

HILTI

PM 40-MG

English



1 Information about the documentation




1.1 About this documentation

- Read this documentation before initial operation or use. This is a prerequisite for safe, trouble-free handling and use of the product.
- Observe the safety instructions and warnings in this documentation and on the product.
- Always keep the operating instructions with the product and make sure that the operating instructions are with the product when it is given to other persons.

1.2 Explanation of symbols used



1.2.1 Warnings

Warnings alert persons to hazards that may occur when handling or using the product. The following signal words are used in combination with a symbol:

	DANGER! Draws attention to an imminent hazard that will lead to serious personal injury or fatality.
	WARNING! Draws attention to a potential hazard that could lead to serious personal injury or fatality.
	CAUTION! Draws attention to a potentially dangerous situation that could lead to minor personal injury or material damage.





1.2.2 Symbols in the documentation

The following symbols are used in this document:

	Read the operating instructions before use
	Instructions for use and other useful information

1.2.3 Symbols in the illustrations



The following symbols are used in illustrations:

	These numbers refer to the corresponding illustrations found at the beginning of these operating instructions.
	The numbering reflects the sequence of operations shown in the illustrations and may deviate from the steps described in the text.
	Item reference numbers are used in the overview illustration and refer to the numbers used in the key in the product overview section.
	This symbol is intended to draw special attention to certain points when handling the product.

1.3 Product-dependent symbols

1.3.1 Symbols on the product

The following symbols are used on the product:

	Pendulum locked (laser beam inclined)
	Pendulum unlocked (self-leveling system active)

1.4 Product information

Hilti products are designed for professional use and may be operated, serviced and maintained only by trained, authorized personnel. This personnel must be informed of any particular hazards that may be encountered. The product and its ancillary equipment can present hazards if used incorrectly by untrained personnel or if used not in accordance with the intended use.

The type designation and serial number are stated on the rating plate.

- ▶ Write down the serial number in the table below. You will be required to state the product details when contacting Hilti Service or your local Hilti organization to inquire about the product.

Product information

Multi-line laser	PM 40-MG
Generation	01
Serial no.	

1.5 Declaration of conformity

We declare, on our sole responsibility, that the product described here complies with the applicable directives and standards. A copy of the declaration of conformity can be found at the end of this documentation.

The technical documentation is filed and stored here:

Hilti Entwicklungsgesellschaft mbH | Tool Certification | Hiltistraße 6 | 86916 Kaufering, DE

2 Safety

2.1 Safety instructions

In addition to the warnings given in the various sections of these operating instructions, the following points must be strictly observed at all times. The product and its ancillary equipment may present hazards when used incorrectly by untrained personnel or when used not as directed.

- ▶ Keep all safety instructions and information for future reference.
- ▶ Check the accuracy of the tool before use and several times during use.
- ▶ Stay alert, watch what you are doing and use common sense when operating the tool. Do not use the tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating the tool may result in serious personal injury.
- ▶ Tampering with or modification of the tool is not permitted.
- ▶ Do not render safety devices ineffective and do not remove information and warning notices.
- ▶ Keep children and other persons away from the area while the tool or appliance is in use.
- ▶ Take the influences of the surrounding area into account. Do not use the tool where there is a risk of fire or explosion.
- ▶ The laser plane should be well above or well below eye height.
- ▶ You must check the accuracy of the device after it has been dropped or subjected to other mechanical stresses.
- ▶ To achieve maximum accuracy, project the line onto a vertical, flat surface. When doing so, set up the tool at 90° to the surface.
- ▶ Keep the laser exit aperture clean to avoid measurement errors.
- ▶ Observe the information printed in the operating instructions concerning operation, care and maintenance.
- ▶ When not in use, tools must be stored in a dry, high place or locked away out of reach of children.
- ▶ Observe the national health and safety requirements.

2.2 Proper preparation of the working area

- ▶ Avoid awkward body positions when working from ladders. Make sure you work from a safe stance and stay in balance at all times.
- ▶ Secure the site in which you are taking measurements and take care to avoid directing the beam towards other persons or towards yourself when setting up the tool.
- ▶ Measurements taken through panes of glass or other objects may be inaccurate.
- ▶ Ensure that the tool is set up on a stable, level surface (not subject to vibration).
- ▶ Use the tool only within its specified limits.
- ▶ If several laser tools are used in the same working area, care must be taken to avoid confusing the beams.
- ▶ Strong magnetic fields may affect the accuracy of the tool. Magnetic objects should thus be kept away from the measuring tool. Hilti magnetic adapters may be used.
- ▶ When the tool is brought into a warm environment from very cold conditions, or vice-versa, allow it to become acclimatized before use.

