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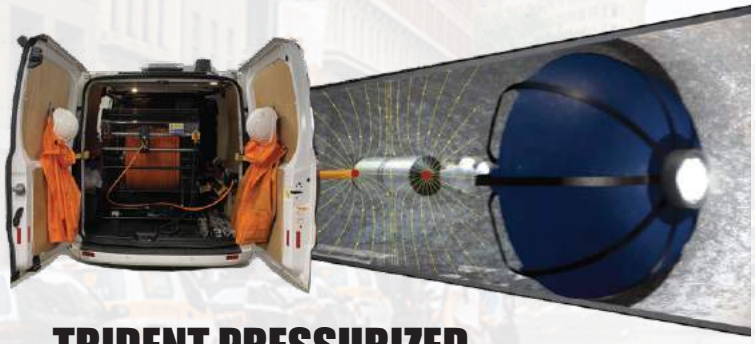
LEAK DETECTION PRODUCT & SERVICES CATALOG

2022

DELTA PRESSURIZED WATER LEAK DETECTION



ES-600 SEWER

TRIDENT PRESSURIZED WATER LEAK DETECTION

ES-600 SEWER PORTABLE

OUR QUALITY STANDARDS AND YEARS OF SERVICE CONTINUE TO OFFER SOME OF THE MOST TALENTED FIELD AND TECHNICAL PERSONNEL IN THE INDUSTRY.

International Patents and Patents Pending.

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AWARDS

2022

Edie Sustainability Award: Product Innovation of the Year - Finalist
(Winner unannounced at time of print)

Winner of Builtworlds Venture West Demo Days

2021

IoT Breakthrough Awards: Leak Detection Solution of the Year

Petronas: Technology Challenge 15 Winner
(Inspection Technique of Non-Metallic Underground Piping)

2016

Sacramento Region Innovations Award - Finalist

2015

NASTT: Joseph L Abbott Jr Award for Product Innovation

UKSTT: Best Project Award for Small Scheme

AEI: American Leadership Award

2014

Green Tec Awards: Water & Sewerage - Finalist

2013

The New Economy Clean Tech Awards: Best Water & Wastewater Solutions

South West Water: PURE Award for Innovation

WEF: Innovative Technology Award

NASTT: Joseph L Abbott Jr Award for Product Innovation

Sierra Nevada Innovation: CleanTech Award

PETRONAS: TECHNOLOGY CHALLENGE 15 WINNER

LEAK DETECTION SOLUTION OF THE YEAR

BEST WATER & WASTERWATER SOLUTIONS

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TABLE OF CONTENTS

INTERNATIONAL PATENTS & PATENTS PENDING
CA 2864503, CA 2874808, CA 2905492, EP 2748576, JP 6062541, JP 6193893, NZ 713053,
US Patents: 9143740, 9304055, 9933329, 10451515, 10557772, 10816431

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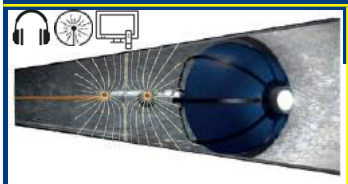
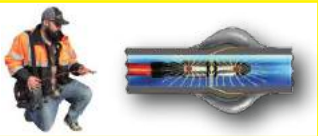
PRODUCT OVERVIEW

Product	Number	Selected Application	Sales / Licensing[1]
	**DELTA** Multi-Sensor Probe	Small-to-Medium Pressurised Water Mains or Sewer Rising Mains up to 60 inches (1500mm). Up to 3,300 ft (1km) per survey, or 6,600 ft (2km) with special upgrades.	Only available for service-related projects. Not for sale to utility customers or contractors. Contractor licensing subject to training, qualifications, and annual support agreement.
	**TRIDENT** Multi-Sensor Probe - American Version - British Version	Small-to-Medium Pressurised Water Mains or Sewer Rising Mains, up to 60 inches (1500mm). Up to 240m per survey (120m in a single direction).	Available for sale to municipal or investor-owned utilities. Available for licensing to contractors on a daily or per meter basis.
	**ES-600 CCTV** Optional: ES-670, ES-660, ES-650 ES-400	Medium-to-Large diameter Sewer or Stormwater Pipes, or Gravity Water Mains 6-72 inches (150-1800mm). Rack-mounted onto an existing CCTV truck or van. 1,500ft (460m) range.	Available for sale to municipal or investor-owned utilities. Available for licensing to contractors on a daily or per meter basis.
	**ES-600 Portable** Optional: ES-670, ES-660, ES-650 ES-400	Medium-to-Large diameter Sewer or Stormwater Pipes, or Gravity Water Mains 6-72 inches (150-1800mm) that are difficult to access by vehicle. 1,000ft (305m) range.	Available for sale to municipal or investor-owned utilities. Available for licensing to contractors on a daily or per meter basis.
	**ES-400 Push Rod** Optional: Plug Reel, Hand Cart ES-200, ES-50	Small-to-Medium diameter Sewer or Stormwater Pipes 4-24 inches (150-600mm). Push rod length is limited to approximately 490 ft (150m).	Available for sale to municipal or investor-owned utilities. Available for licensing to contractors on a daily or per meter basis.
	**ES-200 Push Rod** Optional: Plug Reel, Hand Cart ES-50	Small diameter Sewer or Stormwater Pipes 3-8 inches (76-150mm). Best for private laterals. Push rod length is limited to approximately 490 ft (150m).	Available for sale to municipal or investor-owned utilities. Available for licensing to contractors on a daily or per meter basis.
	**ES-25 & 50 Push Rod** Optional: Plug Reel, Hand Cart	Very small diameter Plumbing Fixtures or Industrial Tubing 0.5-4 inches (25-100mm).	Scheduled for release in Second Quarter 2022.
	**Kingfisher & Swordfish**	Very small diameter water pipes 0.5-4 inches (13-100mm).	Available for sale to utilities and plumbers. Available for licensing to contractors on a daily or per meter basis.
	**CriticalH_2O® Cloud App**	Web-based data management & storage, including SQL database for storing real-time inspection results for Low Voltage Conductivity, Acoustic, and CCTV surveys.	Requires set-up fee, per seat licensing, and minimum 2-year software support agreement.
	**CriticalSewers® Cloud App**	Web-based data management & storage, including SQL database for storing real-time inspection results for Low Voltage Conductivity.	Requires set-up fee, per seat licensing, and minimum 2-year software support agreement.

1. All products are available for international projects, and require detailed maps and a project plan addressing permitting, traffic control, and pipe access.

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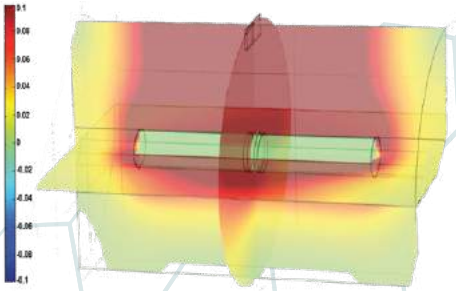
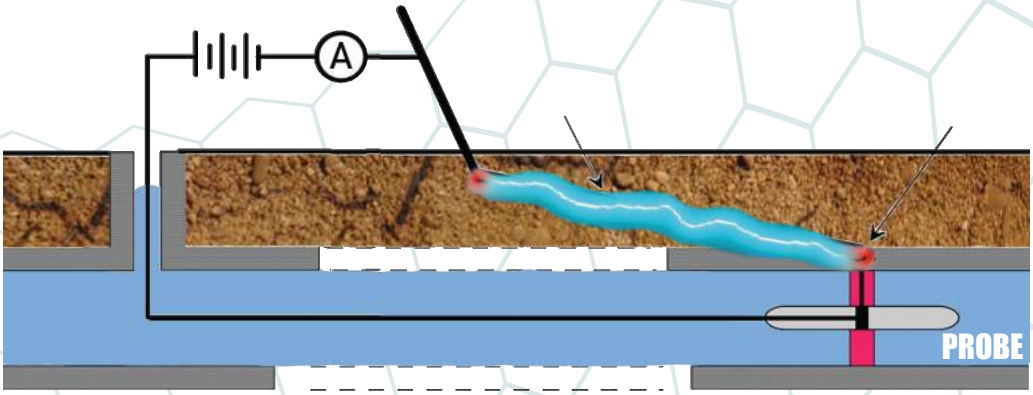
NON-ACOUSTIC LEAK DETECTION

How Leaks Are Found & Measured in GPM

If a pipe leaks electricity, it leaks water,
and can be measured in Gallons per Minute or Liters per Second.





- **Machine-Based Leak Location.**
- **Measures the Size of Hole by Focused Electric Current.**
- **Machine-Based Leak Quantification in GPM or LPS.**
- **As Featured in AWWA M77, ASTM F2550, JACSOMA #7**

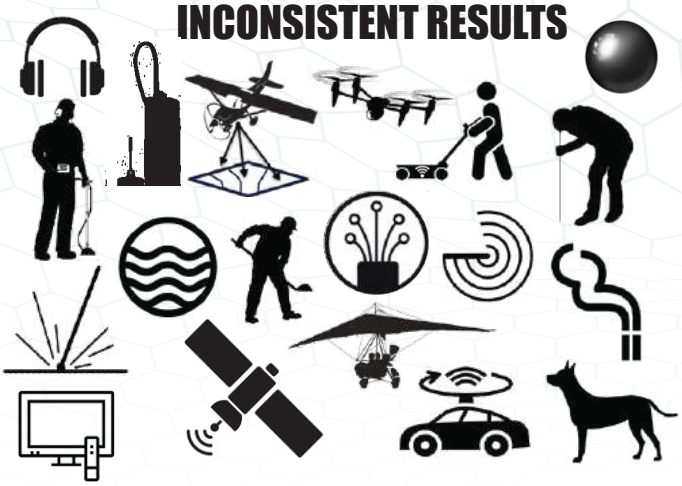
GPM

± 0.4 INCH ACCURACY
REPEATABLE RESULTS

CONDUCTIVITY

NO GPM

QUESTIONABLE ACCURACY
INCONSISTENT RESULTS



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COMPETITIVE ADVANTAGES

Company YES ✓ NO	electro scan inc.		Aquam	Xylem/Pure/WRc		Aganova	Ingu	Utilis
Features / Product	**Delta**	**Trident**	**JD7**	**Sahara**	**SmartBall®**	**Nautilus**	**Recon**	**Satellite**
Technology	Acoustic, CCTV, Conductivity	CCTV, Conductivity	Acoustic, CCTV	Acoustic, CCTV	**Acoustic**	Acoustic	Acoustic	**Synthetic Aperture Radar**
In-Pipe Connection	Tethered	Tethered	**Tethered**	Tethered	**Free Flowing**	Free Flowing	Free Flowing	
Device								
Visual Inspection with Camera	✓	✓	✓	✓				
Joint Spacing	✓	✓						
Leak Location – Accuracy 1cm	✓	✓						
Leakage Severity – Expressed in Gallons per Minute or Litres per Second	✓	✓						
Finds & Measures Leaks in Plastic Pipe	✓	✓						
Pressurised Water & Gravity Sewers	✓	✓						
Wall Thickness for Cement Asbestos	✓	✓						
Able to Find Leaks With 'NO FLOW'	✓	✓						
Repeatability of Leak Location +2years	✓	✓						

