
-  Pengukuran jarak tidak langsung
 -  Pengukuran tinggi tidak langsung
 -  Pengukuran tinggi tidak langsung ganda
 -  Pengukuran panjang tidak langsung
 -  Pengukuran trapesium
-  Pengukuran luas dinding
-  Fungsi patok
-  Pengukuran kemiringan/waterpas digital
-  Pengukuran kontinu

» Tekan tombol  untuk membuka menu **Fungsi**.

» Pilih fungsi pengukuran yang diinginkan dengan tombol  atau tombol .

» Tekan tombol  atau tombol  untuk mengonfirmasi pilihan.

Fungsi bantuan terintegrasi ?



Fungsi bantuan yang terintegrasi pada alat ukur menawarkan detail animasi pada tiap-tiap fungsi pengukuran/proses pengukuran.

- » Buka menu **Fungsi**.
- » Pilih fungsi yang diinginkan dengan tombol atau tombol dan tekan tombol .

Animasi akan menampilkan detail prosedur untuk fungsi pengukuran yang dipilih.

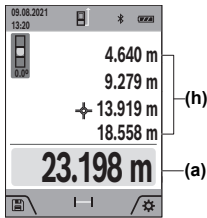
- » Tekan tombol untuk menunda

animasi atau melanjutkan animasi.

- » Tekan tombol atau untuk menampilkan langkah selanjutnya atau sebelumnya.






Pengukuran panjang

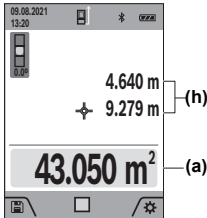
- » Tekan tombol untuk membuka menu **Fungsi**.
- » Pilih pengukuran panjang dan konfirmasi pilihan dengan tombol .
- » Tekan singkat tombol untuk menyalakan laser.
- » Tekan tombol untuk memulai pengukuran.
Nilai pengukuran akan ditunjukkan pada baris hasil **(a)** pada display bawah.
- » Ulangi langkah di atas saat setiap kali mengukur.



Saat melakukan beberapa pengukuran panjang secara berturut-turut, hasil ukur yang terakhir akan ditunjukkan pada baris nilai pengukuran **(h)**. Nilai pengukuran terakhir terletak pada display bagian bawah, nilai kedua terakhir berada di atasnya dan seterusnya.





Pengukuran luas



- » Tekan tombol  untuk membuka menu **Fungsi**.
- » Pilih pengukuran luas dan konfirmasi pilihan dengan tombol .
- » Tekan singkat tombol  untuk menyalakan laser.
- » Tekan tombol  untuk memulai pengukuran pertama, misalnya panjang ruang.
- » Tekan tombol  untuk memulai pengukuran kedua, misalnya lebar ruang.

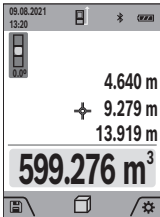


Setelah pengukuran kedua selesai, luas permukaan secara otomatis dihitung dan ditampilkan. Hasilnya akan ditunjukkan pada baris hasil **(a)**. Nilai pengukuran masing-masing dapat ditemukan pada baris nilai pengukuran **(h)**.

Pengukuran volume

- » Tekan tombol  untuk membuka menu **Fungsi**.
- » Pilih pengukuran volume dan konfirmasi pilihan dengan tombol .
- » Tekan singkat tombol  untuk menyalakan laser.
- » Tekan tombol  untuk memulai pengukuran pertama, misalnya panjang ruang.

- » Tekan tombol  untuk memulai pengukuran kedua, misalnya lebar ruang.
- » Tekan tombol  untuk memulai pengukuran ketiga, misalnya tinggi ruang.




Setelah pengukuran ketiga selesai, volume secara otomatis dihitung dan ditampilkan. Hasilnya akan ditunjukkan pada baris hasil **(a)**. Nilai pengukuran masing-masing dapat ditemukan pada baris nilai pengukuran **(h)**.

Pengukuran jarak tidak langsung





Pengukuran jarak tidak langsung digunakan untuk menentukan jarak yang tidak dapat diukur secara langsung karena ada sesuatu yang menghalangi jalannya sinar atau tidak ada permukaan target yang tersedia sebagai reflektor. Cara pengukuran ini hanya dapat dilakukan dalam arah vertikal. Segala penyimpangan dalam arah horizontal akan menyebabkan kesalahan dalam pengukuran.

Pengukuran jarak tidak langsung selalu kurang akurat bila dibandingkan dengan pengukuran jarak langsung. Kesalahan pengukuran dapat lebih besar daripada pada pengukuran jarak langsung tergantung pada penggunaannya. Untuk meningkatkan akurasi pengukuran, direkomendasikan untuk menggunakan tripod (aksesori).

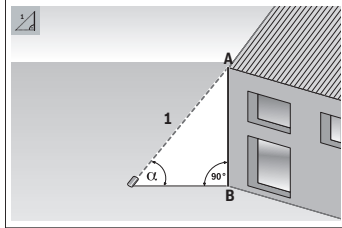
-  Saat menggunakan tripod, perhatikan bidang acuan yang telah diatur. (lihat „Memilih bidang acuan“, Halaman 164)

Sinar laser akan tetap menyala di antara proses pengukuran tunggal.

Tersedia **4** fungsi pengukuran pada pengukuran jarak tidak langsung dan tiap-tiap fungsi tersebut dapat digunakan untuk menentukan jarak yang berbeda-beda:








-  Pengukuran tinggi tidak langsung
-  Pengukuran tinggi tidak langsung ganda
-  Pengukuran panjang tidak langsung
-  Pengukuran trapesium

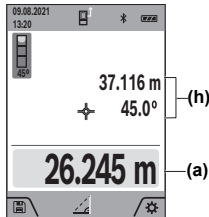
Pengukuran tinggi tidak langsung



Dengan pengukuran tinggi tidak langsung, jarak **AB** dapat ditentukan dengan mengukur jarak **1**. Alat ukur akan menghitung tinggi **AB** yang dicari dari sudut α dan jarak **1**.

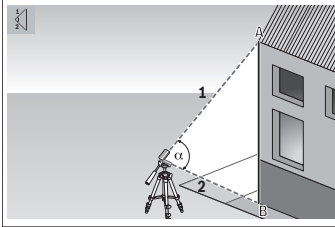
Hasil yang tepat hanya akan diperoleh jika sudut siku-siku yang diperlukan pada tiap-tiap pengukuran benar-benar dipatuhi.

- » Tekan tombol  untuk membuka menu **Fungsi**.
- » Pilih pengukuran jarak tidak langsung  dan konfirmasi pilihan dengan tombol .
- » Pilih pengukuran tinggi tidak langsung  dan konfirmasi pilihan dengan tombol .
- » Tekan singkat tombol  untuk menyalakan laser.
- » Letakkan alat ukur pada tinggi titik ukur bawah **B**.
- » Miringkan alat ukur sehingga laser mengarah ke titik ukur atas **A**.
- » Tekan tombol  untuk memulai pengukuran.











Setelah pengukuran selesai, tinggi secara otomatis dihitung dan ditunjukkan pada baris hasil **(a)**. Nilai pengukuran untuk jarak **1** dan sudut α terdapat di baris nilai pengukuran **(h)**.

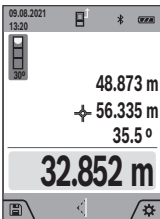
Pengukuran tinggi tidak langsung ganda



Dengan pengukuran tinggi tidak langsung ganda, jarak **AB** dapat ditentukan dengan mengukur jarak **1** dan **2**. Alat ukur akan menghitung tinggi **AB** yang dicari dari sudut α dan jarak **1** dan **2**.







Untuk pengukuran ini, direkomendasikan untuk menggunakan tripod.

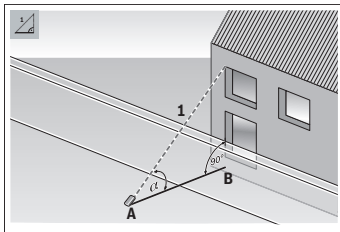
- » Tekan tombol  untuk membuka menu **Fungsi**.
- » Pilih pengukuran jarak tidak langsung  dan konfirmasi pilihan dengan tombol .
- » Pilih pengukuran tinggi tidak langsung ganda  dan konfirmasi pilihan dengan tombol .
- » Tekan singkat tombol  untuk menyalakan laser.
- » Miringkan alat ukur sehingga laser mengarah ke titik ukur atas **A**.
- » Tekan tombol  untuk memulai pengukuran pertama.
- » Miringkan alat ukur sehingga laser mengarah ke titik ukur bawah **B**. Saat melakukannya, jangan mengubah posisi alat ukur.
- » Tekan tombol  untuk memulai pengukuran kedua.



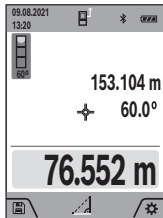
Setelah pengukuran selesai, tinggi secara otomatis dihitung dan ditunjukkan pada baris hasil **(a)**. Nilai pengukuran untuk jarak **1**, **2**, dan sudut α terdapat di baris nilai pengukuran **(h)**.

Pengukuran panjang tidak langsung

- » Tekan tombol  untuk membuka menu **Func**.
- » Pilih pengukuran jarak tidak langsung  dan konfirmasi pilihan dengan tombol .
- » Pilih pengukuran panjang tidak langsung  dan konfirmasi pilihan dengan tombol .
- » Letakkan alat ukur pada titik awal **A** dari jarak **AB** yang dicari.
- » Miringkan alat ukur sehingga laser mengarah ke bidang tempat titik akhir **B** juga berada.
- » Tekan tombol  untuk memulai pengukuran.

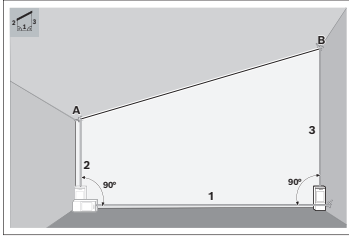


Dengan pengukuran panjang tidak langsung, jarak **AB** dapat ditentukan dengan mengukur jarak **1**. Alat ukur menghitung panjang **AB** yang dicari dari sudut α dan jarak **1**.



Setelah pengukuran selesai, panjang secara otomatis dihitung dan ditunjukkan pada baris hasil **(a)**. Nilai pengukuran untuk jarak **1** dan sudut α terdapat di baris nilai pengukuran **(h)**.

Pengukuran trapesium












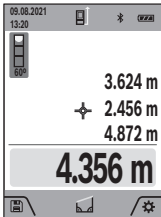
Dengan pengukuran trapesium, misalnya panjang dari kemiringan atap dapat ditentukan. Jarak **AB** dapat ditentukan dengan mengukur jarak **1**, **2**, dan **3** dalam urutan ini. Alat ukur akan menghitung jarak **AB** yang dicari dari jarak **1**, **2**, dan **3**.

i

Pastikan pengukuran jarak **3** dimulai tepat pada titik akhir jarak **1** dan terdapat sudut

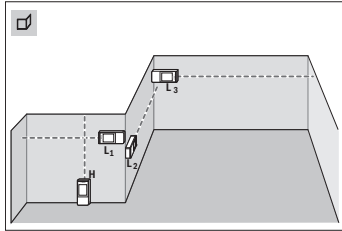
siku-siku antara jarak **1** dan **2** serta antara jarak **1** dan **3**.

- » Tekan tombol  untuk membuka menu **Fungsi**.
- » Pilih pengukuran jarak tidak langsung  dan konfirmasi pilihan dengan tombol .
- » Pilih pengukuran trapesium  dan konfirmasi pilihan dengan tombol .
- » Tekan singkat tombol  untuk menyalakan laser.
- » Ukur jarak **1** dengan tombol .
- » Ukur jarak **2** dengan tombol .
- » Ukur jarak **3** dengan tombol .






Setelah pengukuran selesai, jarak **AB** secara otomatis dihitung dan ditunjukkan pada baris hasil **(a)**. Nilai pengukuran untuk jarak **1**, **2**, dan **3** terdapat di baris nilai pengukuran **(h)**.

Pengukuran luas dinding



Pengukuran luas dinding digunakan untuk menentukan jumlah dari beberapa bidang tunggal dengan ketinggian yang sama. Syarat penghitungan luas permukaan yang benar yakni panjang yang telah diukur pertama (sebagai contoh, tinggi ruang **H**) identik untuk semua luas permukaan parsial. Pada contoh yang digambarkan, luas keseluruhan beberapa dinding perlu ditentukan yang memiliki tinggi ruang **H**

yang sama, tetapi panjang **L** yang berbeda.

