GOLDEN-ROD GROUNDWATER DETECTOR OPERATION MANUAL

Contents

1. Overview of the instruction

On the basis of traditional MT electrical geophysical prospecting theory, referring to the design of advanced geophysical prospecting instruments at home and abroad, and combining with advanced technologies such as Internet of Things and AI, the golden hoop stick for water prospecting has been developed, and the data acquisition circuit and algorithm have been accumulated iteratively for nearly 50 years, which can remove the terrain and ground environment interference in most parts of the world. The special MN (electrode) and TT (electromagnetic probe) measurement modes can be switched for measurement, and MN (electrode) measurement is used as far as possible in some places where the interference is particularly large, so as to solve the problem of field data acquisition interference to a greater extent. Obtained a number of national patents (201110454869.X、 201310205318.9、 202121767124.4、 202121767138.6, etc.). In particular to a geophysical prospecting method and a measuring device for correcting the field source of the earth electromagnetic field, which solves the problem that the field source changes at any time. Since the listing of the company in 2016, it has been deeply supported and trusted by the vast number of users around the world. At the same time, it has collected some shortcomings and hopes for improvement, so in 2024, it upgraded a new water-finding golden hoop stick to optimize and upgrade in many aspects: improve the measurement accuracy, optimize the measurement frequency accuracy, which can greatly improve the measurement accuracy of the instrument and optimize the grounding performance of the MN electrode. The stability of data acquisition is improved; a depth layering mode is added, and the depth layering mode is divided into three selectable depth intervals of 5 meters, 10 meters and 20 meters, so that different requirements of a user on depth layering can be met; a depth segmentation selection is added, and the measurement starting depth and the measurement ending depth can be set, so that the special requirement that the user only needs to measure a certain depth can be met; Add data processing function, set data processing parameters according to the model, and automatically generate 2D, 3D and slice images; add AI automatic analysis function, online AI automatic analysis function, and 24-hour online data analysis. The golden hoop stick for water exploration is mainly used for water exploration and relatively shallow hot springs, and can also be used for hydrogeological exploration, mineral

exploration and some engineering geophysical exploration. The water-finding golden hoop stick connects the control host, mobile phone and tablet computer (currently only supporting Android and Hongmeng systems) through WiFi wireless to set relevant parameters, collect data, process data, perform rapid inversion calculation, 2D/3D automatic mapping, AI automatic analysis, etc. It can also share data with the cloud server on the PC through the web side, so as to realize the data processing function of the app side on the collected data.

2. Main features

(1) Improve the accuracy and stability: optimize the measurement frequency accuracy, which can greatly improve the measurement accuracy of the instrument, optimize the grounding performance of MN electrode, and improve the stability of data acquisition;

(2) A depth layering mode is added: the depth layering mode is divided into three optional depth intervals of 5, 10 and 20 meters, which can meet the different requirements of users for depth layering;

(3) The depth layering mode is added: the depth segmentation selection is added, and the starting and ending depths of the measurement can be set to meet the special requirement that the user only needs to measure a certain depth;

(4) New software: built-in data processing function, automatic generation of 2D, 3D and slice maps, and online AI automatic analysis function, 24-hour online data analysis.

(5) Add an offline measurement key to the fully wireless connection through WiFi, no need to connect any cables, even without the connection of mobile phones and tablets to achieve offline measurement.

3. Introduction of the working principle of the instrument

The AIDU series instruments use natural electromagnetic field of the earth as the working field source to study the electrical structure inside the earth. According to the principle that different frequencies of electromagnetic waves have different skin depths in the conductive coal, the surface is measured from high frequency to The low-frequency Earth electromagnetic response sequence studies the difference in electrical variation of geological bodies at different depths in the subsurface and

determines the occurrence of underground geological bodies.

3.1 Electromagnetic wave propagation theory, Helmholtz equation

Ground electromagnetic waves are sent to the ground, and the propagation of electromagnetic waves in the earth and soil follows the Maxwell equation. If it is assumed that most of the subterranean geotechnical soil is non-magnetic and is uniformly conductive macroscopically, there is no charge accumulation, then the Maxwell equation can be simplified to:

$$\left.\begin{aligned}\nabla^2 H + k^2 H = 0\\ \nabla^2 E + k^2 E = 0\end{aligned}\right\} \quad (1)$$

（1）where k is called the wave number (or propagation coefficient)

$$k = [\omega^2 \mu\varepsilon - i\omega\sigma\mu]^{\frac{1}{2}} \quad (2)$$

Considering that the propagation coefficient k is a complex number, let k = b + ia, where: a is called the phase coefficient and b is called the absorption coefficient.

In the electromagnetic frequency range measured by the ADMT series of natural electric field geophysical instruments (0.1Hz to 8KHz), the displacement current can usually be ignored, and K is further simplified as:

$$k = -i\omega\mu\sigma \quad (3)$$

3.2 Wave group resistance and resistivity

A magnetic field with a change in the Helmholtz equation induces a changing electric field, and we have a magnetoelectric relationship:

$$\frac{E}{H} = -\frac{i\omega\rho}{k} \quad (4)$$

The surface impedance Z is defined as the ratio of the surface electric field and the horizontal component of the magnetic field. In the case of uniform earth, this impedance is independent of the polarization of the incident field and is related to the

earth resistivity and the frequency of the electromagnetic field:

$$Z = \frac{E}{H} = \sqrt{\omega\mu\rho}e^{i\pi/4} \quad (5)$$

（5）The formula can be used to determine the resistivity of the earth:

$$\rho = \frac{1}{5f}\left|\frac{E}{H}\right|^2 \quad (6)$$

3.3 Skin depth

In non-magnetic media, the skin depth formula is:

$$\delta \approx 503\sqrt{\rho/f} \quad (7)$$

It can be seen from the above equation that the penetration depth of electromagnetic waves is related to frequency and resistivity. The frequency is certain, the higher the resistivity, the greater the penetration depth, the higher the resistivity, and the lower the frequency, the greater the penetration depth.

4. Instrument instruction

Acquisition circuit, MN electrode, TT sensor, high-performance lithium battery, switch button and charging port are highly integrated in the water-finding golden-rod (Fig. 2). Wherein the electromagnetic sensor adopts an alloy material subjected to special heat treatment as an electromagnetic conduction iron core. A certain number of coils are meticulously wound on the outer layer of the iron core by using a mold skeleton, and sensors with different precisions are precisely matched and debugged to meet the measurement requirements of different depths. Generally speaking, the longer the iron core of the electromagnetic sensor is, the higher the measurement accuracy is, and the more stable the performance is. Especially in the low frequency band, the measurement effect is good, and the measurement depth will be deeper. The length of several commonly used models is 34 cm, 64 cm and 79 cm, and the weight is different with different length.

Figure 1

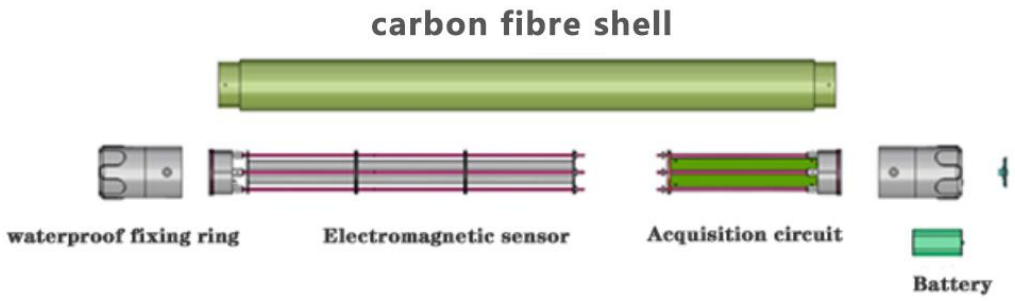

Figure 2

4.1 Main parameters

Specification

Parameter \ Version	ADMT-3H	ADMT-3HT2	ADMT-8HT2	ADMT-3HT3	ADMT-8HT3
Max Depth	300m	300m	800m	300m	800m
Scan Interval	5/10/20(m)				
Battery	7.4V 2600mAH lithium battery, Power consumption approx. 140mA				
Connecting	WIFI				
MN Electrode	Four L-shaped alloy electrodes, each with a size of 100*95*30mm				
Core Features	selectable depth sections, variety in scan interval options, auto 2D/3D imaging, AI expert interpretation of image, on/offline operation				
TT Coil (mm/w)	——	300/4	300/4	450/8	550/8
TT Iron Core (KmH/m)	——	80	100	100	120
Ground Conditions	soft ground only	all grounds			
Freq. Range (Hz)	1-8K				
Sensing Mode	MN	MN/TT			
Discrim.	0.1mV±5%			0.01mV±1%	
Acquisition Time (s)	14-420	14-420	14-700	14-420	14-700
Main Unit Weight (kg)	0.8	1.9		2.6	
Main Unit Size (mm)	340*71mm	650*71		790*71	
Shipping Weight (kg)	4.5	6		7.5	
Shipping Size (mm)	540*225*195	785*225*195		940*225*195	

Figure 3

5. Introduction to the main page of the software

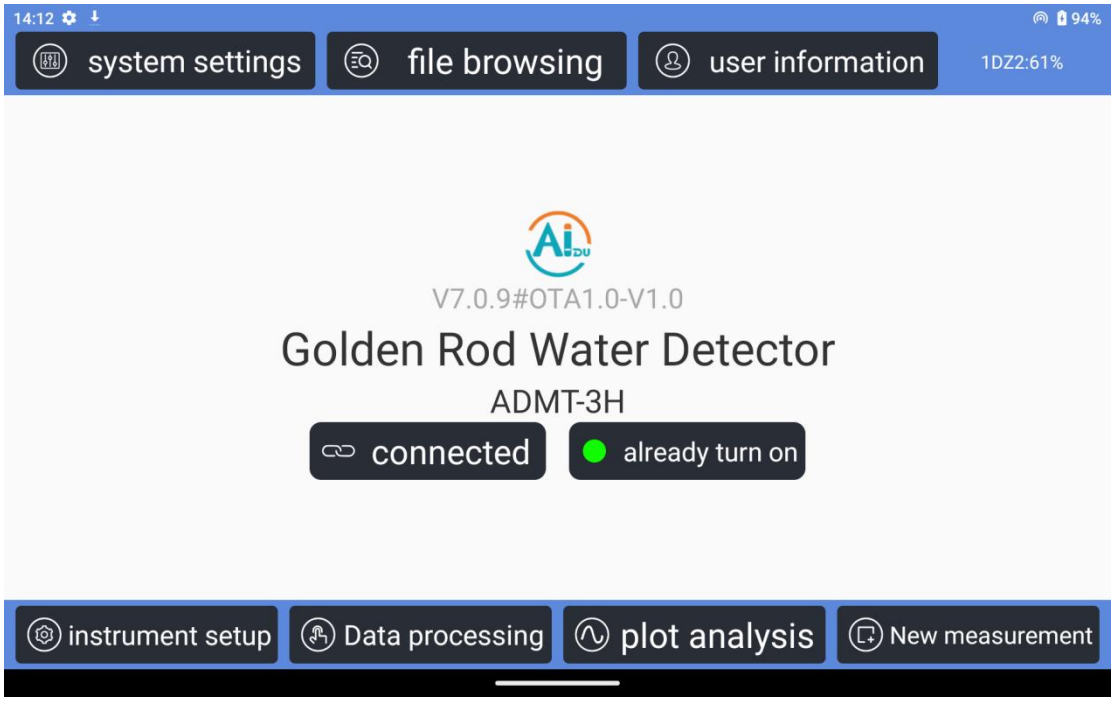

Figure 4

5.1 System settings

It mainly includes parameter download, Bluetooth, WiFi, language, WiFi hotspot,

mobile data, intelligent distribution network, screen brightness and other system functions, which can be used according to actual needs, and some functions may not be used temporarily.

5.2 File browsing

You can see the files that have been measured or downloaded from the account, and you can delete, cloud (share, download, delete), backup, view, draw and other operations on the files.

5.3 User Information

It mainly includes registration login, logout login, personal information, scanning login, device binding, about us, system messages, check updates and other functions.

5.4 Battery level

Display the electric quantity of the control host and the golden-rod device, and scroll alternately. "SYSTEM: electric quantity percentage" indicates the current electric quantity of the control host; after the golden-rod device is connected, "ID number: electric quantity percentage" is displayed.

5.5 Central area

Display the version number of the software APP, the firmware version of the water-finding golden-rod, the product name, the product model, the connection status, the TCP service opening status, etc. The product name and model number are displayed as empty when they are first used, and the product name and model number of the last connection are displayed by default after the device is initially connected.

5.6 Instrument settings

Connection device, measurement mode, depth gap mode, stacking times, start depth, end depth, measurement starting point, point increment and other operation functions.

5.7 Data processing

Including profile data merging, survey area data merging, equipment model, configuration scheme, data file selection, more equipment viewing, setting saving, processing execution and other operation functions.

5.8 Drawing analysis

It mainly includes data processing switch, (vertical contour map/plane contour map/plane curve map, etc.), survey line/depth option, picture saving, etc.

5.9 New Measurement

Create a new project or select an existing project to continue measuring.

5.10 System Control Bar

From left to right, they are Hide System Control Bar, Turn Up Volume, Return, Return to Desktop, Function Key (to view the programs currently running), Screenshot Key, and Turn Up Volume.

6. Initialize settings

6.1 Selection of operation host or software installation

If you use the mobile phone or tablet computer (which currently only supports Android and Hongmeng systems) to connect to the water-seeking golden hoop stick, you can scan the two-dimensional code (Fig. 5) or enter the download link (http://d.aidush.com/d4) to download the "Aidu water-seeking" APP software. After the installation is completed, open the software to use.

