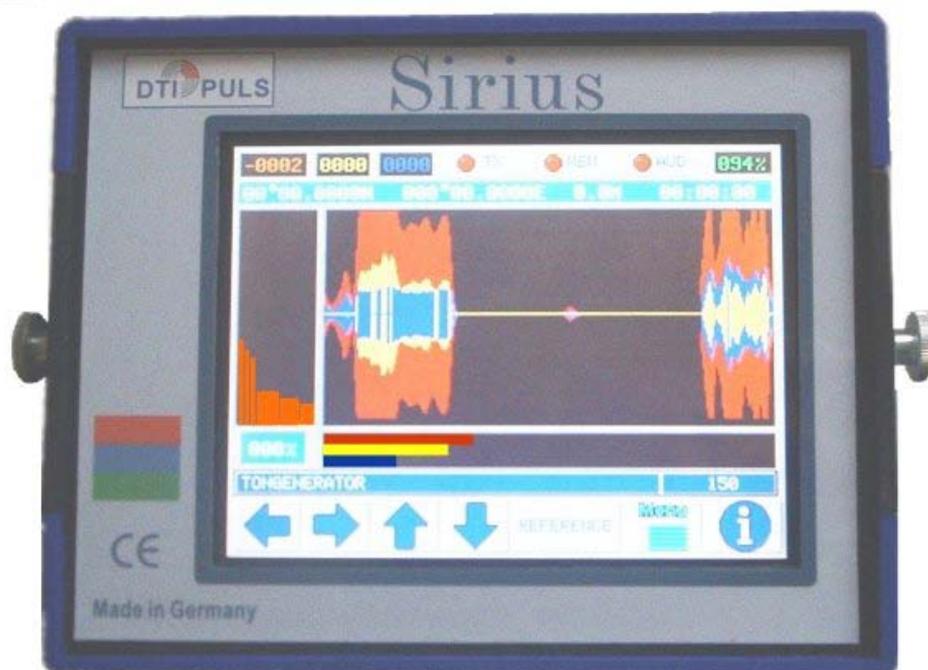# Manual and Handbook

DTI-Puls-Sirius

Software-Version: 5.1.1

DTI-Puls-Sirius

Metal Detectors of the DTI-Pulse-Series are working on the basis of Pulse-Eddy-Systems. Data handling works completely digital. The system is based on two processors. The first processor is handling the measurement and the calculation of the data. The second processor is responsible for management, display, communication and operating.

Measured data are displayed on a graphic display with 320 x 240 pixel, and via a built in speaker or headphone. The detector can be driven with several coils. A menu showing the types of coils is available.

The system works with online metal discrimination. The display shows recognized objects in different kind of ways.

The software may be adapted according the newest versions. The hardware does have several plugs for future expansions. The detector can follow technological improvements for a longer time. The system is prepared for following future expansions:

1. Multi language menus and displays
2. Wireless headphones (already available)
3. Wireless data communication
4. Data recording (Recording of the search on MMC-Card for later analyses on PC)
5. GPS (Position of searching area)
6. External active Ground Scan Radar

With a new generation of detectors new problems come up. The user might be irritated by the many possibilities of adjustments.

Only testing with different objects in the air and in the ground can help. Changing parameters will cause different behaviour of the detector.

After a short time you will recognize that handling will not cause problems any more.

Assembling

After opening of the Aluminium-Box you will see the electronic unit of the DTI-Puls-Instrument, the 28 cm – coil, a manual and a checklist. Take this parts out. Below the coil you will find the headphone and the battery charger and rods for the coil.

Mount the coil to the lower rod. Assemble the rods and adjust the length according your body size. Turn the cable around the rod and put the connector into the female connector of the electronic unit. Please obey that the connector fits tide.

Touch-keys are all with touch-screen allow several functions. Depending on the menu they have different functions.

Vote the active parameter back

Vote the active parameter forward

Increase the parameter value

Decrease the parameter value

Choose the menu

The current adjustments will shown
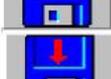
Program load

Program store

Exit Manu
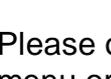
Menu item activate. Menu item exit.

Please obey that a reaction time of up to one second can happen, if you go back to a menu or if to leave a menu. After adjustments in the main menu the system always takes a few seconds until it is stable again after leaving the menu.
Please obey that you need to make a ZERO after leaving the main menu. That has to be replayed when the coil is near the ground.

The detector has a demonstration mode. This mode allows you to become familiar with the keys and its reactions. The detector has connectors on both sides. Below the ON/OFF-switch is the coil connector. It has a protecting cap prohibiting coming dirt and moisture in it. Please put this cap always on if you don't use the instrument. Always obey to fix the connector tide when you connect the coil. A bad connection causes uncontrollable currents which can destroy the power amplifier.

On the other side are the load- and the headphone connectors and the communication connector. Headphones with a minimum impedance of 32 Ohm and 6 mm connector can be used. It should have the possibility to adjust the loudness. The internal loudspeaker will be switched off when plugging in the connector. The input for the charger is a 2.1 mm connector. More under point charging.

The communication connector is a Sub-D9 female connector. This connector for the external components is a Sub-D15 female connector.

Setting to Operation

Before the first use you should load the detector with the attached charger for 15 hours. Especially when you read a warning after the fist switching on.

The condition of the rechargeable batteries will be checked. If the rechargeable battery is not ready for operation a message will be displayed. You have to switch off the detector for charging batteries.

If there is no problem with the rechargeable battery you will see the start logo. Together with the start logo the detector starts sending pulses. The start phases starts.

If you start directly with the coil please obey the good fitting of the connector.
Never connect a coil when the instrument is switched on. The exception is when you will be asked for by the menu. See the chapter Changing Coils.
Look for a place where are not many big metal parts near by. In rooms television or computers may not be switched on. The emissions of this instruments are being received by the coil.

