艾都慧测

ADMT安卓屏系列产品

ADMT SERIES PRODUCES

操作手册

OPERATION MANUAL

中国制造 • MADE IN CHINA

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目录

本操作手册适用以下仪器：

型号 / 系列	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		

Contents

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 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

2.1 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%。

2.2 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。

2.3 深度可选：在不同型号的最大深度范围内的深度可选。

2.4 通道可选：1、1-16、1-32 通道任意选择。

2.5 输入灵活：可以 1、1-16、1-32 道MN 电极输入，MN 间距 1-10 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。

2.6 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：

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

式中 k 称为波数（或传播系数）

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

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：

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

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：

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

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：

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

（5）式可用于确定大地的电阻率：

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

3.3 趋肤深度

在无磁性介质中，趋肤深度公式为：

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

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

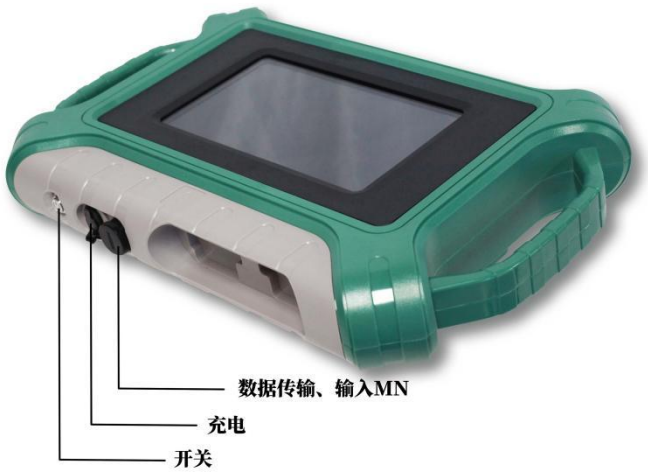


图 1

4.2 16 通道仪器介绍

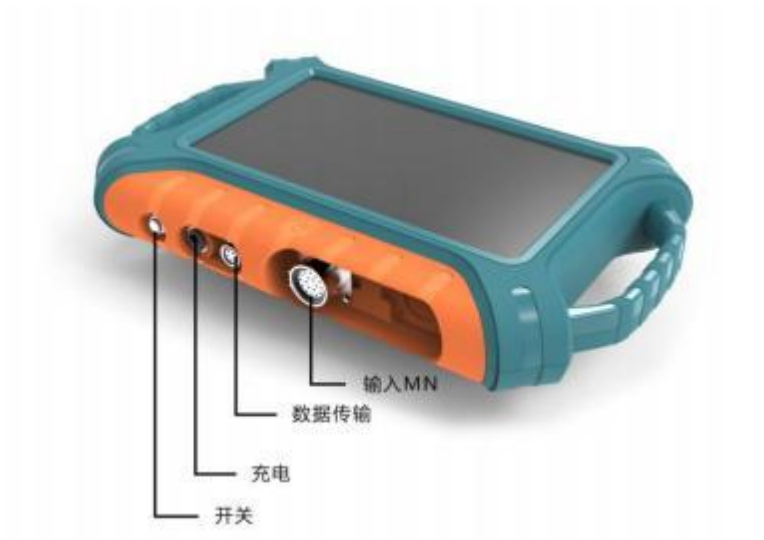


图 2

4.3 32 通道仪器介绍

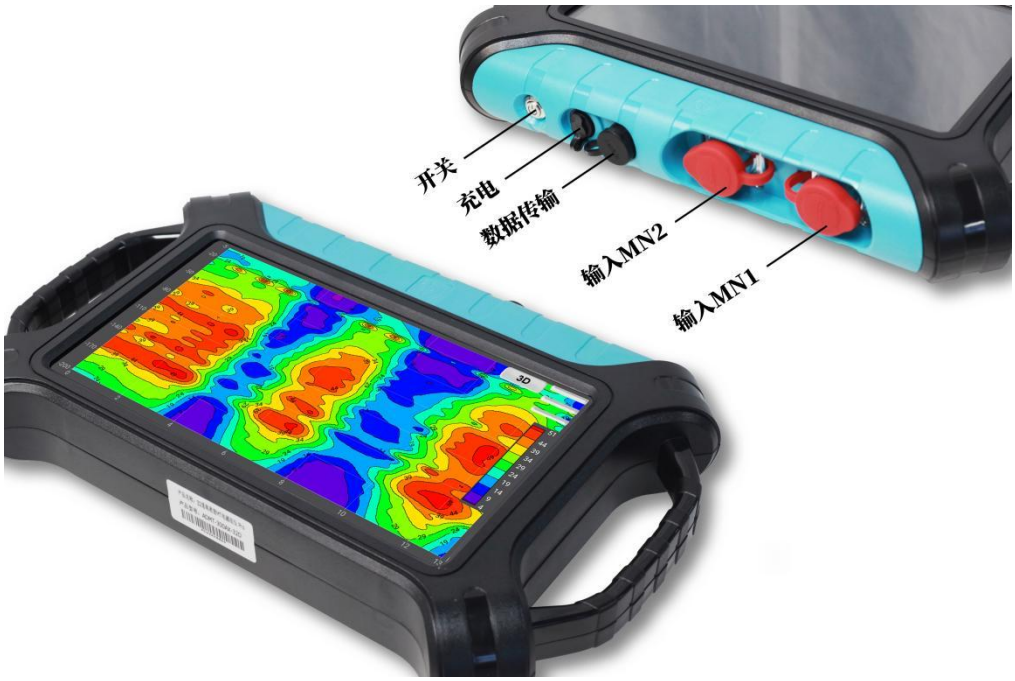


图 3

4.4 基本款单通道主要技术参数

型号 / 参数	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-A78 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			

表 1

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，标配最大电极间距2.5m，可选配最大电极间距5m/7.5m/10m				
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-A78 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				

表 2

4.6 基本款 32 通道主要技术参数

型号 / 参数	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，标配最大电极间距2.5m，可选配最大电极间距5m/7.5m/10m				
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-A78 核 CPU 2.0Hz				
GPU	OpenGL ES 2.C				
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	

表 3

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-A78 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	

表 4

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，标配最大电极间距2.5m，可选配最大电极间距5m/7.5m/10m					
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-A78 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

表 5

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，标配最大电极间距2.5m，可选配最大电极间距5m/7.5m/10m						
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-A78 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

表 6

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、系统设置、数据处理的六个菜单主界面（如图 4）。

图4

首次使用本仪器需在有网络的环境下使用手机号发送密码登录，登录后的手机号和密码可登录艾都勘探手机 APP 或 WEB 艾都智能数据处理系统，实现多终端数据同步。手机发送的登录密码可保留，只要以后不重新发送密码，则这密码永久有效。也可以使用邮箱账号或微信登录本系统。 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：点击主页面的“系统设置”按钮，进入系统设置菜单，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《13.2.5 系统 WiFi 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，可选择“手机号快速登录”、“邮箱快速登陆”、“微信快速登陆”三种登陆方式，建议选择“手机快速登录”，这样方便多终端数据共享。

特别提示： 一定要连接好 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。

在（图 5）中也可以进行语言切换操作：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。

图 5

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 6），点击“获取登陆密码”输入手 机接收到的登陆密码，点击登录即可登录到系统主界面。

图 6

5.3 邮箱快速登录

点击“邮箱快速登录”跳转至登陆界面（如图 7），输入电子邮箱后点击“获取登陆密码”，输入邮箱内收到的登陆密码，即可登录到系统主页面。

图 7

5.4 微信快速登录

“微信快速登陆”一般适用于在手机上安装本软件的登录操作，仪器主机一般无法使用。手机用户在使用“微信快速登录”时需要确认手机中已下载微信并登录自己的微信账户。在登陆界面中点击“微信快速登录”后（图 8），即会自动跳转至微信页面进行登录操作，完成后会跳转回艾都勘探 APP。

图 8

六、数据处理操作方法

6.1 自动设置参数

在软件主界面点击“数据处理”进入数据处理界面（图 9），点击“下载最新参数”可下载最新参数设置，在“仪器型号”中会显示当前连接的仪器型号，参数为“默认”状态，仪器会按照厂家设置的、该型号的默认的数据处理方式，数据处理方法涵盖了数据修正、数据整理、数据平滑和似电阻率反演等功能，仪器所测量的原始数据经过这些数据处理功能后极大程度的去除干扰噪音，还原了相对真实地下各地质地层及异常体特征等，初级使用本仪器的用户一般建议使用此参数设置。

