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# PRODUCT SUBSURFACE INSTRUMENTS, INC.





**SUBSURFACE INSTRUMENTS, INC.**  
AML PRO™ & AML+™ PRODUCT GUIDE



INTRODUCING THE  
TECHNOLOGICALLY ADVANCED  
**AML™ SERIES**

REFINED.  
PROVEN.  
TRUSTED.

Both the AML Pro & AML+ are available in 3 optional housing colors.



Yellow



Black



Carbon Fiber

**AML+**  
SERIES

- > Lightweight Construction (2.0 lbs.)
- > Durable ABS Housing
- > New Microprocessor Intelligence
- > Patented Radio Wave Technology
- > 9 Sensitivity Settings
- > Headphones
- > USB Powered Port
- > Rechargeable Lithium Battery
- > 3 Year Limited Warranty

*The All-New AML PRO™ & AML+™ Series "All Material Locators" are scientific instruments that utilize modulated, ultra-high radio frequencies to find differences in subsurface densities. This offers the best method for locating PVC & PE pipes and nearly any other subsurface object that has an edge.* Utilizing technology that was developed for lunar exploration, the AML will locate subsurface materials indiscriminately - plastic, metal, wood, cable or pipe. Unlike the deficiencies of GPR (Ground Penetrating Radar), the AML will work in clay, wet soil, snow or even standing water. Redesigned specifically for the utility, water, gas and cable industries, the AML allows professionals to locate objects faster, while maximizing job efficiency.

**AMLPRO**  
SERIES

**INCLUDES ALL AML+ FEATURES AND:**

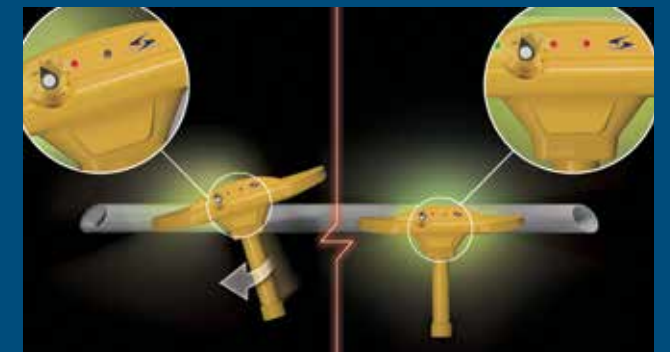
- > Lightweight Construction (2.5 lbs.)
- > Durable ABS Housing
- > Backlit Display
- > GPS Plotting & Tracking
- > 32 Sensitivity Settings
- > Digital Leveling Meter
- > Digital Targeting Indicator
- > Noise Isolating Headphones
- > Customizable User Preferences

**UNDERSTANDING HOW ULTRA-HIGH FREQUENCY (UHF) RADIO WAVES WORK**

The key to how the AML works is to understand how its ground-penetrating UHF radio waves detect PVC pipes, PE pipes and other objects.



Holding the AML's handle parallel to the ground, scan the area of the undetectable buried object until one or both of the target indicators activate.



While the left or right target indicator is activated, rotate the AML until both LED target indicators light simultaneously, triggering the AML's tone and laser marker. This alert indicates that the pipe or object has been detected and that the AML is now parallel with the underground object.



With the AML parallel with the pipe or underground object, you can now scan the entire length of the object's edge. As an alternative, utilize the "W" method of scanning by sweeping the area in a back-and-forth "W" motion, marking the object's location and run direction as it is tracked.

# AML PRO SERIES

Patented Radio-Frequency Technology  
Proudly Made in the USA  
by SubSurface Instruments, Inc.  
FCC, IC, UE/CE Approved

## EASY BATTERY ACCESS

Powered by a convenient 9-volt battery system, the AML features long, powerful on-the-job usage between power source changes.

## ERGONOMIC HANDLE

An ergonomic handle provides a firm grip in any weather condition.



## HEADPHONE JACK

A convenient headphone jack allows the user to listen to audio signals with premium noise isolating headphones (included).

## LIGHTWEIGHT, DURABLE CONSTRUCTION

The AML is constructed from lightweight, shock-resistant materials that make it easy to use and handle throughout the work day.



## DURABLE CARRYING CASE

The AML is a highly technical scientific instrument. To protect it, an impact resistant and water proof carrying case with a shock-absorbent foam housing protects your AML while in transit or on the job site.

## RECHARGEABLE LITHIUM BATTERY KIT

Use it as an auxiliary long lasting power source.

## RIGHT SIDE & LEFT SIDE TARGET INDICATORS

The LED indicators provide a visual signal when an undetectable object has been located. Individual left and right LED lights, as well as the digital target indicators provide the user with an accurate reading of the subsurface objects being scanned, allowing them to be marked and tracked efficiently.

## MULTI-BUTTON PANEL

Durable tactile membrane buttons control the unit's power source and menu options. Once the unit is on, the user can navigate its scrolling menu to adjust sensitivity and operational settings displayed on the LCD screen.

## ULTRA-HIGH FREQUENCY (UHF) RADIO WAVE TRANSMITTER

Using advanced circuit board technology, powerful 2.45 GHz ground penetrating, UHF radio waves locate PVC pipes easily. Man-made objects with a straight edge create a change in density or permeability from surrounding materials, which causes refracted radio waves to be detected by the AML.

## DIGITAL BACKLIT DISPLAY

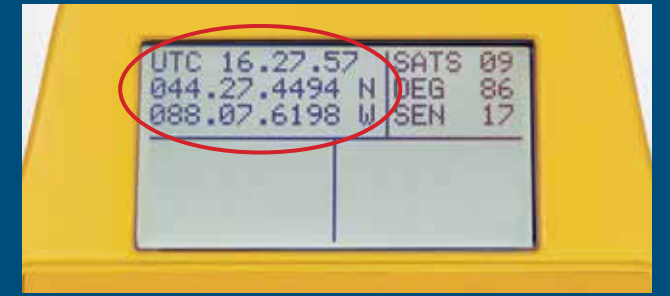
A high contrast, backlit digital display provides superior visibility in both direct sunlight and dark environments.

## LASER TARGET INDICATOR

An easy-to-see laser indicator highlights the located object's position on the ground when it has been detected.

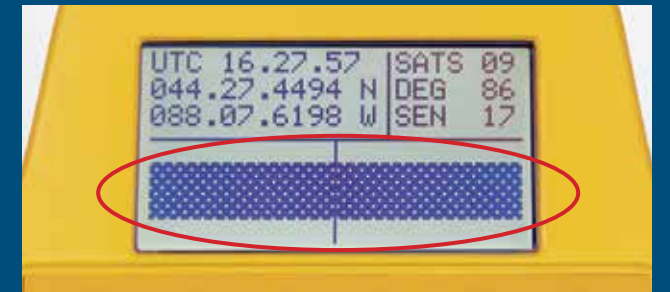
## ULTRA-HIGH FREQUENCY (UHF) RADIO WAVE RECEIVERS

Highly sensitive dual left and right receivers intercept frequency refractions set off by the edges of buried PVC pipes. When the unit is positioned parallel to a pipe, both the left and right target indicators are activated, allowing the user to identify the object's run direction.



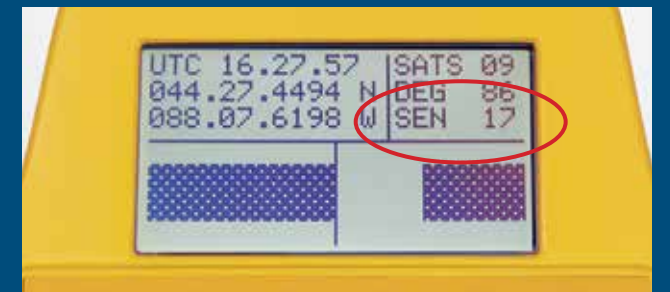
## ADVANCED GPS MAPPING

Map your coordinates on the job site with advanced GPS tracking and export to other devices via data transfer through the USB mini port.



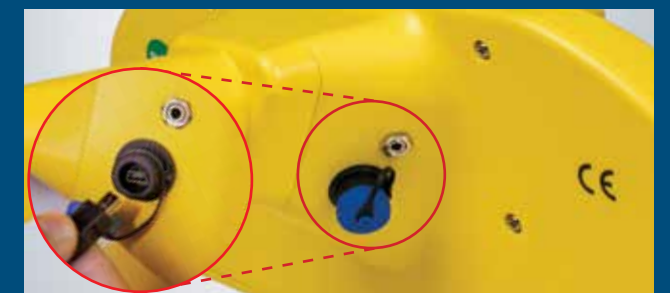
## DIGITAL TARGET INDICATOR

Increase the accuracy and speed of finding subsurface objects. A digital left and right meter hones the operator to the exact location of an underground object so it can be marked and tracked efficiently.