Turn on / Start:
After turning on the Detector you will see the following display.

After showing the version number the detector is waiting for the starting requirements.
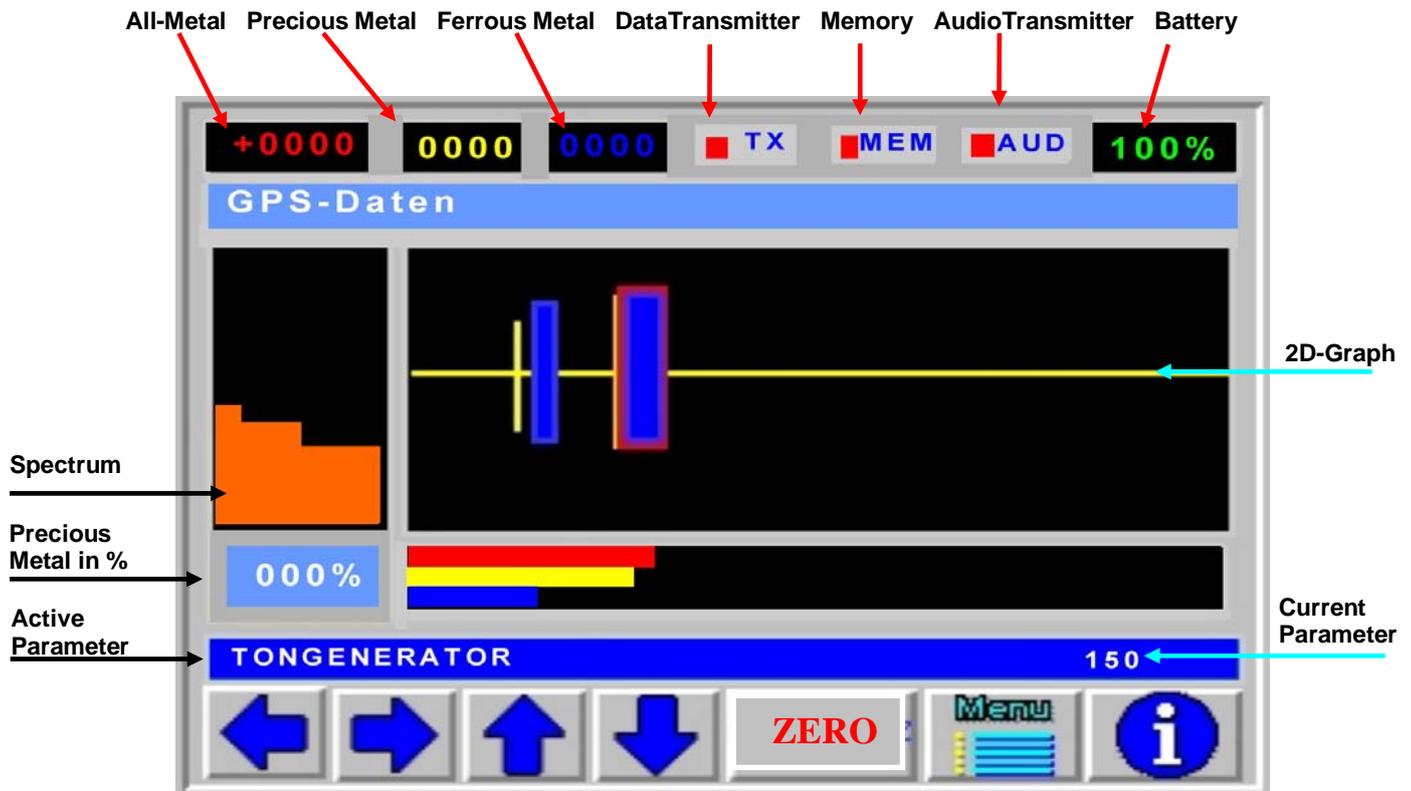
After language selection the battery will be check. This will be displayed for about 8 seconds. Within this time you can choose your own language. Select your language with touching on country flag. The selected language will be displayed above the START-button. The detector will start using the selected language. Without coil the detector will switch to the demonstration mode. The PIU-Memory will be set to factory settings automatically after every start.

In case of a problem with the communication of both internal processors it can happen that the wrong data is being used. That can happen because of some influence from outside of by switching on and off in a short time by accident.
In this case please switch off.

Operation Display

All-Metal   Precious Metal   Ferrous Metal   DataTransmitter   Memory   AudioTransmitter   Battery

2D-Graph

Spectrum

Precious Metal in %

Active Parameter

Current Parameter

The detector is now ready to be used and it is in operating mode.

In the header on the left side, you will find detected objects numerically displayed. All-Metal detection is displayed in the colour red. Ferro magnetic detection is displayed in blue. Precious metal objects are displayed in yellow.

The percentage of precious metal in the object is displayed numerically in percent on the lower left side.
Battery power conditions is shown on the upper right side. A fully charged battery is displayed in green, a lesser than full charged battery is displayed in a different colour.
GPS data is displayed right below the header. It can take up to two minutes until the initial detection is displayed.

The numeric data of All-Metal and Precious Metal is also displayed visually in the spectrum. The more lines are displayed from left to right (in the spectrum), the higher is the ferromagnetic characteristic of the detected object.

The 2D graph colours in the middle of the display, corresponds to the colours of the numeric scale. It shows the field image of the detected object. Up to 200 detection points are displayed in the corresponding colours. That way, a complete picture of the detection points is formed.
In the „Active Parameter" section you can change several parameters at all times, while you are searching. This is similar to the potentiometer of an analogue system. The value of the active parameters can be adjusted with the Up/Down arrows.

The numeric display of the All-Metal is shown with a plus/minus sign. If a high negative value is displayed, due to parameter change, a ZERO becomes necessary.

