

LEAK DETECTION PRODUCT & SERVICES CATALOG

2022

DELTA PRESSURIZED WATER LEAK DETECTION



ES-600 SEWER



TRIDENT PRESSURIZED WATER LEAK DETECTION



SWORDFISH LEAD 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.

electro^{scan}inc.

AWARDS

2022

IoT Breakthrough Awards: Leak Detection Solution of the Year

Edie Sustainability Award: Product Innovation of the Year - Finalist

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 & WASTEWATER SOLUTIONS

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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

PRODUCT OVERVIEW

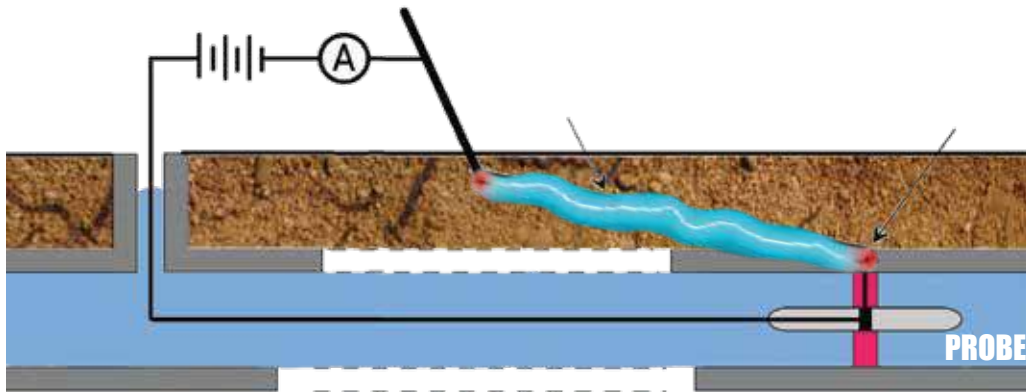
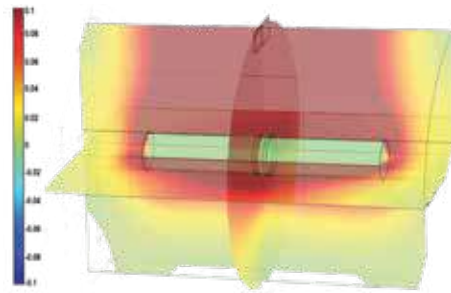
	DELTA Multi-Sensor Probe	Small-to-Medium Pressurised Water Mains or Sewer Rising Mains up to 60 inches (1500mm). Up to 3,300 ft (1km) per survey, or 6,600 ft (2km) with special upgrades.	Only available for service-related projects. Not for sale to utility customers or contractors. Contractor licensing 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.
	Swordfish 	Buried lead pipe detection. 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.
	CriticalH₂O® 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.
	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.
	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.

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**

**± 0.4 INCH ACCURACY
REPEATABLE RESULTS**











CONDUCTIVITY



**QUESTIONABLE ACCURACY
INCONSISTENT RESULTS**



COMPETITIVE ADVANTAGES

Company	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	electro ³ scaninc.	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	Free Flowing
Device										
Visual Inspection with Camera			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Joint Spacing			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leak Location – Accuracy 1cm			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leakage Severity – Expressed in Gallons per Minute or Litres per Second			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finds & Measures Leaks in Plastic Pipe			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pressurised Water & Gravity Sewers			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wall Thickness for Cement Asbestos			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Able to Find Leaks With 'NO FLOW'			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Repeatability of Leak Location +2years			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

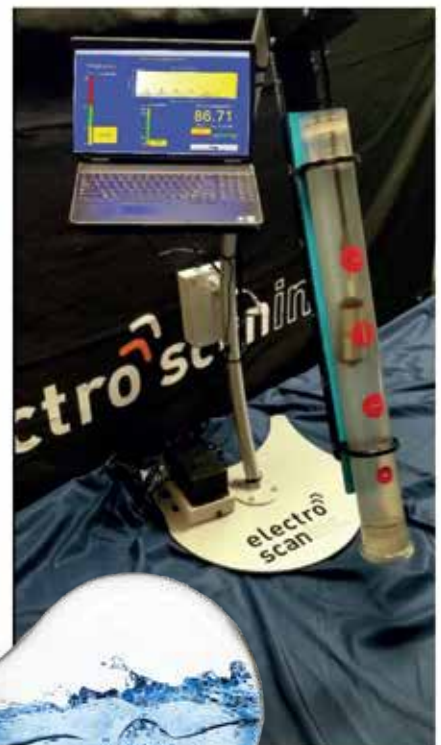
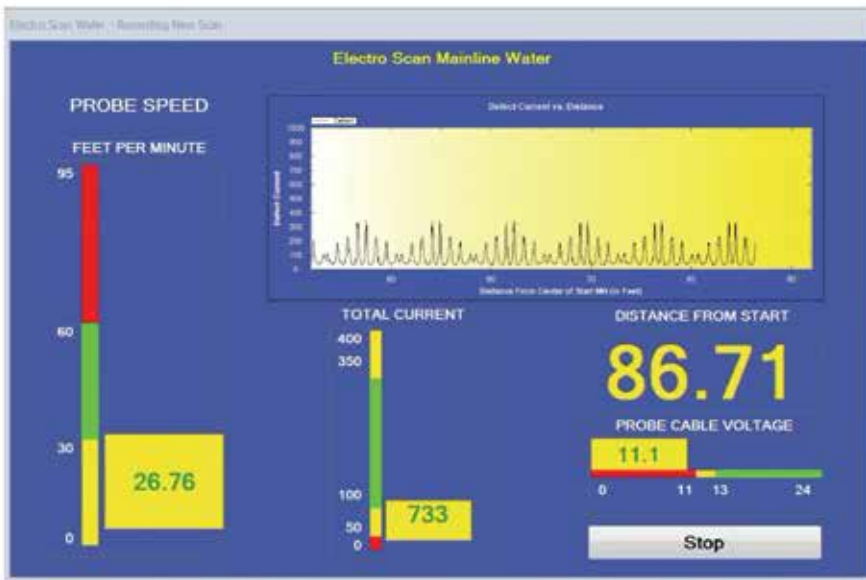


FIBER OPTIC

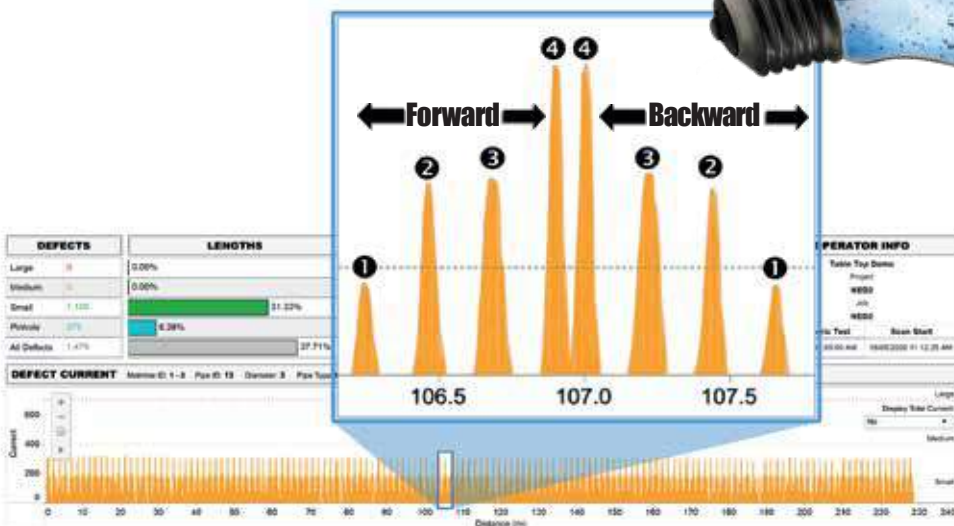
4. High Accuracy
High Repeatability



CONDUCTIVITY



Conductivity Benchmark Testing



PIPE MATERIALS

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



PRE-REHABILITATION



Asbestos Cement Pipe

Electro Scan FELL is unique in its ability to not only map the existing wall, i.e. thickness of ACP.

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



DEFECT CURRENT

ORROSION

DEFECT FLOW

As demonstrated by dependent benchmarks, since acoustic 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 & localize 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 F2350.

Evenly Spaced Defects Indicate Problem Joints.



What Electro Scan Finds Next?

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.



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 moment 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.



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



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
• Overcuring
• Stretching
• Top-Rail 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.



DEFECTIVE (NEW) SIPP

Unlike air testing, FELL does not force any packed 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



DEGRADED GROUT



RECOMMENDED USE:
1. All Pre-Grouted Pipes.
2. Post-Grouted Pipes, 0-12 Months After Grout to Detect Drying or Shrinkage.
3. Prior to Warranty Acceptance.



Spray-In-Place 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.



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.



