FS Future Series

Rover Gold

Version 1.0

User's Manual

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Chapter 1

Introduction

1.1 Preface

Dear customer,

thank you for choosing the OKM Rover Gold. Over the years, OKM has diligently worked with our metal detector customers, enthusiasts and professionals to build a better, more efficient detector. We proudly introduce to you the Rover Gold. This is the first detector by OKM specifically built to locate naturally occurring mineralization.

Unlike other instruments manufactured by OKM to hide and not show areas of mineralization, the Rover Gold is built for the prospector to help in localizing mineral deposits. There are several new features of the Rover Gold which have increased the simplicity of the unit and make it much easier for the novice as well as the professional prospector. The one touch „Mineral Scan“ feature has eliminated many of the steps in completing a scan. In addition to simplifying the scanning process, it has also eliminated many of the common mistakes made by new users. When users make fewer mistakes, their chance of success increases.

The Rover Gold has been streamlined to give you only the necessary tools to complete the task of finding mineral beds, veins and deposits. We have realized that excess accessories are not necessary for the prospector to carry into the field. Our packaging of the unit is now smaller and lighter making it easier to transport.

At OKM, we are constantly improving our products to make them more reliable and worry free. The equipment is under recurrent control by our staff and engineers to ensure that every unit is of the highest quality and workmanship. Every unit has a two year manufacturers warranty against defects.

With the purchase of an OKM unit, we cannot guarantee that a find with the unit will be made. As with any product, recognizing a potential target has other contributing factors like ground dielectric constants, attenuation from clays and other geologic properties which can hinder a signal.

OKM makes every effort to assist with the data analysis. In the event that a scan is not understood, you may send to us the original, unfiltered Visualizer 3D file and the control scan for free analysis to our email, info@okm-gmbh.de. Also, per telephone and email, we will gladly assist with any technical support and assistance at absolutely no cost to the owner or operator of this device.

For more information on this particular device on where it has been used and tested, please visit our Internet site, Facebook page to read up on the results or contact a sales representative. Our equipment is constantly being tested and improvements are made as with the development of our equipment. In some cases, there may be information within this handbook that may not be completely accurate or pertain to your specific build or version.

1.2 Important Notes

Prior to using the Rover Gold and its accessories, please read these operating instructions carefully. These instructions give information on how to use the detector and potential sources where precautions should be taken.

The Rover Gold and its accessories serve for the analysis, documentation and detection of sub-surface anomalies and ground disturbances. The recorded data of the ground structure will be transmitted to a PC to give a visual representation using our proprietary software program. Any additional notes to the software should be observed. Please read the user manual of the software!

1.2.1 General Notes

Being an electronic device, the Rover Gold has to be treated with caution and treated with care as with any electronic device. Any failure to observe the safety precautions given or any use for purposes other than the ones it is designed for may result in damage or destruction of the processing unit and/or its accessories or connected components.

The device has a built in anti-tampering module which will destroy the unit if it is improperly opened. There are no end user serviceable parts on the inside of the unit.

1.2.2 Possible Health Hazards

If used properly this device normally does not pose any health hazards. According to current scientific knowledge, the high-frequency signals are not harmful to the human body on account of their low power.

1.2.3 Surrounding Area

When moving this unit from a cold place to a warmer place, watch out for condensation. Do not immediately operate the unit until any possible condensation could have evaporated. The unit is not weather proof and water or condensation can destroy the unit.

Avoid strong magnetic fields, which may occur in places where there are large electric motors or unshielded loudspeakers. Try to avoid using this equipment within 50 meters (150 ft) of this type of equipment.

Metallic objects on the ground such as cans, tin, nails, screws or debris can influence your scan data and present negative results regarding your scan data. Also it is a good habit to remove any metallic objects off of your person like cellular telephones, keys, jewelry, etc... Do not wear steel toe boots.

1.2.4 Voltage

The power supply should not be outside the indicated range of values. Use only approved chargers, batteries and rechargeable batteries which are included in the scope of delivery.

Never use the 115/230 Volt mains supply.

1.2.5 Data safety

Data errors can occur if:

- the range of the sender module has been exceeded,
- the power supply of the device or the batteries are too low,
- the cables are too long,
- the unit is operating to close to devices which sends out disturbances or
- atmospheric conditions (electrical storms, lightning, etc...).

1.3 Maintenance and Services

In this section you will learn how to maintain your measuring instrument with all included accessories to keep it in good condition a long time and to get good measuring results.

The following list indicates what you absolutely should avoid:

- penetrating water
- strong dirt and dust deposits
- hard impacts
- strong magnetic fields
- high and long lasting heat effect

To clean your device please use a dry soft rag. To avoid any damage you should transport the device and accessories always in the appropriate carrying cases.

Prior to using your Rover Gold please be sure that all batteries and accumulators are fully charged. Also allow the batteries to completely discharge before recharging them, regardless if you are working with the external battery or with internal accumulators. This way your batteries will have a long and durable life.

> To charge the external and internal batteries, use only the approved chargers which are part of our scope of delivery.

1.4 Danger of Explosion during Excavation

Unfortunately, the last two world wars also made the ground in many places of the world a potentially explosive scrap heap. A host of those lethal relics are still buried in the ground. Do not start digging and hacking for an object wildly when you receive a signal of a piece of metal from your device. Firstly, you might indeed cause irreparable damage to a truly rare find, and secondly, there is a chance that the object reacts in an insulted way and strikes back.

Note the color of the ground close to the surface. A red or reddish color of the ground is an indicator of rust traces. As regards the finds themselves, you should definitely pay attention to their shape. Curved

or round objects should be a sign of alarm, especially if buttons, rings or little pegs can be identified or felt. The same applies to recognizable ammunition or bullets and shells. Leave that stuff where it is, do not touch anything and, most importantly, do not take any of it home with you. The killing machines of war made use of diabolical inventions such as rocker fuses, acid fuses and ball fuses. Those components have been rusting away in the course of time, and the slightest movement may cause parts of them to break and be triggered. Even seemingly harmless objects such as cartridges or large ammunition are anything but that. Explosives may have become crystalline over time, that is, sugar-like crystals have formed.

Moving such an object may cause those crystals to produce friction, leading to an explosion. If you come across such relics, mark the place and do not fail to report the find to the police. Such objects always pose a danger to the life of hikers, walkers, farmers, children and animals.

Chapter 2

Data transfer via bluetooth

In this section you will learn how to install the bluetooth software on your computer. This software is necessary to transfer all measured data from your Rover Gold to the computer.

2.1 Installation of bluetooth software

In the first section of this chapter it will be explained how to install the bluetooth software. Please note that the represented figures do not necessarily correspond to the current version of your operating system or the version of usb installation.

2.1.1 Install software and driver

The bluetooth software is situated on the software CD which is included in the scope of delivery. Place the CD inside the CD Rom drive of your computer and wait until a window like shown in figure 2.1 appears.

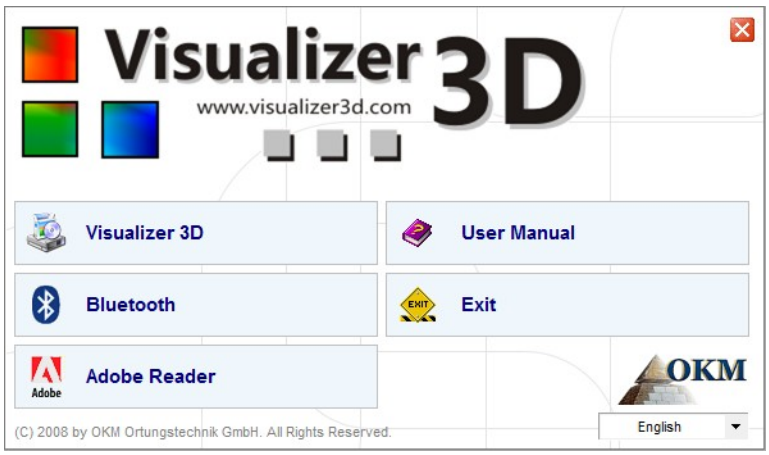


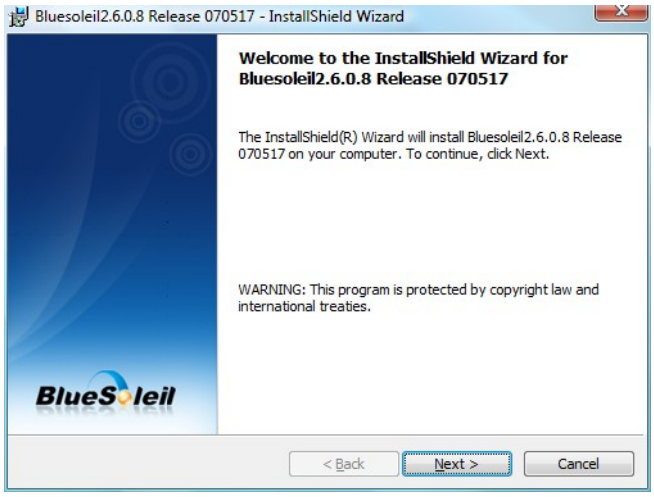
Figure 2.1: Start screen when inserting in the software CD

Click on the entry *Bluetooth*, to start the installation of the bluetooth software and follow the instructions on the screen of your computer, like it is explained in the following steps.

Step 1

Select the language and click on the button "OK".

Figure 2.2: Installation of bluetooth software, step 1



Step 2

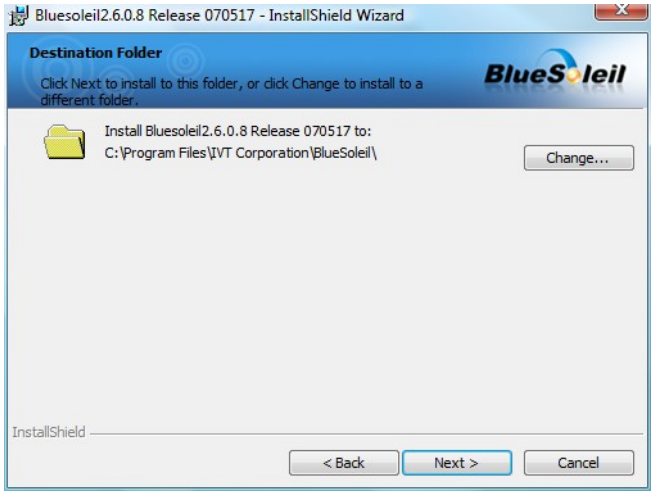
Click on "Next >".

Figure 2.3: Installation of bluetooth software, step 2

Step 3

Mark the entry "*I accept the terms in the license agreement*" and after that click on "Next >".

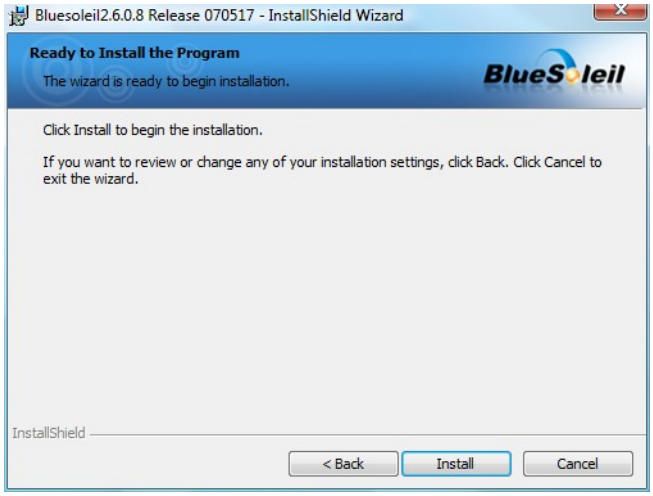
Figure 2.4: Installation of bluetooth software, step 4



Step 4

Click on "Next >".