## SENSITIVITY LEVEL

Designed to provide the highest degree of accuracy available, the AML Pro has 32 individual sensitivity settings that allows the user to zero out unwanted feedback and focus directly on the object itself.



## BUILT-IN USB MINI PORT

Powerful USB flexibility allows users to export GPS coordinates, import the latest firmware updates and connect to the auxiliary lithium battery source.

# AML+ SERIES

Patented Radio-Frequency Technology  
Proudly Made in the USA  
by SubSurface Instruments, Inc.  
FCC, IC, UE/CE Approved

## EASY BATTERY ACCESS

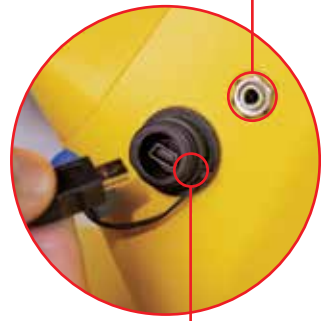
Powered by a convenient 9-volt battery system, the AML features long, powerful on-the-job usage between power source changes.

## ERGONOMIC HANDLE

An ergonomic handle provides a firm grip in any weather condition.

## HEADPHONE JACK

A headphone jack allows the user to listen to audio signals with high quality headphones (included).



## BUILT-IN USB MINI PORT

A protected USB mini port provides the ability to connect the supplied external Lithium Battery source.

## LIGHTWEIGHT, DURABLE CONSTRUCTION

The AML is constructed from lightweight, shock-resistant materials that make it easy to use and handle throughout the work day.



## RECHARGEABLE LITHIUM BATTERY KIT

Used as a long lasting power source.

## DURABLE CARRYING CASE

The AML is a highly technical scientific instrument. To protect it, an impact resistant and water proof carrying case with a shock-absorbent foam housing protects your AML while in transit or on the job site.

## ULTRA-HIGH FREQUENCY (UHF) RADIO WAVE RECEIVERS

Highly sensitive dual left and right receivers intercept frequency refractions set off by the edges of buried PVC pipes. When the unit is positioned parallel to an undetectable object, both left and right target indicators are activated, allowing the user to identify the pipe's location and run direction.

## RIGHT SIDE & LEFT SIDE TARGET INDICATORS

Easy to read left and right LED target indicators identify when a PVC pipe has been located, and when the pipe is parallel with the AML. Audio and laser target indicators work in unison with the right and left LEDs to alert the operator of a pipe's presence, and to place its location.

## POWER & MULTI-POSITION SENSITIVITY SWITCH

This switch controls the unit's power source and sensitivity. Once the unit is turned on, the operator can choose from 9 different levels of sensitivity to match the needs of each job's conditions.

## LED POWER INDICATOR

The power indicator emits a bright green LED light when the unit is on. This LED also serves as the battery life indicator. It will alternate between green and red to indicate low battery life, blinking red more often as the batteries deplete. This feature will provide you with ample warning time to complete your current job before needing to change power sources.

## ULTRA-HIGH FREQUENCY (UHF) RADIO WAVE TRANSMITTER

Using advanced circuit board technology, powerful 2.45 GHz ground-penetrating, UHF radio waves locate PVC pipes with ease. Man-made objects with a straight edge create a change in density or permeability from surrounding materials, which causes refracted radio waves to be detected by the AML.

## LASER TARGET INDICATOR

An easy-to-see laser indicator highlights the located object's position on the ground when it has been detected.



## LED POWER INDICATOR

The LED power indicator has 2 functions:  
1) A green light indicates the unit is ready for use.  
2) A blinking green and red light indicates a low battery and requires a change in power source.



## POWER & MULTI-POSITION SENSITIVITY SWITCH

This switch controls the unit's power supply and sensitivity. Once the unit is on, the operator can choose from 9 different levels of sensitivity depending on each job's conditions.



## TARGET INDICATORS

Easy to read left and right target indicators identify when an undetectable object has been located, and is parallel with the AML.



## ERGONOMIC HANDLE

The AML+ handle is designed to provide the user with a comfortable grip, ensuring an accurate reading when the fingers are placed along the knurls.

# ML-1 & ML-1M MAGNETIC LOCATORS



## KEY FEATURES

- 1 Low Battery Warning (when only 5% battery life left)
- 2 Speaker
- 3 On/Off & Volume Control
- 4 Gain Up
- 5 Gain Down
- 6 - and + Signal Strength

## FEATURES

- ▷ Detection of ferrous metal objects, including property pins and markers, live wires, weapons, devices and other objects.
- ▷ Easy and simple, one handed operation – 3 keypad switches:
  - ▷ On/Off button: Turns unit on or off.
  - ▷ Gain Up button: Increases the locating sensitivity of the unit.
  - ▷ Gain Down button: Decreases the locating sensitivity of the unit.
- ▷ Strong aluminum "MonoTube" construction from the tip through the end of the handle. The ABS injection molded electronics compartment provides the best structural integrity in a hand-held locator.
- ▷ Lightweight - just over 2 pounds, including batteries.
- ▷ Volume built into the on/off key: just hold down the key while it cycles through settings.
- ▷ Microprocessor remembers the volume and gain settings from the last time the unit was on.
- ▷ Battery compartment separated from electronic components and circuit board.
  - ▷ No exposing electronics to replace the batteries.
- ▷ Non-metered (ML-1), and Metered (ML-1M) versions designed to look, feel, and operate exactly the same.
- ▷ The metered version (ML-1M) adds features without complexity. No learning curve between units.
- ▷ Detection of buried ferrous metal objects at depths up to 10'.
  - ▷ Handgun: 1' to 2'
  - ▷ 175mm projectile: 4' to 5'
  - ▷ Water Shutoff valve: 6' to 10'
- ▷ Soft-pack carrying case included. Hard case optional.
- ▷ Over 5000 ML-1M units in Afghanistan used for detection of improvised explosive devises (IEDs) and Unexploded Ordnances (UXOs).
- ▷ 7 year warranty.

## SPECIFICATIONS

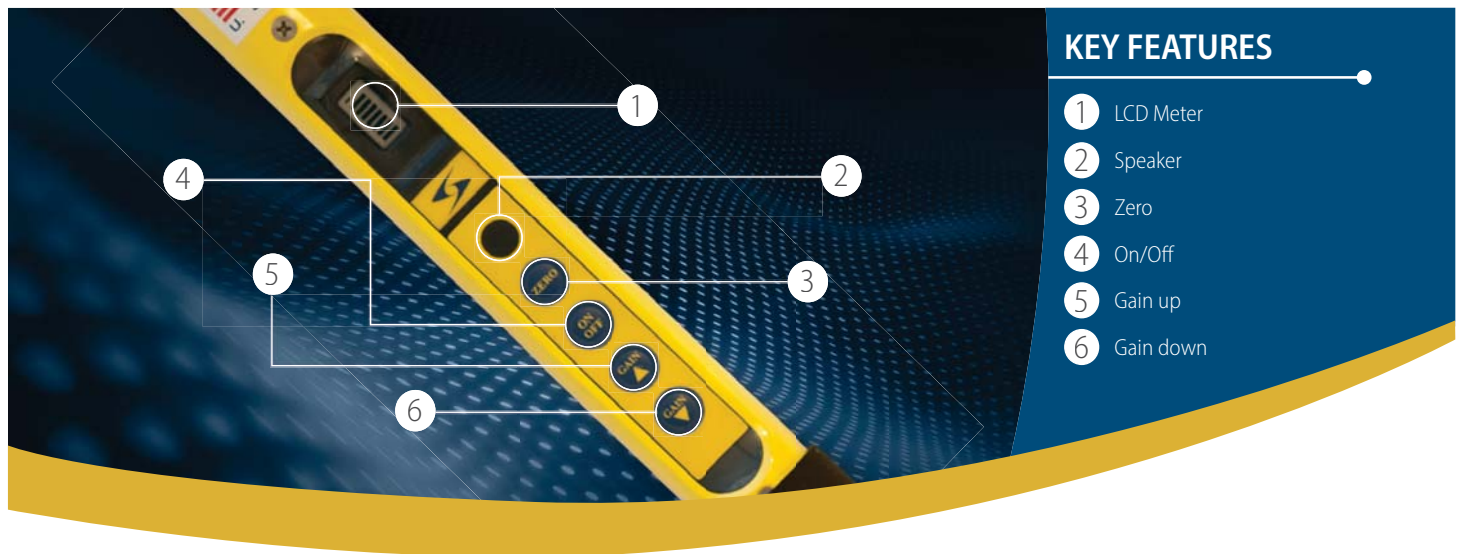
- ▷ **Overall length:** Aluminum tube is 39" (98.4cm). The electronics compartment is 3.25" (8.25cm) tapered to 2.5" (6.4cm) wide x 4.5" (10.15cm) deep tapered to 2.5" (6.4cm).
- ▷ **Weight:** 2lbs.(0.9kg) including batteries.
- ▷ **Battery Life:** Under normal operation, approximately ±30 hours.
- ▷ **Input Power:** Two standard 9-volt alkaline batteries in custom molded bottom compartment.
- ▷ **Function:** Electronic keypad that clicks when a key is depressed.
- ▷ **Audio:** A real speaker is in the front panel providing outstanding volume. The speaker pitch increases in frequency proportional to field intensity.
- ▷ **Visual:** ML-1M model has LCD display with bar graph indicating relative strength of signal and polarity. Flashing battery symbol indicates low battery.
- ▷ **Construction:**
  - ▷ Exterior Sensor Tube made of aircraft grade aluminum.
  - ▷ Electronic Compartment made of ABS injection molded plastic.
- ▷ **MADE IN USA.** Built and serviced entirely in Wisconsin.



