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OKM ROVER C4 MANUAL

INTRODUCTION

TECHNICAL SPECIFICATIONS

CONTROL ELEMENTS

ASSEMBLY & PREPARATION

OPERATING MODES

DATA TRANSFER

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INTRODUCTION

1 INTRODUCTION

1.1 PREFACE

Dear customer,

our engineers, sales, training and support staff at OKM GmbH would like to thank you for your purchase of the Rover C4.

The Rover C4 detector works on the principle of Electro-Magnetic Signature Reading (EMSR). Besides the detection of metallic objects this device is also capable of detecting natural features of the earth like formations of strata, cavities, voids, faults, ground water and other non-metallic objects. Then, of course, this equipment is best suited to the detection of sepulchers, treasures, buried utilities, tanks etc.

The Rover C4 is able to locate, document and analyze buried objects within various structures and vessels non-intrusively without having to excavate the area. Using EMSR is particularly useful in areas where detection is a must and excavation is not possible. The facile and flexible handling of the Rover C4 can easily and quickly give reproducible results.

With our team of specialists we guarantee that our products are under recurrent control. Our specialists try to implement new developments in terms of further quality improvements for you.

By purchasing or using our products, we cannot guarantee that you will be successful and have a find during the course of your research. The recognition of hidden and buried objects depends on a huge number of factors. As you well may know there are different soil types all over the world with different levels of natural attenuation. Variable soil properties can and will hamper and alter ultimate scan measurements. Areas with an extreme amount of ground water, varying clays, sands and wet soils make scanning more difficult and may reduce the maximum depth capabilities of the detection equipment, regardless of make or model.

For more information regarding where this equipment has been used and operated, please visit our website. Our equipment is constantly being tested. Improvements and upgrades are listed on our website.

It is necessary for our company to protect our developments and all of the information learned during the "Research and Development" phases in creating our technology. We strive to stay within the given framework of legislation, patents and trademark registration.

Please take your time to read this User Manual and familiarize yourself with the operation, functionality and how to utilize the Rover C4. We also offer training for OKM equipment in our factory and on-site. We strive to maintain a worldwide dealer network for assistance and support. Please visit our website www.okmdetectors.com for more information.

1.2 IMPORTANT NOTES

Prior to using the Rover C4 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 C4 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 refer to the Visualizer 3D Studio Documentation!

1.2.1 General Notes

Being an electronic device, the Rover C4 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 inside the unit.

1.2.2 Possible Health Hazards

If used properly this device usually 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 (150ft) 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 can not be outside the indicated range of values. Use only approved chargers, batteries and rechargeable batteries which are included within 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 too close to devices which send 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 clean and dry soft rag or cloth. To avoid any damage you should transport the device and accessories always in an appropriate way.

Prior to using your Rover C4 please be sure that all batteries and accumulators are fully charged.

To charge the external batteries use only the approved chargers which are part of the 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 to 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. The same applies to recognizable ammunition or bullets and shells. Leave ammunition where it is, do not touch it and, most importantly, do not take any of it home with you. The devices of war made use of 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.

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.

1.5 CARE AND USE

The Rover C4 is a sturdy instrument, but it is not designed to withstand abuse. In caring for your ground scanner, there are several important DOs and DON'Ts to remember:

- DO NOT use to get rid of bushes, flatten area by swinging wildly or pry rocks loose.
- DO NOT drop the machine into water or use it while it is raining or wet.
- DO NOT leave it exposed at night where dew could form on it.
- DO NOT store it in places that could get extremely hot.
- DO NOT leave it in the trunk of a car where high temperatures could build up.
- DO NOT spray lubricants, or any type of cleaners, solvents, sealants or other chemicals into or onto the electronic parts, switches or controls.
- DO NOT attempt to modify or repair the detector's electronics as this will void your detector's warranty.
- DO clean your unit with a soft dry or slightly damp cloth to remove dust and residue from the previous use.
- DO use the device within the proper operating guidelines.
- DO use the detector with the proper OKM Power Pack as to not cause damage to the unit.

The warranty does not cover damage resulting from an accident, neglect or abuse.

1.6 PROTECTING YOUR INVESTMENT

Often detector users become disappointed when their new detector becomes less and less responsive and seems to have lost some of its original peak performance. You can help prevent this from happening to your detector by following these basic care and protection guidelines:

- Operate your detector exactly as recommended in this User Manual.
- Use only approved OKM Power Packs.
- Avoid hitting the probe against hard, solid objects and surfaces.
- Keep your probe slightly off of the ground, especially when using in gravel or hard, rocky dirt.
- If working in or near water, or if there is a possibility of rain, use a protective weather resistant pouch or plastic bag to cover the control housing. Make sure it can "breathe" in order to ensure against condensation buildup inside.
- After each use, clean the detector with a soft cloth to remove dust, moisture or other contaminants.
- When transporting the detector in a car during hot weather, store it on the floor of the passenger compartment if possible. Using the Peli case gives additional protection. In any case, never allow the detector to roll around unprotected in the trunk or back of a pickup truck.
- Protect your detector from dust, moisture, and extreme temperatures during storage.
- When shipping, use the original factory carton or similar heavy-duty container and provide sufficient padding around all parts.
- Treat your detector as you would treat any sensitive electronic instrument. Though it is designed to withstand the demands of normal treasure hunting, proper care is essential.

2 TECHNICAL SPECIFICATIONS

The technical specifications are medial values. During operation slight variations are possible.

2.1 CONTROL UNIT

Dimensions (L x W x H)	360 x 320 x 140 mm
Weight	1.6 kg
Input (max)	19V DC, 3.16A, 60W
Processor / Main CPU	Cortex M3, 32MHz
Processor / Slave CPU	Cortex M0, 24MHz
Display	3.5" Resistive touch, 480 x 320 Pixel
Display CPU	Cortex M3, 32MHz, 128KB RAM
Data memory	4GB
Sample rate	1024 values/second
Measurement resolution	16bit
Operating temperature	-10–60 °C
Storage temperature	-20–70 °C
Audio	Internal speaker / Bluetooth
Air humidity	5%–75 %
Waterproof	No

2.2 WIRELESS DATA TRANSFER

Technology	Bluetooth 5.1
Frequency range	2.402–2.480GHz
Maximum transfer rate	1Mbps
Maximum Transmitting Power:	+8dBm
Maximum Range:	approx. 10m

2.3 STANDARD PROBE

Length	445 mm
Diameter, Shaft / LED Orbit	35 mm/65 mm
Weight	0.4 kg
Sensor technology	SCMI-15-D

2.4 SUPER SENSOR

Length	960 mm
Diameter, Shaft / LED Orbit	50 mm/65 mm
Weight	0.9 kg
Sensor technology	SCMI-15-D

TECHNICAL SPECIFICATIONS

CONTROL ELEMENTS

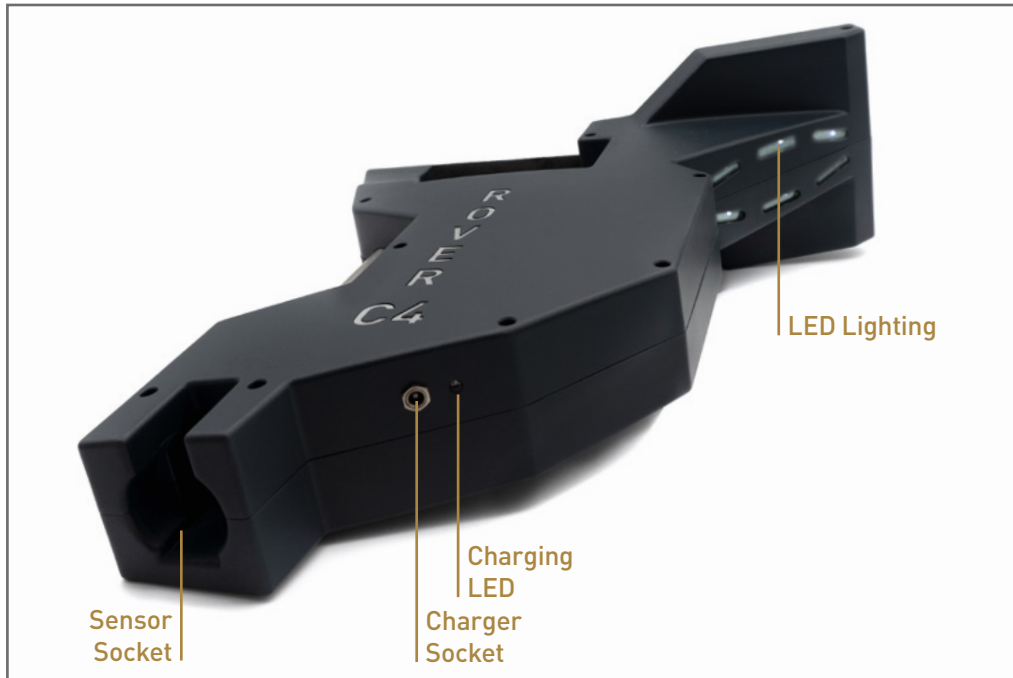
3 CONTROL ELEMENTS

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

Assembled Metal Detector with Standard Probe



3.1 CONTROL UNIT







Charger Socket / Charging LED: When the internal battery is too low, you have to recharge it by connecting the appropriate charger to the Charger Socket. As long as charging is in progress, the Charging LED is **orange**. As soon as the Charging LED turns off, the battery is fully charged.

Sensor Socket: At this socket you have to connect the probe. Without any probe there is no measurement possible. You may either attach the Standard Probe or the Super Sensor.



LED Lighting: The LED lights can be turned on to illuminate the scan area (see section „5.6.4 Lighting“ on page 32).

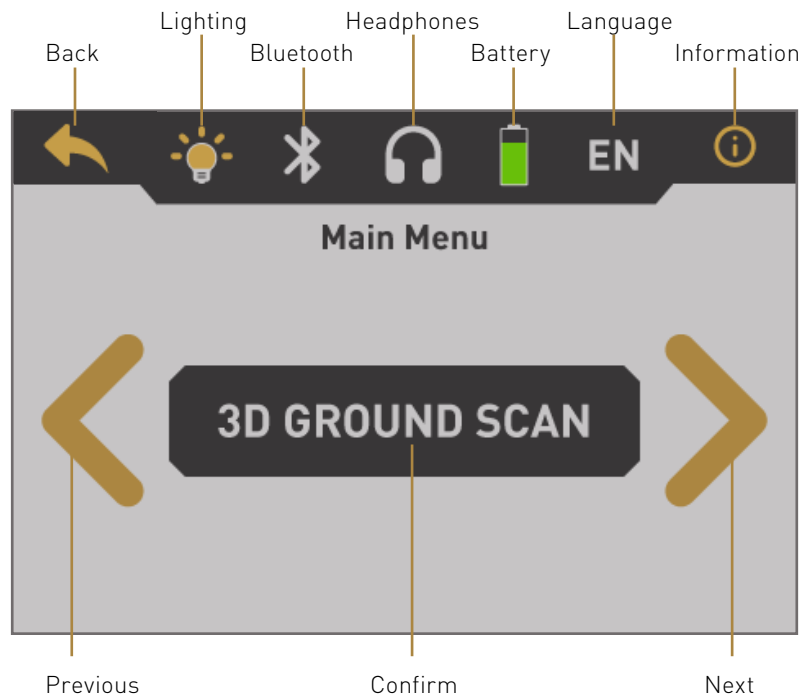
Touchscreen / Buttons: The display of the device shows all operating modes, messages and measuring states. The display is a modern touchscreen that allows to touch the function area to change your options and settings (see section „5.6 SETTINGS“ on page 32 for additional information). Below that display there are 4 control buttons to operate the device even without touchscreen. The button functions are described in the following table and in the chapter of the relating operating mode.