2.3 Electromagnetic compatibility

Although the device complies with the strict requirements of the applicable directives, **Hilti** cannot entirely rule out the possibility of interference to the device caused by powerful electromagnetic radiation, possibly leading to incorrect operation. Check the accuracy of the device by taking measurements by other means when working under such conditions, or if you are unsure. Likewise, **Hilti** cannot rule out the possibility of interference with other devices (e.g. aircraft navigation equipment).

2.4 Laser classification for laser class 2/class II tools

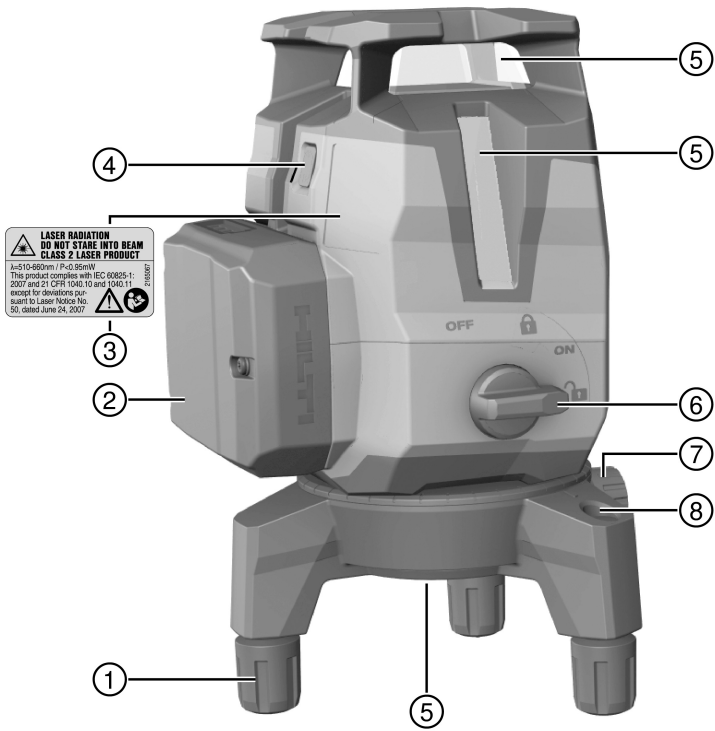
The tool complies with laser Class 2 as per IEC 60825-1:2007 / EN 60825-1:2008 and Class II as per CFR 21 § 1040 (FDA). These devices can be used without further protective measures. Nevertheless, as with the sun, do not look directly into the light source. If you do inadvertently look into the laser beam, immediately close your eyes and move your head clear of the laser beam. Do not aim the laser beam at persons.

2.5 Careful handling and use of batteries

- ▶ Observe the special guidelines applicable to the transport, storage and use of lithium-ion batteries.
- ▶ Do not expose batteries to high temperatures, direct sunlight or fire.
- ▶ Do not take apart, squash or incinerate batteries and do not subject them to temperatures over 80 °C.
- ▶ Do not attempt to charge or continue to use damaged batteries.
- ▶ If the battery is too hot to touch, it may be defective. In this case, place the power tool in a non-flammable location, well away from flammable materials, where it can be kept under observation and left to cool down. Contact **Hilti** Service after the battery has cooled down.

3 Description

3.1 Product overview



- | | |
|--|--|
| ① Adjustable foot | ⑤ Laser exit window |
| ② Li-ion battery | ⑥ Rotary on/off and pendulum lock switch |
| ③ Warning sticker | ⑦ Fine adjustment for rotation platform |
| ④ Selector button for line and receiver mode | ⑧ Circular bubble level |

3.2 Intended use

This tool is a self-leveling multi-line laser level that allows a single person to transfer right angles, level horizontally, carry out alignment work and plumb accurately.

The tool has three green laser lines (one horizontal and two vertical), a reference point below the tool as well as four beam intersection points (front, back, left, right and above) with a range of approx. 20 m. Range depends on the brightness of ambient light.

The tool is designed for mainly indoor use and is no substitute for a rotating laser level. If used for outdoor applications, care must be taken to ensure that the conditions are the same as for indoor applications. If this is not the case, the **Hilti** PMA 31G laser receiver should be used.

Possible applications are:

- Marking the position of partition walls (at right angles and in the vertical plane).
- Checking and transferring right angles.
- Aligning components to be installed or sections of a structure in three axes.
- Transferring points marked on the floor to the ceiling.

The laser lines can be switched on either separately (vertical or horizontal line only) or together. When used with inclination angle, the pendulum for automatic leveling is blocked.

