

PQWT-TC150



PQWT-TC300



PQWT-TC500

First Edition, 2025



PQWT-TC150



PQWT-TC300



PQWT-TC500

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Forward

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Over the years, Puqi focuses on Hydrogeological exploration, Intelligent data-capture technology and Application of special technique, carrying out Scientific research, Technical services and Marketing application. We have completed more than 65 items including National ministries, Sino-foreign cooperation and major scientific research projects. Having the honour to win a number of national research awards .

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Meanwhile, Puqi has established long term cooperation relationship with many scientific research institutes in Germany, US, Australia, Hong Kong and other countries and regions. Number of geological data laboratories has been established at multiple places in china, using our own unique software to carry out long term data collection, analysis and detection for different geologic structure, and set up the differential database of different geologic structure area.

Hunan Puqi Geologic Exploration Equipment Institute
Hunan Puqi Water Environment Institute Co.Ltd.
Hunan Puqi New Energy Institute Co.Ltd

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Address: No.1 -4Puqi building, No.769 Qingzhuhu Road,Qingzhuhu Street, Kaifu District, Changsha, Hunan,China.

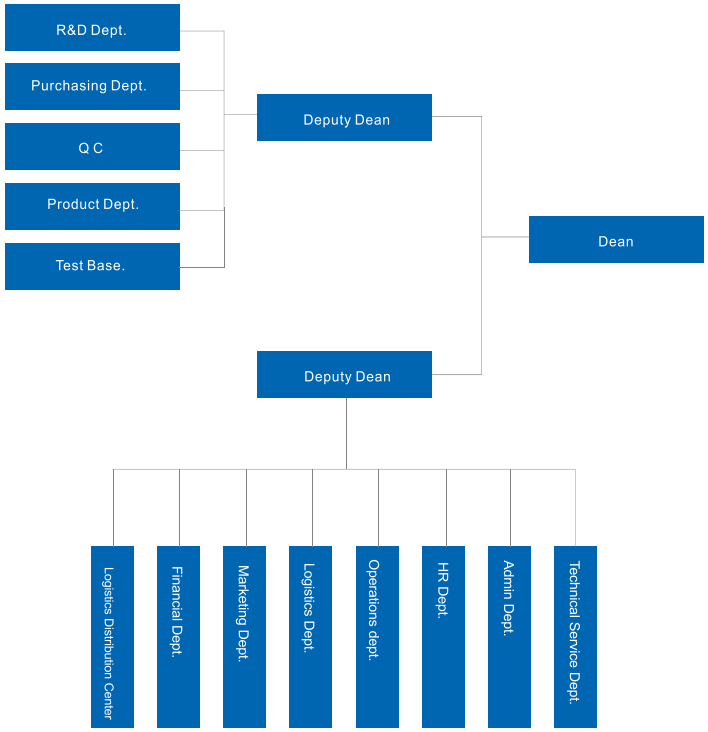
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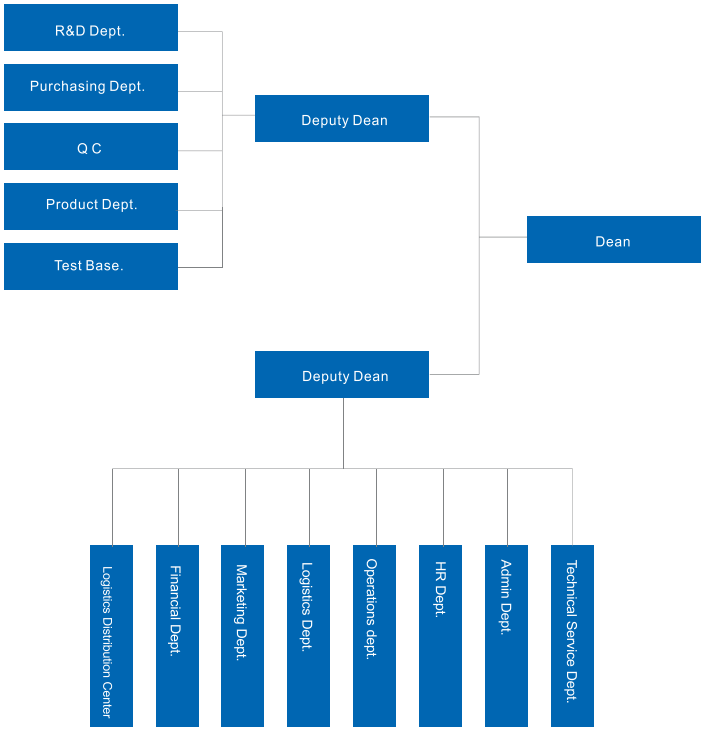
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Institute Structure



Institute Structure



Caution

1. The instrument early in the design has been fully taken into account the use of the extreme environments . But still have to pay attention to the correct method of operation, please do not fall equipment deliberately, proper use will extend the life of the instrument .

2. The instrument is not waterproof, please do not immerse the instrument in water or operate in the rain.

3. Please do not strike LCD screen, do not expose the monitor for a long time in direct sunlight, if there is a touch faulty, please shutdown and restart.

4. After using, please clean the instrument and load it into special box, please place the parts into the corresponding position, do not crush the screen.

5. The instrument should be placed in a cool and dry space.

6. Please do not disassemble the instrument, this will cause the instrument data errors or system crashes.

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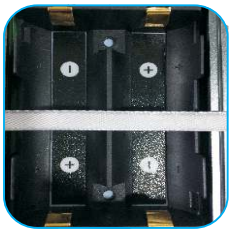
Model 26650 lithium battery, each manufacturer's batteries are slightly different positive and some positive is some of the bumps of the beginning of the design of the instrument has been fully considered its adaptability, the battery compartment can be loaded into different manufacturers of standard 26650 battery.



If you encounter by the head battery into a flat battery, or the shrapnel is too much compression caused by poor contact can not boot the failure of the shrapnel slightly pushed to make contact with the battery poles.



Please pay attention to the battery polarity when install battery into the compartment, installed anti-battery will lead to failure to boot.



The function of the pulling rope is convenient to take out Battery, so when loading the battery, please press the pulling rope against the bottom of the battery compartment.

8. About battery



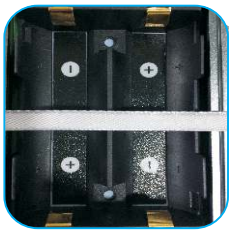
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8. About battery

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Battery Loading Completed.



Take out the battery with both your hands Pull up the lifting rope pull up the lifting rope.



There is a tips of battery usage inside the battery compartment cover.

8. About battery

Battery

Battery parameters:

Li-ion26650 lithium battery

3.7v dosage of 2, the proposed selection

4000mAh or more capacity.

Charging

Take the battery out of the compartment to charge, select the charger which support the battery, charging plug can be used

Indoor charging plug or car charging Plug, it is recommended to use the output current 1A and above charging plug.



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Product Overview

PQWT-TC Series geophysical prospecting instrument: the use of natural electric field source as a working farm, with resistivity contrasts underground rocks and minerals or groundwater, based on measuring the natural electric field on the surface of the N different frequency electric field component, according to their different variation to study Abnormal changes in geological bodies produce, reaching solve geological problems one electrical prospecting methods. Because this method measures the electrical component of the electromagnetic field of the earth, so called natural electric field method; and we chose the corresponding frequency as measured within -50 meters, that were selected frequency, so called frequency selection method, it is always referred to as natural potential frequency method. According to this theory the design and production of equipment called potential frequency of detecting instrument, referred to natural selected frequency electric field instrument or instruments for geological exploration work. Therefore, from a professional point of view to classify, geological equipment should belong to this category in the instrument geophysical equipment among electrical equipment. From the application point of view to classify, it can be call-

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ed prospecting meter, water detector, empty detector, prospecting instrument, instrument engineering exploration, geothermal detector, archeology instrument, logging tools, measuring water detector, water detector, prospecting equipment , prospecting instrument. From the perspective of the measurement field source classification, also known as natural electric field instrument, audio electric field instrument, the earth audio instrument. The instrument is the use of natural earth field source without going through artificial field that is omitted clumsy power supply system in order to achieve the simple, lightweight instrument.

After data collection by the unique built-in computing functions, the instrument can automatically draw curve graph and profile map with one button, according to the profile map,

you can clearly understand the geological structure and quickly determine the location of ore body (seam), hollow (cave), water (aquifer) etc.

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Advantages

◆ High Measurement Speed and High Efficiency

Complete more than 8000 meters profile in one day to realize geological abnormality in different depths,the prospecting speed and efficiency is improved about 10 times more than traditional resistivity method.

◆ Convenient to Carry

Without heavy power supply, it uses low frequency signals in earth natural electric field as signal source, and the complete set weight is less than 2kgs so easy to carry.

◆ Simple operation

Equipment is automatically controlled by micro PC. You can learn its operation in 10 minutes. It will take 10 minutes for persons without prospecting experience to finish training.

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◆ Good performance and high Accuracy

The resolution of measurement is up to 0.001mV,and precision is ±2%.It gains high stability and abnormity curves matching with that of traditional geo-electrical equipment in lots of field survey.

◆ Strong Anti-interference Ability

It has advanced anti-jamming technology and multiple anti-jamming designs. You can observe abnormity curves result with good repetition even in weak signal area, city, high electric jamming area and working area with other exterior interference via frequency selector and digital processing.

◆ The unique feature of Automatic mapping

This instrument can automatically form curve graph and profile map with one button after completed recording data, no need transfer the data to computer for drawing mapping.

