



OKM

# Bionic X4



version 1.3 or higher

## User's Manual

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# CHAPTER 1

## **Introduction**

## 1.1 Preface

Dear Customer,

First of all we would like to thank you in choosing a product manufactured by OKM. The present product is based on a measuring method to detect gold objects that are a distance away from the operator. The longer the object is buried in the ground the better and deeper it can be located by the device.

With our team of specialists we guarantee that our products are under recurrent control. Our specialists are constantly implementing new developments in terms of further quality improvements for you. Of course by selling our products we cannot guarantee that you will make a find during your research. The recognition of hidden objects and structures depends on a huge number of factors – as you are already aware of. Determining factors like the dielectric constant of the ground, the grade of mineralization and the dimensions of an object relating to its depth size and displacement. Especially in very wet soils like clay and sand with high conductivity or attenuation of the ground. In certain conditions recording of the measured results can be falsified strongly.

For more information regarding where this equipment has been used and operated, please visit our web site. Our equipment is constantly being tested and when improvements or upgrades are available, we will list them also on our web site.

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 the time to read this User Manual and familiarize yourself with the operation, functionality and how to utilize the Bionic X4. We also offer training for your equipment in our factory and on-site training is also available. We strive to maintain a worldwide dealer network for assistance and support. Please visit our web site for more information.

## 1.2 Important Notes

Prior to using the Bionic X4 and its accessories, please read these operating instructions carefully. These instructions give information on how to properly use the detector and potential sources where precautions should be taken.

### 1.2.1 General Notes

Being an electronic device, the Bionic X4 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 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 has evaporated. The unit is not weather proof and water, moisture 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.

Avoid using this equipment around active military installations and airports or where there may be other devices that may hamper the signals received. Radars for aircraft, boats and weather reporting may lower the units capabilities.

### 1.2.3 Voltage / Power Supply

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.**

### 1.2.4 Maintenance and Services

In this section you will learn how to maintain your measuring instrument with all of its included accessories. This will keep it in good condition a long time and you will be able 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
- strong microwave fields
- high and long lasting heat effect like leaving unit in the sun on a hot day

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

Prior to using your Bionic X4 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.

### **1.2.5 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 or felt. The same applies to recognizable ammunition or bullets and shells. Leave that stuff alone and where it is, do not touch anything and, most importantly, do not take any of those items home with you. The killing machines of war made use of many 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 within them have formed, they are still dangerous and should be regarded as a potential killer.

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 or proper authority. Such objects always pose a danger to the life of hikers, walkers, farmers, children and animals.



# CHAPTER 2

## **Technical specifications**

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

## 2.1 Control Unit

Dimensions (H x W x D) .....	260 x 140 x 220 mm
Weight .....	approx. 780 g
Display .....	LCD display
Voltage .....	12 VDC
Operating time (no smart phone at USB) .....	approx. 16 hours
Operating time (smart phone at USB) .....	approx. 8 hours
Operating temperature .....	0 °C to +70 °C
Feedback .....	acoustical, visual
Processor .....	Atmel AtMega CPU, 14,7 MHz

## 2.2 Laser

Laser beam distance .....	max. 150 m
Laser output .....	max. 3 mW
Emitted wavelength .....	650 nm
Laser class .....	3R (EN 60 825-1)
Operating temperature .....	15 °C to +35 °C

## 2.3 Wireless Data Transfer

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

# CHAPTER 3

## **Scope of delivery**

In the following section you can find all standard equipment and optional parts of the Bionic X4.

Description	Quantity
Control unit	1
Wireless headphones	1
Android Smart Phone and included accessories	1
Power Pack incl. charger and traveling adapter	1
User manual	1
Carrying case	1

*Table 1: Scope of delivery*

# CHAPTER 4

## 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.

## 4.1 Control Unit

Figure 4.1 shows all the control elements of the Bionic X4.



*Figure 4.1: Control elements of Bionic X4*

**Handle with electrodes:** When using the device you have to take hold of the handle. Especially in the bionic mode you have to make sure that your hand has contact with the electrodes on both sides of the handle. Those electrodes are used to measure your body's bio-energy which influences the whole measurement.