The info button shows the current parameters and settings. You leave the menu with the ZERO button.
The in the header have the following functions: TX = Data transmission, MEM = MMC Adaptor, AUD = Audio transmitter.

The detector is ready for working immediately, but it will take 1-2 minutes until coil battery and electronic are thermally stable. By pressing the pushbutton "ZERO" the memories are loaded new and set by factory parameters. All driftings will be compensated. If you do a ZERO above a metal object, this object also will be compensated and can not be detected any more.

Active Parameter
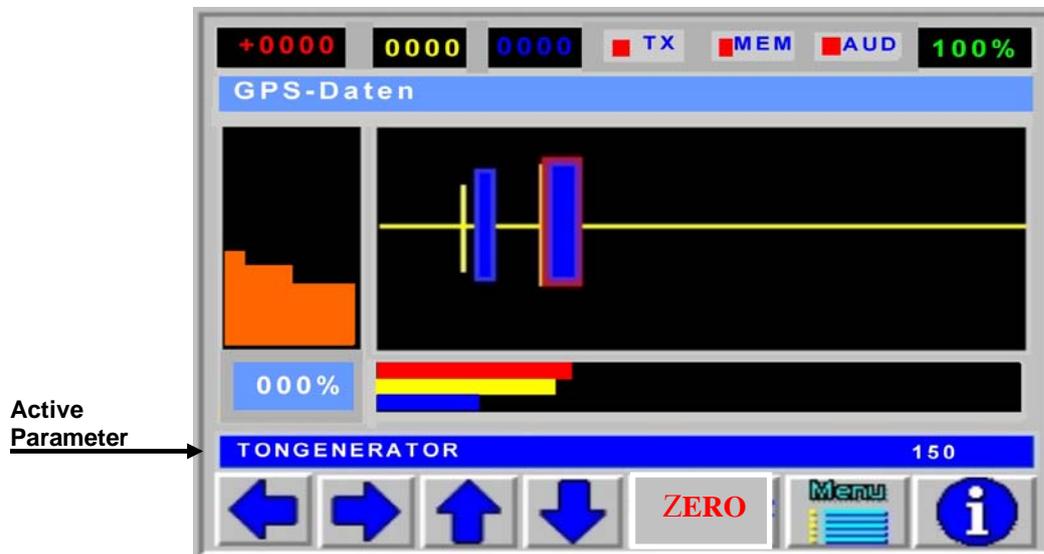
The detector has the possibility to change parameters online during searching. This is comparable to the analogue function of a potentiometer. So you are able to change the most important parameters without calling up a menu.

Press the touch-button ⬆ e. g. ⬇. The number above the Info-Button will change accordingly

After starting always appears.

SOUND GENERATOR:

By setting the Tone Generator you adjust the threshold of the tone. You adjust the strengths of the signal when the first click shall appear. After start always 150 is set. The higher you choose the value the smaller the signal strength of a measured object may be. Generally a click rate of 1-2 will be adjusted without signal.

You press ➡ Button and as an active parameter you will see

SEARCH MEMORY:

The main memory of the system has been devided in several layer and sectors. Out of this memory the searching memory will be generated. There are 1-33 chooseable searching memories. The detector always starts using the searching memory 11. This approves that a detection is possible using all types of coils. The smaller the number of searching memory the more sensitive the detector reacts on smallest objects. On the other hand that can mean that you will have a permanent detection even in 50 cm hight above the soil and doing a ZERO will reduce the range of values dramatically. You have to ZERO always at the place of using the detector.

Depending on the soil concerning the searching depth it is not possible to give a statement. The settings of the searching memory will not be stored in memory. So it always has to be set individually. The factory setting is a good average value for 28 cm – 50 cm coils.

You press ➡ Button and as an active parameter you will see

AUDIO GAIN:

The audio amplifier multiplies the click rate of the tone generator by its value. The maximum value is 16. If you have a signal with 10 clicks per second the click rate will be multiplied to 160 when amplifying by maximum. Accordingly the raising speed of the audio signal and its sensitivity is rising.

You press ➡ Button and as an active parameter you will see

THRESHOLD

The "AM-(+0000)" All-Metal value shows a + and – sign. You can see directly if you have a bad coil calibration. This can happen by deviation or by changing of the coil field. In this case the value "AM" becomes negative and the sensitivity will be reduced. On the values you can see if a "ZERO" necessary. Likewise you can see if you have a detection although a detection signal is not available. First of all this is a advantage by the big coils, if you can not do a ZERO caused by area circumstance. With the Threshold you can add positive or negative value to the store without making a ZERO and you can get a detection on the accounts. This value will delete automatically after making the ZERO.

You press ➡ Button and as an active parameter you will see

OBJECT SIZE:

The parameter Object Size allows filtering of small to medium objects. This is absolutely necessary on mineralized soils. Especially for coils of sizes 50 cm to 200 cm an adaption is necessary. Because of the high penetration depth and because of that the big volume of soil a rising of the Object Size is mandatory. Without this adaption the range of value will be overloaded. The range of value 1 – 200 has to be adapted right at place.

You press ➡ Button and as an active parameter you will see

SEARCH GAIN:

The Searching Sensitivity is a sensitive parameter and should only be used for very low signals. When the audio amplifier is set to maximum and the searching sensitivity will rise to the searching amplifier will be multiplied by the audio amplifier. This results in very fast detection signals. The ZERO (ZERO) has to be made very carefully. Range of Searching Sensitivity is 1 – 8.