- » Tekan tombol  untuk membuka menu **Fungsi**.
- » Pilih pengukuran luas dinding  dan konfirmasi pilihan dengan tombol .
- » Ukur tinggi ruang **H** seperti saat mengukur panjang.

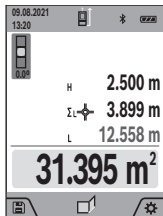
Nilai pengukuran akan ditampilkan di baris nilai pengukuran bagian atas. Sinar laser tetap menyala.

- » Kemudian ukur panjang **L1** dinding pertama.

Luas akan secara otomatis dihitung dan ditampilkan pada baris hasil. Nilai pengukuran panjang terakhir terletak di baris nilai pengukuran bagian bawah. Sinar laser tetap menyala.

- » Selanjutnya, ukur panjang **L2** dinding kedua.

Panjang **LX** lainnya dapat diukur secara opsional, kemudian nilai tersebut akan otomatis ditambahkan dan dikalikan dengan tinggi **H**.

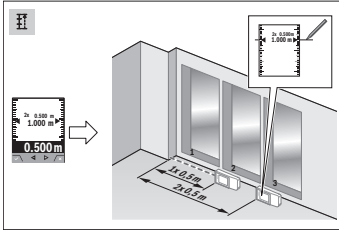


Nilai pengukuran tunggal yang ditampilkan pada baris nilai pengukuran (**h**) akan ditambahkan ke panjang **L1**. Jumlah kedua panjang (ditampilkan di baris nilai pengukuran (**h**) bagian tengah) akan dikalikan dengan tinggi **H** yang tersimpan. Nilai luas keseluruhan ditunjukkan pada baris hasil (**a**) pada display bawah.

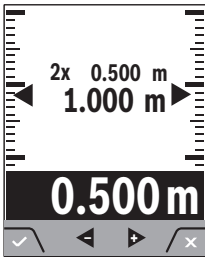
Fungsi patok





Pada fungsi patok, bidang acuan merupakan penanda yang ditampilkan pada display. Ujung alat ukur bukanlah bidang acuan.






Fungsi patok akan mengukur panjang yang ditentukan (jarak) secara berulang. Panjang ini dapat dikirimkan ke permukaan untuk memungkinkan pemotongan material dengan panjang potongan yang sama atau untuk mengatur dinding partisi pada konstruksi drywall. Panjang minimal yang dapat diatur sebesar 0,1 m, panjang maksimal sebesar 50 m.





» Tekan tombol  untuk membuka menu **Fungsi**.


» Pilih fungsi patok  dan konfirmasi pilihan dengan tombol .

» Tekan tombol  untuk mengatur panjang yang diinginkan.


» Atur panjang yang diinginkan dengan tombol  atau tombol .

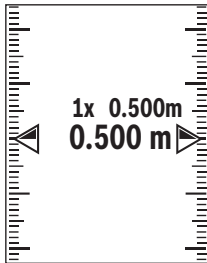
Tekan lama tombol  atau tombol  untuk menambah

ukuran panjang.

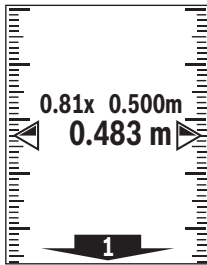
» Tekan tombol  untuk memulai fungsi patok dan bergeraklah menjauhi titik awal.

Alat ukur terus mengukur jarak ke titik awal. Saat pengukuran, panjang yang telah ditentukan serta nilai pengukuran saat ini akan ditampilkan. Panah bawah atau atas menunjukkan jarak terpendek ke tanda selanjutnya atau sebelumnya.

Saat melakukan pengukuran kontinu, nilai yang diukur dapat ditetapkan sebagai panjang yang ditentukan dengan menekan dan menahan tombol .






Koefisien kiri menunjukkan seberapa sering panjang yang ditentukan telah tercapai. Panah hijau samping pada display menunjukkan panjang yang dicapai untuk tujuan penandaan.

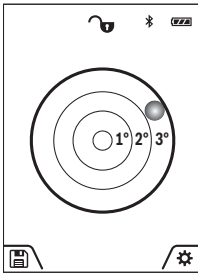


Tanda panah merah dan tulisan merah menunjukkan nilai yang sebenarnya jika nilai acuan berada di luar display.

Pengukuran kemiringan/waterpas digital

Waterpas digital digunakan untuk memeriksa kesejajaran horizontal atau vertikal suatu objek (misalnya mesin cuci, kulkas, dll.). Pengukuran kemiringan digunakan untuk mengukur tanjakan atau kemiringan (misalnya pada tangga, selusur pagar, saat mengukur mebel, saat mengatur posisi pipa, dll.). Alat ukur akan beralih secara otomatis antara dua fungsi apabila posisi alat ukur diubah.

- » Tekan tombol  untuk membuka menu **Fungsi**.
- » Pilih pengukuran kemiringan/waterpas digital  dan konfirmasi pilihan dengan tombol .

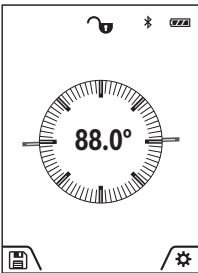


Sisi bawah alat ukur digunakan sebagai bidang acuan untuk waterpas digital.

» Untuk menggunakan waterpas digital, letakkan alat ukur dengan bagian belakang alat menempel pada permukaan yang akan diukur.

Pembacaan nilai pengukuran dapat dihentikan dengan menekan tombol ▲.

» Jika sudut kemiringan 3° terlampaui, bola pada display akan menyala merah.



Sisi kiri alat ukur digunakan sebagai bidang acuan untuk mengukur kemiringan. Jika display berkedip selama proses pengukuran berlangsung, alat ukur terlalu miring ke samping.

» Untuk menggunakan pengukuran kemiringan, letakkan alat ukur dengan permukaan samping di atas objek yang ingin diukur kemiringannya.

Pembacaan nilai pengukuran dapat dihentikan dengan menekan tombol ▲.

Pengukuran kontinu \leftrightarrow

Pada pengukuran kontinu, nilai pengukuran akan terus-menerus diperbarui. Pengguna dapat menjauh misalnya dari dinding hingga ke suatu jarak yang diinginkan selama jarak saat ini selalu dapat terbaca.

» Tekan tombol **Func** untuk membuka menu **Funcsi**.

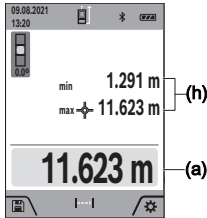
» Pilih pengukuran kontinu \leftrightarrow dan konfirmasi pilihan dengan tombol **Func**.

» Tekan singkat tombol ▲ untuk menyalakan laser.

» Gerakkan alat ukur beberapa saat hingga jarak yang diinginkan muncul pada baris hasil.

Pengukuran kontinu dapat dibatalkan dengan menekan singkat tombol ▲.

» Tekan kembali tombol ▲ untuk melanjutkan pengukuran kontinu.



Nilai pengukuran saat ini ditampilkan pada baris hasil **(a)**, nilai pengukuran maksimal dan minimal ditampilkan pada baris nilai pengukuran **(h)**.

Pengukuran kontinu akan nonaktif secara otomatis setelah **5** menit.

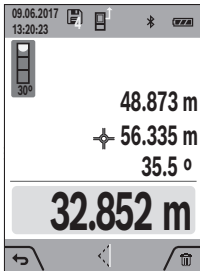
Fungsi memori

Nilai atau hasil akhir dari tiap pengukuran yang telah selesai akan tersimpan secara otomatis. **50** nilai terakhir (nilai pengukuran atau hasil akhir) akan disimpan. Jika memori penuh, nilai yang paling lama tersimpan akan ditimpa. Nilai terlama berada di posisi 1 dalam memori, nilai terbaru berada di posisi **50** (pada **50** nilai memori yang tersedia).

» Tekan tombol  untuk membuka fungsi memori.

Nilai terakhir akan ditampilkan.

» Tekan tombol  atau tombol  untuk menggulir nilai yang tersimpan.




Angka nilai memori ditampilkan pada display bagian atas dan simbol fungsi pengukuran terkait ditampilkan di sebelah kiri. Jika tidak ada nilai yang tersedia di memori, pada display bagian bawah akan ditampilkan "0.000" dan "0" di bagian atas.

Menghapus nilai memori


» Tekan tombol  untuk menghapus nilai yang ditampilkan.

» Konfirmasi dengan tombol .

Untuk menghapus seluruh nilai yang tersimpan, pada menu **Pengaturan dasar**  pilih item menu **Hapus memori**.


Menambah/mengurangi nilai

Menambah nilai saat melakukan pengukuran panjang

- » Pilih fungsi pengukuran panjang.
- » Lakukan pengukuran pertama.
- » Tekan tombol .
- » Lakukan pengukuran kedua.

Begitu pengukuran kedua selesai, hasil dari pengukuran kedua akan ditampilkan pada baris nilai pengukuran **(h)** dan hasil akhir akan ditampilkan pada baris hasil **(a)**.

Menambah nilai saat melakukan pengukuran luas dan volume

- » Pilih fungsi pengukuran luas atau pengukuran volume.
- » Lakukan pengukuran luas atau pengukuran volume yang pertama.
- » Tekan tombol .
- » Lakukan pengukuran luas atau pengukuran volume yang kedua.

Begitu pengukuran kedua atau ketiga selesai, luas atau volume secara otomatis akan dihitung dan ditampilkan. Hasilnya akan ditunjukkan pada baris hasil **(a)**. Nilai pengukuran masing-masing dapat ditemukan pada baris nilai pengukuran **(h)**.


- » Tekan tombol  untuk menampilkan hasil akhir dari penambahan nilai.


Hasil akhir akan ditunjukkan pada baris hasil **(a)**. Hasil dari pengukuran luas atau volume masing-masing dapat ditemukan pada baris nilai pengukuran **(h)**.

Mengurangi nilai

- » Untuk mengurangi nilai, tekan tombol . Prosedur selanjutnya sama dengan "Menambah nilai".

Menghapus nilai pengukuran

Nilai pengukuran yang ditentukan terakhir pada semua fungsi pengukuran dapat dihapus dengan menekan singkat tombol .

Dengan menekan singkat tombol  beberapa kali, nilai pengukuran akan dihapus dalam urutan sebaliknya.

Antarmuka *Bluetooth*[®]

Pengiriman data ke perangkat lain

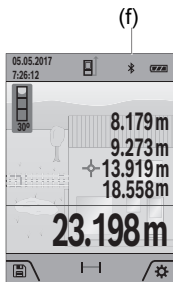
Alat pengukur dilengkapi dengan modul *Bluetooth*[®] yang memungkinkan pengiriman data ke perangkat seluler tertentu dengan antarmuka *Bluetooth*[®] (misalnya smartphone, tablet) melalui teknologi radio.









Informasi mengenai persyaratan sistem yang diperlukan untuk koneksi *Bluetooth*[®] dapat dilihat pada situs internet Bosch di www.bosch-pt.com.

► Informasi lebih lanjut dapat ditemukan di halaman produk Bosch.

Ketika mengirim data melalui *Bluetooth*[®], dapat terjadi penundaan waktu antara perangkat seluler dan alat pengukur. Hal ini dapat disebabkan oleh jarak antara kedua perangkat atau oleh objek pengukuran itu sendiri.

Pengaktifan antarmuka *Bluetooth*[®] untuk pengiriman data pada perangkat seluler











- ✓ Pastikan antarmuka *Bluetooth*[®] telah diaktifkan pada perangkat seluler.
 - » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
 - » Pilih .
 - » Tekan tombol  atau tombol  untuk memilih .
 - » Tekan tombol  untuk mengonfirmasi pilihan.
- Simbol *Bluetooth*[®] ditampilkan pada display dengan warna putih (f).

Aplikasi Bosch tersedia untuk memperluas cakupan fungsi. Aplikasi ini dapat diunduh di App Store terkait menyesuaikan perangkatnya.

Setelah memulai aplikasi Bosch, koneksi antara perangkat seluler dengan alat ukur akan dibuat. Pilih alat ukur yang tepat sesuai dengan nomor seri jika ditemukan beberapa alat ukur yang aktif. Nomor seri (15) dapat ditemukan di label alat ukur.

Penonaktifan antarmuka *Bluetooth*[®]




- » Tekan singkat tombol  atau tekan dan tahan tombol  untuk membuka menu **Pengaturan dasar** .
- » Pilih .
- » Tekan tombol  atau tombol  untuk memilih .
- » Tekan tombol  untuk mengonfirmasi pilihan.
Simbol *Bluetooth*[®] ditampilkan pada display dengan warna abu-abu.