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Technical Parameters

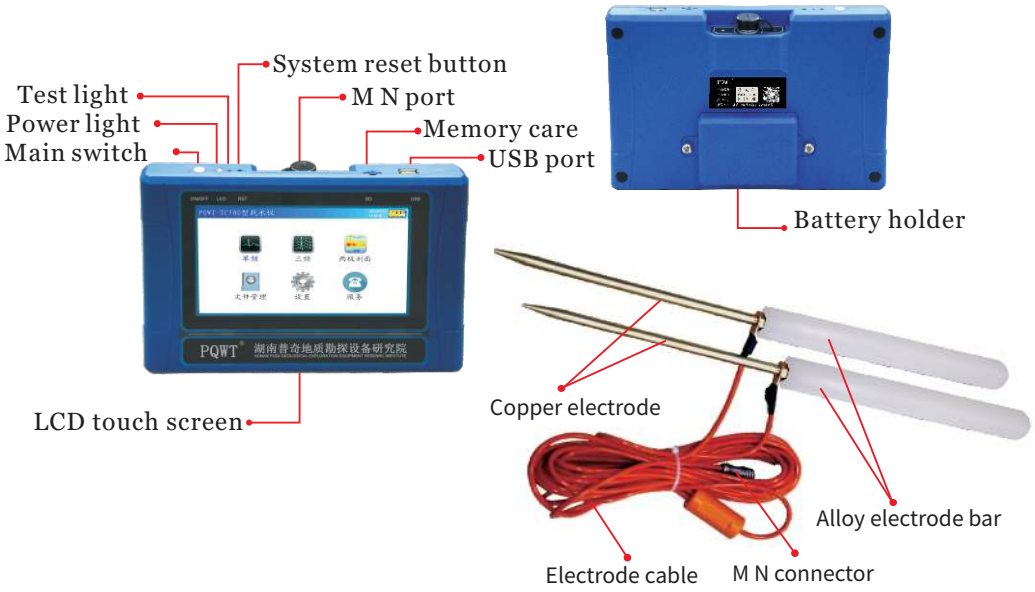
Model No.	Depth	Controller	Operating system	Channel gain	Measurement accuracy	Measurement channel	Measuring range	Unit of measurement data		Other relevant parameters
PQWT-TC150	150M	32 bit high speed CPU	PQWT 6.0	1-500 thousand times	0.001mV	Single	0-6000mV Automatic conversion range	Electric field components of different frequencies of magnetotelluric field E (mV)		1.Automatic noise reduction,strong anti-jamming ability. 2.User-friendly interactive ;interface ,high-speed CPU ;control and menu prompting. 3.Automatic measurement and storage of data. 4.Automatic drawing curve graph and drawing profile map in the water detector, no need output data to computer for drawing map. 5.The data will be saved ,automatically after power off. 6.Store 999measuring lines data and record 999 measuring points data each line. 7.The data could be directly formed curve graph or map in the detector or output data to computer for drawing map. 8.Using rechargeable batteries,stand by time more than 12 hours.
PQWT-TC300	300M	32 bit high speed CPU	PQWT 6.0	1-500 thousand times	0.001mV	Single	0-6000mV Automatic conversion range			
PQWT-TC500	500M	32 bit high speed CPU	PQWT 6.0	1-500 thousand times	0.001mV	Single	0-6000mV Automatic conversion range			
Model No.	Power	A/D Swith	Input impedance	Measuring frequency	Working environment temperature	Relative humidity	Power Supply	Weight	Display	
PQWT-TC150	<2.5W	16bit 3.6 MSPS	≧10MΩ	Single, triple and 33 frequency	minus 20-50℃	≦85%	#26650 Battery*2 DC12V 4000mAh Built-in Battery	Host weight 0.7kg G.W:6.9KG	Industrial 7-inch HD touch screen	
PQWT-TC300	<2.5W	16bit 3.6 MSPS	≧10MΩ	Single, triple and 40 frequency	minus 20-50℃	≦85%				
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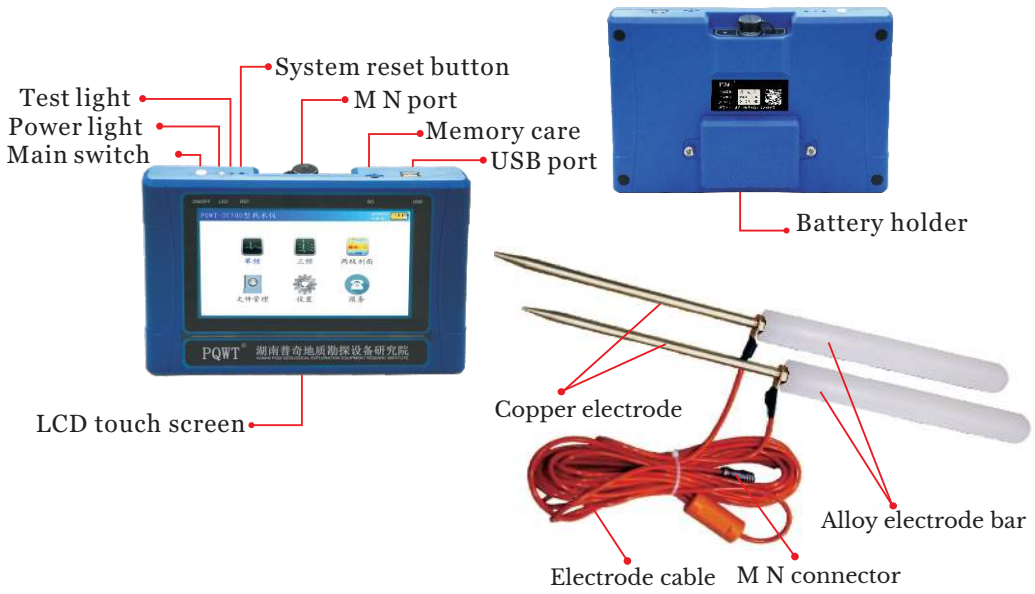
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● PQWT-TC150/TC300/TC500



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Components

1. LCD Screen

Display various operating states and the measurement results e.g. measuring data, curves graph and profile map.(refer to the use of the Instrument)

2. Main Switch

Turns on the instrument power, if the indicator light on blue. Flashing indicate the normal operation of the system, a long light indicate the system is busy or halted, light off represent power off or low voltage automatic shutdown protection. Cable test indicator light: green.

3. M N Port

Input terminal, insert M, N electrode connector.

4. USB port

Insert connection cable to USB port for connecting the host machine to computer or with the OTG cable connecting to Andrew system mobile phone to output data files and curve and profile map (only a small part of the Andrew system mobile phone support OTG function).

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Working Principle

◆ PQWT-TC as sample

Geophysical exploration is detecting stratigraphic rocks, geological structure and other geological conditions through the study and observation of changes in a variety of geophysical fields. commonly used geophysical exploration methods include gravity exploration, DC exploration, alternating current survey exploration, magnetic exploration, sonic exploration, seismic exploration, radioactive exploration, At present, the main geological exploration instrument is

electricity exploration in the market. And most of the instruments with features of complex operation, heavy weight, too complex post-data processing, The users must be many-year experienced technician who have to be professionally trained before the operation of electricity exploration instrument.

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PQWT-TC series of natural Electric field geophysical exploration underground water detector is the latest product which research and development by our institute

The instrument is light and easy to carry, the length of measurement line need only 5-10 meters, only one person can complete the operation, saving manpower and time, full touch LCD screen,,

Simply operation, external insert a large-capacity memory card, the instrument with real-time mapping function, to find high resistance (fracture Band), low resistance (such as detection of water and ore body) through real-time mapping, it can be directly displayed the geological structure abnormal on-site.

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Innovations

Compared with the traditional DC electricity underground water detector, the key circuit part adopt the discrete component design, circuit modular design, the application of a number of shielding technology to reduce circuit itself noise, to achieve greater gain and resolution, the use of more high-precision high-speed AD,8-channel sampling, precision switching capacitor filter, the new system (column) high-speed CPU, multi-stage filter, Two levels of power frequency in wave, the use of signal enhancement technology to cover interference, highlighting the useful signal. The instrument uses super strong anti-jamming design of circuit against the electromagnetic environment Disturbance, suitable for geological exploration in various environmental.The new test methods of power supply,voltage and current, improved the electrode cable test, programming using the latest digital filtering technology, including FFT digital filtering, FIR, IIR and other filtering technology. Digital filtering combined with conventional filtering, frequency resolution up to 0.1Hz. Software upgrade online, new UI, optimize operation interface, which make the instrument easier to use.

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Works Introduction

PQWT-TC are using the Natural electric field frequency optional geological exploration, Controlled Source Audio Magnetotelluric (CSAMT) and Audio Magnetotelluric (AMT).

By the M, N electrode probe (transducer) via a cable earth's magnetic field to electrical signal input to high impedance input stage , after the anti-jamming exchange amplification, frequency selection, select the desired operating frequency, and then by the A / D sampling, central processor (CPU) for data processing. Where in the entire measurement process, high-speed central processing unit (CPU) of the cont++rol, instrumentation automatic range conversion and automatic frequency selection.

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Finally display the measured data and curves graph, and then click “profile” the instrument will automatically draw profile map directly on the LCD of instrument, also can output measurement data, curve graph and profile map by USB cable to computer for analysis and making geological conclusion. After connecting the instrument by straps , back in the body for convenient use. Turn on the main switch, after display boot system information, LOGO and company information, automatically enters root menu interface and operating mode.

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Main Screen Description

Boot into the boot screen , after a successful start into the main screen, Figure 1, Figure 2 (main screen displays the contents of the boot).