Button	Description
	This button has 2 different meanings: 1) Power your detector on and off. When the device is powered off and you press this button, the device will be switched on and the Operating LED turns green . To power the device off, press the button at least 3 seconds until the LED turns off. 2) Start a measurement and release single impulses when using the manual impulse mode.
	Select the next option or jump to the next setting.
	Confirm a selection or change a specific settings value.
	Go back to the previous screen or cancel a specific operation.


Speakers: By default the internal speakers are used for sound output. After pairing Bluetooth headphones with the detector, those speakers are disabled. The volume can be adjusted in the settings menu as described in section „5.6.1 Volume“ on page 32.


After powering on the Rover C4 metal detector by pushing the  button, a start screen is shown while the system is booting up. When finished, the main menu allows to choose the desired operating mode with the  button or by clicking the arrows on the touchscreen itself. If the desired option is visible, confirm it by pushing **OK** or by touching the display button directly.



Previous: Touch this area to go to the previous option. If you reach the first of all available options it will automatically jump to the last option.

Confirm / OK: Touch this area with your finger to confirm the current option. The same effect can be achieved by using the **OK** button.


Next: Touch this area with your finger to show the next possible option. If you reach the end of all available options it will automatically jump back to the first option. The same effect can be achieved by using the  button.

Back: The back icon is used to cancel an active operating mode like Magnetometer, Pinpointer, 3D Ground Scan or Mineral Scan. Furthermore, it is used to return to the previous screen, e.g. to leave a submenu. The same effect can be achieved by using the  button.

Lighting: Toggle the LED lights on the back of the display to light the search area. By touching this icon you may either switch on or off your LED lighting. Also read section „5.6.1 Volume“ on page 32 for detailed information.

Bluetooth: The wireless data connection icon indicates if a Bluetooth connection with your PC has been established successfully.

Headphones: By default the internal speakers are used for any sound output. The headphones icon indicates if Bluetooth headphones have been successfully connected with the Rover C4. More information on how to connect Bluetooth headphones is available in section „5.6.2 Headphones“ on page 32!

Battery: The battery icon indicates the current charge state of the internal battery. If the battery is too low () , you have to recharge it by using the appropriate charger.

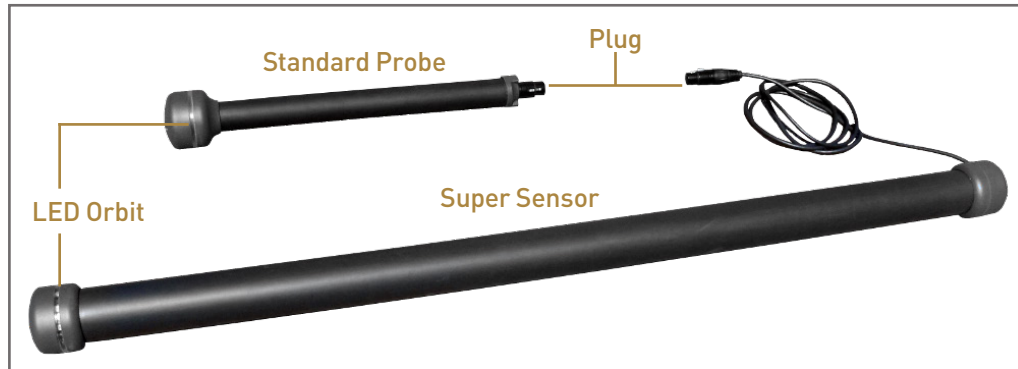
Language: The language icon indicates the chosen language for the user interface by showing its 2-letter-code according to ISO-639-1. Touching the language icon opens the language screen where you are able to select any of the available languages. Read section „5.6.3 Language“ on page 32 to learn more about setting your preferred language.

Information: The information icon is only visible in the main menu and represents a shortcut to the information screen as described in section „5.7 INFORMATION“ on page 33.

3.2 STANDARD PROBE / SUPER SENSOR

Both measuring probes are equipped with a light sphere called *LED Orbit*, that can indicate the measured values by color changes during the scanning process.

The plug is used to connect the probe with the sensor socket of the control unit.





3.3 BLUETOOTH HEADPHONES

The Rover C4 can be operated with any Bluetooth headphones available on the market. Your Rover C4 already includes Bluetooth headphones.



To use the headphones with your metal detector, please follow these simple steps:

1. Select "Settings" from your main menu.
2. Now select "Headphones".
3. Power on your Bluetooth headphones and push the pairing button.

The Rover C4 tries connecting for 60 seconds. If the Bluetooth connection between headphones and device can be established successfully, the headphones icon changes from  to . Otherwise try again.

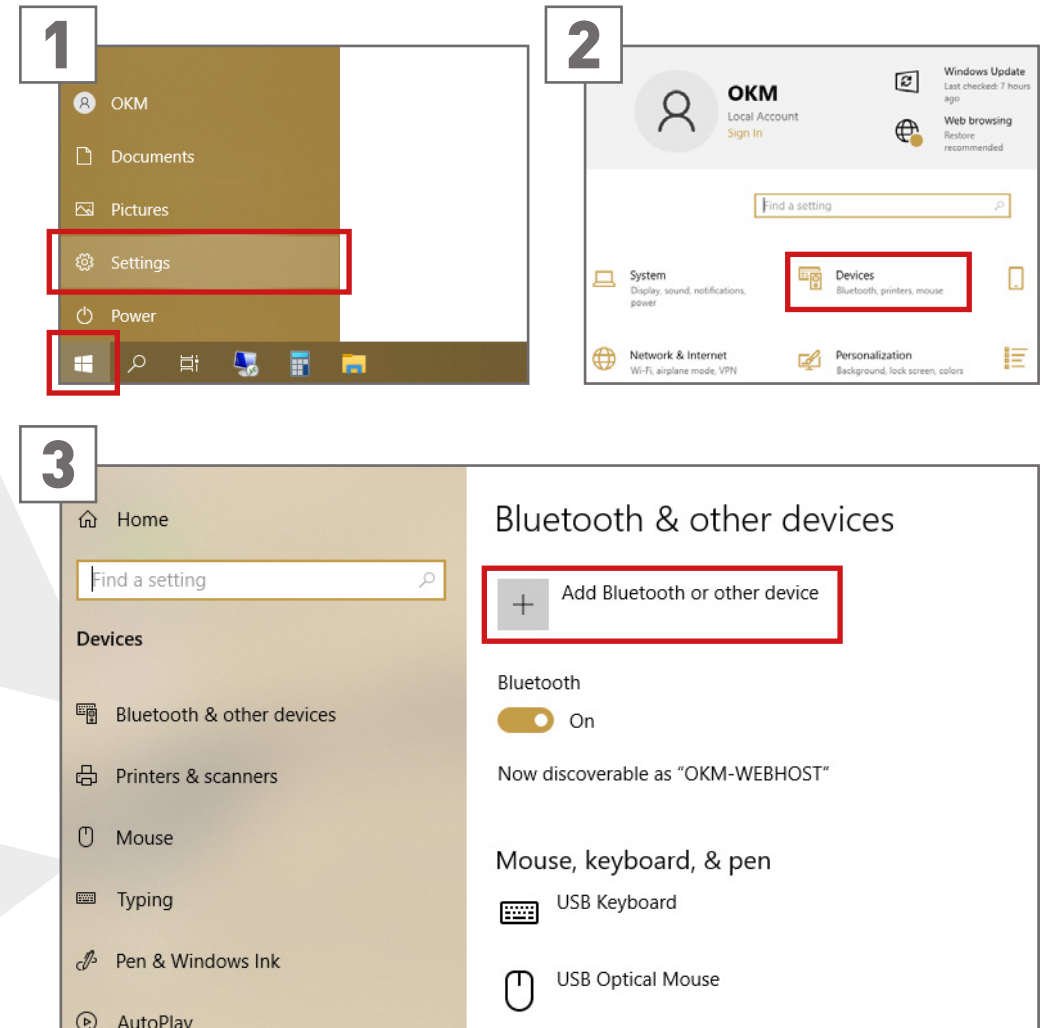
See also section „5.6.2 Headphones“ on page 32 for more detailed information regarding connecting the Bluetooth headphones.

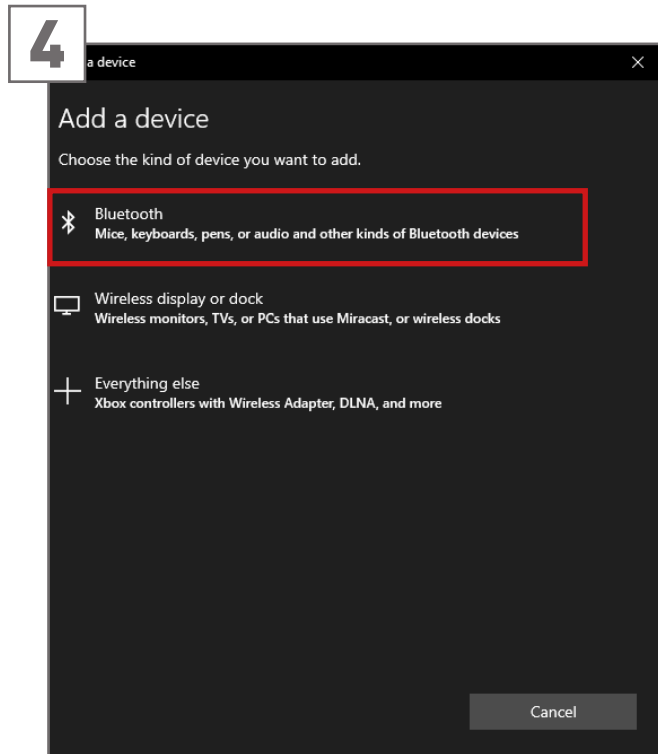
ASSEMBLY & PREPARATION

4 ASSEMBLY AND PREPARATION

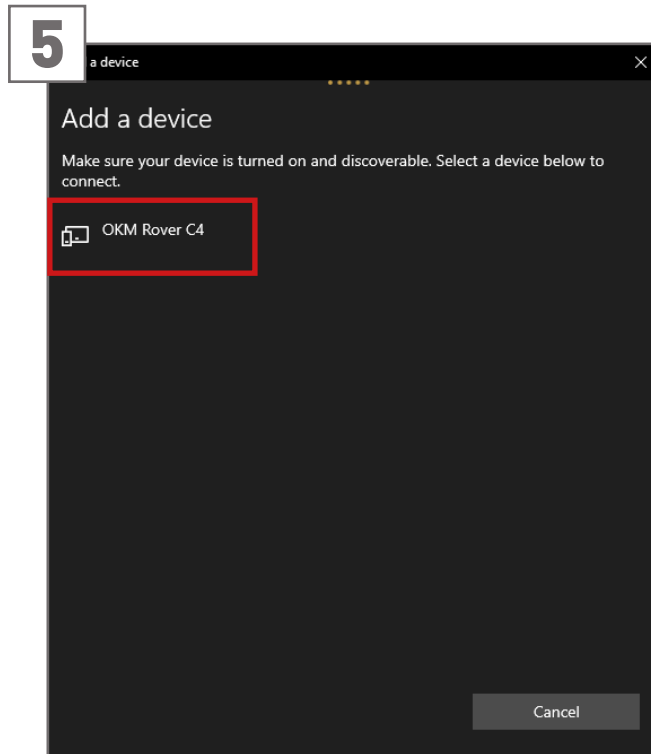
4.1 PAIRING BLUETOOTH

Prior to transferring scan data to the Visualizer 3D Studio software, the Bluetooth of your computer must be paired with your OKM detector.

