FS Future Serie®

Future Software

User's manual

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1   Licence Agreement and Limited Warranty

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2   Installation, Start and Activation

By using the software you give your accordance to the terms of this contract and the conditions of this agreement. Read again carefully all terms before starting to use the software.

The utilisation of this program requires an activation. Therefore you will get a personal activation code. This code can only be used in one operating system. Every installation in a new operating system requires a different activation code. This code is fee required beginning from the fifth activation. The first 4 activations are included in the purchase price.

The following description of the installation and activation requires that the user have access to internet and own a proper email address. If these conditions are not given, please contact your dealer to obtain your activation code.

This section describes how to install and activate the software. After installation is finished you have to obtain a personal activation code which has to be entered in the program to start working with the software.

2.1   Installation

To install the software on your PC please go the following instructions:

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

2. (a) Double click on **Desktop** and then click twice on your CD–ROM drive. Now you see the contents of the CD. Start the file `start.exe` or `autorun.exe` with a double click.

   or

   (b) Click on **Start → Run...** and insert `d:\start.exe` or `d:\autorun.exe` whereby `d:` notes your CD–ROM drive. Confirm your input with a click on **OK**.

3. Select *Install 3d software* in the installation dialog to start the installation.

4. Follow the instructions on the screen to finish the installation!

2.2   Execute program

2.2.1   Windows XP, 2000, ME and 98SE

Be sure that you are logged in as administrator in your Windows system and click on the program
icon inside the start menu!

2.2.2   Windows Vista

In Windows Vista you have to execute the program as administrator. It is not enough only to log
in to the system as administrator. You have to open the program explicitly in the administrator
mode. Therefore two different ways are possible:

- You can open the program explicitely in the adminstrator mode every time.

- You can configure the program that every time the adminstrator mode will be executed
  automatically.

2.2.2.1   Start program one time as administrator

Open the start menu and search for the entry of your software. Now click with the *right* mouse
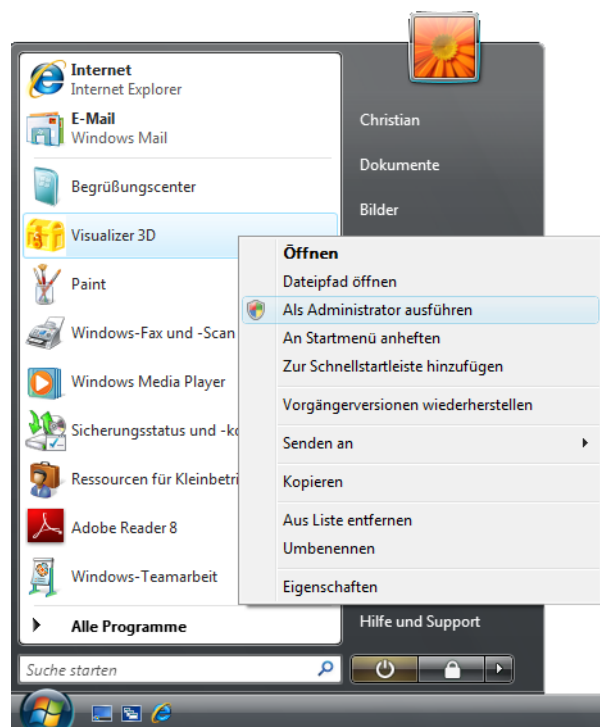button on it to open the menu from figure 1.

Figure 1: Open program as administrator

In this menu you have to select the entry *Execute as administrator* and click on it with the
left mouse button. Confirm the following questions to execute the program in the adminstrator
mode.

2.2.2.2   Always start program as administrator

If the program should always be started automatically in the administrator mode open the start menu and search for the entry of your software. Now click on it with the *right* mouse button to open the menu like represented in figure 2.
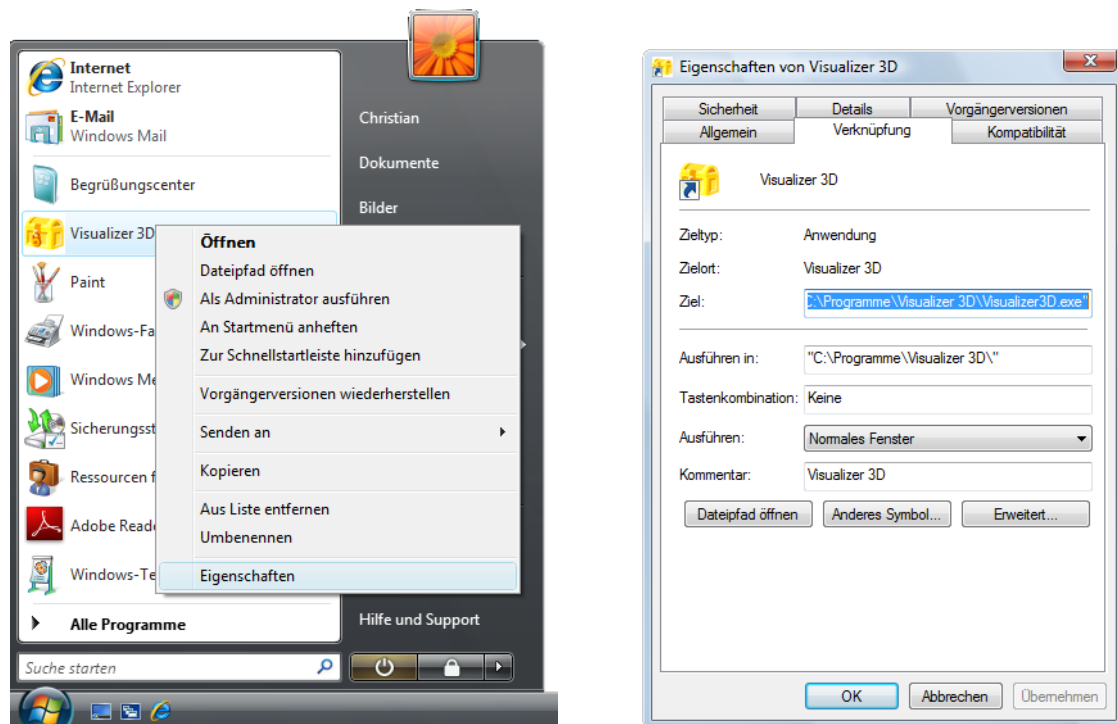
Figure 2: Open program properties

In this menu you have to select the entry *Properties* and click on it with the left mouse button. A dialog window like in figure 2 will appear. Click there on the button *Enhanced*, to open the dialog window from figure 3.