KEY ADVANTAGES

- No Lost Balls or Spheres. **100% Retrieval Since We're Tethered.**
- No False-Positives from 'Hitting' the Pipe Wall like Acoustic. **Not Possible With Ohm's Law.**
- No Missed Leaks. **We Find Them All.**
- No Guessing 'Which Leak is Larger?' **Each Has a Liters per Second or GPM.**
- No High Pressure Needed. **We're Pressure-Independent; Able to Scan 0-175 psi (12 bar).**
- No Long Wait for Reports. **Data is Available in Minutes!**
- No Estimated Locations or Ranges. **Pinpoint Locational Accuracy of 1cm (0.4in).**
- No Late Night / Early Morning Testing. **Ambient Noise & Customer Pipe Usage Is Not a Factor.**
- No Effect from High Groundwater Surrounding Pipes. **Electro Scan Measures Size of Hole.**
- No Need to Increase Pipe Pressure to Hear Leak. **Electro Scan Is Non-Acoustic.**

SURVEY REPEATABILITY

1. Low Accuracy
   Low Repeatability

ACOUSTIC

2. Low Accuracy
   High Repeatability

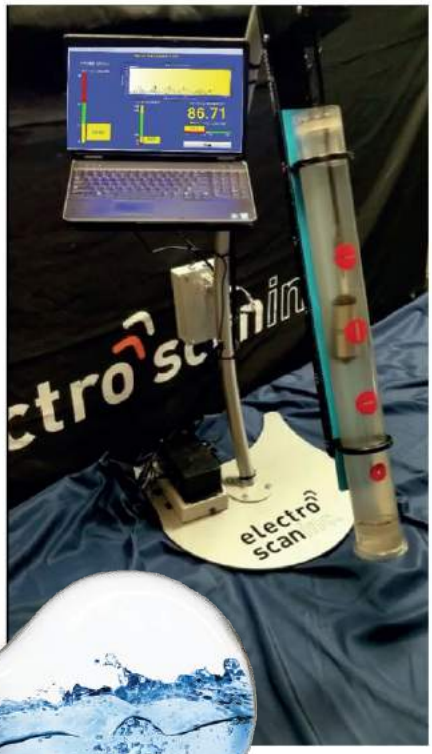
SATELLITE

3. Medium Accuracy
   Low Repeatability

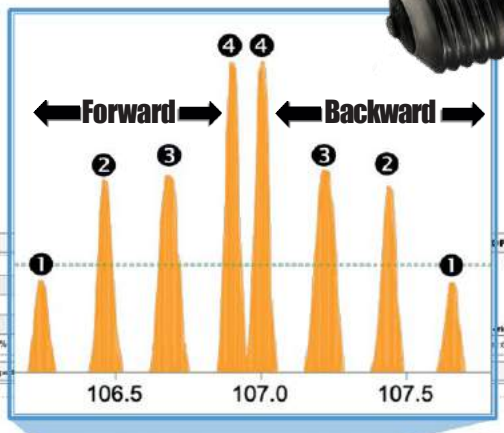
FIBER OPTIC

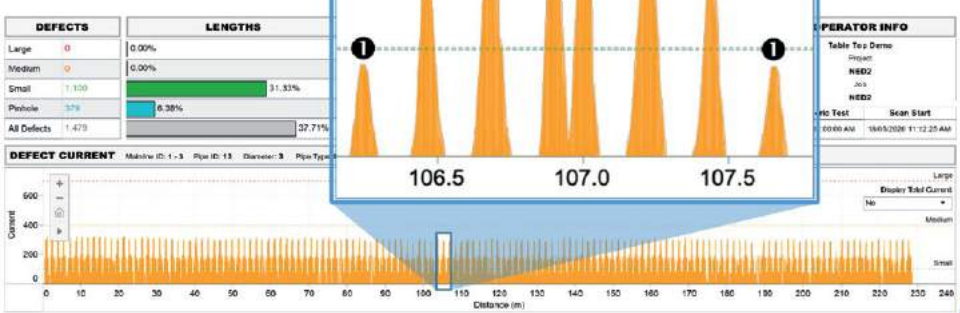
4. High Accuracy
   High Repeatability

CONDUCTIVITY



Conductivity Benchmark Testing





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PIPE MATERIALS

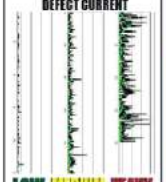
ABS	Acrylonitrile-butadiene-styrene	PCCP	Prestressed Concrete Cylinder Pipe
ACP	Asbestos Cement Pipe	PE	Polyethylene
BRK	Brick	PFP	Pitch Fiber Pipe
CMLSP	Cement Mortar Lined Steel	PP	Plastic Pipe
CON	Concrete	PVC	Polyvinyl Chloride
CIPP	Cured-In-Place Pipe	RCP	Reinforced Concrete Pipe
DIP	Ductile Iron (w/Protector 401)	RPM	Reinforced Plastic Mortar
FRP	Fiberglass Reinforced Pipe	RTR	Reinforced Thermosetting Resin
FRPM	Fiberglass Reinforced Polymer	SIPP	Spray-in-Place Pipe
GRP	Glass Reinforced Pipe	SPR	Spiral Wound Pipe
HDPE	High Density Polyethylene	TC	Terracotta or Clay Pipe
ORP	Orangeburg Pipe	VCP	Vitrified Clay Pipe
PB	Polybutylene		

PRE-REHABILITATION

Asbestos Cement Pipe

Electro Scan FELL is unique in its ability to geometrically map the remaining wall, i.e. corrosion of ACP.

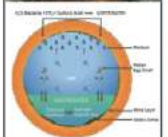
Finding & Measuring Pipe Corrosion Using Electro Scan's Patented Data Analytics

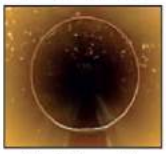


CORROSION

DEFECT FLOW

As demonstrated by independent benchmarks, since acoustic and transient pressure sensors are unable to provide detail geometric assessments of pipe walls, and therefore unable to estimate remaining pipe walls, Electro Scan represents a game changing solution to assess & prioritize ACP.





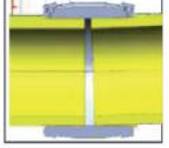
High Density Polyethylene Pipe

Poor mechanical or fused joints are the Achilles heel of HDPE, and not seen by CCTV cameras or heard by acoustic data loggers or sensors. But, found & quantified by FELL in accordance with ASTM F2550.

Evenly Spaced Defects Indicate Problem Joints.

What Electro Scan Finds Most?

Inadequate Clamping or Restraint during Fusion (Below)



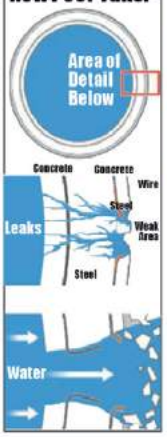
Prestressed Concrete Cylinder Pipe

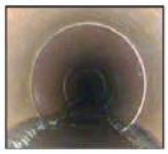
Electro Scan represents the only technology able to reliably & consistently find & measure leaks in GPM.

While other devices may attempt to locate corroded wire mesh that may or may not indicate a weakness in the pipe wall, Low Voltage Conductivity represents a game-changing solution to provide unbiased leak locations & severity for each defect.

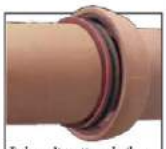
Superior to acoustic and electromagnetic sensors, Electro Scan's Low Voltage Conductivity detects leaks other technologies miss.

How PCCP Fails?





Vitrified Clay Pipe

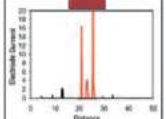


It doesn't matter whether you evaluate VCP from the outside or inside of a pipe, CCTV, Laser, LIDAR, Sonar, GPR, or Acoustic, are not able to detect or measure defect flows.

ELECTRO SCAN ASSESSES 100% OF JOINTS

Electro Scan's FELL is the only technology, representing a Non-Destructive Test (NDT) able to follow a 90° pipe bend to locate a pathway for water to enter or exit a pipe.

By measuring the change in current and the amount of flow, the size of the opening can be computed and translated into an estimated GPM.



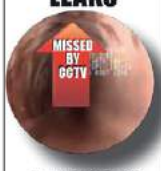
Open trench evaluation of FELL located defects, missed by CCTV, exactly showed three matching leaks due to fittings that were never tightened. Just one of over a dozen tests proving FELL superiority.

POST-REHABILITATION

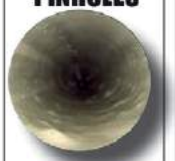
Cured-In-Place Pipe

CIPP liners may not be watertight and defects not seen by certified operators using CCTV cameras. As a result, ASTM F2550 should be added to CIPP specifications to ensure pipe quality & integrity.

LEAKS



PINHOLES



SOAKAGE

RECOMMENDED USE:
To Find & Quantify Leakage From

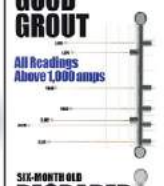
- Accelerant Burns
- Accidental Cuts
- Bad Service Reconnect
- Bad Lateral Liners
- Blisters
- Delamination
- Defective Epoxy
- Equipment Damage
- Foreign Objects
- Pinholes
- Poor Curing
- Overcooking
- Stretching
- Top-Hat Defects
- Wet-Out Failures
- Wrinkles, including: Buckling, Fins, Folds, Lifts, and Ridges

Grout

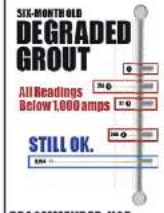
FELL is now preferred over using traditional packers to test joints for water tightness, due to FELL's Non-Destructive Testing (NDT) of joints, laterals, and cracks.

Unlike air testing, FELL does not force any added pressure on joints or laterals. Since air testing can open joints, shift pipes, and even temporarily correct out-of-round conditions in plastic pipes as areas around joints are inflated, packers are no longer recommended for testing the quality of joints or laterals.

GOOD GROUT



SIX-MONTH OLD DEGRADED GROUT

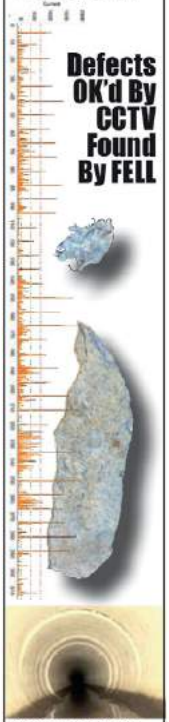


RECOMMENDED USE:

1. All Pre-Grouted Pipes.
2. Post-Grouted Pipes, 6-12 Months After Grout to Detect Drying or Shrinkage.
3. Prior to Warranty Acceptance.

Spray-In-Place Pipe

DEFECTIVE (NEW) SIPP



Defects OK'd By CCTV Found By FELL

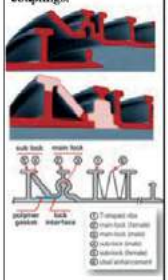
RECOMMENDED USE:

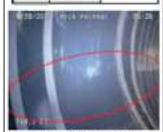
1. Pre-SIPP.
2. Post-SIPP All Liners.
3. Prior to Warranty Acceptance.

Spiral Wrap Pipe

Locking individual wraps is key to any successful Spiral Wrap Pipe project, with problems not identified by CCTV.

In contrast, Electro Scan FELL inspection can find defects to individual couplings.





