Metal and Water Finder

MF 1500 SMART

User Manual

The user manual for MF 1500 Smart

Four searching systems .

WWW.MWF-USA.COM

Contents

Metal and Water Finder

Safety information

The operating in high voltage areas would limit the results and performance

The cell signal interferes with the device signal, so turn off the cell while operating

Don't operate two devices with same method of search at the same place

Don't store in high temperature or high humidity

Disconnect the batteries before long time storage

The operator Must remove any metals that might affect the opreatin e.g.: Rings,watch, belt....

Any attempt to tamper the device or unapproved maintenance would void the warranty

For devices that work on replaceable batteries, use good quality batteries to work longer hours.

- The user must practice before starting the detecting operations and discoveries
- Store in Cool and dry place 15-40 C 5%-75% humidity

Read & Understand
The User's manual
before using this device

Technical

Search System:	Multiple Search Systems: 1- Long Range Locator (Hand-held) 2- Long Range Locator (Line Tracking) 3- iON Sense 4- Ground Sense
Search Principle:	1- Digital Frequency Signal Processing (DFSP) To receive the electrostatic fields of target. 2- Digital Frequency Signal Processing (DFSP) To receive the electrostatic fields of target. 3- Processing the ionic levels in the field. 4- Magnetic fields sensing and evaluating
Operating Processor:	MICROCONTLLER PIC18 & ARM 7
Operating Frequency:	1- From 1 KHz to 30 KHz 2- From 1 KHz to 30 KHz 3- 20.000 MHz 4- Magnetic Field Measurement
Power Rating:	7.4 V / 6000 mAh
Power Consumption:	Max power @ 150 mAh
Battery Endurance:	15 Working hours
Charger	5.1 V DC / 3 Amps
Display:	3.2 "TFT LCD Display, 16 bit color depth CDMA GPU @ 48 MHz
Targets	Gold - Gold ore -Silver - Copper - Brass - Bronze - Iron - Groundwater - Voids and cavities - Gems

Technical

Target Discrimination:	YES
Selective Target Mode:	YES, selective target search mode or auto search for discovered targets
Search Depth	40 Mt with Selective Depth control system in the depth menu. and 450 m for water.
Search Distance:	2000 Mt with Selective Distance Control system in the distance menu.
Search Results:	1- Signal and Guidance towards the target location 2- Signal and Guidance towards the target location 3-Visual data with digital information about the target size and location 4- Visual indicator (10 Bar-graph LED) and Sound Indicator
Bluetooth:	NO
Wireless communications:	YES
Smart Auto guiding System:	no
Audio notifications:	YES
Vibration notifications:	YES ,For Ionic System
Operating Temperature:	From (5° F) to (140° F) / From (-15 °C) to (60 °C)

Technical

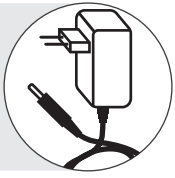
Storing Temperature	From (5° F) to (140° F) / From (-15 °C) to (60 °C)
Humidity:	Store and operate within 90% humidity ratio
Weight:	7.75 Lbs (3.5Kg) with all the Accessories, 12.25 Lbs (5.5 Kg) for the case.
Dimensions:	mm 185X135X53
Case Dimensions:	mm 400x520x180

Main Unit

The Main Control Unit for the device to set the search and device parameters. Communicate with the other search systems via wireless link.

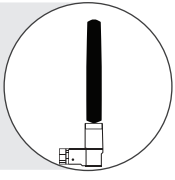
Charge Adapter

This charger is used to recharge the battery, make sure the power switch is on before starting the search or a screen would appear on the display prompting doing so.
Ratings: input 100-240v DC 50-60Hz 0.4A - Output:5v AC 3A 15W



Wireless Antenna

Antenna for boosting the signal for transmitting the data to the other search systems.

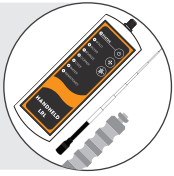


Ground Transmitter

Connect this unit to the Main unit and plant it in the ground to send the waves and reinforce the signal.
The ground transmitter should be connected for both systems to work.

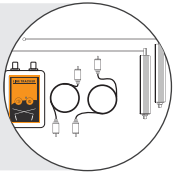
Hand-held Unit

The LRL unit consist of the main unit, transceiver antenna, and the grip.
The unit runs on 4xAA batteries.



Line Tracker and Antennas

Connect the cable to the rods and the Line Receiver.
Use this unit with the Line Tracking search method.
The unit runs on a 9v battery.



Verification Unit and iON Sensor

This unit is for detecting the ionic fields of the precious metals.
This unit is set by the Main Unit Wirelessly.

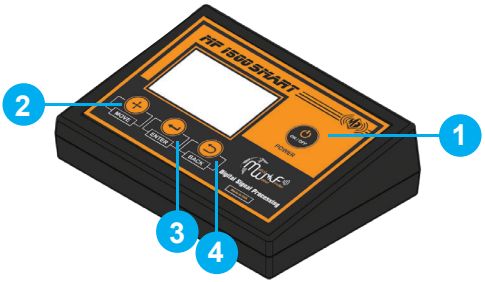
Ground Sensor

Connect to the Main Unit with the Ground Sensor System or Ground Scan System to Measure the magnetic levels of the ground to determine and locate targets.
Equipped with high sensitivity sensors for best performance.

Headphones

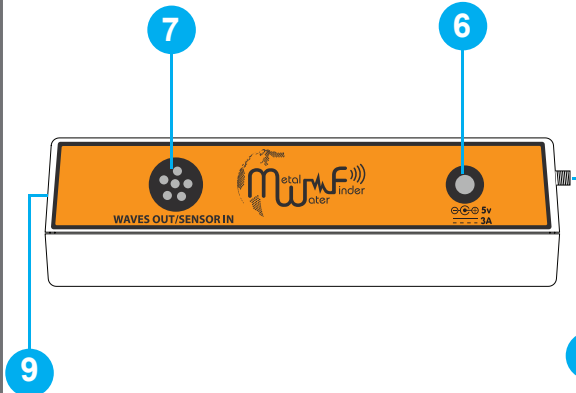
Connect to the Main unit headphone jack or the Verification Unit.

