艾都慧测

ADMT安卓屏系列产品

ADMT SERIES PRODUCTS

操作手册

OPERATION MANUAL

中国制造 · MADE IN CHINA

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目录

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本操作手册适用以下仪器：

系列 / 型号	单通道系列	16通道系列	32通道系列
基础版	ADMT-300S-X	ADMT-300SX-16D	ADMT-400SX-32D
	ADMT-600S-X	ADMT-500SX-16D	ADMT-600SX-32D
	ADMT-1200S-X	ADMT-1200SX-16D	ADMT-1200SX-32D
	ADMT-3000S-X	ADMT-2000SX-16D	ADMT-3000SX-32D
		ADMT-3000SX-16D	ADMT-4000SX-32D
专业版	ADMT-20KG-X	ADMT-60KG-16D	ADMT-60K-32D
	ADMT-100KG-X	ADMT-60D-16D	ADMT-100D-32D
	ADMT-60D-X	ADMT-200AX-16D	ADMT-300AX-32D
	ADMT-100D-X	ADMT-300AX-16D	ADMT-600AX-32D
	ADMT-200AX	ADMT-500AX-16D	ADMT-1200AX-32D
	ADMT-300AX	ADMT-600AX-16D	ADMT-3000AX-32D
	ADMT-500AX		ADMT-5000AX-32D
	ADMT-600AX		
	ADMT-1200AX		
	ADMT-3000AX		
	ADMT-5000AX		

一、仪器概述

ADMT 安卓屏系列产品是一款集数据采集、实时成像、数据多终端同步的物联网智能仪器，配备 10 寸安卓系统触摸屏（单通道标配 5寸或7 寸)、测量主板、1/16/32 道 MN 电极输入接口、可拆卸聚合物电池和充电器、不同颜色开模外壳和铝箱外包装。数据采集完成后实现仪器屏、手机屏、电脑屏均可查看数据和绘图分析，智能简单。

单通道系列采用 1 道输入测量，配置 20 米 MN 标准测线；16 通道系列采用 16 通道同时输入测量，配置 16 道 MN 输入大线；32 通道系列采用 32 通道同时输入测量，配置两根 16 道 MN 输入大线。均支持 MN 电极和 TT 探头测量模式可切换，数据叠加滤波可设置，均可选配有线电磁探头通过 MN 输入或无线蓝牙连接金箍棒进行数据采集。

16 或 32 通道系列分别支持 1-16、1-32 通道数可选、多通道同时输入测量，解决了 MT 法场源随时变化的缺陷，可以获得相对稳定场源，重复测量一致性非常好。通过多通道同时输入测量，可获得高密度法测量的大数据，突破了传统高密度电法仪深度限制，使勘探深度最大能达到 5000 米。还可以采用三台或以上 32 道仪器无线组网而成为 96 道、128 道、256 道及 512 道来进行大数据采集，大大提高野外数据采集的精确度。

ADMT 系列产品获得多项发明专利（专利号：201310205318.9、201110454869.X、202121767124.4、201821856730.1、201821856703.4、），上市以来荣获上海市高新技术成果转化项目认定。 在长达近 20 年的实践上，广泛与人工直流电法仪器对比试验，获得非常好的异常曲线一致性，在某些接地条件不是很好的地区取得比人工直流电法类仪器更加真实的异常曲线，得到广大客户的普遍认可和支持。

二、仪器主要特点

21 精准高效：采用 1-16、1-32 通道同时输入测量，解决 MT 电法场源变化的缺陷，准确率大大提升，比一般单通道准确率提升 30-60%。

22 智能方便：标配 7/10 寸触摸屏实时成图，并且与手机或平板电脑、PC 电脑三屏互通进行数据处理和制图。

23 深度可选：在不同型号的最大深度范围内的深度可选。

24 通道可选：1、1-16、1-32 通道任意选择。

25 输入灵活：可以 1、1-16、1-32 道 MN 电极输入，MN 间距 1-5 米灵活可变，也可以采用电磁传感器输入解决特殊地层的测量。

26 先进稳定：多重创新设计获得多项发明专利，先进稳定、一致性极高。

三、仪器工作原理简介

ADMT 系列产品利用大地天然电磁场作为工作场源，研究地球内部的电性结构，依据不同频率的电磁波在导电媒质中具有不同趋肤深度的原理，在地表测量由高频至低频的地球电磁响应序列，研究地下不同深度地质体的电性变化差异，确定地下地质体的赋存状态。

3.1 电磁波传播理论、亥姆霍兹方程

地面电磁波发送到地下，电磁波在岩土中的传播遵循 Maxwell 方程。如果假设大多数地下岩土为无磁性物质，并且宏观上均匀导电，不存在电荷积累，那么 Maxwell 方程就可简化为：

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

式中 k 称为波数（或传播系数）

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

考虑到传播系数 k 为复数，令$k = b + ia$，其中：a 称为相位系数，b 称为吸收系数。

在 ADMT 系列天然电场物探仪测量的电磁波频率范围内（0.01Hz~8KHz）,通常可以忽略位移电流，这时 K 进一步简化为：

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

3.2 波阻抗与电阻率

有亥姆霍兹方程变化的磁场感生出变化的电场，我们有磁电关系：

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

表面阻抗 Z 定义为地表电场和磁场水平分量的比值。在均匀大地的情况下，此阻抗与入射场的极化无关，和地电阻率以及电磁场的频率有关：

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

（5）式可用于确定大地的电阻率：

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

3.3 趋肤深度

在无磁性介质中，趋肤深度公式为：

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

由上式可知，电磁波的穿透深度与频率、电阻率有关系。频率一定，电阻率越高穿透深度越大，电阻率一定，频率越低穿透深度越大。

四、仪器接口介绍及主要技术参数

4.1 单通道仪器介绍

图 1

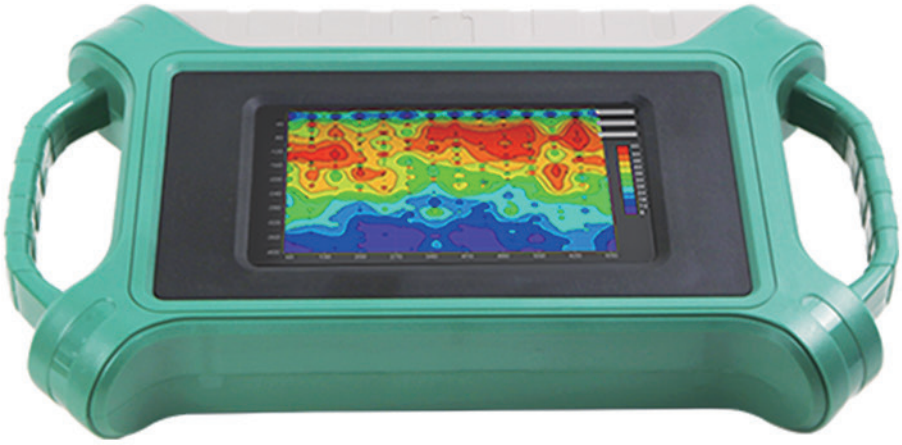


图 2

4.2 16 通道仪器介绍

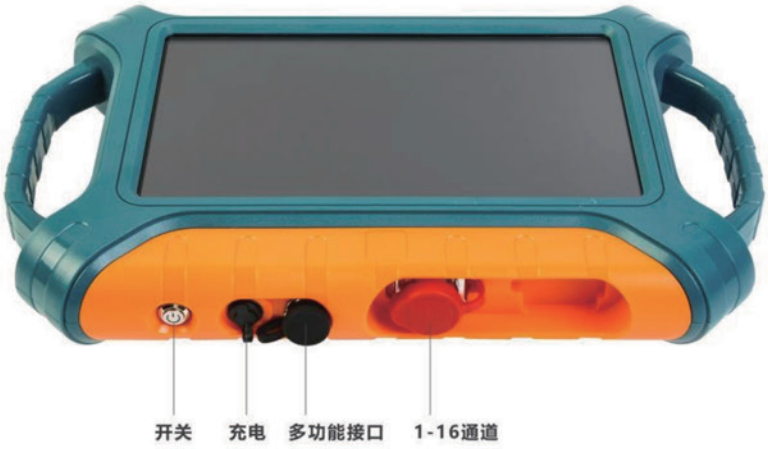


图 3

4.3 32 通道仪器介绍

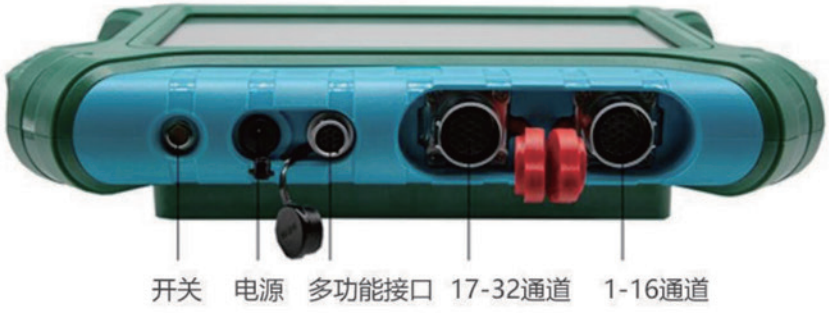


图 4

4.4 基本款单通道主要技术参数

参数 \ 型号	ADMT-300S-X	ADMT-600S-X	ADMT-1200S-X	ADMT-3000S-X
最大深度(m)	≤300	≤600	≤1200	≤3000
通道输入	1通道MN输入			
通道选择	1			
可选深度(m)	100-300	100-600	100-1200	100-3000
深度分层	10-60		10-80	
连接方式	串口、Wifi、蓝牙4.0、USB(选配4G通讯)			
操作显示	7寸IPS广角178°可视触摸屏			
操作系统	安卓6.0.1			
CPU	ARM Cortex-A7 8核CPU 2.0Hz			
GPU	OpenGL ES 2.0			
主要功能	深度可选、实时2D/3D绘图、电池可拆卸			
测量模式	MN/TT			
频率范围(HZ)	1-8K		0.01-8K	
选频滤波	预设选频和智能选频、模拟+数据滤波1-16次叠加可选			
分辨率	0.1mV±5%		0.01mV±2%	
采样时间(秒)	30-280		60-900	
电池功耗	600mA/H			
主机重量	1.6kg			

4.5 基本款16通道主要技术参数

型号 / 参数	ADMT-300SX-16D	ADMT-500SX-16D	ADMT-1200SX-16D	ADMT-2000SX-16D	ADMT-3000SX-16D
最大深度(m)	≤300	≤500	≤1200	≤2000	≤3000
通道输入	16道同时输入, 最大电极间距2.5m				
通道选择	1-14				
可选深度(m)	最大深度内可选, 参考100/200/300/400/500/600/800/1200/2000/3000m				
深度分层	10-80				
连接方式	串口、Wifi、蓝牙4.0、USB(选配4G通讯)				
操作显示	10.1寸IPS广角178°可视触摸屏(1024×600)				
操作系统	安卓6.0.1				
CPU	ARM Cortex-A7 8核CPU 2.0Hz				
GPU	OpenGL ES 2.0				
主要功能	深度可选、实时2D/3D绘图、电池可拆卸				
测量模式	MN/TT				
频率范围(HZ)	1-8K		0.01-6K		
选频滤波	预设选频和智能选频、模拟+数据滤波1-16次叠加可选				
分辨率	0.1mV±3%		0.01mV±2%		
采样时间(秒)	60-3600		120-5400		
电池功耗	800mA/H				
主机重量	1.85kg				

4.6 基本款32通道主要技术参数

参数 \ 型号	ADMT-400SX-32D	ADMT-600SX-32D	ADMT-1200SX-32D	ADMT-3000SX-32D	ADMT-4000SX-32D
最大深度(m)	≤400	≤600	≤1200	≤3000	≤4000
通道输入	32道同时输入, 最大电极间距5m				
通道选择	1-30				
可选深度(m)	最大深度内可选100/200/300/400/500/600/800/1200/2000/3000/4000m				
深度分层	40-160				
连接方式	串口、Wifi、蓝牙4.0、USB(选配4G通讯)				
操作显示	10.1寸IPS广角178°可视触摸屏(1024×600)				
操作系统	Android6.0.1 运行内存1G 内存8G(可扩展128G)				
CPU	ARM Cortex-A7 8核CPU 2.0Hz				
GPU	OpenGL ES 2.0				
主要功能	深度可选、通道数可选、实时2D/3D绘图、电池可拆卸				
测量模式	MN/TT				
频率范围(HZ)	1-8K		0.01-6K		
选频滤波	预设选频和智能选频、模拟+数据滤波1-16次叠加可选				
分辨率	0.001-7K				
采样时间(秒)	120-7200		160-9000		
电池功耗	900mA/H				
主机重量	2.0kg			2.2kg	

4.7 专业款单通道主要技术参数

型号 / 参数	ADMT-200AX	ADMT-300AX	ADMT-500AX	ADMT-600AX	ADMT-1200AX	ADMT-3000AX	ADMT-5000AX	ADMT-20KG-X	ADMT-100KG-X	ADMT-60D-X	ADMT-100D-X
最大深度(m)	≤200	≤300	≤500	≤600	≤1200	≤3000	≤5000	≤20	≤100	≤60	≤100
通道输入	1通道MN输入										
通道选择	1										
可选深度(m)	最大深度内可选, 参考5/10/20/40/60/100/200/300/500/800/1200/2000/3000/4000/5000m										
深度分层	10-100							5-20	5-100		
连接方式	串口、Wifi、蓝牙4.0、USB(选配4G通讯)										
操作显示	7寸IPS广角178°可视触摸屏										
操作系统	安卓6.0.1										
CPU	ARM Cortex-A7 8核CPU 2.0Hz										
GPU	OpenGL ES 2.0										
主要功能	深度可选、实时2D/3D绘图、电池可拆卸										
测量模式	MN/TT										
频率范围(HZ)	1-8K				0.001-8K			100-8K			
选频滤波	预设选频和智能选频、模拟+数据滤波1-16次叠加可选										
分辨率	0.1mV±2%				0.01mV±1%			0.01mV±2%			
采样时间(秒)	100-360				120-1500			40-3600			
电池功耗	700mA/H							800mA/H			
主机重量	1.6kg									2.5kg	

4.8 专业款16通道主要技术参数

型号 / 参数	ADMT-200AX-16D	ADMT-300AX-16D	ADMT-500AX-16D	ADMT-600AX-16D	ADMT-60D-16D	ADMT-60KG-16D
最大深度(m)	≤200	≤300	≤500	≤600	≤60	≤60
通道输入	16道同时输入,最大电极间距5m					
通道选择	1-14					
可选深度(m)	5-200	5-300	60-500	60-600	5/10/20/40/60m	
深度分层	10-100				5-60	
连接方式	串口、Wifi、蓝牙4.0、USB(选配4G通讯)					
操作显示	10.1寸IPS广角178°可视触摸屏(1024×600)					
操作系统	安卓6.0.1					
CPU	ARM Cortex-A7 8核CPU 2.0Hz					
GPU	OpenGL ES 2.0					
主要功能	深度可选、通道数可选、实时2D/3D绘图、电池可拆卸					
测量模式	MN/TT					
频率范围(HZ)	1-8K				100-8K	
选频滤波	预设选频和智能选频、模拟+数据滤波1-16次叠加可选					
分辨率	0.01mV±2%					
采样时间(秒)	40-3600					
电池功耗	900mA/H					
主机重量	1.85kg	2.8kg	1.85kg	2.8kg	2.8kg	1.85kg

4.9 专业款32通道主要技术参数

型号 / 参数	ADMT-300AX-32D	ADMT-600AX-32D	ADMT-1200AX-32D	ADMT-3000AX-32D	ADMT-5000AX-32D	ADMT-100D-32D	ADMT-60KG-32D
最大深度(m)	≤300	≤600	≤1200	≤3000	≤5000	≤100	≤60
通道输入	32道同时输入,最大电极间距5m						
通道选择	1-30						
可选深度(m)	5-300	100-600	10-1200	60-3000	60-5000	5-100	5-60
深度分层	60-200					5-100	
连接方式	串口、Wifi、蓝牙4.0、USB(选配4G通讯)						
操作显示	10.1寸IPS广角178°可视触摸屏(1024×600)						
操作系统	Android6.0.1 运行内存1G 内存8G(可扩展128G)						
CPU	ARM Cortex-A7 8核CPU 2.0Hz						
GPU	OpenGL ES 2.0						
主要功能	深度可选、通道数可选、实时2D/3D绘图、电池可拆卸						
测量模式	MN/TT						
频率范围(HZ)	0.001-7K					100-8K	
选频滤波	预设选频和智能选频、模拟+数据滤波1-16次叠加可选						
分辨率	0.001mV±2%		0.001mV±1%			0.01mV±2%	
采样时间(秒)	1200-9000		280-14400			40-3600	
电池功耗	700mA/H		1100mA/H			1000mA/H	
主机重量	2.2kg					3.0kg	2.2kg

五、系统登录及注册

5.1 系统介绍及网络连接

打开仪器电源后，屏幕显示串口连接、触摸导出、文件夹、新建测量、参数配置、数据处理等菜单（如图 5）。

图 5

首次使用本仪器需在有网络的环境下利用手机号发送验证登录和注册账号后登陆使用，登陆后的手机号或注册账号是云端数据管理账号，可以在手机、电脑上登陆本账号实现数据同步分析。仪器标配不带 4G 网络的，需要在有 WiFi 的环境或使用手机 WiFi 热点功能来为仪器提供无线网络。

连接方法为：手指轻触屏幕左侧上半部分会跳出一点隐藏左侧菜单，手指顺势向右滑动屏幕会调出左侧菜单，选择“设置”后点击“系统 WiFi 设置”来搜索并连接附近的 WiFi 网络。可以参照本说明书《11.3.3 系统设置》，注册完成后除数据备份及同步外，其他操作无需网络。

仪器连接网络后，点击任意图标可以进行登录和注册（图 6），可选择“手机号快速登录”、“账号密码登录”两种登录方式，建议选择“手机号快速登录”输入手机号发送验证码来登录，（验证码有效期为 4 小时，并且支持在其他设备上登录）。特别提示定要连接好 WiFi 网络或手机 WiFi 热点保持仪器网络畅通发送验证码和登录才有效，如未连接网络或网络异常情况下会提示发送验证码失败。

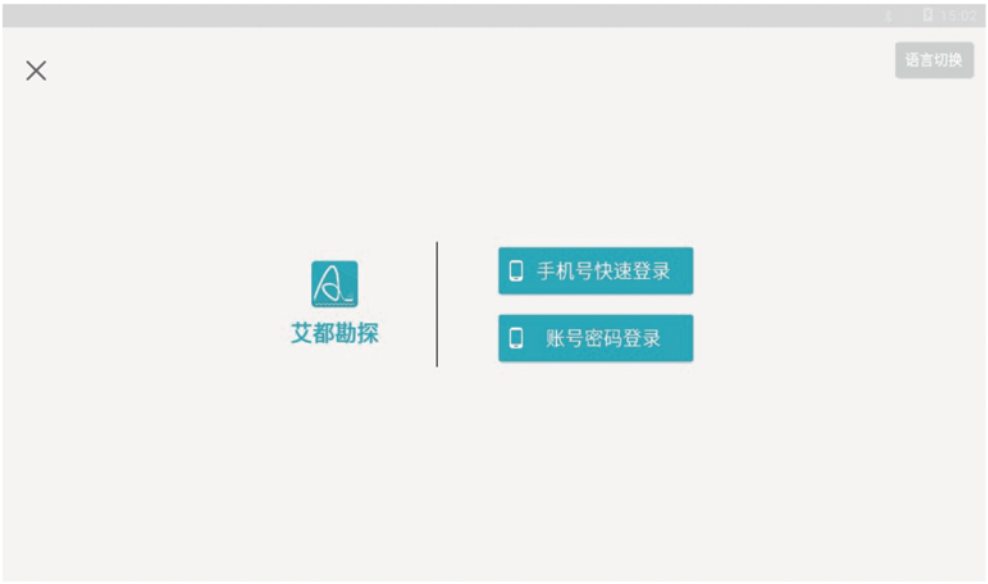


图 6

5.2 手机号快速登录

点击“手机号快速登录”输入手机号码（如图 7 ），点击“获取验证码”输入手机接收到的验证码，点击登录即可登录到系统主界面。

图 7

5.3 账号密码登录

点击“账号密码登录”跳出登录框（如图 8），首次登录需要先注册账户，点击“立即注册”跳到注册界面（如图 9），输入手机号获取验证码、输入账号、密码完成注册。注册成功后，再次点击“账号密码登录”，输入账号、密码便可登录系统。

图 8

图 9

语言切换：点击屏幕右上角“语言切换”，可根据需要切换成相应国家语言界面。

六、新建测量操作

6.1 新建测量

点击“新建测量”进入测量界面（如图 10），输入测线名称（可中文、数字、英文输入）、制图 X 坐标默认为 10，一般无需更改，数值填写越大制图 X 坐标显示越宽。系统支持在测量完成后再根据需要来修改。

