

Touch Pro | High Performance Water Leak Noise Correlator

Touch Pro is an Advanced Leak Noise Correlation for leak detection in more difficult leak conditions of buried water pipes including metal, plastic or large diameter pipes

Touch Pro is one of the most capable equipment of the industry for quick & accurate leak detection.

The Touch Pro noise correlator is designed especially for the more difficult leak detection situations, including plastic or large diameter pipes.

The Touch Pro Portable high speed leak location system employs:

1. Touch screen controller "base unit" with integrated noise filtering, analysis and management software with built in wireless connectivity.
2. 2 X highly sensitive acoustic sensors (Accelerometers)
3. 2 X Outstation units.



Features:

- **Automatic Intelligent Filtering System:** obtains best result by employing up to **55 filter combinations** on each correlation, automatically optimizing results.
 - **Displays three correlation graphs** to allow user select best result.
 - Compatible with **live and pre-recorded data**, it renders manual filter adjustments obsolete.
 - The unit effectively embodies an '**expert user**' through its **intelligent filtering capabilities**.
 - **High quality:** upgraded long range telemetry.
 - **User definable pipe types and velocity:** to ensure accuracy of results.
- **Easy to use:** step by step menu system guides user through correlation process. Enter 3 simple inputs & begin the survey: (1. Pipe Material 2. Pipe Diameter 3. Pipe length section at which sensors installed).
 - **In case charging:** through mains and 12V vehicle supply.
 - **External antennas:** support improved signal strength .

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How It Works :

The Touch Pro performs leak noise correlation measuring the time difference between leak noise signals arriving at each of the sensors. The touch pro determines the leak position by relating the difference in propagation time (travel time) to velocity of sound along the pipe and to the measured distance between the sensors.

2 x sensors are physically attached & deployed on pipe fittings, on either side of the suspected leak position.

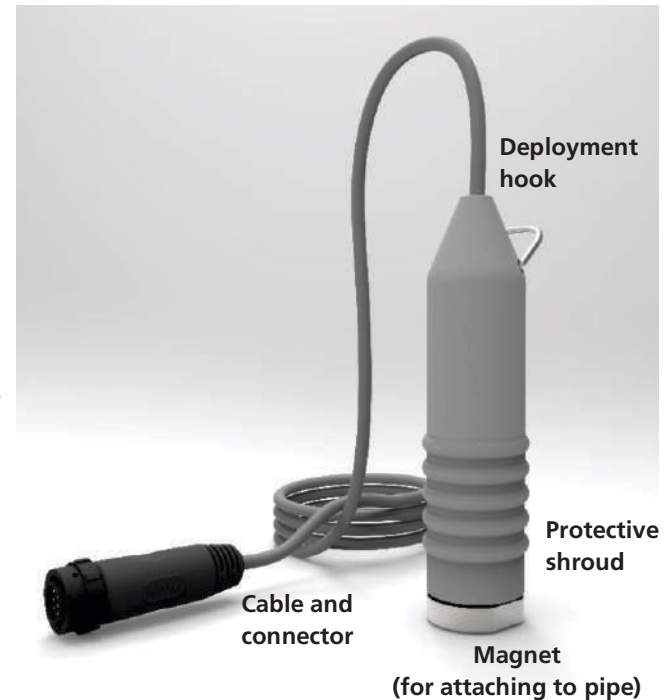
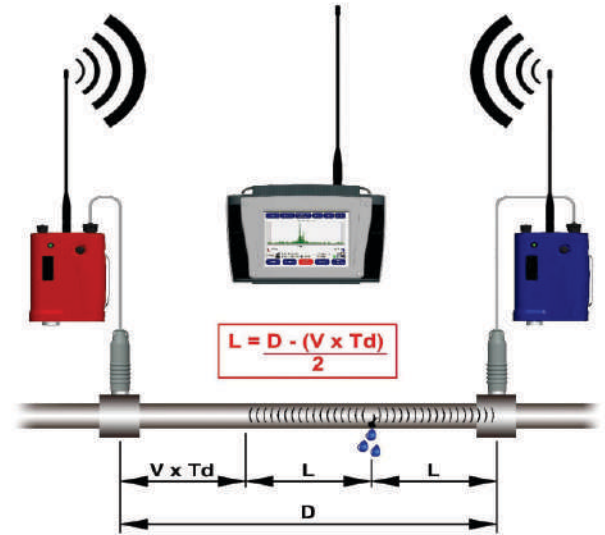
Sensor is selected based on type of connection – Dry which are attached to the outside of the pipes and wet which are in direct contact with water.