Front View



1. Power Button
2. Move Button
3. Enter button
4. Back Button

Back View



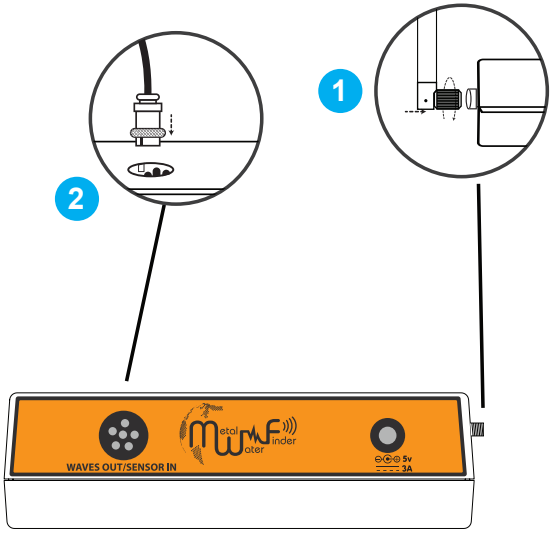
6 Charger Jack

7 Ground Transmitter Connector

8 Wireless antenna connection Jack

9 Headphone Jack

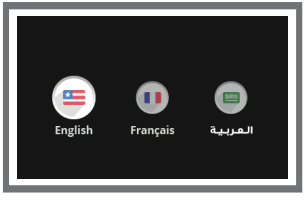
Assembly

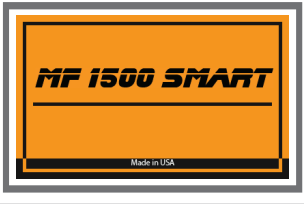


1. Connect Wireless antenna connection like drawing

2. Ground Transmitter Connector. Connect when using Long Range Locator system or Line Tracking.

- Turn on the device by press and hold the power button in th front.
- The device will start and show a loading screens ,Then show the main menu.
- Note: The first run for the device you will be prompted to choose the system language.



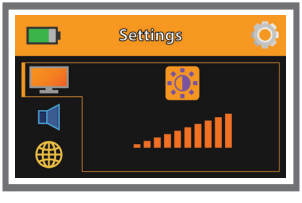


❖ Use the (Move) button to navigate through menus on the display and press (Enter) to select or confirm. Press (Back) to go to the previous Menu

❖ Settings Menu

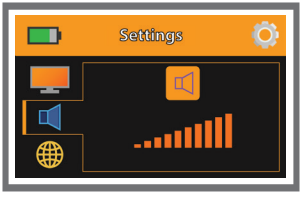
To access the Settings Menu select the gear icon in the Main Menu and press (Enter) to the settings.

- To set the screen brightness select the icon and press(Enter) to change the brightness from 10% to 100%.



❖ Settings Menu

- To set volume select the Speaker icon and press (Enter) to change the Volume from 1 to 5 or mute.

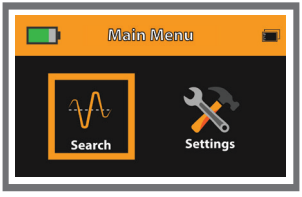


- To change the System language select and press(Enter) the device will load the language and display the menus in the designated language.

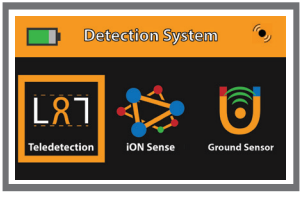
❖ Press (Back) to exit the Settings Menu and go back to the Main Menu.

Starting the Search

- To start the search process select the Search option from the Main Menu to access the search systems.



The search systems will appear on the display:
Select the Long Range System



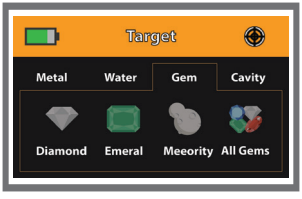
After selecting the Long Range System two options will appear on the screen (Line Tracking-Hand-held LRL)
These systems are the remote sensing methods.
Select a method to start with and press (Enter)

TARGETS LIST

Metal Meniu : contains the following objectives (Gold - Silver - Copper - Bronze)

Water Menu : contains the following objectives (All Type - Salty - Mineral - Natural)

Gem Menu : contains the following objectives (Diamond - Emeral - Meeority - All Gems)

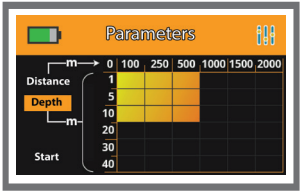


Cavity Menu : contains the following objectives (Cavity)

START SEARCH ❖

- After selecting the desired target type, the system will move to the list of criteria. Then specify the distance and depth parameters by using the (Move) button to move between the values of the distance and the depth

- When you have finished selecting search options go to the start option and press the (Enter) button to go and select the search method

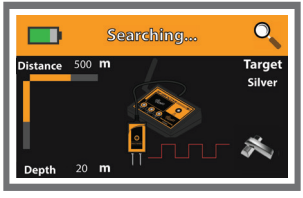


- Select the desired search method and press the (Enter) button to confirm

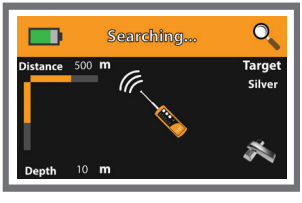
❖ Note:
Make sure that the (Hand-held LRL) Unit or the (Line Tracker) is turned on and working before confirming the start of the search

