
ARTEMIS

Non-Linear Junction Detector



User Manual

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Radio Approval's

CE MARK EMC COMPLIANCE

The CE mark is affixed to the ARTEMIS to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC on the approximation of Laws of Member States relating to Electromagnetic Compatibility and the following EMC and Radio Type Approval standards:

EN 300 220-3
EN 300 330-1
EN 300 440-1
EN 301 489-3
EN 60950 LVD

Warnings

When operating the equipment within Europe where Type Approval is a legal requirement, all equipment, including transmitter, receivers and batteries must be to type approved standard in order for the system to remain type approved. Therefore, only equipment supplied by Audiotel International should be used. It is the operator's responsibility to operate the equipment only on frequencies licensed to them.

How to use this manual

This manual is divided into a number of sections. The following brief description shows the type of information presented in each section:

- Introduction to ARTEMIS* - a brief description of ARTEMIS and how it works
- Getting started* - Setting up and looking after your ARTEMIS – contains a packing list, details of the power requirements and battery care. Also how to set up the ARTEMIS ready for use.
- Basic operation* - describes the basic procedures for using ARTEMIS. This is not meant to be an exhaustive description of ARTEMIS's capabilities or functionality, merely a quick guide to allow basic searches to be carried out. The following mode selections give more details of the various modes and their use.
 - Detect Mode* - describes operating in this mode, which shows the output from the ARTEMIS detectors and allows ARTEMIS parameters to be adjusted.
 - Analyse Mode* - describes using the analyse mode to help identify what type of target has been detected.
 - Locate Mode* - describes how to use the ARTEMIS to accurately locate the position of a detected target.
- Log* - Gives details on Snapshot displays which can be stored within the ARTEMIS.
- Connection to a PC* - describes how the log can be downloaded to a PC.
- Technical Specifications* - technical details relating to the unit.

