PS 1000

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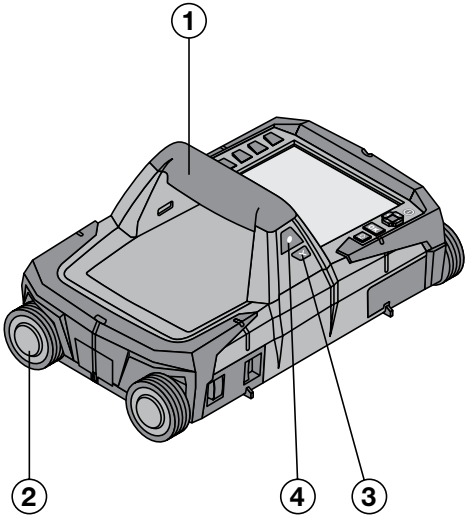

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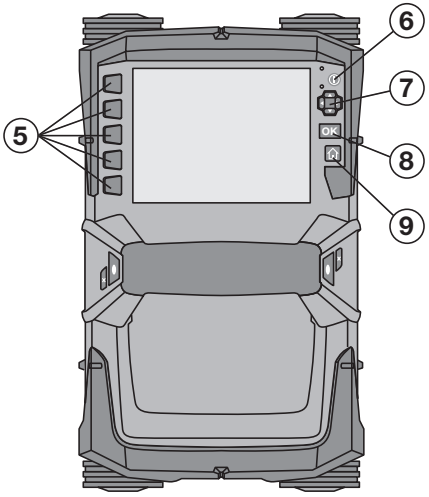
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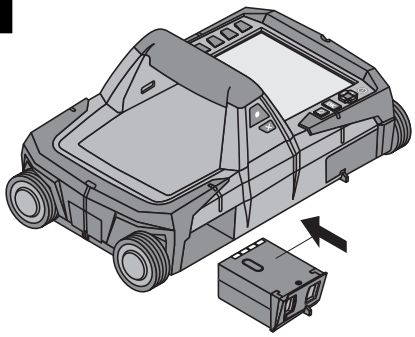

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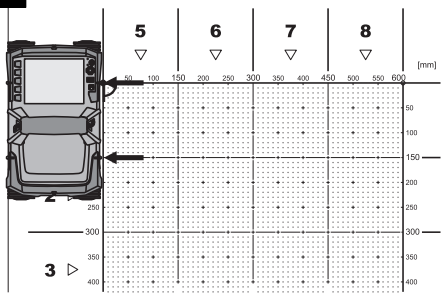
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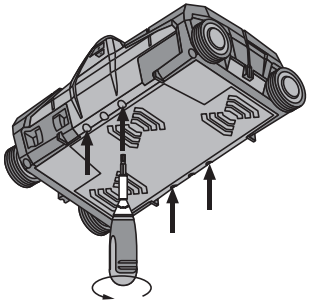

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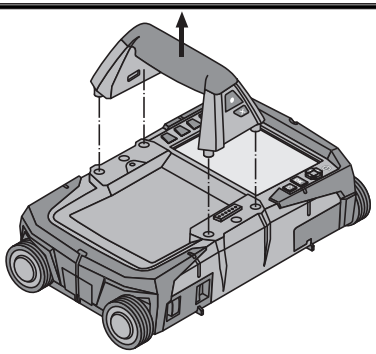

ORIGINAL OPERATING INSTRUCTIONS

PS 1000 x-scan

It is essential that the operating instructions are read before the tool is operated for the first time.

Always keep these operating instructions together with the tool.

Ensure that the operating instructions are with the tool when it is given to other persons.

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1 These numbers refer to the illustrations. You can find the illustrations at the beginning of the operating instructions.

Scanner 1

① Grip (removable)
② Wheels
③ Cancel button
④ Start/stop button

Buttons 2

⑤ Function buttons
⑥ On/off button
⑦ 4-way controller
⑧ Confirmation button (OK)
⑨ Home button

1 General information

1.1 Safety notices and their meaning

DANGER
Draws attention to imminent danger that will lead to serious bodily injury or fatality.

