Halma Water Management

PATROLLER

Patroller II User Manual

Patroller II User Manual

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IMPORTANT SAFETY INSTRUCTIONS

This equipment is designed to comply with EN61010-1:2001 (Safety requirements for measurement, control, and laboratory use) - observe the following precautions:

- With exception of the battery packs there are no user serviceable parts inside the equipment - do not attempt to open the equipment, refer service to Palmer environmental or authorised distributor.
- All batteries supplied are rechargeable lithium ion part number ICR-18650H. Do not short-circuit these batteries. Any misuse may result in explosion or fire. They must not be used in any other application or used with any other equipment. Only batteries/battery-packs supplied by HWM-Water Ltd (Palmer Environmental) or authorised distributors must be used.
    - Disposal considerations for the battery pack: Do not incinerate, or subject cells to temperatures in excess of 70^0C. Such abuse can result in loss of seal, leakage, and/or cell explosion. Dispose of in accordance with appropriate local regulations.
    - The sealed battery packs contain circuitry to prevent overcharging and over-discharging.
    - If the system is going to be stored for any length of time, to ensure long life of batteries it is recommended that they are charged to approx. 1/4 of capacity.
- When charging the batteries in the equipment only use the 12V DC output charger supplied with the equipment. The charger must only be used indoors to charge the batteries in the equipment.

Note: HWM-Water Ltd. SHALL not be liable for any consequential damages, losses, costs or expenses arising from the misuse of this equipment however caused.

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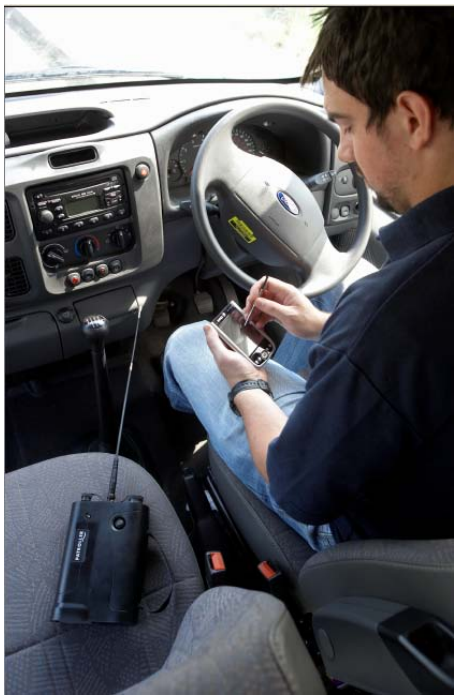

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Warnings

Patroller Unit

When charging from a 12v vehicle supply, if the engine is switched off the unit must be disconnected prior to restarting the vehicle, failure to do this may result in permanent damage to the charge circuits. Once the engine is running, it is safe to re-connect the Patroller for charge.

The Patroller contains a lithium backup battery of which there is a real danger of explosion if this battery is incorrectly replaced. It should only be replaced with the same or equivalent battery type. Used batteries must be disposed of according the manufacturers instructions.

Permalog® 3 and Permalog® Plus Sensor and Magnet Warning

Both the Permalog® 3 and Permalog® Plus sensor can be seen from the bottom of the unit. Users must not attempt to unscrew this sensor as this may break internal components resulting in irreparable internal damage; sensor replacement is then the only option.

Any necessary repair or dismantling of the sensor must be carried out by an authorised distributor. Permalog® units have no user serviceable parts. The enclosure protects the user from electrical shock and other hazards. Servicing must be referred to authorised competent personnel. If any unit does not appear to function correctly then it must be returned to an authorised representative.

Important Safety Note

Both the Permalog® 3 and Permalog® Plus logger use 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.

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® leak noise loggers are deployed throughout the water distribution network to provide continuous surveying of leakage. Each Permalog® 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® unit enters an alarm state and transmits a signal to indicate a leak condition.

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, the Permalog® 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 benefits 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 loggers can be fully configured without having to be removed from the chamber.

Patroller II is compatible with both Permalog® 3 and Permalog® Plus loggers.

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.
- New Patroller is backwards compatible with Permalog® 3.
- Bluetooth and RF technology allow wireless configuration on site.
- Logging can be fully customised to fit customers' 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 increasing profits per year.
- No night work required for leak surveying.
- 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 50,000 units' deployed world wide, 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 (Palmer Environmental), your gateway to the latest technology, solutions and services.

Patroller II Interface Equipment

The Patroller is supplied with all the cables and accessories required for normal operation.

The standard Patroller kit includes: -

- Patroller Bluetooth Interface Unit fitted with rechargeable battery pack
- 12V DC power cable with standard vehicle lighter adapter
- Mains powered charger unit
- Small antenna for portable use
- Mag-mount antenna with integral co-axial lead

The following equipment is not supplied as standard but may be supplied as optional accessories to the Patroller: -

- PDA
- PDA Hard Case
- PDA in-car charger and holder
- Cowl (for interrogating Permalog 3 loggers)
- Replacement battery pack
- Transit case

Please Note:

Only suitable PDA's are compatible. Please check with your distributor for a list of compatible PDA's for use with the Patroller system.

Patroller II Interface Unit Features

The various features of the Patroller unit are identified below.

1) **Charging Connection**
2) **Aerial Connection**
3) **Cowl Connection**
4) **LED Displaying Battery and Communications Status**
5) **On/Off Button**
6) **Carry Handle**
7) **Injection Moulded Casing**
8) **Battery Compartment**

Figure 1: Patroller II Interface Unit

Permalog® Plus Features

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

1) **Antenna**
2) **LED**
3) **Lifting Hook Insert**
4) **IP68 Rated Housing**
5) **Stainless Steel Accelerometer**

Figure 2: Permalog® Plus

Permalog® 3 Features

The main features of the Permalog® 3 are listed below:-

1) **Antenna**
2) **LED and Infrared Communication Window**
3) **Lifting Hook Insert**
4) **IP68 Rated Housing**
5) **Stainless Steel Accelerometer**

Figure 3: Permalog® 3

Permalog® Logger Deployment Instructions

Ensure that both the screw thread on the aerial and the lower recessed screw-hole in the Permalog® are clean, then screw the aerial into the lower screw-hole firmly by hand. Ensure that the rubber washer is fitted to make a watertight seal. Remove the magnet keeper and store for later use.

Start/Reset the Permalog® by passing a magnet close to, and across, the top of the logger. Look to see a sequence red LED flashes 3 consecutive times and then green/red 3 times rapidly. If the LED does not flash, pass the magnet across the top again and look at the LED to verify.

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. Permalog® 3 loggers once reset, do not store the information in memory and it is recommended they have their history downloaded via the Patroller Cowl prior to actual reset.

Attach the Permalog® to a metal pipe-fitting using the magnet on the base. Always ensure that the contact point is free from dirt so that the magnet makes a good contact. If an eye-hook (optional accessory) is used, this must be screwed into the top of the logger. For best performance, it is recommended that the Permalog® unit is deployed in a vertical/upright position.

Permalog® Logger Re-Deployment Instructions

Ensure you have sufficient keepers for the magnets. Removing keepers from logger magnets takes some effort. Insert a piece of thin card between the keeper and the magnet to make this job easier.

On retrieval, always grasp the main body of the logger. Do not pull loggers by the aerials. Ensure the magnet from one logger is kept more than 3 inches (8cms) away from the window of the nearest logger. If any magnet is held too close to the logger window, the logger will continually reset causing an incorrect internal clock setting and subsequent erroneous results.

Pairing Interface Unit to PDA (Bluetooth)

Pairing Bluetooth devices differs on each PDA model/make; please refer to your PDA manual for specific instructions.

The following is based on a Dell Axim X51 PDA unit:-

1. Turn the Patroller II Interface Unit on by pressing the on/off button located on the front of the unit. See *Figure 1*.
2. Turn the PDA on.
   2.1. Go to "**Start**", navigate to "**Settings**".
   2.2. Go to the "**Connections**" tab and select the "**Bluetooth**" icon.
3. From the connections screen, open the Bluetooth connection settings. Ensure the PDA's Bluetooth is turned on.
4. Go to "**Devices**" tab
   4.1. Create a new partnership; this will search for any Bluetooth devices in range. Once it has found the Patroller Interface Unit (Patroller 2 xx.yy—where xx.yy are the last four digits of the Bluetooth identity) click next.
5. Enter a Passkey of 0000 (4 zeros) and click next.
6. You can rename the found device for ease of use, call it "**Patroller II**" and ensure the "**Serial Port**" checkbox is ticked.
7. Click "**Finish**" to finalise the pairing of the Patroller Interface Unit and the PDA.
8. Click "**ok**" twice to exit the Main page of the PDA.

The PDA is now ready to be paired with the Interface Unit when the application starts up. For initial first time connection with the paired interface unit, please follow: Setup Patroller (PDA Setup) on Page *27*.

Changing the PDA Power Settings

To stop the PDA going into standby mode whilst carrying out a patrol, you can configure the Power Saving options. The following is based on a Dell Axim X51 PDA unit:-

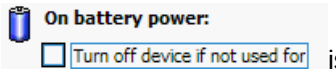
From the main PDA screen

Go to "**Start**", navigate to "**Settings**".

Click the "**System**" tab and click the

icon.

In the new window, select the "**Advanced**" tab.

Ensure 

is **unchecked** and click "**ok**".

To help conserve battery power you can adjust the brightness settings by selecting

icon from the "**System**" tab in "**Settings**". Using the slide bar,

adjust the brightness to an acceptable level and click "**ok**".

The Patroller Icons

From Patroller II PDA Software version 4.4.0.X onwards, the icons the user will see on the main icons screen will depend on what has been permitted by the Administrator. On first installation, the only icon available will be that of the ABOUT icon, see *Figure 4*.

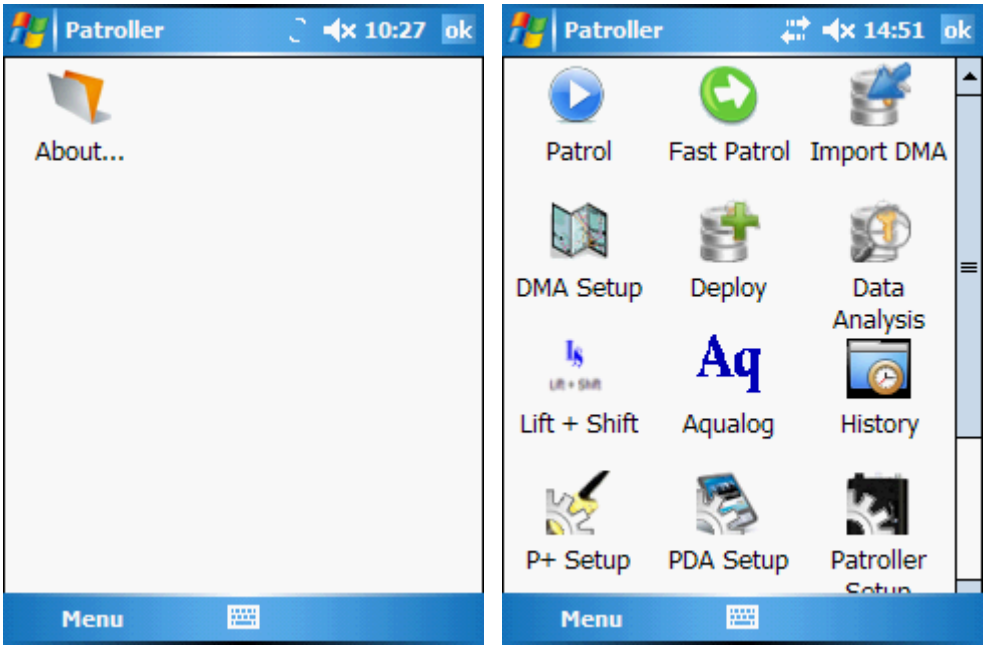


Figure 4: Default Main Icons Screen after First Installation & Fully Populated Main Icons Screen

Each screen will be explained in depth in later sections.

