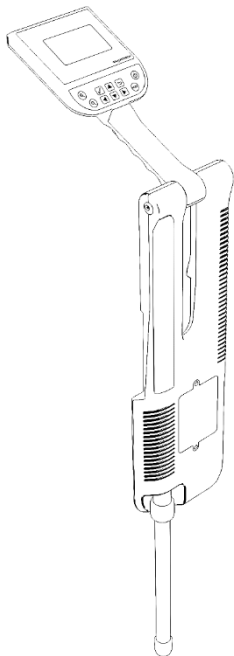


GROUNDTECH®

DISCOVERY SERIES



USER MANUAL

Dear Customer; Thank you for choosing GROUNDTECH products. It is recommended that you read this user manual carefully to understand how the products work and then try to gain experience. This is a scientific and electronic device and all instructions in the user manual must be followed.

**ATTENTION! MUST READ
BEFORE USING THE PRODUCTS.**

The information in this user manual is subject to change without notice.

Reproduction, distribution and copying of this user guide unauthorized by the Groundtech Detectors is strictly prohibited.

General Information

GROUNDTECH products should be used with caution as one do with electronic devices. Search coils and main unit should be used with caution; they should be protected against impacts and hard objects and refrained from applying excessive force.

Injury

GROUNDTECH products do not cause injury or health problems when used normally. GROUNDTECH products usually do not pose a threat to the human body. It should be kept away from children as one would do with electronic devices. Be careful to take all precautions against any kind of risk.

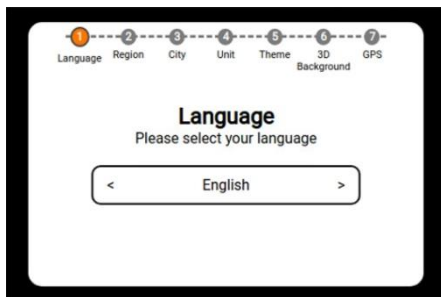
Before starting to search, make sure that the main unit battery is fully charged. Inadequate battery level may cause you to be in the wrong.

Repair

Any repairs resulting from technical malfunctions for a period of two (2) years from the date you purchased the product are free. Contact your dealer for product service or inquiries. The unit is inspected by a qualified technician and repaired if necessary. After two years, all repairs are charged.

If you damage the product or open the main unit, the warranty will lose its validity.

INITIAL SETUP SCREEN

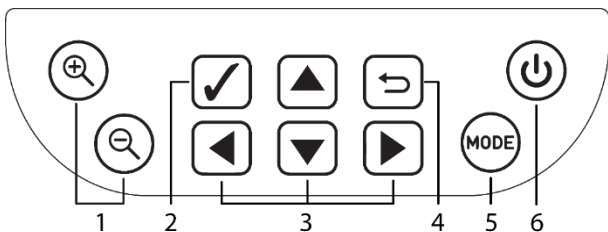


To start using Discovery, you have to complete the initial setup. This setup allows you to personalize your product. In 7-steps setup screen, select the option you want to select with the right and left buttons and press the OK button. It will skip to the next level when you press the OK button. Optionally you can change the selections you made in the initial setup from the device menu after the device setup is ended.

1. **Language:** Select the display language that you want to use your device in.
2. **Region:** Select the region that you use your device in. This selection will enable you to get the hour, date and location information of your area.
3. **City / Time Zone:** Select the city that you use your device in. If you can't find your city, select the city closest to the time zone in your area.
4. **Distance Unit:** Select the unit of distance you want to use on your device. You can choose either metric or imperial.
5. **Menu Theme:** Select the menu and color theme that you want to use in menu appearance.
6. **3D Screen Background:** Select the background color you want to use when scanning and performing the 3D graphical analysis of the scan result.
7. **GPS:** You can turn the built-in GPS locator on and off in your device. GPS allows you to obtain information such as time, date, location in your area.

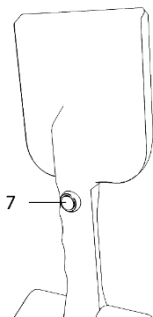
The initial set up is completed. You can start using your device.

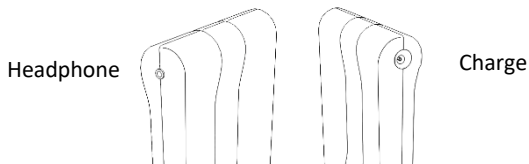
BUTTONS and SETTINGS



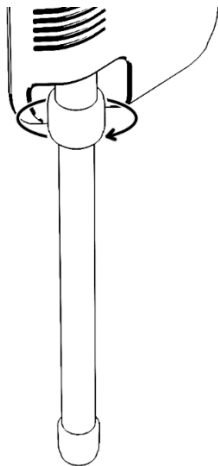
Buttons on the device;

1. **Zoom Buttons:** Zoom in and out of the 3D graphic and select the type of ground.
2. **OK Button:** Allows you to select a menu.
3. **Navigation Buttons:** Allows you to ride in the menu.
4. **Back Button:** Allows you to go back to the previous screen.
5. **Mode Button:** Allows you to switch to 3D rotation, panning, depth, and detail menus in 3D graphics review.
6. **Power Button:** Allows you to turn your device on and off.
7. **Start Button:** Located under the handle of the device, the start button used for manual measurement.



