GPR Systems for Concrete & Utility Applications

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GSSI

AN IMPACT IN EVERY CORNER OF THE GLOBE

1970
YEAR FOUNDED

7
CONTINENTS SERVED

86
NUMBER OF EMPLOYEES

72k
HQ SPACE SQ. FT.

COMPANY VISION

GSSI is an internationally respected corporation known for our technological advancements in the geophysical, archaeological, forensics, infrastructure, public 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.

ABOUT GSSI

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

3
NUMBER OF FULL TIME TRAINERS

49
YEARS OF EXPERIENCE IN TEAM

100 +
NUMBER OF CLASSES, YEARLY

5k
DEDICATED TRAINING SPACE (SQ. FT.)

GSSI ACADEMY

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

STRUCTURESCAN™ MINI XT

THE PROFESSIONAL SCANNER 'S CHOICE

The StructureScan™ 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 60 cm (24 inches)	**ANTENNA FREQUENCY** 2700 MHz
WEIGHT 1.8 kg (4 pounds)	**STORAGE CAPACITY** 14.5 GB
OPTIONAL SOFTWARE RADAN 7 for StructureScan Mini	**ACCESSORIES** Palm XT Antenna, LineTrac XT, 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 3 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

STRUCTURESCAN™ MINI XT

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

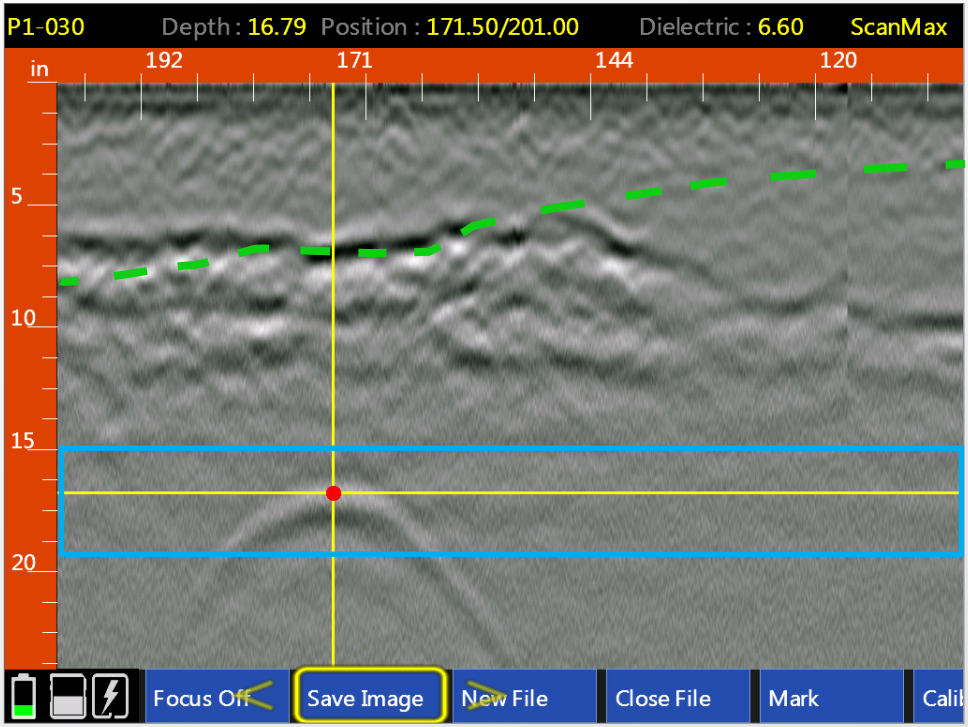
LineTrac XT

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 Hz
- Rugged, IP-65 rated enclosure

IDENTIFY STRUCTURAL FEATURES

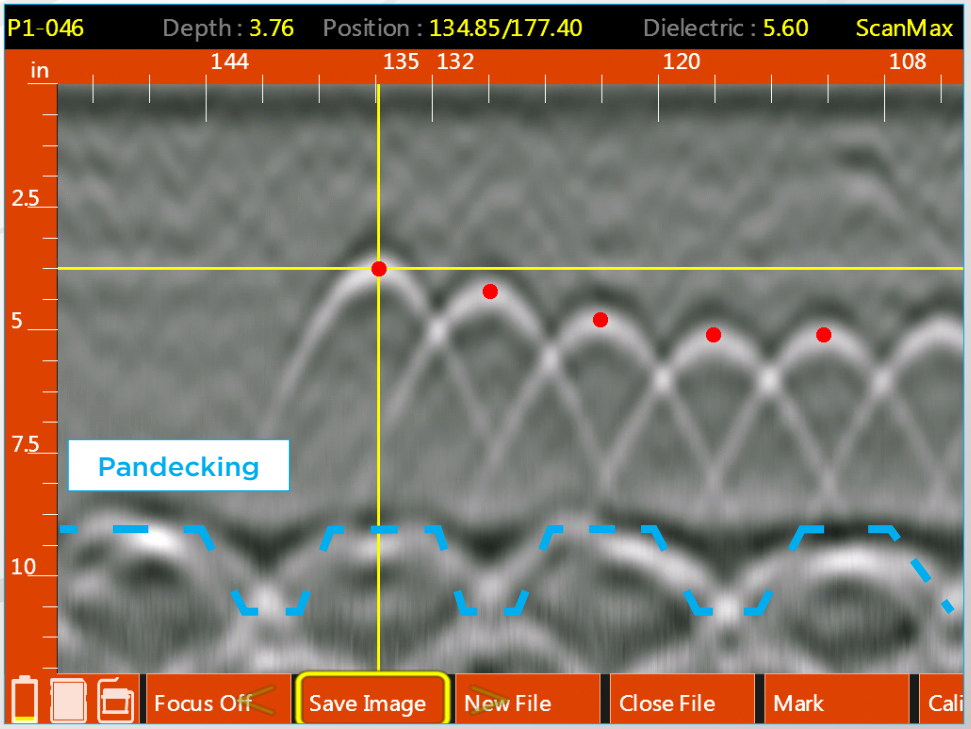
Data Example: Data was collected with the Mini XT on a large concrete wall of a flood control system. Data shows multiple layers of rebar. Long flat reflector (**GREEN LINE**) is due to the system running on top of the longitudinal rebar. **BLUE BOX** indicates the back side of wall.