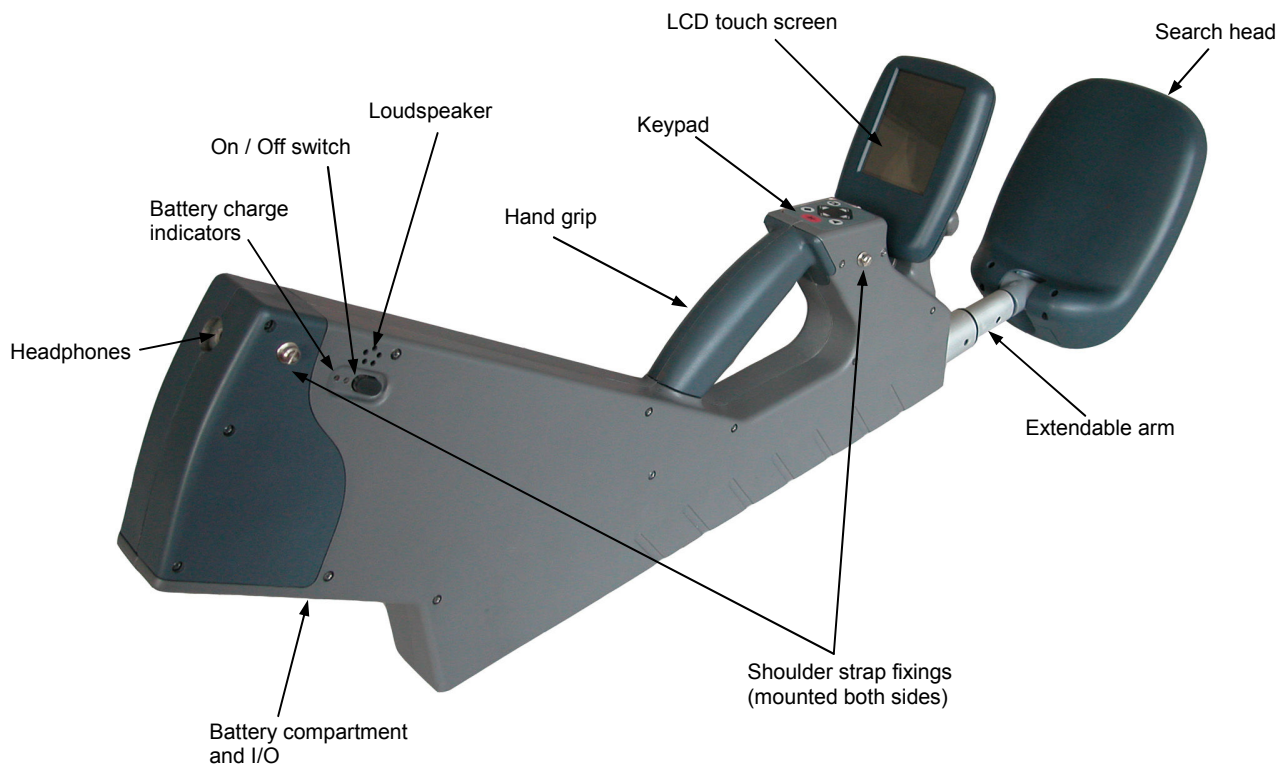
Introduction

The ARTEMIS is a compact, sophisticated search tool which is designed to detect, identify and locate concealed electronic devices.

Combining conventional bar graph displays, spectral analysis capability and an innovative locate display facility enables electronic targets to be quickly, easily and accurately found.

The Unit

The ARTEMIS unit, shown below, is a hand held case with a paddle shaped search head on an extendable arm.



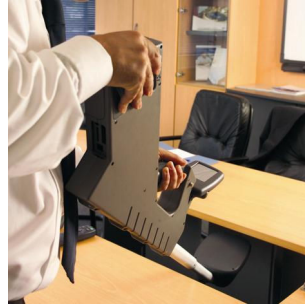
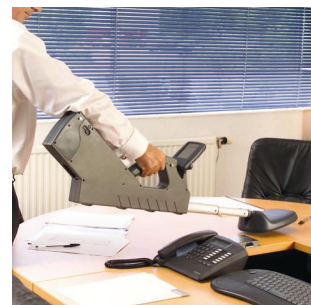
Controls are grouped next to the handle for convenient thumb operation and information is presented on a tilting LCD touch sensitive screen.

The input and output ports are grouped together under the tail of the unit along with the battery compartment. The On / Off switch, audio output and headphone socket are conveniently located at the top of the unit tail.

Handling

The extendable search head contains all the ARTEMIS sensor antennae. During a sweep the search head should be passed, as close as possible, over all areas of possible concealment.

Rotatable on two axis the head can be twisted to provide the best attitude and position for searching most surfaces.



The extendable arm provides convenient access for the difficult to reach parts of a target area, for example ceilings, floors etc.

To minimise strain the unit has provision for a shoulder strap allowing ARTEMIS to be handled like a guitar and is designed to be balanced with the search head arm extending approximately half way.

The tail of the unit is also designed to provide a convenient handle to control the unit when searching high surfaces.

Getting Started

This section covers setting up the ARTEMIS ready for operation with a basic description of the controls and how to use the ARTEMIS to locate hidden electronic devices.

Out of the box

The basic ARTEMIS unit can be ordered with a number of accessories. The actual specification of the accessories will vary from country to country dependant on supply voltage.

The basic ARTEMIS consists of;

- The ARTEMIS unit
- Li-Ion battery pack (7.2v)
- Multimedia card
- ARTEMIS manual

The following accessories can be ordered as separates;

Item	Order Code
Li-Ion battery pack	2-400-0002
AC/DC power adaptor	2-400-0003
Mains power lead	(dependant on country)
Shoulder strap	2-400-0005
Pelicas case with foam inserts	2-400-0006
Headphones (folding)	2-400-0007
Stand-alone Li-Ion battery charger	2-400-0008
Multi-media memory card	2-400-0009
Lightweight carry case	2-400-0012
Test target	2-400-0013

Charging the battery

The ARTEMIS battery pack should be fully charged before use.

- Remove the battery door from the unit and insert the battery, (the end with the four contacts goes in first), into the battery compartment.

WARNING: Only factory supplied, batteries should be inserted into this compartment.



- Replace the battery compartment door and place the unit on charge by connecting an appropriate AD/DC adaptor to the charge socket. When successfully connected to a live power supply the RED indicator next to the On / Off switch lights to indicate the battery is being charged.




Note: It is not necessary to switch the ARTEMIS unit on to charge the battery.

When the battery is fully charged the RED indicator turns off and the GREEN indicator lights. The unit is now ready for use.