You press ➡ Button and as an active parameter you will see

DISCRIMINATOR:

The discriminator has a range of 1-5. Because of the high sensitivity of the detector it is not possible to distinguish smallest and biggest objects in the same matter. The discriminator is based on an algorithm for alloys. It equals a balance scale. The possibility of discrimination is based on the characteristics of the metals. Deciding are its conductivity, shape, alloy, position and distance. Furthermore die type of soil is important. The elec-

tromagnetic field may be influenced. Also there is an enormous amount of soil behind the detected object which also will be detected and measured. Very often a bigger distance to the ground or tipping up of the coil can help. The post important parameter is that the detection for a defined identification has to be reproduceable. The sum of different characteristics of different objects may produce a similar signal to gold. If you imagine how many unknown characteristics have to be considered that is not astonishing. Therefore tests with different objects and metals are necessary. Bigger or massive non ferrous metals will always show a negative result in the air if they are not "alloyed". Even if pure gold will be "alloyed" in the soil by salts crystals or smallest objects.

In setting 1 the discriminator has the strongest filter. A golden ring (333, 485) will be detected very sure. After start the discriminator setting is 2. The spectrum is working independent of the discriminator setting and can help when testing and finding settings.

You press ➡ Button and as an active parameter you will see

PIU GAIN - A:

The initial signal can be multiplied as follows:
0: no change; 1: double; 2: quadrupled; 3: 8-times. Before you begin your search, you have to adjust the parameter settings in conjunction with the other multiplier parameters if necessary. Right away, you have 1 qm³ ground under a 28 cm coil.

If you have put the setting on too sensitive, every movement above the search area will show a maximum signal even without an object. This is due to the magnetic condition of the ground. High sensitivity require high search mode and low search speed.

You press ➡ Button and as an active parameter you will see

PIU GAIN-B

Here you can directly reduce the sensitivity :
0: = 0; 1: = 2-times; 2: = 4-times; 3: = 8-times
This can be done directly in case of a strong signal over an object or during the scanning without new referencing and without changing other parameters when the detector is set to high sensitivity. This is very helpful on mineralized soils which changes very fast. The other settings will stay and will be not changed.

You press ➡ Button and as an active parameter you will see

Search Mode:

The search mode include five filtration stages. The higher the filter, the higher is the sensitivity to external interferences. Stage number 4 is used in habitat areas and inside rooms.

You press ➡ Button and as an active parameter you will see

GPS:

Here you can turn off the GPS.

With the ⬅ button you return to the active parameters back.

As you can see, there is some ecxercise necessary to understand the reaction of the detector. Use the maximum extent of these parameters, before you increase the pulse gain. By increasing the pulse gain, the detection depth and the ground volume is increased under the coil.

MAIN MANU

Exit   Value   Program   Program   To confirm / to release
          up / down   load   save
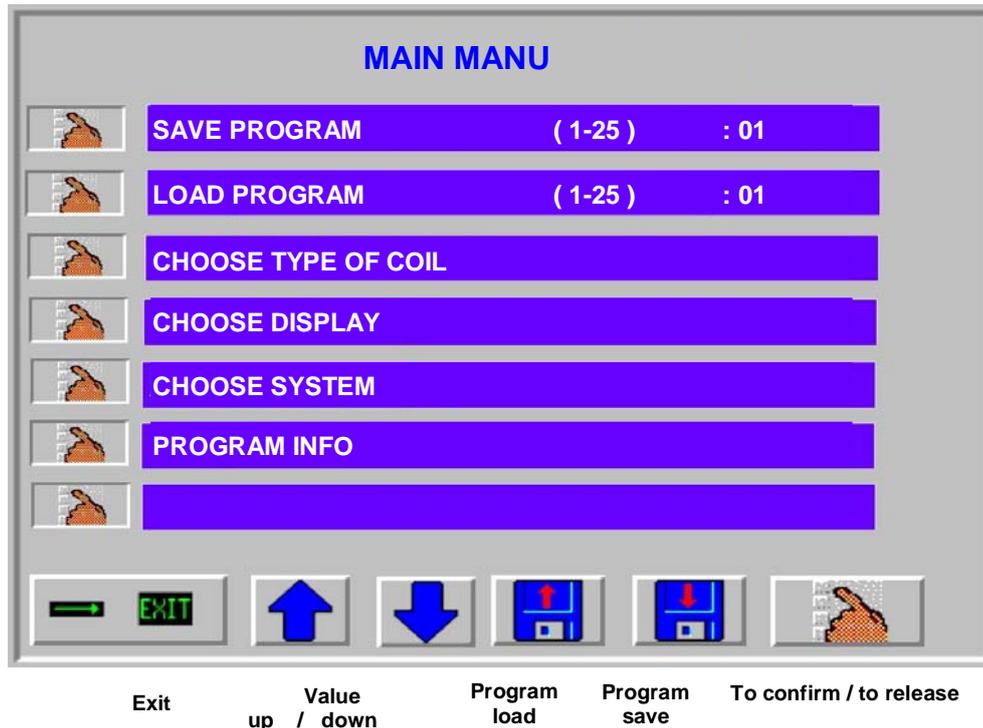
With the hand icon left side of the display you choose the manu item.

With the buttons 'up/down' you change the adjustment.

If you want to store a special adjustment and decided for a program store number than you have to press the disc icon with the arrow down and the adjustment will be save under the program number.

If you want to load a stored program than press disc icon with the arrow up and the program will be load.

When you choose a manu item and later you have to release it otherwise you can not leave the menu or make further adjustments.

You can release the manu item with the hand icon right side below on the display.

With the 'Exit' icon below left side on the display you can leave the manu.