Figure 5

Figure 6

6.2 Initialization flow chart

For the first time, the initial connection registration shall be carried out. Refer to the following flow chart (Figure 7):

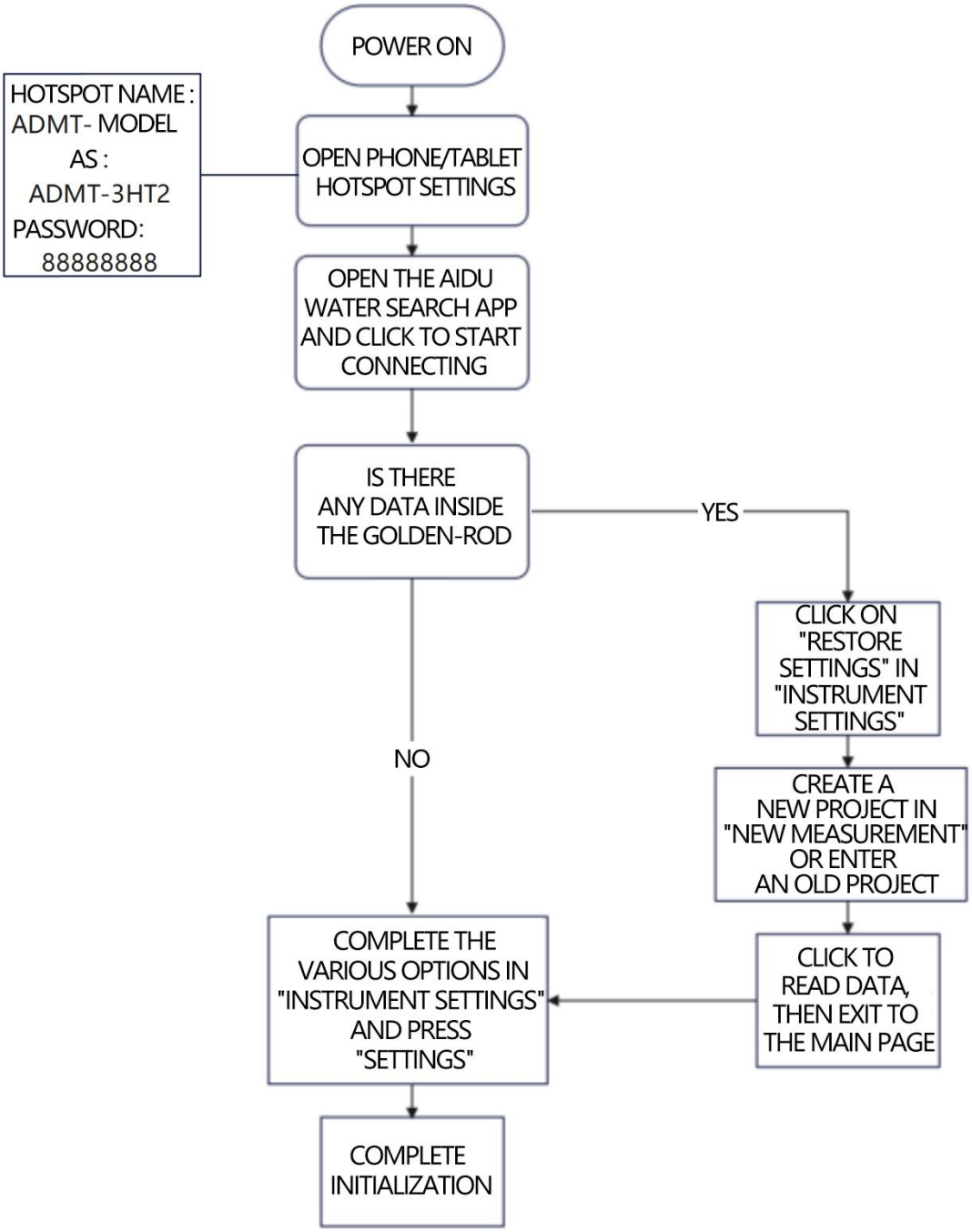

Figure 7

6.3 WiFi Hotspot Settings

On the main interface of the software, Select System Settings → WiFi Hotspot → Hotspot Settings → WLAN Hotspot Settings (Figure 8) → Set the network name to the full model name of the instrument (such as ADMT-8HT2) → Security: WPA2 PSK → Password: 88888888 → Save → Enable WLAN Hotspot → Return to the previous interface → Enable Service → Finish. It may take 1-3 minutes to connect successfully. Or open the personal hotspot settings in the system settings and set it according to the above process.

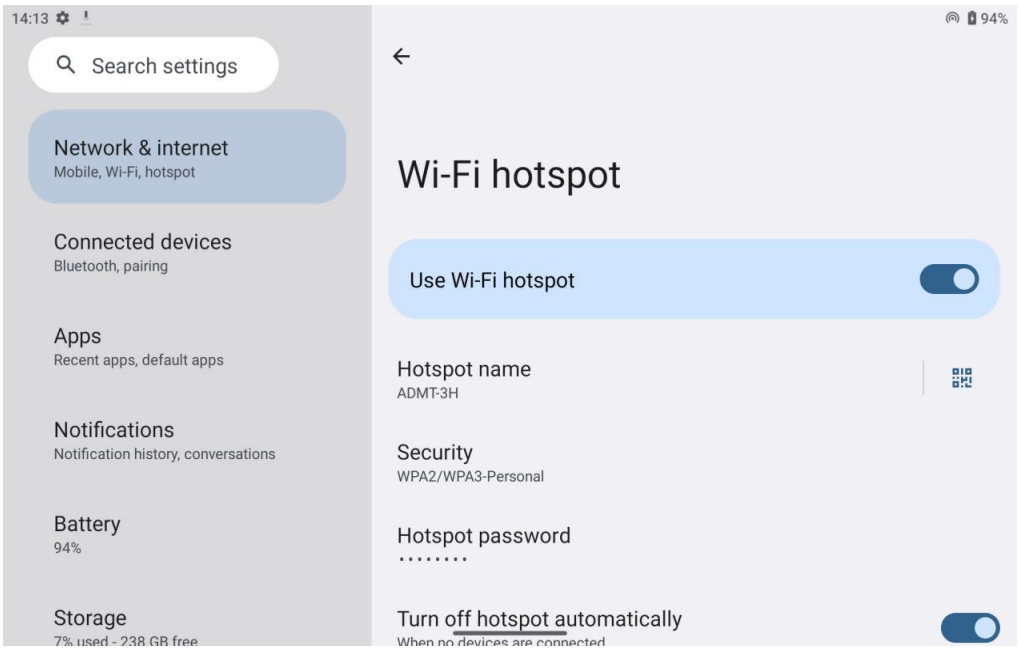

Figure 8

6.4 Connecting the water-seeking golden-rod

After the personal hotspot is set and turned on, long press the power button on the panel at one end of the water-finding golden hoop stick to turn on the red light until it is always on, which means that the startup is successful, and the WF light (blue light) flashes slowly. Press the "Not open" button on the main interface of APP software (Figure 9), wait for about 10-30 seconds, "Connected" and "Open" will be displayed, the blue light on the golden-rod panel will be on, the version number, water-finding golden-rod and the specific model will be displayed in the central area of the software, and the initialization is successful.

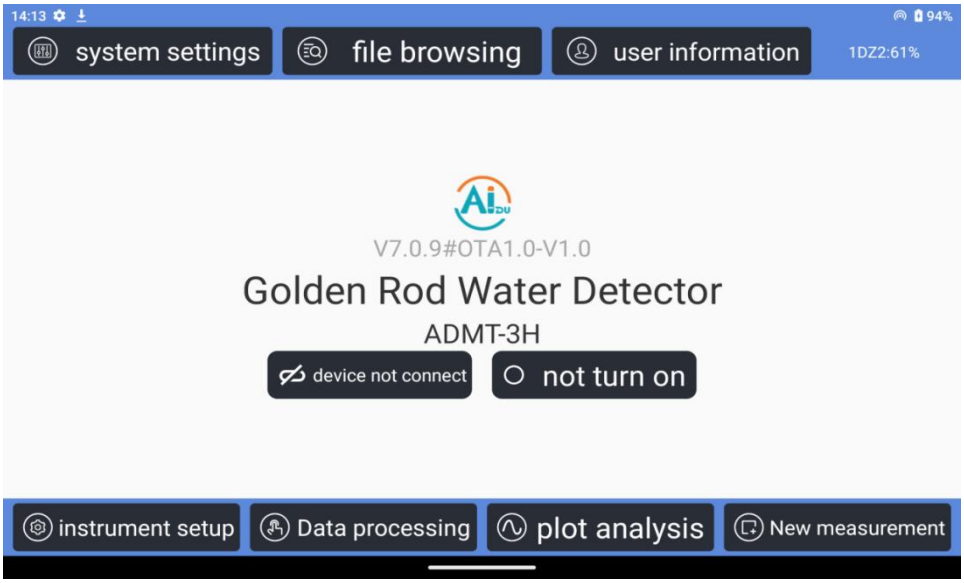

Figure 9

6.5 Daily connection of water-finding golden-rod

After initialization, the daily connection is much more convenient. In the main interface of the software, select System Settings → WiFi Hotspot → Open WLAN Hotspot → Return to the previous interface → Open Service. Press and hold the power supply (red light) on the panel at one end of the water-finding golden-rod until it is normally on, and the WF light (blue light) flashes slowly. Press the "Not open" button on the main interface of the APP software, wait for about 10-30 seconds, "Connected" and "Open" will be displayed, the blue light on the panel of the golden-rod will always be on, and the version number, water-finding golden-rod and the specific model will be displayed in the central area of the software, so that the connection is successful.

7. Simple operation and use method

7.1 Instrument setup

After daily connection according to (6.5), first check whether there is data in the water-finding golden-rod. The specific operation method is as follows:

Click "Restore Data" in "Instrument Settings" → input the project name and line number in "New Project" at will or according to your own habits → click "Read Data". If the data is read, it indicates that there is measurement data that has not been read before, confirm whether it is the data that needs to be kept to keep the record; If the data is not read, it means that there is no data for the water-finding golden-rod, and the relevant parameters can be reset for a new measurement task.

Click "Instrument setting" to confirm that the connected equipment is online (the equipment ID number appears and the green light is on). Select the measurement mode → depth gap mode → stacking times → start depth → end depth → measurement starting point → Point increment → setting.

Click "Setting" to prompt "Setting parameters successfully".

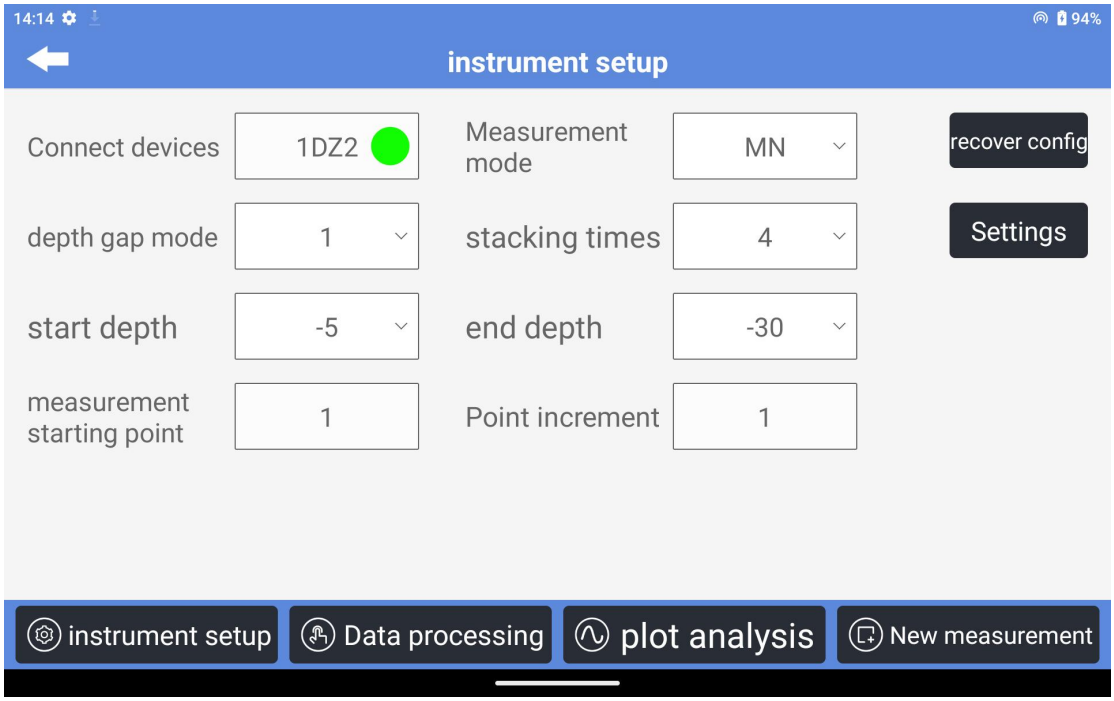

Figure 10

"Online measurement" refers to the direct data measurement, data reading, data processing, drawing analysis and other functions after setting relevant parameters by using the APP operating software on the control host, mobile phone or tablet computer. "Off-line measurement" refers to the use of APP operating software on the host, mobile phone or tablet computer to set the relevant parameters, instead of operating on the host, mobile phone or tablet computer, it uses the "measurement" button on the water-seeking golden-rod to measure, and after the measurement is completed, it connects with the host, mobile phone or tablet computer. Read data and complete data processing, drawing analysis and other functions at one time.

7.2 Online measurement

After the "Instrument Settings" is completed, the "New measurement" (Figure 11) is directly used to measure the data. The "New Project" and "Line No." Need to be entered on the page. The survey mode, equipment model, depth gap mode, start depth and end depth are only for viewing and cannot be set, because the settings have been completed in the "Instrument Settings". To change these settings, go to "Instrument Settings".

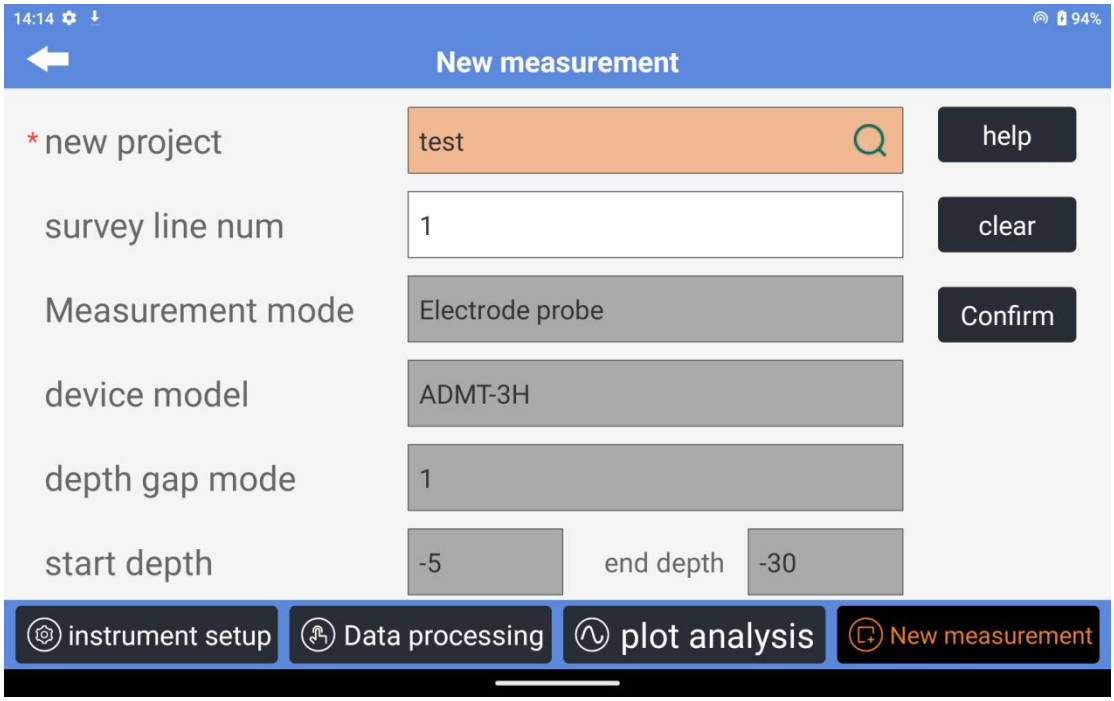

Figure 11

Enter the project name and line number in "New Project" → enter the measurement page (Fig. 12) → click "device detect" → click "sample" → the measurement is completed after the progress bar is completed.

