Leica Detection Solutions

The best way to detect underground utilities

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Leica Detection Solutions

Surveyors, utility companies and contractors, now more than ever, need accurate, highly reliable, and up-to-date information – available for immediate use. Using the latest technology, detecting underground features becomes a simple and efficient task, increasing your safety and the protection of buried utilities. Our detection solutions provide a truly streamlined process from the field to the office, and back again, able to cover the entire utility detection, avoidance and mapping workflow with integrated solutions.

Cable Avoidance

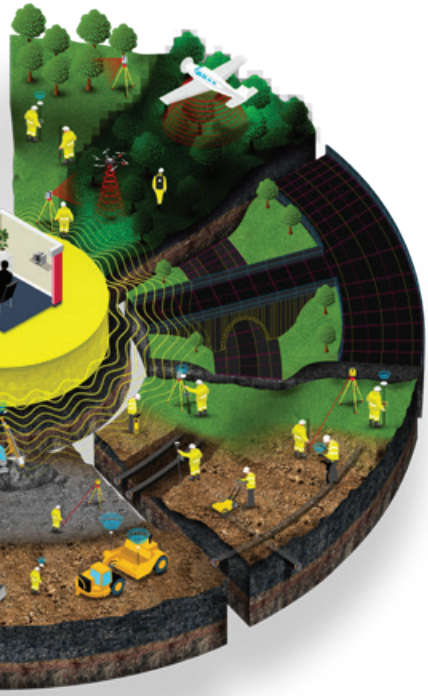
Undertaking any excavation will inevitably bring site workers into close proximity to underground utilities. Consideration should always be given to knowing the exact location of all buried utilities before and during the excavation process.

The SMART utility locator solution, including the DD230/220 cable locator series, DX Shield software and signal transmitters, is the only complete portfolio of detection solutions which allows users to detect buried utilities, transfer and access data remotely to a hosted service for multiple users, across multiple sites to manage site activities.

Utility Tracking

Utility surveying means exact detection and mapping of the utility. Asset owners precisely want to know where their infrastructure is. For future planning and utility maintenance, they need to have their utilities mapped digitally.

Save time and increase confidence in your results with the Leica ULTRA, our most advanced precision utility tracing instrument.



Detection & Mapping

A utility map shows the positioning and identification of buried pipes and cables beneath the ground. Combine mapping process with a topographical survey and the results will provide you with a comprehensive detailed map of utilities.

The Leica DS2000 utility detection radar finds all potential threats, including non-conductive pipes and fibre optics. The perfect system for users with previous experience using ground penetrating radar (GPR).

For utility repair and maintenance, civil engineering and surveying companies, the Leica DSX utility detection solution allows to easily locate, visualize and map utilities. Unlike any other ground penetrating radar (GPR) system, the Leica DSX maximises productivity with cutting-edge software that automates data analysis and creates a 3D utility map on the field.

Training: Leica Detection Campus

- Understand your detection and surveying environment
- Be able to conduct a full utility survey and provide detailed results
- Know how to find work and gain knowledge of all technologies and digital efficiencies for your business

Leica Geosystems – when it has to be right

Revolutionising the world of measurement and survey for nearly 200 years, Leica Geosystems is the industry leader in measurement and information technologies. We create complete solutions for professionals across the planet. Known for innovative product and solution development, professionals in a diverse mix of industries, such as surveying and engineering, building and heavy construction, safety and security, and power and plant trust Leica Geosystems for all their geospatial needs. With precise and accurate instruments, sophisticated software, and trusted services, Leica Geosystems delivers value every day to those shaping the future of our world.

Leica Geosystems is part of Hexagon (Nasdaq Stockholm: HEXA B; hexagon.com), a leading global provider of information technology solutions that drive productivity and quality across geospatial and industrial landscapes.

Swiss Technology
by Leica Geosystems

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Leica Detection Campus

Leica DD SMART utility locator solution

Leica DSX

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A clearer view of underground utilities

Leica DSX

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Leica DSX utility detection solution

For utility repair and maintenance, civil engineering and surveying companies, the Leica DSX utility detection solution, consisting of a portable hardware with intuitive software allows to easily locate, visualise and map utilities. Unlike any other ground penetrating radar (GPR) system, the Leica DSX maximises productivity with cutting-edge software that automates data analysis and creates a 3D utility map on the field.