Pemeriksaan akurasi

Periksa akurasi pengukuran kemiringan dan pengukuran jarak secara berkala.

Pemeriksaan akurasi dan kalibrasi pengukuran kemiringan

- » Untuk melakukannya, letakkan alat ukur pada meja dan ukur kemiringannya.
- » Putar alat ukur sebesar 180° dan ukur kembali kemiringannya.
Selisih nilai yang ditampilkan tidak boleh melebihi 0,3°.
Apabila terdapat selisih yang lebih besar, alat ukur harus dikalibrasi ulang.

- » Tekan dan tahan tombol  untuk mengakses menu **Fungsi dasar**.
- » Pilih  dan konfirmasi pilihan dengan tombol .
- » Ikuti petunjuk pada display.

 Jika alat mengalami benturan atau perubahan suhu yang besar, direkomendasikan untuk melakukan pemeriksaan akurasi dan bila perlu kalibrasi alat ukur. Setelah mengalami perubahan suhu, suhu alat ukur harus disesuaikan beberapa saat sebelum kalibrasi dilakukan.

Pemeriksaan akurasi pada pengukuran jarak

Untuk memeriksa akurasi, pengukuran sebaiknya dilakukan pada kondisi yang menguntungkan, yakni jarak pengukuran berada di dalam ruangan dan permukaan target pengukuran harus mulus serta memantulkan cahaya dengan baik (misalnya dinding bercat putih).

- » Pilih jarak pengukuran dengan panjang dari sekitar **3** hingga **10** m dan panjangnya dapat diketahui dengan pasti (misalnya lebar ruangan, bukaan pintu).
- » Ukur jarak sebanyak 10 kali secara berturut-turut.




Penyimpangan pada pengukuran tunggal dari nilai rata-rata tidak boleh lebih dari ± 2 mm terhadap seluruh jarak pengukuran pada kondisi yang menguntungkan. Catatlah pengukuran tersebut untuk dapat membandingkan akurasinya di lain waktu.

Pemeriksaan akurasi dan kalibrasi display target (tanda bidik)

Periksa akurasi keselarasan laser dan display target secara berkala.

- » Untuk melakukannya, pilih area yang cerah dengan cahaya seminim mungkin (misalnya dinding putih) pada jarak minimal 5 m sebagai target.
- » Periksa pada display apakah titik laser berada di dalam display target.
Jika titik laser berada di luar display target, display target harus dikalibrasi ulang.

Melakukan kalibrasi ulang display target

- » Tekan dan tahan tombol  untuk mengakses menu **Fungsi dasar**.
- » Pilih  dan konfirmasi pilihan dengan tombol .
- » Ikuti petunjuk pada display.

Bekerja dengan tripod (aksesori)

Tripod sangat diperlukan saat melakukan pengukuran jarak yang lebih besar.

- » Letakkan alat ukur dengan ulir 1/4" (**17**) pada pelat penggantian cepat tripod (**27**) atau tripod foto pada umumnya.
- » Kencangkan alat ukur dengan sekrup pelat penggantian cepat.
- » Atur bidang acuan untuk pengukuran dengan tripod (lihat „Memilih bidang acuan“, Halaman 164).

Pesan gangguan



Alat ukur memantau ketepatan fungsi pada setiap pengukuran. Apabila terdapat kerusakan, display hanya akan menampilkan simbol di sebelahnya dan alat ukur akan mati. Pada situasi tersebut, kirimkan alat ukur ke layanan pelanggan Bosch melalui dealer Anda.

Mengatasi gangguan

Peringatan suhu

Peringatan suhu berkedip, pengukuran tidak dapat dilakukan

Penyebab: Alat ukur berada di luar suhu pengoperasian sebesar -10°C hingga $+45^{\circ}\text{C}$ (pada fungsi pengukuran kontinu hingga $+40^{\circ}\text{C}$)

Solusi: Tunggu hingga alat ukur mencapai suhu pengoperasian

"ERROR" pada display

Tampilan "ERROR" pada display

Penyebab: Penambahan/pengurangan nilai pengukuran dengan satuan ukur yang berbeda

Solusi: Tambahkan/kurangi nilai pengukuran hanya dengan satuan ukur yang sama

Penyebab: Sudut antara sinar laser dan target terlalu lancip

Solusi: Perlebar sudut antara sinar laser dan target

Penyebab: Pantulan pada permukaan target terlalu kuat (misalnya cermin) atau terlalu lemah (misalnya material berwarna hitam) atau cahaya sekitar terlalu terang

Solusi: Gunakan reflektor sinar laser (aksesori)

Penyebab: Outlet sinar laser **(19)** atau lensa penerima **(18)** berembun (misalnya karena perubahan suhu yang cepat)

Solusi: Seka outlet sinar laser **(19)** atau lensa penerima **(18)** dengan kain lembut hingga kering

Penyebab: Nilai yang dihitung lebih besar dari 1 999 999 atau kurang dari -999 999 m^2/m^3

Solusi: Bagi penghitungan di pertengahan proses

Kalibrasi

Tampilan "CAL" dan tampilan "ERROR" pada display

Penyebab: Kalibrasi pengukuran kemiringan tidak dilakukan dalam urutan yang tepat atau dalam posisi yang tepat

Solusi: Ulangi kalibrasi sesuai dengan petunjuk pada display dan panduan pengoperasian

Penyebab: Area yang digunakan untuk kalibrasi tidak tepat dalam posisi vertikal atau horizontal

Solusi: Ulangi kalibrasi pada permukaan vertikal atau horizontal dan jika perlu periksa permukaan sebelumnya dengan waterpas

Penyebab: Alat ukur digerakkan atau dimiringkan saat tombol ditekan

Solusi: Ulangi kalibrasi dan tahan alat ukur saat menekan tombol agar alat tidak bergeser atau bergerak di atas permukaan

Hasil pengukuran

Hasil pengukuran tidak meyakinkan

Penyebab: Permukaan target tidak memantulkan dengan jelas (misalnya air, kaca)

Solusi: Tutupi permukaan target

Penyebab: Outlet sinar laser (19) atau lensa penerima (18) terhalang

Solusi: Jaga kebersihan outlet sinar laser (19) dan lensa penerima (18)

Hasil pengukuran tidak logis

Penyebab: Terdapat penghalang di jalur sinar laser

Solusi: Pastikan titik laser benar-benar berada di atas permukaan target

Penyebab: Memilih bidang acuan yang tidak tepat

Solusi: Pilih bidang acuan menyesuaikan pengukurannya

Bluetooth®

Bluetooth® tidak dapat diaktifkan

Penyebab: Baterai terlalu lemah

Solusi: Ganti baterai atau isi daya baterai alat ukur

Tidak ada sambungan Bluetooth®

Tidak ada sambungan Bluetooth®, Tampilan "ERROR" pada display

Penyebab: Gangguan pada sambungan Bluetooth®

Solusi:

– Periksa apakah Bluetooth® telah aktif (pada alat ukur maupun pada perangkat seluler)

- Nonaktifkan *Bluetooth*® lalu aktifkan kembali (pada alat ukur maupun pada perangkat seluler)
- Periksa aplikasi pada perangkat seluler
- Pastikan perangkat seluler tidak mengalami kelebihan beban
- Perpendek jarak antara alat ukur dan perangkat seluler
- Hindari penghalang (misalnya beton baja, pintu logam) antara alat ukur dan perangkat seluler; jaga jarak dengan sumber gangguan elektromagnetis (misalnya transmitter WLAN)

Perawatan dan servis

Perawatan dan pembersihan

Simpan dan bawalah alat pengukur hanya di dalam kantong pelindung yang telah disertakan.

Jaga kebersihan alat.

Jangan memasukkan alat pengukur ke dalam air atau cairan lainnya.

Jika alat kotor, bersihkan dengan lap yang lembut dan lembap. Jangan gunakan bahan pembersih atau zat pelarut.

Bersihkan terutama lensa penerima **(18)**, outlet sinar laser **(19)**, dan kamera **(20)** dengan cermat: Pastikan tidak ada kotoran yang tertinggal pada lensa penerima, outlet sinar laser, dan kamera. Bersihkan lensa penerima, outlet sinar laser, dan kamera hanya dengan alat yang juga cocok untuk lensa kamera. Jangan pernah mengusap kotoran pada lensa penerima, outlet sinar laser, dan kamera atau membersihkan dengan benda yang tajam (risiko tergores).

Saat alat akan dibawa untuk diperbaiki, simpan alat ukur di dalam tas pelindung **(21)**.

Layanan pelanggan dan konsultasi penggunaan

Layanan pelanggan Bosch menjawab semua pertanyaan Anda tentang reparasi dan perawatan serta tentang suku cadang produk ini. Gambaran teknis (exploded view) dan informasi mengenai suku cadang dapat ditemukan di: **www.bosch-pt.com**

Tim konsultasi penggunaan Bosch akan membantu Anda menjawab pertanyaan seputar produk kami beserta aksesorinya.

Jika Anda hendak menanyakan sesuatu atau memesan suku cadang, selalu sebutkan nomor model yang terdiri dari 10 angka dan tercantum pada label tipe produk.

Indonesia

PT Robert Bosch
Palma Tower 10th Floor

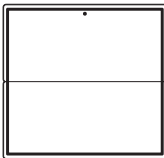
Jalan RA Kartini II-S Kaveling 6
Pondok Pinang, Kebayoran Lama
Jakarta Selatan 12310
Tel.: (021) 3005 5800
Fax: (021) 3005 5801
E-Mail: boschpowertools@id.bosch.com
www.bosch-pt.co.id

Alamat layanan lainnya dapat ditemukan di:

www.bosch-pt.com/serviceaddresses

Aksesori

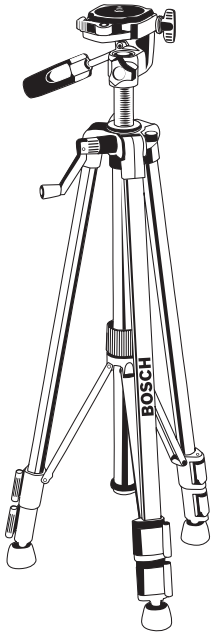
Aksesori dapat ditemukan melalui tautan yang disediakan di situs web Bosch



Reflektor sinar laser **(24)**
2 607 001 391



Kacamata laser (merah) **(25)**
1 608 M00 05B



Tripod BT 150 (26)
0 601 096 B00

Tiếng Việt

Hướng dẫn an toàn



Phải đọc và chú ý mọi hướng dẫn để đảm bảo an toàn và không bị nguy hiểm khi làm việc với dụng cụ đo. Khi sử dụng dụng cụ đo không phù hợp với các hướng dẫn ở trên, các thiết bị bảo

vệ được tích hợp trong dụng cụ đo có thể bị suy giảm. Không bao giờ được làm cho các dấu hiệu cảnh báo trên dụng cụ đo không thể đọc được. **HÃY BẢO QUẢN CẨN THẬN CÁC HƯỚNG DẪN NÀY VÀ ĐƯA KÈM THEO KHI BẠN CHUYỂN GIAO DỤNG CỤ ĐO.**

- ▶ **Thận trọng** - nếu những thiết bị khác ngoài thiết bị hiệu chỉnh hoặc thiết bị điều khiển được nêu ở đây được sử dụng hoặc các phương pháp khác được tiến hành, có thể dẫn đến phơi nhiễm phóng xạ nguy hiểm.
- ▶ **Máy đo được dán nhãn cảnh báo laser** (được đánh dấu trong mô tả máy đo ở trang đồ thị).
- ▶ **Nếu văn bản của nhãn cảnh báo laser không theo ngôn ngữ của bạn, hãy dán chồng nhãn đính được cung cấp kèm theo bằng ngôn ngữ của nước bạn lên trên trước khi sử dụng lần đầu tiên.**



Không được hướng tia laze vào người hoặc động vật và không được nhìn vào tia laze trực tiếp hoặc phản xạ. Bởi vì bạn có thể chiếu lóa mắt người, gây tai nạn hoặc gây hỏng mắt.