Table 1: Patroller Icons

	Patrol - Main screen for carrying out patrol	(Page 44)
	Deploy - Deploy single and multiple Permalog's.	(Page 46)
	DMA Setup - Add, edit and delete DMA information.	(Page 52)
	Data Analysis - View logger information and status.	(Page 50)
	PDA Setup - Select Patroller unit being used.	(Page 27)

	Patroller Setup - Configures the Interface unit.	(Page 43)
	Lift + Shift - Configures Lift + Shift Mode.	(Page 62)
	P+ Setup - Configures Permalog Plus options.	(Page 31)
	Import DMA - Imports previously saved DMA information.	(Page 54)
	History - Download Level and Spread/Histograms.	(Page 55)
	Aqualog - configures Aqualog Mode.	(Page 59)
	About - Displays current software version.	
	Fast Patrol - Select database and Patrol.	(Page 65)
	Permalog (COWL)	(Page 28)

The Patroller II PDA Software

The Patroller uses on-screen icons and menus for its operational functions.

Press the power button on the front of the Interface unit to switch the unit on (See *Figure 1*). The system will automatically initialise Bluetooth communications.

Start the PDA Patroller application.

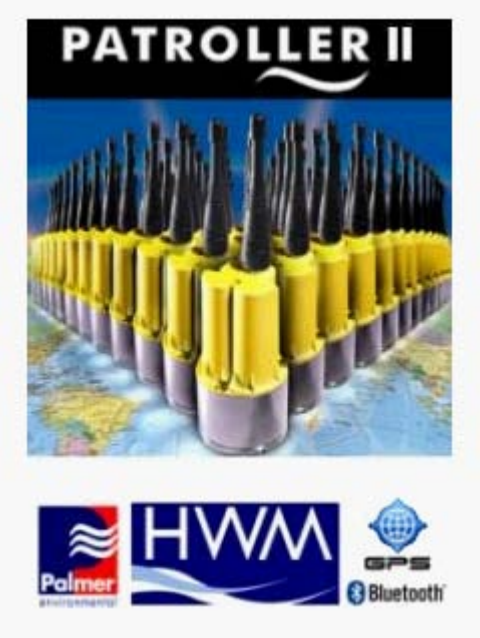


Figure 5: Patroller II PDA - Application Startup Splash Screen

Unlike version pre-version 4.4.0.x, a normal user will no longer have to enter a password. Immediately after the Splash Screen shown in *Figure 5*, the Main Icons screen will appear as shown in *Figure 4*. What the end-user could see on this screen is determined by the Administrator.

The number of icons shown depends on what the Administrator has permitted the end-user to see.

For ease of use, click on the icons to quickly access the relevant function.

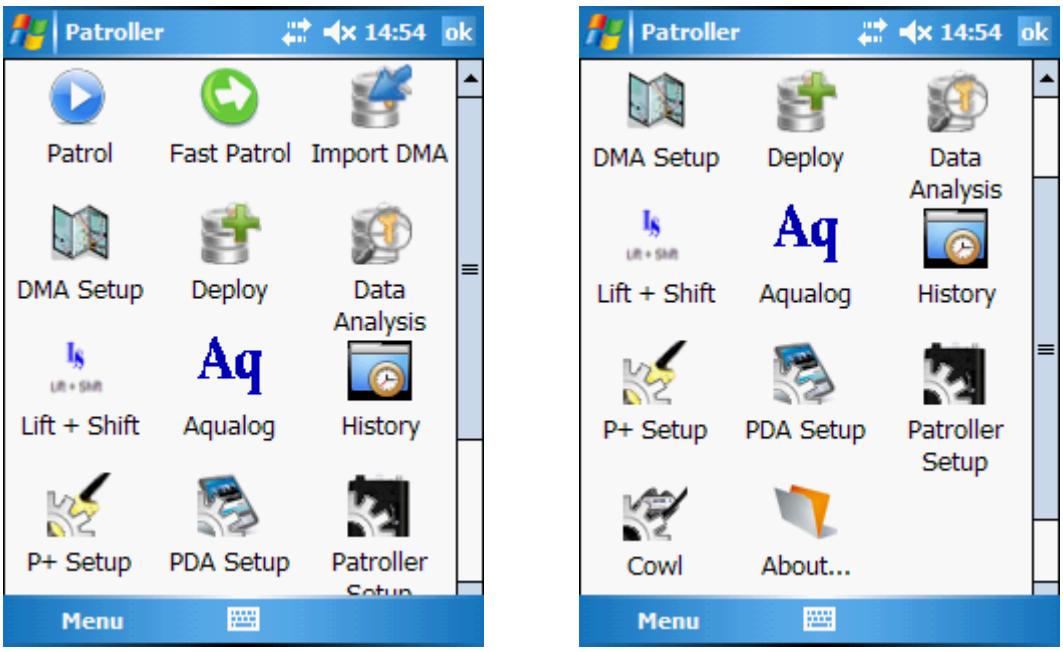


Figure 6: Patroller II PDA - Main Icons Screen

Pass-code Screen

To access the pass-code screen, in the main icons screen shown in *Figure 4*, select “Menu” at the bottom left corner of the screen (See *Figure 7*) and select “Option (Pass-code Access Only)”, the screen shown in *Figure 8* will pop up.

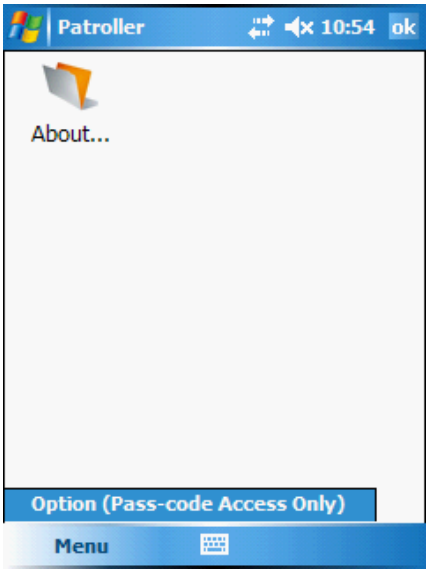


Figure 7: Menu -> Option (Pass-code Access Only)

For information regarding Pass-code please consult Palmer or authorised distributors.

If you are the Administrator, please refer to the Administrator’s manual MAN-0096-0006.

If you are the Distributor, please refer to the Distributor’s manual MAN-096-0007.

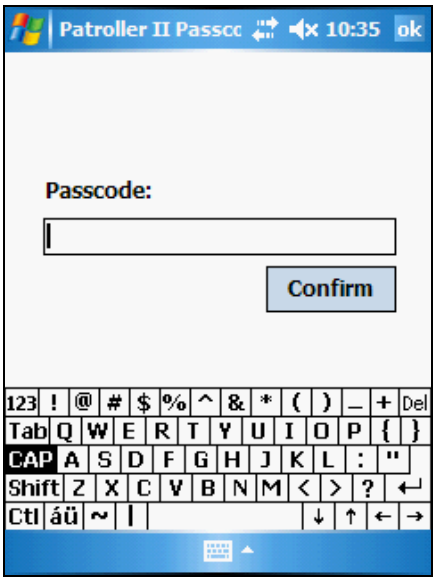


Figure 8: Pass-code Screen

Menu->Database Import/Export DMA

If the Administrator has enabled the display Menu->Database Import/Export DMA, the Menu option on the main icons screen will be different from what was shown in *Figure 7*. See *Figure 9*.

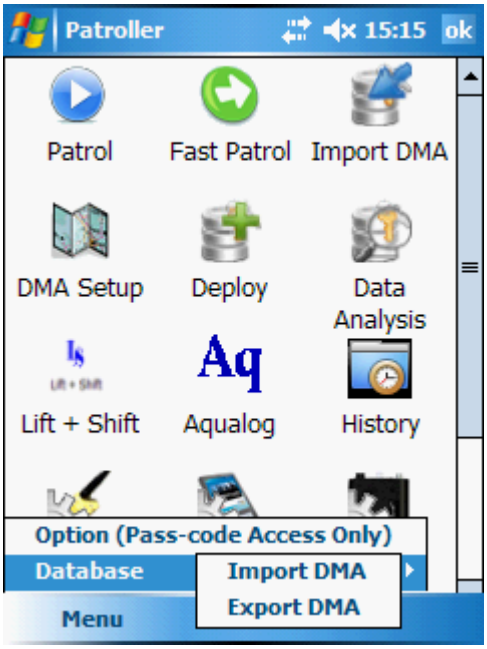


Figure 9: Menu->Database Import/Export DMA

Menu->Database->Import DMA

Operation is the same as Import DMA, shown on page *54*.

Menu->Database->Export DMA

Create Permalog PC Software CSV file of specified DMA loggers in the database.

Setup Patroller (PDA Setup)

From the PDA Setup screen, the user can select the Patroller Interface Unit (*Bluetooth Device*) being used. This must be done prior to anything else. This step is crucial if the user is using the application for the first time or if the software has been upgraded. Once done the PDA application will remember the Interface unit linked until the software is re-installed again due to software upgrade.

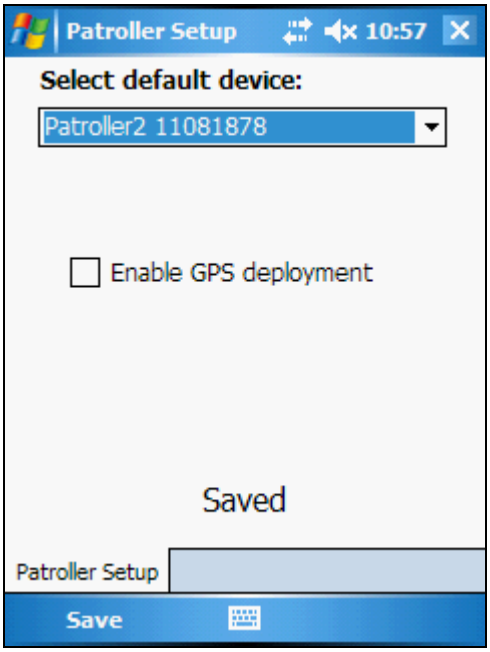


Figure 10: PDA Setup

Patroller Setup Tab

Ensure the '**Select default device**' is set to '**Patroller II**' (if instructions have been followed in Page *19*: *Pairing Interface Unit to PDA (Bluetooth)*).

Click '**Save**' to save any changes and then clicks the "**x**" to close the window. The system will return to the main screen.

Checkbox: Enable GPS deployment

Ensure that Checkbox "Enable GPS deployment" is checked if you which a GPS enabled PDA to identify the GPS Coordinate detected by the PDA when deploying a P+ logger.

Setup Permalog Cowl

Before connecting the Permalog 3 Cowl to the Interface unit, ensure the communications window on the logger is clean and free from debris. Place the Cowl over the communications window and ensure a good seal is made.

Click '**Menu - Setup - Permalog Cowl**' to enter the setup screen (below). Click '**Connect**' prior to selecting a menu command.

General Tab

Having completed the step above, on the '**General**' tab, see *Figure 11*, select from the drop down menu the command you wish to use and click '**Send**'.

Specific Commands are:

Cowl Link: Allows user to establish cowl communications

Firmware Data: Shows current version of the Permalog firmware

Monitor Noise: Displays current noise heard by logger.

Set Standby: Allows the user to send the Permalog to sleep.

Pipe Material: Select from Metal or Plastic.

Display Histogram: Shows the history of the logger in a graphical format.