Figure 3: Configurate program as administrator

Mark the entry *Execute as administrator* and confirm the selection by a click on the button *OK*.

Confirm the following questions to execute the program in the administrator mode.

2.3 Activation

After installation of the software on your PC you can start the program for the first time. Therefore click on the created icon in start menu.

Figure 4: Window to enter your activation code

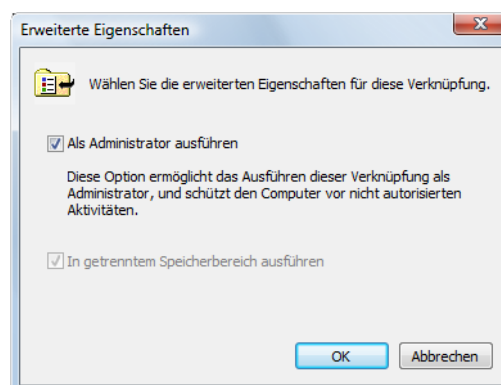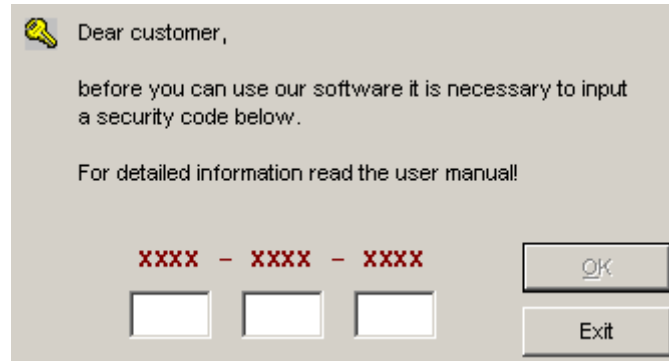A dialog like in figure 4 will open itself, where you have to enter your activation code. This code you can get yourself via internet under www.okm-gmbh.de/register[1]. Figure 5 shows the internet activation form where you can ask for your activation code.

In this dialog you have to enter the following information:

a the CD-key which is printed onto your CD (e.g. X0X0X – X0X0X – X0X0X – X0X0X – X0X0X)

b the numeric software code from the dialog on your computer screen (e.g. XXXX – XXXX – XXXX)

c your email address, where your activation code will be sent to. So be sure you do not make any typing errors. Also keep in mind that you need exactly the same email address for any further activation.

If there are any activation problems please contact your dealer for assistance!

Insert now the activation code into the dialog from figure 4. To confirm the correct numeric code press *OK*. The software is now activated and ready for use.

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[1]You can only use the online registration, if there is an alphanumeric key printed on your CD (e.g. X0X0X – X0X0X – X0X0X – X0X0X – X0X0X). If this is not your case or you do not have any connection to internet please contact your dealer to obtain the activation code!

Figure 5: Internet activation form to obtain the activation code

3   Utilisation and Structure

Figure 6 shows the complete screen of the software. In the following section all functions will be explained.
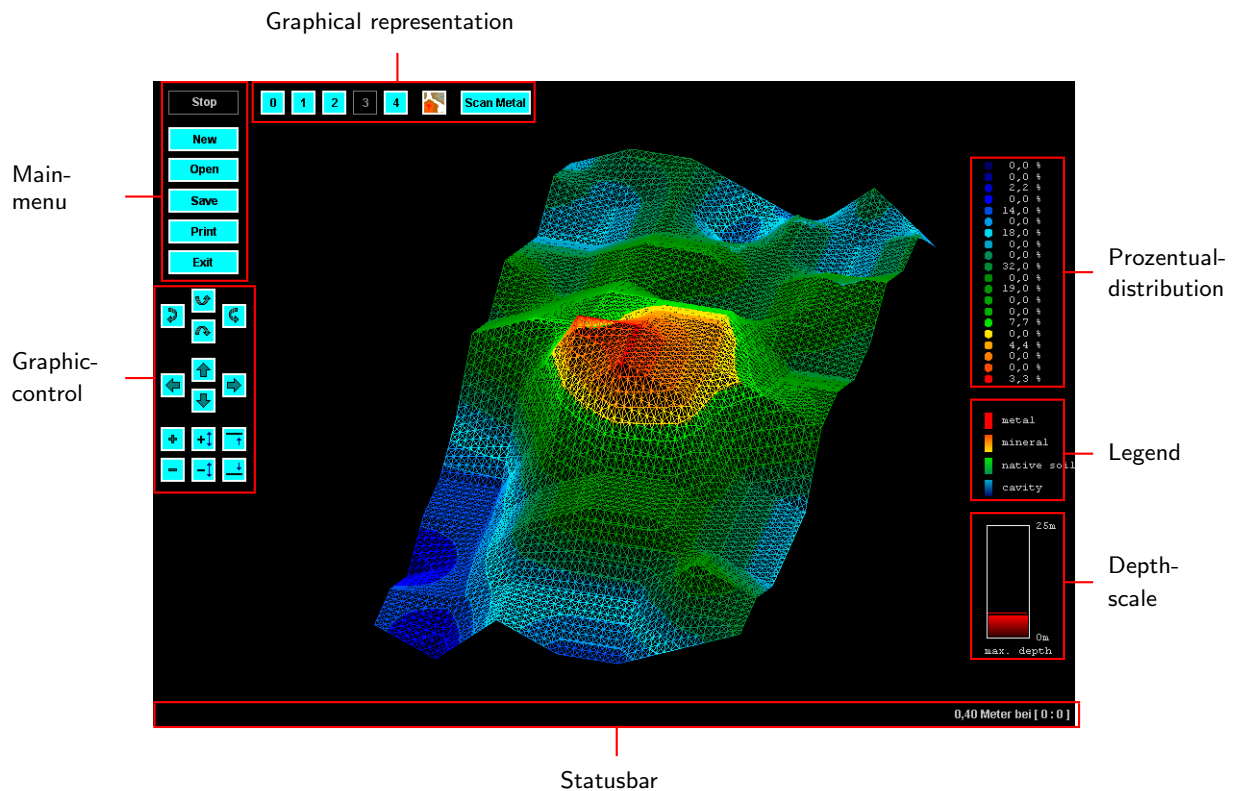
Figure 6: Software

3.1   Mainmenu

In this menu you can select the following operating modes:

- **Stop**

  By clicking on **Stop** the current data transfer will be stopped, the active COM-Port will be closed. When this option is activated, data can enter in the software program.