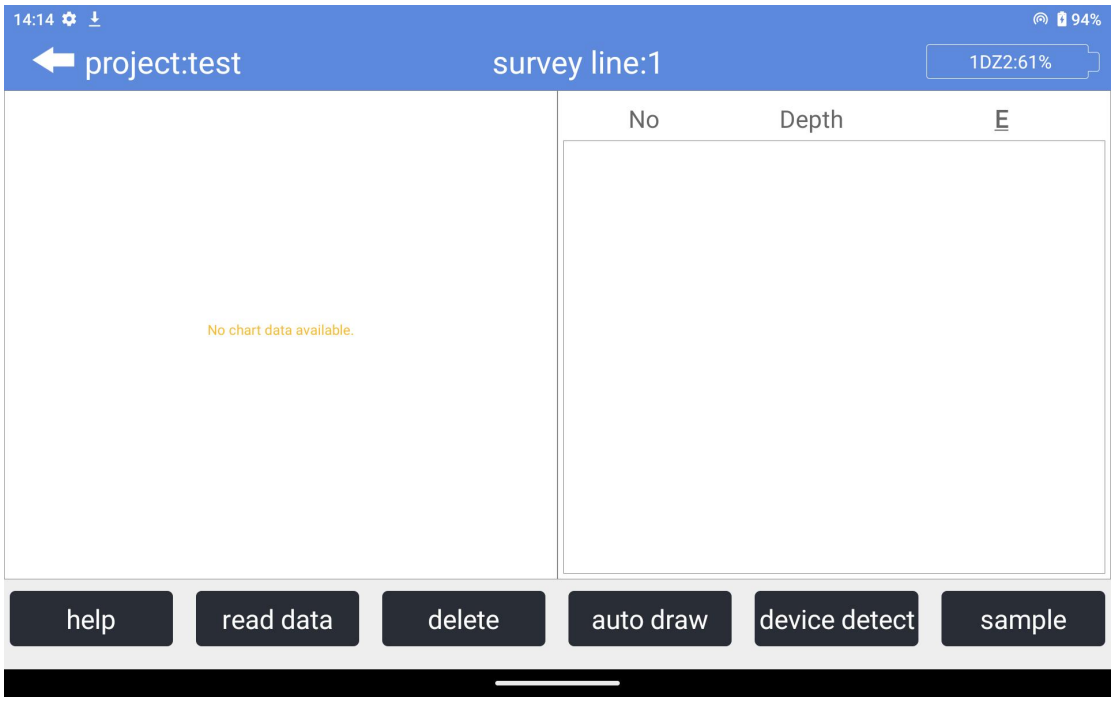

Figure 12

Read data: read the current measurement data in the water-finding golden-rod. After the online measurement or offline measurement can be completed, read the data consistently.

Delete: delete the last read data. When multiple data are read, delete the last one.

Auto draw: jump to the drawing analysis page, automatically draw the vertical contour map of the front data, and also proceed to other related operations of the drawing.

device detect: The device detect can insist whether the connection channel is effectively connected or not, or other related functions.

sample: click the instrument after the arrangement of measuring points is completed for sample.

7.3 Read Data

In the "online measurement" mode, after confirming that the profile measurement has been completed, directly click the "read data" button to read the profile data of this measurement at one time.

In the mode of "offline measurement", after daily connection according to Section 6.5, click "Restore Data" in "Instrument Settings" → enter the project name and line number in "New Project" at will or according to your own habits → click "Read Data" to read the profile data of this measurement at one time.

7.4 Off-line measurement

After the "instrument setting" is completed, the APP software can be closed or not connected, and the "measurement" key at one end of the water-finding golden-rod can be used to realize offline measurement. After pressing the "measurement" key for a long time, two prompts will be given, and the measurement lamp MEAS (green) will flash, indicating that the measurement is in progress. When the water-finding golden-rod gives two prompt sounds again and the measuring lamp MEAS (green) stops flashing and is normally on, it indicates that the measurement of the measuring point has been completed, and it can move down to the next measuring point for repeated measurement until the measurement of the whole profile data is completed.

7.5 Simple Operation Flow Chart

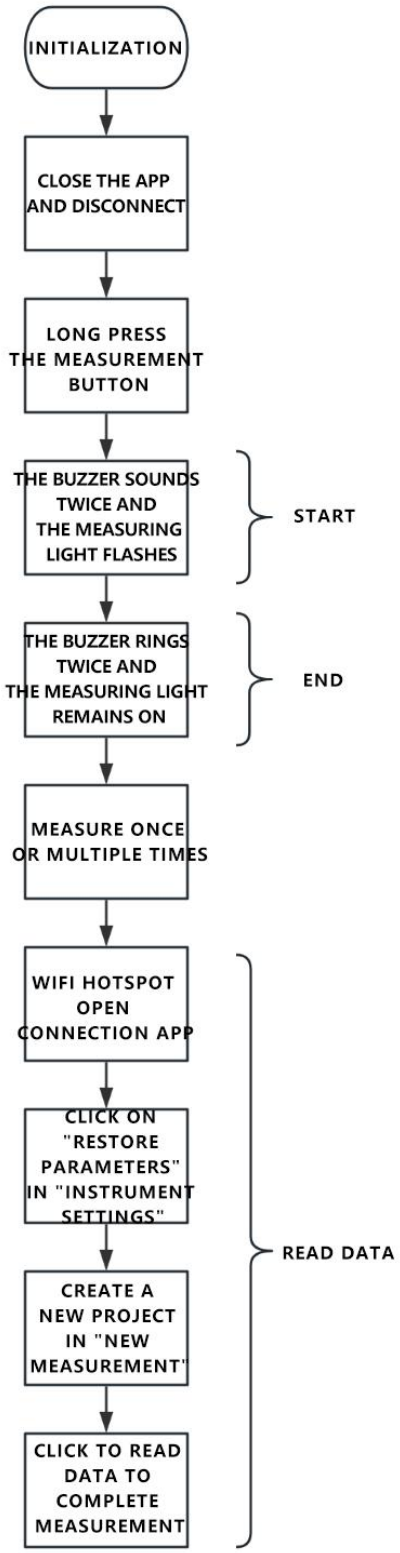

Figure 13

7.6 Precautions for simple operation

1、In the process of measurement, it is possible to exit the software interface or the background process of the software is interrupted. It can be judged whether the measurement is over by the measurement lamp MEAS (green) on the panel of the water-finding golden-rod flashing or stopping. Generally, the measurement is still in progress when it flashes, and the measurement is over when it is on for a long time.

2、In the process of measurement, the software interface can be used alternately by clicking the measurement key (online measurement) and the measurement key (offline measurement) on the panel of the water-finding golden-rod. When the software interface clicks on the measurement, if the water-finding golden-rod is in the process of measurement, the software will prompt "busy".

3、After the measurement, the data is stored inside thegolden-rod and will not be automatically uploaded to the software. You need to manually click "Read Data" to upload the data to the software.

4、In the process of measurement, the operating host, tablet or mobile phone is out of power, but the water-finding golden-rod still has power, so it can continue to use the "offline measurement" method to measure, and then connect to read the data after the operating host, tablet or mobile phone is charged.

5、If thegolden-rod is powered off or crashed during the measurement, the current measured data will be lost, but the previous data will be retained.

8. Drawing Analysis

8.1 Entry mode of drawing function

There are three places to enter the drawing analysis function in Aidu Water APP. The first is to directly click the "auto draw" button to enter the drawing analysis function after reading the data in the "New Measurement" interface. The second is to directly click the "Drawing Analysis" button in the main interface of the software to enter the drawing analysis function. Third, on the file browsing page of the main interface of the software, select a file and click the "Drawing" button to enter the drawing analysis function.

8.2 vertical contour map

After entering the drawing function in the first and second modes, the "vertical contour map" (Figure 14) of the current latest file will be directly displayed. The "vertical contour map" in the upper right corner can be used to switch the "plane

curve map, plane contour map" and other graphics, and the data processing switch in the upper left corner can also be used to switch the graphics before and after data processing. Tap Project to switch to a different project file.

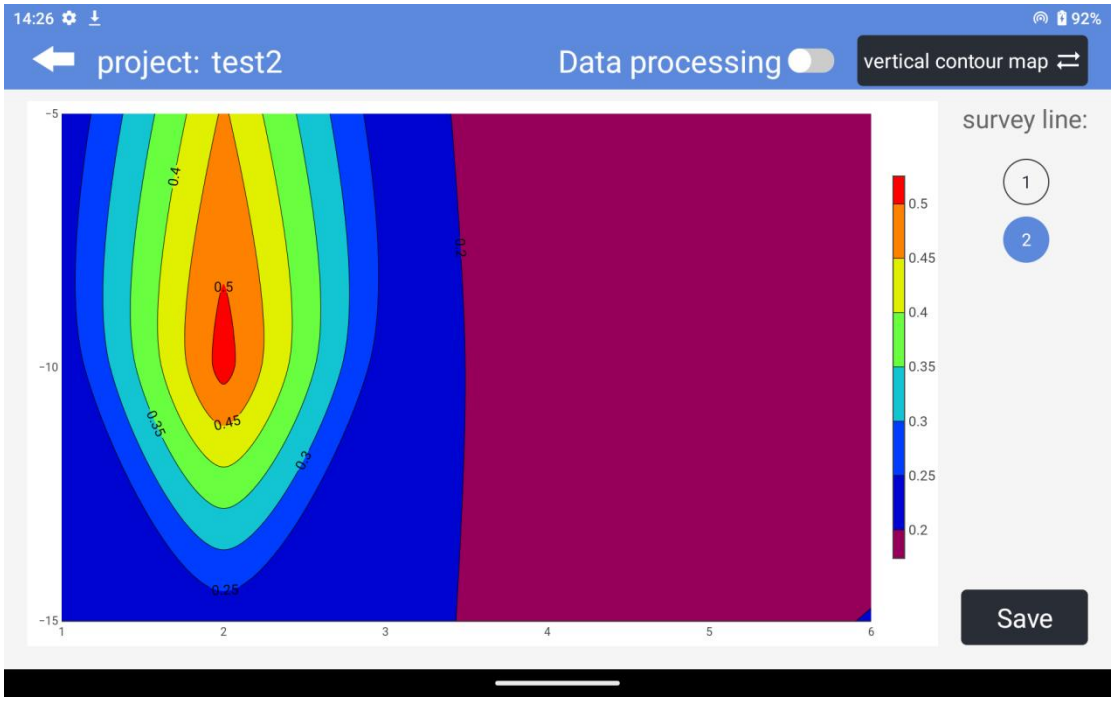

Figure 14

The vertical contour map of all survey lines in the current project file is displayed. You can select the survey line on the left side. Click in the contour map to display the XYZ value at the clicked position (X-survey point number, Y-depth, Z-specific value). "Save" in the lower left corner can save the current image to the tablet or mobile phone. A minimum of one survey line is required, and a minimum of six survey points on each survey line are required for mapping.

8.3 Plane curve diagram

The specific depth data curve of all survey lines in the current project file is displayed (Figure 15). Different depths in the file can be selected on the left, and the current image can be saved by "Save" in the lower left corner.

Figure 15

8.4 Plane contour map

The plane contour map (Figure 16) of all survey lines in the current project file is displayed. On the left side, you can select different depth maps under the file. XYZ values (X-survey point number, Y-survey line number, Z-specific value) will be displayed in the contour map. Save in the lower left corner saves the current image. Generally, at least 2 survey lines and at least 6 survey points for each survey line are required for the plane contour map.

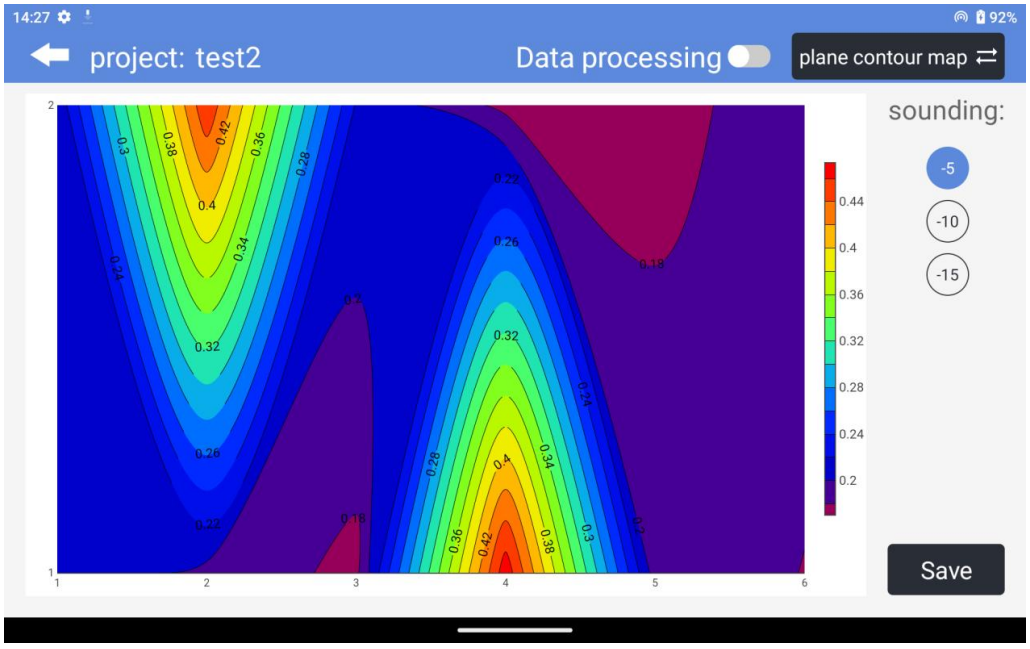

Figure 16

8.5 AI Automatic Analysis

After clicking "AI Analysis", the system will enter the result of AI analysis of the file data (Fig. 17), and the bottom will prompt "The black (red) box with the depth of XX-XX meters near the measuring point xx-xx is an abnormal area" and other prompts. This abnormal area is generally the routine abnormal judgment set by the instrument, and also the location or depth to guide you to drill. Generally, AI will prompt 1-2 areas for you to choose. You can make a comprehensive judgment and make a decision based on your experience and the actual hydrogeological environment.

At the same time, if you are not satisfied with the results, you can click the first operation icon at the bottom right of the screen to enter the AI analysis setting interface (Figure 18), click "Data Download" to download the latest AI analysis parameters, or click "Parameter Type" to select "Default" or "AI Recommendation". Among them, "default" is the ideal analysis parameter set for a certain type of product of the company, and "AI recommendation" is that after the AI analysis system establishes the data model according to the results of user feedback records, AI automatically learns and adjusts the generation of relevant analysis parameters, which in principle is closer to the real analysis. Of course, this needs to be determined by the accuracy of the data marked by the user himself and the number of marks.

