



Warranty Registration



Please register online

Scan the Code with your smartphone or go to our website at:

www.ssilocators.com/warranty-registration

Operator's Manual

- Originally designed by NASA engineers for use in lunar exploration
- Re-designed to find buried objects and pipes of all kinds including PVC, PE, Rubber, Steel, etc.
- Patented, Radio Frequency Technology
- Lightweight, Durable Construction



SAFETY INFORMATION



READ & OBSERVE ALL INSTRUCTIONS

Save these instructions for future reference.



INSPECTION OF THE AML PRO

DO NOT open the housing of this unit; doing so will damage the transmission and receiving antennas. There are no user serviceable parts inside. Opening the sealed case will void the warranty.



If maintenance, tuning or repair becomes necessary, contact:

SubSurface Instruments, Inc.

Email: info@ssilocators.com Telephone: 920-347-1788 or Toll free: 1-855-422-6346

Or by mail:

SubSurface Instruments, Inc.

1230 Flight Way Drive De Pere, WI 54115 USA

















SAFETY INFORMATION



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LASER

This product uses a Class II/2M laser. Avoid direct exposure to the beam.

Do not direct the laser beam at people or animals. Do not stare into the laser beam. The AML Pro produces Laser Class II/2M laser radiation according to IEC 60825-1.

Looking directly into the laser beam - especially with optical instruments such as binoculars or magnifiers - can permanently damage the eye.

This is a professional tool, not a toy. It should not be used by children



OPERATION

Only use this equipment for the purpose specified by the manufacturer. Any misuse may void the warranty.



RoHs Compliant

The Restriction of Hazardous Substances Directive restricts the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment.

HOW THE AML WORKS?

A powerful 2.45 GHz radio frequency locates density differences through the transmission and reception of UHF signals.

The unit locates objects by analyzing differences in material densities, which are then interpreted by the highly advanced circuitry.

The signal can travel, on average, around 20'; but the maximum depth is directly related to the type of substrate you are working on.

USER REFERENCE - SCANNING QR CODES

The AML Pro has a QR Code placed on the blade's face. Scan this code for more operator information and for continuing updates provided by the manufacturer. AML Pro additional information can be accessed from your smart phone using a standard QR code App. For more information on how to download and/or use a QR code App., visit the App. store on your smart phone. Reference materials can also be accessed by visiting the SSI website at www.ssilocators.com



The All Materials Locator finds Density Changes Between Material



- 1 THREADED BATTERY CAP
- (2) ergonomic handle
- (3) PUSH KEYPAD
- (4) TARGET INDICATOR LIGHTS
- (5) BACK-LIT LCD DISPLAY
- **(6)** uhf rf signal transmitter
- (7) LASER POINTER
- 8 UHF RF SIGNAL RECEIVERS
- 9 3.5mm HEADPHONE JACK
- (10) mini usb port/connector
- (11) lithium external battery
- **(12)** 9V BATTERY PACK
- 13 NOISE REDUCING HEADPHONES

AML PRO PARTS OVERVIEW











(1) POWERING OPTIONS.

Powered by either a convenient 9v battery system or by a rechargeable lithium battery pack.

Remove used 9v batteries by unscrewing the battery cap and sliding the battery sleeve out. Install fresh new 9v batteries. Make sure to insert the sleeve back in with the silver lead end first and tighten the battery cap.

(2) CONTROL PANEL.

Gives you access to the many features of the AML Pro and allows you to navigate through the AML Pro's menu screens. There are six function buttons; ON/OFF, TX (Transmitter), MENU, DOWN ARROW, UP ARROW, SEL (Select).

(3) TARGET INDICATORS.

Right and Left LED target indicators identify when an object has been located. Digital target indicators are displayed at the bottom of the LCD display and work in unison with the right and left receivers to indicate an object's presence.

AML PRO FEATURES







- 4 UHF RADIO TRANSMITTER/RECEIVERS
 The transmitter emits high frequency radio
 waves. The receivers capture the reflected
 waves with antennas on both ends of the
 unit.
- (5) LASER TARGET INDICATOR. A red laser indicator identifies the target position when an object has been detected; an audible signal is emitted when both indicators are on.
- OUSB PORT. The USB Port has several functions such as connecting the external lithium battery supply to the USB Port for extended power, and for uploading or downloading diagnostic information including GPS log

<u>^!\</u>

DO NOT connect the AML Pro directly to an AC outlet through the USB Port.