### Includes:

- ▷ Soft-pack custom case
- ▷ Instruction manual
- ▷ 1 set of 9-volt batteries

# ML-3S & ML-3L MAGNETIC LOCATORS



## FEATURES

- ▷ Detection of ferrous metal objects, including property pins and markers, live wires, weapons, devices and other objects.
- ▷ Waterproof sensor tube pressure tested to water depths up to 75 meters (246 feet).
- ▷ Easy to use one handed operation with four button keypad:
  - ▷ On/Off button: Turns unit on or off.
  - ▷ Zero button: Automatically calibrates unit to ambient magnetic conditions.
  - ▷ Gain Up button: Increases the locating sensitivity of the unit.
  - ▷ Gain Down button: Decreases the locating sensitivity of the unit.
- ▷ Includes soft case with carrying straps and inside pocket for batteries and manual
- ▷ Rugged construction suitable for field conditions
- ▷ Varying pitch audio signal mode using a moving coil speaker for enhanced audio output.
- ▷ Low battery indicator with flashing LCD.
- ▷ With a choice of 2 lengths (40" or 55"), it will fulfill any technician's needs.
- ▷ Detection of buried ferrous metal objects at depths up to 10'.
  - ▷ Handgun: 1' to 2'
  - ▷ 175mm projectile: 4' to 5'
  - ▷ Water Shutoff valve: 6' to 10'
- ▷ Underwater Search and detection of:
  - ▷ Submerged Vehicles
  - ▷ UXOs and Mines
  - ▷ Salvageable Wrecks
  - ▷ Pipes and Cables
- ▷ Optional aluminum hard case available
- ▷ Over 3500 ML-3 units used for detection of improvised explosive devises (IEDs) and Unexploded Ordnances (UXOs)
- ▷ 7 year warranty.

## SPECIFICATIONS

- ▷ **Overall length:** Short version- 40" (101.6cm)  
Long version- 55" (139.7cm)
- ▷ **Weight:** short version- 1.8lbs.(0.8kg); long version- 2.5lbs(1.13kg) including batteries.
- ▷ **Waterproof:** Sensor tube pressure tested to water depths up to 75 meters (246 feet).
- ▷ **Audio:** Speaker pitch increases in frequency proportional to field intensity.
- ▷ **Visual:** LCD display with bar graph indicating polarity and relative strength of signal. When lights are flashing it also indicates low battery.
- ▷ **Input Power:** Three standard 9-volt alkaline batteries.
- ▷ **Battery Life:** Under normal operation, approximately ±40 hours.
- ▷ **Operation Temperatures:** -13° to 140° F (-25° to 60° C)
- ▷ **Construction:** Exterior Sensor Tube made of aircraft grade aluminum.
- ▷ **MADE IN USA.** Built and serviced entirely in Wisconsin.



### Includes:

- ▷ Soft-pack custom case
- ▷ Instruction manual
- ▷ 1 set of 9-volt batteries

# PL-960 PIPE & CABLE LOCATOR



## KEY FEATURES

- 1 Receiver
- 2 Transmitter
- 3 Clamps, Stake, Cables
- 4 Soft Carrying Case

## FEATURES

- ▶ PL-960 is equipped with the Single Coil Antenna to track a buried metallic line utility over a long distance and the Differential Coil Antenna to locate the same utility correctly.
- ▶ PL-960 is equipped with three different frequencies designed in the most efficient range of 27kHz, 83kHz and 334kHz to locate and track the buried metallic line utility.
- ▶ PL-960 has Radio Mode which adds another function to track the buried metallic line utility without using the power from the Transmitter when the induction magnetic field.
- ▶ The single vertical bar (line) in the receiver is the "peak hold" feature. The peak hold shows the maximum signal measured in the last three seconds.
- ▶ PL-960 has the Minimum Mode indicating the position of Receiver when it is positioned at the side of right or left of the buried metallic line utility.
- ▶ PL-960 displays the sensitivity level changed in the step from 00 10 40 to the signal from the transmitter.
- ▶ PL-960 displays the current measurement by the step from 000 to 100 which indicates if the depth of a buried object has been measured correctly.
- ▶ Optional accessories include an External Coil, and Cable drum with 50 meter cable.



### Includes:

- ▶ Padded Carrying Case
- ▶ Ground Stake
- ▶ Direct Connection Cables
- ▶ Instruction Manual

## SPECIFICATIONS

### TRANSMITTER

- ▶ SIZE: 11.3" x 9.5" x 4.1"  
(288mm x 241mm x 105 mm)
- ▶ WEIGHT: 5.5lb (2.5 kg)
- ▶ FREQUENCY: 27kHz, 83kHz, 334kHz
- ▶ OUTPUT POWER: Induction Mode = Approx. 20 hours  
Direct Mode = Approx. 10 hours
- ▶ POWER SUPPLY: DC 12-volts  
(8 "D" batteries or external 12-v battery)
- ▶ BATTERY LIFE: Induction Mode = 0.5W  
Direct Mode = 3.0W
- ▶ OPERATING TEMP: 14° to 122° F (-10° to 50° C)
- ▶ ANTENNA: Single Coil
- ▶ DEPTH ACCURACY: 0 to 78: Within 5%  
78 to 197: Within 10%

### RECEIVER

- ▶ SIZE: 5.2" x 11" x 24"  
(132mm x 279mm x 610mm)
- ▶ WEIGHT: 3.5lb (1.6kg) - 4.4lb (2.0kg w/batteries)
- ▶ POWER SUPPLY: DC 9-volts (6 "AA" batteries)
- ▶ BATTERY LIFE: 8 hours at non-signal condition  
5 hours by using speakers  
5 hours by using back light
- ▶ OPERATING TEMP: 14° to 122° F (-10° to 50° C)
- ▶ FREQUENCY DISPLAY: Value in three figures
- ▶ OPERATING MODES: "Peak" (or "Max"), "Live Cable"
- ▶ SENSITIVITY: Continuous Bar Graph with Auto Sensitivity Adjustment
- ▶ WARRANTY: 3 Years



# PL-960AC PIPE & CABLE LOCATOR



## KEY FEATURES

- 1 Receiver
- 2 Transmitter
- 3 Clamps, Stake, Cables
- 4 Soft Carrying Case

## FEATURES

- ▶ PL-960 is equipped with the Single Coil Antenna to track a buried metallic line utility over a long distance and the Differential Coil Antenna to locate the same utility correctly.
- ▶ The PL-960 AC has two active frequencies 27KHz and 83KHz designed in the most efficient range, to locate and track the buried metallic line utility.
- ▶ PL-960 has Radio Mode which adds another function to track the buried metallic line utility without using the power from the Transmitter when the induction magnetic field.
- ▶ The single vertical bar (line) in the receiver is the "peak hold" feature. The peak hold shows the maximum signal measured in the last three seconds.
- ▶ PL-960 has the Minimum Mode indicating the position of Receiver when it is positioned at the side of right or left of the buried metallic line utility.
- ▶ PL-960 displays the sensitivity level changed in the step from 00 10 40 to the signal from the transmitter.
- ▶ PL-960 displays the current measurement by the step from 000 to 100 which indicates if the depth of a buried object has been measured correctly.
- ▶ Optional accessories include an External Coil, and Cable drum with 50 meter cable.