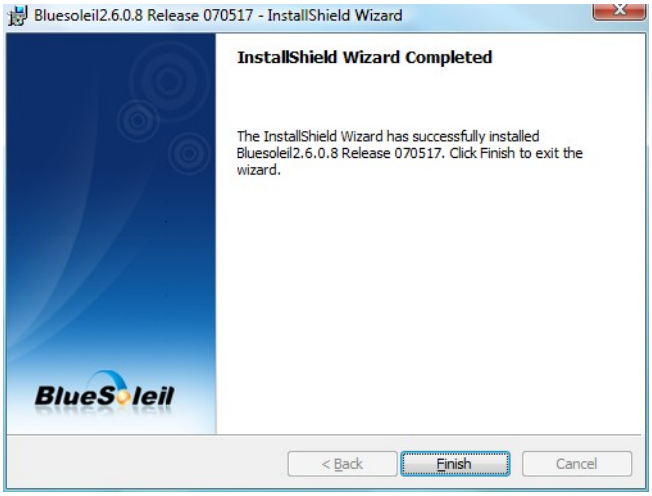
Figure 2.5: Installation of bluetooth software, step 5



Step 5

Click on "Install".

Figure 2.6: Installation of bluetooth software, step 5



Step 6

Click on "Finish".

Figure 2.7: Installation of bluetooth software, step 6

Restart your computer after finishing the installation, to agree to the changes on your system!

2.1.2 Configurate bluetooth dongle

After restarting your computer the bluetooth software should open automatically. Check if you can find the bluetooth icon (grey/white) on the down right side of the task bar.

If you do not find this symbol there, you should start the bluetooth software manually. In this case just click on the bluetooth symbol, which has been created on your desktop during the installation.

Step 7

Double click on the new created bluetooth symbol on your desktop to open a window like here on the right side.

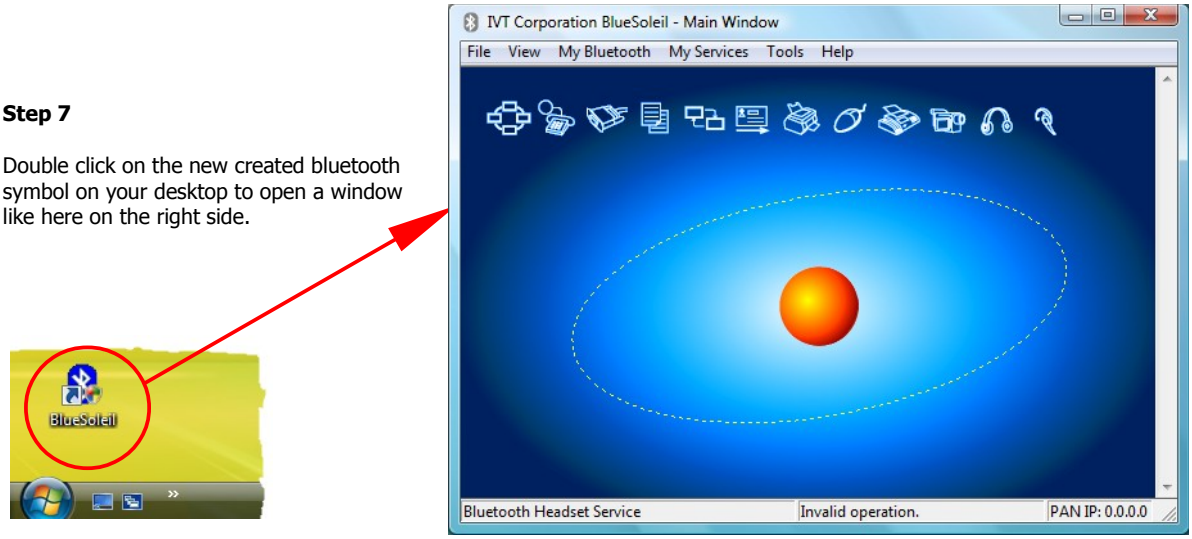
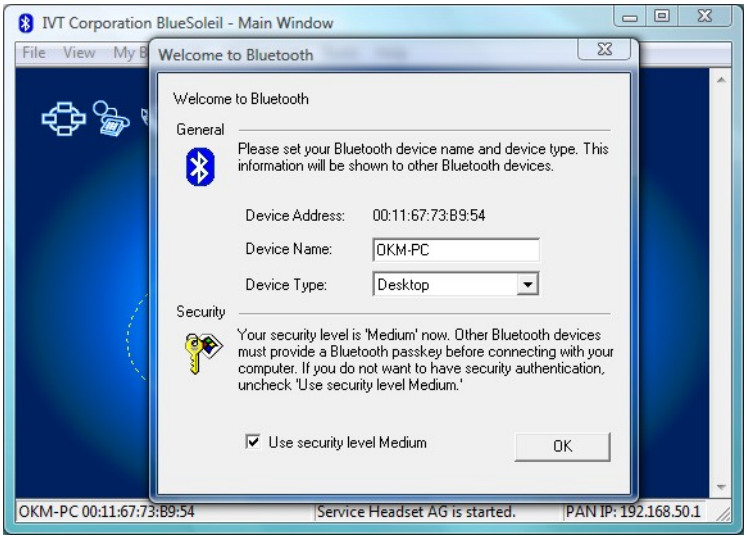


Figure 2.8: Installation of bluetooth software, step 7

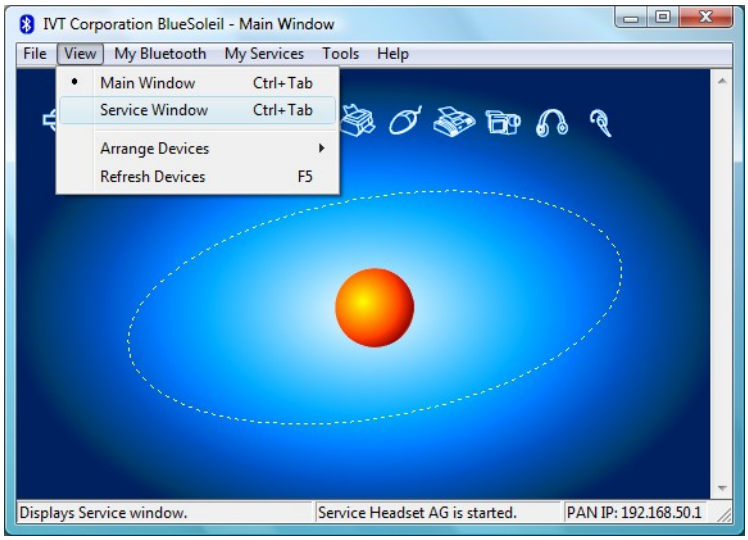


Step 8

Plug in the bluetooth dongle in a free USB connection of your computer. When the dialog from the left figure appears click on "OK".

Figure 2.9: Installation of bluetooth software, step 8

Now the bluetooth drivers will be installed on your computer. This can take several minutes, depending on your computer. Please wait until all drivers are installed successfully and then continue with step 9.



Step 9

Click in the menu on "View → Service window", to see the installed services.

Figure 2.10: Installation of bluetooth software, step 9

Step 10

Behind the entry "Serial Port A" you can find the assigned COM port, which you should select during the data transfer in the software Visualizer 3D.

In our example here it is COM6.

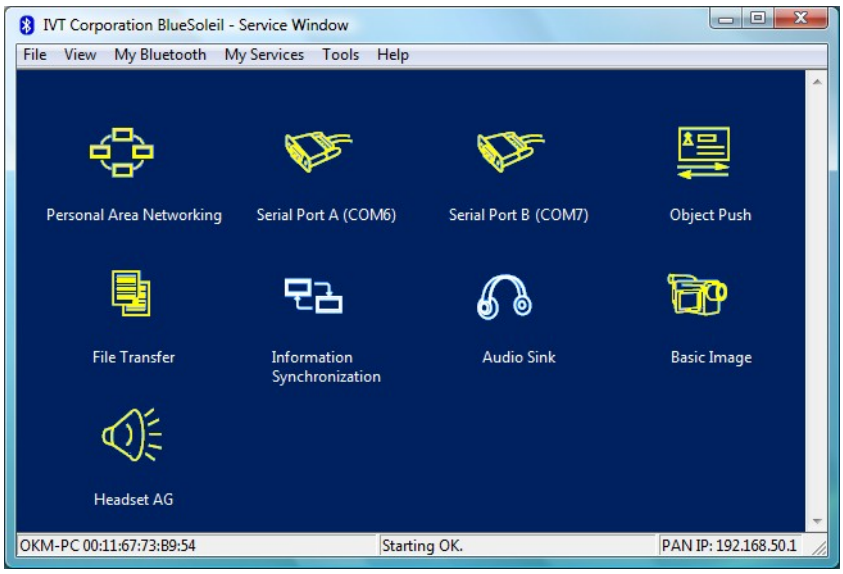
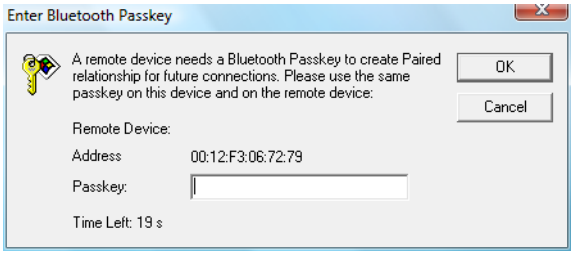


Figure 2.11: Installation of bluetooth software, step 10

2.1.3 Setup connection

When you connect the device via bluetooth for the first time, to transfer data the computer, you should enter the bluetooth passkey. The passkey is **OKM** (take care to write in capital letters!).



Step 11

When connecting the device to computer the first time you should enter the bluetooth passkey.

Enter **OKM** in capital letters and click on "OK".

Figure 2.12: Installation of bluetooth software, step 11

Step 12

When the bluetooth connection is established successfully the bluetooth symbol in the task bar will be visible in green.

Only after the bluetooth connection is successfully established, you can transfer data from your measuring instrument to the computer.

The measuring instrument should establish the bluetooth connection always by itself. It is not possible to search for the device via the bluetooth software. You only can use the bluetooth dongle delivered with the device!

2.2 Uninstall bluetooth software

In this section it is explained how to delete the bluetooth software from your computer.

Therefor click on the entry **`Start -> All Programs -> IVT BlueSoleil -> Uninstall BlueSoleil`** and follow the instruction on the screen of your computer. After uninstalling your bluetooth drivers you should reboot your computer.

Chapter 3

Technical specifications

The following technical indications are medial values. During operation small variations are quite possible. Technical changes due to development are possible!

3.1 Control unit

Dimensions (H x W x D) ..... 390 x 140 x 300 mm
Weight ..... about 1 kg
Voltage ..... 12 VDC
Processor ..... Motorola, 32 MHz
Data memory (control chip) ..... about 32700 measured values
Operating temperature ..... 0 – 50 °C
Storage temperature ..... -20 – 60 °C
Air humidity ..... 5 % – 75 %
Waterproof ..... No
Sensor technology..... SCMI-15-D

3.2 Data transfer

Technology ..... Bluetooth
Frequency range ..... 2.4 – 2.4835 GHz
Maximum transfer rate ..... 1 Mbps
Receiving sensitivity ..... -85 dBm
Maximum range ..... about 100 m

3.3 Computer, minimum requirements

The indicated values should help you for a correct selection of a suitable computer for analysis of your measured results.