- Select the desired search method and start searching

❖ (Line tracker) search interface

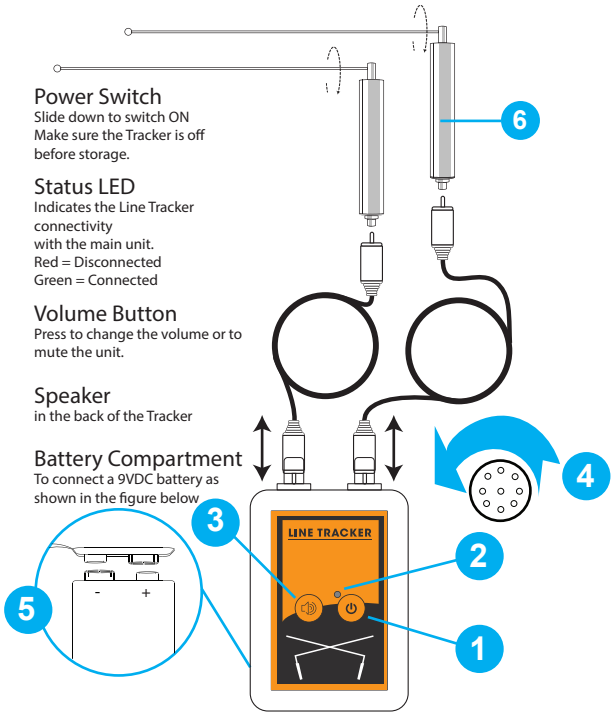


❖ (Handheld LRL) Search Interface

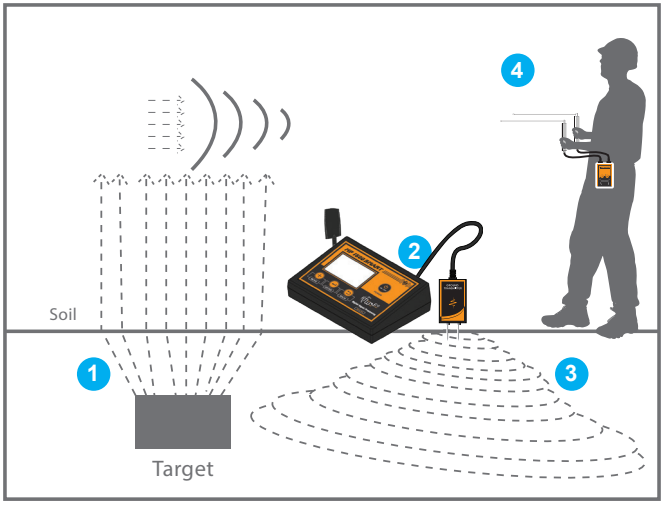


Line Tracking

Line Tracker and Antennas



1. **Power Switch**
   Slide down to switch ON
   Make sure the Tracker is off before storage.
2. **Status LED**
   Indicates the Line Tracker connectivity with the main unit.
   Red = Disconnected
   Green = Connected
3. **Volume Button**
   Press to change the volume or to mute the unit.
4. **Speaker**
   in the back of the Tracker
5. **Battery Compartment**
   To connect a 9VDC battery as shown in the figure below
6. Connect the rods to the antennas then connect the unit in the top to the antennas by the attached cable.

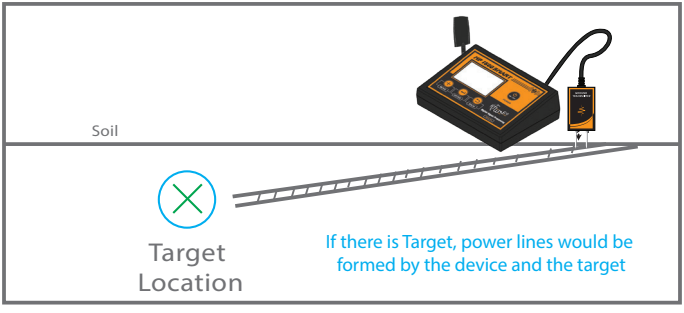


1. The Target is affected by the earth electrostatic and magnetic fields
2. The tuning and transmitting unit transmits a electro-frequency waves to determine target location
3. The out waves spread through the earth which stimulate the formed fields around the target identify it and forming a power lines
4. The line Tracker device receives the power lines that connected to the target to determine the location

If you selected the Line Tracking search method, make sure that the Line Tracker is switched on and the indication LED is on then the Main Unit will send the start command to the Line Tracker with the selected parameters.

Note:

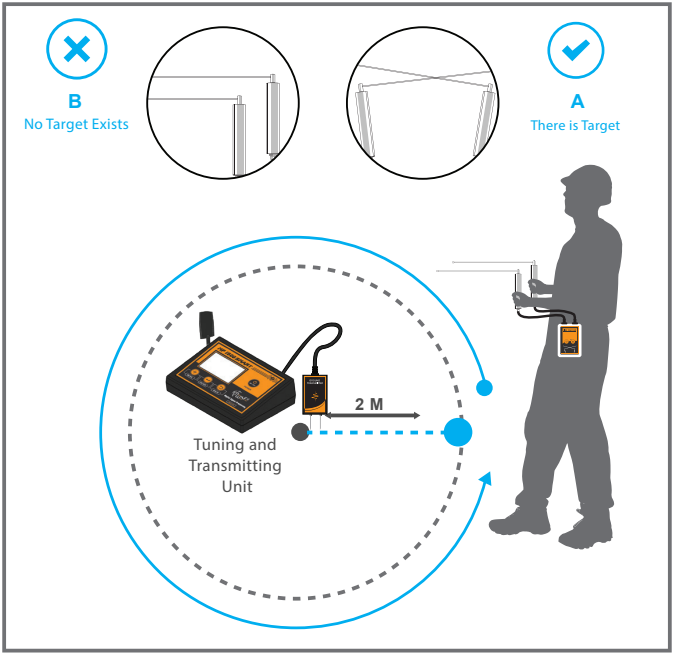
If there is Target, the device would form a frequency power line between the Target and the device. If there is no target in the search area there would be no connection between the device waves and the selected target type.