### Includes:

- ▶ Padded Carrying Case
- ▶ Ground Stake
- ▶ Direct Connection Cables
- ▶ Instruction Manual

## SPECIFICATIONS

### TRANSMITTER

- ▶ SIZE: 11.3" x 9.5" x 4.1"  
(288mm x 241mm x 105 mm)
- ▶ WEIGHT: 5.5lb (2.5 kg)
- ▶ FREQUENCY: 27kHz, 83kHz
- ▶ OUTPUT POWER: Induction Mode = Approx. 20 hours  
Direct Mode = Approx. 10 hours
- ▶ POWER SUPPLY: DC 12-volts  
(8 "D" batteries or external 12-v battery)
- ▶ BATTERY LIFE: Induction Mode = 0.5W  
Direct Mode = 3.0W
- ▶ OPERATING TEMP: 14° to 122° F (-10° to 50° C)
- ▶ ANTENNA: Single Coil
- ▶ DEPTH ACCURACY: 0 to 78: Within 5%  
78 to 197: Within 10%

### RECEIVER

- ▶ SIZE: 5.2" x 11" x 24"  
(132mm x 279mm x 610mm)
- ▶ WEIGHT: 3.5lb (1.6kg) - 4.4lb (2.0kg w/batteries)
- ▶ POWER SUPPLY: DC 9-volts (6 "AA" batteries)
- ▶ BATTERY LIFE: 8 hours at non-signal condition  
5 hours by using speakers  
5 hours by using back light
- ▶ OPERATING TEMP: 14° to 122° F (-10° to 50° C)
- ▶ FREQUENCY DISPLAY: Value in three figures
- ▶ OPERATING MODES: "Peak" (or "Max"), "Live Cable"
- ▶ SENSITIVITY: Continuous Bar Graph with Auto Sensitivity Adjustment
- ▶ WARRANTY: 3 Years

# PL-1500 HIGH & PL-1500 LOW PIPE & CABLE LOCATOR



## KEY FEATURES

- 1 Receiver
- 2 Receiver's Control Panel
- 3 Speaker
- 4 Transmitter's Control Panel
- 5 Transmitter

## FEATURES

- ▷ The PL-1500 Low Transmitter has 3.0 watts power output in the Direct Connection Mode, allowing locates for longer distances. Use the Inductive mode to quickly locate shorter Pipes and Cables.
- ▷ The Receivers are very light-weight, weighing only 3.5 lb, with large, easy-to-read LCDs and thumb-controlled switches.
- ▷ The single vertical bar (line) in the receiver's display, is the "Peak Hold" feature, shows the maximum signal measured in the last 3 seconds.
- ▷ Press the PL-1500 receiver's "DEPTH" switch, and the depth will be displayed (down to 16 ft deep).
- ▷ The PL-1500 Transmitter shows the actual measured output current in the Direct Connection Mode. If the output current is low, then increase the output power level or move the ground stake.

## SPECIFICATIONS

### TRANSMITTER

- ▷ FREQUENCY: 82.525 kHz (PL-1500 High)  
8.125 kHz (PL-1500 Low)
- ▷ OUTPUT POWER: 0.5 watts Inductive Mode, 1.0 watts Direct Mode for PL-1500 High  
0.5 watts Inductive Mode, 3.0 watts Direct Mode for PL-1500 Low
- ▷ POWER SUPPLY: DC 12-volts  
(8 "D" batteries or external 12-v battery)
- ▷ BATTERY LIFE: 20 hours Typical (Alkaline)  
12 hours at Max Power
- ▷ OPERATING TEMP: -10C to -50C

### RECEIVER

- ▷ OPERATING MODES: "Peak" or "Max", "Live Cable"
- ▷ POWER SUPPLY: DC 9-volts (6 "AA" batteries)
- ▷ BATTERY LIFE: More than 40 hours (Alkaline)
- ▷ OPERATING TEMP: -10C to -50C

### LOCATING ACCURACY (AT DEPTHS)

- ▷ 0 to 47 inches: Within 0.80 inch
- ▷ 47 to 78 inches: Within 2 inch
- ▷ 78 to 197 inches: Within 10 inch

### DEPTH ACCURACY (AT DEPTHS)

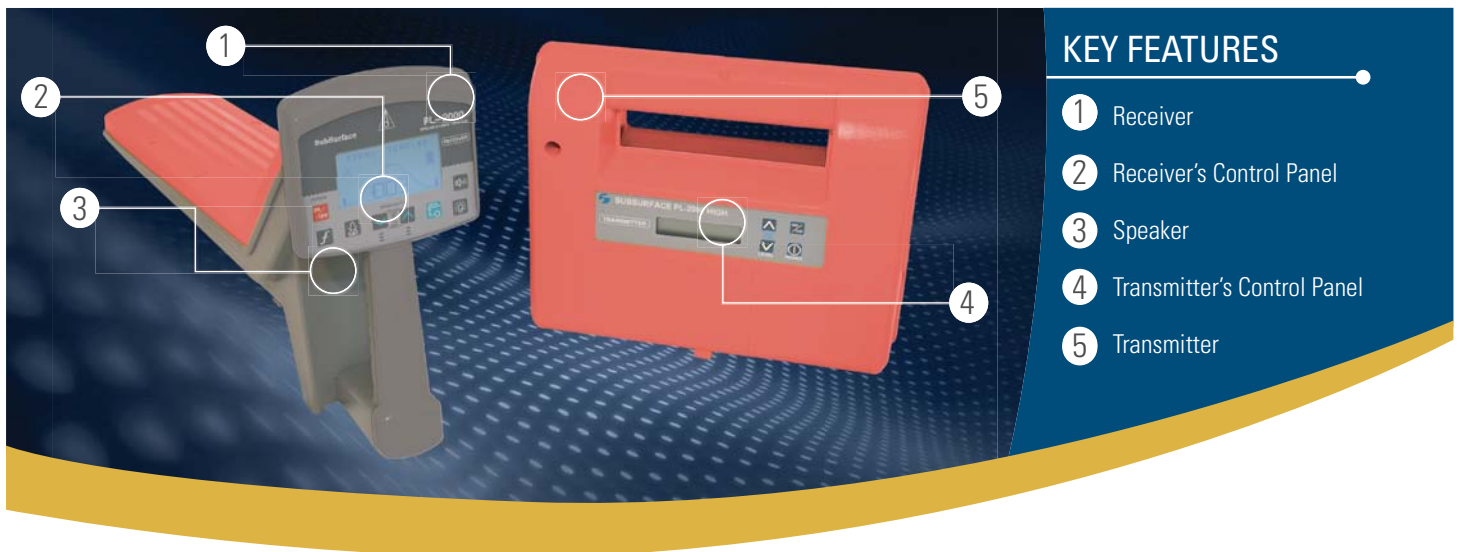
- ▷ 0 to 78 inches: Within 5%
- ▷ 78 to 197 inches: Within 10%



### Includes:

- ▷ Padded Carrying Case
- ▷ Ground Stake
- ▷ Direct Connection Cables
- ▷ Instruction Manual

# PL-2000 MULTI-FREQUENCY PIPE & CABLE LOCATOR



## KEY FEATURES

- 1 Receiver
- 2 Receiver's Control Panel
- 3 Speaker
- 4 Transmitter's Control Panel
- 5 Transmitter

## FEATURES

- ▶ The PL-2000 Low Transmitter has 3.0 watts power output in the Direct Connection Mode, allowing locates for much longer distances than the lower power typical in other transmitters.
- ▶ The light-weight, balanced PL-2000 Receiver, offers 4 different operating modes: "Peak" mode, for the most accurate locates and for depth measurement; "Null" mode, for fast, easy tracking; "Dist" mode, for even longer distances; "Sonde" mode, for locating sewer sondes and measuring their depths.
- ▶ The PL-2000 has 3 "active" frequencies at 512 Hz, 8.125 kHz, and 26.725kHz; plus 2 "passive" frequencies at 50/60 Hz (current flowing A/C) and Radio (15 khz - 25 kHz).
- ▶ Simultaneously transmit all 8.125 kHz, 26.725 kHz, and .5kHz in the "Mix" mode in the Transmitter.
- ▶ Detects poor "ground" conductivity at the Transmitter in the Direct Connection operating mode.
- ▶ Current measurement in the depth function indicates if the measured depths are correct for congested utilities.
- ▶ "Auto Off" functions in both the Transmitter and Receiver shut off their operations after a set time period if they are accidentally left "On".