WARNING
Draws attention to a potentially dangerous situation that could lead to serious personal injury or fatality.

CAUTION
Draws attention to a potentially dangerous situation that could lead to slight personal injury or damage to the equipment or other property.

NOTE
Draws attention to an instruction or other useful information.

1.2 Explanation of the pictograms and other information

Warning signs

General warning

Obligation signs

Read the operating instructions before use.

2 Description

2.1 Use

The PS 1000 X-Scan is designed to locate objects in concrete structures.

2.2 Limitations of use

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The tool complies with the requirements of the directives and standards listed in section 8.

Prior to use of ground or wall-penetrating radar equipment, the user should check that there are no sensitive radio sites/systems in the near vicinity (airfields, radio astronomy sites, etc.). These sites may be operated by a service defined as such by the national authority responsible. If such sites are present in the vicinity of the location at which the tool is to be used, contact should be made with the operator of the site in order to reach agreement about use of the ground or wall-penetrating radar equipment before beginning scanning.

3 Safety instructions

3.1 General safety instructions

WARNING! **Read all safety instructions and other instructions.** Failure to follow safety instructions and other instructions may result in electric shock, fire and/or serious injury. **Retain all safety precautions and instructions for future reference. .**

a) **Operation of the tool in the proximity of military installations, airports or radio astronomy facilities is not permissible unless prior permission has been obtained.**
b) **Keep children away. Keep other persons away from the working area.**
c) **Check the display after switching the tool on.** The display should show the Hilti logo and the name of the tool. The disclaimer notice subsequently displayed must be accepted by the user before the main menu for the current project can be accessed.
d) **Operation of the tool in the proximity of persons with a cardiac pacemaker is not permissible.**
e) **Operation of the tool in the proximity of pregnant women is not permissible.**
f) Rapidly changing detection conditions may lead to inaccurate readings.
g) **Do not use the tool in the proximity of medical instruments and appliances.**
h) **Do not drill at positions where the device has located an object. Take the diameter of the drill bit into account and always allow an adequate safety factor.**
i) **The warnings shown in the display must always be observed.**
j) **Due to the scanning principle employed, the results of the scan may be negatively affected by certain ambient conditions. These include, e.g. proximity to appliances that generate powerful magnetic or electromagnetic fields, dampness, construction materials containing metal, aluminium foil-backed insulation, multiple layers, materials with cavities or electrically conductive wall coverings or tiles. Accordingly, other sources of information (e.g. plans of the building) should also be consulted before beginning drilling, sawing or grinding in the area scanned.**
k) **Take the influences of the surrounding area into account. Do not use the tool where there is a risk of fire or explosion.**
l) **Make sure that the display area can be easily read (e.g. do not touch the display area with the fingers, keep the display area clean).**
m) **Do not use the device if it is defective.** Contact Hilti Service.
n) **Keep the underside of the scanner and the wheels clean as these parts can have an influence on scanning accuracy. If necessary, clean the detection surface of the scanner with water or alcohol.**
o) **Always check how the tool is set before using it.**
p) **Always remove the battery pack before transporting the tool.**
q) **Store and transport the device safely. The permissible storage temperature range is -25°C to +63°C (-13°F to +145°F).**
r) **When the tool is brought into a warm environment from very cold conditions, or vice-versa, allow it to become acclimatized before use.**
s) **When accessories are to be used, check that they are fitted correctly before beginning use.**

3.2 Proper organization of the workplace

a) **Avoid unfavorable body positions when working from ladders. Make sure you work from a safe stance and stay in balance at all times.**
b) **Only use the tool within the defined limits.**
c) Observe the accident prevention regulations applicable in your country.
d) **Check the wheels periodically and, in particular, check that the wheel caps are fitted.** Missing wheel caps may cause incorrect measurement of the length of the path scanned. The correct length of the path scanned can be checked by using the reference grid.
e) **Check the settings and the parameters set each time before use.**
f) **Attach the reference grid securely and, when necessary, use the given corner positions of the grid to mark the corner points on the concrete surface.**

g) **Always use the wrist strap when working with the scanner.**

3.3 Electromagnetic compatibility

The device complies with the requirements of the directives and standards listed in the Declaration of Conformity section . Prior to planned use of ground or wall penetrating radar equipment, the user/operator should check that there are no sensitive radio sites/systems in the near vicinity (airfields, radio astronomy sites, etc.). These sites may be operated by a service defined as such by the national authority responsible. If such sites are present in the vicinity of the location at which the device is to be used, contact should be made with the operator of the site in order to reach agreement about use of the ground or wall-penetrating radar equipment before beginning scanning.

