

Geophysical exploration manual

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Software version: Aidu Measure V5.0**This manual applies to the following instruments:**

Series Model	Single Channel	16 Channels	32 Channels
Professional Type	ADMT-20KG-X	ADMT-60KG-16D	ADMT-60KG-32D
	ADMT-100KG-X	ADMT-60DX-16D	ADMT-100DX-32D
	ADMT-60D-X	ADMT-300AX-16D	ADMT-300AX-32D
	ADMT-100D-X	ADMT-600AX-16D	ADMT-600AX-32D
	ADMT-300AX		ADMT-1200AX-32D
	ADMT-600AX		ADMT-3000AX-32D
	ADMT-1200AX		ADMT-5000AX-32D
	ADMT-3000AX		
	ADMT-5000AX		

1 Instrument Overview

The ADMT Android screen series product is a smart instrument that integrates data acquisition, real-time imaging, and data synchronization with multiple terminals. Equipped with 10-inch (7-inch for single channel), measurement board, and 1/16/32 channel MN electrodes input access. After data collection is completed, the instrument can check the data and form graph immediately.

Single channel series adopt 1 channel input measurement, equipped with 10m MN standard measuring line;16 channel series adopt 16 channels input measurement at the same time, equipped with 16 channels MN input large line; 32 channel series adopt 32 channels input measurement at the same time, equipped with two 16 channels MN input big line. Both support MN electrode and TT probe measurement mode can be switched, data superposition filter can be set, can be equipped with wire electromagnetic probe through MN input or wireless Bluetooth connection to the gold hoop for data collection.

The 16 or 32 channel series respectively support 1-16,1-32 channels, and multi-channel simultaneous input measurement, which solves the defect of the MT method field source changing at any time, can obtain a relatively stable field source, and repeat measurement consistency is very good. Through multi-channel simultaneous input measurement, big data of high-density measurement can be obtained, which breaks through the depth limitation of traditional high-density electrical method, and enables the maximum exploration depth to reach 5000 meters.

It is also possible to use three or more 32 channels of instruments in wireless networking to become 96 channels,128 channels,256 channels and 512 channels for large data collection, which greatly improves the accuracy of field data collection.

ADMT series products have obtained a number of invention patents (patent

numbers:201310205318.9, 201110454869.X, and have been awarded the Shanghai High-tech Achievement Transformation Project since they went on the market. In practice for nearly 20 years, we have extensively compared the test with the artificial direct current method instrument, and obtained very good abnormal curve consistency. In some areas with poor grounding conditions, the abnormal curve is more realistic than the artificial direct current method instrument. Getting the general recognition and support of our customers.

2 Main Features

2.1 Accurate and efficient:

Using 1-16, 1-32 channels to input measurement at the same time, to solve the defects of MT electrical field source changes, the accuracy rate is greatly improved, and the accuracy rate is 30-60% higher than that of the general single channel.

2.2 Smart and convenient:

Standard 7/10 inch touch screen for real-time drawing, and intercommunication with mobile phone or tablet computer, PC computer for data processing and drawing.

2.3 Depth adjustable:

Optional depth within the maximum depth range of different models.

2.4 Channel optional:

1,1~16,1~32 Any channel selection.

2.5 Flexible input:

It can input 1,1-16, 1-32 channels of MN electrodes, and the MN spacing is flexibly variable from 1-5meters. Electromagnetic sensor input can also be used to solve the measurement of special formations.

2.6 Advanced and stability:

Multiple innovative designs obtained multiple invention patents.

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:

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

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

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

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 (0.1 Hz to 5 kHz), 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:

3.3 Skin depth

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

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 and Main Parameters

4.1 Professional Type Single channel instrument instruction



Figure 1

4.2 Professional Type 16 channels instrument instruction



Figure 2

4.3 Professional Type 32 channels instrument instruction

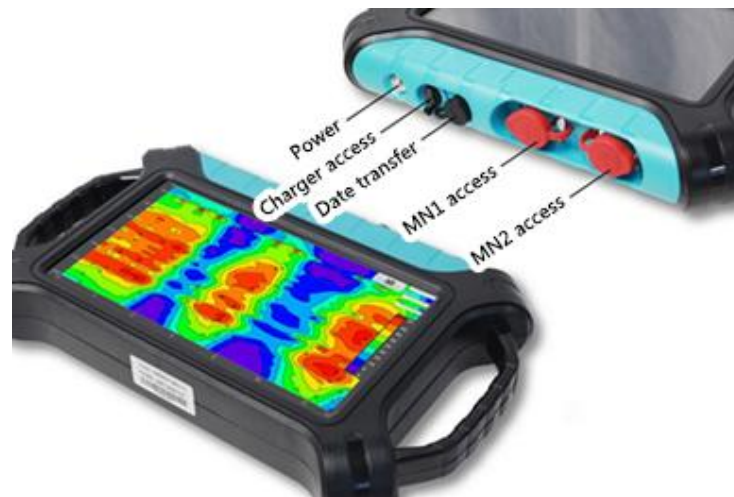


Figure 3

4.4 Main parameters of Professional Type Single channel instrument

Model Parameter	ADMT-300AX	ADMT-600AX	ADMT-1200AX	ADMT-3000AX	ADMT-5000AX	ADMT-20KG-X	ADMT-100KG-X	ADMT-60D-X	ADMT-100D-X
Maximum depth(m)	≤300	≤600	≤1200	≤3000	≤5000	≤20	≤100	≤60	≤100
Channel input	1 Channel MN input								
Channel option	1								
Optional depth(m)	Maximum depth in optional 5/10/20/40/60/100/200/300/500/800/1200/2000/3000/4000/5000m								
Deep stratification	10-100					5-20	5-100		
Connection type	Serial port, Wifi, Bluetooth 4.0, USB(optional 4G communication)								
Display	7 inch IPS wide-angle 178 ° visual touch screen								
Operating system	Android 13								
CPU	RK3568								
GPU	Mali G52								
Main function	Depth optional, real-time 2D/3D mapping, battery removable								
Measure mode	MN/TT								
Frequency range(HZ)	1-8K	0.001-8K				100-8K			
Frequency-selective filtering	Preset frequency selection and intelligent frequency selection, analog + data filtering 1-16 overlay options								
Resolution ratio	0.1mV±2%	0.01mV±1%				0.01mV±2%			
Sampling time (s)	100-360	120-1500				40-3600			
Battery power consumption	700mA/H					800mA/H			
Main engine weight	1.6kg							2.5kg	

Table 1

4.5 Main parameters of Professional Type 16 channels instrument

Model Parameter	ADMT-300AX-16D	ADMT-600AX-16D	ADMT-60DX-16D	ADMT-60KG-16D
Maximum depth(m)	≤300	≤600	≤60	≤60
Channel input	16 simultaneous input, standard maximum electrode spacing 2.5m, optional maximum electrode spacing 5m/7.5m/10m			
Channel option	1-14			

Optional depth(m)	5-300	60-600	5/10/20/40/60m
Deep stratification	10-100		5-60
Connection type	Serial port, Wifi, Bluetooth 4.0, USB(optional 4G communication)		
Display	10.1 inch IPS wide-angle 178 ° visual touch screen		
Operating system	Android 13		
CPU	RK3568		
GPU	Mali G52		
Main function	Depth optional, real-time 2D/3D mapping, battery removable		
Measure mode	MN/TT		
Frequency range(HZ)	1-8K	100-8K	
Frequency-selective filtering	Preset frequency selection and intelligent frequency selection, analog + data filtering 1-16 overlay options		
Resolution ratio	0.01mV±2%		
Sampling time (s)	40-3600		
Battery power consumption	900mA/H		
Main engine weight	2.8kg		1.85kg