Set Up Job / Quick Scan

- Set the grid size according to your job's need or start Quick Scan
- Add different background layers, such as Google Maps or DXF/DWG

Data acquisition

- See your scanning path and positioning accuracy in real-time for guidance
- Set point of interests, such as manholes, lamp posts or hydrants

Processing on Site

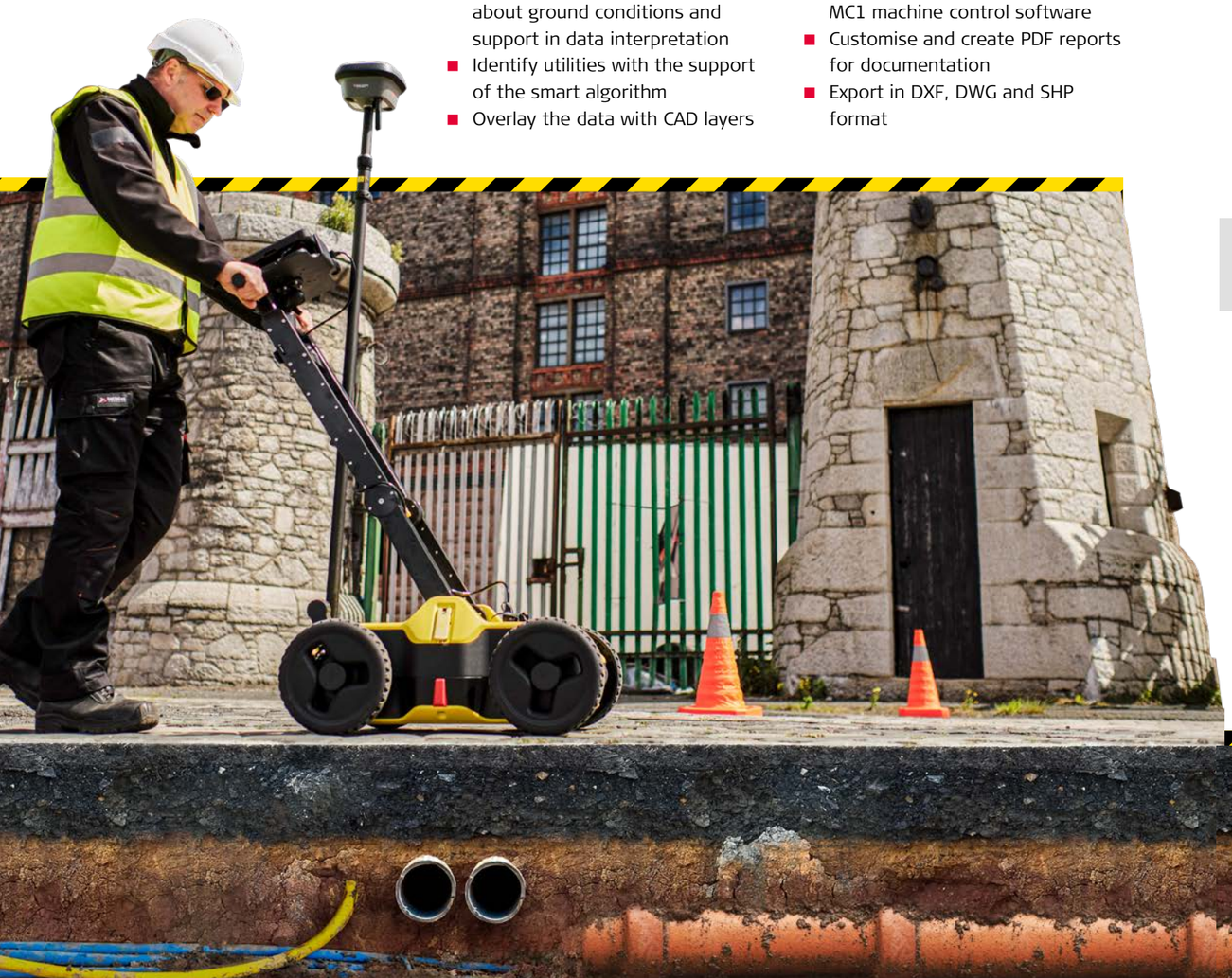
- Slice through different depths of the 3D detection image
- Use B-scan function to get insights about ground conditions and support in data interpretation
- Identify utilities with the support of the smart algorithm
- Overlay the data with CAD layers

Visualise data

- See utilities in 2D and 3D
- Measure point to point distance
- Identify and mark ground anomalies, objects and features using B-scan view
- Let software lead you to the required utility