Battery

The internal rechargeable Lithium Ion battery pack gives approximately 4 hours continuous use. Automatically re-charged when external power is applied to the ARTEMIS via an external AC/DC adaptor. Internal protection circuitry protects the battery against over voltage, over current, short circuit and reverse polarity connections.

When the battery charge is low a battery icon, , is displayed on the display screen. This will indicate there is approximately enough power to keep the ARTEMIS operating for a further 10 minutes. If the battery is completely exhausted the display will flicker and fail.


WARNING: This input should only be connected to a 12v DC @ 4A, reverse polarity, overvoltage and over current protected external AC to DC adaptor as supplied by Audiotel.

Multimedia Memory card

A multimedia memory card is used to allow screen shots to be stored and transferred to a PC for further analysis and reporting. The ARTEMIS can be operated without a multimedia memory card installed although you will be unable to save screen shots.

Note: The ARTEMIS should be off when a multimedia memory card is inserted into the memory card slot. The contacts of the card should be facing away from the accessory socket.



The number of screen snapshots that can be stored is displayed in the snapshot counter  in the upper section of the display.

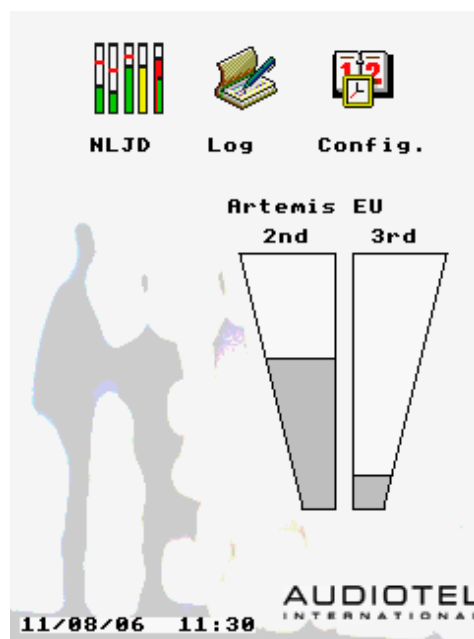
If no memory card is installed the snapshot counter is shown crossed out .

Switching the unit On (and Off)

To switch the ARTEMIS unit “On” press and hold the “On / Off” switch for a few seconds.

The unit will perform a self-test and calibration during which the message ‘Please Wait’ will be displayed on the screen (this will take approximately 40 seconds).

Once the initialisation is completed the main menu will be displayed.

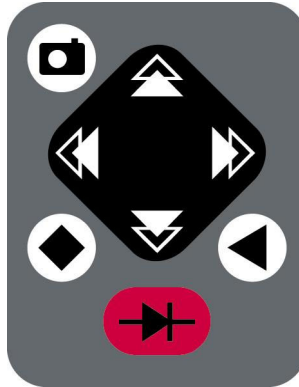


The unit can be switched “Off” at any time by pressing the “On / Off” switch.

The backlight will turn “Off” immediately although a residual image may linger on the screen for a few moments.

Using the controls and selecting options


To navigate around the various screens and select options a combination of keypad controls and on-screen buttons are used.





Controls




The navigation controls are arranged up, down, left and right in the centre of the keypad. Their use depends on the current screen and the current screen item selected.


Usually the left and right controls change the current selection left or right and the up and down controls adjust levels (e.g. transmit power level).

The  control is primarily used to toggle between setting the unit volume and the current selection.

The  control is used to return back up to the parent screen of the current screen.

The  control is used in the Analyse screen to pause the display and capture screen images.

- Press  once to pause the display
>>> P a u s e d <<< appears across the display
- Press  a second time to save a screen shot to the memory card
- To cancel the pause press the  control.

The  control is used to enable / disable the ARTEMIS transmitter.

Setting the time & date

From the main menu screen select Config by either;

- Touching the Config icon on the screen

Or

- using the left and right controls on the keypad to highlight the Config icon, then press the  control.

The configure screen is displayed.