CONCRETE DATA

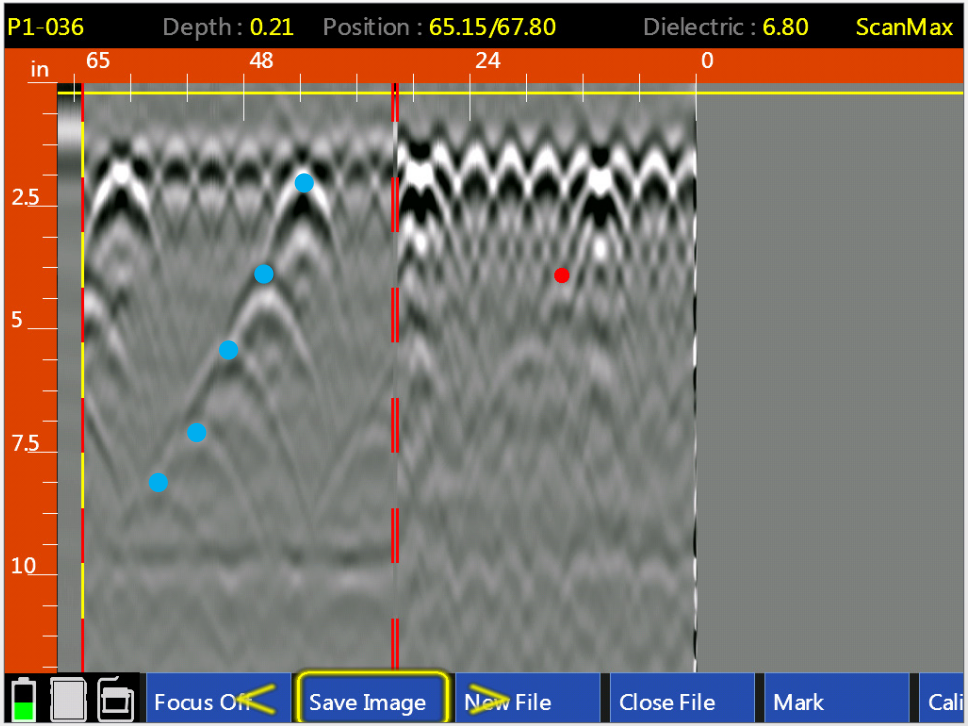
DETECTING BOTTOM OF SLAB

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



ENHANCED VISUALIZATION: CROSS POLARIZATION

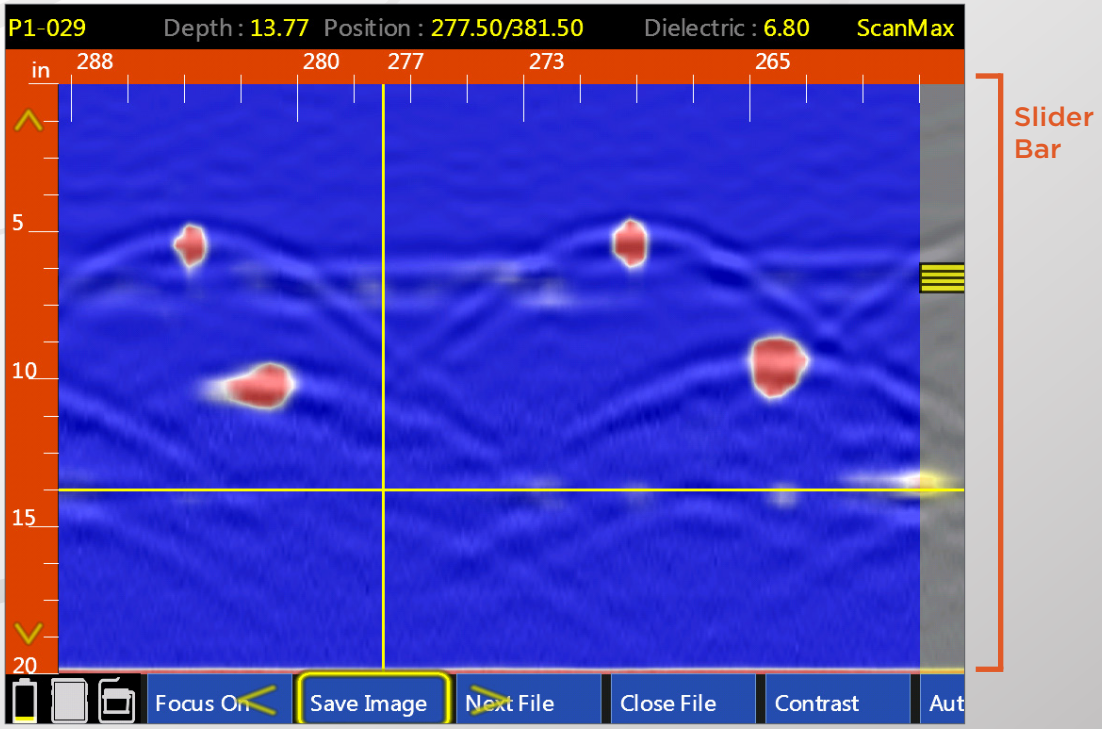
Data Example: The two sections of data below were collected with Mini XT and Palm XT antenna over the same area and in the same direction. Data shows a top layer of heavy wire mesh with multiple cascading plastic and steel targets. Data on left was collected using cross polarization method and shows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