- ▶ Use only **Hilti** B12 2.6 Li-ion batteries with this tool.
- ▶ Use only the **Hilti** C4/12-50 charger to charge these batteries.

3.3 Features

The tool levels itself automatically within a range of approx. 3.0°. If this is not sufficient, the tool can be leveled using the adjustable feet and circular bubble level. Self-leveling takes only about 3 seconds.

When the self-leveling range is exceeded, the laser beams blink as a warning.

When switched on initially, the tool is in standard mode, i.e. visible beam mode with high line brightness. When the selector button for line and receiver mode is pressed and held for a short time the tool switches to receiver mode and is then compatible with the PMA 31G laser receiver. Receiver mode can be deactivated by again pressing and holding the selector button for a short time or by switching the tool off.

3.4 Items supplied

Multi-line laser, toolbox, operating instructions, manufacturer's certificate.

You can find other system products approved for your product at your local **Hilti** Center or online at: www.hilti.com

3.5 Information displayed during operation

Status	Meaning
The laser beam blinks twice every 10 seconds (pendulum not locked) or every 2 seconds (pendulum locked).	<ul style="list-style-type: none"> • The batteries are almost exhausted.
The laser beam blinks five times and then remains permanently on.	<ul style="list-style-type: none"> • Activation or deactivation of receiver mode.
The laser beam blinks very rapidly.	<ul style="list-style-type: none"> • The tool cannot level itself.
The laser beam blinks every 5 seconds.	<ul style="list-style-type: none"> • Inclined line operating mode; the pendulum is locked, so the lines are not leveled.

4 Technical data

Range of the lines and intersection point without laser receiver	20 m
Range, lines and intersection point with laser receiver	2 m ...50 m

Self-leveling time (typical)	3 s
Laser class	Class 2, visible, 510-660 nm (EN 60825-1:2008 / IEC 60825-1:2007); Class II (CFR 21 § 1040 (FDA))
Line width (distance 5 m)	< 2.2 mm
Self-leveling range	±3.0° (typical)
Operating status indicator	Laser beams and the switch positions "Off", "On locked" and "On unlocked"
Power source	Hilti B 12 Li-ion battery
Battery life (all lines on)	Hilti B12 Li-ion battery, 2600 mAh, temperature +24 °C (+72 °F): 7 h (typical)
Battery life (horizontal or vertical lines on)	Hilti B 12 Li-ion battery, 2600 mAh, temperature +24 °C (+72 °F): 10 h (typical)
Operating temperature	-10 °C ... 40 °C
Storage temperature	-25 °C ... 63 °C
Dust and water spray protection (except battery compartment)	IP 54 in accordance with IEC 60529
Tripod thread	BSW 5/8"UNC1/4"
Beam divergence	0.05 mrad ... 0.08 mrad
Average output power (max.)	< 0.95 mW
Weight including battery	1.24 kg

5 Operation

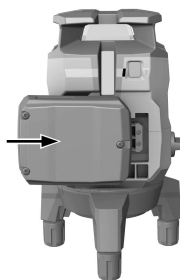


CAUTION

Risk of injury! Do not direct the laser beam toward persons.

- ▶ Never look directly into the source of the laser beam. In the event of direct eye contact, close your eyes and move your head out of the path of the laser beam.

5.1 Inserting the battery



- ▶ Push the battery in until it engages securely.



Note


Only the Li-ion batteries recommended by **Hilti** may be used to power the tool.

5.2 Removing / adjusting the base plate



1. Remove the base plate by pulling it forward and clear of the device.
2. The rubber sleeves of the feet can be pulled down to provide protection if the device has to be set up on an easily damaged surface.
3. The feet of the base plate can be screwed out for leveling.

5.3 Switching the laser beams on

1. Turn the rotary switch to the  position (on/unlocked).
 - ◀ The vertical laser beams are visible.
2. Press the mode selector button repeatedly until the desired line mode is set.



Note

The operating modes change in the following sequence and the sequence then repeats itself: Vertical laser lines, horizontal laser line, vertical and horizontal laser lines.

5.4 Switching the laser beams off

- ▶ Turn the rotary switch to the OFF position (off/locked).
 - ◀ The laser beam is no longer visible and the pendulum is locked.



Note

The tool switches itself off when the battery is low.

5.5 Activating or deactivating laser receiver mode


1. To activate receiver mode, press the line / receiver mode selector button for longer than 4 seconds until the laser beam blinks 5 times as confirmation.
2. To deactivate receiver mode, press the selector button again for longer than 4 seconds.



Note

Receiver mode is deactivated when the tool is switched off.