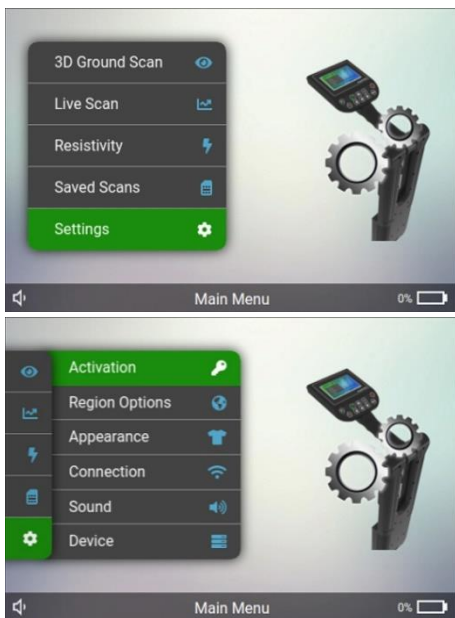


On the right side of your device is the headphone jack and on the left is the charging jack. Only charge your device with the included charging adapter. The battery charging lamp on the main body will flash red while your device is charging. If your battery is fully charged, it will turn to stationary red light. You can see the battery level of your device on the screen.



In the lower left part of the device, there is a round adjustment ring for adjusting the sensor length. You can adjust the length of your telescopic sensor to suit your height and then use the device.

GENERAL SETTINGS

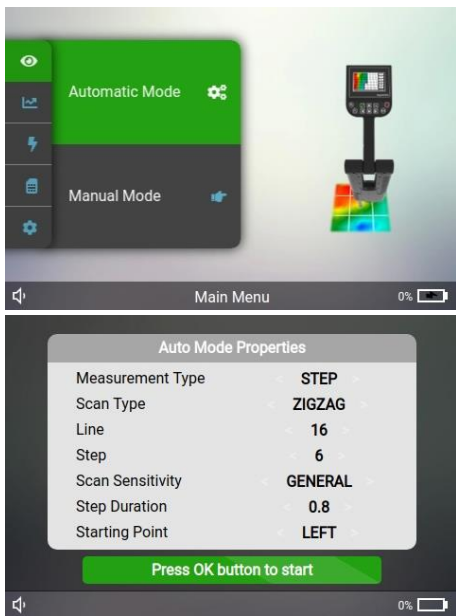


The general settings section of your device;

1. **Activation:** To activate the external mobile applications of your device, read the square code on the screen or enter the numbers on the screen. The numbers on this screen are also the identification number of the product.

2. **Region Settings:** In this menu, you can change the device display language, the unit of measurement you use, and the time zone.
3. **Appearance:** You can change the device menu theme and the background color of the 3D graph review screen.
4. **Sound:** You can adjust the volume of the device and turn on/off the vibration function.
5. **Device Settings:**
 - 1.1. **Factory reset:** In this menu, you can delete the stored data on your device or restore the factory settings. If you restore the factory settings or deleted the stored data, all your settings will be reset and you cannot restore them.
 - 1.2. **Hardware Information:** You can view hardware information such as the sensor and processor used in your device, and information such as memory, and processor temperature level.
 - 1.3. **Software Information:** You can see the version and update information of GTOS software specially developed for Discovery.
 - 1.4. **Help:** You can find the user manual, user videos and answers to problems in this section.

SEARCH MODES - 3D GROUND SCAN



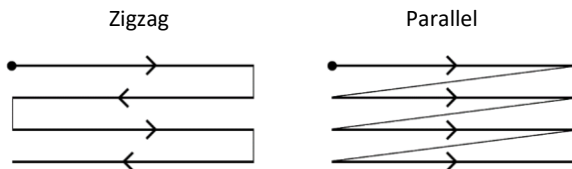
3D Ground scanning allows you to create 3D graphs based on whether you scan a specific area. There are two options in the ground scanning function: Automatic and Manual. You do not need to press any button in automatic scanning for each number of signal pulses entered, and you need to press the start button for each signal in manual scanning.