The Touch Pro principle of correlation, basis is $L = 1 / 2 (D - (V \times T_d))$ advises the leak position.

Leak noise travels at a constant velocity (V) which depends on material & diameter of the pipe. Sounds arriving at each sensor are compared, and the **sound will arrive first at the sensor closer to the leak**.

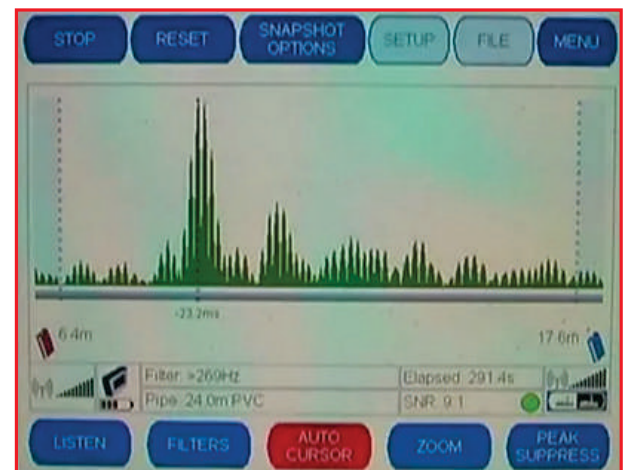
The 2 x accelerometer sensors are positioned on either side of the potential leak location on the pipe are typically utilized with the 2 X Outstation units. Each outstation unit has a built in radio transmission for remote transferring leak noise data to the base correlating control unit.

The operator monitors the noise obtained from the sensors with stereo headphones **allowing the operators to listen for signals from both out-station units**.



Option for Plastic Pipes & Large Diameter pipes : The Touch Pro can also be optionally **utilized with hydrophone sensors** which are utilized in difficult operating conditions where they are mounted for direct contact with water column at hydrant, air valve or flow meter points (pressurised water) - Hydrophones are also more ideally suited for large diameter trunk leaks and all types of plastic pipe systems, and detects the noise signals travelling within the water column itself.

Note : Hydrophone sensor set would need to be procured as an addition to the TouchPro LNC Set.



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Basic LNC Survey

Survey Mode (Quickly Check for Leaks) :

Survey Mode provides a simplified correlation display that enables you to check large distances rapidly for the presence of leaks. (No pipe material settings are required as all of the filters can be set to 'open').

The **survey mode helps to identify whether there is a leak on the pipe** ; it does not try to locate the leak.

Accelerometers are the most practical signal sensors for quick operation and for highest accuracy the distance between sensors should be kept reasonably short; generally, up to 400 metres for metal pipes and 50-60 meters for plastic is a good maximum for accelerometers in this mode of operation.

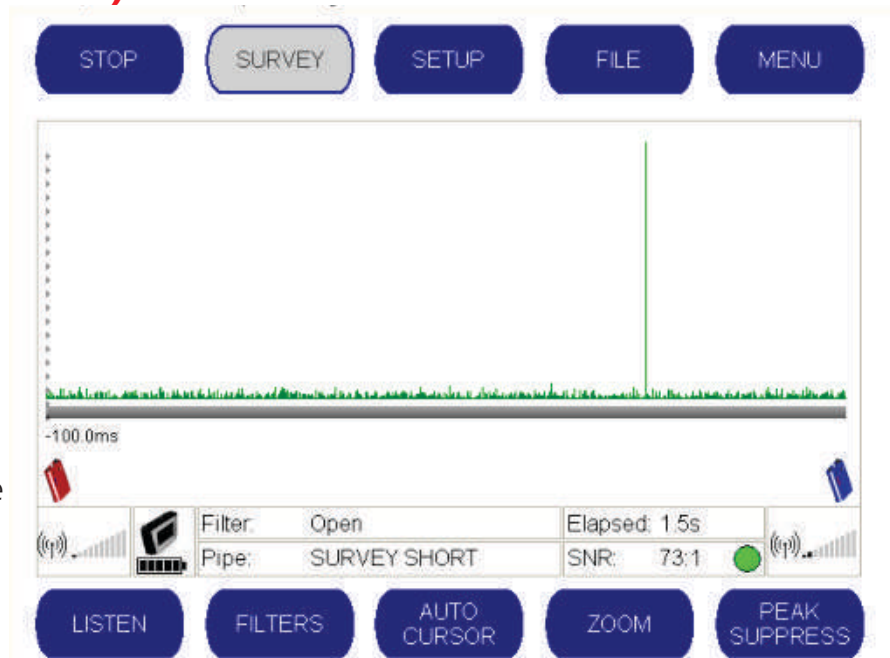
It is however possible as example to deploy the sensors upto 2 Kms range on metal