Table 2

4.6 Main parameters of Professional Type 32 channels instrument

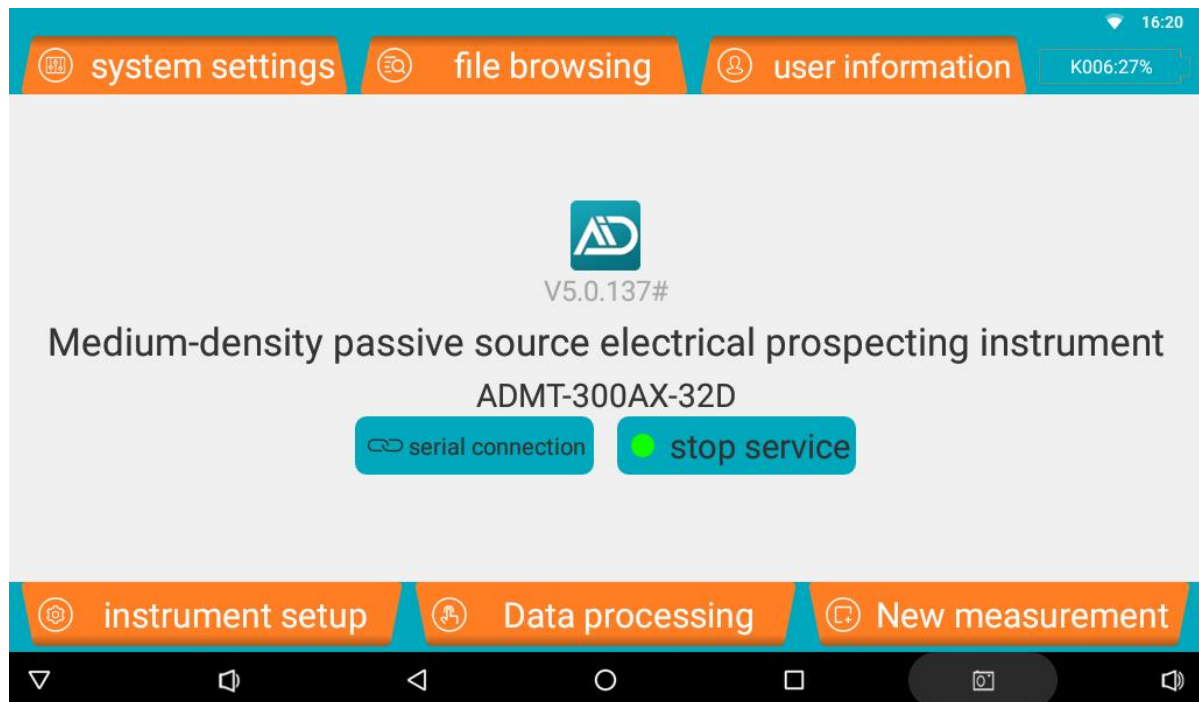
Model Parameter	ADMT-300AX -32D	ADMT-600AX -32D	ADMT-1200AX -32D	ADMT-3000AX -32D	ADMT-5000AX -32D	ADMT-100DX -32D	ADMT-60KG -32D
Maximum depth(m)	≤300	≤600	≤1200	≤3000	≤5000	≤100	≤60
Channel input	32 simultaneous input, standard maximum electrode spacing 2.5m, optional maximum electrode spacing 5m/7.5m/10m						
Channel option	1-30						
Optional depth(m)	5-300	100-600	10-1200	60-3000	60-5000	5-100	5-60
Deep stratification	60-200					5-100	
Connection type	Serial port, Wifi, Bluetooth 4.0, USB(optional 4G communication)						
Display	10 inch IPS wide-angle 178 ° visual touch screen						
Operating system	Android 13						
CPU	RK3568						
GPU	Mali G52						
Main function	Depth optional, real-time 2D/3D mapping, battery removable						
Measure model	MN/TT						
Frequency range(HZ)	0.001-7K					100-8K	
Frequency-select ive filtering	Preset frequency selection and intelligent frequency selection, analog + data filtering 1-16 overlay options						
Resolution ratio	0.001mV±2%		0.001mV±1%			0.01mV±2%	
Sampling time (s)	1200-9000		280-14400			40-3600	
Battery power consumption	700mA/H		1100mA/H			1000mA/H	
Main engine weight	2.2kg					3.0kg	2.2kg

Table 3

5 Login and Registration

5.1 System introduction and network connection

After turning on the instrument power supply, the screen displays: system setting, file browsing, user information, serial connection, start (stop) service, instrument setup, Data processing, New measurement (Figure 4).



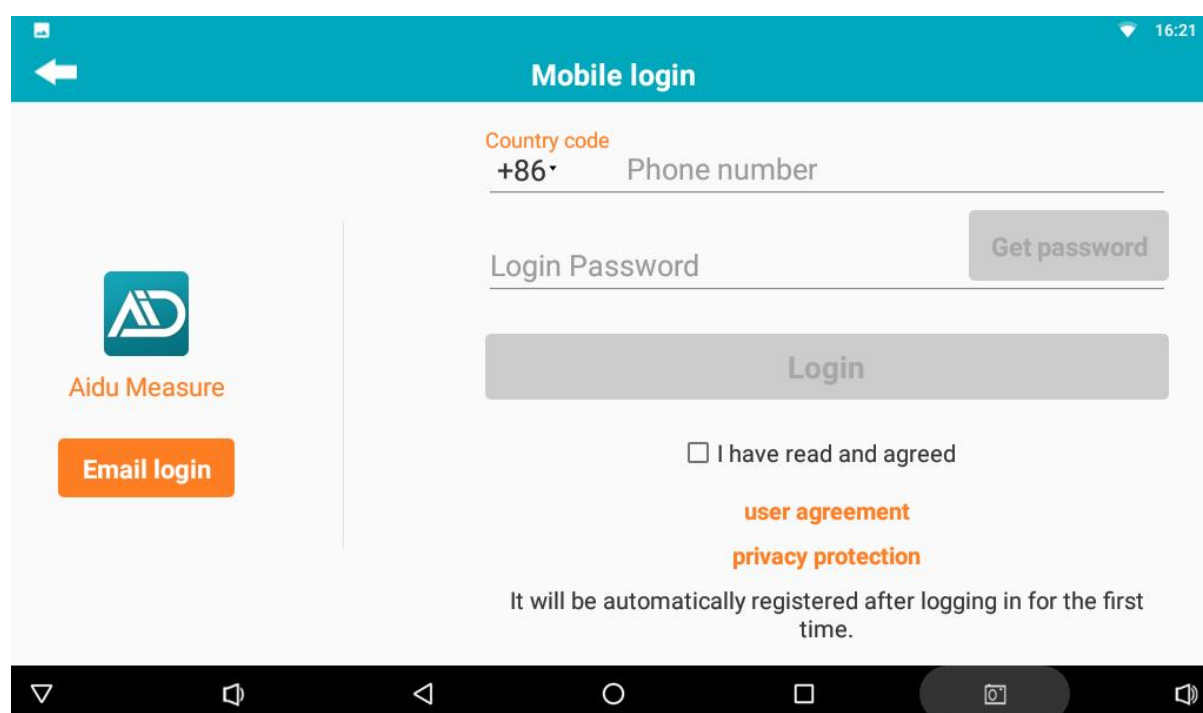
(Figure 4)

When using this instrument for the first time, it is recommended to send a mobile phone number to verify login and register an account in a network environment before login and use. The mobile phone number or registered account after login is a cloud data management account, and you can log in this account on your mobile phone or computer to realize data synchronization and analysis. The instrument has no network and can only use basic measurement and mapping functions.

After the instrument is connected to the network, click the icon on the upper left or click "User Login" in the system Settings to log in and

register (Figure 5). You can choose two login methods: "Mobile number login" and "Email login". It is recommended to select "Mobile number Quick login" and enter the mobile number and send the password to log in. You are advised to obtain the password once and save it for the next login or login from another device.

Special tips: Be sure to connect the WiFi network or mobile phone WiFi hotspot to keep the instrument network unblocked to send the verification code and login to be effective, such as not connected to the network or the network anomaly will prompt the verification code failure.



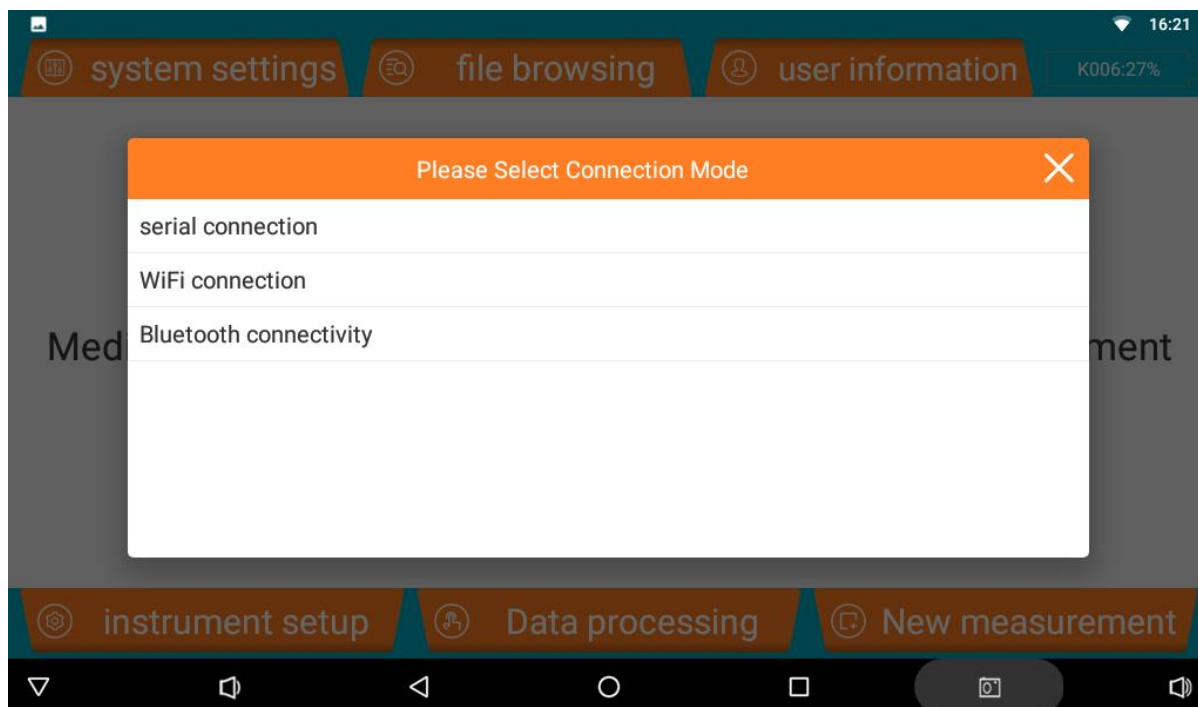
(Figure 5)

6 Instrument Connection and Setup

6.1 Instrument connection

Four kinds of instrument connection methods are provided in Aidu Measure APP. ADMT screen series water search instrument uses serial port

connection, and it is necessary to confirm that the connection mode is set to serial port connection when using.



(Figure 6)

6.2 Instrument setting

Display the instrument ID number, and measurement parameters in the instrument setup page.

Before setting this parameter, ensure that the serial port connection mode is set and the device is properly connected.

It is recommended to set up the instrument after the wiring is completed and the instrument is connected.

"Sampling channel number": The instrument will automatically detect the number of channels connected to the measurement line, and select the number of measurement channels according to the need.