- **New**

  Click here to scan a new area and to transfer data to your PC. Before you start the measurement you have to configurate the data transmission. More information you can find in section 4 on page 17.

- **Open**

Load a stored scan file from your hard disk. A dialog will open itself where you can select a file.

- **Save**

  If you want to save the current graphic on your hard disk to keep it for later analysis, click on this item. A dialog will open where you have to select file name and memory place. If you already have saved the current graphic on your PC no dialog will open. Changes will be saved on the same name.

- **Print**

  The current scan will be printed onto a connected printer. The printed version will be exactly the same like you see on the screen. Move the graphic in the right way before print.

- **Exit**

  Use this item to exit the program.

3.2   Graphic control

Figure 7 shows all control tools for the graphical manipulation.
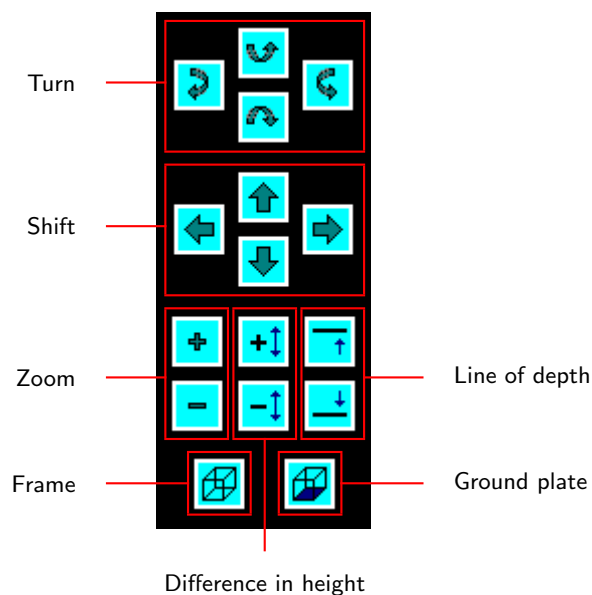

Figure 7: Control elements for graphical manipulation

- **Turn**

  You can turn the whole graphic, to see the measurement from different points of view.

Another possibility to turn the graphic is to keep pressed the left mouse button while moving.

- **Shift**

  Shift the graphic if some parts are out of view from your screen.

- **Zoom**

  Use this function to zoom out / in the whole image scan.

- **Difference in height**

  If the difference between the maximum and minimum of depth values is to high / low you can size it down / up. This function is usefull if the side view for depth measurement is to big for your screen. If your graphic shows *black marks* please size down the difference in height. Then all values out of vision will be indicated on the screen.

- **Line of depth**

  To measure the depth of a specific object, the line of depth have to be moved. Further information you will find in section 5.1.5 on page 26!

- **Frame**

  Fade in / out a frame around the complete measure field.

- **Ground plate**

  Fade in / out the ground plate, which shows the deepest measure values.

3.3   Graphical representation

Figure 8 shows all control elements of the graphical representation.
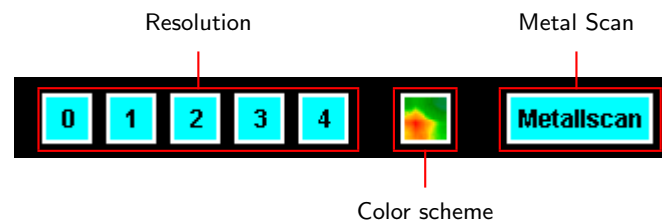
Figure 8: Control elements for the graphical representation

- **Resolution**

  Here you can change the resolution of your graphic (wireframe). To calculate more measure points select a higher resolution, which also means a longer calculation time of your PC. The computer will work more slowly. The duration of this calculation depends on the efficiency of your computer.

- **Color scheme**

  You can choose between different color schemes. It is your decision which scheme you choose. It does not have any influence on the measured data.

- **Metal Scan**

  In this function only the highest measure values will be shown in red color on your screen. You can easily find out if some signals are real objects (metals). Further information how to use this option you can find in section 5.1.4 on page 25.

3.4 Prozentual distribution

This scheme indicate the prozentual color distribution of this graphic. A lot of red color values does not necessarily mean a real object.

3.5 Legend

The legend shows which color represent what kind of material.

3.6 Depth scale

Figure 9 indicate the depth. You can also see the maximal penetration depth, shown from the red line above.
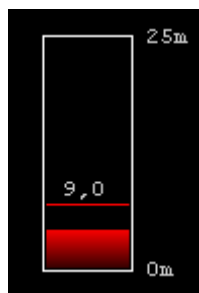
Figure 9: Indication of depth

During measurement you can read the current depth in every measure point (impulse), provided is the use of direct data transmission. The depth scale will be changed and adapted to the current measure point.

3.7 Statusbar

The Statusbar in the lower edge of screen is split up in two sections. On the left side the current action, which is connected with one of the numerous surfaces, is indicated. When you go over a surface with your mouse, the linked action is indicated on this left side of the Statusbar.

On the right side of the Statusbar you can read the depth values and the current position of the cross hairs in the graphic. Further information you can find in section 5.1.5 on page 26.

3.8 Key functions

Many functions can be used with a simple key pressure. Table 1 shows all key combinations which are possible.