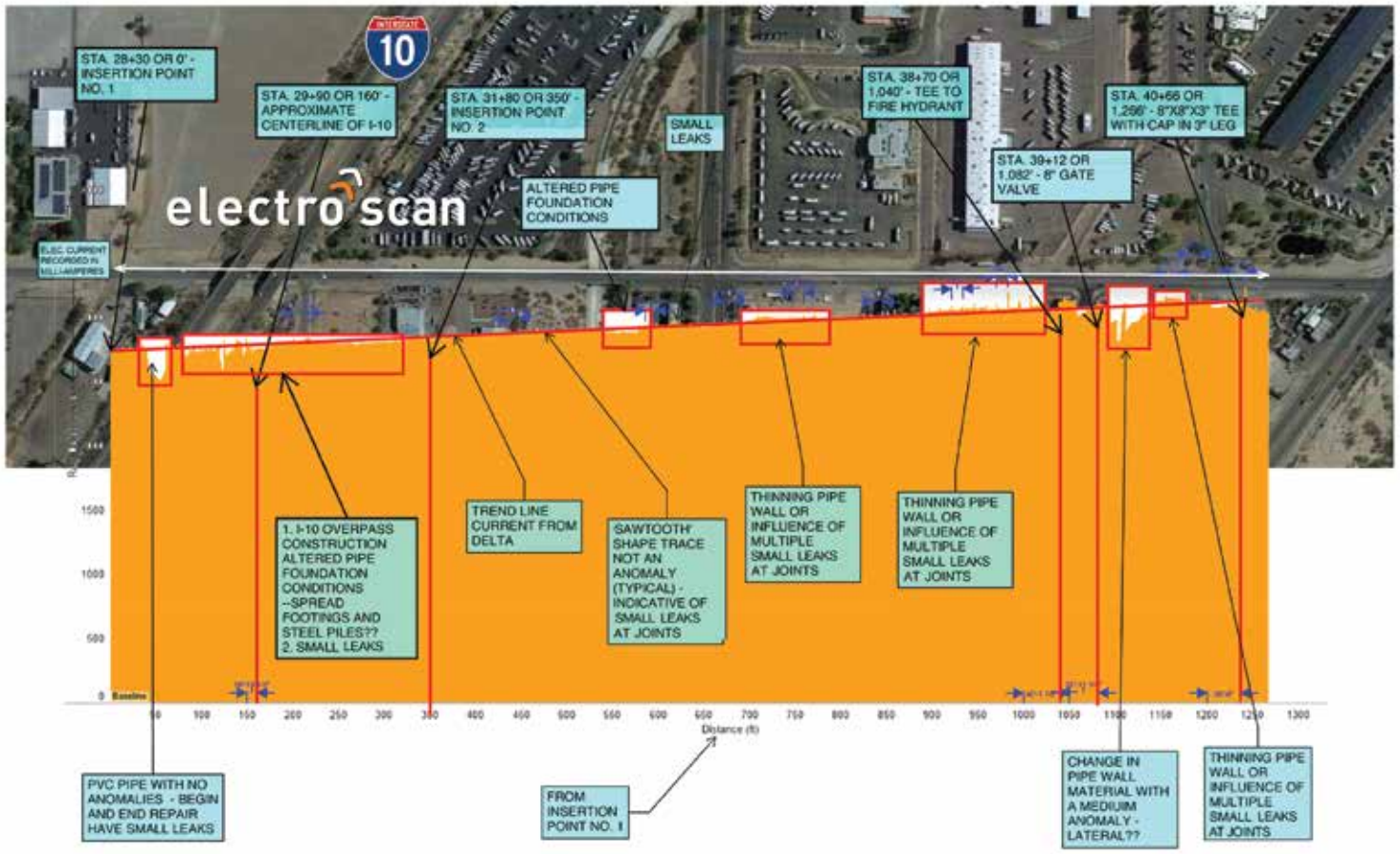
DEFECTIVE (NEW) SIPP

Defects OK'd By CCTV Found By FELL

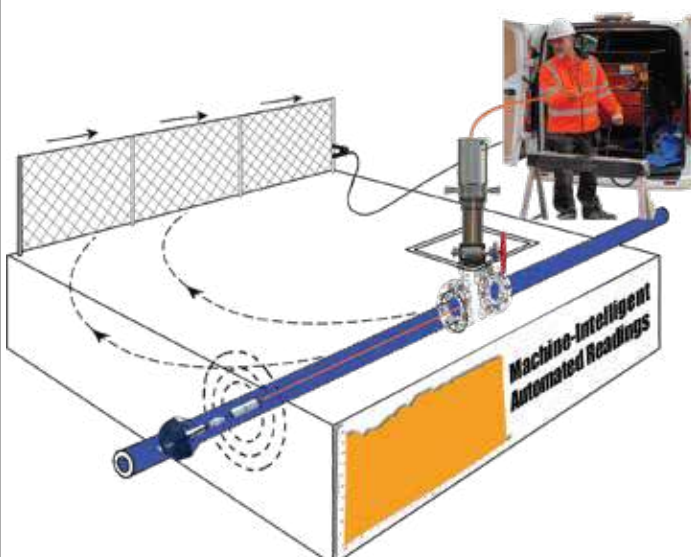


RECOMMENDED USE:
1. Pre-Spiral Wrap.
2. Post-Spiral Wrap.
3. Prior to Warranty Acceptance.

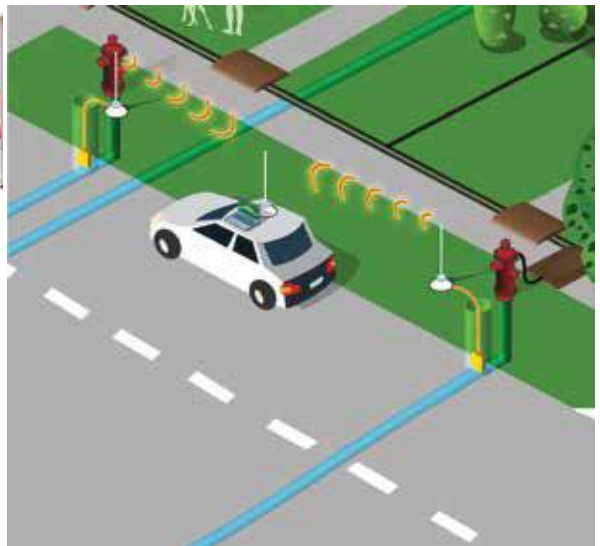
PIPE WALL THICKNESS



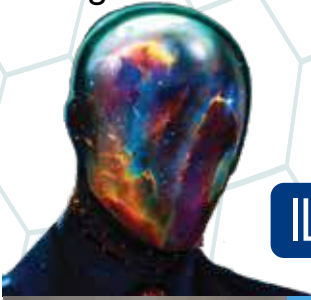
Full-Length 360-Degree vs. Average for Entire Pipe



ACTIONABLE DATA



NO ACTIONABLE DATA

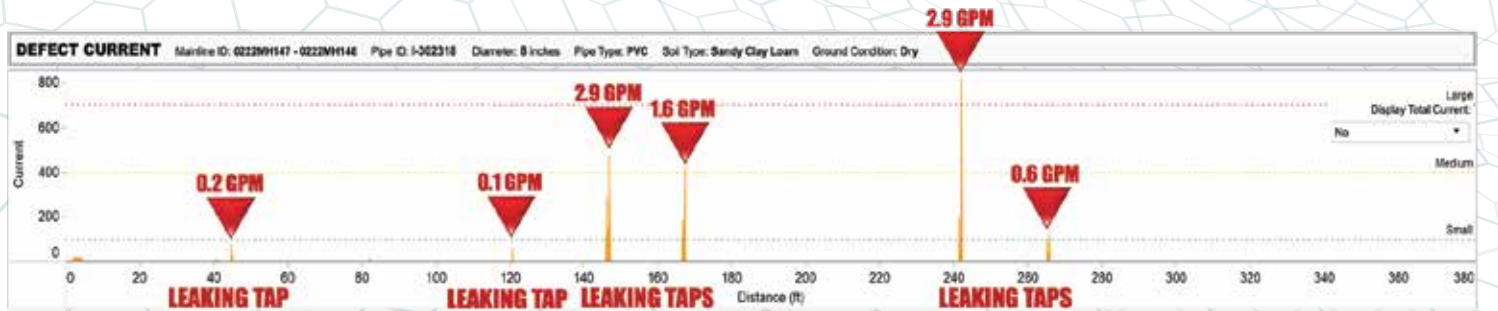
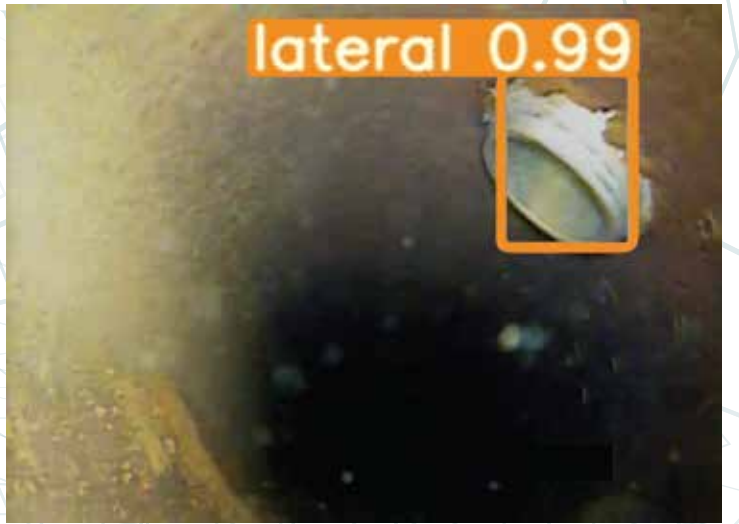
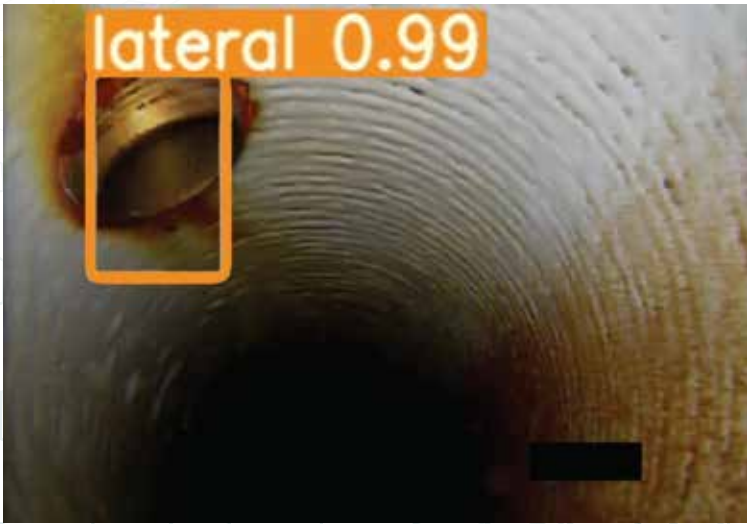