图 9

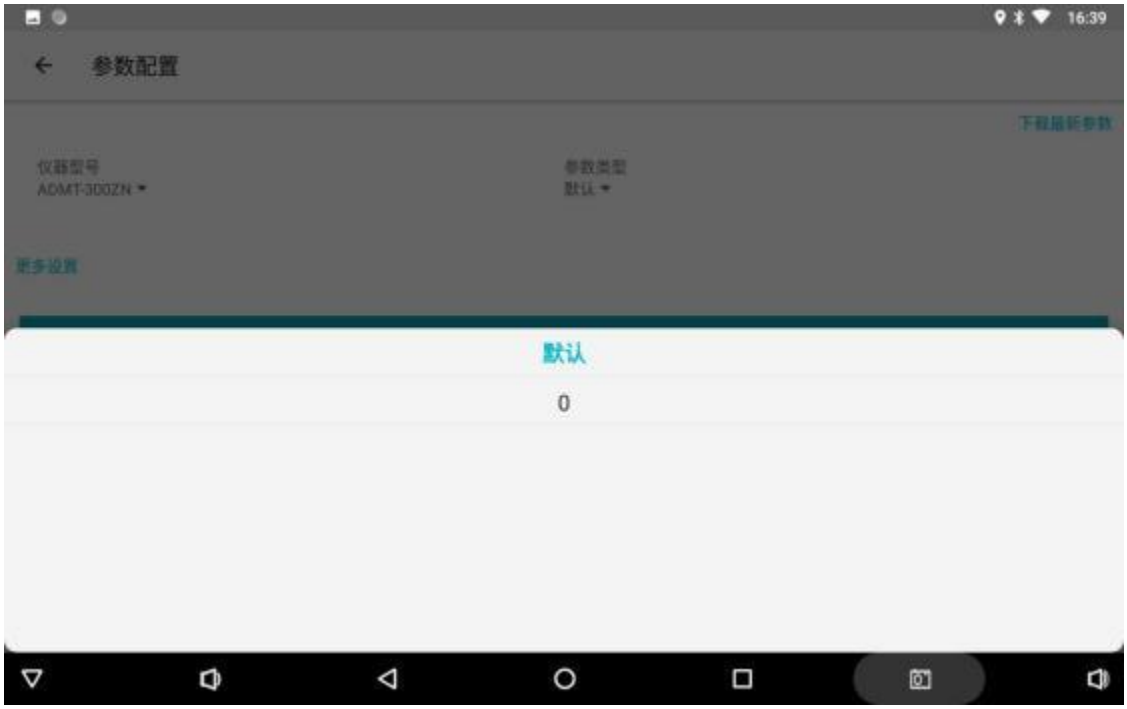


图 10

当然，部分艾都老用户因为习惯使用之前数据处理方式，可以点击“默认 ”后（图 10）显示“默认 ”和“0 ”可以选择 “0 ”的状态，这是旧的数据处理方式，相对“默认 ”的数据处理方式少了数据整理、数据平滑和似电阻率反演等功能。

6.2 手动设置参数

当仪器使用熟练到一定程度后，或对于本参数的数据处理效果不很满意，可自行对参数进行调整，调整完成后可点击“添加参数类型 ”输入参数名称来保存该参数至艾都服务器， 自添加的参数名称在仪器上、网页端或手机等其他设备上登录该账号来选择使用，如需删除该参数，可点击“删除参数配置 ”来删除该组设置的参数（图 11-12）。


参数配置
下载最新参数
仪器型号
ADMT-300ZN
参数类型
默认
隐藏更多设置
数据修正
修正幅值
0.1
修正阈值
0.1
修正幅值
0.3
修正阈值
0.4
修正幅值
0.0
修正阈值
0.0
数据整理
数据重组
格式转换
数据下载

图 11


参数配置
数据平滑
3点平均
5点平均
无
似电阻率反演
反演模型
0.1
模型系数
1.0
添加参数类型
删除参数类型
保存
数据重组
格式转换
数据下载

图 12

数据处理相关设置说明

【数据修正】是去除环境干扰或测量过程中其他干扰造成的部分过高或过低的异常测点数据，修正幅值的幅值越大，修正后的数据波动范围就越大。例如，如果修正幅值为 0.2 或 0.3，则修正数据可能在原始数据的 20%或 30％范围内波动；修正阀值输入值越大，坏点修正后的数据偏差就越大。若修正阀值过大，数据易发生明显偏移；若阀值过小，则修正数据可能与真实数据相差较大。并且数据修正分为 X、Y、Z 三个轴向来修正，X 是水平方向，一般指各测点之间，Y 是垂直方向，一般是深度或测线方向，Z 是整体数据的维度。

【数据整理】是按照中 X、Y、Z 三个维度来整体滤波处理，设置为 0 为不整理，设置为 1 为整理，X 是水平方向，一般指各测点之间，Y 是垂直方向，一般是深度或测线方向，Z 是整体数据的维度。

【数据平滑】数据平滑可以减少相邻数据之间的峰谷值，平滑曲线并降低噪声，让图像效果更加流畅丝滑，可以选择 3 点、5 点、7 点、3 次 5 点、3 次 7 点等平滑方式，根据需要选择。

【似电阻率反演】似电阻率反演时对原始数据进行归一化、模型化处理，把原始测量的电场或电磁数值按照一定模型算法反演出地层电阻率，这不是真实的电阻率，跟电阻率相似，所以命名为“似电阻率”，也可以理解为视电阻率，反演模型选择一般是 0.1-0.9 个模型数据，模型值越大地层似电阻率变化越快，模型系数一般设置为 1，设置 0 时不执行该步骤。

6.3 数据重组

在主屏幕，单击“参数配置”，在下方有三个数据处理按钮，分别是“数据重组”、“格式转换”、“数据下载”（如图 13）。“数据重组”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 14），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。

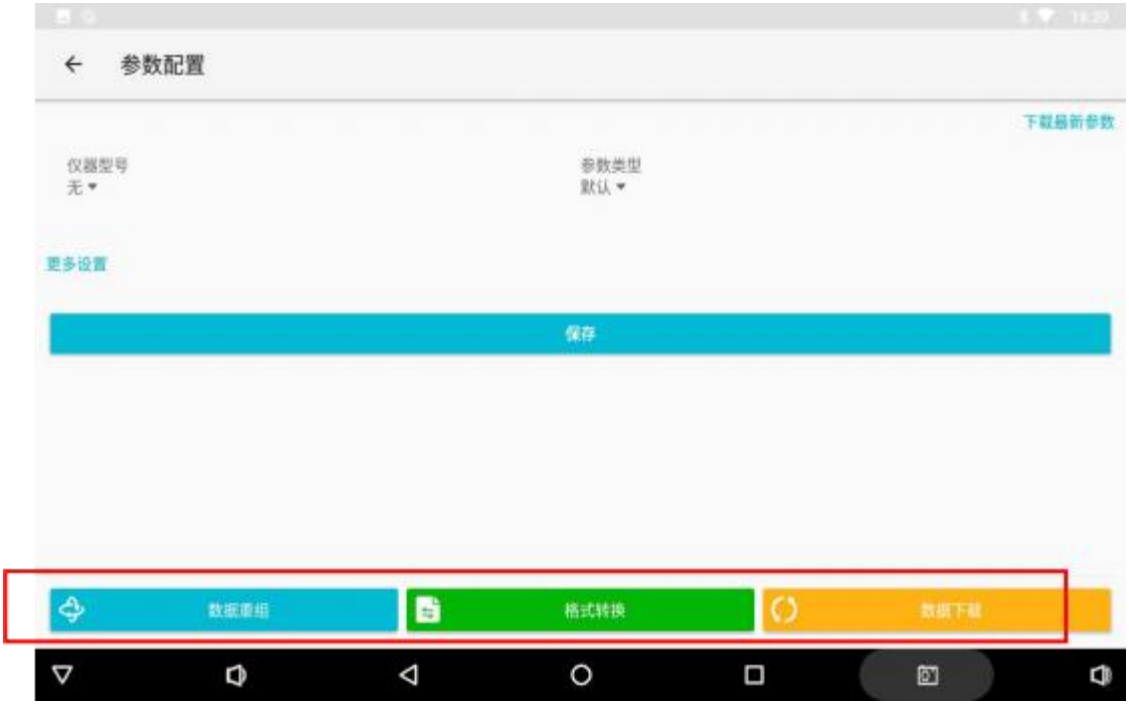


图 13

图 14

6.4 格式转换

该功能可将测量数据格式转换成瑞典 Res2dinv 高密度仪器所需要反演数据格式，方便在电脑上进一步反演绘图。

6.5 数据下载

点击“数据下载”可将当前账户上所有备份到云端数据下载到本地，实现多终端数据同步，数据云端备份的功能可以保证更换设备、手机和其他意外情况发生时，数据不丢失。同时，其他人分享给您的数据，也可通过数据下载获得。

七、新建测量操作

7.1 新建测量

点击“新建测量”进入测量界面（如图 15），可中文、数字或英文输入测线文件名称，不支持特殊符合输入，可以属于相应的备注信息。

图 15

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 16）。

图 16

7.2 测量参数设置

7.2.1 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。

7.2.2 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。

7.2.3 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，也可以点击“检查更新 ”来更新通道数量。

7.2.4 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。

7.3 仪器自检

点击“测量 ”后会进入“仪器自检 ”（图 17），没有问题会正常进入测量阶段，如出现错误提示（如图 18），请点击“检查通道 ”返回测量界面，并检查 MN 电极接地是否良好，或检查测量线缆与仪器和电极连接是否良好，如果连接都没问题，可能是当地的接地电阻过大，可以对电极与地面的连接处浇些水来建立良好连接，当然也可选择“继续测量 ”，这样仪器会正常测量出数据，测量的数据是否可靠一般由现场人员来把握，如自己不能解决请与厂家和经销商联系。