Material Database (Define Pipe Materials)

To activate the Survey mode, attach the sensors to the pipe fittings and tap on the 'Survey' button that is shown within the main screen.

The Touch Pro base unit has a built-in database of pipes of differing material types and diameters. Each pipe material type and pipe diameter is pre-programmed with the expected speed of sound traveling through it.

This enables the correlator to obtain a good estimate for the speed sound in a pipe network when doing correlations, allowing it to pinpoint the distance from the sensors to the leak (when the correct pipe material(s) and diameter(s) are identified).



SELECT PIPE MATERIAL TO BE EDITED

DUCTILE IRON	CAST IRON	STEEL	COPPER
LEAD	ASBESTOS CEMENT	PVC	HDPE
MDPE	FIBREGLASS	CONCRETE	CLAY
USER-DEFINED MATERIAL 1	USER-DEFINED MATERIAL 2	USER-DEFINED MATERIAL 3	USER-DEFINED MATERIAL 4
BACK	EDIT NAME	EDIT SOUND SPEEDS	RESTORE DEFAULTS

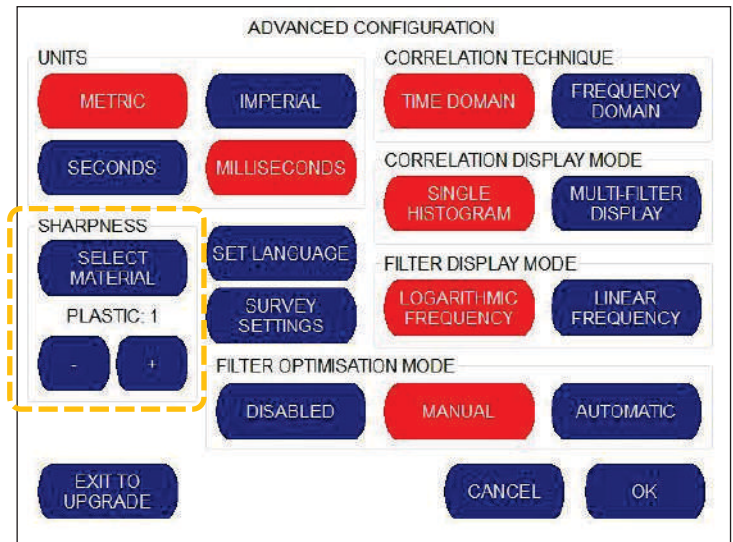
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Advanced features for Accuracy :

AFIS (Filter Optimization) feature:

While the Touch pro provides default filter settings for a wide range of pipe material and sizes, to account for Unknown variables that can change the frequency of the Leak noise, the Touch Pro incorporates an "automated filtering interference system" (AFIS) which **effectively applies multiple filter settings to determine the best possible correlation result**