Export data

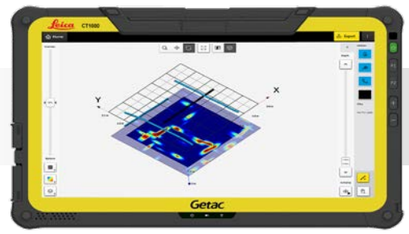
- Export utilities directly to the Leica MC1 machine control software
- Customise and create PDF reports for documentation
- Export in DXF, DWG and SHP format



Uncovering utilities clearly and effortlessly

Reliable Detection Result

- Detect all types of underground utilities in high resolution to assure reliable avoidance zones
- Verify detected utilities with the support of the smart algorithm
- Import of POI's and utility records to help you make better decisions



Instant 2D/3D Utility Map

- Save your time on site by mapping underground utilities and identifying subsurface anomalies in just minutes
- Export utilities in CAD formats for further usage
- Create professional reports on site to be used and shared immediately

Ease of Use

- Ensure smooth and accurate underground utility detection without expert knowledge
- Complete utility detection and mapping in just a few steps through the intuitive user interface
- Scan anywhere and at any time, even in narrow areas and under severe conditions

Integrated Solution

- Offer a complete workflow from acquire to excavate
- Locate underground utilities with survey-grade accuracy
- Generate utility maps, compatible with all coordinate reference systems
- Export, store, share and access data on major Cloud service providers
- Maximise troubleshooting efficiency by sharing diagnostics data via Cloud

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Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 3.8bn EUR. Learn more at hexagon.com and follow us @HexagonAB.

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Leica DD SMART utility locator solution

Work safer, work smarter, work simpler

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Leica DD SMART utility locator solution

The Leica DD SMART utility locators and DX Shield software open the door to a connected world, anywhere, anytime. Leica DD SMART utility locators detect underground assets deeper, faster and more accurately. Understand site activity and utility locator use in greater detail with DX Shield software. The DD230/220 SMART locators are scalable and designed with the latest Bluetooth technology, providing a wire-free connection to mobile devices.

Greater confidence with SMART locating

Connect and download data stored in the DD SMART utility locators' internal memory, including GPS positioning and transfer it back to the DX Shield software for analysis. USB connectivity provides a convenient connection to DX Office Shield for product configuration, maintenance and data analysis.

Leica DD220 SMART

Simplicity

Easy to use and learn with on board video support. Intuitive hardware and software significantly reduce errors.

Safety

With usage alerts and system diagnostics, assets and site workers are protected

SMART Solution

With on board locate alerts and an automatic locate process, the DD SMART locators help to reduce time spent locating buried utilities and prevent utility damage.

Leica DD230 SMART

Ease of use

DD SMART utility locators offer an easy-to-use tracing system which delivers high accuracy results without complication.

Confidence

Trace utilities with confidence in environments with high utility density and complexity.