图 17

图 18

7.4 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 19）。

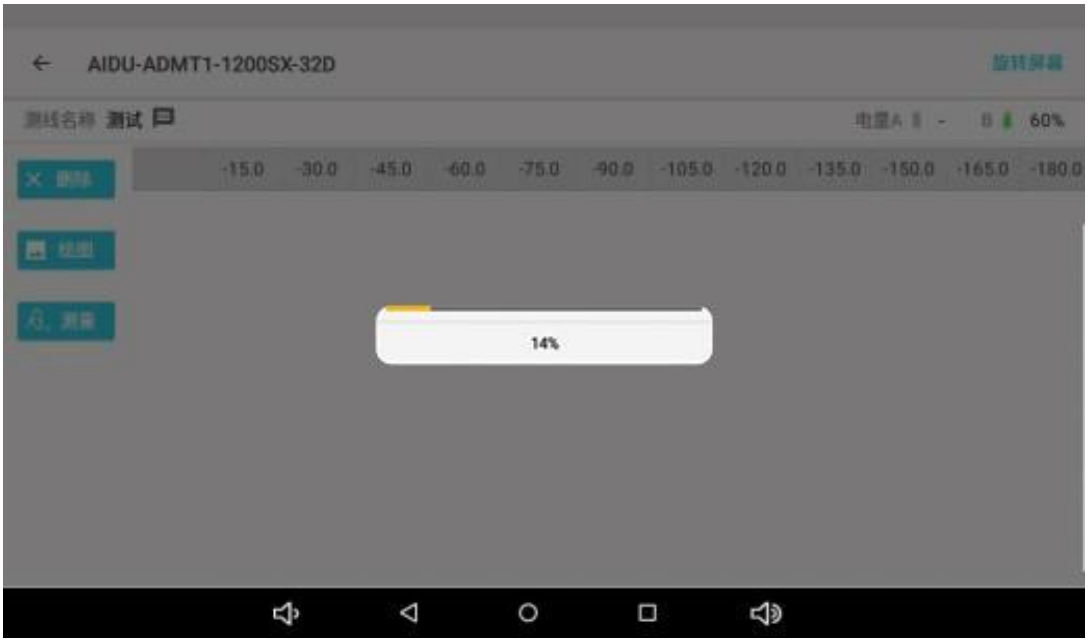


图 19

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 20）。

图 20

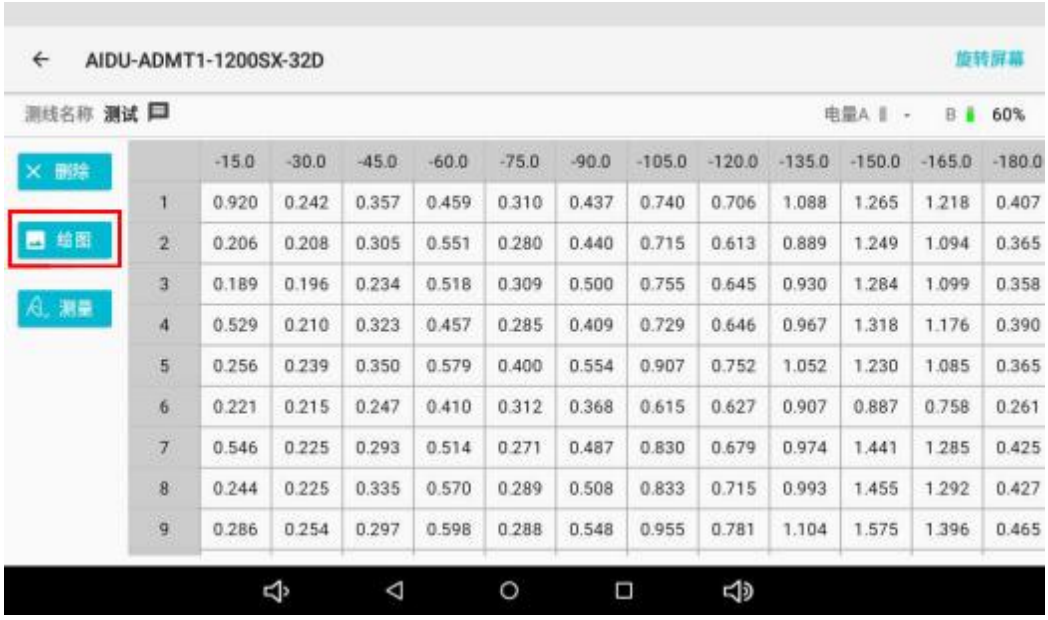
选择“删除”可以删除上一次测量数据。如果不需要删除则将设备移至下一测点后点击“测量”测量下一组数据，依次类推完成整个剖面的测量采集工作（如图 21）。

图 21

八、绘图操作方法

8.1 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 22），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。



	-15.0	-30.0	-45.0	-60.0	-75.0	-90.0	-105.0	-120.0	-135.0	-150.0	-165.0	-180.0
1	0.920	0.242	0.357	0.459	0.310	0.437	0.740	0.706	1.088	1.265	1.218	0.407
2	0.206	0.208	0.305	0.551	0.280	0.440	0.715	0.613	0.889	1.249	1.094	0.365
3	0.189	0.196	0.234	0.518	0.309	0.500	0.755	0.645	0.930	1.284	1.099	0.358
4	0.529	0.210	0.323	0.457	0.285	0.409	0.729	0.646	0.967	1.318	1.176	0.390
5	0.256	0.239	0.350	0.579	0.400	0.554	0.907	0.752	1.052	1.230	1.085	0.365
6	0.221	0.215	0.247	0.410	0.312	0.368	0.615	0.627	0.907	0.887	0.758	0.261
7	0.546	0.225	0.293	0.514	0.271	0.487	0.830	0.679	0.974	1.441	1.285	0.425
8	0.244	0.225	0.335	0.570	0.289	0.508	0.833	0.715	0.993	1.455	1.292	0.427
9	0.286	0.254	0.297	0.598	0.288	0.548	0.955	0.781	1.104	1.575	1.396	0.465

图 22

选择绘图后，可选择绘制“经典”、“新版”、“曲线图 1”、“曲线图 2”和“AI 分析”（如图 23），根据实际需要选择图形种类。“经典”和“新版”属于两种不同的等值线图绘图方式，可以按照需求自行选择，“曲线图 1”和“曲线图 2” 属于两种不同的绘制曲线图的方式。“AI 分析”是艾都结合目前热门的人工智能 AI 技术，实现的自动化看图分析功能，24 小时在线，分析一次只需要 2 秒。

图 23

8.2 绘制经典等值线图

选择“经典”系统会自动生成等直线图（如图 24）。

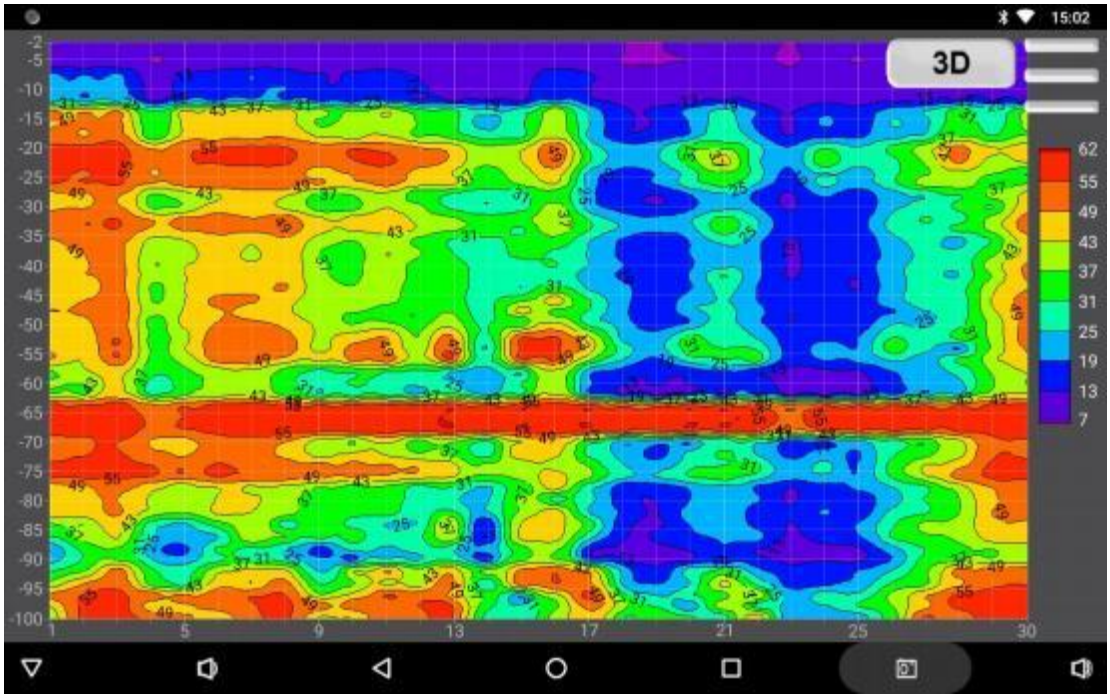


图 24

点击绘图界面上方“3D”或“2D”图标可切换 2D 图和 3D 图（如图 25），点击绘图界面右上角图标可以点击 “ ”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 “  ”退回测量数据界面（图 26）。

