

## GPR Systems for

## Concrete \& Utility Applications

## AN IMPACT IN EVERY CORNER OF THE GLOBE



GSSI is an internationally respected corporation known for our technological advancements in the geophysical, archaeological, forensics, infrastructure, public
$\qquad$ works and transportation industries. We serve our clients with technical expertise, unsurpassed customer support and training facilities, and superior products.

## OUR MARKETS

GSSI products are distributed through a series of application specialists and representatives worldwide to five primary markets: concrete inspection, utility mapping and locating, road and bridge deck evaluation, geophysics and archaeology. We also serve many specialty markets including autonomous vehicles, tree assessment, golf course management, environmental assessment, and ice and snow investigation, to name a few.

# TRAINING IS A BIG PART OF WHAT WE DO HERE AT GSSI 

## OUR APPROACH

Serious professionals know that proper training on the equipment and in the application area is key to long-term success and the avoidance of costly claims. Our professional trainers provide exceptional instruction because you deserve the best.

## OUR FACILITIES

With more than 465 sq. m (5,000 sq. ft.) of dedicated training space at our HQ, and a training location in Nevada, our trainers hold more than 120 classes a year. Our HQ facilities include two classrooms, a specialized concrete forms room, and a first-in-the-industry 70.6 sq. m ( 760 sq. ft.) indoor utility pit. We bring real-world conditions into a safe learning environment.

Training in Antarctica


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## THE PROFESSIONAL SCANNER 'S CHOICE

The StructureScan TM $_{T M}$ Mini XT is the tool designed for today's professional concrete scanner and built to handle all your job site and survey needs. This rugged system is designed with an integrated display for single operator data collection and interpretation. Reduce safety risks, financial exposure, costly delays and provide the full-range of services to your customers by adding this concrete scanner to your toolbox.

## The Mini XT Advantage

The StructureScan Mini XT is ideal for concrete inspection and evaluation. Easily and accurately locate the position and depth of metallic and non-metallic objects in concrete structures, including rebar, conduit, post-tension cables, pan decking, voids and service utilities.


| MAX DEPTH | ANTENNA |
| :---: | :---: |
| 60 cm (24 inches) | FREQUENCY <br> 2700 MHz |
| WEIGHT | STORAGE CAPACITY <br> 1.8 kg (4 pounds) |
| OPTIONAL | ACCESSORIES |

Palm XT Antenna, LineTrac XT, StructureScan Mini

Extension Pole

## STRUCTURESCAN MINI XT FEATURES

## Enhanced Target Visualization

The StructureScan Mini XT provides excellent near-surface resolution while also maintaining the ability to see deeper targets. The Mini XT provides multiple modes for data collection and interpretation:

Scan EZ: With the press of just one button, this mode provides the ideal amount of information with 2D data views for efficient mark-and-go surveys

Scan Max: Focus mode is designed to simplify the data to better highlight embedments, locate voids and see closely spaced targets

Scan 3D: 3D visualization is often used in complicated structural scenarios where the survey area may contain multiple levels of targets. This mode helps the user visualize congested areas and non-linear targets

## Increase Job Site Efficiency with Mini XT Kit

Today's professional scanners need a variety of tools to conquer all job site obstacles. For large survey areas the extension pole allows for better ergonomics and ease of use. Using the Mini XT harness and Palm XT antenna together allows the user to collect data with one-hand operation ensuring you maintain three points of contact to comply with OSHA regulations.

## TYPICAL USES

Find Rebar, Post Tension, Conduits, and Non-metallic Objects

Measure Slab Thickness and Void Location

Concrete Scanning and Imaging

Condition Assessment

Structure Inspection

FCC, RSS-220 and CE Certified

## ACCESSORIES

## 2300 MHz - Palm XT Antenna

Palm XT gives users the ability to scan tightly spaced areas and between obstacles. The survey wheel orientation can quickly be rotated between three positions for increased survey flexibility. This feature also makes it simple to switch between standard and cross
 polarized data collection.