CD-ROM drive ..... min. 4x
Interface (data transmission) ..... USB
Free disk space ..... min. 50 MB
Working memory (RAM) ..... min. 256 MB
Graphic card ..... min. 128 MB, OpenGL-compatible
Operating system ..... Windows XP, Windows Vista, Windows 7

Chapter 4

Scope of delivery

In the following section you can find all standard equipment and optional parts of Rover Gold.The scope of delivery can be different in some circumstances because of some optional accessories which should not be included in the basic equipment.

Description	Quantity
Control unit	1
Wireless headphones incl. 2 batteries (AAA)	1
Super Sensor	1
Power Pack incl. charger and traveling adapter	1
User manual	1
Carrying case	1
Software "Visualizer 3D"	1
Bluetooth dongle	1
Control chip	4
Telescoping carrying tube	1

Table 1: Scope of delivery

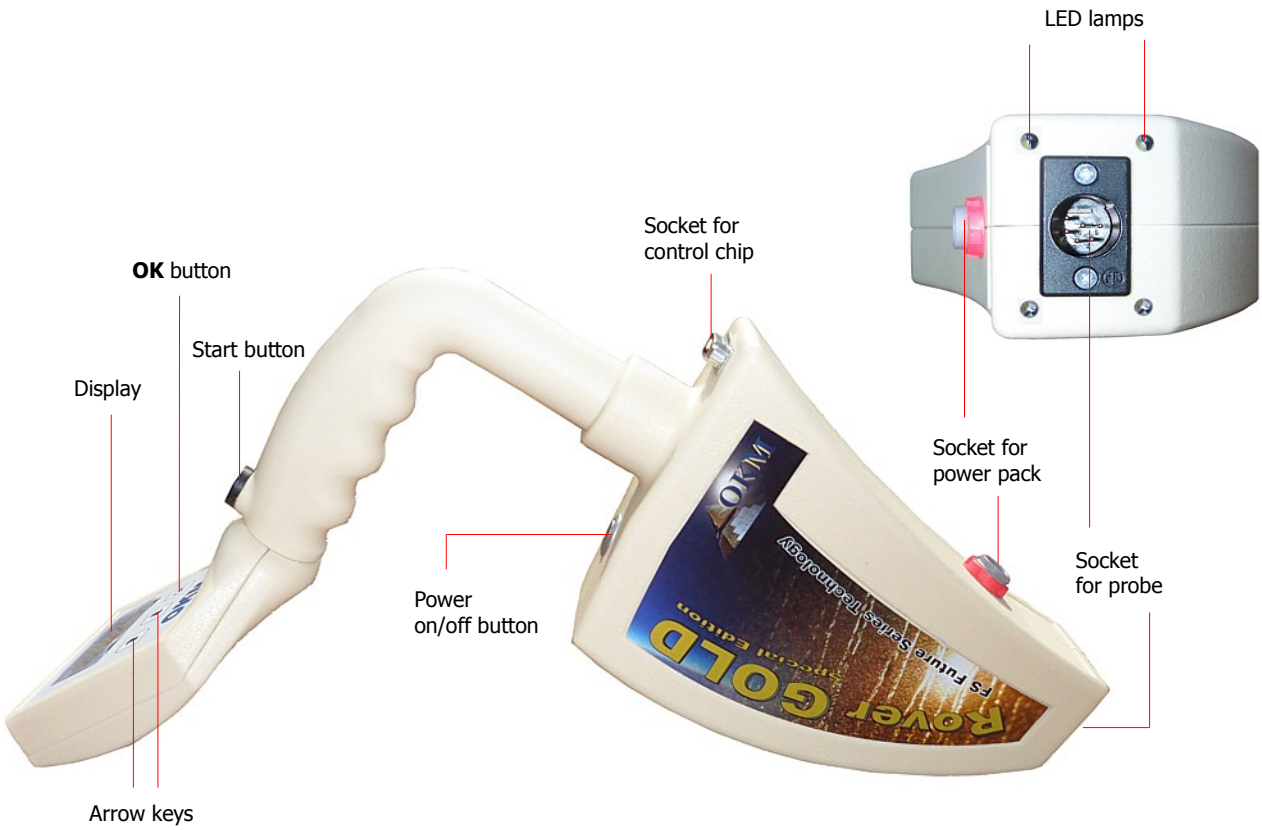
Chapter 5

Control elements

In this section you will learn more about the fundamental use of all control elements for this measuring instrument. All connections, inputs and outputs are explained in detail.

5.1 Control unit

Figure 5.1 represents all control elements of the control unit of Rover Gold.



Power on/off button: With the power on/off button you can switch on or off the device. Also the power on/off button is used to activate/deactivate the internal speakers. When the device is powered off and you press the power on/off button the device will be switched on and the LED of the power on/off button will shine green. If the device is powered on and you press the power on/off button the integrated speakers will be activated. If you press the power on/off button again, the internal speakers will be deactivated. To power off the device, you should keep pressing the power on/off button until the devices powers off and the integrated LED lamp turns out.

Start button: Primarily the start button is used to start a measurement and to release every single impulse in the manual impulse mode. If you are in the main menu, the start button has an additional function. With the start button you can also power on/off the integrated LED lamps on the bottom of the device.

Socket for power pack: Before you can power on the device you should connect the delivered power pack to the socket of power pack and switch it on. Information how to use the power pack you can find in a separate enclosed user manual.

Socket for probe: At this socket you should connect the probe. Without the probe there is no measurement possible.

Socket for control chip: At this socket the control chip (hardware dongle) should be connected, to guarantee a correct functioning of the device. Without connecting a control chip, the display will indicate the message *"Insert Control Chip"* and a permanent signal tone will sound.

Display: The display of the device shows all operating modes, messages and measuring states. Below the display there are 3 control buttons to operate the device. The **OK** button is mostly used to activate the selected operating mode. In some circumstances this button is allocated with another function which will be explained at the appropriate place inside this manual. By using the arrow buttons 🡻 and 🡹 you can switch between the operating modes in the main menu and select the options in the submenus. With these arrow buttons you can finish the measurement of an operating mode and get back into the main menu.

5.2 Headphones

Figure 7.7 shows all control elements of the delivered wireless headphones.

Figure 5.2: Control elements of wireless headphones

To use the delivered wireless headphones, you should insert two charged micro type AAA batteries inside the battery case. Therefor you should remove the ear pad on the left site "L" and insert the batteries into the battery case. Pay attention to use the correct polarity. Now place the ear pad again on the battery case and press and turn carefully until it snaps into place.

Power on the wireless headphones with the power on/off button and find the correct channel with the frequency control. The device Rover Gold should be powered on and release an acoustic signal during

this adjustment. The best way is to power on the device without connecting a control chip. Then the message "*Insert Control Chip*" will appear in the display and a permanent signal tone will sound, which you can use for the optimal setting of the wireless headphones.

Via the volume control you can regulate the volume of the headphones.

Chapter 6

Assembly

In this section is explained how to assemble the device and how to prepare a measurement.

Before you can use the device Rover Gold for a field measurement you should do some preparations. Please pay attention to the following steps!

Step 1

Without the control chip the device cannot be activated. It is used as a safety key. Connect the control chip to the designated socket!

Furthermore it is used as a memory chip to store measured values. If you have several control chips, you can store one measurement on each chip!

Figure 6.1: Connect control chip

Step 2

The probe is used to measure the underground values and should be connected to the socket on the bottom of the unit. Avoid hard impact or other damages.

Figure 6.2: Connect probe

Step 3

To supply the device with power, you should connect the delivered power pack.

Plug in the connector of the power pack in the designed socket and turn it to left or right until it locks into place.

When you pull on the connector, it will be detached from the socket.

Figure 6.3: Connect power pack for power supply

Step 4

After connecting the power pack and powering it on you can simply put it in your trouser pocket or other pocket.

Now you should power on the device with the power on/off button.

Figure 6.4: Pocket the power pack

Chapter 7

Operating modes

In this section you will learn more about operating the device. Every operating mode will be explained in a proper subsection.

Every time when you power on the device with the power on/off button the device type and device version will be displayed. After that, you will always see the selection to adjust the background light of the display.

There are 3 different settings for the background light which you can select by using the arrow keys 🡻 and 🡹:

- **Automatic**
  Automatic regulation of the background light. Within the selection menus the display light is always on and during the activated operating modes (during the measurements) the display light will be off.
- **On**
  The background light is always activated, which means that the display is always lighted.
- **Off**
  The background light is always deactivated, which means the display is always unlighted.

After you have selected the desired option with the keys 🡻 and 🡹 you should confirm this selection with the button **OK**. Then you will enter into the main menu where you can select all available operating modes.

The device Rover Gold offers the following operating modes:

- **1 Mineral Scan**
  A special measurement to find natural minerals like gold.
- **2 Ground Scan**
  A graphical measurement for data analysis on a computer will be processed.
- **3 Pin Pointer**
  Measured values of the sensor will be sent directly to a computer for pin pointing and metal discrimination.
- **4 Transfer Memory To PC**
  Measurement values will be sent from the internal memory (control chip) to a PC for analysis.

The selection of the correct operating mode depends on the planned mission. Normally you should use several operating modes one after another to explore an area. In this way you can obtain as much information as possible from the underground of the scanned area.

The complete menu structure of Rover Gold you can find in figure 7.1 as a schematical representation.

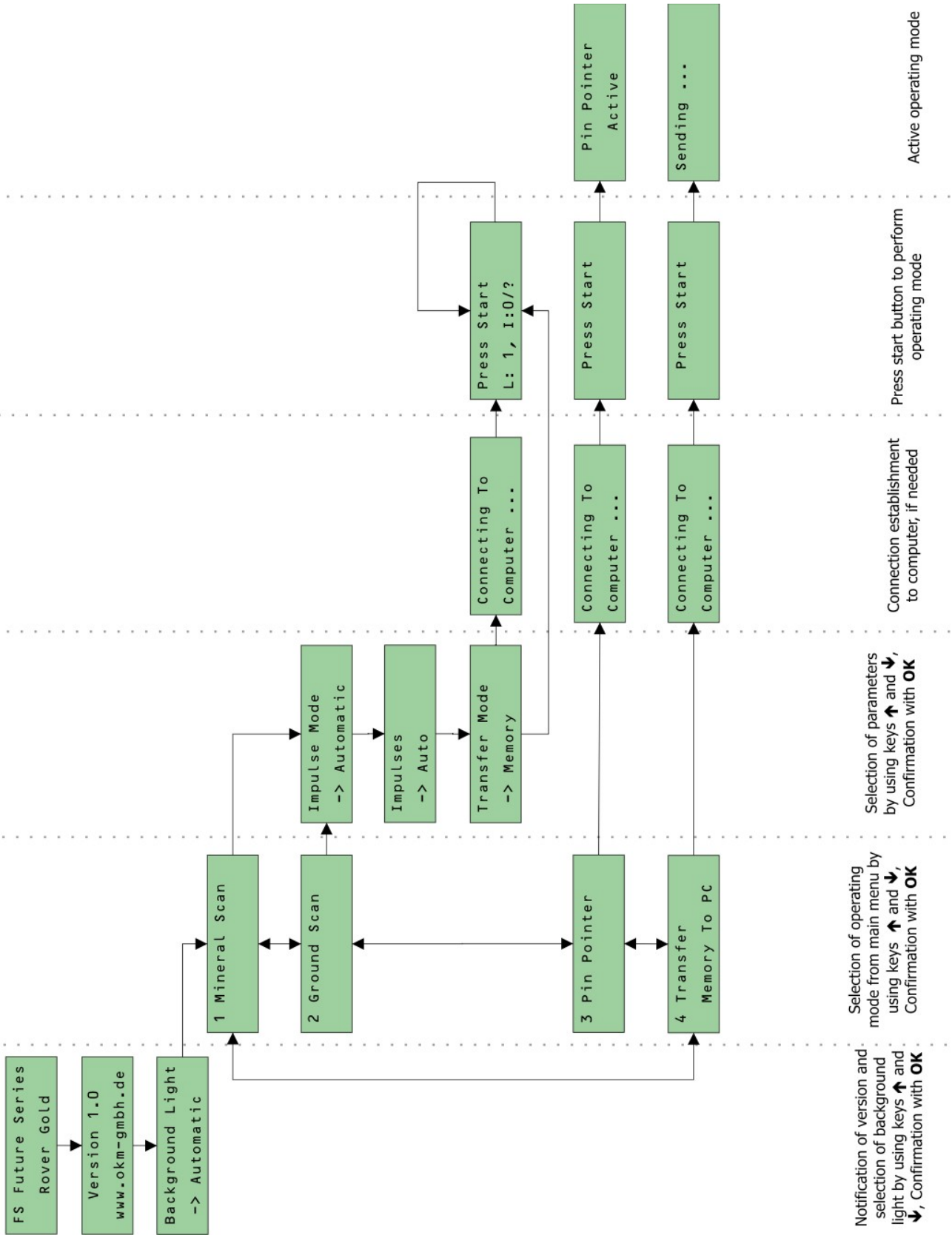


Figure 7.1: Overview about menu structure

7.1 Mineral Scan

When prospecting for mineral deposits or other naturally occurring minerals or formations located in the ground, it is important to work in a clean environment, free of debris. Debris may contaminate the area and lower the probability of success. The presence of debris may also lead to false or misleading signals. Be sure to always work with data that can be repeated.