Then rotate around the ground transmitter unit

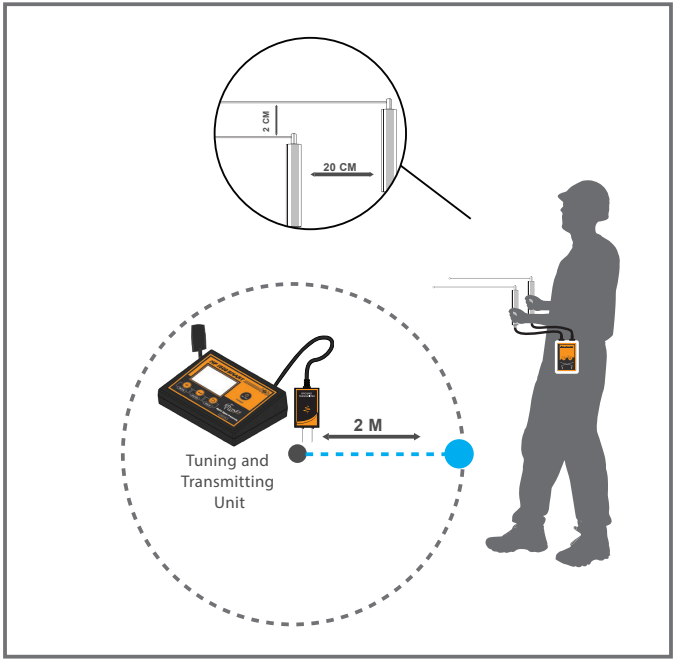
A-If there is target in the search area a signal will be received which represented by the intersecting of the antenna at some point which is the power line direction point between the device and the Target location.

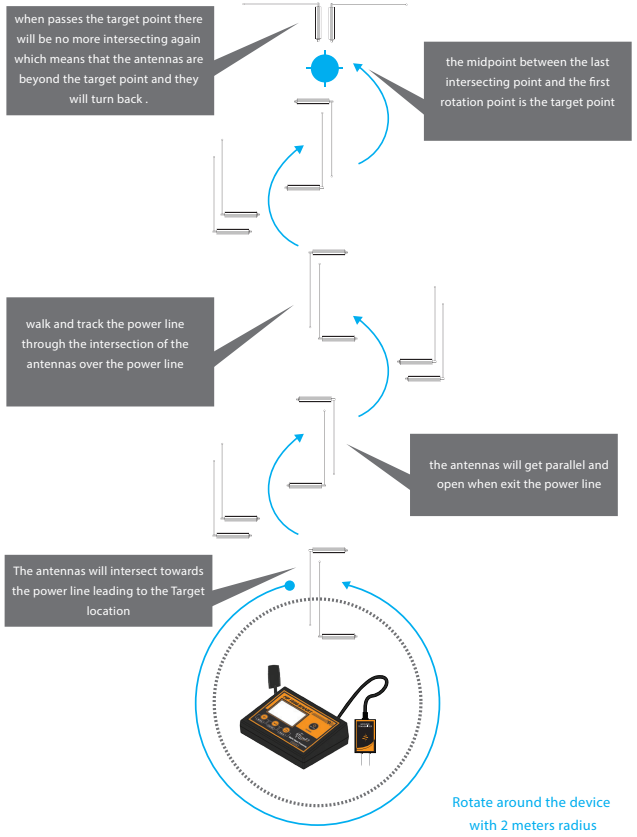
B- but if the user rotates a full circle and no intersection happened,then the selected search target does not exist in the search area.



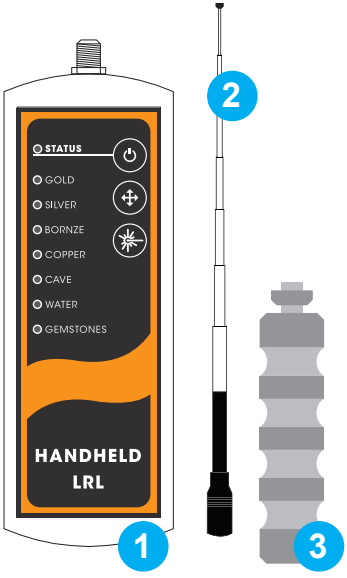
How to locate Target (Stage one):

After setting and configuring the receiving device for search. fasten the Line Receiver Device on the belt or put it in pocket then measure a two meters distance from the ground transmitter unit which transmits the waves then hold the receiving antennas horizontally to the ground. hold an antenna in each hand with a 25 cm distance between and make sure that the right antenna is 2 cm above the left antenna as shown in figure

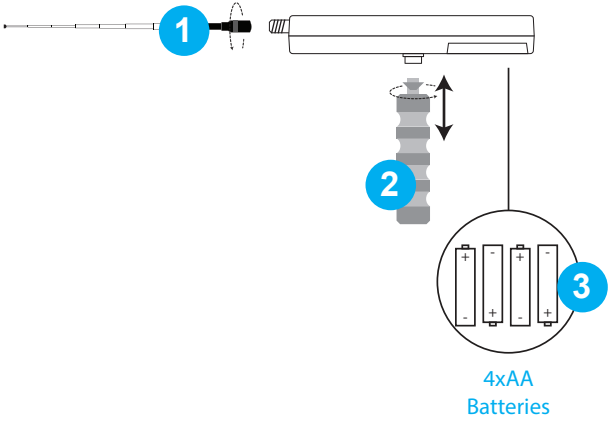



when passes the target point there will be no more intersecting again which means that the antennas are beyond the target point and they will turn back .
the midpoint between the last intersecting point and the first rotation point is the target point
walk and track the power line through the intersection of the antennas over the power line
the antennas will get parallel and open when exit the power line
The antennas will intersect towards the power line leading to the Target location
Rotate around the device with 2 meters radius