### Includes:

- ▶ Padded Carrying Case
- ▶ Ground Stake
- ▶ Direct Connection Cables
- ▶ Instruction Manual

## SPECIFICATIONS

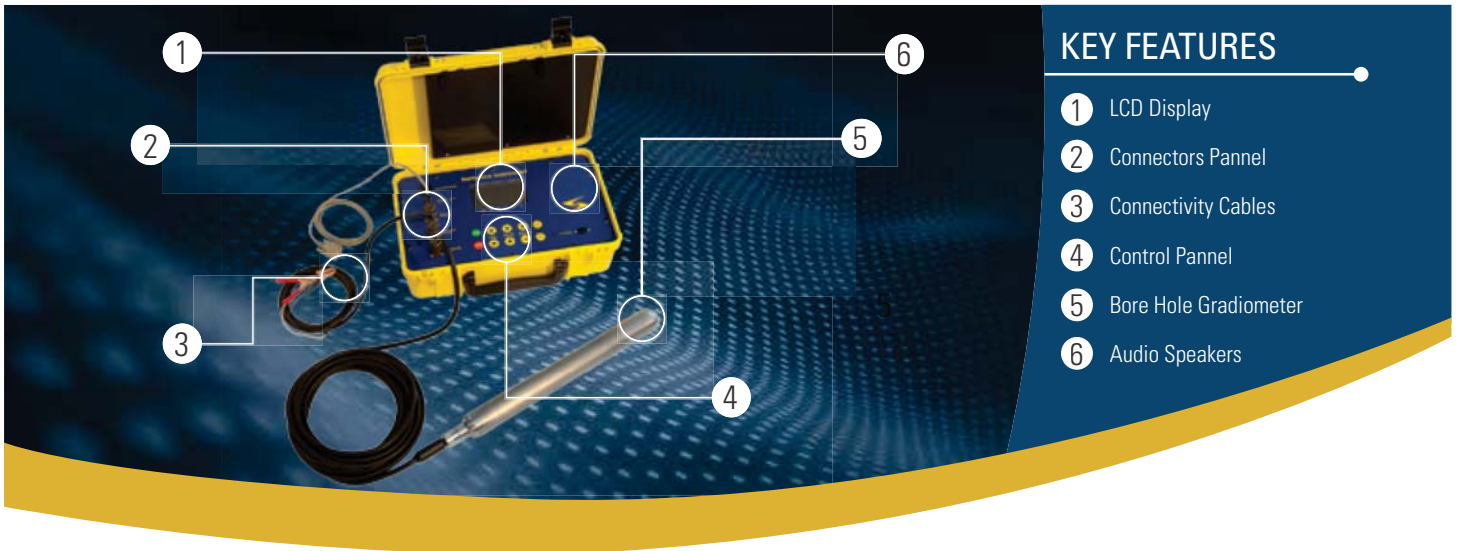
### TRANSMITTER

- ▶ FREQUENCY: 26.725 kHz, 8.125 kHz, and 512 Hz
- ▶ OUTPUT POWER: 0.5 watts Inductive Mode  
3.0 watts Direct Mode
- ▶ TRANSMITTING MODE: Continuous Wave (non-modulating)
- ▶ ANTENNA: Single Coil Antenna
- ▶ POWER SUPPLY: DC 12-volts (8 "D" batteries or external 12-v battery)
- ▶ BATTERY LIFE: 20 hours Typical (Alkaline)  
8 hours at Max Power
- ▶ WEIGHT: 5.5 lbs (2.49 Kg)
- ▶ SIZE: 11"w x 9.5"h x 4.1"d

### RECEIVER

- ▶ FREQUENCY: 26.725 kHz, 8.125 kHz, and 512 Hz
- ▶ OUTPUT POWER: 0.5 watts Inductive Mode  
3.0 watts Direct Mode
- ▶ TRANSMITTING MODE: Continuous Wave (non-modulating)  
"Radio" mode: 15 kHz - 25 kHz  
"Live Cable" mode: 50/60 Hz AC
- ▶ OPERATING MODES: "Peak", "Null", "Dist", and "Sonde"
- ▶ POWER SUPPLY: DC 9 Volts (6 "AA" batteries)
- ▶ BATTERY LIFE: 8 hours Continuous (Alkaline)
- ▶ WEIGHT: 4.4 lb (2.04 Kg)
- ▶ SIZE: 5.2"w x 11"h x 24"L

# BHG - BORE HOLE GRADIOMETER

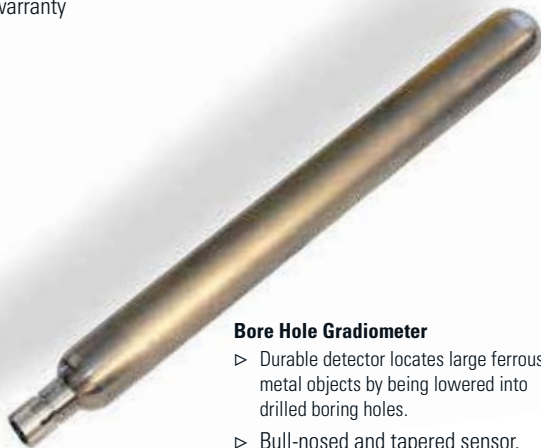


## KEY FEATURES

- 1 LCD Display
- 2 Connectors Panel
- 3 Connectivity Cables
- 4 Control Panel
- 5 Bore Hole Gradiometer
- 6 Audio Speakers

## FEATURES

- ▷ Heavy-duty sensor cable acts as lanyard. 30', 50', 100' (non-standard lengths available)
- ▷ High-quality connectors and "Toilet Seat" cover over headset jack. "Seacon" connectors available.
- ▷ Alligator clips for 12-volt auxiliary power.
- ▷ Gel-cell auto-charges when auxiliary power connected.
- ▷ "Zero" to "Null" gradient.
- ▷ Permanent gel-cell battery-mounted under electronics panel.
- ▷ Bull-nosed and tapered sensor on BHG; longer sensor on MUL for diver or boat towing.
- ▷ 1 year warranty



### Bore Hole Gradiometer

- ▷ Durable detector locates large ferrous metal objects by being lowered into drilled boring holes.
- ▷ Bull-nosed and tapered sensor.

## SPECIFICATIONS

### CONTROLS

- ▷ On, Off
- ▷ Volume Up and Down
- ▷ Range setting (Gain or Sensitivity) Up and Down
- ▷ Zero, Plus and Minus
- ▷ Auto Zero - Automatic self-adjusting

### OUTPUTS

- ▷ Audio Frequency Pitch (speaker and jack for headset)
- ▷ Visual LCD Display
- ▷ Bar Graph - range Gain setting - milligauss
- ▷ RS-232 PC connection (cable included)
- ▷ Control all keypad functions data log range, keypad and signal settings works with hyper terminal or equivalent

### POWER OPTIONS

- ▷ Internal Battery: 12-volt, 7.2Ah sealed lead acid
- ▷ Battery Life: 72 hours continuous use, charges to full overnight
- ▷ External Power: 12 to 15-volt, cable included
- ▷ Internal battery charging circuit is enabled when external power or AC charging cable is connected

