

**SENSORS & SOFTWARE®**  
from RADIODETECTION



**NOGGIN®**

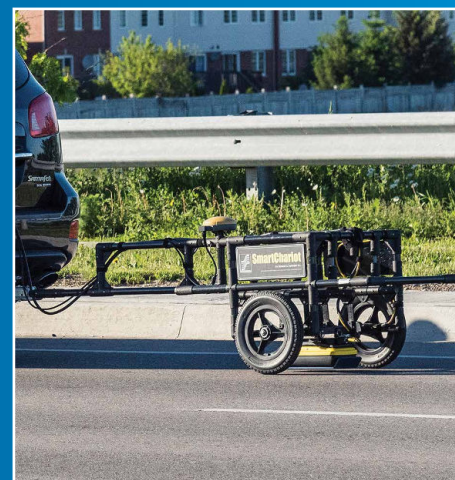
# Adaptable, High-performance GPR

Are you a GPR professional who performs multiple surveys daily?

Need a flexible GPR system for many applications in varied terrains?

Do you need to scan large areas efficiently?

If so, Noggin is the GPR for you!



**SPX**  
TECHNOLOGIES

# NOGGINs provide optimal flexibility and performance

## 5 Sensors

## 5 Configurations

HIGHER RESOLUTION

DEEPER PENETRATION

1000



### SmartCart®

Durable, 4-wheeled, folding cart; provides rapid data collection in open areas.



500



### SmartTow™

Light, compact hand-tow configuration; traverse rough or difficult terrain.



250



### SmartSled™

Hand or vehicle tow over rough terrain or survey large areas quickly.



100



### SmartChariot™

Rugged, vehicle hitch-mounted; rapidly survey large, flat areas such as roads, parking lots and golf courses.



Ultra 100



### SmartHandle™

Versatile, compact handle; operates on vertical or overhead surfaces and in confined spaces.

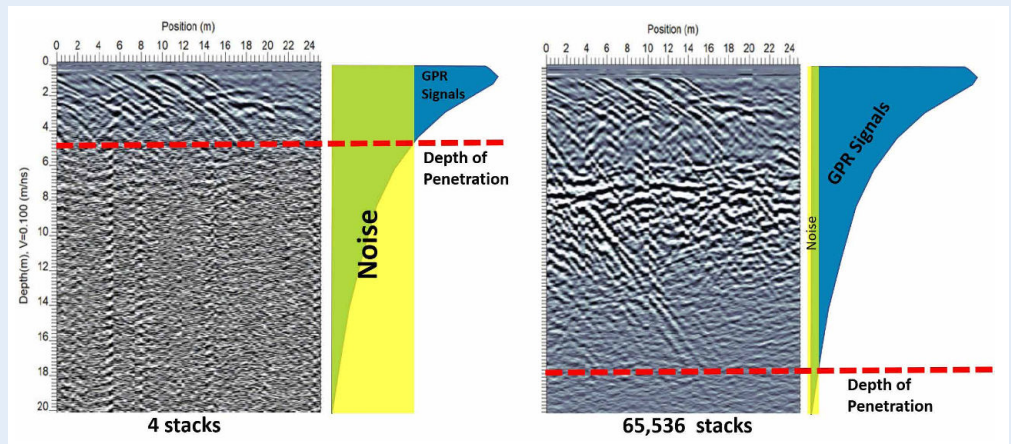


Use your Noggin system to expand your business into new markets. Easily add another frequency, a new configuration or accessories to your existing Noggin system and your subsurface investigation opportunities are limitless.

Choose the **NOGGIN** and configuration that is right for you. Or mix and match.