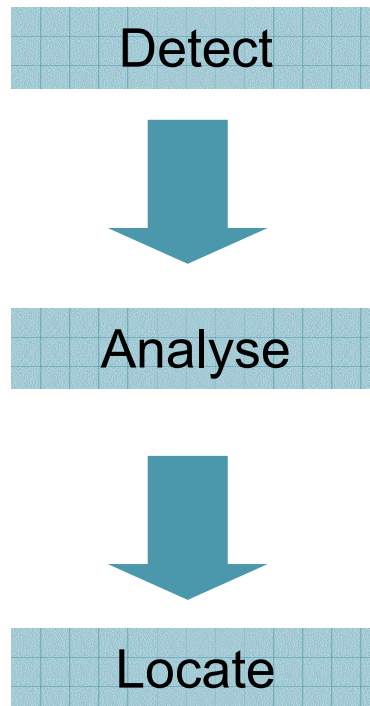
Use the left and right controls on the keypad to move the highlight (underscore) between the digits in the day/month/year/hour/minute fields. The up and down controls increase (up) and decrease (down) the entry.

Once the time and date are correct press the Accept on screen button to set the time and date.

The ARTEMIS is now ready for use.

Basic Operating Methodology

The basic operating method for using the ARTEMIS follows three sequential steps.



Detect

With the ARTEMIS either in the Main menu or the Detect screen the unit should be moved around the area to be secured. When a response is noted on the bar graphs it can be investigated further using the Analyse mode.

Analyse

The Analyse mode allows the user to identify which type of target has been detected using a spectrum analyser type display.

Locate

The Locate mode involves moving the ARTEMIS search head around the immediate vicinity of the detected response to pin point the target location.

Detect Mode

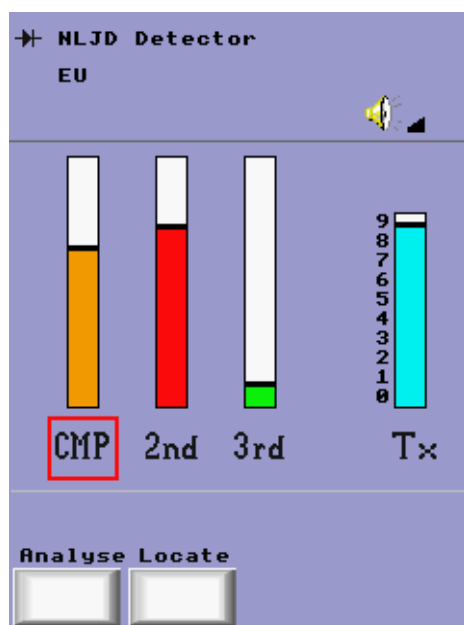
From the main menu screen select NLJD by either;

- Touching the NLJD icon on the screen

Or

- using the left and right controls on the keypad to highlight the NLJD icon, then press the  control.

The Detect screen is displayed.



The Detect screen shown a number of indicator bar graphs representing the following;

- CMP - Compare shows the difference between 2nd and 3rd harmonic return signals (2nd – 3rd)
- 2nd - The 2nd harmonic signal strength
- 3rd - The 3rd harmonic signal strength
- Tx - The transmitter power level

The audio output in this screen is a 'Geiger' click that rises and lowers in pitch in relation with the currently selected bar indicator (the current indicator is highlighted with a RED box).

The current selection can be adjusted by either;

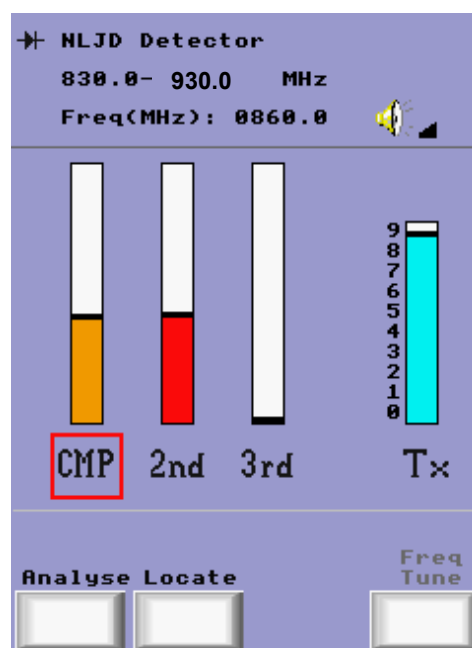
- touching the required indicator bar name on the screen
- or
- using the left and right controls on the keypad to highlight the indicator bar name.

To change the TX power

- Select the TX indicator bar
- Use the Up and Down controls on the keypad to increase or decrease the power setting.

To change the TX frequency – Worldwide configured units only

The centre frequency of the transmitter will be factory set.
The user can adjust the transmitter frequency over a range of 830MHz to 930MHz in 100kHz steps. When the frequency is changed the new frequency will be come the default start up frequency.