- Cross Polarization scanning can reduce the top layer of mesh from view and assist with material discrimination
- Full keypad control via the antenna top provides remote control of the user interface



## LineTrac XT

LineTrac XT adds the ability to detect AC power present in conduits. This accessory detects low amplitude AC signals associated with difficult to locate conduits.

- Seamless fusion with GPR data
- Aids in target discrimination
- Detection at $50 / 60 \mathrm{~Hz}$
- Rugged, IP65 rated enclosure


## IDENTIFY STRUCTURAL FEATURES

Data Example：Data was collected with the Mini XT on a large concrete wall of a flood control system．Data shows multiple layers of rebar．Long flat reflector（GREEN LINE）is due to the system running on top of the longitudinal rebar．BLUE BOX indicates the back side of wall．


## DETECTING BOTTOM OF SLAB

Data Example: Data was collected using Mini $X T$ with the Palm $X T$ antenna and shows wire mesh (RED DOTS) with 15 cm ( 6 in ) spacing over pandecking (BLUE LINE).


## ENHANCED VISUALIZATION: CROSS POLARIZATION

Data Example: The two sections of data below were collected with Mini XT and Palm XT antenna over the same area and in the same direction. Data shows a top layer of heavy wire mesh with multiple cascading plastic and steel targets. Data on left was collected using cross polarization method and shows a series of targets (BLUE DOTS) that are not clearly visible using the normal data collection method (right).


## ENHANCED VISUALIZATION: Focus mode

Data Example: Data collected with Mini XT and Palm XT antenna showing multiple layers of structural steel. Focus mode function allows user to simultaneously view raw and focus data using the slider bar.


## 3D DATA WITH VIRTUAL BOREHOLE FEATURE

Data Example: 3D data set collected with Mini $X T$ and Palm $X T$ antenna showing structural support within a wall in a parking garage. This data is visible on the Mini XT screen after the 3D grid has been compiled. The size of the Borehole feature is user-selectable after the grid is complete.


## MINI XT ACCESSORY: LINETRAC XT

Data Example: Data was collected using the Mini XT with the LineTrac XT accessory. Crosshair cursor highlights a shallow conduit carrying 3 amps of current at 60 Hz .
BLUE LINE at the bottom of the data represents the measured response from the powered conduit.



## PREMIUM FEATURES, ENTRY-LEVEL PRICE

The StructureScan TM Mini LXT is designed and built for the concrete contractor who needs to locate and mark targets. This rugged, handheld system is ideal for locating the position and depth of metallic and non-metallic objects in concrete structures including rebar, conduit, post-tension cables, voids and service utilities. The Mini LXT helps to reduce safety risks, financial exposure, and costly delays in concrete renovations.

## The Mini LXT Advantage

The StructureScan Mini LXT is the newest addition to our family of concrete inspection GPR systems and offers a high-resolution antenna with superior target resolution and can reach up to 60 cm (24 inches) of depth.


| MAX DEPTH | ANTENNA <br> FREQUENCY |
| :---: | :---: |
| $60 \mathrm{~cm}(24$ inches) | 2700 MHz |
| WEIGHT | STORAGE CAPACITY |
| $1.8 \mathrm{~kg}(4$ pounds) | 14.5 GB |
| OPTIONAL |  |
| SOFTWARE |  |
| RADAN 7 for |  |
| StructureScan Mini |  |$\quad$ ACCESSORIES | Extension Pole |
| :---: |

## STRUCTURESCAN MINI LXT FEATURES

## Locate with Confidence

The Mini LXT incorporates integrated lasers on the front and sides to clearly and easily mark targets and clear coring locations. This system can quickly and reliably detect metallic and non-metallic targets in concrete, measure slab thickness and locate voids in depths of up to 60 cm (24 inches).


## Enhanced Data Visualization

Get first-in-class data visualization with a state-of-the-art 6.5 inch HD touchscreen user interface and several modes for data collection and interpretation.

