



# **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 unit's housing, as this will damage the transmitting and receiving antennas. The unit contains no userserviceable parts, and 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



# READ & OBSERVE ALL INSTRUCTIONS

Save these instructions for future reference.



## LASER

This product uses a Class IIIb 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 IIIb 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. Use eye protection when using this product. When the two LED lights are on, that indicates the laser is on. 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?**

The unit utilizes a powerful 2.45 GHz radio frequency to detect density variations by transmitting and receiving UHF signals.

It identifies objects by analyzing material density differences, which are processed by its advanced circuitry.

On average, the signal penetrates up to 20 feet; however, the maximum depth depends on the type of substrate being analyzed.

#### USER REFERENCE - SCANNING QR CODES

The AML Pro features a QR code located on the blade's face. Scan this code for detailed operator information and updates from the manufacturer. Additional information about the AML Pro can be accessed on your smartphone using a standard QR code app. To learn how to access the QR code information, refer to your smartphone's camera manual. You can also find reference materials by visiting the SSI website at www.ssilocators.com.



The All Materials Locator finds Density Changes Between Materials and works over almost all surfaces.



- (1) THREADED BATTERY CAP
- ② ERGONOMIC HANDLE
- (3) PUSH KEYPAD
- (4) TARGET INDICATOR LIGHTS
- (5) BACK-LIT LCD DISPLAY
- (6) UHF RE SIGNAL TRANSMITTER
- (7) LASER POINTER
- (8) Uhf rf Signal receivers
- (9) 3.5mm HEADPHONE JACK
- 10 MINI USB PORT/CONNECTOR
- (1) USB DATA TRANSFER CABLE
- (12) TWO LI-ION BAT. PACKS
- 13 NOISE ISOLATING HEADPHONES

## **AML PRO PARTS OVERVIEW**



1

#### **POWER SOURCE**

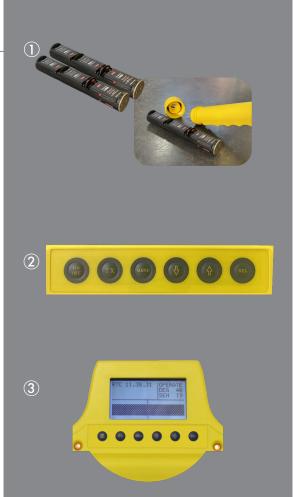
The AML Pro is powered by a convenient rechargeable 9V lithium battery system, with the option to use 9V alkaline batteries. To replace used batteries, unscrew the battery cap and slide out the battery sleeve. Recharge the 9V batteries using the 3-in-1 charging cord without removing them from the holder. When reinserting the sleeve, ensure the silver lead end goes in first, then securely tighten the battery cap.

2 CONTROL PANEL

Provides access to the AML Pro's extensive features and enables navigation through its menu screens. The unit includes six function buttons: ON/OFF, TX (Transmitter), MENU, DOWN ARROW, UP ARROW, and SEL (Select).

3 TARGET INDICATORS

The right and left LED target indicators signal when an object is detected. Digital target indicators, displayed at the bottom of the LCD screen, work in harmony with the right and left receivers to indicate the presence of an object.



## **AML PRO FEATURES**



LASER TARGET INDICATOR. A red laser indicator identifies the target position when an object has been detected; an audible signal is emitted when both LED indicators are also on.

USB PORT.

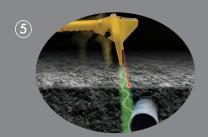
The USB Port is used for uploading or downloading diagnostic information, new firmware and updates, and data transfer, including GPS log files.



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.







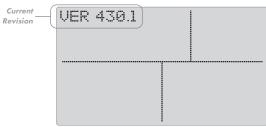
#### **CONTROL PANEL**

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 firmware 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



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

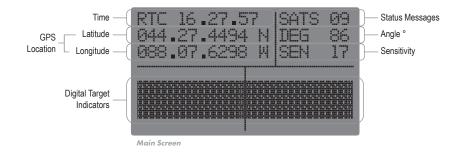
**DEG (Degree).** As referenced from the blade face angle (0°) of the AML Pro.

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.



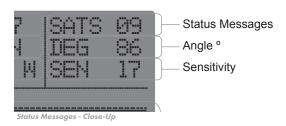
TX (Transmitter) Press the TX Button to turn the transmitter ON or OFF.
When the transmitter is OFF, a
STANDBY message on the right side of the screen will appear.