CHOOSE SYSTEM
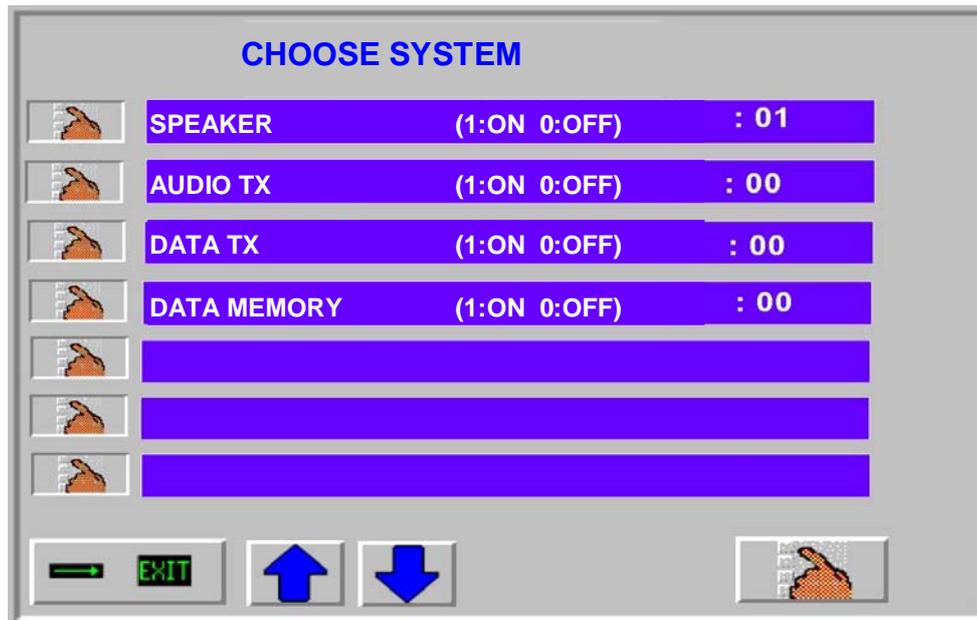
SPEAKER
The internal speaker can be switched of independently. Also the connector for the headphone is out of order when switched off. This function is to be used in connection with the audio transmitter.

AUDIO TX / AUDIO TRANSMITTER
The detector has an option for an audio transmitter which allows a wireless transmission to a wireless headphone. The audio transmitter can be put in additional. It always comes together with the GENESIS.
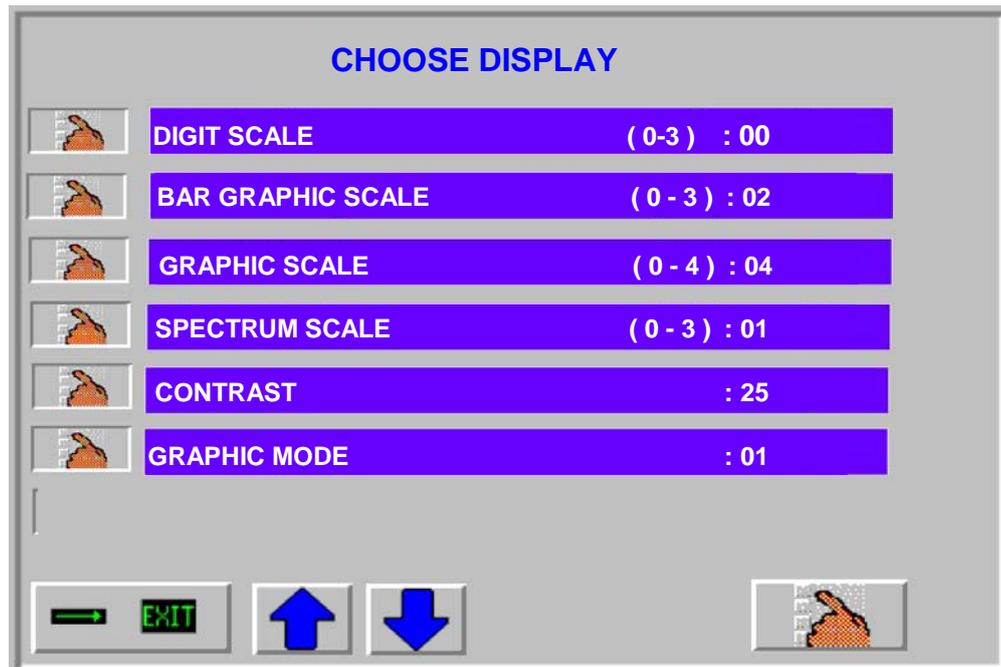
DATA TX
The Detector has an option for an data transmission which allows a wireless transmission to a PC/Laptop.

DATA MEMORY
The Detector has an option for a MMC-Memory which allows to record the datas while you search the area.

CHOOSE DISPLAY

CHOOSE DISPLAY

DIGIT SCALE	(0-3)	: 00
BAR GRAPHIC SCALE	(0 - 3)	: 02
GRAPHIC SCALE	(0 - 4)	: 04
SPECTRUM SCALE	(0 - 3)	: 01
CONTRAST		: 25
GRAPHIC MODE		: 01

→ EXIT

DIGIT SCALE
This parameter changes the range of display of the number display. The range up to 1000 will be devided by this value.

BAR GRAPHIC SCALE
This parameter changes the range of the bargraph. Discriminator and all metal display do have the same value. You are able to equal the display to the tone behaviour.

GRAPHIC SCALE
This parameter changes the display range of detection record.