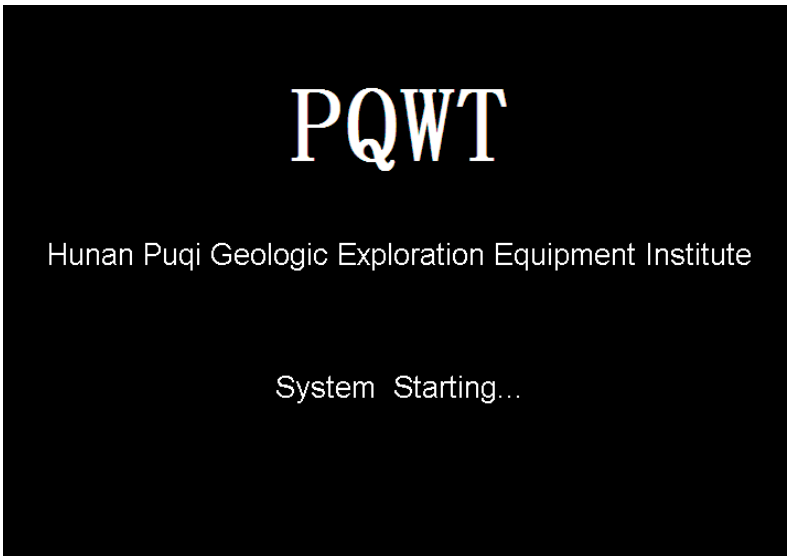


Figure 1 start interface

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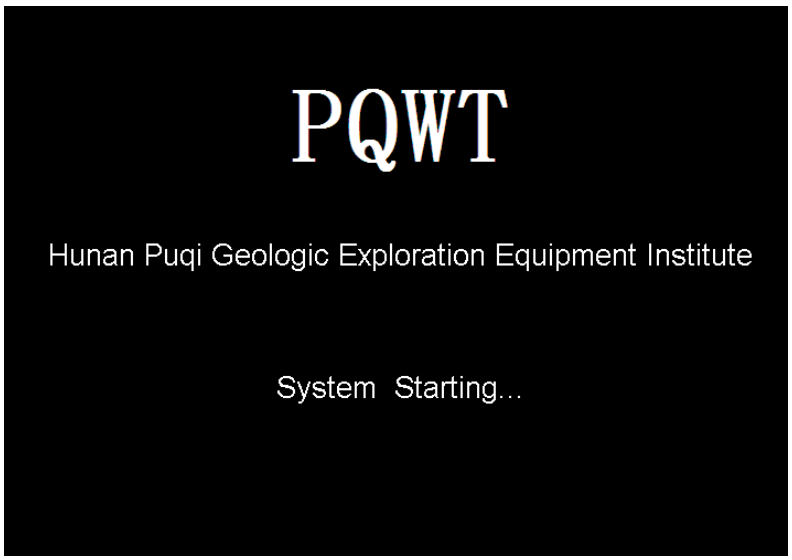


Figure 1 start interface

- 21-

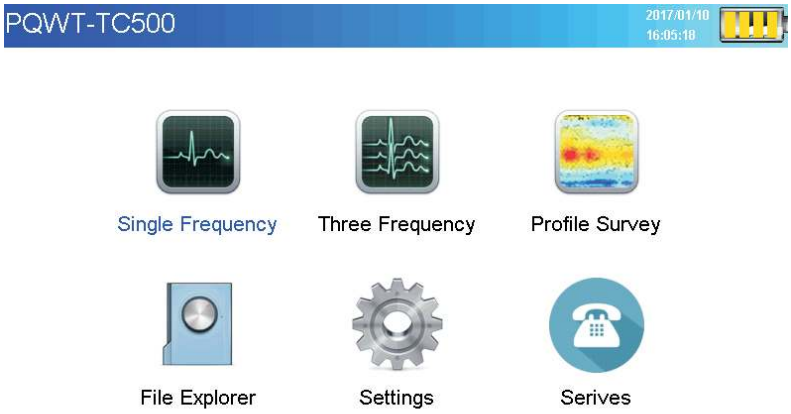


Figure 2 main screen displays the contents of the boot

◆Single Frequency Measurement State

After entering the main screen, double-click the "single-frequency" into the single-frequency measurements, it can proceed single frequency measurement-related operations as shown below in Figure 3.

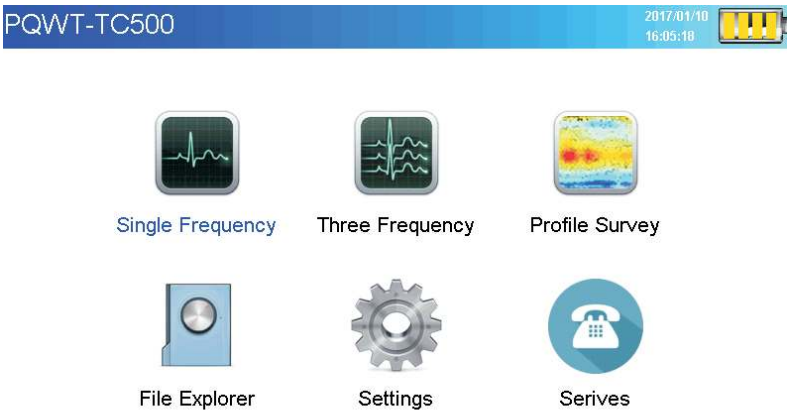


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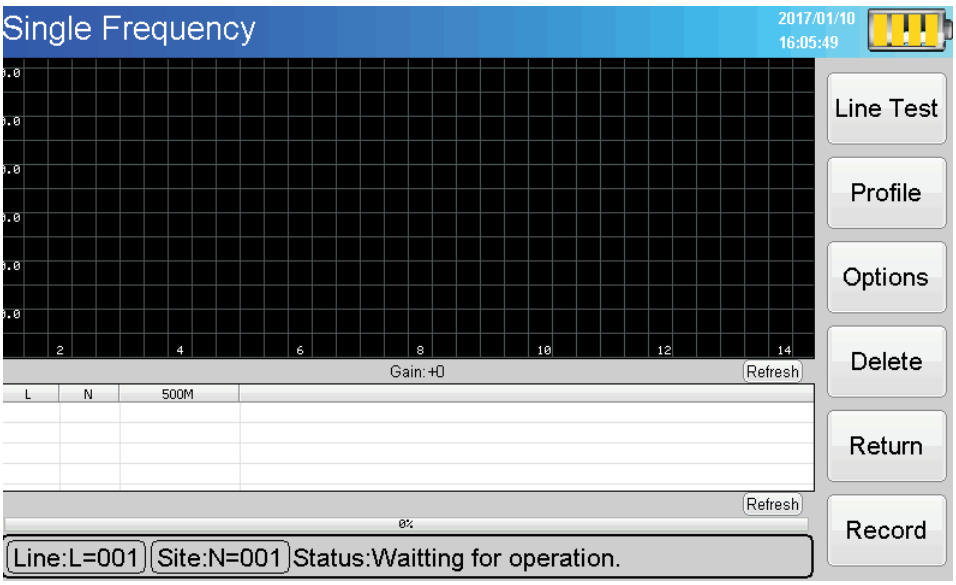


Figure 3 The display on single frequency measurement status

(1) Line Test :

Check whether prospecting instrument can work normally or not before measurement.

Cross these two connected copper electrodes and put them together, click on the " Line

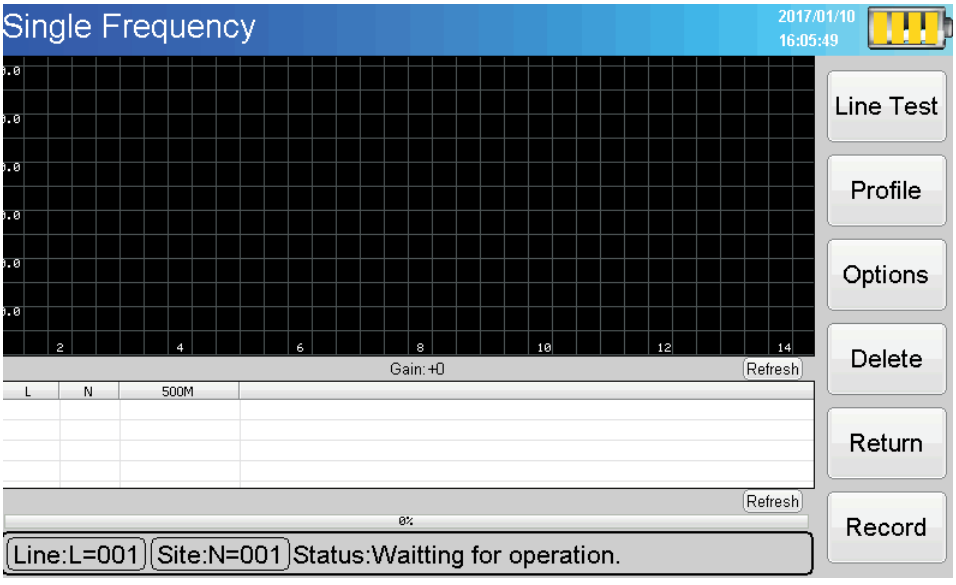


Figure 3 The display on single frequency measurement status

(1) Line Test :

Check whether prospecting instrument can work normally or not before measurement.

Cross these two connected copper electrodes and put them together, click on the " Line

Test ", if the detection indicator (green) light, it's Line normal. Without light ,It is a cable fault, need to repair or replace the cable.

(2) Profile: (The function suit for profile survey)

(3) Options:Click the" Options " button ,then pop-up " Options" dialog box (shown below Figure4)

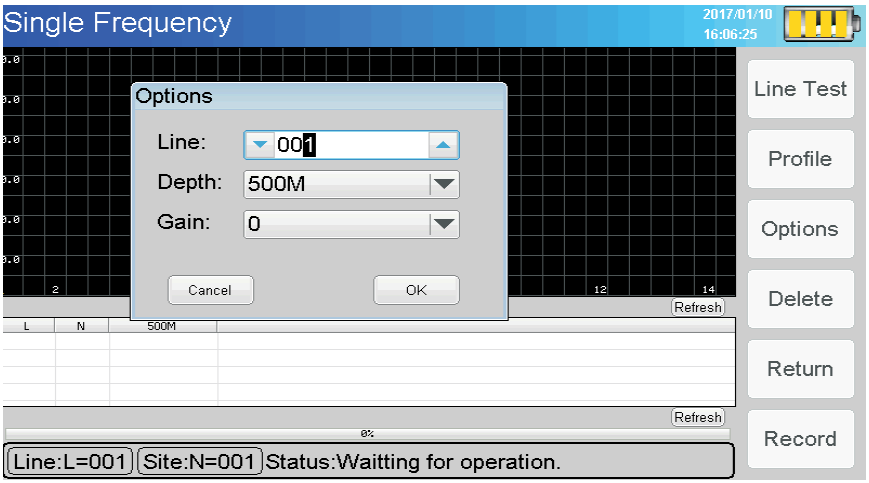


Figure 4 Single frequency setup

Test ", if the detection indicator (green) light, it's Line normal. Without light ,It is a cable fault, need to repair or replace the cable.