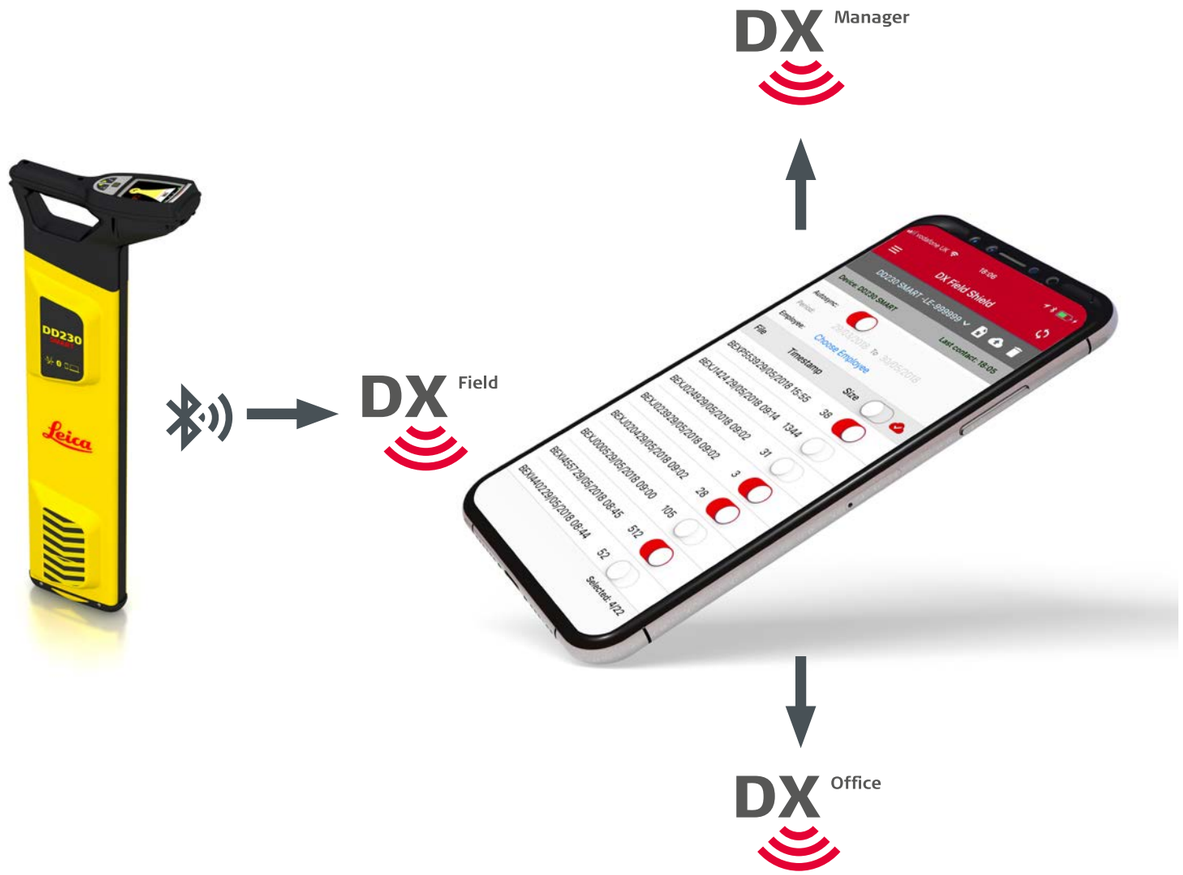
Accuracy

Locate utilities accurately with simple workflows using the latest digital technology.

Leica DD SMART utility locator solution
System overview

For professionals looking to streamline utility locating operations, the Leica DD SMART utility locators create a single source solution. DX Shield software provides a space for utility analysis and a convenient connection between SMART locators to increase productivity and save time.

DX Shield software allows you to gain a better understanding of task performance and site complexities with easy-to-use reports that provide a fast and convenient overview of product use, reducing utility strikes and saving direct repair costs and project downtime.



DX Shield software

Connect your DD SMART locator with the DX Field Shield app to enable automatic data synchronisation and access your collected data using your mobile device. The DX Field Shield app provides operators with a remote transfer tool, linking data from the site to DX Manager Shield or DX Office Shield. DX Manager Shield provides organisations with a centralised hosted platform for multiple users, across multiple sites. The site notes and photos from DX Field Shield document site activities. DX Office Shield provides organisations with a scalable local solution on a single-source platform.

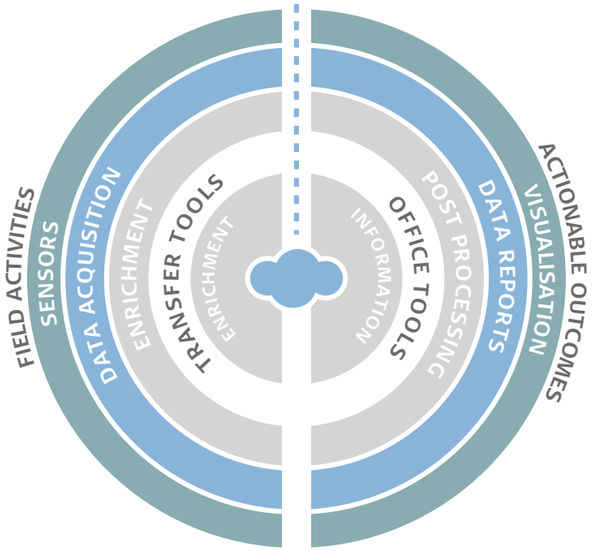
DX Manager

- Hosted service to centralise data

DX Field

FIELD APP

- Transfer locator data and site notes from the field through a mobile device



DX Office

- PC software to generate reports on usage
- Connect to CalMaster and link to the web for calibration verification