This will result in permanent damage to the internal circuitry of the unit.

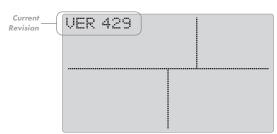
CONTROL PANEL

AML Pro Control Panel Keypad Functions



Control Panel Keypad

Press and hold the On/Off Button until the SSI Logo appears on the screen. It takes about 3 seconds for the AML Pro to perform a self-check; after that it will display the current revision on the start up screen.



Opening Screen - Current Firmware Installed

When the self-check is completed, the MAIN SCREEN will appear.

Control panel functions

There are six function buttons on the AML Pro control panel:

- ① On/Off Press and hold the On/Off Button to turn the unit On or Off.
- 2 TX (Transmitter) Press the TX Button to turn the transmitter On or Off.
- Menu Press the Menu Button to bring up the Menu Screen. There are two pages of Menu Screens.
- 4 Down Arrow Use the Down arrow to eithe adjust the sensitivity level down or to move the cursor down once inside of the menu screens
- Up Arrow Use the Up arrow to either adjust the sensitivity level up or to move the cursor up once inside of the menu screens.
- SEL Press the SEL button to either activate the GPS Functions or to Select the Menu option once inside of the menu screens.



RTC (Real Time Clock). Is set to 24-hour Military Time. Adjust it to your area's time utilizing the Time Zone Chart in page 15.

GPS (Global Positioning System). Digits on the screen are read in degrees, minutes and seconds. Latitude: N for North of the equator or S for South of the equator. Longitude: E for East of the Prime Meridian or W for West of the Prime Meridian

SATS (Satellites). refers to the number of satellites communicating with the AML Pro

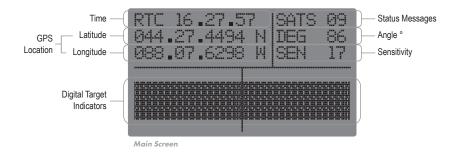
DEG (Degree). As referenced from the blade face angle (0°) of the AML Pro.

SEN (Sensitivity Level). shows the current Level of Sensitivity (1 to 32 with 32 being the most sensitive).

Digital Target Indicators. They appear at the bottom of the screen. Both bars will come together when a target is positively identified.

MAIN SCREEN INTERFACE

This screen is displayed when the AML Pro is in Operate Mode.



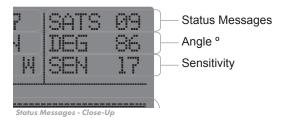
TX (Transmitter) Press the TX Button to turn the transmitter ON or OFF. When the transmitter is OFF, a STANDBY message on the right side of the screen will appear.

When the transmitter is turned back on, the message will change to OPERATE.

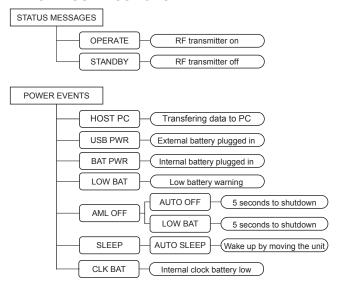
RTC	16	.27.57	STANDBY
044	.27	_4494N	DEG 86
088	.07	.6298#	SEN 17

RTC	16	.27.57)	OPER	TE
944	.27	.4494	Ν	DEG	86
088	.07	.6298	М	SEN	17

STATUS MESSAGES FLOW CHART



GENERAL STATUS MESSAGES



GENERAL STATUS MESSAGES

All status messages are displayed on the top right corner of the LCD Display. Every time there is a new event, a message will be displayed for 4 seconds and then it goes back to OPERATE status.

POWER EVENTS

Directly related to power consumption, power source and auto shut off setting in the AML Pro. The unit will emit a sound and display the related message.

Use the POWER EVENTS flow chart as a reference for all events descriptions. The low battery event applies only to the internal 9v battery pack.