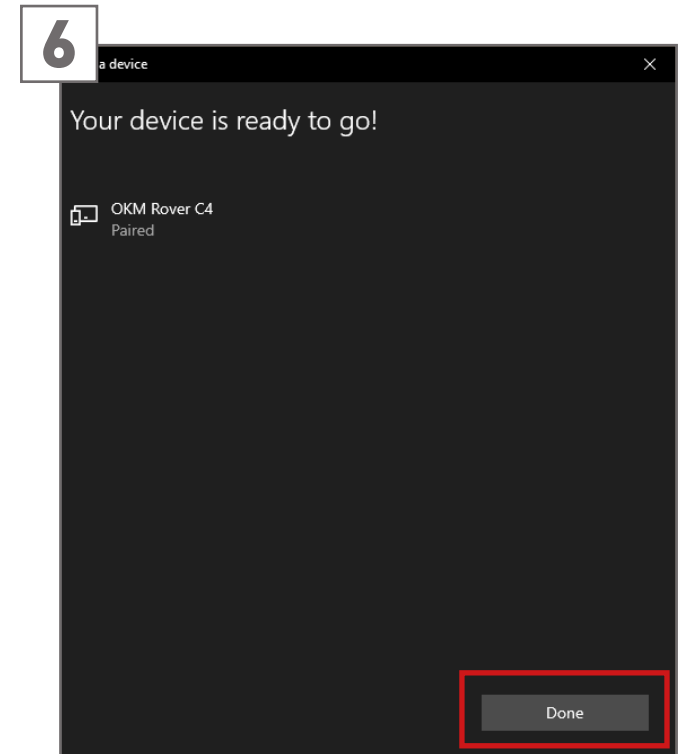




In the "Add a device" dialog select **Bluetooth**.



Make sure your device is turned on and discoverable.
Click on **OKM Rover C4**.



Confirm your selection with click on **Done**.

4.2 ASSEMBLING THE DETECTOR

Please follow the following instruction to assemble your detector and get ready for your first measurement.



1

Make sure to recharge the internal battery of the detector before going into the field.



Alternatively, you can use the Power Pack to recharge the detector.

The Power Pack is optionally available (not included in the standard delivery scope).



2

Either connect the Standard Probe or the Super Sensor to the Sensor Socket.

The probe is used to measure the underground values and needs to be connected to the socket on the bottom of the unit.

Push the plug into the Sensor Socket until the notch snaps in. There is only one correct direction possible to connect the probe properly.

Avoid hard impact or other damages!





OPERATING MODES

5 OPERATING MODES

After powering on the Rover C4 metal detector by pushing the ► button, a splash screen appears on screen while the system is booting up:



When finished, the main menu appears where you can select the desired operating mode.

The main menu offers the following operating modes and functions:

- **3D Ground Scan:** A graphical 3D measurement for detailed analysis on a computer.
- **Pinpointer:** Transfer live data to Visualizer 3D Studio software to pinpoint potential targets.
- **Magnetometer:** Process an acoustic magnetic field measurement to detect ferrous metals.
- **Mineral Scan:** Conduct a graphical measurement for minerals and natural gold detection.
- **Memory To PC:** Transfer stored measurements to Visualizer 3D Studio software.
- **Settings:** Adjust general settings like display brightness, volume, language etc.
- **Information:** View information like serial number and firmware version.

The choice of the operating mode depends on your planned project. Usually, you should use several operating modes one after another to explore an area. In that way you can obtain as much information as possible from the underground of the scanned area.

5.1 3D GROUND SCAN

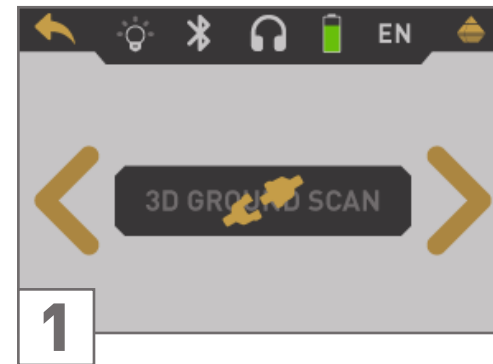
The operating mode "3D Ground Scan" provides a graphical measurement of any area for analysis on a computer. For the measurement you can either use the Standard Probe or the Super Sensor. Get general information on conducting a geophysical measurement in the "3D Ground Scan Guide".

5.1.1 Preparing a 3D Ground Scan

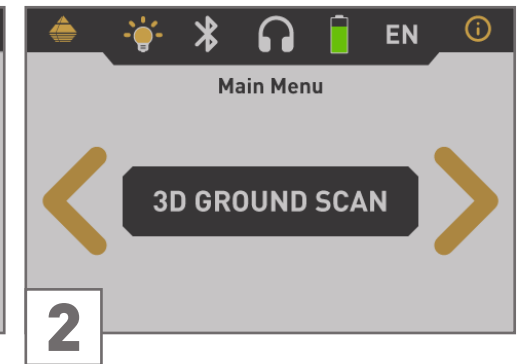
Before starting the actual measurement, you have to adjust 4 essential parameters:

- **Impulses**
- **Impulse Mode**
- **Scan Mode**
- **Transfer Mode**

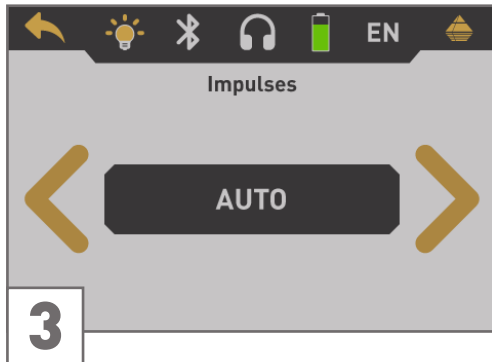
These settings are necessary to define the field size and how to step out the area to record measuring values. The next subsections will explain these parameters in more detail.



Power on the device and select the operating mode "3D Ground Scan" from the main menu. If there is no probe connected, the button is disabled and shows the 🗺️ icon.



As soon as the Super Sensor or Standard Probe is connected, confirm the operating mode "3D Ground Scan" by pushing the **OK** button.

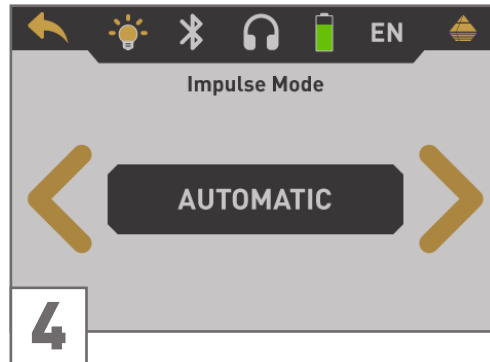


First, set the number of measure points (Impulses), which will be recorded for each single scan line.

Auto: The number of measure points of one scan line will only be defined during the measurement. If you reach the end of the first scan line in automatic impulse mode, press the **▶** button to save the required number of measure points. In manual impulse mode, press the **OK** button (the **▶** button is used to release the impulses). This number of measure points will then be used for all following scan lines. Beginning from the second scan line, the device will stop by itself, when the defined number of measure points has been sent.

In "Auto" mode you can not transfer data directly to a computer. You can only store the measured values in the internal memory, because the exact length of field is not yet selected.

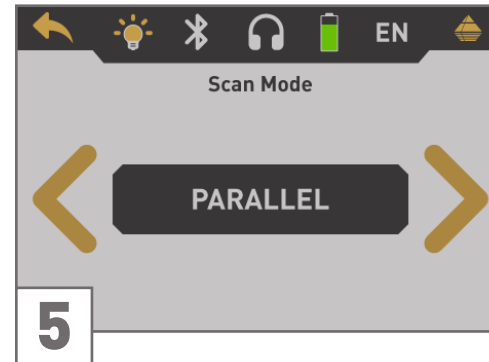
10, 20, ..., 200: Each scan line consists of the selected number of measure points. At the end of each scan line the device stops by itself, as soon as the number of measure points has been recorded.



The impulse mode sets the way of how the single impulses (measure values) will be released by the metal detector. There are two impulse modes available:

Automatic: Each measure value will be recorded automatically and continuously without any break.

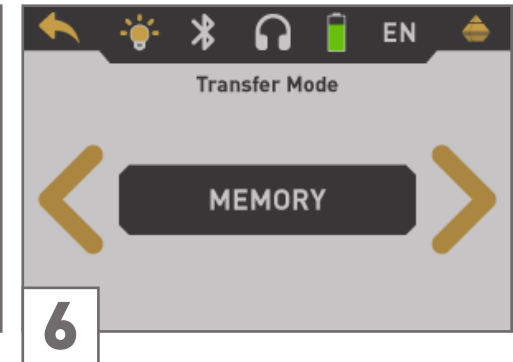
Manual: One measure value will only be recorded after you have pressed the **▶** button.



Selecting the scan mode tells the Rover C4 how you will step out the scan field. There are different ways to walk over the field while recording the underground information. The following scan modes are available:

Parallel: This scan mode is used to scan all scan lines into the same direction. So you will scan the first path to its end and then come back to the starting point without further scanning. Now you step to the left and scan the next path. This repeats until you reached the last scan line.