图 10

点击确定，进入测量设置界面，随后会弹出测量参数界面来设置相关参数（如图 11）。

图 11

6.2 参数设置说明

1　　测量深度（米）：

选择您需要测量的深度，一般默认值为本型号所能测量的最大深度，在＜最大深度范围内提供多种深度供用户选择。

2　　测量模式：

可选 TT（电磁探头）和 MN（电极）两种测量模式供选择，用户根据实际的信号输入类型进行选择。

3　　测量通道数：

单通道仪器通道数默认 1 无需更改；16 通道仪器通道数默认为 14，可以在 1-14 通道内任意选择；32 通道仪器通道数默认为 30，可以在 1-30 通道内任意选择；简单理解在该型号仪器所支持的最大通道数内可以任意选择测量通道数量。

4　　选频叠加次数：

不同型号产品可选次数不一样，一般有 4-6、4-10、4-16 次可以选择。一般选择叠加次数数值越大，测量时间会越长，抗干扰能力也会越强，数据更稳定可靠。

点击“确定”即进入测量界面。

6.3 数据测量

进入测量界面后点击屏幕左侧“测量”按钮并可采集数据，测量进度条到 100%完成当前测点数据采集（如图 12）。

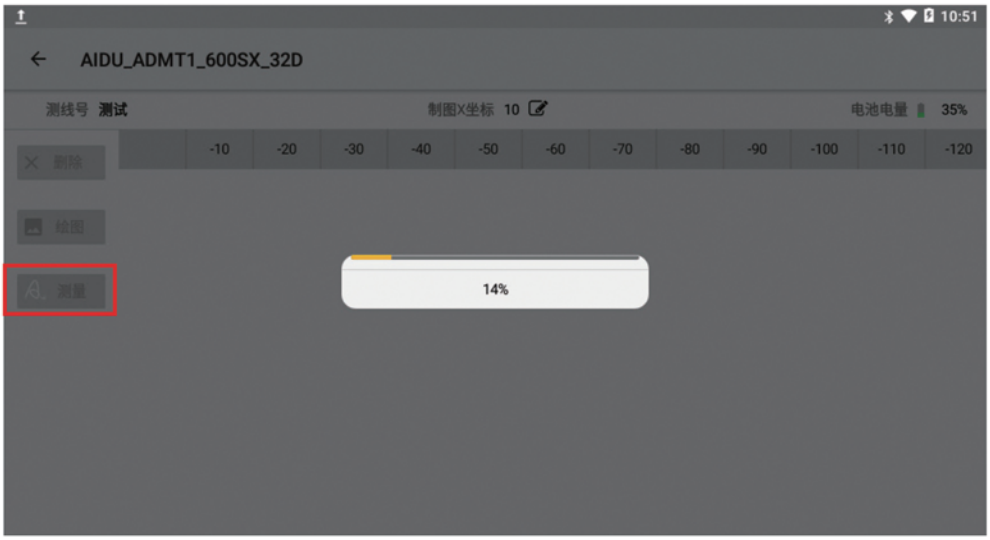


图 12

点击“确认”可保存数据，点击“重测”可对该点进行重新测量（如图 13）。

图 13

选择“删除”可以删除上一次测量数据。如果不需要删除则将设备移至下一测点后点击“测量”测量下一组数据，依次类推完成整个剖面的测量采集工作（如图 14）。在完成整个剖面数据测量过程中不要点击“绘图”，因为选择绘图后进行的数据处理可能会影响数据准确性。

	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100	-110	-120
0	0.119	0.178	0.227	0.268	0.316	0.523	0.186	0.198	0.152	0.431	0.200	0.149
10	0.119	0.176	0.229	0.247	0.247	0.457	0.157	0.159	0.160	0.177	0.193	0.121
20	0.109	0.176	0.228	0.267	0.257	0.335	0.169	0.142	0.145	0.212	0.125	0.108
30	0.125	0.184	0.246	0.274	0.305	0.356	0.203	0.129	0.135	0.202	0.122	0.098
40	0.109	0.171	0.225	0.239	0.214	0.257	0.141	0.124	0.125	0.142	0.142	0.085
50	0.107	0.168	0.223	0.236	0.219	0.253	0.138	0.116	0.114	0.144	0.101	0.076
60	0.129	0.178	0.233	0.252	0.238	0.331	0.165	0.174	0.185	0.302	0.126	0.097
70	0.131	0.182	0.227	0.247	0.262	0.305	0.169	0.128	0.195	0.288	0.147	0.095
80	0.106	0.160	0.204	0.220	0.169	0.389	0.124	0.145	0.111	0.122	0.122	0.101

图 14

6.4 通道检测

测量过程中如出现错误提示（如图 15），请点击“检查通道”返回测量界面，并检查 MN 是否正常接地或者测量线缆是否连接好仪器，连接信号输入正常才能进行正常测量，如果选择“强制测量”仪器会正常测量出数据，但数据可能不准确。如自己不能解决请与厂家和经销商联系。

图 15

七、绘图操作方法

7.1 绘图基本操作

在测量时，当测点数超过 6 个点时屏幕左侧“绘图”按钮会变蓝，此时可点击绘图（如图 16），**建议在没有完成整条剖面测量时，不要中途绘图，这样操作可能影响数据的准确性。**

	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100	-110	-120
0	0.177	0.178	0.252	0.285	0.242	0.439	0.182	0.168	0.172	0.219	0.175	0.142
10	0.116	0.176	0.249	0.261	0.256	0.432	0.201	0.156	0.149	0.220	0.185	0.171
20	0.117	0.178	0.248	0.251	0.247	0.305	0.164	0.132	0.154	0.191	0.163	0.156
30	0.136	0.174	0.228	0.244	0.227	0.266	0.157	0.128	0.154	0.192	0.148	0.128
40	0.111	0.166	0.221	0.231	0.204	0.247	0.152	0.110	0.113	0.146	0.165	0.093
50	0.107	0.168	0.221	0.235	0.201	0.248	0.139	0.111	0.110	0.141	0.114	0.100
60	0.149	0.176	0.238	0.241	0.230	0.288	0.167	0.134	0.145	0.185	0.182	0.147
70	0.114	0.178	0.219	0.221	0.215	0.253	0.150	0.127	0.150	0.169	0.136	0.157
80	0.112	0.161	0.209	0.217	0.185	0.368	0.131	0.122	0.109	0.143	0.142	0.107

图 16

选择绘图后可选择绘制“等直线图”和“曲线图”（如图 17），根据实际需要选择图形种类。首次选择“等直线图”可能会提示安装“艾都制图”，根据提示安装即可，因为选择“等直线图”会跳转到“艾都制图”程序中绘图，有时在点击“等直线图” 会提示“艾都制图已停止运行”等错误提示，这是系统冲突所致，一般可以通过退出后重新进入或重启仪器来恢复。

	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100	-110	-120
0	0.177	0.178	0.252	0.285	0.242	0.439	0.182	0.168	0.172	0.219	0.175	0.142
10	0.116	0.176	0.2					0.156	0.149	0.220	0.185	0.171
20	0.117	0.178	0.2					0.132	0.154	0.191	0.163	0.156
30	0.136	0.174	0.2					0.128	0.154	0.192	0.148	0.128
40	0.111	0.166	0.2					0.110	0.113	0.146	0.165	0.093
50	0.107	0.168	0.221	0.235	0.201	0.248	0.139	0.111	0.110	0.141	0.114	0.100
60	0.149	0.176	0.238	0.241	0.230	0.288	0.167	0.134	0.145	0.185	0.182	0.147
70	0.114	0.178	0.219	0.221	0.215	0.253	0.150	0.127	0.150	0.169	0.136	0.157
80	0.112	0.161	0.209	0.217	0.185	0.368	0.131	0.122	0.109	0.143	0.142	0.107

图 17

7.2 绘图 2D、3D 等直线图

选择“等直线图”系统会自动生成等直线图（如图 18）。

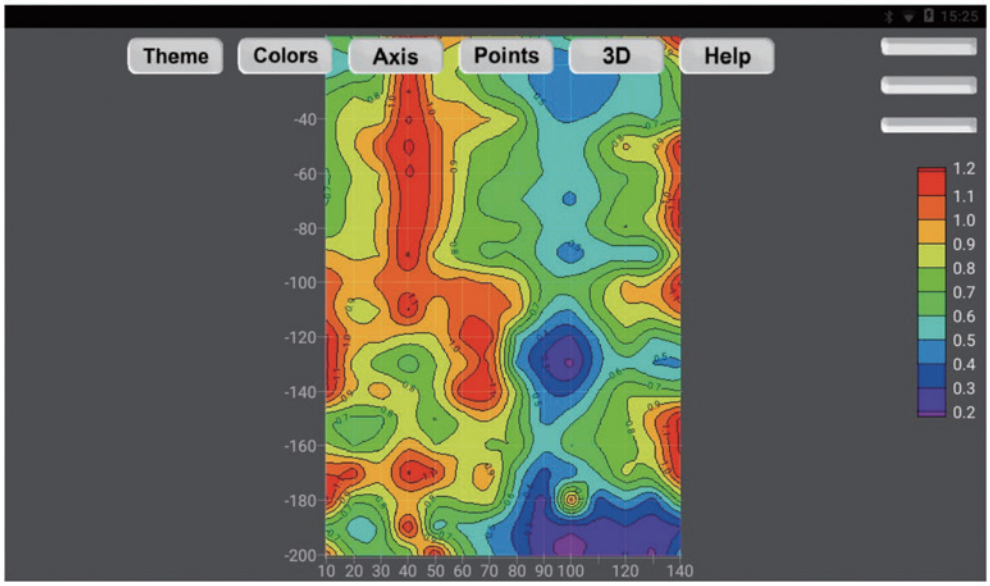


图 18

点击绘图界面上方“3D”或“2D”图标可切换 2D 图和 3D 图（如图 19），点击绘图界面右上角图标可以设置颜色标尺，一般默认为 5 不用改变设置。点击“保存图片”后确认保存把效果图直接保存到系统文件设备名称中，点击 “退出”退回测量数据界面。

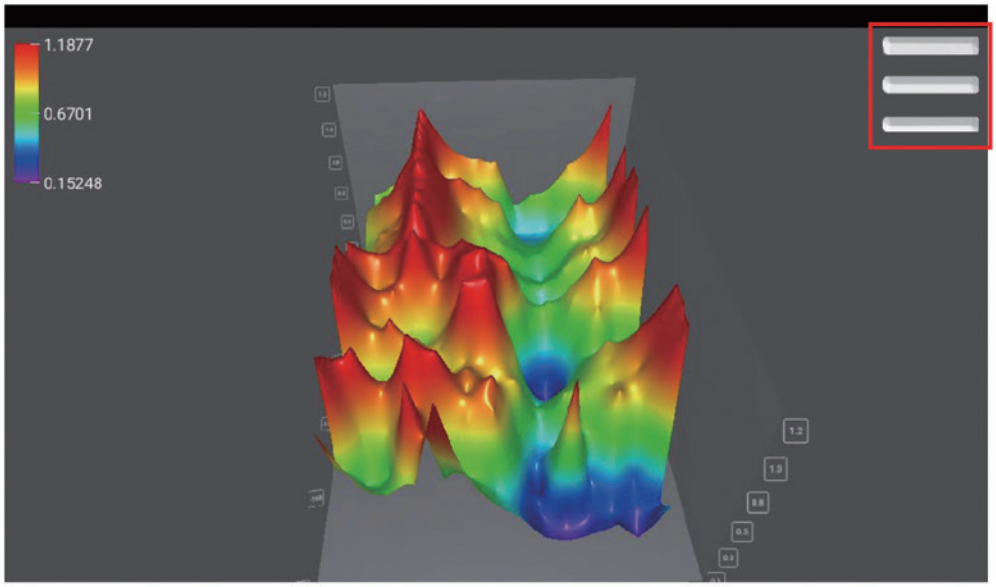


图 19

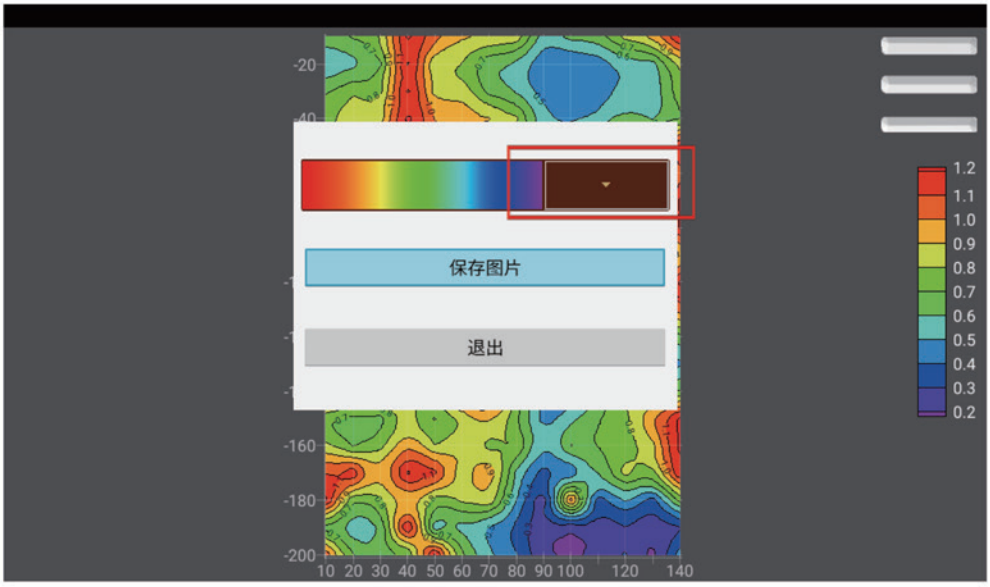


图 20

7.3 绘图曲线图

如果选择“曲线图”系统会自动生成曲线图（如图 21）。

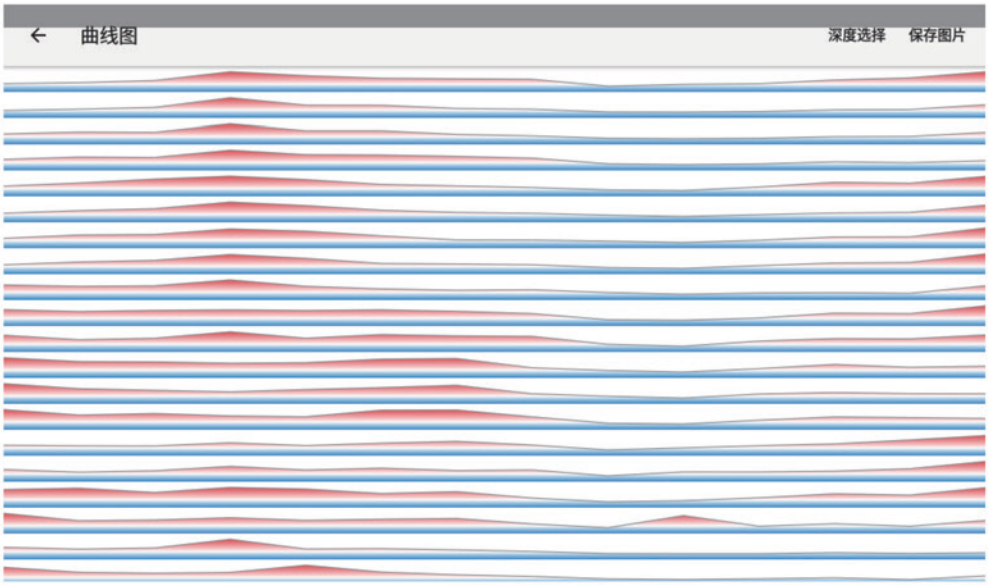


图 21

通过点击右上角“深度选择”可以自主选择相应深度的曲线显示（如图 22）。

图 22

选择“保存图片”来保存曲线图至文件夹（如图 23）。

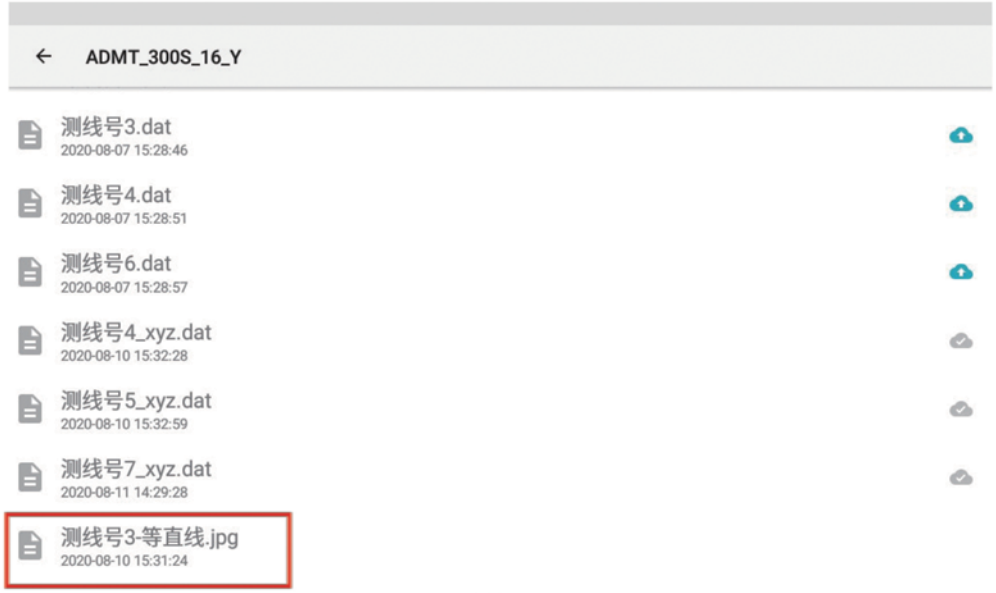


图 23

7.4 在文件夹中绘图

通过选择文件夹中需要查看和绘图的文件名称（如图 24）可以直接 “查看数据”和“连接补测”（如图 25），选择“查看数据”进入数据页面（如图 21），选择“连接补测”部分仪器支持补充测量功能，继续该测线的数据测量。

图 24

图 25

八、文件夹操作方法

8.1 文件夹基本操作

文件夹是所有数据查看、绘图的入口，文件首先按照文件建立的时间来命名，如20200808，仪器测量的数据、同步的数据及其他方式传输过来的数据都可在“文件夹”中查看、绘制、查看及提交专家分析等。

点击“文件夹”可看到所有文件，数据按照添加时间自动排列（如图 26）。点击左上角的“←”返回上一界面，点击右上角的“”，数据文件名称关键字可以搜索文件。点击日期文件夹可以查询该日期下所有数据文件（如图 27）。在有网络环境下可点击图标把待上传的文件上传至云端。标记这样图标的文件，说明已经在云端备份，可以在手机和电脑端同步下载、查看制图。

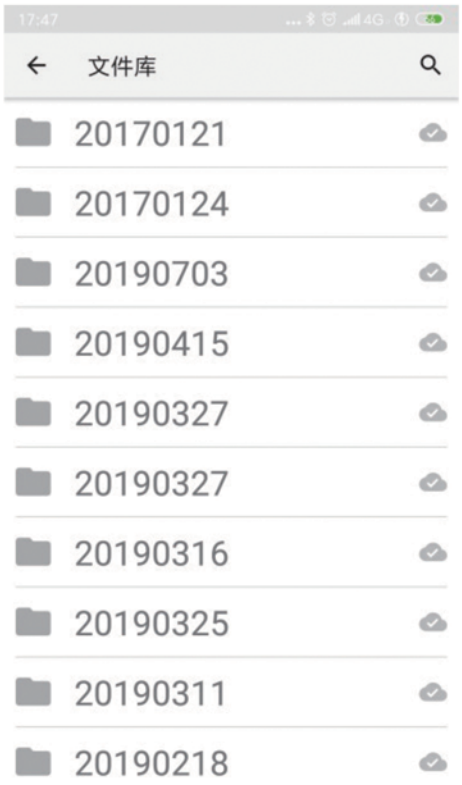


图 26

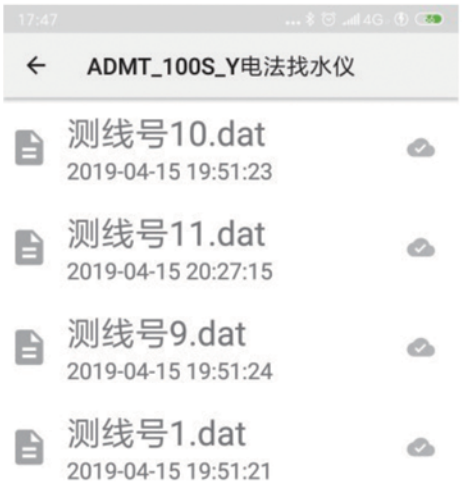


图 27

8.2 专家分析提交

长按需要处理的数据文件，被长按的文件高亮同时进入多选状态（如图 28），点击“专家分析”跳转到专家分析提交界面（如图 29），可以提交本数据给后台在线专家分，同时可以说明本数据的测量图片、测量现场视频、测量点距等信息，点击“保存”后提交给艾都勘探专家后台，专家分析后再将分析结果反馈到系统中，通过《11.2.5.专家分析》中去查看。

图 28

图 29

8.3 数据删除和导出

长按需要处理的数据文件，被长按的文件高亮同时进入多选状态（如图 30），选择“删除”会提示“本地删除”和“云端删除”。选择“云端删除”可以删除云端备份数据，选择“本地删除”可以删除本设备保持的数据。