A rechargeable coin battery is located within the unit, the CLK BAT message indicates low voltage on it. Keep a fresh 9v battery pack in the unit to recharge the internal battery.

GPS EVENTS

(See the GPS downloads section for detailed information).

Display the GPS coordinates on the screen by pressing the SEL button, a minimum of 3 satellites is needed to display coordinates on the screen. Continue pressing SEL every time you want to record a GPS coordinate. The AML's memory will store up to 300 logs.

The unit will emit a sound and show SATS ##
message every time a new satellite has been
acquired or dropped. We recommend
having at least 10 satellites locked for more
accurate coordinates. The accuracy of
the coordinates will increase with a higher
number of satellites.

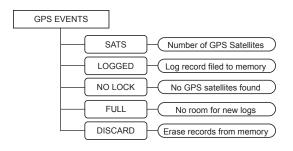
CALIBRATION EVENTS

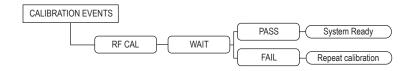
Perform the Calibrate option on the AMI
Pro's menu to re-calibrate your unit and
restore original values to the RF circuit
board.

Go to page 17 for more details about the calibration process.

Note: This process does not restore other factory settings.

STATUS MESSAGES FLOW CHART





MENU SETTINGS

The AML Pro has 6 menu settings listed on the screen

>SPEAKER VOLUME2
TIME ZONE SET18
BACKLIGHT OFF/ON0
AUTO OFF MIN00
CALIBRATE00
FACTORY SETTINGS

AML Pro Menu

Press the MENU Button to display the AMI Pro settings.

- This symbol will mark the menu setting you want to adjust.
- Use the UP and DOWN arrows to navigate through the menu settings.
- Press the SEL button to adjust the setting. Continuing to press SEL (select button will loop the selection until reaching desired setting.
- Press the MENU Button to save the setting and exit the MENU screen.

NOTE: The MENU will time out after 30 seconds if no changes are made. Either press the Menu button, or let the MENU time out to save changes. If the unit is turned off while in the menu screen, it will NOT save the changes recently made.



MENU SETTINGS

SPEAKER VOLUME. Controls the built-in speaker volume. Set it to 0 to mute and 3 for the highest volume level.

TIME ZONE SET. Set your current location's time on the clock. See next page for full description.

⇒ BACKLIGHT OFF/ON. Set to 1 to turn the backlight on. Set to 0 to turn it off.

AUTO OFF MIN. Automatically shuts off the unit after inactivity. Set it to 5, 20 or 30 minutes or to 0 to disable it. A STANDBY message will display and an audible alert will sound when it activates. The unit will shut off immediately after.

CALIBRATE. Re-Calibrates the RF board to original parameters. Go to page 17 for details.

FACTORY SETTINGS. Returns the unit to its original factory settings (Backlight, Speaker Volume, etc). This will erase the GPS Logs stored in the memory.

>SPEAKER VOLUME	2
TIME ZONE SET	18
BACKLIGHT OFF/ON	0
AUTO OFF MIN	88
CALIBRATE	88
FACTORY SETTINGS	0

AML Pro Menu





Press the SEL button to adjust the setting. Continuing to press SEL button will loop the selection until reaching desired setting.

MENU SETTINGS

SPEAKER VOLUME2	
>TIME ZONE SET18	3
BACKLIGHT OFF/ON0	
AUTO OFF MIN0	9
CALIBRATE0	a
FACTORY SETTINGS0	

AML Pro Menu





Press the SEL button to adjust the setting. Continuing to press SEL button will loop the selection until reaching desired setting.

Reference the Time Zone World Map on the next page for more information.