5.6 Setting the laser beams to the “Inclined line” function

1. Turn the rotary switch to the  position (on/locked).
 - ◀ Only the horizontal laser beam is then visible.
2. Press the line mode selector button repeatedly until the desired line mode is set.




Note

When the “Inclined line” function is active, the pendulum is locked and the tool is not leveled. The laser beam(s) blink every 5 seconds.

The operating modes change in the following sequence and the sequence then repeats itself: Horizontal laser line, vertical laser line, vertical and horizontal laser lines.

5.7 Setting the laser beams to the “Inclined line” function

1. Turn the rotary switch to the  position (on/locked).
 - ◀ Only the horizontal laser beam is then visible.
2. Press the line mode selector button repeatedly until the desired line mode is set.



Note

When the “Inclined line” function is active, the pendulum is locked and the tool is not leveled. The laser beam(s) blink every 5 seconds.

The operating modes change in the following sequence and the sequence then repeats itself: Horizontal laser line, vertical laser line, vertical and horizontal laser lines.

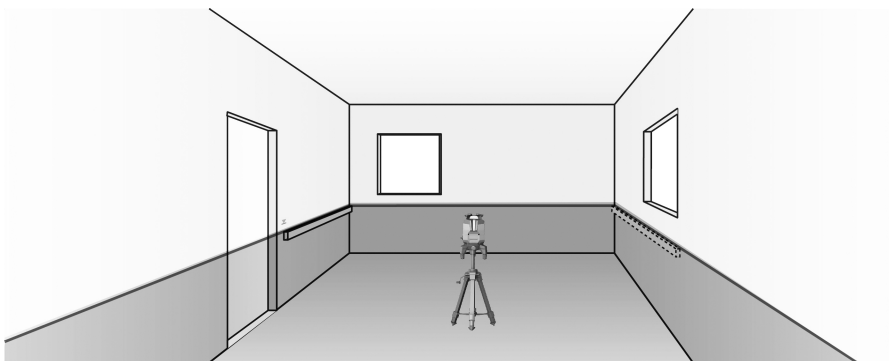
5.8 Examples of applications



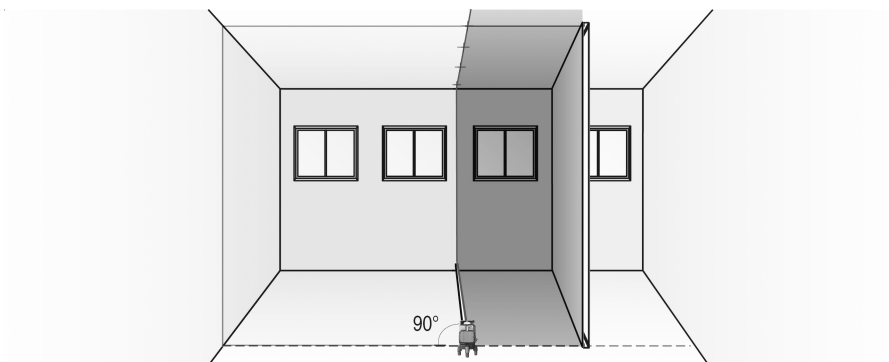
Note

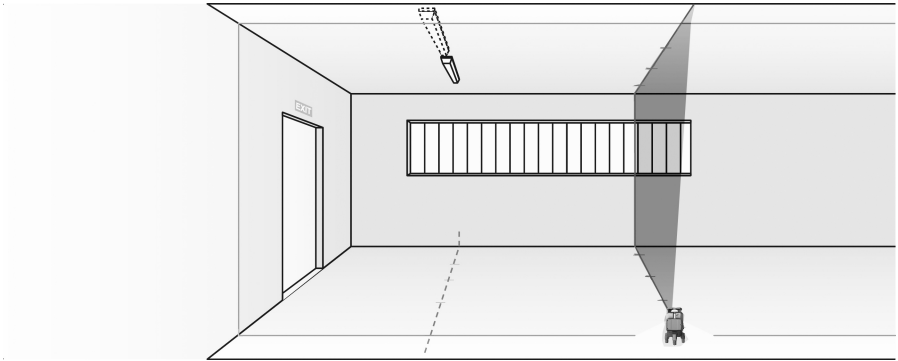
The adjustable feet allow the tool to be pre-leveled approximately on very uneven surfaces.