DD SMART Locators
Technical Specifications

MODE	DD220 SMART	DD230 SMART
Power	50 / 60 Hz mains electrical and harmonics	50 / 60 Hz mains electrical and harmonics
Radio	15kHz to 60kHz	15kHz to 60kHz
Auto	Power, Radio, 33kHz	Power, Radio, 33kHz
Transmitter Modes	131.072 (131) kHz 32.768 (33) kHz 8.192 (8) kHz	131.072 (131) kHz 32.768 (33) kHz 8.192 (8) kHz 512 Hz 640 Hz
Depth Range	Line 0.1m to 5m Line 4 inches to 16.4 feet Sonde 0.1m to 7m Sonde 4 inches to 23 feet	Line 0.1m to 7m 4 inches to 23 feet Sonde 0.1 to 10m Sonde 4 inches to 32.8 feet
Depth Accuracy*	5%	5%
Bluetooth	Class 2 BLE dual mode module Bluetooth Classic 2.1 Bluetooth 4.0 (LE)	Class 2 BLE dual mode module Bluetooth Classic 2.1 Bluetooth 4.0 (LE)
GPS**	Chipset (1): u-blox®GPS Receiver Type: GPS L1C/A, SBAS L1C/A, QZSS L1C/A, GLONASS L1OF, BeiDou B1 Accuracy (2): Horizontal Position 2.5 m Autonomous, 2.0 m SBAS,CEP Start time: Cold 45 s typical, Aided 7 s typical, Hot 1 s typical	Chipset (1): u-blox®GPS Receiver Type: GPS L1C/A, SBAS L1C/A, QZSS L1C/A, GLONASS L1OF, BeiDou B1 Accuracy (2): Horizontal Position 2.5 m Autonomous, 2.0 m SBAS,CEP Start time: Cold 45 s typical, Aided 7 s typical, Hot 1 s typical
Memory Capacity	8 GB internal memory	8 GB internal memory
Environmental Standard	IP65	IP65
Operating Temperature	-20 °C to +50 °C -4 °F to +122°F	-20 °C to +50 °C -4 °F to +122°F
Battery	7.4V Rechargeable Li – Ion	7.4V Rechargeable Li – Ion
Battery operating time ***	15 h	15 h
Dimensions (HxWxD)	765x290 x93mm 30.12 x11.42x3.66 inches	765x290 x93mm 30.12 x11.42x3.66 inches
Weight with batteries	2.7Kg 5.95 lbs	2.7Kg 5.95 lbs

*Depth to an undistorted signal
** (1) All data/information according to manufacturer u-blox®GPS; Leica Geosystems does not assume any liability whatsoever for such information.
(2) Accuracy is dependent upon various factors including atmospheric conditions, multipath, obstructions, signal geometry and number of tracked satellites.
*** Constant use at 20°C/68°F

DA Signal Transmitters
Technical Specifications

MODE	DA230
Induction Mode Frequencies	32.768 (33) kHz / 8.192 (8) kHz
Power Output	Up to 1 Watt max.
Direct Connection Mode Frequencies	131.072 (131) kHz / 32.768 (33) kHz / 8.192 (8) kHz / 512 Hz / 640 Hz
Power Output* 1 Watt Model 3 Watt Model	 Up to 1 Watt max. Up to 3 Watt max.
Environmental Standard	IP67
Operating Temperature	-20 °C to +50 °C / -4 °F to +122°F
Storage temperature	-40°C to +70°C, / -40°F to +158°F
Battery	7.4V Rechargable Li-ion
Battery operating time **	15 h
Dimensions (HxWxD)	250 x 206 x 113 mm / 9.84 x 8.11 x / 4.45 inches
Weight with batteries	2.38Kg / 5.25 lbs

* Utility impedance of 300 Ohms
**Defined at 20°C (77°F) power level 2

TRACE RODS
Used with the DD Locators and DA Signal Transmitter to trace the route of non metallic drains, ducts or pipes.
Trace Rod 50M / Trace Rod 80M

TRANSMITTER CLAMPS
Used with the DA Signal transmitter to apply a trace signal to utilities such as telecom cables, power cables and pipes.
Transmitter Clamp 100mm (4") / Transmitter Clamp 80mm (3.15")

PROPERTY PLUG CONNECTOR
Used with the DA Signal transmitter to apply a trace signal to residential electrical supplies

SONDES
Used to trace the route of drains, sewers plastic pipes and ducts. Available in many sizes to cover a wide range of applications.