3.4 General safety precautions

a) **Check the condition of the tool before use. If the tool is found to be damaged, have it repaired at a Hilti Service Center.**
b) **Keep the device clean and dry at all times.**
c) **Do not apply stickers or adhesive labels / plates at the sensor area on the underside of the device.** Metal plates / labels, in particular, will affect scanning results.
d) **You must check the accuracy of the tool after it has been dropped or subjected to other mechanical stresses.**
e) **In conjunction with the PSA 70 extension, the PS 1000 X-Scan may be used only for floor scanning applications.** The extension system is not designed for scanning ceilings or walls.
f) **Although the tool is designed for the tough conditions of jobsite use, as with other measuring instruments it should be treated with care.**
g) **Although the tool is protected against the entry of moisture, it should be wiped dry before being put away in its transport container.**
h) **Do not open the casing or modify the device in any way.**
i) **Check the accuracy of the tool before using it to take measurements.**

3.5 Careful use of battery-powered tools or appliances

a) **Keep batteries out of reach of children.**
b) Remove the batteries from the tool if it is to remain unused for some time. The batteries will self-discharge and may begin to corrode if stored for a long period.
c) **Do not expose the battery to high temperatures or fire.** This may cause the battery to explode or release toxic substances.
d) **Do not use damaged batteries.**
e) Under abusive conditions, liquid may be ejected from the battery, **Avoid contact. If contact accidentally occurs, flush with water. In the event of the liquid coming into contact with the eyes, rinse the eyes with plenty of water and consult a doctor.** Liquid ejected from the battery may cause irritation or burns.
f) **Recharge only with the charger specified by the manufacturer.** A charger that is suitable for a certain type of battery may present a risk of fire when used with other types of battery.
g) **Observe the special guidelines applicable to the transport, storage and use of Li-ion batteries.**

4 Before use

4.1 Inserting the battery pack and switching the tool on 3

1. Fully charge the PSA 81 battery pack (please refer to the operating instructions for the PUA 81 mains adapter and PSA 81 battery pack).
2. Insert the charged battery pack.
3. Insert the PSA 95 SD memory card (supplied) in the tool. This feature is not available with the PS 1000-B.
   NOTE Always check that the tool is switched off before inserting the SD memory card.
   NOTE When an SD memory card is present in the tool, the scan data will be saved on the card. When no memory card is present, the scan data will be saved in the tool's internal memory.
4. Switch the tool on by pressing the on/off button.
   If outside the operating temperature range, error message no. 00012 is displayed and the tool switches off automatically. In this case, allow the tool to cool down or warm up and then switch it on.
5. You must accept the terms of the disclaimer notice displayed on the screen before the tool can be operated.
6. To switch off, press and hold the on / off button for 3 seconds.

4.2 Settings

When operating a brand new tool you will first be requested to select the country-specific settings.

1. Use the 4-way controller to select the desired language and confirm your choice by pressing the “OK” button.
2. Make further settings using the 4-way controller and the “OK” button.
3. Use the “OK” button to confirm the settings made.
   NOTE You can also use the “Skip” button to skip making these settings until the next time the tool is switched on.

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5 Operation

5.1 Displaying the operating instructions

1. Press the “Home” button for 5 seconds.
   The operating instructions will be shown in the right context in the display. You can then browse through the complete operating instructions.
2. The operating instructions can also be displayed from the settings menu by way of the “Help” function button.
3. To close the operating instructions, press the “Back” function button.