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

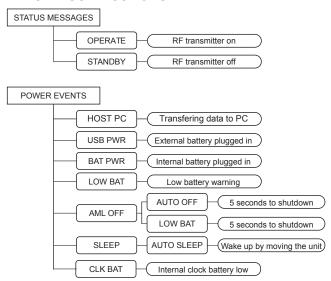
RTC	16	.27.57	STANDI	3Y
944	.27	.4494N	DEG (	36
088	.07	.6298#	SEN	17

RTC	16	.27.5	7	OPER	ATE
		<b>.</b> 4494	N	DEG	86
088,	.07	.6298	М	SEN	17

### STATUS MESSAGES FLOW CHART



#### **GENERAL STATUS MESSAGES**



#### **GENERAL STATUS MESSAGES**

All status messages appear in the top right corner of the LCD display. When a new event occurs, the corresponding message is displayed for 4 seconds (with the exception of the "SATS 00" message that will stay on for 1 second) before returning to the Operate status.

#### **POWER EVENTS**

Power events are directly linked to power consumption, the power source, and the auto shut-off settings in the AML Pro. When a power event occurs, the unit will emit a sound and display a corresponding message. Refer to the Power Events flowchart for detailed descriptions of each event. Note that the low battery event specifically pertains to the internal 9V battery pack.

A rechargeable coin battery is housed within the unit, mounted on the control board. The "CLK BAT" message indicates that its voltage is low. To recharge the internal coin battery, ensure a fully charged 9V battery pack is installed in the unit.

#### **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 beer
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

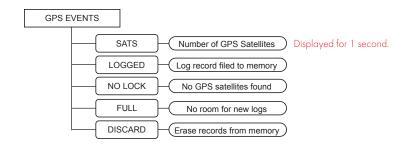
#### CALIBRATION EVENTS

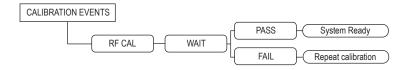
Perform the Calibrate option on the AML Pro's menu to re-calibrate your unit and restore original values to the RF circuit board.

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

*Note:* This process does not restore othe factory settings.

## STATUS MESSAGES FLOW CHART





Press the MENU Button to display the AML Pro settings.

This symbol will mark the menu setting you want to adjust.

4

Use the UP and DOWN arrows to navigate through the menu settings.

SEL

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.

The AML Pro has 6 menu settings listed on the screen

>SPEAKER VOLUME2	:
TIME ZONE SET1	8
BACKLIGHT OFF/ON	ı
AUTO OFF MIN	10
CALIBRATE	10
FACTORY SETTINGS	

AML Pro Menu

>SPEAKER VOLUME	.2
TIME ZONE SET	.18
BACKLIGHT OFF/ON	.0
AUTO OFF MIN	.00
CALIBRATE	.00
FACTORY SETTINGS	.0

AML Pro Menu



Use the UP and DOWN arrows to



navigate through the menu settings.



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

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

> 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.

	SPEAKER VOLUME	2
þ	TIME ZONE SET	18
	BACKLIGHT OFF/ON	0
	AUTO OFF MIN	00
	CALIBRATE	00
	FACTORY SETTINGS	0

AML Pro Menu

- Use the UP and DOWN arrows to
- navigate through the menu settings
- Press the SEL button to adjust the setting.

  Continuing to press SEL button will loop the selection until reaching desired settina.

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

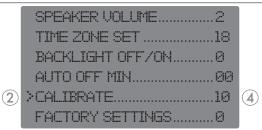


## TIME ZONE WORLD MAP

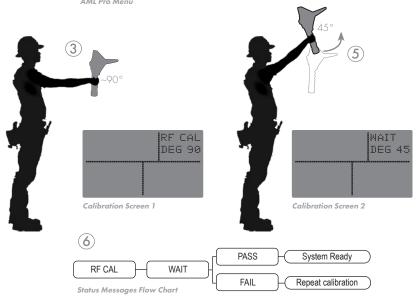


Please contact us at info@ssilocators.com for more information.

- (5) Point the AML to an unobstructed sky. Raise
- - the Fail message persists.



AMI Pro Menu



#### **USING THE AML PRO**

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.

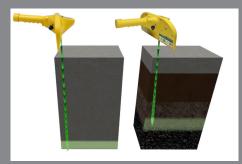
The depth of the AML Pro transmission signal varies with the type of soil. This unit can be used in various material types such as water, snow, red-clay, and does not have some of the restrictions of ground penetrating radar (GPR).

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.