electro scan inc.

ILLEGAL & LEAKING TAP CONNECTION ASSESSMENTS



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

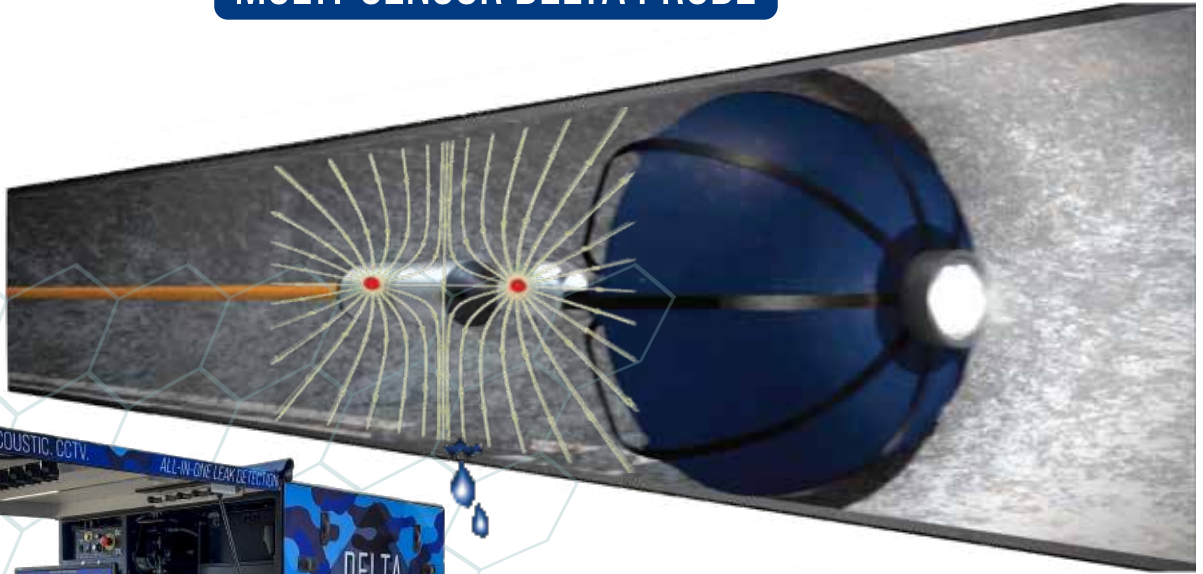


**WATER
LEAK DETECTION PRODUCTS**

MULTI-SENSOR DELTA PROBE



DWI Reg 31



ACOUSTIC*

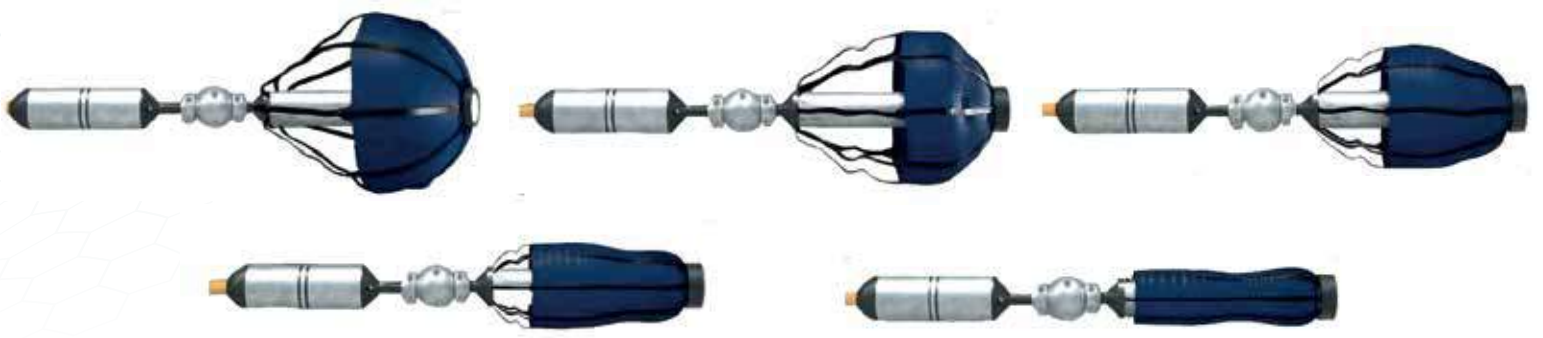


CONDUCTIVITY



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.