**Connector for Power Pack:** The Bionic X4 has no internal batteries but uses the external Power Pack. Additional information about the usage and care of the Power Pack you may find in the separate description.

**Power on/off button:** Use the power on/off button to power your device on and off. In case of any critical situation you can switch off your device at any time. The functionality of the device will not be affected.

**Handle button:** In the first place the handle button is used to navigate through the single menu items. If you are using the Android Smart Phone this button is also used to fix the current scan directions which is visible in the screen.

Additional information about that procedure you may find in chapter 6.1.3 „Scan with activated Smart Phone“ on page 25.

**Green multi-function button:** The green multi-function button is used to confirm the current menu selection and to start and stop the measurements. It is also used to switch the LED lights and the laser pointer on and off.

**Display:** In the display of the device you will see all of the available menus and several status messages, i.e. the calibration and the measurement results.

**Calibration Control:** This regulator is used to calibrate the device during the bionic measurement to adjust it for the current environment.

**Holder for Smart Phone:** When using the Bionic X4 you have the possibility to connect it with an Android Smart Phone to have additional graphical options for directional reference. Just place the Smart Phone into the attached holder.

**USB port:** The USB port may be used to charge the Android Smart Phone. If you are using the Smart Phone for your measurements you just need to connect it via USB cable with the device to reach a longer working time, since the Smart Phone is charged while working. The USB port is always powered on as long as the Power Pack is switched on, even when the Bionic X4 is powered off.

**LED lights:** You may use the LED lights during searches at night.

**Laser pointer:** The laser pointer can be used at night searches for optical directional reference. The laser pointer is just some additional tool to assist you in determining the position of located objects.

Please pay attention to the security information in chapter 6.4 on page 30.

## 4.2 Wireless Headphones

Figure 4.2 shows all control elements of the delivered wireless headphones.



*Figure 4.2: Control elements of wireless headphones*

To use the delivered wireless headphones, you should insert two fully charged type AAA rechargeable or alkaline batteries inside the battery case. Remove the battery cover on the left site "L" and insert the batteries into the battery case. Please make a note to insert the batteries correctly. Now place the protective cap again on the battery case and press carefully until it snaps into place.

Power on the wireless headphones with the power on/off button (ON/OFF) and find the correct channel with the frequency regulator (TUNE). The device Bionic X4 should be powered on and release an acoustic signal during this adjustment.

Via the volume control (VOL) you can regulate the volume of the headphones.



# CHAPTER 5

## **Assembly**

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

Before you can use the device Bionic X4 for a field measurement you should do some preparations. Please pay attention to the following steps!



*Figure 5.1: Connecting the Power Pack with the device*

**Step 1**

Connect the cable of the Power Pack with the device.



*Figure 5.2: Switch on the Power Pack*

**Step 2**

Switch on your Power Pack. The LED on your Power Pack should light up in green now.

If the LED shows red, you have to charge the Power Pack first.



*Figure 5.3: Switch on the Smart Phone*

**Step 3**

If you decide to work with Smart Phone you have to switch it on and follow the next steps.

If you decide to work without Smart Phone you have to continue with step 8!



*Figure 5.4: Place the Smart Phone into the holder*

#### **Step 4**

After powering on the Smart Phone, you have to place it into the holder.

Avoid hard impact or other damages.



*Figure 5.5: Run the application on the Smart Phone*

#### **Step 5**

Now run the application on the Smart Phone by touching the Bionic icon with your finger.

You should turn the holder into the required position and fix it with the two knurled screws.



*Figure 5.6: Connecting the USB cable to the device*

#### **Step 6**

For charging the Smart Phone while working with the device you have to connect the big end of the USB cable with the USB port of the device and ...





Figure 5.7: Connecting the USB cable to the Smart Phone

### Step 7

... the small end with the USB port of the Smart Phone.

Charging the Smart Phone is also possible with the Bionic X4 switched off. As soon as the USB cable is connected and the Power Pack is switched on charging takes place.



Figure 5.8: Switch on the Bionic X4

### Step 8

Switch on the Bionic X4 by using the power on/off button.



Figure 5.9: Start the measurement

### Step 9

After switching on the device, the menu item „Bionic Scan“ appears in the display.

Now your device is prepared for the first measurement.