### DIMENSIONS

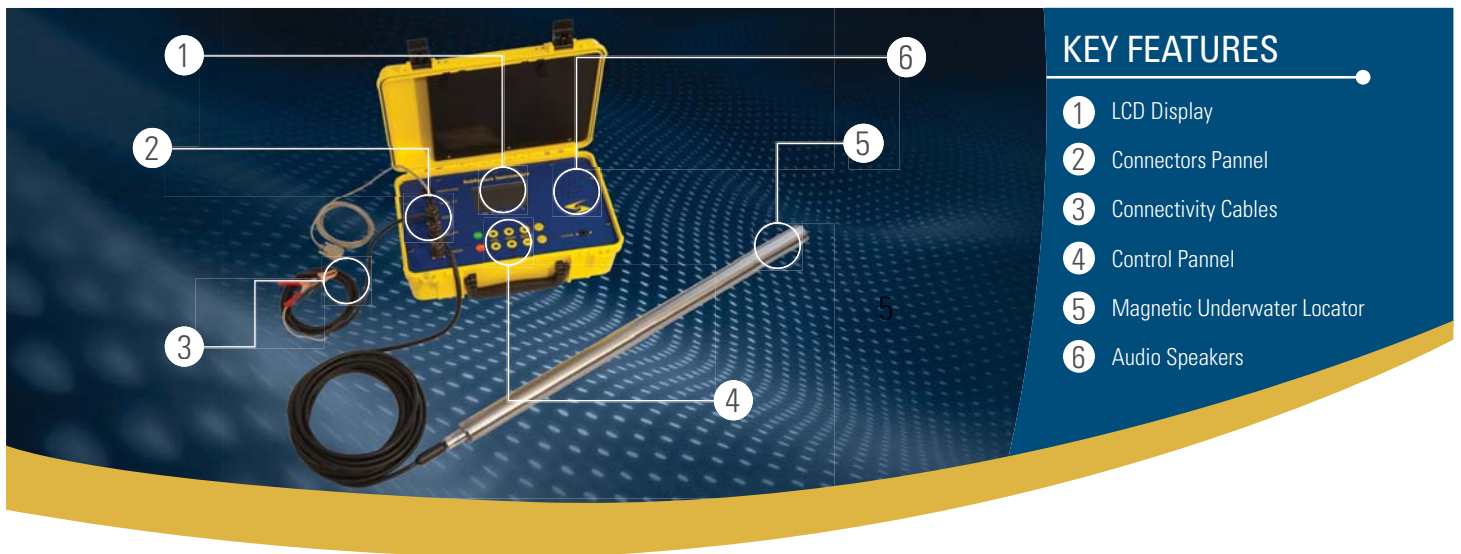
- ▷ Electronics: 16.9" w x 10" h x 6.5" d
- ▷ Sensor: 1.625" d x 34.375" L (4.13cm x 87.3cm)



### Includes:

- ▷ ABS custom case
- ▷ Connectivity cables
- ▷ Instruction manual

# MUL-1 MAGNETIC UNDERWATER LOCATOR



## KEY FEATURES

- 1 LCD Display
- 2 Connectors Panel
- 3 Connectivity Cables
- 4 Control Panel
- 5 Magnetic Underwater Locator
- 6 Audio Speakers

## FEATURES

- ▷ Heavy-duty sensor cable acts as lanyard. 30', 50', 100' (non-standard lengths available)
- ▷ High-quality connectors and "Toilet Seat" cover over headset jack. "Seacon" connectors available.
- ▷ Alligator clips for 12-volt auxiliary power.
- ▷ Gel-cell auto-charges when auxiliary power connected.
- ▷ "Zero" to "Null" gradient.
- ▷ Permanent gel-cell battery-mounted under electronics panel.
- ▷ Bull-nosed and tapered sensor on BHG; longer sensor on MUL for diver or boat towing.
- ▷ 1 year warranty



### Magnetic Underwater Sensor

- ▷ Durable detector finds metal immersed in 1,000+ feet of water
- ▷ Longer sensor, for diver or boat towing.

## SPECIFICATIONS

### CONTROLS

- ▷ On, Off
- ▷ Volume Up and Down
- ▷ Range setting (Gain or Sensitivity) Up and Down
- ▷ Zero, Plus and Minus
- ▷ Auto Zero - Automatic self-adjusting

### OUTPUTS

- ▷ Audio Frequency Pitch (speaker and jack for headset)
- ▷ Visual LCD Display
- ▷ Bar Graph - range Gain setting - milligauss
- ▷ RS-232 PC connection (cable included)
- ▷ Control all keypad functions data log range, keypad and signal settings works with hyper terminal or equivalent

### POWER OPTIONS

- ▷ Internal Battery: 12-volt, 7.2Ah sealed lead acid
- ▷ Battery Life: 72 hours continuous use, charges to full overnight
- ▷ External Power: 12 to 15-volt, cable included
- ▷ Internal battery charging circuit is enabled when external power or AC charging cable is connected

### DIMENSIONS

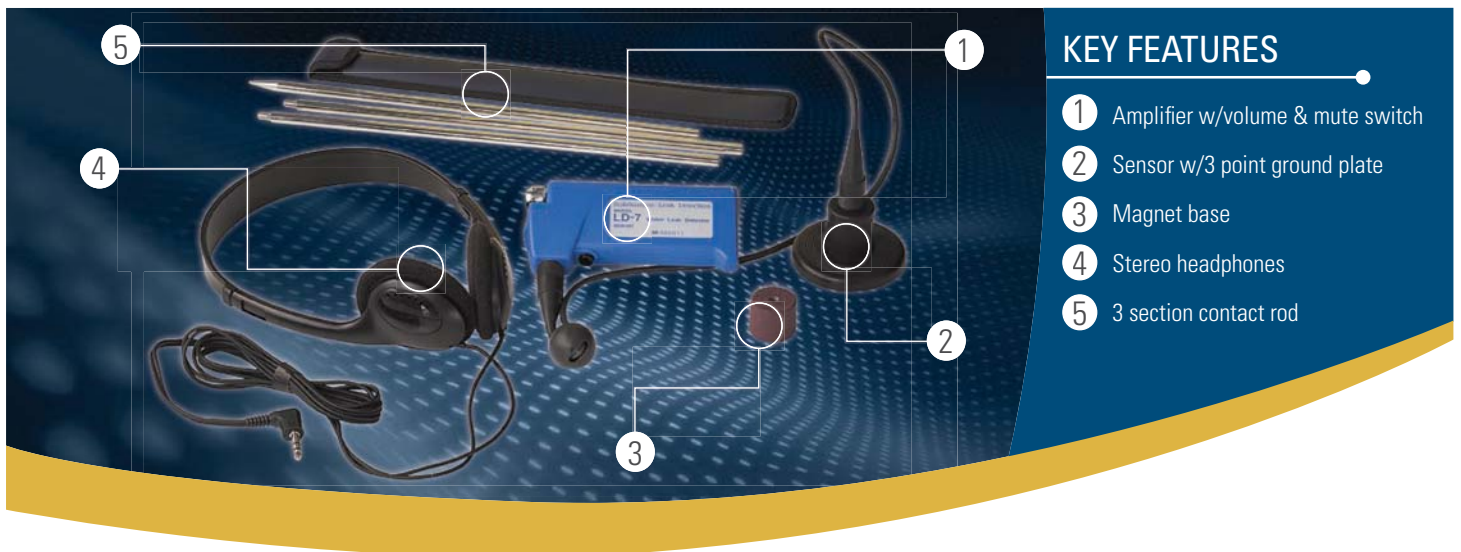
- ▷ Electronics: 16.9" w x 10" h x 6.5" d
- ▷ Sensor: 1.625" d x 34.375" L (4.13cm x 87.3cm)



### Includes:

- ▷ ABS custom case
- ▷ Connectivity cables
- ▷ Instruction manual

# LD-7 WATER LEAK DETECTOR



## KEY FEATURES

- 1 Amplifier w/volume & mute switch
- 2 Sensor w/3 point ground plate
- 3 Magnet base
- 4 Stereo headphones
- 5 3 section contact rod

## FEATURES

- ▷ Compact amplifier (with mute switch) fits inside the palm of the user's hand. Press the mute switch (on/off) to activate the leak sounds in the headphones, and then release the mute switch when moving the sensor (protects your hearing!).
- ▷ Designed for all of the water leak detection applications, including leak surveys and leak pinpointing. Use the 3-point ground plate for pinpointing on streets and concrete slabs. Use the magnet base or the contact rod for leak surveys at hydrants, valves, or meters.
- ▷ Extremely compact and lightweight. The entire LD-7 inside its heavy duty carrying case measures only 14 inches x 10 inches x 6 inches, small enough to be stored behind the seat inside the cab of the truck.
- ▷ 5 High Frequency filters, 3 Low Frequency filters (plus Low filter OFF), and 2 Notch filters (plus Notch filter OFF) to remove continuous interfering noises from A/C hum, motors, wind, etc.
- ▷ Hard ABS plastic custom carrying case included.