"Measurement Mode": Select the corresponding measurement mode according to the connected measurement accessories, select "MN" mode when measuring

with the line, and select "TT" mode when measuring with the probe.

"Overlay times": After clicking, you can set the overlay times when the instrument is measured.

"Measurement Depth": You can set the start and end depth of the current measurement, and the maximum depth can be set according to different models.

After setting the above four items, click Settings, it will automatically jump to the new measurement page.

6.3 Data processing

After logging in, users can set parameters for data processing and AI analysis, either using the default parameters set by Aidu or adjusting parameters according to local conditions.

(1) Data processing: Download → device model → Aidu just parameters if necessary → Save Settings.

When setting parameters, you can synchronize parameters to download the default parameters of all bound devices in the login account.

Click "Save configure" to save the current parameter scheme to the server after modifying the parameter value.

Click "Update configure" to delete the currently selected custom scheme; Click "Delete configure " to modify the parameter values of the current configuration scheme.

Parameter description:

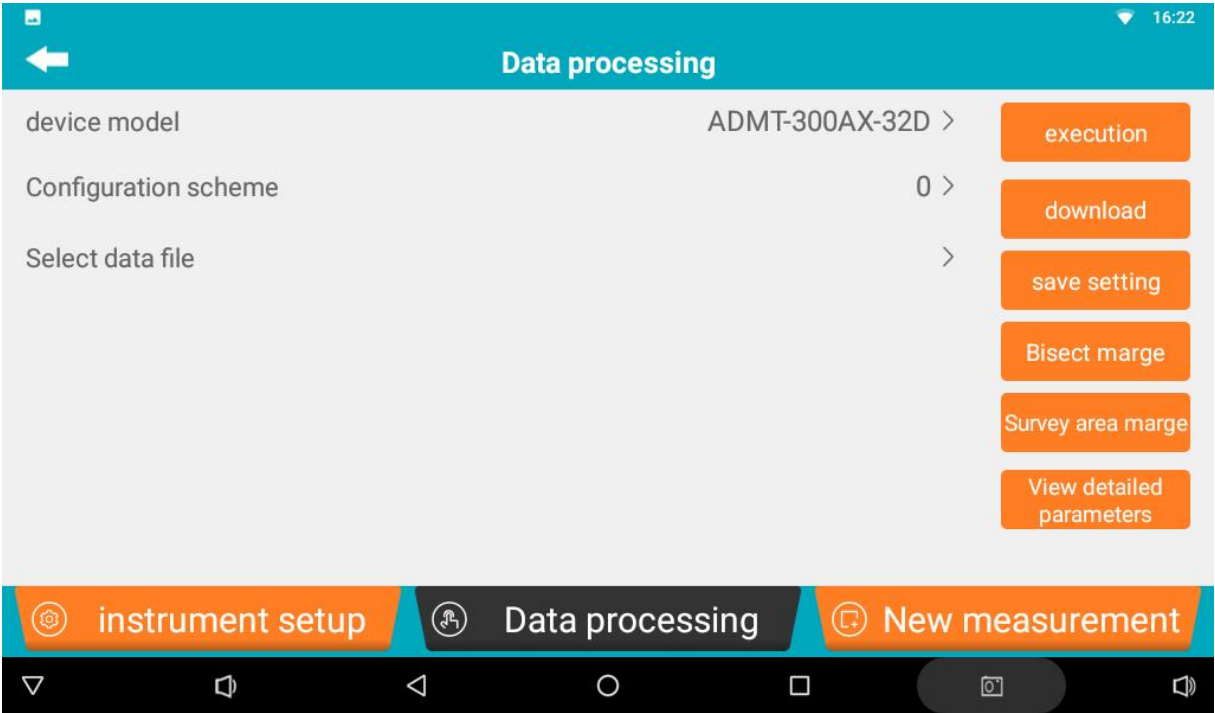
[Data correction] is to remove part of the abnormal measurement point data that is too high or too low caused by environmental interference or other interference in the measurement process. The larger the amplitude of the correction value, the larger the fluctuation range of the corrected data. For example, if the correction amplitude is 0.2 or 0.3, the revised data may fluctuate within 20% or 30% of the original data; The larger the input value of the corrected threshold, the greater the deviation of the data after the bad point correction. If the correction threshold is too large, the data is prone to obvious deviation; If the threshold is too small, the corrected data may differ greatly from the true data. And the data correction is divided into X, Y, Z three axis correction, X is the horizontal direction, generally refers to the measurement between points, Y is the vertical direction, generally refers to the depth or measurement line direction, Z is the dimension of the overall data.

[Data collation] is the overall filtering processing according to the three dimensions of X, Y and Z, set to 0 for no sorting, set to 1 for sorting, X is the horizontal direction, generally referring to the measurement

points, Y is the vertical direction, generally the depth or measurement line direction, Z is the dimension of the overall data.

[Data smooth] Data smoothing can reduce the peak and valley values between adjacent data, smooth the curve and reduce the noise, so that the image effect is more smooth and smooth, you can choose 3 points, 5 points, 7 points, 3 times 5 points, 3 times 7 points and other smoothing methods, according to the need to choose.

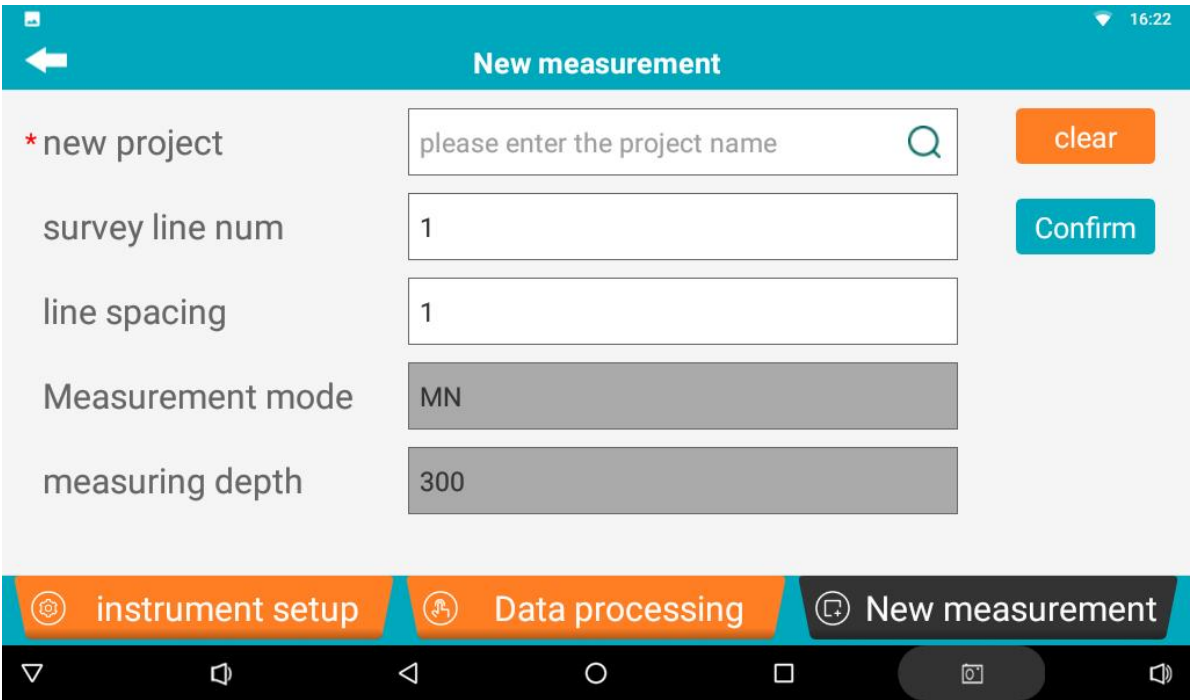
[Apparent resistivity inversion] In the inversion of apparent resistivity, the original data are normalized and modeled, and the original measured electric field or electromagnetic value is reversed according to a certain model algorithm to perform the formation resistivity, which is not the real resistivity, similar to resistivity, so it is named "apparent resistivity", which can also be understood as apparent resistivity. Inversion model selection is generally 0.1-0.9 model data, the larger the model value is, the faster the formation apparent resistivity changes, the model coefficient is generally set to 1, and this step is not performed when 0 is set.