RECOMMENDED USE:

1. Pre-Spiral Wrap.
2. Post-Spiral Wrap.
3. Prior to Warranty Acceptance.

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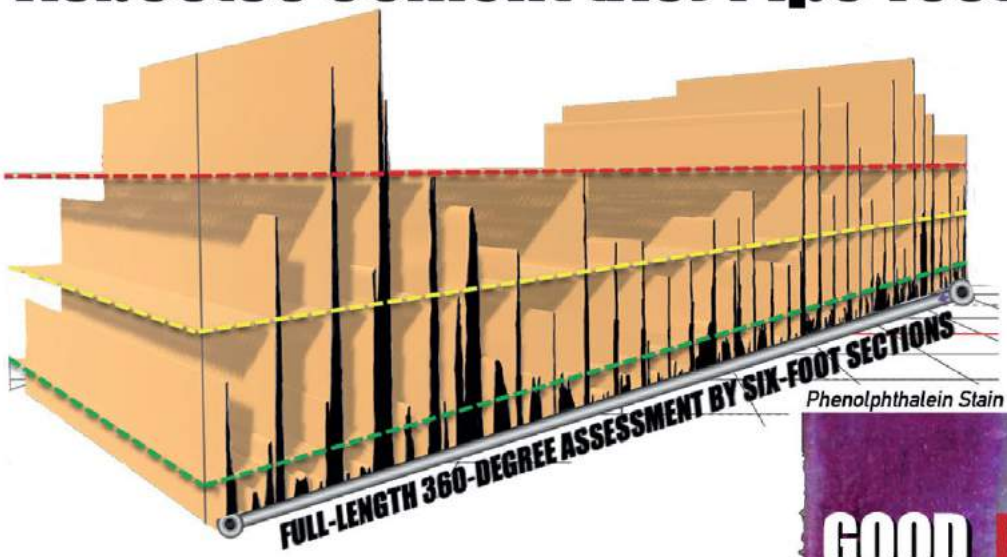
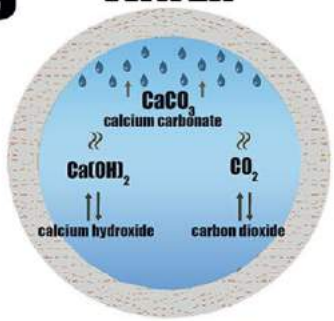
PIPE WALL THICKNESS

Asbestos Cement (AC) Pipe Testing



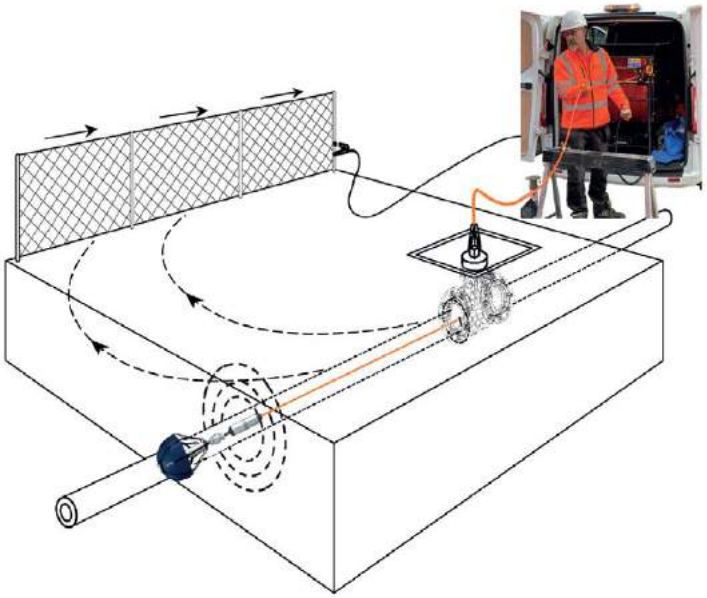
Wall Thickness Measured By Electro Scan.
Missed By Acoustic Sensors & CCTV Cameras.

WATER

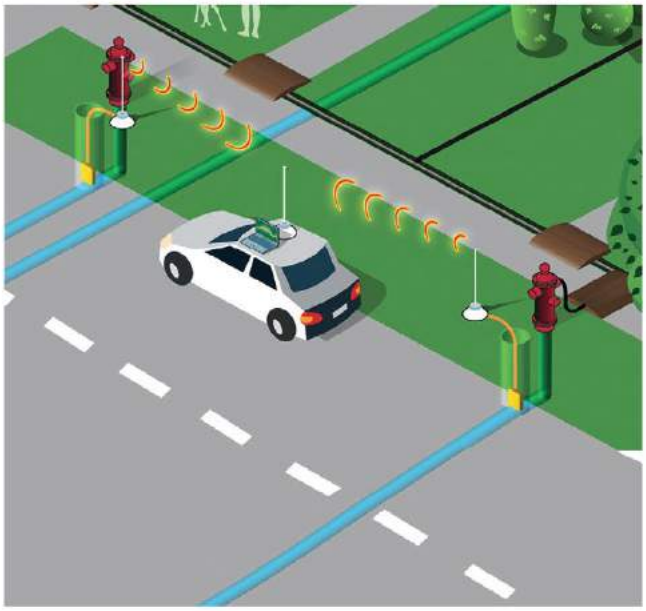


WASTEWATER

Full-Length 360-Degree vs. Average for Entire Pipe



ACTIONABLE DATA



NO ACTIONABLE DATA

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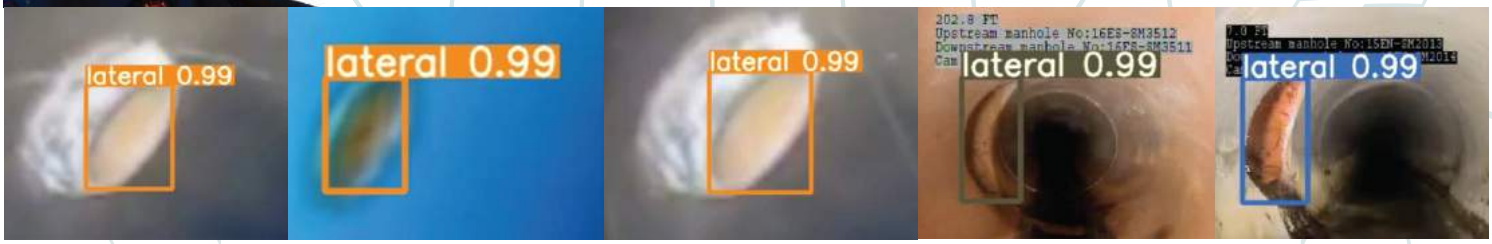
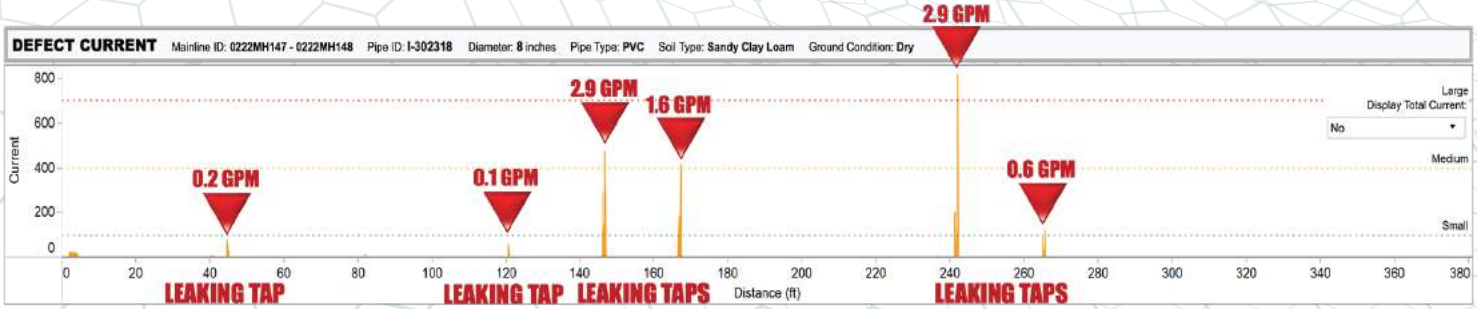
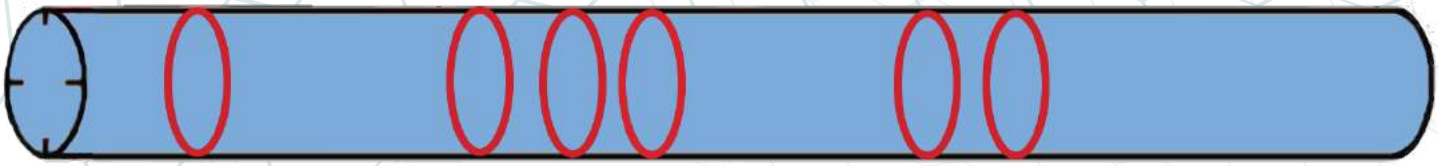
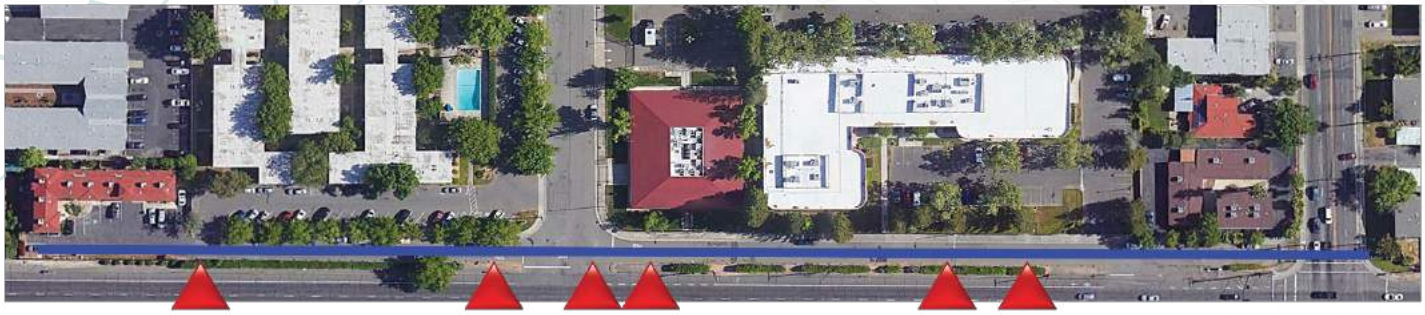
ILLEGAL & LEAKING TAP CONNECTION ASSESSMENTS



ELECTRO SCAN USES PINPOINT ACCURACY AND AI-CCTV TO ACCURATELY IDENTIFY LEAKS AT TAPS v. PIPE WALLS







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WATER
LEAK DETECTION PRODUCTS

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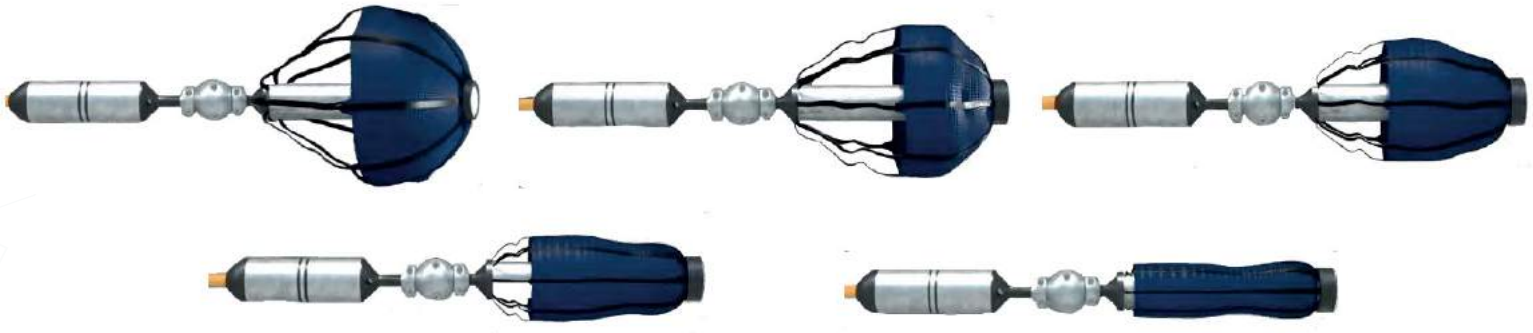
MULTI-SENSOR DELTA PROBE

ACOUSTIC* CONDUCTIVITY CCTV

Condition	Performance
Features	Low Voltage Conductivity FELL, CCTV, Acoustic Hydrophone, Pressure Sensor
Pipe Diameters	8-60 inches (200-1500mm)
Pressure	ZERO to 12 bar (175 psi)
Temperatures	41-86° F / 5-30° C
Common Launch Points	Air Release Valves, Blow Off Valves, Gate Valves, Hot Taps, Hydrants, and Meters
Flow Rate	Min. Flow Rate for Hydrochute Propulsion is 0.3m/sec. Pull-Through able to handle NO FLOW conditions.
Pricing	Per Day or Per Meter Based on Project Size, Access Difficulty, Insertion Points, Diameters, and Traffic Control
Pipe Lengths Per Survey	1km Recommended for CCTV. Up to 2km with specialized equipment.
Average Production	1-2 Pipe Sections per Day



* Integrated Acoustic Sensor lets utilities compare results with Conductivity, revealing what they are "not" hearing.

electro scan inc.