PRE-SCAN SETTINGS IN AUTO & MANUAL SCAN

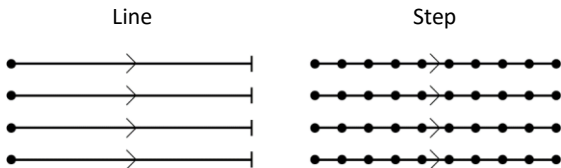
When you select Automatic ground Scan, you will be directed to the settings you need to make before the search.

Measurement Type: You must choose the number of steps or meters. In the step option, you have to enter step numbers in step and line options. For example, 5 steps, 5 rows.

In the Meter option, you must enter in meters in step and line options. For example, 5 meters line, 5 meters row.



Scanning Type: You can scan in parallel or zigzag. You should start scanning from the start point and finish at the endpoint, as shown in the graph. When the number of signal pulses entered for each row is complete, you should proceed to the next scan row. The measuring tool should not be turned when you move to the next row.

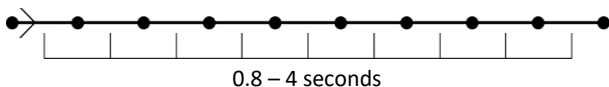


Line: You must enter the row size of the search area in meters or steps according to the unit you have selected in the "Measurement type" section. Depending on the number of signal pulses you have entered, you should go to the next scan row when the signal pulses are over.

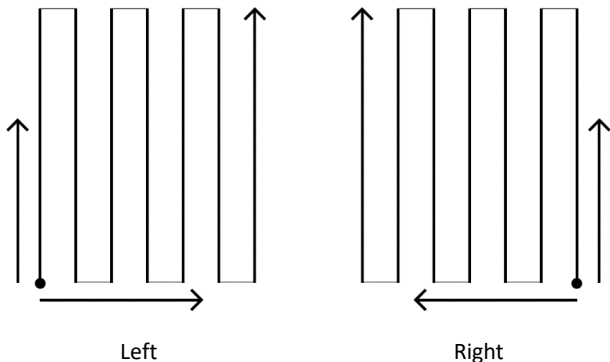
Step: You must enter the row size of the search area in meters or steps according to the unit you have selected in the "Measurement type" section.

Target Type: You can select three different search objectives: Small, General and Tunnel according to the purpose of your screening. Small should be selected if your target is small objects. In the Small option, each scan signal range should be 15-20 cm. You can select the General scan, such as normal object, space, structure. In this option, your scan signal range should be between 25 and 35 cm. You can select the Tunnel option for your scans covering large areas such as tunnel, room, and grave. In this option you can search at 50 cm intervals.

For example; If you select 10 signal steps and select small as the target type you will scan with a distance of 30 cm each; You will have created a scanning line of 300 cm or 3 meters.



Step Duration: If you want the device to wait between each signal pulse, you can select not less than 0.8 seconds. When you increase the time, the waiting time will increase. This feature is activated in the automatic search option.



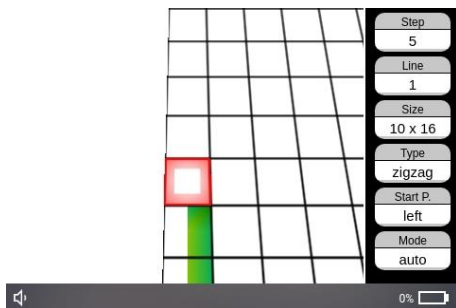
Starting Point: You can adjust your scanning starting point by starting at the bottom right or bottom left corner. To do this, you must select left or right from the starting point. If you start searching from the bottom left corner, you should continue with the next scan row on your right. If your selection is in the bottom right corner, you should continue with your next scan row on your left.

After you have made all the settings, you can start scanning by pressing the Confirm button.

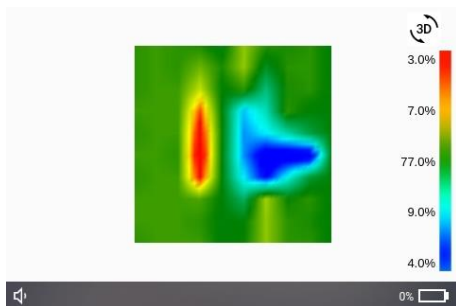
AUTO & MANUAL 3D SCAN

Depending on the settings you made before the search, the 3D Ground scan will begin. During scanning, you will see colors such as green, red, yellow, and blue, depending on the measurements you have taken. All metallic objects and objects with high magnetic effect are mostly red, some are orange, Underground cavities, filled soils, cavities are blue, you can see

the soil as green without any changes and anomalies. You can see mineral soils and objects with a relatively low magnetic effect as yellow and orange. After the scan, you can examine this data in detail on the analysis screen.