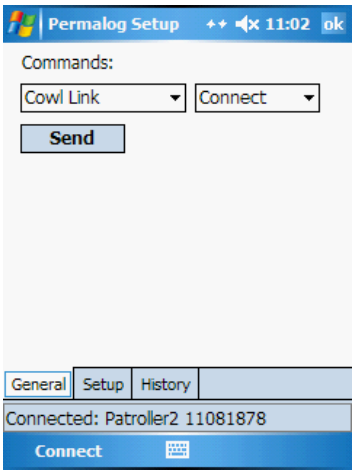


Figure 11: Menu - Setup - Permalog Cowl - General Tab

Click the "**ok**" to close this window and return to the main screen.

Setup Tab

Click the '**Setup**' tab (See *Figure 12*) to configure the Permalog. Click Read to view the current configuration settings of the Permalog.

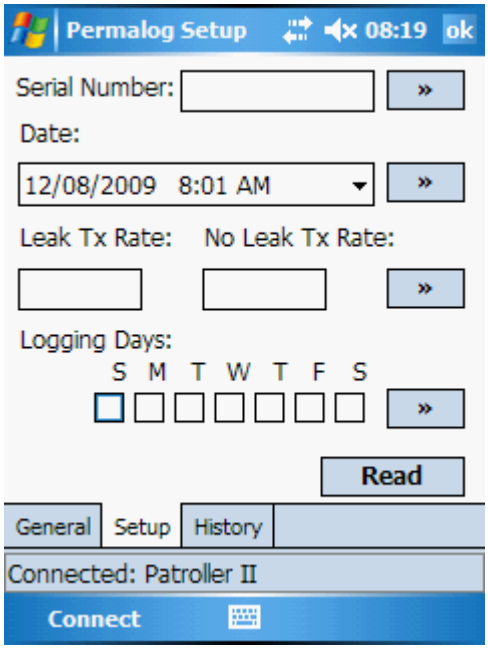


Figure 12: Menu - Setup - Permalog Cowl - Setup Tab

Please ensure you have clicked '**Connect**' and the system is showing '**Connected**' before you make any changes. Clicking the Read button displays the current setup of the logger.

From here you can change the serial number of the logger as well as:-

- Synchronise the Permalog Date and Time with the PDA Date and Time. (Please ensure your PDA's Date and Time is correct).
- Change the Tx (Transmit) rate for Leak and No Leak modes. This increases or decreases the transmission frequency of data.
- Select which days you would like to log data.

To save the settings, click the blue arrow button to the right of the option being changed.

Click the "**ok**" to close this window and return to the main screen.

History Tab

Please ensure you have clicked '**Connect**' and the system is showing '**Connected**' before you attempt to read up to 12 days level and spread information of the connected logger. See *Figure 13*. Clicking the Read button displays 12 Day Level and Spread history of the selected logger.

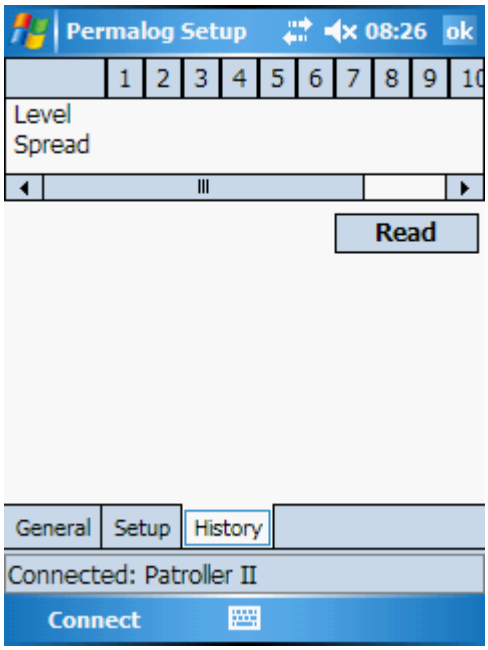


Figure 13: Menu - Setup - Permalog Cowl - History Tab

Click the "**ok**" to close this window and return to the main screen.

Setup Permalog Plus (P+ Setup)

The P+ Setup Screen allows the user to execute write to Multiple P+ at the same time. The user is allowed to read back the configuration of one P+ at a time.

P+ Quick Information: One of the Permalog+ main features over the Permalog 3 and other loggers is that it contains a two way radio allowing the Permalog to receive and execute commands from the Patroller II Interface Unit. The P+ setup screen is where the commands to the Permalog+ can be sent.

The sequence for each Permalog is to:

1. Transmit its data every 2 seconds.
2. Listen for a command every 30 seconds. So any command that is sent by the Patroller II could be delayed by up to 30 seconds before that command is executed.

    2.1. If however you reset the Permalog by swiping a magnet the logger will go to a reset mode for 2 minutes. During this period the Permalog will send data and listen for commands every 2 seconds.

    2.2. If you wish to communicate with Permalogs in an office, it is recommended that you reset the Permalog to start this reset mode.

        2.2.1. This reduces the response time of the P+ from up to 30 seconds to just 2 seconds.

Important information: Before clicking the Program button, if you have checked Patrol Window or Logging Days, please ensure that those tabs are filled in before clicking Program. Any attempts to write NULL configuration to the P+ could put the logger permanently into no Patrol and no logging Days mode. In such situation, the only way to reconfigure the logger is to go to the site to swipe it with a magnet. It is always recommended that the user read the particular logger's configuration before attempting to overwrite it existing configuration.

Discovery Tab

Please ensure you have clicked '**Connect'** and the system is showing "**Connected**" before proceeding.

When connected, click Discover to search for loggers within Radio range. Any loggers within communication range will be listed. *Figure 14*.

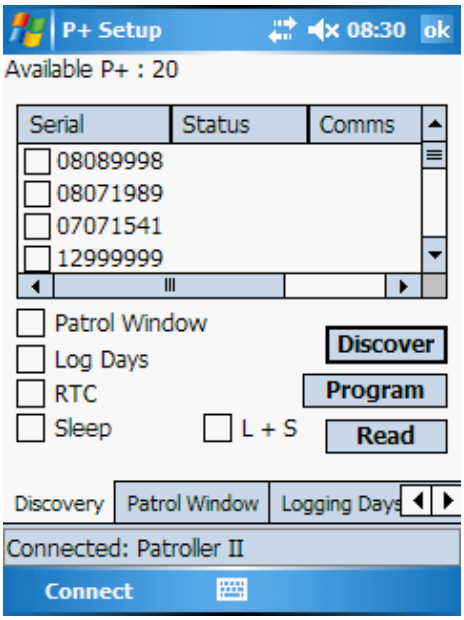


Figure 14: P+ Setup - Discovery tab

Important information: The user could read one logger at a time but could write to multiple loggers at the same time.

Checkboxes for reading and writing:

1. Patrol Window
2. Log Days
3. RTC
4. L + S – If checked, and the Program button is pressed, it will clear the Level and Spread data to 00

Checkbox for writing only:

1. Sleep – If checked, and the Program button is pressed, it will put the Permalog to sleep. The Permalog will have to be reset before deploying or no transmission or logging will be performed

   1.1. To put a logger to sleep, highlight the relevant logger check ☑ Sleep then press the Program button. Confirmation will be displayed at the top of the screen.

To edit logger/s:

1. ☑ Check the check box with logger/s serial/s.
2. Using the tabs, edit the logger to your requirements. Use the ◀ ▶ buttons to scroll through tabs not shown on screen.

Configuration tabs include:

Patrol Window: Select the days to carry out a patrol.

Logging Days: Select the days and time the logger will record data.

Time: Change the loggers' real time clock. Sync with PDA clock

Utility: Sensor Check, Sensor Bar Chart, RF Test and Histogram. Select the command you wish to use and click Send.

Clicking "**ok**" closes the window and returns the user to the main screen.

Additional Notes:

The Utility tab contains some advanced commands that can be sent to the Permalog.

To use press the discover button as before and select a Permalog serial number to transmit to.

Go to the Utility tab and select the command you want to send to the Permalog. The command will then be sent to that Permalog, any response will appear either in the space below or will be stored in a file which can be found by the path specified by the Patroller software.

Log Data: Display purposes, also allow user to delete logs individually.

Click the "**ok**" to close this window and return to the main screen.

Procedure to write the configuration set in the Permalogs

1. Open the P+ setup window
2. At the bottom of the screen there are a number of tabs to allow you to setup Patrol Window, Logging Days, Time, etc
3. Select each tab and setup as you require.

4. Once you have finished with configuration, select the 'Discovery' tab to return to the 'Discovery' screen.
5. Ensure that the PDA is connected to the Patroller II by pressing connect in the bottom left hand corner.
6. To find all Permalog+ in the area press the Discover button.
7. The list will then fill with serial numbers of all the Permalog+ found in range of the patroller II Interface Unit.
8. To send configurations to the Permalog check/tick the boxes depending on what configuration you want to send.
9. You can select as many parameters as you need in one transmission
10. Select the Permalog serial number you want to send the configuration to and press 'Program'.
    10.1. More than one Permalog can be selected to be programmed.
11. Depending on what check boxes you selected, the configuration set on the Patrol Window and Logging days tab will then be sent to the selected Permalogs.
12. A status message will appear next to each Permalog serial number when the transmission is completed.

Procedure to read the configuration set in the Permalogs

1. Press the Discover button to list all Permalog+ loggers in the area.
2. Check/Tick the boxes in the "Discover" Tab, depending on what parameter you want to read.
3. Select the Permalog serial numbers you want to read from.
   3.1. Note: User could only read the configuration one Permalog at any time.
4. Press the Read button.
5. Wait for the status message to say that the transmission was successful.
6. You can then view the configurations by selecting each of the tabs Patrol Window, Logging days, Time etc.
7. Time tab:
   7.1. The 'Time' tab is only used for the read command. The time displayed in the "Time" Tab will not be downloaded to the Permalog. If you select the RTC box and press program the Patroller II will set the Permalog time to the system time of the Patroller II Interface Unit.

Patrol Window Tab

The Patrol Window tab, shown in *Figure 15*, display either one particular logger Patrol Window read, or allow the user to configure and write new patrol window configuration to one or multiple P+.

For this Window to be used, the ☐ Patrol Window checkbox in the '**Discovery**' Tab, see *Figure 14*, must be checked.

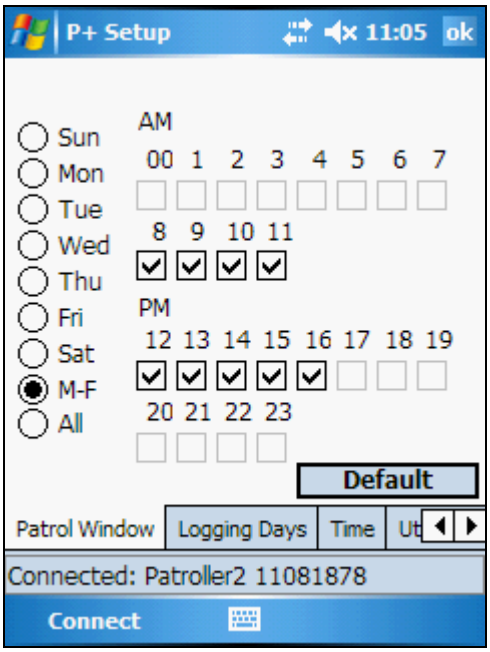


Figure 15: P+ Setup - Patrol Window tab

To read the Patrol Window of a particular P+:

1. In '**Discovery**' tab, ☑ check the logger to be read.
2. In '**Discovery'** tab, check the checkbox for ☑ Patrol Window .
3. In '**Discovery'** tab, click the Read button.
4. Once successfully read, the status information in "**Discovery**" tab for the logger will be set to "Successful".
5. Go to "**Patrol Window**" tab to view logger Patrol Window configuration.

To write the Patrol Window to one or multiple P+:

1. In "**Discovery**" tab, check the logger/s to be configured.
2. In "**Discovery**" tab, check the checkbox for ☑ Patrol Window .
3. In "**Patrol Window**" tab, ☑ check the required Patrol Window days of week and time to wake up to patrol.
4. Return to the "**Discovery**" tab and click **Program**.