Mini Sonde 33
18mm (0.7") diameter with a 33kHz output.
Working range 7 metres (23ft)

Duct Sonde 33
24mm (0.95") diameter with a 33kHz output.
Working Range 5m (16.4ft)

Midi Sonde 8/33
38mm (1.5") diameter with an 8kHz or 33kHz output.
Working Range 5m (16.4ft)

Clamp Sonde 33
40mm (1.57") diameter with a 33kHz output. Clamp sonde clamps onto a 12mm (0.74inch) flexible rod.
Working range 5m (16.4ft)

Maxi Sonde 8/33
55mm (2.17") diameter with an 8kHz or 33kHz output. Working range 12m (39.4ft)

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IDS GeoRadar

StreamC

The compact solution for
accurate 3D utility mapping

High quality, High productivity and Simple to Use compact radar system for real time underground surveys

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IDS GeoRadar: The leader in multi-frequency and multi-channel Ground Penetrating Radar

www.idsgeoradar.com

IDS GeoRadar

Stream C

Stream C is the compact solution for real time 3D mapping of underground utilities and features. Thanks to increased level of accuracy provided by a massive antenna array, Stream C is able to automatically detect pipes and cables.
Daily use of Stream C is aided by ergonomic features including electronic ride height adjustment, options to tow manually or with a small vehicle and a motor assisted drive wheel.
Stream C is available in Basic and Advanced configuration

Stream C anACtenna array

Stream C pivoting and motorized front wheel

Stream C with vehicle towing kit

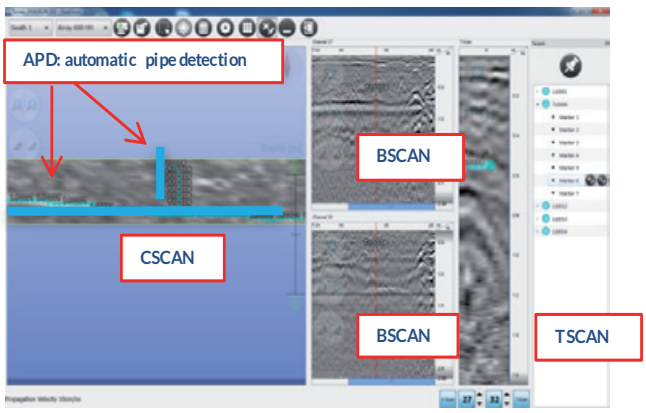
Stream C adjustable handle

STREAM C BENEFITS

- High Productivity: surveys only need to be performed in one direction to ensure optimal detection for both longitudinal and transversal pipes.
- No advanced training needed: the system automatically detects and locates the position of pipes in real time and displays them on screen.
- Reduced user fatigue: thanks to electronic ride height adjustment and a motor assisted drive wheel.
- Facilitates large surveys: the system can be towed manually or with a small vehicle, increasing the acquisition speed (up to 5 km/h).

STREAM C FEATURES

- Massive array of 34 antennas in two polarizations: this enables an accurate 3D reconstruction of the underground utility network to be created in a single scan.
- Automatic Pipe Detection (APD): real time automatic detection of buried pipes and cables
- Compact size: Stream C's small dimensions enable it to survey areas inaccessible to larger array systems while maintaining the same accuracy.
- Robust construction: built to the highest standards and with hardwearing materials so that it can be used in harsh, demanding environments.
- 3D radar tomography: real-time tomography on a GPS or Total Station assisted cartographic background.
- Professional subsurface survey: pipes, cables and buried objects can be automatically transferred to CAD and GIS formats allowing a complete subsurface GIS based digital map to be quickly produced.



One Vision: real time acquisition software with APD (Automatic Pipe Detection)

GRED HD 3D CAD: post processing software with pipe results

Stream C configurations:

Basic or Advanced

Electronic ride height adjustment of antenna

Adjustable handle gives you always the perfect grip

Pivoting wheel working in vehicle towed version

Dedicated GPS Pole mounting kit

Dense antenna array for accurate 3D mapping

No exposed cables gives you peace of mind assurance of no rupture in the field

SCAN TO DISCOVER MORE

SYSTEM SPECIFICATIONS		
BASIC Configuration	OVERALL WEIGHT (PC not included):	75kg (lbs)
ADVANCED Configuration	OVERALL WEIGHT (PC not included):	95kg (209 lbs)
RECOMMENDED LAPTOP:		Panasonic FZ G1
MAX ACQUISTION SPEED:		5km/h (3,1 Mph)
POWER CONSUMPTION:		60W
POSITIONING:		integrated encoder and/or GPS/Total station
RADAR POWER SUPPLY:		SLA battery 12V DC 12 AH
ENVIRONMENTAL:		IP65
ANTENNA FOOTPRINT:		120x57 cm
NUMBER OF HARDWARE CHANNELS:		32 (23VV-9HH)
ANTENNAS CENTRAL FREQUENCIES:		600 MHz
ANTENNA POLARIZATION:		HH and VV
SCANNING WIDTH:		96 cm
CERTIFICATION:		EC, FCC, IC