MULTI-SENSOR DELTA PROBE

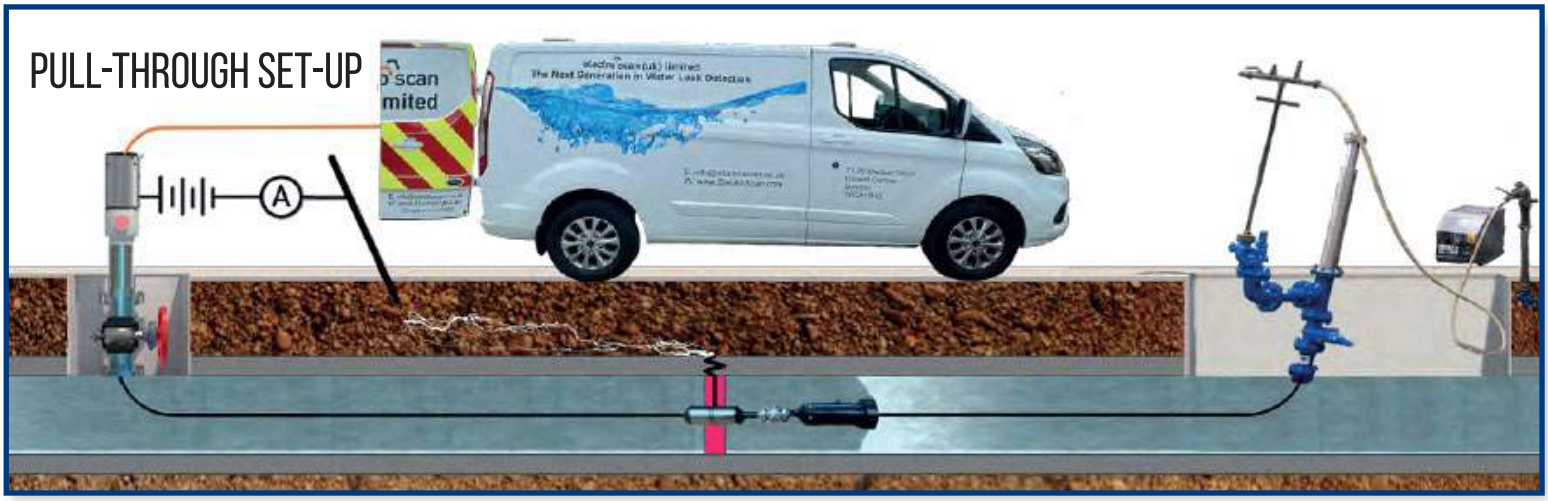
electro scan inc.

MULTI-SENSOR DELTA PROBE

ONLY AVAILABLE AS A SERVICE BY AUTHORIZED CONTRACTORS

HYDROCHUTE SET-UP

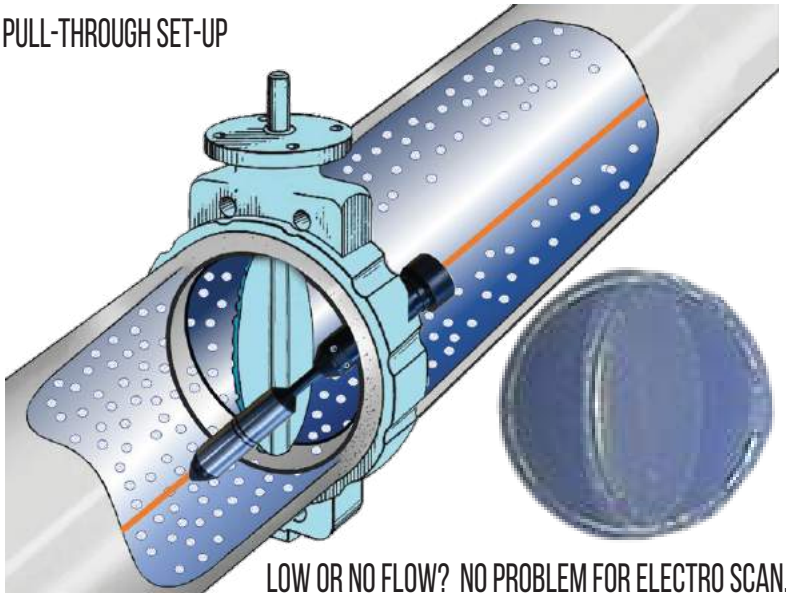
PULL-THROUGH SET-UP



OVER 3,000 PRESSURIZED PIPE INSERTIONS

HYDROCHUTE SET-UP

PULL-THROUGH SET-UP



LOW OR NO FLOW? NO PROBLEM FOR ELECTRO SCAN.

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SAMPLE SURVEY DATA

Pipe	Description
Length	170m (560ft)
Diameter	600mm (24in)
Material	Cement Mortar Lined Ductile Iron
Pressure	130.5 psi (9 bar)
Test Date	17 September 2020
Prior Leak Testing	Hydrostatic Pressure Test (FAILED) Tethered Acoustic (NO LEAKS) Un-Tethered Sphere (NO LEAKS) Surface Data Logger (NO LEAKS) Listening Stick (NO LEAKS)

HANSEN
Hansen Analytics, LLC

criticalh2o

Scans | Export | Support | Log Out

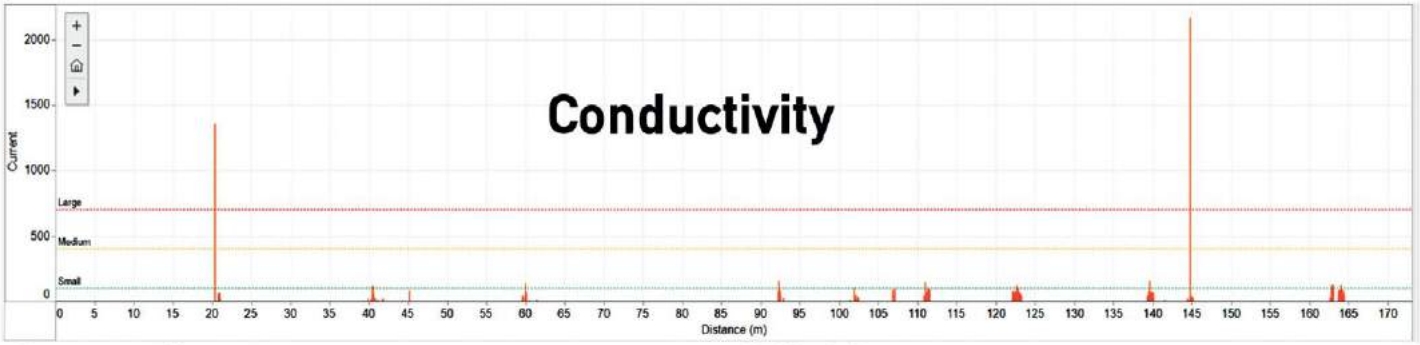
DEFECTS	
Large	2
Medium	0
Small	13
Pinhole	0
All Defects	15

DEFECT FLOW	
Severe	1.5817
Moderate	0.6820
Minor	0.1369
Total LPS	2.401
LPD	207.403
Severe %	65.89%
Moderate %	28.41%
Minor %	5.70%

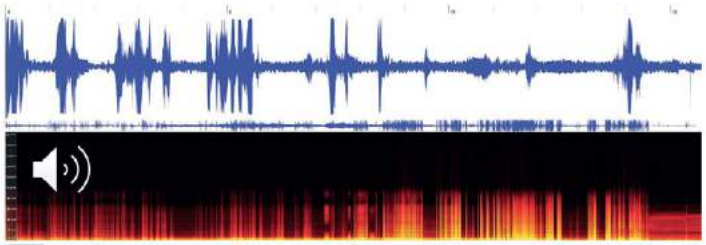
Defects	Length	Total LPS	% of LPS	LPD
15	341	2.401	100%	207,410

Largest Defects Ranked By LPS

Defect Start	Defect End	Total LPS	% of LPS	LPD
162,883	162,980	0.471	19.61%	40,664
144,722	144,723	0.389	16.19%	33,578
92,231	92,281	0.364	15.16%	31,452
122,652	122,725	0.358	14.93%	30,962
Top Four Leaks		**1.582**	**66%**	**136,656**



Acoustic - ONLY FALSE-POSITIVES



CCTV

Data Partner

T4S

Smart Wireless Solution

electroscaninc.

MULTI-SENSOR TRIDENT PROBE

Pressurized Water Main Leak Detection.
Finding & Measuring Leaks in GPM or LPS.

CONDUCTIVITY

CCTV

CHLORINATION CHAMBER

Condition	Performance
Probe Sensors	Low Voltage Conductivity FELL and CCTV
Pipe Diameters	4-10 inches (100-255mm)
Pressure	0 to 160 psi (11 bar)
Temperatures	5-30°C, 41-86°F
Flow Rate	Push Cable able to handle flow or no-flow conditions
Pricing	Per Day or Per Meter Based on Total Project Size
Launch Points	Hydrants, Air Release Valves, Blow Off Valves, Gate Valves, Hot Taps, Meters
Pipe Length Per Survey	Up to 400ft (120m) in either direction from access
Construction	High impact ABS & powder-coated, zinc-plated mild steel
Dimensions (Length x Width)	5 inches x 1.6 inches
Camera Features	Display: 10.1", 1280 x 800 HD color TFT Storage: Internal 128Gb, USB flash storage supported Power Options: Mains Input (100-240 VAC), DC Output (16 VDC) or Built-In Battery (4S2P) Focal Range: 10mm to ∞ Active Pixels: 768 x 492 (NTSC) / 765 x 582 (PAL) LED Luminance: ≥ 208 Lumens Resolution: ≥ 460 TVL

electro scan inc.

STANDARD OPERATING PROCEDURE

1 Hydrant, Hot Tap, or Valve

Hydrant Entry

Hot Tap

Actual Field Insertion

2 Flow Meter

Electro Scan first measures flow velocity and flow direction before any leak survey.

3 Chlorination & Cleaning

In addition to passing 'materials in contact' testing requirements, Electro Scan does not use any equipment except as designed for water networks, with all components cleaned & sanitized before its use in pressurized water mains.

4 Insertion Tube

Electro Scan's insertion tube is carefully lowered into place and secured before inserting its multi-sensor probe.

5 Probe Launch

After a final pre-insertion cleaning, the Electro Scan probe is lowered into the insertion tube with the pipe re-pressurized.

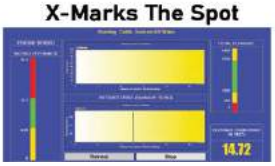
6 Push Reel

Utilizing a two-person team, Electro Scan's Trident is spooled off the reel and then pushed through the insertion tube for initial deployment.