Zigzag: This scan mode is used to scan all scan lines in zigzag style. Here you will scan the first path to its end, then you step to the left and you scan the second path in reverse. Now step to the left again to scan the next path. This repeats until you reached the last scan line.



Define the type of data transfer. The transfer mode configures where to send and store your data.

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 "Memory To PC". You can store up to 4 measurements at a time in the internal memory of the Rover C4.

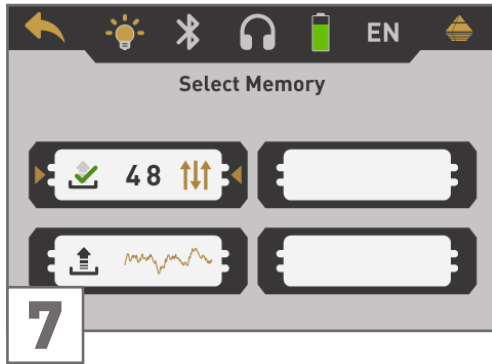
Continue reading section [„5.1.1.1 Saving into Memory“ on page 18!](#)

Computer: The measured data will be transferred right away to a connected computer. Therefore, a Bluetooth connection will be established before starting the measurement. The option "Computer" is not available if the number of impulses has been set to "Auto".

Continue reading section [„5.1.1.2 Transferring to Computer“ on page 19!](#)

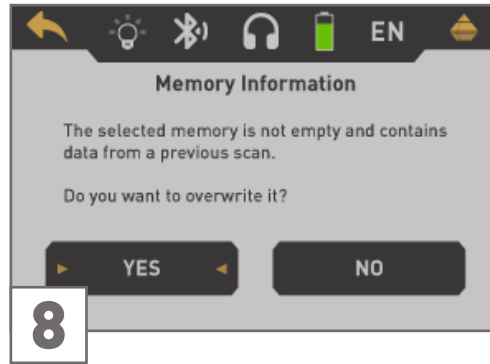
5.1.1.1 Saving into Memory

If you have selected "Memory" as transfer mode, you need to select one of the four memory areas.



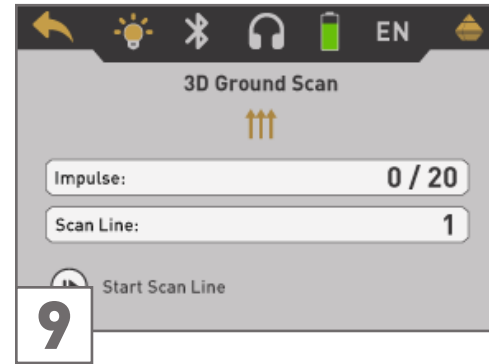
Select one of the four memory areas in which the new scan data should be stored.

Use the ► button to highlight a specific slot and confirm it with the **OK** button.



In case you selected a memory area that already contains data from a previous scan, the shown message appears.

Use the ► button to either highlight the "Yes" or "No" button and confirm it with the **OK** button.



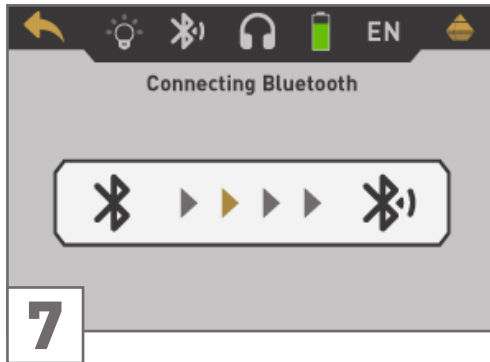
Now you can get ready and start your first scan line by pushing the ► button.

Read section „5.1.2 Conducting a 3D Ground Scan“ on page 20 to learn more about conducting a complete ground scan.

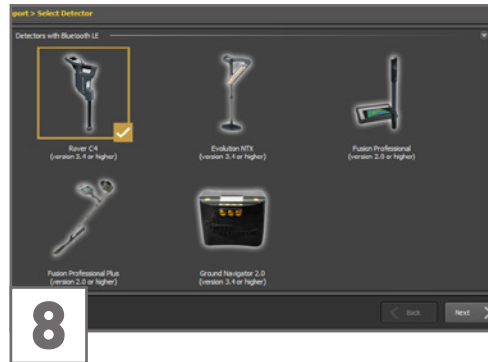
If you are going to cancel this operating mode simply push the ◀ button.

5.1.1.2 Transferring to Computer

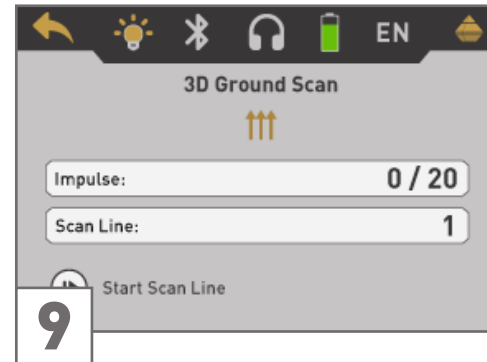
If you selected "Computer" as transfer mode, you need to establish a wireless data connection to the Visualizer 3D Studio software on your PC.



Rover C4 is now waiting for an incoming Bluetooth connection from your computer with Visualizer 3D Studio.



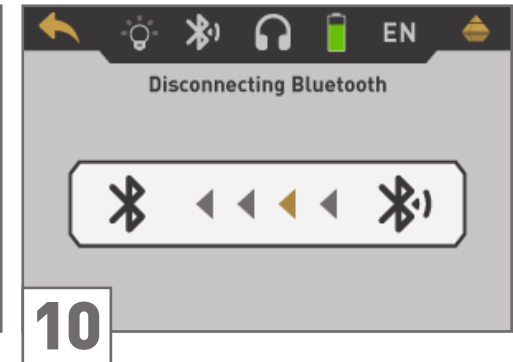
Set up your Visualizer 3D Studio software with all the corresponding settings as explained in chapter „6 PREPARING DATA TRANSFER“ on page 34.



After the Bluetooth connection is established you can start your first scan line by pushing the ► button.

Read section „5.1.2 Conducting a 3D Ground Scan“ on page 20 to learn more about conducting a complete ground scan.

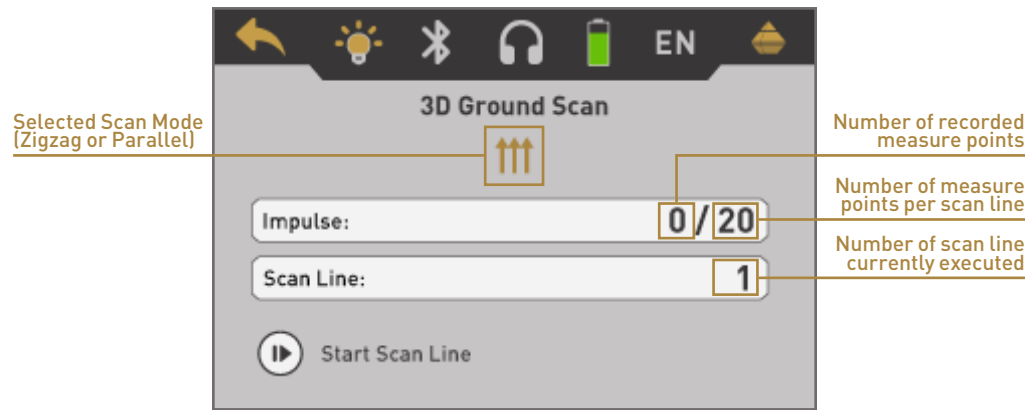
If you are going to cancel this operating mode simply push the ◀ button.



After canceling the 3D Ground Scan screen, the device also exits the wireless data connection before returning back to the main menu.

5.1.2 Conducting a 3D Ground Scan

After all parameters have been adjusted, the device is ready to start the first scan line. Beginning from this moment, the display will indicate the current number of scan lines and the current number of measured impulses per scan line.



The display indicates that the first scan line has started and no impulse has been measured up to now. In total, there will be 20 measure points per scan line. The device is waiting for the user to press the **▶** button to begin the measurement recording.

After setting all parameters you can start recording measure values. So go to your start position of the first scan line and press the **▶** button.



- If you have selected the impulse mode "Automatic" just keep going slowly until you have reached the end of the first scan line. When you already have defined the number of impulses then the device will stop automatically at the end of the line, otherwise – if selected "Auto" – you should press the **▶** button when you have reached the end of the first scan line. Now please go to the start position of the next scan line and press the **▶** button again. The device will stop automatically by itself at the end of the scan line.
- If you have selected the impulse mode "Manual" you should press the **▶** 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 **▶** button. The impulses will not be sent out automatically. Now you should do a little step forward and press the **▶** button, to measure the second measure point. The device stops and you should again walk a little step forward and press the **▶** button once more. Now continue in this way until you have reached the end of the first scan line. If you already have defined the number of impulses per line, the device will automatically signalize the end of the scan line, otherwise you should press the **OK** button when you like to finish the first line. Now go to the start position of your next scan line and push the **▶** button again. Go another step forward and repeat the measurement in the same way like you recorded the first scan line. The device will now signalize automatically the end of the next scan line.

Continue to measure all further scan lines until you have recorded the complete measure area. To finish the operating mode "3D Ground Scan" and return back to the main menu you simply push the **◀** button.



Read about the general scanning procedure in the "3D Ground Scan Guide".

5.2 PINPOINTER


As the name "Pinpointer" already indicates, it allows you to pinpoint potential targets more precisely. Furthermore you have the possibility to distinguish between ferromagnetic and non-ferromagnetic metals. This operating mode can only be used with the Super Sensor. You cannot use the Standard Probe.

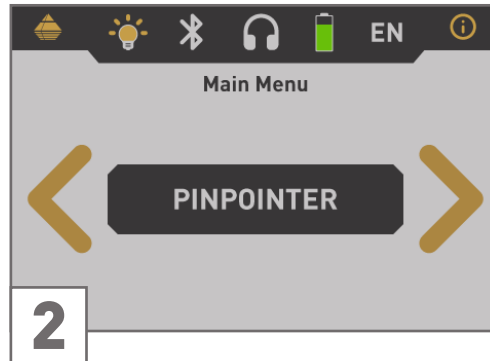
Usually, this operating mode is used after you have executed a complete measurement in the operating mode "3D Ground Scan". It is mainly used to analyze the detected object in detail. Due to the analysis of the measurement results in the mode "3D Ground Scan" you can determine the position of a located object to know at which place of the measuring area you should research in detail with the Super Sensor.

5.2.1 Preparing a Pinpointer Scan

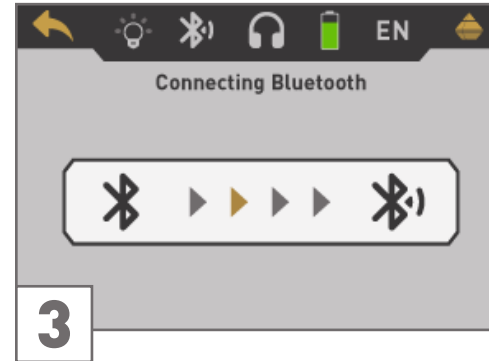
In this operating mode all measured data will be sent directly to a computer. Therefore, a wireless data connection to the Visualizer 3D Studio software must be established first.