Key	Function
F1	Information about the program
F2	Fade in / out crosshairs
F3	Wireframe
F4	Fade in / out segments
F5	Move down lower color level
F6	Move up lower color level
F7	Move down upper color level
F8	Move up upper color level
F9	Show and work on personal notes for a project
F10	Switch in / off simplified evaluation
−	Move up simplified color level
+	Move down simplified color level
Einf	Zoom in graphic
Entf	Zoom out graphic
Pos1	Maximize depth
Ende	Minimize depth
Bild ↓	Move crosshairs down
Bild ↑	Move crosshairs up
0	Graphic in basic level (short calculation time)
1	Graphic in level 1
2	Graphic in level 2
3	Graphic in level 3
4	Graphic in level 4 (longer calculation time)
F	Change color scheme
S, L	Change language between German and English

Table 1: Key functions

4   Data Transmission

Before transfering measure values of a scanned area to your PC you have to configurate some adjustments. Therefore click in the main menu on the item **New**. You have to enter different information depending on the device and software you are using. Please read attentively the section according to your ground penetrating instrument.

In the dialog you can find the two configuration sheets

- data transmission and

- information.

The option *information* you can also open with the key $\boxed{\textbf{F9}}$ after data transmission. Important notes are for example:

- name of the project

- size of the measured area

- position of your starting point

- distance between scan points and scan lines

After long time these information will help you to remember your measurement and to find the exact position of possible objects in these areas (see also section 5 on page 20).

4.1   Rover C, Rover Deluxe, Walkabout, Walkabout Deluxe, Cavefinder, Grailfinder

If you work with a *Rover C*, *Rover Deluxe*, *Walkabout*, *Walkabout Deluxe*, *Cavefinder* or *Grailfinder* a dialog like figure 10 will open on your screen.
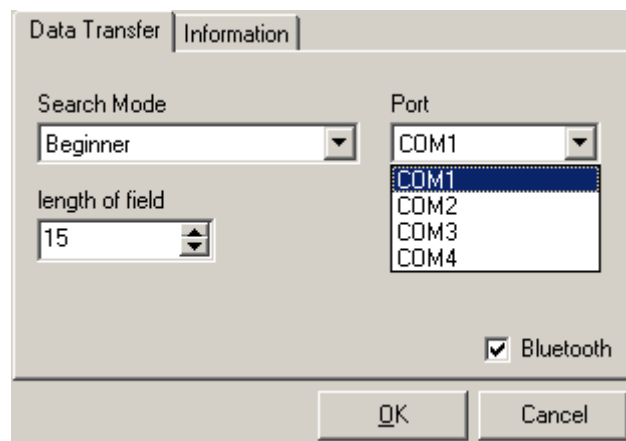

Figure 10: Dialog to record a new measurement

- **Search mode**
  In this option are no changes possible.

- **COM-Port**

  In this list you find all available COM-Ports. Select your COM-Port on which the cable for data transfert is connected to your PC. Standard is COM1.

  If you use a serial USB-adapter, to receive data from your device, an equivalent COM-Port will be assigned to your USB-Connection. If you don't know which one is the right one, please try all available COM-Ports!

  Also if you use a Bluetooth Dongle an equivalent COM-Port will be assigned. It is necessary that the check button *Bluetooth* is checked.

- **Field length**

  Enter here the number of impulses per search line.It has to be at least two impulses to get a graphical representation. Normally it should be more than 10 impulses. There are no maximal restrictions for the number of impulses. Further information for optimal number of impulses you can find in your device manual!

4.2   Future 2005

If you work with a *Future 2005*, the dialog from figure 11 will open on your screen.
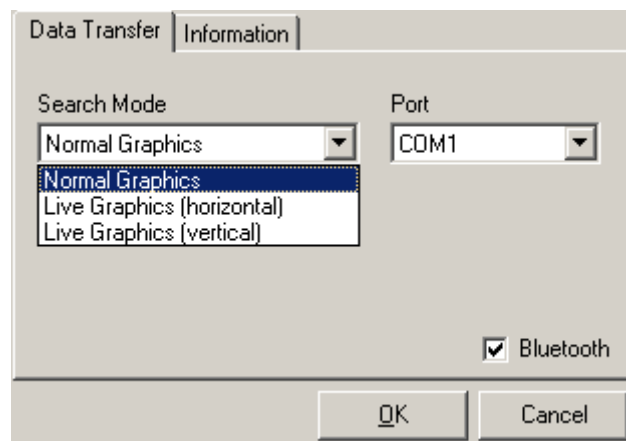
Figure 11: Dialog to record a new measurement

- **Search mode**

  In this list you can select, if you want to do a normal measurement (standard graphic), a live-representation with the horizontal probe (*live-picture (horizontal)*) or a live-representation with the vertical probe (*live-picture (vertical)*).

- **COM-Port**

  In this list you find all available COM-Ports. Select your COM-Port on which the cable for data transfert is connected to your PC. Standard is COM1.

If you use a serial USB-adapter, to receive data from your device, an equivalent COM-Port will be assigned to your USB-Connection. If you don't know which one is the right one, please try all available COM-Ports!

Also if you use a Bluetooth Dongle an equivalent COM-Port will be assigned. It is necessary that the check button *Bluetooth* is checked.

4.3 Future I-160

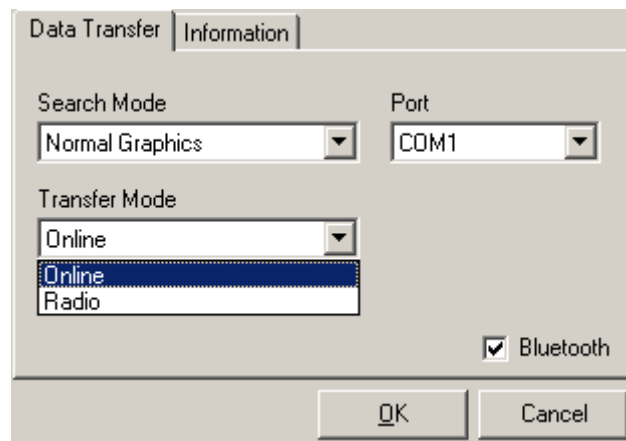If you work with *Future I-160*, the dialog from figure 12 will open on your screen.