Practice on a Known Object



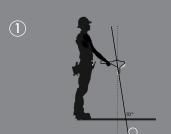
Signal Penetrates Deeper Through High Density Materials

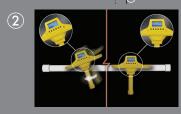


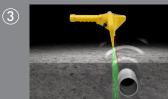
#### **USING THE AML PRO**

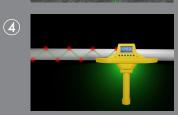
#### LOCATING AN OBJECT WITH THE AML

- 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.









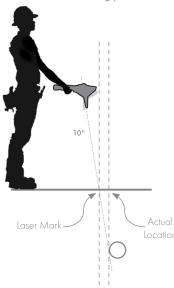




#### **USING THE AML PRO**

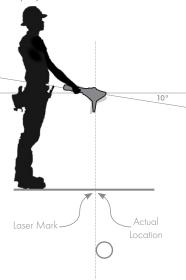
#### SEARCHING POSITION:

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.

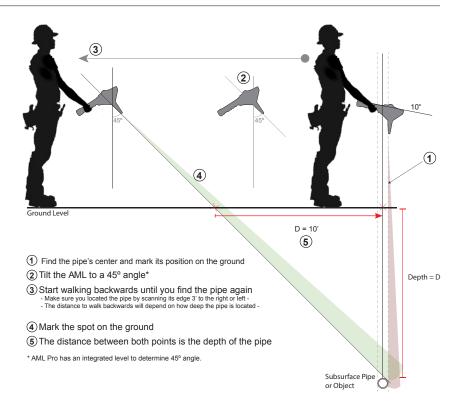


# Determining depth with the AML Pro

Follow these steps to determine the depth of a PVC pipe or underground object:

- Identify the center of the PVC pipe or underground object and mark its position on the ground.
- Tilt the handle of the AML Pro downward until the blade is positioned at a 45° angle relative to the ground.
- Walk backward while keeping the unit angled until you detect the top of the pipe again.
- Confirm your position by scanning 3 feet to the left and right to ensure you've located the pipe's edge.
- Once the pipe is located, mark the ground where the AML Pro's laser indicator aligns with the object.
- Measure the distance between the first marked point (the object's center) and the second marked point.
- This measurement represents the depth of the PVC pipe or underground object.

### **USING THE AML PRO**



# **GPS Logs Download**

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



Scan for video tutorial



**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 1 second 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.

## INITIAL SETUP (ONLY FOR WINDOWS OPERATING SYSTEM)

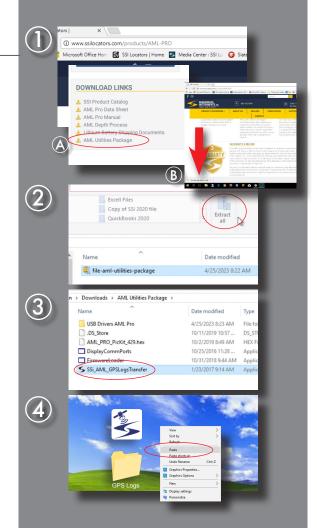
- Download the AML Utilities App from our website <a href="https://www.ssilocators.com/products/AML-PRO">www.ssilocators.com/products/AML-PRO</a>.
  - A Click on the *AML Utilities Package* under the Download Links section.
  - (B) It will **automatically download** a compressed folder to your computer; choose a location and save it.

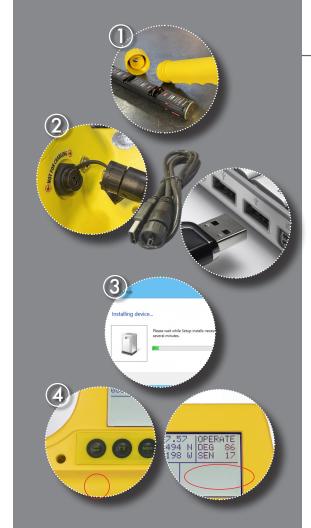
(At SSI we ensure our applications are malware free and safe to install in your computer.

You can safely accept the Windows<sup>TM</sup> security measures.)

- 2 Extract the files in the compressed folder "file\_AML\_Pro\_utilities.zip". If you can't find it, it's usually in your downloads folder.
- The folder contains several small applications that communicate with the AML Pro, for this setup we are interested on the GPS Logs Transfer app.
- Copy and Paste the folder into your desktop, or a location convenient for you to access it later. These are self contained apps and do not requiere instalation.

**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

After collecting GPS logs from your worksite, ensure the AML Pro is turned OFF before connecting it to a computer. Your computer must have an active Internet connection to complete this process.