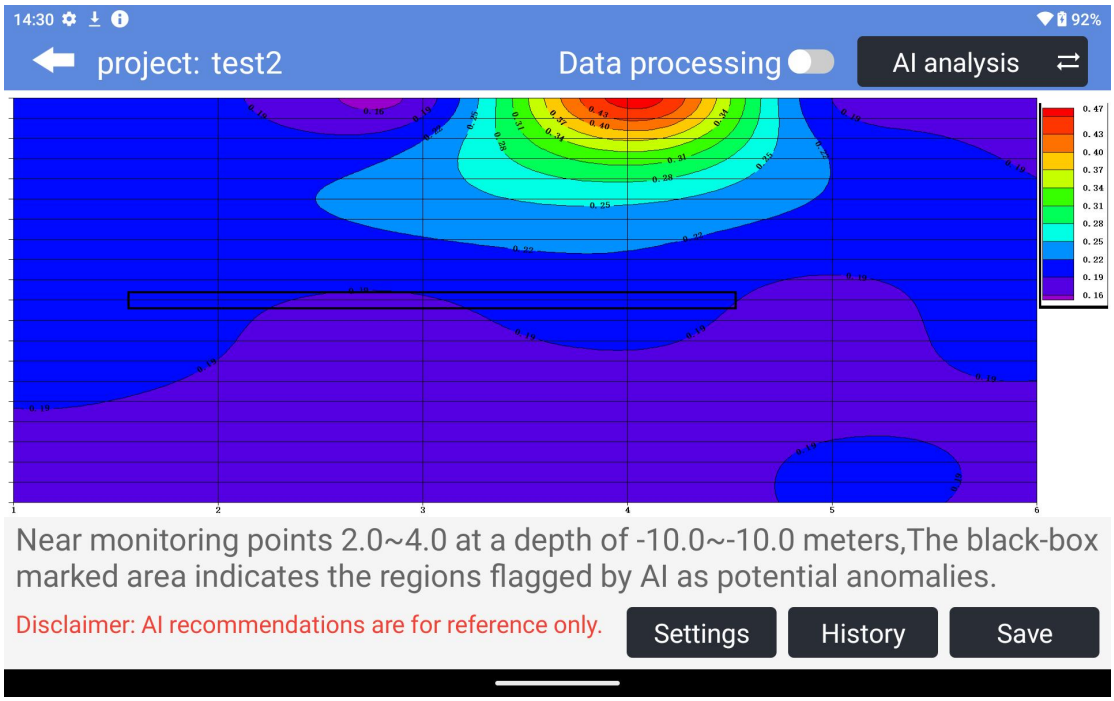

Figure 17

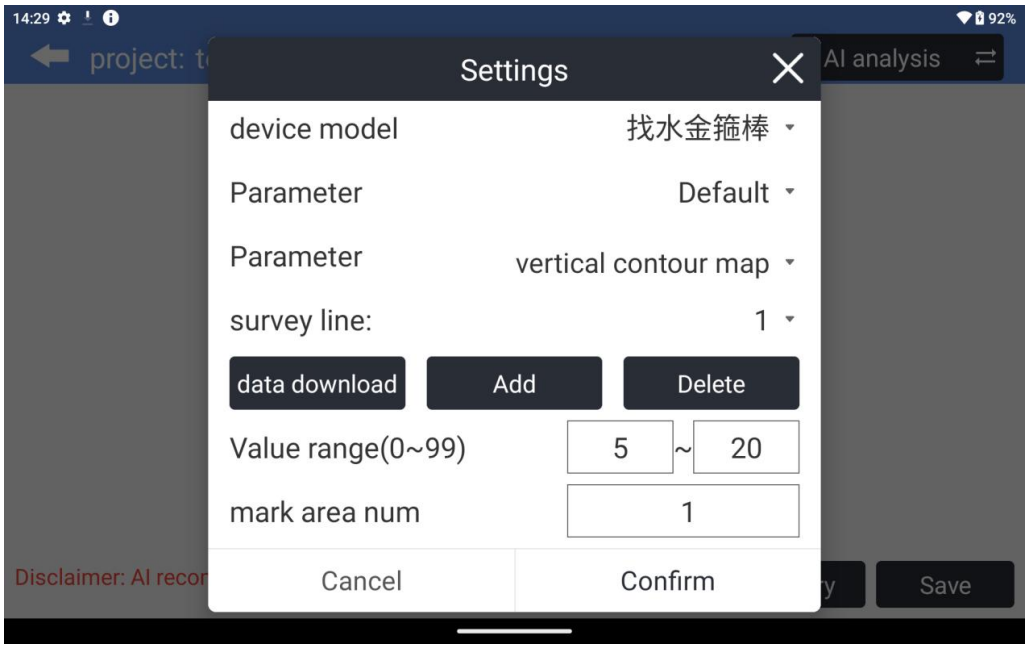

Figure 18

You can also select the "Add" function to manually add the AI analysis parameters belonging to your account. All our analysis algorithms have been concentrated on a percentage representation. You can manually slide the percentage of the value range left and right to adjust the AI analysis results. Generally, the smaller the percentage is, the lower the apparent resistivity will be displayed. The larger the percentage is, the higher the apparent resistivity will be displayed. It can also be an intermediate area, etc. By adjusting this percentage, it can be displayed to the area you think is the most accurate. In this way, AI will analyze according to this setting later, which will be more accurate. You can also set the mark area to 1 so that only one optimal mark area is displayed.

This AI parameter setting generally requires very skilled use of this instrument, and has some practical experience and local data performance of this type of instrument as the basis for setting. If the primary use of this instrument, it is not recommended to use it.

Select Delete to delete this set of Set AI Analysis parameters.

8.6 Record AI analysis result feedback

AI analysis result feedback is very important, because AI is based on user feedback to machine learning, establish effective allocation rules, all AI automatic analysis is "the more accurate, the more feedback the more accurate".

In the AI analysis interface, click the second operation button at the bottom right of the screen to find the history interface (Figure 19). Select the "Default" button in the "Validity" column behind the analyzed data file. If the analysis result is consistent

with the actual situation, click "Yes" (Figure 20). At this time, the system will record the valid data. AI analysis will be more and more accurate.

If not, click "No". After clicking "No", the drawing effect operation box (Figure 21) will pop up. The result of AI analysis can be adjusted by manually sliding the percentage range of the value range left and right. Generally, the smaller the percentage is, the lower the value area will be displayed, and the larger the percentage is, the higher the resistance area will be displayed. It can also be a certain value in the middle. Adjust the analysis result to be consistent with the actual result, and then mark it as valid, so as to increase the amount of data marked as valid. If it is not adjusted, it will not be recorded.

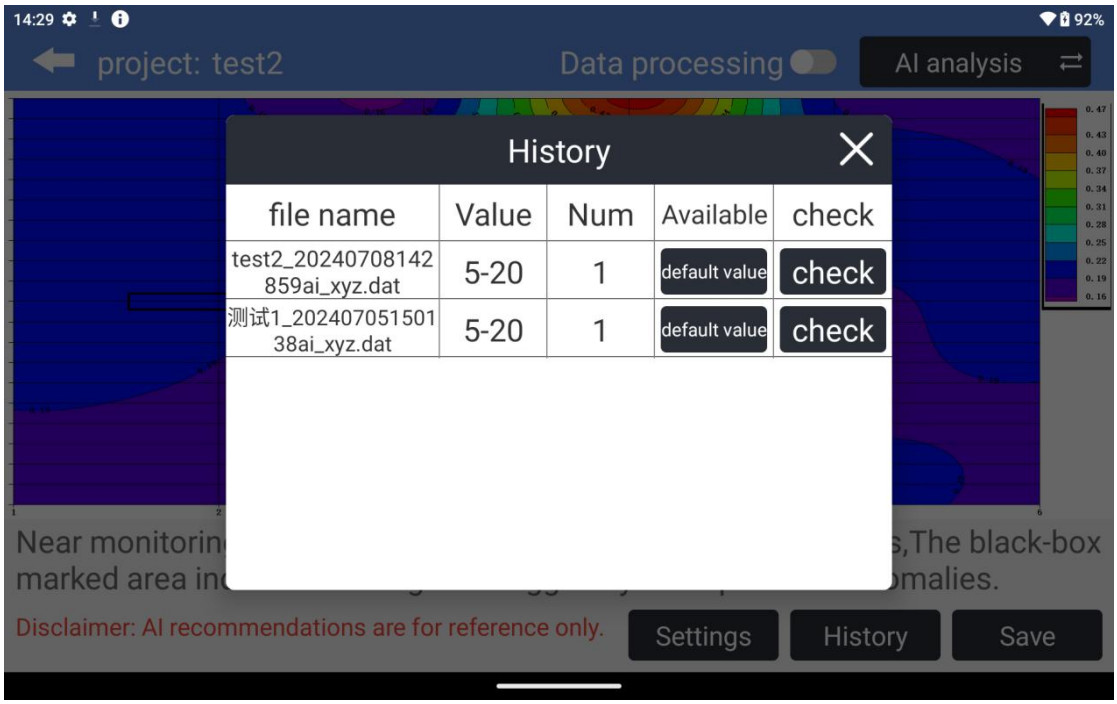

Figure 19

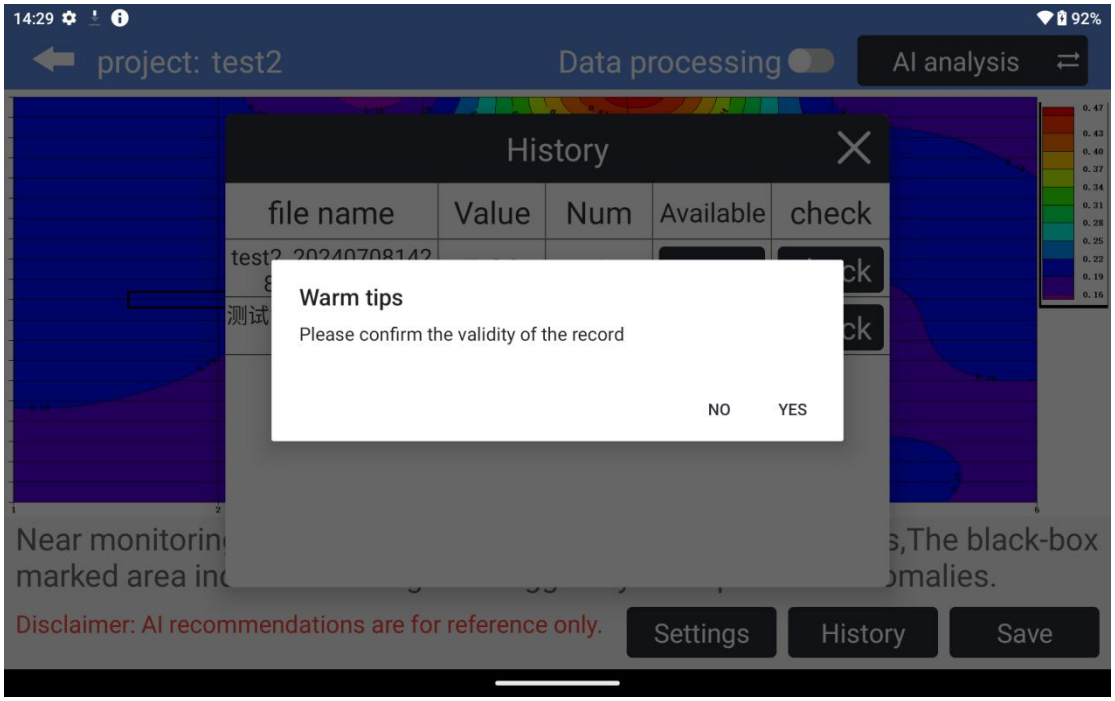

Figure 20

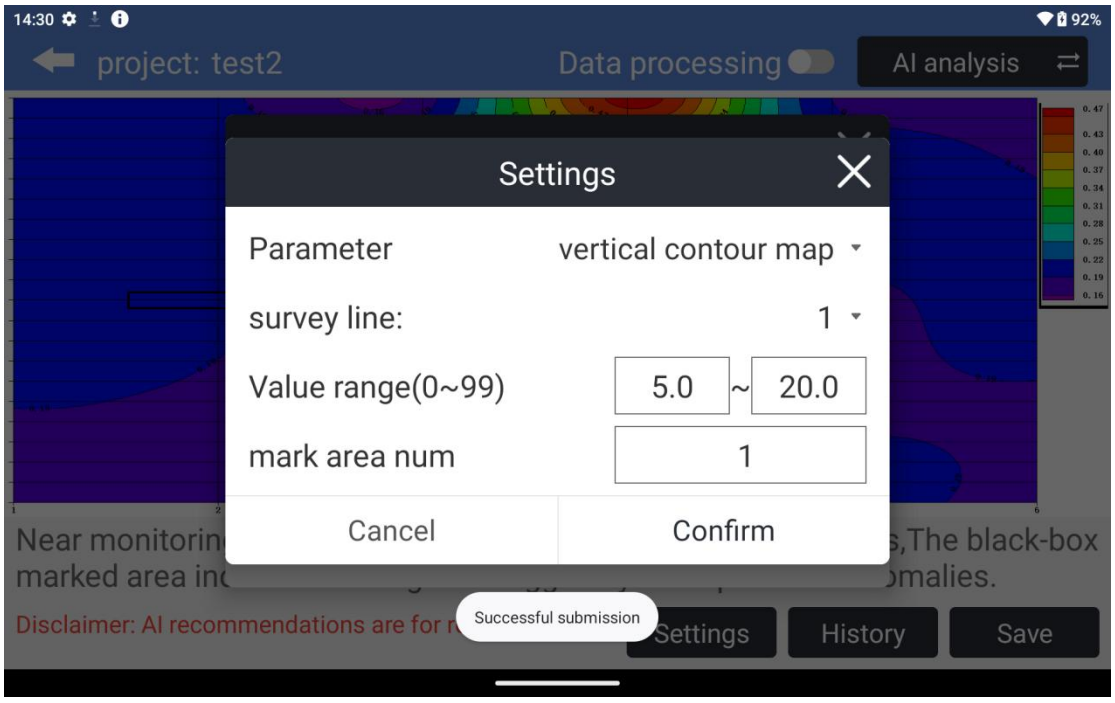

Figure 21

8.7 Save AI Analysis Results

In the AI analysis interface, click the third operation button at the bottom right of the screen (Figure 22) to save the images automatically analyzed by AI.

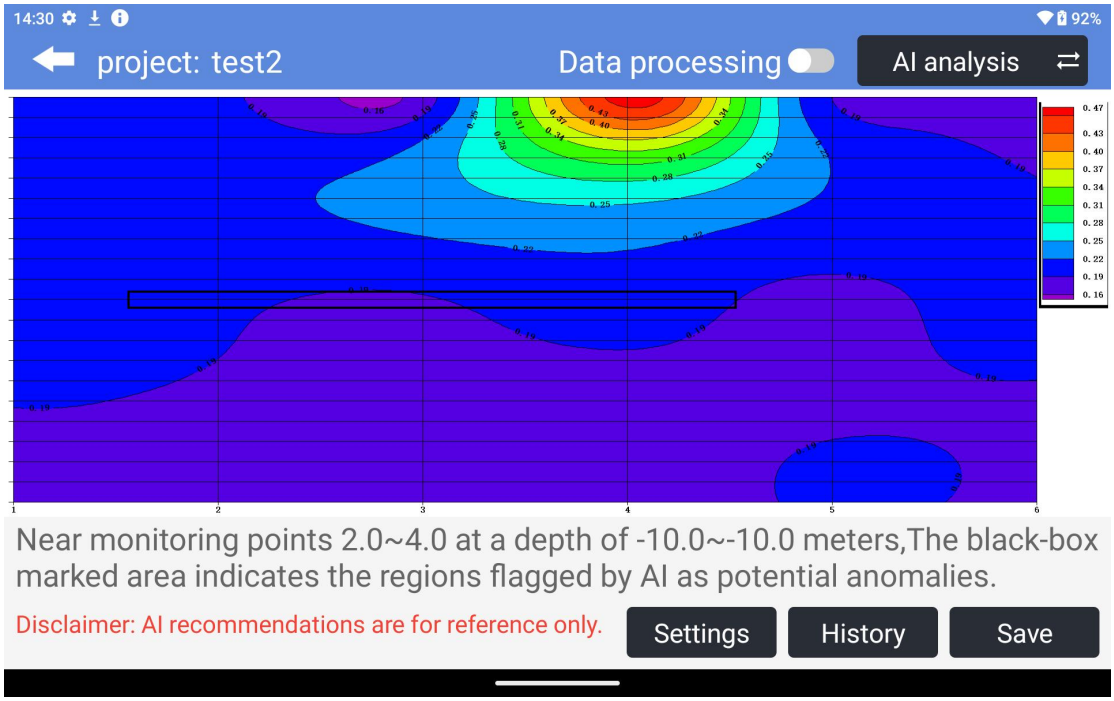

Figure 22

9. Instrument Settings

After connecting the instrument, directly enter the instrument setting interface from the main interface of Aidu Water APP (Fig. 23).