图 30

可以在手机中可将选中的数据选择“导出”功能，通过微信或者 QQ 传输下载链接和密码到 PC 电脑中，点击连接输入密码可以下载本数据文件。

九、参数配置操作方法

在主屏幕单击“参数配置”，进入参数配置界面，如下图（图 31）：

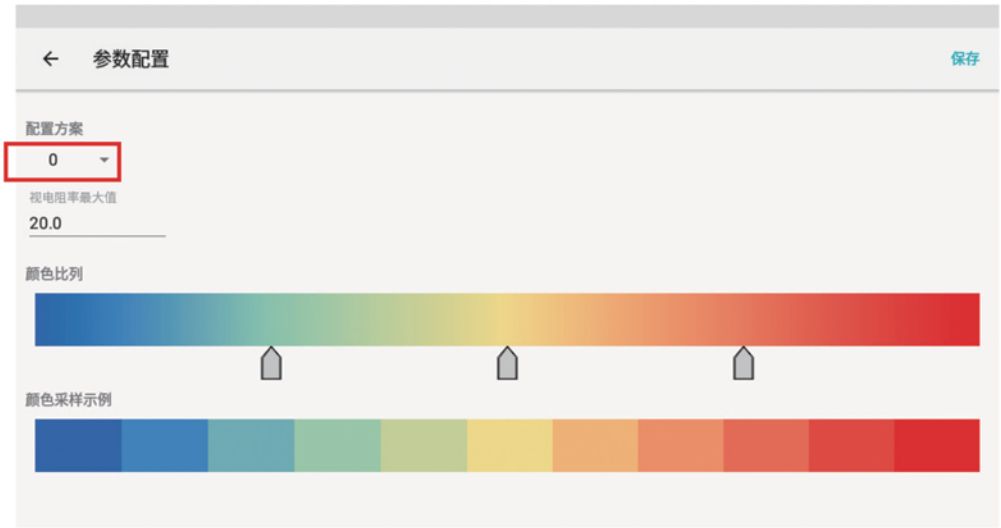


图 31

点击配置方案旁边小箭头，可选择不同参数配置，同一组数据选择不同的参数配

置绘制效果图不一样，不同参数可适用不同地区和应用场景。用户可根据实际用途和地区自由选择，并且遵守物探的基本原则“已知道未知”的原则，在已知的目标上测量后选择不同参数来绘图，视图形与实际相符程度来确认参数配置方案。参数配置方案选择是长期经验总结来优化选择配置，可以更加准确适用不同地区和应用场景。一些高级用户可以选择方案 8 来自行设置参数（普通用户慎用）。建议参数配置选择方案：

方案 0 为通用参数，可以匹配大部分地区。

方案 1 可以应用于北方地区找水，地质分层较好。

方案 2 可以应用于南方地区找水，地质分层一般，方便判断裂隙和岩溶构造。

方案 3 可以应用于大深度勘探，如地热温泉、地质构造和普查。

方案 4 可以应用于空洞、考古及一些浅层勘查工作。

方案 5 可以应用于水利工程、堤坝管涌检测、边坡灾害等。

方案 6 可以应用于城市工程物探、环保、堤坝及工程建设。

方案 7 可以应用于专业物探勘查，兼顾浅中层效果，用于找矿等。

方案 8 专业模式，需要用户自行设置各参数（慎用）。

该配置方案可能会根据实际应用场景进行调整，请关注艾都勘系统更新。

十、数据处理操作方法

在主屏幕，单击“数据处理”进入数据处理界面（如图 32）。

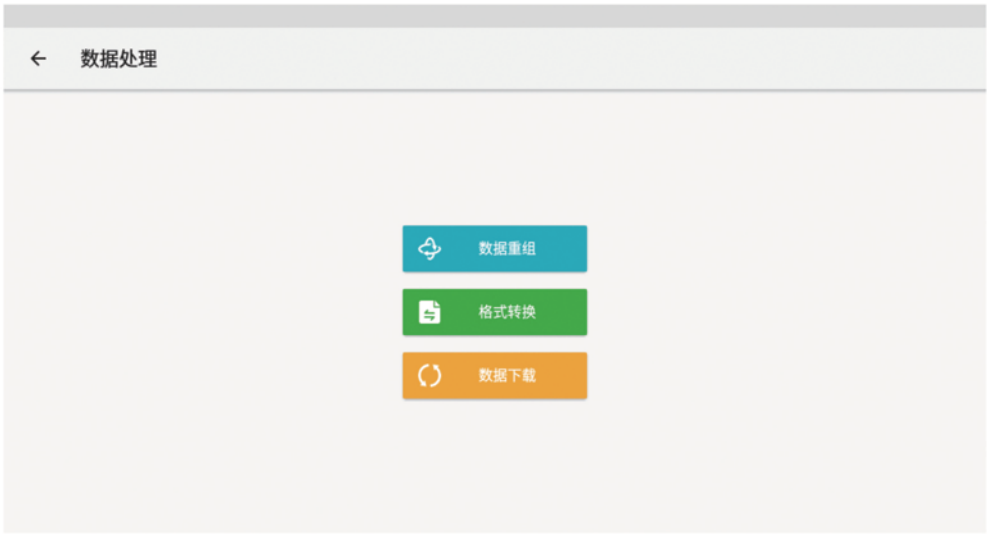


图 32

10.1 数据重组

该功能可对不同剖面的测线数据在相同深度的测量数据进行重组绘制平面剖面图。

点击“数据重组” 进入数据重组操作界面（如图 33），点击右方“＋”号可选择多条要处理的测线数据，输入需要重组的测量深度，点击“确定”即可完整数据重组。

图 33

10.2 格式转换

该功能可将测量数据格式转换成其他高密度仪器制图软件格式，方便交互使用。

10.3 数据下载

该功能可将当前登录账户上所有云端数据下载到本地，实现多终端数据同步。

十一、仪器其他功能操作方法

11.1 触屏导出操作方法

当主机连接方式为“串口连接”及“WiFi 连接”时无法使用触屏导出功能，当连接方式改为“蓝牙连接”方式，并且与外部带触摸屏测量主机蓝牙连接好可将外部主机测量数据导入到本仪器系统文件夹中（具体导出方法见 ADMT 系列产品操作手册“蓝牙传输”介绍与厂家联系）。

11.2 主机侧边隐藏菜单操作方法

用手指肚轻触屏幕左侧上半部分会跳出一点隐藏左侧菜单，手指顺势向右滑动屏幕会调出左侧菜单（如图 34）。

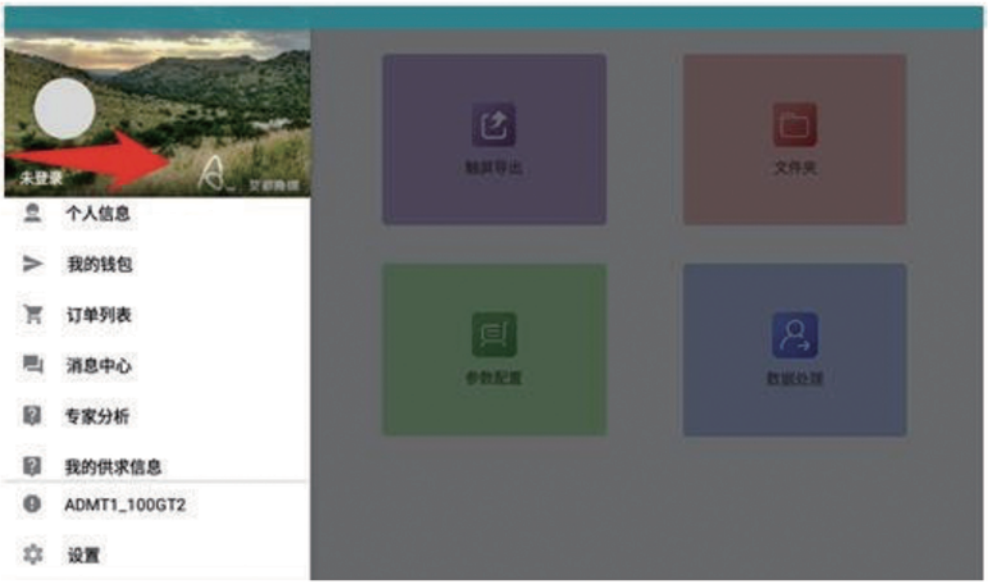


图 34

11.2.1 个人信息

点击“个人信息”可查看、编辑个人资料。

11.2.2 我的钱包

点击“我的钱包”可查看个人积分数据。

11.2.3 订单列表

点击“订单列表”，暂不支持。

11.2.4 消息中心

点击消息中心可以查看系统消息。

11.2.5 专家分析

可查看 APP 后台专家分析结果，需要在文件夹中提交数据给专家进行分析，具体操作参照《8.2 专家分析提交》

11.2.6 我的供求信息

可发布供求信息，暂不支持。

11.2.7 点击连接设备

点击可查看仪器型号及设备号，仅蓝牙模式显示。

11.2.8 设置

点击设置进入系统设置界面(如图 35)。

图 35

11.3 系统设置

11.3.1 语言选择：点击“中文”可进行中文和其他国家语言界面切换。

11.3.2 连接方式：点击可根据仪器型号规格选择“蓝牙连接”、“串口连接”、“WiFi 连接”，一般出厂已设置好连接方式，无需更改。但系统提供选择连接方式可以作其他用途，蓝牙连接可以连接其他外部主机使用、WiFi 连接用于无线组网实现 1-200 道同时测量，您购买的仪器是否支持和兼容该功能请与厂家确认。

11.3.3 系统设置：点击“系统蓝牙设置”可连接操作艾都带蓝牙的系列仪器；点击“系统 WiFi 设置”可搜索和连接附近无线网络信号，为仪器提供网络便于用户登录、注册登录、数据备份同步；点击“屏幕亮度设置”可设置屏幕显示亮度、打开和隐藏系统状态栏、导航栏参数。

11.3.4 其他

注册协议：点击可查看主机相关使用协议。

隐私保护政策：点击可查看公司对使用仪器的客户相关隐私保护政策。

检查更新：在有网络状态下点击可检查系统版本，可更新到最新版本软件。

关于：点击可查看本仪器 APP 版本号。

退出：点击可退出当前登录的账户。

十二、仪器野外连接方法

12.1 单通道连接方式

12.1.1 有线电极连接方式：

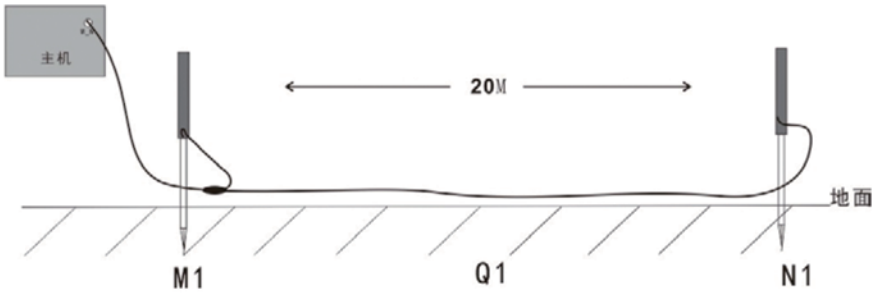
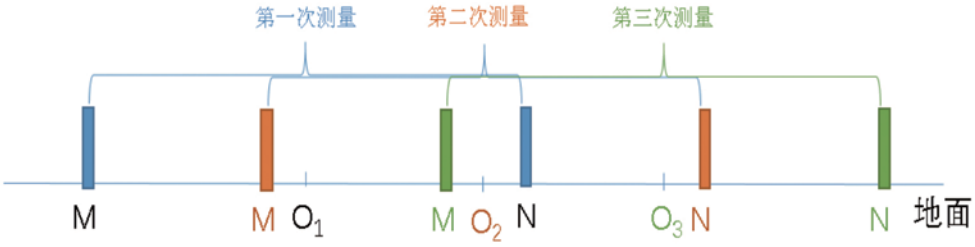


图 36

仪器开机后按上图所示连接仪器（如图 36），将 M、N 测量电极插地，开始采样，测点位置为两根 M、N 电极棒的中心位置。该点采样结束后以一定的点距往相同方向移动 M、N 电极，进行第二个测量点采样测量（如图 37）。以此类推，直至完成整条剖面测量。



MN为测量电极，O_1、O_2、O_3……为测量点，为MN的中点

图 37

12.1.2 有线磁探头连接方式（选配）

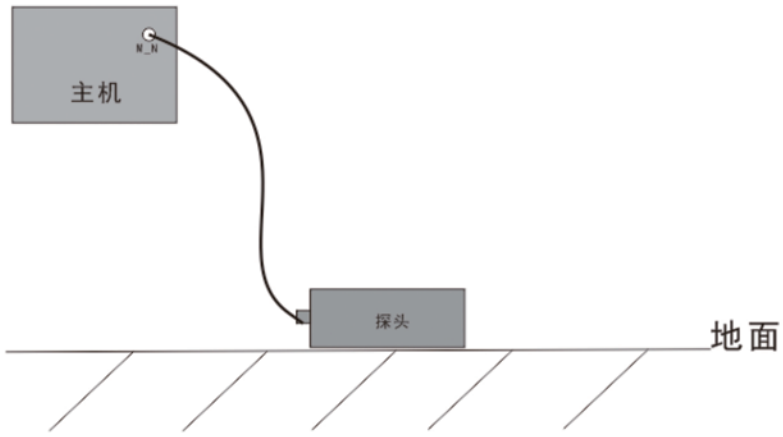


图 38

仪器开机后按上图所示连接仪器（如图 38），将传感器平放在地面上，开始采样，测量点为传感器正下方位置。传感器的摆放方向无要求，但是一条测线上各个测点传感器的摆放方向要求一致。该点采样结束后以一定的点距往相同方向移动传感器，进行第二个测量点采样测量。以此类推，直至完成整条剖面测量。

12.1.3 无线磁探头连接方式（选配）。

图 39

仪器开机后仪器通过蓝牙连接金箍棒主机，将金箍棒主机放在地面上，开始采样，测量点为金箍棒主机正下方位置。该点采样结束后以一定的点距往相同方向移动金箍棒主机，进行第二个测量点采样测量（如图 39）。以此类推，直至完成整条剖面测量。

12.2 16 通道仪器连接方式

12.2.1 16 通道系列基本连接方法：

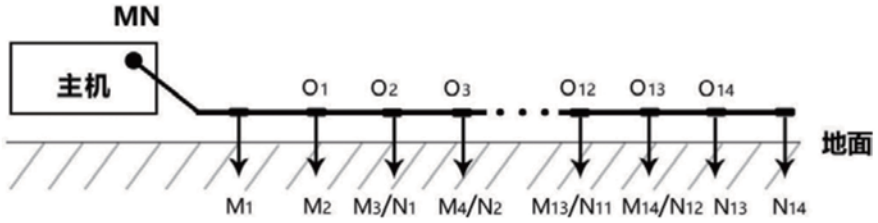


图 40

仪器开机后按上图所示连接仪器（如图 40）,将测量线缆沿着测线方向铺开，电极插地，通过拔插卡连接电极与测量线缆。准备妥当即可开始采样。16 通道仪器一次测量可同时完成 14 个测点的数据采集，测量点为 MN 电极的中心点，即第二根电极为第一个测量点位置，第 3 根电极为第二个测量点位置，依此类推，最后一个测量点在倒数第二个电极处。测量完成可进行第二个剖面的采样测量。以此类推，直至完成整条剖面测量。

12.2.2 16 通道仪器有线电磁探头连接方式：

图 41

仪器开机后按上图所示连接仪器（如图 41）,将测量线缆沿着测线方向铺开，传感器平放地面，其摆放方向无要求，但测线上各个传感器的摆放方向要求一致。通过拔插卡连接传感器与测量线缆。准备妥当即可开始采样。16 通道仪器一次测量可同时完成 8 个测点的数据采集，测点位置为传感器正下方，测量完成可进行第二个剖面的采样测量。以此类推，直至完成整条剖面测量。

12.3 32 通道仪器连接方式

12.3.1 32 通道仪器基本连接方法：

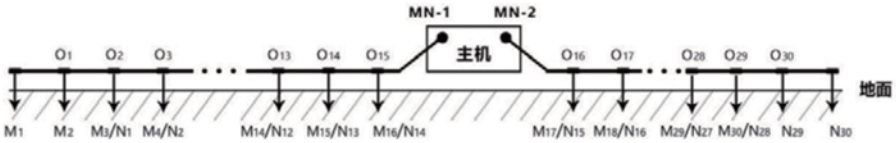


图 42

将两根 16 道测量线缆沿着测线方向铺开，仪器放在两根线缆中间，电极插地，通过拔插卡连接电极与测量线缆（如图 42、43）。准备妥当即可开始采样。32 通道仪器一次测量可同时完成 30 个测点的数据采集；场地限制也可只布设一条线缆，线缆接口需选择 M_N_1 号接口连接。测线起始电极为 M_N_1 号线缆最末端，测量点为 MN 电极的中点，即 M_N_1 号线缆末端第二根电极为第一个测量点位置，第 3 根电极为第二个测量点位置，依此类推，最后一个测量点在倒数第二个电极处。测量完成可进行第二个剖面的采样测量，以此类推，直至完成整条剖面测量。

图 43

12.3.2 32 通道仪器有线电磁探头连接方式：

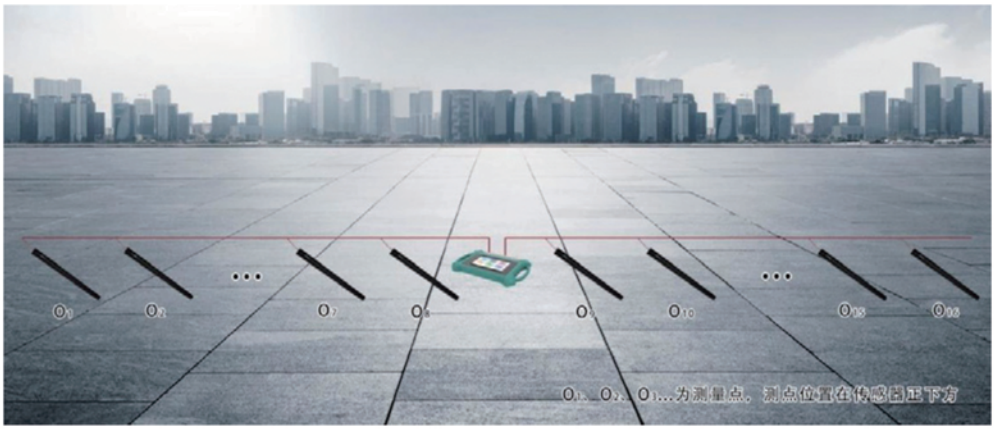


图 44

仪器开机后按上图所示连接仪器（如图 44）,将测量线缆沿着测线方向铺开，仪器放置在两根线缆中间，电磁传感器平放地面，传感器的放置方向无要求，但是一条测线上各个传感器的摆放方向要求一致，通过拔插卡连接传感器与测量线缆。准备妥当即可开始采样。32 通道仪器一次测量可同时完成 16 个测点的数据采集。场地限制也可只布设一条线缆，线缆接口需选择 M_N_1 号接口连接。测线起始测点号为 M_N_1 号线缆最末端，测点位置为传感器正下方。测量完成可进行第二个剖面的采样测量。以此类推，直至完成整条剖面测量。

十三、实地测线布设方法

测线布设是勘探中非常重要环节，测线布设好坏会直接影响到测量精度和提高抗干扰能力，基本原则是测线方向最好能垂直勘探目标体走向，直线剖面尽量直、圆形剖面尽量圆、地面尽量平。根据实际地形地貌选择不同的测线布设方法。

13.1 直线剖面的平行布设方法

直线剖面是最常用的一种布设方法，并且由多条直线剖面平行形成多直线剖面，这样的方法可以快速判读勘探目标物的走向。首先假设和判读出勘探目标物的走向，垂直勘探目标物方向来布置测线（如图 45）直线剖面可布设 1 条或多条，一般布置 2-3 可以快速异常体的走向，根据勘探目标物的长度来布设多条直线剖面，每条直线剖面直接的距离叫做线距，线距一般≤勘探目标物的长度，单位为米。

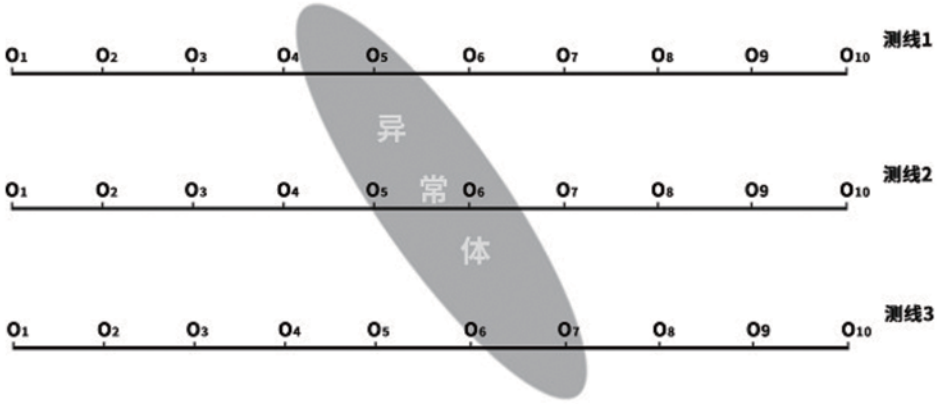


图 45

13.2 直线剖面的十字交叉或斜线交叉布设方法

测量完 1 条直线剖面后发现有异常体或场地比较有限难以布设多条直线剖面时，可以使用十字交叉（如图 46）或斜线交叉（如图 47）来布设第二条直线剖面，结合两条直线剖面异常区域可以重复确认勘探目标物的存在，也可以辅助判断确认勘探目标物的大致走向。