QuickScan Collect 2D data with the push of one button ScanMax Access advanced options
Scan3D For complex reinforcement environments

## Safety \& Ergonomics

The StructureScan Mini LXT is compact and lightweight, weighing only 1.8 kg ( 4 lbs ), making it easy to use on the ground or above-the-head on your job site. For large survey areas, add the optional extension pole for better ergonomics and ease of use.

The Mini LXT allows the user to collect data with one-hand operation ensuring that while scanning on walls and ceilings with ladders or lifts, you maintain three points of contact to comply with OSHA regulations.


## TYPICAL USES

Find Rebar, Post Tension, Conduits, and Non-metallic Objects

Measure Slab Thickness and Void Location

Concrete Scanning and Imaging

Condition Assessment
Structure Inspection

FCC, RSS-220 and CE Certified

## HIGH RESOLUTION ANTENNA

Data Example: Data shows multi-layer rebar in an elevated slab. Bottom of slab is clearly visible at $20 \mathrm{~cm}(8 \mathrm{in}$ ) in depth. Note the closely spaced rebar highlighted in the BLUE BOX.


## ENHANCED DEPTH PENETRATION

Data Example: Data shows a drainage pipe marked with a RED DOT underneath a concrete slab reinforced with wire mesh. The dip in the wire mesh represents a thickened slab-on-grade footing positioned for a load bearing wall.



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## COMPACT GPR SYSTEM FOR UTILITY LOCATING

Locating and marking underground utilities in real-time in the field has been a powerful application of ground penetrating radar (GPR) for many years. A knowledgeable utility locator with a GPR system as part of their tool box is able to accurately identify buried utilities. UtilityScan is built for the utility locating professional to accelerate workflow from target detection to reporting.

| MAX DEPTH | ANTENNA <br> FREQUENCY <br> 10 m (35 feet) |
| :---: | :---: |
| WEIGHT | STORAGE CAPACITY <br> 15.4 kg (34 pounds) |
| OP4 GB |  |

## Real-time Target Mapping

- Easily pair with your external Bluetooth-enabled GPS, system includes built-in GPS pole adapter
- Map Mode allows you to trace your steps and gain a bird's-eye view of your survey
- Place APWA color-coded marks on your 2D data and geo-referenced map simultaneously


## Advanced Capabilities

- Collect and create 3D scans
- Optional LineTrac ${ }^{\oplus}$ power detection module to identify and trace precise location of underground and RF-induced utilities


## Rugged, Flexible System

- Rated IP65 - Durable components tested to withstand the toughest conditions
- Compact and portable - weighs just 15.4 kg (34 lbs)
- Optional three- or four-wheel survey carts for challenging survey conditions


## UTILITYSCAN FEATURES

## Rugged System for Construction Environments

UtilityScan is rated IP65 and built to meet your job site needs. It can withstand the most challenging survey environments including rain, dust, and extreme cold down to $-20^{\circ} \mathrm{C}\left(-4^{\circ} \mathrm{F}\right)$. The Panasonic G2 tablet screen is designed for rain and glove use. For areas where Wi-Fi is prohibited, this system includes a rugged Ethernet cable that can be used for communication between the tablet and antenna.

## Integrated Advanced Sensor

## TYPICAL USES

Scan utilities - metallic and non-metallic

Locate water lines
Detect voids and underground storage tanks (USTs)

Identify soil and foundation characteristics

Locate shallow objects for archaeology

FCC, RSS-220 and CE Certified

UtilityScan can be configured with an optional LineTrac ${ }_{\circledast}$ power detection module. LineTrac is designed to identify and trace the precise location of underground electric and RFinduced utilities. This allows the detected power or induced frequencies data to be overlaid on the radar data, providing reliable positioning and target information to the user. These technologies are integrated into one seamless system to aid in target recognition and mapping, a first for the utility detection industry.