Power on the device and select the operating mode "Pinpointer" from the main menu. If there is no Super Sensor connected the button is disabled and displays the  icon.



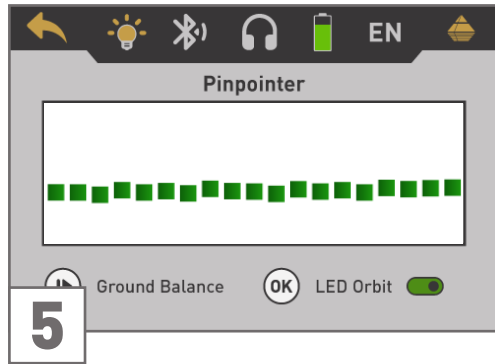
If the Super Sensor is connected, please confirm the operating mode "Pinpointer" with the **OK** button.



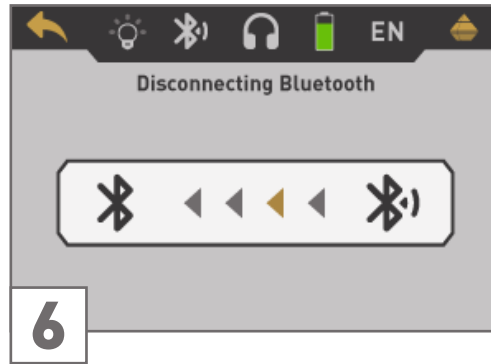
Rover C4 is now waiting for an incoming Bluetooth connection from your computer with Visualizer 3D Studio.



Set up your Visualizer 3D Studio software with all the corresponding settings as explained in chapter „6 PREPARING DATA TRANSFER“ on page 34.



The display shows the active Pinpointer screen. You can repeat the ground balance at any time by pushing the **▶** button. The LED Orbit can be enabled by pushing the **OK** button. The visual representation on the screen is very rough and should not be used to distinguish the signatures. To cancel this operating mode push the **⬅** button.



After canceling the Pinpointer mode, the device also exits the wireless data connection before returning back to the main menu.

5.2.2 Conducting a Pinpointer Scan

After the data transfer to the computer has been established, you are ready to start your measurement. Hold the Super Sensor correctly during the measurement.



Push the **▶** button to start scanning the underground. Move the Super Sensor slowly from one side to another above the desired object. Try to capture the complete object, which means measure beyond the edges of the object. Repeat this measurement a few times to get a clear signature of the object. During this procedure the Super Sensor should point vertical towards the ground.

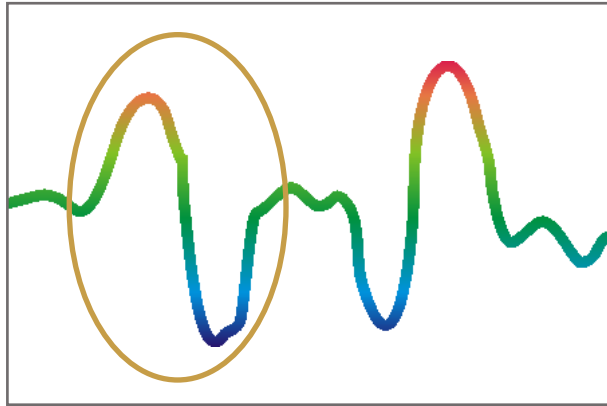


DO NOT turn, swing or pivot the sensor.

You may push the **▶** button from time to time to repeat ground balancing the metal detector. To quit the operating mode "Pinpointer" and return back to the main menu, push the **⬅** button.

5.2.3 Analyzing a Pinpointer Scan

While scanning in Pinpointer mode you might see one or more different signatures, from which you can recognize a specific characteristic of any target.

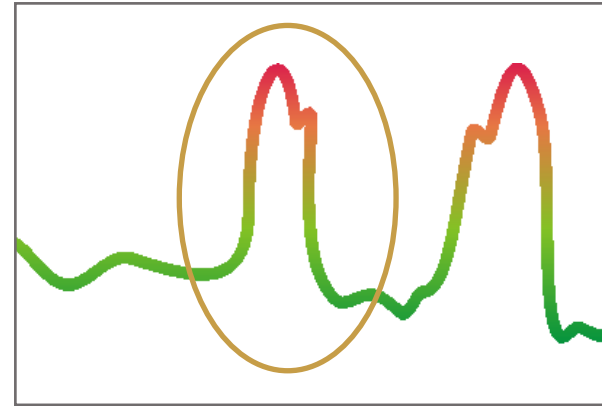


Ferromagnetic metals

Ferromagnetic targets have a positive-negative-signature.

The typical signature of a ferromagnetic metal like iron 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 Super Sensor. If you keep moving the probe from one side to another, these 2 signatures will change continuously.

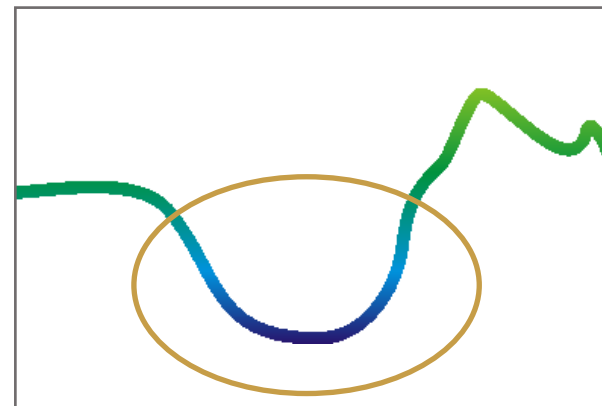
Take care to move the Super Sensor slowly and equal above the ground and above a detected object to get a clear signature.



Non-ferromagnetic metals

Non-ferrous targets have a pure positive signature.

In a signature of a non-ferrous target you can recognize that there is only a positive amplitude (red). In addition to the main amplitude there is another small peak, which is typical 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.

The signature of all non-metallic targets and structures such as voids, tunnels or buried plastic pipes or boxes are represented as negative amplitude (blue) only.


5.3 MAGNETOMETER

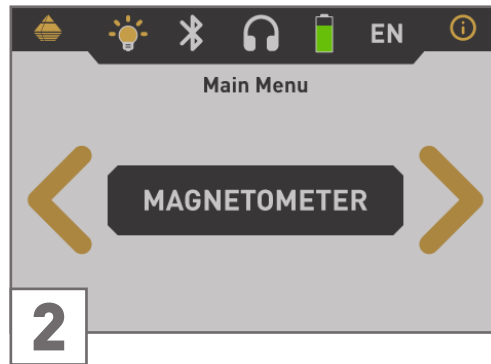
The operating mode "Magnetometer" allows to research the area in regard to ferromagnetic metals, e.g. iron, cobalt and nickel and other metals or objects which include traces of such metals. Primarily, this function is an acoustic mode, it generates a very rough graphical representation on the display to visualize the highs and lows.

Use the Standard Probe or the Super Sensor for this operating mode. By using the high resolution Super Sensor you can obtain a much better penetration depth. Please note that it can also react on metallic trash or contamination laying on the surface or near to the surface.

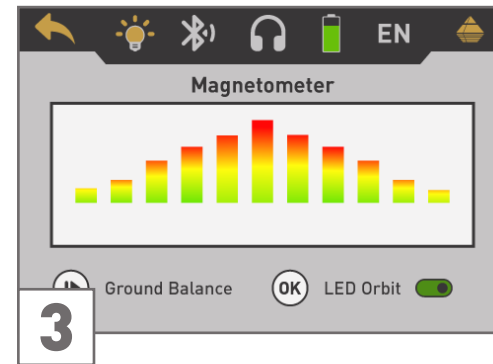
5.3.1 Preparing a Magnetometer Scan





Power on the device and select "Magnetometer" from the main menu. If there is no appropriate probe connected, the button is disabled and displays the  icon.




If a proper probe is connected, confirm the operating mode "Magnetometer" with the **OK** button.



The display shows the active Magnetometer screen. You can repeat the ground balance at any time by pushing the  button. To cancel this operating mode push the  button.

5.3.2 Conducting a Magnetometer Scan

Right after activating the "Magnetometer" mode, no sound should come from the device. If you can hear any sound output, repeat the ground balance. Make sure you hold the device straight downwards to the ground, as you would do during the scanning process, and run the ground balance by pushing the  button. After that, the sound output should be silent.



Move slowly forwards, backwards and sideways, but avoid turning the probe. The probe should always point vertical to the ground. **DO NOT** pivot, swing or turn around its own axis.





As soon as an acoustic signal sounds, the device has detected a potential metal target right under the position of the probe. In this way it is possible to find small metal objects near the surface like nails, screws, wires, seals and similar targets.

You should use the operating mode "Magnetometer" to remove such disturbing metal pieces from the area that you like to scan. The less metals near to the surface, the better your result in the operating mode "3D Ground Scan". You can also find larger metal targets which are located deeper underground.

A general rule is: The larger the target, the deeper it can be detected underground.

Also you can use the operating mode "Magnetometer" as a useful pinpointer during the excavations. If you already have dug out a large hole and do not remember where exactly the detected object was situated, you can simply use the Magnetometer mode to relocate fast and efficient the target position.

After using this operating mode for a while you should process a new ground balance by pushing the  button. To finish the operating mode "Magnetometer" and return back into the main menu you simply press the  button.

5.4 MINERAL SCAN

When prospecting for mineral deposits or 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 Studio 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.

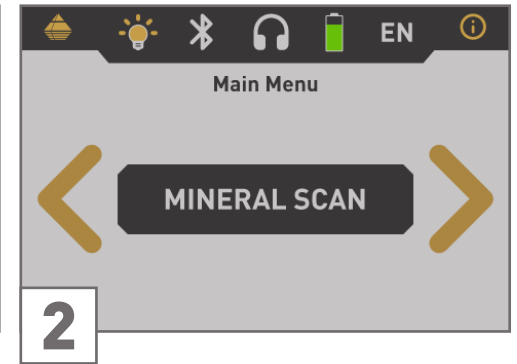
When searching for fields of mineralization, it is important to identify areas of higher probability with the assistance or research of a geologist. Locating and prospecting in known areas of higher probability will greatly increase your chances of success. Different geological formations may give different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

5.4.1 Preparing a Mineral Scan

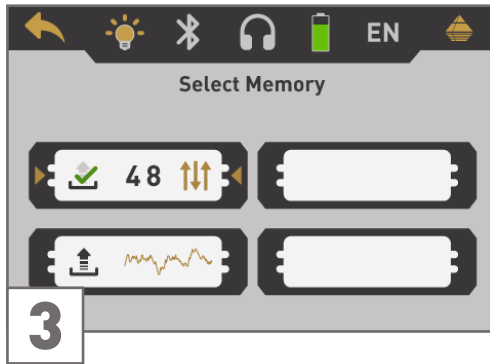
The operating mode "Mineral Scan" only works with the Super Sensor and can only be stored in the internal memory. Select one of the four memory areas before conducting the actual measurement.