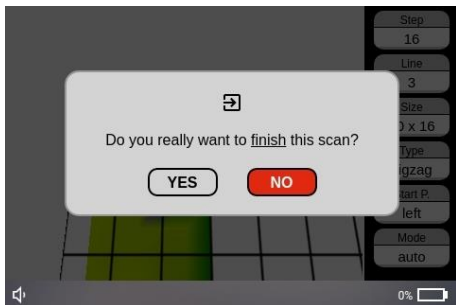


On the right side of the scan screen, you will see the settings you made before scanning. If your selection is Automatic mode, you will be directed to press the **Start** button when the number of signal steps entered for each sequence is complete. You must do this for each scan line.



If your selection is Manual Mode, you must press the start button on the front handle for each signal step.

When the number of signal steps and lines entered is complete, the device will automatically exit the search function and direct you to the 3D Viewer function for a detailed analysis of the received data.



If you want to end the search before the number of signal steps entered and the line row is completed, you must press the **Back** button on the device. Press Back and the device will ask you if you want to end the search. Select Yes and your search will end and you will be directed to the 3D Viewer screen. If you select No, you can continue your search from where you left off.

To obtain regular and accurate data, you must complete the number of signal steps and the number of lines entered.

3D MONITOR AND GRAPHICAL ANALYSIS

Your device will direct you to this screen after scanning so you can examine the graphics you have obtained with 3-Dimensional Ground Scanning in detail. On this screen, you will see 3D graphics of the data you have collected in the center. The color bar on the right gives information about the soil that was scanned.

Functions of the buttons in 3D Viewer:

Mode: Switches between different types of analysis.

Arrow buttons: Turn the graph up, down, left and right; move the graph and go through each square in the details page.

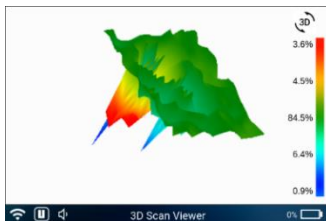
Zoom: Makes the graph bigger or smaller to examine in detail.

OK: Turns on and off the grid on the graph. Squares on this grid correspond to each of your search signals.

Back: Allows to go back to the main screen from 3D Viewer.

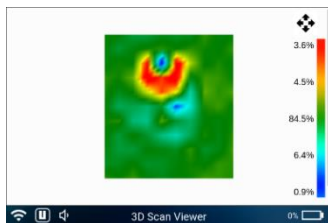
Start: Allows to go back to the main screen from 3D Viewer. This view allows you to analyze the data in more detailed lines.

There are 4 different graph analysis features on the 3D Viewer function.

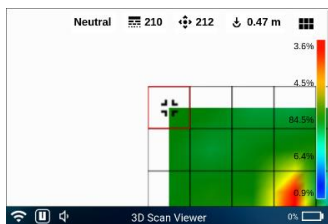


3D Rotation: You can use the direction buttons on the device to rotate your graph left-right and up-down. This way, you can see your graphic from different angles. You can use the magnifier buttons to

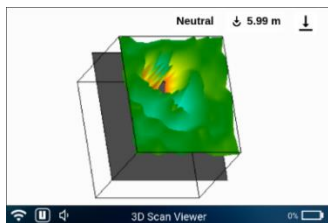
zoom in and zoom out to the graphic. You can zoom in with the button that has a plus sign and zoom out with the button that has a minus sign.



3D Pan: You can examine your graph and the colors closely by zooming in. You can move the graph left and right, up and down with the direction buttons and go through the graph.



Scanning Details: You can see numerical values of your data and get information about depth by choosing type of soil. You can go around the graph with direction buttons and examine the point details.

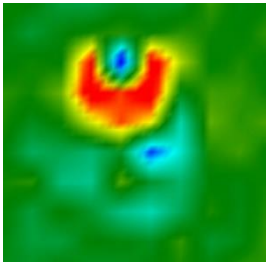


Depth Information: You can find out the general depth information of the measurement and see the start and end points of ground and other variables.

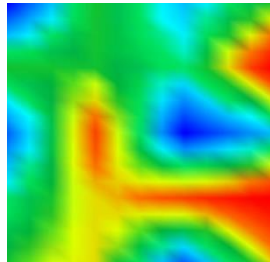
The colors on the graph represent the following;

- **Red:** Metallic objects and objects with high magnetic effect,
- **Blue:** Filled dirt, tunnels and cavities in the underground.
- **Green:** Standard soil that does not have any magnetic effects.
- **Orange and Yellow:** Mineral substances, mineral soil and objects that have relatively low magnetic effect.

