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1 Preface

Dear customers,

first off all, we want to thank you for buying a product by OKM Ortungstechnik GmbH.

The growing demand for non-destructive and cost-cutting measuring methods for analyzing various structures and objects, and a constant awareness of environmental protection matters require a constant development of new technology for application and technical know-how, which is continuously being developed further by our specialists.

Civil engineers, architects, municipalities, geo-physicists, archaeologists, the police and a number of other persons and institutions involved in solving various tasks and problems require information on the structure of objects to be examined.

*Localizer 3000* may be used to select and document hidden foundations and objects without the need to perform any excavations. This method has several advantages over geo-electrical, seismic or magnetic methods, particularly in areas close to the surface and up to a depth of 10m, for example by offering quick results, which are easy to reproduce.

Therefore, *Localizer 3000* should be regarded as an appropriate supplement to those well-established methods.

*Localizer 3000* is based on an electromagnetic pulse method which can be used to select an anomaly in the target area, e.g. natural features such as a formation of strata, hollow spaces, level groundwater, but also buried objects such as pipes, tanks, boxes, etc.

Thus it is possible to recognize various structures. The depth of intrusion depends on several factors, e.g. relative permittivity or highly mineralized ground.

For example, the energy may be reduced to a level causing the depth range to be reduced significantly in very wet ground containing a lot of clay and sand with a high conductivity.
2 Important Notes

Please read these operating instructions carefully and closely before using Localizer 3000 and its accessories.

These instructions give information on how to use the device. They also point out potential sources of danger. No warranty is made and no responsibility is taken for any damage resulting from a failure to observe the operating instructions or from improper usage!

Any claims under guarantee will become null and void if repairs or work are performed by persons who have not been authorized by us to do so or if supplementary or accessory parts are added to our devices which have not been matched for them. Localizer 3000 will get destroyed if the device is opened improperly.

Avoid strong magnetic fields, which may occur in places such as near machines or loudspeakers, and avoid using a detector within a radius of 50 meters.

Localizer 3000 and its accessories serve to detect objects deposited and changes performed in the ground. These changes and deposited objects are registered using the modules which have been supplied or which are additionally available. The registered data on the ground structure are transmitted by a radio link to a PC for display using the components we offer. Any additional notes relating to this must be observed.

2.1 General Notes

Being an electronic device, Localizer 3000 must be treated with the caution and care necessary when such devices are used. Localizer 3000 comprises of a magnetometer and underground radar within one device. Any failure to observe the safety precautions given or any use for purposes other than the ones it is conceived for may result in a damage to or destruction of the processing unit and connected components.

2.2 Possible Health Hazards

Localizer 3000 normally does not pose any health hazards if used properly. According to current scientific knowledge, the high-frequency signals are not harmful to the human body on account of their low power. As an electric device, Localizer 3000 must be kept away from children!

2.3 Surrounding Area

Having been transferred from a cold to a warmer place, Localizer 3000 must not be operated immediately afterwards. Any condensation, which may have formed, might cause the device to get destroyed. Avoid strong magnetic fields, which may occur in places such as near machines or loudspeakers, and avoid using a detector within a radius of 50 meters.
2.4 Voltage

The power supply should not be outside 9 – 12 Volts. Only use batteries and rechargeable batteries!

2.5 Data Safety

There can be errors in the process of data collection if

- the power supply of the devices is to low,
- the cables you are using are to long,
- other electronic devices sends out troubles,
- atmospherics (lightning, . . . ) occurs.

2.6 Warranty

Please contact your dealer if the Localizer 3000 is in need of repair or in case of inquiries or problems. A qualified technician will examine the problem and initiate any repair work necessary. This service is free of charge within the regular warranty period of one year. After the expiration of the warranty period, you will receive an estimate of repair costs.
3 Technical Specification

The following technical specifications are medial values. During usage minor variances are possible.

3.1 Localizer

Avoid permanent solar radiation because parts of the unit can be destroyed.