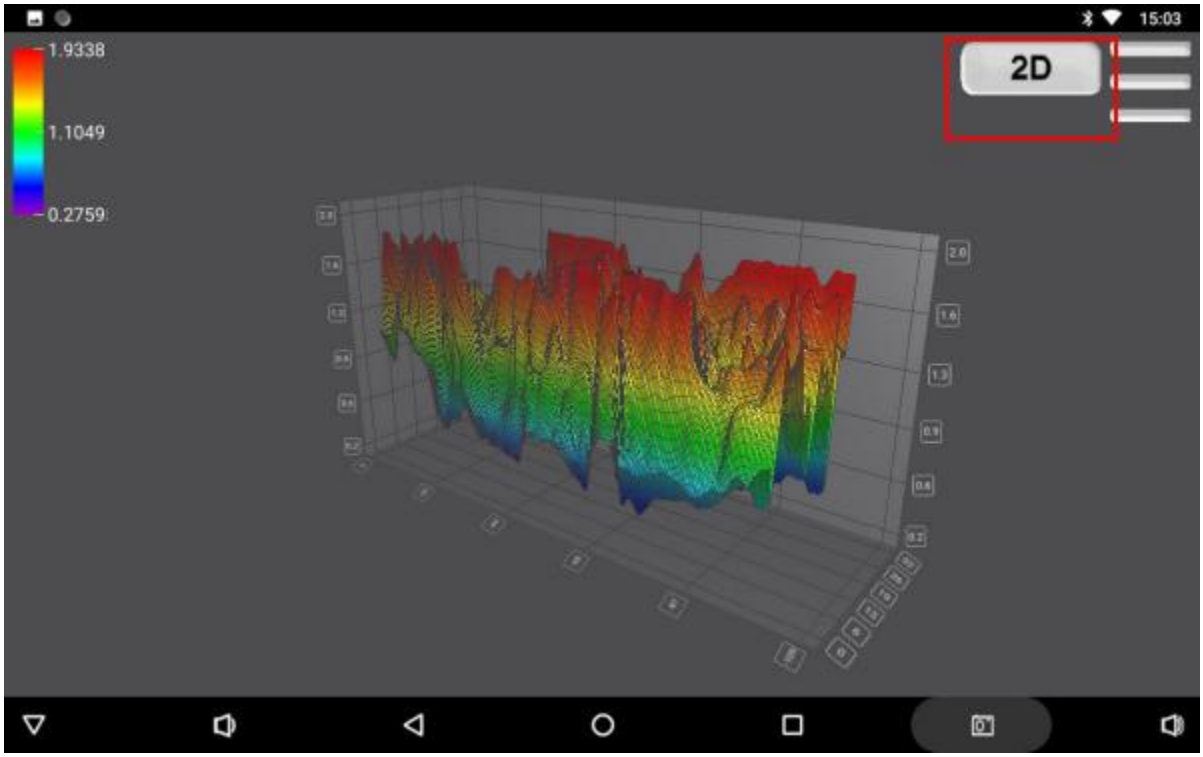


图 25

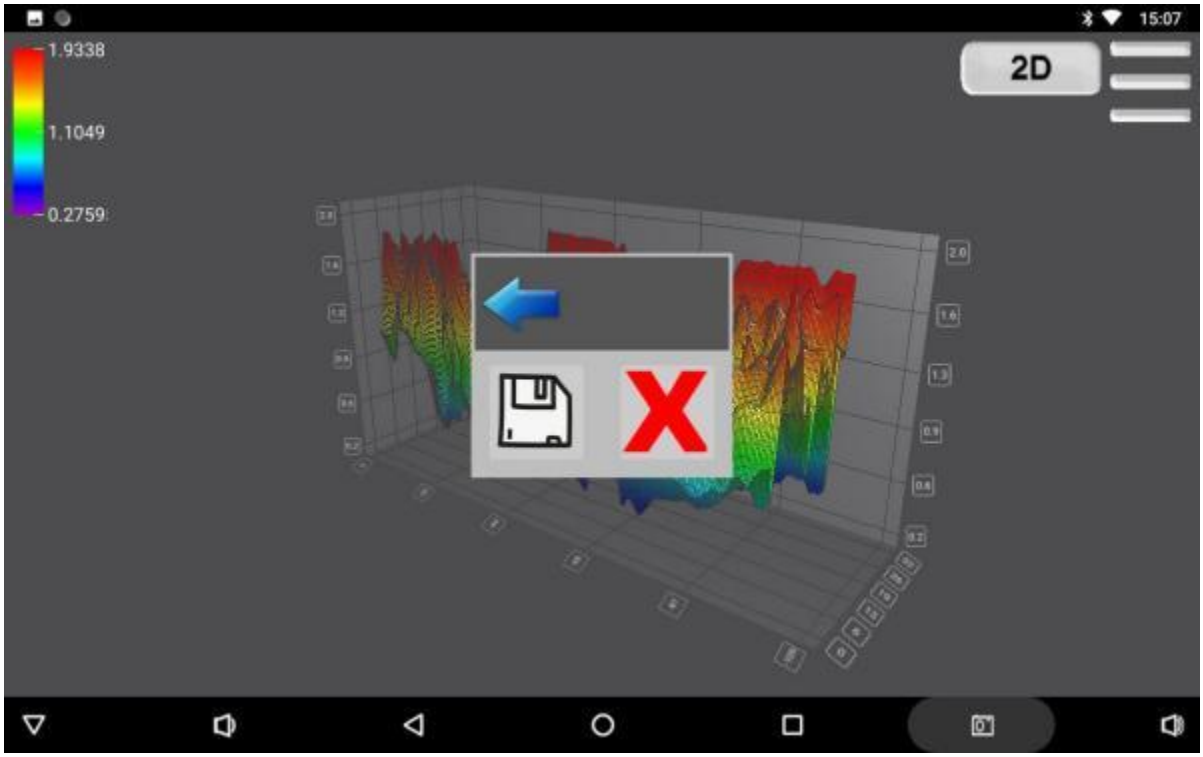


图 26

8.3 绘图等值线图（新版）

选择“新版”会自动生成新版等值线图，如（图 27）。单击图中位置，可以显示该点的 X(测点号)，Y（深度），Z（电阻率值）数据。双指拉开可以进行放大，双击可以返回默认页面。点击红框图标可以保存图像。