(Figure 7)

7 New Measurment

(1) Set the name of the new project: Enter the project name in the pop-up window



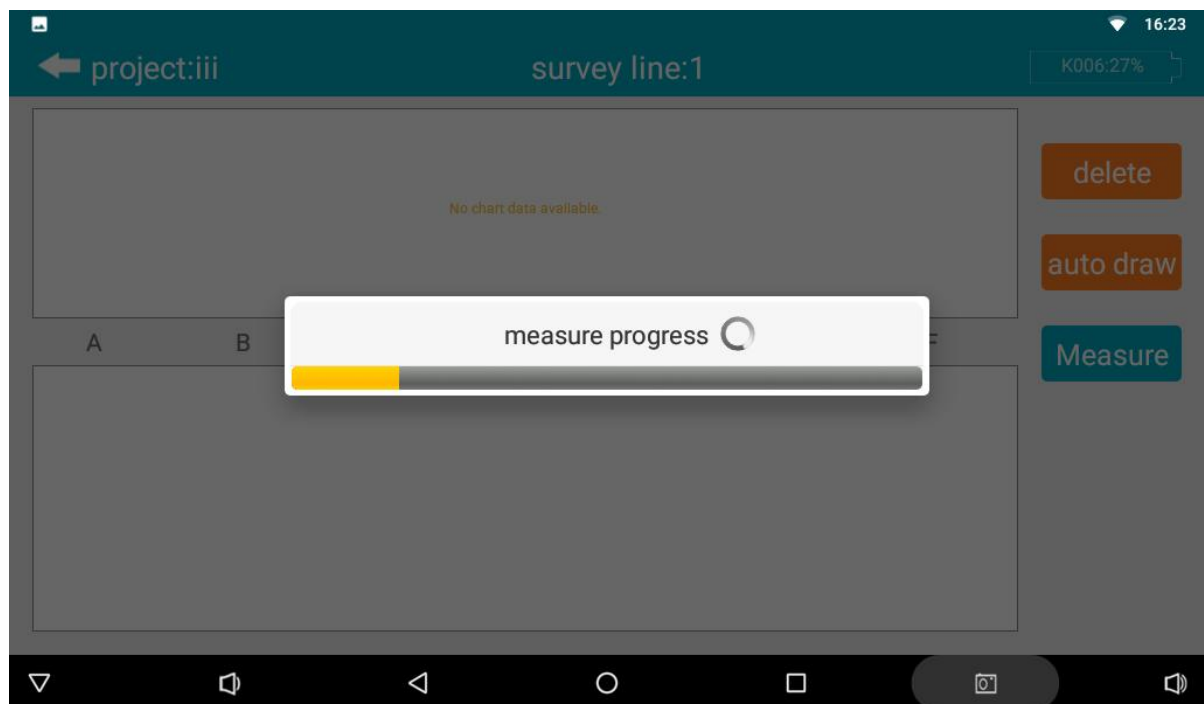
(Figure 9)

(2) Set the number of measuring lines, measuring line spacing.

(3) Click "Confirm" to enter the measurement page.

(4) Clicking "Measurement" will first conduct channel detection to detect the channel connection. The connection status of all channels is displayed in the channel detection pop-up window. Red indicates that the channel is disconnected and you need to check the channel connection. Blue indicates that the channel is connected properly and can be measured normally.

(5) Click "Confirm" to perform the measurement. The line chart of the current measurement result is displayed at the top and the data is displayed at the bottom. ABCDEF represents "measurement point number", "measurement depth", "apparent resistivity", "Device ID number", "current channel number" and "total channel number" respectively.

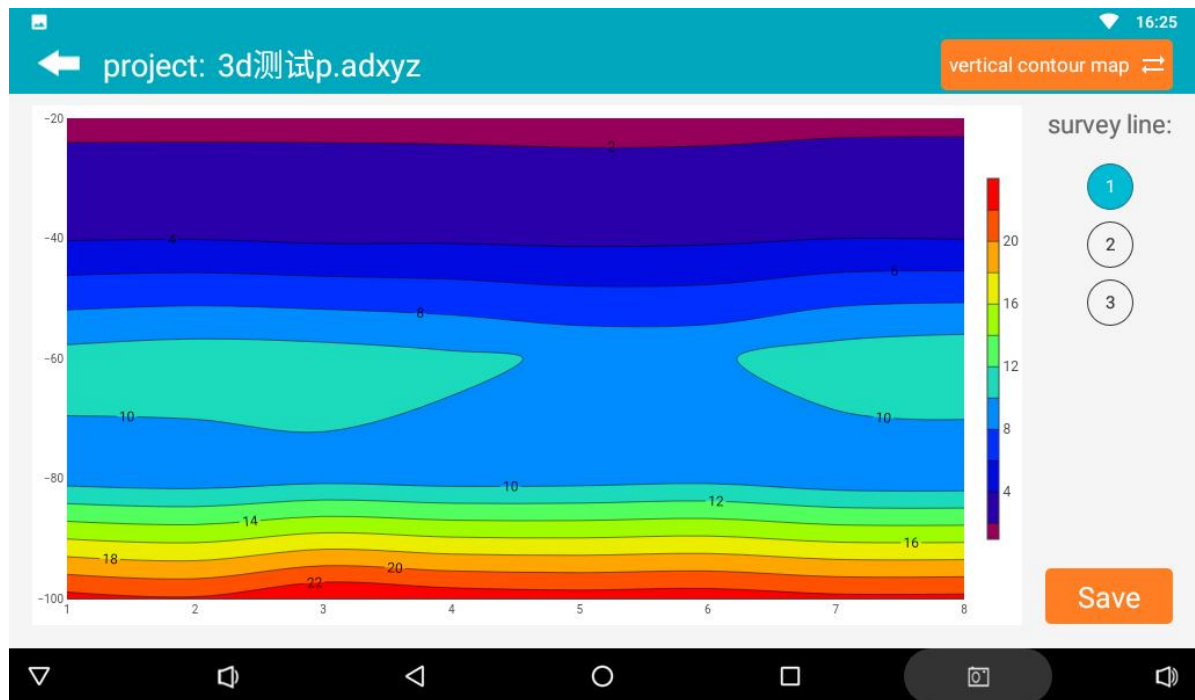


(Figure 10)

(6) After completing the measurement, you can click "Automatic drawing"

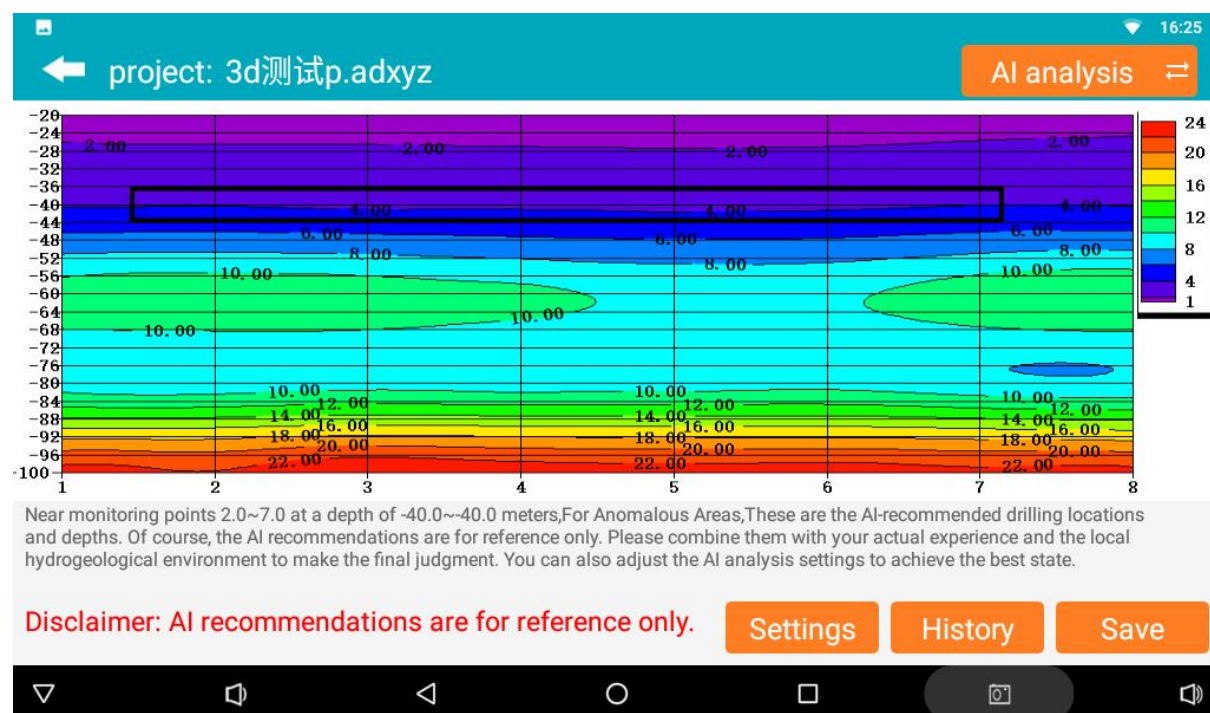
to enter the drawing page.

① vertical contour map.



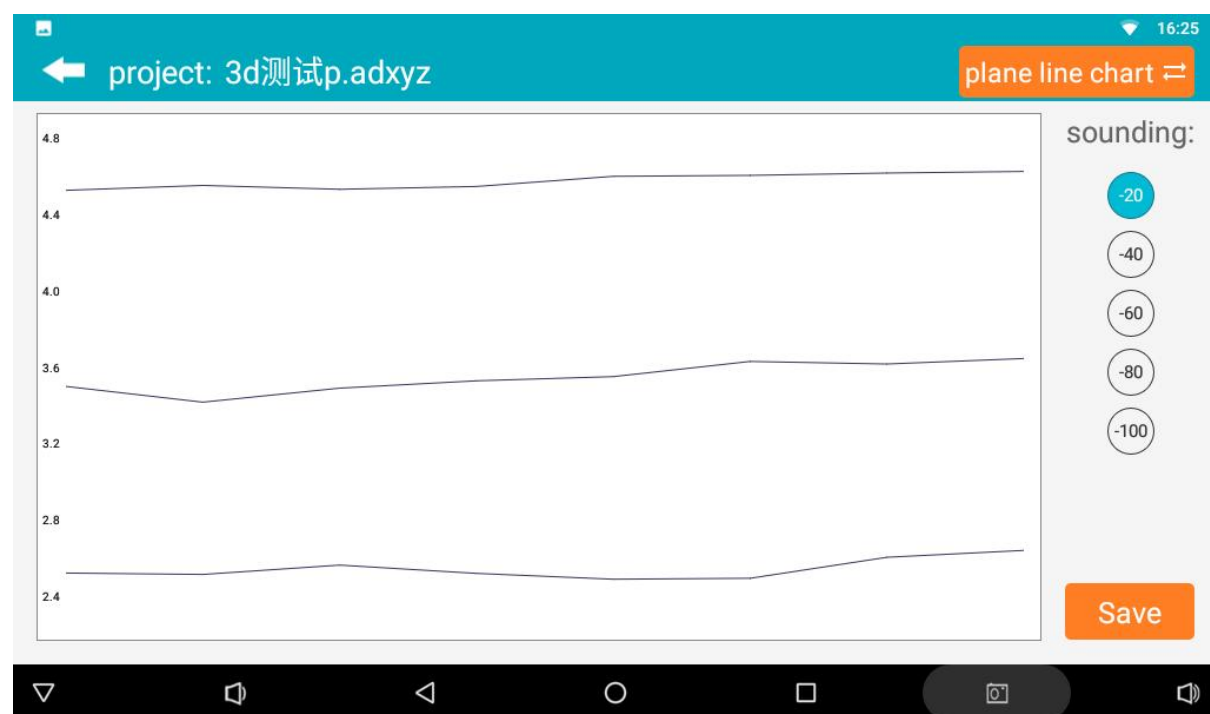
(Figure 11)