(2) Profile: (The function suit for profile survey)

(3) Options:Click the" Options " button ,then pop-up " Options" dialog box (shown below Figure4)

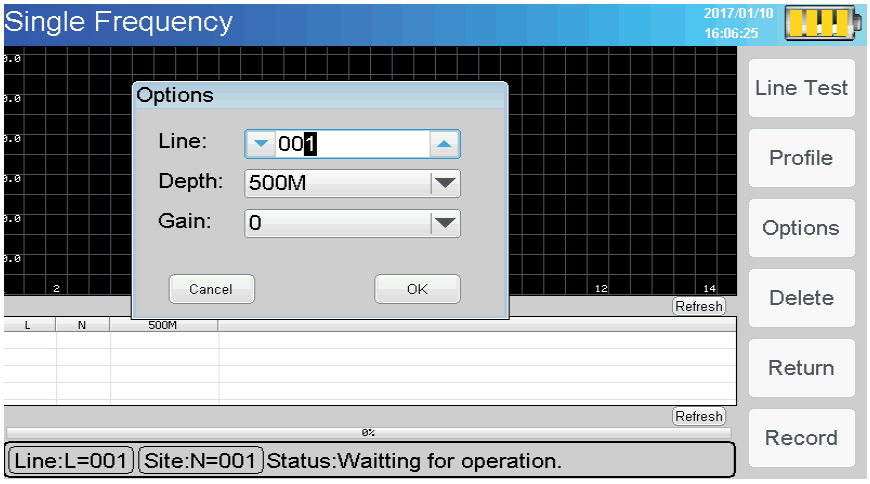


Figure 4 Single frequency setup

“ Line”he instrument can store 999 measurement lines, each measuring line can store 999 measurement site .The display information of measuring line and measuring site is shown at the bottom left. The number behind "Line: L =" indicates the current line number, The number behind " Site: N =" indicates the stored measuring site on the current measuring line. For example, "Line: L =5 ; Site: N= 20" indicates 20site has been measured on the No. 5 line. “Depth”: 500M(300Model should be 300m, 150model should be 150m).

“ Gain”: The default "0X", in the field of weak areas according to the actual situation adjusted to "1X", "2X" enhanced field source signal. During the measurement of a line, it is not allowed to shift, otherwise it will cause data disorder. Press "OK" to save the “options” and return.

(4) Delete

In the process of measurement, if the case of accidents or data mutations occur can not be determined, the data of last measuring site need to be deleted, you can click on the "delete" button, delete the last column in the table , while the number behind "Site: N = " minus 1 , indicating that the measuring Site data is deleted. Click once to delete a set of measuring Soint data.

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(5) Click the "Return" button to return to the main screen

(6) Record:

Click on the "Record " button , the instrument can be sampled (measured) operations , the screen below the status bar displays the "Waiting for operation" to " Recording Freq1 Data ." Then DATA column shows the data of frequencies. After the sampling is completed which display “record completed”. Click the "Record " button again, the number after the " Site: N= " will plus 1, and then measured the data of next point. You can repeat this step until you complete a measuring line (N≦999). Since the instrument stores up to 999 measuring points each measuring line , so when the number of sites is 999 ("N = 999"), then click on the "Record" button, the instrument will cover the previous measurement site. Now you must press the " Options" button after entering, re-select the " Line: 002 ", and then keep going the measuring operation. “stop”:click ”Record”, the screen show ”Stop”, During the record process, if the electrode rods contact with the ground is not good, there is no plug firmly, the operator need to stop something, etc. can press the "stop" button, and then start record.

Note: Please don’t shut down the instrument when it is measuring, otherwise it will cause data loss or program confusion. Any other time you can shut down.

(5) Click the "Return" button to return to the main screen

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Click on the "Record " button , the instrument can be sampled (measured) operations , the screen below the status bar displays the "Waiting for operation" to " Recording Freq1 Data ." Then DATA column shows the data of frequencies. After the sampling is completed which display “record completed”. Click the "Record " button again, the number after the " Site: N= " will plus 1, and then measured the data of next point. You can repeat this step until you complete a measuring line (N≦999). Since the instrument stores up to 999 measuring points each measuring line , so when the number of sites is 999 ("N = 999"), then click on the "Record" button, the instrument will cover the previous measurement site. Now you must press the " Options" button after entering, re-select the " Line: 002 ", and then keep going the measuring operation. “stop”:click ”Record”, the screen show ”Stop”, During the record process, if the electrode rods contact with the ground is not good, there is no plug firmly, the operator need to stop something, etc. can press the "stop" button, and then start record.

Note: Please don’t shut down the instrument when it is measuring, otherwise it will cause data loss or program confusion. Any other time you can shut down.

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◆Three Frequency Measurement State

Enter Three-frequency measurement state, LCD display is shown below

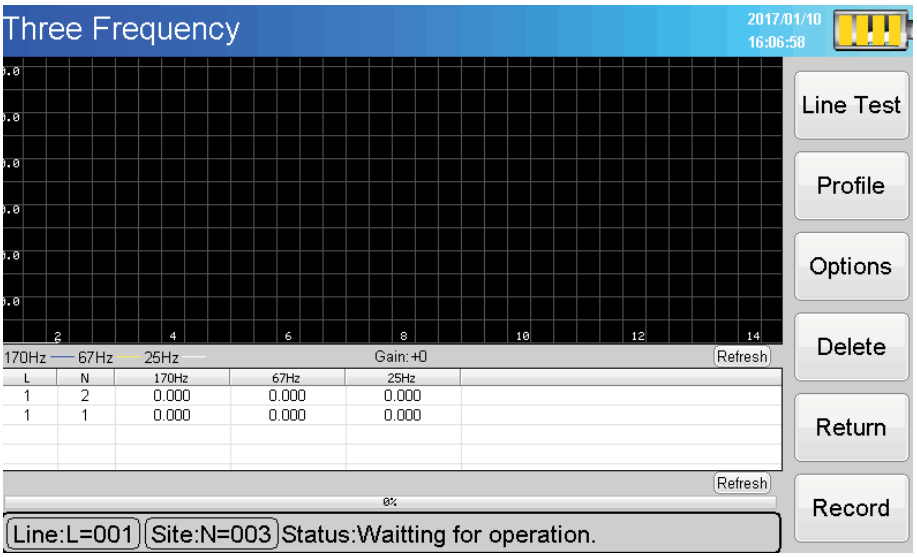


Figure 5 The display on three frequency measurement status

(1)Line Test (4) Delete (5) Return (6)Record the function have introduced at the Signal Frequency measurement state.

◆Three Frequency Measurement State

Enter Three-frequency measurement state, LCD display is shown below

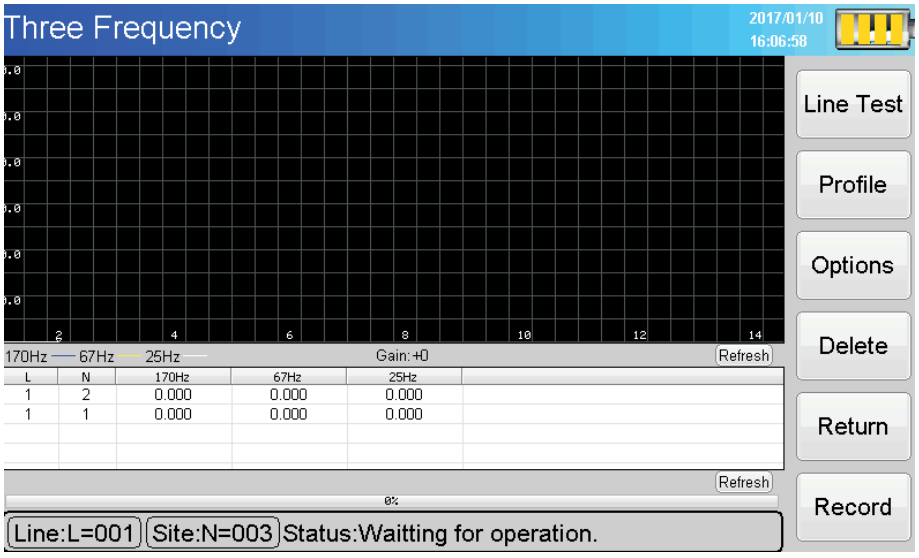


Figure 5 The display on three frequency measurement status

(1)Line Test (4) Delete (5) Return (6)Record the function have introduced at the Signal Frequency measurement state.

(3)Options:

Click the " Options " button , then pop-up "Options" dialog box (shown above Figure 6)By selecting the measuring line below Line: 001 press OK , you can make the next step Record operation. Measuring line and measuring site have be introduced at single frequency measurement state.