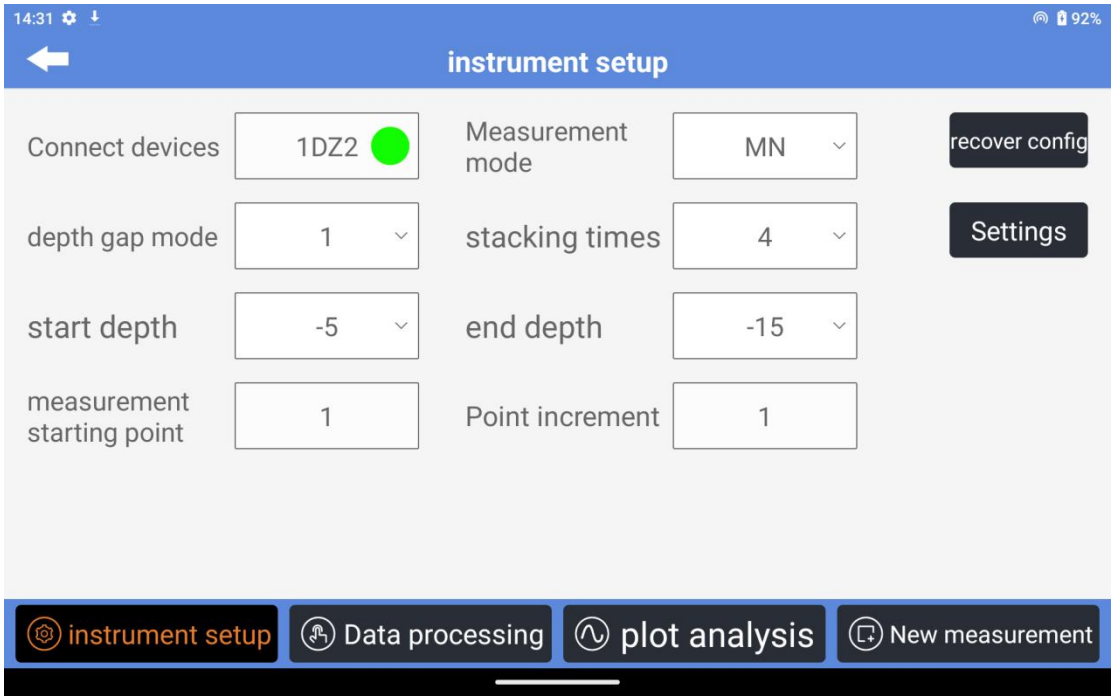

Figure 23

9.1 Connection equipment

The ID number and connection status of the connected device are displayed, with a green light for normal connection and a red light for disconnection.

9.2 Measurement mode

TT (probe) and MN (electrode) modes are available. If MN mode is selected, 4 small electrodes are inserted into the ground. If TT mode is selected, 4 small electrodes are not used. ADMT-3 H has no electromagnetic sensor, so TT mode cannot be used. The default is generally TT.

9.3 depth gap mode

After the upgrade and modification of the water-finding golden-rod, there are three depth gap modes to select, "1" mode is 5 meters interval, and the measurement depth is -5, -10, -15 to be carried out; "2" mode 10 m interval, measurement depth is -10, -20, -30 The "3" mode is 20 m interval, and the measurement depth is -20, -40, -60 to carry out. The default is "2".

The depth measurement time of each layer is about 7 seconds, for example, the minimum depth is -5, the maximum depth is -300, and the selection mode "1" needs to measure 30 layers, so the measurement time is about 210 seconds.

9.4 Number of Stacks

This is to set the superposition times of AD conversion. Generally, the higher the selection times, the more accurate the data will be, but the longer the measurement time will be. The default value of the software is "4", and the optional range is "4-16". Users can set and adjust it according to actual needs.

9.5 Start depth

Select the starting depth of the survey. You can select any starting depth within the maximum depth range of the water finding gold hoop rod and under any mode of "1", "2" and "3". Generally, the default is the minimum depth value under the mode "2" of the model.

9.6 End depth

Select the end depth of the survey. Any depth within the maximum depth range of the water-finding golden-rod can be selected, but it cannot be the same as the start depth. Generally, the default value is the maximum depth value under the model mode "2".

9.7 Starting point of measurement

Enter the initial number of the measuring point of the profile, generally 0, 1, or other values, both positive and negative, and the starting point of the profile file will automatically increase according to the settings. The default value is 1.

9.8 Point increment

Enter the automatic increment of the survey number, which is generally 1 or more (it can also be a negative value). The profile is automatically incremented to the next survey point value based on the survey point increment on the basis of the start point. The default value is 1.

9.9 Recovery config

You can read the relevant parameters set last time in the water-finding golden-rod.

9.10 Setup

Click the "Set" key to complete the setting, and transmit the relevant parameter settings to the water-finding golden-rod instrument.

10. Data processing

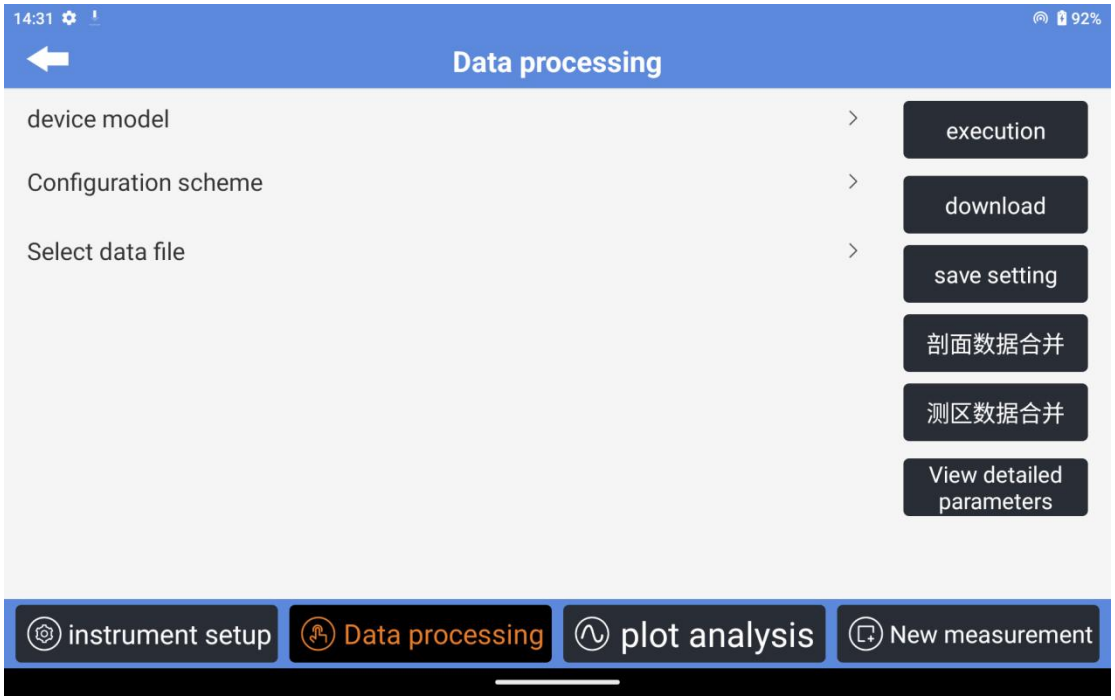

Figure 24

10.1 Equipment model

After the APP software is connected to an instrument model, the software will automatically identify the instrument model; You can also select the currently used device model after binding the used device in "Device Binding" in "User Information". After the upgrade and modification of Aidu Water Exploration, the principle of geophysical exploration is more followed, and different data processing methods are set according to the application scenarios of different instruments, such as different uses and different depths. In principle, the data processing methods of each instrument model are different.

10.2 Configuration Scheme

In addition to the "default" parameter settings provided according to different models after the upgrade and modification of the water-finding golden-rod, the detailed settings of data processing parameters can also be customized, which can better meet the user's local hydrogeological environment and personal use habits. Of course, it is generally necessary to set the parameters after being very skilled in using this type of instrument or relatively very professional people. In general, it is not recommended to use it. It is better to use "default".

10.3 Selecting a Data File

Select a file to be processed for data reprocessing.

10.4 Execution processing

After selecting "Equipment Model", "Configuration Scheme" and "Data File", click "Execute Processing", and a window will pop up to prompt to enter the generated file name. After entering, click OK to complete the data processing. If you do not need to work with data files, you do not need to use this function.

10.5 Download parameters

Downloading the latest parameters that the company matches for the model in the cloud for data processing will make the data processing more accurate.

10.6 Save Settings

Saves the current data processing parameter settings for use in data and plot analysis. Click "Save Settings" to save the data processing parameters, whether they are downloaded, automatically matched or customized.

10.7 Viewing Main Settings

Click to modify the parameter scheme on the left side (Figure 25). After the parameter modification, you can create the current scheme to the cloud -- "Add Scheme", save the current parameter configuration to the current scheme -- "Modify Scheme", and delete the current scheme -- "Delete Scheme".

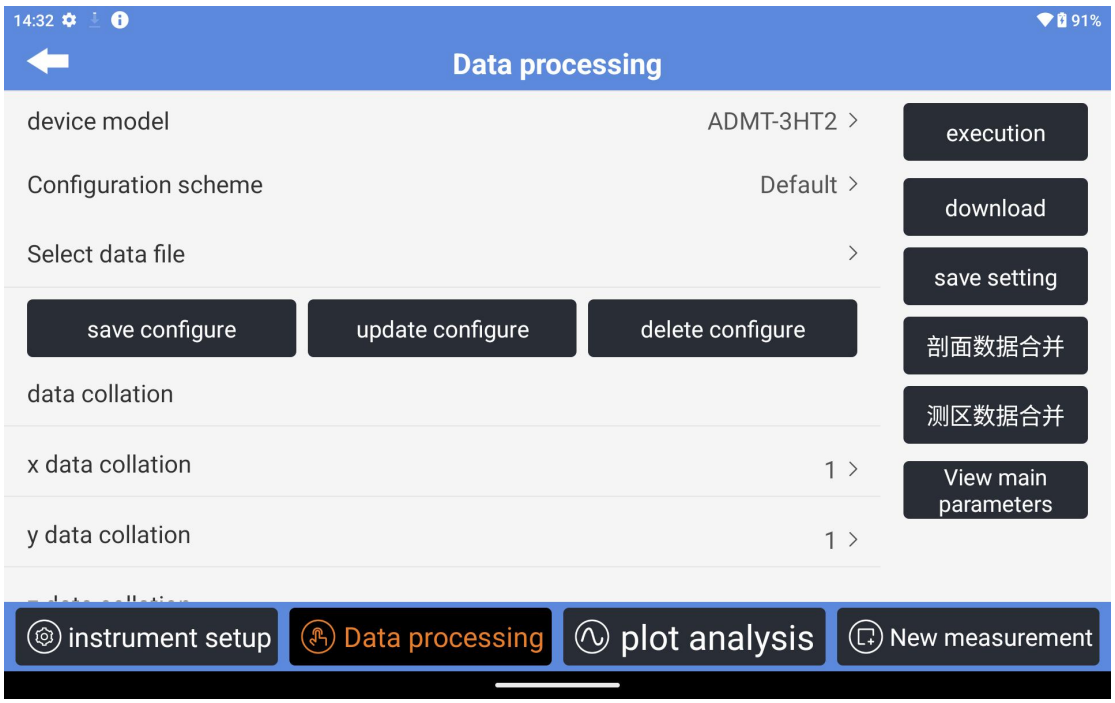

Figure 25

10.8 Merging of profile data

Multiple data files can be merged to form a profile file (as shown in Fig. 26). Fill in "Measurement starting point", "Point increment" and "Generated file name" → press "Add file" and select the data file to be merged → click to confirm. Files that need to be merged must first be data processed.

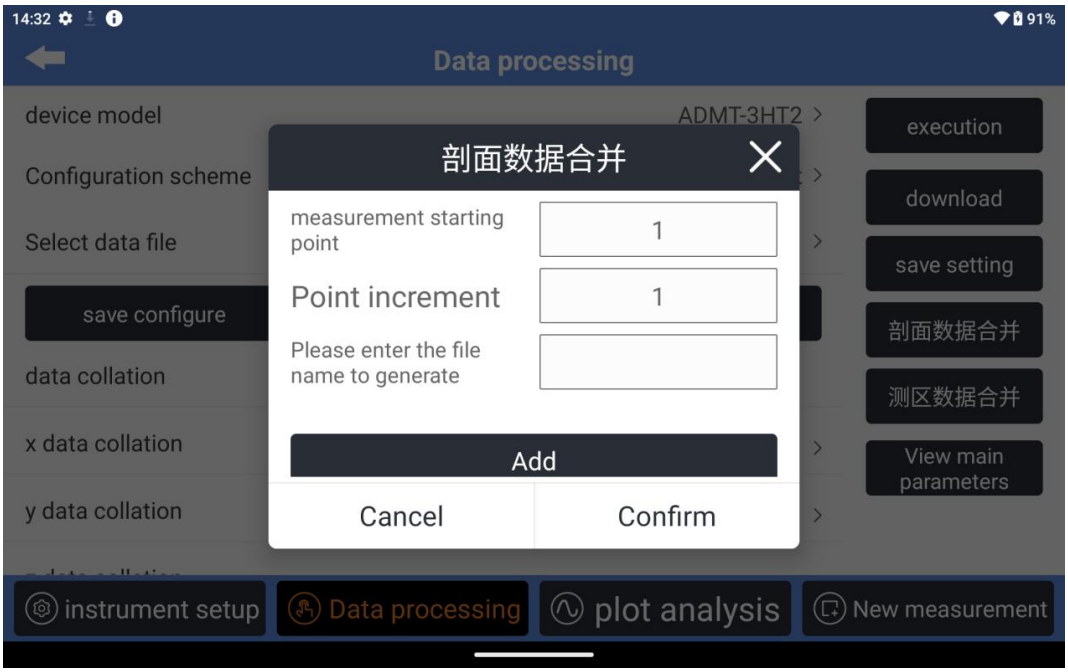

Figure 26

10.9 Data consolidation of survey area

Multiple data files can be merged to form a survey area file (Fig. 27). Fill in "Survey starting point", "Survey point increment", "Number of the first survey line", "Lateral line spacing" and "Generated file name" → press "Add file" and select the data file to be merged → click to confirm. Files that need to be merged must first be data processed.