Hand-held Long Range Locator



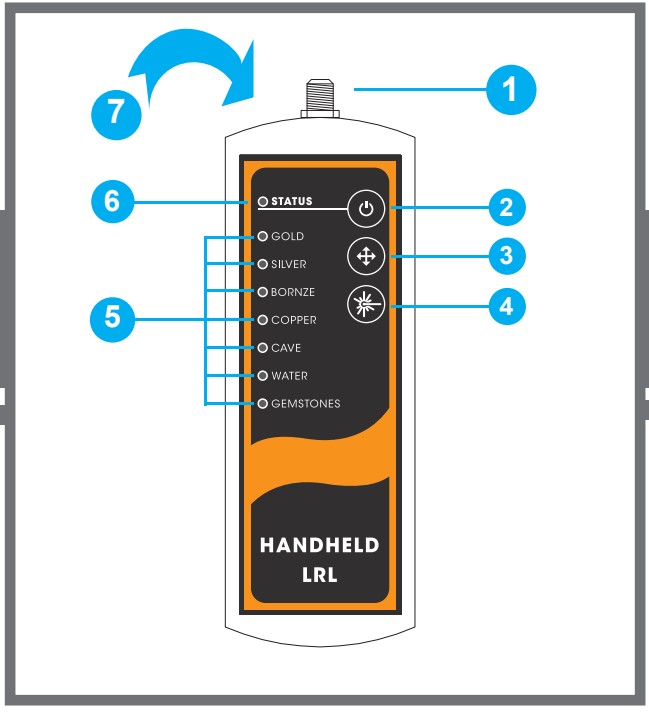
1. Hand-held LRL Unit
2. Transceiver Antenna
3. Handling Grip



1. Plug the antenna to the jack in front of the Handheld LRL Unit.
2. Connect the grip to the socket in the bottom of the Unit.
3. Put 4xAA Batteries in the battery compartment and pay attention to the polarity.

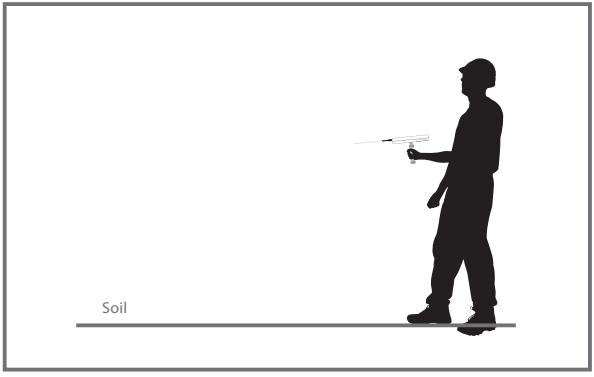
Note:

For the best product life use High quality batteries and remove them before storage.

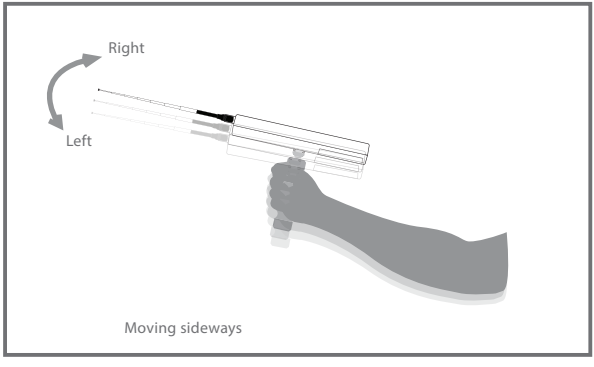


1. Antenna Jack
2. Power Button
3. Target Selection Button
4. Laser Button
5. Status indicator
6. Target LEDs
7. Laser Pointer Out

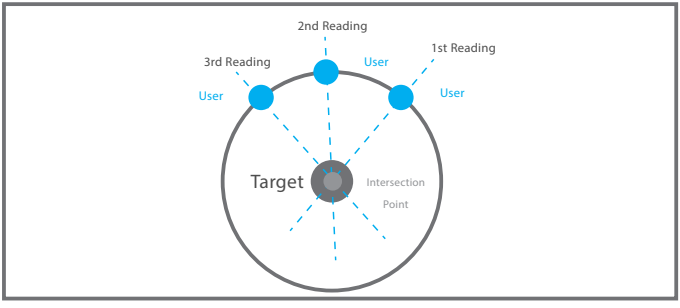
❖ The user must carry the device by grip horizontally slightly sloped towards ground as shown in the figure below



❖ Then stimulate the device's waves and output fields by moving the device right and left slowly then stop the device.



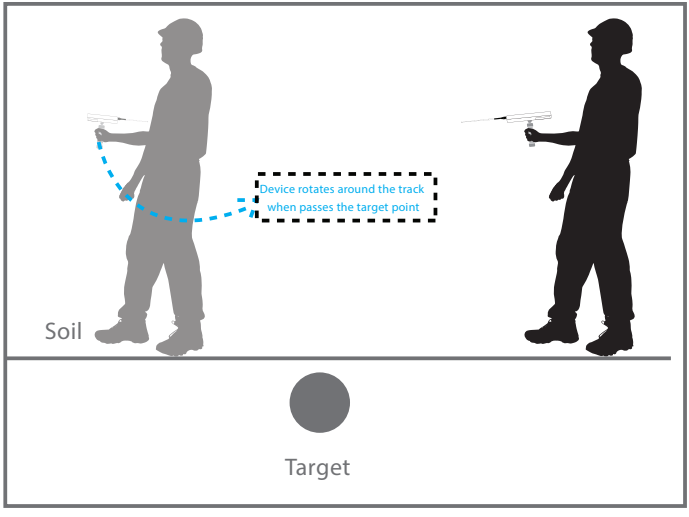
In the case of a located target , the device will receive signal and a reading that will divert the device from the normal track to another track which is the target point track,
then the device will steady at the same direction ,in the meantime rotate fully around the direction that the device went toward until reaching the opposite and notice the track change once more and go toward the target.
then get 30 m sideway from the first reading point and stimulate the device's waves and steady the device and wait for the result if the target is legit the device will rotate towards the same point again therefore the target have been confirmed.
For more accurate reading and determining repeat the step from different points , and if all the tracks intersect in a point then it is the target point.