7 Data & Video Capture

Utilizing a two-person team, Electro Scan's TRIDENT is carefully 'spooled' into its insertion tube, then 'pushed' through the insertion tube for full pipe length deployment. Representing a breakthrough, data acquisition and video do not require operator interpretation.

X-Marks The Spot

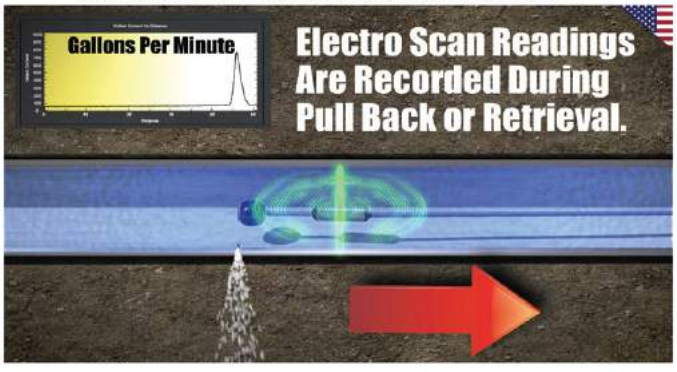


8 CCTV *Push Forward Direction*

Closed-Circuit Television (CCTV) video is automatically captured and streamed real-time so operators can navigate through valves and around obstructions.

9 Electro Scan *Pull Back Direction*

Once a maximum distance is achieved (up to 400ft or 120m), then the operator begins recording Electro Scan data as the probe is pulled back through the pipe.



10 Probe Retrieval

After the probe has exited the water main, while still in the insertion tube, the gate valve may may be closed to allow for the probe to be fully retrieved from the pipe.

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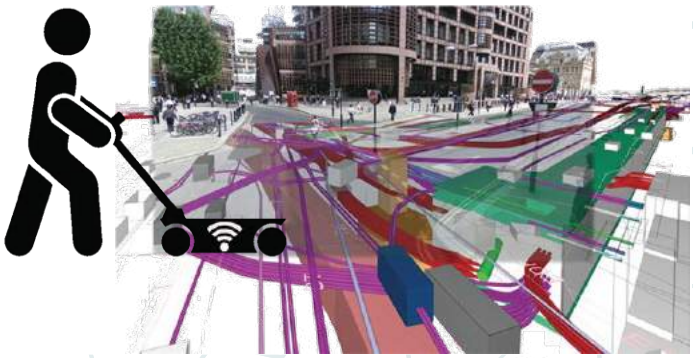
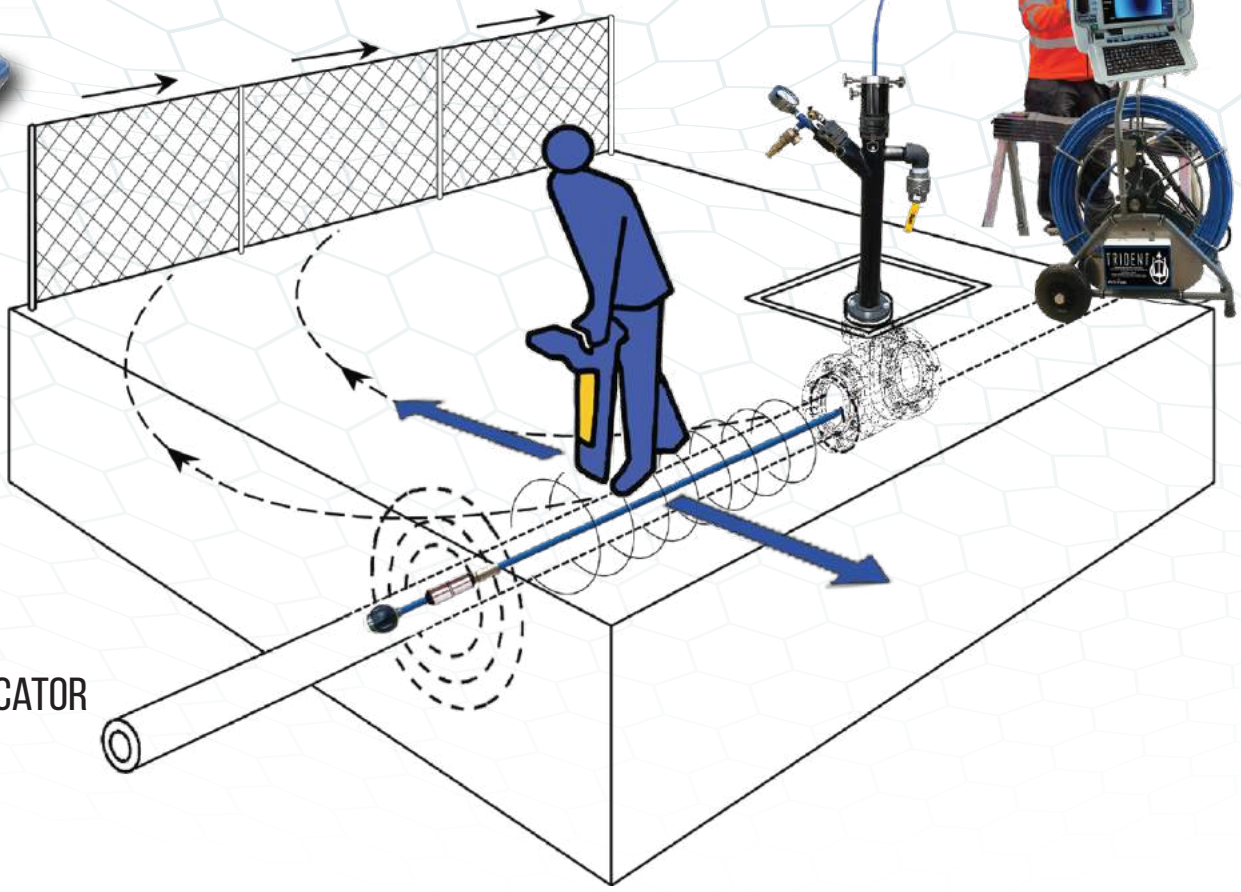
new

LINE LOCATION

DRAWBACK OF GROUND PENETRATING RADAR:
DIFFICULT TO LOCATE WATER MAINS



PRECISION SONDE LOCATOR



LOCATE LINES WITH THE TRIDENT PROBE'S BUILT-IN SONDE

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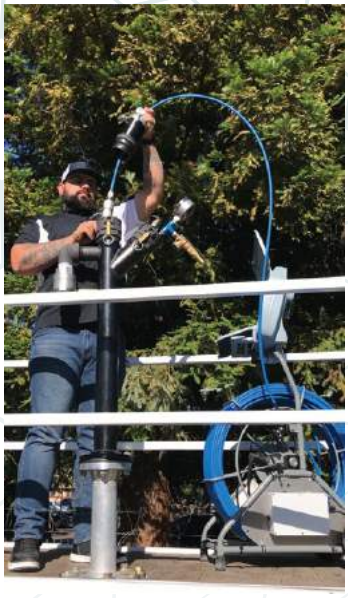
NEW

WATER LEAK TRAINING CENTER

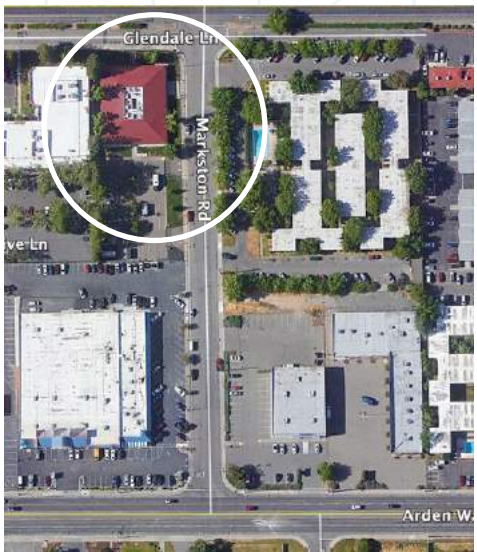
INSTRUCTION

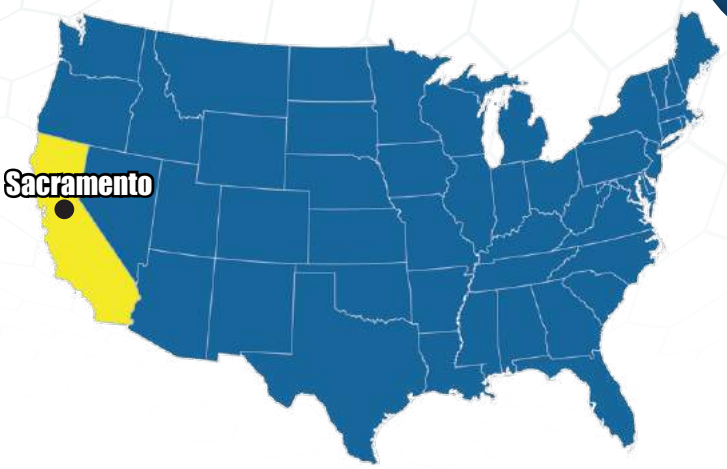
HANDS-ON TRAINING



IN-PIPE NAVIGATION

AUTOMATIC DATA CAPTURE





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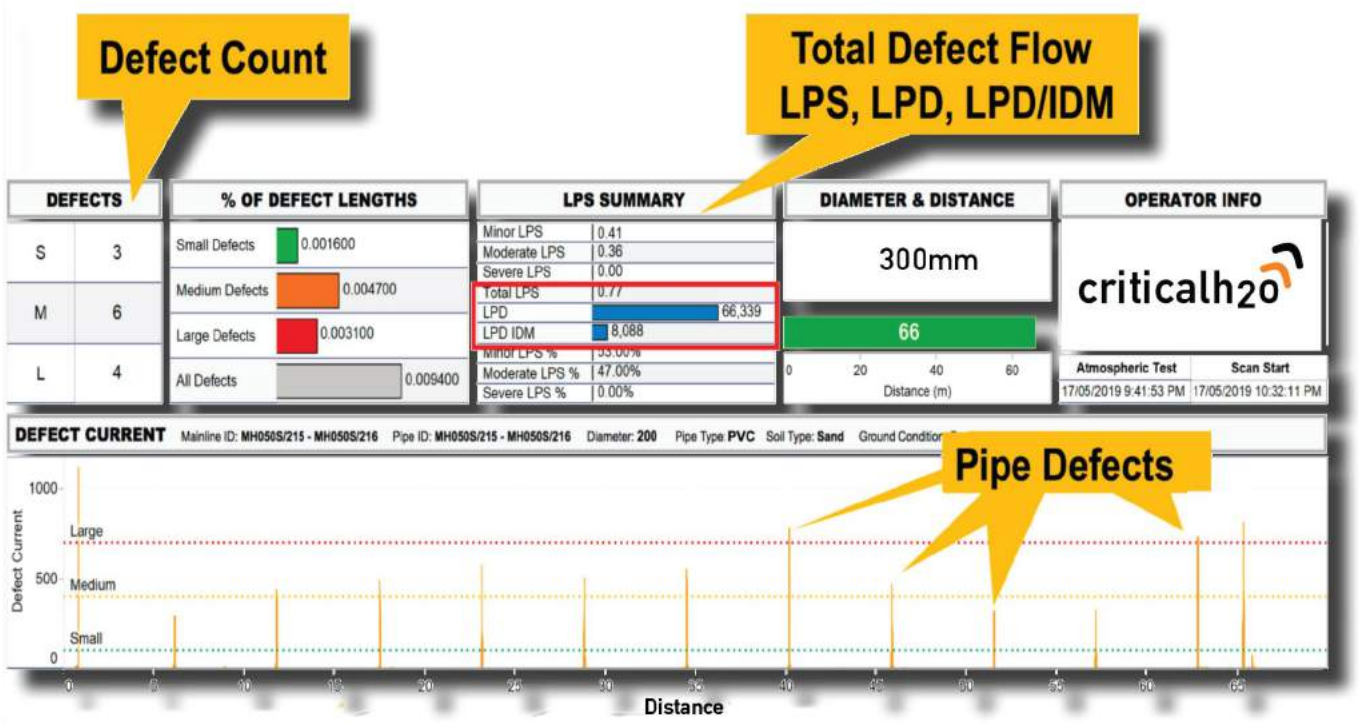
CRITICAL H2O CLOUD APPLICATION



FIELD

Field Data 5-Minutes or Less.

