

FINDS & MEASURES LEAKS MISSED BY ACOUSTIC SENSORS



ELECTRO SCAN DELTA

isionment + Energy In Sionment + Energy In electro scan TOP PRODUCT 2021

NO IMPACT DUE TO PRESSURE, NOISE, GROUNDWATER, PIPE MATERIAL, OR CUSTOMER USAGE.

ion for I Pipes DELTA

Condition	Performance
Features	Low Voltage Conductivity FELL, CCTV, Acoustic Hydrophone, Pressure Sensor
Pipe Diameters	3-60 inches (76-1500mm)
Pressure	ZERO to 12 bar (174 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 specialised equipment.
Average Production	1-2 Pipe Sections per Day



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



What the Judges Said About Electro Scan's DELTA?

E+E LDR Electro Scan's leak detection system ability to quantify leak severities (gallons per minute or liters per second) and leak location accuracy within 1cm or less is truly remarkable."

"This service provides superior leak detection which can prevent environmental impacts before they happen by detecting leaks that can become worse and result in disasters at worst, or less costly repairs to prevent damage."

"This product allows smart water utilities to initiate pipeline stewardship programs that can validate leakage reductions by comparing pre- and post-rehabilitation programs."

"Success for this product is measured by quickly actionable results that can be used to prevent, remediate or generate repairs or rehabilitation."

Chuck Hansen to Present July 20 & 21



"The New Standard for Leak Detection & Water Tightness Testing for New & Rehabilitated Pipelines"

Tues, July 20. 3:00PM Eastern



Chuck Hansen

- +40 years in Water & Sewer Condition Assessment.
- Former Owner, HANSEN SOFTWARE (1980-2007).
- Multi-Patent Holder Condition Assessment Technology.
- Former Chair ASTM F36.2, Water & Sewer Inspection.
- ESG / Cleantech Private Equity Investor.
- Appeared on Last 2 CDs of Tower of Power playing Baritone & Bass Sax

Wed, July 21. 3:00PM Eastern



Electro Scan Measures Full-Length 360-Degree Pipe Wall Thickness







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







Reliance on Hearing **OLD WAY** a Leak

Measuring The Size of a Hole NEW WAY













Ohms Law + Orifice Equation



1cm Accuracy and LPS





Unambiguous Unbiased Unprecedented





SNIFF LEAKS?







HEAR LEAKS?







Sensory-based Systems Need Machine-Intelligent Upgrade.

You Can't Manage What You Don't Measure •



Next Generation in Leak Detection



Water Leak Detection Product Comparison

MULTI-SENSOR DELTA PROBE COMPETITIVE ADVANTAGES

Company	electro 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	0
Device		ō.	*	(0)	9	6	- <mark></mark>	1
Visual Inspection with Camera		Ö	۲	۲	0	0	0	0
Joint Spacing	۲	۲	0	0	0	0	0	0
Leak Location – Accuracy 1cm	۲	۲	0	0	0	0	0	0
Leakage Severity – Expressed in Gallons per Minute or Litres per Second	۲	۲	0	0	0	0	0	0
Finds & Measures Leaks in Plastic Pipe	۲	۲	0	0	0	0	0	0
Pressurised Water & Gravity Sewers	۲	۲	0	0	0	0	0	0
Wall Thickness for Cement Asbestos	۲	۲	0	0	0	0	0	0
Able to Find Leaks With 'NO FLOW'	۲	۲	0	0	0	0	0	0
Repeatability of Leak Location +2years	۲	۲	0	0	0	0	0	0

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.

MULTI-SENSOR TRIDENT PROBE	Trident Machine-Intelligent Lak Betection eterrisen
<image/>	<image/>
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 stee
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. Adds Line Location to Leak Detection Leaks Expressed in Gallons Per Minute or

Litres Per Second, And Now GPS Location.

Finally, Actionable 'Leak Location' Results Without Ever Leaving The Field!

Electro Scan Answers The Challenge Water Mains That Can't Be Found? Leaks That Can't Be Heard?