MULTI-SENSOR DELTA PROBE



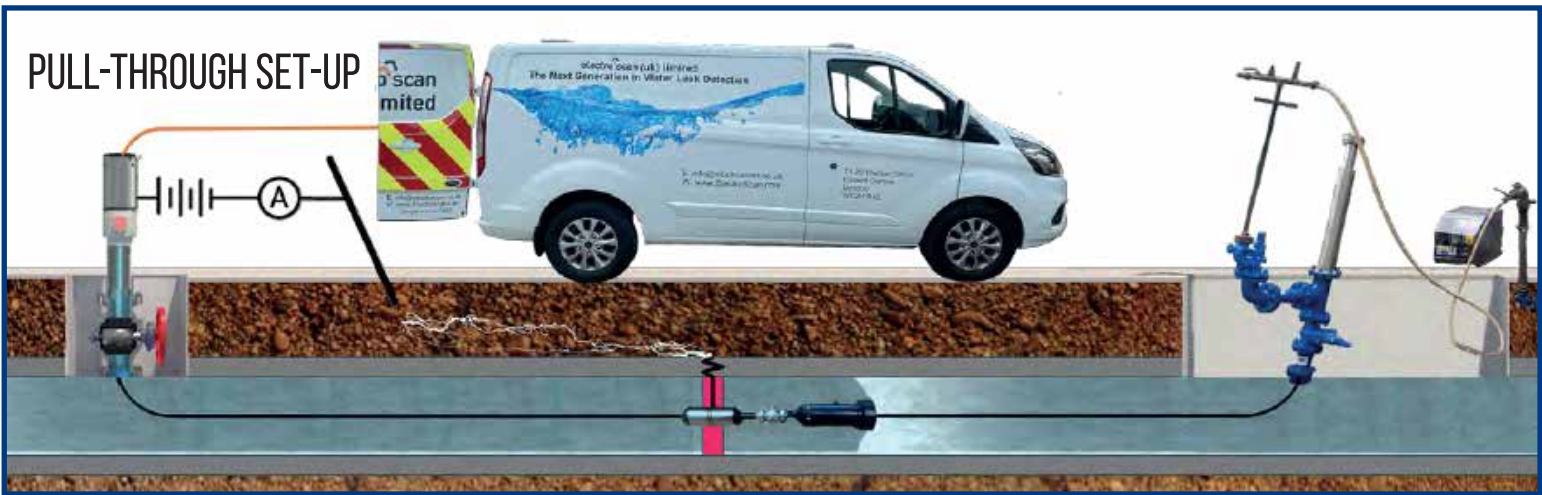
MULTI-SENSOR DELTA PROBE

ONLY AVAILABLE AS A SERVICE BY AUTHORIZED CONTRACTORS

HYDROCHUTE SET-UP



PULL-THROUGH SET-UP

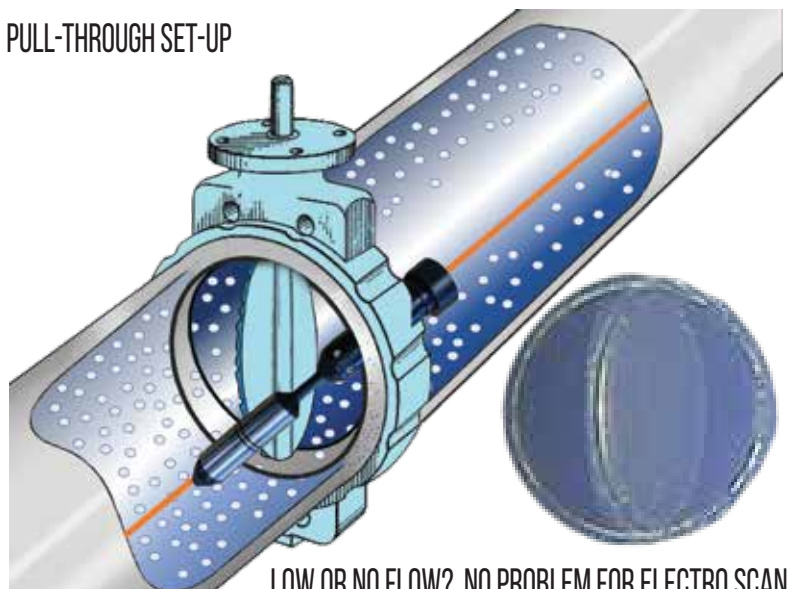


OVER 3,000 PRESSURIZED PIPE INSERTIONS

HYDROCHUTE SET-UP



PULL-THROUGH SET-UP



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

Scans | Export | Support | Log Out

criticalh2o

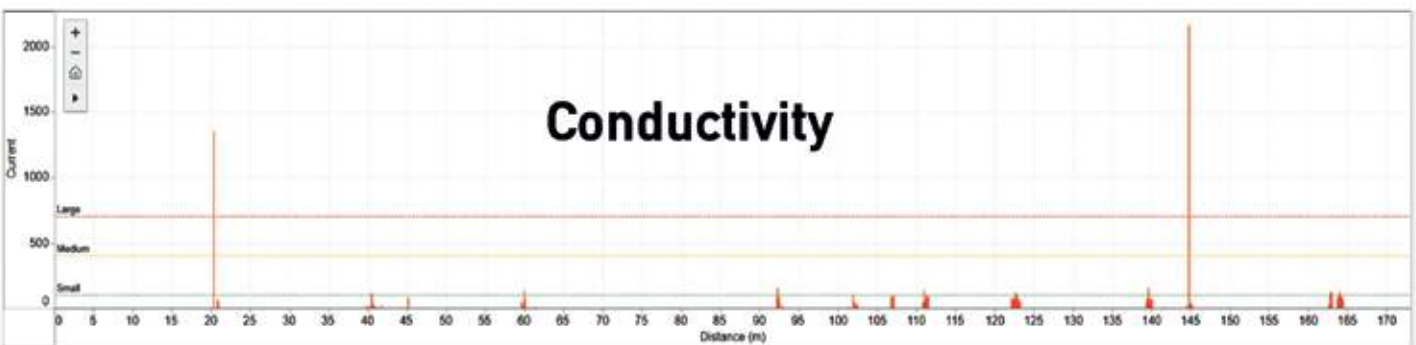
DEFECTS	
Large	2
Medium	0
Small	13
Pinhole	0
All Defects	15

DEFECT FLOW	
Severe	1.5817
Moderate	0.6820
Minor	0.1359
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
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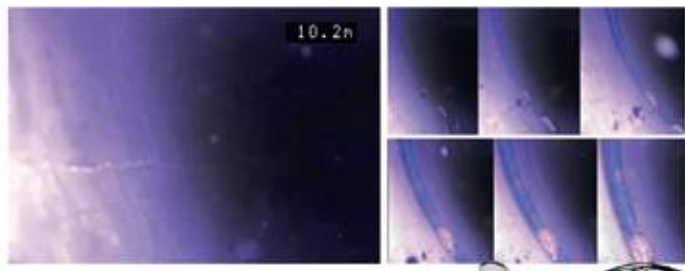
Acoustic - ONLY FALSE-POSITIVES



Data Partner



CCTV



Smart Wireless Solution



IN THE FIELD



IN THE FIELD



IN THE FIELD



ACOUSTIC

ELECTRO SCAN

**Real-Time
Data Display
& Acquisition**



MULTI-SENSOR TRIDENT PROBE

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



CONDUCTIVITY



CCTV



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

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.



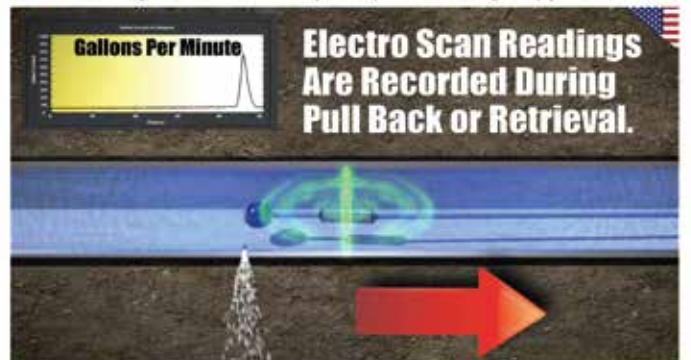
8 CCTV Push Forward Direction

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.