DETECTION & METAL-MINERAL DIFFERENTIATION



Metal

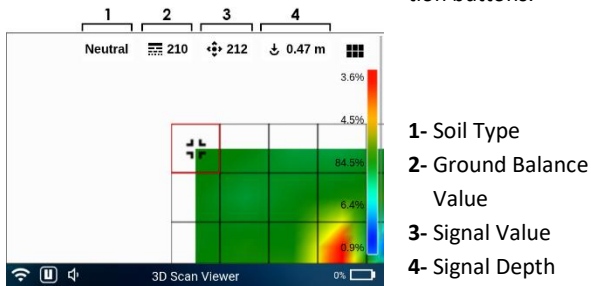


Mineral

- Metallic objects have a distinct shape, while minerals usually have a messy and scattered appearance.
- Metallic objects have red color, mineral substances are usually yellow and orange.

- The most important property of metallic objects that distinguishes them from minerals is that there is a significant numerical difference between them and soil in the collected data.

In order to see these numerical values, you have to switch to the Scanning Details feature in the 3D Viewer function. You can see soil balance value and numerical values of the selected area in the top bar when you go around the graph with direction buttons.



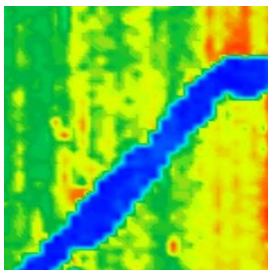
There must be an increase of at least 15 units between the soil, which is shown with green on the graph, and metallic objects which are shown with red. For example, if the level of soil is 150, there should be a numerical value of at least 165-170 in order to be a metallic object present. If there is a difference of a couple of units, this data indicates mineral. A few units of increase are also possible for new objects that have less magnetic effect and have not been underground for too long.

If there is a big difference between the soil and object that has magnetic effect, there is a great possibility of valueless metal.

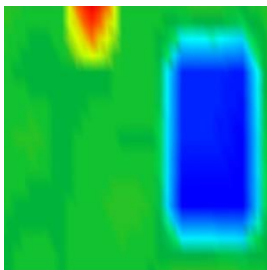
For example, when the level of soil is 80 units and magnetic object is 200 units.

Metallic objects that have been buried underground for a longer period of time can be detected more easily. Precious materials such as gold or silver can be detected only if they were buried together with objects that have high magnetic effect. In order to see whether the data represents a real object or not, more than one measurement should be performed in the same spot and all of them should result similarly.

CAVITY DETECTION



Tunnel



Grave

Artificially created underground cavities such as tunnels, chambers, tombs are seen as **blue** color in the graphic. In the event of any dents or soil filled in the underground, the data will be light blue, turquoise or light green.

What you are searching for must have a distinctive shape and form, for example if you are searching for a structure that

resembles a tomb, the blue area on the graph should be rectangular and the size of a tomb.

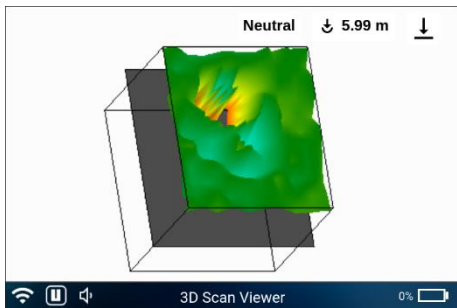
In order to see this numerical value, you should switch to the Scanning Details feature in 3D viewer function.

There must be a decrease of at least 15 points between the soil which is shown with green and grounds which are shown with blue. For example, if soil level is 150, then the grounds should have a value of 135-130.

If there is a difference of a few units, this data indicates ground caused by rocks or superficial soil variations.

When you go around the graph with direction buttons, you can see the soil balance value and numerical value of the selected point on the top bar.

DEPTH CALCULATION



You can get approximate information about real objects, metallic objects or the depths of underground grounds with the calculations. Depth calculations may vary depending on type of soil or objects staying underground for a long period of time.

You must switch to **Scanning Details** in 3D Viewer function.

You must select the type of soil accordingly to the area you are working on from the depth information screen. You can select the type of soil using zoom in and zoom out buttons.

For example, if the area you are working on is completely rocky, choose “**concrete**”, If it is stony, choose “**stony**”, If it is non-mineral; field-like, choose “**light mineral**”, If it has high mineral concentrations, choose “**high mineral**”. If you have no information or estimations about the type of soil, you can make several calculations in different options and compare them or choose “Overall” for a more accurate calculation.

After you select the type of soil, you will see depth information for each point on the top bar as you go around the graph with direction buttons.

In order to see total depth information, you will have to switch to **Depth Information** in the 3D Viewer function. You can move the depth level indicator up and down with zoom in and zoom out buttons on this screen. You can see the total depth information on the top bar. Numbers on the graph show meters or feet.

If there are no objects with magnetic effect or different abnormalities in your calculations, the depth information you see will be zero or very low numbers.