② "AI" is the mapping of AI analysis. After entering, parameter analysis of AI analysis needs to be performed first, and the measurement line can be selected, and the data of AI analysis in the past can be loaded by selecting history;



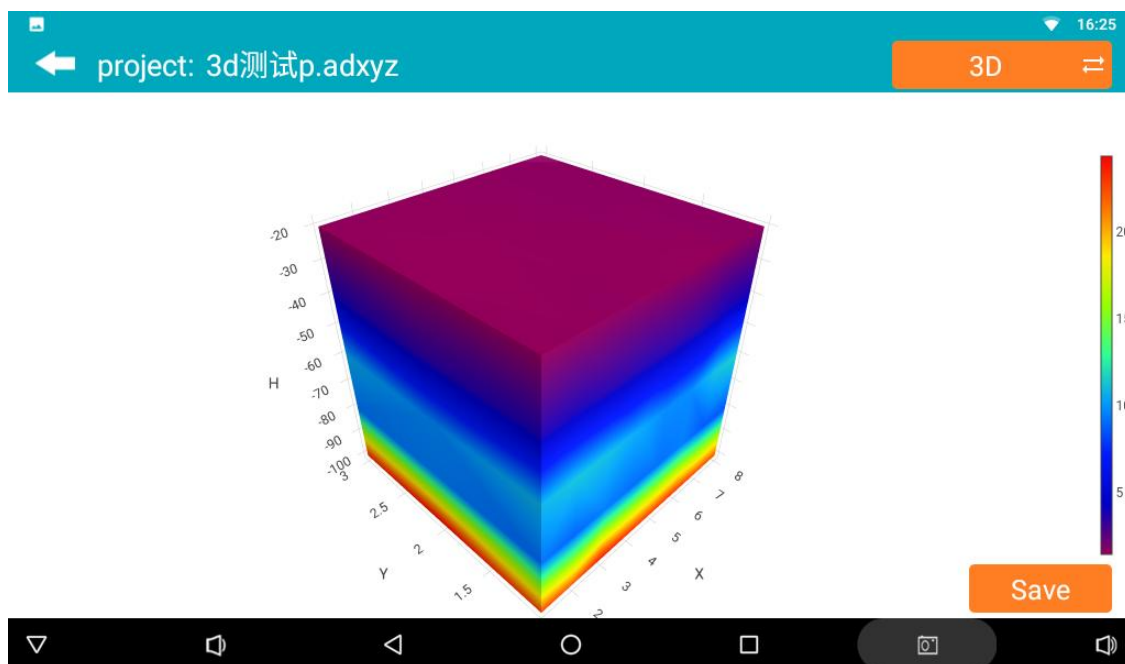
(Figure 12)

③ Plane line chart, you can choose the measurement point number to be displayed for drawing;



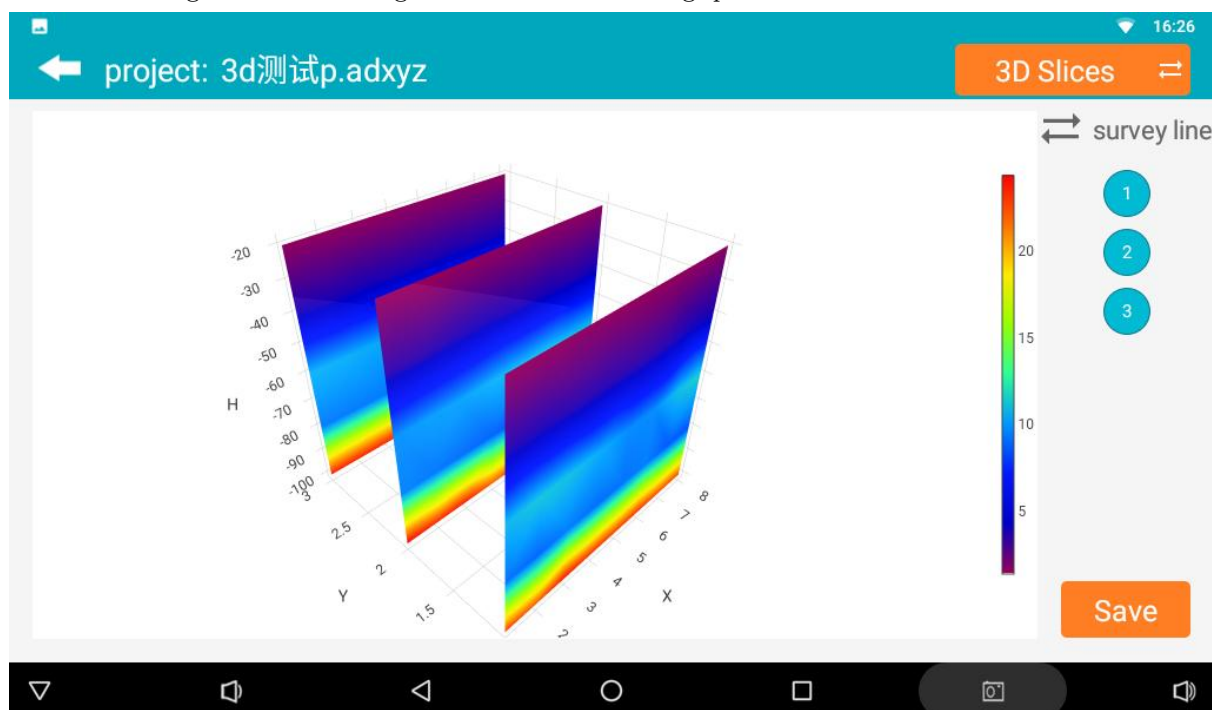
(Figure 13)

④ "3D" is 3D contour map;



(Figure 14)

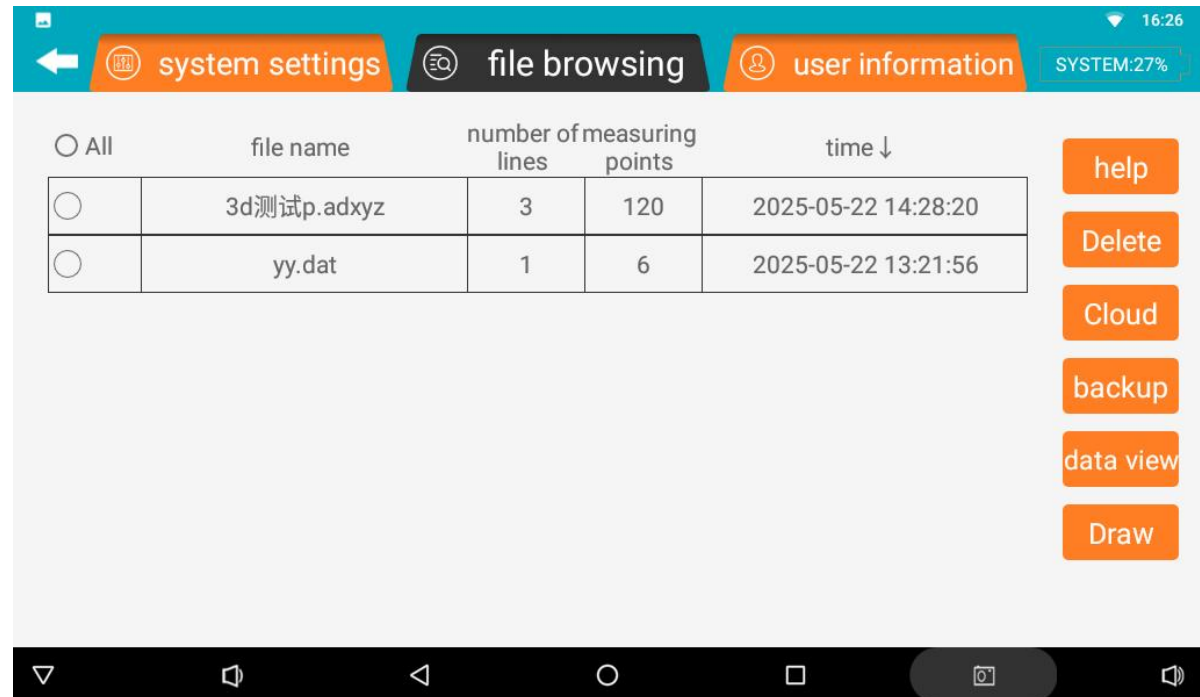
⑤ 3D slice map, in the 3D slice map need to choose according to the sounding or measuring line or measuring point increment to slice.