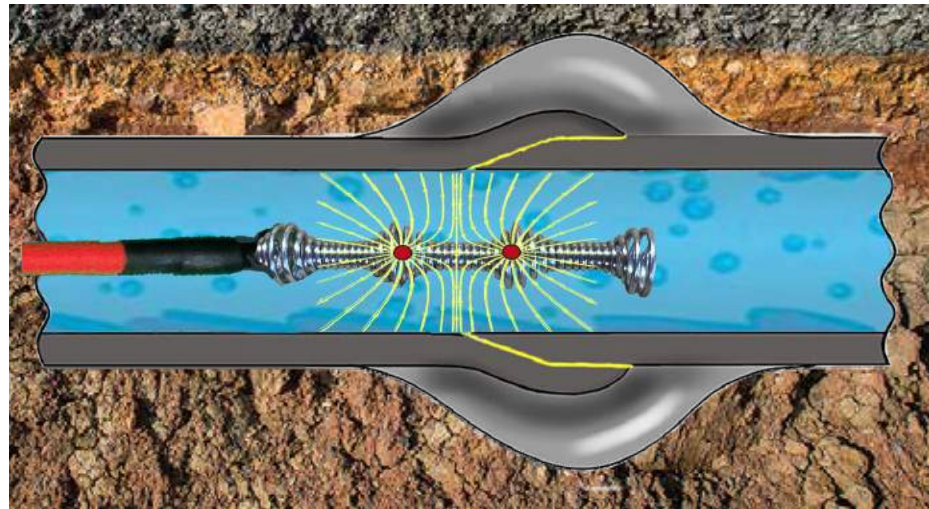


10 Probe Retrieval

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

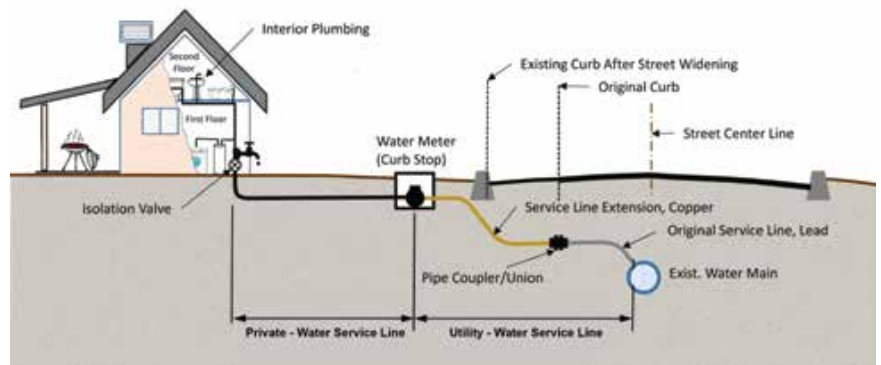


SWORDFISH



APPLICATIONS

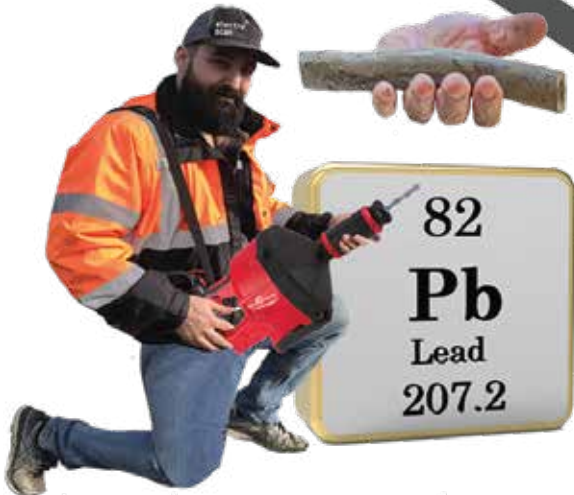
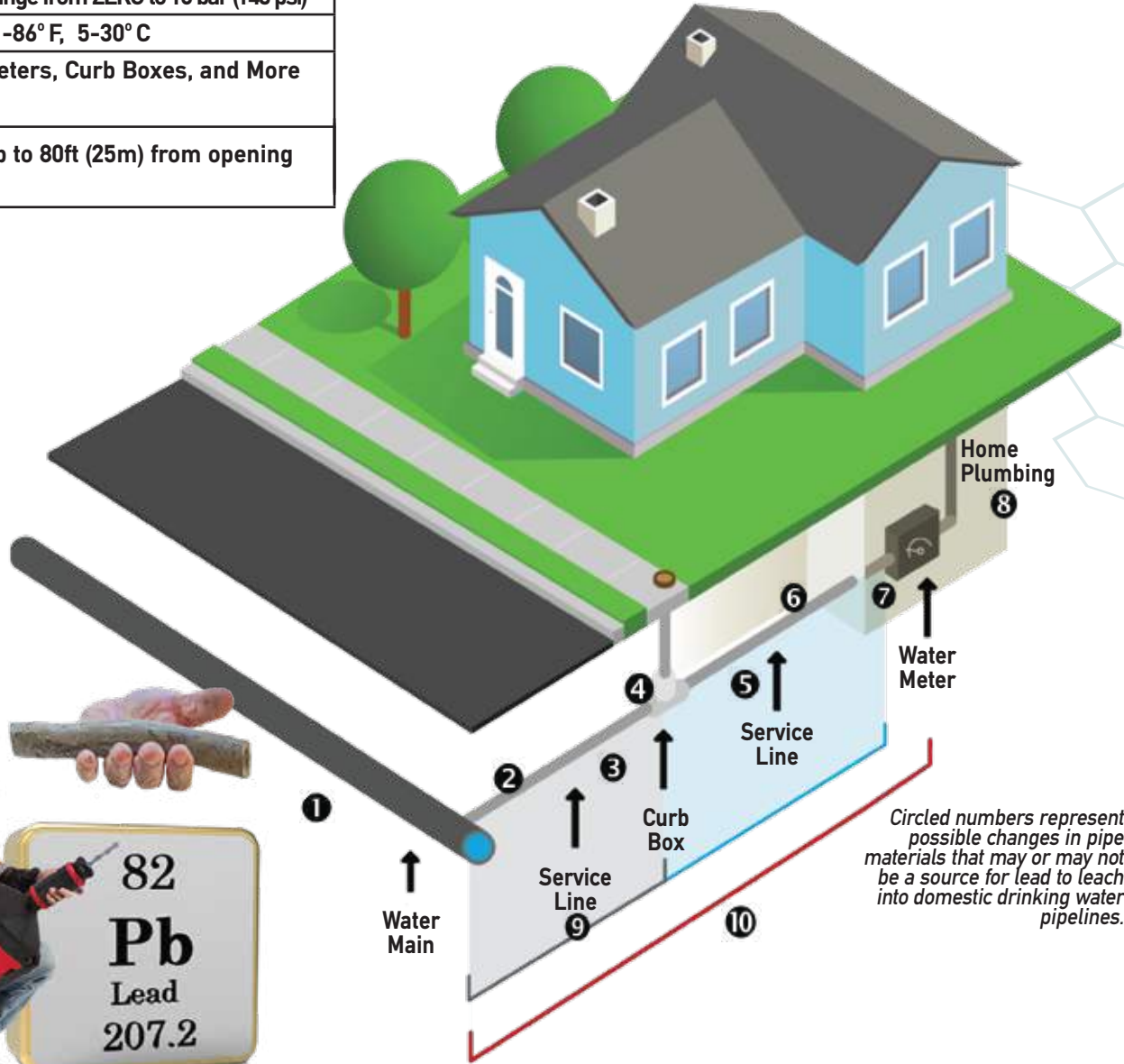
SWORDFISH IS THE WORLD'S FIRST HAND-HELD BURIED LEAD PIPE DETECTION TOOL. USING AN AUTO-FED CABLE AND LOW-VOLTAGE CONDUCTIVITY PROBE, SWORDFISH AUTOMATICALLY IDENTIFIES LEAD PIPES. READINGS ARE TRANSMITTED IN REAL-TIME TO ELECTRO SCAN'S CRITICAL H2O CLOUD APPLICATION, WITH RESULTS INDEPENDENTLY VERIFIED USING 3M LEAD TEST KITS FOR 100% VERIFICATION OF LEAD PIPE.



BURIED LEAD PIPE DETECTION

SWORDFISH

Features	Buried lead pipe detection
Pipe Diameters	0.5" to 3" (13mm to 75mm)
Pressure	Range from ZERO to 10 bar (145 psi)
Temperatures	41-86° F, 5-30° C
Common Launch Points	Meters, Curb Boxes, and More Points
Pipe Lengths Per Survey	Up to 80ft (25m) from opening



SWORDFISH KIT

<p>SWORDFISH UNIT</p>	<p>PROBE</p>	<p>MOBILE APP</p>	<p>INSERTION TUBE</p>
<p>WI-FI JET PACK</p>	<p>100 TEST KITS</p>	<p>CLOUD</p>	