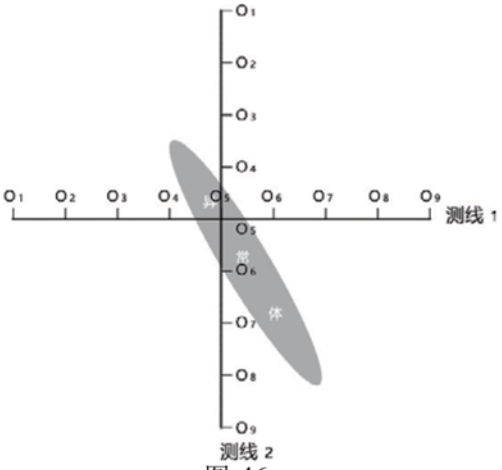


图 46

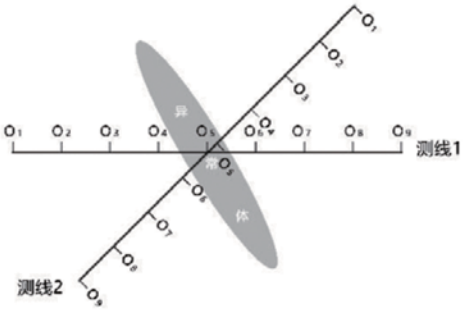


图 47

13.3 圆形剖面布设方法

部分区域勘测场地确实比较窄小或者附近有类似变压器、信号发射塔等点状干扰物时，以场地或干扰物为中心做圆形（图 48）或半圆形（图 49）布设剖面来测量，也可快速追索勘探目标物体（水脉、矿脉等）走向和位置。

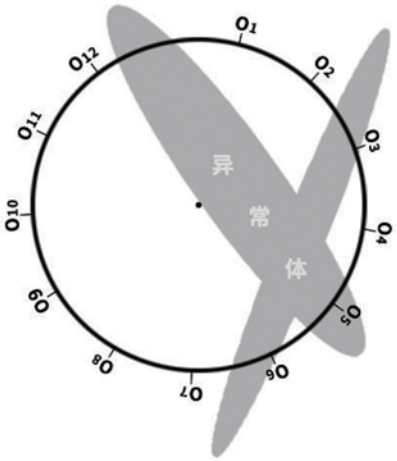


图 48

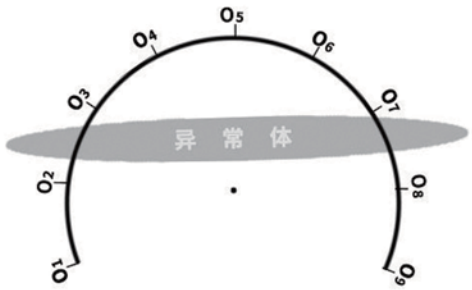


图 49

13.4 多台 32 通道组成 96-512 道矩阵高密度法布设方法

为了让数据采集更加精准高效，可以采用 3 台或以上的 32 通道仪器组成矩阵高密度测量方法。详细与厂家另行联系。

13.5 布线原则

13.5.1 测线布设应尽量垂直异常体走向，直线剖面尽量直、圆形剖面尽量圆、地面尽量平。可以借助用罗盘或标杆三点一线的方法确定测线尽量直。

13.5.2 在山坡上测量时尽量选择相同海拔高度布设，遇到无法等高布设时，尽量选择坡度一致或者坡度较缓方向布设，相邻点之间的高差最好不超过 2 米。

13.5.3 测线应尽可能地远离高压输电线和电话线，当不能远离时，布线方向尽可能与其平行。

13.5.4 测量时尽可能保证 M、N 电极在同一平面，记录点为 M、N 电极中心点或设备传感器下方。

13.5.5 在同一测区中的点距尽量保持相同、线距保持相同，方便记录和分析。

13.5.6 MN 电极模式测量时尽量保持 M、N 电极接地一致性。

十四、使用仪器的注意事项

14.1 请定期检查设备电池电量，定期充电。工作时间保持电量充足，工作结束后及时关闭电源。

14.2 设备在运输或使用过程中要有专人保管，避免仪器受剧烈震动、撞击和进水受潮。

14.3 每次工作结束后，保持设备及 MN 电极干净，放置在通风干燥处。

14.4 MN 电极或者电磁传感器未连接或者断开会提示测量失败，请检查线路是否连接好。

14.5 设备测量中遇到每个测点的测量数据都偏小且数值基本一致时，可能是仪器故障，请联系售后确认。

注意：本产品说明书内定义的产品操作可能会随公司产品优化改进而有所变动， 如有变动以我司电子版说

This operation manual applies to the following Models:

Category / Model	Single channel series	16-channel series	32-channel series
Basic version	ADMT-300S-X	ADMT-300SX-16D	ADMT-400SX-32D
	ADMT-600S-X	ADMT-500SX-16D	ADMT-600SX-32D
	ADMT-1200S-X	ADMT-1200SX-16D	ADMT-1200SX-32D
	ADMT-3000S-X	ADMT-2000SX-16D	ADMT-3000SX-32D
		ADMT-3000SX-16D	ADMT-4000SX-32D
Professional version	ADMT-20KG-X	ADMT-60KG-16D	ADMT-60K-32D
	ADMT-100KG-X	ADMT-60D-16D	ADMT-100D-32D
	ADMT-60D-X	ADMT-200AX-16D	ADMT-300AX-32D
	ADMT-100D-X	ADMT-300AX-16D	ADMT-600AX-32D
	ADMT-200AX	ADMT-500AX-16D	ADMT-1200AX-32D
	ADMT-300AX	ADMT-600AX-16D	ADMT-3000AX-32D
	ADMT-500AX		ADMT-5000AX-32D
	ADMT-600AX		
	ADMT-1200AX		
	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 (5-inch or 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 20m 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, 202121767124.4, 201821856730.1, 201821856703.4), and have been awarded the Shanghai Hightech 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.,Get 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 1-5 meters. 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:

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

(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 (0.1 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:

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

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 and Main parameters

4.1 Single Channel Instrument Instruction

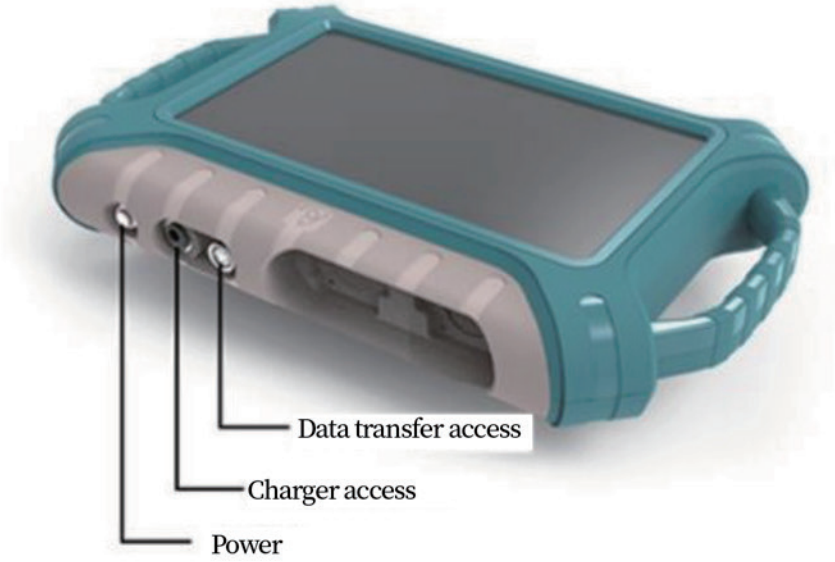


Figure 1

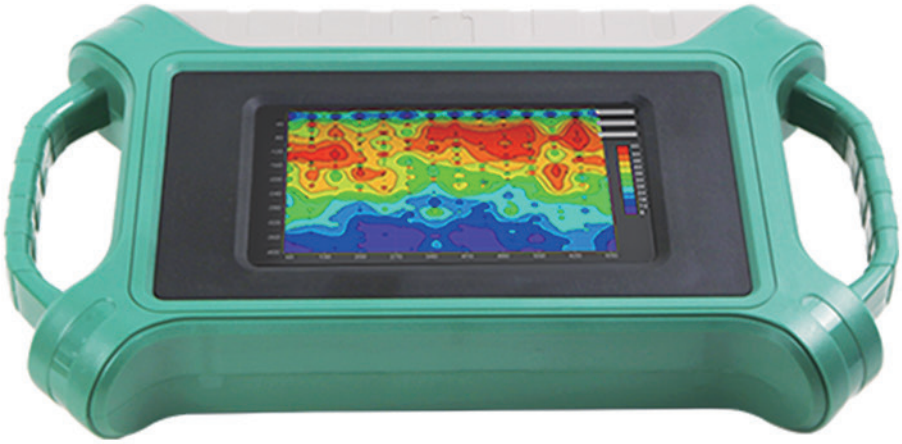


Figure 2

4.2 16 channels instrument instruction

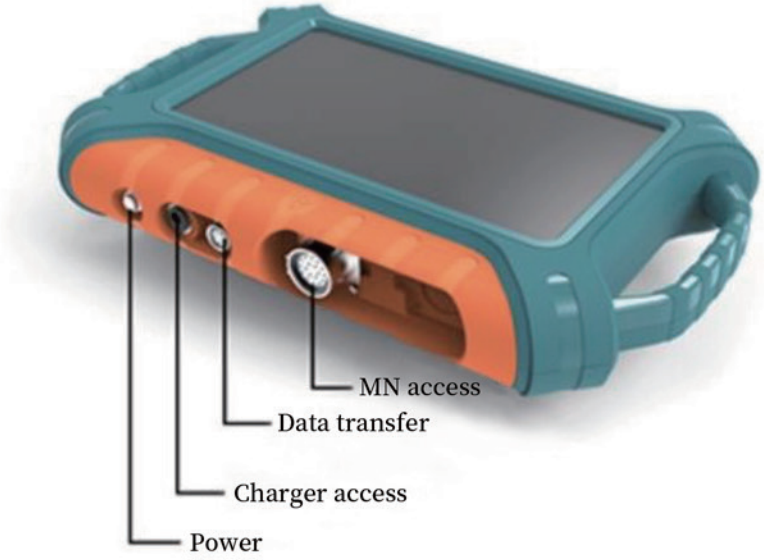


Figure 3

4.3 32 channels instrument instruction

Figure 4

4.4 Main parameters of basic model 1 channel

Versions	ADMT-300S-X	ADMT-600S-X	ADMT-1200S-X	ADMT-3000S-X
Max Depth (m)	⩽300	⩽600	⩽1200	⩽3000
Sensing Mode	1 channel MN input			
Number of Channels	1			
Depth Options (m)	100-300	100-600	100-1200	100-3000
Scan Interval (m)	10-60		10-80	
Connections	Serial port, Wifi, Bluetooth 4.0, USB (optional 4G)			
Display	7-inch IPS wide-angle 178° visual touch screen			
OS	Android 6.0.1			
CPU	ARM Cortex-A7 8-core CPU 2.0Hz			
GPU	OpenGL ES 2.0			
Features	Multiple options of depths, 2D/3D plotting, removable battery			
Sensing Mode	MN/TT			
Frequency Range (hz)	1-8K		0.01-8K	
Filtering	Preset or intelligent frequency selection, analog + data filtering 1-16 times superposition optional			
Discrim.	0.1mV±5%		0.01mV±2%	
Acquisition Time (s)	30-280		60-900	
Battery	600mA/H			
Console Weight	1.6kg			

4.5 Main parameters of basic model 16 channels

Versions	ADMT-300SX-16D	ADMT-500SX-16D	ADMT-1200SX-16D	ADMT-2000SX-16D	ADMT-3000SX-16D
Max Depth (m)	⩽300	⩽500	⩽1200	⩽2000	⩽3000
Sensing Mode	16 channels input simultaneously, maximum electrode spacing 2.5m				
Number of Channels	1-14				
Depth Options (m)	Optional within the maximum depth, refer to 100/200/300/400/500/600/800/1200/2000/3000m				
Scan Interval (m)	10-80				
Connections	Serial port, Wifi, Bluetooth 4.0, USB (optional 4G)				
Display	10.1-inch IPS wide-angle 178° visual touch screen (1024×600)				
OS	Android 6.0.1				
CPU	ARM Cortex-A7 8-core CPU 2.0Hz				
GPU	OpenGL ES 2.0				
Features	Multiple options of depths, channel number optional, 2D/3D plotting, removable battery				
Sensing Mode	MN/TT				
Frequency Range (hz)	1-8K		0.01-6K		
Filtering	Preset or intelligent frequency selection, analog + data filtering 1-16 times superposition optional				
Discrim.	0.1mV±3%		0.01mV±2%		
Acquisition Time (s)	60-3600		120-5400		
Battery	800mA/H				
Console Weight	1.85kg				

4.6 Main parameters of basic model 32 channels

Versions	ADMT-400SX-32D	ADMT-600SX-32D	ADMT-1200SX-32D	ADMT-3000SX-32D	ADMT-4000SX-32D
Max Depth (m)	⩽400	⩽600	⩽1200	⩽3000	⩽4000
Sensing Mode	32 channels input simultaneously, maximum electrode spacing 5m				
Number of Channels	1-30				
Depth Options (m)	Optional within the maximum depth, refer to 100/200/300/400/500/600/800/1200/2000/3000/4000m				
Scan Interval (m)	40-160				
Connections	Serial port, Wifi, Bluetooth 4.0, USB (optional 4G)				
Display	10.1-inch IPS wide-angle 178° visual touch screen (1024×600)				
OS	Android 6.0.1, running memory 1GB, memory 8GB(expandable 128GB)				
CPU	ARM Cortex-A7 8-core CPU 2.0Hz				
GPU	OpenGL ES 2.0				
Features	Multiple options of depths, channel number optional, 2D/3D plotting, removable battery				
Sensing Mode	MN/TT				
Frequency Range (hz)	1-8K		0.01-6K		
Filtering	Preset or intelligent frequency selection, analog + data filtering 1-16 times superposition optional				
Discrim.	0.001-7K				
Acquisition Time (s)	120-7200		160-9000		
Battery	900mA/H				
Console Weight	2.0kg			2.2kg	

4.7 Main parameters of professional 1 channel

	ADMT-200AX	ADMT-300AX	ADMT-500AX	ADMT-600AX	ADMT-1200AX	ADMT-3000AX	ADMT-5000AX	ADMT-20KG-X	ADMT-100KG-X	ADMT-60D-X	ADMT-100D-X
Max Depth (m)	⩽200	⩽300	⩽500	⩽600	⩽1200	⩽3000	⩽5000	⩽20	⩽100	⩽60	⩽100
Sensing Mode	1 channel MN input										
Number of Channels	1										
Depth Options (m)	Optional within the maximum depth, refer to 5/10/20/40/60/100/200/300/500/800/1200/2000/3000/4000/5000m										
Scan Interval (m)	10-100							5-20	5-100		
Connections	Serial port, Wifi, Bluetooth 4.0, USB (optional 4G)										
Display	7-inch IPS wide-angle 178° visual touch screen										
OS	Android 6.0.1										
CPU	ARM Cortex-A7 8-core CPU 2.0Hz										
GPU	OpenGL ES 2.0										
Features	Multiple options of depths, 2D/3D plotting, removable battery										
Sensing Mode	MN/TT										
Frequency Range (hz)	1-8K				0.001-8K			100-8K			
Filtering	Preset or intelligent frequency selection, analog + data filtering 1-16 times superposition optional										
Discrim.	0.1mV±2%				0.01mV±1%			0.01mV±2%			
Acquisition Time (s)	100-360				120-1500			40-3600			
Battery	700mA/H							800mA/H			
Console Weight	1.6kg										2.5kg

4.8 Main parameters of professional 16 channels

	ADMT-200AX-16D	ADMT-300AX-16D	ADMT-500AX-16D	ADMT-600AX-16D	ADMT-60D-16D	ADMT-60KG-16D
Max Depth (m)	⩽200	⩽300	⩽500	⩽600	⩽60	⩽60
Sensing Mode	16 channels input simultaneously, maximum electrode spacing 5m					
Number of Channels	1-14					
Depth Options (m)	5-200	5-300	60-500	60-600	5/10/20/40/60m	
Scan Interval (m)	10-100				5-60	
Connections	Serial port, Wifi, Bluetooth 4.0, USB (optional 4G)					
Display	10.1-inch IPS wide-angle 178° visual touch screen (1024×600)					
OS	Android 6.0.1					
CPU	ARM Cortex-A7 8-core CPU 2.0Hz					
GPU	OpenGL ES 2.0					
Features	Multiple options of depths, channel number optional, 2D/3D plotting, removable battery					
Sensing Mode	MN/TT					
Frequency Range (hz)	1-8K				100-8K	
Filtering	Preset or intelligent frequency selection, analog + data filtering 1-16 times superposition optional					
Discrim.	0.01mV±2%					
Acquisition Time (s)	40-3600					
Battery	900mA/H					
Console Weight	1.85kg	2.8kg	1.85kg	2.8kg	2.8kg	1.85kg

4.9 Main parameters of professional 32 channels

	ADMT-300AX -32D	ADMT-600AX -32D	ADMT-1200AX -32D	ADMT-3000AX -32D	ADMT-5000AX -32D	ADMT-100D -32D	ADMT-60KG -32D
Max Depth (m)	⩽300	⩽600	⩽1200	⩽3000	⩽5000	⩽100	⩽60
Sensing Mode	32 channels input simultaneously, maximum electrode spacing 5m						
Number of Channels	1-30						
Depth Options (m)	5-300	100-600	10-1200	60-3000	60-5000	5-100	5-60
Scan Interval (m)	60-200					5-100	
Connections	Serial port, Wifi, Bluetooth 4.0, USB (optional 4G)						
Display	10.1-inch IPS wide-angle 178° visual touch screen (1024×600)						
OS	Android 6.0.1, running memory 1GB, memory 8GB(expandable 128GB)						
CPU	ARM Cortex-A7 8-core CPU 2.0Hz						
GPU	OpenGL ES 2.0						
Features	Multiple options of depths, channel number optional, 2D/3D plotting, removable battery						
Sensing Mode	MN/TT						
Frequency Range (hz)	0.001-7K					100-8K	
Filtering	Preset or intelligent frequency selection, analog + data filtering 1-16 times superposition optional						
Discrim.	0.001mV±2%		0.001mV±1%			0.01mV±2%	
Acquisition Time (s)	1200-9000		280-14400			40-3600	
Battery	700mA/H		1100mA/H			1000mA/H	
Console Weight	2.2kg					3.0kg	2.2kg

5 Login and registation

5.1 System instruction and connection

After turning on the power of the instrument, the screen displays the serial port connection, touch export, folder, new measurement, parameter configuration, data processing and other menus (Figure 5).

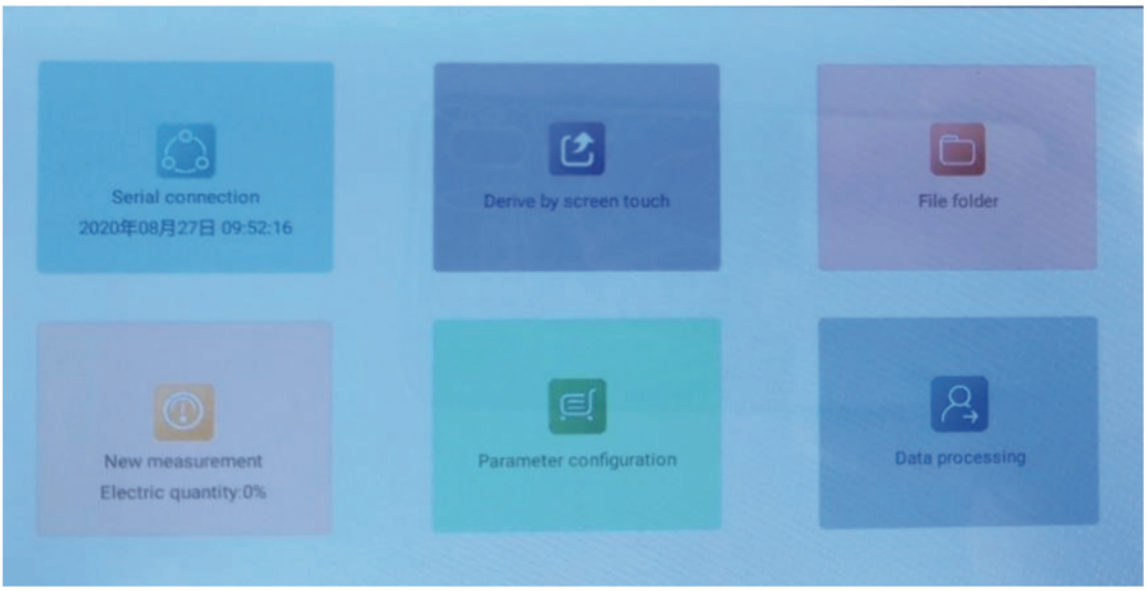


Figure 5

To use this instrument for the first time in an environment with a network, you need to use your mobile phone number to send verification login and log in after the registered account. The mobile phone number or registered account after login is a cloud data management account. You can log in to this account on your mobile phone or computer to achieve data synchronization analysis. If the instrument does not have a 4G network as standard, you need to provide a wireless network for the instrument in an environment with WiFi or use the mobile WiFi hotspot function.