# CHAPTER 6

## Operating modes

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

The device supports the following functions and operating modes, which you can select from the main menu of the control unit:

- **Bionic Scan**  
Measurement based on the bio-energy of the human body as well as the magnetic field of earth.
- **Ionic Scan**  
Measurement for long time buried gold objects.
- **LED Light**  
Switch the LED lights on and off.
- **Laser**  
Switch the laser pointer on and off.
- **Headphones**  
Connecting the Bluetooth headphones.

To switch between the menu items you have to press the handle button. Push it one time to get to the next menu item. The complete menu structure is displayed in figure 6.1.

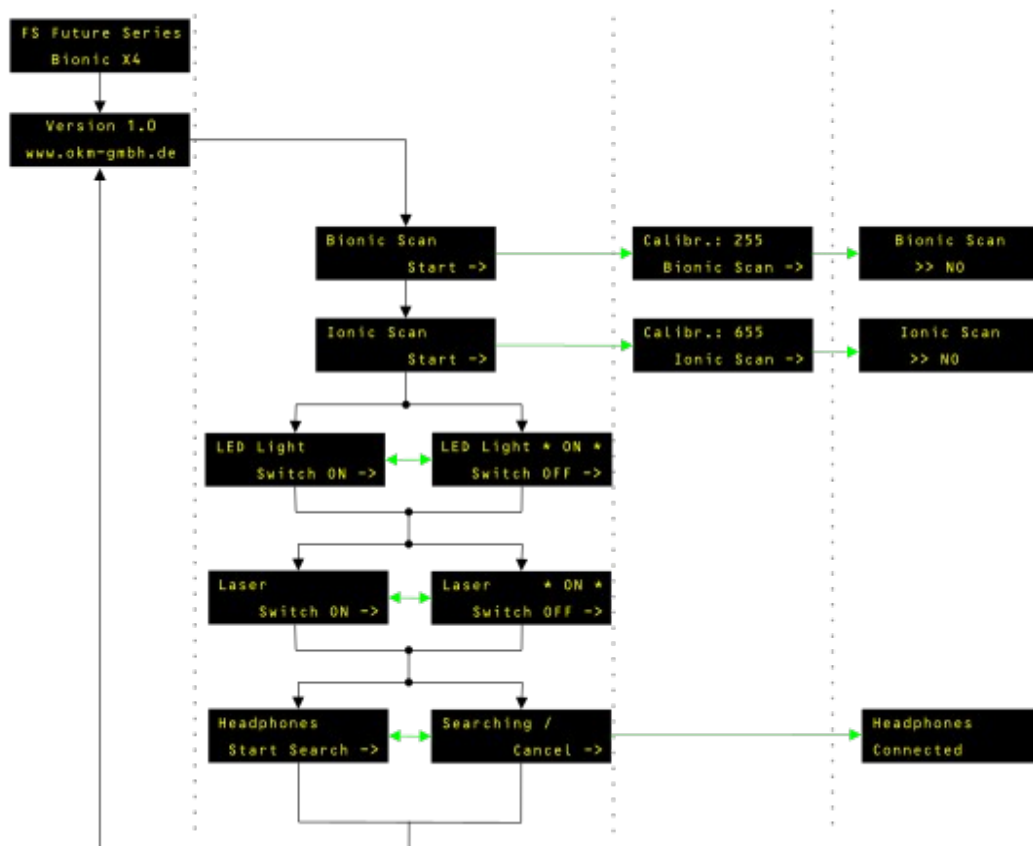


Figure 6.1: Complete menu structure

## 6.1 Bionic Scan

In order to make a scan with the Bionic X4 first turn on the unit with the power button located on the left side. After switching on the unit you will see in the display „Bionic Scan | Start ->“. Confirm this function by pushing on the green multi-function button. Then the Bionic X4 will have to be calibrated to your body's own natural bio-energy.

### 6.1.1 Calibration

In order to calibrate the Bionic X4 be sure that your hands are in contact with the electrodes. Figure 6.2 shows an example of how to hold the unit.



Figure 6.2: Contact between operators hand and the electrodes

Turn the calibration control from one side to the other very slowly until a higher value is seen. The upper value of 255 is too high and must be lower. For the optimum range a good setting is between 220 and 254. This value will make the unit very sensitive to buried gold.