Dimensions (H x W x D) ................. 430mm x 150mm x 260mm
Weight ........................................... ca. 3kg
Power Supply ...................................... 9.6 – 14.4 VDC
                      22W maximal
Safety Class .............................. IP40
Operating Time (Battery fully charged,
included external power supply, 25°C) ................. ca. 3 Hours
Operating Temperature ................................ 0°C– 40°C

Display ............................................. 300mcd backlight
                                      6,4” Diagonale
                                      640 x 480 Pixel TFT Color
Computer ........................................... 300 MHz Processor
                                      INTEL i586- compatible
Working Memory ............................... 64 MB RAM
Data Memory (according to construction) ................. 14 – 110 MB
Data Transfer to PC ............................. serial, 19200 Baud
Feedback ......................................... motor, acoustic, visual
Controller .......................................... Motorola 4 MHz
3.2 Power Supply

Dimensions ........................................ 180mm x 200mm x 87mm
Weight ......................................................... ca. 3kg
Output Voltage .......................... nominal 12V, not stabilized
Safety Class .................................................... IP40
Charger .......................................................... Charging Device
Charging Time (Battery fully discharged, 25°C) ........... ca. 5 Hours
4 Scope of Delivery

If you bought your device from one of our dealers the scope of delivery can be different in some circumstances. For questions about this please contact your local dealer! Beware that pictures in this manual could be different to delivered parts.

Figure 1: Scope of Delivery
4.1 Localizer 3000 (Standard)

- Localizer 3000 (1x)
- External Power Supply (1x)
- Charger for External Power Supply (1x)
- Cable for External Power Supply (1x)
- Wireless Headphone (1x)

  - Manual (1x)
  - Carrying Case (1x)

4.2 Differential Probes (Optional)

- Differential Probe (2x)

4.3 3D Software (Optional)

- Setup-CD (1x)
- Data Cable (1x)

4.4 Disc Detector Visualization System (Optional)

- Metal Detector (1x)

4.5 Wireless Long Range System (Optional)

- Long Range System (1x)
- 9V Battery (1x)
- Charger for 9V Battery (1x)
5 Hardware

In this section you learn how to handle the base unit of Localizer 3000. We demonstrate you connectors and ports, key functionalities and details of usage. Also the optional additional parts will be described.

![Figure 2: Localizer 3000 in General](image)

The control handle is necessary to handle the device. With this tool you can select different functions and operating modes. Detailed instructions about using the control handle you can find in section 5.1.

Inside the mini monitor different selection menus as well as special visualizations of single operating modes are displayed. Detailed instructions about all operating modes you can find in section 5.2.
To work with *Localizer 3000* you have to connect the external power supply into port ④. Remarks for usage of the external power supply you find in an additional manual.

After powering on the external power supply you have to press the Power-Button ⑥ of the device. You can hear a short vibration and the Voltage-LED ⑦ starts to shine. It depends of the state of the external power supply whether the LED is shining green (full), orange or red (nearly empty, please charge).

![Select your operating mode!](image)

*Figure 3: Main Menu*

After a short while, the integrated pc-module needs to boot the system, the main menu is shown which you can see in figure 3. In this menu you can select your needed operating mode and start to work with *Localizer 3000*.

### 5.1 Control Handle (Joystick)

The control handle is used to navigate through menus and to select operating modes.

The control keys ①A and ①B are used to navigate through menu options. Use key ①A to jump to the previous menu option. Key ①B is used to jump to the next menu option.

The OK-Key ①C is used to confirm the selected menu option. The ESC-Key cancels the current working process. During working in a special operating mode this both keys could be attached to other functions. Detailed informations about this you can find in the corresponding sections.

### 5.2 Operating Modes

The different operating modes of the device you can select with the control handle. The main menu which is shown in figure 3 contains following entries:

- **Headphone: On/Off**
  Activate/deactivate headphone.

- **Magnetometer**
  Area scan with integrated magnetometer.
5.2.1 Headphone

For reasons of energy savings headphone is deactivated. This state is displayed with a double underline of the word Off. To activate the headphone select the menu option Headphone: On/Off. After you confirmed this selection the option changes to Headphone: On/Off. Another confirmation of this option will deactivate the headphone.
If the headphone is activated the maximum working time of the external power supply is reduced for 25%.