CONCRETE DATA

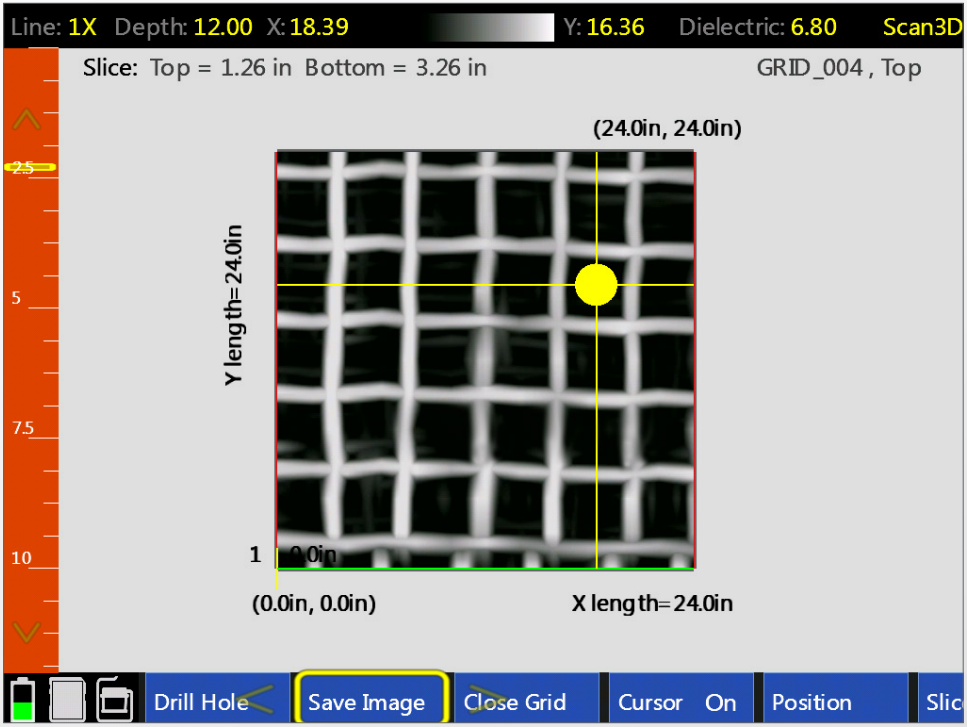
ENHANCED VISUALIZATION: FOCUS MODE

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 XT and Palm XT 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.