(Figure 15)

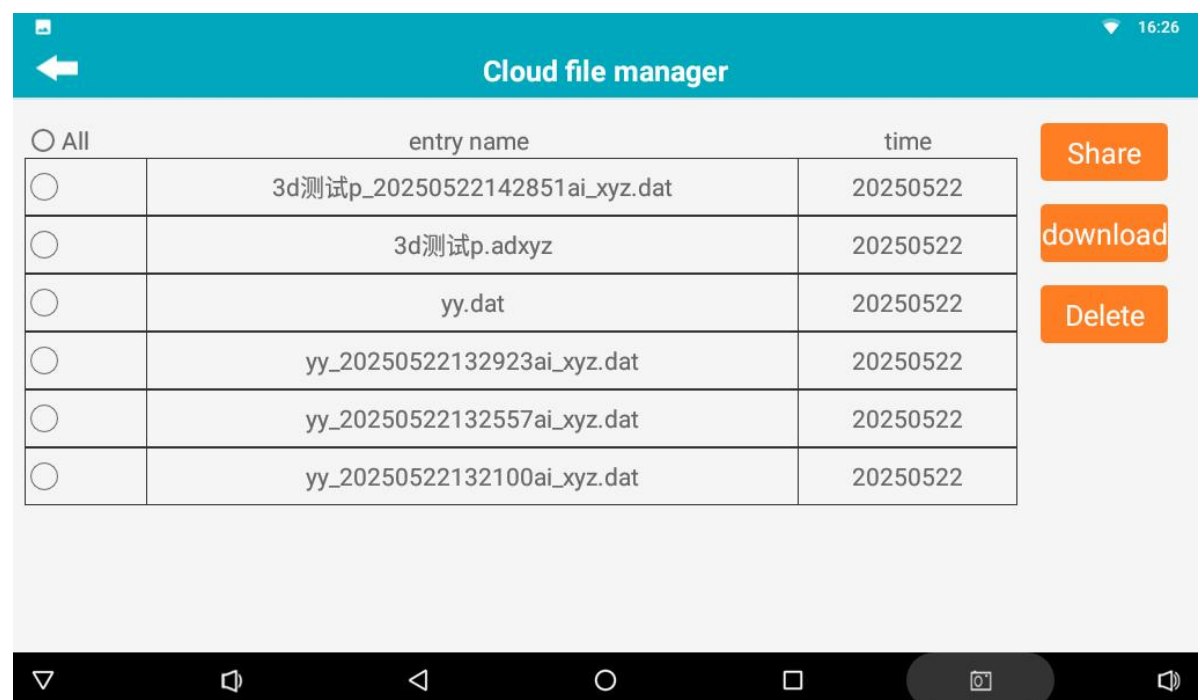
8 Folder Browsing

(1) You can select the file for drawing, "Backup" - backup data to the cloud and "Data View" - view the data of the selected file.



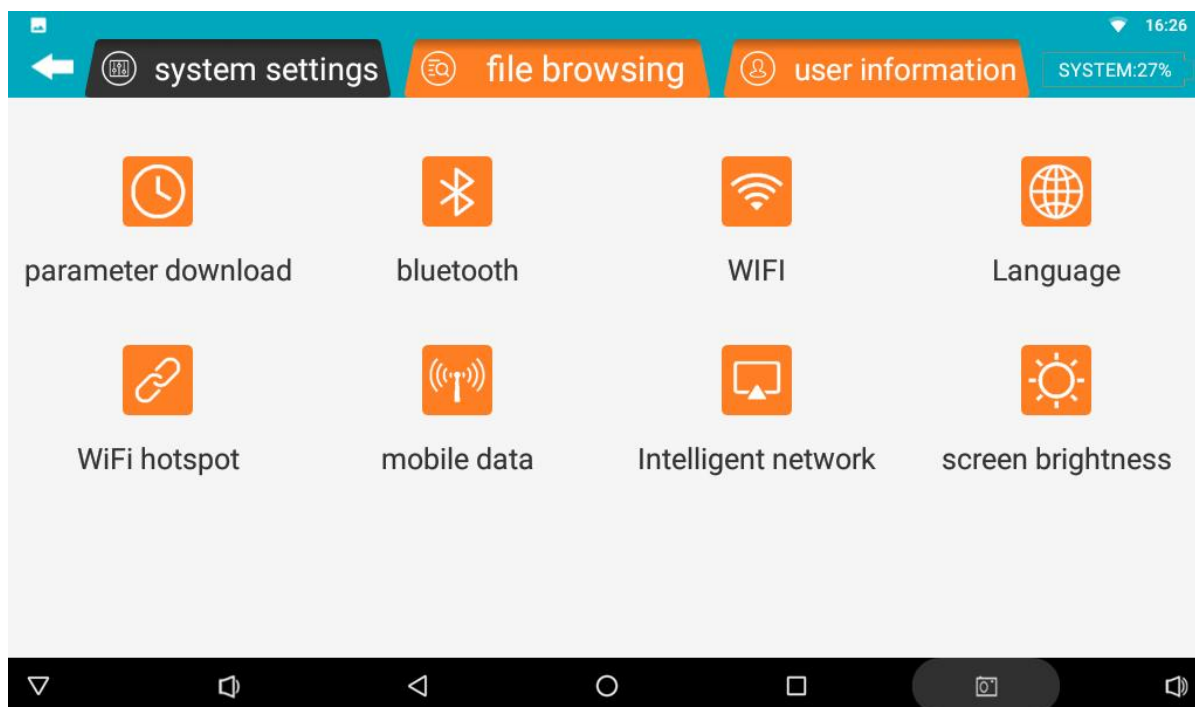
(Figure 16)

(2) In "Cloud", you can view the files saved in the cloud and delete or download them to the local computer.



(Figure 17)

9 System Setting



(Figure 18)

On the system Settings page, you can set user accounts, device information, language, and host functions. In the three function keys on the top row, you can log in to the user account, log out of the login, set personal information, and scan the code to log in to the web page.

“parameter download”: Download device parameters from the server

“Language”: Aidu Measure APP provides ten languages for users to choose, you can adjust the display language in the software.

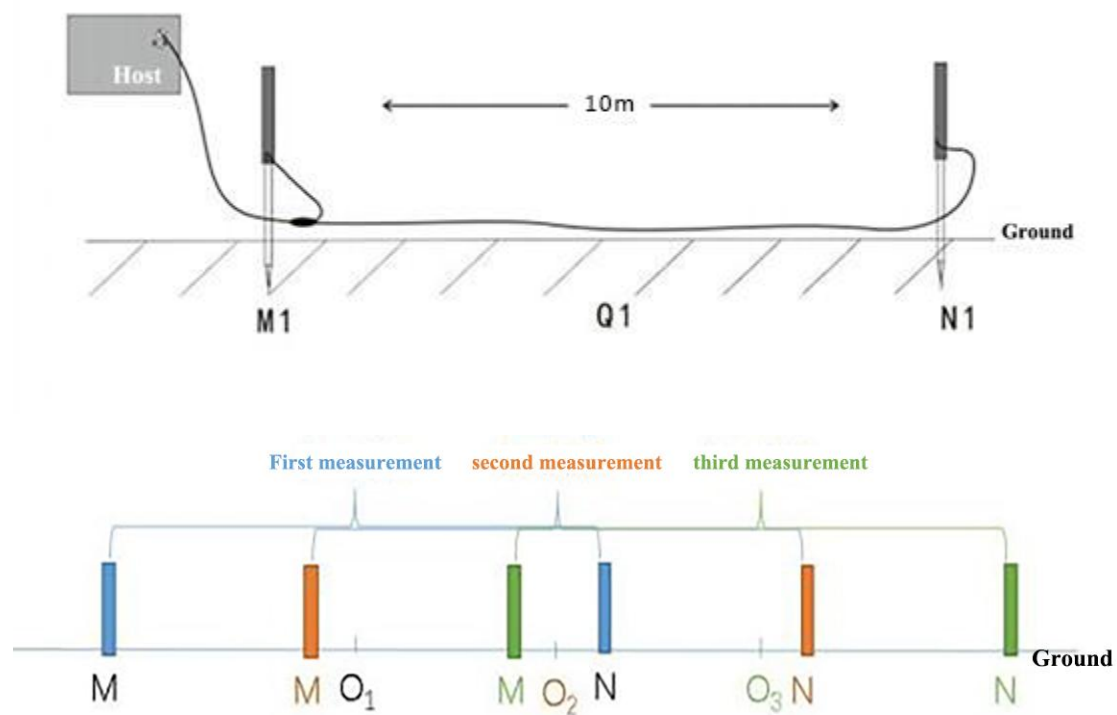
“Bluetooth”, “WiFi”, “WiFi hotspot”, “mobile data” and “Screen brightness”: set the corresponding functions of the device, and mobile data is only open to 4G devices.

“Intelligent network”: Intelligent distribution network connection for specific versions of instruments.

10 Instrument Field Connection Method

10.1 Single channel connection mode

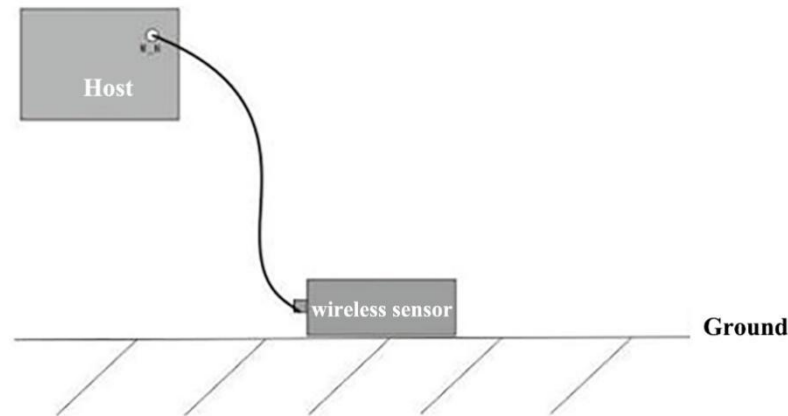
Wired electrode connection method: After the instrument is turned on, connect the instrument as shown in the figure above (Figure 19), insert the M、N measuring electrodes into the ground, and start sampling. The measuring point position is the center position of the two M、N electrode rods. After the sampling of this point, the M、N electrodes are moved in the same direction at a certain point distance to conduct sampling and measurement of the second measuring point (Figure 20). And so on until the entire section is measured.