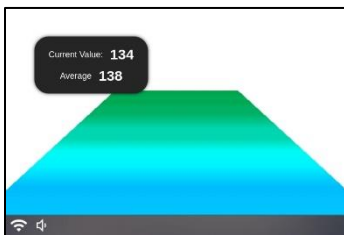
As seen on the sample graph, the metallic object has 1.57 written on it. This means the depth of the metallic object is 1.57 meters according to light mineral soil.

Data on depth information are created with certain calculations.

These are to give you approximate information. The information is not exact or binding.

LIVE SCANNING

Live scanning means search modes with 3 different search options that allow you to make fast, 2-dimensional point detections.



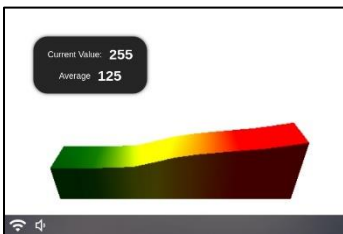
Live scan:

You can see objects with magnetic effect, metallic objects, grounds and structures buried underground faster. On live scanning

screen, you can see all metallic objects and most of the objects that have magnetic effect with **red**, and some objects that have magnetic effect with **orange**, Tunnels, filled dirt and cavities underground with **blue**, soil that had no changes or

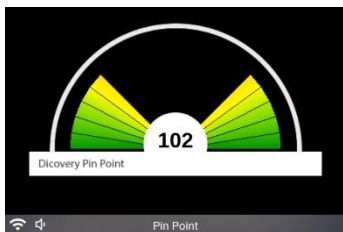
anomalies with **green**. Mineral soil and objects that have relatively low magnetic effect are **yellow** and **orange**.

Additionally, you can see soil balance values and numerical values of instant data on the top left corner.



Dynamic Graph:

You can see objects with magnetic effect, metallic objects, grounds and structures faster, like the live screening option. In Dynamic Graph option, your device automatically detects the level of soil on your first scan and calculates your scanning according to this level. If you press the **OK** button on your device during scanning, the device will instantly update the soil level and you can carry on scanning with this new level of soil.



Pinpoint: Allows you to make point detections. You can use pin point option to determine the exact location of the metallic or magnetic effect objects you have detected. The color of

the graph will change from green to red as you approach the target in pin point mode. A proper red color indicates that you

are in the highest magnetic effect zone. This means you are close to the object.

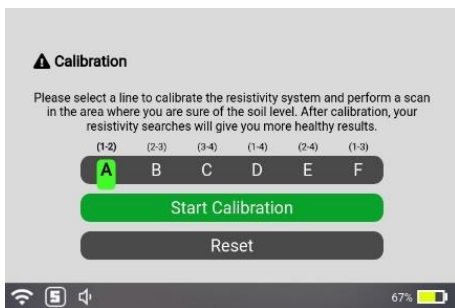
RESISTIVITY SCANNING

Resistivity scanning allows you to find large metals, large structures such as tunnels, chambers, caves. Resistivity scanning has two different search modes as automatic and manual.

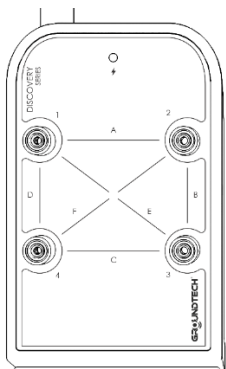
WARNING!

Before you start resistivity scanning, you must attach the conducting probes and wires. Absolutely do not attach wires to the sockets after the scanning begins. Resistivity scanning has the output power of **110 volts**. Do not touch the metal parts with your bare hands during the scanning. This may cause serious injuries.

CALIBRATION



Wet soil can cause mistaking in your operations resistivity scanning. In order to minimize the rate of mistaking, you must perform soil calibration.



For calibration settings, arrange the probes 1-2 meters apart and place 2 conducting probes on the ground. Place the probes in ground free of any metal, cavities, or water.

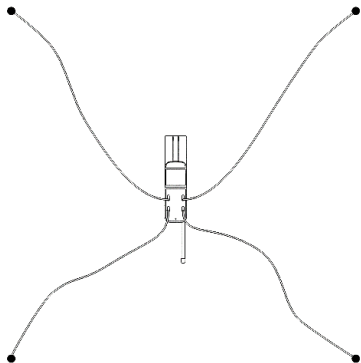
Attach the conducting wires which come with your device to the probes and the other ends to any line on your device. For example, to the A line output sockets number 1 and 2.

Select the calibration option in the resistivity scan menu. Select the line on which you have attached the probes and select Calibration. The calibration should now be completed. The data will be fixed as soil level. In automatic search or manual search modes, you can scan with the obtained calibration value.

You will need to redo the calibration in each different scan or area.

For deleting the calibration and returning to the interval of the device on manufacture, select the Reset option on the calibration menu. Therefore, the calibration values of the device will be reset to factory defaults.

