

ZONESCAN 800 - Correlating radio logger



How does Zonescan 800 work?

Deployed throughout the water distribution network at regular intervals (often attached to valve spindles or fire hydrants via the integrated magnetic base), the Zonescan-800 'leak intelligence units' continuously monitor and analyse noise characteristics within the distribution system and can detect and identify the presence and location of a leak.

Once in range of a Zonescan-800 logger, a patrol operator will receive automatic notification from the systems voice embedded host software, first identifying the unit, before announcing the presence or probability of a leak at that point in the water network. If audible confirmation of the leak noise is desired, the operator can, at any time, listen directly to the digitally transmitted leak noise from his vehicle without the need for any physical connection with the loggers.

Once Zonescan has confirmed the presence of a leak, the operator can select a neighbouring unit and pinpoint the precise position of the leak between the two units, without ever leaving his vehicle. The data retrieved from each unit is automatically archived in the Zonescan database, and can be used to provide detailed reports for repair teams or a total historic analysis for future distribution system improvement policies. The data can also be integrated with GPS and GIS operating systems.

ZONESCAN-800 loggers function in a similar manner to standard (flow & pressure) loggers, in that they "wake up" to take recordings at user programmable times and also when interrogated by the host software (via a PC or PDA device). At all other times the loggers remain "asleep" to conserve the battery life. Based on a typical operational pattern of one full download every 10 days, they will operate continuously for 5 years before requiring battery replacement.

A fully programmable acoustic logger

ZONESCAN 800 loggers can be individually or collectively programmed to suit each and every different location and environment. The 'industry standard' setting of 02:00am to 04:00am at 3 second sampling is easily achieved as Zonescan can log up to 23 hours and 59 minutes at any sampling rate from 1 to 180 seconds. These results are then presented in an easy to read format by the Windows based host software.

By utilising longer recording periods combined with rapid sampling, the ZONESCAN 800 equipped leakage engineer eliminates the phenomenon of "ghost leaks" and the considerable time wasted attempting to pinpoint leaks that don't exist. Other, inferior acoustic loggers have been proven to waste

up to 50% of costly detection time looking for “ghost leaks”, especially in heavily populated town and city districts.

ZONESCAN 800 loggers have a 100mW transmission power output, compared with the 3-10mW outputs of inferior radio loggers. This enables the patrol vehicle to interrogate and download the loggers from up to 250 metres away. The operator chooses the 'type' of patrol via the Zonescan's host software according to local geographical restrictions. In tests Zonescan offered an average 'patrol' of 72 loggers downloaded and/or programmed per hour, compared with only 28 loggers achieved by other types of radio logger.



The smallest, robust and highly portable logger

At only 115mm high, with a flexible carrying handle that houses the aerial, and with an all round alloy casing, the ZONESCAN 800 logger is the smallest, lightest and most robust logger available. Other radio loggers that have either fixed plastic aerials or plastic housings, or both, are prone to operational damage e.g. when chamber covers are replaced and press down on the aerial, or when leakage inspectors accidentally puncture the logger casing with listening sticks. Weighing less than 0.4kg each, ZONESCAN 800 loggers are easily transported and deployed by one engineer.

Logged results are displayed in the software database as 'Project Table'