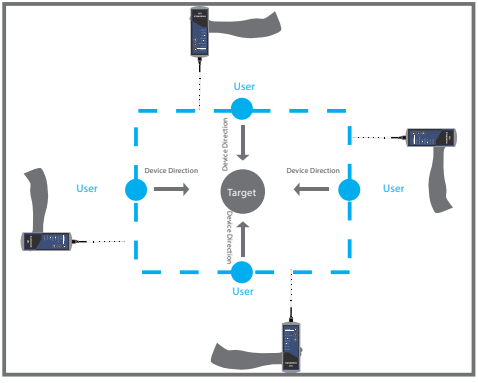
To confirm after the target location, select a lower space value and repeat the previous steps.

How to Locate Target

- Initially the user must direct the scanning antennas down slightly towards the ground.
- After ensuring multiple readings towards the target. Start walking in the same direction holding the device normally . until you reach the passing point you will notice that the device rotates around the normal track towards the point. Rotate with device slowly and start walking towards the target slowly until you reach the point where the device rotates right and left then you have located the target point.



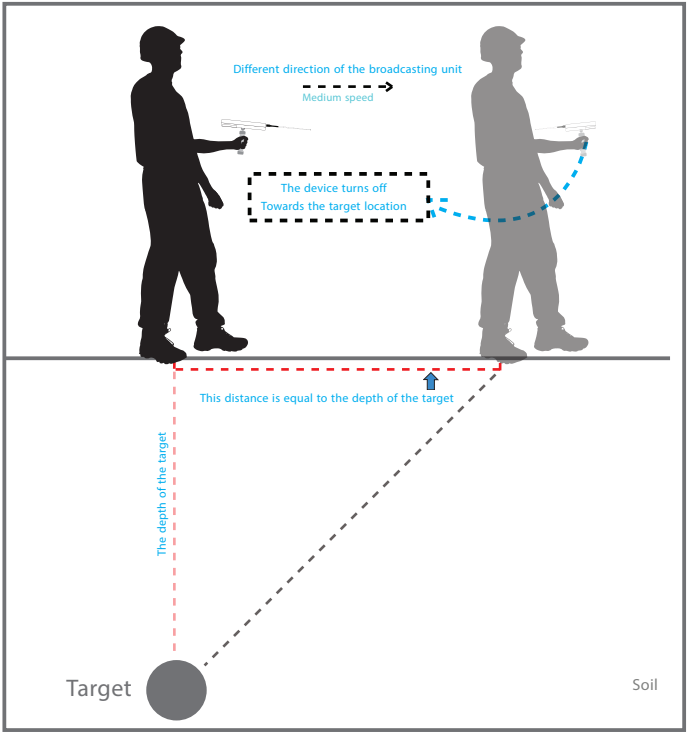
❖ There is another way to locate the target point more accurately, (Square method) take 4 different readings for the target from 4 angles forming a square 3 m from target point the intersection point of the for readings is the target point.



The user can see the approximate depth of the target by going back to the main menu, Select the search settings again, and changing the depth level through the depth list. For example, if the depth specified is the first time 5 meters we reduce the depth to 3 meters and enter the information, And we move away from the target location 20 meters and carry the device and wait for reading the target location, if there is a reading of the target site here we know that the depth may be between 3 meters, and we do this process to reduce the depth until we know the approximate depth of the target.

- Second method of depth determination:
After confirming the point of the target, we reduce the search distance to the lowest level and maintain the depth of the search to the highest level and complete the steps of work, and stand in the detection unit specified above the target directly and we go in a different direction of the transmission unit at medium speed until the unit circumvent the target location and measure the distance resulting from this The point to the target location is the depth of the target

How to Locate Target Debth



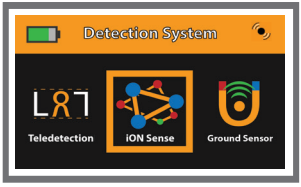
iON Sense

Verification Unit

This unit will detect the buried metals by sensing the ionic fields that formed around the metal in which the sensor will locate the metals location and beep in the area of the detected field.
This unit implement the ionic detection system. In which the device will identify the metals and burials ions underground that formed from being buried for a long period of time

Search Operation:	Metals and Burials Detection
Search System:	iON sense
Operating Processor:	Microcontroller
Processor Frequency:	20.000 MHz
Processing Type:	Digital Signal Processing (DSP)
Indicators:	Visual indicator (10 Bargraph LED) and Sound Indicator

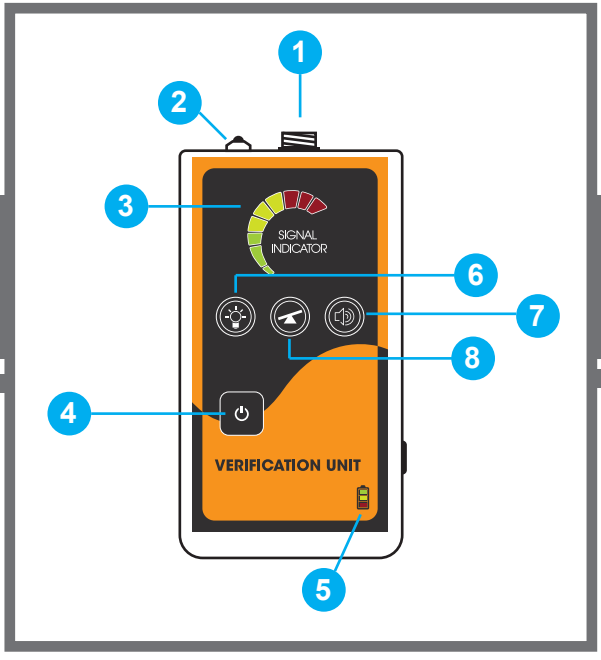
If you selected the iON Sense search method, make sure that the Verification Unit is switched on and the indication LED is on