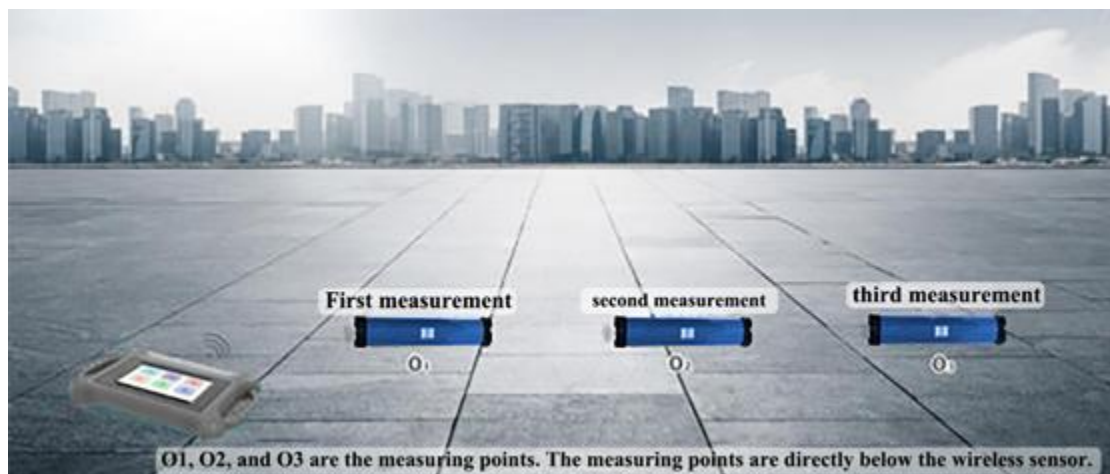
MN is the measuring electrode, O1,O2,O3 is the measuring point, and is the midpoint of MN.

Wired magnetic probe connection (optional): After the instrument is turned on, connect the instrument as shown in the figure above (Figure 21), place the sensor on the ground, and start sampling. The measuring point is directly below the sensor. The direction of sensors is not required, but the direction of sensors at each measurement point on a

measurement line must be the same. After the sampling of this point, the sensor is moved in the same direction with a certain point distance, and the sampling measurement of the second measuring point is carried out. And so on until the entire section is measured.

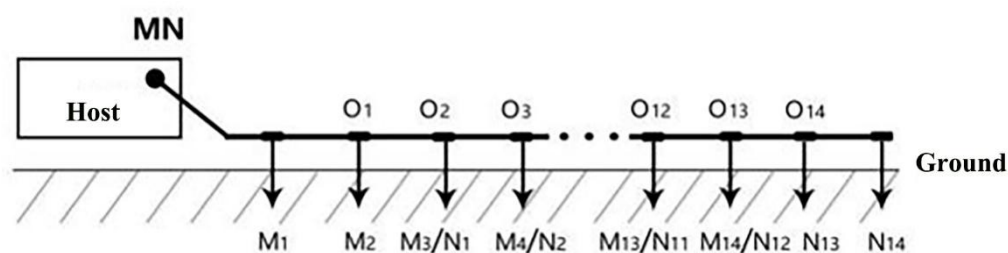


The wireless magnetic probe can also be configured. The connection method is as follows: After the instrument is turned on, the instrument connects to the master computer of the Cudgel rod through Bluetooth. The host of the cudgel rod is placed on the ground and sampling is started. After the end of sampling at this point, the golden rod host is moved in the same direction at a certain point distance to conduct sampling measurement at the second measuring point (as shown in Figure 22). And so on until the entire section is measured.



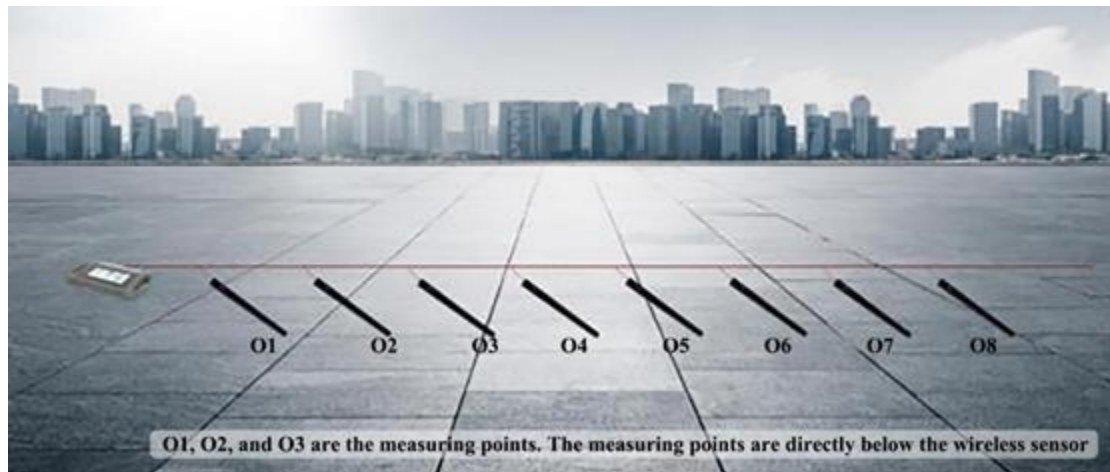
10.2 16 channels connection mode

Basic connection method of the 16-channel series: After the instrument is turned on, connect the instrument as shown in the figure above (Figure 23), lay out the measurement cable along the measurement line, insert the electrode into the ground, and connect the electrode to the measurement cable through the plugboard. Start sampling when ready. The 16-channel instrument can complete the data collection of 14 measurement points at the same time in one measurement, the measurement point is the center point of the MN electrode, that is, the second electrode is the first measurement point, the third electrode is the second measurement point, and so on, the last measurement point is at the penultimate electrode. After the measurement is complete, the sampling measurements of the second section can be carried out. And so on until the entire section is measured.



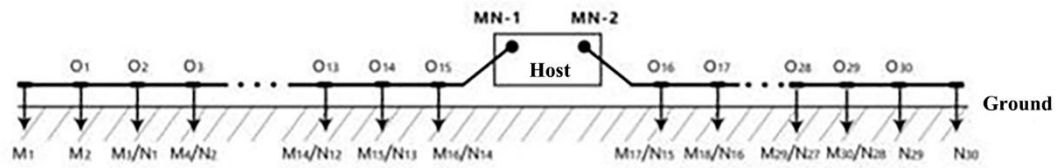
Connect the wired electromagnetic probe of the 16-channel instrument: After the instrument is started, connect the instrument as shown in the figure above (Figure 24). Lay the measurement cable along the direction of the measurement line, and lay the sensor flat on the ground. The direction of the sensor is not required, but the direction of the sensor on the measurement line must be the same. Connect the sensor to the measurement cable using a pluggable card. Start sampling when ready. The 16-channel instrument can complete the data acquisition of 8 measurement points at the same time, and the measurement point is directly below the sensor, and the sampling measurement of the second section can be

completed. And so on until the entire section is measured.



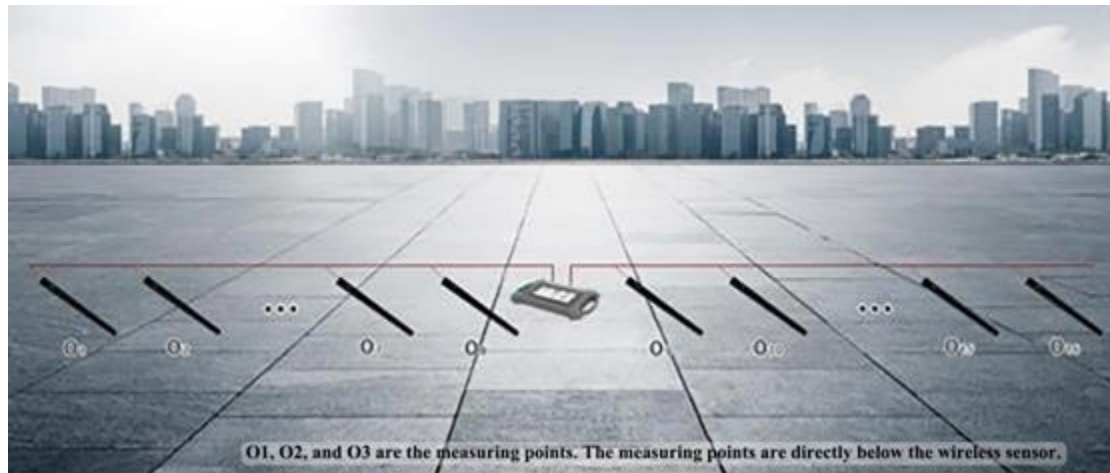
10.3 32 channels connection mode

Basic connection method for a 32-channel instrument: Lay two 16-channel measuring cables along the direction of the measurement line, place the instrument in the middle of the two cables, insert the electrodes into the ground, and connect the electrodes to the measurement cables through the plugboard (see Figure 25 and 26). Start sampling when ready. The 32-channel instrument can complete the data acquisition of 30 measuring points at the same time. Only one cable can be deployed, and the cable interface must be connected through port M N 1. The starting electrode of the measuring line is at the end of the MN 1 cable, and the measuring point is the midpoint of the MN electrode, that is, the second electrode at the end of the MN 1 cable is positioned at the first measuring point, the third electrode is positioned at the second measuring point, and so on, the last measuring point is at the second to last electrode. After the measurement is complete, a second section can be sampled and measured, and so on, until the entire section is measured.