SPECTRUM SCALE
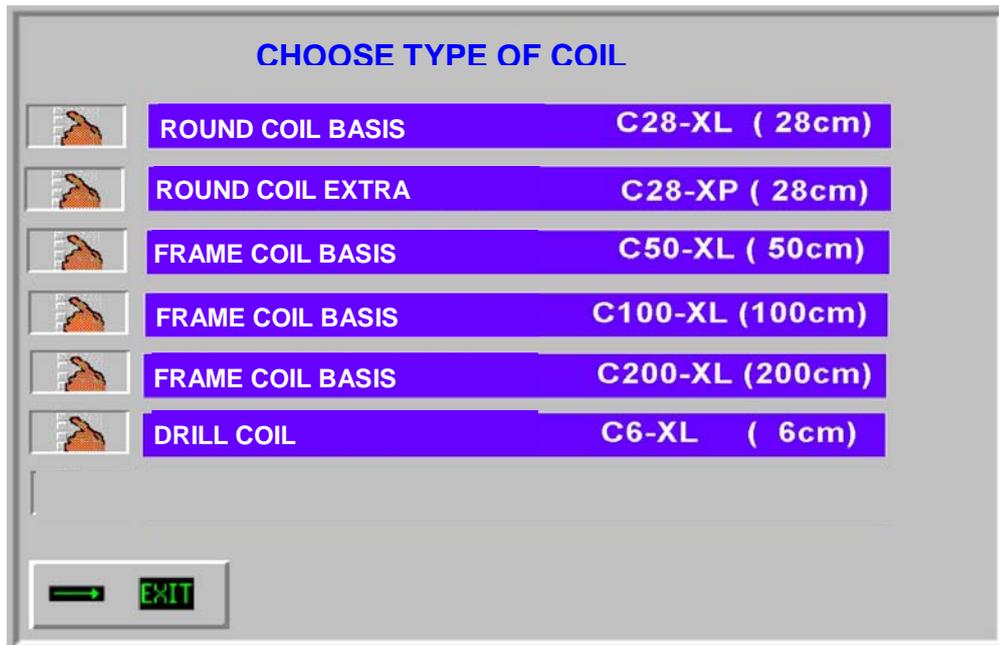This parameter changes the display range of the spectrum.

CONTRAST
This parameter changes the backlight of the display.

GRAPHIC MODE
Here you can change an other graphic display mode. On this Software you have only one version mode.

CHOOSE TYPE OF COIL

👆	ROUND COIL BASIS	C28-XL (28cm)
👆	ROUND COIL EXTRA	C28-XP (28cm)
👆	FRAME COIL BASIS	C50-XL (50cm)
👆	FRAME COIL BASIS	C100-XL (100cm)
👆	FRAME COIL BASIS	C200-XL (200cm)
👆	DRILL COIL	C6-XL (6cm)

Here you choose the type of coil used. The pulse power will be adapted for the coil automatically if the setted power is too high.
By coil changing the "OBJECT SIZE" will be set automatically.
  50 cm coil: Object size 30
100 cm coil: Object size 40
200 cm coil: Object size 80
Note, that value of this parameter "Object size" will be set automatically. You can change the value later if you want.
The type of coil has been printed to the coil label e. g. can be recognized by the diameter.
If you select the proper coil and press the hand icon left side this type will be stored.
If you leave the menu with EXIT you will receive a message.

NEW COIL PULSE IS OFF ..!

CHANGE THE COIL ..!

RESTART WITH KEY (START)

You will now be able to change the coil when the detector is switched on. Only if you see this message, changing is allowed. Afterwards the instrument only needs some time for stabilizing the coil. If you change from a higher power coil to a lower power coil the power will be adapted, but not rise again automatically if you go back to a higher power coil. So you should store the settings before changing.

PROGRAMM INFO

+0000	0000	0000	■ TX	■MEM	■AUD	100%

00°00, 0000N 000°, 0000E 16:22,	05-06-07

SEARCH GAIN	:01	COIL TYPE	:02
OBJECT SIZE	:000	PULSE POWER	:01
DISCRIMINATOR	:01	SPEAKER	:01
AUDIO GAIN	:01	GRAFIC MODE	:01
PIU GAIN B	:01	SEARCH MODE	:04
DIGIT SCALE	:00	GRAFIC SCALE	:04
BAR GRAFIC SCALE	:02	AUDIO TX	:00
SPECTRUM SCALE	:01	SEARCH MEM	:11
PIU GAIN A	:00	PROGRAM	:01
GPS	:01		

000%

TONGENERATOR	150

← → ↑ ↓ **ZERO** Menu ℹ

The menu „PROGRAM INFO" shows all stored values of the program. Here as an example Program 01 without stored values.

As discribed the SEARCH MEM(ORY) is always start by 11.

By the pushbutton "EXIT" you leave the info side and you get to the detecting display.

Operating the Detector

The first start should be made with the coil being in the air. So you will learn the behaviour of the detector for a known metal object. The coil is a sensitive receiver and antenna for pulsing signals., which for example are transmitted by monitors, televisions and short wave instruments. So no of this type of instruments should be switched on near the test location. You may eliminate interference signals by turning or tipping up of the coil. There shouldn't be any big metals within a distance of 1,5 – 2 m (boxes, plates).

Place the coil (28 cm) in a fixed position. You should be able to reach it from all sides with an object. Connect the coil. Please obey that the connector fits right. In case of a loose contact the power amplifier can be destroyed.

Switch the detector on. After starting press pushbutton . The detector starts after a few seconds with its factory settings and the operation display. The thermal starting phase begins. A loaded rechargeable battery needs some minutes until it reaches to its actually voltage. Also the electronic gets stabilized. Press the pushbutton
'ZERO' – from time to time. There must be no metal in the near of the coil otherwise this object will be stored in the compare memory. Take an object of your choice and move it to the coil. Comes the object in the detection area the graphic display discribed under 'Detection Display' and the loudspeaker are showing a response. Hold this point of detection in memory. Take the object away und press 'ZERO'.
Now repeat this test. You will recognize that the detection depth has increased.
The compare memory has been loaded with current values in air without object. Now bring the object so close to the coil that the tone or the all metal display are near the maximum. Now press the pushbutton 'ZERO' again. When you now try the object again you will recognize that you will have to get closer to get a signal.
This example shows you what happens when you press the pushbutton
'ZERO during working in the field.

The characteristic of the soil and of the objects are being stored in the ZERO memory and only changes of the intensity of signal will be detected. So you need to do the ZERO (storing in ZERO memory) either in the air, with big distance to the soil or when tilting the coil. Do the ZERO always in the air when you want to compensate lowering of the battery voltage or other thermal relating drifting. Otherwise you will loose sensitivity. The ZERO should be done step by step. To pinpoint a strong signal move away from the point and go back step by step doing the ZERO from time to time. Only the strongest signal will remain.