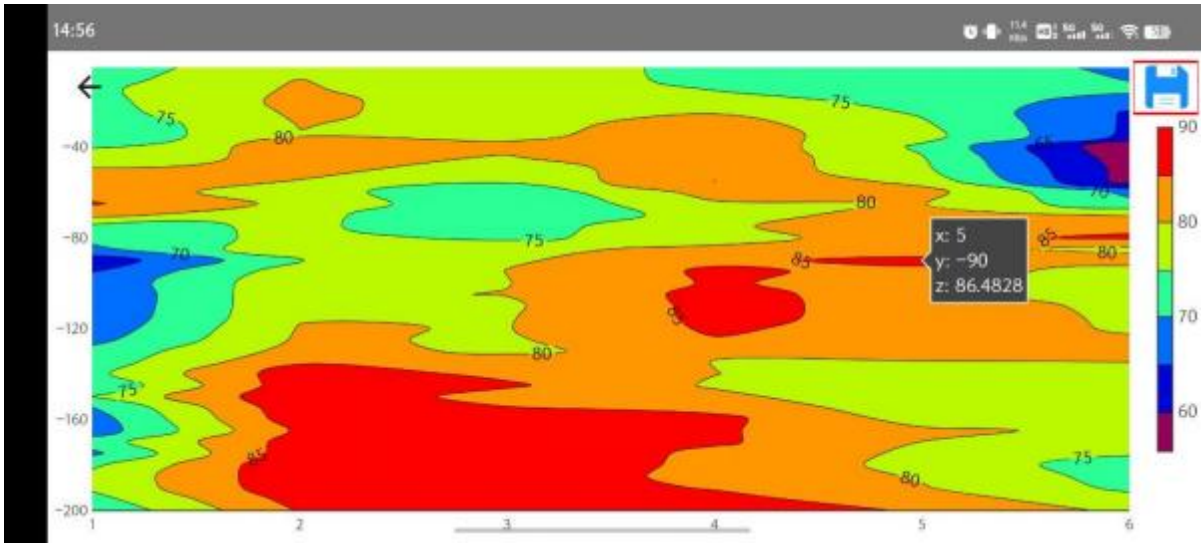


图 27

8.4 绘图曲线图

如果选择“曲线图 1”或“曲线图 2”系统会自动生成曲线图（如图 28）。

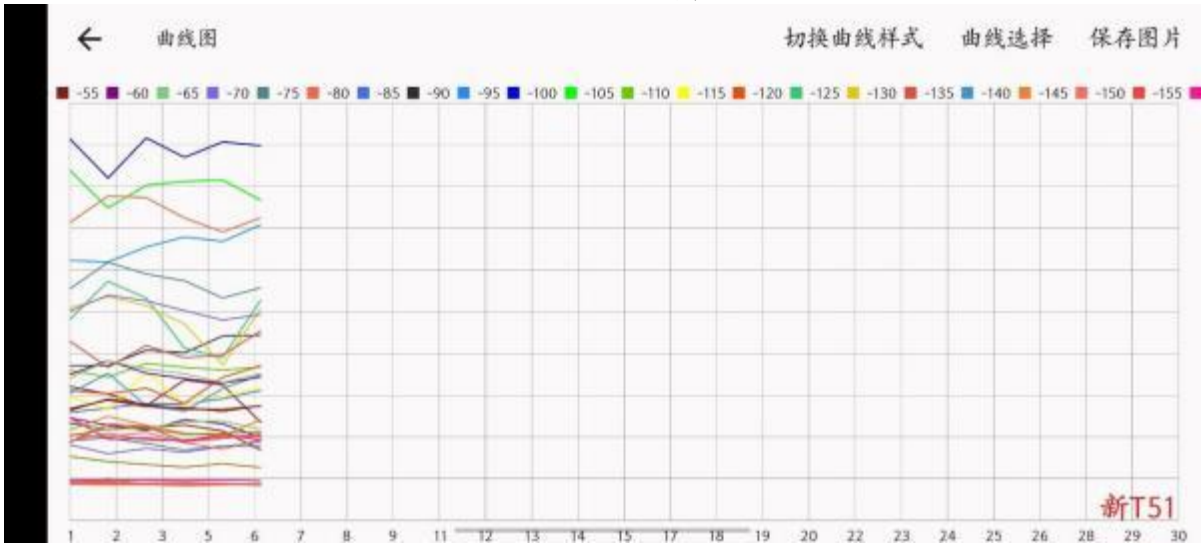


图 28

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 29）。

图 29

点击“切换曲线样式”可以切换到“曲线图 2”，选择“保存图片”来保存曲线图至文件夹（如图 30）。

图 30

8.5 AI 分析

如（图 31）选择“AI 分析”后，艾都 AI 自动分析功能会本次测量的数据进行自动分析，本型号仪器在使用中快速显示分析结果“在测点 2.0~5.0 附近-20.0~-10.0 米深度黑色框标识区域内是 AI 为你考虑的异常区域” （如图 32）智能高效。但使用“AI 分析”一定要在有网络的情况下进行，具体操作可操作本说明书的第 13.2.5 的“系统 WiFi 设置”连接方法为：点击主页面的“系统设置”按钮，进入系统设置菜单，点击 “系统 WiFi 设置”来搜索并连接附近的 WiFi 网络。 关于“AI 分析”的相关设置操作可参照本说明书的第 9 条的 AI 设置”。


15:22
WEB
请选择绘图效果
经典
新版
曲线图1
曲线图2
AI分析

图 31

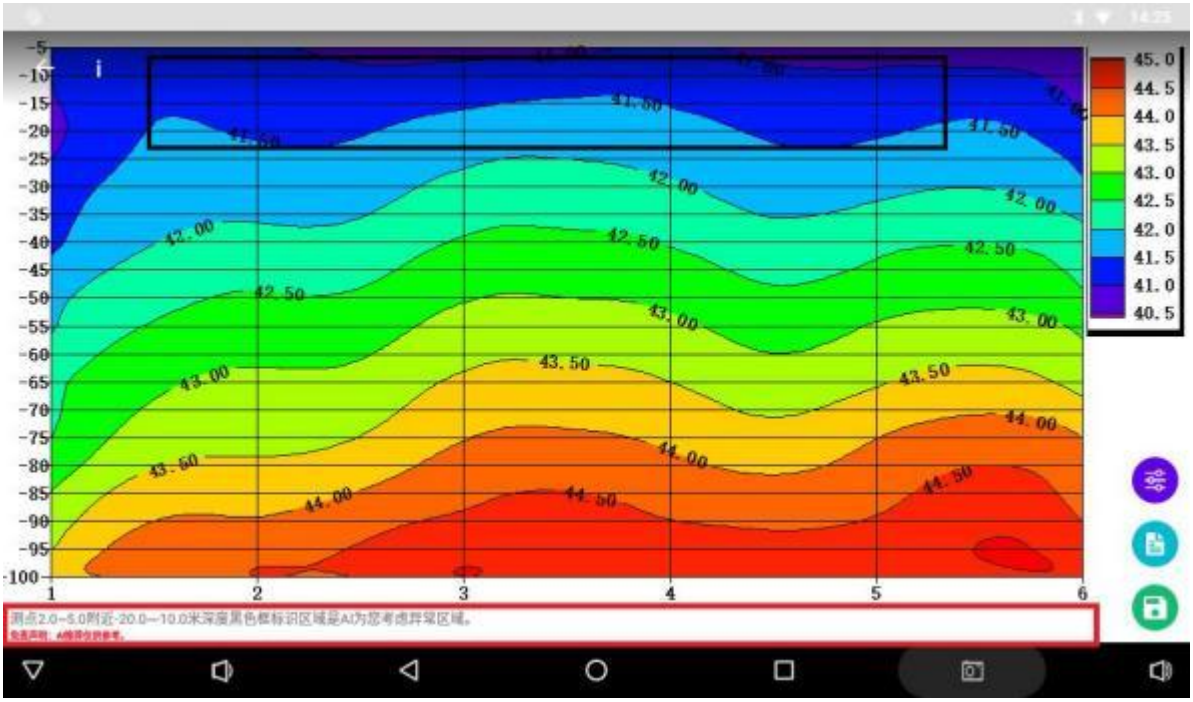

45.0
44.5
44.0
43.5
43.0
42.5
42.0
41.5
41.0
40.5

图 32

九、文件夹操作方法

9.1 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 表示是 2020 年 8 月 8 日所测量和操作的文件内容，仪器所测量的数据、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、AI 分析、备份、分享、删除等操作。

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 33）。点击左上角的“←”返回上一界面，点击右上角的“Q”，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 34）。

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，数据云端备份的功能可以保证更换设备、手机和其他意外情况发生时，数据不丢失。也可在手机、WEB 电脑端同步下载、查看和绘图等。

文件夹中一般包含两种类型的文件，后缀名为.dat 的原始数据文件和后缀名为_xyz.dat 的文件是点击“绘图”后自动生成，这个文件的数据是经过数据修正、数据整理、数据平滑、似电阻率反演等数据处理后所生成的文件，可以直接绘图或 AI 分析。

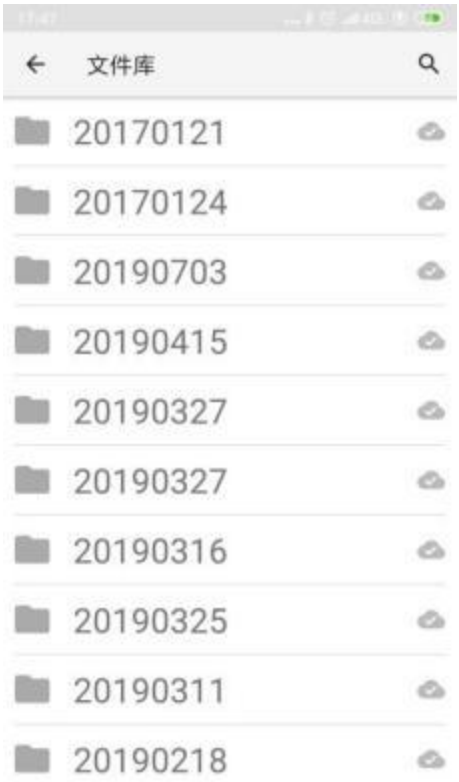


图 33

图 34

9.2 原始文件.dat 绘图

选择“.dat”文件（如图 35）可以直接点击 “查看数据”和“连接补测”（如图 36）来进行相关操作，选择“查看数据”进入数据页面（如图 22），选择“连接补测”进入补充功能继续该测线的数据测量，进入数据页面后进行“测量”或“绘图”操作，详细操作见本说明书第六、七条，部分仪器支持补测，部分仪器不支持该功能。