SOFTWARE SPECIFICATIONS	
One Vision Acquisition Software	- Automatic calibration for an easy and quick start-up- -Metric and Imperial units- Several filter option and filters macros- Visualization and storage of antenna array data set (32 channels) - Real time visualization of radar tomography (time slices) at different depths- Mark of targets and pipes through software- Multilanguage software- Connection with NMEA positioning device- export to CAD, dxf and shp formats
ADP tool for One Vision Acquisition Software (optional)	- Automatic Pipe Detection tool
GRED HD 3D CAD Processing Software	- Advanced 3D Processing Software with Autocad direct export link

IDS GeoRadar, part of Hexagon, provides products and solutions, based on radar technology, for mining, civil engineering and monitoring applications. The company is a leading provider of Ground Penetrating Radar (GPR) and Interferometric Radar solutions worldwide.

IDS GeoRadar is committed to delivering best-in-class performance solutions and to the pursuit of product excellence, through the creation of application-specific, innovative and cost-efficient systems for a wide range of applications including mining, utility detection and mapping, civil engineering, geology, archaeology and public safety.

Hexagon is a global leader in digital solutions that create Autonomous Connected Ecosystems (ACE). Hexagon (Nasdaq Stockholm: HEXA B) has approximately 20,000 employees in 50 countries and net sales of approximately 3.8bn EUR. Learn more at hexagon.com and follow us **@HexagonAB.**

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IDS GeoRadar

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Stream EM

The vehicle towed solution for extensive 3D utilities mapping

Arrays of multi-frequency, multi-polarized antennas setting new standards for accuracy and productivity

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IDS GeoRadar: The Leader in Multi-frequency and Multi-channel Ground Penetrating Radar

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Stream EM

Stream EM is a vehicle towed radar solution for extensive 3D mapping of underground utilities and features. To accomplish this task it uses massive arrays of multi-polarized, multi-frequency antennas. The use of a massive array enables it to perform fast scans of large areas while maintaining a high level of accuracy. Being multi-polarized provides optimal detection of both longitudinal and transversal features without the need to perform multiple scans.

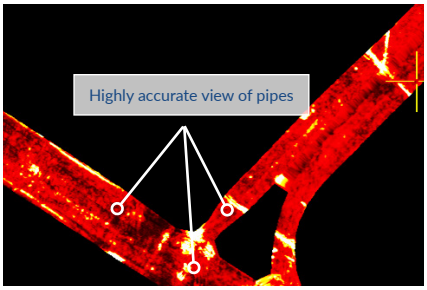
STREAM EM BENEFITS

- **Cost and time reduction** with no need to block trafficor perform surveys during the night.
- **Increase in accuracy** with a detection accuracy of as little as 5 cm (2 inches).
- **Increase productivity** and able to detect every buried target.
- **Highly modular structure** allows it to be reconfigured to map sidewalks and difficult to access areas.

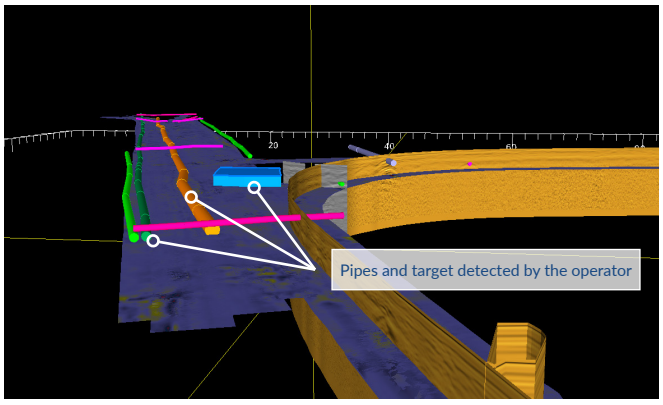
STREAM EM FEATURES

- **Massive array of 40 antennas in two polarizations:** This results in accurate 3D modeling of the subsurface and ease of detecting buried targets and anomalies. The use of both polarizations provides optimal detection of main and junction pipes at the same time.
- **Speed:** Stream EM can be towed by a vehicle up to 15 km/h (9 mph) and can be run continuously without blocking traffic.
- **Accurate to as little as 5 cm (2 inches):** Stream EM can be interfaced with GPS or a total station in order to accurately geo-locate the surveyed area and to individually distinguish all pipes, cables and anomalies detected.
- **Professional subsurface survey:** Pipes, cables and buried objects can be automatically transferred to CAD and GIS formats allowing a complete subsurface GIS-based digital map to be produced in just a few days.
- **Advanced acquisition and navigation software** with real-time tomography and survey control with parameter editing.