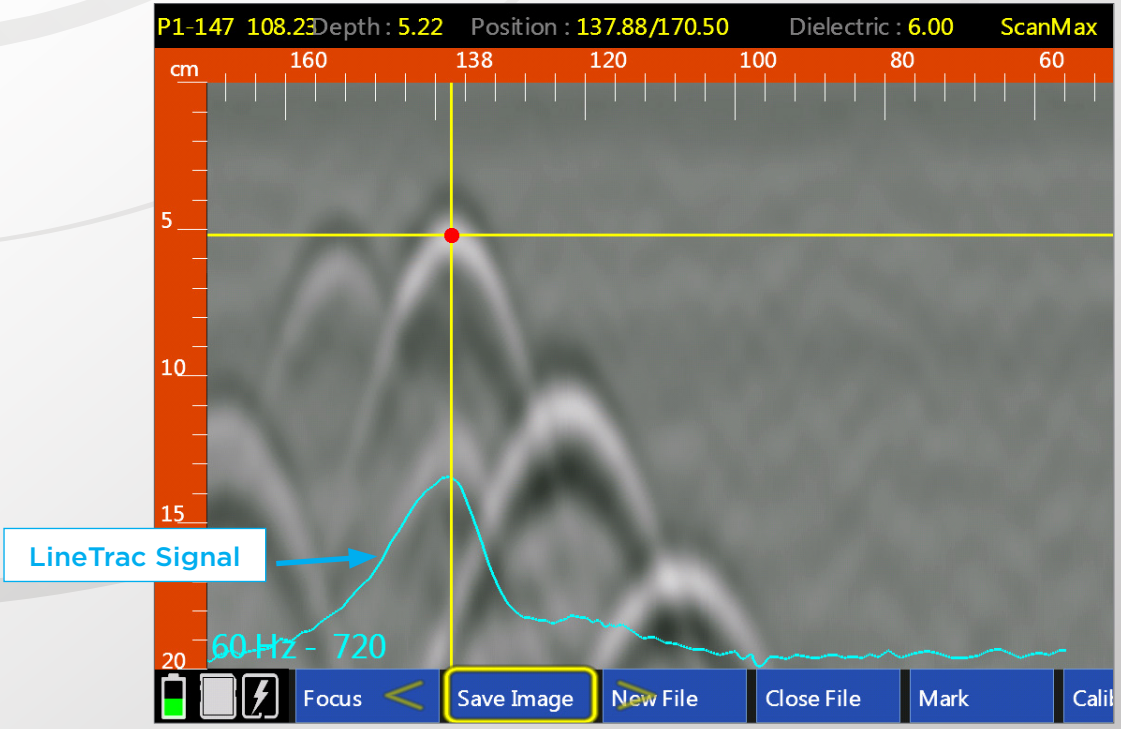


CONCRETE DATA

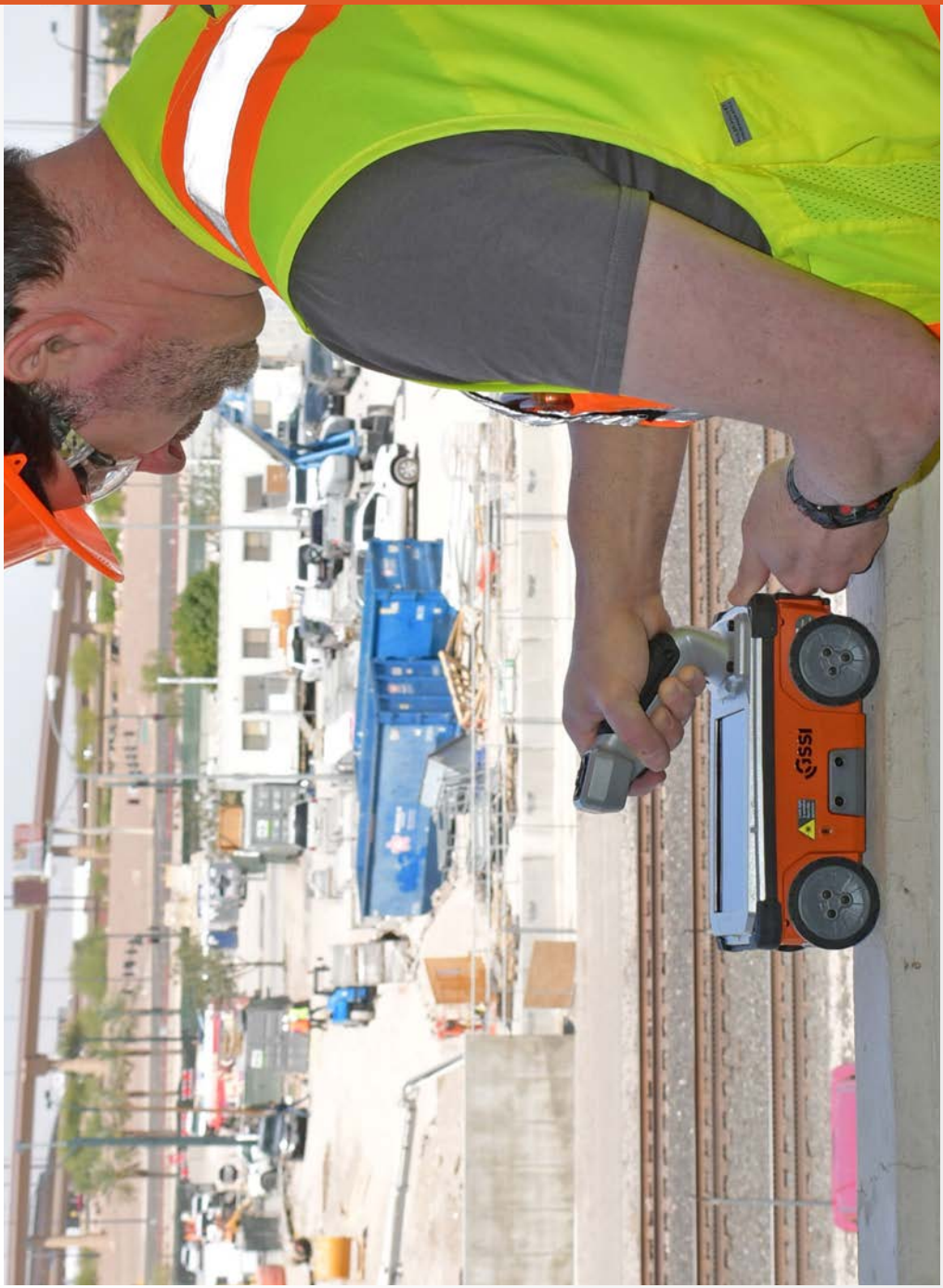
MINI XT ACCESSORY: LINETRAC XT

Data Example: Data was collected using the Mini XT with the LineTrac XT accessory. Cross hair cursor highlights a shallow conduit carrying 3 amps of current at 60Hz.

BLUE LINE at the bottom of the data represents the measured response from the powered conduit.



STRUCTURESCAN™ MINI LXT



PREMIUM FEATURES, ENTRY-LEVEL PRICE

The StructureScan™ 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 60 cm (24 inches)	**ANTENNA FREQUENCY** 2700 MHz
WEIGHT 1.8 kg (4 pounds)	**STORAGE CAPACITY** 14.5 GB
OPTIONAL SOFTWARE RADAN 7 for StructureScan Mini	**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

STRUCTURESCAN™ MINI LXT

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 3 points of contact to comply with OSHA regulations.