Figure 6.3: Calibrating the device in bionic mode

The higher the unit is calibrated to the more exact it will look for gold. Wait then a couple of seconds so that the value is stable before pushing the green button. The shown frequency needs to be stable before



pushing the green button.

On another note, it is very important that your hand does not lose contact with the electrodes while making a measurement. If contact is lost, then it is possible to receive a false signal. It is important to practice holding the unit comfortably, not too tight and not too loose. While calibrating the unit it is extremely important to keep the same pressure on the electrodes. In the event that the signal is broken during the calibration, then it must be repeated.

As soon as the optimum calibrated value is reached, then confirm the setting by depressing the green button. In the display will be shown "Bionic Scan | - NO - ". In the event that the display constantly switches between " - NO - " and " - YES " very quickly then most likely you will have to calibrate the unit again and check your grip so that it is not too tight or change your location for you might be too close to a gold object.

### 6.1.2 Processing a scan

After you have successfully calibrated the unit and the operating mode is active, you can begin your scan. In a left to right and horizontal to downward motion (as shown in Figure 6.4) move the Bionic X4. Do not move the unit too quickly, slowly so it has the time to detect the gold within the bionic stream.



*Figure 6.4: Measurement with the Bionic X4*

As soon as the Bionic X4 has detected an anomaly, you will hear an acoustic signal and in the display you will see "Bionic Scan | - YES - ". You will need to conduct a control scans on the object by repeating it from various directions. When the object has a constant signal then you have most likely located its position. With the Bionic X4 you can then take a photograph of the direction in order to see the probable target. Move to a new position, approx 25 to 500 m from the original, as shown in Figure 6.5.

Repeat the measurement including the calibration of the unit. When the same positive signals are received then you can point the direction of the location of highest probability. Afterward press on the green button again to return to the main menu so that you can complete the triangulation and locate the object.



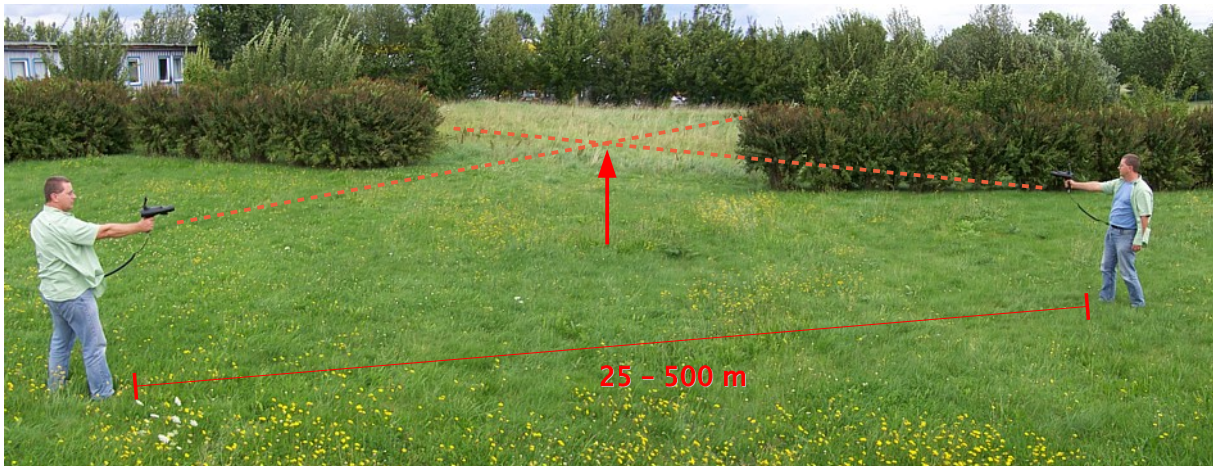


Figure 6.5: Triangulating with the Bionic X4

Should the object be at a greater distance, it will be necessary to travel closer to the object to get a better reading. So travel closer to the object, repeat the scans including calibration to narrow down the cross hairs. Of course it is better to use multiple positions in order to better locate your item.