OFFICE

tableau

Innovyze®

amazon web services

SEWER
INFILTRATION PRODUCTS

electro scan inc.

ES-600 CCTV TRUCK INTEGRATION ES-670, ES-660, ES-650, ES-400

Aries

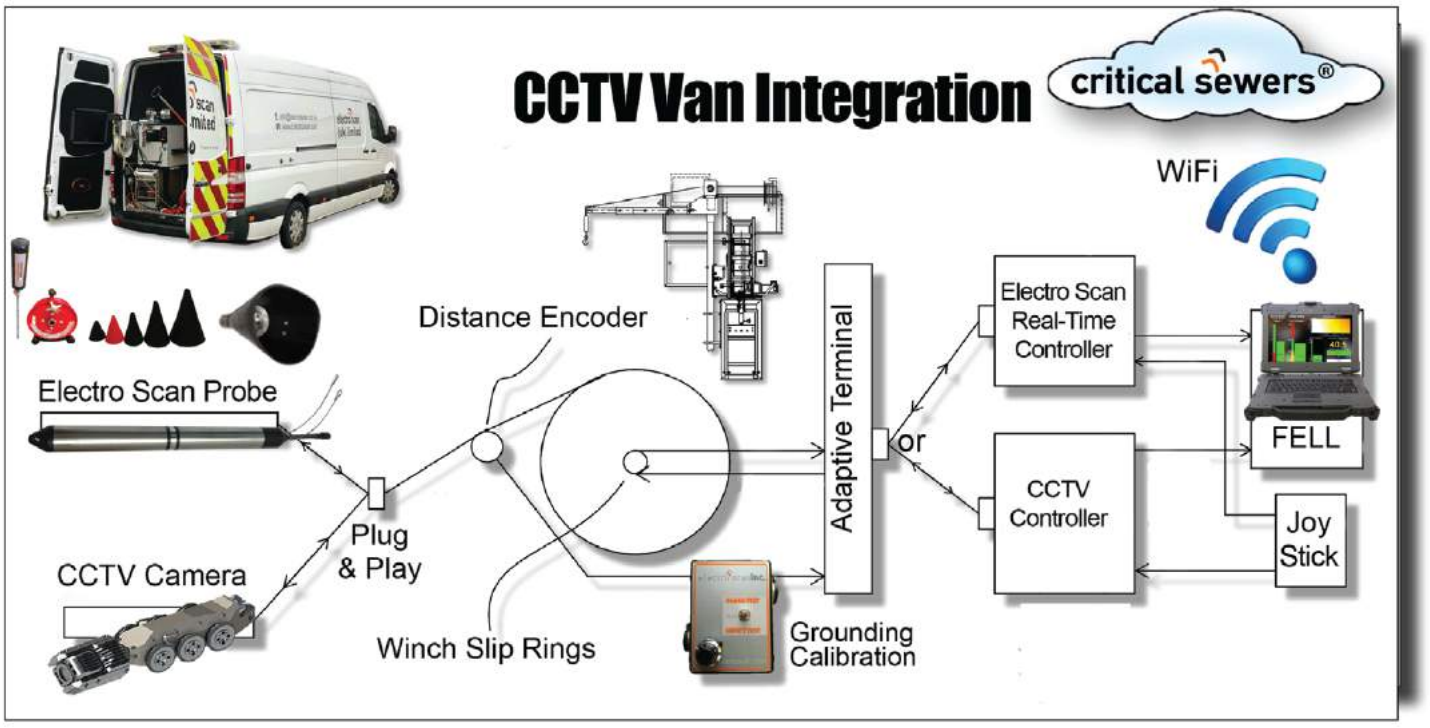
Cues

IBAK

Ipek

Rausch

Custom



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ES-600 STANDARD SPECIFICATIONS AND FEATURES

ES-600 Series	Conveyance	Combined Sewer & Storm Systems, Separated Gravity Mains, Gravity Water Mains, Force Mains, Siphons, and Stormwater Networks.	
	Required Flow	None. Dry, Partially, or Fully-Surcharged Flow. Aided by Jet Truck.	
	Pipes	Pipe Diameters	ES-670: Up to 72 inch (1800mm) ES-660: 6 to 60 inch (150 to 1500mm) ES-650: 6 to 30 inch (150 to 800mm) ES-400: 4 to 16 inch (100 to 400mm)
		Pipe Shape	Any, including Circular, Box, Egg-shaped, Oval, and Trapezoidal.
		Pipe Materials	Any Electrically Non-Conductive Pipe Walls, including Asbestos Cement, Brick, Cement Mortar Lined and Coated Steel, Cured-In-Place Pipe, Ductile Iron with Epoxy Coatings, Fiberglass Reinforced Pipe, High-Density Polyethylene Pipe, Prestressed Concrete Cylinder Pipe, Polyethylene, Polyvinyl Chloride, Reinforced Concrete, Vitrified Clay Pipe, etc.
	System Specification	Dimensions	ES-660 & ES-670 Length: 36 in (914mm); Diameter: 3 in (76mm)
		Scan Recording	Critical Sewers® Field Laptop PC, Wifi Connection to Critical Sewers® Cloud Application.
		Speed	45-60 ft/minute (15-20 meters/minute)
		Operating Temperature	20°F to 120°F (-7°C to 50°C)
		Power Supply	120VAC / 60Hz - or - 220VAC / 50Hz
		Range	1,500 ft (460m) range from single point of access.
		Current (max)	40 mA
		Electrical Array	Focused tri-electrode array
		Defect Flow Calculation	± 30% Accuracy measured in Gallons Per Minute (GPM) or Liters Per Second (LPS).
		Defect Location	ES-650 & ES-660 ±0.4 inches (1cm) ES-670 ±1 inch (2.5cm)
	Advantages	1. No manual coding required. 2. Finds & measures all leaks at cracks, joints, tap connections, and pipe wall. 3. Measures leaks in GPM (LPS). 4. No bypass pumping required for inspection. 5. Use in field rain or shine. 6. Recommended for all Pre- and Post-Rehabilitation. 7. Finds defects not seen by CCTV, such as inside joints. 8. Differentiates superficial cracks from cracks through pipe.	9. Repeatable test results, as verified by US, UK, German, Japanese, and Australian testing. 10. Finds & measures defects hidden by grease, silt, & encrustation. 11. Automatically evaluates 360° of pipe wall. 12. Determines water tightness of sewers & lateral connections. 13. Robust design has no moving parts. 14. Recommended by WRc, developers of NASSCO CCTV Codes. 15. Reports available in minutes, not hours, days, or weeks.
	Limitations	1. Does not provide a clock position of defect location inside the pipe, but location is accurate to within 0.4 inches (1cm). 2. Cannot scan pipes with obstructions or collapsed sections.	

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ES-600 PORTABLE ES-670, ES-660, ES-650, & ES-400

PORTABLE SYSTEMS UTILIZE CUES K2 PORTABLE REEL OR EQUIVALENT

ES-600 SERIES PORTABLE* CONTINUED FROM PRIOR PAGE	PIPES	PIPE DIAMETERS	6 TO 72 INCH (150 TO 1800MM)
		RANGE	1,000 FT (305 M). DEPENDENT ON JET TRUCK HOSE LENGTH.
		PIPE SHAPE	ANY, INCLUDING CIRCULAR, BOX, EGG-SHAPED, OVAL, AND TRAPEZOIDAL.
		PIPE MATERIALS	ELECTRICALLY NON-CONDUCTIVE PIPE WALLS, INCLUDING ASBESTOS CEMENT, BRICK, CEMENT MORTAR LINED AND COATED STEEL, CURED-IN-PLACE PIPE, DUCTILE IRON WITH EPOXY COATINGS, FIBERGLASS REINFORCED PIPE, HIGH-DENSITY POLYETHYLENE PIPE, PRESTRESSED CONCRETE CYLINDER PIPE, POLYETHYLENE, POLYVINYL CHLORIDE, REINFORCED CONCRETE, VITRIFIED CLAY PIPE, ETC.

*FOR DIFFICULT TO ACCESS LOCATIONS AND EQUIPMENT PORTABILITY.

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ES-400 PUSH ROD

ES-400	PIPES	PIPE DIAMETERS	4 TO 24 INCH (100 TO 600MM)
		PIPE SHAPE	ANY, INCLUDING CIRCULAR, BOX, EGG-SHAPED, OVAL, AND TRAPEZOIDAL.
		PIPE MATERIALS	ELECTRICALLY NON-CONDUCTIVE PIPE WALLS, INCLUDING ASBESTOS CEMENT, BRICK, CEMENT MORTAR LINED AND COATED STEEL, CURED-IN-PLACE PIPE, DUCTILE IRON WITH EPOXY COATINGS, FIBERGLASS REINFORCED PIPE, HIGH-DENSITY POLYETHYLENE PIPE, PRESTRESSED CONCRETE CYLINDER PIPE, POLYETHYLENE, POLYVINYL CHLORIDE, REINFORCED CONCRETE, VITRIFIED CLAY PIPE, ETC.
	SYSTEM SPECIFICATION	DIMENSIONS	LENGTH: 8 IN (203MM); DIAMETER: 2.2 IN (56MM)
		SCAN RECORDING	CRITICAL SEWERS® FIELD LAPTOP PC, WIFI CONNECTION TO CRITICAL SEWERS® CLOUD APPLICATION.
		SPEED	30 FT/MINUTE (10M/MINUTE)
		ENVIRONMENTAL	IP 67. ABLE TO WITHSTAND RAIN AND LOW PRESSURE WASH DOWN. 20^0F TO 120^0F (-7^0C TO 50^0C)
		POWER SUPPLY	12V RECHARGEABLE EXTERNAL BATTERY PACK -OR- 12V DC EXTERNAL POWER SUPPLY.
		REEL	SPOOL DIAMETER 39 INCHES, L32 INCHES, W20 INCHES, H38 INCHES L81CM, W51CM, H96CM. LENGTH: 400 FT (120 M)
		CURRENT (MAX)	40 MA
		ELECTRICAL ARRAY	FOCUSED TRI-ELECTRODE ARRAY
		DEFECT FLOW CALCULATION	±30% ACCURACY MEASURED IN GALLONS PER MINUTE (GPM) OR LITERS PER SECOND (LPS)
		DEFECT LOCATION	±0.4 INCHES (1CM)
		WEIGHT	PROBE: 2.95 LB (1.34KG) | TOTAL WEIGHT 80LBS (36KG)