The connection method is: touch the upper part of the left side of the screen with your finger, a little bit will pop up to hidden left menu, and swipe your finger to the right to bring up the left menu, select "Settings" and then click "System WiFi Settings" to search and connect nearby WiFi network. You can refer to this manual "11.3.3 System Settings", after registration is completed, except for data backup and synchronization, other operations do not require a network.

After the instrument is connected to the network, click any icon to log in and register (Figure 6). You can choose between "mobile phone number fast login" and "account password login". It is recommended to select "mobile phone number fast login" and enter your mobile phone number to send verification Code to log in, (the verification code is valid for 4 hours and supports logging in on other devices). Special reminder: Be sure to connect to the WiFi network or mobile WiFi hotspot to keep the instrument network open to send the verification code and login to be effective. If the network is not connected or the network is abnormal, it will be prompted to send the verification code failed.

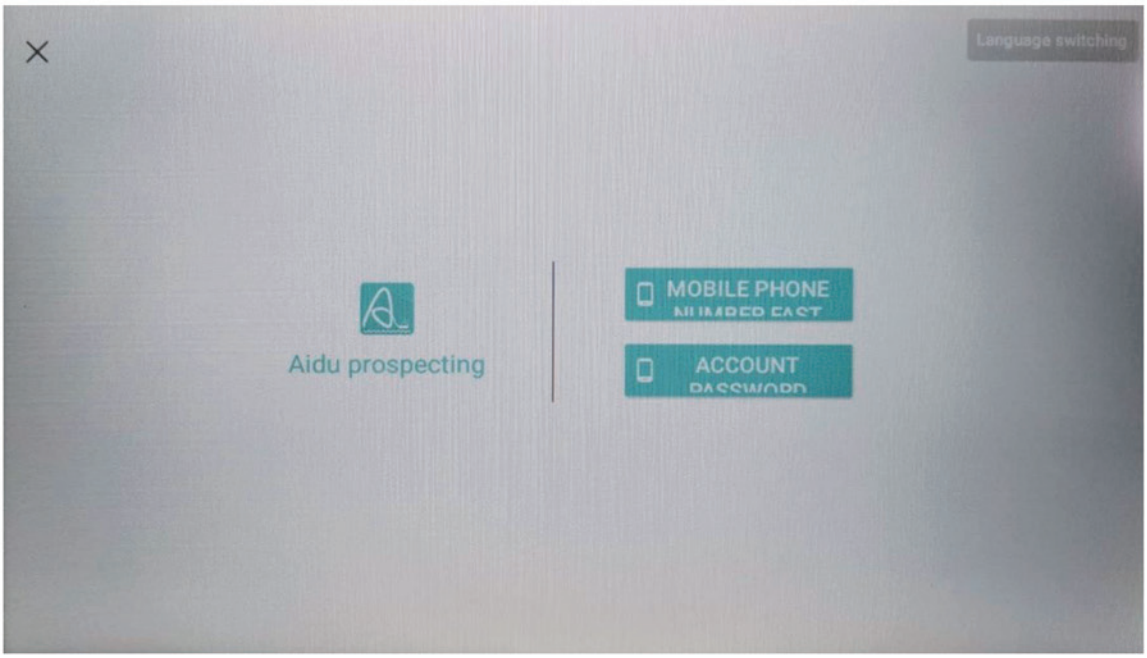


Figure 6

5.2 Mobile Fast Login

Click "Mobile phone number fast login" to enter the mobile phone number (Figure 7), click "Get the verification co2de" to enter the verification code received by the mobile phone, and click Login to log in to the main interface of the system.

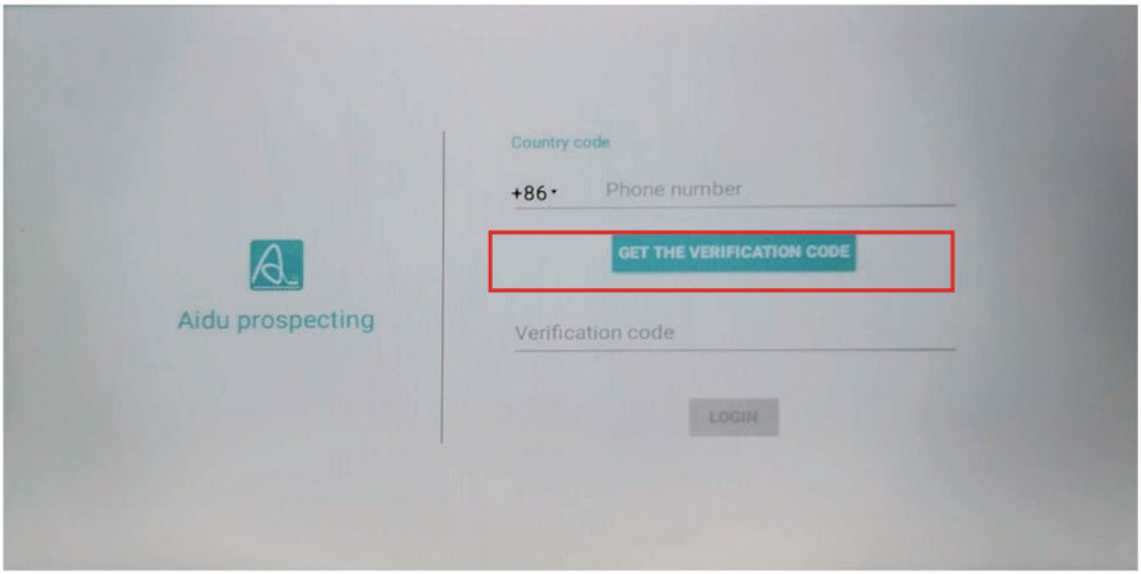


Figure 7

5.3 Account Password login

Click "Account Password Login" to pop up the login box (Figure 8), you need to

register an account for the first login, click "IMMDIATE REGISTATRTION" to jump to the registration interface (Figure 9), enter your phone number to get the verification code, enter your account number, and your password to complete the registration . After successful registration, click "Account Password Login" again, and enter the account and password to log in to the system.

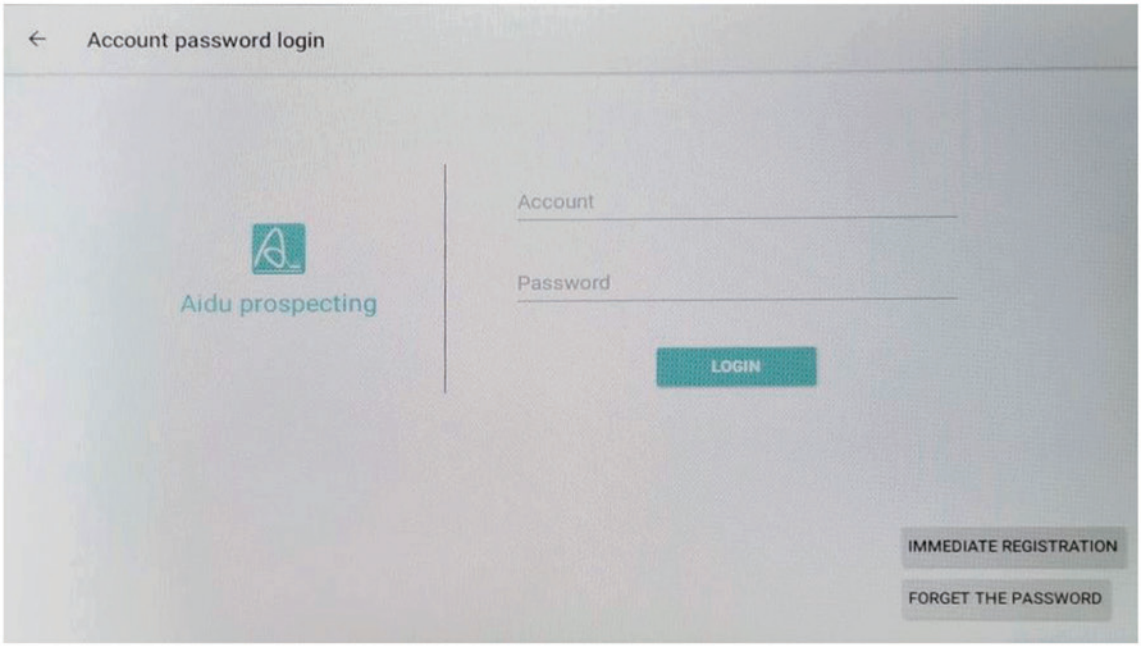


Figure 8

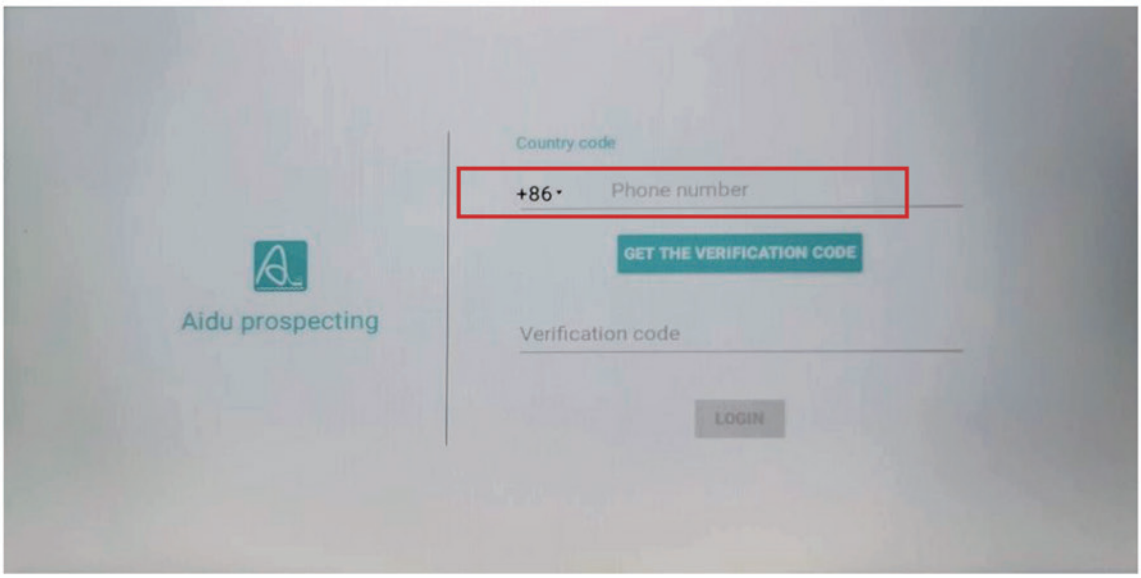


Figure 9

Language switch: Click "Language switch" in the upper right corner of the screen to switch to the corresponding national language interface as needed.

6 New Measurement

6.1 New Measurement

Click "New Measurement" to enter the measurement interface (as shown in Figure 10), enter the survey line name (can be entered in Chinese, numbers, and English), and the default X coordinate of the drawing is 10. Generally, there is no need to change it. The larger the value, the wider the display of the drawing X coordinate. The system supports modification as needed after the measurement is completed.

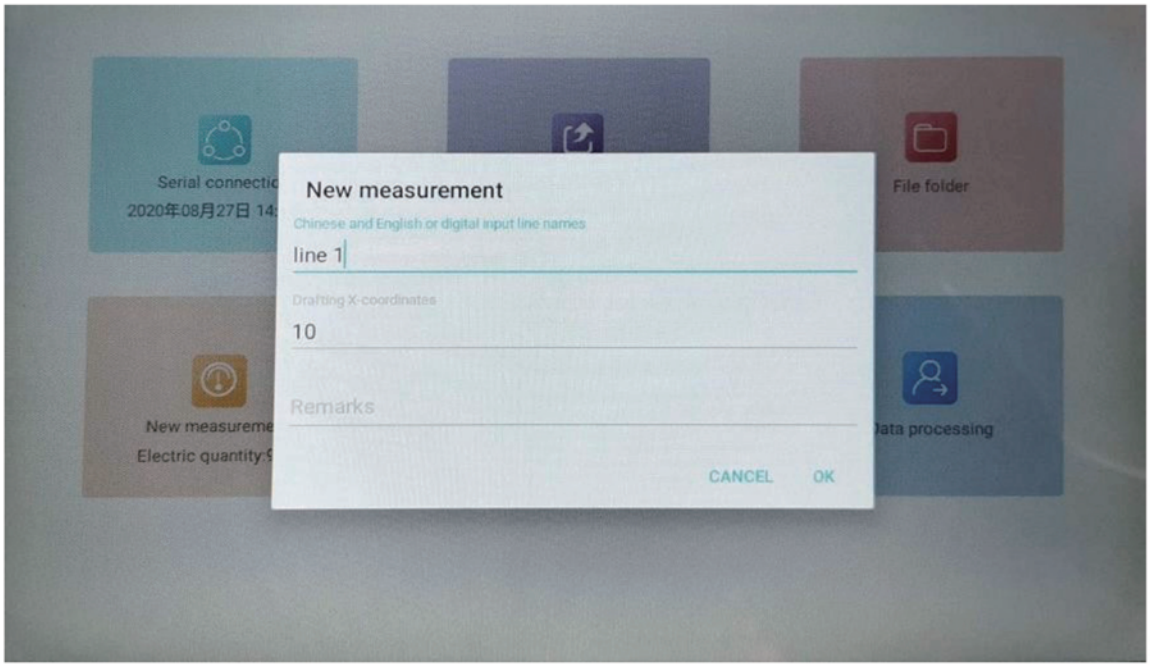


Figure 10

Click OK to enter the measurement setting interface, and then the measurement parameter interface will pop up to set the relevant parameters (Figure 11).

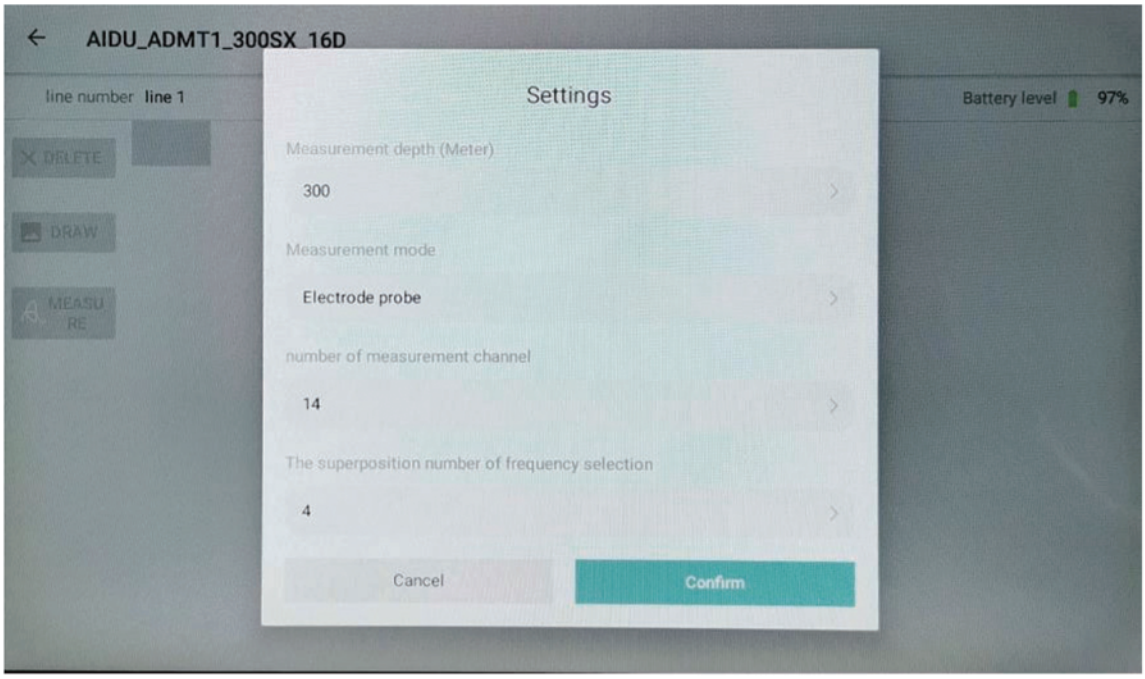


Figure 11

6.2 Parameter setting description

6.2.1 Measuring depth (meter):

Select the depth you need to measure. Generally, the default value is the maximum depth that this model can measure. A variety of depths are provided for users to choose from within the range of the maximum depth.

6.2.2 Measurement mode:

Two measurement modes of TT (electromagnetic probe) and MN (electrode) are available for selection, and users can choose according to the actual signal input type.

6.2.3 Number of measurement channel:

The default number of single-channel instruments is 1 and there is no need to change; the default number of 16-channel instruments is 14, which can be arbitrarily selected from 1-14; the default number of 32-channel instruments is 30, which can be arbitrarily selected from 1-30 channels; simple understanding The number of measurement channels can be arbitrarily selected within the maximum number of channels supported by this model instrument.

6.2.4 The superposition of frequency selection:

Different types of products can choose different times, generally 4-6, 4-10, 4-16 times can be selected. Generally, the larger the number of stacking times, the longer the

measurement time, the stronger the anti-interference ability, and the more stable and reliable data.
Click "OK" to enter the measurement interface.

6.3 Measure

After entering the measurement interface, click the "Measure" button on the left side of the screen to collect data, and the measurement progress bar will reach 100% to complete the current measurement point data acquisition (Figure 12).

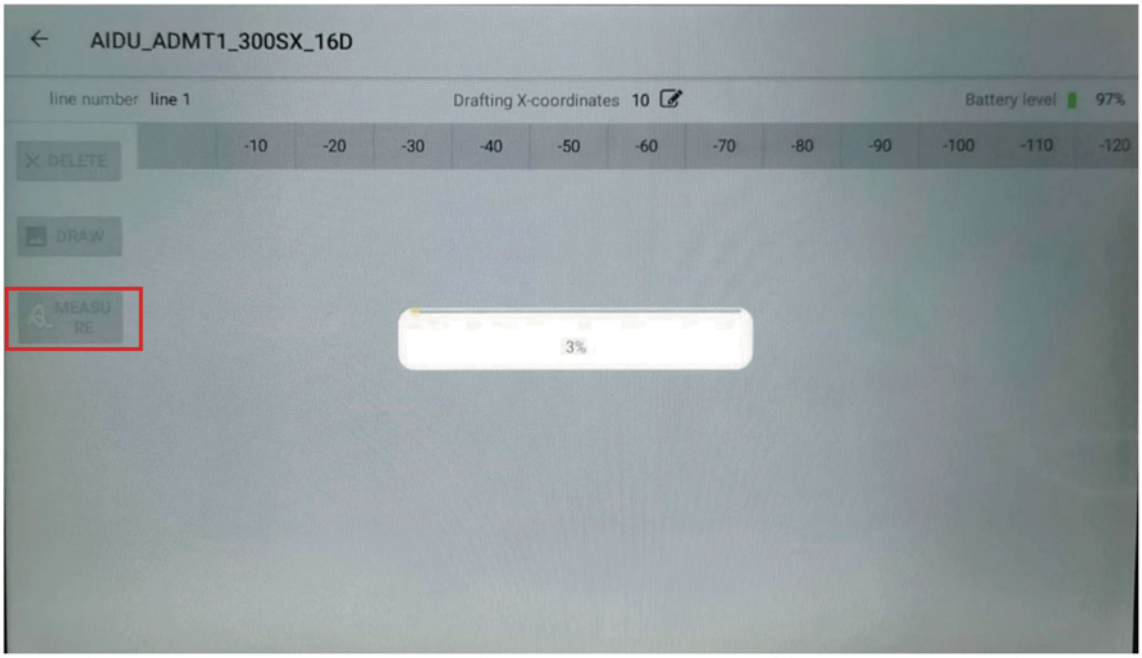


Figure 12

Click "Confirm" to save the data, and click "Measure again" to re-measure the point (Figure 13).

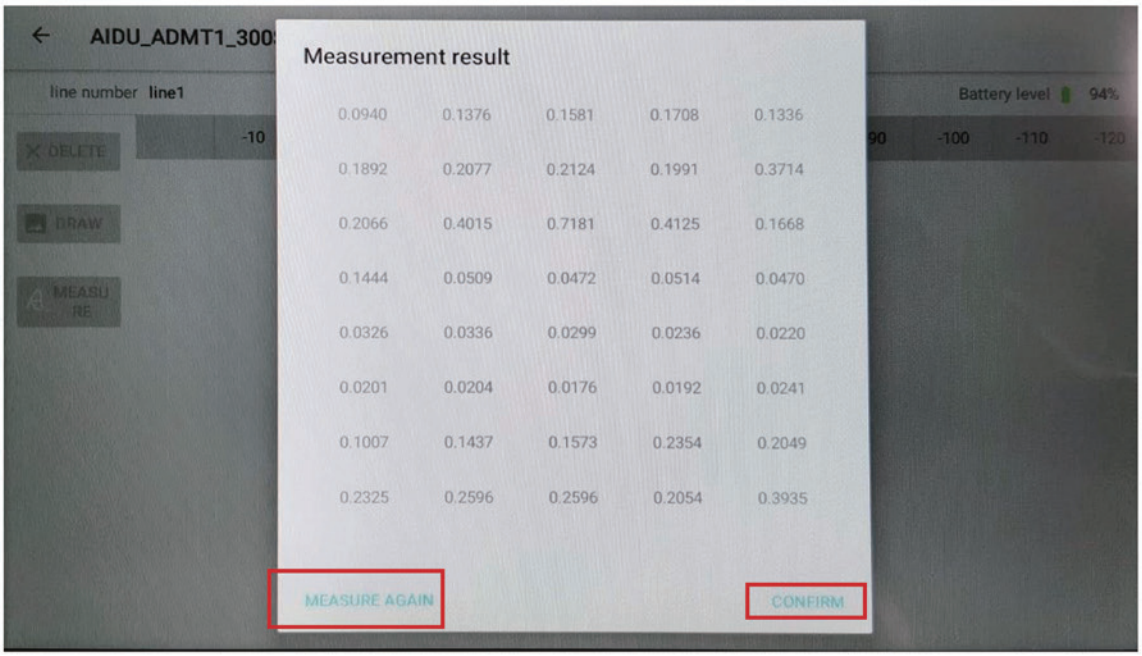


Figure 13

Select "Delete" to delete the last measurement data. If you don't need to delete it, move the device to the next measurement point and click "Measure" to measure the next set of data, and so on to complete the measurement collection of the entire profile (Figure 14). Do not click "Draw" during the process of completing the entire profile data measurement, because the data processing after selecting the drawing may affect the data accuracy.