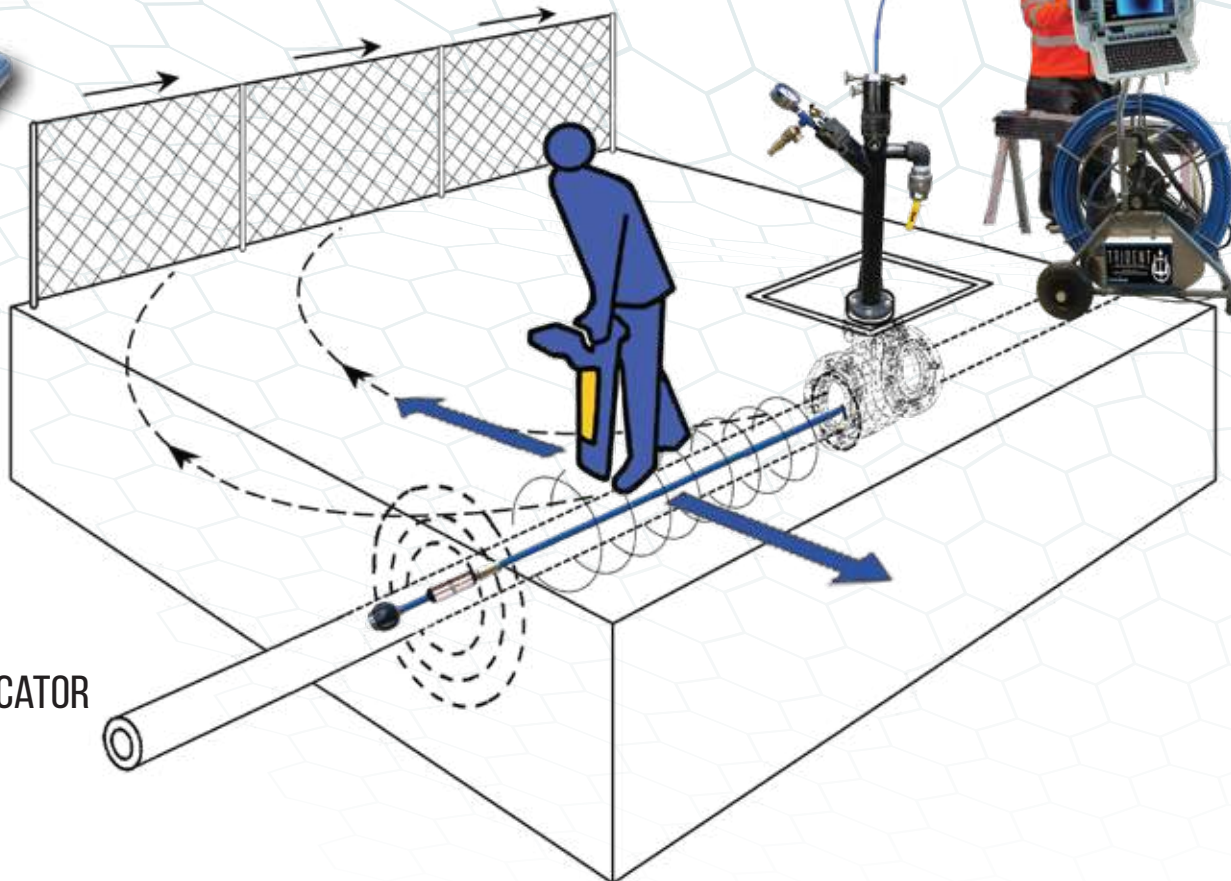
LINE LOCATION



DRAWBACK OF GROUND PENETRATING RADAR:
DIFFICULT TO LOCATE WATER MAINS



PRECISION SONDE LOCATOR



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

NEW

WATER LEAK TRAINING CENTER

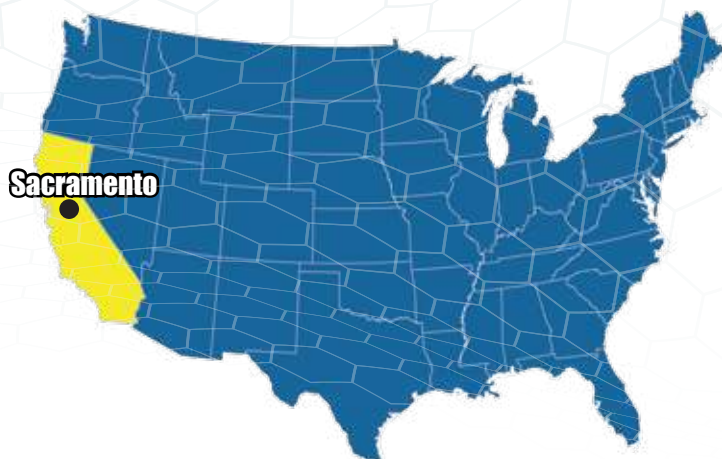
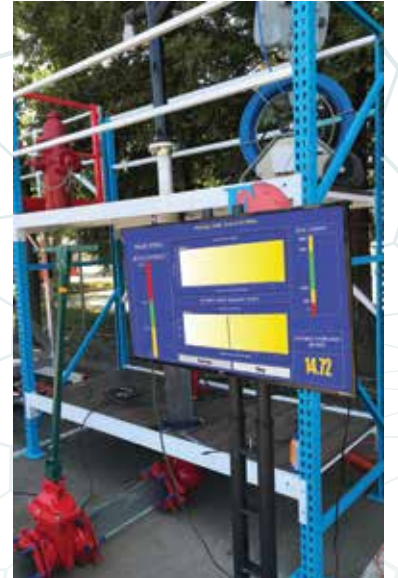


INSTRUCTION

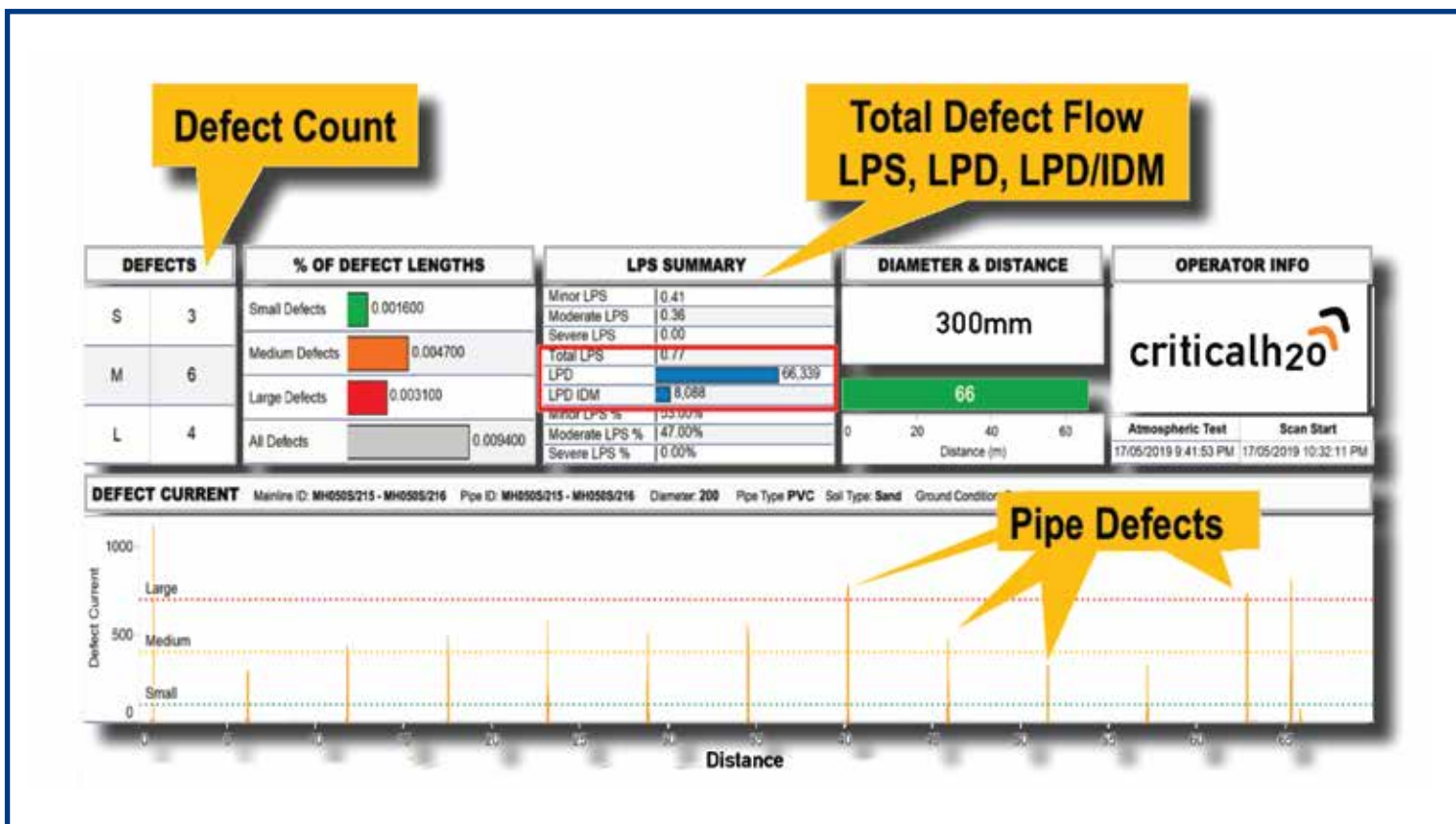
HANDS-ON TRAINING

IN-PIPE NAVIGATION

AUTOMATIC DATA CAPTURE



CRITICAL H2O CLOUD APPLICATION



FIELD



OFFICE



**SEWER
INFILTRATION PRODUCTS**



electro^{scan}inc.