Figure 12: Dialog to record a mew measurement

- **Search mode**

  In this list you can select, if you want to do a normal measurement (standard graphic), a live-representation with the horizontal probe (*live-picture (horizontal)*) or a live-representation with the vertical probe (*live-picture (vertical)*).

- **COM-Port**

  In this list you find all available COM-Ports. Select your COM-Port on which the cable for data transfert is connected to your PC. Standard is COM1.

  If you use a serial USB-adapter, to receive data from your device, an equivalent COM-Port will be assigned to your USB-Connection. If you don't know which one is the right one, please try all available COM-Ports!

  Also if you use a Bluetooth Dongle an equivalent COM-Port will be assigned. It is necessary that the check button *Bluetooth* is checked.

- **Transfer mode**

  Here you select if you want to transfer data via radio or cable. The transmission via radio is more slowly and more susceptibly to error signals.

5   Analysis and Evaluation of Measurements

Before measurement you have to know what kind of objects or cavities you are looking for and if the area you choose is suitable for this. Measurement without a plan will not give you the results you would like. For this reason please consider the following indications:

- What are you looking for (graves, tunnels, buried objects, ...)? This question has its effects on your concrete manner to measure an area. If you are looking for big objects you can enlarge your distance between the measure points (impulses), for small objects use small distances.

- Inform yourself about the area you select for measurement. Is it usefull to search at this place? Are there historical indications, which confirm your speculations? What type of soil is on this area? Are there good conditions? Is a correct data recording possible?

- Your first measurement in a unknown area has to be large enough to get representative values (e.g. 20 impulses, 20 search lines).

- What is the form of the object you search? If you are looking for an angular metal box, the identified object in your graphic should have a form according to this.

- To get exact values concerning the depth measurement, the object has to be in the centre of the graphic, which means it has to be framed by normal reference values (normal ground). If the object is on the side of the graphic and not totally visible a correct depth measurement is not possible.

- There should not be more than one object in a graphic. This will influence the exactness of depth measurement.

- You should do at least two control scans to get sure about your results. So you also can recognize and isolate mineralized ground.

5.1   Ground Scan

With operating mode *Ground Scan* all recorded measured values are represented in a three dimensional graphic on the screen. All high-grade positive signals (e.g. metals) are shown in red color and all low-order negative values (e.g. cavities) are represented in blue color. The markedness of the red- and blue coloring depends among other things of the following factors:

- Type of soil (e.g. loam, sand, stone, ...)

- Contamination through other metallic objects

In the following subsections it is explained in which way the graphical representations can be edited and analysed.

5.1.1 Metal or Mineralization

On the beginning it is not always easy to find out the difference between metallic objects and mineralizations. Generally metals are represented in red color, but mineralized depositis in the ground can also include red color signals.

Here some important notes how to distinguish a real object from a mineralization:

- **Form**
  If the object represented in your graphic has a special form (e.g. rectangle, circle, ...), you can conclude of a possible real found.

- **Color**
  If there are many yellow and orange color values around the object, it will be probably a mineralisation.

- **Depth**
  With a small depth of about 0,10m or 0,40m there is a high possibility that there is only a mineralisation of the ground.

- **Color Filter**
  If position and form of the object are changing with the use of the color filter it is probably a mineralisation.

- **Control Scan**
  If position, depth and form of the object stay nearly the same, also in further control scans you can conclude of a real object. Also if some graphics look similiar you always have to compare all indications.

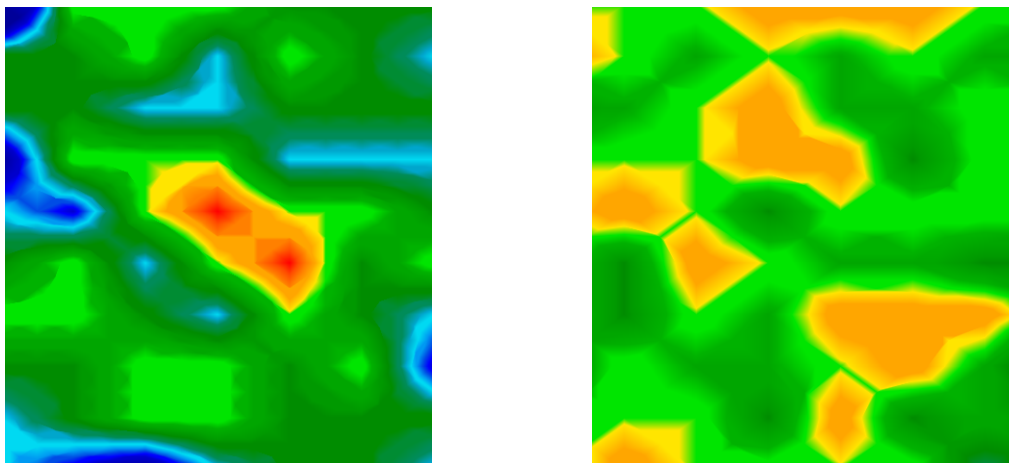Figure 13 shows a real object (left side) and a mineralized accumulation (right).

Figure 13: Comparison of object and mineral

5.1.2 Signal Correction

Throughout usage of data transfer with radio receiver it is possible that some signals will be modified. Error signals express themselves often with totally red coloration of the whole graphic. Figure 14 (a) shows a graphic with an error signal.