### 6.1.3 Scan with activated Smart Phone

As written earlier, you can conduct the scans without the Smart Phone. When using the Smart Phone and the integrated camera, you can get assistance and an exact direction from the Smart Phone application which will help you greatly in locating the target. As soon as the application is started on the Smart Phone, you will have an image similar to the one shown in Figure 6.6.

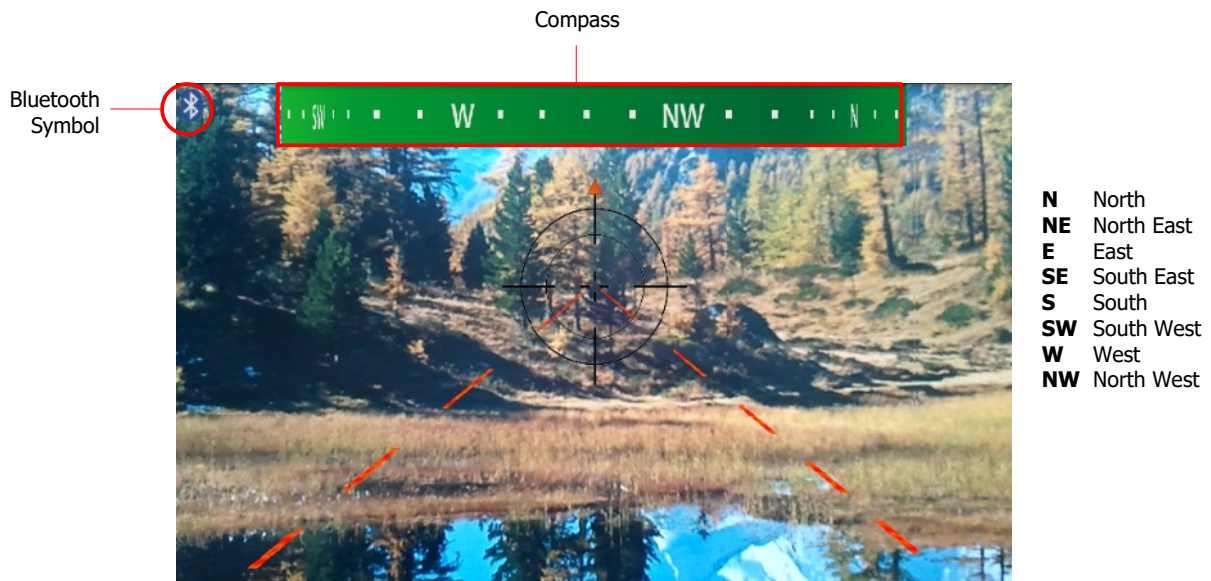


Figure 6.6: Screenshot of the Smart Phone

On the top portion of the screen you will find a digital compass which will show the compass direction. This will show you the direction that the Bionic X4 is pointed at. When the Bluetooth on the Smart Phone is activated (the Bluetooth symbol can be seen in the upper left hand corner of the Smart Phone) then there is an active data exchange in process between Bionic X4 and the Smart Phone. When the connection is active, you can push the trigger on the hand grip (handle button) at any time to take a picture to complete the triangulation as shown in Figure 6.7.