The Visualizer 3D software or the geophysical equipment itself can not identify element specific materials, minerals or items that occur naturally in the ground. It can identify and locate the presence of ferrous, non-ferrous, fracture zones and other naturally occurring anomalies. The actual detection of gold is based on results from various known gold fields and mines. It is completely possible that other non-ferrous elements resemble the results obtained from gold.

When conducting searches for fields of mineralization, it is important to identify areas of higher probability with the assistance or research of a geologist or a known geological location. Locating and prospecting in known fields or areas of higher probability will greatly increase your chances of success. Different geological formations may give different results in any particular area. If possible it is always best to start the training and/or field testing of the equipment in or on a known area to properly identify the mineral signature in the software. Different locations will have other geologic properties and may or may not be able to give an accurate reading or measurement.

Figure 7.2: Measurement in "Mineral Scan"

To conduct a new scan, power on your device and select the operating mode "Mineral Scan" by using the arrow buttons 🡻 and 🡹. Press the **OK** button to activate the operating mode. In the display you will see the current number of measure points which has been recorded so far.

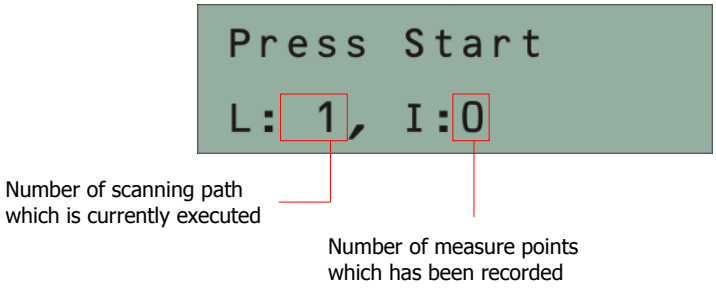


Figure 7.3: Display representation of operating mode "Ground Scan"

Position yourself at the start point (A) of your measurement (see figure 7.2 on page 36) and press the start button. The device starts to capture scan values whereas you have to move forward slowly but continuously to the end point (B). Walk a straight line to the end of your scan line (B) and press the start button again to finish the measurement. Make sure that your scan line has a minimum length of 20 meters (65 feet) to have enough data for later analysis.

After finishing the measurement the program of the device jumps automatically to the menu "Transfer Memory To PC". So you can transfer your scan directly to a PC for a detailed analysis. In figure 7.4 you can see which settings must be applied to transfer the data correctly into the software program. Very important is the number of impulses per scan line which needs to be "**2**" for the "Mineral Scan" (Operating mode = "Ground Scan", Scan mode = "Zig-Zag", Impulses = "2").

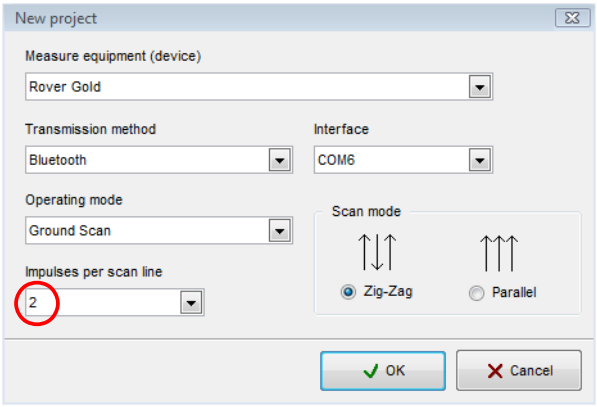


Figure 7.4: Software settings to transfer the scan data

On your screen you will now see a scan that is a straight line as shown in figure 7.5. This scan is now ready for analysis.

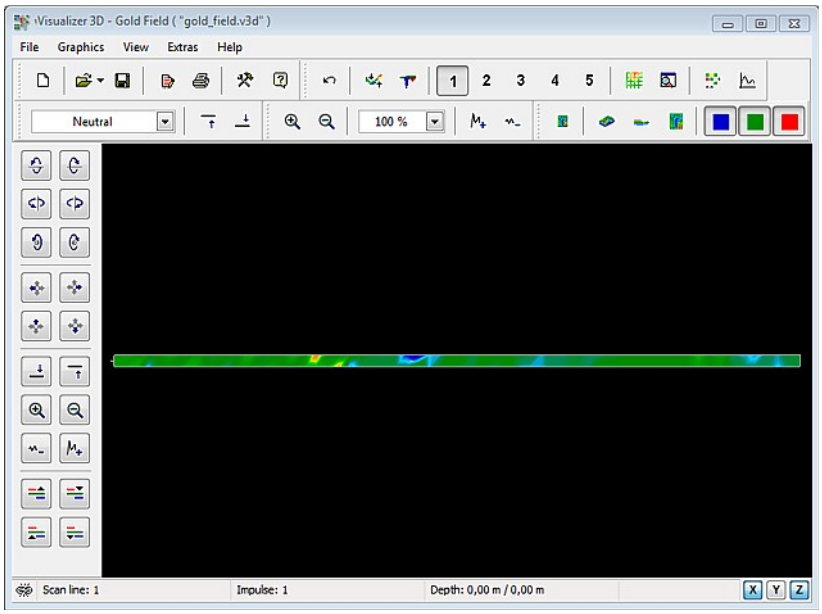


Figure 7.5: Top view of measured data from "Mineral Scan"

To see the differences within the scan rotate it to the side. Then you will see something like shown in figure 7.6.

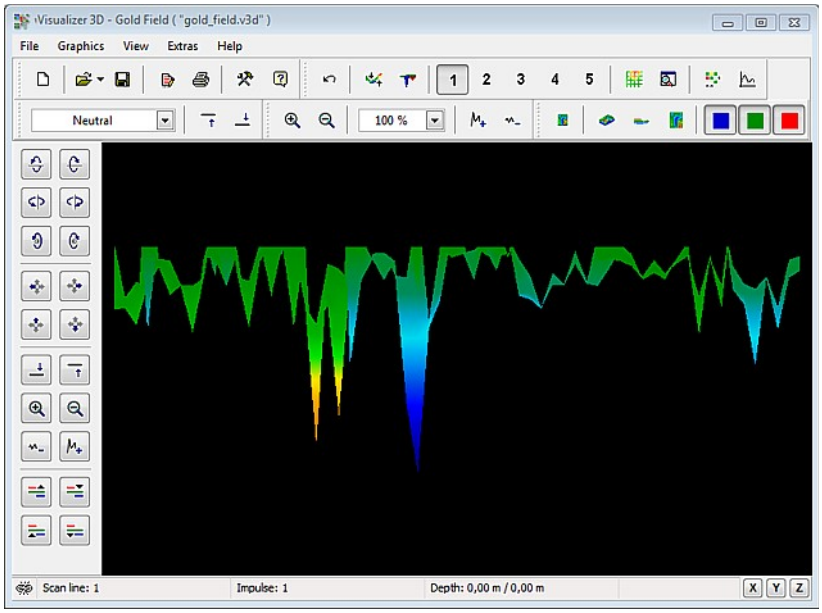


Figure 7.6: Side view of measured data from "Mineral Scan"

The figure 7.7 has the highlighted section of how a natural mineral field appears like. Please note the above colors, they are difficult to notice when in direct sun or bright light. Please do the analysis in an area where the computer can be shaded from most of the natural light to better recognize the colors. The image is from practical experience in the field.

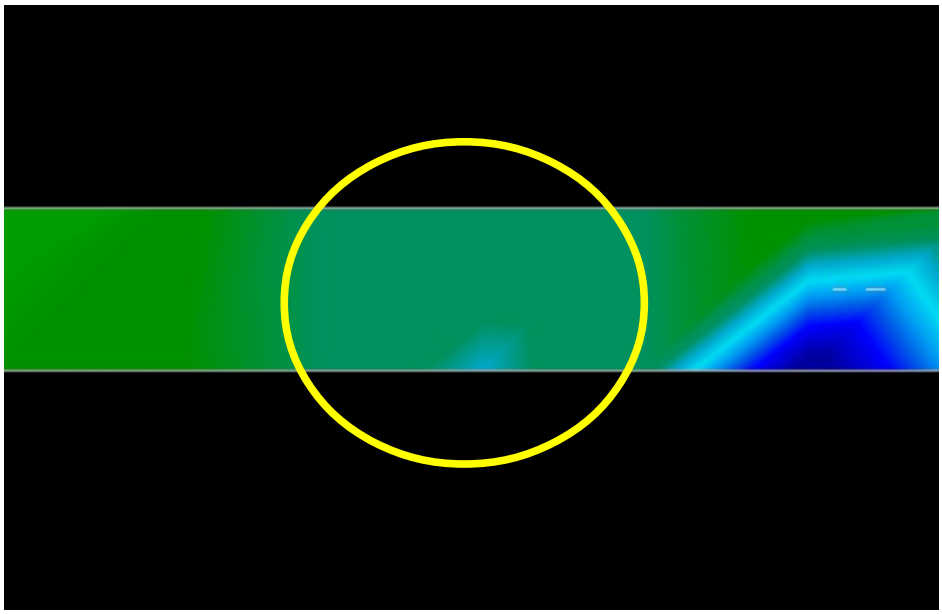


Figure 7.7: Natural Mineral Field

Practical experience and the repeatability factor from several locations world-wide have made this color the one to watch for within the scans. As stated previously it is not an easy to recognize color.