The display always starts with the active parameter 'SOUND Generator' (150) above the pushbutton . Now press pushbutton ' . The value will increase. Hold this pushbutton until the first click tones can be heart. Up to now this value had to be produced by the object before you could hear a click. This value now is the new threshold. The response is increased now. Test it with your test object. By the parameter 'SOUND GENERATOR' – you adjust the threshold of the acoustic signal.

Now choose the parameter ‚AUDIO GAIN' – by the pushbutton. Here you multiply the number of clicks by the chosen value. If you have a click rate of 10 clicks per second and your adjusted value is 10 you will get 100 clicks per second. Smallest detection changes can be heart by this feature. For big objects this value should not be too high.

By this parameters you are able to double the range of distance compared to the starting parameters. So you should do several tests with different test object and this parameters. Especially when testing in the air in is recommended to use the ZERO after changes of parameters. Because of missing movement of the coil little signal changes do have an influence.

All the parameter below the pushbutton are adjustable online. They take effect immediately. So it is possible to do changes above the detected object.

Choose the 'AUDIO GAIN' and set the value to 1. To be able to follow the effect a slow rise of the click tone is necessary.

Choose the parameter 'SEARCH MEMORY' – by the pushbutton '➡'. This is an outstanding parameter. After start it always has the value 11. It always will be stored in the program memory with this value. So the value has to be adjusted after starting or loading a program in accordance to the current environment. The detector has 64 searching memories. 33 auf these can be chosen. Every searching memory is calculated out of 16 measured values. Each of this 16 values represent a certain range of the detection signal. Tests have shown that the range of 11-15 is a good average to grant a good functionality with all types of coils. The smaller this value becomes the higher is the sensitivity for smaller objects. On the other hand the reaction on the movement of the coil in the magnetic field of the earth and above the soil in case of mineralization increases. Especially when the Audio Gain it set to high values.
A find adjustment in the lower range will have following effects:
The SOUND GENERATOR doesn't work in the range minimum to maximum any more, but reacts in the lower range or not at all. The bargraph display shows the same behaviour. That doesn't change if you use bigger objects. The spectrum further on shows the detection. You will recognize that from the left to the right the first bars are not shown. For the 28 cm – 50 cm – coils an increasing of the 'SEARCH MEMORY' is sufficient. It may be necessary to increase the 'OBJECT SIZE'. More later in this manual.

Please proceed following test:
Settings: 'SEARCH MEMORY' and 'AUDIO GAIN' –
1. Take you test object and move it to the middle of the coil. Stop at the first reaction and lower the 'SEARCH MEMORY'. When lowering now the click rate will increase what means that the searching depth increases. Increase the 'SEARCH MEMORY' and the reaction is visa versa. You should do the same test in combination of 'SEARCH MEMORY' and 'SEARCH GAIN' to observe the reaction.
By the same way you can optimize the characteristics of the detector in the field. Either by detecting with the factory settings, better by adjusting using your test object lying on the soil.

A further parameter influencing the detecting results is the 'SEARCH GAIN'. This setting should be only changed if very week detecting signals can be seen. Set all discussed parameters to factory settings and do a ZERO (press 'ZERO'). Chose the parameter

'SEARCH GAIN' by pushbutton ' '. All incoming measured values will be influenced by this setting. Every change of the value has to be confirmed by 'ZERO' for being taken over to the memory. So every measured value is multiplied if it has been multiplied in the 'AUDIO GAIN'. That can cause instability if the values are too high. So it has to be checked in the field which settings are useable.

For the test increase the value. The detector will now react showing the maximum detecting display. Now you have to press 'ZERO' to pass this settings to the memory. It is not recommendable to do this ZERO automatically because you might not notice it or the coil might not be in the correct position. That could cause week signals being eliminated (See 'ZERO'). Combine the test with parameters 'SEARCH MEMORY' and 'AUDIO GAIN'. It is possible that you are not able to do the test up to the maximum of all values in you test room. When doing the ZERO in a noisy environment or during high settings of amplifying values it will happen that you eliminate some noise. For that reason it is recommended to do 2 – 3 ZEROs. After a short time you will recognize a "wrong ZERO". You should do the settings with various objects (size and material). Also it is recommended to chose a ZERO object. This object should be carried with when using the detector. So you can always compare the known behaviour with the behaviour at the field e. g. do a calibration to adapt the detector to the soil. To detect coins or other flat objects the coil should be tipped and moved. The response can be different depending on the location and position.

Another parameter which influences the detecting is the "OBJECT SIZE".
Again set the parameters to factory settings. Chose the parameter "OBJECT SIZE" by
pushbutton ' '. By this parameter you can filter out small objects in low depth or big
objects at the edges of the coil. You can compare that to following process:
You detect a coin, increase the height of the coil until the detection signal vanishes. A
little distance far away there are several coins. You will have a signal at the same height.
Go back to the single coin. If you now increase the "OBJECT SIZE" – object size – at a
height you had before until the signal vanishes, you will not see this single coin any more,
even if it was lying directly above a bigger object. A bigger object lying deeper can be fil-
tered out in the same way. Big objects always have the characteristic that they produce a
constant signal above the complete area. Mineralized soils have the same characteristic
and can be filtered out in the same way.

When testing this parameters do as with the 'SEARCH MEMORY'. The searching mem-
ory should always be set to 10 – 15.

By this parameter also frame coils will be calibrated. This parameters are working with
frame coils 50 cm – 200 cm x 100 cm. Do a ZERO when using this coils by turning them
by 90° - the active area showing in direction of air.