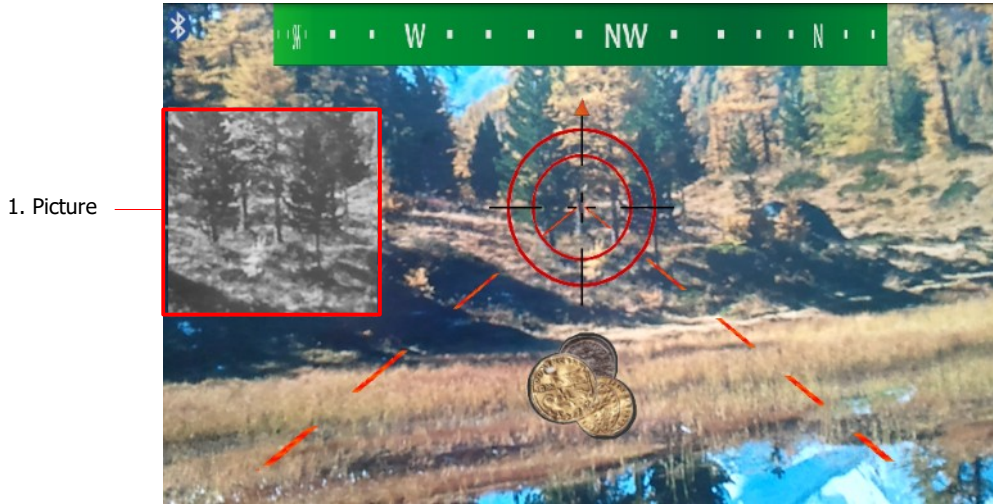



Figure 6.7: Starting the cross bearing

As soon as you have located a possible object then the symbol  of gold coins will be displayed. This is the correct direction for the first picture to be taken. Wait until the symbol is stable then squeeze the trigger on the hand grip to take the image.

Then afterward you can change your position and begin a new scan. Again like the previous scan wait until you have the symbol and it has stabilized to take the second image. Afterward in the Smart Phone display, as shown in Figure 6.8 , you will see the images.

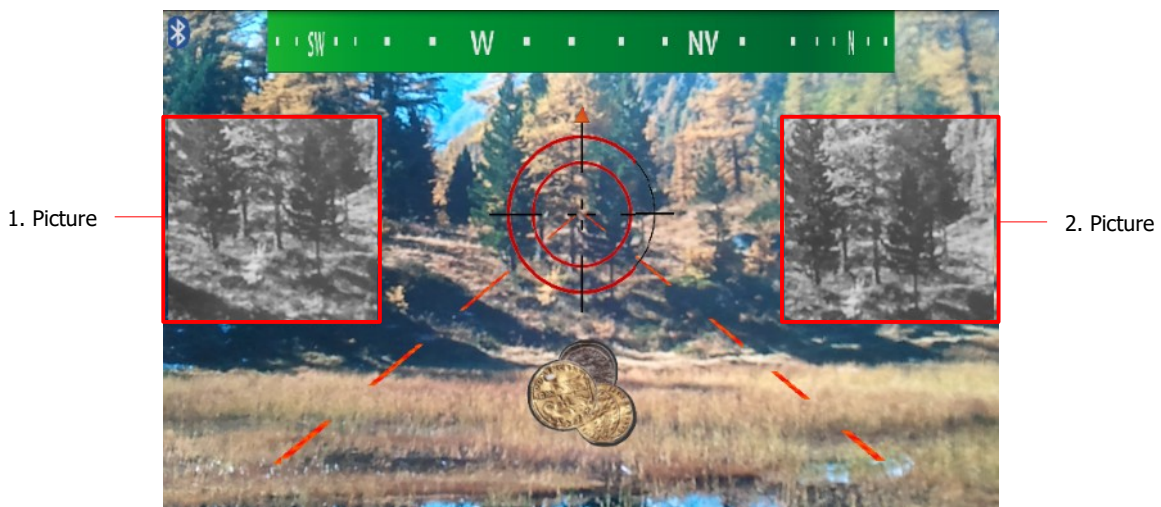


Figure 6.8: Completing the cross bearing

There on the display the image will be see on the Smart Phone display and then you can study the

---

results to ensure that the directions are correct. There where the two images are a triangulation can be made and this will be the point of highest probability. Clicking again the trigger on the hand grip will clear the images so that you can begin again.



## 6.2 Ionic Scan

The Ionic Mode of the Bionic X4 is specialized for the location of gold objects that have been buried for a long time. The longer the object has been buried the better it can be read. For the search of freshly buried objects we recommend the use of the Bionic mode.

To use the Bionic X4 in the Ionic mode, switch the unit on. After the unit has been turned on, click on trigger on the hand grip until you have reached the menu entry of "Ionic Scan | Start ->". Then push on the green multi-function button.

### 6.2.1 Calibration

The next step is to calibrate the Bionic X4 on the desired object (gold) within the Ionic stream. Use an adequate amount of gold to receive a good signal and complete the Bionic X4 calibration. The use of a physical gold object will assist the unit in its calibration of the ionic stream.