32 channel instrument wired electromagnetic probe connection: After the device is powered on, connect the device as shown in the figure above (Figure 27), lay the measuring cable along the direction of the measuring cable, place the device in the middle of the two cables, lay the electromagnetic sensor flat on the ground, the direction of the sensor is not required, but the direction of each sensor on a measuring line must be the same, and connect the sensor to the measuring cable by removing and inserting a card. Start sampling when ready. The 32 channel instrument can complete the data acquisition of 16 measurement points at the same time. Only one cable can be deployed, and the cable interface must be connected through port M N 1. The starting point of the measurement line is the end of the M N 1 cable, and the position of the measurement point is directly below the sensor. Once the measurement is complete, the second section can be sampled. And so on until the entire section is measured.





11 On-Site Survey Line Layout Method

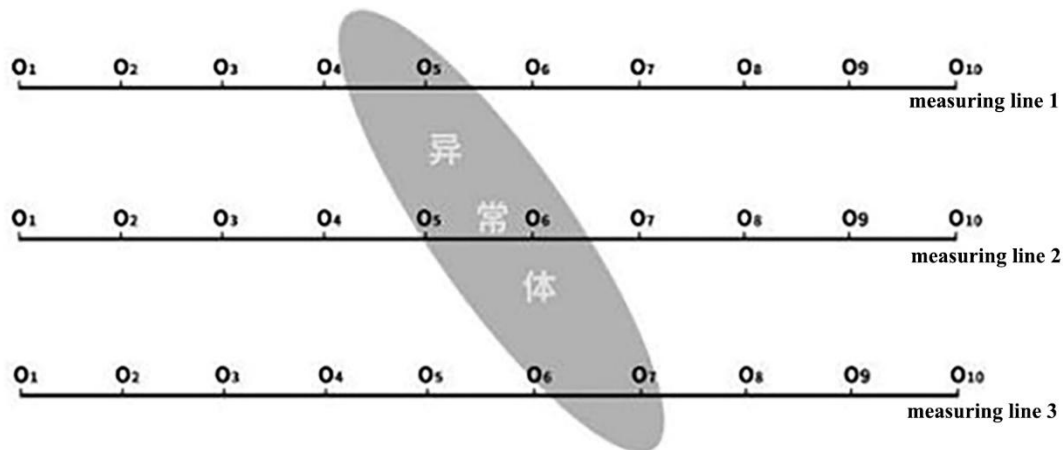
The layout of survey line is a very important link in the exploration, and the quality of survey line layout will directly affect the measurement accuracy and improve the anti-interference ability. The basic principle is that the direction of the survey line is best to explore the direction of the target body vertically, and the linear section is as straight as possible, the circular section is as round as possible, and the ground is as flat as possible. According to the actual terrain and geomorphology, different line layout methods are selected.

11.1 Parallel layout method straight section

Linear section is the most common layout method, and multiple linear sections are parallel to form multiple linear sections.

This method can quickly interpret the direction of the exploration target. First, assume and interpret the direction of the exploration target, One or more lines can be arranged in the vertical exploration direction of the target object (as shown in Figure 28). Generally, 2-3 lines can be arranged to quickly track the direction of the abnormal body, and multiple lines can be arranged according to the length of the exploration target object, The direct distance of each straight section is called the line distance, and the line distance is generally $\leq$ the length of the

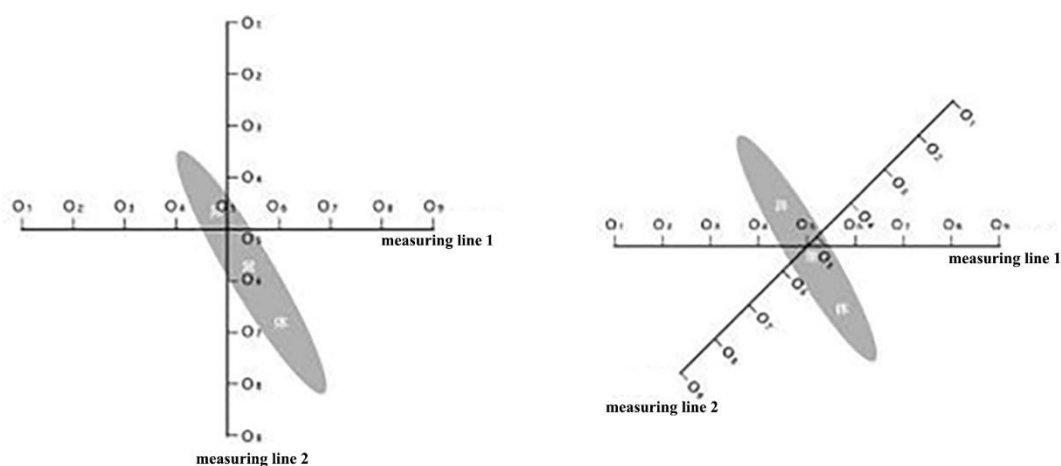
exploration target, The unit is meters.



11.2 Layout method of cross or diagonal cross of straight section

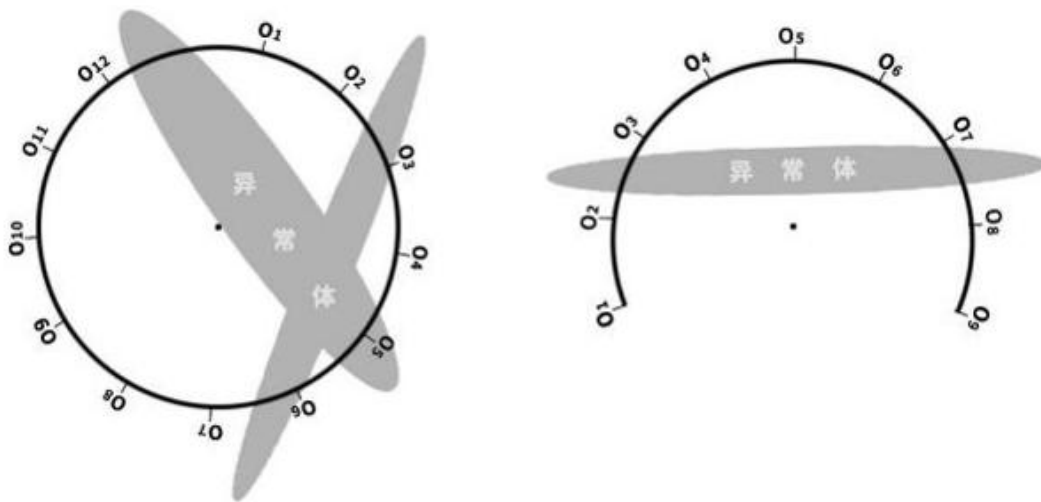
After measuring one straight section, it is found that there are abnormal bodies or limited sites and it is difficult to lay multiple straight sections.

The second straight section can be laid with a cross section (as shown in Figure 29) or a diagonal cross section (as shown in Figure 30). Combining the abnormal areas of the two straight sections can confirm the existence of the exploration target repeatedly, and can also assist in judging and confirming the general direction of the exploration target.



11.3 Layout method of circular section

When the survey site in some areas is really small or there are spot disturbances such as transformers and signal towers nearby, a circular (FIG. 31) or semi-circular (FIG. 32) section is laid to measure the site or disturbance as the center, and the direction and position of the exploration target object (water vein, mineral vein, etc.) can also be quickly tracked.



11.4 Multiple 32 channels are composed of 96-512 channels matrix high density method

In order to make the data acquisition more accurate and efficient, three or more 32-channel instruments can be used to form the matrix density measurement method. Contact the manufacturer separately for details.

11.5 Wiring principle

11.5.1 The layout of the survey line should be as vertical as possible to the direction of the abnormal body, the linear section should be as straight as possible, the circular section should be as round as possible, and the ground surface should be as flat as possible. You can use a compass or a pole to determine the line as straight as possible.

11.5.2 When measuring on the hillside, try to choose the same altitude layout. When it is not possible to arrange the same height layout, try to choose the same slope or a slower slope direction layout, and the height difference between adjacent points should not exceed 2 meters.

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

11.5.4 When measuring, ensure that the M and N electrodes are in the same plane as much as possible, and the recording point is the center point of the M and N electrodes or below the equipped sensor.

11.5.5 The point distance and line distance in the same measurement area should be kept the same as far as possible to facilitate recording and analysis.

11.5.6 When measuring MN electrode mode, ensure that the grounding of M and N electrodes is consistent.

12 Precautions for using the instrument

12.1 Periodically check the battery level and charge the device. Keep sufficient power during working hours, and turn off the power promptly after work.

12.2 Special personnel shall take care of the equipment during transportation or use to avoid severe vibration, impact and water and moisture.

12.3 After each work, keep the equipment and MN electrodes clean and place them in a ventilated and dry place.

12.4 The MN electrode or electromagnetic sensor is not connected or disconnected, indicating a measurement failure. Please check whether the cable is properly connected.

12.5 If the measurement data of each measurement point is small and the value is basically the same, the instrument may be faulty. Please contact the after-sales service for confirmation.