	Applications	SmartCart	SmartTow	SmartSled	SmartChariot	SmartHandle
1000	<ul style="list-style-type: none"> <li>Pavement</li> <li>Bridge deck</li> <li>Concrete assessment</li> </ul>					
500	<ul style="list-style-type: none"> <li>Archaeology</li> <li>Forensics</li> <li>Ice/snow</li> </ul>					
250	<ul style="list-style-type: none"> <li>SUM/SUE</li> <li>Underground storage tanks (UST)</li> <li>Drainage systems</li> </ul>					N/A
100	<ul style="list-style-type: none"> <li>Geologic mapping</li> <li>Geotechnical applications</li> </ul>			N/A	N/A	N/A
Ultra 100	<ul style="list-style-type: none"> <li>Deep Geologic mapping</li> <li>Deep Geotechnical applications</li> </ul>			N/A	N/A	N/A

The **NOGGIN Ultra 100** system stacks (averages) the GPR data up to 65,536 times, increasing the signal-to-noise ratio and suppressing random, background noise. This results in the detection of weaker GPR signals from greater depths.



# NOGGIN Field-proven solutions across many applications

Noggin GPRs are trusted by leading researchers to provide high quality data in countless subsurface applications, even in the most demanding conditions worldwide – from the Arctic to the Sahara desert.

## Archaeology & Cemeteries



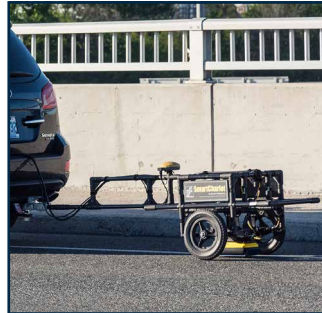
- Search for artifacts and tombs
- Locate foundations of ancient structures
- Find graves and burials

## Subsurface Utility Engineering



- Detect metallic and non-metallic pipes and cable
- Locate abandoned infrastructure and buried structures

## Concrete & Pavement



- Assess the interior of concrete for deterioration
- Measure pavement layering
- Prioritize infrastructure maintenance

## Geotechnical & Environmental



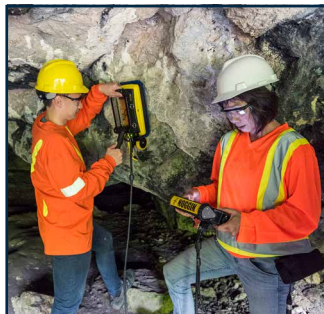
- Map depth to bedrock and geological stratigraphy
- Locate underground storage tanks (UST)
- Detect sinkholes
- Conduct bathymetry and sub-bottom profiling

## Forensics & Military



- Find buried caches of drugs, money and weapons
- Locate clandestine graves and tunnels
- Detect landmines, UXO and buried IEDs

## Mining & Quarrying



- Improve mine safety practices
- Guide resource development
- Locate fractures, faults and joints

## Agriculture & Forestry



- Map drainage tile
- Characterize soil conditions in crop-growing areas
- Map tree roots
- Evaluate water content
- Conduct biomass assessment

## Ice & Snow



- Measure snow and ice thickness
- Detect crevasses
- Survey glaciers and ice sheets