- Press the Freq Tune on-screen button
The RED selection box should move over the frequency read Out
- Use the Up and Down keypad controls to increase or decrease the TX frequency.
- Once the desired TX frequency is displayed press the Freq Tune on-screen button a second time to set the TX frequency.
The RED selection box should return to the previous position.

Note: Adjusting the TX frequency can be used to overcome interference problems (blocking), this is only available on worldwide units.

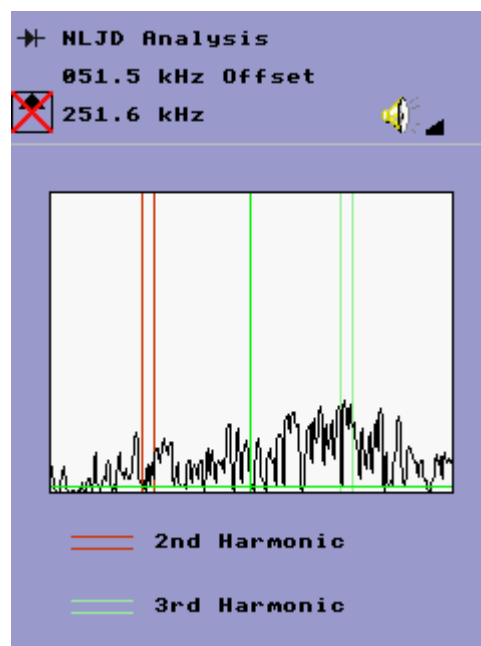
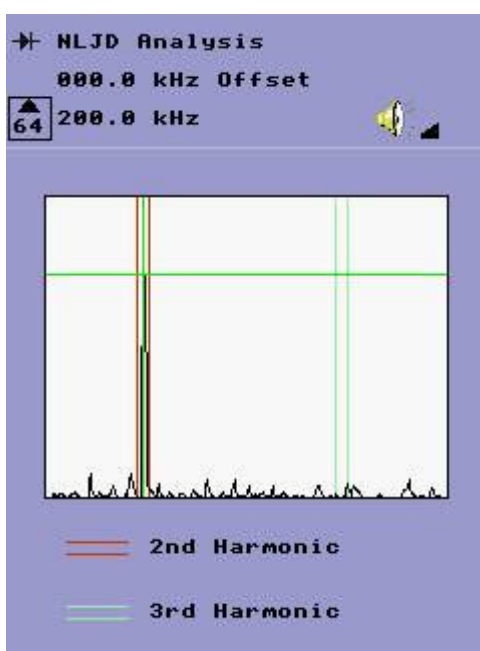
Note: It is the operator's responsibility to operate the equipment only on frequencies licensed to them.

Analyse Mode

The analyse screen shown the spectral response of the 2nd and 3rd harmonic returns from a detected target.

- the analyse mode is selected by pressing the on-screen button

The analyse screen is displayed.

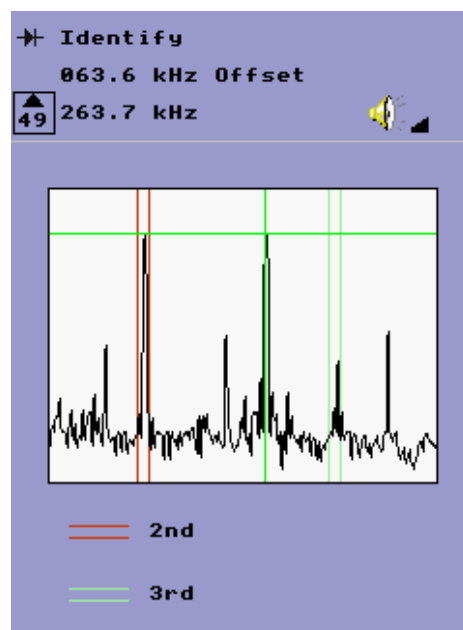


The 2nd harmonic returns should appear between the RED vertical lines.

The 3rd harmonic returns should appear between the GREEN vertical lines.

Also included on this screen is an offset cursor, which allows the real frequency of any sidebands returned on the harmonics to be measured.

The appearance of sidebands in the return signals may be caused by some active electronic targets, the offset would equal the internal low frequency clock signal within the target.