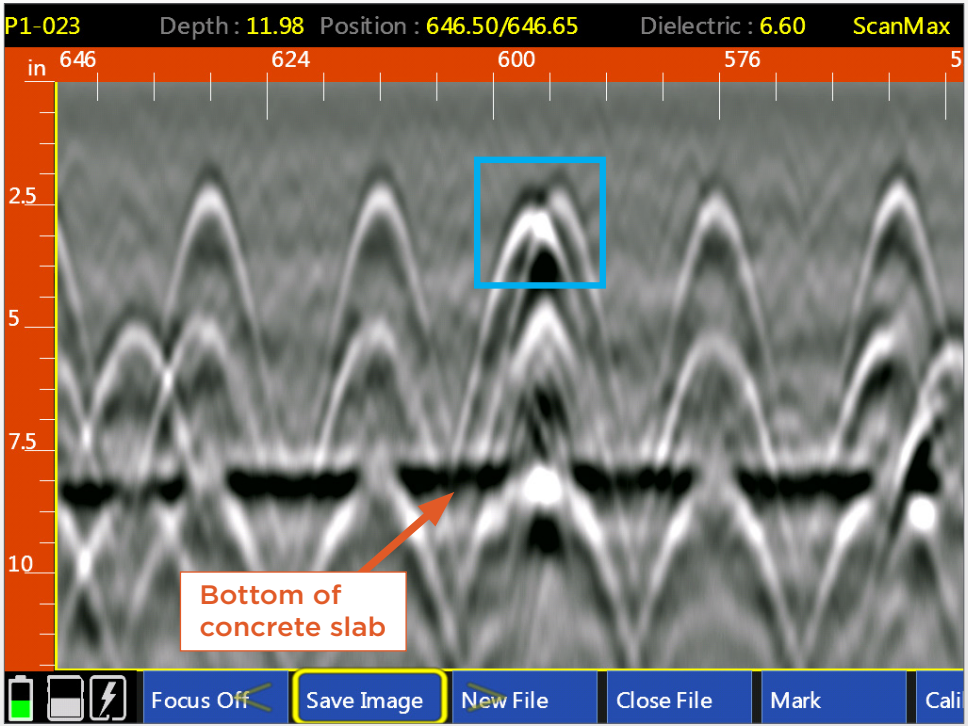
TYPICAL USES

- 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

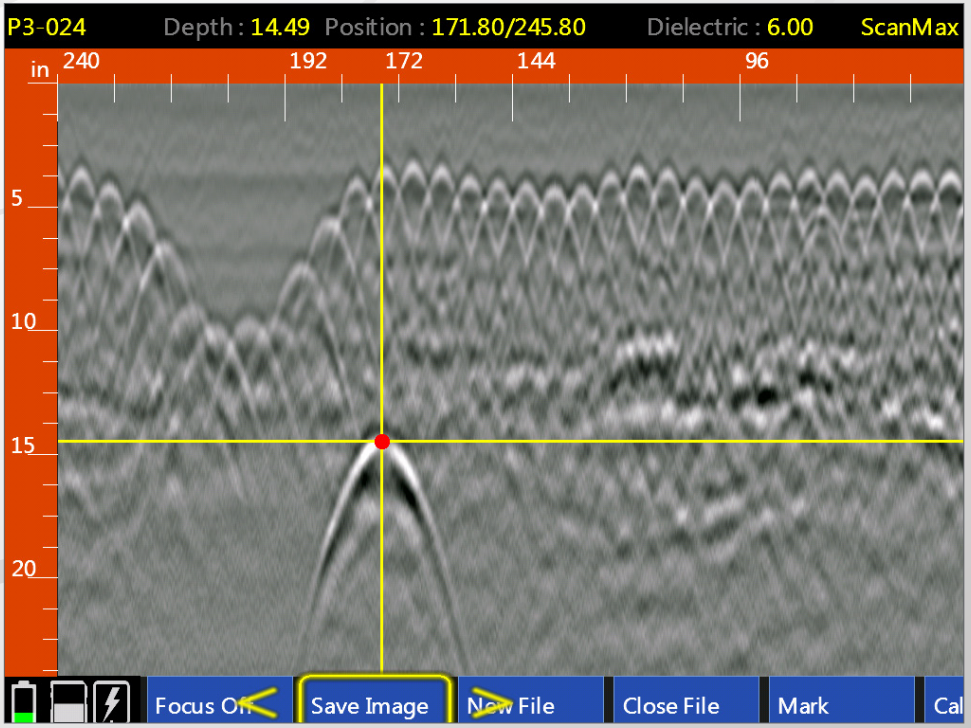
Data Example: Data shows multi layer rebar in an elevated slab. Bottom of slab is clearly visible at 20 cm (8 in) in depth. Note the closely spaced rebar highlighted in the **BLUE BOX**.



CONCRETE DATA

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.



UTILITYSCAN®

COMPACT GPR SYSTEM FOR UTILITY LOCATING

The UtilityScan® provides a rich feature set that redefines the level of performance available in a low cost utility locating system. Its compact size makes it extremely portable and easy to maneuver in tight survey areas. The simple operation is ideally suited to meet the needs of service providers, engineering contractors and state and local municipalities.