# NOGGIN – Powerful yet simple data collection



High visibility touch screen display unit

Free lifetime system software updates

User selectable languages

US Standard and Metric units



On-site Reports

Produce instant reports from your display unit in the field



USB

USB for easy data transfer



Integrated GPS

Integrated GPS receiver for geo-referencing data



Optional External GPS

For high accuracy positioning and mapping



Wi-Fi

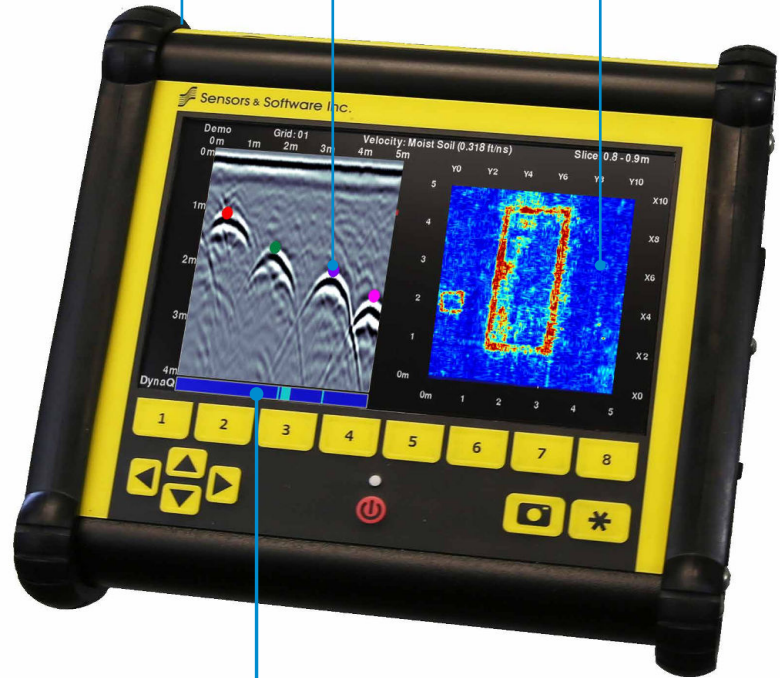
Built-in Wi-Fi capability

Color Field Interpretations

Mark targets at depth with the touch of a finger

In-Field Depth Slicing

Flexible grid collection with immediate results



## DynaQ® – Dynamic Stacking

Don't waste a nanosecond! For odometer-based data collection, DynaQ increases data quality by stacking (averaging). You always collect the highest quality data for your survey speed.

Up to 2048 stacks for NOGGIN 100/250/500/1000.

Up to 65,536 stacks for NOGGIN Ultra 100.

Number of stacks	Colour Code
0	White
1-3	Yellow
4-7	Blue
8-511	Dark Blue
512-2049	Purple
2050-8191	Light Green
8192-65536	Dark Green

Higher quality



## NOGGIN Data Collection Trigger Options:



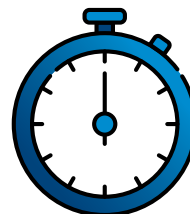
Odometer

User sets distance interval between data traces



Free run – Speed

User sets distance interval between data traces and towing speed



Free run – Time

User sets time interval between data traces



Manual Button Press

User collects data traces when desired

# NOGGIN Configuration features

GPS  
for geo-referencing data

Foldable cart  
for easy transport

12 Volt battery  
in case



## SmartCart

Fiberglass  
to eliminate signal  
interference

Interchangeable  
brackets  
allow any Noggin  
sensor to be attached

Optical odometer  
for precise positioning

SmartSled cover  
to protect equipment from dust,  
debris and water

Optical odometer  
for precise positioning

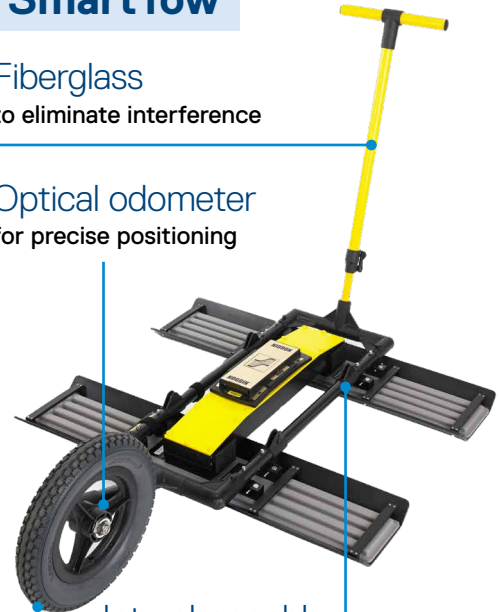


Tow hitch  
for use on any vehicle:  
truck, ATV's, tractors,  
golf carts, snowmobiles

## SmartTow

Fiberglass  
to eliminate interference

Optical odometer  
for precise positioning



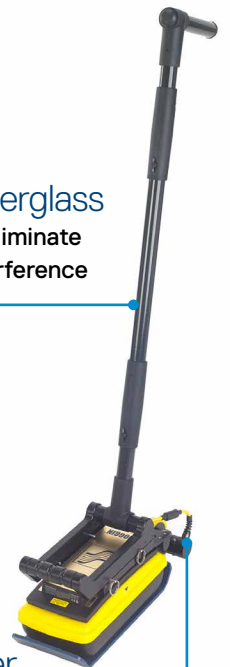
Interchangeable  
brackets  
allow any Noggin  
sensor to be attached