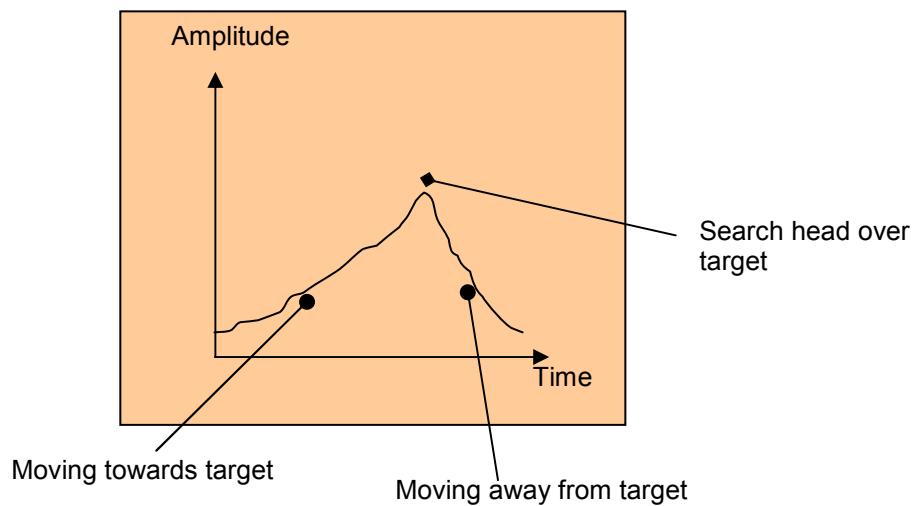
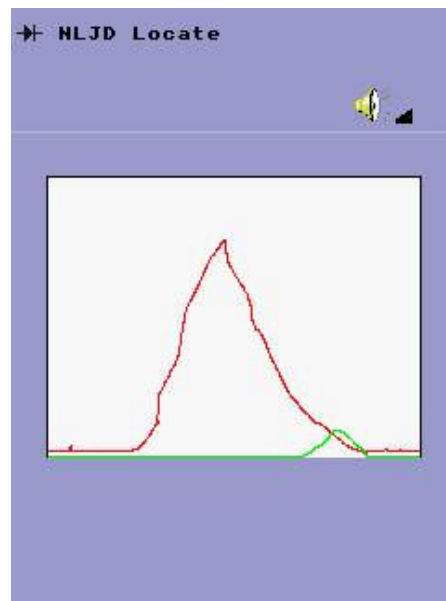
Noisy return spectrums can be caused by some metal junction targets

Locate Mode

The locate mode presents a simple display of detector signal strength against time. The search head will be closest to the target when the display indicates the highest peak.

- The Locate mode is selected by pressing the on-screen button.

The Locate screen is displayed.



The RED trace indicates 2nd harmonic signal strength, the GREEN trace indicates 3rd harmonic signal strength.

Log

The Log holds details of snapshots stored in the Analyse screen (when multimedia memory card is installed).

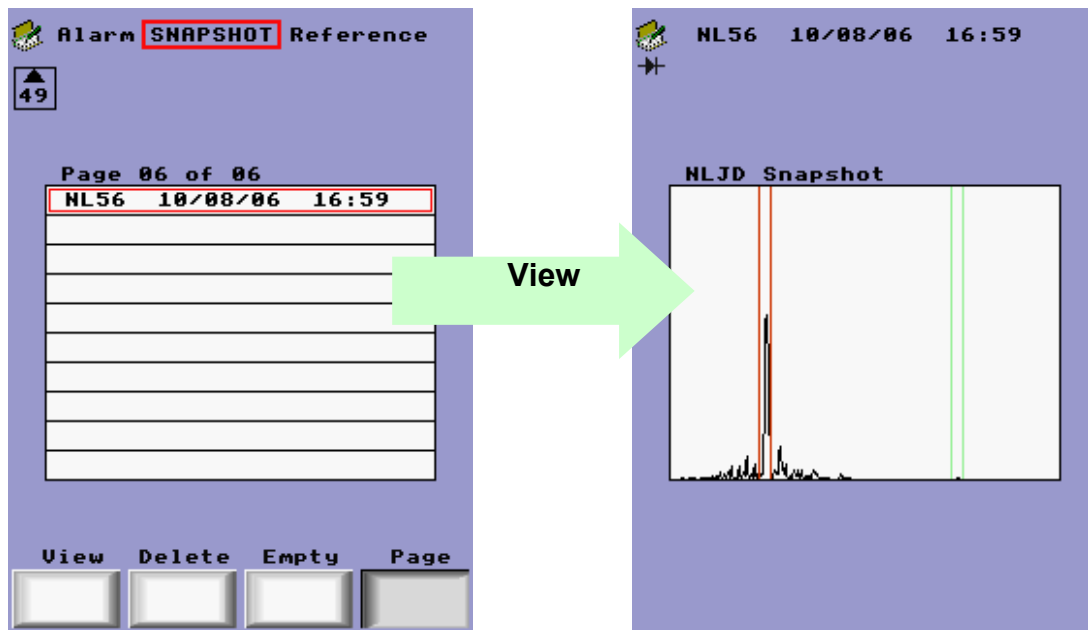
From the main menu screen select Log by either;