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

Aries



Cues



IBAK



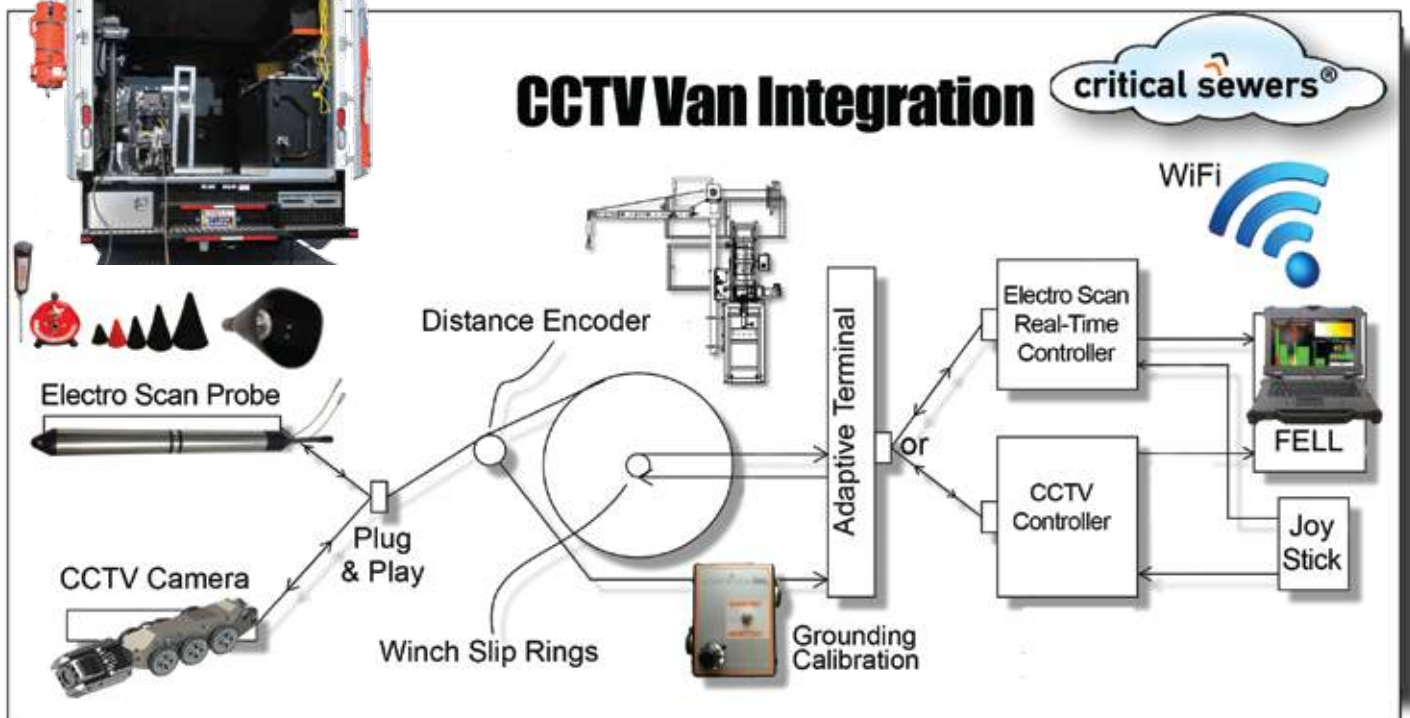
Ipek



Rausch



Custom

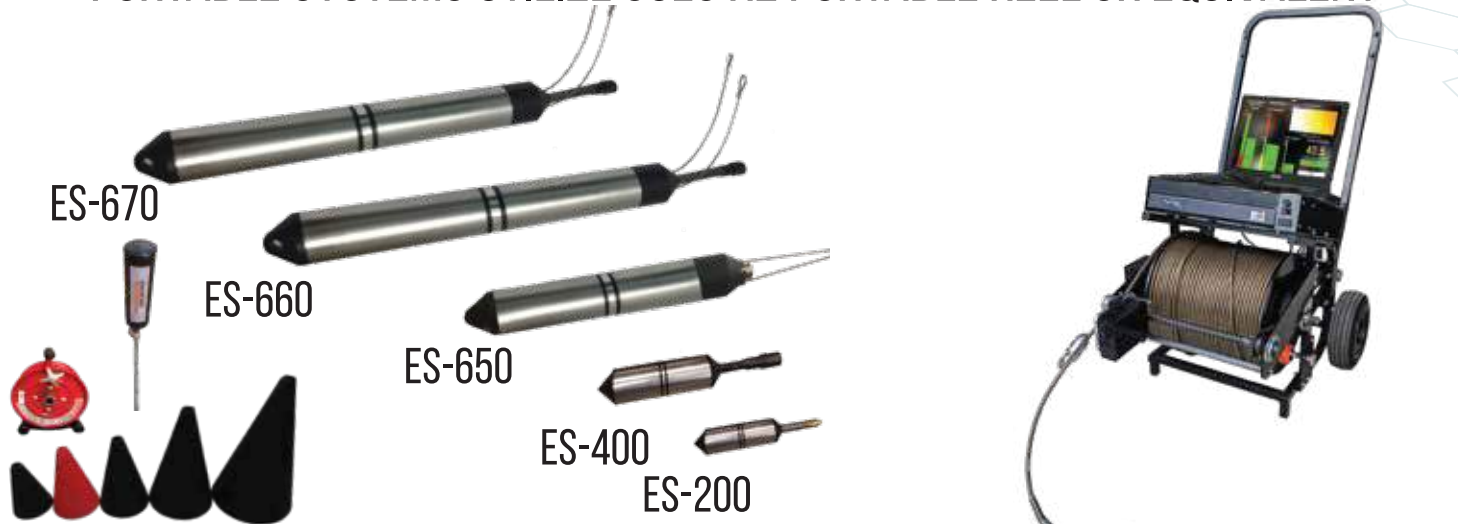


ES-600 STANDARD SPECIFICATIONS AND FEATURES

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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 			

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

PORTABLE SYSTEMS UTILIZE CUES K2 PORTABLE REEL OR EQUIVALENT



ES-600 SERIES PORTABLE*	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.
CONTINUED FROM PRIOR PAGE			

*FOR DIFFICULT TO ACCESS LOCATIONS AND EQUIPMENT PORTABILITY.



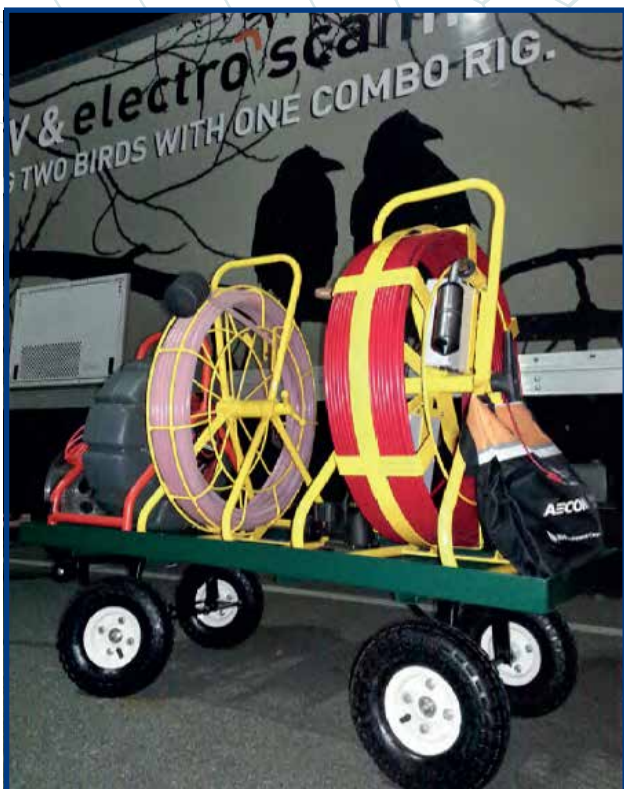
ES-400 PUSH ROD

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°F TO 120°F (-7°C TO 50°C)
		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)		



ES-200 PUSH ROD

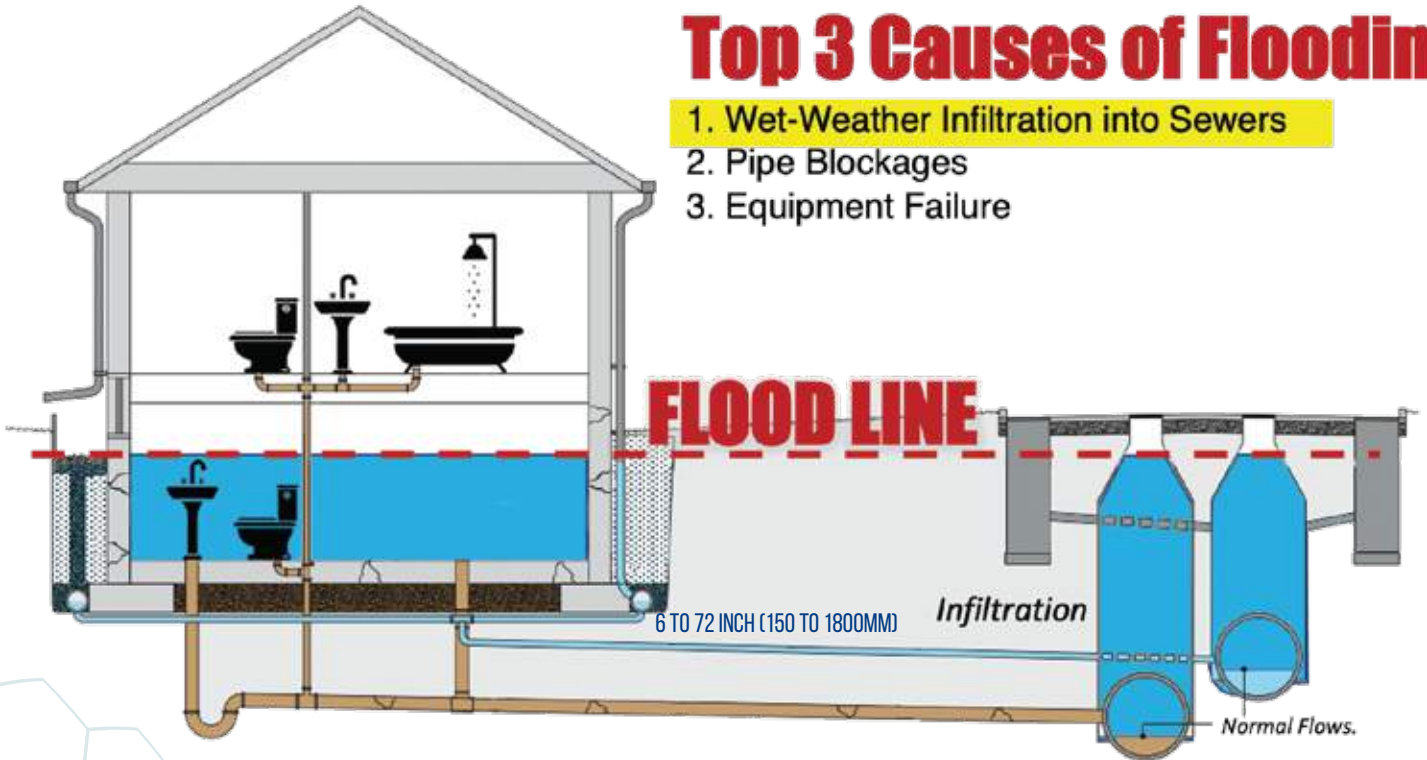
ES-200	PIPES	PIPE DIAMETERS	3 TO 8 INCH (76 TO 200MM)
		PIPE SHAPE	ANY, INCLUDING CIRCULAR, BOX, EGG-SHAPED, OVAL, AND TRAPEZOIDAL.
		PIPE MATERIALS	ELECTRICALLY NON-CONDUCTIVE PIPE WALLS, INCLUDING ASBESTOS CEMENT, BRICK, CEMENT MORTAR LINED AND COATED STEEL, CURED-IN-PLACE PIPE, DUCTILE IRON WITH EPOXY 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 ⁰ F TO 120 ⁰ F (-7 ⁰ C TO 50 ⁰ C)
		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)		