The **Default** button will result in a Patrol Window of Monday to Friday from 8am to 5pm.

Logging Days Tab

The "**Logging Days**" tab, shown in *Figure 16*, display either one particular logger Logging Days configuration read, or allow the user to configure and write new Logging Days configuration to one or multiple P+.

For this Window to be used, the ☑ Log Days checkbox in the Discovery Tab, see *Figure 14*, must be checked.

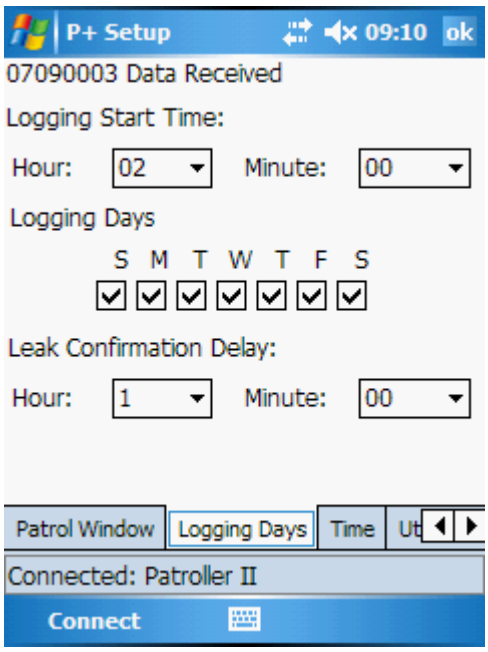


Figure 16: P+ Setup - Logging Days tab

To read the Logging Days of a particular P+:

1. In "**Discovery**" tab, ☑ check the logger to be read.
2. In "**Discovery**" tab, check the checkbox for ☑ Log Days .
3. In "**Discovery**" tab, click Read button.
4. Once successfully read, the status information in "**Discovery**" tab for the logger will be set to "Successful".
5. Go to "**Logging Days**" tab to view logger Logging Days configuration.

To write the Logging Days to one or multiple P+:

1. In "**Discovery**" tab, ☑ check the logger/s to be configured.
2. In "**Discovery**" tab, check the checkbox for ☑ Log Days .
3. In "**Logging Days**" tab, configure the required logging days, an example of which is shown in *Figure 16*, this example shows the default manufacturer's setting for P+ logging days.
4. Return to the "**Discovery**" tab and click **Program** button.

Time Tab

The "**Time**" tab, shown in *Figure 17*, display either one particular logger Real-time clock time read, or allows user to change the loggers' real time clock. Sync with PDA clock.

For this Window to be used, the ☑ RTC checkbox in the Discovery Tab, see *Figure 14*, must be checked.

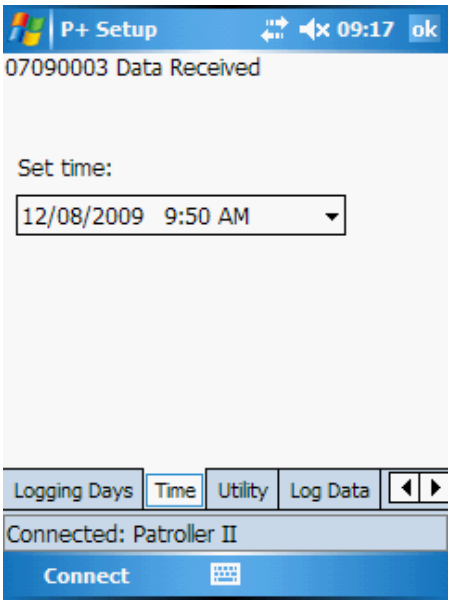


Figure 17: P+ Setup - Time tab

To read RTC of a particular P+:

1. In "**Discovery**" tab, ☑ check the logger to be read.
2. In "**Discovery**" tab, check the checkbox for ☑ RTC.
3. In "**Discovery**" tab, click **Read** button.
4. Once successfully read, the status information in "**Discovery**" tab for the logger will be set to "Successful".
5. Go to "**Time**" tab to view logger Real-Time Clock Time.

To write the RTC to one or multiple P+:

Before proceeding, ensure that the PDA system time is correct. If not, please follow the manufacturer's instructions of the particular brand of PDA to set the System time of the PDA.

1. In "**Discovery**" tab, ☑ check the logger/s to be configured.
2. In "**Discovery**" tab, check the checkbox for ☑ RTC .
3. In "**Discovery**" tab and click **Program** button.

Utility Tab

The "**Utility**" tab, shown in *Figure 18*, allows direct communication between a P+ and an interface unit.

Specific Default Commands are:

Set Patrol Mode: Set the P+ to Patrol Mode.

Set Fixed Network: Set the P+ to Fixed Network Mode.

Read P+ Operating Mode: Read the operating mode of a selected P+. P+ could be in either Patrol Mode or Fixed Network Mode.

Specific Administrator Permitted Commands are:

Sensor Check: Display continuously Level information of selected logger, in integer value.

Sensor Bar Chart: Display continuously Level information of selected logger, in bar chart format.

Stop Sensor Check : Stop Sensor Check or Stop Bar Chart.

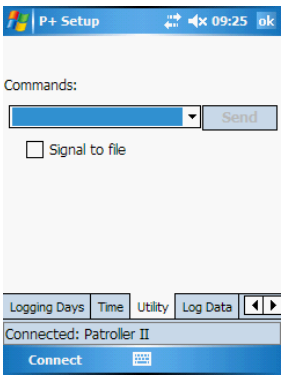


Figure 18: P+ Setup - Utility tab

To communicate with a particular P+ in Utility tab:

1. In "**Discovery**" tab, check the logger to establish communication with.
2. In "**Utility**" tab, choose the command to issue and click Send.

Log Data Tab

The "**Log Data**" tab, shown in *Figure 19*, display logs date for P+.

User could ignore this screen for now.

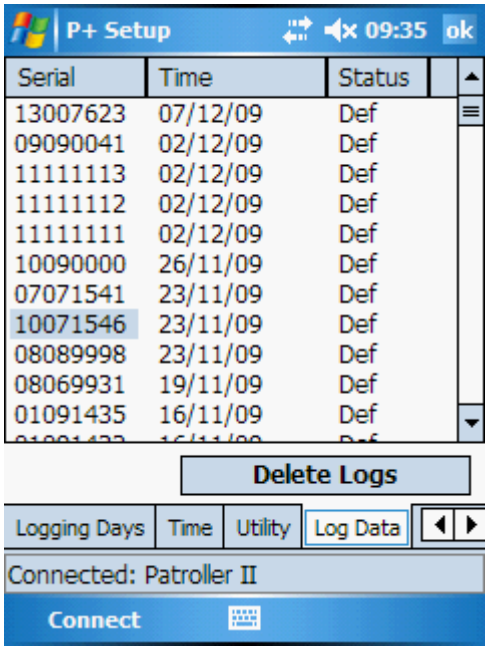


Figure 19: P+ Setup - Log Data tab

Patroller Setup (Setup Interface Unit)

Please ensure you have clicked "**Connect**" and the system is showing "**Connected**" before you make any changes.

"**Production**" and "**Custom**" tabs will not be covered in this user manual.

System Tab

Figure 20 shows the "**System**" Tab of the Interface Setup Screen.

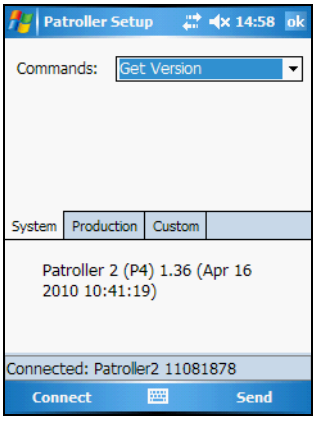


Figure 20: Patroller Interface Setup - System Tab

Specific Default Commands are:

Get Version:	Displays current firmware version of the Interface Unit.
Get Time:	Displays the current time and date set in the Interface Unit.
Main Battery:	Displays the Temperature, Voltage and Charge Status of the Interface Unit Battery.
Set Sounder:	Option to change settings on the sounder.

Specific Distributor Permitted Commands are:

Set Time:	Set the time and date for the Interface Unit.
Radio Power:	Set Radio Power: Attenuate or No Attenuate.
Regional radio Settings:	Set Radio to regional frequency.
P+ LED:	Set to on or off.

Patrol Screen

The Patrol Screen, shown in *Figure 21* is the screen for carrying out a patrol. Once connected, if Patrol does not start automatically, click "**Start**" to initialise the patrol.

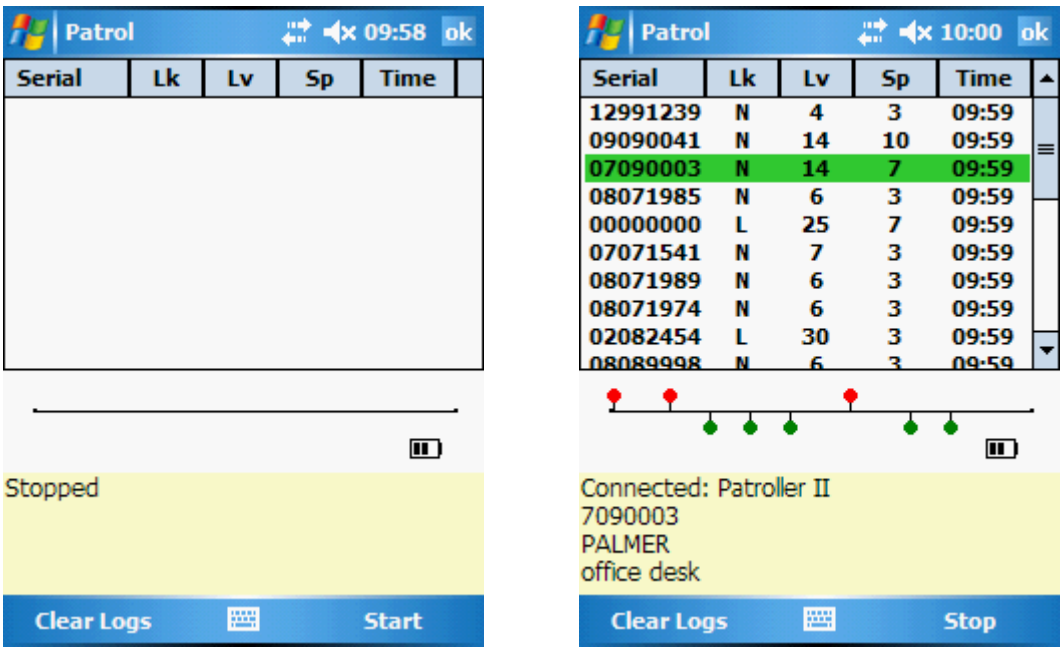


Figure 21: Patrol Screen

As loggers are detected they will appear in the list. The information given is logger Serial Number, Leak Status, Level & Spread, the time it reported in and a colour bar denoting leak (**red**) or no leak (**green**).

To clear the current list of loggers, click "**Clear Logs**". This will remove the list of loggers being displayed. This will not remove the data itself as this is stored in the database.

Click "**Stop**" to stop the patrol.

Click "**ok**" to close this window and return to the main screen.

Drive Mode

With Patrol selected it is possible, by clicking right on the PDA's 4 way navigational keypad to enlarge the display details of the currently highlighted P+ logger and then display the latest received logger leak information.