- ▶ **Nếu tia laser hướng vào mắt, bạn phải nhắm mắt lại và ngay lập tức xoay đầu để tránh tia laze.**
- ▶ **Không thực hiện bất kỳ thay đổi nào ở thiết bị laser.**
- ▶ **Không sử dụng kính nhìn tia laser (Phụ kiện) làm kính bảo vệ.** Kính nhìn tia laser dùng để nhận biết tốt hơn tia laser; tuy nhiên kính không giúp bảo vệ mắt khỏi tia laser.
- ▶ **Không sử dụng kính nhìn tia laser (Phụ kiện) làm kính mát hoặc trong giao thông đường bộ.** Kính nhìn tia laser không chống UV hoàn toàn và giảm thiểu thụ cảm màu sắc.
- ▶ **Chỉ để người có chuyên môn được đào tạo sửa dụng cụ đo và chỉ dùng các phụ tùng gốc để sửa chữa.** Điều này đảm bảo cho sự an toàn của dụng cụ đo được giữ nguyên.
- ▶ **Không để trẻ em sử dụng dụng cụ đo laser khi không có người lớn giám sát.** Có thể vô tình làm lóa mắt người khác hoặc làm lóa mắt chính bản thân.
- ▶ **Không làm việc với dụng cụ đo trong môi trường dễ nổ, mà trông đó có chất lỏng, khí ga hoặc bụi dễ cháy.** Các tia lửa có thể hình thành trong dụng cụ đo và có khả năng làm rác cháy hay ngùn khói.
- ▶ **Máy đo được trang bị một giao diện sóng vô tuyến.** Hãy chú ý các giới hạn địa điểm hoạt động ví dụ như trên máy bay hoặc bệnh viện.

Biểu tượng chữ *Bluetooth*® cũng như biểu tượng ảnh (các logo) do công ty cổ phần Bluetooth SIG đăng ký nhãn hiệu và sở hữu. Công ty trách nhiệm hữu hạn Robert Bosch Power Tools GmbH đã được cấp phép để sử dụng những biểu tượng chữ/biểu tượng ảnh này với sản phẩm của mình.

- ▶ **Cẩn thận!** Nếu sử dụng máy đo với cổng *Bluetooth*® có thể gây nhiễu các dụng cụ, thiết bị khác cũng như máy bay và dụng cụ y tế (ví dụ: máy tạo nhịp tim, máy trợ thính). Và cũng không thể loại trừ hoàn toàn những tổn hại cho người và động vật ở môi trường trực diện xung quanh. Không sử dụng máy đo có kết nối *Bluetooth*® ở gần những thiết bị y tế, trạm xăng, cơ sở hóa học, các khu vực có nguy cơ gây nổ và các khu vực cháy nổ. Không sử dụng máy đo có kết nối *Bluetooth*® trên máy bay. Tránh để máy hoạt động gần cơ thể trong thời gian dài.
- ▶ Không chụp ảnh người hoặc động vật bằng dụng cụ đo, vì chùm tia laser có thể được bật vĩnh viễn. Bởi vì bạn có thể chiếu vào mắt người, gây tai nạn hoặc gây hỏng mắt khi chùm tia laser được bật.
- ▶ Không sử dụng dụng cụ đo, nếu có thể phát hiện hư hại kính màn hình (ví dụ nứt trên bề mặt, vv). Việc này bao gồm nguy hiểm gây thương tích.



Không để dụng cụ đo và phụ kiện từ tính ở gần mô cấy và các thiết bị y tế khác, ví dụ như máy trợ tim hoặc bơm insulin. Từ tính của dụng cụ đo và phụ kiện có thể tạo ra một trường ảnh hưởng xấu đến chức năng của mô cấy và các thiết bị y tế.

- ▶ Để dụng cụ đo và phụ kiện từ tính tránh xa các phương tiện nhờ từ tính và các thiết bị nhạy từ. Ảnh hưởng của từ tính từ dụng cụ đo và phụ kiện có thể gây mất dữ liệu không phục hồi được.

Mô Tả Sản Phẩm và Đặc Tính Kỹ Thuật

Hãy gấp trang có hình minh họa của dụng cụ đo ra, và để trang này mở rộng khi bạn đọc hướng dẫn vận hành.

Sử dụng đúng cách

























Dụng cụ đo lường được thiết kế để đo độ xa, độ dài, chiều cao, khoảng cách, độ nghiêng và để tính toán diện tích và thể tích.

Dụng cụ đo phù hợp để sử dụng trong vùng bên ngoài và bên trong.

Kết quả đo có thể được gửi qua *Bluetooth*® đến các thiết bị khác.

Các bộ phận được minh họa

Sự đánh số các biểu trưng của sản phẩm là để tham khảo hình minh họa dụng cụ đo trong hình minh họa.

- (1)  Hiển thị
- (2)  Nút đo
- (3)  Phím mềm bên phải
- (4)  Nút cộng
- (5)  Nút thu phóng
- (6)  Nơi gắn dây đeo máy
- (7)  Nút nhả thanh ghim đo góc
- (8)  Thanh ghim đo góc
- (9)  Phím Tắt/Mở
- (10)  Nút hiển thị đích
- (11)  Nút trừ
- (12)  Phím mềm bên trái
- (13)  Phím bấm chức năng
- (14)  Nhãn cảnh báo laser
- (15)  Mã seri sản xuất
- (16)  Nắp dây pin
- (17)  1/4"-Lỗ cắm giá ba chân
- (18)  Thấu kính
- (19)  Lỗ chiếu luồng laser
- (20)  Camera
- (21)  Túi xách bảo vệ
- (22)  Nắp vận
- (23)  Ấc quy
- (24)  Cọc ngắm đích laser^{A)}

(25) Kính nhìn tia laser^{A)}

(26) Giá đỡ ba chân^{A)}

A) Phụ tùng được trình bày hay mô tả không phải là một phần của tiêu chuẩn hàng hóa được giao kèm theo sản phẩm. Bạn có thể tham khảo tổng thể các loại phụ tùng, phụ kiện trong chương trình phụ tùng của chúng tôi.

Hiển thị các Phần tử

(a) Hàng kết quả

(b) Hiển thị đích (Dấu chữ thập)

(c) Hiển thị góc nghiêng

(d) Ngày/Giờ

(e) Điểm xuất phát đo chuẩn

(f) Trạng thái *Bluetooth*[®]

✖ *Bluetooth*[®] không được kích hoạt

✔ ➔ *Bluetooth*[®] được kích hoạt, kết nối được tạo

(g) Bộ Chỉ Báo Tình Trạng Pin

(h) Các hàng giá trị đo được

(i) Các thiết lập ban đầu

(j) Hiển thị chức năng đo

(k) Bộ nhớ trong

(l) Quay lại

(m) Chức năng trợ giúp tích hợp

(n) MÀN HÌNH K.ĐỘNG

(o) Menu các thiết lập ban đầu khác

(p) Menu các thiết lập ban đầu

(q) Menu chức năng đo

Thông số kỹ thuật

| Máy đo khoảng cách laser | GLM 100-25 C |
|---|----------------------|
| Mã hàng | 3 601 K72 Y.. |
| Phạm vi đo ^{A)} | 0,08–100 m |
| Biên độ đo (trong điều kiện đo khó) ^{B)} | 0,08–60 m |
| Sai số ^{A)} | ±1,5 mm |

| Máy đo khoảng cách laser | | GLM 100-25 C |
|--|--|---|
| Sai số (trong điều kiện đo khó) ^{B)} | | ±3,0 mm |
| đơn vị biểu thị nhỏ nhất | | 0,5 mm |
| Đo gián tiếp khoảng cách và bọt thủy | | |
| Phạm vi đo | | 0°–360° (4 × 90°) |
| Đo độ dốc | | |
| Phạm vi đo | | 0°–360° (4 × 90°) |
| Sai số ^{C)D)} | | ±0,2° |
| đơn vị biểu thị nhỏ nhất | | 0,1° |
| Giới thiệu chung | | |
| Nhiệt độ hoạt động ^{E)} | | –10 °C ... +45 °C |
| Nhiệt độ lưu kho | | –20 °C ... +70 °C |
| Độ ẩm không khí tương đối tối đa. | | 90% |
| Chiều cao áp dụng tối đa bên trên chiều cao tham chiếu | | 2000 m |
| Mức độ bền theo IEC 61010-1 | | 2 ^{F)} |
| Cấp độ laser | | 2 |
| Loại laser | | 650 nm, < 1 mW |
| Phân kỳ tia laser | | < 1,5 mrad (Góc đáy) |
| Tắt tự động sau khoảng. | | |
| – Điểm laser | | 20 s |
| – Dụng cụ đo (khi không đo) | | 5 phút |
| Bộ nguồn | | 3 × 1,5 V LR6 (AA) |
| Trọng lượng theo Quy trình EPTA-Procedure 01:2014 | | 0,23 kg |
| Mức độ bảo vệ | | IP 54 (được bảo vệ chống bụi và tia nước) |
| Kích thước | | 142 (176) × 64 × 28 mm |
| Truyền dữ liệu | | |
| Bluetooth® | | Bluetooth® 4.2 Low Energy ^{G)} |
| Dải tần số hoạt động | | 2402–2480 MHz |

Máy đo khoảng cách laser**GLM 100-25 C**

công suất phát tối đa

8 mW

- A) Đo từ mép phía trước của dụng cụ đo, áp dụng cho mục tiêu có khả năng phản xạ cao (ví dụ như một bức tường sơn trắng), ánh sáng nền yếu và nhiệt độ làm việc là 25 °C; ngoài ra cần tính đến độ lệch $\pm 0,05$ mm/m phụ thuộc khoảng cách.
- B) Đo từ mép phía trước của dụng cụ đo, áp dụng cho mục tiêu có khả năng phản xạ cao (ví dụ như một bức tường sơn trắng), ánh sáng nền mạnh và nhiệt độ làm việc là 25 °C và độ cao lớn. Thêm vào đó cần tính tới một mức sai lệch phụ thuộc khoảng cách khoảng $\pm 0,15$ mm/m.
- C) Ở nhiệt độ hoạt động 25 °C
- D) Sau khi hiệu chỉnh người dùng ở 0° và 90°; lỗi độ nghiêng bổ sung $\pm 0,01$ /độ đến 45° (tối đa) cần được lưu ý. Cảnh trái của dụng cụ đo được dùng làm mặt phẳng tham chiếu để đo độ nghiêng.
- E) Trong chức năng Đo liên tục, nhiệt độ hoạt động tối đa là +40 °C.
- F) Chỉ có chất bán không dẫn xuất hiện, nhưng đôi khi độ dẫn điện tạm thời gây ra do ngưng tụ.
- G) Với các thiết bị *Bluetooth* tiêu thụ năng lượng thấp, tùy thuộc vào model và hệ điều hành, có thể không cần các thiết lập kết nối. Các thiết bị *Bluetooth* phải có tính năng hỗ trợ GATT profile.


Số xêri (15) đều được ghi trên nhãn mác, để dễ dàng nhận dạng loại máy đo.


Lắp/thay bộ nguồn

Khuyến nghị nên sử dụng pin alkali-manganese hay pin Niken-kim loại hydrua (đặc biệt là ở nhiệt độ vận hành thấp) cho sự hoạt động của dụng cụ đo.

Pin 1,2-V có thể có khả năng đo nhiều hơn so với pin 1,5-V phụ thuộc vào điện dung.

- » Nhấn nút nhà (7) và mở chốt định cỡ (8) khoảng 180°.
- » Để mở nắp đậy ngăn pin (16) hãy gấp nắp vận (23) hướng lên trên và vặn nó một phần tư vòng ngược chiều kim đồng hồ.
- » Hãy kéo nắp đậy ngăn pin lên ở nắp vận (16) (23).
- » Lắp pin hoặc pin nạp lại được.

 Luôn thay tất cả pin hoặc ắc quy cùng một lần. Chỉ sử dụng pin hoặc ắc quy cùng một hiệu và có cùng một điện dung.

 Xin hãy lưu ý lắp tương ứng đúng cực pin như được thể hiện mặt trong ngăn chứa pin.

Nếu biểu tượng pin cạn xuất hiện lần đầu tiên trên màn hình hiển thị, chỉ có thể thực hiện ít phép đo.

Khi biểu tượng pin rỗng và nhấp nháy màu đỏ, không thể thực hiện phép đo nữa. Thay pin hoặc sạc quy.

- ▶ **Tháo ác quy hoặc pin ra khỏi dụng cụ đo nếu bạn không muốn sử dụng thiết bị trong thời gian dài.** Khi cất giữ pin trong một thời gian dài, pin/pin nạp lại được có thể bị ăn mòn và tự phóng điện.