Electro Scan In-Pipe Intelligent Platform Embeds Sonde Radio-Based



WATER





Fully Integrated CCTV, FELL, LINE LOCATION in Pressurized Lines.

DRAWBACK OF GROUND PENETRATING RADAR:

DIFFICULTY LOCATING WATER MAINS

LEAK DETECTION SOLUTION OF THE YEAR

2.863

032





MEASURING SIZE OF HOLES

ROUG

AWARD



Not Acoustic
Not Electro-Magnetic
Not Laser
Not Pressure Transient
No Lost Balls Causing Damage

Lectros

Science of Electro Scan





And, Field Operations.







Acoustic Sensors Miss Leaks That Low Pressure Conceals









FOHOW Electro Scan on LinkedIn!

150

316 SS TUBE & SOCKET

DSI

NOSHOK

50

200

300

250



Machine-Intelligent Leak Detection

.....

1

Trident

BRITISH UV-CURED CIPP APPROVED BY CCTV CAMERAS WITH LEAKS.*

What's InP **Same Day Testing of CIPP** as Watertight Using **Electro** Scan

Approving CIPP that Leak Using CCTV Cameras What's Out?

*MISSED BY ACOUSTICS.

BRITISH FIBERGLASS UV-CURED PIPE APPROVED BY CCTV WITH MAJOR LEA

The Holy Grail of Leak Detection: What is the Gallon per Minute for a Water Leak?







"The search for how to detect leaks & express them in Liters per Second has eluded the water industry for centuries, until Electro Scan discovered the secret."

– Chuck Hansen



Water Leakage

Acoustic data loggers miss 80-100% of underground leaks.



Sewer Overflows

CETV cameras miss 80-100% of underground leaks

WHY CCTV MISSES SO MANY LEAKS?



WATER



GOOD BAD



POSSIBLE AVERAGE WALL THICKNESS USING ACOUSTIC WAVES



electroscaning. Ways That Electro Scan Overcomes Drawbacks of Acoustic Listening Devices

10 Household Usage

















Trenching & Bedding

Air Pockets

Air Bubbles

Air Pocket











'Electro Scan Said What?"

"That Acoustic Data Loggers Miss 90-100% of All Leaks?"

"But, That's Our Whole Buiness!"

The Biggest Reason That Acoustic Sensors Can't Find or Measure Leaks?



CCTV ONLY 'SEE' 50% OF A PIPE, AND CAN'T TELL WHERE OR HOW MUCH WATER LEAKS INTO OR OUT OF A PIPE

What's In? **Knowing** Which **Cracks Go** Through **Al & Visual** a Pipe CCTV Wal **at Don't 'See**'

Leaks What's Out?

Smarter Technologies, Like Electro Scan Needed Page 1 of 2 Untethered Acoustic Ball Misses Leaks And, Catastrophic Failures Follow Robbinsdale, MN



Rupturg#12:#2 - Micr Accustle Ball Found No Leaks



Rupture#2-15-Months Mier 1st Rupture

Page 2 of 2



Ruptures Cost Over \$2 Million, Each



421.1 FT. HH STOP: 42nd and Reilroad Ave heading WEST

CCTV of dewatered pipe showed major radial cracks that were not identified as 'LEAKS' using Untethered Acoustic Ball.

Electro Scan automatically identifies & quantifies leaks from cracks, without dependence on pipe pressure or noise.

Electro Scan – By Pipe Material

PE

PFP

PP

TC

ABS
ACP
BRK
CMLSP
CON
CIPP
DIP
FRP
FRPM
GRP
DR

Acrylonitrile-butadiene-styrene Asbestos Cement Pipe Brick Cement Mortar Lined Steel Concrete Cured-In-Place Pipe Ductile Iron (w/Protector 401) Fiberglass Reinforced Pipe Fiberglass Reinforced Polymer Glass Reinforced Pipe High Density Polyethylene Orangeburg Pipe Polybutylene

PCCP Prestressed Concrete Cylinder Pipe Polvethylene Pitch Fiber Pipe Plastic Pipe **PVC** Polyvinyl Chloride RCP Reinforced Concrete Pipe **RPM** Reinforced Plastic Mortar RTR **Reinforced Thermosetting Resin** SIPP Spray-in-Place Pipe SPR Spiral Wound Pipe Terracotta or Clay Pipe VCP Vitrified Clay Pipe