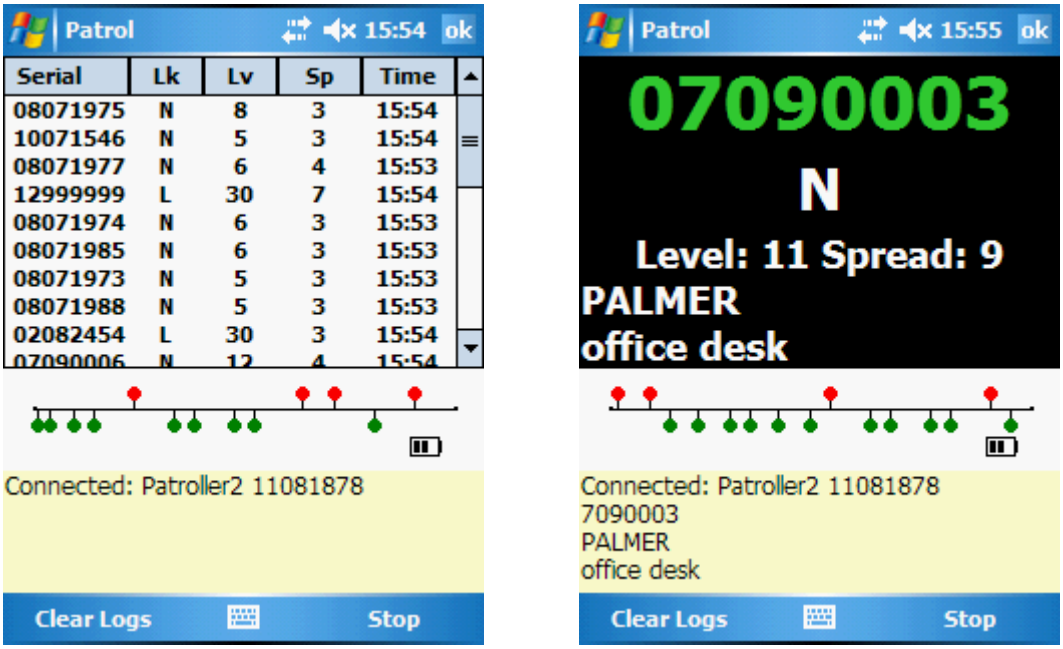


Figure 22: Left - Normal Patrol Mode & Right - Drive Mode

To return back to the previous display state click left on the keypad, this may be toggled at will.

Also by Following the Deploy instructions on Page *46* *Deploy Screen*, it is possible to enter the details of an individual logger, thus displaying them in Drive Mode. See *Figure 22*.

Deploy Screen

The deployment screen shown in *Figure 23*, allows you to view, add and edit loggers in the database.

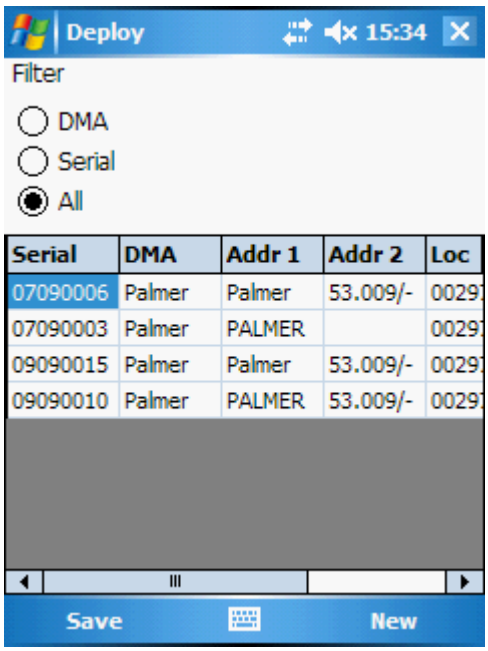


Figure 23: Deploy Screen

Filter options:

DMA: Show all loggers within specific DMA deployment information.

Serial: Show only specified Serial number deployment information.

All: Show all loggers deployment information regardless of DMA, in the database.

To add new logger/s to the database:

1. Click “New”.
2. Proceed with Edit Permalog (Applicable for New Permalog) on Page *48*.

To edit an existing logger:

1. Highlight the relevant logger.
2. Proceed to Permalog Details on Page *49*.

To delete a logger:

1. Highlight the logger to be deleted.
2. Proceed to Permalog Details on Page *49*.

Clicking "**x**" closes this window and returns you to the main screen.

NOTE: You must have a DMA setup prior to adding loggers to a DMA in the Deploy screen.

Refer to DMA on Page *52* for information on how to setup a DMA.

Edit Permalog (Applicable for New Permalog)

The screen shown in *Figure 24* is used for editing existing logger information or to add a new logger to the database.

To add a New Logger to the database:

1. Fill in the text boxes shown in *Figure 24* with the required information. The Serial Number is required at minimum to add new logger to database.
2. Click on "**Add New**" to add logger to the database.
3. Click "**Cancel**" or "**ok**" to return to the main Deploy Screen when done.

To edit an existing logger in the database:

1. Modify the existing information of the logger in the "**Edit Permalog**" screen.
2. Click "**ok**" to save and close this window, and return to the main deploy screen.

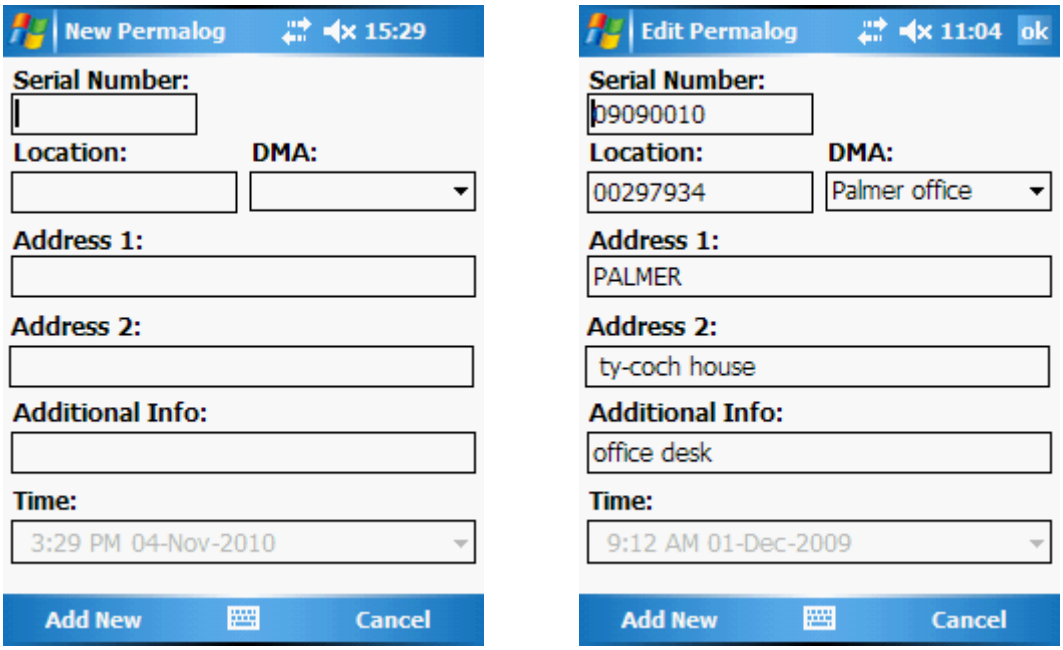


Figure 24: Deploy Screen - Add/Edit Permalog

Permalog Details

Figure 25 show the Permalog Details Screen. The user could choose to edit or delete these details.

To Delete the displayed Permalog Details:

1. Click "**Delete**".
2. The screen will automatically return to the Deploy screen.

Note that "Delete" is an Administrator permitted option. If the Administrator has not permitted the user to delete a logger in deployment screen, the "Delete" option shown in *Figure 25* will be disabled.

To Edit the displayed Permalog Details:

1. Click "Edit" and this will display a populated screen, similar to the one shown in *Figure 24*.
2. Follow the instructions on Edit Permalog (Applicable for New Permalog) on Page *48*.

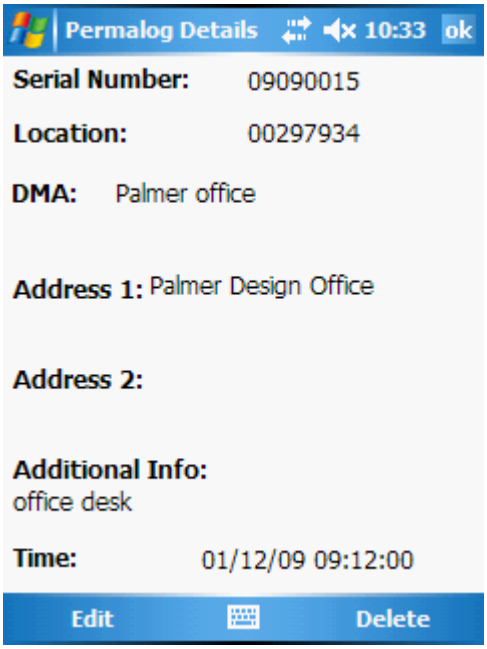


Figure 25: Deploy Screen - Permalog Details

Data Analysis

The database screen shown in *Figure 26* allows you to interrogate the database information.

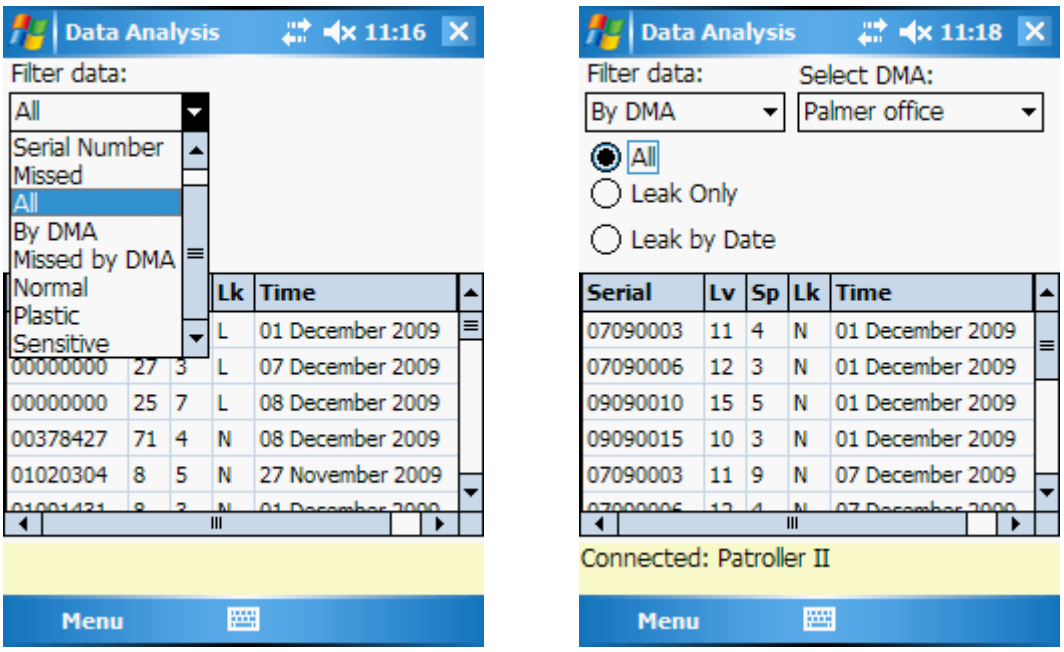


Figure 26: Data Analysis

Filter options are:

Leak Only: Will display only log data of those loggers that are reporting in Leak mode.

Serial Number: Allow the user to search for a specific logger via its serial number, to display it log data.

Missed: Displays Permalog information of any loggers that have not been accounted for during a patrol.

All: Shows all loggers log data regardless of its state.

By DMA: Display logger/s log data by DMA.

Additional filtering available. Show All, Filter by Leak Only or Filter by Date.

Missed by DMA: Displays Permalog information of any loggers within a specific DMA that have not been accounted for during a patrol.

Normal: Display logger/s log data by DMA.

Normal is the standard Leak status as reported by Permalog.

Additional filtering available. Show All, Filter by Leak Only or Filter by Date.