5.2.2 Magnetometer

Select option *Magnetometer* from main menu to search ground involving the magnetic field of earth. You can see a graphical representation of a oscilloscope-like picture on the screen. It shows you if you are standing on top of a metal object or cavity.

![Magnetometer](image)

Figure 5: Magnetometer

After you confirmed your selection of option *Magnetometer* the device will be initialized with the current ground value. While the device is initializing itself the graphical representation on the monitor will be in white color. After this process its colored as you can see in figure 5.

If you power on your device above neutral ground conditions all metals will be shown with a deflection to the top of the screen and all cavities will be shown with a deflection to the bottom of the screen. If you activate the option while you are standing above a metal object all equivalent metal things will be ignored.

5.2.3 Ground Scan

To create a complete picture of the ground use option *Ground Scan*. After your confirmation of this option you see a second menu where you can select the number of impulses per search line. Select *Cancel* to jump back to main menu.

After you confirmed your selection of impulses you have to press the OK-Key of your control handle. With this you start scanning a new search line. If the line is finished the device is waiting until you are ready to start the next search line.

You have to scan in a given manner that your device can calculate the measured values in a right way. In figure 7 you can see a scheme of this process. Start searching in point ➀ and finish in point ➋.
Let’s assume you have selected 20 impulses. Now you go to your start point and scan a straight line in consistent speed of walking. When you see the message

\[ \text{OK} = \text{next scan line} \]
\[ \text{ESC} = \text{stop scanning} \]

on screen, also shown in figure 8, the current scan line is finished. Take a step to the left and scan backwards.

If you want to complete the scanning or cancel it press the ESC-Key of your control handle. Now you are back in main menu. The measured data in option ground scan automatically was saved into the internal memory. At a later time you can transfer this data via optional software.
to your PC. Detailed informations about this you find in section 7 on page 26.

You can scan a lot of areas in option *Ground Scan* without deleting older scans. Every scan will be saved into the internal memory.

### 5.2.4 Side Scan

All data measured in this mode will not be saved. You can use this operating mode to get a overview of the ground as live picture. So you can detect an unknown area very fast and efficient for metals.

![Side Scan](image)

Figure 9: Side Scan

If you found a possible target you always have to use option *Ground Scan* to scan the area around your target to determine it’s correct position.

### 5.2.5 Long Range

Using the Long Range System you are able to detect gold up to a distance of 3 kilometers. If the device is detecting gold the integrated vibration system of *Localizer 3000* will be activated.

![Long Range](image)

Figure 10: Long Range

Detailed informations about the usage of the Long Range System you find in section 5.4 of this manual!
5.2.6 Detector

Figure 11: Detector

Detailed informations about the usage of the Detector you find in section 5.3 of this manual!

5.2.7 Exit

Select option Exit to stop working with your device. After confirming this option the integrated computer system is shutting down and the device will be powered off by itself.
5.3 Disc Detector Visualization System (DDV)

DDV is a high-performance metal detector which supports you for searching metal objects. It also has filtering possibilities and a graphical representation.

For using the metal detector system plug in connector D into port 6 of Localizer 3000. After this you select option Detector.

Caution: After confirming this option a ground balance will be done. For this hold the coil of the detector approx. 5cm above the ground. Keep this distance of coil and ground while you’re searching.

Pivot the detector continuously and consistent over the ground. You also can take over the rhythm of the graphical representation. If you reach a metal object in ground a yellow color will appear on screen and in headphone you can hear accustic signals.
5.4 Wireless Long Range System (WLR)

In figure 13 you see the controls of the optional Long Range System with what you can detect gold and auriferous ores up to a distance of three kilometers.

To use the Long Range System with Localizer 3000 select option Long Range in the main menu. After this power on your Long Range System by means of pressing button A. Don’t forget to load the battery case C with a fully charged 9V battery. Based on the Power-LED B you see the state of readiness.

Data transfer between Long Range System and Localizer 3000 takes place via a wireless connection. If you use the WLR-System north always have to be on your back side. Figure 14 shows you the complete process in a schematic way.

Take the device in your hand and take care that north is always behind you. So you measure from north to south. Move your Long Range System slowly from top to bottom as you see it in figure 14b. Then also move it to the right and left until Localizer 3000 starts vibrating. In the graphical representation on the screen of Localizer 3000 you see red colors that displays a possible found.