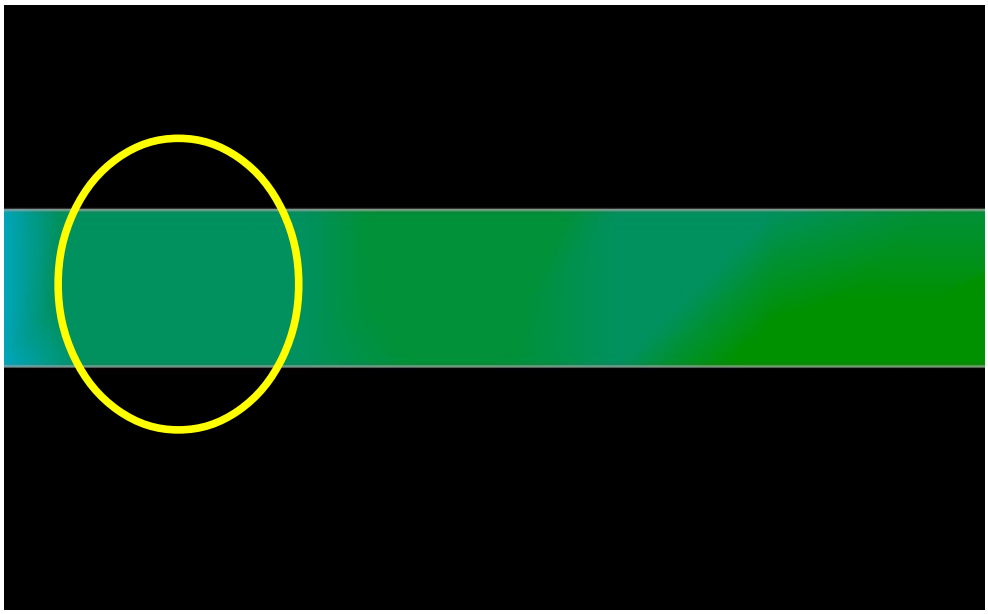


Figure 7.8: Natural Mineral Field (additional example)

Another signature to look for is the signature that is also commonly referred to as a "hit within a hit" like shown in the example of figure 7.9. The scan image needs to be viewed from the side view. Click on the "Minimize the difference in height" order to be able to fit the scan on the screen. If the values are too high then noticing the differences will not be possible.

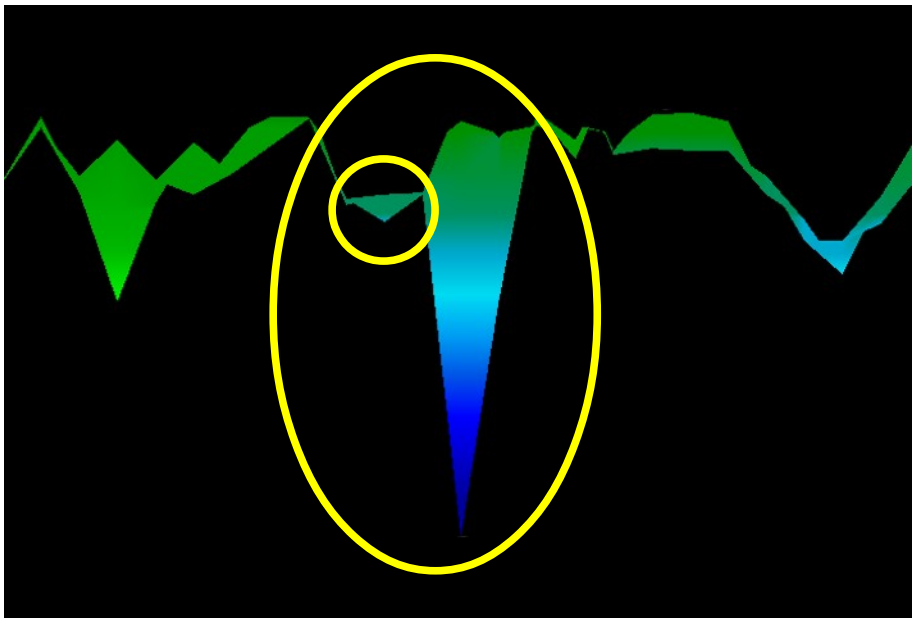


Figure 7.9: Example shows the "Hit inside a Hit", signal of non-ferrous metal

In figure 7.9 the smaller area is attached to the larger area, this is very typical and occurs quite often when working with minerals located within hard rock.

After an initial area has been located, to determine the size of the field or potential mineral field then a conventional ground scan needs to be conducted. When conducting a conventional scan be very careful to not rotate the antenna. Rotational errors are very easily done and can be frustrating.

In the following examples are other instances of naturally occurring gold that have been found. These particular examples are from a user in North Sudan.

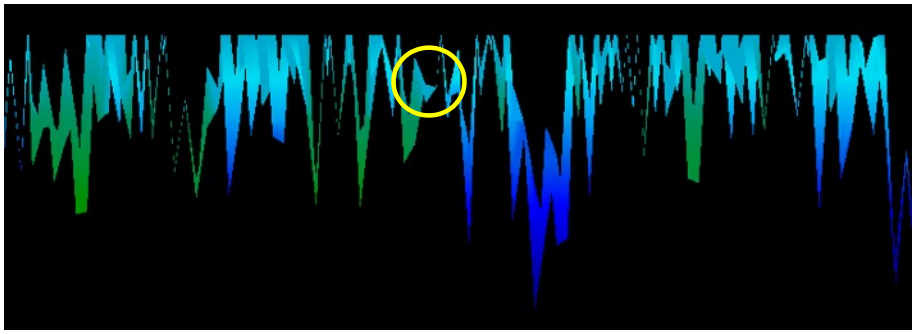


Figure 7.10: Shows a weak signal which can be smaller or deeper.

These additional examples yielded gold that was embedded in the rock alongside with quartz and black sand.

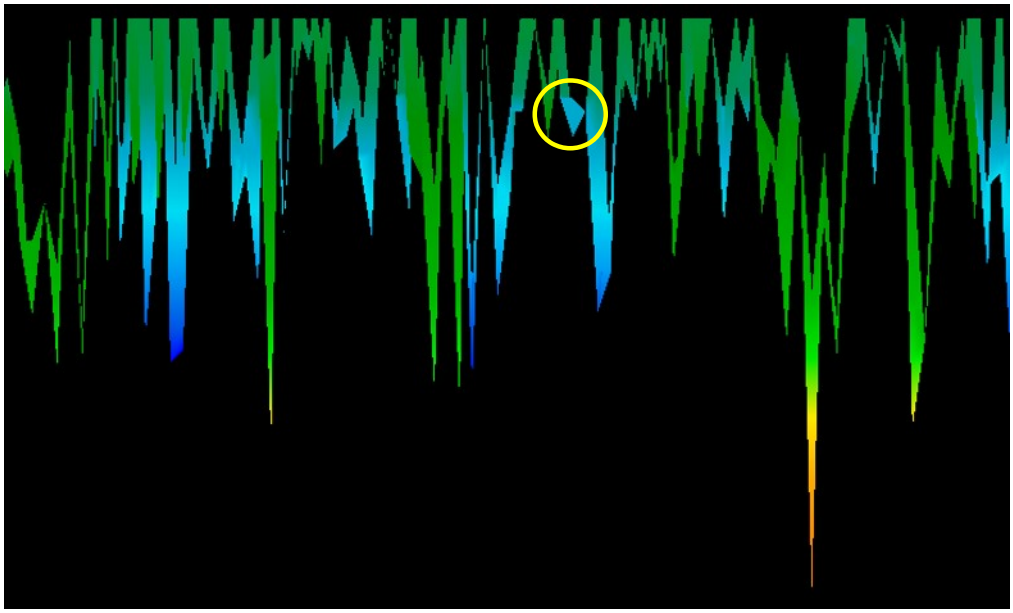


Figure 7.11: Measure value indicating a non-ferrous anomaly

7.2 Ground Scan

The operating mode "Ground Scan" allows a graphical measurement of any area for analysis on a computer.

Power on the device and select the operating mode "Ground Scan" in the main menu by using the arrow keys 🡻 and 🡹. Press the **OK** button to activate the operating mode. Now you have the option to adjust the 3 different parameters. The first parameter is the impulse mode and offers the following choices:

- **Automatic**
  Each measure value will be recorded automatically and continuously without any break.
- **Manual**
  One measure value will only be recorded after you have pressed the start button.

The second adjustable parameter is the number of measure points (*Impulses)*, which will be recorded for each single scanning path. The following choices can be made:

- **Auto**
  The number of measure points of one scanning path will only be defined during the measurement. At the end of the first scanning path the start button should be pressed to save the required number of measure points. This number of measure points will than be used automatically for all following scanning paths. Beginning from the second scanning path the device will stop by itself, when the defined number of measure points has been sent out.
  If you select "Auto" you are not able to do a direct transfer to a computer. You can only store the measured values in the internal memory of the device, because the exact length of field is not yet selected.
- **10, 20, ..., 200**
  Each scanning path consists of the selected number of measure points. At the end of each scanning path the device stops by itself, as soon as the number of measure points is achieved.

In a final step you have to define the type of data transfer (*Transfer Mode*). You should select one of the following choices:

- **Memory**
  The measured data will be stored in the internal memory of the device. After finishing the measurement you should transfer the data to a PC by using the operating mode "Transfer Memory To PC". You can only store one measurement at a time in the internal memory. As soon as a new measurement will be recorded, the measured data from the previous measurement will be deleted irrevocable.
- **Computer**
  The measured data will be transferred right away to a computer. Therefor a bluetooth connection to a computer will be established before starting the measurement. The option "Computer" is not available if the number of impulses (*Impulses*) has been set on "Auto".

After all parameters has been adjusted the device is ready to start the first scanning path. Beginning from this moment the display will indicate the current number of scanning paths and the current number of measured impulses per scanning path.

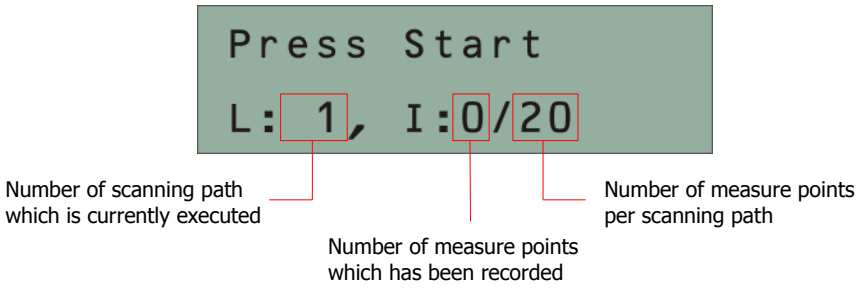


Figure 7.12: Display representation in operating mode "Ground Scan"

The figure 7.12 shows the display which indicates that the first scanning path has begun and no impulse has been measured up to now. In totally there will be 20 measure points per scanning path. The device is waiting for the user to press the start button to begin the measurement recording.

Please go to your start position of the first scanning path and press the start button.

a) If you have selected the impulse mode "Automatic" just keep going slowly until you have reached the end of the first scanning path. When you already have defined the number of impulses than the device will stop automatically at the end of the line, otherwise you should press the start button when you have reached the end of the first scanning path. Now please go to the start position of the next scanning path and press the start button again. The device will stop automatically by itself at the end of the scanning path.

Figure 7.13: "Zig-Zag" scanning in mode Ground Scan

b) If you have selected the impulse mode "Manual" you should press the start button to start your measurement. Now you are using the manual scan mode, which means you should release each single measure impulse manually one by one with the start button. The impulses will not be sent out automatically. Now you should do a little step forward and press the start button, to measure the second measure point. The device stops and you should do again a little step forward and press the start button again. Now continue in this way until you have reached the end of the first

scanning path. If you already have defined the number of impulses per line, the device will automatically signalize the end of the scanning path, otherwise you should press the **OK** button when you like to finish the first line. Now go to the start position of your next scanning path and press again the start button. Go another step forward and repeat the measurement in the same way like you recorded the first scanning path. The device will now signalize automatically the end of the next scanning path.

Continue to measure all further scanning paths until you have recorded the complete measure area. To finish the operating mode "Ground Scan" and go back to the main menu you simply press one of the arrow keys 🡻 or 🡹.