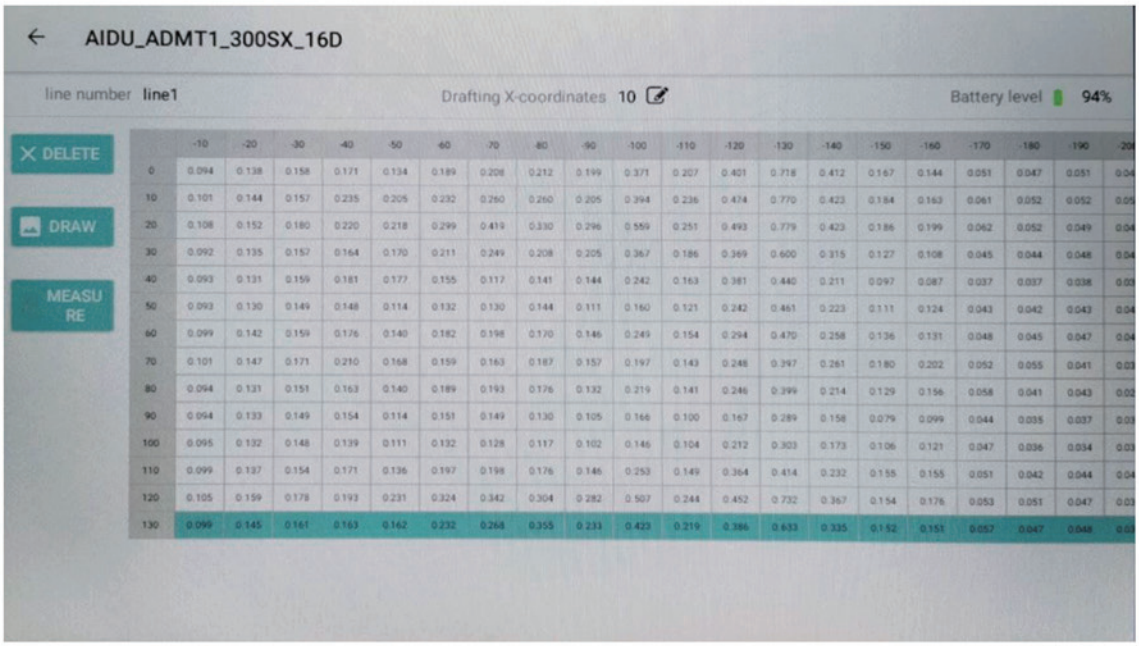


Figure 14

6.4 Check the channel

If an error message appears during the measurement process (as shown in Figure 15), please click "Check the Channel" to return to the measurement interface, and check whether the MN is properly grounded or the measurement cable is connected to the instrument. Normal measurement can only be performed if the signal input is normal. The "Forced Measurement" instrument will measure the data normally, but the data may be inaccurate. If you can't solve it by yourself, please contact the manufacturer and dealer.

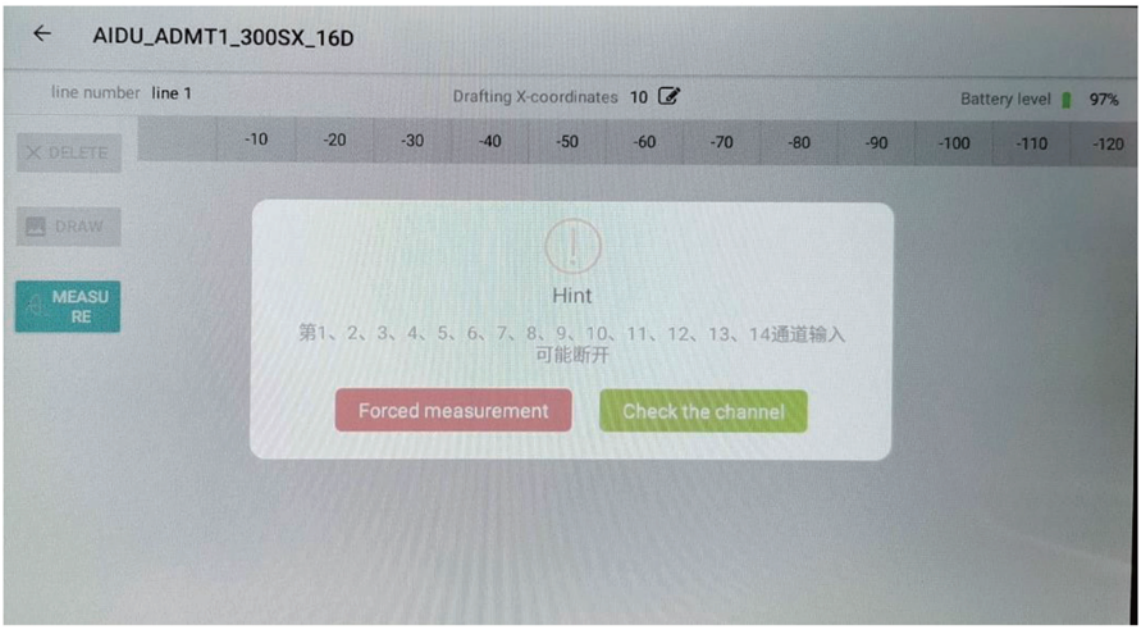


Figure 15

7 Drawing operation method

7.1 Basic drawing operations

During measurement, when the number of measurement points exceeds 6 points, the "Draw" button on the left side of the screen will turn blue. At this time, you can click to draw (Figure 16). It is recommended that you do not draw halfway when the entire profile measurement is not completed. May affect the accuracy of the data.

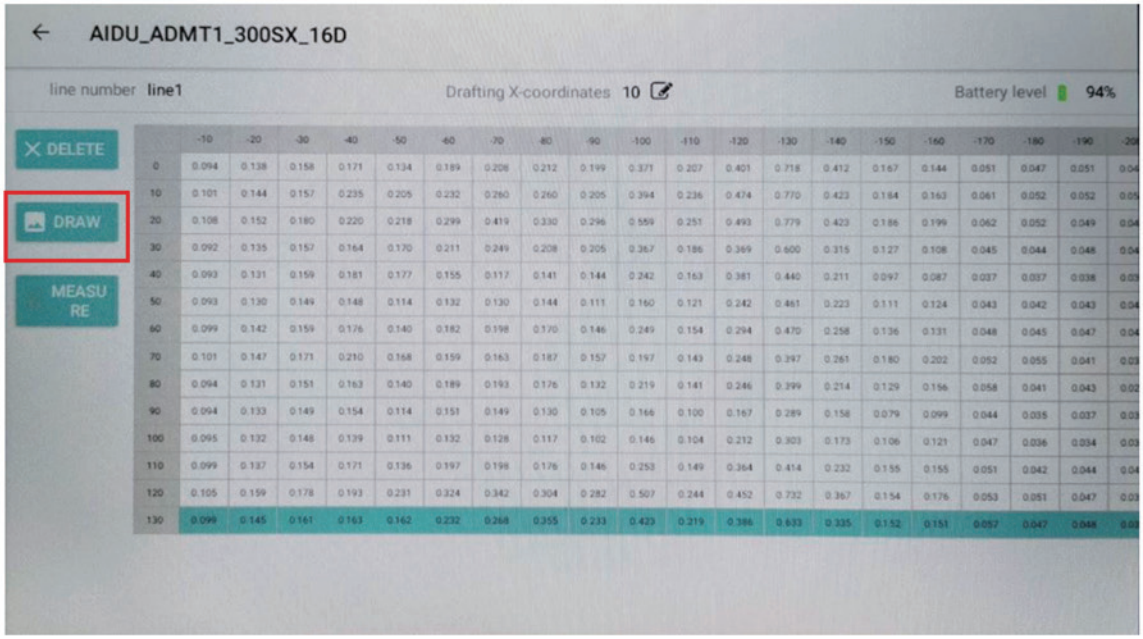


Figure 16

After selecting the drawing, you can choose to draw "isoline graph" and "graph" (Figure 17), and select the type of graphics according to actual needs. Choosing "Isoline graph" for the first time may prompt to install "Aidu Drawing", just install it according to the prompts, because selecting "Isoline Graph" will jump to the drawing in the "Aidu Drawing" program, and sometimes click on "Isoline graph" "Will prompt "Aidu Mapping has stopped running" and other error prompts, which are caused by system conflicts, and can generally be recovered by exiting and re-entering or restarting the instrument.

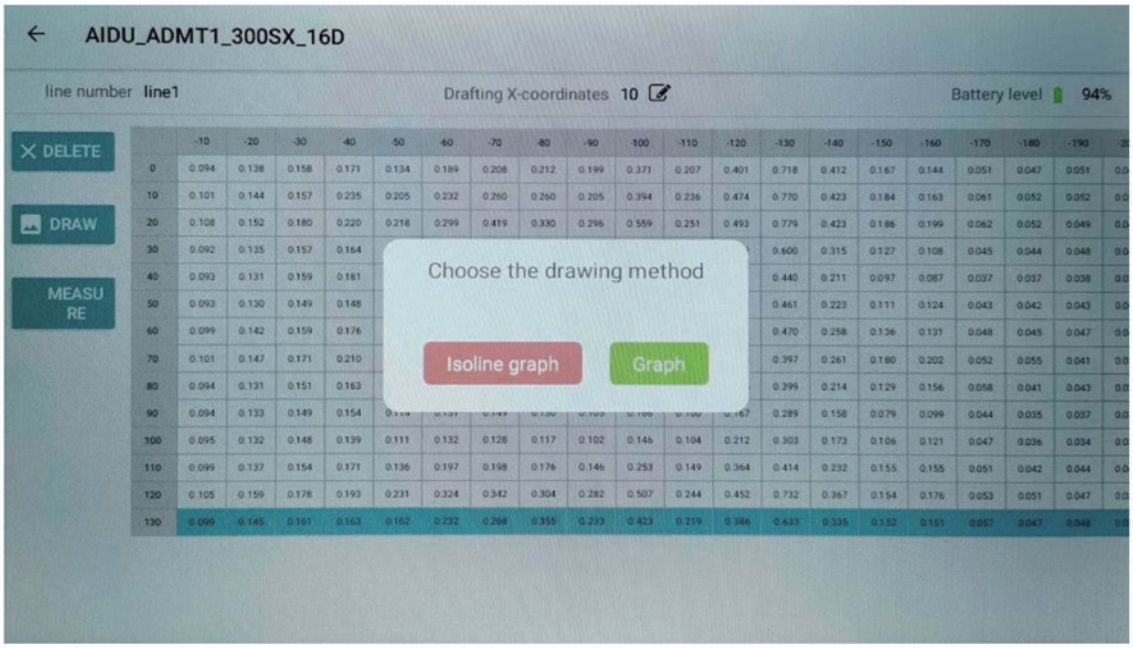


Figure 17

7.2 Draw 2D, 3D, etc. line graphs

Select "Isoline graph" and the system will automatically generate Isoline graph (Figure 18).

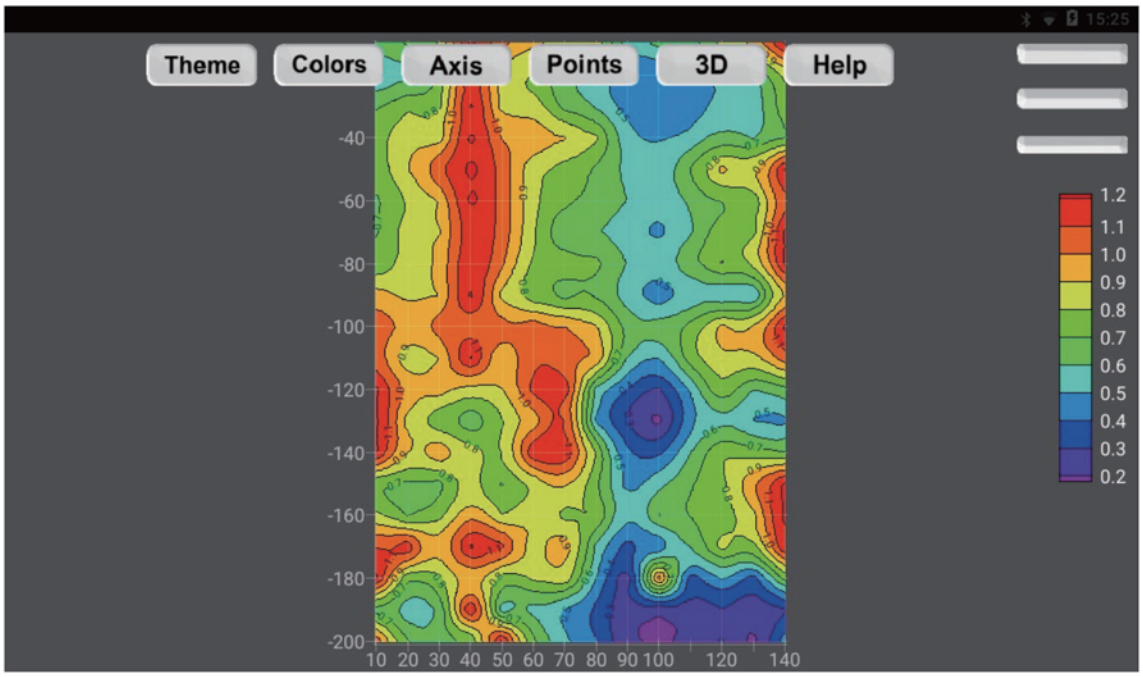


Figure 18

Click the "3D" or "2D" icon at the top of the drawing interface to switch between 2D and 3D (Figure 19), and click the icon in the upper right corner of the drawing interface to set the color scale. Generally, the default is 5 without changing the setting. Click "Save Picture" and confirm to save the effect picture directly to the system file device name, click "Exit" to return to the measurement data interface.

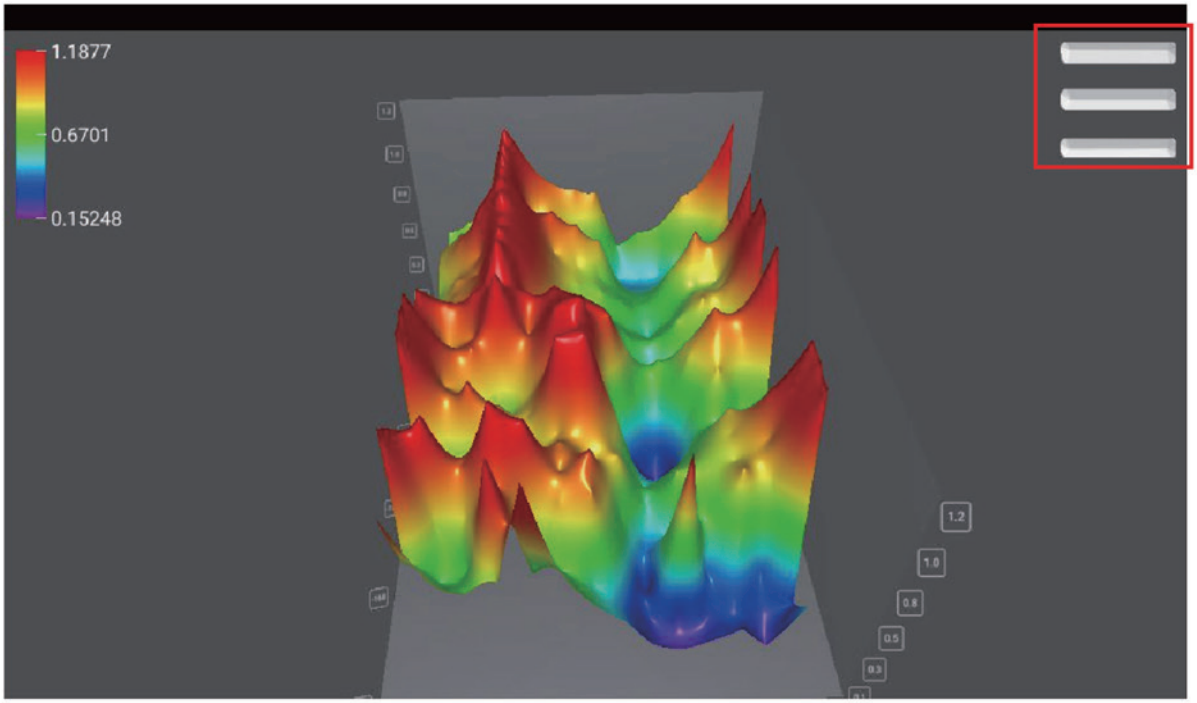


Figure19

Figure 20

7.3 Drawing Graph

If you choose "graph", the system will automatically generate a graph (Figure 21).

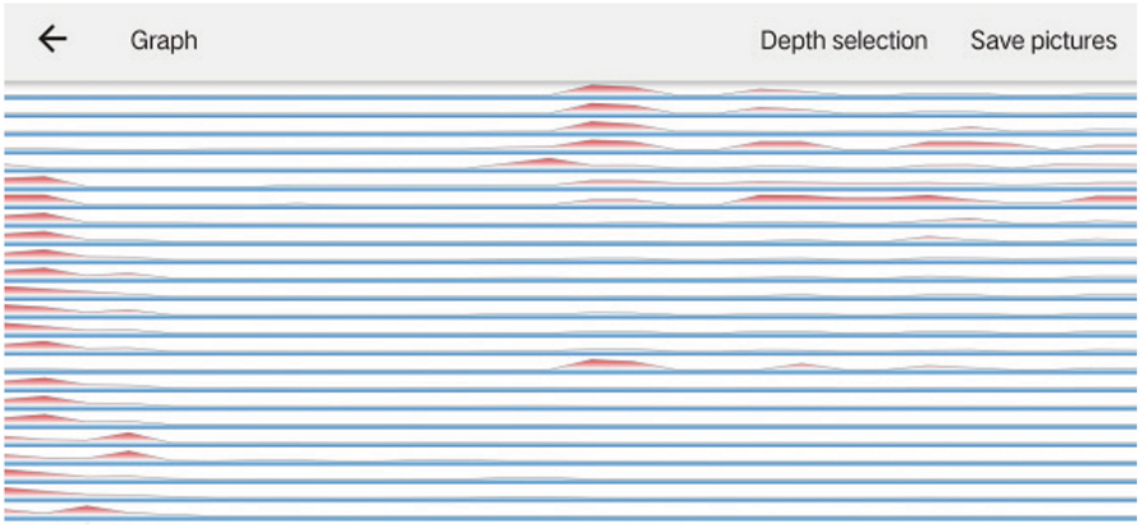


Figure 21

You can independently select the corresponding depth curve display by clicking "Depth Selection" in the upper right corner (Figure 22).

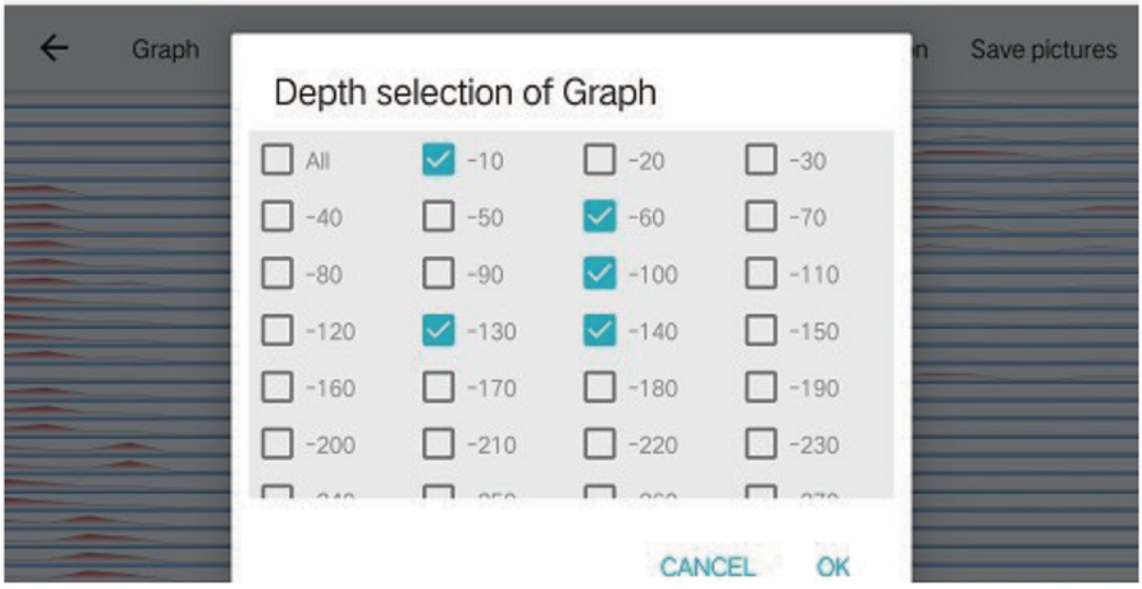


Figure 22

Select "Save Pictures" to save the graph to a folder (Figure 23).