Figure 27

11. System Settings

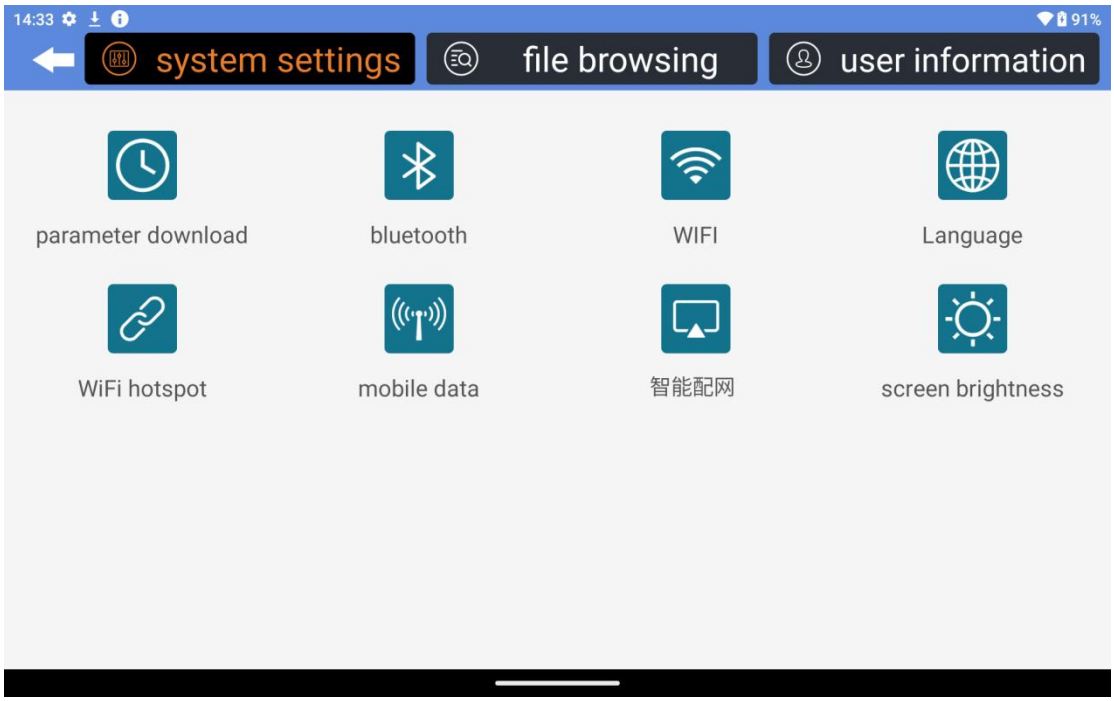

Figure 28

11.1 Parameter Download

Some instrument parameters need to be downloaded, but generally do not need to be used, and the water-finding golden-rod does not need to download parameters.

11.2 Bluetooth settings

It is used to open the system Bluetooth setting function in the control host, mobile phone or tablet computer.

11.3 WIFI settings

It is used to open the system WiFi function in the control host, mobile phone or tablet computer. It is used to set the WiFi hotspot name and password when the instrument is initialized.

11.4 Language Settings

Switch software language settings, with Chinese and English options.

11.5 WIFI Hotspot

It is used to open and control the system WiFi hotspot function in the host, mobile phone or tablet computer. After initialization, this function is often used to open the WiFi hotspot during daily connection. Because there is an automatic protection mechanism in the Android or Hongmeng system, the WiFi hotspot will be automatically closed after a long time of non-use.

11.6 Mobile Data Settings

It is used to open the mobile data switch setting function in the control host, mobile phone or tablet computer. If the control host supports 4G Internet access, you can choose to control the use by yourself.

11.7 Intelligent distribution network

For intelligent distribution network equipment, this function is not required for the water-finding golden-rod.

11.8 Screen Brightness

It is used to turn on and control the screen brightness and screen off time in the host, mobile phone or tablet computer.

12. Document browsing

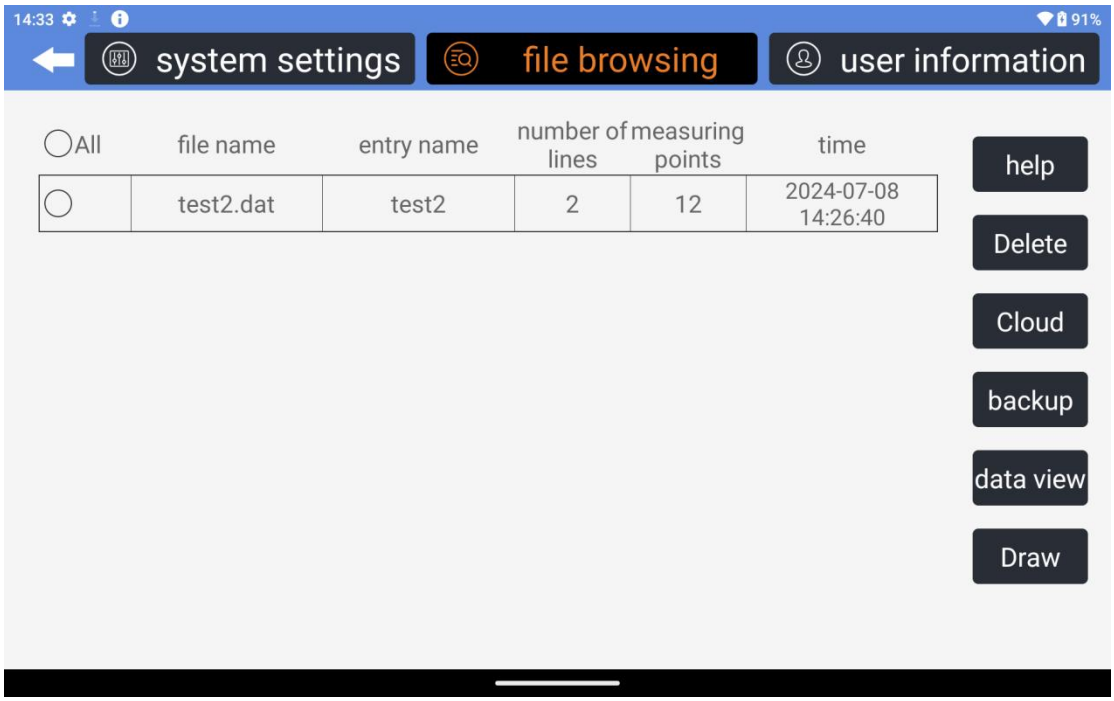

Figure 29

12.1 List of documents

You can view the file name, project name, number of survey lines, number of survey points, time and other detailed information of the stored file. You can select one or all of the file to perform other functional operations.

12.2 Help

Help can be queried for relevant help information, if any.

12.3 Deletion

After selecting the file to be deleted, clicking the "Delete" key will prompt "Are you sure to delete the selected file? Cannot be restored after deletion.

12.4 Cloud

Enter the cloud interface (Figure 30) to share the cloud files to other users, download the cloud files or delete the cloud files.

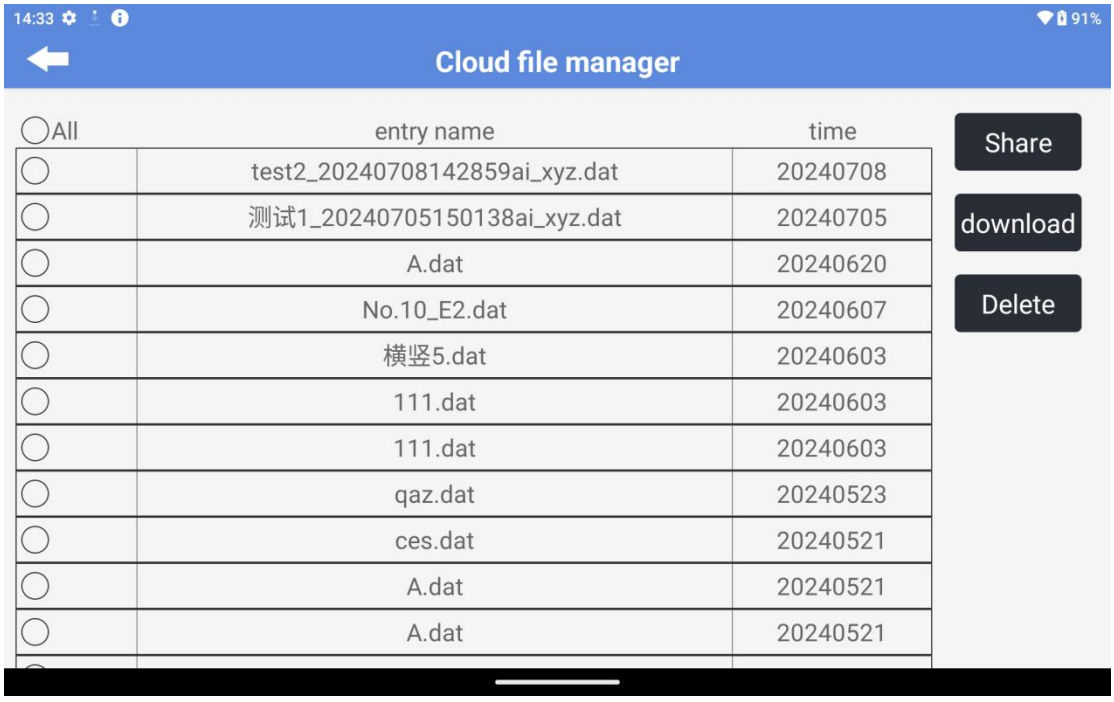

Figure 30

12.5 Backup

After selecting a file, click Backup File to back it up to the cloud.

12.6 View

After selecting the file, click View File to view the data in the current measurement file.

12.7 Drawing

After selecting a file, click Plot to enter the "Plot Analysis" interface of the corresponding file. For details, refer to Plot Analysis in Chapter 7.

13. User Information

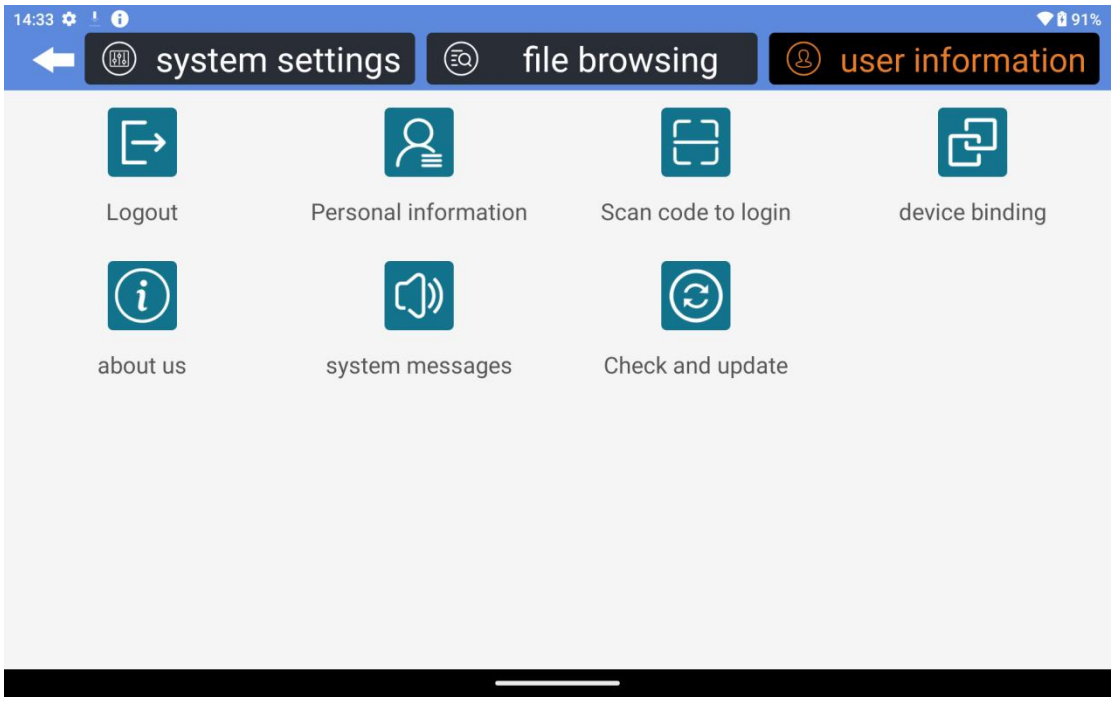

Figure 31

13.1 User Login/Logout

User login: Enter the mobile phone number to get the login password. After entering the login password in the SMS, you can log in directly. Login requires reading and agreeing to the user agreement and privacy protection policy. If you have not registered before, login is registration.

User exit: exit the current account.

13.2 Personal Information

View the personal information of the current account.

13.3 Login by scanning code

Use the control host, mobile phone or tablet computer with camera to scan the code to log in the http://web.aidush.com of Aidu Data Processing System. Please select the account of "Aidu Looking for Water" when logging in.

13.4 Device Binding

The connected instrument and equipment model can be bound to the login account or unbound.

13.5 About Us

Display software version, user agreement and privacy protection policy details.

13.6 System messages

System messages can be queried.

13.7 Checking for updates

Check whether the software is updated with the latest version, and select the update as required.

14. Aidu WEB Intelligent Data Processing System

14.1 Aidu WEB Data Processing System Login

Use the browser to access the Aidu data processing system (http://web.aidush.com), select the account type of "AIDU Water Detector", and log in with the same mobile phone number and password as the instrument or mobile phone, so as to share all the data under the account, or scan the code to log in through the Aidu Exploration APP in the mobile phone (Figure 32-36).

Figure 32

Figure 33

Figure 34

Figure 35

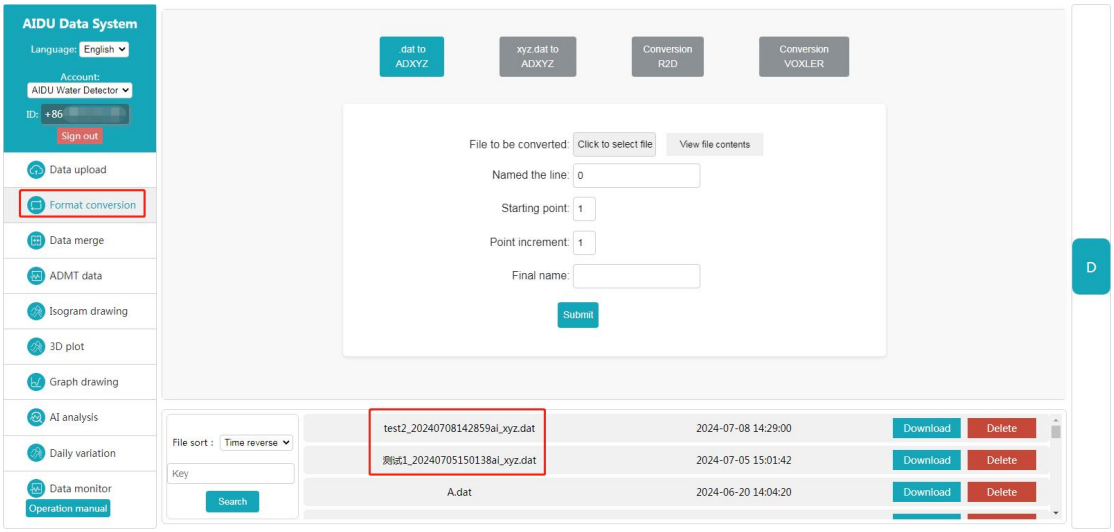

Figure 36

14.2 Data upload

After selecting "Data Upload" on the left, you can select the data files in the computer from the folder icon in the middle to upload. Click the + sign to select multiple files. After clicking "Data Upload", the data will be uploaded to the cloud database of the current application type of the current account. If the data in the instrument is selected for backup, it will be automatically saved in the data file list at the bottom, and there is no need to use this upload function.