AUTOMATIC MODE



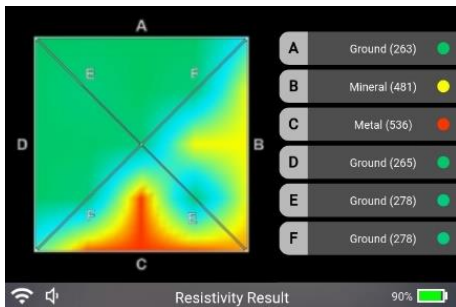
You can use resistivity mode for large metals and large-scale searches such as tunnels, caves, water, underground structures. You cannot detect small objects with resistivity search mode. Before starting Automatic Mode Resistivity scanning, place the

4 conductive probes which come with your device to the ground, forming a square.

Arrange the distance between two probes according to the depth you want to scan. Attach 4 conductive wires which come with your device to the output sockets of your device and the other ends to the conducting probes.

Then select the Automatic Mode on device menu. You will need to press the OK button on your device to start the scanning. When you press the OK button, search will be initiated automatically between 4 probes.

If you want to stop the scanning for any reason, press Back button.



After the scanning is completed, you can see the graphic results and numerical values on the right side of the screen, about the measurements you have taken. You can rotate this graph left, right, up and down with the direction buttons on the device. You can switch to wire cage view with the Start BUTTON in the front part of the device.

The colors on the graph correspond to;

Green: Soil

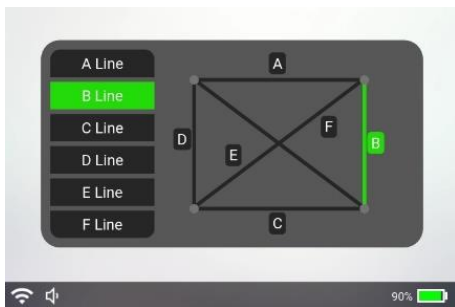
Blue: Ground

Light blue: Water

Yellow: Mineral

Red: Metal. Also, the data on the right show the results perceived on the lines after scanning.

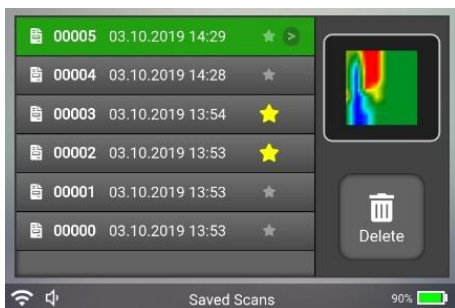
MANUAL MODE



Manual Mode Before starting the resistivity scan, place the 2 supplied conductive probes in parallel with the ground. Adjust the distance between the probes according to the depth you want to scan. Your scan depth is equal to the average half of the distance between the two probes. Connect the 2 supplied conductive wires to any of the output sockets on your device and the other ends to the conductive probes. For example, connect to output sockets 1 and 2 with line A.

Select Manual Mode from the device menu. Select the line where Conductive Probes are installed. The scan will begin. After the scan, you will see the measurement result graphically and numerically on the device screen.

OPEN A SAVED FILE



You can save a large number of measurements that you took to your device. You can save measurements in two different options: 3D ground scanning and Resistivity scanning.

There are 3 different options in the Saved File open menu.

1. 3D ground scan files
2. Favorite scan files
3. Resistivity scan files

3D Ground scan recorded files are sorted in order of recording. You can scroll through the recorded files with Up-Down arrow buttons. On the right, you can see a preview of your scan when switching between saved files.

Press the **OK** button on the device to open the saved scan file.

To delete your saved files, you can delete them using the Delete option from the menu on the right.

Press the Mode button on your device to add your recorded files to **the favorite list**. Press Mode Button again to remove them from the favorite list.

You can view the saved scans that you added to the favorite list from the Favorite Scans menu. Only scans you add to the favorite list appear in this menu.

In the **Resistivity Scans menu**, you can see and delete only the resistivity scans. To view the resistivity scans, press the OK button on the scan you wish to turn on.

FREQUENTLY ASKED QUESTIONS

Can this device be used stand-alone?

Yes. This product displays the anomalies under the ground in the form of 3-D graphics. The built-in screen allows you to have detailed reviews and analyses on the 3-D graphics. You may use the licensed Android software of the product for more comprehensive reviews and analyses. To do that, you use this product with a device capable of running the Android operating system.

Is it necessary to have an Internet or GPS connection while using this device?

There is no requirement to use an Internet connection for the performance of the scanning procedures. GPS connection is required for the local time and location information of the area where you are in. Data from the GPS connection is used only to record the scanning data of your device with the time

and location information thereof. This information is used only on your scanning details. You will need an Internet connection to update the software of the product.

Can I install the software of the device on another computer or an Android tablet-telephone?