5.8.1 Transferring heights

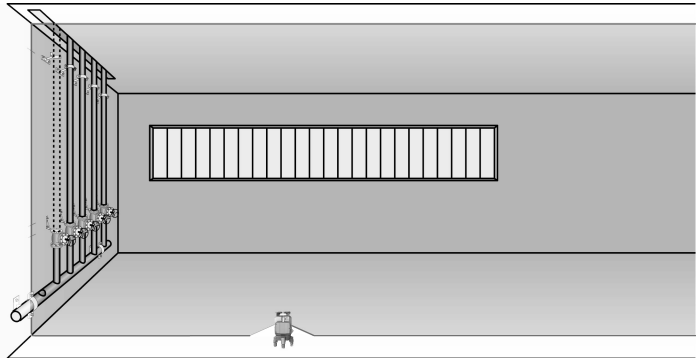


5.8.2 Setting up drywall track for a partition wall

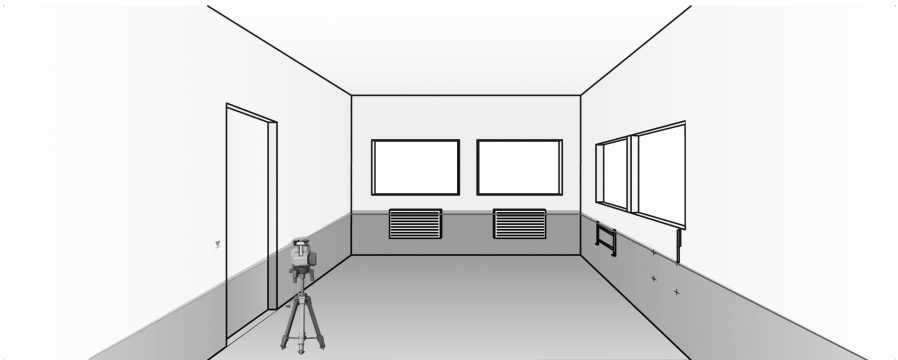




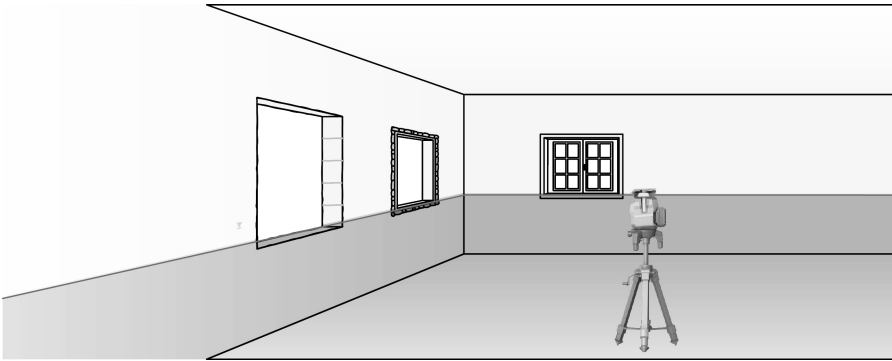
5.8.3 Vertical alignment of pipes



5.8.4 Aligning heating units

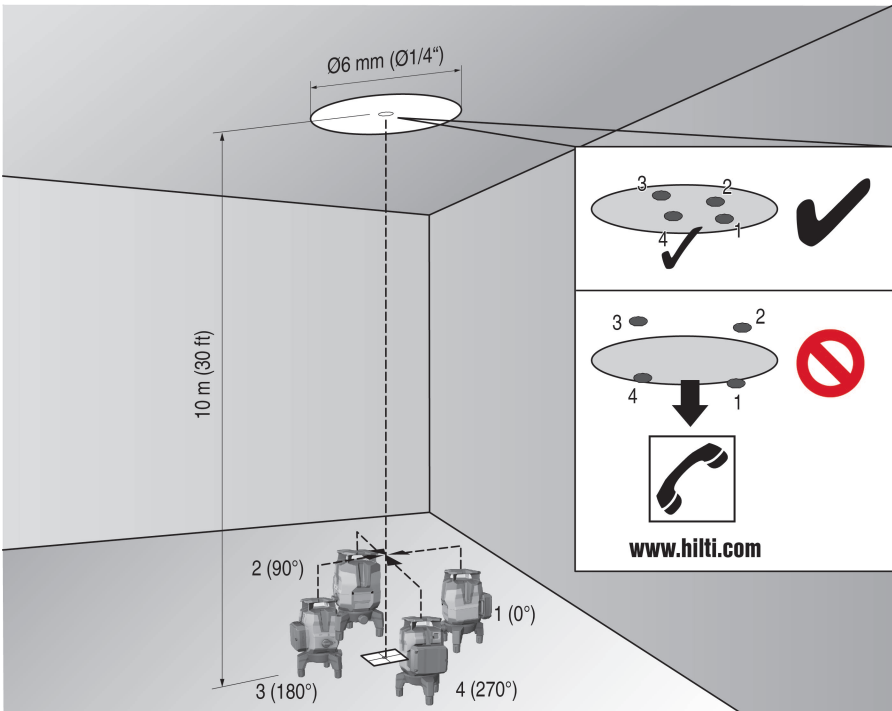


5.8.5 Aligning door and window frames



5.9 Checking

5.9.1 Checking the plumb point



1. Make a mark on the floor (a cross) in a high room (e.g. in a stairwell or hallway with a height of 5–10 m).
2. Place the tool on an even, level surface.
3. Switch the tool on and unlock the pendulum.
4. Position the tool so that the lower plumb beam coincides with the center of the cross marked on the floor.
5. Mark the top point of intersection of the laser lines on the ceiling. Attach a sheet of paper to the ceiling before making the mark.

6. Pivot the tool through 90°.



Note

The lower red plumb beam must remain on the center of the cross.

7. Mark the top point of intersection of the laser lines on the ceiling.
8. Repeat the procedure after pivoting the tool through 180° and 270°.



Note

Form a circle on the ceiling from the 4 marked points. Measure the diameter of the circle D in millimeters or inches and the height of the room in meters or feet.

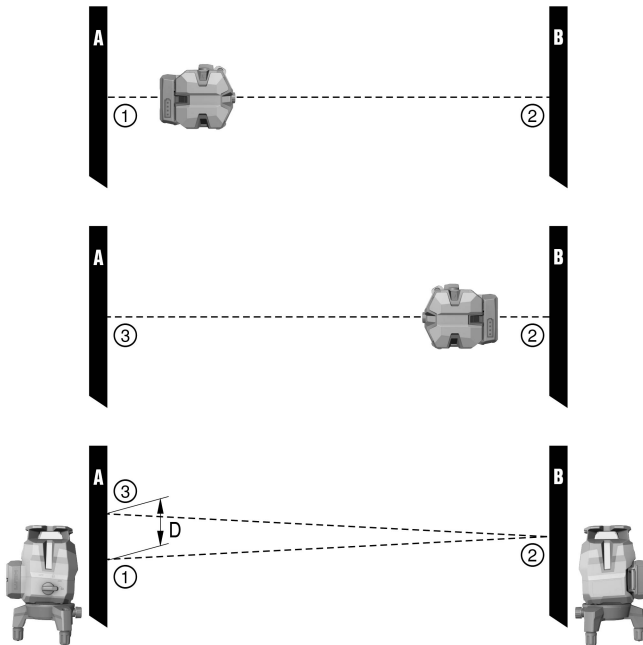
9. Calculate the value R.