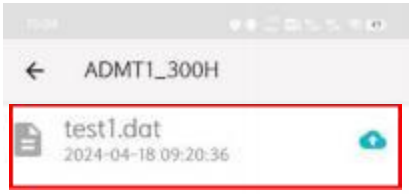


图 35

图 36

9.3 绘图文件_xyz.dat 绘图

点击后缀为_xyz.dat 的绘图文件会显示“经典”、“新版”、“AI 分析”的弹框（图 37），选择 “经典”或“新版”会直接绘图出经典和新版等值线图，详见本说明书的第 7.2、7.3 条的详细操作，选择“AI 分析”会本本数据进行 AI 自动分析，快速分析测量结果，详见本说明的第 7.5 条详细操作。

图 37

9.4 数据删除和分享

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 38），选择“删除”会提示是否确认删除（图 39），选择“确认”后，会提示选择“本地删除”和“云端删除”（图 40）。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 41）。


温泉洞1线向右移7点.dat
2023-08-18 09:32:43
温泉矿洞1线.dat
2023-08-18 09:05:31
矿洞2线.dat
河边靠水100米测深.dat
2023-08-18 09:05:02
河边100米测.dat
2023-08-18 09:04:53
全选

图 38


15:13
温馨提示
是否确认删除?
取消
确认
温泉矿洞1线.dat
矿洞2线.dat
河边100米测.dat
全选

图 39

图 40

图 41

可以在仪器中将选中的数据选择“分享”功能（图 42），分享给已经在艾都仪器或手机 APP 上注册或登录过的手机账号，输入手机号后点击“确认”分享给成功（图 43），该手机账号如在 WEB 艾都智能数据处理系统中登录后变可看到相关数据，如果该手机账号在手机艾都勘探 APP 中登录的，则需要进入软件主页面的“数据处理”中

的数据下载后（图 44-45），可以在文件夹中查看本次分享的数据。

图 42

图 43


17:18
参数配置
下载最新参数
仪器型号
ADMT-1200ZN
更多设置
同步提示
点击确定开始下载数据
取消
确认
数据重组
格式转换
数据下载

图 44


17:18
参数配置
下载最新参数
仪器型号
ADMT-1200ZN
参数类型
更多设置
检查中...
数据重组
格式转换
数据下载

图 45

十、AI 分析详细设置

10.1 分析参数设置

不管是测量界面、文件夹的原始数据.dat 或绘图文件_xyz.dat 的界面，选择“AI 分析”后系统会进入到 AI 分析的结果界面（图 46），点击屏幕右下方第一个操作图标可进入 AI 分析设置界面（图 47）， 点击“数据下载”可以下载最新的 AI 分析参数，也可点击“参数类型”中可选择“默认”或“AI 推荐”，其中“默认”为公司旗下某型号产品设置的理想分析参数，“AI 推荐”为 AI 分析系统根据用户反馈记录结果来建立数据模型后，AI 自动学习调整生成相关分析参数（图 48），原则上这组参数更加贴近真实分析，当然这需要用户自身标记的数据是否准确和标记的数量多寡来决定。

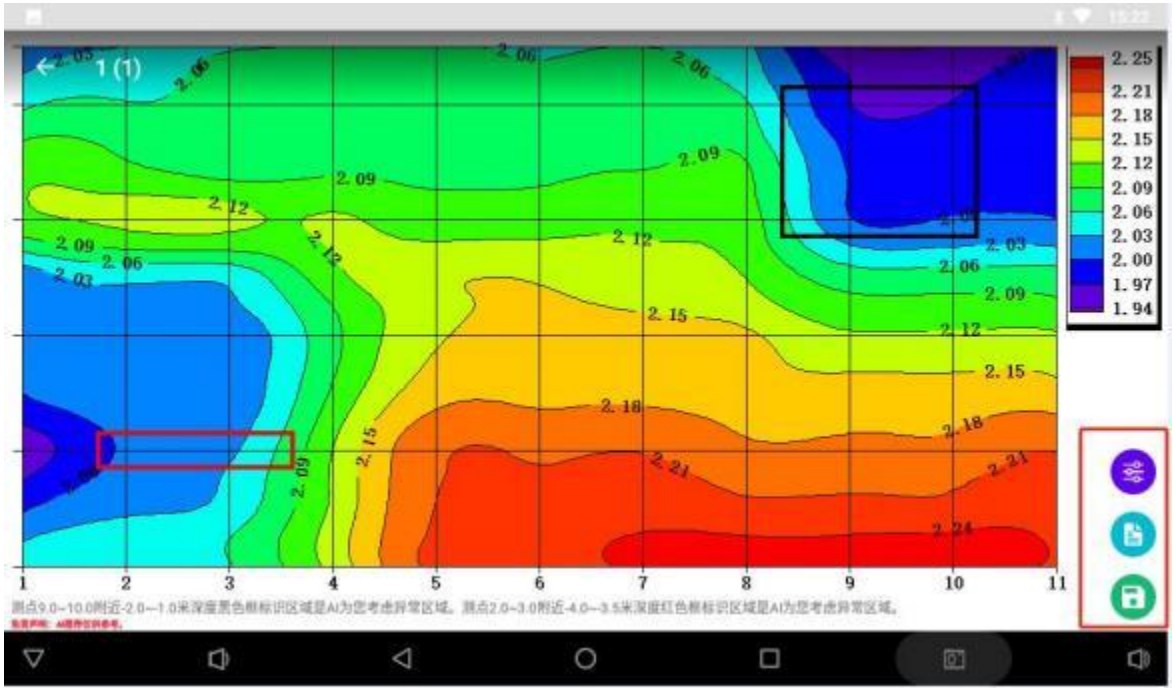


图 46

图 47

图 48

选择“添加”功能可手动添加 AI 分析参数，通过可手动左右滑动取值范围的百分比范围来调整 AI 分析的结果，一般百分百越小会显示越低值区域，百分比越大会显示越高阻区域，也可以是中间某值，这是根据用户的实际使用经验，和该型号仪器在当地寻找某种异常体特点来设置，如果初级使用本仪器，暂不建议使用。

选择“删除”会删除该组设置 AI 分析参数。

10.2 记录 AI 分析结果反馈

在 AI 分析界面点击屏幕右下方第二个操作按钮来找到历史记录界面（图 49），选择分析过的数据文件后面的“有效性”栏中的“默认”按钮（图 50），如果分析的结果与实际情况一致，则点击“是”，这时系统会记录有效数据，记录越多准确的数据，AI 分析会越来越准确（图 51）。

不符合则点击“否”，点击“否”后会弹出绘图效果操作框（图 52），可通过可手动左右滑动取值范围的百分比范围来调整 AI 分析的结果，一般百分百越小会显示越低值区域，百分比越大会显示越高阻区域，也可以是中间某值，调整分析结果与实际结果一致再标记为有效，这样增加标记有效的数据量，如不调整则不记录。