Yes. The products comes with a CD or flash disk. You may download the Android software from Google Play Store. You need to purchase an additional license for an application installed on another computer or Android device. In case there is any problem with the tablet or computer supplied together with the product making them unusable, then the former license is to be cancelled and, a new license will be provided for free. However, a license fee is required to be paid for an application to be installed on a third computer or tablet-telephone.

What is the minimum system requirements to install the application?

Operating System: Windows 8.1. or newer, CD-ROM driver or USB port; Alternatively, you may download the applications from our website.

USB 2.0 connector or higher level of Bluetooth, 1 GHz Processor, 1 GB RAM (Memory), 250 MB Free storage on hard disk, DirectX9 graphic card.

For Android devices, 5.0 and higher operating system and minimum 1 GB ram of memory.

Is the device water-resistant?

No. Avoid contact with water and using in rainy weather.

What is the battery life of the device?

It is maximum 6 hours in case of uninterrupted use. (This may vary for other models)

How long does it take to charge the battery of the device?

It takes 5-6 hours with the wall outlet charger supplied with the device and, 6-7 hours with the vehicle input charger. It takes longer if you use a power bank to charge the device. It may vary depending on the voltage and ampere output power of the power bank.

Will the failure to charge the battery harm the device? Will it kill the battery?

In case you do not use the device for a prolonged period of time, the li-ion battery inside the device may be completely discharged and become unusable. Therefore, you need to charge the device at certain intervals when it is not in use.

The tablet/pc supplied with the device is broken, what should I do?

A tablet or a pc is given as a gift when you purchase the device. In case of a failure of this tablet or pc, you may contact the international service points of the manufacturer/distributor thereof for repairs and maintenance.

The accessories supplied with the device are broken/lost, are they under warranty?

All the accessories supplied with the device are not under warranty. The main unit of the device is under international warranty of 2 years.

The device breaks down and, there is no service or authorized seller in my region, what should I do?

You need to send your device by courier or deliver it in person to the manufacturer or main service department.

How does the measurement system work?

It is a passive magnetic field measurement method with UMD-2 sensors using a sensitive magnetic anomaly detection technology.

What is the highest depth measurement of my device?

The highest depth measurement is maximum 18 to 25 meters depending on the soil structure, the size, type and magnetic field sensitivity of the object and, how long it has been under the ground.

Can I find gold with this device?

This magnetic field measurement method allows for detection of objects and structures under the ground that are capable of creating magnetic fields such as metals, structures, bricks, caves, tunnels, water sites, graves, underground pipelines, alluvium wells, old wine cellars, findings from the world wars etc. In particular, such metals with magnetic effect buried under the ground for an extended period of time (metals such as iron and steel) could easily be detected. You may find ingots, coins or other treasures if they have been buried under the ground for an extended period of time and they are within a metal with magnetic field. You may use the metal detectors to find small and golden materials such as gold coins, coins etc. that are directly buried under the ground.

Is the depth information indicated on the application the accurate?

The application uses a certain algorithm to provide estimated depth information. This information is not accurate and binding. Estimated information is provided.

Is it possible to understand the sizes, shapes and weights of the buried objects?

3D Systems display the shape and size of the buried object in graphics, but these shapes and sizes may be misleading depending on the underground minerals or the scanning mistakes of the user. You may not detect the weight.

Can the device help me find precious metals?

Natural precious metals such as diamond, ruby, sapphire or opal are in generally found in combination with cores and minerals. These minerals may be represented as anomalies in the scanning images.

Can I detect water with this device?

These devices measure the anomalies in the magnetic field. A cave with full of water or a constrained underground water reservoir or an underground water flow may be seen in the graphics as a space.

Is it possible to make a search in any direction when scanning?

You need to make your scanning always in the north-south direction. Otherwise, the data you obtain may be wrong.

When I scan the same area in different times, I obtain different results and different graphics, what is the reason of this?

The magnetic measurement method, the magnetic sensitivity of the area you are scanning, the sun and time differences as well as starting the scanning from different points may cause you to have different data.

How can I be sure that my device is robustly functioning?

Your device functions if the numerical values are obtained in a different but certain level in the data you have. However, there may be a failure in your device if there is a single, standard color in your graphic (such as red, blue, green etc.) and all the numerical values remain between 0 and 5 for all the data.

What is the size of the area that I can scan with my device?

You can perform scanning up to maximum 50 rows and 50 signal pulses. In order to avoid possible mistakes in the scanning, you may perform scanning for at least 10 rows and 10 signal pulses and, not more than 20 rows and 20 signal pulses to get an average measurement.

What should the maximum distance between the device and the ground be when scanning?

The distance between the ground and the sensor should be up to 15 cm and remain unchanged when scanning.

How fast can I scan with the device?

You should scan in a normal walking speed.