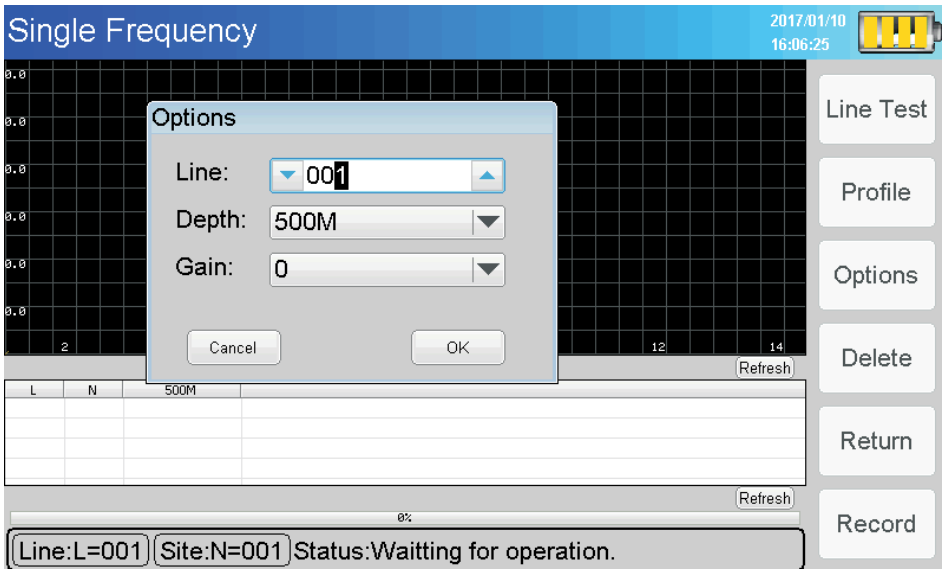


Figure 6 Three Frequency

(3)Options:

Click the " Options " button , then pop-up "Options" dialog box (shown above Figure 6)By selecting the measuring line below Line: 001 press OK , you can make the next step Record operation. Measuring line and measuring site have be introduced at single frequency measurement state.

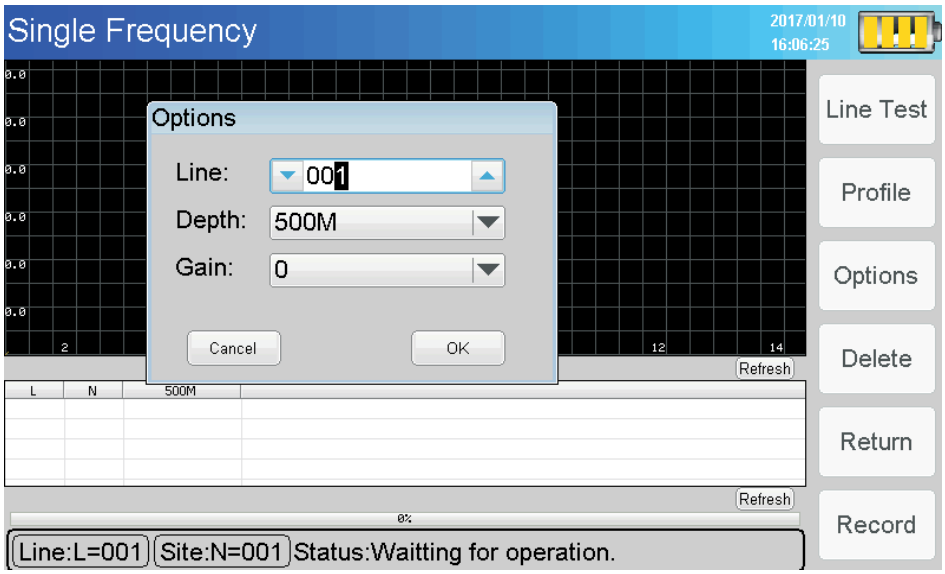


Figure 6 Three Frequency

- 28-

◆ Profile Survey Measurement State

Enter profile survey measurement state, LCD display is shown below

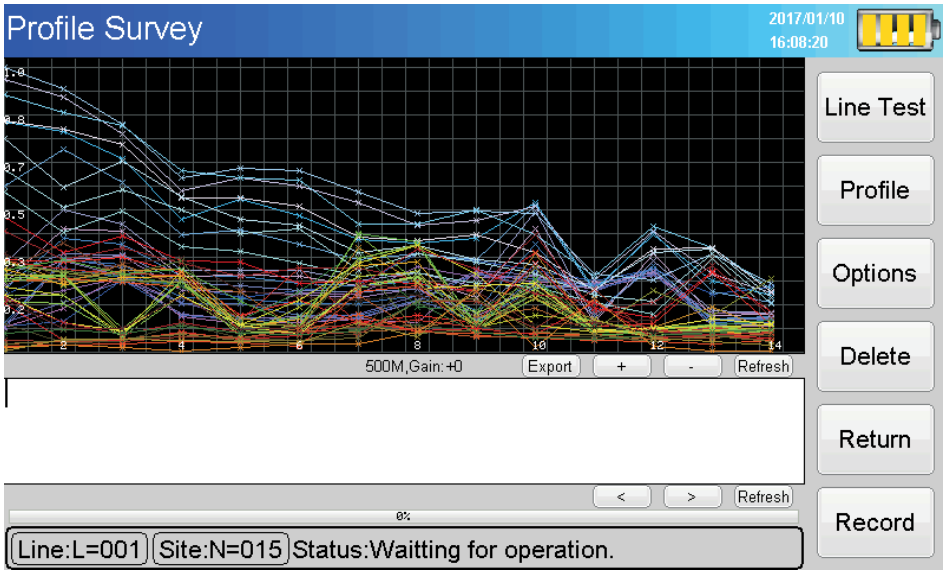


Figure 7 The display on profile survey measurement status

(1)Line Test (4) Delete (5) Return (6)Record the function have introduced at the Signal Frequency measurement state.

◆ Profile Survey Measurement State

Enter profile survey measurement state, LCD display is shown below

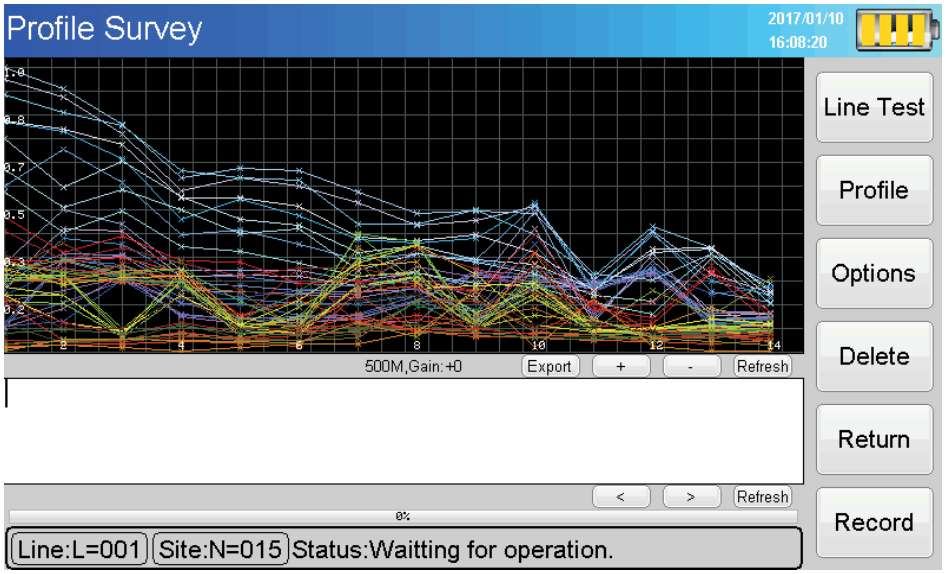


Figure 7 The display on profile survey measurement status

(1)Line Test (4) Delete (5) Return (6)Record the function have introduced at the Signal Frequency measurement state.

(3)Options:

Click the " Options " button , then pop-up "Options" dialog box (shown above Figure 8)By selecting the measuring line below Line: 001 press OK , you can make the next step Record operation. Measuring line and measuring site have be introduced at single frequency measurement state.

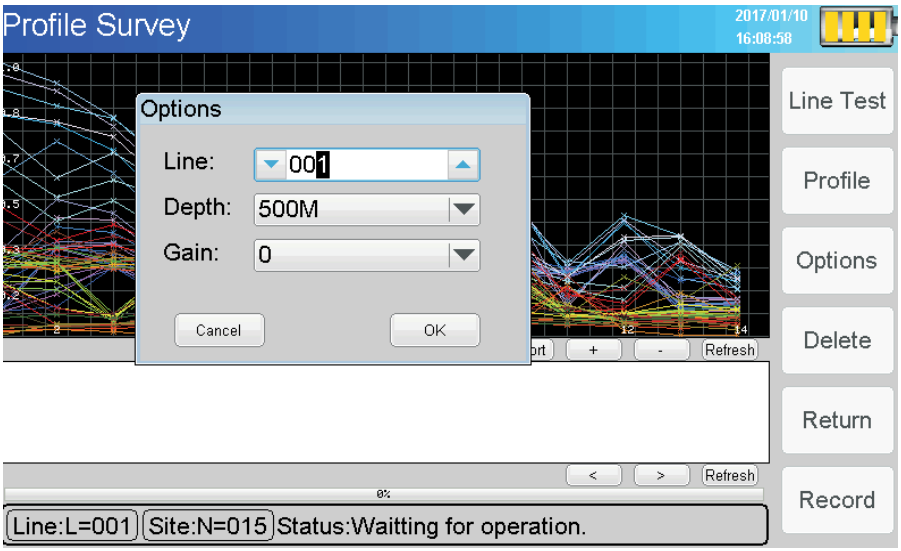


Figure 8 profile survey options

(3)Options:

Click the " Options " button , then pop-up "Options" dialog box (shown above Figure 8)By selecting the measuring line below Line: 001 press OK , you can make the next step Record operation. Measuring line and measuring site have be introduced at single frequency measurement state.