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ES-200 PUSH ROD

ES-200	PIPES	PIPE DIAMETERS	3 TO 8 INCH (76 TO 200MM)
		PIPE SHAPE	ANY, INCLUDING CIRCULAR, BOX, EGG-SHAPED, OVAL, AND TRAPEZOIDAL.
		PIPE MATERIALS	ELECTRICALLY NON-CONDUCTIVE PIPE WALLS, INCLUDING ASBESTOS CEMENT, BRICK, CEMENT MORTAR LINED AND COATED STEEL, CURED-IN-PLACE PIPE, DUCTILE IRON WITH EPOXY COATINGS, FIBERGLASS REINFORCED PIPE, HIGH-DENSITY POLYETHYLENE PIPE, PRESTRESSED CONCRETE CYLINDER PIPE, POLYETHYLENE, POLYVINYL CHLORIDE, REINFORCED CONCRETE, VITRIFIED CLAY PIPE, ETC.
	SYSTEM SPECIFICATION	DIMENSIONS	LENGTH: 6.5 INCHES (165MM); DIAMETER: 1.57 INCHES (39.88MM)
		SCAN RECORDING	CRITICAL SEWERS® FIELD LAPTOP PC, WIFI CONNECTION TO CRITICAL SEWERS® CLOUD APPLICATION.
		SPEED	30 FT/MINUTE (10M/MINUTE)
		ENVIRONMENTAL	IP 67. ABLE TO WITHSTAND RAIN AND LOW PRESSURE WASH DOWN. 20^0F TO 120^0F (-7^0C TO 50^0C)
		POWER SUPPLY	12V RECHARGEABLE EXTERNAL BATTERY PACK -OR- 12V DC EXTERNAL POWER SUPPLY.
		REEL	SPOOL DIAMETER 26 INCHES, L26 INCHES, W12 INCHES, H32 INCHES L66CM, W30CM, H81CM. LENGTH: 400 FT (120 M)
		CURRENT (MAX)	40 MA
		ELECTRICAL ARRAY	FOCUSED TRI-ELECTRODE ARRAY
		DEFECT FLOW CALCULATION	±30% ACCURACY MEASURED IN GALLONS PER MINUTE (GPM) OR LITERS PER SECOND (LPS)
		DEFECT LOCATION	±0.4 INCHES (1CM)
		WEIGHT	PROBE: 1.1 LB (.50KG) | 50LBS (23KG)

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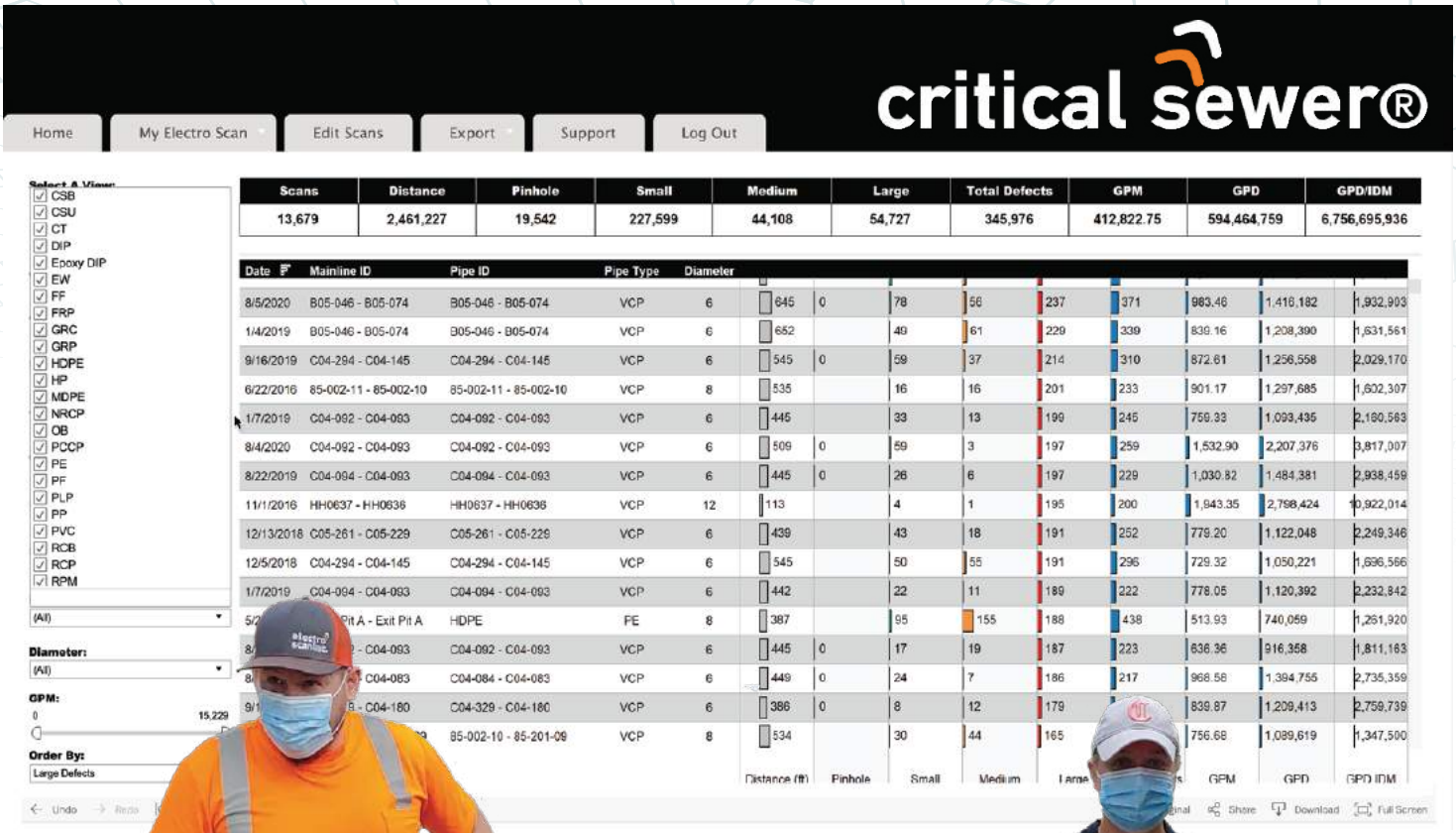
CRITICAL SEWERS® CLOUD APPLICATION



PLUMBER'S
WATER & SEWER LEAK DETECTION

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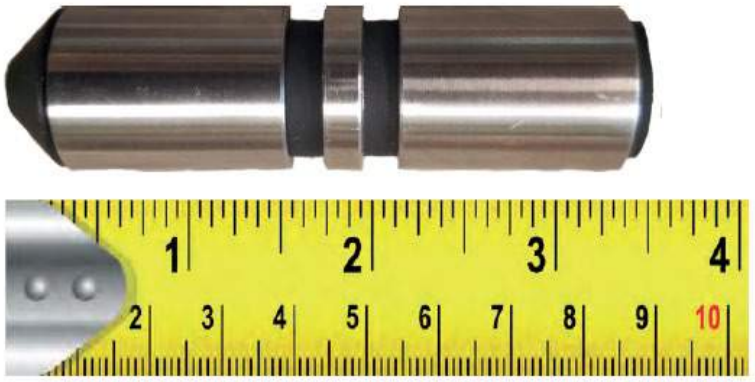
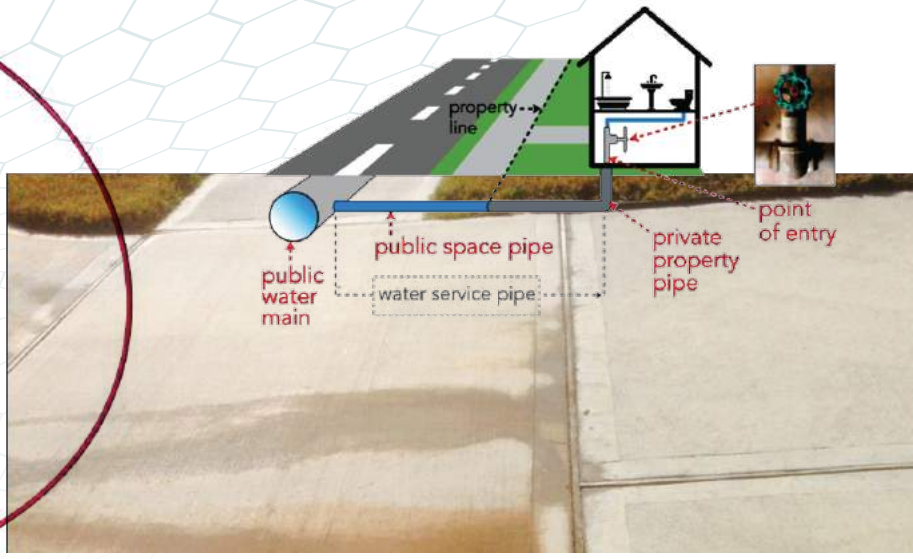
ES-25 & ES-50 PUSH RODS FOR WATER



ES-25 & ES-50 PROBES

PIPE DIAMETERS:
1-2 INCHES (25-50MM) | 2-4 INCHES (50-100MM)

APPLICATIONS:
LEAK DETECTION FOR RESIDENTIAL & COMMERCIAL PLUMBING, AND INDUSTRIAL APPLICATION, HYDRANT ENTRY, HIGHLY TUBERCULATED WATER MAINS TO MINIMIZE DISRUPTION, ASSESSMENT OF VERTICAL PIPES, INCLUDING CIPP WATERTIGHTNESS TESTING.



HIDDEN LEAKAGE UNDER DRIVEWAY

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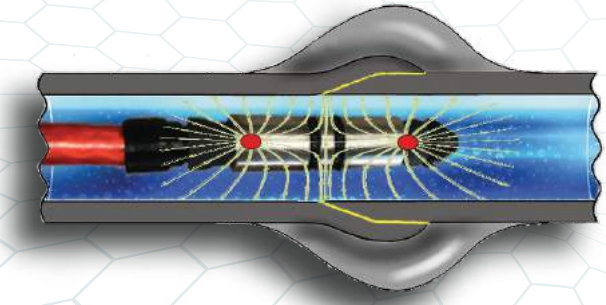
KINGFISHER & SWORDFISH
COMBINED LEAD AND LEAK DETECTION

CONDITION	KINGFISHER	SWORDFISH
FEATURES	LEAD DETECTION AND LEAK LOCATION	
PRESSURES	ZERO TO 12 BAR (175 PSI)	
COMMON LAUNCH POINTS	AIR RELEASE VALVES, BLOW OFF VALVES, CURB BOX, GATE VALVES, HOT TAPS, AND METERS	
PIPE DIAMETERS	1/2" TO 1.5" (16MM TO 40MM)	2" TO 4" (16MM TO 40MM)
SURVEY LENGTH	UP TO 50 FT (15M)	UP TO 100 FT (30M)



$75,000, plus Data Reporting Charge.

SafeContractor APPROVED

Circled numbers represent possible changes in pipe materials that may or ay not be a source for lead to leach into domestic drinking water pipelines.