MAX DEPTH 10 m (35 feet)	**ANTENNA FREQUENCY** 350 MHz
WEIGHT 15.4 kg (34 pounds)	**STORAGE CAPACITY** 64 GB
OPTIONAL SOFTWARE RADAN 7 for UtilityScan, RADAN 7	**ACCESSORIES** Transit case, Battery booster kit, Geode GPS, Model 656 rugged cart, Sunshade

The UtilityScan Advantage

Reliable mark outs, paper records, and as-builts on buried utilities are rare. UtilityScan can quickly identify the location and depth of service utilities such as gas, communications, and sewer lines – as well as other metallic and nonmetallic targets including underground storage tanks and PVC pipes.

UTILITYSCAN FEATURES

Compact and Portable

The UtilityScan is incredibly compact. Weighing in at only 34 pounds, UtilityScan can collapse to fit in the back of a small vehicle or even in an airline overhead compartment. For survey conditions in rough terrain, the user can remove the handle and wheels and place the capsule into the (optional) rugged cart.

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

Premium Features, Entry Level Price

UtilityScan is based on GSSI's patented HyperStacking technology, which provides excellent near-surface resolution and increased depth penetration in most soil types. A new wireless antenna eliminates the need for cabling, resulting in a system that can withstand challenging field conditions.

Advanced Capabilities

UtilityScan can be provided with LineTrac power detection module. This module is designed to identify and trace the precise location of underground electric and RF induced utilities. Another feature of this system is the integrated GPS and built in GPS adapter for an additional GPS pole (customer provided).

UTILITYSCAN®

UTILITYSCAN ADVANTAGES

LineTrac®

LineTrac is the first use of a power detection capability in a utility locating radar system. The most important requirements for utility locators are ease-of-use, accuracy and reliability.

The combination of UtilityScan and LineTrac addresses these needs with features that deliver accurate, dependable and repeatable performance. These technologies are integrated into one seamless system to aid in target recognition and mapping for the first time in the industry.

Dynamic Gain Control

Dynamic Gain Control recognizes a difference in subsurface conditions and automatically modifies the display gain. This eliminates the need for users to continually adjust the gain during surveys and provides a clearer, consistent data image.

HyperStacking®

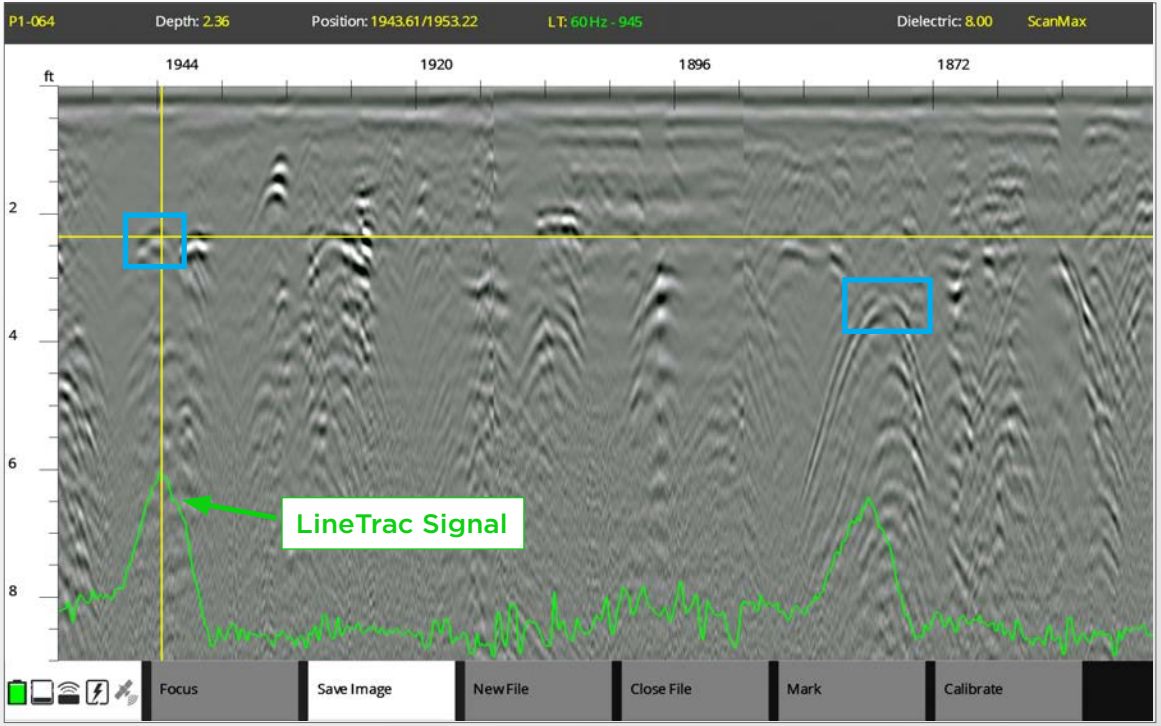
HyperStacking results in superior near surface resolution, deeper depth penetration, and vastly improved RF noise immunity when compared to traditional GPR antennas.

HyperStacking (HS) is a patented real-time sampling (RTS) technique that improves performance while maintaining measurement speed and minimizing radiated emissions. The technique uses multiple stacking (averaging) during data acquisition in order to reduce random noise and improve data quality.