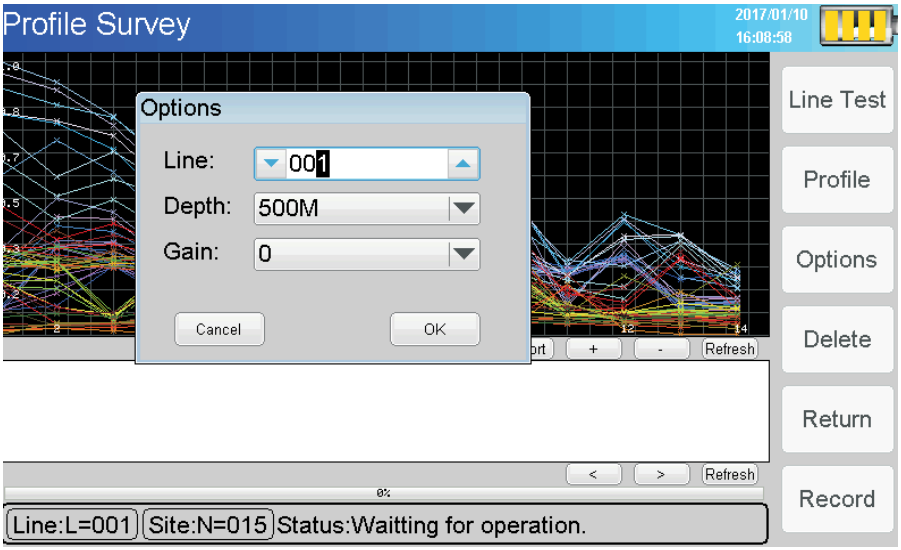


Figure 8 profile survey options

Profile Curve :In the current survey line, each measuring a measuring site, the system automatically generates the curve, the measurement is complete, you can click “+” to appropriate size ,Click "Export" button, the system will automatically save the curve to "File Explorer" within the current line, with the data saved together.

(2)Profile

Click “Profile”button,The system automatically generates the profile, then we can click on "+" the picture adjust to enlarge, click on “-” the picture adjust to narrow.

Click"Export" the system will automatically draw the picture is saved to the "File Explorer "in the current line of the folder within the line, and the data curve saved together with the drawing of the profile .as shown in Figure 9.

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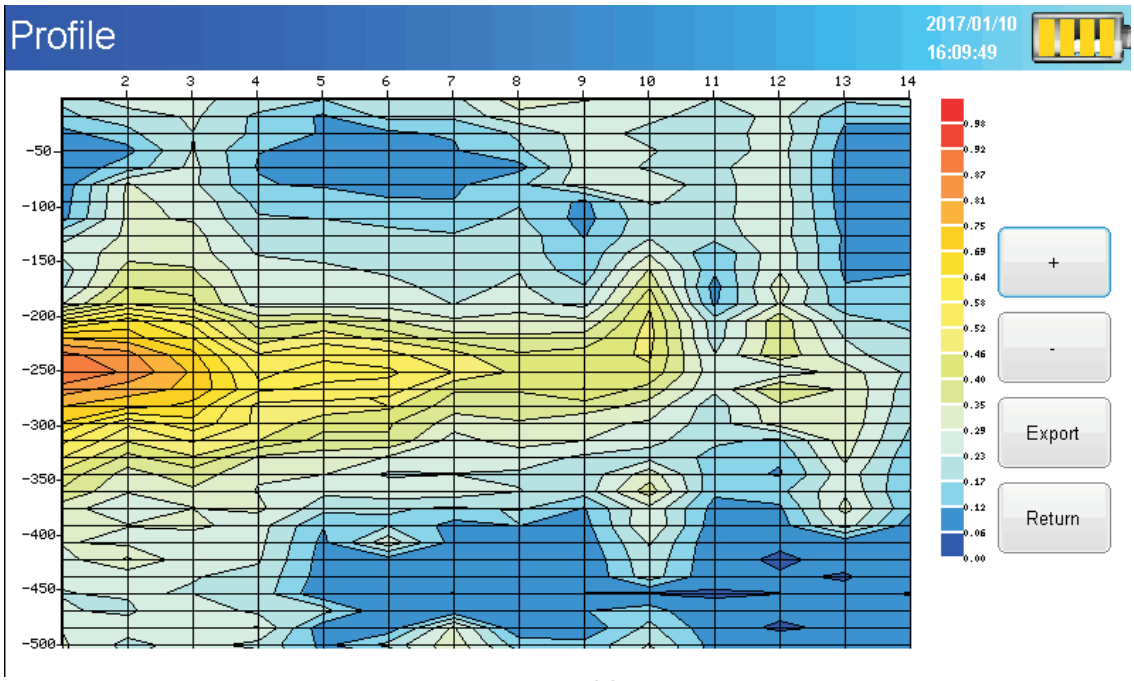


Figure 9 profile map

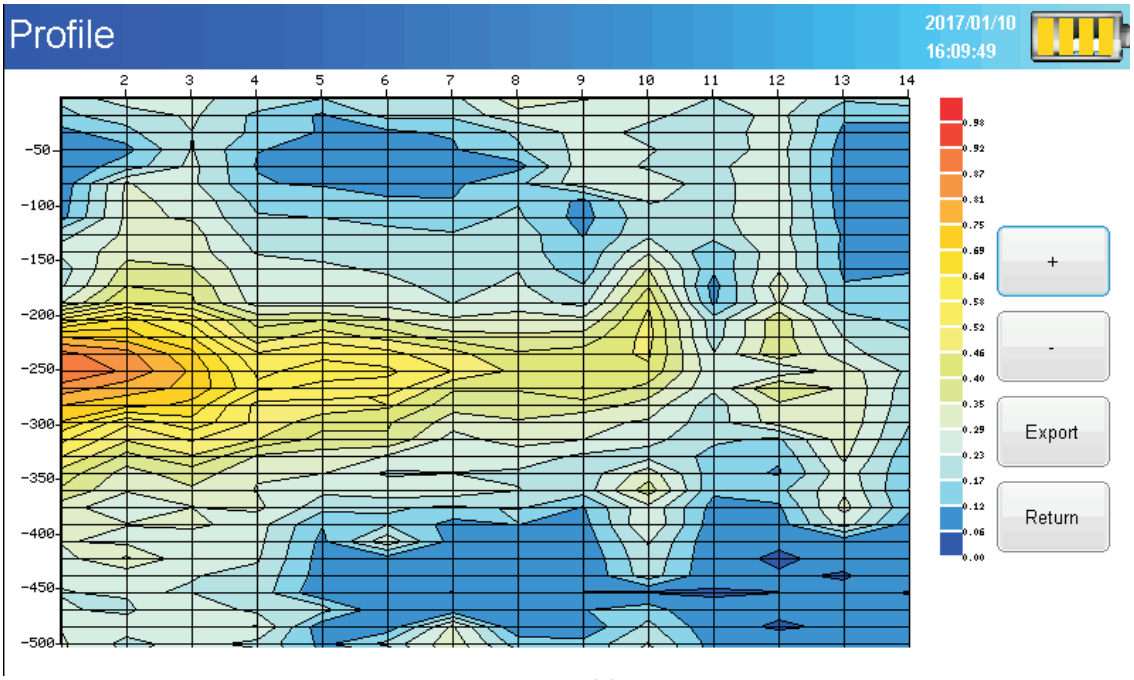
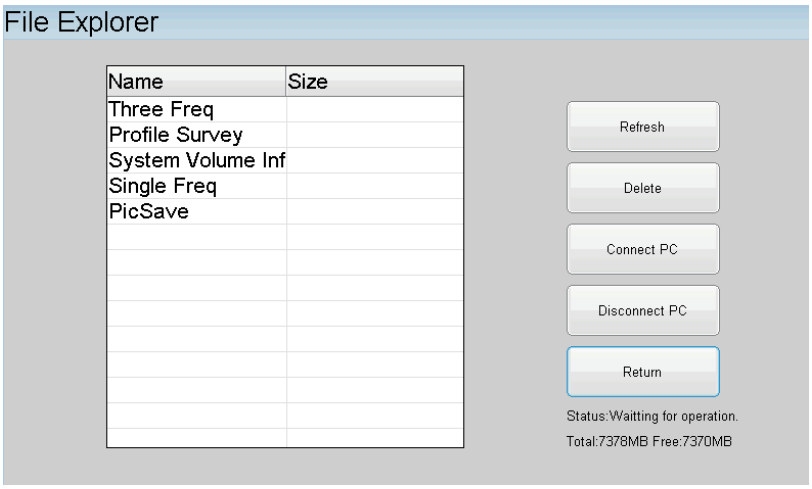


Figure 9 profile map

File Explorer

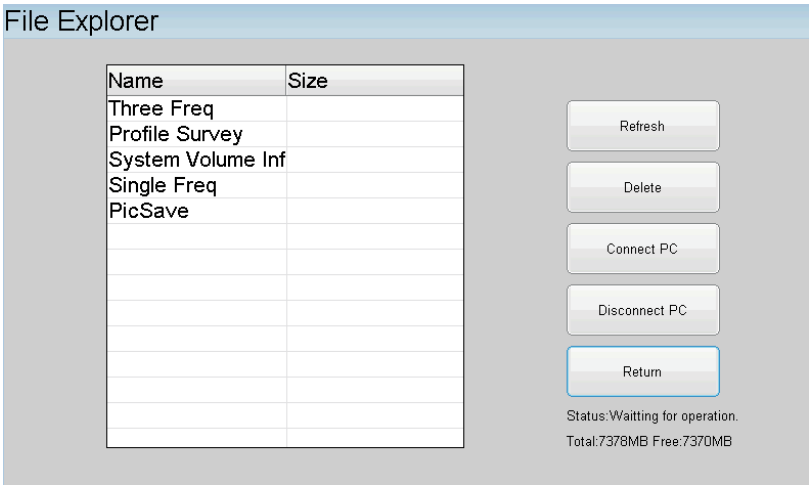
Start and inter the main screen, then click “ File Explorer”,as figure 10 as below:



Note: The folder in the profile survey is divided by the line number, eg "L1", "L2", "L3", and so on. After the measurement is complete, simply click on the "File Export" and "Profile" of the curve. There will be three files in each line folder: System volume inf , Profile Survey ,Three Freq . Click on the "connect PC" through the data cable connected to the computer, copy to the computer open for analysis. If your phone is an Android system and supports "O

File Explorer

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Note: The folder in the profile survey is divided by the line number, eg "L1", "L2", "L3", and so on. After the measurement is complete, simply click on the "File Export" and "Profile" of the curve. There will be three files in each line folder: System volume inf , Profile Survey ,Three Freq . Click on the "connect PC" through the data cable connected to the computer, copy to the computer open for analysis. If your phone is an Android system and supports "O

-TG" function, you can use the "OTG" cable in the package to connect the data cable to your mobile phone, and copy the data to your mobile phone.