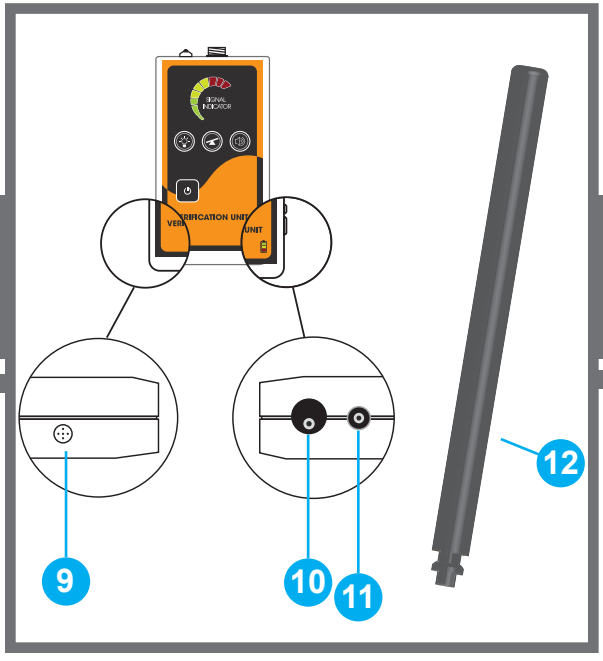
Select the target type for the search from the target menu then press "Enter".
Then press Start "Enter" again to confirm the target and start the search.

The "Verification Unit" will switch on and set to the selected target from the main unit wirelessly.

Note:
Make sure that the verifaction unit is switched on and within distance.



1. iON Sensor Connector
2. Flash LED
3. Visual Signal indicator
4. Power button
5. Battery indicator
6. Flash LED button
7. Volume button
8. Calibration button



9 Speaker out

10 Power Switch ON/OFF

11 DC in 5v-3A

12 iON Sensor: Connect to the iON Connector (1)

Power button: Press and hold to turn on the unit after switching the power switch ON.

LED flashlight button: press the button to turn the flashlight in the front of the unit for ease of use in night. Keep in mind that working with flashlight increases the power consumption and therefore less working hours.

Volume button: press the button to select the sound level

Ground calibration key: With this key, the user can adjust the unit to adapt to the terrain and environment in which the device operates. The device gives the normal and stable adjustment of the search tool for better results.
Note: We may start searching in an area where the device is issuing a signal in general
We press the calibrate key once and wait for the signal to stabilize
If this continues to sound in any direction we press the key again until we get a stable result and then go to the search area to determine the targets.
There are three levels to adjust the calibration if the device is not calibrated. You are located in areas where there is high noise from high voltage, etc.

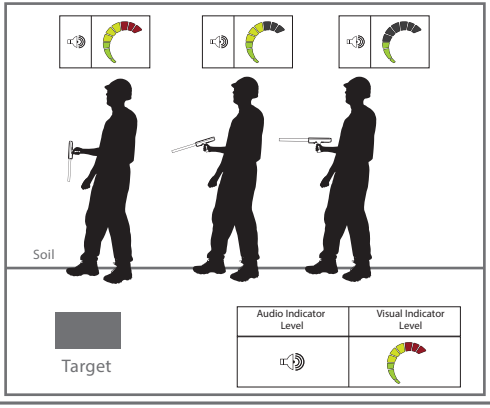
To use the Verification Unit ,First move away from suspected target location and calibrate the device by pressing the balance button, then start moving around the target location. The unit will react according to the target ionic field indicating sound and visual signals.
The signal will increase when the unit is near the target.

Note:

The ionic field intensity depends on the metal type and the period that been underground.

Note:

The approximate depth of the target can be determined by using this unit. After the target point is determined, direct the target to the target and walk in any direction until the acoustic indicator is disconnected. We measure the distance from this point to the target point, which is the approximate distance to the depth of the target.



Caution

-Charge the battery immediately after use.
-When the battery is full disconnect the charger.
-Only use the charge adapter that is attached with the product.
-Charge and store the unit away from flammable objects.
-Turn the unit off after use and don't leave it idle.

Battery Status while charging

Description	LED Indicator
Flashing Red: The battery is starting to charge in first stage	
The red indicator stops flashing and the yellow start to flash indicating the start of the second stage of the charging process	
The yellow indicator stops flashing and the green start to flash indicates the third and final stage of the charge process	
All lights on full battery charge achieved disconnect the charger	

Battery Status while working

Description	LED Indicator
Battery at 100%	
Battery at 50%	
Battery at 25%	
Flashing Red: The battery is low and the unit will shut-down automatically	

Charge Adapter for the Verification Unit :5V DC / 3-A 15W

Ground Sensor

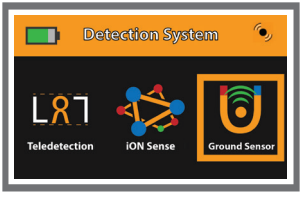
Ground Sensor System

The Ground Sensor System works on scanning the soil layers and identifying the contents by reading the magnetic fields to determine and locate the metals and voids underground.

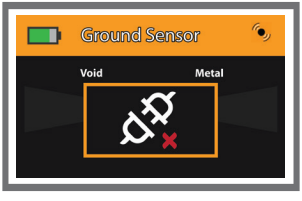
- A smart User Interface with all the needed data and ease of use about the search process
- Discimination system to differentiete between metals and voids
- Waveform logging to keep track of the target size and place
- Advanced sensors to provide instant results in real-time
- Accurate obtaining to the target point with on screen display.