Figure 23

7.4 Drawing in a folder

By selecting the file name in the folder that needs to be viewed and drawn (Figure 24), you can directly "Vi " and "Connect " (Figure 25), select "Vi " to go to the data page (Figure 21), select the "Connec " section of the instrument to support supplementary measurement functions, and continue the measurement of the line.

Figure 24

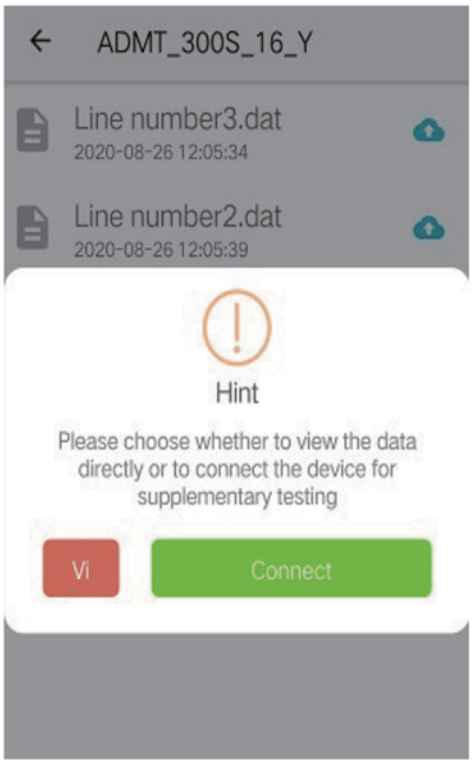


Figure 25

8 Folder operation method

8.1 folder Basic operation

The folder is the entrance to all data viewing and drawing. The file is first named according to the time the file was created, such as 20200808. The data measured by the instrument, the synchronized data and the data transferred by other methods can be viewed and drawn in the " File Folder ", View and submit expert analysis, etc.

Click "File Folder" to see all files, and the data will be automatically arranged according to the time of addition (Figure 26). Click "←" in the upper left corner to return to the previous interface, click "" in the upper right corner, data file name keywords can search for files. Click the date folder to query all data files under that date (Figure 27). Click in the network environment icon, Upload the file to be uploaded to the cloud mark Files with such icons，Description has been backed up in the cloud，You can download and view drawings simultaneously on your mobile phone and computer.

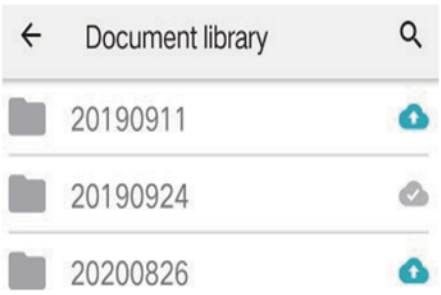


Figure 26

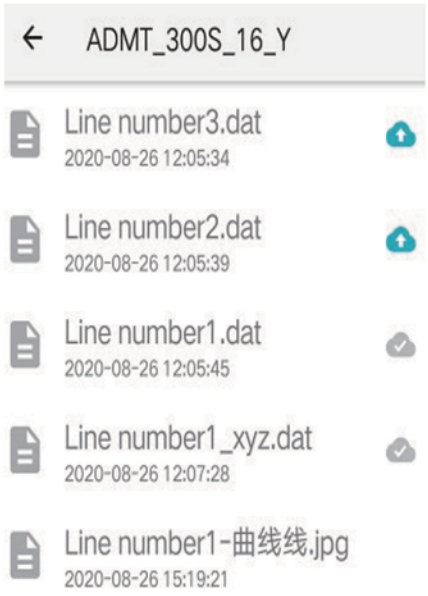


Figure 27

8.2 Expert analysis submission

Long press the data file that needs to be processed, the long-pressed file is highlighted and enters the multi-selection state (Figure 28), click "Expert Analysis" to jump to the expert analysis submission interface (Figure 29), you can submit this data to the background Online expert points, at the same time can explain the measurement picture, measurement site video, measurement point distance and other information of this data, click "Save" and submit it to Aidu Exploration Expert backstage. After the expert analyzes, the analysis result will be fed back to the system. 11.2.5. "Expert Analysis" to check.

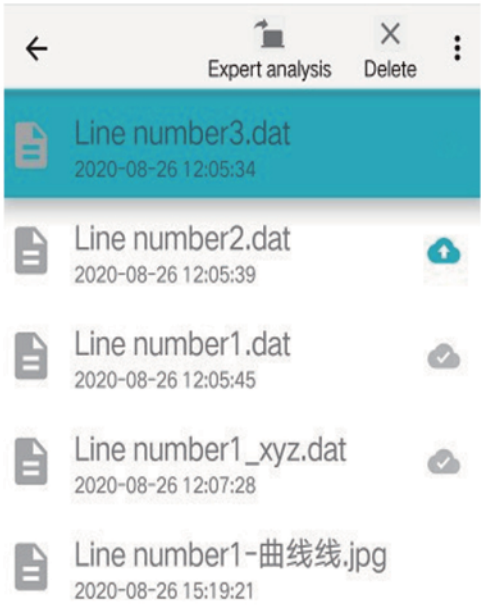


Figure 28

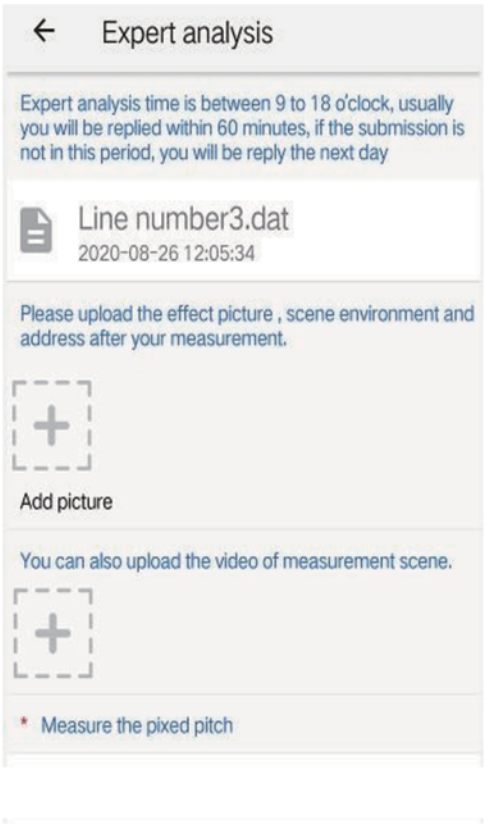


Figure 29

8.3 Data deletion and export

Long-press data files that need to be processed, long-pressed files are highlighted and enter a multi-select state (Figure 30), and selecting Delete prompts For “local deletion” and “Cloud deletion”. Select Cloud deletion to delete backup data in the cloud, and local deletion to delete data kept by this device.

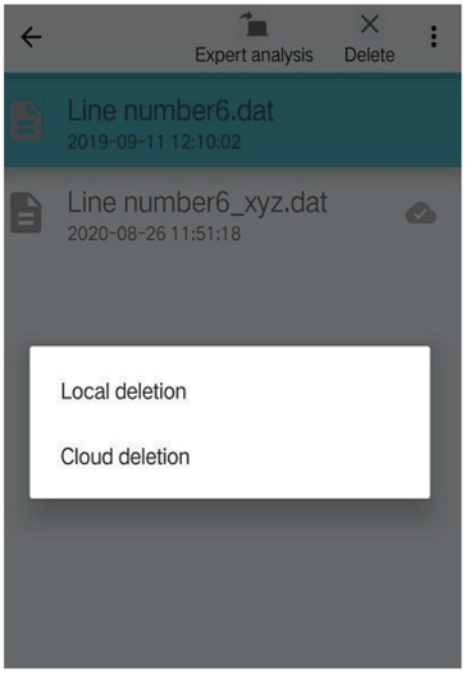


Figure 30

9 Parameter configuration operation method

Click "Parameter Configuration" on the main screen to enter the parameter configuration interface, as shown in the figure below (Figure 31):

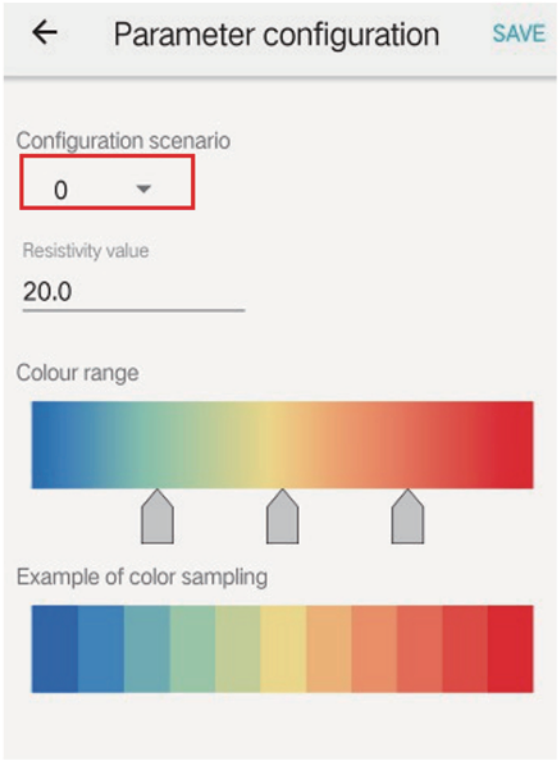


Figure 31

Click the small arrow next to the configuration plan to choose different parameter configurations. The same set of data can choose different parameter configurations to draw different renderings. Different parameters can be applied to different regions and application scenarios. The user can freely choose according to the actual use and area, and abide by the basic principle of geophysical prospecting: "Know the unknown" principle. After measuring on a known target, select different parameters to draw, and confirm the parameter configuration scheme by the degree of conformity between the view shape and the actual situation. The parameter configuration scheme selection is a summary of long-term experience to optimize the selection configuration, which can be more accurately applied to different regions and application scenarios. Some advanced users can choose option 8 to set the parameters themselves (normal users use it with caution). Recommended parameter configuration options:

Scheme 0 is a general parameter, which can match most areas.

Option 1 can be applied to water search in northern China, with good geological stratification.

Option 2 can be applied to search for water in southern China, with general geological stratification, which is convenient for judging fractures and karst structures.

Option 3 can be applied to deep exploration, such as geothermal hot springs, geological structures and general surveys.

Option 4 can be applied to caverns, archaeology and some shallow exploration work.

Option 5 can be applied to water conservancy projects, dyke piping detection, slope disasters, etc.

Option 6 can be applied to urban engineering geophysical prospecting, environmental protection, dams and engineering construction.

Option 7 can be applied to professional geophysical prospecting, taking into account the effects of shallow and middle layers, and for prospecting.

Program 8 professional mode, users need to set the parameters by themselves (use with caution).

The configuration scheme may be adjusted according to actual application scenarios, please pay attention to the update of Aidu system.

10 Data processing operation method

On the main screen, click "Data Processing" to enter the data processing interface (Figure 32).

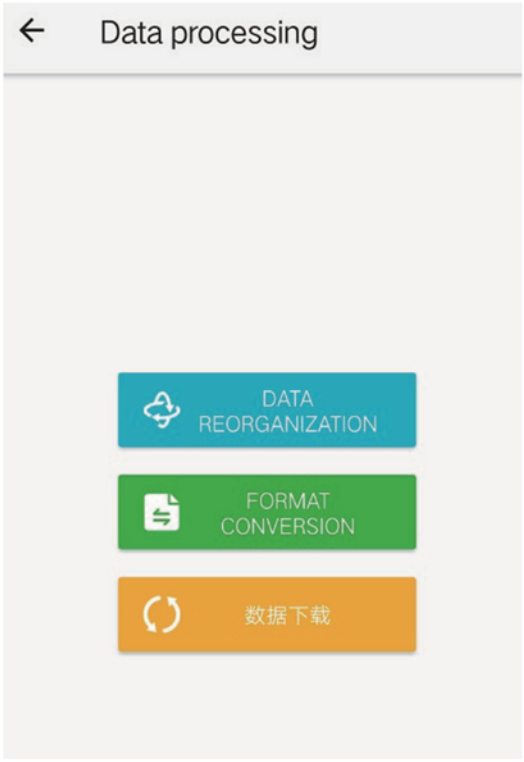


Figure 32

10.1 Data reorganization

This function can reorganize the survey data of different sections at the same depth and draw the plane section diagram. Click "Data Reorganization" to enter the data reorganization operation interface (Figure 33), click the "+" sign on the right to select multiple survey line data to be processed, enter the measurement depth to be reorganized, and click "Confirm" to complete the data reorganization.

Figure 33

10.2 Format conversion

This function can convert the measurement data format into other high-density instrument drawing software formats, which is convenient for interactive use.

10.3 Data download

This function can download all cloud data on the currently logged-in account to the local, realizing multi-terminal data synchronization.

11 Operation method of other functions of the instrument

11.1 Touch screen export operation method

When the host connection mode is "Serial connection" and "WiFi connection", the touch screen export function cannot be used. When the connection mode is changed to the "Bluetooth connection" mode, and the Bluetooth connection with the external

touch screen measurement host can import the external host measurement data To the system folder of this instrument (for the specific export method, please refer to the introduction of "Bluetooth Transmission" in the ADMT series product operation manual and contact the manufacturer).

11.2 Operation method of the hidden menu on the side of the host

Touch the upper part of the left side of the screen with the belly of your finger to pop up a little bit to hide the left menu, and slide your finger to the right to bring up the left menu (Figure 34).

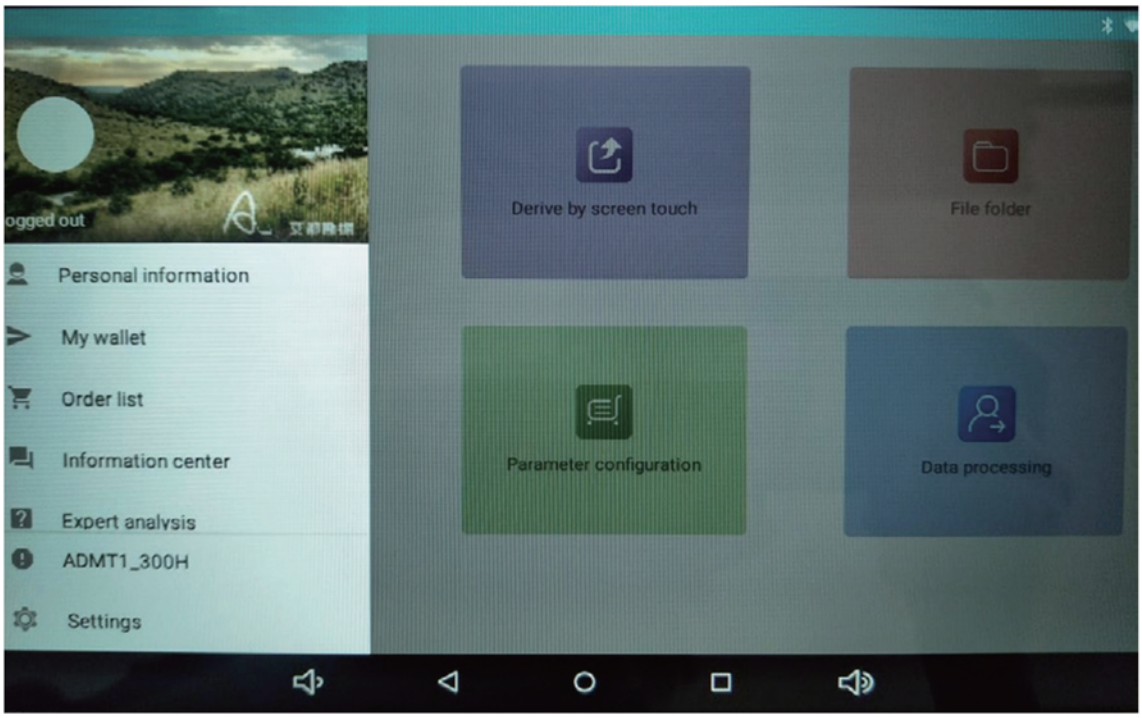


Figure 34

11.2.1 Personal information

Click "Personal Information" to view and edit personal information.

11.2.2 My Wallet

Click "My Wallet" to view personal points data.

11.2.3 Order List

Click "Order List", it is not currently supported.

11.2.4 Information Center

Click the Information center to view system messages.

11.2.5 Expert analysis

You can view the expert analysis results of the APP background, and you need to submit the data in the folder to the experts for analysis. For specific operations, refer to "8.2 Expert Analysis Submit"

11.2.6 My supply and demand information

Supply and demand information can be released, but it is temporarily not supported.

11.2.7 Click to connect device

Click to view the instrument model and device number. Only the Bluetooth mode is displayed.

11.2.8 Settings

Click Settings to enter the system settings interface (Figure 35).

Figure 35

11.3 System Settings

11.3.1 Language selection: Click "Language" to switch between Chinese and other languages.

11.3.2 Connection mode: Click to select "Bluetooth connection", "Serial connection", and "WiFi connection" according to the instrument model specifications. Generally, the connection mode has been set at the factory and does not need to be changed. However, the system provides optional connection methods for other purposes. Bluetooth connection can be used to connect to other external hosts, and WiFi connection can be used for wireless networking to achieve 1-200 simultaneous measurements. Please confirm with the manufacturer whether the instrument you purchased supports and is compatible with this function.

11.3.3 System settings: Click " Bluetooth Settings" to connect and operate Aidu's series of Bluetooth instruments; click " WiFi Settings" to search for and connect to

nearby wireless network signals, and provide a network for the instrument to facilitate user login, registration, and data backup synchronization; Click "Screen Brightness Settings" to set the screen display brightness, open and hide the system status bar and navigation bar parameters.

11.3.4 Others

Registration agreement: Click to view the host-related usage agreement.

Privacy policy: Click to view the company's privacy protection policy for customers who use the instrument.

Check for update: Click to check the system version when there is a network, and you can update to the latest version of the software.

About: Click to view the APP version number of this instrument.

Logout: Click to log out of the currently logged-in account.

12 Field connection method of the instrument

12.1 Single channel connection

12.1.1 Wired electrode connection mode:

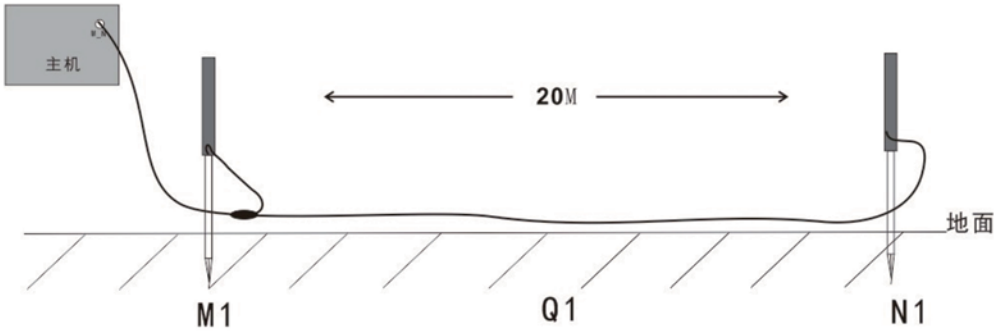
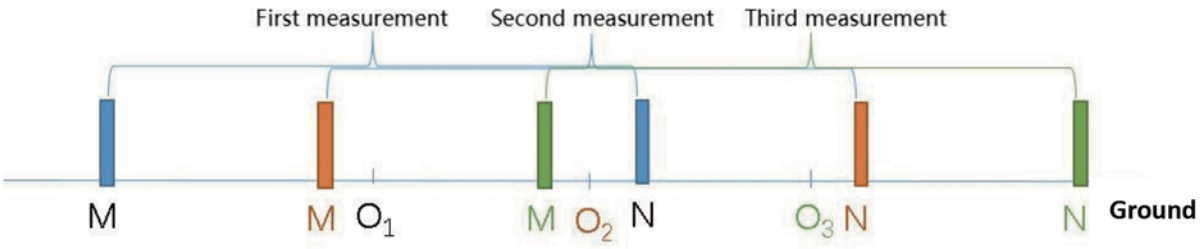


Figure 36

After the instrument is turned on, connect the instrument as shown in the figure above (Figure 36), plug the M and N measuring electrodes into the ground, and start sampling. The measuring point is at the center of the two M and N electrode rods. After sampling at this point, move the M and N electrodes in the same direction at a certain point distance to perform the second measurement point sampling measurement (Figure 37). And so on, until the entire profile measurement is completed.



O1, O2, O3 are measurement points, which are located directly under the wireless sensor.