## SPECIFICATIONS

### AMPLIFIERS

- ▷ Input Impedance: 430k ohm +/- 1%
- ▷ Output Impedance: 4-10 ohm
- ▷ Amplification: 56 dB +/- 3%
- ▷ Frequency Range: 100Hz to 1500Hz
- ▷ Power: 2 AA dry cell batteries (1.5 V x 2)
- ▷ Power Consumption: 20 mA Nominal (30-hour life)
- ▷ Weight: 0.507 lb. (230 gm)
- ▷ Size: 5.7" x 3" x 1.25"  
(145mm x 30mm x 68mm)

### HEADPHONES

- ▷ Impedance: 20 ohms

### ABS CARRYING CASE

- ▷ Weight (full): 5.84 lbs (2.65 Kg)
- ▷ Size: 14" x 10.5" x 6"  
(356mm x 267mm x 152mm)



### Includes:

- ▷ ABS custom case

# LD-8 WATER LEAK DETECTOR



## KEY FEATURES

- 1 4-Section contact rod set (52")
- 2 Over the ear stereo headphones
- 3 Amplifier w/display & volume control
- 4 ABS plastic custom carrying case
- 5 Short contact rod (4")

## FEATURES

- ▷ Amplifier with push button ON/OFF switch, volume control, two-digit display of loudness, and three-range sensitivity switch.
- ▷ Use the short contact rod for listening at hydrants.
- ▷ Use the long contact rods for listening at below-grade meters and below-grade valves.
- ▷ Notch filters reduce A/C hum from transformers, power lines, etc.
- ▷ Excellent sensor sensitivity, leak sound amplification, and audio clarity.
- ▷ Stereo headphones with soft leather ear covers are comfortable for hours and hours.
- ▷ Use the two-digit display to compare the loudness of leak sounds at nearby locations, like adjacent water meters, close water hydrants, close water valves, etc. The display can show which is loudest when your ears can not tell.
- ▷ Sturdy, light-weight carrying case weighs only 10 lbs. and fits behind the seat in the truck.

## SPECIFICATIONS

### AMPLIFIER

- ▷ Sensor: Piezoelectric Element
- ▷ Amplification: 55 dB
- ▷ Frequency Range: 100Hz to 2000Hz
- ▷ Notch Filters: 150Hz and 180Hz
- ▷ Temperature Range: 25 F to 130 F
- ▷ Batteries: Two AA (dry cell or rechargeable)
- ▷ Battery Life: 24 hours minimum (alkaline cells)
- ▷ Weight: 10.6 ounces (with batteries)
- ▷ Size: 8.15" w x 3.3" h x 2.4" d

### HEADPHONES

- ▷ Impedance: Stereo, 8 ohms

### ABS CARRYING CASE

- ▷ Weight (full): 10 lbs (4.55 Kg)
- ▷ Size: 18" w x 12" h x 7" d  
(457mm x 304mm x 178mm)

### STANDARD CONTACT RODS

- ▷ Short Rod: 4 inches, anti-slip tip
- ▷ 4-Section Rod Set: 52" in 4 sections, each 13" long, threaded connections

### OPTIONAL CONTACT RODS

- ▷ 40 Inches Rod: Single piece, light-weight stainless steel
- ▷ 60 Inches Rod: Single piece, light-weight stainless steel



### Includes:

- ▷ ABS custom case
- ▷ Instruction manual

# LD-12 WATER LEAK DETECTOR



## STANDARD ITEMS

- ① 3 Section Contact Rod
- ② Amplifier
- ③ Ground Microphone & Handswitch
- ④ Magnet Base
- ⑤ Stereo Headphones
- ⑥ Nut Driver

## FEATURES

- ▷ Large meter display (with backlight) of sound loudness, allowing the user to pinpoint the exact leak location.
- ▷ Light weight amplifier, weighing only 31 ounces, with a padded carrying case and a strap.
- ▷ Six selectable filters, split into three "low side" filters (100Hz, 200Hz, or 400Hz) and three "high side" filters (600Hz, 800Hz, or 1200Hz).
- ▷ "Limiter" switch which cuts off all loud noises greater than 110dB. If you drop the sensor, you won't hurt your hearing.
- ▷ "Filter-Thru" switch, which turns OFF all of the amp's filters, allowing the user to hear all sounds from 50Hz to 15,000Hz.
- ▷ High-sensitivity ground microphone and low "electronic noise" amplifier combine to offer the very best quality sound for leak detection.
- ▷ Three accessories for attachment to the sensor:
  - ▷ Ground plate for pinpointing on streets/slabs
  - ▷ Magnet base for surveying at hydrants/valves
  - ▷ Contact rod for surveying at meters/fittings

## SPECIFICATIONS

### AMPLIFIER

- ▷ Input Impedance: 50k ohms
- ▷ Output Impedance: 15 ohms
- ▷ Amplification: 62 dB +/- 3dB
- ▷ Frequency Range:
  - 1) 100Hz to 1200Hz (13 dB) with Filter-Thru OFF
  - 2) 15Hz to 30,000Hz (13 dB) with Filter-Thru ON
- ▷ Power: 6 AA dry cell batteries
- ▷ Power Consumption:
  - 1) 70 mA or less with backlight ON
  - 2) 35 mA or less with backlight OFF
- ▷ Battery Life:
  - 1) 28 hours with backlight OFF (alkaline cells)
  - 2) 14 hours with backlight ON (alkaline cells)
- ▷ Weight : 31 ounces (885 g)
- ▷ Size : 6.7"w x 2.8"h x 4.1"d (170mm x 71mm x 103mm)

### ABS CARRYING CASE

- ▷ Weight (full) : 16.4 lb. (7.43 Kg)
- ▷ Size : 18.5"w x 14.6"h x 7.5"d (470mm x 371mm x 190mm)



AMPLIFIER WITH METER DISPLAY AND FILTER CONTROLS

### AMPLIFIER CONTROLS

- ▷ Power ON/OFF Switch
- ▷ Battery Indicator
- ▷ Adjustable Filter buttons
- ▷ Headphone Jack
- ▷ Sensor Jack
- ▷ Meter Display
- ▷ Volume Control
- ▷ Display Light Switch



### Includes:

- ▷ ABS custom carrying case
- ▷ Instruction manual



# LD-15 WATER LEAK DETECTOR



## KEY FEATURES

- 1 Amplifier w/meter display & filter controls
- 2 Aviation-grade stereo headphones
- 3 High sensitivity sensor & cable
- 4 Padded case & waist strap

## FEATURES

- ▷ High sensitivity sensor with Neodymium magnet (extra strong). Sensor and cable connection completely sealed and water-proof (submersible).
- ▷ Amplifier with superior audio quality (very low distortion and superior signal-to-noise ratio) and large meter display. Press the Mute Switch to hear sounds when you are ready.
- ▷ "Survey" for water leaks by listening at hydrants and valves with the sensor and magnet. Survey at water meters with a Long Contact Rod (optional).
- ▷ "Pinpoint" water leaks in pipes under asphalt or concrete with the base plate attached to the sensor and magnet.
- ▷ Use the High filter range for water leak surveying. Use the Low filter range for water leak pinpointing. High frequency leak sounds travel on the pipes, but only low frequencies pass through the soil.

## SPECIFICATIONS

### AMPLIFIER

- ▷ Amplification: 56 dB
- ▷ Filter Ranges:
  - 1) High Range: 30 Hz to 5000 Hz
  - 2) Low Range: 30 Hz to 800 Hz
  - 3) Notch Filter: 150 Hz, 180 Hz
  - 4 "C" dry cell batteries
- ▷ Power:
- ▷ Battery Life: 80 hours with alkaline batteries at 68° F
- ▷ Weight: 31 ounces (including batteries)
- ▷ Size: 6.4" w x 3.0" h x 5.7" d (163mm x 76mm x 144mm)

### SENSOR

- ▷ Sensitivity: 10 V/g
- ▷ Resonance Frequency: 950 Hz ( $\pm 150$  Hz)
- ▷ Weather Protection: IP68 or equivalent (3 ft under water for 3 hours)
- ▷ Cable Length: 9.75 ft



### Soft Case

- ▷ Padded custom case
- ▷ Standard belt (40 inches)



### Includes:

- ▷ ABS custom case
- ▷ Instruction manual

# LD-18 WATER LEAK DETECTOR



## KEY FEATURES

- 1 Amplifier w/LCD, & Control Panel
- 2 Padded case for amplifier
- 3 Magnetized sensor (optional)
- 4 Aviation-grade stereo headphones
- 5 Ground mic & hand switch

## FEATURES

- ▷ All-digital amplifier, with automatic noise reduction of intermittent sounds, high and low filters, storage and graphing of sound levels at different locations on the pipe, bar graph and numeric display of sound loudness, USB connection, and back light.
- ▷ Automatic noise reduction capability for intermittent noises such as pedestrian footsteps, people talking, and passing vehicles.
- ▷ Storage and graphical display of the leak's loudness at multiple locations along the pipe.
- ▷ Large LCD Display, provides superior visibility in both direct sunlight and dark environments.
- ▷ 5 High Frequency filters, 3 Low Frequency filters (plus Low filter OFF), and 2 Notch filters (plus Notch filter OFF) to remove continuous interfering noises from A/C hum, motors, wind, etc.
- ▷ Hard ABS plastic carrying case included.
- ▷ Soft padded case and waist strap for the transmitter.