Rugged treaded tire  
for challenging terrains

## SmartHandle

Tow hitch  
for any vehicle

Fiberglass  
to eliminate  
interference

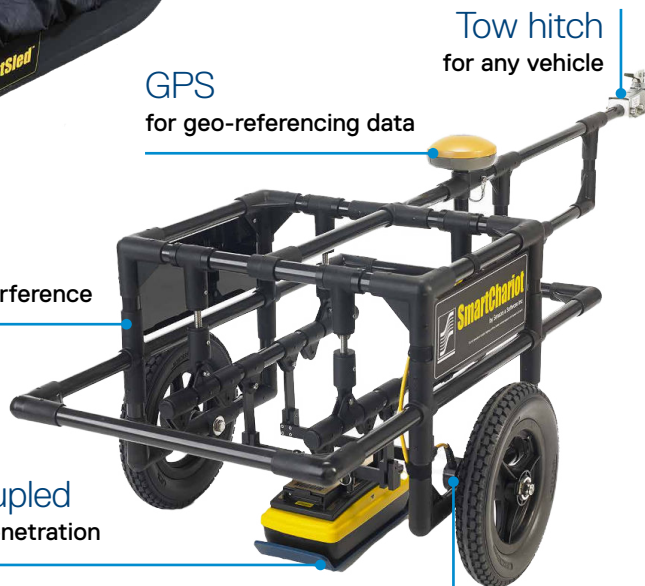


## SmartSled

Rugged treaded tire  
for challenging terrains

Fiberglass  
to eliminate interference

Ground Coupled  
for maximum penetration

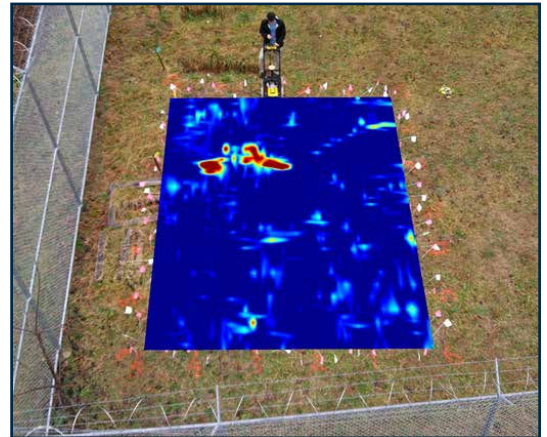
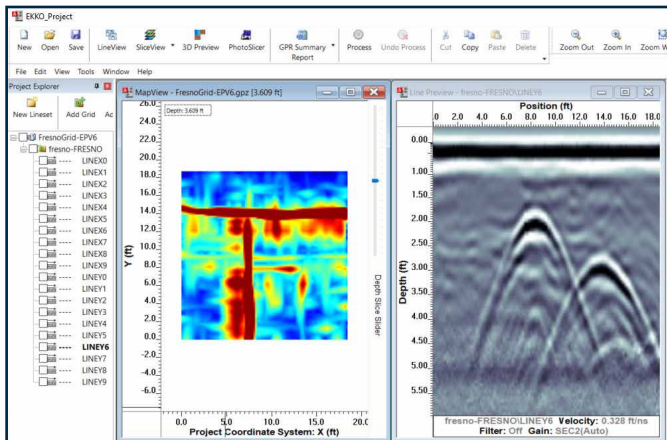