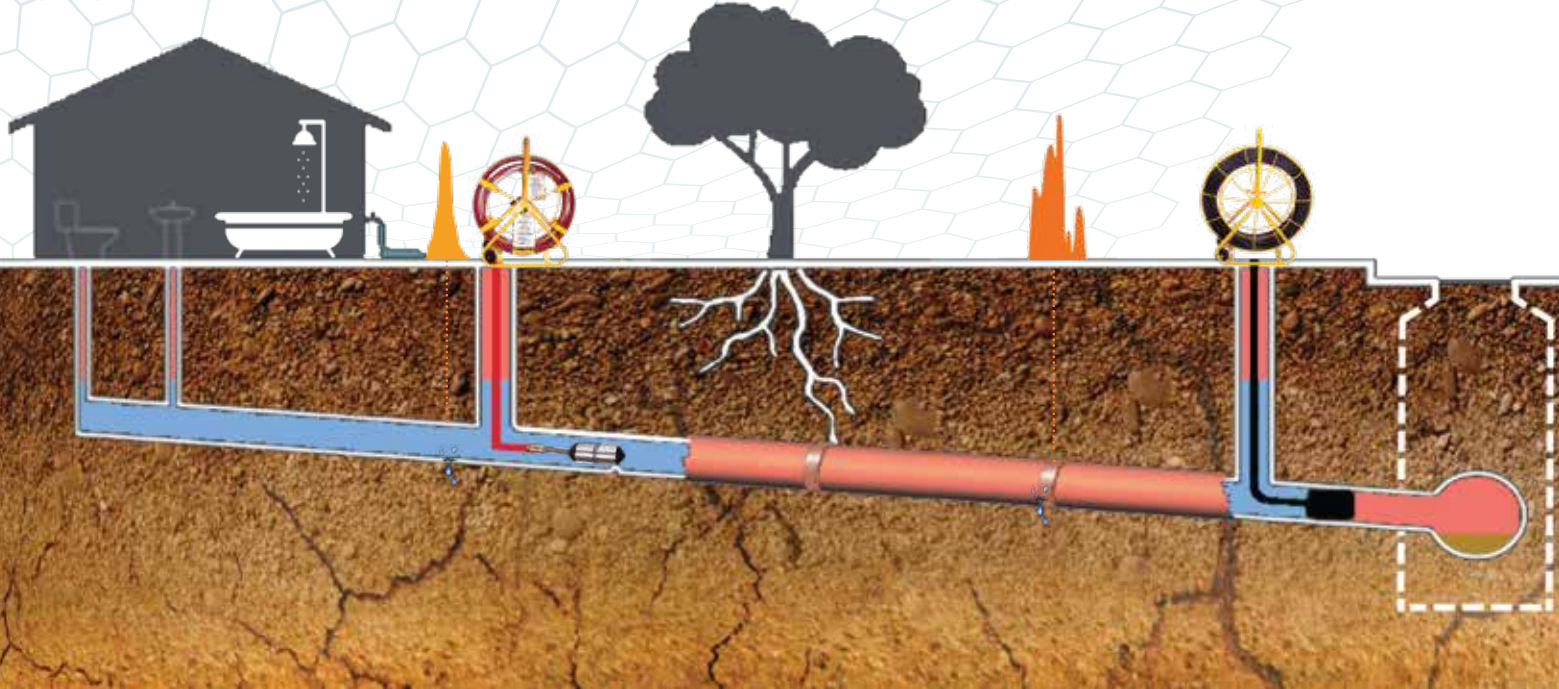
SEWER LATERAL ASSESSMENT

Top 3 Causes of Flooding

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



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



CRITICAL SEWERS® CLOUD APPLICATION

critical sewer®

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Scans	Distance	Pinhole	Small	Medium	Large	Total Defects	GPM	GPD	GPD/DM
13,679	2,461,227	19,542	227,599	44,108	84,727	345,976	412,822.75	594,464,789	6,756,695,936

Date	Mainline ID	Pipe ID	Pipe Type	Diameter	Pinhole	Small	Medium	Large	Total Defects	GPM	GPD	GPD/DM	
8/5/2020	B05-046 - B05-074	B05-046 - B05-074	VCP	6	845	0	78	96	237	371	983.46	1,416,182	1,932,903
1/4/2019	B05-046 - B05-074	B05-046 - B05-074	VCP	6	852	0	49	61	229	309	839.16	1,208,380	1,631,561
9/16/2019	C04-294 - C04-145	C04-294 - C04-145	VCP	6	545	0	59	37	214	310	872.81	1,256,558	1,629,170
6/22/2016	85-002-11 - 85-002-10	85-002-11 - 85-002-10	VCP	8	535	0	16	16	201	233	901.17	1,297,085	1,602,307
1/7/2019	C04-092 - C04-093	C04-092 - C04-093	VCP	6	445	0	33	13	199	245	759.33	1,093,435	1,450,563
8/4/2020	C04-092 - C04-093	C04-092 - C04-093	VCP	6	509	0	58	3	197	259	1,532.90	2,207,376	3,817,007
8/22/2019	C04-094 - C04-093	C04-094 - C04-093	VCP	6	445	0	26	6	197	229	1,030.82	1,484,381	2,938,459
11/1/2016	HH0637 - HH0638	HH0637 - HH0638	VCP	12	113	0	4	1	195	300	1,943.35	2,798,424	5,922,014
12/13/2018	C05-261 - C05-229	C05-261 - C05-229	VCP	6	439	0	43	18	191	252	779.20	1,122,048	2,249,346
12/5/2018	C04-294 - C04-145	C04-294 - C04-145	VCP	6	545	0	50	95	191	296	729.32	1,050,221	1,696,566
1/7/2019	C04-094 - C04-093	C04-094 - C04-093	VCP	6	442	0	22	11	189	222	778.05	1,120,362	2,232,842
5/2/2019	85-002-10 - 85-002-09	85-002-10 - 85-002-09	VCP	8	534	0	30	44	165	217	756.68	1,089,519	1,347,500
8/1/2019	C04-092 - C04-093	C04-092 - C04-093	VCP	6	445	0	17	19	167	223	636.36	916,358	1,811,163
8/1/2019	C04-083 - C04-083	C04-084 - C04-083	VCP	6	449	0	24	7	186	217	968.58	1,394,755	2,735,359
9/1/2019	C04-180 - C04-180	C04-329 - C04-180	VCP	6	386	0	8	12	179	217	839.87	1,209,413	2,759,739
8/1/2019	85-002-10 - 85-201-09	85-002-10 - 85-201-09	VCP	8	534	0	30	44	165	217	756.68	1,089,519	1,347,500



electro^{scan}inc.

CONFIRM SATELLITE 'POINTS OF INTEREST'

 Satellite/Drones 			  Electro Scan  											
HITS		MISSES	PIPE-SPECIFIC LEAK QUANTIFICATION											
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	Number of Leaks				
										Pinhole	Small	Medium	Large	Total

Satellite Imagery & Aerial Drone Water Leak Screening Technologies
 APEM, Orbital Eye, Orbital Sidekick, Parrot, RezaTec, Satelitics, Utilis, WADI, Workswell

Don't Let 'MISSED' Leaks Using Acoustic Sensors Turn You 'Off' to Using Satellites or Drones to Screen for Leaks!



USE ELECTRO SCAN AS YOUR 'BOOTS-ON-THE-GROUND' TO LOCATE WITH 1/2" / 1CM ACCURACY AND SEVERITY IN GPM / LPS

electro scan inc.

SERVICES

CONTRACT SERVICES

Direct Services By Electro Scan's International Field Teams

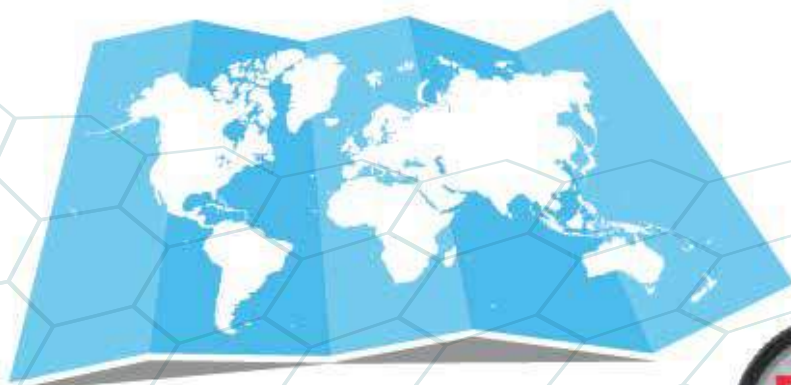
TECHNOLOGY LICENSING

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

UTILITY SALES & SOFTWARE CLOUD LICENSING



ACCURATE, FAST, REPEATABLE



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