Figure 37

12.1.2 Wired magnetic sensor connection method (optional)

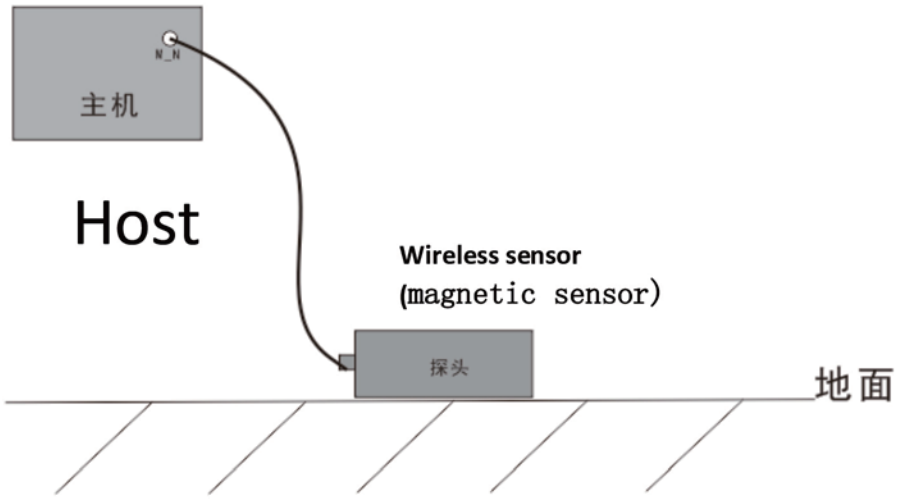


Figure 38

After the instrument is turned on, connect the instrument as shown in the figure above (Figure 38), place the sensor on the ground, and start sampling. The measurement point is directly below the sensor. The sensor placement direction is not required, but the placement direction of each measuring point sensor on a survey line is required to be consistent. After sampling at this point, move the sensor in the same direction at a certain point distance to perform sampling measurement at the second measurement point. And so on, until the entire profile measurement is completed.

12.1.3 Connection mode of wireless magnetic sensor(optional).

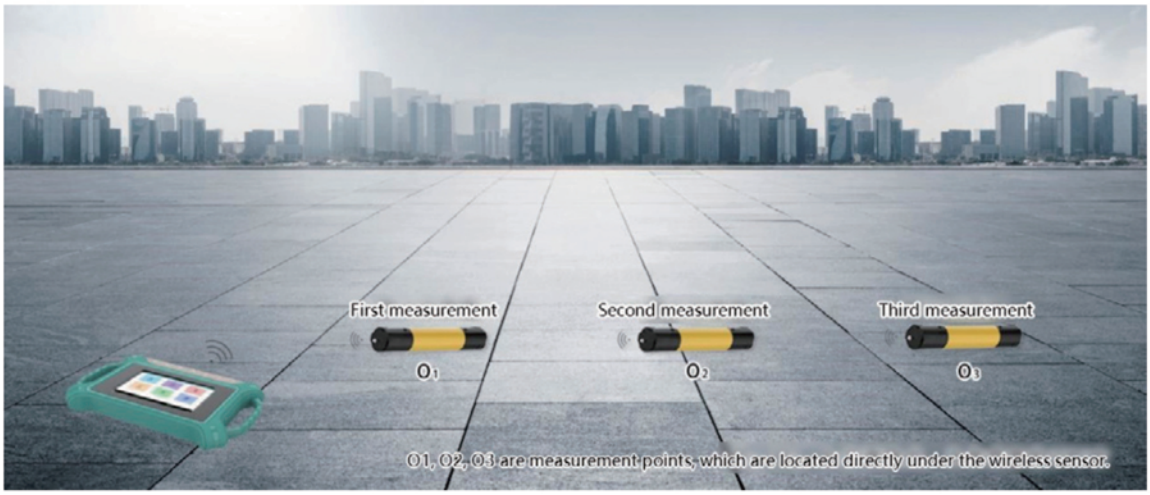


Figure 39

After the instrument is turned on, the instrument is connected to the wireless host via Bluetooth. Place the wireless host on the ground and start sampling. The measuring point is directly below the wireless host. After sampling at this point, move the wireless host in the same direction at a certain point distance to perform sampling measurement at the second measurement point (Figure 39). And so on, until the entire profile measurement is completed.

12.2 16-channel (ADMT-16D STYLE) instrument connection mode

12.2.1 Basic connection method of 16-channel series:

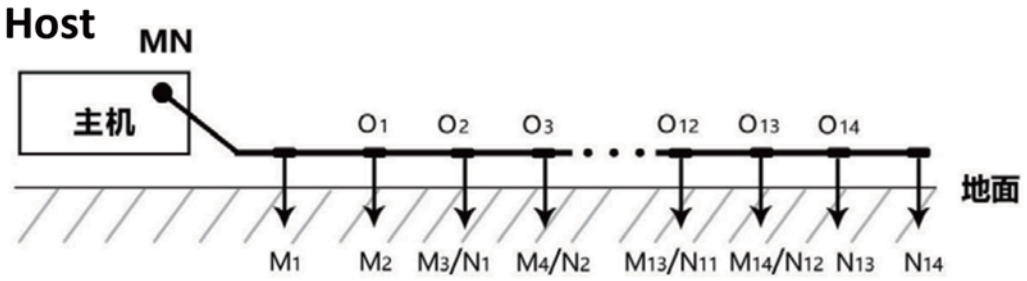


Figure 40

After the instrument is turned on, connect the instrument as shown in the figure above (Figure 40), spread the measuring cable along the measuring line, insert the electrode into the ground, and connect the electrode to the measuring cable by pulling out the card. Get ready to start sampling. The 16-channel instrument can

complete data acquisition of 14 measuring points at the same time in one measurement. The measuring point is the center point of the MN electrode, that is, the second electrode is the position of the first measuring point, and the third electrode is the position of the second measuring point. By analogy, the last measurement point is at the penultimate electrode. After the measurement is completed, the second profile can be sampled and measured. And so on, until the entire profile measurement is completed.

12.2.2 16-channel instrument wired electromagnetic sensor connection mode:

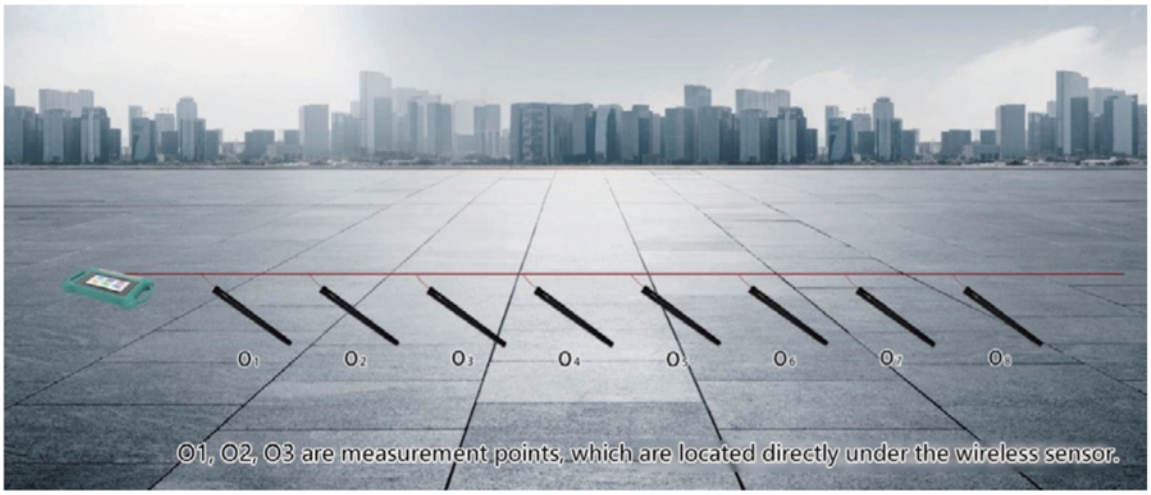


Figure 41

After the instrument is turned on, connect the instrument as shown in the figure above (Figure 41), and spread the measuring cable along the measuring line. The sensor is flat on the ground. There is no requirement for its placement direction, but the placement direction of each sensor on the survey line The requirements are consistent.

Sampling can be started after connecting the sensor and the measuring cable by pulling out the card. The 16-channel instrument can complete the data collection of 8 measuring points at the same time in one measurement. The measuring point is directly below the sensor. After the measurement is completed, the second profile can be sampled and measured. And so on, until the entire profile measurement is completed.

12.3 32-channel instrument connection mode

12.3.1 Basic connection method of 32-channel instrument:

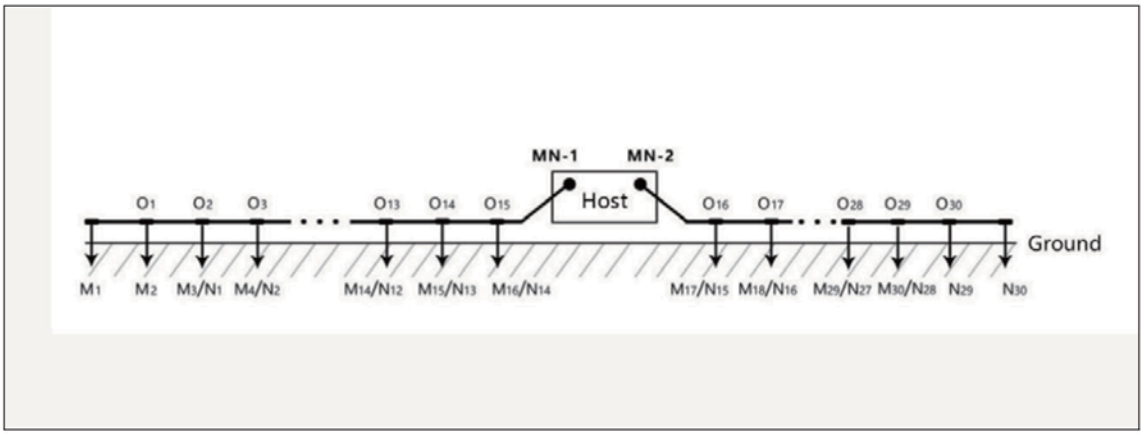


Figure 42

Lay out the two 16-channel measuring cables along the measuring line, put the instrument host in the middle of the two cables, insert the electrode into the ground, and connect the electrode and the measuring cable by pulling out the card (Figure 42, 43). Get ready to start sampling.

The 32-channel instrument can complete the data acquisition of 30 measuring points at the same time in one measurement; the site limit can also only be arranged with one cable, and the cable interface needs to be connected with the M_N_1 interface. The starting electrode of the measurement line is the end of the M_N_1 cable, and the measurement point is the midpoint of the M N electrode, that is, the second electrode at the end of the M_N_1 cable is the position of the first measurement point, and the third electrode is the second measurement point Position, and so on, the last measurement point is at the penultimate electrode. After the measurement is completed, the sampling measurement of the second profile can be performed, and so on, until the entire profile measurement is completed.

Figure 43

12.3.2 32-channel instrument wired electromagnetic sensor connection mode:

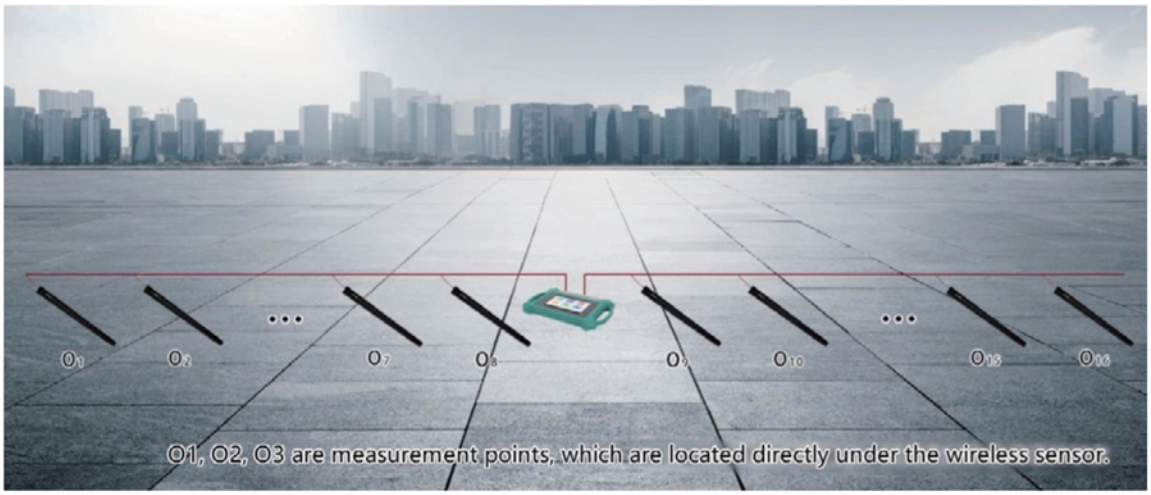


Figure 44

After the instrument is turned on, connect the instrument as shown in the figure above (Figure 44), and spread the measuring cable along the measuring line. The instrument is placed between the two cables. The electromagnetic sensor is flat on the ground. The orientation of the sensor is not required. However, the placement direction of each sensor on a measurement line is required to be consistent, and the sensor and the measurement cable are connected by pulling out the card.

The 32-channel instrument can complete the data acquisition of 16 measuring points at one time. There can also be only one cable laid out due to site restrictions, and the cable interface needs to be connected to the M_N_1 interface. The starting point of the measuring line is the end of the M_N_1 cable, and the position of the measuring point is directly below the sensor. After the measurement is completed, the second profile can be sampled and measured. And so on, until the entire profile measurement is completed.

13 On-site survey line layout method

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

13.1 Parallel layout method of straight section

Straight-line profile is the most commonly used layout method, and multiple straight-line profiles are formed in parallel by multiple straight-line profiles. This method can quickly determine the direction of exploration targets.

First, assume and judge the direction of the exploration target, and arrange the survey line perpendicular to the direction of the exploration target (Figure 45). One or more linear profiles can be laid out. Generally, 2-3 can be used to quickly the direction of anomalous objects, according to the exploration target. Multiple straight-line sections are laid out based on the length of the object. The direct distance of each straight-line section is called the line distance. The line distance is generally ≤ the length of the exploration target, in meters.

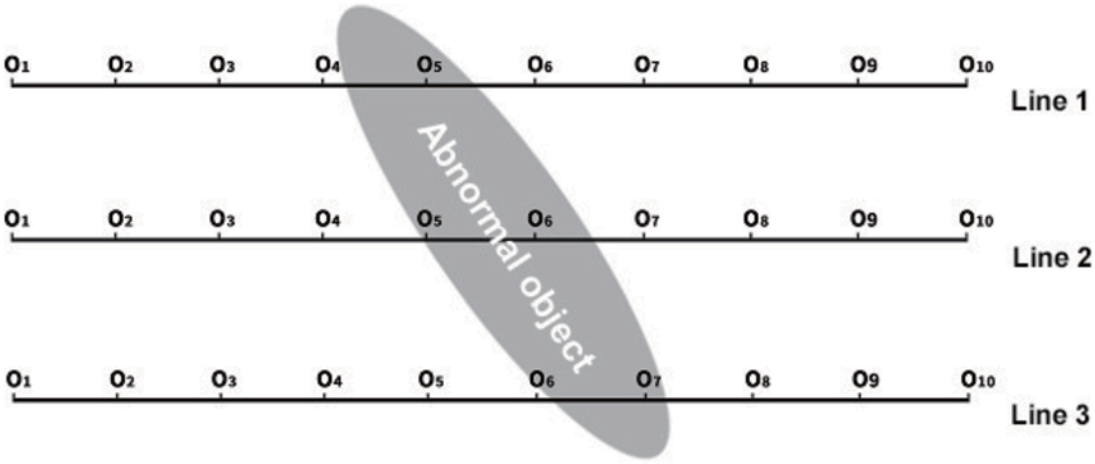


Figure 45

13.2 Layout method of cross or diagonal cross of straight section

After measuring one straight line section, it is found that there is an abnormal body or the site is relatively limited. When it is difficult to lay out multiple straight line sections, you can use cross (Figure 46) or diagonal crossing (Figure 47) to lay out the second line. The anomalous 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 approximate direction of the exploration target.

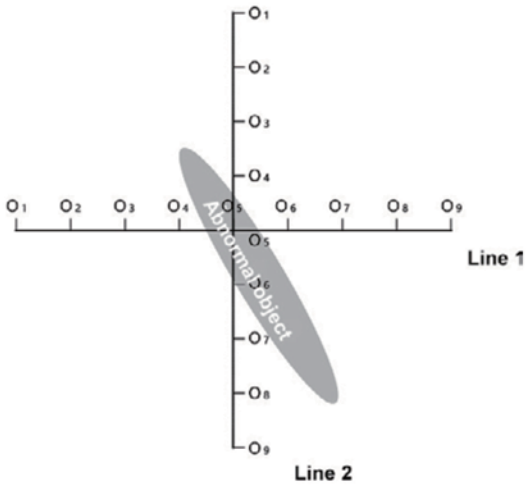


Figure 46

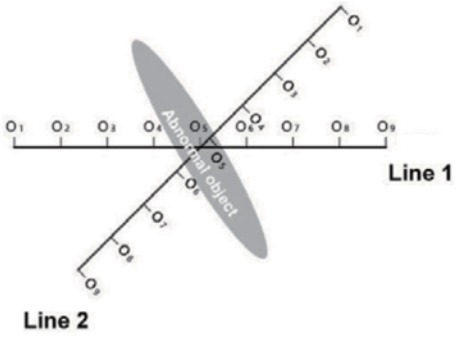


Figure 47

13.3 Layout method of circular section

When the survey site in some areas is really narrow or there are point interferences like transformers, signal transmission towers, etc. nearby, make a circle (Figure 48) or semicircle (Figure 49) with the site or interference as the center to measure. , Can also quickly track the direction and location of exploration target objects (water veins, mineral veins, etc.).

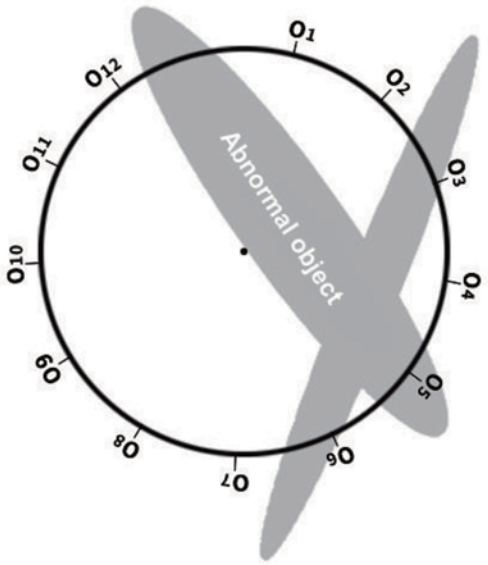


Figure 48

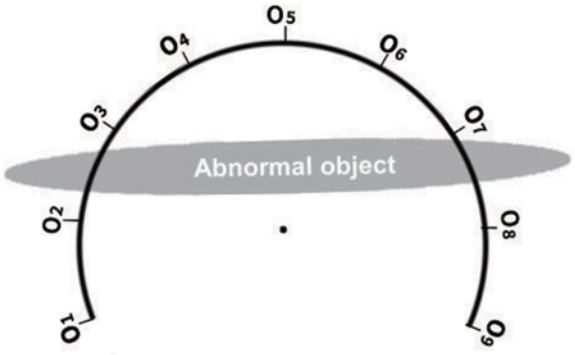


Figure 49

13.4 The high-density layout method of 96-512 channel matrix composed of multiple 32 channels

In order to make data acquisition more accurate and efficient, 3 or more 32-channel instruments can be used to form a matrix high-density measurement method. Please contact the manufacturer separately for details.

13.5 Wiring Principle

1. The survey line layout 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 as round as possible, and the ground as flat as possible. You can make sure that the survey line is as straight as possible by using a compass or a benchmark with three points and one line.
2. When measuring on a mountain slope, try to choose the same altitude layout. When the same height layout is not possible, try to choose the same slope or a gentle slope direction as possible. The height difference between adjacent points should preferably not exceed 2 meters.
3. The measuring line should be as far away as possible from high-voltage transmission lines and telephone lines. When not far away, the wiring direction should be as parallel as possible.
4. When measuring, make sure that the M and N electrodes are on the same plane as much as possible, and the recording point is the center point of the M and N electrodes or below the device sensor.
5. In the same measurement area, the point distance should be kept the same as far as possible, and the line distance should be kept the same to facilitate recording and analysis.
6. Try to keep the grounding consistency of M and N electrodes when measuring in MN electrode mode.

14 Precautions for using the instrument

1. Please check the battery level of the device regularly and charge it regularly. Maintain sufficient power during working hours and turn off the power promptly after work.
2. The equipment should be kept by a dedicated person during transportation or use to avoid severe vibration, impact, and moisture ingress.
3. After each work, keep the equipment and MN electrode clean and place them in a ventilated and dry place.
4. If the MN electrode or electromagnetic sensor is not connected or disconnected, it will prompt measurement failure. Please check whether the line is connected.
5. When the measurement data of each measuring point is too small and the value is basically the same in the equipment measurement, the instrument may be malfunctioning, please contact the after-sales confirmation.

Note: The product manual may change with the optimization and improvemen t of the company's products. If there is any change, the electronic version of o ur company's manual shall prevail.

艾都慧测

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Guilin Technology Hydrogeological Investigation Institute

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探矿服务热线/Mineral Exploration：400-902-5836
考古服务热线/Treasure Exploration：400-995-3656
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