5.2 Basic functions

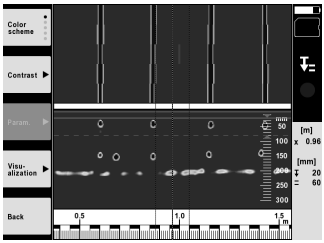
The function buttons can be used to select the available functions.

The 4-way controller can be used to shift the focus, change parameter values or, depending on the setting, shift the cross hairs or change the layer thickness/depth, etc.
The “OK” button can be used to select the object in focus or to start data processing.

5.3 Quickscan detection

This function is used to indicate the position of objects in a concrete structure directly, during the scan. Objects lying perpendicular to the scanning direction can be made visible in a plan view or cross-sectional view and their position then marked directly on the surface.

1. Switch the tool on or use the “Home” button to go to the main menu.
2. Select “Quickscan detection”.
3. Hold the scanner against the surface of the area to be scanned.
4. Start the scan by pressing the start/stop button.
   A beep indicates the start of the scan and a red recording mark appears in the display.
5. Move the scanner to the left or right (at least 32 cm) over the surface to be scanned and back along the same scanning path in order to locate concealed objects.
   Read the position of an object using the center line in the display and mark this point on the surface of the concrete at the upper marking notch between the wheels. Alternatively, use the broken lines to mark the position of an object along the corresponding edge at the side of the tool.
   Audible and visual warnings are emitted if the scanner is moved at a speed approaching the maximum permitted scanning speed. If the scanner is moved too quickly the scan will be canceled.



6. The “Color scheme”, “Contrast” and “Param.” buttons can be used to change the visualization and calculation parameters.
   NOTE The “Param.” values must be set before a scan is made (please refer to the operating instructions displayed by the tool).
7. The 4-way controller can be used to set the depth/thickness according to the position of the object.
8. End the scan by pressing the start/stop button.
   A double beep indicates that the scan has ended.

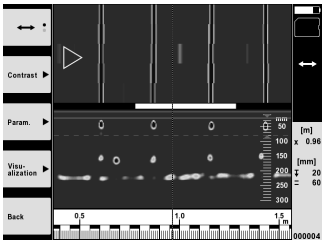
5.4 Quickscan recording

NOTE
This feature is not available with the PS 1000-B.

It can be used to scan a long path on a concrete structure. After ending the scan, objects that lie perpendicular to the scanning direction can be made visible in a plan view or cross-sectional view.

1. Select the “Quickscan recording” function from the main menu.
2. Set the scanning direction.
3. Hold the scanner against the surface of the area to be scanned.
4. Start the scan by pressing the start/stop button.
   A beep indicates the start of the scan and a red recording mark appears in the display. A minimum length of 32 cm must be scanned in order to obtain data suitable for evaluation. The red bar showing scanning progress turns black when the minimum length is reached. The maximum length of scan is 10 m.
5. Move the scanner in the direction you have previously set.
   Audible and visual warnings are emitted if the scanner is moved at a speed approaching the maximum permitted scanning speed. If the scanner is moved too quickly, the scan will be canceled and the data not saved.

   Do not change the scanning direction. If the scanner is moved more than 16 cm in the opposite direction, the scan will be canceled automatically.
6. End the scan by pressing the start/stop button.
   A double beep indicates that the scan has ended.



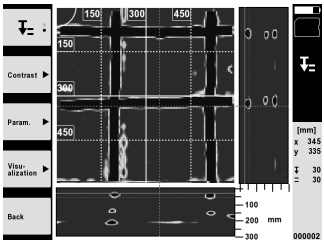
7. Use the “Preview last scan” function to check the last scan. Use the function button at top left to select the function to be controlled by the 4-way controller. The 4-way controller can be used to set the depth/thickness according to the position of the object.
   NOTE The “Contrast”, “Param.” and “Visualization” buttons can be used to change the visualization and calculation parameters. If you change the parameters under “Param.”, the data must be recalculated. To do this, press the “OK” button.

5.5 Imagescan 4

The Imagescan function creates an image of the objects present in an area of a concrete structure. The objects are shown in a plan view and a cross-sectional view.