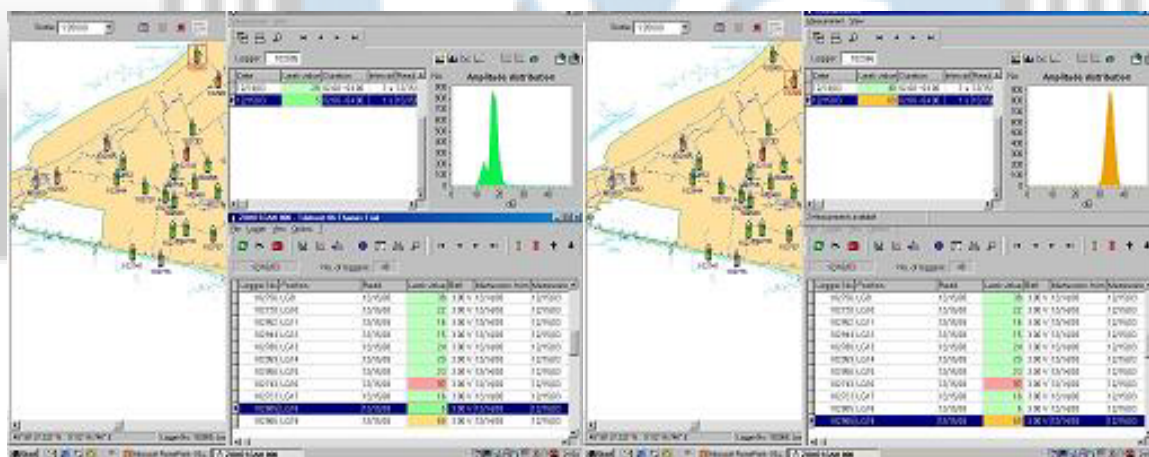
Each result is given as a “Leak Value” between 0 and 100 for initial interpretation. This Leak Value is determined by the level and occurrence of the logged decibel readings. The operator sets the 'Leak Value threshold' within the host software. This determines whether the result is indicated in red (caution, probable leak), orange (possible leak) or green (no leak). The same threshold is also used for triggering the audio warnings if required.

The Leak Value can be used to prioritise detection/confirmation tasks. For example, with the Leak Value

threshold set to '30', quiet, low volume leakage (such as weeping fire hydrants and passing boundary valves) may still be highlighted in 'orange' in the project table, along with greater volume leaks. With the threshold set to 50, these lower volume/priority leaks will be coloured 'green' in the Project Table and will not trigger a leak audio warning to the patrol engineer. Because the patrol operator sets this threshold level based on his local knowledge of the network, different logged areas with different average pressures and pipe materials can be patrolled with improved effectiveness and efficiency. The logged decibel values for each logger are displayed in the Measurements Graph. Each logger has a revolving memory that will retain 30 days of measurements graphs and 180 days of Leak Values, with the oldest value being overwritten when the memory is full. The storage of historic information is only limited by the host PC's memory. An "acoustic fingerprint" can be built up and viewed in the Measurements window allowing a degree of local asset appraisal to be carried out.

Each ZONESCAN 800 Project Table can contain an unlimited amount of loggers

A different 'Zonescan Project' is recommended for each specific D.M.A./L.C.Z. as this can assist in patrol planning and data management. Each Project can be saved separately as a ZIP file for archiving and/or emailing.



A digital leak locating correlator

In addition to noise logging, each ZONESCAN 800 logger can ALSO be independently programmed to record a sample of actual pipe noise at any time of the day or night, and this is performed during synchronisation (programming or downloading). This noise sample is then digitised and stored in the logger's memory for onward transmission when the logger is interrogated by the host software platform. These digitised noise files are stored in the Noise Signals section of the ZONESCAN800 software to enable cross correlation between loggers to pinpoint the source of the leak noise between any two loggers.

Simply selecting any two loggers from the Project Table, then clicking on the 'Correlate' icon, enables the user to conduct a cross correlation. For exacting accuracy, pipe details can be entered and the graph

will then indicate the precise distance of any leak in relation to the first logger selected.

NEW AUTOMATIC MULTI-TEST CORRELATION BETWEEN ALL LOGGERS IN THE SAME PROJECT!

Zonescan software now offers the user another world first. By simply selecting a dedicated 'test correlation' icon within the Zonescan's correlation programme, the powerful host software will perform a test correlation between ALL loggers within the same project. Using specific correlation formulae, the Zonescan-800 will then provide the user with a list of all the highest probable leak positions - at the click of a button!

ZONESCAN 800 — Technical Specifications

Memory:

- Capable of storing and transmitting last 180 days of leakage analysis and leak value for each logger.
- Capable of storing and transmitting last 30 days noise level distribution and spread data (in dB) for each logger.
- Database capable of showing unlimited number of historic noise level and spread data readings.