What Utilities Hate to Hear **About Acoustic Data Loggers**

FHAT'S ODD

Count Water Leak

Common Reasons Acoustic Sensors Miss Leaks

- 1. Ambient noise interferes with readings.
- 2. Lower pressures contribute to missed leaks.
- 3. Requires third-party data interpretation.
- 4. Unable to accurately assess HDPE, PE, PVC pipes.
- 5. Customer water usage 'sounds' the same as a leak.
- 6. May report ZERO LEAKS, where WATER LEAKS found.
- 7. Lack of repeatability by crew, by equipment.
- 8. Leak size difficult to determine No GPM or LPS.
- 9. Numerous FALSE-POSITIVES make results unreliable.
- 10. Defects at repair clamps often missed.
- 11. Can't certify Cured-In-Place Pipe (CIPP) liners as watertight.
- 12. Loose or worn components cause poor readings.
- 13. Different backfill materials affect results. AGOINS
- 14. Special training required for crews.
- 15. Lengthy reporting times.
- 16. Unable to differentiate leaks at Customer Tap, Joint, or Pipe Wall.
- 17. Untethered balls banging on pipe wall = FALSE-POSITIVE.
- 18. Misses silent / undetected leaks = FALSE-NEGATIVE.
- 19. Air pockets cause false readings.
- 20. Different results routinely occur with different pipe diameters.
- 21. Variable water tables affect acoustic results.
- 22. Poor assessments lead to bad repair decisions.

23. Can't certify new pipe installations or repairs as watertight or leak-free. 24. Total cost per leak rarely factors in cost of unsuccessful leak detection. and

25. Everybody knows that water surrounding the outside of a pipe creates a natural insulation that makes it almost impossible to 'hear' a leak.





SAFETY

SCHEMES IN

SSP

Direct Services By Electro Scan (UK) Limited Staff

Technology Licensing

Licensing to 3rd Party Contractors Equipment Provided, But Not Sold to Perform Large Scale Projects







Clean Tech

"Electro Scan's Focused **Electrode Leak** Location, is a **Game Changing** Technology"

> Helium or Smoke Testing

How Do We Find & Measure Leaks?

If a pipe leaks electricity, it leaks water. And can be measured in gallons per minute or litres per second.





CALIFORNIA S4.5 million CIPP Lining Project Shows Major Collapses 16-Months After Installation.

SALES

TEXAS Mutiple Post-CIPP Assessments Show Major Leakage.

ILE Post-CIPP Survey

UKSTT Setects Electri Scan as Best Project With Over a Daren Projects Completed.

FLORIDA

30-Mite Post-CIPP Survey Finds Majo

Approved

UK

RANCE Major French Water ormany limites Electro can to Perform Field

Trials Near Paris

GERMANY

ectro Scan Participate Major IKT CIPP Line Study Working With

> UAE 14-km Assessment of Pre- & Post-CIPP Using Electro Scan to Test & Certify Watertightness of UV-Oured Line:

JAPAN

ASCOMA Award Electro Scan Inc

> AUSTRALIA Major Water Utility ompletes Electro Scar enchmark Comparing CCTV & FELL.

SERVICES

UK & EU

Contact: Brad Weston Director, UK Field Services Email: brad@electroscan.com Mobile: +44 7739 358611

> Multi-Sensor Leak Detection for Pressurized Pipes

> > DELTA

electro scan

North America

Contact: Mike App VP, Business Development Email: mike@electroscan.com Mobile: +1 917 817 0090

Asia Pacific

Contact: Chuck Hansen Tel: +61 08 8311 3950 Email: chuck@electroscan.com Mobile: +1 916 275 2921

electro scan in C. 1745 Markston Road Sacramento, California 95825

Tel: +1 916 779 0660 info@electroscan.com www.electroscan.com



Worldwide

Contact: Carrisa Boudwin VP, Marketing Email: carissa@electroscan.com Mobile: +1 917 817 0090