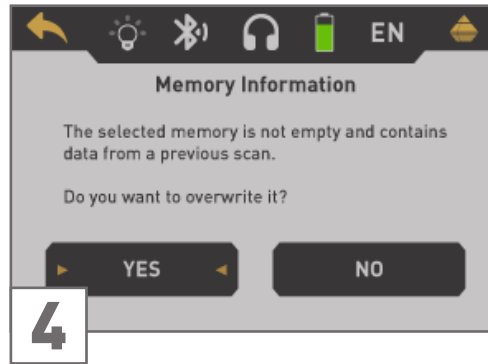
Power on the device and select "Mineral Scan". If there is no Super Sensor connected, the button is disabled and displays the  icon.



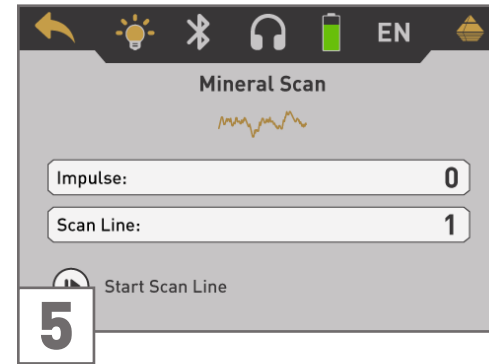
If the Super Sensor is connected, please confirm the operating mode "Mineral Scan" with the **OK** button.



Select one of the memory areas by using the ➤ button. Confirm the selection with **OK**.



In case you selected a memory area that already contains data from a previous scan, an information dialog appears. Use the ➤ button to either highlight the "Yes" or "No" button and confirm it with the **OK** button.



If you have selected a free memory area or confirmed to overwrite an occupied one, the Mineral Scan screen appears. In the display you will see the current number of measure points (impulses) which has been recorded so far. As indicated on the bottom of the screen, you can start the measurement by pushing the ▶ button.

5.4.2 Conducting a Mineral Scan

If the Mineral Scan screen is shown on the display of the Rover C4, position yourself at the start point (A) of your measurement and press the **▶** 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 from (A) to the end of your scan line (B) and press the **▶** button again to stop the measurement.

While scanning you may pause and continue your measurement for as many times as needed by pushing the **▶** button. If you reached the final end point (B) of your scan area, pause the measurement and push the **◀** button to finish the scan and return back into the main menu.

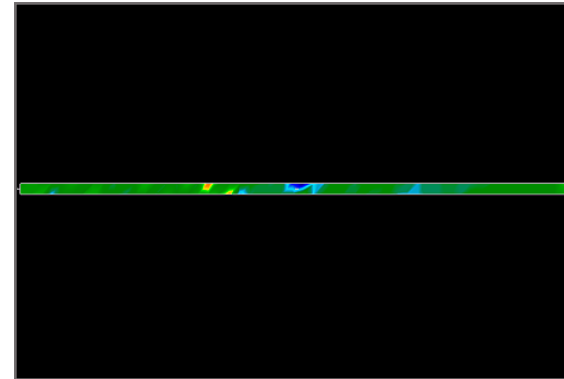
Make sure that your scan line has a minimum length of **20 meters (65ft)** to have enough data for later analysis.



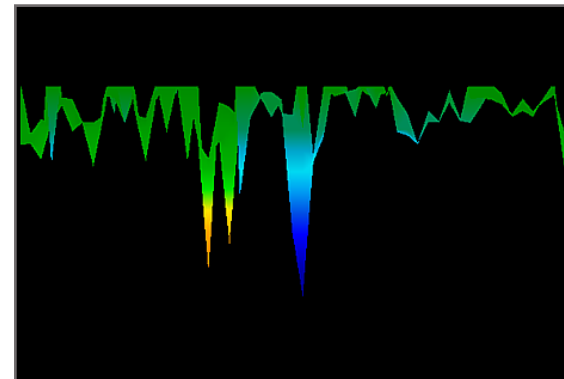
After finishing the measurement you can transfer your scan to a PC with Visualizer 3D Studio software for a detailed analysis. Therefore, follow the instructions in chapter „6 PREPARING DATA TRANSFER“ on page 34.

After an initial area has been located, determine the size of the field or potential mineral field by conducting a conventional 3D Ground Scan. Be careful to not rotate the antenna during this measurement. Rotational errors can occur very easily and can be frustrating.

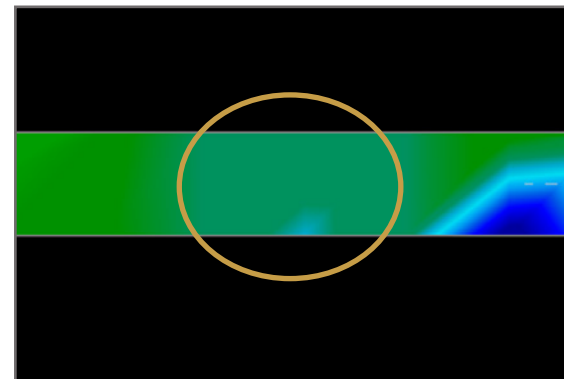
5.4.3 Analyzing a Mineral Scan



After transferring the scan data to Visualizer 3D Studio you will see a scan that is a straight line. This scan is now ready for analysis.

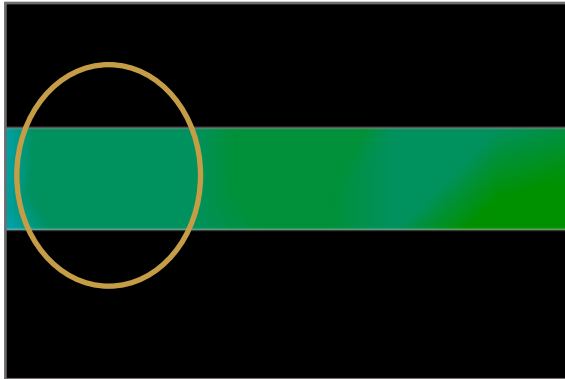


To see the differences within the scan, rotate it to the side.

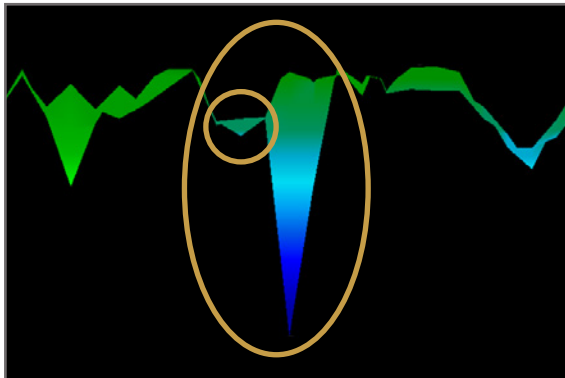


This scan shows the highlighted section of how a natural mineral field appears like. Please note the above colors, they are difficult to notice when in direct sun or bright light. Analyze your scan in an area where the computer can be shaded from most of the natural light to better recognize the colors.

The image is taken from practical experience in the field.

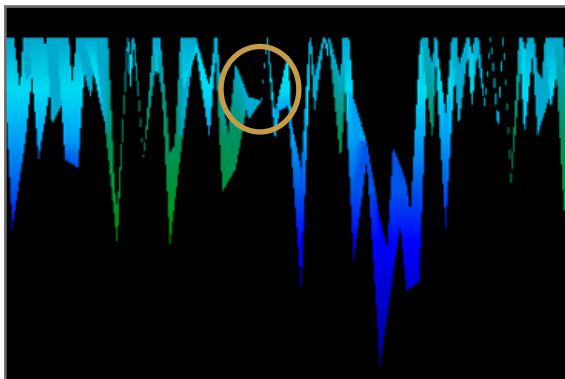


Practical experience and the repeatability factor from several locations world-wide have made this color the one to watch for within the scans. As stated previously, it is not an easy-to-recognize color.



Another signature to look for is the one that is also commonly referred to as a "hit within a hit". The scan image needs to be viewed from the side view and fitted onto the screen. If the values are too high, you won't be able to recognize the differences.

The smaller area is attached to the larger, this is very typical and occurs quite often when working with minerals in hard rock.

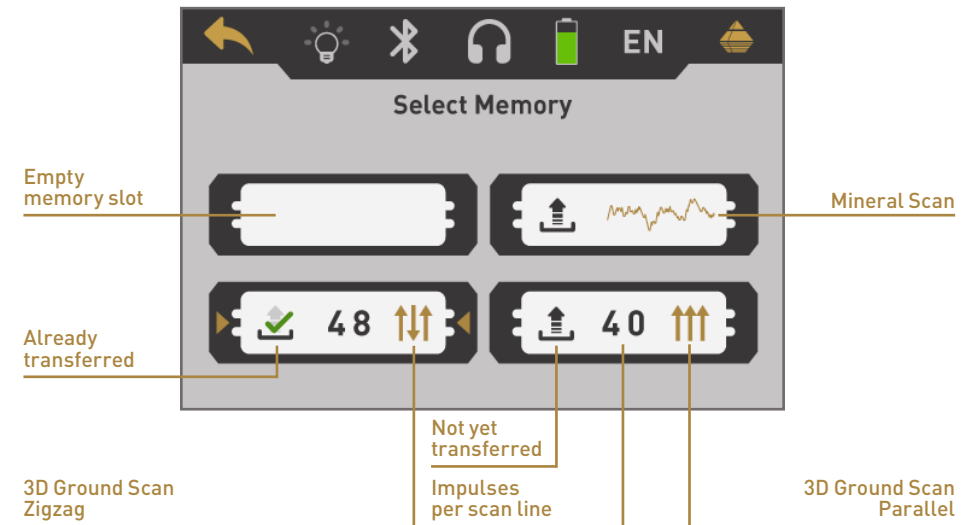


This example shows naturally occurring gold that has been detected by a user in North Sudan. The gold was embedded in the rock alongside with quartz and black sand.

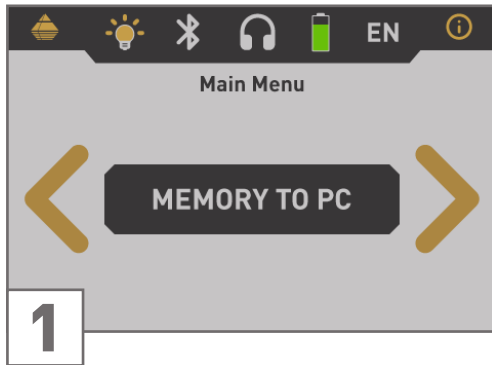
5.5 MEMORY TO PC

By using the operating mode "Memory To PC" you can transfer measured data from the internal memory of the Rover C4 to the Visualizer 3D Studio software.