TIME ZONE SET. Sets the clock to local time

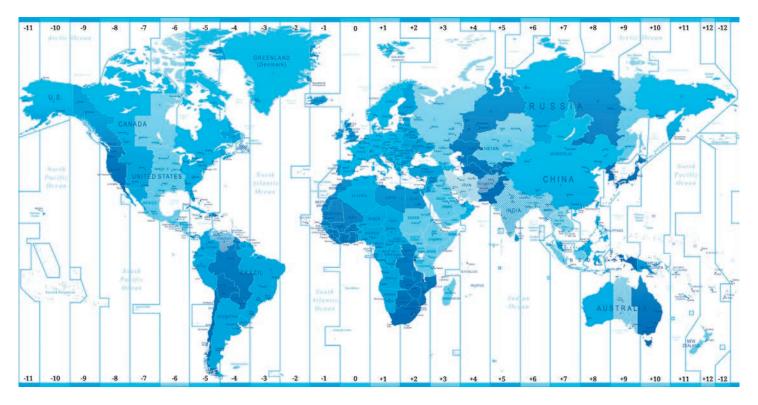
Use the following OFFSET table to find the corresponding CODE for your Coordinated Universal Time (UTC) zone.

UTC Time Offsets	ENTER THIS CODE	UTC Time Offsets	ENTER THIS CODE
UTC ± 00.00	00	UTC ± 12.00	12
UTC + 01.00	01	UTC - 11.00	13
UTC + 02.00	02	UTC - 10.00	14
UTC + 03.00	03	UTC - 09.00	15
UTC + 04.00	04	UTC - 08.00	16
UTC + 05.00	05	UTC - 07.00	17
UTC + 06.00	06	UTC - 06.00	18
UTC + 07.00	07	UTC - 05.00	19
UTC + 08.00	08	UTC - 04.00	20
UTC + 09.00	09	UTC - 03.00	21
UTC + 10.00	10	UTC - 02.00	22
UTC + 11.00	11	UTC - 01.00	23

Enter the corresponding CODE and save your adjustment. The RTC (Real Time Clock) will be updated right after a GPS communication has been made. If you are in a location without GPS signal the RTC won't be updated.



TIME ZONE WORLD MAP



Please contact us at info@ssilocators.com for more information.

CALIBRATE. Re-calibrates your unit and restore original values to the RF circuit board. Note: Does not restore other factory settings.

Jse the following procedure to calibrate the unit:

- (1) Move to an outdoor location.
- (2) Select CALIBRATE from the menu.
- (3) Keep the AML Pro positioned at an approximate 90° angle in front of you.
- (4) Change the value from 00 to 10 and save the selection by pressing MENU.

You have 10 seconds from this point to finish the process.

If you exceed this time, the process will time out and

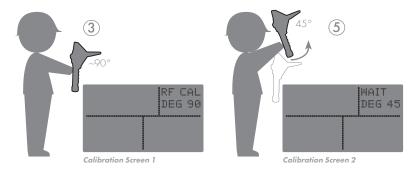
You'll have to restart it.

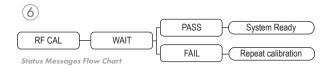
- (5) Point the AML to an unobstructed sky. Raise the AML slowly until it reaches 45° and the screen displays a WAIT message.
- 6 Hold the AML for approximately 7 seconds until the PASS or FAIL message is displayed
 - Pass Unit is calibrated and ready to use.
 - Fail Repeat the process. Contact SSI if the Fail message persists.

MENU SETTINGS

	SPEAKER VOLUME2	
	TIME ZONE SET18	
	BACKLIGHT OFF/ON0	
	AUTO OFF MIN00	
2	>CALIBRATE10	4
	FACTORY SETTINGS0	

AML Pro Menu

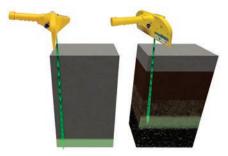




USING THE AML PRO



Practice on a Known Object



Signal Penetrates Deeper Through High Density Materials

The proper operation of the AML Pro requires a lot of practice. We advise that you practice on a known buried object like a culvert pipe or other partially exposed objects. Once the principles of operation are understood, acquiring a technique is relatively simple with a little practice. Factory training is available and highly recommended

The depth of the AML Pro transmission signal varies with the type of soil. This unit can be used in various material types such as water, snow, red-clay, and does not have some of the testrictions of around penetratina (GPR) radar.

The AML Pro has 32 sensitivity settings with setting 32 being the strongest. The transmission signal will penetrate deeper through high density materials such as concrete, clay, asphalt, or highly compacted soil; and less deep in sand, granular soil, or recently backfilled soil which tends to absorb some of the return signal.