Advanced Functionality:

- "Caution Leak" (red), "Possible Leak" (orange) and "No Leak" (green) visual indications at each logged point.
- Individual Leakage probability (from 0-100%) given at each logged point.
- Logger Serial Number, Logger Location (Valve Box and Street etc) provided at each logged point.
- Voice notification and alarms (in all languages) for each logged point via loudspeaker.
- Capable of performing a leak noise correlation for automatic, remote pinpointing of precise leak location
- Automatic multi-test correlation providing precise leak positions between ALL loggers in the same project.
- Remote listening to digitally recorded and transmitted leak noise from within the 'patrol vehicle'
- Geographical mapping of pipe network and distribution of logged points with auto colour coding of logger icons i.e. no leak (green), possible leak (orange), caution; probable leak (red)
- Indication of multiple leaks at each logged point
- Integration of GIS and/or GPS possible
- Unlimited number of logged points monitored simultaneously

Downloading and/ or Programming:

- User interface via portable PC or Palm PDA.
- All or individual loggers freely re-programmable remotely from patrol vehicle during leakage patrol. Digital integrated acoustic system
- Automatic and immediate transmission of all logged data from loggers once within range of

patrol vehicle (advantage of each logger being a transceiver).

- Noise logger date and time automatically synchronized to patroller/PC during every patrol/communication.
- Transmits AND receives (two-way communication with transceiver units for remote re-programming without the need to remove loggers from valve chamber).

Communication:

- Wireless, from up to 250m from patrol vehicle
- Automatic download of data once within range
- Automatic remote synchronization with PC or PDA clock
- 2-way Communication with Loggers (for remote re-programming etc). No physical connection or 'docking station' is required.
- High Logger Output of 100mW for improved communications.
- Ultra High Frequency (UHF) radio communication (two-way), 868 or 915MHz for RF transmission over much greater distances
- Download all data automatically into Zonescan Windows™ Software to PC or Palm PDA.

Dimensions & Physical:

- Logger measurements: 125 x 40mm. Smallest overall dimensions of any acoustic/correlating logger.
- Logger weight: 340 grams. Lightest weight of any acoustic/correlating logger.
- 60mm loop antenna is flexible in case of limited space in valve chamber, and also acts as a reinforced handle for easier logger positioning.
- Internal battery life of 5 years under normal use
- Battery cell replaceable locally by trained agent. Does not need to be returned to factory.
- COMLink Transceiver measurements: 120 x 100 x 35mm
- COMLink Transceiver weight: 0.2kg (approx).
- Magnetic Stub-Antenna (100mm in length) suitable for vehicle mount OR walking patrol.
- Replaceable or rechargeable batteries (2 x AA, 1.5V, LR6) for COMLink patrol unit
- All interrogation can be performed remotely from patrol vehicle during patrol, without any physical connection to logger is required.

Additional ZONESCAN System Benefit:

- Standard software package includes user selectable 'Full Professional' and simplified 'Wizard Assisted' versions.
- Noise logger can be programmed by the user to operate daily for any logging period from 1 minute up to 23 hours and 59 minutes. Not restricted to factory set time of 2 hours between 02:00 and 04:00
- High-speed data collection at speeds of up to 70Km/h.
- Can be programmed and downloaded with Palm PDA
- Upgradeable (without removing loggers from valve chamber) to FULLY remote office based

communication system, with up-to-date leakage data & alarm reports sent direct to an office PC (or mobile phone) on a daily basis.

- All Zonescan software upgrades supplied free of charge for the life of the equipment.

ZONESCAN 800 — Specifications Summary

Casing:	Aluminium, with magnetic attachment
Sensor:	High sensitivity piezo-ceramic sensor
Dimensions:	125 x 40 mm diameter (4.9 x 1.6" diameter)
Weight:	400 gr (0.9lb.)
Protection:	IP68, fully submersible to 2m
Power:	Replaceable Lithium battery cell
Battery Life:	Typically 5 years (depending upon operation)
Memory:	180 days leak value for each logger (most recent) 30 days of leak analysis and histogram for each logger (most recent)
Temperature range:	-20 to +55 deg C (-4 to +131 deg F)
Radio Type:	Transceiver for interactive communication
Radio Output:	100mW

EVS
Q16 Greenogue Business Park,
Rathcoole,
Dublin 24
Ireland

Phone : 00353 (01) 2573413
Email : info@expressvalveservices.com
Web : www.expressvalveservices.com