Vận Hành


Bắt Đầu Vận Hành

- ▶ **Không cho phép dụng cụ đo đang bật một cách không kiểm soát và hãy tắt dụng cụ đo sau khi sử dụng.** Tia Laser có thể chiếu vào những người khác.
- ▶ **Bảo vệ dụng cụ đo tránh khỏi ẩm ướt và không để bức xạ mặt trời chiếu trực tiếp vào.**
- ▶ **Không cho dụng cụ đo tiếp xúc với nhiệt độ khắc nghiệt hoặc dao động nhiệt độ.** Không để nó trong chế độ tự động quá lâu. Điều chỉnh nhiệt độ cho dụng cụ đo khi có sự dao động nhiệt độ lớn, trước khi bạn đưa nó vào vận hành. Trong trường hợp ở trạng thái nhiệt độ cực độ hay nhiệt độ thay đổi thái quá, sự chính xác của dụng cụ đo có thể bị hư hỏng.
- ▶ **Tránh va chạm mạnh hoặc làm rơi dụng cụ đo.** Sau khi có tác động mạnh từ bên ngoài lên dụng cụ đo, cần tiến hành kiểm tra độ chính xác trước khi tiếp tục (xem „Kiểm tra độ chính xác“, Trang 225).

Bật Mở và Tắt

- » Bấm vào nút  để bật dụng cụ đo và laser.

Bạn cũng có thể bật dụng cụ đo mà không cần laser bằng cách nhấn nút .

- » Nhấn giữ nút  để tắt dụng cụ đo.

Các giá trị và các thiết lập thiết bị hiện có trong bộ nhớ sẽ được giữ lại.

Camera



Nhấn vào nút  để bật hoặc tắt camera.

Sau khi tắt dụng cụ đo, tình trạng đã chọn sẽ được lưu lại.

Với khoảng cách lớn hơn (khoảng > 5 m), một đánh dấu đích cũng được hiển thị để đánh dấu điểm đo.

Tối ưu hóa độ rõ của điểm laser

Khi sử dụng dụng cụ đo đặc biệt là ngoài trời, khi có bức xạ mặt trời nhưng quang đường dài hơn trong vùng bên trong thì điểm laser không thấy rõ. Bật camera. Độ rõ của điểm laser/đích đo có thể được cải thiện bằng:

- Cài đặt độ sáng màn hình (xem „Cài đặt độ sáng màn hình “, Trang 209)
- Sử dụng thu phóng bằng nút 

Quy trình đo

Sau khi bật lên, dụng cụ đo ở chế độ đo độ dài.

Mép phía sau của dụng cụ đo được chọn làm mức tham chiếu để đo sau khi bật. Bạn có thể thay đổi mức tham chiếu. (xem „Chọn mức tham chiếu“, Trang 202)

» Đặt dụng cụ đo ở điểm đầu tiên muốn đo (ví dụ như bức tường).


» Nhấn vào nút  để kích hoạt đo.


Sau quá trình đo, chùm tia laser bị tắt. Đối với phép đo tiếp theo hãy lặp lại quy trình này.



Các giá trị đo hoặc kết quả cuối cùng có thể được cộng vào hoặc bị trừ.

Giá trị đo thường xuất hiện trong vòng 0,5 s và chậm nhất sau khoảng 4 s.

Thời gian đo phụ thuộc vào độ xa, tình trạng ánh sáng và đặc tính phản xạ ánh sáng của bề mặt đối tượng. Sau quá trình đo, chùm tia laser bị tắt tự động.

Khi bật liên tục chùm tia laser và trong chức năng đo liên tục, đo sẽ bắt đầu sau khi nhấn nút lần đầu .

Chùm tia laser bật liên tục không được ngắt sau khi đo (xem „Chùm tia laser liên tục “, Trang 205).

-  Không được di chuyển dụng cụ đo trong quá trình đo. Do đó, hãy đặt dụng cụ đo trên một bề mặt chặn hoặc đỡ chắc chắn nếu có thể.
-  Ống kính thu nhận (18), đầu ra của tia laser (19) và camera (20) không được bị che khi đo.

Ảnh hưởng đến khoảng đo

Khoảng đo phụ thuộc vào tình trạng ánh sáng và đặc tính phản xạ ánh sáng của bề mặt đối tượng.

Sử dụng camera tích hợp (20), kính ngắm laser (26) (phụ kiện) và bảng đích laser (25) (phụ kiện), hoặc che bề mặt đích.

Ảnh hưởng đến kết quả đo

Do các tác động vật lý, không thể loại trừ trường hợp đo sai sẽ xảy ra khi đo trên các bề mặt khác nhau. Trong đó bao gồm:



- bề mặt trong suốt (ví dụ: thủy tinh, nước),
- bề mặt phản chiếu (ví dụ như kim loại được đánh bóng, thủy tinh),
- bề mặt rỗ (ví dụ vật liệu cách nhiệt),
- bề mặt có cấu trúc (ví dụ như thạch cao thô, đá tự nhiên).

Sử dụng bảng đích laser trên các bề mặt này nếu cần (25) (Phụ kiện).


Các phép đo không chính xác cũng có thể xảy ra trên các bề mặt đích được nhắm nghiêng.

Các lớp không khí có nhiệt độ khác nhau hoặc phản xạ nhận gián tiếp cũng có thể ảnh hưởng đến giá trị đo.

Điều hướng trong menu

Trong menu bạn có thể chuyển sang phải bằng nút  và chuyển sang trái bằng nút .

Để xác nhận lựa chọn, hãy nhấn nút  hoặc nút .

Để thoát menu, hãy nhấn nút .

Chọn mức tham chiếu

Để đo, bạn có thể chọn giữa các mức tham chiếu khác nhau:



mép trước của dụng cụ đo (ví dụ ví dụ khi áp dụng ở tường)








đầu nhọn của tấm cỡ chặn gập 180° (ví dụ cho phép đo từ góc)



mép trước của dụng cụ đo (ví dụ khi đo từ một cạnh bàn)



phần giữa của ren giá ba chân (17) (ví dụ khi đo bằng giá ba chân)

- » Nhấn phím mềm  để mở menu **các thiết lập ban đầu**.
- » Chọn .
- » Chọn mức tham chiếu mong muốn bằng nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .














Gập vào và mở ra chốt định cỡ (8) 180° được nhận diện tự động và các mức tham chiếu tương ứng được gợi ý. Để xác nhận lựa chọn, hãy nhấn nút














Sau mỗi lần bật dụng cụ đo, mép sau của dụng cụ đo sẽ được thiết lập sẵn làm mặt phẳng tham chiếu.











Menu các thiết lập ban đầu

Trong menu **các thiết lập ban đầu** hãy tham khảo các thiết lập ban đầu:

-  Bật/tắt *Bluetooth®*
-  Thay đổi mức tham chiếu (xem „Chọn mức tham chiếu“, Trang 202)
-  Hẹn giờ
-  Bật và tắt chùm tia laser liên tục
-  Hiệu chuẩn đo độ dốc (xem „Kiểm tra độ chính xác“, Trang 225)
-  Hiệu chuẩn hiển thị đích
-  Cài đặt ngôn ngữ
-  Cài đặt ngày & giờ
- **ft/m** Thay Đổi Đơn Vị Đo Lường
-  Thay đổi đơn vị góc
- PRO Kích hoạt PRO360
-  Mở thông tin về thiết bị
-  Bật/tắt tín hiệu âm thanh
-  Cài đặt thời gian tắt
-  Cài đặt thời gian làm mờ









-  Cài đặt độ sáng màn hình
-  Bật/tắt xoay màn hình tự động
- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn cài đặt mong muốn bằng nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .

Bật/tắt *Bluetooth*[®]

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Chọn .
- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .

Hẹn giờ

Chức năng hẹn giờ trợ giúp khi đo các điểm khó tiếp cận hoặc nếu các chuyển động của dụng cụ đo bị cản trong khi đo.

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Chọn .
- » Chọn khoảng thời gian mong muốn từ khi kích hoạt đến lúc đo và xác nhận bằng nút  hoặc nút .
- » Bấm vào nút  để bật chùm tia laser và nhắm vào điểm đích.
- » Nhấn lại vào nút  để kích hoạt đo.




Do sau khoảng thời gian được chọn. Giá trị đo được hiển thị trong dòng kết quả **(a)**. Trong thanh trạng thái bên trên, khoảng thời gian được hiển thị từ lúc kích hoạt đến khi đo.

Không thể đo liên tục cũng như đo tối đa/tối thiểu khi cài đặt chức năng hẹn giờ. Bộ hẹn giờ vẫn được cài đặt đến khi tắt dụng cụ đo hoặc đến khi bộ hẹn giờ trong menu „Cài đặt“ được tắt.

Chùm tia laser liên tục

Bạn có thể cài đặt chùm tia laser được bật liên tục. Chùm tia laser vẫn bật trong cài đặt này giữa các phép đo. Để đo chỉ cần nhấn nhanh một lần nút



» Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .

» Chọn .




» Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .

» Để xác nhận lựa chọn, hãy nhấn nút .

» Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .

Ngắt chùm tia laser liên tục được thực hiện lại trong các cài đặt hoặc tự động khi tắt dụng cụ đo.

Cài đặt ngôn ngữ




» Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .

» Hãy chọn menu **các thiết lập cơ bản** .








» Chọn  và xác nhận lựa chọn bằng nút .

» Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .

» Để xác nhận lựa chọn, hãy nhấn nút .











» Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc phím mềm .

Ngày tháng & giờ

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu các thiết lập cơ bản .
- » Chọn .
- » Cài đặt ngày và giờ theo chỉ dẫn và xác nhận bằng nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .








Thay Đổi Đơn Vị Đo Lường ft/m





Thiết lập ban đầu là đơn vị đo "m" (Mét).

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
 - » Hãy chọn menu **các thiết lập cơ bản** .
 - » Chọn ft/m.
 - » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
 - » Để xác nhận lựa chọn, hãy nhấn nút .
 - » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .
- Sau khi tắt dụng cụ đo, thiết lập thiết bị đã chọn sẽ được lưu lại.

Thay đổi đơn vị góc

Thiết lập cơ bản là đơn vị góc "°" (Độ).

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn .
- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .











- » Để xác nhận lựa chọn, hãy nhấn nút .
 - » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .
- Sau khi tắt dụng cụ đo, thiết lập thiết bị đã chọn sẽ được lưu lại.

PRO360 PRO)

Kích hoạt lần đầu là cần thiết. Chỉ có thể truyền dữ liệu với ứng dụng hoặc chương trình PC tương ứng. PRO360 có thể bị bỏ kích hoạt bất cứ lúc nào.








GLM 100-25 C: Sau khi thay pin, dụng cụ đo phải được bật lại một lần để khởi động lại PRO360.

Hãy tham khảo các thông tin chi tiết về PRO360 tại www.pro360.com.












- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn PRO).
- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .

Thông tin về thiết bị

Hãy tham khảo các thông tin về dụng cụ đo tại đây ví dụ số seri, phiên bản phần mềm và giấy phép.












- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn **i** .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .

Bật/tắt tín hiệu âm thanh

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn .
- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .






Cài đặt thời gian tắt







Thời gian tắt tự động có thể cài đặt: 2, 5, 10 phút hoặc không bao giờ.

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn .
- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .

Cài đặt thời gian làm mờ












Đèn chiếu sáng màn hình sẽ sáng liên tục. Nếu không có nút nào được ấn, đèn chiếu sáng màn hình sẽ mờ đi sau khoảng 30 giây để tiết kiệm pin. Thời gian đến lần khởi động làm mờ có thể cài đặt.

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn .

- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .












Cài đặt độ sáng màn hình

Độ sáng của màn hình hiển thị được điều chỉnh theo nhiều mức phù hợp với các điều kiện xung quanh.

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn .
- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .

Bật/tắt xoay màn hình tự động













Nếu xoay màn hình tự động được bật, hiển thị trong màn hình sẽ xoay tự động khi xoay dụng cụ đo.

- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Hãy chọn menu **các thiết lập cơ bản** .
- » Chọn .
- » Để thay đổi lựa chọn, hãy nhấn nút  hoặc nút .
- » Để xác nhận lựa chọn, hãy nhấn nút .
- » Để thoát menu **các thiết lập ban đầu** , nhấn nút  hoặc nút .



Các chức năng đo

Chọn/thay đổi các chức năng đo

Trong menu chức năng hãy tìm các chức năng sau đây:

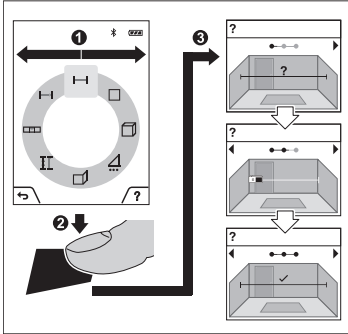
-  Đo Chiều Dài
-  Đo Diện Tích
-  Đo khối lượng
-  đo khoảng cách gián tiếp
 -  đo chiều cao gián tiếp
 -  đo chiều cao gián tiếp kép
 -  đo chiều dài gián tiếp
 -  Đo hình thang
-  Đo diện tích tường
-  Đo chia khoảng
-  Đo độ dốc/Ổng bọt nước kỹ thuật số
-  Đo liên tục

» Nhấn nút  để mở menu **Các chức năng**.