## Warranty and Support

At GSSI, we fully back our products to ensure our customers get the maximum value for their investment. UtilityScan comes with a two-year warranty and complimentary training from our staff of dedicated, professional trainers during the warranty period. With every purchase, we provide unmatched technical support for the lifetime of your system.

## ACCESSORIES



## Transit Case

This Pelican case features custom-cut foam and is designed to hold the UtilityScan system as well as its components and accessories. The case is designed to easily transport the system whether you're throwing it in the back of your truck, shipping it across the country or checking it on a plane.


## Optional Survey Carts

Model 626: three-wheel cart (shown above) that includes a specifically-built centerpositioned bracket to hold the UtilityScan system chassis and is best suited for uneven surfaces and grassy field areas.

Model 656: four-wheel cart that is suited for rugged terrain survey conditions.

## MAP MODE

With Map Mode on UtilityScan, you can simultaneously pick targets and view their corresponding location on the GIS map shown on the right side of the screen. You can select the window size of the data and the map, or keep it split evenly as shown. The map shows an overview where the user located three different types of utilities. The dark green line represents the path that was taken when collecting the data.

Data on the left side of the screen shows a typical utility at 1.25 m in depth and shows a nicely defined base layer at .4 m in depth.

The blue dot on the data image is a water line.


## 3D IMAGE

On-screen 3D data collection mode allows you to define an area of interest. You can easily define the time slice depth and thickness in the field with the 3D data on the screen. The map window can be minimized to view your 3D display full screen.
Data image shows a horizontal yellow line that is a water line located at 1.25 m in depth, collected with 3D mode. This grid is $6 \times 9$ meters. The arrow on the left is the vertical position of the target. The + and - is how you control the thickness of the time slice.


## SATELLITE \& AERIAL IMAGERY

UtilityScan software automatically saves a sample image (Target 1990 in the image below) for every target designated within the software. These in field targets can easily be exported into commonly available geo-browsers. These browsers can be used to create images for reports in the office or in the field.

Image shows a water line (blue), sewer line (green) and an electrical line (red)
The yellow line is the GPS track taken by the user.


## LINETRAC.

Data was collected using UtilityScan enabled with LineTrac option. Data shows multiple underground power lines (BLUE BOXES) entering large commercial buildings. The other targets visible in the data are non-powered utilities. GREEN LINE at the bottom of the data represents the measured response from the powered conduit.


## PREMIER

GPR SYSTEM FOR
CONCRETE INSPECTION

## Accurate, Reliable and Safe Concrete Imaging

StructureScan Pro is a versatile concrete inspection system offering a wide variety of antenna options for concrete and other applications. Based on the SIR 4000 controller, the StructureScan Pro provides the GPR professional with solutions to any scanning situation.

Premium Mobility The rugged handcart-based system is lightweight and simple to transport. GPR is a safe technology with no site hazards or the need to close off work areas as with radiography (X-ray).

Fully Customizable System The StructureScan Pro comes with two antenna options; 1600 MHz or 2600 MHz . Designed to fit your needs, the StructureScan Pro is adaptable to expand survey capabilities, such as bridge and utility applications, with antenna upgrades.


| MAX DEPTH | $46 \mathrm{~cm}(18 \mathrm{in})$ |
| ---: | :--- |
| ANTENNA <br> FREQUENCY | $1600 \mathrm{MHz}, 2600 \mathrm{MHz}$ |
| OPTIONAL <br> SOFTWARE | RADAN $_{\circledast} 7$ |
| ACCESSORIES | Palm Antenna, SIR 4000 stand, <br> SIR 4000 carry harness |

INDUSTRY STANDARD IN GPR FOR UTILITY MAPPING AND
LOCATING

With UtilityScan Pro, users can quickly identify and mark the position and depth of metallic and non-metallic objects including utilities such as gas, communications and sewer lines as well as underground storage tanks and PVC pipes. Based on the SIR 4000 controller, the UtilityScan Pro provides the GPR professional with solutions to any underground locating situation.