Search System:	Ground Sensor
Search Principle:	Sensing the magnatic fields of the target and display the results i real-time
Frequencey:	Magnatic Measurement
Search Results:	Visual and audio signals with indicators in addition to waveform for logging

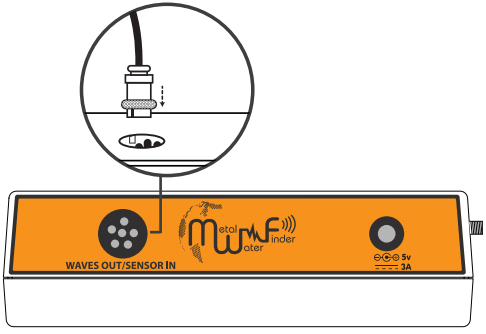
To start working with the Ground Sensor System go to main menu then select the system and press (ENTER) to go the system interface.



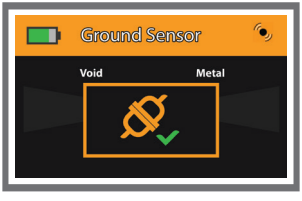
If the Ground Sensor is not connectoed, a notification will appear on the display indicating that the user must connect the Ground Sensor to continue working with the system.



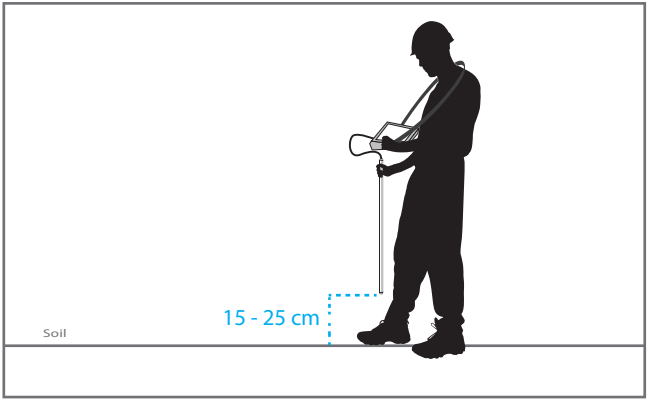
Connect the Ground Sensor plug to the sensor in jack in the back of the Main Unit as shown in the figure below.



A notification will appear on the display indicating that the Ground Sensor has been connected successfully. As shown in the figure below.

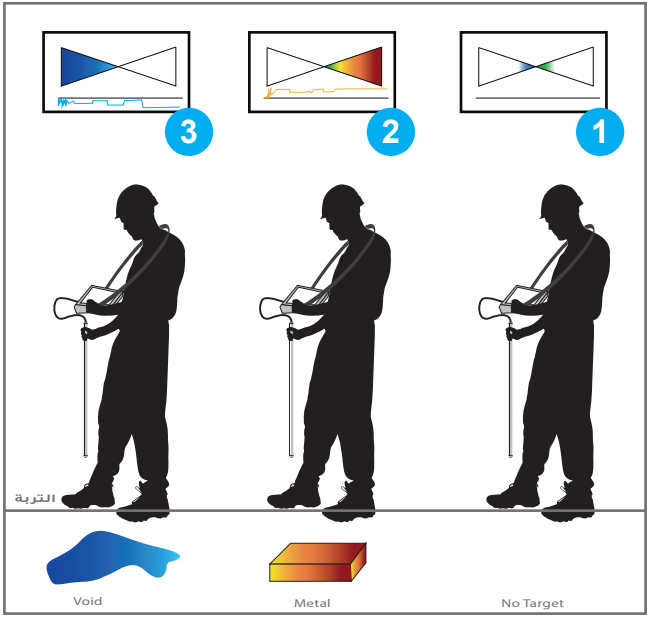


To start the scanning process put the carrying belt across the shoulders and hold the Ground Sensor 15-20 cm away from the earth surface perpendicularly to the earth.

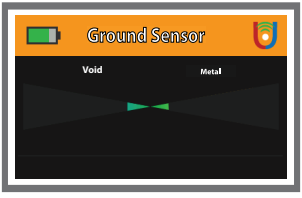


Before starting the user has to balance the device and adjust the sensitivity according to the ground by pressing ENTER or the Button on the top of the Ground Sensor to take a balancing measurement in a stable place unaffected.
The flux density is affected by the location of the search so in dense magnetic flux areas the readings will indicates to a false metal readings.
It might be necessary to take several balancing measures due to different soils and layers might have different flux fields.

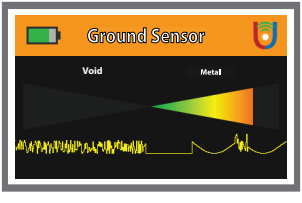
The user has to walk toward the search area holding the Ground Sensor, After making a balance measurement.
The results of sentivity will appear on the display in Real-time.



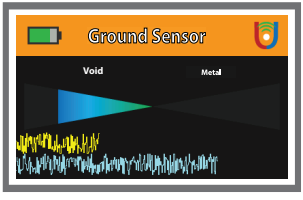
A stable indicator in the middle range indicates no targets in the search area.



In case of metal target in the search are the indicator will show a high values in the high range of the display .
An increasement in the waveform above the midline will indicate the sensitivty of the target showing the contours of the target dimensions and size



In this case the existing target is void and the interactive indicator with high values of blue according to the received signals and the target size in the search area
A diffrential signals on the waveform will show the an increasment over the midline when cavity is sensed and the waveform would decrease below the midline after passing the target which will give the user an estimation of the cavity or void size and dimensions.

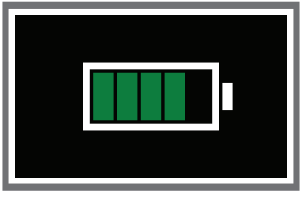


Notes:

-The device will make a beeping sound when the battery is full and the charging is done, so disconnect the charger when the notification is heard.

-An indicator will show the charging progress in the upper corner while the device is working.

-To ensure the performance of the device is kept in best state, Turn the device off and remove any batteries before storing.



Metal and Water Finder

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