1. First use Quickscan detection in order to determine how the objects are oriented (see Section 5.3).
2. Place the reference grid on the surface to be scanned at right angles to the direction in which the objects are oriented and secure it with the adhesive tape.
   NOTE The distances indicated by the scanner display and by the reference grid will correspond only when the reference grid remains flat and taught and is securely attached to the surface.
3. Select “Imagescan” from the main menu.
4. Select the grid size (possible only with the PS 1000) and the starting point.
5. Hold the scanner against the surface of the area to be examined, at the starting point and in line with the grid.

6. Start the scan by pressing the start/stop button.
   A beep indicates the start of the scan and a red recording mark appears in the display. A double beep indicates the end of the path to be scanned.
   The scan ends automatically at the end of each path.
7. Move the scanner over the area to be examined along the paths indicated by the reference grid. Scan all paths.
   Audible and visual warnings are emitted if the scanner is moved at a speed approaching the maximum permitted scanning speed. If the scanner is moved too quickly, the scan along this path will be canceled and must be repeated.
   Scanning progress is indicated by a bar in the display. The red bar showing scanning progress turns black when the minimum length is reached.
8. To discard the previously scanned path, press the “Cancel” button.
   A new scan can then be started.
9. After the last path has been scanned, the result is displayed immediately for checking and evaluation.



10. The “Contrast”, “Param.” and “Visualization” buttons can be used to change the visualization and calculation parameters. If the parameters are changed, the data must be recalculated. To do this, press the “OK” button.

5.6 Projects

This function can be used to manage projects and to display and evaluate recorded scans:

1. Select “Projects” from the main menu.
2. Select the desired project. The active project can be identified by its “dog ear” at top right.
   The data from the next scan will be saved under this active project.
3. Select the desired scan.
   The scan is displayed and can be re-evaluated.

5.7 Data transfer

NOTE
This feature is not available with the PS 1000-B.

The scan data can be transferred to the PSA 100 monitor using the PSA 50/51 data transfer cable or directly to a PC using the PSA 95 SD memory card and PSA 96 adapter.
When the SD memory card is used to transfer scan data, always check to ensure that the PS 1000 is switched off before removing the card.
Data may otherwise be lost.

5.8 Removing the grip 5 6

The height of the PS 1000 X-Scan may prevent access to the surface to be scanned in certain situations where obstructions are present. To allow scanning to be carried out in such situations the grip can be removed.

Release the screws on the underside of the tool and then lift the grip upwards, away from the tool.

6 Settings

6.1 You can adjust the following:

- Brightness
- Volume level
- Date / time
- Energy modes
- Country settings

NOTE
Press the “Help” function button to display the complete operating instructions.

7 Disposal

WARNING
Improper disposal of the equipment may have serious 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.

Most of the materials from which Hilti tools or appliances are manufactured can be recycled. The materials must be correctly separated before they can be recycled. In many countries, Hilti has already made arrangements for taking back old tools or appliances for recycling. Ask Hilti Customer Service or your Hilti representative for further information.

For EC countries only

Do not dispose of electronic measuring tools or appliances together with household waste.

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

Dispose of the battery in accordance with national regulations.

8 EC declaration of conformity (original)

Designation:	X-Scan
Type:	PS 1000
Generation:	01
Year of design:	2010

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We declare, on our sole responsibility, that this product complies with the following directives and standards: until 19th April 2016: 2004/108/EC, from 20th April 2016: 2014/30/EU, 2011/65/EU, 2006/66/EC, 1999/5/EC, EN ISO 12100, EN 302066-1 V1.2.1, EN 302066-2 V1.2.1.

Hilti Corporation, Feldkircherstrasse 100, FL-9494 Schaan

Paolo Luccini
Head of BA Quality and Process Management
Business Area Electric Tools & Accessories
06/2015

Edward Przybylowicz
Head of BU Measuring Systems
BU Measuring Systems
06/2015

Technical documentation filed at:

Hilti Entwicklungsgesellschaft mbH
Zulassung Elektrowerkzeuge
Hiltistrasse 6
86916 Kaufering
Deutschland

Hilti Corporation
LI-9494 Schaan
Tel.: +423 / 234 21 11
Fax: +423 / 234 29 65
www.hilti.com

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