Fully Customizable System Users can customize the UtilityScan Pro with multiple antenna offerings and cart options. The tailored options provide survey flexibility, from smooth prepared surfaces to rugged terrain with our rugged four-wheel cart, and suit a number of utility locating applications.

Data Visualization The UtilityScan Pro system features our state-of-the-art SIR 4000 controller and can incorporate an optional AC power accessory. The SIR 4000 controller incorporates advanced display modes and filtering capabilities for in-the-field processing and imaging. The LineTrac accessory for digital antennas adds the ability to detect AC power and induced RF energy present in buried utilities.


| MAX DEPTH | $0-12 \mathrm{~m}(0-40 \mathrm{ft})$ |
| ---: | :--- |
| ANTENNA | $400 \mathrm{MHz}, 300 / 800 \mathrm{DF}, 350 \mathrm{HS}$ |
| FREQUENCY |  |
| OPTIONAL |  |
| SOFTWARE | RADAN $_{\odot} 7$ for UtilityScan, RADAN ${ }_{\odot} 7$ |
| ACCESSORIES | Multiple GPS options, LineTrac |

## DUAL-

 FREQUENCY
## DIGITAL

 SYSTEM
## Locate and Map Underground Utilities

UtilityScan DF incorporates our innovative dual-frequency digital antenna ( 300 and 800 MHz ) and an easy-to-use touchscreen interface to view shallow and deep targets simultaneously in a single scan.

Target Designation The UtilityScan DF features real-time data collection. This portable GPR unit has a backup cursor and crosshair cursor that allows the user to confidently mark targets.

Premium Mobility The UtilityScan DF has two different cart options to enhance ease of use on all job sites. The four-wheel cart is built to withstand the toughest job sites, while the two-wheel cart is lightweight and easy to transport.

Enhanced Software Capabilities There are several modes to view collected data. Our patented Blend Mode combines high resolution near-surface data with lower depth details into one 'blended' data set.


| MAX DEPTH | $7 \mathrm{~m}(21 \mathrm{ft})$ |
| ---: | :--- |
| ANTENNA <br> FREQUENCY | $300 / 800$ Dual Frequency |
| OPTIONAL <br> SOFTWARE | RADAN $_{\circledast} 7$ for UtilityScan, RADAN ${ }_{\circledR} 7$ |
| ACCESSORIES | Multiple GPS opotions, LineTrac, <br> Sunshade for Panasonic G1 |

## ANTENNA FREQUENCY, APPROXIMATE DEPTH PENETRATION AND APPROPRIATE APPLICATION

| APPROPRIATE | PRIMARY ANTENNA | SECONDARY ANTENNA | APPROXIMATE APPLICATION |
| :---: | :---: | :---: | :---: |
| Structural Concrete, Roadways, Bridge Decks | 2600 MHz | 1600 MHz | 0-0.3 m (0-1.0 ft) |
| Structural Concrete, Roadways, Bridge Decks | 1600 MHz | 1000 MHz | 0-0.45 m (0-1.5 ft) |
| Structural Concrete, Roadways, Bridge Decks | 1000 MHz | 900 MHz | 0-0.6 m (0-2.0 ft) |
| Concrete, Shallow Soils, Archaeology | 900 MHz | 350 HS | 0-6 m (0-20 ft) |
| Shallow Geology, Utilities, USTs, Archaeology | 350 HS | 400 MHz | 0-6 m (0-20 ft) |
| Geology, Environmental, Utility, Archaeology | 270 MHz | 200 HS | 0-18 m (0-60 ft) |
| Geology, Environmental | 200 HS | 100 MHz | 0-18 m (0-60 ft) |
| Geologic Profiling | 100 MHz | MLF ( $16-80 \mathrm{MHz}$ ) | 0-30 m (0-90 ft) |
| Geologic Profiling | MLF (16-80 MHz) | None | Greater than 30 m (90 |



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