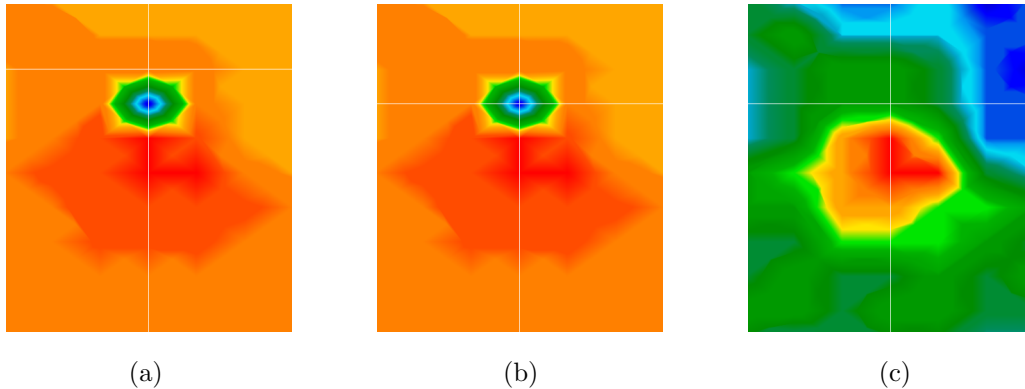(a)   (b)   (c)

Figure 14: Signal correction

To avoid a totally new measurement of the scanned area, an error signal can also be corrected with the help of your software. Therefore please go the following instructions:

1. Choose a position for the crosshairs directly on a measure point next to the error signal (move crosshairs with arrow keys). If the crosshairs are not visible please press the key $\boxed{\textbf{F2}}$ so fade them in.

2. Now press the key combination $\boxed{\textbf{Alt}}$ + $\boxed{\textbf{F12}}$. A dialog like in figure 15 will open itself. Keep in mind the indicated numerical value and close this window.

3. Now move the crosshairs directly on the error signal like in figure 14 (b). The key combination $\boxed{\textbf{Alt}}$ + $\boxed{\textbf{F12}}$ opens the dialog from figure 15. Replace this indicated value with the other measure value you kept in mind. Confirm your input by a click on **OK**.
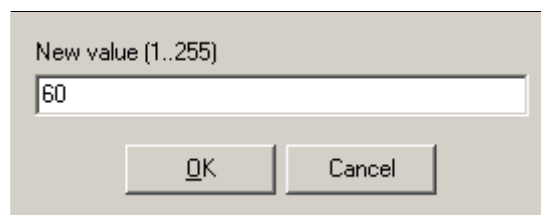

Figure 15: Dialog to enter your measure value

After this correction it is possible that other hidden objects will become visible, like in figure 14 (c).

5.1.3   Color Filter

The graphical representation can be adapted not only by changing the color scheme but also by moving the blue and red color level. This function is only possible by using the keys $\boxed{\textbf{F5}}$, $\boxed{\textbf{F6}}$, $\boxed{\textbf{F7}}$ and $\boxed{\textbf{F8}}$. Figure 16 shows the original graphic (left) and the modified representation after moving the red color level.

Key	Function
F5	Move down blue color level (reduce blue color parts)
F6	Move up blue color level (add blue color parts)
F7	Move down red color level (add red color parts)
F8	Move up red color level (reduce red color parts)
−	Move up color level (only in Metal Scan)
+	Move down color level (only in Metal Scan)

Table 2: Key functions for color filter

Table 2 shows the key functions for the color filter, which were already mentioned in table 1 on page 16.
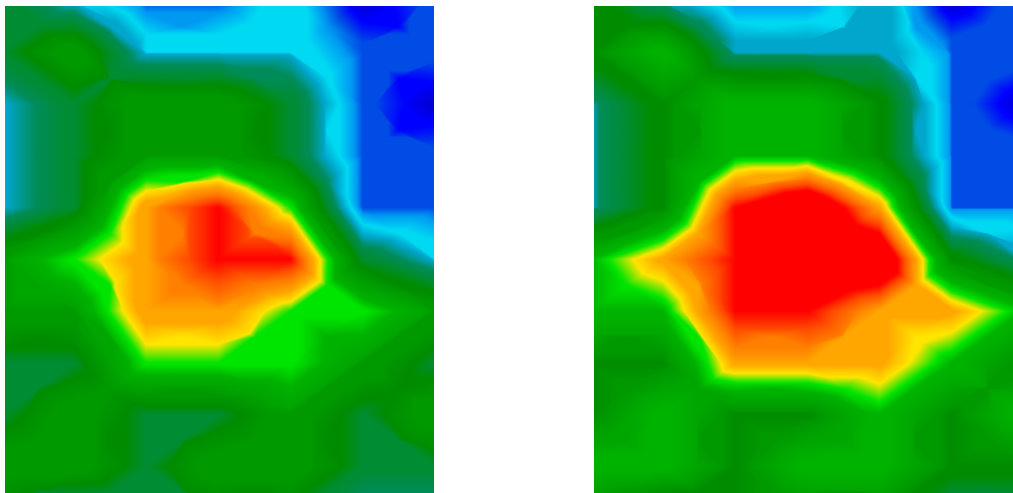

Figure 16: Use of the color filter by moving the color levels

Figure 17 shows two more examples, how the original graphic in figure 16 can be modified. On the left side you can see the graphic after moving the blue color level and on the right figure you see the graphic after moving both levels.

Normally the preset color levels are adjusted optimal and don't have to be changed manually. But it can be usefull to control the graphic regarding the mineralisation. If the signal is changing strong with a little change of the color level then it is a probably a mineral and no metal.
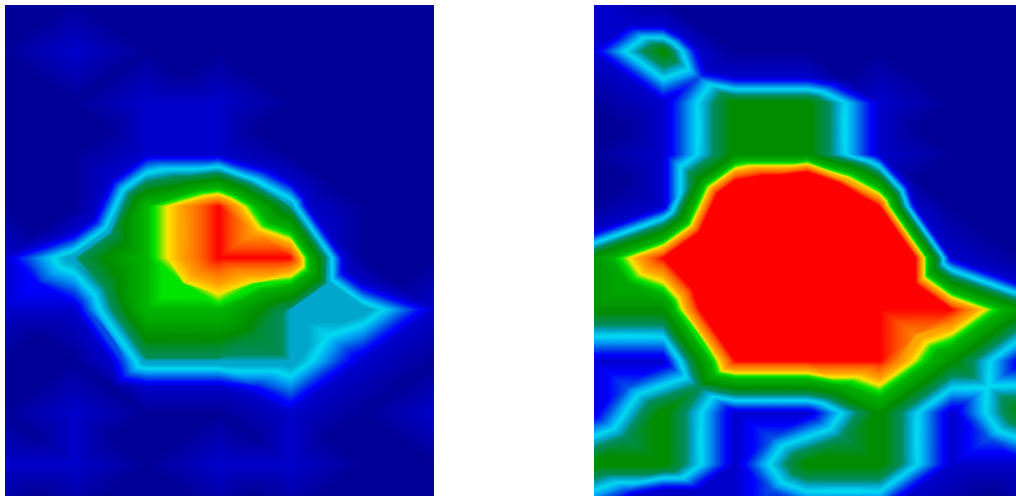
Figure 17: Use of the color filter by moving the color levels

Also the function *Metal Scan* is a preset movement of the color level and can be used to check the graphic for minerals. Further information you can find in section 5.1.4 on page 25!