7.3 Pin Pointer

In the operating mode "Pin Pointer" you have the possibility to pin point possible targets and distinguish between ferromagnetic and non-ferromagnetic metals. The figure 7.14 shows, how to retain the Super Sensor during the measurement.

Figure 7.14: Position of the Supersensor during a measurement

As in other operating modes, the Super Sensor should point vertical towards the ground. It should not be turned or pivoted.

Figure 7.15: Discrimination with Supersensor

Normally this operating mode is used after you have executed a complete measurement in the operating mode "Ground Scan". It is mainly used to analyze the detected object in detail. Due to the analysis of the measurement results in the mode "Ground Scan" you can determine the position of a located object and now know at which place inside the measure area you should research in detail with the Supersensor.

In this operating mode all measured data will be sent directly to a computer. Therefore it is at first necessary to set up the data transfer inside the 3d software. Figure 7.16 shows the configuration dialog of the software "Visualizer 3D". Please be sure to select the operating mode *"Discrimination"* during the configuration.

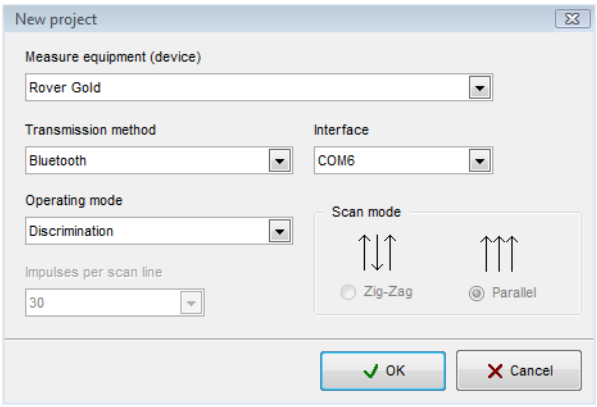
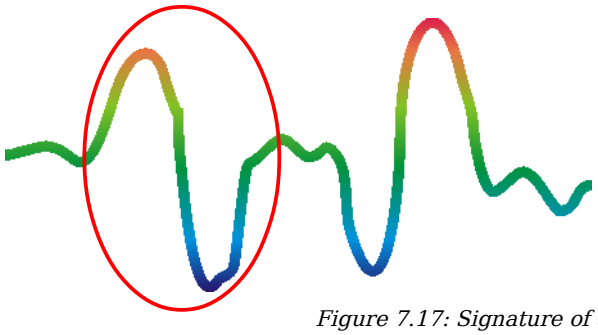


Figure 7.16: Configuration of the 3d software in operating mode "Pin Pointer"

To adjust the COM port correctly please also read chapter 2 ("Data transfer via bluetooth") on page 13! Click on the button *OK*, when you have adjusted all parameters.

After you have prepared the software for the data transfer, please go near to the detected object, power on the device and select operating mode "Super Sensor Discrimination" from the main menu by using the arrow keys 🡻 and 🡹. Press the **OK** button to activate the operating mode.

After the data transfer to computer has been established you can press the start button to start the data transfer and the measurement. Now you can slowly move the Supersensor from one side to another above the possible object. Please try to capture the complete object, which means you should measure beyond the edges of the object. Repeat this measurement a few times to get a clear signature of the object. There are 3 different signatures, from which you can recognize a specific characteristic of any target.



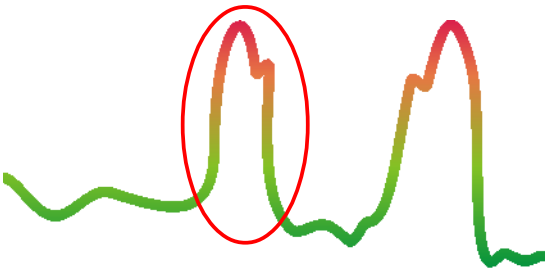
Ferromagnetic metals

Ferromagnetic targets have a positive-negative-signature.

Figure 7.17: Signature of a ferromagnetic metal target

The figure 7.17 shows a typical signature of a ferromagnetic metal like e.g. iron. The signature includes a positive (red) and a negative (blue) amplitude. When looking closely you can see even 2 ferromagnetic signatures. The first signature starts with a positive amplitude and the second signature starts with a negative amplitude. The order is not important, it depends on the direction of movement of the Supersensor. If you keep moving the probe from one side to another, these 2 signatures will change continuously.

Take care to move the Supersensor slowly and equal above the ground and above a detected object to get a clear signature.

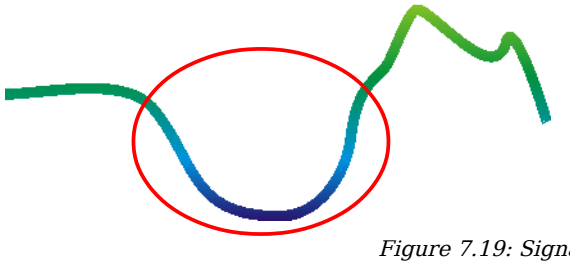


Non-ferromagnetic metals

Non-ferrous targets have a pure positive signature.

Figure 7.18: Signature of a non-ferromagnetic metal target

The figure 7.18 represents a signature of a non-ferrous target. You can recognize that there is only a positive amplitude (red). Additionally to the main amplitude there is another small peak, which is typically for precious metals. Also here the order of amplitude and the small peak is not important and depends on the scan direction.



Non-metallic targets

All non-metallic items have a pure negative signature.

Figure 7.19: Signature of a non-metallic target

The last of the typical signatures is represented in figure 7.19. It is the signature of all non-metallic targets and structures. These can be voids, tunnels or buried plastic pipes or boxes. You can recognize that there is only a negative amplitude (blue).

To quit the operating mode "Super Sensor Discrimination" and get back into the main menu you just have to press one of the arrow keys 🡻 or 🡹.

7.4 Transfer Memory To PC

By using the operating mode "Transfer Memory To PC" you can transfer measured data from the internal memory of the device to a computer. Therefore it is necessary to plug in the bluetooth dongle into the computer and to prepare the software to receive the data. As soon as all settings are made in the correct way you can use this operating mode successfully.

> Detailed information about the correct setting of the software you can find in the user manual of the software.

Power on the device and select the operating mode "Transfer Memory To PC" from the main menu by using the arrow keys 🡻 and 🡹. Press the **OK** button to activate the operating mode. The display of the device shows now the message *"Connecting To Computer ..."*. As soon as the device is ready to transfer the data the message *"Press Start"* appears in the display. Press the start button to transfer all data from the internal memory to the computer. After sending all data the message *"Disconnecting From Computer ..."* will appear in the display. The operating mode "Transfer Memory To PC" will be finished automatically and you will get back into the main menu.

Chapter 8

Field procedure

This chapter gives practical instructions about the general procedure of scanning an area. The different scanning methods and procedures will be explained in detail.

8.1 General scanning procedure

In general every scan always starts on the bottom right corner of your scan area. Starting from this point, you should walk scan path by scan path, whereby every following path is situated on the left side of its previous path. During walking these lines, the measurement values will be recorded and depending on the selected operating mode either transferred directly to a computer or saved into the memory of the device.

The device stops at the end of each finished scan line, so that the user can find the starting position of the next line. In this way, all paths will be recorded and the area will be measured.

Figure 8.1 shows all 4 possible starting positions and the corresponding first scanning path. Depending on the composition of your terrain you can determine the optimal starting point for your measurement by yourself.

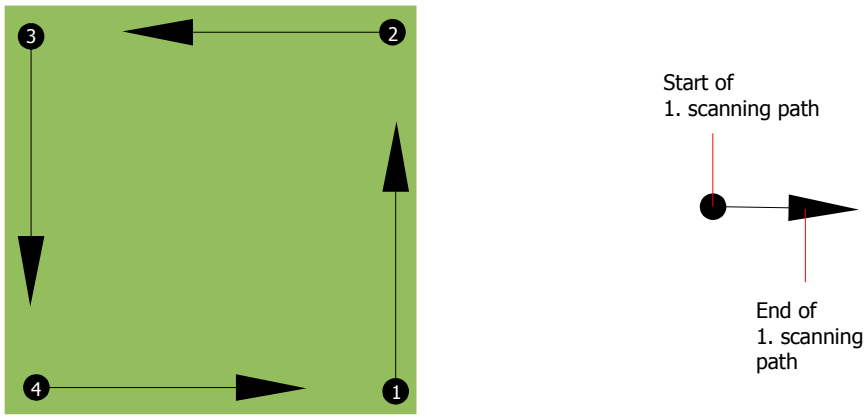


Figure 8.1: Starting position of a scan area

The scanning paths may be referred as "Zig-Zag" or "Parallel" traverses. Also the number of impulses (measure points), which are recorded during one scanning path can be adjusted individually depending on the size of your scan area (length of scanning path).

8.1.1 Scan Mode

There are two general techniques to surveying an area with the Rover Gold:

- **Zig-Zag**
  The starting position of two scanning paths next to each other is on the opposite side of the measured area. You will record data on your scanning path and on the return path as well.
- **Parallel**
  The starting position of two scanning paths is always on the same side of the measured area. You will only record data in one way and in one direction, while you should return and walk back to the starting position of the next scanning path without recording data.

Figure 8.2 represents both techniques schematically.

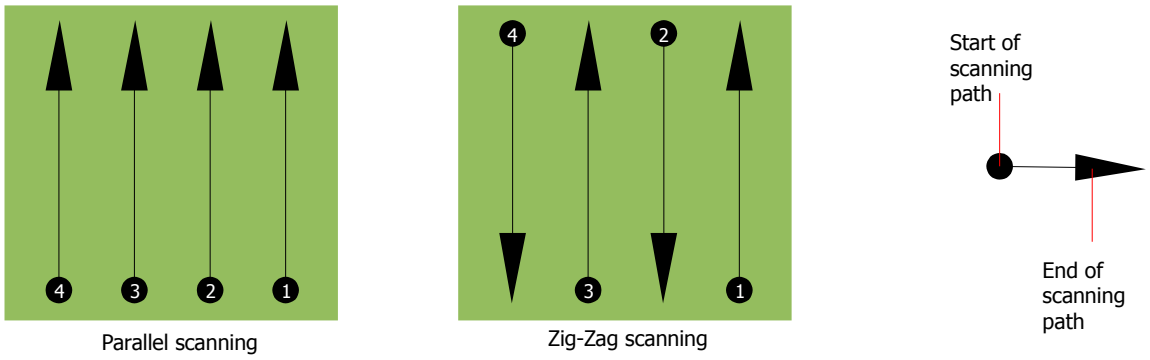


Figure 8.2: Scan modes to measure an area

Doing the scan in "Parallel" mode you will start on the bottom right corner of your scan area (point ❶) to walk and record a scan path towards the upper right corner of the area. After recording the first line, you should walk back to the starting point and move to the left of the first scan line to start the scan path 2 (point ❷), to start there the second scanning path. In this way all other paths will be scanned, until you have reached the left side of your measure area.

Doing the scan in "Zig-Zag" mode you will start also from the bottom right side of your measure area (point ❶) to walk and record a scanning path towards the right upper corner of the measure area. Different from the parallel measurement, you should continue recording data while walking back the second scanning path. So you go to the starting point of the second scanning path (point ❷) and scan in the opposite direction. In this way, all other paths will be scanned in the scan mode "Zig-Zag" until you have reached the left side of your measure area.

The distance between the scanning paths should be consistent during one measurement but can vary from measure area to measure area. If you mostly look for smaller targets than you should also select a smaller distance between the lines. A standard rule is: The smaller the distance between the paths, the more accurate your scans will be. When you are conducting your first scans the lines should not be to close together to locate possible targets.

8.1.2 Regulation of the number of impulses per scanning path

It is possible to select the number of impulses before starting the measurement or selecting the automatic mode ("Auto") to adjust the number of measure points after finishing the first scanning path.