- ◁ The value R should be less than 3 mm (corresponds to 3 mm at 10 m).
- ◁ The value R should be less than 1/8".

$$R = \frac{D \text{ [mm]}}{2} \times \frac{10}{RH \text{ [m]}} \quad (1)$$

$$R = \frac{D \text{ [1/8 in]}}{2} \times \frac{30}{RH \text{ [ft]}} \quad (2)$$

5.9.2 Checking the leveling of the laser beam



1. Place the tool on an even, level surface approx. 20 cm from the wall (A) with the point of intersection of the laser lines directed toward the wall (A).
2. Mark the point of intersection of the laser lines with a cross (1) on wall (A) and with a cross (2) on wall (B).
3. Place the tool on an even, level surface approx. 20 cm from wall (B) and carefully aim the point of intersection of the laser lines at cross (1) on wall (A).
4. Use the adjustable feet to adjust the height of the point of intersection of the laser lines so that the point of intersection coincides exactly with the mark (2) on the wall (B). In doing so, make sure that the bubble level remains centered.
5. Mark the point of intersection of the laser lines again with a cross (3) on the wall (A).
6. Measure the offset D between the crosses (1) and (3) on the wall (A) (RL = room length).

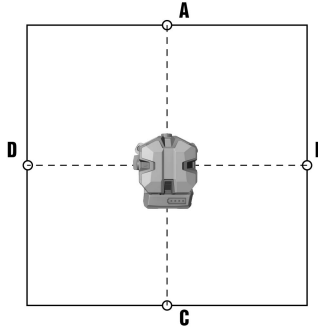
7. Calculate the value R.

- ◁ The value R should be less than 2 mm.
- ◁ The value R should be less than 1/8".