Plastic : Display logger/s log data by DMA.

Plastic is available for use in plastic piped area's. Leak status to be recalculated by the PDA Software based on pipe material specified.

Additional filtering available. Show All, Filter by Leak Only or Filter by Date.

Sensitive: Display logger/s log data by DMA.

Sensitive is used to identify points of interest that may be leaks. Leak status to be recalculated based on pipe material specified.

Additional filtering available. Show All, Filter by Leak Only or Filter by Date.

NOTE: Sensitive filtering may identify non-leaks erroneously, please always use secondary verification before any further action.

Menu Options

Menu – Database Maintenance – Delete Logs: To clear the list of loggers from the PDA.*

Menu – Database Maintenance – Delete Serial: To clear the list of a specific logger serial number from the PDA.*

Menu – Create CSV – All: Create Permalog PC Software CSV file of all loggers in the database.

Menu – Create CSV – Select DMA: Create Permalog PC Software CSV file of specified DMA loggers in the database.

Menu – Create CSV – Filtered: Create Permalog PC Software CSV file of only filtered results.

Menu – Patroller Download – Start

Menu – Patroller Download - Stop

***NOTE**: This does not delete the information from the Patroller Interface Unit, only the PDA database.

Click "**x**" to close this window and return to the main screen

DMA Setup

The DMA Setup screen, shown in *Figure 27*, shows the list of DMA's in the database. DMA's (District Metered Areas) make multiple logger deployment a lot easier. With most operators covering several large DMA's it can be easy to lose track of where each logger is situated. Creating DMA's prior to logger deployment helps take care of this.

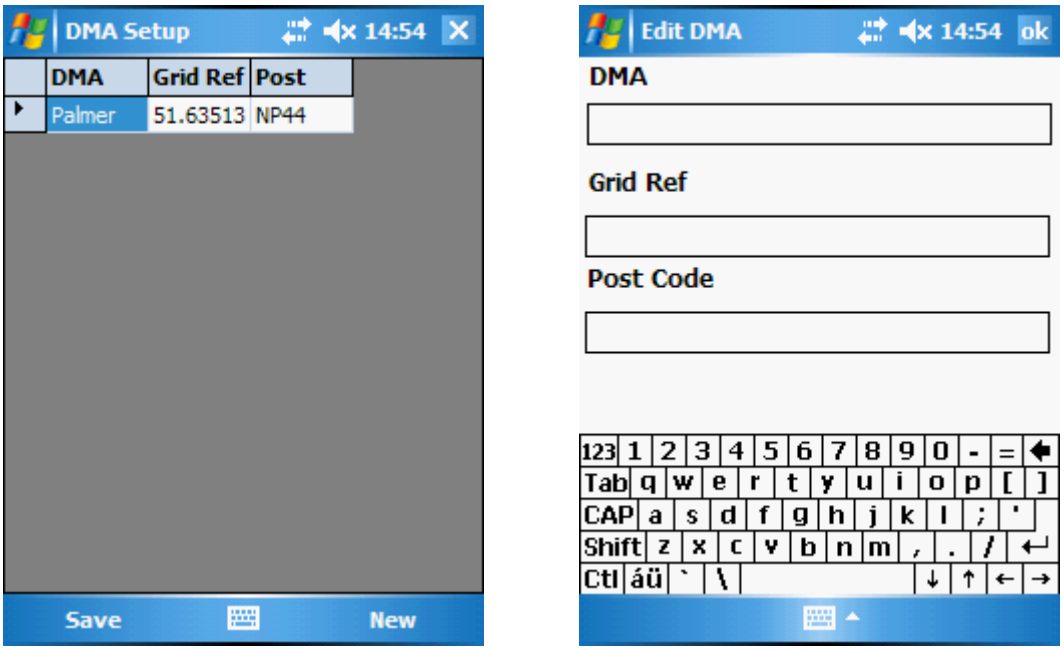


Figure 27: DMA Setup & Edit DMA

Add a DMA

To add a new DMA, click "**New**". This will open a new window where you can enter the DMA name, Grid Reference and Post Code. Once the DMA, Grid Reference and Post Code (optional) have been entered, click "**ok**" in the top right corner. This will return you to the main DMA screen (above). To save the changes, click "**Save**".

Edit a DMA

To edit an existing DMA, click the DMA to be edited and click "**Edit**" in the new window. Edit the information and click "**ok**". Once returned to the main DMA screen, click "**Save**" to permanently save the changes.

Delete an existing DMA

To delete an existing DMA, from the main DMA window (above), select the DMA to be deleted. In the new window shown in *Figure 28*, click "**Delete**". The screen will automatically return to the main DMA window, click "**Save**" to permanently save the changes.

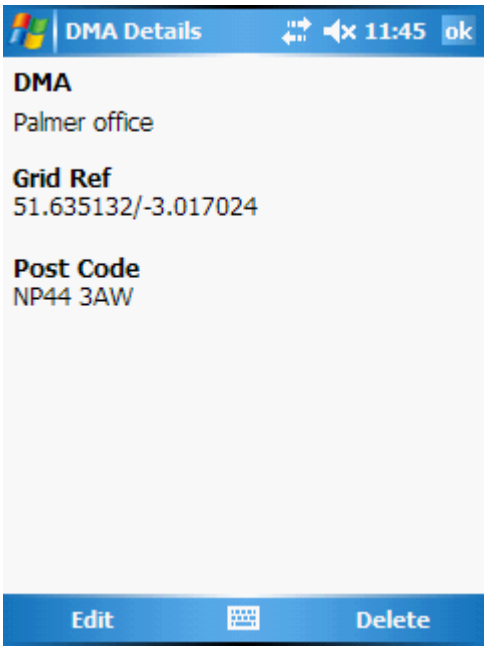


Figure 28: DMA - DMA Details

Click the "**x**" to close this window and return to the main screen.

Import DMA

Import DMA screen, shown in *Figure 29*, allows the user to import the DMA of a Permalog PC Software CSV file format.

NOTES: It is important that the CSV file used is of the correct format, otherwise the DMA will not be successfully created onto the PDA.

In *Figure 29* below, when imported successfully "DMA_All_1430_03Dec09.csv", the new DMA will automatically be named as "All_1430_03_Dec09".

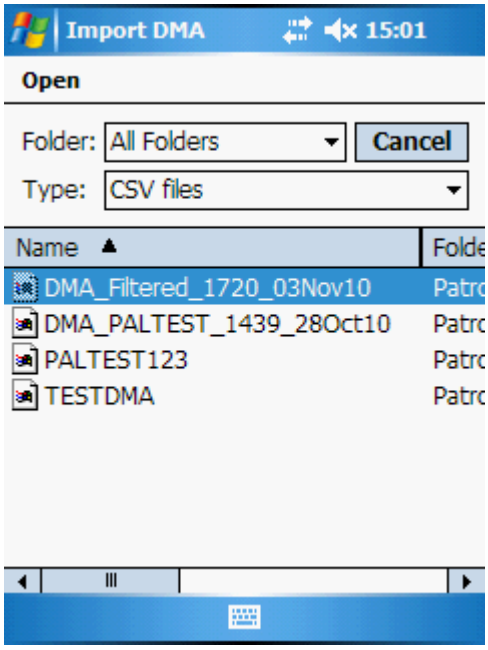


Figure 29: Import DMA

Data Capture

History

History mode, see *Figure 30*, allows user to download and display 29 days Level and Spread information of P+ loggers.

History is split into two tabs, "**Discover**" and "**L+S History**"

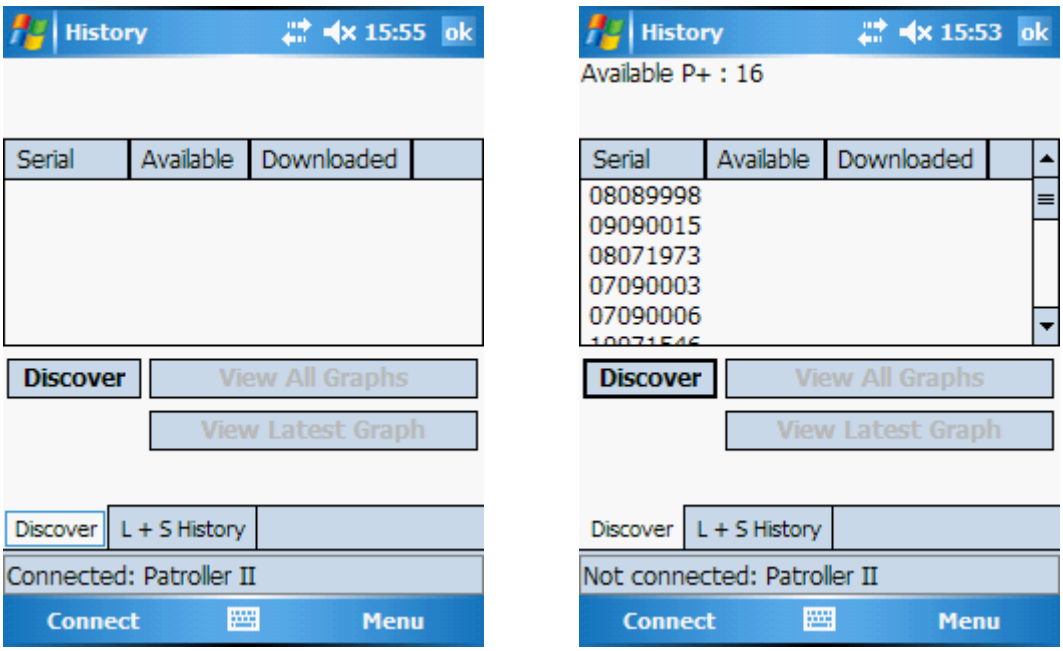


Figure 30: Data Capture - History

View All Graphs or View Latest Graph

1. Select History icon in the Main Icon screen, and confirm connection to interface unit.

2. Click Discover to display a list of available loggers.

3. Then select a logger from the list (by serial number).

4. Click View All Graphs or View Latest Graph to initiate the download of the Logger history.

5. The system communicates with the selected logger via the interface unit requesting history data.

6. When the process is completed, a new tab for the graph will automatically open.

7. You now have the option to close the graph tab, an example of which is shown in *Figure 31*.

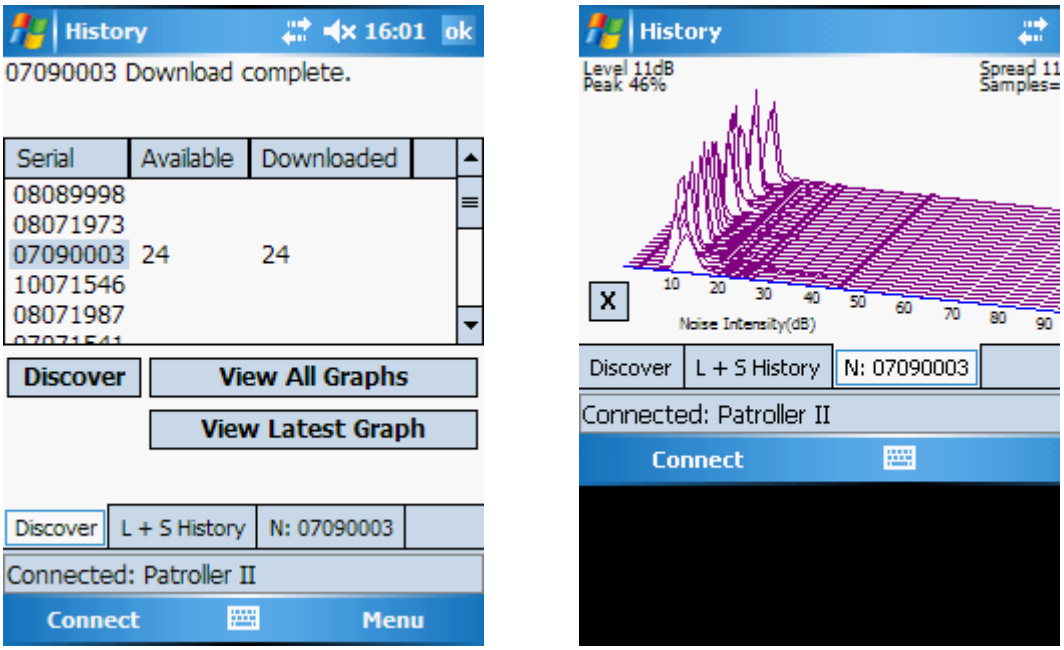


Figure 31: History - View All Graphs

L+S History

'**L+S History**' tab, see *Figure 32*, allows the user to download 29 Day Level and Spread.