When the number of measure points has been configured, the device will stop automatically when this number has been reached and waits for the start of the new scanning path.

In the automatic mode you should stop the measurement of the first scanning path by yourself, by pressing the appropriate button, as soon as you have reached the end of the first scanning path. This effective amount of measure points will be used for all further scanning paths of this measurement. Starting from the second scanning path, the device now stops automatically after the assumed number of impulses has been reached.

Keep in mind the number of impulses which you have recorded per scanning path. This amount should be entered later in the software program, when transferring the data to a PC, to receive all measured data correctly from your measuring instrument!

There is no special rule for selecting the right number of impulses. But there are different aspects which should be considered. These are some considerations

- the length of your measured area and
- the size of the objects you are searching for.

A preferable distance between two impulses is about 15 cm to 30 cm. The smaller the distance between two impulses is, the more exactly the graphical representation will be. If you are looking for small objects you have to select a smaller distance, for big objects you can increase the distance between the impulses.

Figure 8.3 shows the effects of the distance and the number of impulses per scanning path for some objects.

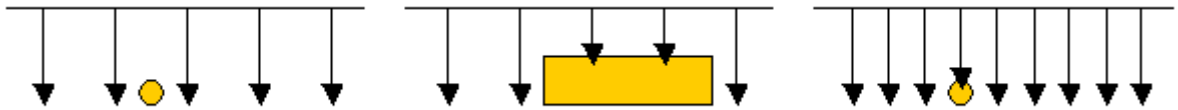


Figure 8.3: Effects of changing the number of impulses and their distance

Figure 8.4 shows the difference between very few impulses (left side) and much more impulses (right side) on the same length of scanning path. Therefor the second record (right side) shows much more details and also smaller objects can be seen.

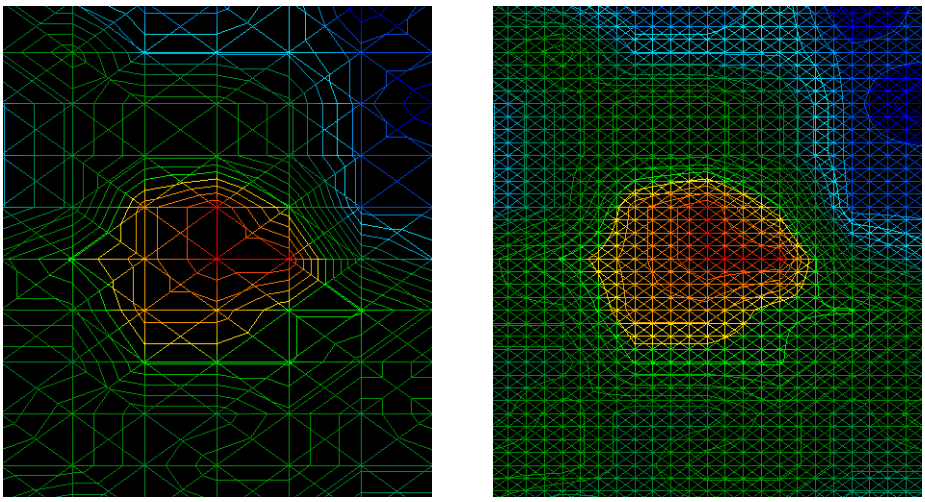


Figure 8.4: Comparison of low and high number of impulses

Do not hesitate to record more measurements with different numbers of impulses. For example you can scan a large area before doing a second detailed precision measurement. Especially if searching for

bigger objects you can proceed like this. With this manner you can measure a larger area very quickly and afterward you make new scans localizing the suspect targets.

When conducting a scan it is important to not only make note of how many impulses are being used but to get a clear picture of what you are scanning, it is very important to watch your speed. Every scan line should be measured at the same speed as the previous line.

Figure 8.5 shows what can happen, if you walk at different speeds during your scan.

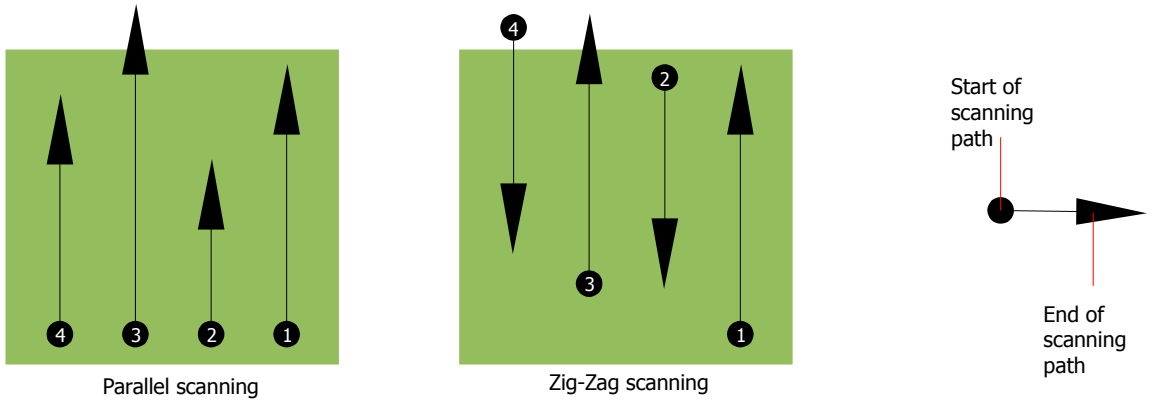


Figure 8.5: Different walking speeds during scanning

Using a different walking speed in the scanning paths, will cause displacements in the scanning path. As a matter of fact, a target can get cut into several smaller items or completely lost because it was missed. Later when the data is downloaded for further analysis, speed errors can make a target completely unidentifiable and may be discarded.

In general, the following rule is valid: Keep scans at practical sizes where you can see the beginning and stop lines and can comfortably traverse an area to keep your speed and the distances reasonable.

8.2 Special advices for field procedure

There are some aspects which you should take note of when conducting scans. In principle, a scan is only as good as the path that was taken. Making errors while scanning will show up in the final graphical representation also as an error. This will cause frustration and lost time.

Before you start with a measurement in the field, you should think of what you are looking for and if the selected area is suitable. Measuring without a plan usually will produce unacceptable results. Please consider the following advice:

- What are you looking for (graves, tunnel, buried objects, ...)? This question has direct effects on how a scan is conducted. If you are looking for larger targets, the distance between the single measure points and scanning paths can be larger, as if you are looking for small targets.
- Inform yourself about the area, where you are searching. Does it make sense to detect here? Are there historical references which confirms your speculation? What type of soil is on this area? Are there good conditions for data recording? Is it allowed to search at this place (e.g. private property)?

- Your first measurement in an unknown area has to be large enough to get representative values. All further control measurements should be adjusted individually.
- What is the form of the object you search? If you are looking for an angular metal box, the identified object in your graphic should have a form according to this.
- To get better values concerning depth measurements, the object has to be in the center of the graphic, which means it has to be framed by normal reference values (normal ground). If the object is on the side of the graphic and not totally visible an estimated depth measurement is not possible and also measurement of size and form are limited. In this case, repeat the scan and change the position of your scan area, to receive an optimal position of the anomaly inside of the graphic.
- There should not be more than one object in a scan. This will influence the depth measurement. It is useful to scan partial areas over such targets.
- You should do at least two controlled scans to be more sure about your results. This is also important to recognize areas of mineralization.
- Most important rule when dealing with mineralization. **REAL TARGETS DON'T MOVE!** If your target moves then it is most likely mineralization.

8.2.1 Orientation of probe

During one measurement the probe should have always the same distance to the ground. Generally we recommend a height of about 5 – 15 cm from the surface of the ground if possible.

In the event that you are going to go over stones, wood or high grass that is higher, start your scan with the sensor higher right from the beginning. In circumstances like these, then perhaps you will need to start the scan with the probe at a height of 2 feet (50 cm) and keep it at that level for the entire scan. It is important to maintain the height, this will eradicate many errors. As a rule, do not change the height during a scan for it may create unnecessary errors.

Another important aspect is the physical orientation of the probe. During the "Parallel" scan mode the orientation of the probe does not change because you are always measuring in the same direction. Even in the "Zig-Zag" scan mode the orientation of the probe must not be changed. That means you are not allowed to turn yourself with the device and the probe at the end of the scanning path. Instead you should walk backwards and continue scanning. Otherwise your obtained graphic includes red or blue stripes. These stripes throughout a scan are commonly referred to as “Rotational Errors”.

8.2.2 Parallel or Zig-Zag?

For skilled users of the Rover Gold both scan modes are suitable. According to experience the best graphics has been received in the "Parallel" mode, because you are starting at the same point and traveling in the same direction. It is also easier to control your walking speed.

Especially in uneven territories like mountain sides, acclivities or other inclined layers the parallel mode is preferred. When it comes to speed, the experienced user will very often use the Zig-Zag mode for the initial scan to determine if there are anomalies in the area worth further research.

8.2.3 Manual or automatic impulse mode?

Large even or passable surfaces are commonly measured in the automatic mode. The manual impulse mode is mostly used for difficult uneven terrain, areas where there is quite a bit of growth and if the measurement result needs to be very accurate.

In terrains with difficult access like mountain cliffs and sides, slippery surfaces or overgrown areas, it is wise to use the manual impulse mode. Because each impulse will be released manually, you have enough time to position the probe in the correct way and record the measured value. In this way, you can also measure accurately previously marked dots of a predefined grid.

8.2.4 Tips from the trainers themselves

When conducting scans, there are some extremely important items that need to be noted. First of all it is crucial that you relax. When you are tense, you are putting too much pressure on yourself to do the scan correctly; often resulting in errors.

- Newly buried targets are difficult to see. Many users receive the equipment and the first thing they do is go out and bury an object. When an object goes into the ground it changes the natural signature of the soil and creates some kind of noise. Usually the buried object has a weaker signature than the unnatural noise and therefor is not detectable. So taken scan images will not show the buried item but visualize the noisy area in blue colors. After the item has been seasoned, meaning it has been in the ground for a complete cycle of seasons (usually a year), the noise gets reduced and the signature of the buried object becomes visible again.
- Train on known targets. In the training course at the factory we have several objects that have been buried for years, just like real targets in the field. These targets can be quickly and easily identified because they are not natural to the soil. Other targets that you can use in your own area are buried utilities. Pipes, tanks, electrical, sewers, graveyards, etc... Most of these items can be found in every community, town or city. This is where you need to begin your training if you are going to self-train.
- Get professional training. When you take advantage of receiving the training, either from the factory or a qualified dealer, you will understand not only the use and operation of the OKM detector but also the software so much easier and be able to identify targets as well as errors.
- Do not rely on just one scan measurement. So many users go out into the field and they make a measurement and see a target. Instead of repeating the scan and reproducing it several times, they go out and get a shovel and dig. On very rare occasion will the first scan be perfect. Even the trainers do multiple scans to ensure that they are not looking at areas of mineralization or an error.

- Soil Mineralization – Oh! Very frustrating! We will all experience it. When you are in an area that is known to have pockets of mineralization, be prepared to conduct more scans than normal.
    - Clay is probably the number one foe. Depending on the iron content of the clay will determine how strong the attenuation will be. A quick rule of iron content is how dark it is, it can vary from a light gray up to a dark orange. The darker the more iron it will have in it.
    - Sand is usually very clear and easy to hunt in. There are two factors of sand that need to be noted. Sand where the ground water is very shallow, meaning that the ground water is usually just a couple of meters from the surface or desert sand where it is very arid. In desert sand, the targets can be situated 3x deeper than indicated.
    - Farmland is another area to take note of. In modern farms, so many nutrients and fertilizers are introduced creating an unnatural area of mineralization.
    - Rocky mountainous areas. Areas with many mountains are also riddled with patches of mineralization. Mountainous areas are created from faults in the earth and this is probably the biggest area for natural treasures as well as mineralization.