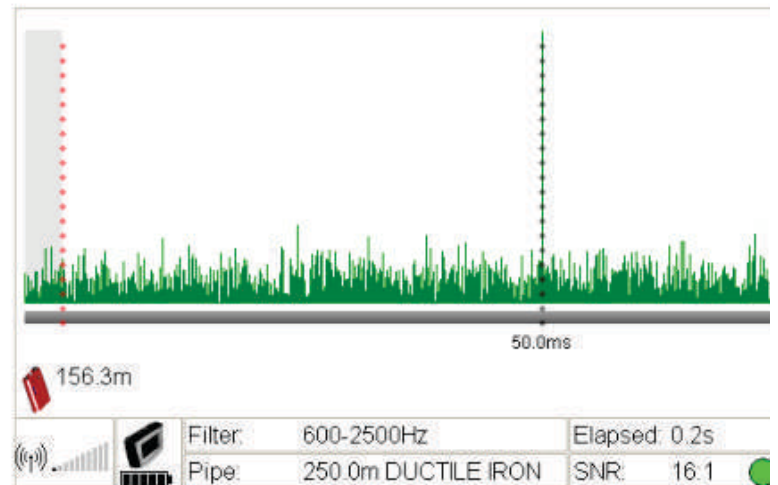
During the correlation the **closest and most accurate result presented is after running up to 55 different filters combinations to present to the user/operator , the most accurate result .**



Auto-Cursor feature

The Auto Cursor will always **locate itself onto the highest peak**, allowing the operator to automatically pinpoint exactly where the highest peak is.

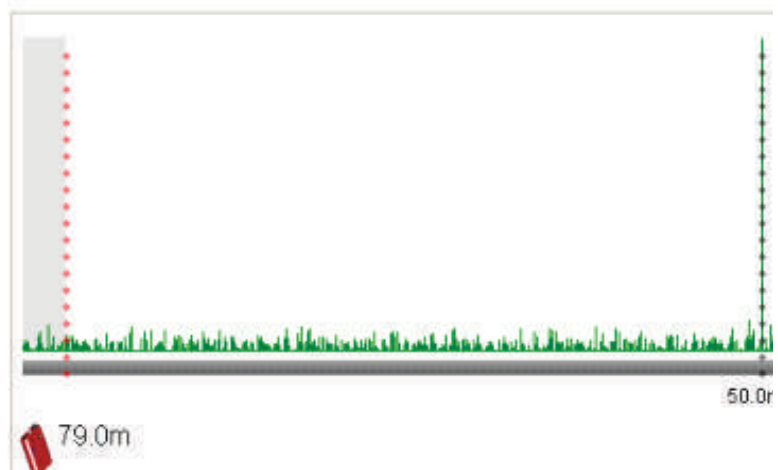
The Auto Cursor is immediately switched off and the screen displays the **distance from the outstations to the selected position.**



Peak Suppress feature

Peak suppression allows the operator to remove an unwanted peak from the correlation result. This is useful when the source of that peak has been identified as a non-leak.

By suppressing this, the unit will correlate ignoring the sound levels being produced at this location on the pipe.



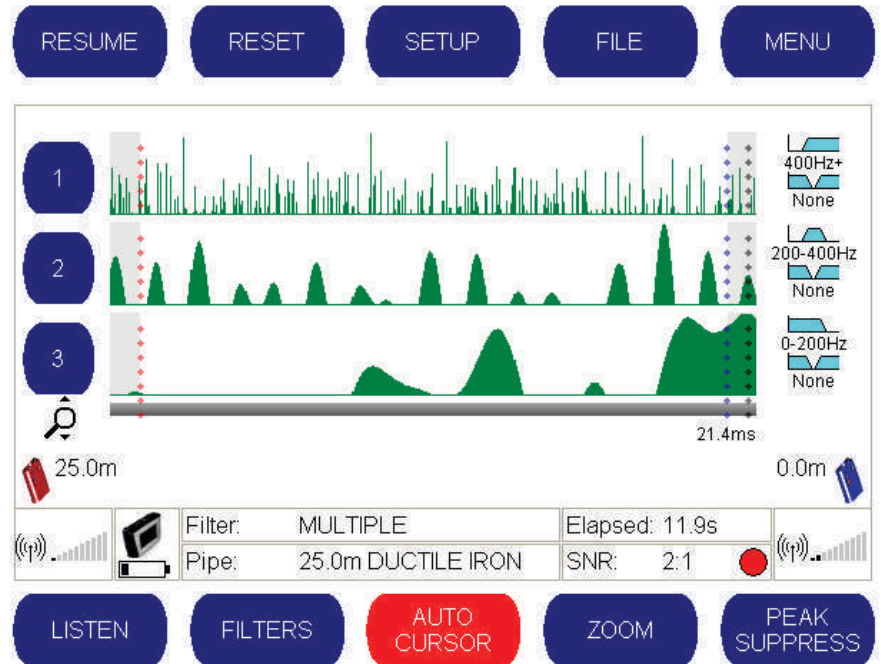
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Advanced features for Accuracy :