» Hãy chọn chức năng đo mong muốn bằng nút  hoặc nút .

» Để xác nhận lựa chọn, hãy nhấn nút  hoặc nút .

Chức năng trợ giúp tích hợp ?



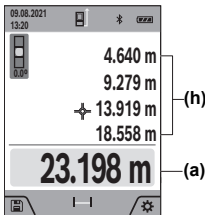
Chức năng trợ giúp tích hợp trong dụng cụ đo cung cấp hoạt ảnh chi tiết về chức năng đo/quá trình đo riêng biệt.

- » Mở menu **các chức năng**.
- » Hãy chọn chức năng mong muốn bằng nút **▶** hoặc nút **◀** và nhấn nút **■**.
- » Hoạt ảnh hiển thị biện pháp chi tiết cho chức năng đo đã chọn.
- » Nhấn vào nút **■** để dừng hoạt ảnh hoặc tiếp tục hoạt ảnh.

» Nhấn nút **▶** hoặc **◀** để hiển thị bước tiếp theo hoặc bước trước.

Đo Chiều Dài —

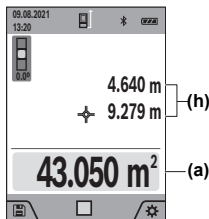
- » Nhấn nút **Func** để mở menu **Các chức năng**.
 - » Chọn đo chiều dài **—** và xác nhận lựa chọn bằng nút **Func**.
 - » Nhấn nhanh nút **▲** để bật laser.
 - » Nhấn vào nút **▲** để kích hoạt đo.
- Giá trị đo được hiển thị bên dưới trong màn hình ở dòng kết quả **(a)**.
- » Lặp lại bước trên với mỗi phép đo tiếp theo.



Với nhiều phép đo chiều dài liên tiếp, kết quả của phép đo cuối được hiển thị trong dòng giá trị đo **(h)**. Giá trị đo cuối cùng sẽ hiện ở góc dưới trong màn hình hiển thị, giá trị đo áp chốt như trên.

Đo Diện Tích

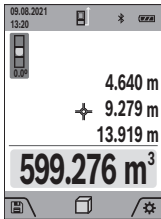
- » Nhấn nút **Func** để mở menu **Các chức năng**.
- » Chọn đo diện tích và xác nhận lựa chọn bằng nút **Func**.
- » Nhấn nhanh nút **▲** để bật laser.
- » Nhấn vào nút **▲** để kích hoạt phép đo đầu tiên, ví dụ chiều dài của phòng.
- » Nhấn vào nút **▲** để kích hoạt phép đo thứ hai, ví dụ chiều rộng của phòng.



Sau khi kết thúc lần đo thứ hai phần diện tích sẽ được tính và hiển thị tự động. Kết quả được hiển thị trong dòng kết quả **(a)**. Giá trị đo riêng biệt ở trong các dòng giá trị đo được **(h)**.

Đo khối lượng

- » Nhấn nút **Func** để mở menu **Các chức năng**.
- » Chọn đo thể tích và xác nhận lựa chọn bằng nút **Func**.
- » Nhấn nhanh nút **▲** để bật laser.
- » Nhấn vào nút **▲** để kích hoạt phép đo đầu tiên, ví dụ chiều dài của phòng.
- » Nhấn vào nút **▲** để kích hoạt phép đo thứ hai, ví dụ chiều rộng của phòng.
- » Nhấn vào nút **▲** để kích hoạt phép đo thứ ba, ví dụ chiều cao của phòng.




Sau khi thực hiện việc đo lần thứ ba, khối lượng được tự động tính toán và hiển thị. Kết quả được hiển thị trong dòng kết quả **(a)**. Giá trị đo riêng biệt ở trong các dòng giá trị đo được **(h)**.

Đo Gián Tiếp Khoảng Cách





Đo gián tiếp khoảng cách được sử dụng để đo khoảng cách mà ta không thể đo trực tiếp được do có vật cản trở ngăn cản luồng laze, hoặc do không có bề mặt mục tiêu sẵn có nào được sử dụng như là vật phản chiếu. Quy trình đo này chỉ có thể sử dụng trong chiều thẳng đứng. Bất cứ sự lệch hướng nào ở chiều ngang cũng sẽ gây ra sự đo sai.

Việc đo khoảng cách gián tiếp sẽ luôn đưa kết quả không chính xác bằng việc đo trực tiếp. Tùy các điều kiện áp dụng, xác suất lỗi đo có thể lớn hơn khi đo khoảng cách trực tiếp. Để cải thiện độ chính xác trong khi đo, nên sử dụng giá đỡ ba chân (phụ tùng).

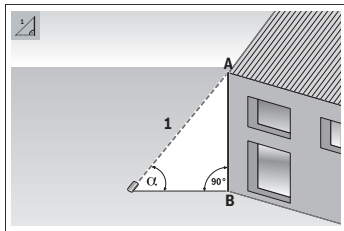
 Khi sử dụng giá ba chân hãy lưu ý mức tham chiếu đã cài đặt. (xem „Chọn mức tham chiếu“, Trang 202)

Luồng laze duy trì ở trạng thái mở giữa các lần đo riêng lẻ.

Đối với việc đo gián tiếp chiều dài, có **4** chế độ đo để ứng dụng, mỗi chế độ đo có thể sử dụng để xác định các khoảng cách khác nhau:



-  đo chiều cao gián tiếp
-  đo chiều cao gián tiếp kép
-  đo chiều dài gián tiếp
-  Đo hình thang

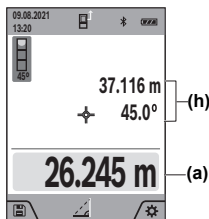
Đo chiều cao gián tiếp



Với đo chiều cao gián tiếp, bạn có thể xác định quãng đường **AB** bằng cách đo quãng đường **1**. Dụng cụ đo tính toàn chiều cao đã đo **AB** từ góc α và quãng đường **1**.

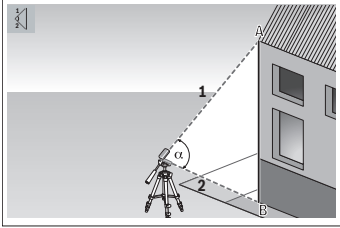
Chỉ có thể đạt được kết quả chính xác, nếu góc bên phải được yêu cầu khi đo tương ứng được tuân thủ chính xác.

- » Nhấn nút **Func** để mở menu **Các chức năng**.
- » Chọn phép đo khoảng cách gián tiếp  và xác nhận lựa chọn bằng nút **Func**.
- » Chọn phép đo chiều cao gián tiếp  và xác nhận lựa chọn bằng nút **Func**.
- » Nhấn nhanh nút **▲** để bật laser.
- » Đặt dụng cụ đo ngang tầm của điểm đo dưới **B**.
- » Nghiêng dụng cụ đo sao cho laser hướng về điểm đo trên **A**.
- » Nhấn vào nút **▲** để kích hoạt đo.



Sau khi kết thúc phép đo, chiều cao sẽ được tính và hiển thị tự động trong dòng kết quả (a). Giá trị đo của đoạn đường „1“ và góc α ở trong các hàng giá trị đo được (h).

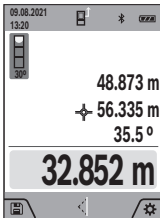
Đo chiều cao gián tiếp kép



Với đo chiều cao gián tiếp kép, bạn có thể xác định quãng đường **AB** bằng cách đo quãng đường **1** và **2**. Dụng cụ đo tính toàn chiều cao đã đo **AB** từ góc α và quãng đường **1** và **2**.







Khuyến nghị sử dụng giá ba chân cho phép đo này.

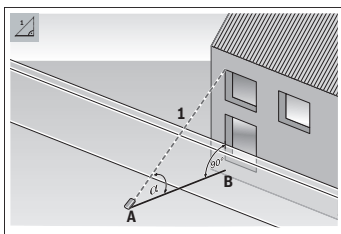
- » Nhấn nút **Func** để mở menu **Các chức năng**.
- » Chọn phép đo khoảng cách gián tiếp và xác nhận lựa chọn bằng nút **Func**.
- » Chọn phép đo chiều cao gián tiếp kép và xác nhận lựa chọn bằng nút **Func**.
- » Nhấn nhanh nút để bật laser.
- » Nghiêng dụng cụ đo sao cho laser hướng về điểm đo trên **A**.
- » Nhấn vào nút để kích hoạt phép đo đầu tiên.
- » Nghiêng dụng cụ đo sao cho laser hướng về điểm đo dưới **B**. Khi đó, không thay đổi vị trí của dụng cụ đo.
- » Nhấn vào nút để kích hoạt phép đo thứ hai.



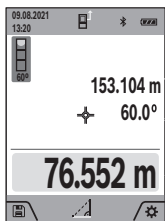
Sau khi kết thúc phép đo, chiều cao sẽ được tính và hiển thị tự động trong dòng kết quả **(a)**. Giá trị đo của đoạn đường **1, 2** và góc α ở trong các hàng giá trị đo được **(h)**.

Đo chiều dài gián tiếp

- » Nhấn nút  để mở menu **Các chức năng**.
- » Chọn phép đo khoảng cách gián tiếp  và xác nhận lựa chọn bằng nút .
- » Chọn phép đo chiều dài gián tiếp  và xác nhận lựa chọn bằng nút .
- » Hãy đặt dụng cụ đo trên điểm khởi đầu **A** của quãng đường **AB**.
- » Nghiêng dụng cụ đo sao cho laser hướng về mặt phẳng mà trên đó có điểm cuối **B**.
- » Nhấn vào nút  để kích hoạt đo.

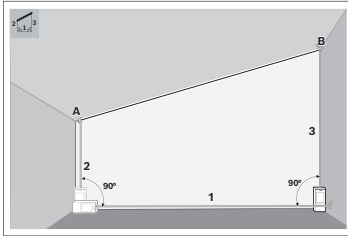


Với đo chiều dài gián tiếp, bạn có thể xác định quãng đường **AB** bằng cách đo quãng đường **1**. Dụng cụ đo tính toàn chiều dài đã dò **AB** từ góc α và quãng đường **1**.



Sau khi kết thúc phép đo, chiều dài sẽ được tính và hiển thị tự động trong dòng kết quả **(a)**. Giá trị đo của đoạn đường „1“ và góc α ở trong các hàng giá trị đo được **(h)**.










Đo hình thang

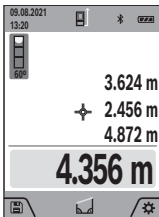


Với phép đo hình thang, chiều dài của độ nghiêng mái có thể được xác định. Bạn có thể xác định quãng đường **AB** bằng cách đo quãng đường **1**, **2** và **3** theo trình tự này. Dụng cụ đo tính toán quãng đường đã đo **AB** từ quãng đường **1**, **2** và **3**.



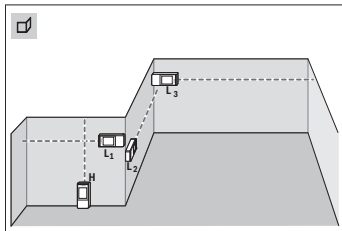
Lưu ý rằng phép đo quãng đường **3** bắt đầu chính xác ở điểm cuối của quãng đường **1** và giữa các quãng đường **1** và **2** cũng như giữa **1** và **3** có góc bên phải.

- » Nhấn nút  để mở menu **Các chức năng**.
- » Chọn phép đo khoảng cách gián tiếp  và xác nhận lựa chọn bằng nút .
- » Chọn phép đo hình thang  và xác nhận lựa chọn bằng nút .
- » Nhấn nhanh nút  để bật laser.
- » Đo khoảng cách **1** với nút .
- » Đo khoảng cách **2** với nút .
- » Đo khoảng cách **3** với nút .



Sau khi kết thúc phép đo, quãng đường **AB** cao sẽ được tính và hiển thị tự động trong dòng kết quả **(a)**. Giá trị đo của đoạn đường **1**, **2** và **3** ở trong các dòng giá trị đo được **(h)**.



Đo diện tích tường



Đo bề mặt tường được sử dụng để xác định tổng số của một số bề mặt riêng lẻ có cùng một chiều cao. Điều kiện để tính toán đúng diện tích, là chiều dài đã đo đầu tiên (trong ví dụ chiều cao phòng **H**) phải đồng nhất đối với tất cả các phần diện tích. Trong ví dụ minh họa, tổng diện tích của nhiều bức tường được xác định, trong đó có chiều cao phòng giống

nhau **H**, nhưng các chiều dài khác nhau **L**.