Stream EM



GRED HD 3D CAD: subsurface time slice view



GRED HD 3D CAD: 3D post processing results

Automatic CAD-and GIS transfer

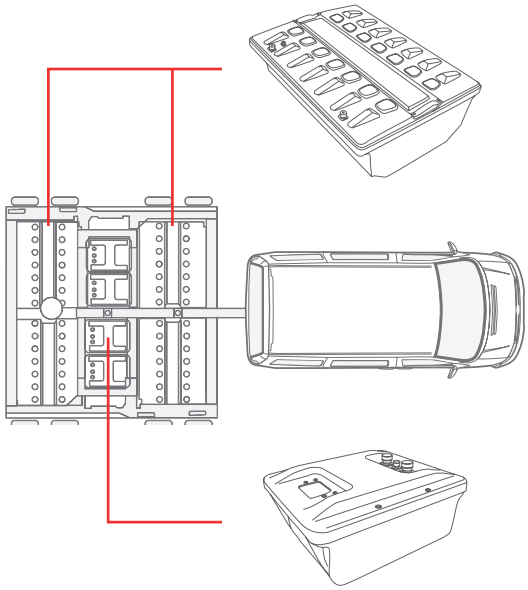
Stream EM Configuration:

Stream X and RIS MF Hi-Mod

Stream EM is a modular system which can quickly be reconfigured with optional frames to suit particular requirements or constraints. It is composed of 2 vertical 200 MHz Detection of Main Line (DML) arrays for detecting main pipes along the road and 4 horizontal dual frequency 200 MHz & 600 MHz Detection of Connection Line (DCL) arrays for the detection of shallow and deep junctions.

Stream X
the DML arrays can be extracted from the Strea EM to be used in the Stream X configuration for archaeology or environment surveys

RIS MF Hi-Mod
the DCL array can be extracted from the Stream EM to be used in the RIS MF Hi-Mod configuration for mapping sidewalks and areas with difficult accessibility



SYSTEM SPECIFICATIONS	
OVERALL WEIGHT (PC NOT INCLUDED)	228 kg (500 lbs)
RECOMMENDED LAPTOP	Panasonic CF-31 Tough-Book or similar
MAX. ACQUISTION SPEED (@ STD. SCAN INTERVAL)	15 kph (9 mph)
POWER CONSUMPTION	72 W
POSITIONING	Survey wheel and/or GPS or total station
NUMBER OF CONTROL UNITS	3 synchronized DAD MCH FW
SCAN RATE PER CHANNEL: (@512 SAMPLES/SCAN)	87 scans/sec
SCAN INTERVAL	17 scans/m @ 200 MHz 33 scans/m @ 600 MHz
POWER SUPPLY:	SLA Battery 12 VDC 100 Ah

ANTENNA SPECIFICATIONS	
ENVIRONMENTAL	IP65
ANTENNA FOOTPRINT	Width 1.84 m
NUMBER OF CHANNELS	38
ANTENNAS CENTRAL FREQUENCIES	200 MHz (34 channels) and 600 MHz (4 channels)
ANTENNA POLARIZATION	Horizontal (HH) and Vertical (VV)
ANTENNA SPACING	6cm
CERTIFICATION	EC, FCC, IC

SOFTWARE SPECIFICATIONS	
ONEVISION ACQUISITION SOFTWARE	• Tomographic map view (C-Scan) including radar scan fusion • 3D data visualization • Advanced targeting using radarscan and tomographic view
GRED HD 3D CAD POST PROCESSING SOFTWARE	• Tomographic map view (C-Scan) including radar scan fusion • 3D data visualization • Advanced targeting using radarscan and tomographic view • CAD, GIS exportation of GPR data and target • Synthetic map (only for the Stream family of products) • Radarscan viewer, filter and advanced filtering macros, multiple radar scan viewer • Layer picking for automatic analysis of sub-layers • GPS and map track viewer including X, Y and Z axis and digital map importation • Video handling (option)

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