Permalog® PLUS

Permalog Plus User Manual

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Permalog Plus User Manual

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Introduction

Permalog® Plus is the very latest in a highly successful line of permanent and semi-permanent leak noise loggers. This logger can be used as both a traditional leak noise logger, and as a "drive by" logger.

Permalog® Plus leak noise loggers are deployed throughout the water distribution net-work to provide continuous surveying of leakage. Each Permalog® Plus unit adapts itself automatically to its environment. If no leak is present a signal is transmitted to indicate normal background conditions, however, as soon as a possible leak is detected, the Permalog® Plus unit enters an alarm state and transmits a signal to indicate a leak condition. The logger also incorporates an LED to display the leak status visually.

Following a rise in unaccounted for water, or at standard intervals, a leakage patrol is carried out in the area using the Permalog® Patroller module. Leak status information from the loggers is displayed on the PDA screen of the Patroller module and stored in the memory.

With no cables or hard installation, Permalog® Plus is simply fitted to a metal fixture within the chamber (usually a hydrant or valve) and left alone. Logging times, Patrol times and Transmission times are fully customisable ensuring the operator gets the most benefit from the system and can configure it to their advantage. With integrated Bluetooth technology, the Permalog® Plus logger offers easy management through the PDA and Patroller Interface Unit. Permalog® Plus can be fully configured without having to be removed from the chamber.

Benefits of Use

Operational Benefits

- **100% of distribution system permanently monitored.**
- **Finds more leaks more quickly than traditional methods.**
- **Responds rapidly to new mains bursts, improving service to customers.**
- **Automates and de-skills leak surveying, eliminating human error and finding leaks that would otherwise be missed.**
- **Eliminates "stop tap bashing" (surveying using listening sticks).**
- **Operates independently of the size, structure or integrity of the area being monitored.**
- **Completely non-invasive method with no detrimental effects on supply to customers (preferred alternative to step testing).**
- **Improves overall detection efficiency and motivation by enabling skilled staff to concentrate on finding "known" leaks and avoid wasting time in no-leak areas.**
- **Operates continuously for up to 5 years (dependant on configuration), enabling a low leakage level to be maintained easily.**
- **Bluetooth and RF technology allow wireless configuration on site.**
- **Logging can be fully customised to fit customer's requirements.**

Economic Benefits

- **Survey costs cut by >90% with elimination of surveying using listening sticks**
- **Dramatic productivity gain - one person can survey several DMA's (District Metered Areas) per day.**
- **Record low leakage levels attainable and easily maintained.**
- **Low installation cost and no maintenance costs enable rapid payback, with in-creasing profits per year.**
- **No night work required for leak surveying.**
- **Negligible incremental cost of additional surveys.**
- **Highly attractive return on capital employed.**
- **Lower leakage level reduces cost of water into supply.**
- **Demonstrates high technology benefits to regulator, customers, shareholders and international clients.**

With over 200,000 units deployed worldwide, it's easy to see why the Permalog range is one of the most highly respected Leak Noise Loggers in the industry. HWM-Water Ltd, your gateway to the latest technology, solutions and services.

Warnings

Canadian warning statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This radio transmitter (10962A-031) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

(Antenna: Type: Helical TNC, Gain: 0dBi, Impedance: 50Ohms)

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

FCC warning statement:

- This device complies with Part 15 of the FCC Rules.
  Operation is subject to the following two conditions:
  (1) This device may not cause harmful interference, and
  (2) This device must accept any interference received, including interference that may cause undesired operation.

- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

WARNING: - LITHIUM BATTERIES
If batteries are exposed - do not short circuit, recharge, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the declared operating temperature range of the product. **Risk of fire or explosion**. These batteries are sealed units which are not hazardous when used according to the recommendations of the manufacturer.

Important Notes

Deployment of Permalog® Plus units should be carried out in accordance with local regulations. Mishandling the logger could result in damage to the antenna (if incorrectly used to lower or raise the logger) or the sensor (connecting the logger to, or re-moving it from, the fitting). Such damage is not covered by HWM's warranty and customers are warned that damage to the sensor in particular is unlikely to be economic to repair.

During handling and transportation of Permalog® Plus units from site to site, care must be taken not to bring the communications window into the magnetic field of a medium or strong strength magnet. Continuous exposure to a magnetic field can result in variation in the logger's internal clock, which will lead to an increased possibility of false alarms. Particular care must be taken to avoid packing Permalog® Plus units head to tail. Remedial work by HWM required to correct loggers that have been affected in this way is not covered by warranty and will be charged.

Always grasp the main body of the logger or use the optional lifting hook when placing or retrieving the logger from the pipe fitting. Do not pull the logger by it's aerial as this can cause damage. Permalog® Plus units have no user serviceable parts. The en-closure protects the user from electrical shocks and other hazards. Servicing must be referred to competent personnel. If any unit does not appear to function correctly then it must be returned to HWM-Water Ltd or an authorised HWM representative.

IMPORTANT SAFETY NOTE:

The Permalog® Plus logger uses a high strength magnet and should not be carried by anyone with a heart pacemaker. This magnet can permanently corrupt magnetic storage media such as floppy discs, hard discs and tapes etc… It can also damage TV and PC monitor screens and some watches.