» Nhấn nút  để mở menu **Các chức năng**.

» Chọn đo diện tích tường  và xác nhận lựa chọn bằng nút .

» Đo chiều cao phòng **H** như đo chiều dài.

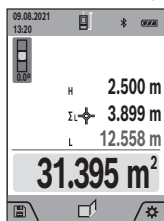
Giá trị đo được hiển thị trong dòng giá trị đo phía trên. Laser vẫn bật.

» Sau đó đo chiều dài **L1** của bức tường thứ nhất.

Diện tích được tính toán tự động và được hiển thị trong dòng kết quả. Giá trị đo chiều dài cuối cùng xuất hiện ở dòng giá trị đo dưới. Laser vẫn bật.


» Đo chiều dài **L2** của bức tường thứ hai.

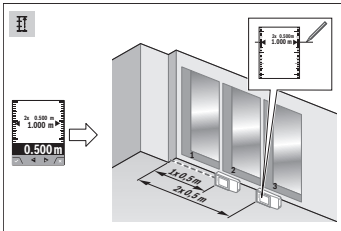
Bạn có thể tùy ý đo nhiều chiều dài tiếp theo **LX** mà tự động được cộng thêm vào và được nhân với chiều cao **H**.



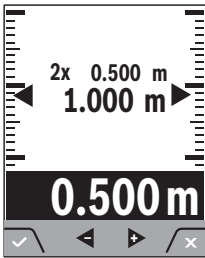
Đơn vị đo hiển thị trong dòng giá trị đo (**h**) sẽ được cộng thêm vào chiều dài **L1**. Tổng hai chiều dài (được hiển thị trong dòng giá trị đo ở giữa (**h**)) sẽ được nhân với chiều cao đã lưu **H**. Tổng giá trị diện tích được hiển thị trong dòng kết quả (**a**) bên dưới ở màn hình.

Đo chia khoảng

 Trong đo chia khoảng, mức tham chiếu là đánh dấu được hiển thị trong màn hình. Mức tham chiếu không phải là cạnh của dụng cụ đo.



Chức năng khoan cọc sẽ đo lại nhiều lần chiều dài xác định (khoảng cách). Những chiều dài này có thể được chuyển thành bề mặt, để cho phép cắt nguyên liệu thành miếng dài bằng nhau hoặc tạo các tường ngăn phụ dạng vách thạch cao. Chiều dài tối thiểu có thể thiết lập là 0,1 m, chiều dài tối đa là 50 m.

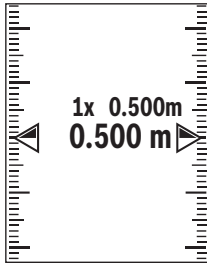


- » Nhấn nút **func** để mở menu **Các chức năng**.
- » Chọn chức năng đo chia khoảng **II** và xác nhận lựa chọn bằng nút **func**.
- » Nhấn vào nút **▲** để cài đặt chiều dài mong muốn.
- » Thiết lập chiều dài mong muốn bằng nút **▶** hoặc nút **◀**.
Để thay đổi chiều dài trong các bước lớn hơn, hãy nhấn nút **▶** hoặc nút **◀**.

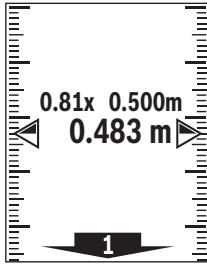
- » Nhấn nút **▲** để khởi động chức năng đo chia khoảng và ra khỏi điểm khởi đầu một cách từ từ.

Dụng cụ đo tiếp tục đo khoảng cách tới điểm khởi đầu. Khi đó chiều dài xác định cũng như giá trị đo hiện tại sẽ được hiển thị. Các mũi tên trên và dưới cho thấy khoảng cách nhỏ nhất đến ký hiệu đánh dấu kế tiếp hoặc trước đó.

Khi đo liên tục, bạn có thể quy định một giá trị đã đo dưới dạng chiều dài xác định bằng cách nhấn và giữ nút **▲**.






Hệ số bên trái chỉ ra chiều dài xác định đã đạt được bao nhiêu lần. Các mũi tên màu xanh lá ở hai bên của màn hình hiển thị cho biết chiều dài đạt được cho mục đích đánh dấu.

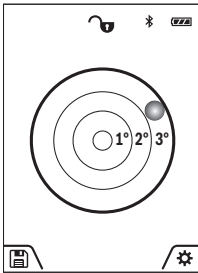


Các mũi tên đỏ và nhãn màu đỏ hiển thị giá trị thực, nếu giá trị chuẩn nằm ngoài màn hình thị.

Đo độ dốc/Ống bọt nước kỹ thuật số

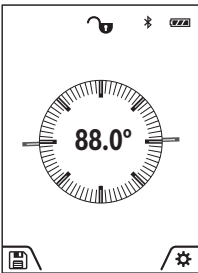
Ống bọt nước kỹ thuật số được sử dụng để kiểm tra các hướng nằm ngang hoặc thẳng đứng của một đối tượng (ví dụ như máy giặt, tủ lạnh, vv). Đo độ nghiêng được sử dụng để đo độ dốc hoặc độ nghiêng (ví dụ như cầu thang, tay vịn cầu thang, khi khớp các đồ gỗ, khi lắp đặt ống, vv). Dụng cụ đo tự động chuyển đổi giữa hai chức năng, nếu bạn thay đổi vị trí dụng cụ đo.

- » Nhấn nút  để mở menu **Các chức năng**.
- » Chọn đo độ nghiêng/ống bọt nước kỹ thuật số  và xác nhận lựa chọn bằng nút .



Cạnh dưới của dụng cụ đo được dùng làm mức tham chiếu cho ống bọt nước kỹ thuật số.

- » Hãy sử dụng ống bọt nước kỹ thuật số, đặt dụng cụ đo với mặt sau lên bề mặt cần đo. Bạn có thể đóng băng giá trị đo bằng cách nhấn nút ▲.
- » Khi độ nghiêng 3° bị vượt quá, hình cầu trong màn hình hiển thị chiếu sáng màu đỏ.



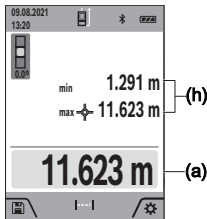
Cạnh trái của dụng cụ đo được dùng làm mặt phẳng tham chiếu để đo độ nghiêng. Khi chỉ thị báo sáng lên trong quá trình đo là do dụng cụ đo bị kéo nghiêng quá nhiều ở chiều bên kia.

- » Để sử dụng phép đo độ nghiêng, đặt dụng cụ đo với mặt bên lên vật thể có độ nghiêng bạn muốn đo. Bạn có thể đóng băng giá trị đo bằng cách nhấn nút ▲.

Đo liên tục \leftrightarrow

Khi đo liên tục, giá trị đo được cập nhật liên tục. Ví dụ bạn có thể đứng cách tường tới khoảng cách mong muốn, khoảng cách hiện tại luôn dễ đọc.

- » Nhấn nút **Func** để mở menu **Các chức năng**.
 - » Chọn đo liên tục \leftrightarrow và xác nhận lựa chọn bằng nút **Func**.
 - » Nhấn nhanh nút ▲ để bật laser.
 - » Di chuyển dụng cụ đo cho đến khi khoảng cách mong muốn được hiển thị trong dòng kết quả.
- Bạn có thể ngưng đo liên tục, bằng cách nhấn nhanh nút ▲.
- » Nhấn lại nút ▲ để tiếp tục đo liên tục.



Giá trị đo hiện tại được hiển thị trong dòng kết quả (a) giá trị đo tối đa và tối thiểu trong dòng giá trị đo (h).

Phép đo liên tục được tự động tắt sau 5 phút.

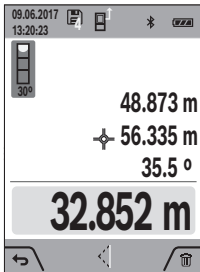
Chức năng bộ nhớ

Giá trị hoặc kết quả cuối cùng của mỗi lần đo xong sẽ được lưu trữ tự động. Các giá trị cuối **50** (Giá trị đo hoặc kết quả cuối) được lưu lại. Nếu bộ nhớ đầy, giá trị cũ nhất bị ghi đè. Phép đo cũ nhất được lưu ở vị trí số 1 trong bộ nhớ, phép đo gần đây nhất được lưu ở vị trí **50** (với **50** giá trị có thể được lưu).

» Nhấn vào nút  để mở chức năng bộ nhớ.

Giá trị cuối được hiển thị.

» Nhấn nút  hoặc nút  để lật thông qua các giá trị đã lưu.




Số giá trị đã lưu được hiển thị ở phía trên của màn hình và phía bên trái là biểu tượng của chức năng đo tương ứng. Nếu không có phép đo nào được lưu trong bộ nhớ, phía dưới của màn hình hiển thị „0.000“ và phía trên hiển thị „0“.

Xóa giá trị bộ nhớ


» Để xóa giá trị đã hiển thị, hãy nhấn nút .

» Hãy xác nhận bằng nút .

Để xóa tất cả giá trị đã lưu, trong menu **thiết lập ban đầu** hãy chọn  mục menu **xóa bộ nhớ**.


Cộng/trừ các giá trị

Thêm giá trị khi đo chiều dài

- » Hãy chọn chức năng đo chiều dài.
- » Tiến hành phép đo đầu tiên.
- » Nhấn nút .
- » Tiến hành phép đo thứ hai.

Ngay khi phép đo thứ hai hoàn thành, kết quả của phép đo thứ hai được hiển thị trong dòng giá trị đo (**h**) và kết quả được hiển thị trong dòng kết quả (**a**).

Thêm giá trị khi đo diện tích và thể tích


- » Chọn chức năng đo diện tích hoặc thể tích.
- » Tiến hành phép đo diện tích đầu tiên của phép đo thể tích.
- » Nhấn nút .
- » Tiến hành phép đo diện tích thứ hai của phép đo thể tích.

Ngay khi phép đo thứ hai hoặc thứ ba kết thúc, diện tích hoặc thể tích được tính và hiển thị tự động. Kết quả được hiển thị trong dòng kết quả (**a**). Giá trị đo riêng biệt ở trong các dòng giá trị đo được (**h**).


- » Nhấn nút  để hiển thị kết quả cuối của phần bổ sung.


Kết quả cuối được hiển thị trong dòng kết quả (**a**). Các kết quả của phép đo diện tích hoặc thể tích ở trong dòng giá trị đo (**h**).

Trừ các giá trị

- » Để trừ các giá trị hãy nhấn nút . Quy trình tiếp theo tương tự như "Cộng các giá trị".

Xóa giá trị đo

Bạn có thể xóa giá trị đo xác định cuối trong tất cả chức năng đo bằng cách nhấn nhanh nút .

Bằng việc nhấn nhanh nhiều lần nút  các kết quả đo sẽ được xóa theo thứ tự ngược.

Giao diện *Bluetooth*®

Truyền dữ liệu sang các thiết bị khác

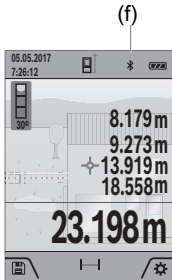
Máy đo được trang bị một mô-đun *Bluetooth*® bằng kỹ thuật sóng vô tuyến cho phép truyền dữ liệu tới các thiết bị di động đầu cuối với giao diện *Bluetooth*® (ví dụ điện thoại thông minh, máy tính bảng).









Các thông tin về điều kiện hệ thống cần thiết cho việc kết nối *Bluetooth*® có thể tìm thấy trên trang Web của Bosch theo địa chỉ www.bosch-pt.com.

► Thông tin tiếp theo xin vui lòng tìm trên trang sản phẩm Bosch.

Khi truyền dữ liệu bằng *Bluetooth*® có thể sẽ xuất hiện thời gian ngưng (time delay) giữa thiết bị di động đầu cuối và máy đo. Điều này có thể là do khoảng cách giữa cả hai thiết bị hoặc do chính đối tượng đo.

Kích hoạt giao diện *Bluetooth*® để truyền dữ liệu tới một thiết bị di động đầu cuối



- ✓ Hãy chắc chắn rằng, giao diện *Bluetooth*® trên thiết bị di động đầu cuối của bạn đã được kích hoạt.
- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
- » Chọn .
- » Hãy nhấn nút  hoặc nút  để lựa chọn .
- » Để xác nhận lựa chọn, hãy nhấn nút .