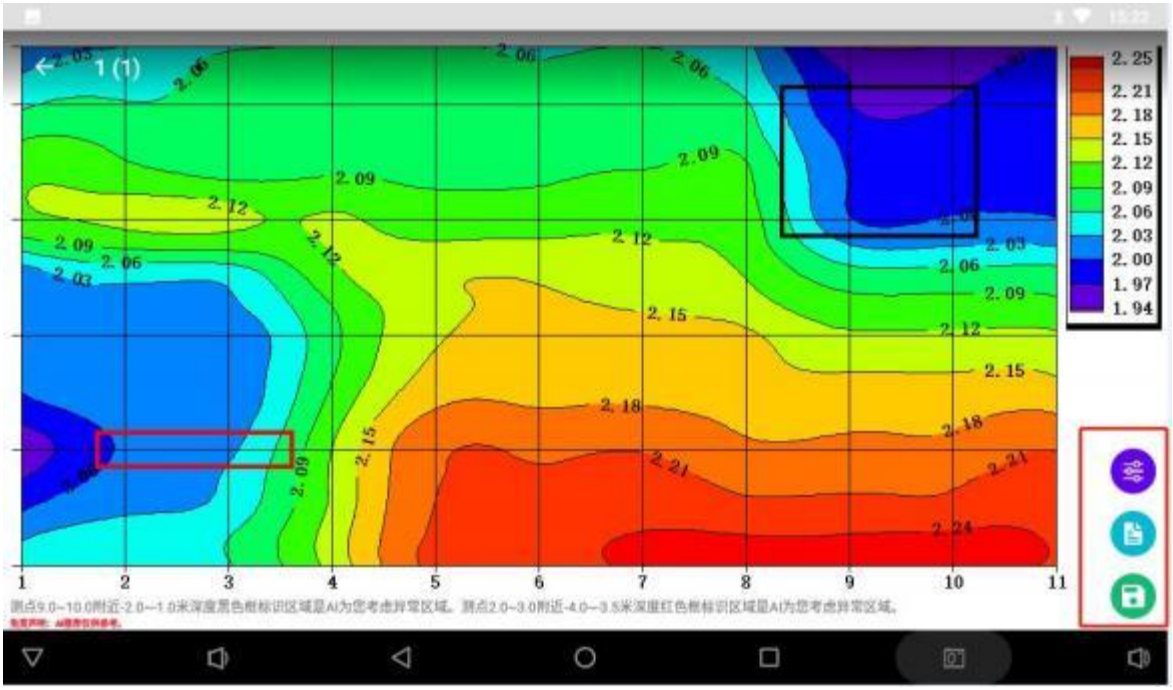


图 49

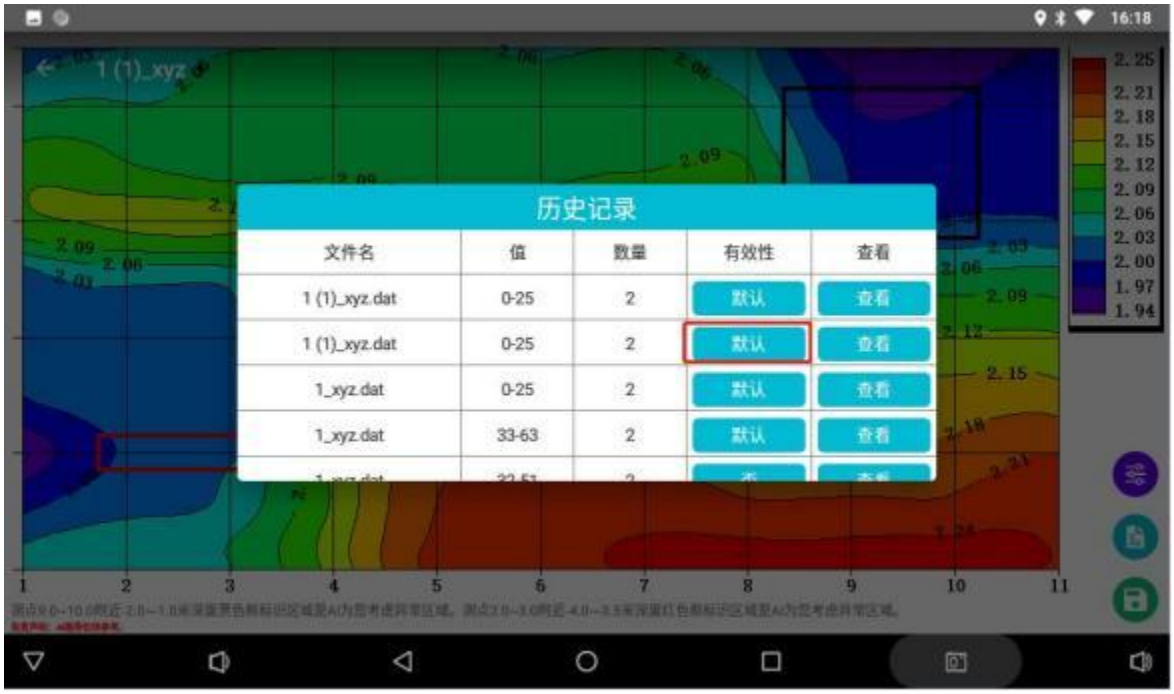

16:18
1 (1)_xyz
历史记录
文件名
值
数量
有效性
查看
1 (1)_xyz.dat
0-25
2
默认
查看
1 (1)_xyz.dat
0-25
2
默认
查看
1_xyz.dat
0-25
2
默认
查看
1_xyz.dat
33-63
2
默认
查看
2.25
2.21
2.18
2.15
2.12
2.09
2.06
2.03
2.00
1.97
1.94

图 50


16:18
1 (1)_xyz
温馨提示
请确认本条记录是否有效
否
是
2.25
2.21
2.18
2.15
2.12
2.09
2.06
2.03
2.00
1.97
1.94

图 51

图 52

10.3 保存 AI 分析结果

在 AI 分析界面点击屏幕右下方第三个操作按钮，图片自动保存在手机相册中（图 53），方便在实际使用中查看和其他用途。

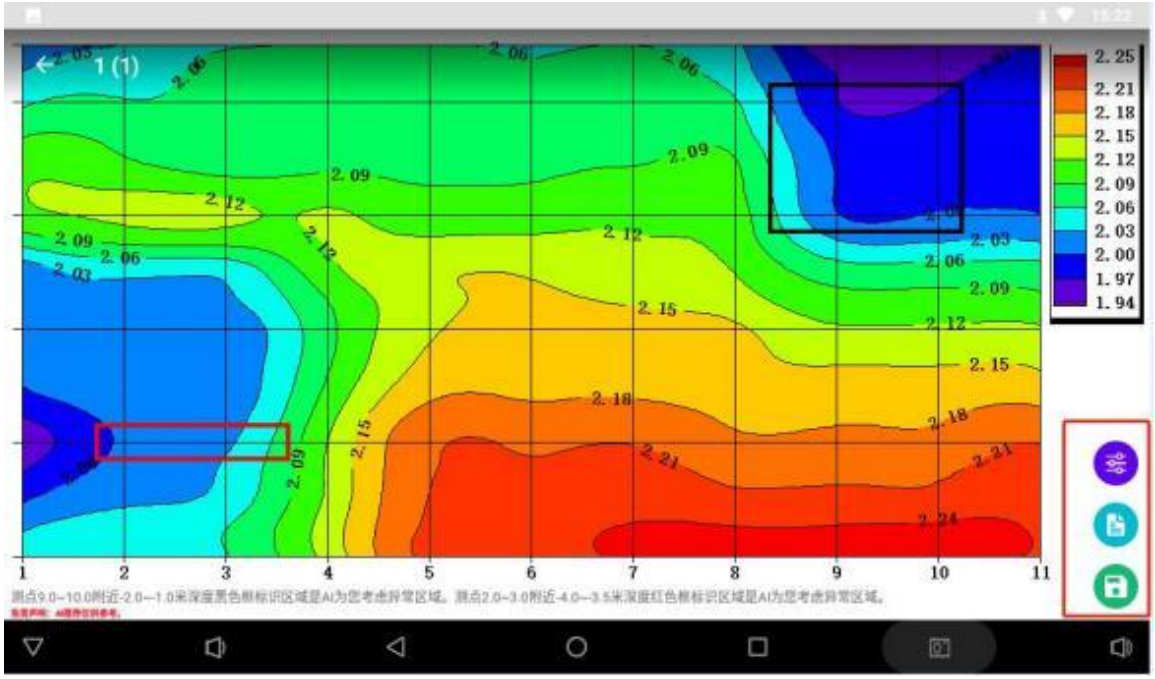


图 53

十一、艾都 WEB 智能数据处理系统

11.1 登录艾都 WEB 数据处理系统

使用浏览器访问艾都数据处理系统http://web.aidush.com，选择“艾都勘探”的账号类型，用仪器或手机一样的手机号、密码来登录，这样就共享该账号下所有数据了，也可通过手机中艾都勘探 APP 来扫码登录（图 54-57）。

图 54

图 55


艾都智能数据处理系统
中文
系统操作说明
账号类型：
艾都勘探
手机登录
邮箱登录
扫码登录
86
请输入手机号
密码
发送密码
登录

图 56


艾都智能数据处理系统
系统操作说明

图 57

11.2 数据上传

选择左侧的“数据上传”后可以在中部的 文件夹图标选择电脑中的数据文件进行上传，点击+号可以选择多个文件，点击“数据上传”后会把数据上传到当前账号的当前应用类型的云端数据库中（图 58）。

图 58

11.3 数据格式转换

点击“格式转换”，选择“老文件转换 ADXYZ”是将原来艾都旧款仪器数据的.dat 文件转换成.adxyz 文件（旧款仪器数据的.dat 文件的数据列是频率、行是测点数据）转换成.adxyz 文件后就可以网站功能的操作了；选择“新文件转换 ADXYZ”后选择需要转换的文件，可以选择 X、Y、Z 数据列用被转换文件的哪一列来组成，同时在还可以选择深度和测点的范围；选择“R2D 数据转换”可以把所选文件转转换成瑞典 Res2dinv 高密度仪器所需要反演数据格式，选择“下载”该数据后，可以用瑞典 Res2dinv 软件进一步反演绘图；选择“VOXLER 格式转换”后可以把所选文件转转换成 VOXLER 三维软件来绘制三维图。

在艾都设备或 APP 中已经使用过 AI 分析或成图会生成 _xyz.DAT 文件，该类型文件可以直接用于网页 AI 分析（图 59-60）。

图 59

图 60

11.4 数据合并

数据合并分为剖面数据合并和测区数据合并。

剖面数据合并可以把多次测量文件合并到一个剖面数据中，具体操作为在剖面数据合并下“点击选择文件”来选择需要合并的第一个文件名称，可以点击加号⊕增加“点击选择文件”的对话框来选择其他文件，直到把需要合并的文件按顺序选择完成后，重新设置测量起点和测点增量，可以都默认为 1，并且设置好新的文件名称，点击“提交”后完成合并，完成后在数据行的前端显示新的文件名称，这各新的文件将是一个完整的剖面文件。