14.3 Data export

Method 1: Log in to your account, backup to a webpage, and then download to your computer.

Method 2: Connect the phone to the computer with a data cable, select the file management mode on the phone, and then open the folder according to the following path: computer name \ phone model \ internal storage device \ Android \ data \ com. aidush. app. water \ files \ aiduw_water \ data. The dat file inside is the data file.

14.4 Data format conversion

Click "Format Conversion" and select "Old File Conversion ADXYZ" to convert the.dat file of the old Aidu instrument data into an.adxyz file (the data column of the.dat file of the old instrument data is frequency, and the row is measuring point data), and then you can operate the website function. Select the file to be converted after selecting "New file conversion ADXYZ". You can select which column of the converted file is used to compose the X, Y and Z data columns. At the same time, you

can also select the range of depth and measuring point. Select "R2D data conversion" to convert the selected file into the inversion data format required by the Swedish Res2dinv high-density instrument. After selecting "Download" the data, the Swedish Res2dinv software can be used for further inversion mapping; Select "VOXLER Format Conversion" to convert the selected file to VOXLER 3D software to draw 3D drawings.

AI analysis or mapping that has been used in Aidu equipment or APP will generate _ XYZ. DAT files, which can be directly used for AI analysis of web pages (Figure 37-38).

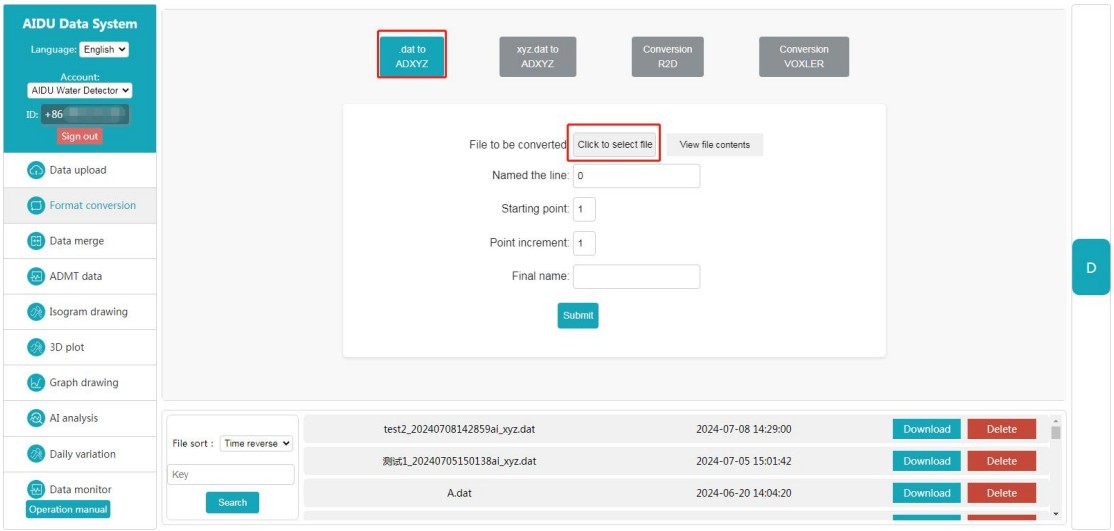

Figure 37

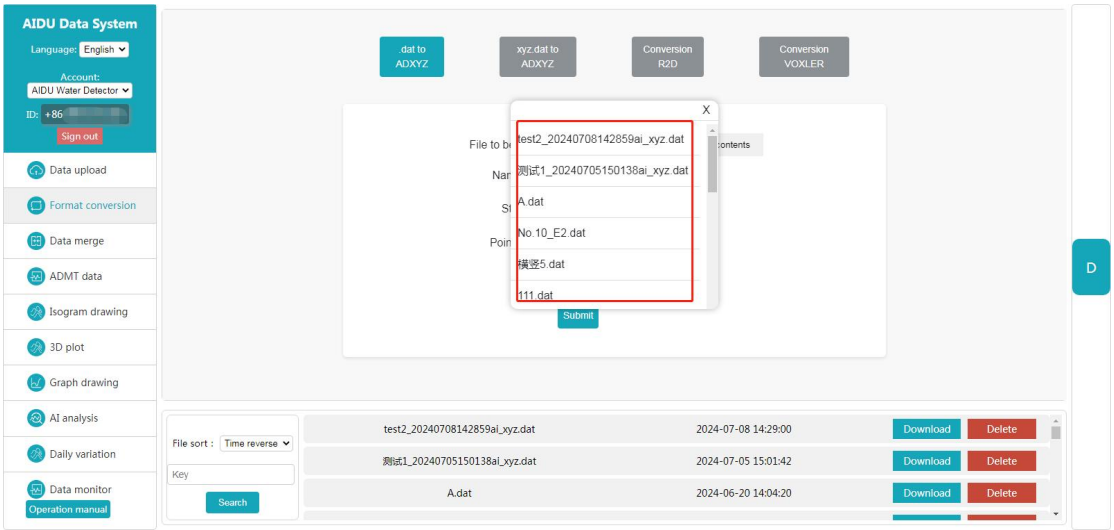

Figure 38

14.5 Data consolidation

Data merging is divided into profile data merging and survey area data merging.

Profile data merging can merge multiple measurement files into one profile data. The specific operation is to select the name of the first file to be merged by clicking "Select File" under profile data merging. You can click the plus sign to add the dialog box of "Select File by Clicking" to select other files until the files to be merged are selected in order. Reset the measurement starting point and Point increment, both of which can be defaulted to 1, and set a new file name. Click "Submit" to complete the merging. After that, the new file name will be displayed at the front of the data line. Each new file will be a complete profile file.

Survey area data merging can merge multiple survey line (profile) data files in the survey area together, so as to draw three-dimensional maps and plane profiles, etc. The specific operation is to select the name of the first file to be merged by clicking "Select File" under the survey area data merging menu, and to select other files by clicking the plus sign to add the dialog box of "Select File". After the files to be merged are selected in sequence, the parameters such as the measurement starting point, the Point increment, the first survey line number, the survey line spacing, and the new file name are redefined, and then the merge is executed by "Submit". After the merge is completed, the new file name is displayed at the front of the data line, and each new file is a merged complete survey area file. The measurement starting point and Point increment can be defaulted to 1, the number of the first measuring line can be defaulted to 0, the distance between measuring lines can be defaulted to 1 or the vertical distance between two adjacent measuring lines, the name of the new file can be customized, and the distance between measuring lines can be automatically increased.

14.6 ADMT Data Processing

The ADMT data processing function can perform corresponding data processing on the original data of the instrument. The file that can be processed is the.adxyz file.

The data processing parameters can refer to the operating instructions in 9.7 of this manual.

14.7 Contour mapping

The contour map can be drawn from the processed data file. The specific operation is to select the function of "drawing contour map" on the left, click the name of the file to be drawn and draw the contour map. The default is "classic contour map". You can switch to "new contour map" in the upper right corner and then select the file to draw.

If it is a survey area data file, the "vertical contour map" and "plane contour map" can be switched. How to obtain the survey area data file can be obtained by setting each survey line during instrument operation and measurement, or by referring to the survey area data merging function in Article 9.9 of this manual.

14.8 Plotting the graph

Select "Draw Curve Chart" to draw various types of curves. The specific operation is to select the "Draw Curve Chart" function on the left, click the file name to be drawn and draw the curve. You can switch the multi-color broken line chart, gray broken line chart and gradient broken line chart in the upper right corner to switch different types of curves.

14.9 AI Automatic Analysis

Click the function of "AI automatic analysis" on the left, and then select adxyz or XYZ. DAT file. You can also modify the AI analysis effect in the operation bar on the right side of the webpage. The account that has been connected to the instrument in Aidu Instrument or Aidu APP has been automatically bound to the instrument, and the bound instrument will be displayed by default in "Device Model" (Figure 39).

If the account has not been bound to the instrument, you need to manually enter the instrument model in the "Model Query". After manually entering the "Model Query", you can select the recommended configuration in the "Configuration Name" below, or enter the desired values in the "Value" and "Number of Target Areas".

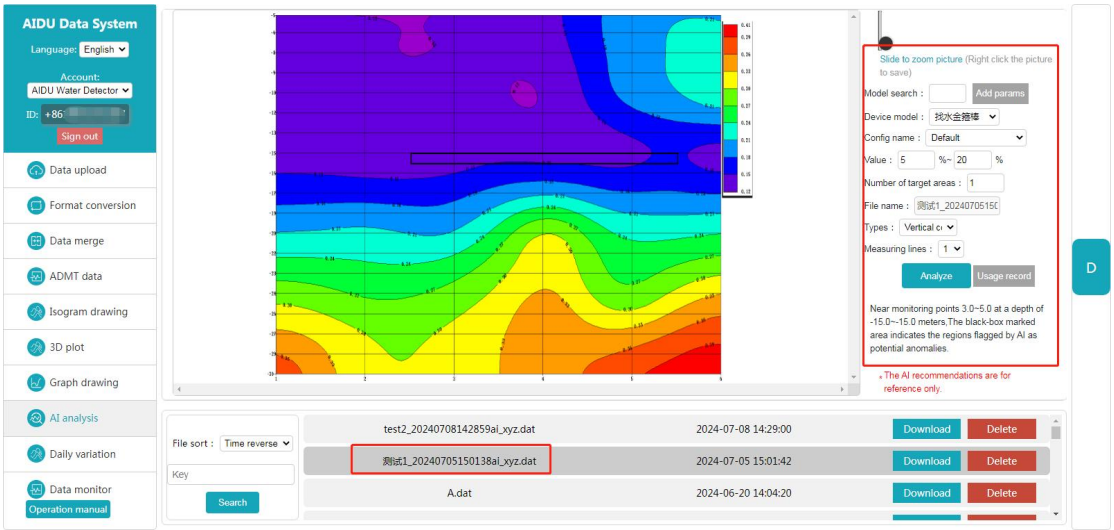

Figure 39

To record whether the AI analysis result is valid, click "Use Record" in the right operation bar, and select "Valid" and "Invalid" behind the analyzed data file (Figure 40).

If the analysis result is consistent with the actual situation, check Valid. At this time, the system will record valid data. The more valid and accurate data are recorded, the more accurate the AI analysis will be.

If not, check "Invalid", and a prompt box will pop up. You can manually adjust the analysis result to be consistent with the actual result, and then record it again. If it is not adjusted, it will not be recorded (Figure 41).

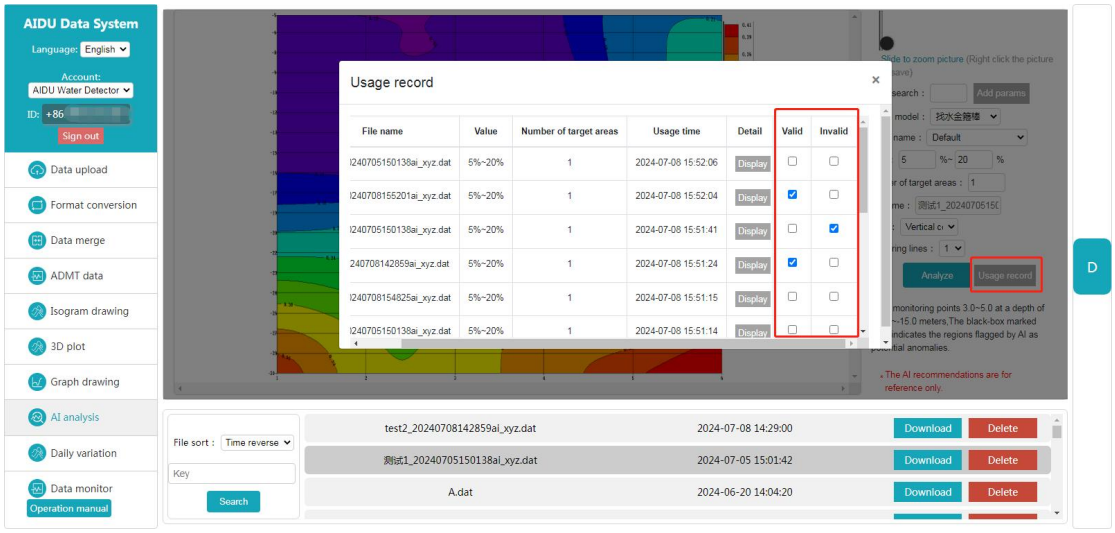

Figure 40

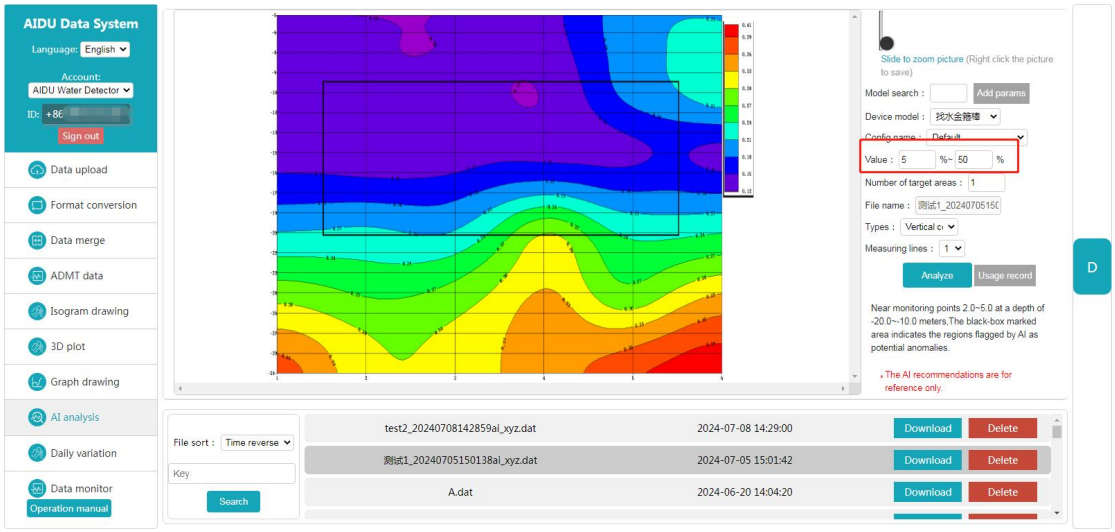

Figure 41

15. Usage of MN and TT Measurement Modes

15.1 MN electrode mode measurement method

Connect the MN metal electrode of the water-finding gold hoop rod. Refer to Chapter IV and V of this manual for instrument initialization and daily connection settings.

After the equipment is started, the measurement depth and the measurement mode are

selected to select the MN electrode, the installed MN metal electrode is inserted into the ground, the sample can be started in the on-line measurement or off-line measurement mode, the positions of the water-finding golden-rods are recorded at the measuring points, and the measuring points are moved to the second measurement O2 after the first measurement O1 is completed. And so on to complete the third measurement of O3, O4, O5, O6, … Until the entire profile is measured (Figure 42). The distance between O1 and O2, and between O2 and O3 is called point spacing, which is generally ≤ the size of the exploration target, and the unit is meter.