Default Operation of **Download 29 Day Level and Spread** is to get from a specific logger it latest history and the history of the last 29 day.

Additional Operations of **Download 29 Day Level and Spread** could be authorized by the Administrator. Possible Administrator permitted feature which will not be visible to the end-user are as follow:

1. Save 29 day Level and Spread History to database and/or
2. Delete 28 day Level and Spread History from the P+.

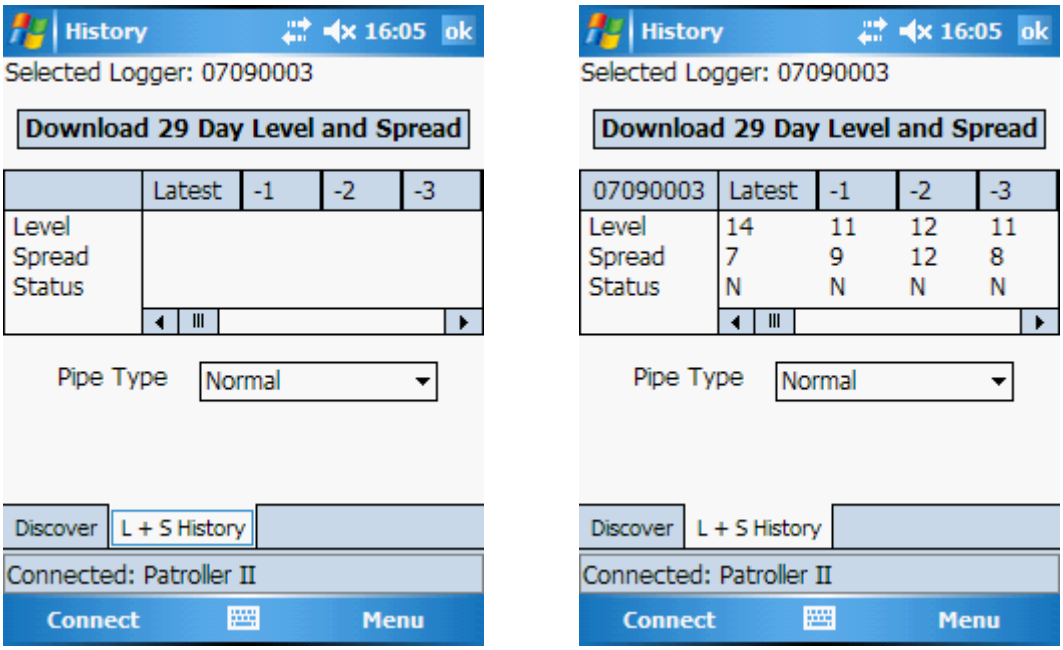


Figure 32: History - L+S History

To download the 29 Day Level and Spread History:

1. Select History icon in the Main Icon screen, and confirm connection to interface unit.
2. Click **Discover** to display a list of available loggers.
3. Then select a logger from the list (by serial number).
4. Go to '**L + S History**' tab as shown in *Figure 32*.

5. Click on the button Download 29 Day Level and Spread .

6. The system communicates with the selected logger via the interface unit requesting the Level and Spread Data.

7. When the process is completed, the table will automatically be populated as shown in *Figure 32*.

   7.1. Additional operations like adding the history to the database and deleting of 28 day history from the logger could be performed in the background if Administrator has permitted those additional features.

8. The user now has the option to incorporate Pipe Type. The leak status of the logger in the table will update accordingly depending on the material the end user has chosen. Materials available: Normal Pipe, Plastic Pipe and Sensitive Pipe.

Aqualog

Aqualog mode, see *Figure 33*, allows a defined set of P+ loggers to continuously log Level and Spread data over a set time period. Individual loggers are selected by serial number and configured in Aqualog setup then data is downloaded as required. Aqualog data is then displayed in graphical form, this can then be saved to file.

Aqualog is split into two tabs, "**Discover**" and "**Setup**".

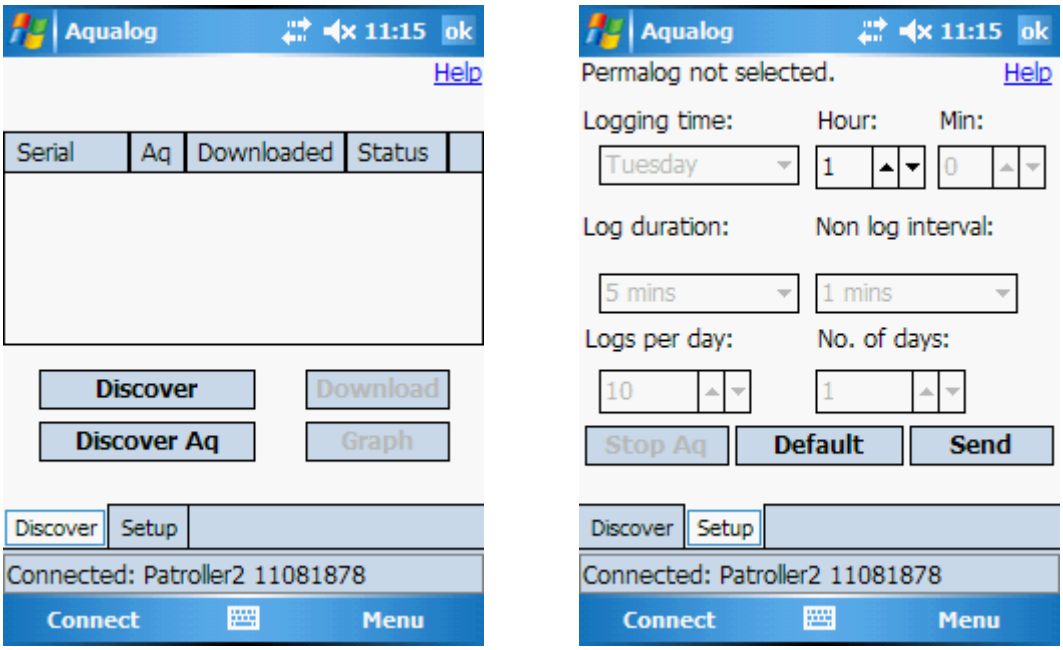


Figure 33: Data Capture – Aqualog

Note that Discover button will discover all loggers regardless of whether they are in Aqualog Mode or Normal Patrol Mode. The Discover Aq button will only discover loggers that are in Aqualog Mode.

Setup logger for Aqualog Mode:

A normal user will not be allowed to configure the Setup tab beyond the Logging Time Hour as shown in *Figure 33*. It is up to the Distributor if the restrictions should be lifted. If the restriction is lifted, the user will be able to perform the following steps:

1. Select Aqualog icon in the Main Icon screen, then click "**Connect**" to interface unit if not connected already.
2. Then click Discover to display a list of available loggers. Select a logger to setup.
3. Click '**Setup**' tab. The System then displays the setup screen, and the selected serial number on the screen. Select start day/time.
4. Select **log duration**.
5. Select **log interval**.
6. Select number of logs per day.
7. Select how many days to log over from a pre-calculated selection.
8. System then calculates and displays the projected end time.
9. Then click Send. Then System sends new Aqualog setup via interface unit.
10. Setup successful message displayed to the user on completion.

Aqualog download:

1. Select Aqualog icon in the Main Icon screen, and confirm connection to interface unit.
2. Click Discover Aq to display a list of available loggers in Aqualog Mode.
3. Then select a logger from the list (by serial number).
4. Click Download to initiate the download of Aqualog data.
5. The system communicates with the selected logger via the interface unit requesting Aqualog data.

6. Click Graph button when it is enabled to display a new tab which will show a 3D graphical representation of the downloaded data. See *Figure 34*.

7. To close the graph tab, click X on the graph. When prompted, choose either save or exit without saving. Note that any data not saved, will be lost.

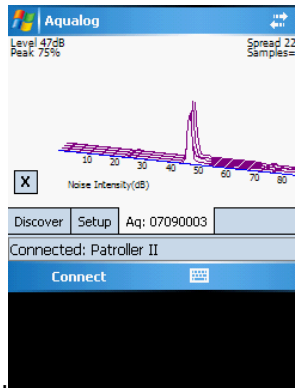


Figure 34: Aqualog Downloaded Graph tab

Lift and Shift

Lift and shift mode is where non-permanently deployed Permalogs are moved on a daily basis. Typically this consists of a set of between 10 and 100 Permalogs+ and a patroller. Each day the Permalogs are collected from the deployed locations, read, and later that day re-deployed to a new location. Therefore history stored in the Permalog+ is irrelevant as the location changes daily.

Shift Tab

For Lift + Shift Screen, the “Shift” tab will be the screen that comes into focus when the user clicks on icon in the Main Screen, see *Figure 35*.

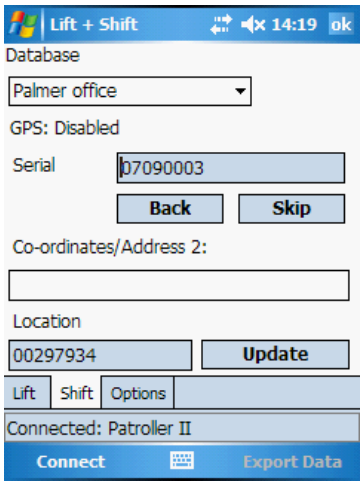


Figure 35: Data Capture - Lift and Shift - Shift Tab

Note: Only loggers that are assigned to a DMA could be deployed for Lift + Shift.

The drop down list on the top will show all available DMA in the database.

To deploy a particular DMA for Lift and Shift in the “Shift” Tab:

1. Select a DMA
2. The first serial number in the particular DMA will be shown in the Serial Text box as shown in *Figure 35*.
   - 2.1. Click the Back button to go back to a previous serial number.
   - 2.2. Click the Skip button to not deploy this particular serial number.
   - 2.3. Enter a Co-ordinates or Address 2.

2.4. Click on the Update button to confirm deployment.

Lift Tab

Figure 36 shows the "**Lift**" tab of the Lift + Shift screen. *Figure 36* right-image shows loggers shifted in the "**Shift**" tab being displayed in the "**Lift**" tab.

Loggers Remaining: Will count down to zero as level and spread information are gathered. When this value counts down to zero, it means that all the loggers in that particular DMA are ready to be lifted to be shifted to a new location, because it level and spread information has been lifted already.

Loggers in Database: Display the total number of logger in the particular DMA.

Export Data: Allow user to export Lift + Shift Data to Permalog PC software CSV format.