LINETRAC: DETECT POWERED UTILITIES

Data Example: 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.

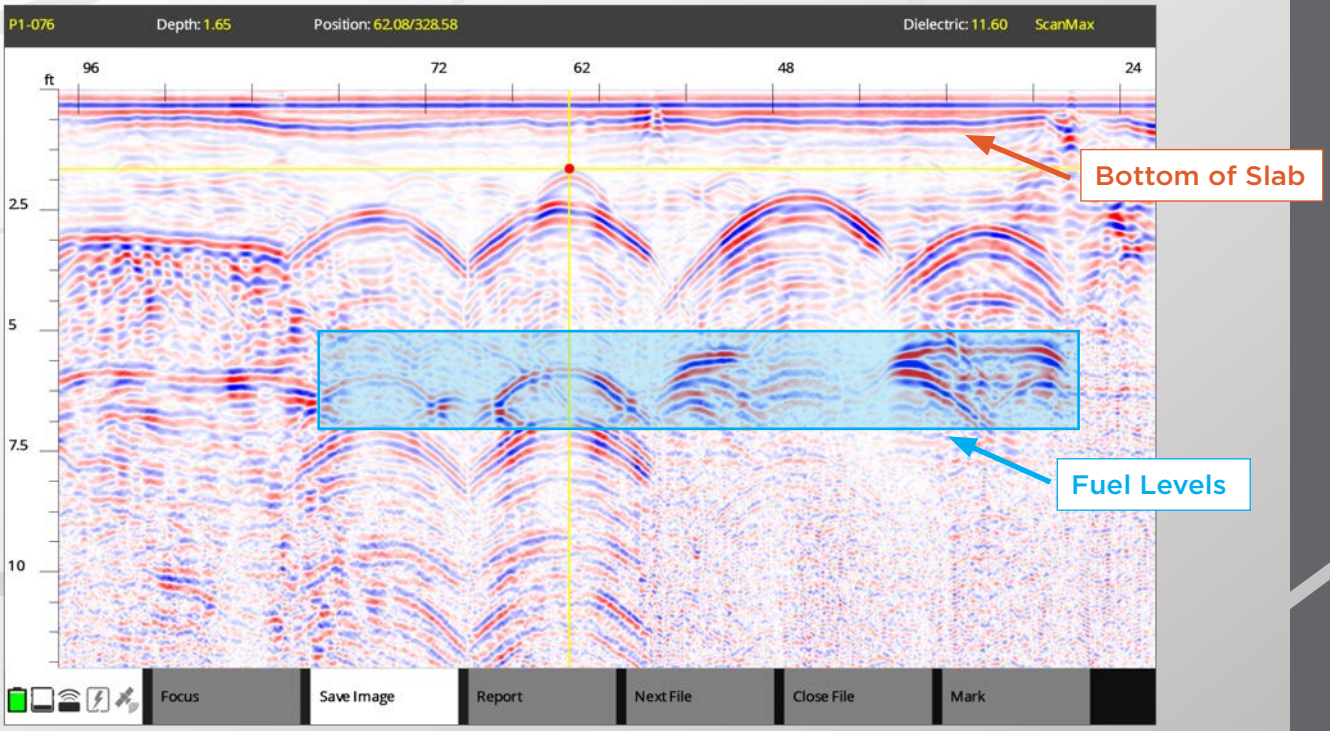
GREEN LINE at the bottom of the data represents the measured response from the powered conduit.