- 1) Ensure a 9V battery holder is inserted into the unit's handle.
- 2 Plug the provided USB cable into the AML Pro. Do not turn the unit on. Then, connect the other end of the cable to a USB port on your computer.
- 3 Upon connection, the computer will automatically download and install the necessary drivers for the AML Pro from the Internet.
  - Wait for the installation to complete, it only take a couple seconds.
  - Once finished, a message confirming successful installation will appear on your computer.

(Note: This is a Windows process, and steps may vary depending on your operating system.)

(4) Turn on the AML Pro, and the startup messages will be displayed. Wait until the status changes to "OPERATE." The unit is now ready for transfering the GPS logs.

#### **RUNNING THE GPS LOGS TRANSFER APPLICATION**

- ① Double-click the GPS Logs Transfer icon to open the application.

  Your system may display a security warning; rest assured, the application is safe and can be used confidently.
- 2 The program will prompt you to confirm that the AML unit is connected and powered ON.
  - Ensure the unit displays the status message "OPERATE" before clicking OK.
- (3) The application will detect the connected AML unit and assign it a Comm Port number.
  - Note that the Comm Port number may vary depending on your computer and device. Click OK to proceed.
- (4) If the AML unit is not detected, an error message will appear. To resolve the issue:
  - Close the application.
  - Disconnect the USB cable from the computer.
  - Reconnect the USB cable and restart the application.

Occasionally, the USB port may not recognize the device. A simple reset typically resolves this problem. Once the issue is fixed, click OK to continue.

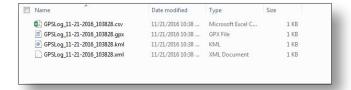
If the problem persists, refer to page 25 for detailed steps to restart the process.





#### **DOWNLOADING GPS LOGS FILES**

- 1 Click on the "Browse for Save Folder" button to create or select a folder where your GPS logs will be stored.
- 2 Click on the "Retrieve Logs" button to begin downloading the GPS logs.
- 3 The process will only take a few seconds. Once completed, the application will display a message confirming the successful data transfe
- 4 The "GPS Logs Importer" will save four types of files into the folder you selected.



#### **CLOSING THE GPS LOGS TRANSFER APPLICATION**

1) You have the option to delete all GPS logs stored in the AML Pro's memory.

Select "YES" to clear the memory or "NO" to keep the logs.

If You Choose "NO": → Proceed to Step 3.

(2) If You Choose "YES": A confirmation message will appear once the records have been deleted.

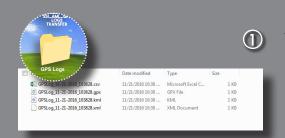
Note: Before deleting any files, verify that the data has been successfully transferred by checking your GPS Logs folder in your computer.

Important: This process is irreversible.

Once the logs are erased, they cannot be recovered.

- 3 To exit the application, click the X in the top-right corner of the software screen. It will save the changes and reset the connection with the AML. Click OK to disconnect the unit.
- 4) After closing the software, it is safe to unplug the AML Pro from the USB port.





2



### **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 Phone: +1 (920) 347.1788

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
Weight 2.5lbs 1.13 kg

# **Power Specifications**

Estimated Battery Life:

 The Lithium Rechargeable 9v Battery holder Provides over 10 hours of continuous usage or over 48 hours of use at average industry usage.

#### **Shipping Dimensions**

Cube20" x 17" x 8"
51cm x 43cm x 20cm
Weight17lbs7.7 kg

#### Includes

- (1) AML Pro Unit
- (2) Lithium Battery Sleeves 9-Volt
- (1) 3 in 1 USB Battery Charger Cable
- (1) USB Data Transfer Cable
- (1) USB Charger Outlet Transformer
- (1) Noise reducing Headphones
- (1) Waterproof Foam-Insulated Hard Case
- (1) Operator's Manual







#### Typical Operating Range

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



# 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

SubSurface Instruments Inc., Its owners, employees, dealers, distributors, and/or assigns, shall not be liable for any action, inaction, injury, or property damage, sustained or expenses incurred, whether consequential or inconsequential; from the use/non-use, misuse, improper or proper use of this or any product designed, manufactured, and/or distributed by SubSurface Instruments Inc. Locating accuracy and safety, all encompassed, are the sole responsibility of the "Operator-user" of the product.

Your Local Dealer:



## SubSurface Instruments Inc.

Is a premier developer, manufacturer and distributor of high frequency and magnetic locators, PVC pipe detectors, PE Pipe, metallic pipe, cable and custom specialty locators.





SubSurface Instruments, Inc. 920.347.1788 phone 855.422.6346 (855-l-can-find-it) info@ssilocators.com www.ssilocators.com