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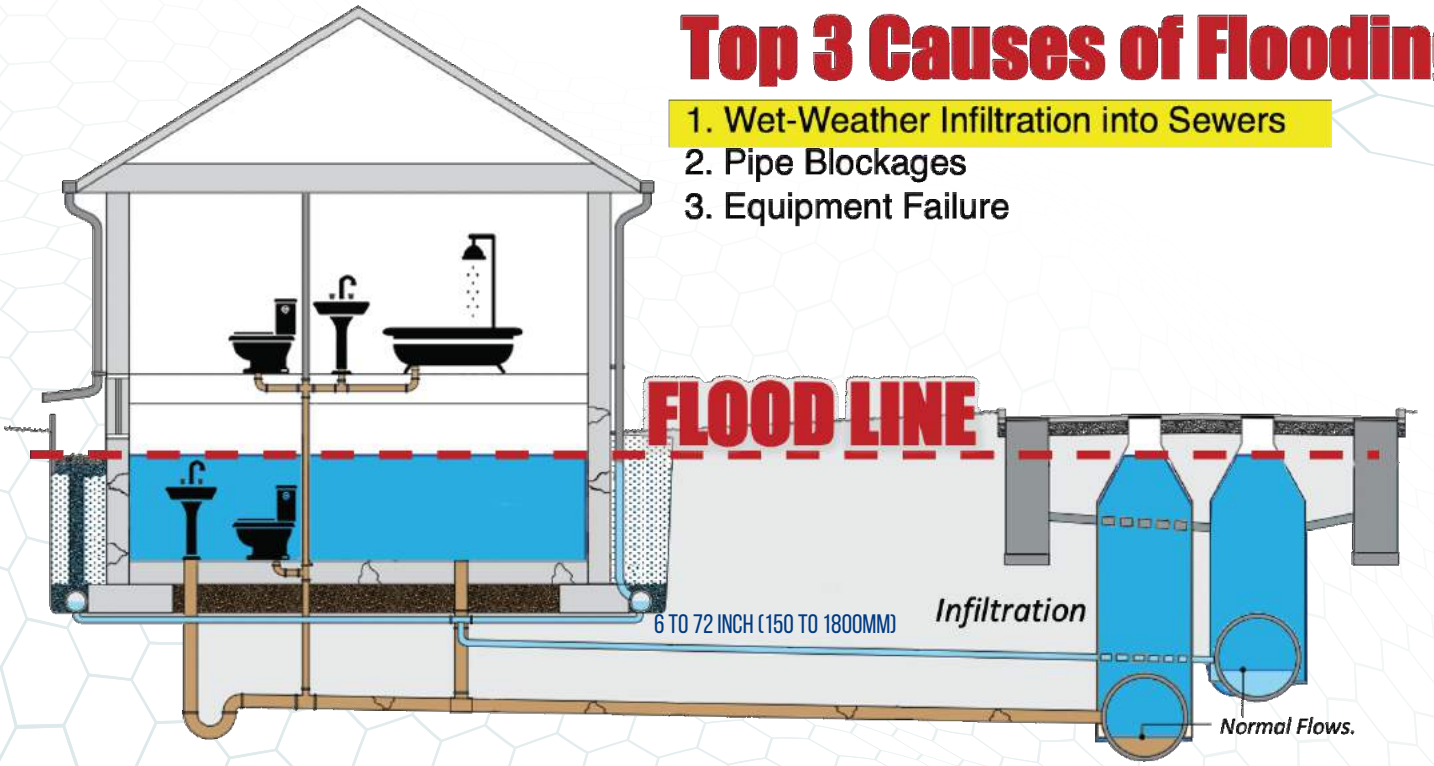
ES-200 & ES-400 PUSH RODS FOR SEWER

Top 3 Causes of Flooding

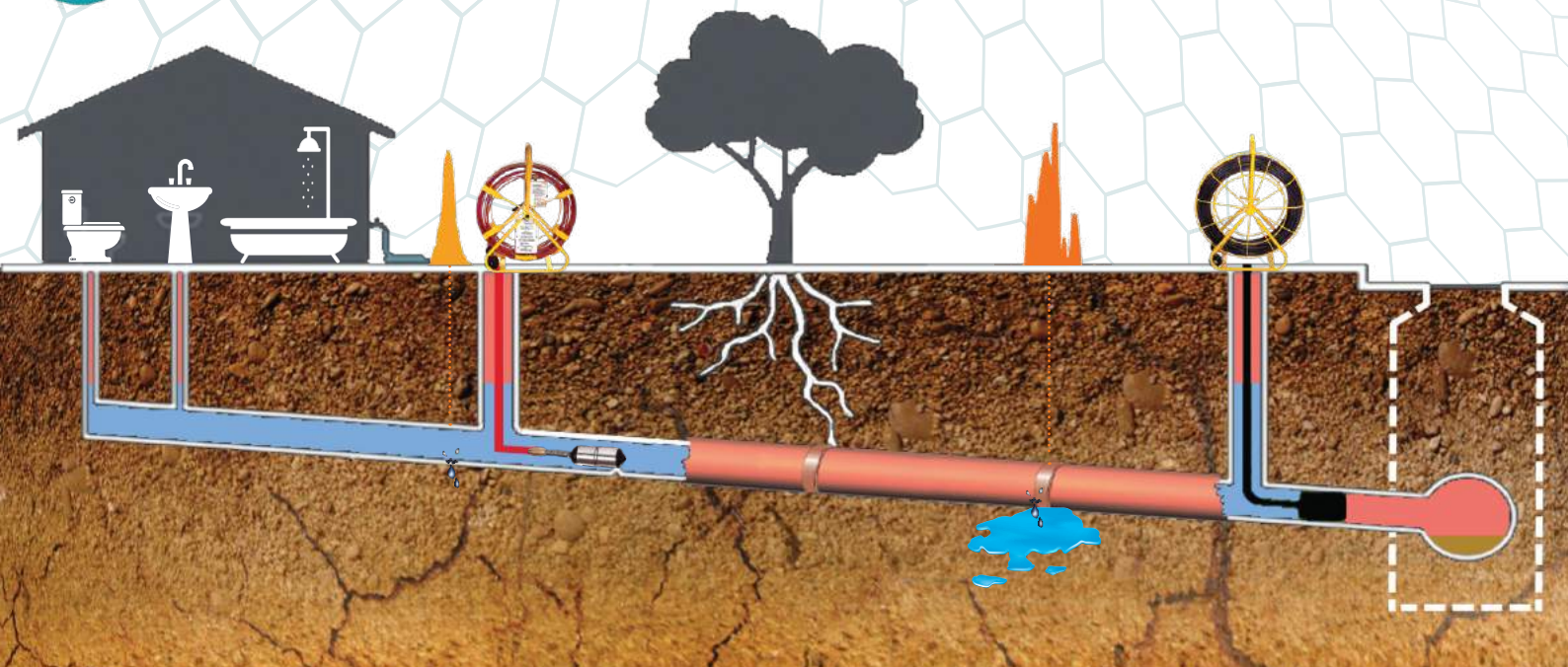
1. Wet-Weather Infiltration into Sewers
2. Pipe Blockages
3. Equipment Failure






THE Water Research FOUNDATION

Focused Electrode Leak Location (FELL) is an "unambiguous way to detect leaks in service laterals."



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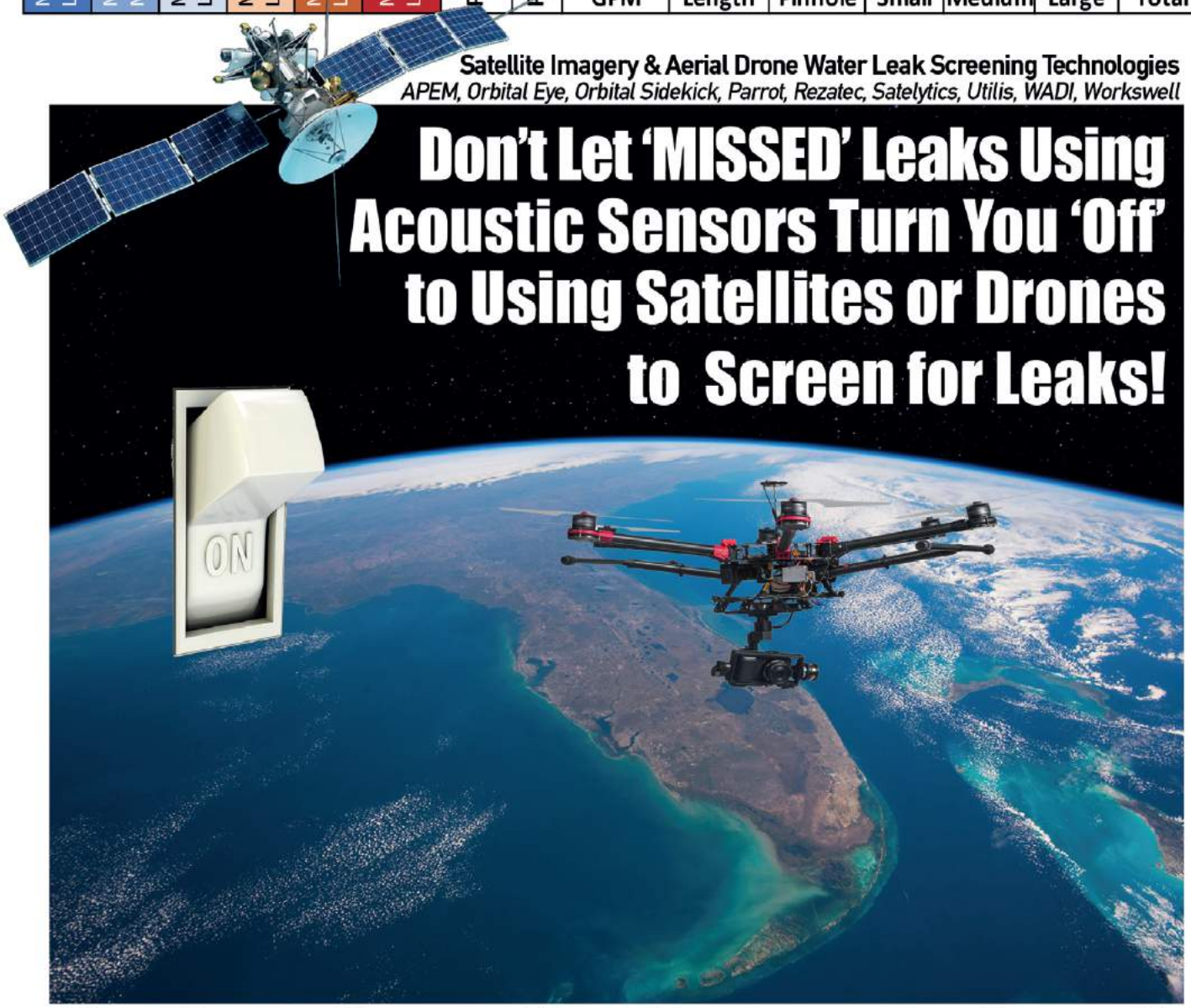
CONFIRM SATELLITE 'POINTS OF INTEREST'

Satellite/Drones			Electro Scan								
HITS			MISSES			PIPE-SPECIFIC LEAK QUANTIFICATION					
									Number of Leaks		
Matching Severe Leaks	Matching Moderate Leaks	Matching Small Leaks	Missed Small Leaks	Missed Moderate Leaks	Missed Severe Leaks	Pipe Material	Pipe Diameter	GPM	Pipe Length	Pinhole	Small	Medium	Large	Total

Satellite Imagery & Aerial Drone Water Leak Screening Technologies

APEM, Orbital Eye, Orbital Sidekick, Parrot, Rezatec, Satelytics, Utilis, WADI, Workswell



Use Electro Scan as Your 'Boots-on-the-Ground' To Locate With 1cm Accuracy & Severity in GPM.

electro scan inc.

SERVICES

CONTRACT SERVICES

Direct Services By Electro Scan's International Field Teams

SPECIFIC PRICING AVAILABLE UPON REQUEST

TECHNOLOGY LICENSING

Licensing to 3rd Party Authorized Contractors Utilizing Electro Scan Certified Equipment

UTILITY SALES & SOFTWARE CLOUD LICENSING

ISO 9001 www.intlcert.com

ISO 14001 www.intlcert.com

ISO 45001 www.intlcert.com

ACCURATE, FAST, REPEATABLE

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Website: www.electroscan.com

International Patents and Patents Pending.