Chapter 9

Tutorial

This chapter gives a detailed step-by-step procedure, which explains the process of a measurement by means of some selected examples.

9.1 Automatic measurement in Zig-Zag mode

Figure 9.1 represents a typical measure area which should be scanned with the Rover Gold. The red frame marks the borders of the measure area. For this example we are using the following parameters:

- **Impulse Mode:** "Automatic"
  Automatic impulse mode, which records measure values (impulses) of a scanning path without any interruption.
- **Impulses:** "Auto"
  Automatic determination of the impulses, which means the number of impulses will be defined during the first scanning path.
- **Transfer Mode:** "Memory"
  Storage of measured data in the internal memory of the device. After finishing the measurement the data has to be transferred to the computer by using the operating mode "Transfer Memory To PC".
- **Scan Mode:** "Zig-Zag"
  The measure area is even and easy to access, that is why we have selected the scan mode "Zig-Zag".

Figure 9.1: Measure area for a survey in mode "Ground Scan"

Now go to the start position ❶ of your measure area and power on the device by pressing the power on/off button. Put on the headphones and power them on, so you can hear the acoustical signal of the sending out of impulses. The display shows the selection menu of the background light. Simply press the **OK** button to activate the automatic regulation for the background light. Now you can see the main menu where you can select the operating mode "Magnetometer". Press one time on the button 🡻, to select the operating mode "Ground Scan". Confirm your selected operating mode by pressing the **OK** button. Now you can see the selection menu of the impulse mode *(Impulse Mode*). It is already set on "Automatic". Confirm this selection by pressing the **OK** button.

The next parameter is the number of impulses *(Impulses*). The default setting is "20". Press two times the arrow key 🡻, to select "Auto". Confirm your selection by pressing the **OK** button.

The last parameter is the method of transfer (*Transfer Mode*). The default setting is "Memory". Confirm your selection by pressing the **OK** button.

The device is now ready to start the first scanning path. The display shows the message *"Press Start, L:1, I:0/?"*. The question mark "?" shows that the number of impulses per scanning path has not been defined yet. As soon as you press the start button the measure values will be recorded continuously. You will hear the acoustical signals via the integrated speakers or the headphones. On the basis of these acoustic signals you can coordinate your walking speed. After pressing the start button you should walk slowly and equally forward to point ❷ of the measure area and press again the start button so that you do not hear any more impulses. The device is now in stand-by position. On the display you can now read the automatic defined number of impulses per scanning path. For example there can be the following message written in the display "*Press Start, L:2, I:0/25"* . Here 25 impulses has been defined.

Now you should go to the start position of your second scanning path (point ❸). Press the start button and walk with the same speed like the first scanning path to the end of your second scanning path (point ❹). This time it is not necessary to press again the start button at the end of the scanning path. The device will stop automatically when it has recorded the same number of impulses like in the first scanning path.

Continue the measurement with the next few scanning paths until you have scanned the complete measure area in the scan mode "Zig-Zag". When you have reached the end of the final scanning path, press one of the arrow keys 🡻 or 🡹, to finish the measurement and go back into the main menu.

When leaving the operating mode "Ground Scan" you should keep in mind the number of impulses which you have used per scanning path! This value you should enter when transferring the data to the software!

In this moment the recorded data of your measure area is saved in the internal memory of your device and should now be transferred to a computer for evaluation.

9.2 Transfer internal memory to computer

The data of your last measurement are saved in the internal memory of the device. Before you can evaluate these measurement values graphically you should transfer them to a computer. The following

section explains how you can transfer the saved measure values from the internal memory to the delivered software "Visualizer 3D".

9.2.1 Prepare software "Visualizer 3D"

Before you can transfer any measured data you should prepare the "Visualizer 3D" software for a data reception. Plug in the bluetooth dongle into a free USB port of your computer and start the program "Visualizer 3D".

When the software is open, click on the menu entry **File → New** and set up the parameters according to your previously recorded measurement!

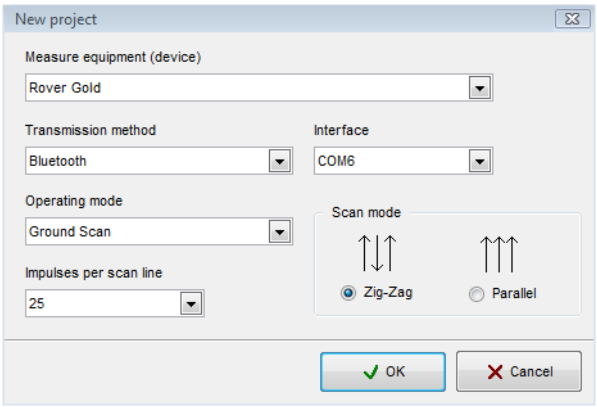


Figure 9.2: Preparation of a new data transfer in "Visualizer 3D"

Select your measure instrument "Rover Gold" from the list.

As transmission method you should select "Bluetooth" and at the entry "Interface" define the correct COM port at which the bluetooth dongle has been installed. Please also read the chapter 2 ("Data transfer via bluetooth") on page 13! If you are using a preconfigured laptop you can find the correct number of the used COM port on the attached sticker.

As operating mode you should select "Ground Scan" and enter in the space "impulses per scan line" the recorded number of measure points per scanning path. In our example we have used 25 impulses. Now you just have to select the scan mode, so that the computer can receive the data correctly. Therefore you should mark the entry "Zig-Zag" and click on the button *OK*.

9.2.2 Establish bluetooth connection and transfer data

After having prepared the software "Visualizer 3D" to receive data, you should establish a bluetooth connection between the Rover Gold and the computer. Power on the measure instrument and select the operating mode "Transfer Memory To PC" with the arrow keys 🡻 and 🡹. Activate the selected operating mode with the **OK** button and wait until the device establishes a connection to the computer. When you are connecting the device the first time to the computer you should enter a password. The password is **OKM** (written in capital letters!). Please read also the chapter 2 ("Data transfer via bluetooth") on page 13!

When the bluetooth connection is established successfully (the bluetooth icon in the task bar will be green), press the start button on your measure instrument.

Now all measured data will be transferred and a graphical representation will appear in the "Visualizer 3D" software. Now click inside the software on **File → Stop**, to finish the data transfer to the software.

9.3 Manual measurement in parallel mode

In figure 9.3 the measured area is represented again. In our second example it should be scanned with the following parameters:

- **Impulse Mode:** "Manual"
  Manual impulse mode, where the measure values (impulses) of a scanning path should be released manually. The device waits after each measure point for the user to release the next impulse.
- **Impulses:** "30"
  Predefined fixed number of impulses, which means that the number of impulses should be exactly 30 within the 1. scanning path and all following scanning paths.
- **Transfer Mode:** "Computer"
  Direct transfer of measured data to a computer. Before starting the measurement a connection between device and computer via bluetooth should be established.
- **Scan Mode:** "Parallel"
  The measure area is even and easy to walk but it is also possible to select the scan mode "Parallel".

Figure 9.3: Measure area for a survey in mode "Ground Scan"

Because all measured values will be transferred directly to the computer while scanning, you should at first prepare the software to receive data.

9.3.1 Prepare "Visualizer 3D" software

Plug in the bluetooth dongle into a free USB port of your computer and start the "Visualizer 3D" software.

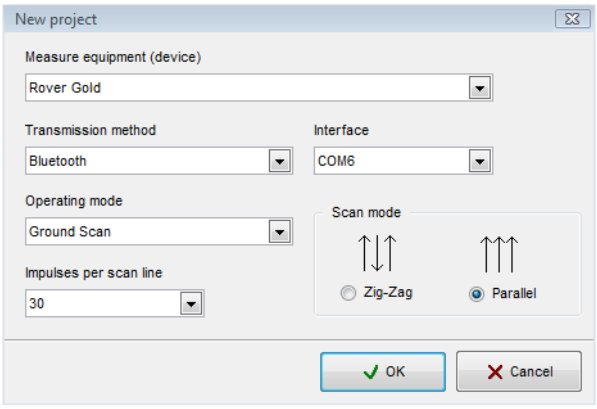


Figure 9.4: Preparation of a new data transfer in "Visualizer 3D"

When the software is open, click on the menu entry **File → New** and set up the parameters according to your planned measurement!

Select your measure instrument "Rover Gold" from the list.

As transmission method you should select "Bluetooth" and at the entry "Interface" define the correct COM port at which the bluetooth dongle has been installed. Please also read the chapter 2 ("Data transfer via bluetooth") on page 13! If you are using a preconfigured laptop you can find the correct number of COM port on the attached sticker.

As operating mode you should select "Ground Scan" and enter in the space "impulses per scan line" the number of measure points which you plan to use for each scanning path. In our example we will use 30 impulses. Now you just have to select the scan mode, so that the computer can receive the data correctly. Therefore you should mark the entry "Parallel" and click on the button *OK*.

9.3.2 Establish bluetooth connection

After having prepared the software "Visualizer 3D" to receive data, you should establish a bluetooth connection between the Rover Gold and the computer. Power on the measure instrument with the power on/off button. The display will indicate the selection menu for setting up the background lighting. Simply press on the **OK** button to activate the automatic regulation of the lighting. After that you will enter into the main menu where the first operating mode "*Magnetometer*" is visible. Press one time on the arrow key 🡻, to select the operating mode "Ground Scan". Confirm the selected operating mode by pressing the **OK** button. Now you entered into the selection menu *Impulse Mode*. The default setting is "Automatic". Press the arrow key 🡻, one time to change to "Manual". Confirm the setting by pressing the **OK** button.

As the next parameter you should select the number of impulses (*Impulses*). The default setting is "20". Press one time the arrow key 🡹, to select "30". Confirm this setting by pressing the **OK** button.

The last parameter is the method of data transmission (*Transfer Mode*). The default setting is "Memory". Press one time the arrow key 🡻, to change to "Computer". Confirm this selection by pressing the **OK** button.

The display of the device shows now the message *"Connecting To Computer ..."*. When you are connecting the device the first time to the computer you should enter a password. The password is **OKM** (written in capital letters!). Please read also the chapter 2 ("Data transfer via bluetooth") on page 13!

As soon as the bluetooth connection has been established successfully (bluetooth icon in task bar shines green) you can start with the measurement.

9.3.3 Performing a measurement

Go to the starting position ❶ of your measure area, put on the headphones and power them on to hear the acoustic signal of the sending out of the impulses. The display shows the message *"Press Start, L:1, I:0/30"*. As soon as you press the start button you will hear a short impulse signal.

The display now shows the message *"Press Start, L:1, I:1/30"*, which means that 1 of 30 impulses has been measured. Now do a small step forwards in direction of point ❷ and press again the start button to measure the 2nd impulse. You will hear again a short signal tone via the internal speakers or the headphones. Repeat this procedure until the device indicates you the end of the scanning path and the display shows the message *"Press Start, L:2, I:0/30"* .

Now go to the start position of your second scanning path (point ❸). Press the start button and measure the second scanning path in the same way like the first scanning path. Continue your measurement for all other scanning paths until you have scanned the complete area in the scan mode "Parallel". When you have reached the end of the final scanning path press one of the arrow buttons 🡻 or 🡹, to finish the complete measurement and return into the main menu.

While measuring the ground all data has been transferred at the same time to the computer and a graphical representation has been created inside the "Visualizer 3D" software. Now click on **File → Stop**, inside the software program to finish the data transfer to computer.