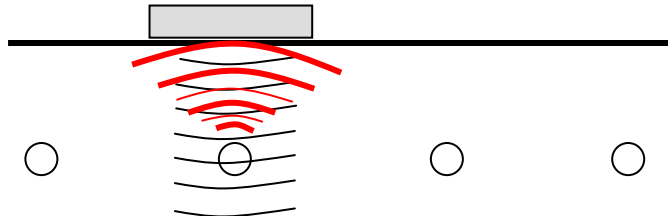


1. What is GPR? How does it work?

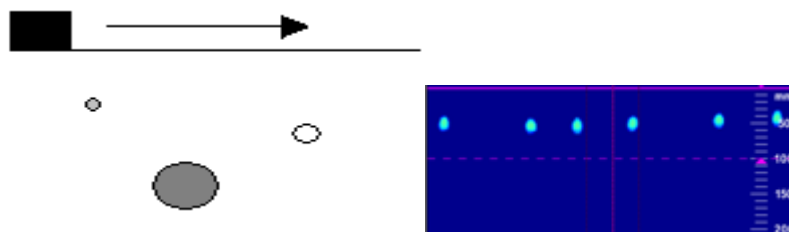
[up](#)

GPR (Ground Penetrating Radar) is a radar-based technology that uses antennas to transmit and receive pulses of electromagnetic energy through a medium such as the ground or concrete. As the radar receives the transmitted pulses it registers "echoes" from objects based on their different electromagnetic conductivity.

A simple illustration of the principle is shown below.



When the Hilti PS 1000 X-Scan is moved along a concrete surface, electromagnetic waves are reflected from objects beneath this surface. These objects are indicated immediately on the display.



This technology can be used to scan various types of materials such as ice, rock, soil, asphalt or concrete depending on the transmission frequency. This makes the technology suitable for use in fields such as geology, archaeology, mining, military applications, security and concrete inspection.

The Hilti PS 1000 is designed to be used for concrete inspection only.

2. Do GPR emissions present a health hazard?

[up](#)

GPR emissions do not present a health hazard to the operator or persons nearby. The system should not be used, however, by persons with a heart pacemaker or by pregnant women.

3. Which objects can the Hilti PS 1000 X-Scan detect?

[up](#)

The Hilti PS 1000 X-Scan can detect all kinds of metal objects (such as rebar, tendon cables, copper or aluminium pipes, etc.) and non-metal objects (such as wood, air cavities, plastic, electrical conduits, glass-fiber cables, etc.) embedded in concrete. It can also detect objects in multiple layers, depending on the condition of the concrete, rebar mesh spacing, object size and depth. It can also indicate slab thickness.

4. Which scanning mode should be used?

[up](#)

The scanning mode should be selected according to the needs of the application. Quickscan, on the one hand, consists of a single-axis real-time scan that can find embedded objects in order to mark them directly on the wall, floor or ceiling. It could also be described as a fast-check scan that provides a cross-sectional view. If longer scan lines need to be recorded for later analysis and documentation Quickscan Recording is recommended. Imagescan mode, on the other hand, is used to analyze a certain section or area of a wall, floor or ceiling. It provides more detailed information about the situation of the embedded objects in a top view and cross-sectional view in 2D and 3D images generated from the data.

5. How many layers can be seen with Hilti PS 1000 X-Scan?

[up](#)

The Hilti PS 1000 X-Scan can detect multiple layers of objects embedded in concrete. Depth measurement performance and layer detection ability, however, is affected by certain limiting factors. These include concrete permittivity or density, rebar spacing, the material from which the embedded objects are made, and their depth and size.

6. Can the Hilti PS 1000 X-Scan locate electrical conduits and clearly identify them? [up](#)

Yes, the tool can locate electrical conduits (PVC or metal), but it cannot identify the material class. Only the object layout, approximate depth, geometry and position of the conduit can be identified. The Hilti PS 1000 X-Scan has been designed to locate objects, not to identify object class (material).

7. What can be done to improve performance on rough surfaces? [up](#)

Since a rough surface causes interference signals and reduces the performance of the tool, it is recommended that a thin board, plastic sheeting or thin polystyrene foam sheet is first placed on the surface to be scanned. Please remember, however, that the thickness of this surface overlay must be taken into account when evaluating the scan.

8. Can the Hilti PS 1000 X-Scan be used on final flooring (hard wood, PVC, tiles)? [up](#)

The Hilti PS 1000 X-Scan can be used on final flooring but the results obtained when scanning over tiles may not be satisfactory or the depth range achieved may not be adequate. Tiles often contain quartz which may cause some interference with radar waves. Plastic sheeting in insulating layers, metal shields in flooring systems and air layers in multi-layer structures may result in similar limitations.

9. Can the Hilti PS 1000 X-Scan be used through plasterwork, insulation layers, etc? [up](#)

The Hilti PS 1000 X-Scan can be used through surfaces of this kind but its performance will be reduced accordingly. It is designed to be used directly on concrete surfaces and any additional layer over the concrete, metal layers or air gaps between layers will negatively affect its performance.

10. Is use of the Hilti PS 1000 X-Scan permitted in power plants, airports and hospitals? [up](#)

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.