IMPORTANT: The AML Pro is water-resistant, not water-proof.



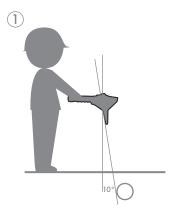
LOCATING AN OBJECT WITH THE AML

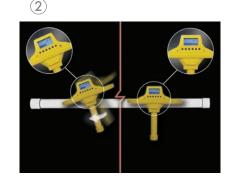
- ① Do not hold the unit above the handle finger knurls as it will produce false readings. Hold the handle parallel to the ground at waist level and at a minimum of 18 inches out in front of your body. The blade face of the unit is designed with a 10° degree outward projection to eliminate interference with the operator's feet.
- (2) When an object is detected, the left LED or the right LED will illuminate. When both LED target indicators illuminate, an audio tone will sound, and the laser indicator will activate identifying the position of your target.
- 3 Lower the sensitivity level to the lowest setting that will still identify the object; this will prevent most false readings from being identified.
- Continue to scan the target holding the handle parallel to the ground and scan the area with a slow and deliberate back and forth "W" movement.

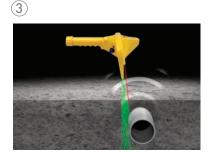
PLEASE SCAN TO WATCH TUTORIAL VIDEOS

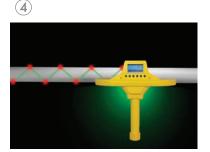


USING THE AML PRO









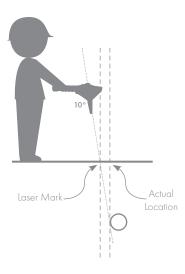
USING THE AML PRO

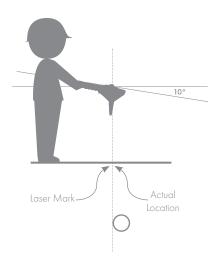
SFARCHING POSITION:

Objects are further than they appear when in the searching position.

LOCATING POSITION:

Tilt the handle upward until the screen displays 0°.





MARKING THE EXACT LOCATION OF AN OBJECT WITH THE AML PRO

Remember that the 10° forward projection of the blade will make the object appear closer than it actually is.

Once the object is found, pivot the handle of the AML Pro upward until the screen displays 0° and the blade of the unit is directly above the area of the signal.

You can now scan the ground for the entire length of the object. Identify its diameter or width, location and run direction as you track the object.

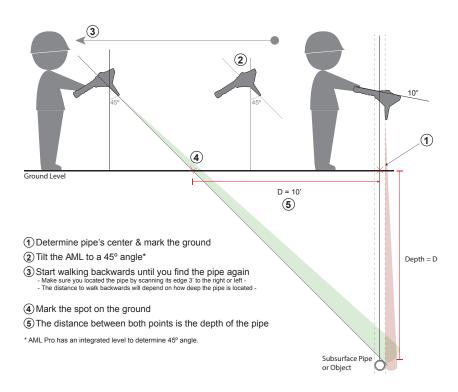
To prevent most false readings from being identified, decrease the sensitivity level to the lowest setting that will still identify the object.

Determining depth with the AML Pro

Once you have located the PVC pipe o underground object:

- Find its center and mark its position on the ground.
- Tilt the handle of the unit downward until the blade is at 45°.
- Walk backwards until you find the top of the pipe, "make sure you found the pipe by scanning its edge 3' to the left or right of your position".
- Make a mark where the laser indicator is located on the ground.
- Measure the distance between both of the marked points, this will be the depth a where the PVC pipe is located.

USING THE AML PRO



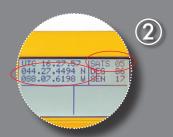
GPS Logs Download

How to download GPS Logs from AML Pro
*Exclusively for Windows Operating Systems



AML Pro Series







RECORDING GPS COORDINATES WITH THE AML PRO

The AML Pro has a GPS tracking system that is active as soon as you turn ON your unit. It is only able to acquire public GPS satellites when you are using the All Materials Locator outdoors.