- Touching the Log icon on the screen

Or

- Using the left and right controls on the keypad to highlight the Log icon, then press the  control.

The Log screen is displayed.



The following on-screen buttons are used to modify the Log;

- View - Shows the actual snapshot
- Delete - deletes the currently selected snapshot
- Empty - deletes the entire Log
- Item - toggles between stepping through the Log an item at a time or a page at a time

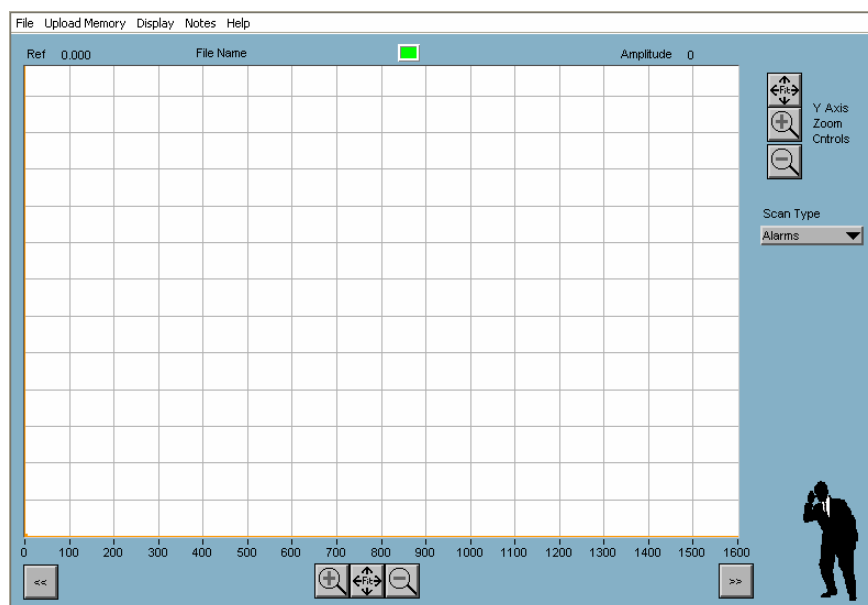
The Log can be navigated by using the Up and Down controls on the keypad.

Connection to a PC

The contents of the Log can be transferred to a PC for storage and reporting by connecting the ARTEMIS USB port to a PC running the viewer software.



The viewer allows the user to download the Log, view and edit the contents.



Technical Specifications

Transmitter Section

Frequency	869.6MHz EU 830MHz – 930MHz Worldwide non compliant variant
Power	1W manually variable down to 3mW (at Chassis)

Receiver Section

Frequency	1739.2MHz and 2608.8MHz EU 1660MHz – 1860MHz & 2490MHz – 2790MHz Worldwide non compliant variant
Sensitivity	-125dBm for 5dB S/N visible indication on LCD (at chassis)

Search Head

Antenna	1 * Archimedean Spiral for TX 1 * Archimedean Spiral for RX
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Outputs

Audio	Internally switched loudspeaker or headphones for signal strength Geiger type click.
Displays	Signal strengths bar graphs for 2 nd , 3 rd , compare (2 nd – 3 rd) and TX power level. Signal strengths over time and spectral analysis of retuned signals.

Power Requirements

Battery	Internal Lithium Ion rechargeable battery provides >4hours operation.
DC Input	External 12V @ 4A reverse polarity, overvoltage and over current protected external AC to DC adaptor.