5.1.4 Metal Scan

The option *Metal Scan* is a preset color filter which only emphasize coloured the highest measure values from your graphic. Figure 18 shows a normal graphic without Metal Scan on the left side and the same graphic after using the metal filter on the right side.
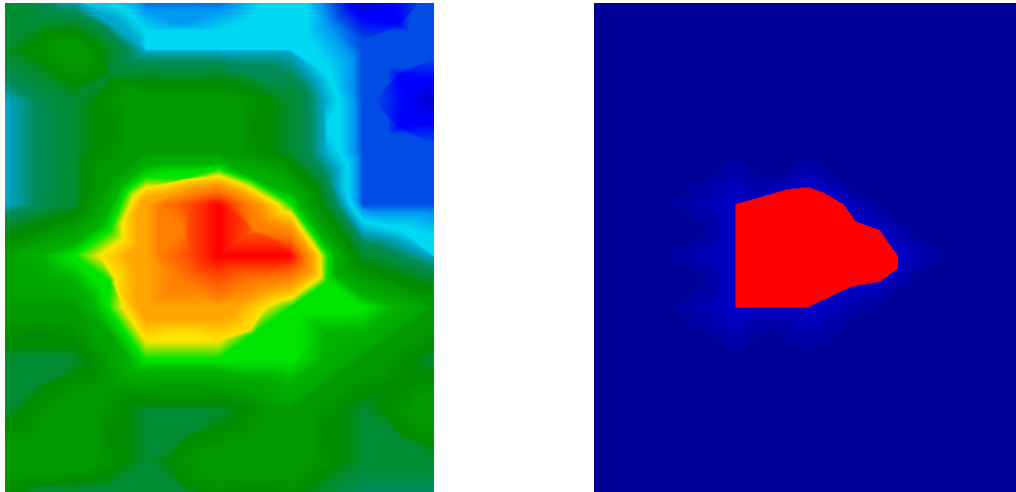

Figure 18: Measurement before and after Metal Scan

It is easy to see that after the Metal Scan the possible object (red color) keeps the same position, size and form like before using the filter. This is an important indication to avoid the false identification of an object because of mineralisation. Please read attentively section 5.1.1 on page 21!

5.1.5   Determining position and depth

Only if you are sure to have found a real object you can begin to determine its position and depth. The next section explains how to proceed.

5.1.5.1   Determine the position

To determine exactly the position of an object it is very important to know not only the size of your scanned area (length and width) but also your starting position. All specifications about the position of the object will be relative to your starting point.
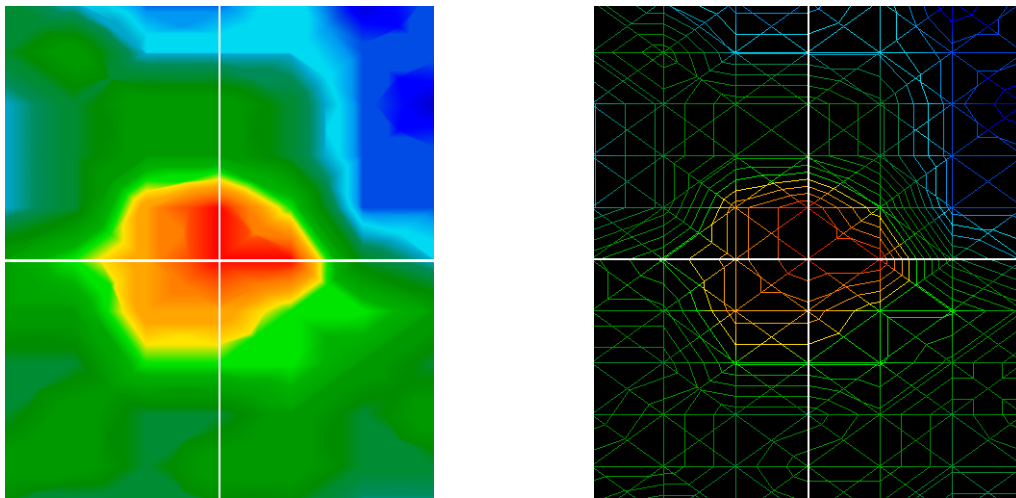

Figure 19: Determing the position of objects

In the statusbar on the lower right side of your screen you can read the exact position of an object[2]. The position is indicated as the number of impulses and scan lines relative to your starting point. The starting point has the coordinates [0:0].

This indicated position is always related to the current measure point under the crosshairs, like you can see in figure 19. You can move the cross hairs with the arrow keys (cursor keys) to any measure point inside your graphic. By using the option wireframe, which can be activated with the key $\boxed{\textbf{F3}}$ every single measure point becomes visible. See also figure 19 on the right side.

If the display shows the position [3:5], that means beginning from your starting point you have to walk 3 impulses forward and 5 scan lines to the left, to stay exactly above the detected object. The first value in the display indicates the number of impulses, which you have to walk forward. The second value indicates the number of scan lines which you have to walk to the left[3].

For this reason it is important to remember the exact starting position and the distance between the impulses and scan lines. Always note these information in the information dialog, which you

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[2]If you don't see this display move up the depth line til this scale appears

[3]Consider that one scan line of a Future 2005 includes 8 sensor lines and a scan line of Future I-160 consists of 16 sensor lines. You have to devide the indicated value in the status bar through 8 or 16 to determine a scan line.

can open with the key   **F9**   (see section 4 on page 17).