Now turn the active area to the soil. You will get a permanent signal. Increase the height
above the soil and check a bigger area. Now increase the "OBJECT SIZE" until the signal
makes changes during movement above the area.
Not again do a ZERO (coil showing to the air). Never do a ZERO with the   active area of
the coil showing to the soil. Do the calibration step by step – parameter ZERO and pa-
rameter object size. The second possibility is you are receiving no signal but the right part
of the spectrum display shows a reaction. This corresponds to the description below
'SEARCH MEMORY'. Increase the "OBJECT SIZE" until the detection signal shows up
again. Do a ZERO as described.

This process can't be done in a room except with the 50 cm coil. Frame coils have a physical characteristic which absolutely have to be obeyed. The prime- and secondary field of the coil is an alternating field. The folded coil works like a transformator. The segments inducts currents to each other. Depending on the form this current can cause an inductive short circuit. This causes an increasing of the current up to a multiple of the normal current. It can happen – depending on the amplifying settings – that the coil or the detector can be damaged.

So always spread out the coil before working.

Up to now the parameter 'PULSE POWER' - has not been discussed. In air an increase of the puls power can be recognized only at big objects. The transmission field is not disturbed through its way through the air and is very stable for that reason. The field can close very early. Small object causes only small disturbances for that reason. With increasing power in the air the sensitivity for small objects decreases. Depending on the soil this effect will be seen up to about 50 cm too. This applies to the high current detectors Nexus and Genesis. So it is always recommended to use the possibilities of the parameters 'SEARCH MEMORY, AUDIO GAIN, SEARCH GAIN before increasing the pulse power.

Test the change of increasing the power with your testing objects. Increasing the power means to use more battery capacity.

A further parameter which influences the detection is the 'DISCRIMINATOR'.
Again set all parameter to factory settings. Chose now the parameter
'DISCRIMINATOR' by pushbutton . The discriminator has a range of 1-5.
When sensitivity it set to high values it is not possible to detect smallest and big objects
in the same way. The discriminator is based on an alloy algorithm. It is compareable to
a beam-balance. The possibility for distinguishing is based on the characteristics of the
metals. Influential factors are its conductivity, shape, alloy,   position and distance.
Furthermore the type of soil is important. The electromagnetic field can be scattered,
directed or bended. Also there is an enormous volume of soil behind the detected object
which is detected and measured too. Perhaps here a   bigger distance of the coil to the
soil or tipping the coil may help. It is essential that the detecting is reproduce able for a
clear identification.
The sum of characteristics of different object may show a silver- or gold-signal
depending on position, depth and soil. If you think about how many factors have to
be considered it is not surprising. Therefore test with different objects and necessary.
Bigger or massif precious metals will always show a negative result in the air, if they
are not alloyed. Even clearest gold will be alloyed by crystals and salts in the soil.

In setting 1 the discriminator is most sensitive to filter out iron and massif objects.
A golden ring (333, 485) will be detected clearly. After start the discriminator is set to 2.
Test the different settings with different materials (chains, rings, coins) and
observe the reaction of the number-, graphic- and spectrum-display. Mix the
materials with iron nails and other materials. By mixing, changing distance and
movement you will learn the reaction of discrimination.

By adding different materials which you move additionally you simulate different
soils e. g. beside lying objects. You should do this with different discriminators and
combine it with the described parameters. Often it is also possible to recognize the
metal by following the course of detection. Ferromagnetic material produces a long
floating course over the complete diameter of the coil. Gold on the other hand
produces a lower tone at the edge of the coil.

If you are in the fiel, test the soil first by your test object.

Switch you detector on. During this procedure the position of the coil is not important.

Wait for about 30 seconds.

Hold the coil into the air and press ‚ZERO'.

Search for a week signal in the nearer environment. You also can use your test object if there is no signal. The test object lying on the soil should produce the same signal as you have seen after start in the air.

Move the coil out of the detection area and increase the 'SOUND GENERATOR' until you hear the first click. Now again do a ZERO in the air. This is necessary because the detector is still in stabilisation phase.

Go back to the detection area and lower the coil over the object until a detection can be recognized. Now chose the 'SEARCH MEMORY' and decrease the value. The detection signal now will become stronger without changing the distance. Rise the coil until the signal becomes weaker again.

Chose the 'SOUND GENERATOR' and increase the value. The detection signal will become stronger without changing the distance. The value should be set in a way that a regular grow fainter of the tone can be heard when increasing the distance to the object. Now again do a ZERO in the air.

If you don't have a detection signal during soil calibration, even using your test object, increase the ‚SEARCH MEMORY' or the ‚OBJECT SIZE' until the signal comes up again. Here we have to do with mineralization or a big flat object is lying below the coil.

As described before, always an increasing ob the 'OBJECT SIZE' is necessary for the frame coils. This must be decided in the field.

CHARCHING

The battery charger consists of following components:

The battery charger is construed for 220V- to 240V AC/ input range. It supplies a constant power of 300 mA to the 21,6 V NIMH-Battery over hole charging time. Charging time is 14 hours.

A processor controlled converter as a optional accessory is available. This converter has an automatic switch off and it allows to charge with the car board battery from your Vehicle.

Warranty

The warranty time for this instrument is 2 years starting with the day of invoice. During the warranty time our service department will repair every failure of the instrument, which is depending on material or manufacturing. The necessary spare parts will not be charged. Old parts will belong to us.
Exceptions concerning warranty are power and connection cable, rechargeable batteries. Lacks depending on non purpose usage and excluded also. Repairing those failures will be charged. In case of an unfounded warranty claim the demanding person will be charged for all costs. Precondition for fulfilling the warranty duty is the presentation of the invoice. The warranty is not transferable. A service does not extent the warranty time.

Danger

The detector must not be used for mine searching. Special mines react on disturbances of the earth magnetic field. This mines can be activated by a strong electromagnetic field. Mine fields are marked. Persons with pacemakers or other medical instruments must not use this instrument. The electromagnetic field might influence the rhythm.

Contents

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METALL-DETEKTOREN & RÖNTGENGERÄTE