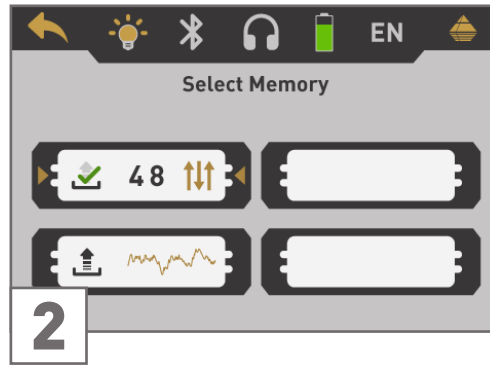
The Rover C4 is equipped with four memory areas that can be used to store either 3D Ground Scans or Mineral Scans. After each data transfer you can decide to clear the used memory area.



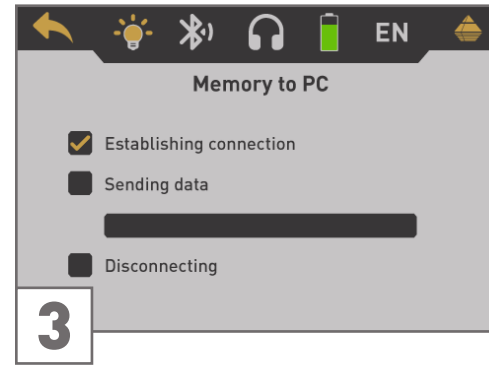
Start your Visualizer 3D Studio software and transfer your scan data from your Rover C4 to the PC software.



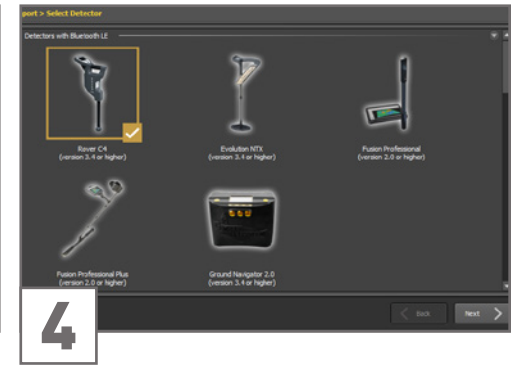
1 Power on the device and select the operating mode "Memory To PC" from the main menu. Push the **OK** button to open the memory areas screen.



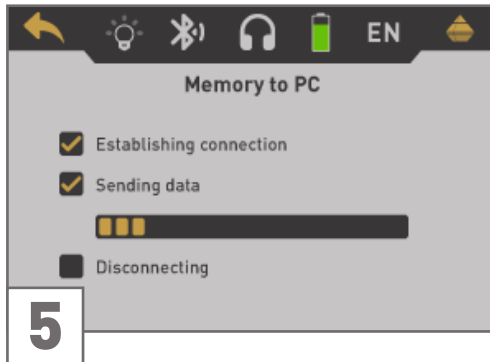
2 Select one of the four memory slots to transfer its data to your computer. Use the **>** button to highlight a specific slot and confirm it with the **OK** button.



3 Now the device waits for a Bluetooth connection initiated by the software.



4 Set up your Visualizer 3D Studio software with all the corresponding settings as explained in chapter „6 PREPARING DATA TRANSFER“ on page 34.



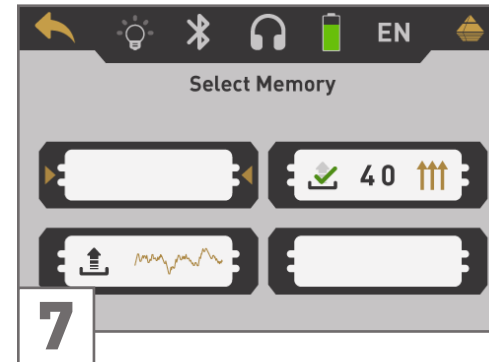
The device starts to transfer all data from the selected memory area. Simultaneously you should see the incoming measure values in Visualizer 3D Studio.

After all data have been transferred, the Bluetooth connection is disconnected.



After transferring the measure values you can decide if you would like to keep the data in the internal memory of the device. If all data has been transferred successfully, you can free the current memory area to use it for new measurements.

Use the **>** button to either highlight the "Yes" or "No" button and confirm it with the **OK** button.



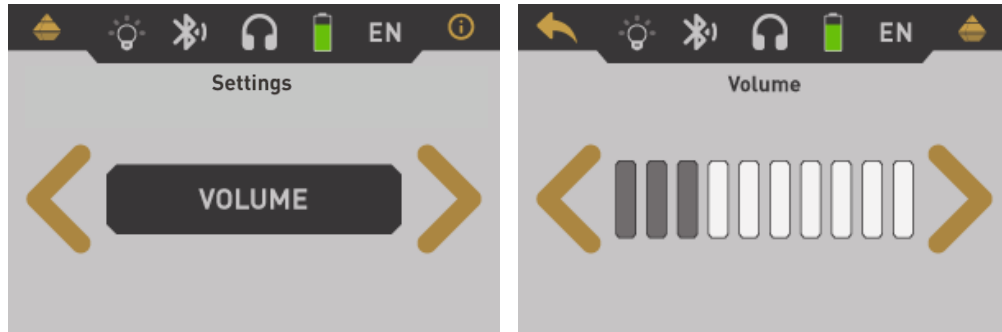
If you decided to clear the memory area, it will be displayed as empty in the memory screen now.

Continue with another memory area or return back to the main menu by pushing the **←** button.

5.6 SETTINGS

5.6.1 Volume

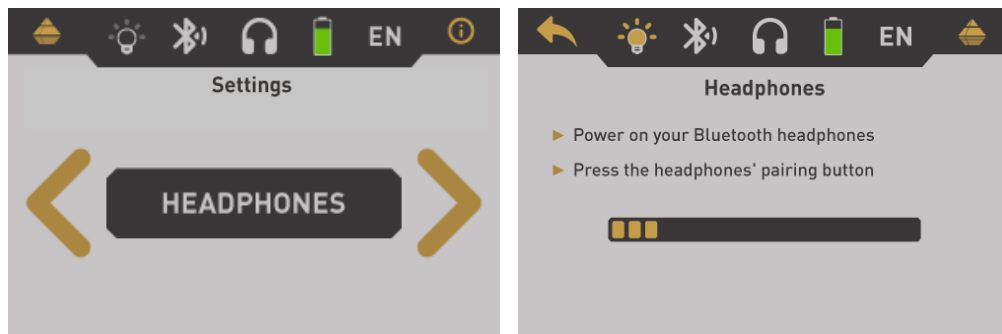
This option changes the volume of the internal speakers or the connected Bluetooth headphones.





Use the **>** button to change the value and confirm it by pushing the **<** button. This will automatically return to the settings menu.

5.6.2 Headphones

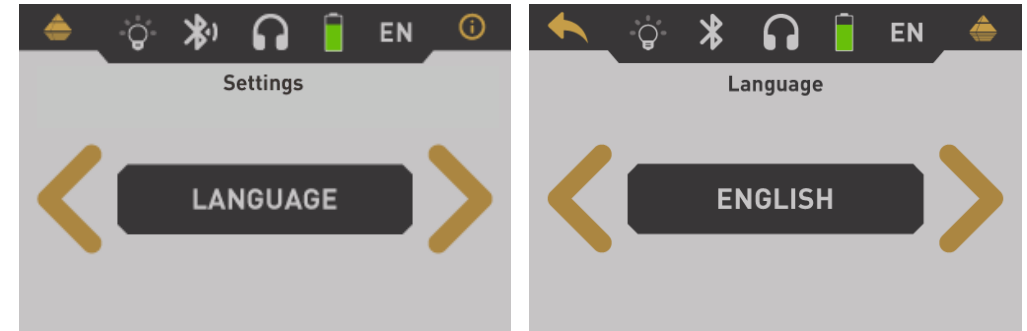
This option allows you to connect Bluetooth headphones with your Rover C4. After activating this option with the **OK** button, you need to power on your headphones and push the headphones' pairing button. The actual pairing process may vary from headphones to headphones.



The program will wait 60 seconds to connect to the headphones. If it is successful the headphones icon will change from  to .

5.6.3 Language

The Rover C4 can be used in different languages to simplify the handling. Use the **>** button to loop through all languages. Confirm your preferred language with the **OK** button or the **<** button.

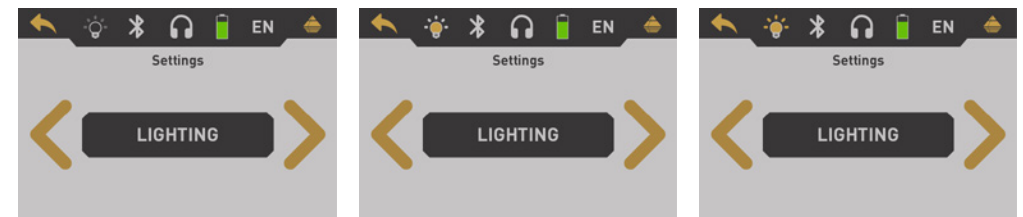


After selecting your preferred language it will be indicated in the toolbar icon with the 2-letter-code according to ISO-639-1. Currently we support the following languages:

- German (DE)
- Spanish (ES)
- Greek (EL)
- Russian (RU)
- English (EN)
- Arabic (AR)
- Italian (IT)
- Turkish (TR)
- French (FR)
- Farsi (FA)
- Chinese (ZH)

5.6.4 Lighting

This option will toggle the LEDs that are embedded in the bottom side of the display unit. With the LEDs switched on you can light the field when scanning in darkness.

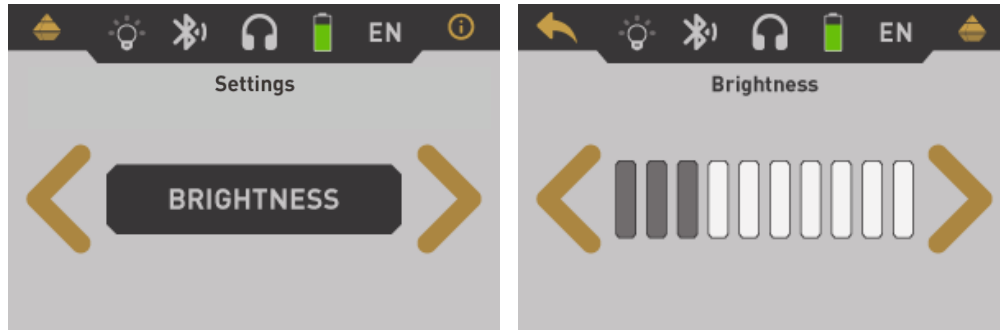


Use the **OK** button to toggle between the states.

The lighting icon indicates the current state:  off  low power  high power.