## SmartChariot

Optical odometer  
for precise positioning

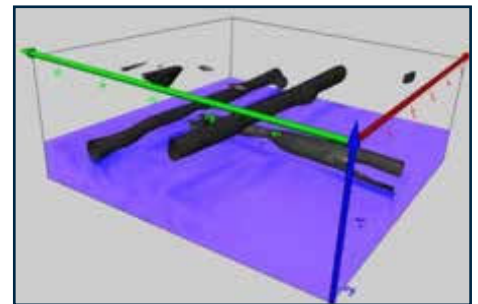
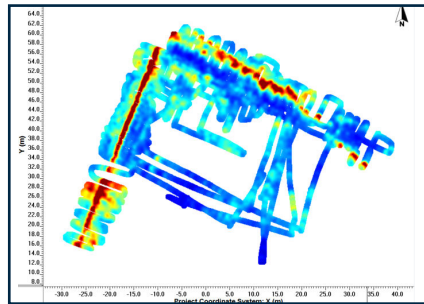
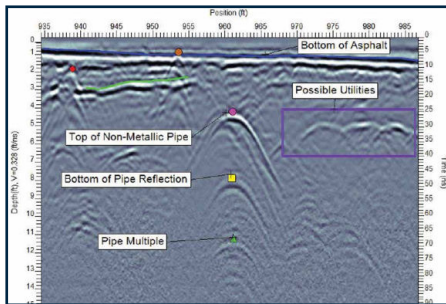
# EKKO\_Project™ Software

Visualize, Understand and Report your GPR results with the optional EKKO\_Project PC Software.



## Core

Organize your GPR data, photos and other files and save as a single project file. Easily create PDF reports of your findings.



Examine (Cross-sections)

Reveal (Depth Slices)

3D Reveal (3D Visualization)

## Specifications – Hardware

Specifications	Noggin Ultra 100	Noggin 100	Noggin 250	Noggin 500	Noggin 1000
Size	91 x 76 x 17 cm (36 x 30 x 6.5 in)	91 x 76 x 17 cm (36 x 30 x 6.5 in)	63 x 41 x 23 cm (25 x 16 x 9 in)	38 x 23 x 15 cm (15 x 9 x 6 in)	30 x 15 x 11 cm (12 x 6 x 4.5 in)
Weight	9.5 kg (21 lbs)	9.5 kg (21 lbs)	7.5 kg (12.5 lbs)	3 kg (6.5 lbs)	2.3 kg (5 lbs)
Center Frequency	100 MHz	100 MHz	250 MHz	500 MHz	1000 MHz
-3dB Bandwidth	50 - 150 MHz	50 - 150 MHz	125 - 375 MHz	250 - 750 MHz	500 - 1500 MHz
Max.Time Window	8000 ns @ 0.5 ns/pt	4000 ns @ 0.8 ns/pt	2000 ns @ 0.4 ns/pt	1000 ns @ 0.2 ns/pt	500 ns @ 0.1 ns/pt
Max. Depth Setting	200 m (656 ft)	200 m (656 ft)	100 m (328 ft)	50 m (164 ft)	25 m (82 ft)
Max. Stacks	65,536	2048	2048	2048	2048
Data output	32-bit	16-bit	16-bit	16-bit	16-bit
Max. points/trace	5,000				
Power	8 watts 12V @ 0.6A DC				
Performance factor	160 dB + 10 log <sub>10</sub> stacks eg: for 193 dB for 2048 stacks				
Acquisition Rate	100,000 samples/second				
Operating Temp.	-50 to +50°C, Environmental IP65				
Emission Regulations	Noggins comply with the Industry Canada (IC), United States Federal Communications Commission (FCC), and European Technical Standards Institute (ETSI) Regulations for ultra-wide bandwidth (UWB) devices.				

## Our Mission

Provide best in class equipment and solutions, to prevent damage to critical infrastructure, manage assets and protect lives.

## Our Vision

To be the world's leader in the management of critical infrastructure and utilities.

## Our Locations



### USA

Raymond, ME  
Kearneysville, WV

### Canada

Mississauga, ON



### Europe

United Kingdom **HQ**  
France  
Germany  
The Netherlands



### Asia Pacific

India  
China  
Hong Kong  
Indonesia  
Australia

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