After you’ve done the previous procedure you’ve got one direction the target could be. But now you don’t know in which distance it is. For that you have to do a so called crossing detection. Simply go 50 meters to the left or right and repeat the complete process of detecting the target. Now you have two directions crossing in one point – the point where your target is located. The
process of crossing detection is shown in figure 14a.
5.5 Error Messages and Hints

Here we present you possible error messages you maybe see while you are working with your device.

Because every scan in option *Ground Scan* will be stored in the internal memory it will be filled completely over time. It depends from area size, scan size and size of memory how much graphics you can store. 5000 is a good estimation. When there is less than 20% of free memory the error message from figure 15 appears.

If there is no more free memory available you see message 16. You can free up your memory if you transfer the stored data with optional software to your computer. Informations about this you find in section 7 on page 26.
If message 17 appears the device can not control the operating voltage. This means it can not show a low status of the battery. Also the automatic shutdown of the device may be affected. It will be a good idea to send it to the manufacturer who can check your device before it gets damaged. Ask your dealer for further help!

Message 18 appears if the battery is low after a long work. You should power off the device and recharge the battery. Otherwise data can be lost.

Because *Localizer 3000* has an integrated pc-module you have to shutdown it like a normal computer. For this you use option *Exit* from main menu. After you did message 19 remembers
you to wait until the device powered off by itself.

![Image of system shutdown message]

Figure 20: Shutting down of system not possible

If the device itself is not able to power off message 20 will be shown. In this case you simply power off your external power supply.

![Image of data transfer progress]

Figure 21: Progress of Data Transfer

If you transfer data from *Localizer 3000* to your computer you can see how many of the files are transferred. Figure 21 shows you an example of this.
6  Power Supply

Detailed informations about using the external power supply you find in the additional attached manual!
7 Software

This section describes how to install and use the software. To understand the instructions in this section basic skills in using a PC/Laptop will be assumed.

7.1 Installation

To install the software on your computer, follow this instructions:

1. Insert the CD into the CD ROM drive of your computer. The CD will start by itself. If not, please go on to point 2 otherwise to point 3.

2. (a) Double-click on Desktop and then click twice on your CD–Drive. Now you see the contents of the CD. Start the file setup.exe with a double-click.

   or

   (b) Click on Start → Run... and insert d:\setup.exe whereby d: denotes your CD–Drive. Confirm your input with a click on OK.

3. Follow the instructions on the screen!

7.2 Structure

The following sections describe all buttons and displays of the program. Figure 22 shows a screenshot of the software and the most important regions.

7.2.1 Main Menu and Toolbar

By using the main menu [1] and the toolbar [2] you have acces to all functions of software. The toolbar contains all functions of the main menu and is useful to speed up your working process.

In the following sections all functions of the main menu will be described.

File

![Open ...](Image)

Load a stored scan file from your hard disk.

![Save](Image)

Save the current file to your hard disk.
Save As ...
Save the current file to your hard disk and choose a name for that file.

Import Data ...
All stored data in the internal memory of *Localizer 3000* will be transfered into the data directory of your PC/Laptop. For that *Localizer 3000* have to be connected with the data cable.

Print ...
The current scan image will be printed onto a connected printer.

Exit
Exit the program.
View

Reset
The current scan image will be reset. That means all rotations and translations will be set back to its standard values and the graphic is displayed as it was opened new.

Top View
The scan image will be displayed that you can see its top.

Side View
The scan image will be displayed that you can see its side. This representation is used to measure the depth of possible targets.

Perspective
The scan image will be displayed perspective. In this view you get a complete overview of the scan area.

Resolution
The resolution of the scan image is also a result of the amount of measure values. You can select a resolution in the range of 0 to 4 to calculate more measure points.

Color Scheme
For the graphical representation of the scan image you have different color schemes:

- Grey / Red
- Blue / Green / Red
- Green / Yellow
- Grey / Green

Display Mode
You can choose between three different display modes:
**Normal:** The scan image will be displayed in solid colors.