*Figure 6.9: Calibrating the device onto a gold object in ionic mode*

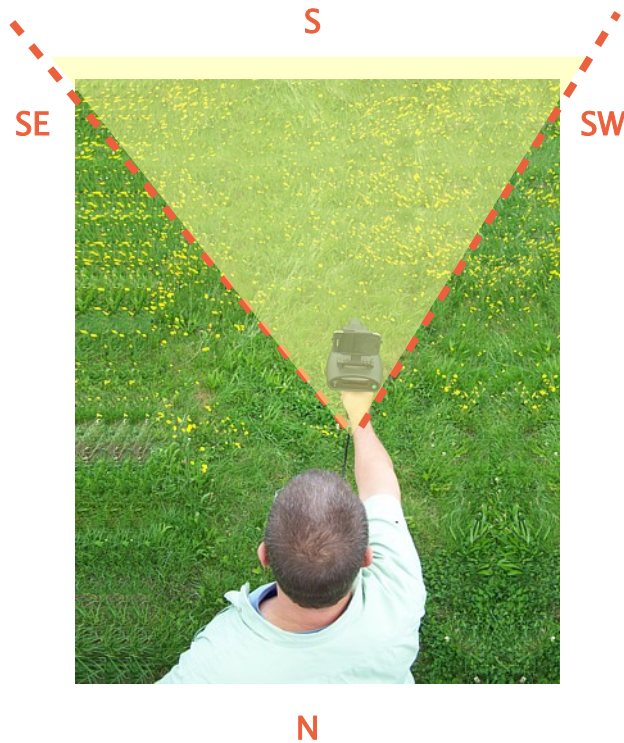
The unit will calibrate itself automatically for the chosen ionic stream (field). Please pay particular attention to the background that it is clear of any foreign objects or debris. Foreign objects or debris can potentially disrupt the ionic stream, limiting the capabilities of the Ionic mode. Confirm the calibration by pushing on the green button.

### 6.2.2 Processing a scan

At this moment the scan can be conducted and the previous technique as explained in the Bionic mode is the same as in the Ionic Mode. The main difference is that when using the Ionic mode that you must not be in contact with the electrodes on the hand grip. The Ionic mode does not require human contact.

The one item to take note of is that when using the Ionic mode the searchable area is limited to the South. You will need to have the North at your back. The limited search area is from the South East (SE) to the South West (SW).

In Figure 6.10 the area is shown. The user can slowly move the Bionic X4 from the SE to the SW being sure to keep the North always on their back. Using the unit outside of this area may give the user an incorrect reading.



*Figure 6.10: Measurement in ionic mode*

In order to end the scan, push the green button again and this will return you to the main menu. Again like that in the Bionic mode, a minimum of two scans from two different direction will have to be done to correctly triangulate the buried object.

### 6.2.3 Scan with activated Smart Phone

When you have the Smart Phone connected, the same for the Ionic mode pertains as with the Bionic mode. You can depress the trigger on the hand grip (handle button) to take an image of the direction to better locating the cross hairs.

Another advantage to using the Smart Phone with its included digital compass is to remain within the SE to SW area. The compass will show you which direction you are pointed ensuring that you can keep North to your back.

## 6.3 LED Light

Press the handle button several times until the display shows the function „LED Light“. Now you can switch the LED light on by pushing the green button. Another push on the green button switches the LED light off again.

## 6.4 Laser

Press the handle button several times until the display shows the function „Laser“. Now you can switch the laser on by pushing the green button. Another push on the green button switches the laser off again.



Never look into the laser beam and never point it at people or animals. Laser radiation can cause damage to eyes or skin.

Lasers should never be used by children. They are not toys.

This product is equipped with a class 3R laser according to EN 60 825-1:2007. Never open the device. Any adjustment or service work is only to be carried out by qualified personnel who are familiar with the risks involved. Improperly made adjustments may result in hazardous laser radiation.

During operation of the device, the laser has to be directed in such a way that no person is located within the range of projection and that unwanted reflected rays (e.g. due to reflecting objects) do not get into the range of any person.

## 6.5 Headphones

Press the handle button several times until the display shows the function „Headphones“. Now you can start connecting your Bluetooth headphones by pushing the green button. The device is now searching for headphones to pair with.

Make sure your Bluetooth headphones are powered on and it is in active pairing mode (please read the headphones manual).

Another push on the green button (while searching is in progress) cancels the pairing process.