Biểu tượng *Bluetooth*® được hiển thị màu trắng

trong màn hình (f).

Các ứng dụng Bosch có sẵn để mở rộng phạm vi chức năng. Bạn có thể tải nó tùy theo thiết bị đầu cuối trong kho ứng dụng tương ứng.

Sau khi khởi động ứng dụng Bosch, hãy thiết lập kết nối giữa thiết bị đầu cuối và máy đo. Nếu phát hiện nhiều dụng cụ đo đã kích hoạt, hãy chọn dụng cụ đo phù hợp dựa theo số seri. Số seri (15) bạn hãy tìm trên nhãn thông tin nhận dạng dụng cụ đo.

Bỏ kích hoạt giao diện *Bluetooth®*




- » Nhấn nhanh nút  hoặc nhấn giữ nút , để mở menu **các thiết lập ban đầu** .
 - » Chọn .
 - » Hãy nhấn nút  hoặc nút  để lựa chọn .
 - » Để xác nhận lựa chọn, hãy nhấn nút .
- Biểu tượng *Bluetooth®* được hiển thị màu xám trong màn hình.


Kiểm tra độ chính xác

Thường xuyên kiểm tra độ chính xác của đo độ dốc và đo khoảng cách.

Kiểm tra độ chính xác và hiệu chỉnh đo độ dốc

- » Hãy đặt dụng cụ đo lên bàn và đo độ dốc.
 - » Hãy xoay dụng cụ đo 180° và đo lại độ dốc.
Độ sai khác của giá trị được hiển thị tối đa là 0,3°.
- Đối với độ sai lệch lớn hơn bạn phải hiệu chuẩn lại dụng cụ đo.

- » Nhấn giữ nút  để mở menu **Các chức năng cơ bản**.
- » Chọn  và xác nhận lựa chọn bằng nút .
- » Làm theo các hướng dẫn trên màn hình hiển thị.

 Sau những thay đổi mạnh về nhiệt độ và sau những sự va chạm, cần phải kiểm tra độ chính xác và nếu có thể hãy hiệu chỉnh máy. Sau khi có sự thay đổi về nhiệt độ máy đo phải được giảm nhiệt/làm mát trong thời gian nhất định trước khi hiệu chỉnh.

Kiểm tra độ chính xác của việc đo khoảng cách

Để kiểm tra độ chính xác, phép đo phải được thực hiện trong điều kiện thuận lợi, tức là khoảng cách đo phải ở trong phòng và bề mặt đối tượng của

phép đo phải trơn nhẵn đồng thời có độ phân xạ tốt (ví dụ tường có vạch trắng).

- » Chọn quãng đo, **3 đến 10 m**, chiều dài của khu vực này phải được biết rõ chính xác (vd. chiều rộng của một căn phòng hay một khung cửa).
- » Đo khoảng cách 10 lần liên tiếp.




Sai lệch của các phép đo riêng biệt so với giá trị trung bình được vượt quá ± 2 mm tổng khoảng cách đo trong điều kiện thuận lợi. Ghi lại các phép đo để sau này có thể so sánh độ chính xác của các phép đo.

Kiểm tra độ chính xác và hiệu chỉnh hiển thị đích (Dấu chữ thập)

Thường xuyên kiểm tra độ chính xác của căn chỉnh laser và hiển thị đích.

- » Hãy chọn bề mặt sáng, được chiếu sáng yếu (ví dụ tường trắng) ở khoảng cách tối thiểu 5 m làm đích.
- » Kiểm tra xem điểm laser có ở trong hiển thị đích ở màn hình không.
Nếu điểm laser không ở trong hiển thị đích, bạn phải hiệu chuẩn lại hiển thị đích.

Hiệu chuẩn lại hiển thị đích

- » Nhấn giữ nút  để vào menu **Các chức năng cơ bản**.
- » Chọn  và xác nhận lựa chọn bằng nút .
- » Làm theo các hướng dẫn trên màn hình hiển thị.

Sử dụng giá đỡ ba chân (phụ kiện)

Sử dụng giá ba chân là đặc biệt hữu ích cho khoảng cách lớn.

- » Hãy đặt máy đo có ren 1/4" (**17**) lên đĩa nhả hãm nhanh của giá ba chân (**27**) hoặc một chiếc giá ba chân của máy ảnh thông thường.
- » Vặn ốc máy đo bằng vít định vị của đĩa nhả hãm nhanh thật chặt.
- » Hãy cài đặt mặt phẳng tham chiếu cho các phép đo bằng giá đỡ ba chân. (xem „Chọn mức tham chiếu“, Trang 202)

Thông báo lỗi



Dụng cụ đo kiểm soát độ chính xác của mỗi phép đo. Nếu lỗi được phát hiện, màn hình chỉ hiển thị biểu tượng bên cạnh, và dụng cụ đo được ngắt. Trong trường hợp này, hãy chuyển dụng cụ đo đến bộ phận dịch vụ khách hàng của Bosch thông qua đại lý bán hàng của bạn.

Khắc phục lỗi

Cảnh báo nhiệt độ

Cảnh báo nhiệt độ nhấp nháy, không thể đo

Nguyên nhân: Dụng cụ đo ở ngoài nhiệt độ làm việc từ -10 °C đến $+45\text{ °C}$ (trong chức năng đo liên tục là tới $+40\text{ °C}$)

Biện pháp khắc phục: Đợi cho đến khi dụng cụ đo về lại nhiệt độ hoạt động cho phép

„ERROR“ trên màn hình

Hiện ra chữ „ERROR“ trên màn hình

Nguyên nhân: Cộng/Trừ trị số đo bằng một đơn vị đo lường khác nhau

Biện pháp khắc phục: Chỉ cộng/trừ trị số đo bằng cùng một đơn vị đo lường như nhau

Nguyên nhân: Góc nằm giữa luồng laze và mục tiêu quá nhọn

Biện pháp khắc phục: Mở rộng góc nằm giữa luồng laze và mục tiêu

Nguyên nhân: Bề mặt đối tượng phản xạ quá mạnh (ví dụ gương), hoặc ánh sáng xung quanh quá mạnh

Biện pháp khắc phục: Sử dụng băng dính laser (Phụ kiện)

Nguyên nhân: Lỗ chiếu luồng laser (19) hoặc thấu kính (18) bị hơi nước (ví dụ do thay đổi nhiệt độ nhanh)

Biện pháp khắc phục: Chà lỗ chiếu luồng laser (19) hoặc thấu kính (18) bằng khăn mềm

Nguyên nhân: Giá trị đã tính lớn hơn $1\,999\,999$ hoặc nhỏ hơn $-999\,999\text{ m}^2/\text{m}^3$

Biện pháp khắc phục: Hãy chia phép tính thành các bước trung gian

Hiệu chuẩn

Hiện thị "CAL" và hiển thị "ERROR" trong màn hình

Nguyên nhân: Sự hiệu chuẩn của phép đo độ dốc không được thực hiện đúng theo trình tự hay đúng vào các vị trí

Biện pháp khắc phục: Lập lại sự hiệu chuẩn dựa trên các hướng dẫn trên màn hiển thị và trong các hướng dẫn hoạt động

Nguyên nhân: Bề mặt sử dụng để hiệu chuẩn không thật sự đồng vị chính xác (đường ngang và thẳng đứng)

Biện pháp khắc phục: Lập lại sự hiệu chuẩn trên bề mặt ngang hay thẳng đứng; nếu cần, kiểm tra bề mặt trước bằng cân thủy

Nguyên nhân: Dụng cụ đo bị chuyển dịch hay nghiêng xuống trong khi nhấn nút

Biện pháp khắc phục: Lập lại sự hiệu chuẩn và giữ dụng cụ đo ở nguyên vị trí trong khi nhấn nút

Kết quả đo

Kết quả đo không cho phép

Nguyên nhân: Bề mặt đối tượng không phản chiếu rõ ràng (ví dụ nước, kính)

Biện pháp khắc phục: Hãy che bề mặt đích

Nguyên nhân: Lỗ chiếu luồng laser (19) hoặc thấu kính (18) bị che

Biện pháp khắc phục: Giữ lỗ chiếu luồng laser (19) và thấu kính (18) luôn thoáng

Kết quả đo không hợp lý

Nguyên nhân: Chướng ngại vật trên đường đi của luồng laser

Biện pháp khắc phục: Lưu ý rằng điểm laser nằm hoàn toàn trên bề mặt đích

Nguyên nhân: Chỉnh đặt sai điểm xuất phát chuẩn

Biện pháp khắc phục: Chọn điểm xuất phát chuẩn tương ứng với cách đo đạt

Bluetooth®

Bluetooth® không thể kích hoạt

Nguyên nhân: Các ắc quy hoặc pin quá yếu

Biện pháp khắc phục: Thay pin hoặc sạc pin của dụng cụ đo

Không có kết nối Bluetooth®

Không có kết nối Bluetooth®, hiển thị "ERROR" trong màn hình

Nguyên nhân: Nhiều kết nối Bluetooth®

Biện Pháp Sửa Chữa:

- Kiểm tra xem Bluetooth® có được kích hoạt không (trên dụng cụ đo hay trên thiết bị đầu cuối di động)
- Tắt Bluetooth® và bật lại (trên dụng cụ đo hay trên thiết bị đầu cuối di động)
- Kiểm tra ứng dụng trên thiết bị di động đầu cuối đang được dùng
- Kiểm tra mức quá tải của thiết bị di động đầu cuối đó
- Rút ngắn khoảng cách giữa máy đo và thiết bị di động đầu cuối đang dùng
- Tránh các vật cản (ví dụ, bê tông cốt thép, cửa kim loại) giữa máy đo và thiết bị đầu cuối đang dùng; giữ khoảng cách tới nguồn gây nhiễu điện từ (ví dụ máy phát Wifi)

Bảo Dưỡng và Bảo Quản

Bảo Dưỡng Và Làm Sạch

Chỉ được cất giữ và vận chuyển dụng cụ đo trong túi xách bảo vệ được giao kèm.

Luôn luôn giữ cho dụng cụ đo thật sạch sẽ.

Không được nhúng dụng cụ đo vào trong nước hay các chất lỏng khác.

Lau sạch bụi bẩn bằng một mảnh vải mềm và ẩm. Không được sử dụng chất tẩy rửa.

Làm sạch thấu kính (18), lỗ chiếu luồng laser (19) và camera (20) thật cẩn thận: Đảm bảo không có chất bẩn trên thấu kính, lỗ chiếu luồng laser và camera. Chỉ vệ sinh thấu kính, lỗ chiếu luồng laser và camera bằng các chất thích hợp cho ống kính máy ảnh. Không thử dùng vật nhọn để lấy chất bẩn

khỏi các thấu kính, lỗ chiếu luồng laser hoặc camera, và không lau qua chúng (rủi ro gây xước).

Trong trường hợp cần sửa chữa, hãy gửi dụng cụ đo trong túi bảo vệ (21).

Dịch vụ hỗ trợ khách hàng và tư vấn sử dụng

Bộ phận phục vụ hàng sau khi bán của chúng tôi trả lời các câu hỏi liên quan đến việc bảo dưỡng và sửa chữa các sản phẩm cũng như phụ tùng thay thế của bạn. Sơ đồ mô tả và thông tin về phụ tùng thay thế cũng có thể tra cứu theo dưới đây: **www.bosch-pt.com**

Đội ngũ tư vấn sử dụng của Bosch sẽ giúp bạn giải đáp các thắc mắc về sản phẩm và phụ kiện.

Trong tất cả các phản hồi và đơn đặt phụ tùng, xin vui lòng luôn luôn nhập số hàng hóa 10 chữ số theo nhãn của hàng hóa.

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Xem thêm địa chỉ dịch vụ tại:

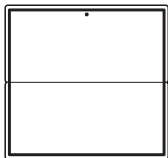
www.bosch-pt.com/serviceaddresses

Phụ kiện

Hãy tìm phụ kiện trên trang web của Bosch bằng liên kết đã cho

Cục tầm đích laser (24)

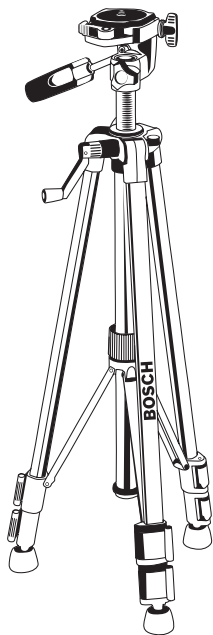
2 607 001 391



Kính nhìn tia laser (đỏ) (25)

1 608 M00 05B





Giá chân BT 150 (26)
0 601 096 B00