### Includes:

- ▷ ABS custom case
- ▷ Screw driver
- ▷ Waist strap
- ▷ USB cable
- ▷ Instruction manual

## SPECIFICATIONS

### AMPLIFIER

- ▷ Combined Sensitivity: 900 V/G or higher (at 400 Hz) and Amplification
- ▷ Low Filters: Off, 100 Hz, 200 Hz, 400 Hz
- ▷ High Filters: 400 Hz, 600 Hz, 800 Hz, 1200 Hz, 2200 Hz
- ▷ Notch Filters: Off, 50 Hz, 60 Hz
- ▷ Maximum No. of Sound: 250 (by date and time) Levels Saved in File
- ▷ Power: 4 C dry cell batteries
- ▷ Battery Life: 24 hours minimum (continuous use)
- ▷ Frequency Range: 50 Hz to 2200 Hz
- ▷ Weight: 35 ounces (including 4 C batteries)
- ▷ Size: 6.4" w x 3.0" h x 5.7" d (163mm x 76mm x 145mm)
- ▷ Weather Resistance: IP52 equivalent
- ▷ Temperature Range: Minus 4 F to Positive 130 F (Working)

### SENSOR

- ▷ Type: Piezo electric ceramic
- ▷ Weather Resistance: IP67 equivalent (3 ft water depth for 30 minutes)
- ▷ Standard Base: 3 - Pronged Plate (removable with nutdriver)

# LC-2500 LEAK NOISE CORRELATOR



## KEY FEATURES

- 1 Main Processor Unit
- 2 LCD Screen & Control Panel
- 3 Blue Pre-Amp w/radio communication
- 4 Red Pre-Amp w/radio communication
- 5 Small sensors for metal pipes

## FEATURES

- ▷ Main Processor Unit with 24 bits digital signal processor, for much faster correlations.
- ▷ New LC-2500 high sensitivity sensors with strong magnets and 100dB dynamic range.
- ▷ Powerful transmitter radios, with 500 mWatts output to send signals up to 3,000 feet.
- ▷ Large LCD Display, provides superior visibility in both direct sunlight and dark environments.
- ▷ Compact and lightweight, less than 7 pounds, can easily be carried all day.
- ▷ Main processor unit & transmitters can operate in rain storms, sub-zero temperatures and direct sun for hours.
- ▷ The new LC-2500 sensors are very sensitive, small in diameter, and totally submersible.
- ▷ Runs all day on standard or rechargeable "D" batteries.
- ▷ Input pipe materials, diameters, and lengths by simply selecting them in the program menus. The automatic functions can do the rest.
- ▷ Blue Pre-amp/Transmitter and Red Pre-amp/Transmitter "hear" the leak sounds at two pipe locations and transmit them separately to the main processor unit.
- ▷ 2 Hard ABS plastic carrying cases included.

### Optional Accessories:

- ▷ Two red sensors for PVC Pipes, "Poly" services, and large diameter mains
- ▷ LC-2500 Windows™ PC software (downloadable)

## SPECIFICATIONS

### MAIN PROCESSOR UNIT

- ▷ Operating temperature range: -10 to 50°C
- ▷ Applicable standard: IP52 (weather tight)
- ▷ External dimensions: 7.8" w X 9.9" h X 4" d
- ▷ Weight: Approx. 6.8 lb. (with batteries)
- ▷ Battery: 4 "D" Cells (std or rechargeable)
- ▷ Continuous Operating Time: 13 hours minimum (at 20°C, backlight OFF)
- ▷ Minimum Operating Voltage: 4.2V
- ▷ Input: Radio or Cable
- ▷ Display: Dot matrix LCD
- ▷ Operation: Polarity correlation
- ▷ Td Range: 650ms, 6100ms, 200ms, 6400ms, 6800ms, 61600ms or automatic setting
- ▷ Time Resolution: 25 ms (in 650ms range), 50 μs (in 6100ms range), 100 ms (in 6200ms range), 200 μs (in 6400ms range), 400 ms (in 6800ms range), 800 μs (in 61600ms range)
- ▷ Filter Range: THRU, 80Hz to 5,000Hz (4 low and 4 high)
- ▷ Notch filter: OFF, 50Hz, 60Hz
- ▷ Auto Filter: Automatically selected from FFT operation
- ▷ Data Memory: 100 correlations
- ▷ FFT Monitor: 1kHz, 2.5kHz, 5kHz (common to both channels)
- ▷ Sound memory: For 16 seconds
- ▷ External Interface: RS-232C

# LC-2500 LEAK NOISE CORRELATOR



High sensitivity, small diameter LC-2500 Sensors standard for metal pipes and A/C mains



Low Frequency Red Sensors for PVC pipes, "poly" services, and large mains. (optional)



David Clark 100 d/c aviation-grade stereo headphones (included).

## FEATURES

### SETUP AND FUNCTIONS

- ▶ **Main Menu:**  
Is the "home page" where every correlation begins. Icons in the upper left corner tell battery power, headphones selection, transmitters received, and RUN status. Press the 2 key to start the correlation.
- ▶ **Status Setup:**  
Choose either the manual or automatic modes for the time delay (Td) range and the filters. In AUTO, the Td range automatically adjusts for all different pipe lengths and materials. In FILTER SETUP, select the high, low, and "notch" filters.
- ▶ **Pipe Data Input:**  
Choose the pipe material, diameter, and length for every section of pipe between the two sensors. Up to six pipe sections can be entered (always in order from the "Blue" sensor to the "Red" sensor).
- ▶ **FFT Analysis:**  
The user can examine the sound signals from both sensors from 0 to 5000 Hz. The FFT function can automatically select the high and low filters if AUTO is chosen in FILTER SETUP.
- ▶ **Correlation:**  
The correlation "picture" indicates whether the leak sounds are clearly heard at both sensors. The distance to the leak and the filter settings are displayed.



## SPECIFICATIONS

### RED AND BLUE PRE-AMPLIFIERS

- ▶ Operating temperature range: -10 to 50°C
- ▶ Applicable standard: IP52 (weather tight)
- ▶ External dimensions: 5.9" w X 14.5" h X 4.3" d
- ▶ Weight: Approx. 6.3 lb. (with batteries)
- ▶ Battery: 6 "D" Cells (std or rechargeable)
- ▶ Continuous Operating Time: 10 hours minimum (at 20°C, backlight OFF)
- ▶ Minimum Operating Voltage: 6V
- ▶ Input:
  - Input Frequency Range: 20Hz to 5kHz (at THRU filter setting)  
100Hz to 5KHz (at STD filter setting)
  - Input Sensitivity: 50 micro V, max.
  - Signal to Noise Ratio: 35dB, min.
- ▶ Radio communication System
  - Output Frequency: UHF under approved freq.
  - Modulation: Direct frequency modulation
  - Output Power: 0.5W (500mW)
  - Output Impedance: 50- $\Omega$

### SENSORS

- ▶ Type: Piezoelectric pick-up
- ▶ Voltage Sensitivity: 2.5V/g (peak)
- ▶ Applicable Standard: IP68 (water-proof)
- ▶ Drop Resistance: 3 feet (asphalt)
- ▶ External Dimensions: 1.2" diameter x 5.1" high
- ▶ Weight: 15 ounces each
- ▶ Power Supply System: 3-wire
- ▶ Output Impedance: 100V, max.
- ▶ Power Supply Voltage: 5.0V

По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72  
Астана +7(7172)727-132  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
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Казань (843)206-01-48

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Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78

Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Уфа (347)229-48-12  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

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