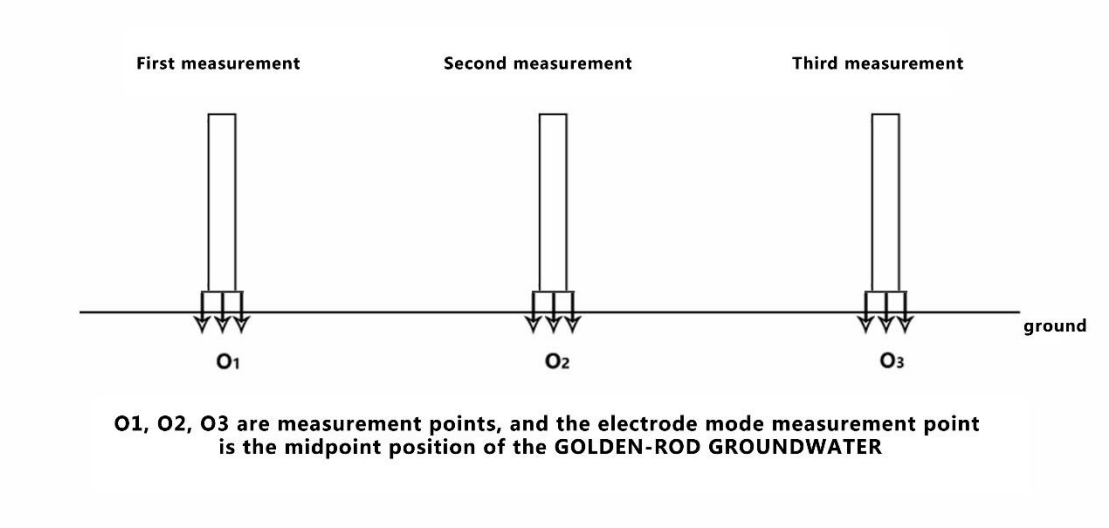

Figure 42

15.2 TT Electromagnetic Probe Measurement Mode

After the equipment is started, select the measurement depth and the measurement mode to select the TT probe, lay the equipment flat on the ground and start sample in the online measurement or offline measurement mode, record the central position O of the equipment, move to the second measurement O2 after completing the first measurement O1, and then complete the third measurement O3, O4, O5, O6 Until the entire profile is measured (Figure 43). The distance between O1 and O2, and between O2 and O3 is called point spacing, which is generally ≤ the size of the exploration target, and the unit is meter.

Of course, it can also be measured vertically like the MN electrode mode (Fig. 44). Insert the installed MN metal electrode into the ground or place it on the ground (the MN metal electrode is not used, and it is mainly fixed or placed horizontally), and start to collect data in the online or offline measurement mode, and record the position of the water finding golden hoop at the measuring point. After completing the first

measurement O1, move to the second measurement O2, and so on, complete the third measurement O3, O4, O5, O6, … Until the measurement of the whole profile is completed. The distance between O1 and O2, and between O2 and O3 is called point spacing, which is generally ≤ the size of the exploration target, and the unit is meter.

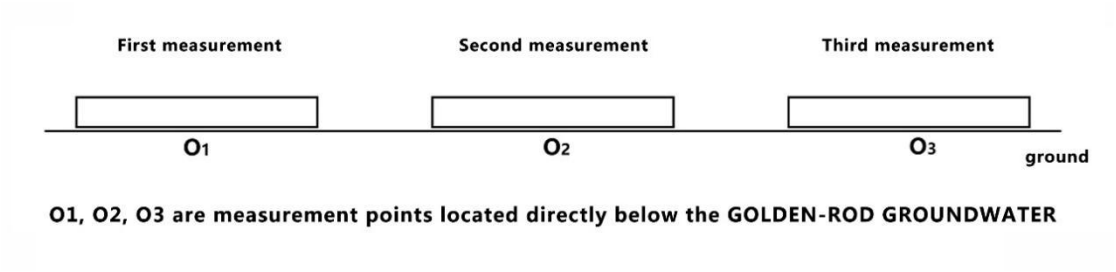

Figure 43

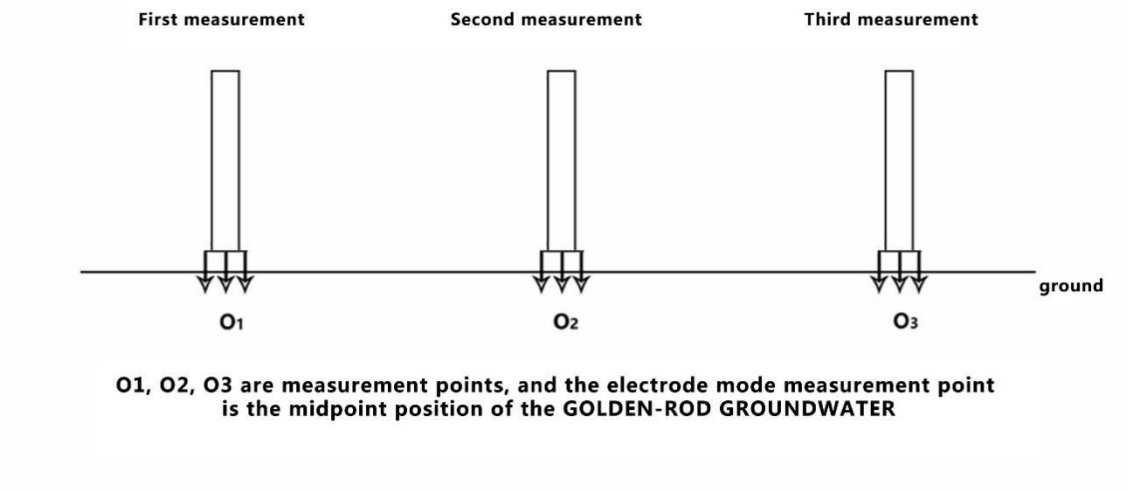

Figure 44

16. Field Survey Line Layout Method

The layout of survey line is a very important link in the exploration. The layout of survey line will directly affect the measurement accuracy and improve the anti-interference ability. The basic principle is that the direction of the survey line should be perpendicular to the direction of the exploration target, the straight line profile should be as straight as possible, the circular profile should be as round as possible, and the ground should be as flat as possible. Select different survey line layout methods according to the actual topography and landform.

16.1 Parallel layout method of straight line section

Straight line section is the most commonly used layout method, and multiple straight

line sections are formed by multiple straight line sections in parallel, which can quickly determine the trend of the exploration target. First, suppose and judge the strike of the exploration target, and arrange the survey line perpendicular to the direction of the exploration target (as shown in Figure 45). One or more straight sections can be arranged, and generally 2-3 straight sections can be arranged to quickly judge the strike of the abnormal body. Multiple straight sections can be arranged according to the length of the exploration target, and the distance between each straight section is called the line distance. The line spacing is generally ≤ the length of the exploration target, and the unit is m.

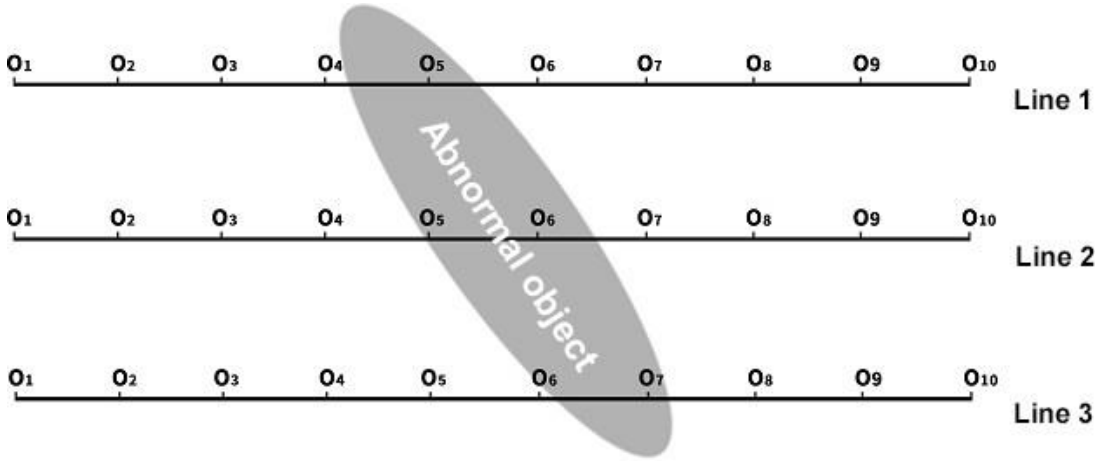

Figure 45

16.2 Cross or Oblique Line Cross Layout Method of Straight Line Section

When an abnormal body is found after measuring a straight line profile or the site is relatively limited and it is difficult to lay multiple straight line profiles, the cross (as shown in Figure 46) or oblique line (as shown in Figure 47) can be used to lay the second straight line profile. Combining the abnormal areas of the two straight line profiles can repeatedly confirm the existence of the exploration target, and can also assist in judging and confirming the general trend of the exploration target.

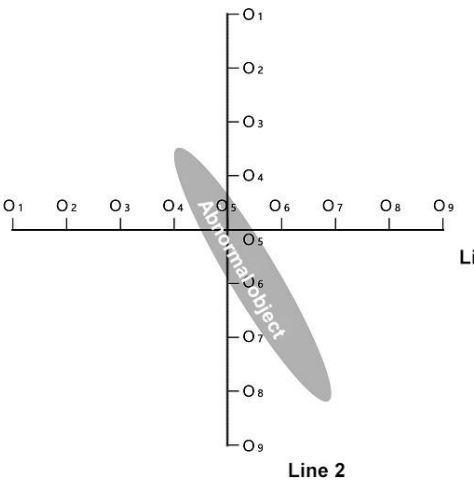

Figure 46

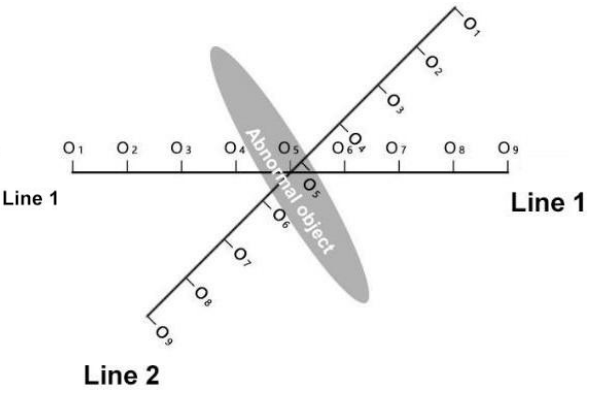

Figure 47

16.3 Circular section layout method

When the survey site in some areas is indeed narrow or there are point-like interfering objects such as transformers and signal transmission towers nearby, a circular (Fig. 48) or semicircular (Fig. 49) profile is laid with the site or interfering objects as the center for measurement, and the trend and location of the exploration target objects (water veins, mineral veins, etc.) can also be quickly traced.

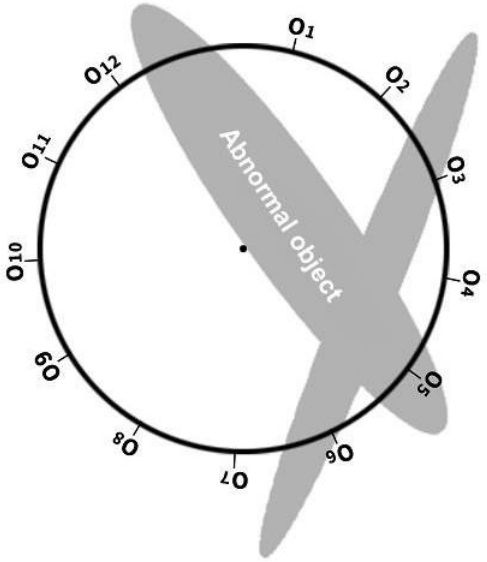

Figure 48

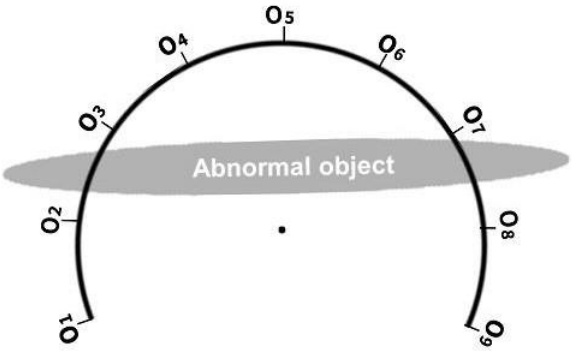

Figure 49

16.4 Several principles of field survey line layout

1、When measuring on the hillside, the same altitude shall be selected as far as possible. When the same altitude cannot be selected, the same slope or gentle slope shall be selected as far as possible. The height difference between adjacent points shall not exceed 2 meters.

2、The measuring line shall be as far away from the high-voltage transmission line and telephone line as possible, and when it cannot be, the wiring direction shall be parallel to it as far as possible.

3、When measuring, try to ensure that the M and N electrodes are in the same plane, and the recording point is the center point of the M and N electrodes or below the equipment sensor.

4、The point spacing and line spacing in the same survey area shall be kept the same as far as possible to facilitate recording and analysis.

5、The grounding consistency of M and N electrodes shall be kept as much as possible during the measurement of MN electrode mode.

6、The survey line shall be laid perpendicular to the strike of the abnormal body as far as possible, the straight line section shall be as straight as possible, the circular section shall be as round as possible, and the ground shall be as flat as possible. The survey line can be determined as straight as possible by using the compass or the method of three points and one line.

7、When measuring on the hillside, the same altitude shall be selected as far as possible. When the same altitude cannot be selected, the same slope or gentle slope shall be selected as far as possible. The height difference between adjacent points shall not exceed 2 meters.

8、The measuring line shall be as far away from the high-voltage transmission line and telephone line as possible, and when it cannot be, the wiring direction shall be as parallel as possible to others.

9、When measuring, try to ensure that the M and N electrodes are in the same plane, and the recording point is the center point of the M and N electrodes or below the equipment sensor.

10、The point spacing and line spacing in the same survey area shall be kept the same as far as possible to facilitate recording and analysis.

11、The grounding consistency of M and N electrodes shall be kept as much as possible during the measurement of MN electrode mode.

17. Precautions for use of the instrument

1、Please check the battery power of the equipment regularly and charge it regularly. Keep sufficient power during working hours, and turn off the power supply in time after work.

2、 The equipment shall be kept by a special person during transportation or use to avoid severe vibration, impact and dampness.

3、After each work, keep the equipment and MN electrode clean, and place them in a ventilated and dry place.

4、If MN electrode or electromagnetic sensor is not connected or disconnected, it will prompt measurement failure. Please check whether the line is connected properly.

5、When the measured data of each measuring point is too small and the values are basically the same during the equipment measurement, it may be the instrument failure. Please contact the after-sales service for confirmation.

找水金箍棒操作手册

GOLDEN-ROD GROUNDWATER DETECTOR OPERATION MANUAL

上海纬奇设备科技有限公司

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