UTILITY DATA

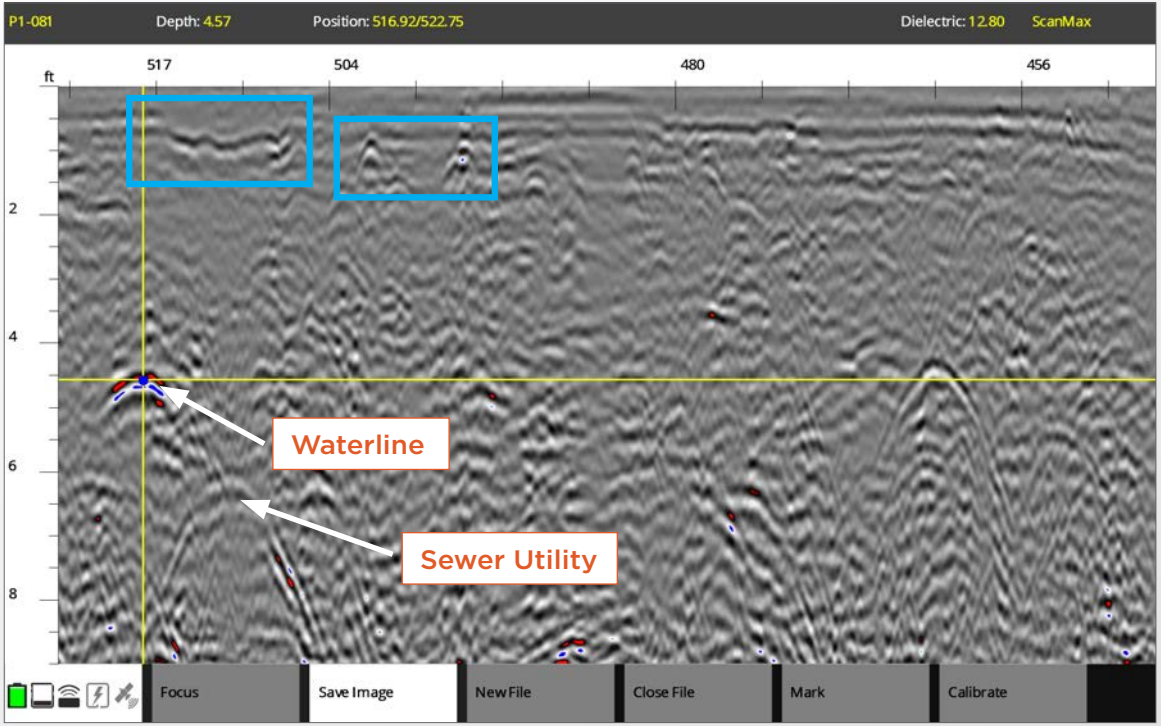
HYPERSTACKING TECHNOLOGY

Data Example: Data was collected over a series of large tanks at a gas station. Tanks are located over a large concrete slab. Note that fuel levels in the tanks (**BLUE BOX**) and near surface slab thickness can be seen in the data. The target indicated by the **RED DOT** is a fill pipe for one of the tanks



HIGH RESOLUTION DATA

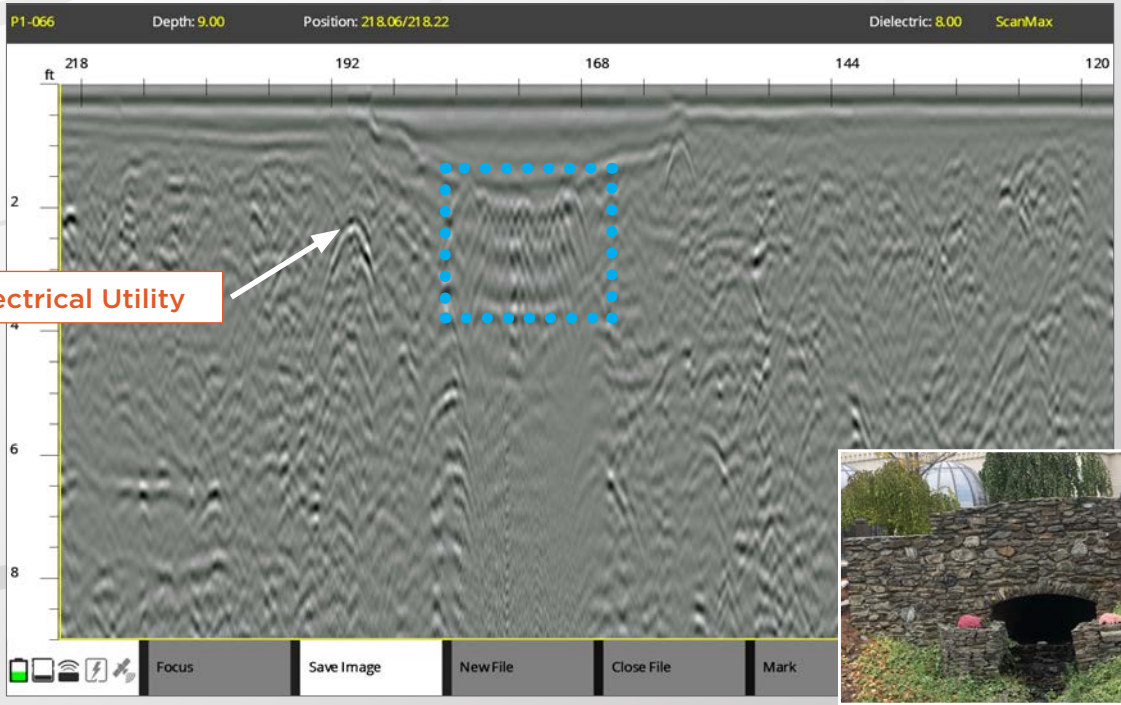
Data Example: Cross hair cursor shows the position of a waterline entering a commercial building. The **BLUE BOXES** highlight well defined excavation trenches for the sewer utility.



UTILITY DATA

CASE STUDY: ORNAMENTAL BRIDGE

Data Example: This data image shows a buried reinforce box culvert that is part of an ornamental bridge. The dip is caused by a topographic inversion created by fill that makes the "bridge" have a crown in the center. Note the electrical utility positioned left of the box culvert.



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 cm (18 in)
ANTENNA FREQUENCY	1600 MHz, 2600 MHz
OPTIONAL SOFTWARE	RADAN® 7
ACCESSORIES	Palm Antenna, SIR 4000 stand, SIR 4000 carry harness

STRUCTURESCAN™ PRO

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 m (0-40 ft)
ANTENNA FREQUENCY	400 MHz, 300/800 DF, 350 HS
OPTIONAL SOFTWARE	RADAN® 7 for UtilityScan, RADAN® 7
ACCESSORIES	LineTrac

UTILITYSCAN® PRO

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 cross-hair 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 m (21 ft)
ANTENNA FREQUENCY	300/800 Dual Frequency
OPTIONAL SOFTWARE	RADAN® 7 for UtilityScan, RADAN® 7
ACCESSORIES	LineTrac, Sunshade for Panasonic G1

UTILITYSCAN® DF

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 MHz)	0-30 m (0-90 ft)
Geologic Profiling	MLF (16-80 MHz)	None	Greater than 30 m (90 ft)

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