

Raptor GPR

3D Multi-array radar



The need to survey larger areas and apply 3D processing and visualization techniques has led to the development of advanced GPR systems that include multiple GPR antennas connected to form a GPR array.

The **ImpulseRadar Raptor** solution contains several individual antenna elements (transmitters and receivers) that are arranged to form multiple measurement channels operating simultaneously and in close proximity to each other.

Although the Raptor system may seem more complex than a standard GPR system, the following interpretation is significantly simpler. 3D processes produce photo-like images, greatly simplifying otherwise tedious interpretation work. It becomes a very intuitive process.

A GPR array collects far more data in one pass compared to a typical GPR system. But since the Raptor system is also based on real-time technology, surveys along each line are equally fast. As a result, surveying large areas can be done more quickly and efficiently. Routine applications now include utility mapping, archaeological surveys and artifact mapping, road surveys, bridge deck investigations, and more.

Raptor – High-speed 3D Radar Array

Raptor is a cutting-edge high-speed 3D-GPR array that enables very fast collection of 3D GPR data, at speeds exceeding 130 km/h, with intervals of 5 cm.

Raptor is the most advanced GPR-Array solution on the market.

- Enhances performance and improves workflows
- Efficient subsurface mapping: Designed with simplicity in mind, Raptor will help you achieve maximum productivity and optimal results.
- Flexibility: It consists of separable transmitters and receivers that a user can configure for an arbitrary number of channels and for different applications.

Available Antennas



Raptor-45

- Frequency: Raptor-45 has a central frequency of 450 MHz.
- Applications: Arrays configured with Raptor 45 units are suitable for utility mapping, archaeological surveys, and railway investigations, among other applications.

Raptor-80

- Frequency: Raptor-80 has a central frequency of 800 MHz
- Applications: Suitable for applications requiring higher resolutions, roadbed layers, concrete scanning, etc.

Raptor GPR System Options and Flexibility

The system is modular and expandable. Operators can choose the number of receivers/transmitters they need for their application and can build their own antennas using the necessary number of Tx/Rx modules for the survey.

Two configurations are available:

- A pushcart that fits an 8-channel GPR array
- A vehicle mount that accommodates 18 channels (Raptor-45 antennas).

Pushcart – Up to 8 channels (Raptor-45 antennas)

Designed to be manually pushed, it allows up to 8 channels to be arranged with a total width of 0.9 m. The handlebar is fully foldable to reduce the physical footprint, making transport and storage much more efficient. The entire unit can be easily transported in the trunk of a standard family car/station wagon. The new high-capacity rechargeable battery provides up to ten hours of continuous operation.

Easy Installation Kit

This solution increases the flexibility of the Raptor 3D GPR array system by allowing quicker reconfiguration between the Raptor pushcart and vehicle mounts.

- Quickly modify configurations to suit site conditions and survey requirements
- Adapt to a wider range of projects
- Reduce survey times thanks to increased productivity

Software

Condor 3D GPR Processing and Interpretation Software

Condor is a modern processing, visualization, and interpretation software for efficient management of Raptor 3D GPR array data.

The data manager enables practical and intuitive organization of information. The user has full control over views and outputs during various processing stages, while the layer manager offers the same for interpretation procedures.

Talon-2 Data Acquisition and Control Software

The modular plug-and-play design simplifies the configuration of any number of channels from a minimum of 4 to a maximum of 30 or user-defined custom solutions. This allows the customization of the array arrangement and vehicle solution to meet your specific needs. Talon acquisition and control software provides an easy yet effective way to manage data collection quality and external positioning data.

ViewR: Windows-based Viewing Software

ImpuseRadar ViewR is a new Windows-based utility software that allows users to quickly and easily open and view Raptor data files in an interpolated top-view format without importing them into Condor (3D GPR Processing & Interpretation Software).

The ability to review a Raptor project in this way allows you to verify the quality and integrity of your project's data while still on site. This approach enables you to identify potential issues with critical positioning data quality before leaving the project site, possibly saving expensive return visits or rework.

Technical features:

ImpulseRadar Raptor-45

Antenna

Technology	ImpulseRadar real-time sampling
Antenna type	Raptor
Centre frequency	450 Mhz
Signal to noise ratio (SNR)	>100 dB
Significant/useful number of bits	>16 bit
Scans/second	>800
Survey speed	> 130 km/h @ 5 cm point interval
Data acquisition rate	160 MHz
Time window	166 ns (18-channels)
Bandwidth	>120%, fractional, -10 dB
Acquisition mode	Wheel, time or manual
Positioning	Wheel encoder, internal DGPS, external GPS, Total-station
GPS support	Integrated support for GPS (int./ext.), NMEA 0183 protocol
Data time-tagging	To 1ms of \GPS-time
Power supply	12 V Li-Ion rechargeable battery, or ext. 12 V DC source
Power consumption	0.5 A per channel
Operating time	10 hours (8-channel with 50 Ah battery)
Dimensions	230 x 165 x 160 mm (Antenna only)
Weight	2.1 kg (Antenna only)
Operating temperature	-20° A +50°c
Environmental	IP65
Regulatory certification	FCC, CE

User Interface, Laptop PC (min. requirements)

Display	10"backlit, sun-readable
Operating system	Windows 10 or later
Processor	>1 GHz, 64-bit (x64)
Memory	>2 GB RAM (64-bit)
Storage	>20 GB (64-bit)
Graphics	DirectX 9 graphics device with > WDDM 1.0 driver
Communications interface	Ethernet 1 GB
Recommendation	Panasonic Tough Book FZ G1 (or equivalent)

Carrier Solutions Cart (up to 8-channels)

Dimensions in-folded (4-wheel solution)	92 x 102 x 45 cm
Scan width (swathe)	60 cm
Weight	56 Kg

Software

Talon-2 3D Data Acquisition software: *

- Quick and easy configuration and start-up
- Positioning configuration and device sync monitoring
- Visualization of radargram for each channel
- Data merge, storage and export

Condor 3D GPR Processing & Interpretation Software *

- OspreyView (application of a novel method of visualizing 3D-GPR data)
- Effective workflows
- Efficient sub-surface imaging

* For other specifications, please refer to the attached documentation (Download area).

Accessori:

Raptor-45 / 8 channels with Push Cart standard configuration, includes:

- N.1 Antenna Raptor-45Rx Master
- N.3 Antenna Raptor-45Rx
- N.5 Antenna Raptor-45Tx
- N.1 Switch & power box 16Tx/15Rx/1pc
- N.1 Raptor Push Cart v2 4-wheel
- N.1 Plastic sheet Raptor 45 Assembled (AC00083)
- N.10 Tx trig coax cable RG58 24cm
- N.9 power/ethernet cable 8pin 36cm -red
- N.3 Rx Sync cable 8pin 20cm Green CAT cable - Yellow
- N.2 Sync/end connector - Yellow
- N.1 External GPS cable 2m - blue
- N.1 RAM Mount X-grip 12" tablet holder complete
- N.1 GPS-unit for improved positioning/timing
- N.1 PC to switch cable M12xcode to RJ45 - 200cm USB-Drive 16GB - Condor, Talon, CrossPoint and Manual
- N.1 Condor - New Subscription 12 months with Raptor order
- N.1 GPS mounting kit for Cart
- N.1 Raptor Push Cart Battery Kit