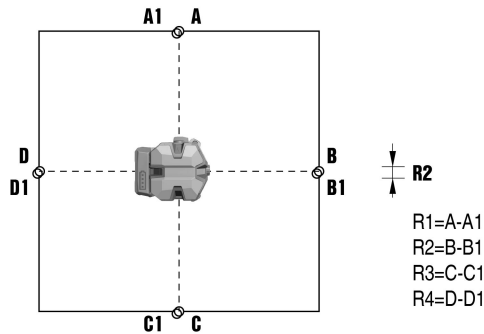
$$R = \frac{D \text{ [mm]}}{2} \times \frac{10}{RL \text{ [m]}} \quad (1)$$

$$R = \frac{D[1/8 \text{ in}]}{2} \times \frac{30}{RL \text{ [ft]}} \quad (2)$$

5.9.3 Checking perpendicularity (horizontal)



1. Position the tool so that the lower plumb beam coincides with the center of a reference cross marked in the middle of a room at a distance of about 5 m from the walls.
2. Mark all 4 points of intersection on the four walls.



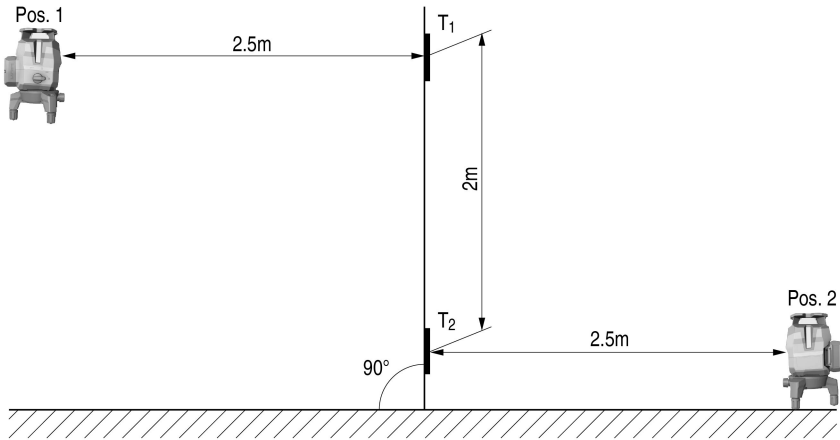
3. Rotate the tool through 90° and make sure that the center of the point of intersection coincides with the first reference point (A).
4. Mark each new point of intersection and measure each offset (R1, R2, R3, R4 [mm]).
5. Calculate the offset R (RL = room length).

- ◁ The value R should be less than 3 mm or 1/8".

$$R = \frac{(R1+R2+R3+R4) \text{ [mm]}}{4} \times \frac{10}{RL \text{ [m]}} \quad (1)$$

$$R = \frac{(R1+R2+R3+R4) [1/8 \text{ in}]}{4} \times \frac{30}{RL \text{ [ft]}} \quad (2)$$

5.9.4 Checking the accuracy of the vertical line



1. Position the tool at a height of 2 m (pos.1).
2. Switch the tool on.
3. Position the first target plate T1 (vertical) at a distance of 2.5 meters from the tool at the same height (2 meters), so that the vertical laser beam strikes the plate. Mark this position.
4. Then place the second target plate T2 at a position 2 meters below the first target plate, so that the vertical laser beam strikes the plate. Mark this position.
5. Mark position 2 at the opposite side of the test setup (mirror image) on the laser line on the floor at a distance of 5 meters from the tool.
6. Now place the tool on the previously marked position (pos. 2) on the floor.
7. Align the laser beam so that it strikes the target plate T1 and the position marked on it.
8. Mark the new position on target plate T2.
9. Read the distance D between the two marks on target plate T2.



Note

If the difference D is greater than 2 mm, the tool must be returned to a **Hilti** repair center for adjustment.

6 Care and maintenance

6.1 Cleaning and drying

- ▶ Blow any dust off the glass.
- ▶ Do not touch the glass surfaces with your fingers.
- ▶ Use only a soft, clean cloth to clean the tool. If necessary, moisten the cloth with a little alcohol or water.
- ▶ Observe the temperature limits when storing your equipment. This is particularly important in summer or winter if the equipment is kept inside a motor vehicle (-25°C to 63°C / -13°F to 145°F).

6.2 Hilti Calibration Service

We recommend that the tool is checked by the **Hilti** Calibration Service at regular intervals in order to verify its reliability in accordance with standards and legal requirements.

Use can be made of the **Hilti** Calibration Service at any time. Calibration at least once a year is recommended. The **Hilti** Calibration Service provides confirmation that the device is in conformance, on the day it is tested, with the specifications given in the operating instructions.

The tool will be readjusted if deviations from the manufacturer's specification are found.