Multi-Graph Modes

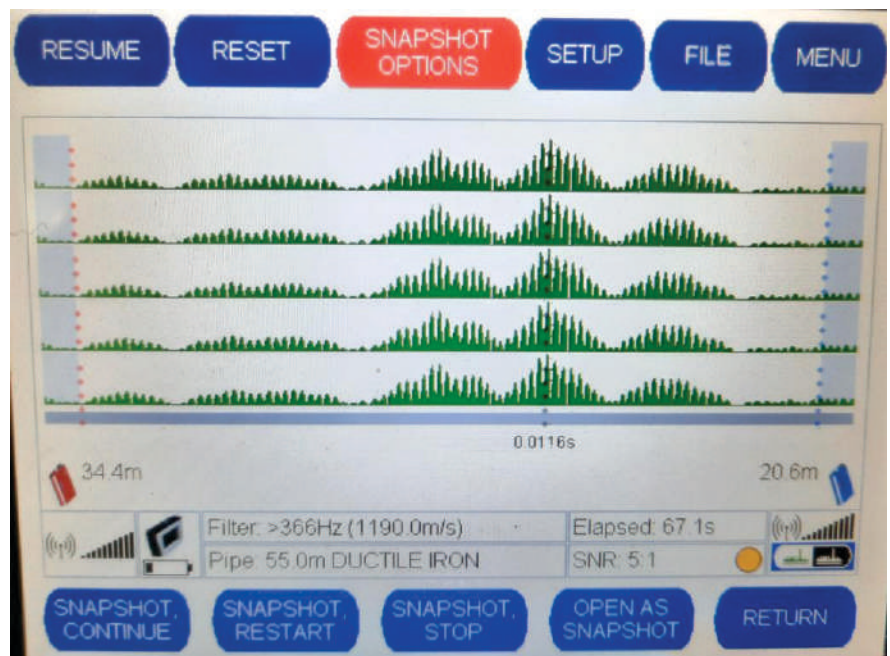
1. Correlation Display (1 Histogram / 3 Histogram) :

- The **default setting** is to display a **Single Histogram** graph during the correlation.
- When the **Multi-Filter Display** option is selected, the main correlation screen changes to **simultaneously, display three correlation graphs**.
- This setup **allows the operator to perform three different correlations simultaneously at the leak site**.
- Each graph has different filter settings applied, thereby **enabling the operator to choose (at a glance) the best out of the correlation results that are on display**.



2. Snapshot Options (Graph Copy)

- The Snapshot feature enables the operator to record (for comparison purposes) a still image of the correlation graph at any time during a real-time correlation.
- Useful for highlighting temporary noises such as sudden traffic noise that might interfere with the correlation result.
- The Snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process



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Specifications

Filter Selection	Manual, FFT, Coherence and Tri Filter correlation. Pipe-data related default settings
Resolution	+ 0.1m
Display	7" Resistive VGA colour touch screen
Antennae	External antennae/magmount (optional)
Battery Type	Rechargeable lithium batteries
Battery Life	12 hours (rechargeable in case)
PC Download	USB to PC, Windows compatible software
Dimensions	H = 90mm, W = 250mm, D = 180mm
Weight	1.9Kg
Temperature Range	-20 to +50°C
Environmental	IP65
Enclosure	PC/ABS plastic enclosure
Connectors	Military specifications
Sensor	
Frequency response	d.c- 5000Hz
Environment	IP68, rubber shroud for shock protection
Connection	2m/3m/5m cables with strain relief military spec connector
Outstation (Optional 1 or 2 radio outstation)	
Radio Frequency	Local regulations apply
Connections	Headphones, external antenna, charging
Battery Type	Rechargeable lithium batteries
Battery Life	12 hours (rechargeable)
Antenna	External antenna (optional)
Dimensions	H = 200mm, W = 135mm, D = 50mm
Weight	870g
Environment	IP65
Housing	PC/ABS plastic enclosure

Note: DXmic Pro ground microphone water leak detector will be required to be used for validation of leak location, after correlation, prior digging for repairs.