Permalog® Plus Features

The Permalog® Plus logger is a fully sealed non-user serviceable unit. A hermetic seal protects the internal battery, radio module and electronics from particle or fluid ingress and is mechanically strong enough to withstand extreme environmental conditions such as ground frost, flooding, heat and humidity.

The main features of the Permalog® Plus are listed below:-

1. **Antenna**
2. **Leak Status LED**
3. **Lifting Hook**
4. **IP68 Rated Housing**
5. **Stainless Steel Accelerometer**

Deployment

Ensure the screw thread for the antenna is clean, before hand-tightening the antenna to the Permalog® Plus logger. If optional lifting hooks have been purchased, please ensure these are fitted tightly.

Start/reset* the Permalog® Plus logger by passing a magnet close to and across the communication LED. Successful start/reset operation is confirmed by observing the LED flash in sequence (Red, Green) after swiping.

***This is the only way to reset the unit. Once reset, it will operate continuously for the life of the batteries. It can only be switched off using the Patroller. The guaranteed battery life depends on factory settings. Any medium strength magnet will reset the Permalog®; for convenience, the magnet on another Permalog® may be used. Do not attempt to remove the magnet from the bottom of any Permalog®.**

Permalog® Plus loggers will retain the history even if reset.

***Please see the Patroller II User Manual for more information.**

Attach the Permalog® Plus logger to a metal pipe fitting using the magnet on the base. Always ensure the contact point is free from dirt so that the magnet makes a good contact. We recommend the use of a wire brush to clean the pipe/valve/hydrant fitting prior to attaching the logger.

For best performance, it is recommended that the Permalog® Plus logger is deployed in a vertical/upright position as this gives the most effective radio range.

Redeployment Notes:

When removing from fitting, please grasp the main body of the logger or use the op-tional lifting hooks. Removal of the logger by grasping the antenna can cause perma-nent damage and is not covered by warranty.

It is recommended the data be read from the logger and stored on the Patroller prior to resetting the logger for redeployment.

Store unused loggers in the original packaging. This ensures the loggers are kept apart enough as to not continuously reset them causing internal clock errors.

User Interface

Permalog® Plus loggers are designed with a battery life span of up to 5* years. To achieve this the logger will spend most of its operating life in a sleep state. While in this state, all components in the logger are switched off unless the logger is awakened for pre-configured activities.

***Dependant on configuration**

The logger is woken from sleep state at the pre-configured time so that it can record a noise sample (default is 2am). The unit then wakes up again during its pre-configured Patrol time and chirps its presence every two seconds. This will be picked up by a roving Patroller which will retrieve the loggers serial number, level & spread, and leak status and send any commands to the logger from the Patroller.

Analysis of the recorded noise levels will cause the logger to switch to one of 3 states:

No Leak Mode:

The logger is in this state when no leak has been detected. If the logger is in Warning mode and there is a no leak result with the second recording, the logger will revert to this mode.

This state is indicted by the LED flashing green and transmitting an "N" through the RF communications to the Patroller unit to signify no leak.

Warning Mode:

If a leak is detected from the first recording then the logger will change to this mode. During this mode the logger will perform a second recording one hour later to confirm or not the leak status and change to leak or no leak mode.

Leak Mode:

If the logger is in Warning mode and a leak is detected with the second recording then the logger will change to leak mode.

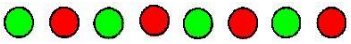
This state is indicated by the LED flashing Red and the logger transmitting an "L" through the RF communications to the Patroller unit to signify a leak.

User Interface (Continued)

The LED is primarily used to signify whether the logger is in leak or no leak mode. Other features indicated by the LED are:

1s Low Battery Warning:

Red LED flashes every second.



Logger Reset/Woken:

A short sequence of red and green flashes.

No Illumination:

Logger is in Storage mode (full sleep) or battery failure.

Patroller Communication

Inside each logger is a radio transceiver module. In normal operation the logger will send a radio chirp every two seconds when it is in its pre-configured Patrol window. The roving Patroller unit detects the loggers chirp and receives its unique ID (serial number), level & spread values and leak status.

With the Patroller communicating with the individual logger, any historical data stored on the logger can be downloaded for analysis and the logger configuration can be changed if needed.

To save power, a patrol window can be configured in the logger. This means that the logger will be available to the Patroller in a certain time period (e.g. between 8am—8pm). If communication is required outside this time period then a magnet swipe is required to wake the logger for a two minute period.

Technical Specification

Logger Dimensions:

Width: 50mm

Height: 122mm

Height (with EU antenna): 196mm

Height (with US antenna): 180mm

Weight:

Without Antenna: 610 g

With Antenna: 625 g

Antenna:

Type: Helical TNC
Gain: 0dB
Impedance: 50Ohms

Antenna Connector:

Type: TNC
Impedance: 50Ohms

Environmental Protection:

IP68

Water Proof to 4m

Operating Temperature Range:

-30°C - +60°C

Construction Materials:

Main Housing: Polybutylene Terephthalate

Sensor Assembly: Stainless Steel

Battery Life:

Up to 5 years (dependant on configuration)

Approvals:

European: CE and R&TTE

USA: FCC

Canada: IC

WEEE and ROHS Compliant

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Note

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