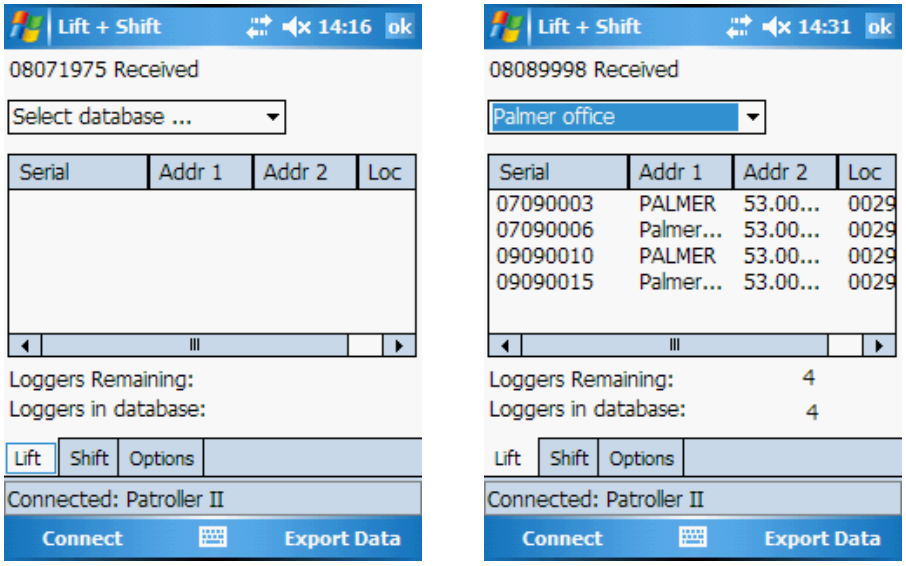


Figure 36: Data Capture - Lift and Shift - Lift Tab

Options Tab

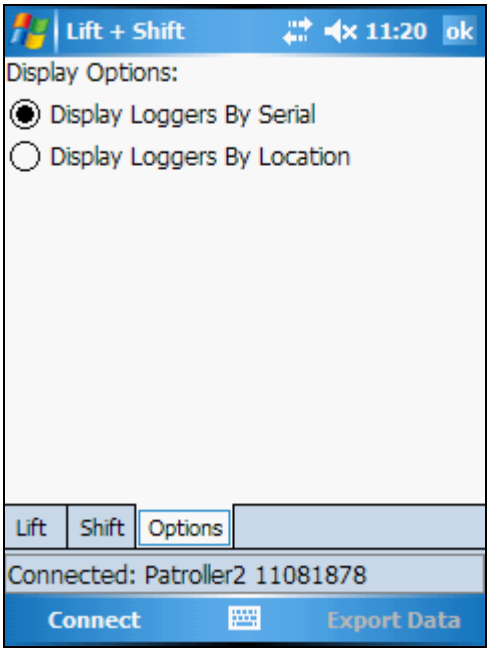


Figure 37: Data Capture - Lift and Shift - Options Tab

In the Options Tab, user is permitted to display loggers by Serial number or by Location number.

Fast Patrol

Fast Patrol mode does not require a password to be entered; as the DMA route is navigated serial numbers of loggers within range will be displayed then removed correspondingly.

Refer to the Lift Tab on Page 63 for information on how to use the screen.

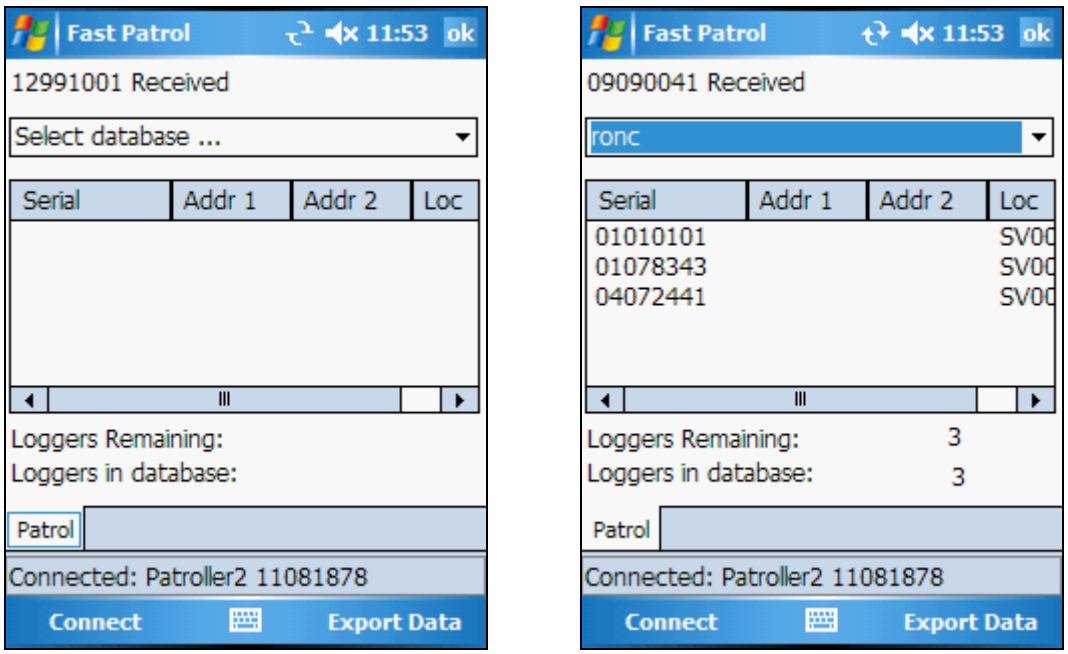


Figure 38: Fast Patrol

Export Data: Allow user to export Fast Patrol Data to Permalog PC software CSV format.

Depending on the options permitted by the Administrator, the user could choose to export all or just todays data report in the Export Data Menu option.

Auto-Import Permalog Software CSV

The Auto-Import CSV Screen is a new screen used to detect if there are Permalog CSV files in the Auto-Import folder on the PDA.

This folder is accessed by both Patroller II PDA Software version from 4.1.x.x onwards and Permalog PC Software version 6.2.5 onwards.

Figure 39 shows the Auto-Import CSV screen of the Patroller II PDA Application. This screen will automatically appear when there is a CSV file in the Auto-Import folder.

The File Name List will display all available CSV file in the Auto-Import folder. By default all file are checked and ready for import.

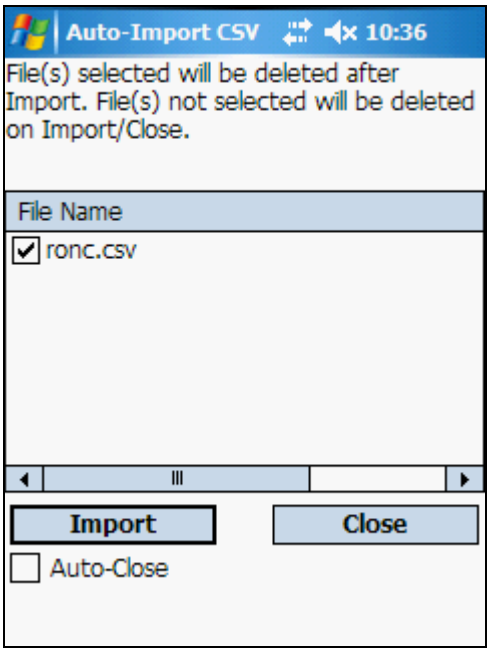
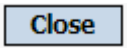
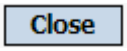


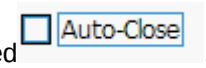
Figure 39: Auto-Import CSV Screen

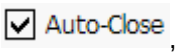
It is important to note the following:

1. If a file name is unchecked (e.g. ☐ ronc.csv) and the user clicks Import , the file will not be imported but will be deleted.
2. If a file name is checked (e.g. ☑ ronc.csv) and the user clicks Import , the file will be imported and then the file will be deleted.

3. If the user clicks 

, all files, checked or unchecked will be deleted. The user will be prompted after clicking the 

button to ensure that this is the action they want performed.
4. The status of the Auto-Close check box status is stored by the PDA.
   4.1. If unchecked 

, the Auto-Import CSV screen will not automatically close when there is no more file to import.
   4.2. If checked 

, the Auto-Import CSV screen will automatically close where there is no more files to import in the Auto-Import Folder.
5. Note that the Patroller II PDA database is automatically backed up each time (previous backup will be overwritten) in the following folder: \My Documents\Patroller Archives

Battery Installation

The Patroller is powered by a rechargeable battery pack located in the underside of the unit. To install the battery pack, use a screwdriver to undo the two panel screws a quarter turn. Remove the panel, connect the battery and Patroller connectors together then fit the battery ensuring the leads will not become trapped or snagged when refitting the back panel.

WARNING:

Do not allow any metal objects to connect the two battery terminals on the connector as this will cause a short circuit resulting in permanent damage to the unit.

You can check the battery status via the menu options in the Patroller software. Nominal battery voltage is 7.5V, when the battery voltage drops to 6.5V the Patroller will start to issue low battery warnings. When the voltage drops to 6.0V the unit will power off automatically and cannot be used until the battery is recharged, or an external power supply is connected.

In the event of a battery failure, a backup battery maintains the data stored in the Patroller for up to one year.

Note that it is very important **not** to store your battery at full charge. A Li-ion battery stored at 40% charge will last many times longer than one stored at 100% charge, particularly at higher temperatures. If a Li-ion battery is stored with too low a charge, you run the risk of allowing the charge to drop below the battery's low-voltage threshold, ending up with an unrecoverable dead battery. Once the charge has dropped to this level, it cannot be recharged.

Storing a Li-ion battery at the correct temperature and charge makes all the difference in maintaining its storage capacity.

Important Information on Use

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 removing it from, the fitting). Such damage is not covered by 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® 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 Permalog® internal clock, which will lead to an increased possibility of false alarms.

Particular care must be taken to avoid packing Permalog® units “head to tail”. Remedial work required to correct loggers that have been affected in this way is not covered by warranty and will be charged.

Due to the strength of the magnet used with Permalog®, large quantities of Permalog® units should not be carried by staff with heart pacemakers.

The magnet keeper fitted to Permalog® loggers should be left attached to the magnet until the unit is ready to be placed in its logging position. If the unit is to be moved for any reason the keeper should be refitted to the magnet. All Permalog® units should be transported with the keeper attached to the magnet.

Please Note:

Only suitable PDA’s are compatible. Please check with your distributor for a list of compatible PDA’s for use with the Patroller II system.

Sounder Options:

Set Sounder can be used with the following numbers entered:

0 to disable all beeps

16 to beep when data signals are received from Permalog's in leak mode only

48 to beep when data signals are received from Permalog's in any mode

20 to beep when signals of any kind are received from Permalog's in leak mode only

60 to beep when signals of any kind are received from Permalog's in any mode

Technical Specifications

Patroller II

Radio communication	**Single frequency digital transceiver**
	(Optional additional single frequency receiver for use with Permalog® 3)
Radio frequency	**UHF (local regulations apply)**
Controls	**ON/OFF with LED status**
Connections	**Charger**
	Communications
	External antenna
Battery type	**Rechargeable Lithium ion, field replaceable**
Battery life	**>10 hours**
Antenna	**External antenna**
Dimension	**203mm x 136mm x 51mm**
Approximate Weight	**0.750 kg**
Operating temperature	**-10^{O}C to +50 ^{O}C**
Operating temperature while charging	**0^{O}C to +50 ^{O}C**
Altitude	**2000m**
Max Rel. Humidity	**80% for temperatures up to 31 ^{O}C decreasing linearly to 50% at 40^{O}C**
Housing	**Fully injection-moulded ABS**
Environmental conditions	**Outdoor use, IP54**
Connectors	**Military specification**

Charger

Type	**DSA-60W-12**
Input	**90 to 264V AC, 47 to 63Hz**
Output	**12V +/- 5%, 5A max**

Safety	**EN60950-1**
EMI	**EN 55022, EN 61000-3-2, EN 61000-3-3**
EMC	**EN 55024**

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Note

HWM-Water Ltd (Palmer Environmental) reserves the right to change products, services or specifications without notice.

Patents

The Permalog® system is patented in the United Kingdom:

GB2335041, GB2361062, GB2361319, GB2361540 & GB2361541

Patents pending in Europe, United States and Japan

Permalog® is a Registered Trademark of HWM-Water Ltd (Palmer Environmental)