Settings

Start and inter the main screen, Click the “settings, and show as the figure 11 below:

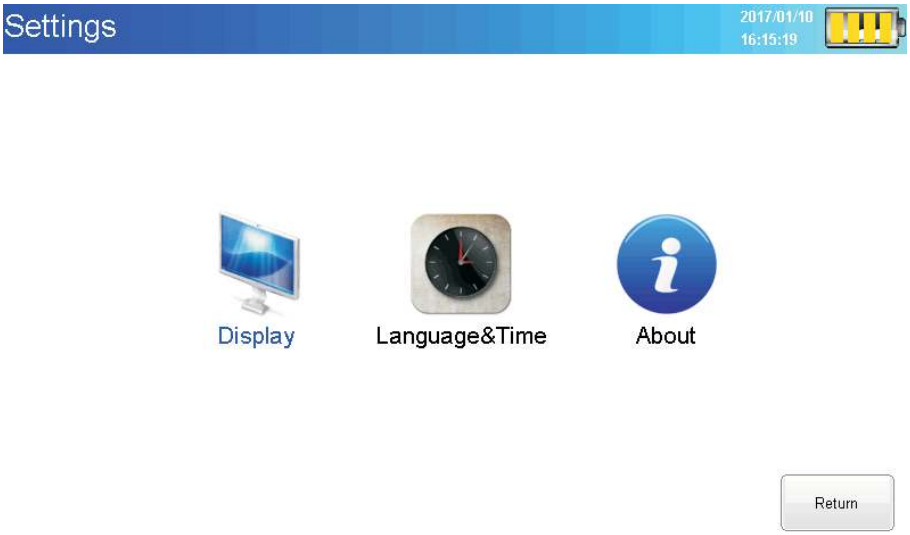


Figure 11. Settings screen

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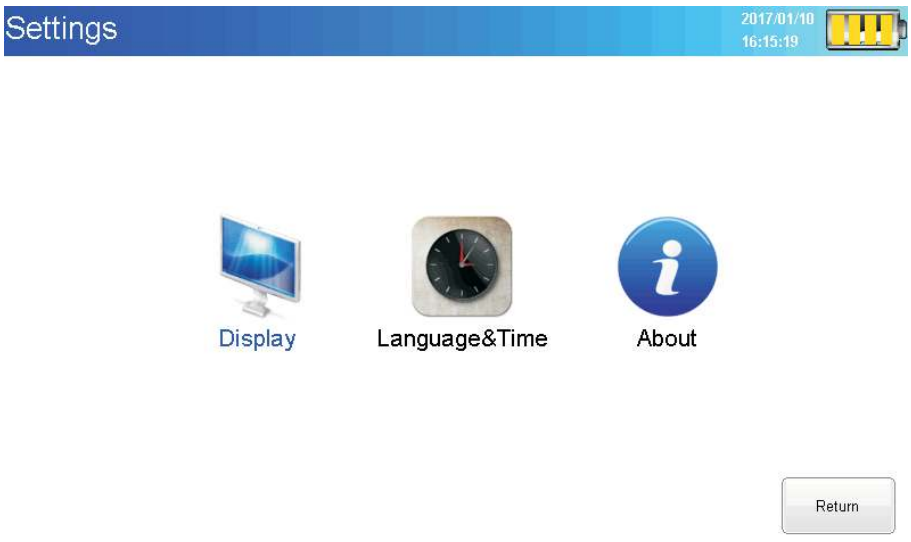


Figure 11. Settings screen

After click the “Display” “Language & Time” “About”, the screen as below:



Figure 12 Display screen

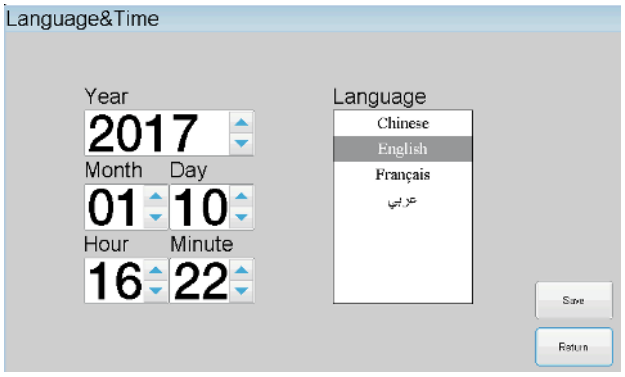


Figure 13 Language & Time screen

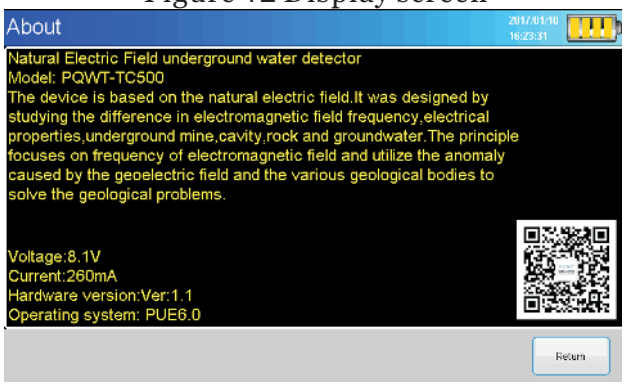


Figure 14 About Screen

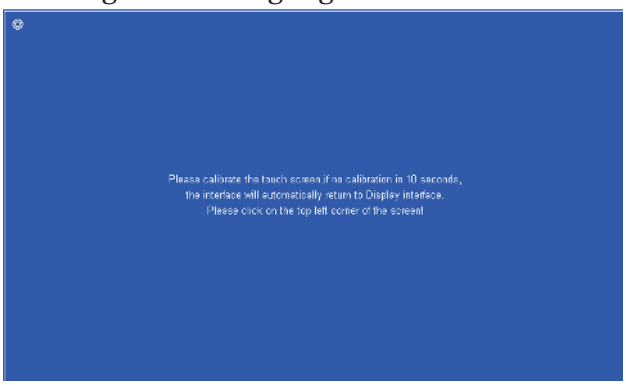


Figure 15 touch Calibration screen

After click the “Display” “Language & Time” “About”, the screen as below:



Figure 12 Display screen

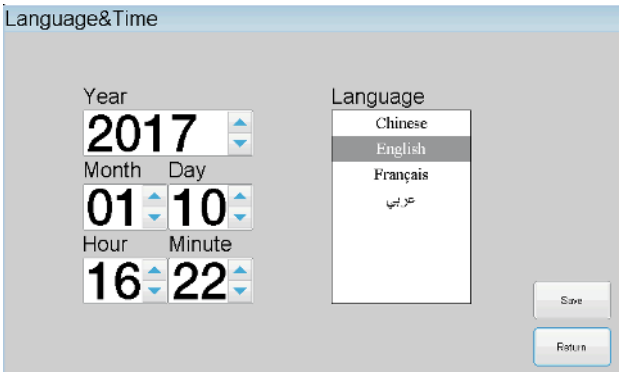


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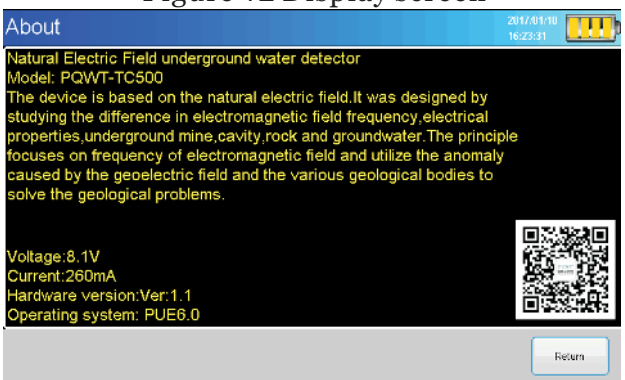


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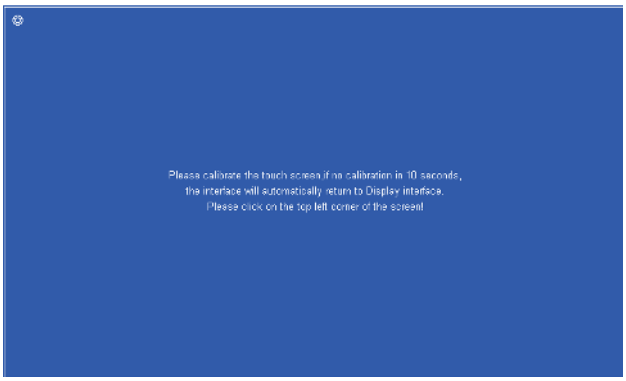
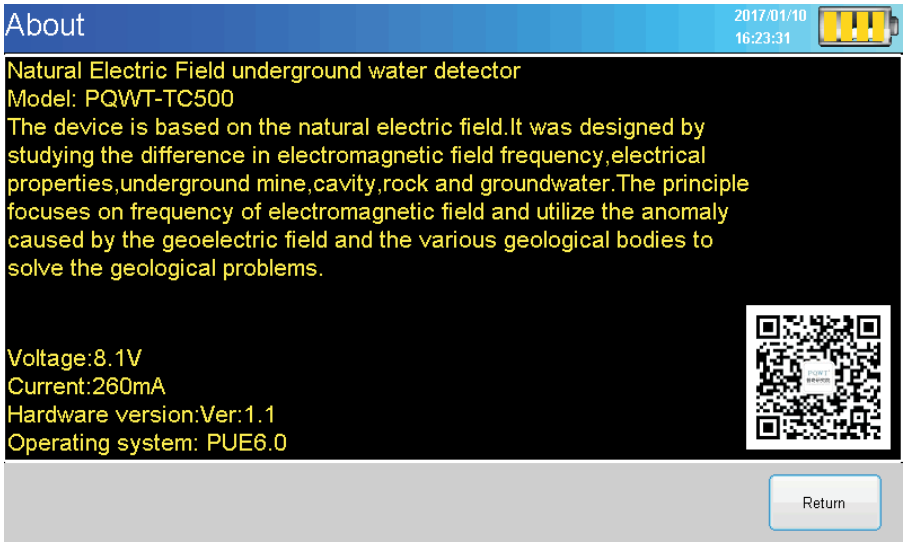