After checking and adjustment, a calibration sticker applied to the tool and a calibration certificate provide written verification that the tool operates in accordance with the manufacturer's specification.

Calibration certificates are always required by companies certified according to ISO 900X.

Your local **Hilti** contact will be pleased to provide further information.

7 Transport and storage

7.1 Transport

- ▶ Use the **Hilti** shipping box or packaging of equivalent quality for transporting or shipping your equipment.

7.2 Storage

- ▶ Remove the tool from its case if it has become wet.
- ▶ The tool, its carrying case and accessories should be cleaned and dried (at maximum 63 °C/145 °F).
- ▶ Repack the equipment only once it has dried completely and then store it in a dry place.
- ▶ Check the accuracy of the equipment before it is used after a long period of storage or transportation.

7.3 Transport and storage of cordless tools

Transport



CAUTION

Inadvertent starting during transport. Uncontrolled starting during transport may occur if the battery is fitted, thereby resulting in damage to the tool.

- ▶ Always remove the battery before transporting the tool.

- ▶ Remove the battery.
- ▶ Transport the tool and batteries individually packaged.
- ▶ Never transport batteries in bulk form (loose, unprotected).
- ▶ Check the tool and batteries for damage before use after long periods of transport.

Storage



CAUTION

Inadvertent damage caused by defective battery. A leaking battery may damage the tool.


- ▶ Always remove the battery before storing the tool.

- ▶ Store the tool and batteries in a place that is as cool and dry as possible.
- ▶ Never store batteries in direct sunlight, on heating units or behind a window pane.
- ▶ Store the tool and batteries in a place where they cannot be accessed by children or unauthorized persons.
- ▶ Check the tool and batteries for damage before use after long periods of storage.

8 Troubleshooting

If the trouble you are experiencing is not listed in this table or you are unable to remedy the problem by yourself, please contact **Hilti** Service.

Trouble or fault	Possible cause	Action to be taken
The tool can't be switched on.	The battery is low.	▶ Charge the battery.
	The battery is not fitted correctly.	▶ Fit the battery and check that the battery is securely seated in the tool.

Trouble or fault	Possible cause	Action to be taken
The tool can't be switched on.	The tool or rotary switch is faulty.	▶ Have the tool repaired by Hilti Service .
Individual laser beams don't function.	The laser source or laser control unit is faulty.	▶ Have the tool repaired by Hilti Service .
The tool can be switched on but no laser beam is visible.	The laser source or laser control unit is faulty.	▶ Have the tool repaired by Hilti Service .
	The temperature is too high or too low.	▶ Allow the tool to cool down or warm up.
Automatic leveling doesn't work.	The tool is standing on an excessively inclined surface.	▶ Turn the rotary switch to the  position.
	The inclination sensor is faulty.	▶ Have the tool repaired by Hilti Service .
The tool switches off after 1 hour.	Automatic switch-off has been activated.	▶ Press the selector button for longer than 4 seconds.


9 Disposal



WARNING

Risk of injury. Hazards presented by improper disposal.

- ▶ Improper disposal of the equipment may have the following consequences: The burning of plastic components generates toxic fumes which may present a health hazard. Batteries may explode if damaged or exposed to very high temperatures, causing poisoning, burns, acid burns or environmental pollution. Careless disposal may permit unauthorized and improper use of the equipment. This may result in serious personal injury, injury to third parties and pollution of the environment.
- ▶ Dispose of defective batteries right away. Keep them out of reach of children. Do not disassemble or incinerate the batteries.
- ▶ Batteries that have reached the end of their life must be disposed of in accordance with national regulations or returned to **Hilti**.

 Most of the materials from which **Hilti** tools and appliances are manufactured can be recycled. The materials must be correctly separated before they can be recycled. In many countries, your old tools, machines or appliances can be returned to **Hilti** for recycling. Ask **Hilti Service** or your Hilti representative for further information.

In accordance with the European Directive on waste electrical and electronic equipment and its implementation in conformance with national law, electric tools or appliances that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.



- ▶ Do not dispose of electronic measuring tools together with household waste.

10 Manufacturer's warranty

- ▶ Please contact your local **Hilti** representative if you have questions about the warranty conditions.

11 FCC statement (applicable in US) / IC statement (applicable in Canada)

This device complies with Part 15 of the FCC Rules and CAN ICES-3 (B) / NMB-3 (B). Operation is subject to the following two conditions:

1. This device shall cause no harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.



Note

Changes or modifications not expressly approved by **Hilti** may restrict the user's authorization to operate the equipment.



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PM 40-MG (01)

[2016]

2014/30/EU

EN ISO 12100

2011/65/EU

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