5.6.5 Brightness

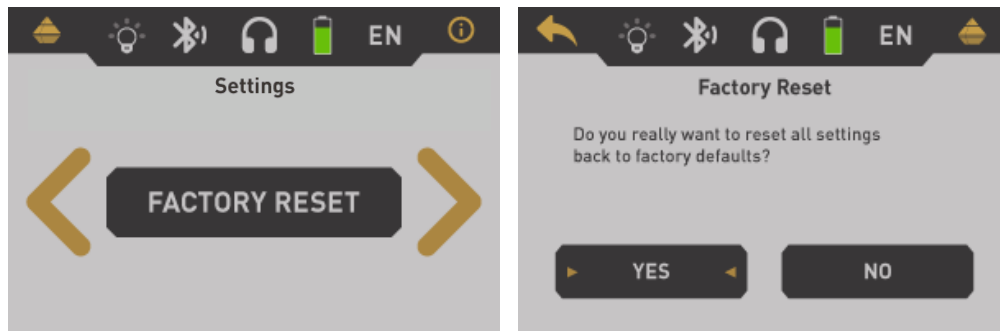
The brightness regulates the background light of the display and touchscreen. The brighter the display, the better you can read it in the sunlight, but the more power it will consume. In dark environments you can turn the brightness down.



Use the **>** button to change the value and confirm it by pushing the **<** button. This will automatically return to the settings menu.

5.6.6 Factory Reset

This option will reset all configurations back to factory defaults. For safeness purposes an additional question pops up to avoid accidental factory resets.



Use the **>** button to highlight the "Yes" option and push the **OK** button to start the factory reset. If you do not want to reset your device select the "No" option instead or push the **<** button.



Factory reset will clear all your personal configuration changes.

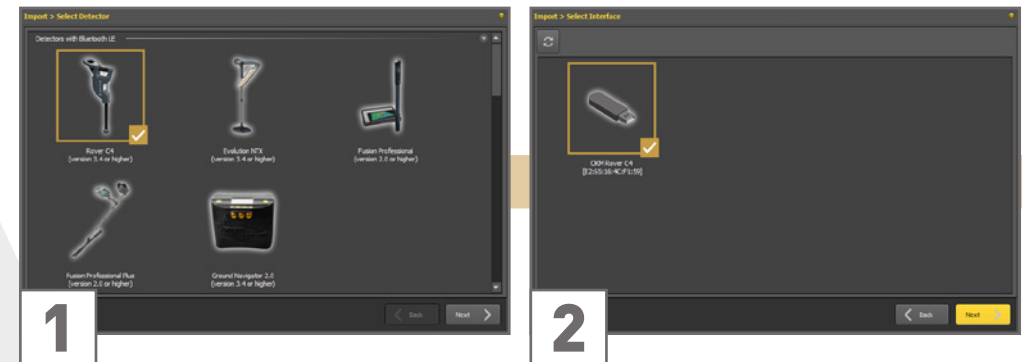
5.7 INFORMATION


This option displays information concerning the device's serial number and firmware version. These information may be useful if you are contacting your local OKM distributor for additional support requests.



6 PREPARING DATA TRANSFER

Make sure you have processed the steps from section „4.1 Pairing Bluetooth“ on page 12.

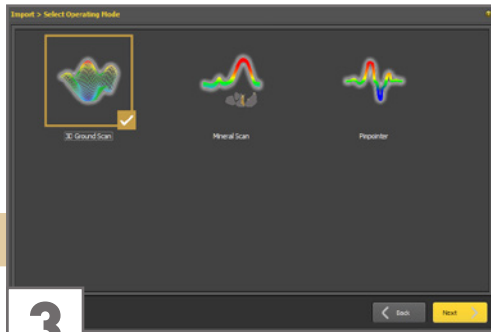


After launching your Visualizer 3D Studio software you have to select **File > Import** from the menu or you simply click the  icon.

Select “Rover C4 (version 3.4 or higher)” from the list and click **Next**.

Wait a moment until your device interface appears in the list. Now select the entry and click **Next**.

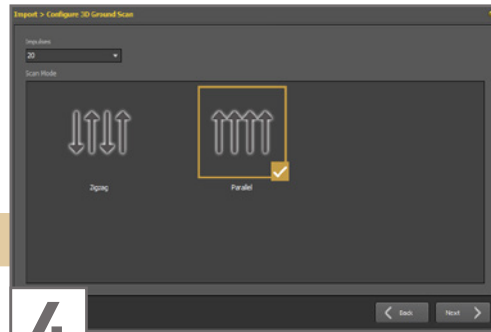
DATA TRANSFER



3

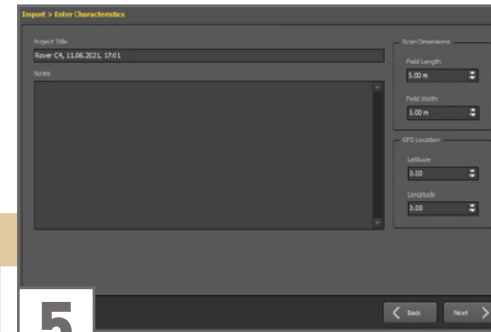
3D Ground Scan

Select the operating mode and click **Next**.



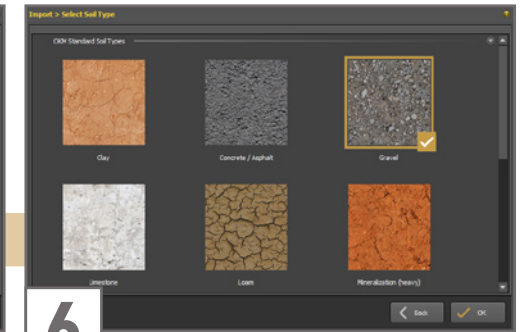
4

Enter the Field Length and select the Scan Mode, then click **Next**.



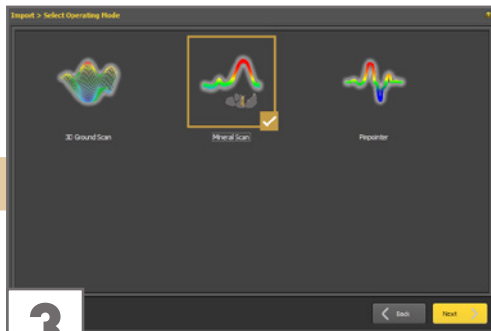
5

Enter title and scan field dimensions. You may also apply GPS coordinates and add notes and remarks. Then click **Next**.



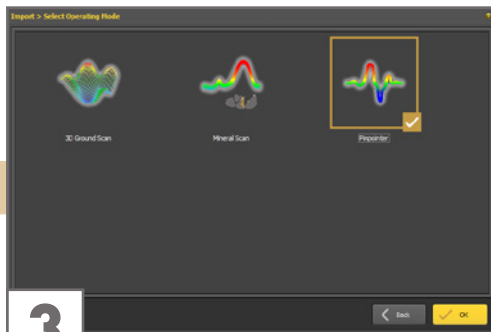
6

Select the corresponding soil type. Start the scan data import by clicking **OK**.



3

Mineral Scan



3

Pinpointer

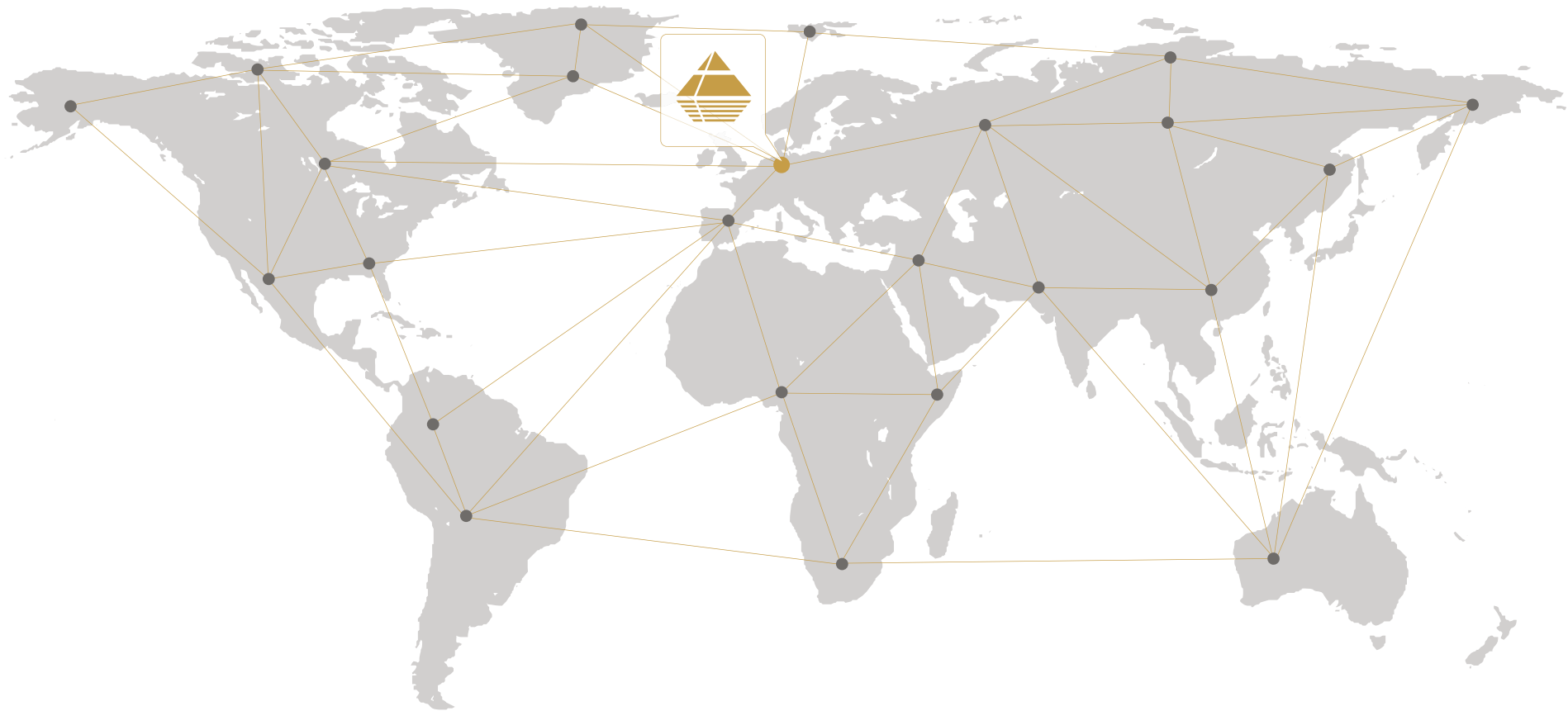
Start the scan data import by clicking **OK**.

OKM GERMAN DETECTORS

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Based in Altenburg, Germany, we are developing and manufacturing geophysical detectors since 1998. Our unique detection technology helps to visualize buried objects and structures.

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