Figure 15 touch Calibration screen

Service

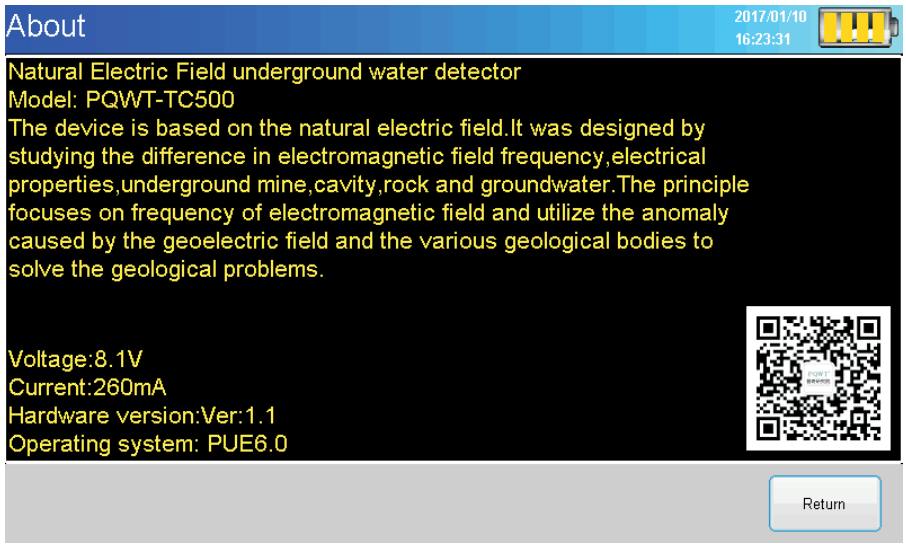
Start and inter the main screen, then click the “Service”, the screen show as below Figure 16.



Note: All instrument user, please send the data, curve graph, profile map to our exchange group, It is indispensable of three file.

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Wiring Method

wiring direction & Location

Geophysical lines are generally arranged perpendicular to the line to be constructed , can detect tectonic crushed zone on both sides of the border and its different physical characteristics , contrast is strong, crushing width , extending distinctive characteristics.

In order to accurately locate, confirmed the location of the abnormal ground point, generally use measuring rope (or tape) pull straight line, and mark with paint at the beginning of the measuring line, so that find、 measure position according to the test results of drawing later. The collected data each time is the data of midpoint between two electrode data, the point O is the first set of data as shown below in figure 16. Electrode spacing is generally 5-10m (Choose 6/8/10m according to your actual situation), dot spacing is generally about 0.5-2m, electrode spacing and dot spacing must keep the same distance for one measuring line.

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- 37-

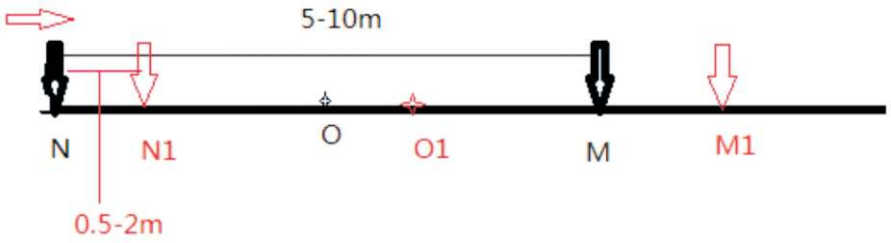


Figure 2 Electrode Wiring Method

MN Electrode Introduction

Electrode

The electrode with alloy rods and copper electrodes. Usage: As following Figure 17 to connect a hand-held alloy rod with copper electrode inserted into the soil, the puddled soil is recommended in each insertion. Before click on the "Record " , Press " Line Test " firstly, judged good grounding , Indicator lights up and then process measuring.

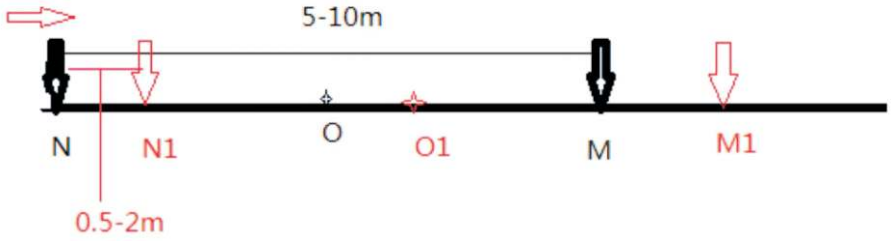


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Note: On dry and hard ground, it's difficult to use hand to penetrate the electrode, pls never hammer the electorde into ground, it will broke the machine function. You can mix some water, salt and soil in a barrel, then put the mud on the hard point so that you can insert the electrode. Meanwhile, you need cover the line that you will measure with salt water to improve the electrical conductivity.

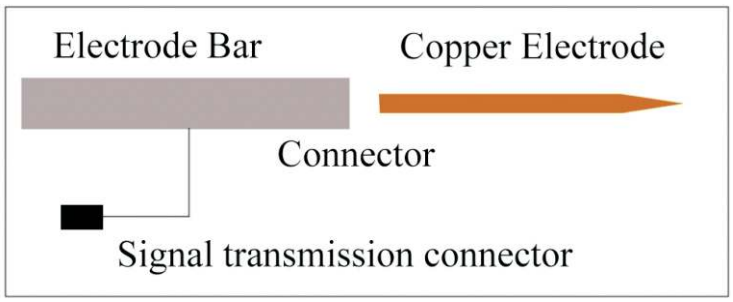


Figure 17 Electrode connecting diagram

Note: On dry and hard ground, it's difficult to use hand to penetrate the electrode, pls never hammer the electorde into ground, it will broke the machine function. You can mix some water, salt and soil in a barrel, then put the mud on the hard point so that you can insert the electrode. Meanwhile, you need cover the line that you will measure with salt water to improve the electrical conductivity.

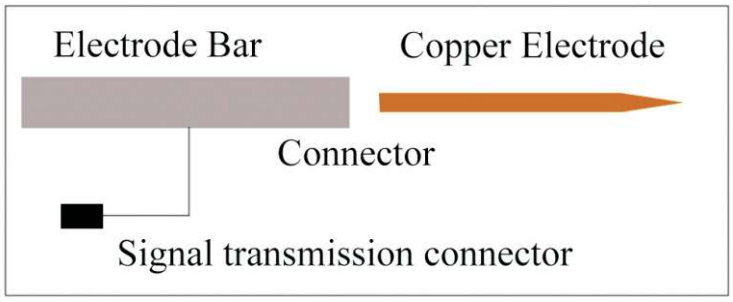


Figure 17 Electrode connecting diagram

Advised Measurement Approach

In order to locate accurately, judge the location of the abnormal ground point, generally using lining rope as straight line, carry out paint markers at the beginning or middle position, so that find the corresponding position according to the test results of graph after measuring.

Cross Method



Advised Measurement Approach

In order to locate accurately, judge the location of the abnormal ground point, generally using lining rope as straight line, carry out paint markers at the beginning or middle position, so that find the corresponding position according to the test results of graph after measuring.

Cross Method



Grid Method

Open area-grid or vertical cross-wiring:the terrain is relatively open,flat,reference to the ground vallegy,can not directly determine the direction of underground tectonic line.The square grid is used to detect the underground structure.As shown above in red line mark;



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Guide for After-sale Services

- Within two years of the purchase date, if instrument quality problems, please send us the photos, we will send the required part or repair for you. Each of us shall take care of the corresponding shipping cost on each side.
- Please save the purchase-related bills and warranty certificate together as a warranty certificate, warranty card shall not be painted .Otherwise, the warranty will be invalid.
- Instrument warranty does not cover the accident, misuse, neglect, alteration, modification, magnetized, unauthorized service and damage caused by prolonged exposure in corrosive salt mixture.
- If need to purchase related accessories, you can contact Hunan Puqi Geologic Exploration Equipment Institute customer service.
- Sales service providers have the obligation to provide quality service to Hunan Puqi Geological Exploration Equipment Institute Customer , such as objection to the quality of their services can directly complaints to our customer service .

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- Sales service providers have the obligation to provide quality service to Hunan Puqi Geological Exploration Equipment Institute Customer , such as objection to the quality of their services can directly complaints to our customer service .

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Configuration Table

Host machine	1set
Electrode Cable	1pc
Charger	1pc
Alloy Electrode Bar	1pair
Copper Electrode	1pair
USB stick	1pc
Universal adapter plugs	1pc

Configuration Table

Host machine	1set
Electrode Cable	1pc
Charger	1pc
Alloy Electrode Bar	1pair
Copper Electrode	1pair
USB stick	1pc
Universal adapter plugs	1pc

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1. Hunan Puqi Geologic Exploration Equipment Institute has the final interpretation of the operating instructions.

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