- Press the SEL button to display the GPS information on the screen. When the unit locks at least 3 satellites, it will show the coordinates on the display. If no satellites have been acquired, it will display zeros instead of location coordinates.
- 2 The accuracy of the coordinates will increase with a higher number of satellites. It's recommended to lock at least 10 satellites to record reliable information; the amount of satellites that you'll have access to, depends on your location.
 - The screen will show the number of satellites on the message status area for **4 seconds** whether you acquire or loose satellites and will also, display your current GPS coordinates on the left side of the screen.
- 3 Press the "SEL" button every time you want to record a GPS coordinate to the AML Pro's memory; if the message "NO LOCK" is displayed, you don't have enough satellites and must wait to acquire more satellites to continue the process.

Up to 300 logs can be recorded in the AML Pro's internal memory, the system will show a FULL message when that number has been reached and you'll need to transfer the data to your computer to continue recording.

23

INITIAL SETUP (WINDOWS COMPATIBLE)

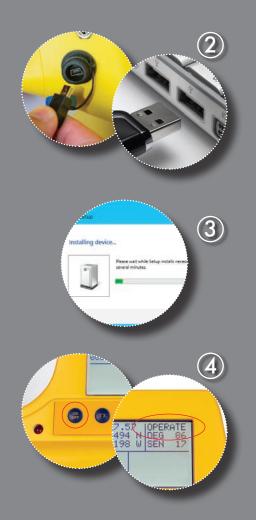
- 1 Download the GPS Logs Transfer App from our website www.ssilocators.com/products/AML-PRO.
 - A Click on the GPS Logs Transfer App link under the Download Links section.
 - B It will **automatically download** a compressed folder to your computer; choose a location and save it.

(At SSI we ensure our applications are virus free and safe to install in your computer. You can safely accept the Windows security measures.)

- 2 Open the compressed folder "file_aml_gps_download_utility.zip". If you can't find it, it's usually in your downloads folder.
- 3 Select **both files** (App & folder) located inside of the folder and copy them.
- Paste the files into your desktop,
 - (application's file)
 - B GPS Logs Folder (destination's folder for your downloaded GPS coordinates)

Note: We suggest you place the application and destination folder on the desktop for easy access, but you can place them anywhere in your computer that is more convenient to you.





CONNECTING YOUR AML PRO TO THE COMPUTER

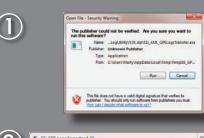
- 1 After acquiring the GPS logs from your work-site, turn your AML Pro OFF before connecting it to the computer. Your computer MUST be connected to Internet to complete this process.
- Plug the provided USB cord into the unit. **DO NOT TURN THE AML Pro ON**. Plug the other end of the cord into a USB port in the computer. As soon as you plug into the USB port the computer will automatically start installing the drivers for the unit into your system (*Important: from the Internet*).
- Your computer will prompt a successful installation message after it's done installing the drivers. - This is a Windows process and may vary depending on your computer's Operating System -

Note: USB PWR status message will show on the screen for 10 seconds.

Turn the AML unit ON and start up messages will be displayed. Wait until the status message changes to "OPERATE". You are now ready to start.

RUNNING THE GPS LOGS TRANSFER APPLICATION

- ① Click on the GPS Logs Transfer Icon to run the application. Your system will prompt the security settings; the application is safe and you can run it with confidence.
- The program will ask if the AML is connected and turned ON. If the unit is ready to transfer with the status message on "OPERATE", click OK
- 3 The application will find the AML connected to your system and assign it a Comm Port number. This number will vary with each computer. Click OK to continue.
- (4) If the AML was not found, you'll get notified with an error message on the screen. Close the App, disconnect the USB cable from the computer and re-start the process. Sometimes the USB port does not recognize the unit and a simple reset will correct the problem. Click OK to continue.