**Wire Frame:** The scan image will be displayed in wire frame.

**Segments:** The scan image will be displayed in solid colors together with line segments.

**Scale Up Amplitude**

If the difference between the maximum and minimum of depth values is too low you can size it up.

**Scale Down Amplitude**

If the difference between the maximum and minimum of depth values is too high and the scan image is bigger than your screen you can size it down.

**Zoom In**

Use this function to zoom in the whole image scan.

**Zoom Out**

Use this function to zoom out the whole image scan.

**Extras**

**Metal Scan**

This filter only shows you metallic parts of your scan image.

**Equal Signal Level**

If there should be a fault signal in your image scan you can eliminate it by using this function.

![Image](image.png)

(a) (b) (c)

Figure 24: Elimination of a fault signal
In figure 24a you see one of this fault signals. Figure Abbildung 24b shows a perspective view of the image scan. Place the hair cross above this faulty signal and select menu option Signalpegel angleichen. In figure 24c you can see the corrected scan image.

↑ Move up Line of Depth
Moves up the line of depth to determine the depth of objects.

↓ Move down Line of Depth
Moves down the line of depth to determine the depth of objects.

✎ Project Remarks ...
This menu option allows you to write down some remarks for your current scan image. This also will be stored in the file.

Preferences ...
With this option you can configure the data transfer. Detailed informations you find in section 7.3 on page 30.

Info
The menu option Info shows you the current version of your software and the serial number of Localizer 3000 it was registered for. Only if the serial number of your software is the same like the one of Localizer 3000 data can be transfered to your hard disk.

7.2.2 Statusbar
The status bar at the bottom of the screen is splitted in different segments. In figure 25 you can see them.

The state of data transfer A shows if a connection to Localizer 3000 is established and data can be transfered to your PC. The regions B and C are necessary for determination of position and depth of a target. In part D of the status bar you see the current rotation and in segment E you see the current zoom state of the displayed scan image.

7.2.3 Keys
In table 1 on page 31 you can find all available short cuts.

7.3 Transmitting Data to PC
Before you can transfer the stored data to your PC you have to set up your serial port and your data directory. This will be done in dialog Einstellungen as you can see in figure 26. You find
If you transfer all data from the device to your computer it will be stored into the data directory. To start transferring data select option *Daten importieren*... from menu *Datei*. You also can use the button from the toolbar.

After the data transfer is finished you find all files in your data directory. This files consists of 14 digits with extension `.scn`. The meaning of the single numbers you can see in figure 27.

### 7.4 Graphical Evaluation

To evaluate the pictures in the right way you always have to make a second scan. We call it control scan. Figure 28 shows a graphical representation of a scanned area. The blue rectangle marks a possible object.

To be absolutely sure that it is a real object in the ground you have to make a control scan. Figures 29 and 30 shows two possible scans.

You can see very easily that control scan in figure 29 is different than the first scan in figure 28.
Although the control scan is not 100% similar to the first scan you can see the blue marked areas are nearly the same. This means there is an object.

Before you can determine the depth of the detected object you have to scan a further image. It only should cover the blue marked area. All other metals and mineralized ground should be ignored because it would disturb the measurement.

7.4.1 Determining of Position and Depth

In the next section you will learn how to measure the depth.

The position of objects you can determine if you place the cross hairs above the object in the scan image. Now you can read the position in part B of the status bar.

To measure the depth of an object rotate the scan image into side view and move down the line of depth to the bottom of the blue. Now you can read the depth in part B of the status bar.

If there is no real object in the ground you almost see a depth of approx. 0.40m. Figure 32a shows this in a schematic way. If there is an object in the scan area you can get the depth of it.

In figure 33 you can see what happens if there are more objects in the ground instead a single one or if there was made a artificial earth deposit. In figure 33b your software will show a depth of 2.70m but as you can see the earth deposit will be ignored. So you have to remember that circumstance if you want to dig. In this example you have to dig about 5.10m.

Caution: If you see a red color in the scan image don’t think it is a real object, a metal box or a big gold found. First of all do a second scan, evaluate the depth values and check all
plausibilities before you start digging!
Figure 30: Control Scan, Version B

Figure 31: Measuring of the Depth

Figure 32: Evaluation of the Depth
Figure 33: Evaluation of the Depth