5.1.5.2 Determine depth

Depth measurement is only possible in measurements which are recorded without discrimination mode. Please do metal discrimination and depth measurement separately[4].

For depth measurement there has to be just one object inside the graphic, because the software can only measure the depth of the deepest object. The object should be in the centre of the graphic and has to be surrounded by normal reference values. These are optimal conditions for an exact depth measurement.

To determine the depth of an object differences of about 0,50m are possible. If there is a strong mineralisation of the ground higher differences can arise.

To determine the depth of an object move the graphic in the side view, like you can see in figure 20.

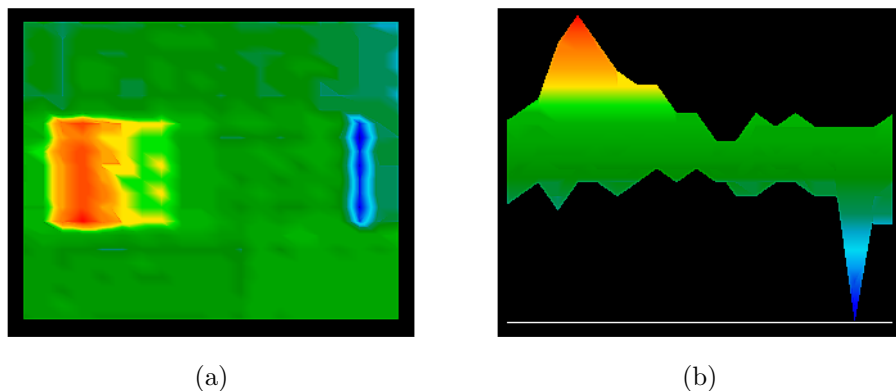(a)   (b)

Figure 20: Determination of depth

Objects are not represent on their real place in the ground, but according to the strength of a signal in different higth. Metals (red) are always placed on the top, normal ground (green) in the middle and cavities (blue) on the bottom of the graphic. Through moving the depth line to the deepest value of the graphic, the depth of the object or cavity is represented on the lower right side of the statusbar.

If you do an interior measurement place the depth line where you can see normal ground (green values in the middle of the graphic). Steel reinforcment of the ground can influence the measurement.
If there is no real object in the ground you almost see a depth of approx. 0,40m. Figure 21 (a) shows a scheme. If there is a real object in your mesured area, you can read the approx. depth of this object. You can only measure the exact depth if you have one single object inside your scan image, like in figure 21 (b).

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[4]This is only the case for Rover Deluxe and Walkabout Deluxe devices.

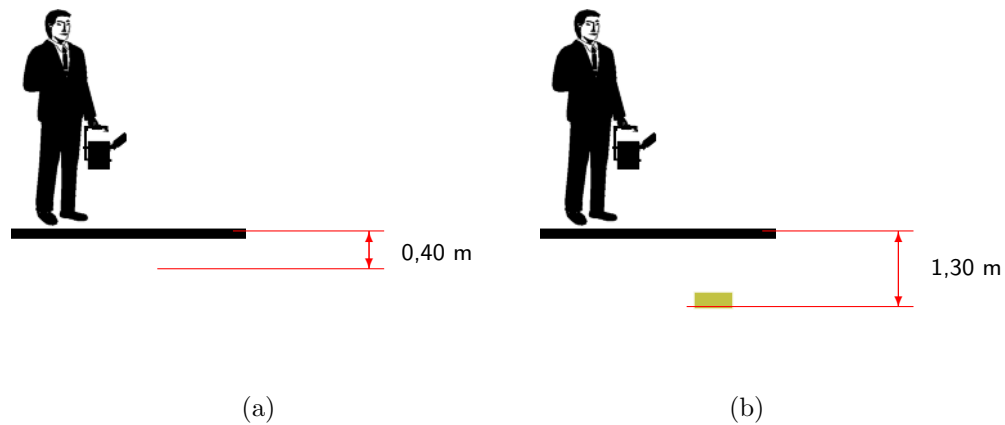(a)   (b)

Figure 21: Characteristics of depth measurement

If there are more than one object in your scan image you can only measure the depth of the deepest signal. Figure 22 (a) explain this case.
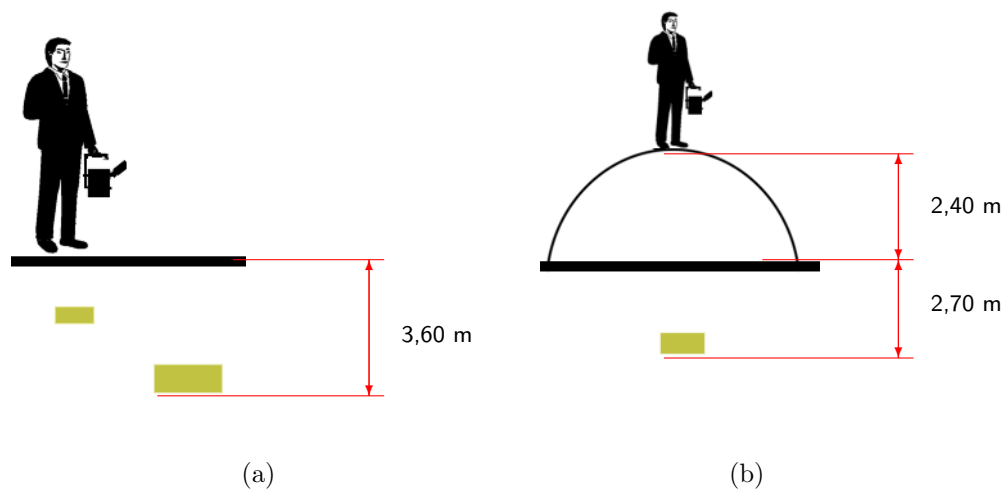

(a)   (b)

Figure 22: Other characteristics of depth measurement

Figure 22 (b) shows a scan on unnatural soil and his effects for depth measurement. The software will show you a depth of 2,70m. Like you can see, the unnatural soil is not considered. You have to dig much deeper to reach the object, in this example 5,10m.

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