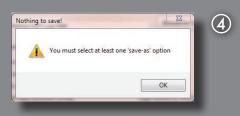


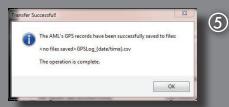












DOWNLOADING GPS LOGS FILES

- Select the "Browse for Save Folder" button, and search for the folder you previously created to store your GPS Logs, we suggested before to place it on your desktop.
- 2) The screen will show 4 file formats to download your data. Select at least one, by checking the box to the left of the file extension.
 - Read the description on the screen to choose the file that fits your needs. You can select all four if you prefer.
- 3 Click on the "Retrieve Logs" button to start downloading.
- (4) If by mistake you did not check any box, the application will display a message to remind you that you need to select at least one file extension.
- (5) The process takes only a couple seconds and the application will display a message to let you know that the data transfer was successful.

CLOSING THE GPS LOGS TRANSFER APPLICATION

1) You can delete all the GPS Logs stored in the AML's memory. Choose "YES" or "NO" to clear the memory.

Note: Go to your GPS Logs folder to confirm the data was successfully transfered before deleting any files from the unit.

If you choose "NO" go to Step 3. The memory will recycle and if the memory is full, the oldest entry will be overwritten.

(2) If you choose "YES" a confirmation message will be displayed on the screen after the records have been deleted.

Important: This process CANNOT be undone! Once the Logs have been erased you won't be able to recover them.

- 3 To exit the application, press the X on the top right corner of the software screen.
- 4 The App will reset the connection with the AML and save the changes; click OK to disconnect the unit.

After the software has been closed, you can safely unplug the AML Pro from the USB port.







TESTING THE GPS LOGS FILES

- 1) You can find the GPS Logs Files inside of the Folder you created at the beginning of the process
- ② Use the files as a source for your mapping software. An example would be GPS Visualizer:

www.gpsvisualizer.com

For more information or If you have any questions, please contact us at:

info@ssilocators.com - Toll free: (855) 422.6346

Or visit us at:

www.ssilocators.com

TECHNICAL SPECIFICATIONS

PRODUCT INFORMATION

Physical Dimensions

Height	13"	. 33 cm
Length	14"	. 35.6 cm
Width	6"	. 15.2 cm
Weight2.5	5lbs	. 1.13 ka

Power Specifications

Estimated Battery Life:

- (3) 9-Volt Industrial Strength Alkaline
 Provides up to 7 hours of continuous
 operation at full power, or 40 hours at
 average industry usage.
- Lithium Rechargeable Battery Pack
 Provides over 12 hours of continuous
 usage and cellphone recharging, or
 over 75 hours of use at average industry
 usage.

Typical Operating Range

Temperature	-20°F to	120°F
	-29 C to	49°C

Shipping Dimensions

Cube	20" × 17" × 8"
	51cm x 43cm x 20cm
Weight	17lbs7.7 kg

Includes

- (1) AML Pro Unit
- (2) Battery Sleeves (Each housing [3] 9-Volt Batteries)
- (1) Lithium Rechargeable Battery Pack with Battery Chargers and Cables
- (1) Noise reducing Headphones
- (1) Waterproof Foam-Insulated Hard Case
- (1) Operator's Manual







Please register your AML Pro Within 30 days of receipt.

It will improve the quality of service we can provide and give us the ability to contact you with updates and upgrades about your unit.

Any unit in need of repair must be returned to:

SubSurface Instruments, Inc. 1230 Flight Way Drive De Pere, WI 54115 USA 920.347.1788 phone info@ssilocators.com www.ssilocators.com



SubSurface Instruments, Inc. is not responsible for errors and/or omissions in this manual. Information in this manual is subject to change without notice.

WARRANTY STATEMENT

WARRANTY PERIOD 36 months or (3) years from original user's purchase date.

The All Materials Locator-Pro (AML Pro) is free of defects in both material and workmanship to the original purchaser. Save your invoice and shipping documents for reference.

Physical abuse, battery acid and water damage as determined by the sole discretion of SubSurface Instruments Inc., are explicitly and entirely excluded from this warranty. Additionally, this is a scientific instrument and cannot be protected by the manufacturer from damage if dropped or if placed in an environment which will cause physical or chemical harm to the unit.

SubSurface Instruments' liability under this warranty is absolutely limited to repair, service, or replacement of the product, at the sole discretion of SubSurface Instruments Inc. No other warranty is expressed or implied.

DISCLAIMER

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