测区数据合并可以把测区内的多条测线（剖面）数据文件合并在一起，这样可以

绘制三维图和平面剖面图等，具体操作为测区数据合并菜单下“点击选择文件 ”来选择需要合并的第一个文件名称，可以点击加号⊕增加“点击选择文件 ”的对话框来选择其他文件，直到把需要合并的文件按顺序选择完成后，重新定义测量起点、测点增量、第一测线编号、测线间距、新文件名称等参数，后“提交 ”执行合并，完成后在数据行的前端显示新的文件名称，这各新的文件是一个合并后完整测区文件。测量起点、测点增量可默认为 1、第一测线编号可默认为 0，测线间距可默认为 1 或相邻两条测线垂直距离、新文件名称自定义，各测线之间的线间距自动增加。

11.5 ADMT 数据处理

ADMT 数据处理功能可以对仪器的原始数据进行相应的数据处理，能处理的文件为.adxyz 文件，旧款仪器或新文件格式均可按照本说明书的第 12.3 数据格式转换获得。

数据处理参数可以参照本说明书的第 9.1、9.2 条操作说明。

11.6 绘制等值线图

绘制等值线图可以把处理好的数据文件来绘制等值线图，具体操作为选择左侧“绘制等值线图 ”功能后，点击所需要绘制的文件名称并可以绘制等值线图，默认为“经典等值线图 ”可以在右上角切换到“新版等值线图 ”后再选择文件绘图，如果是测区数据文件可以切换“垂向等值线图 ”和“平面等值线图 ”如何获得测区数据文件可以在仪器操作测量时设置各测线，也可以参照本说明书的第 12.4 条的测区数据合并功能来获得。

11.7 绘制曲线图

选择“绘制曲线图 ”可以绘制多种样式的曲线图，具体操作为选择左侧“绘制曲线图 ”功能后，点击所需要绘制的文件名称并可以绘制曲线图，可以切换右上角的多色折线图、灰色折线图、渐变折线图来切换不同的曲线图类型。

11.8 AI 自动分析

点击左侧的“AI 自动分析 ”的功能后，然后选择 adxyz 或 xyz.DAT 文件，也可以在网页右侧操作栏修改 AI 分析效果。在艾都仪器或艾都 APP 中已经连接过仪器的账户已经自动绑定该仪器，在“设备型号 ”中会默认显示已绑定的仪器（图 61）。

没有绑定过仪器的账号需要在“型号查询 ”中手动输入使用的仪器型号。在手动输入“型号查询 ”后，可以在下方的“配置名称 ”中选择推荐的配置，或在“值 ”和

“ 目标区域数量 ”中输入自己想要的值。

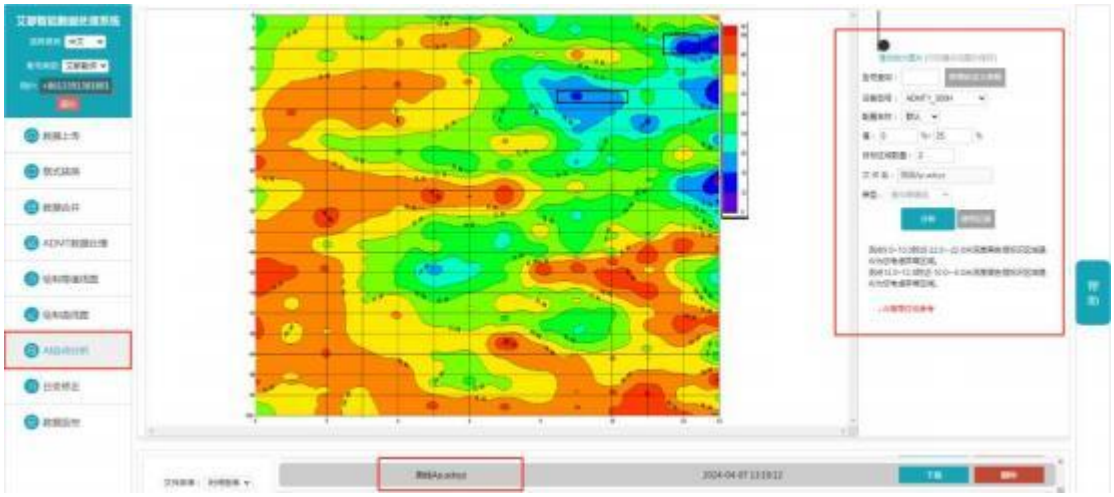


图 61

记录 AI 分析结果是否有效，点击右侧操作栏“使用记录 ”，选择分析过的数据文件后面的“有效 ”“无效 ”（图 62）。

如果分析结果和实际情况一致，则勾选有效，这时系统会记录有效数据，记录越多有效准确的数据，AI 分析会越来越准确。

不符合则勾选“无效 ”，会弹出提示框，可以手动调整分析结果和实际结果一致，再重新记录有效，如不调整则不记录（图 63）。

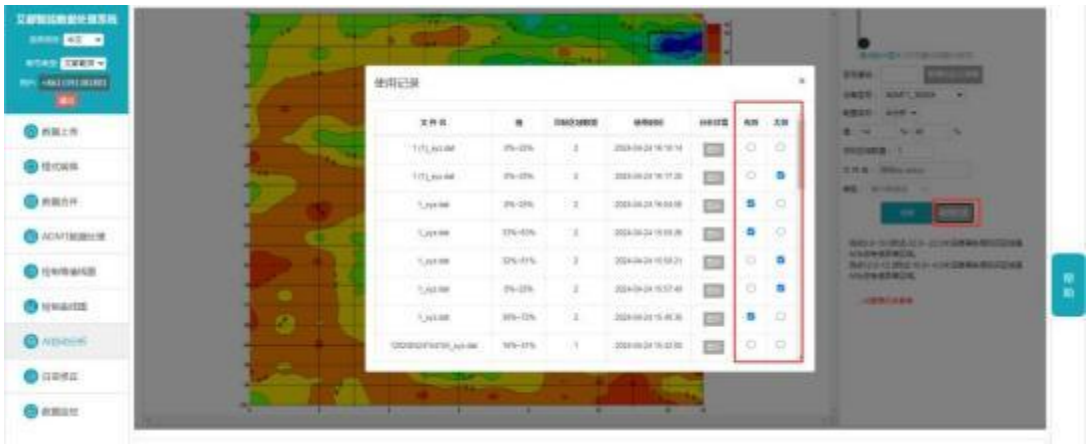


图 62

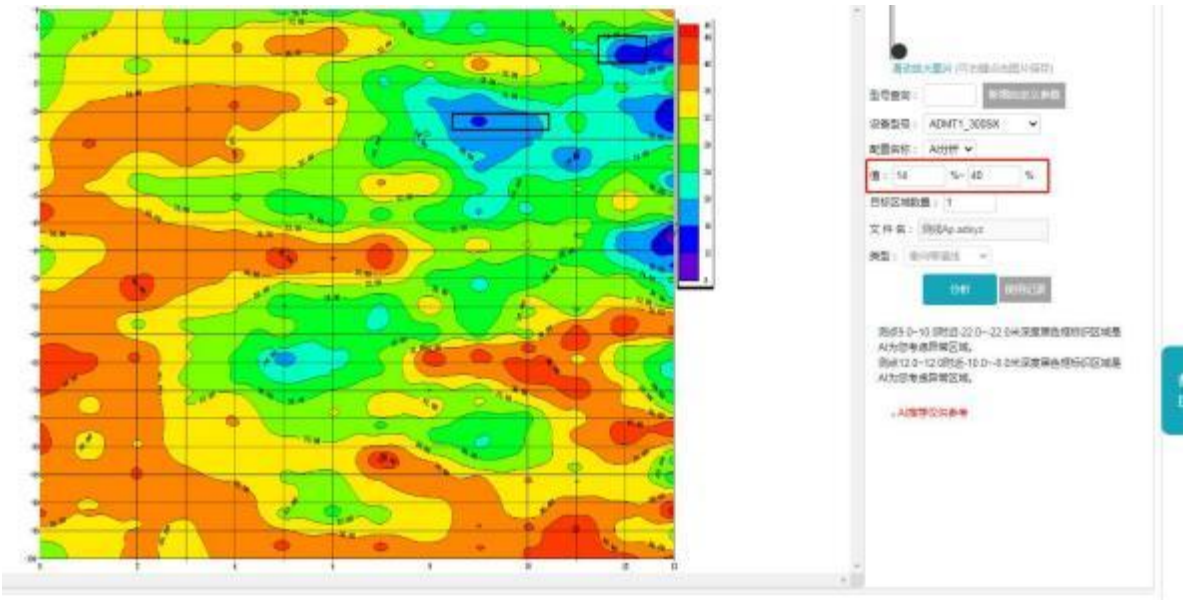


图 63

十二、其他功能操作方法

12.1 触屏导出

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）。

12.2 系统设置

点击“系统设置”，可以进入系统设置页面（如图 64）。

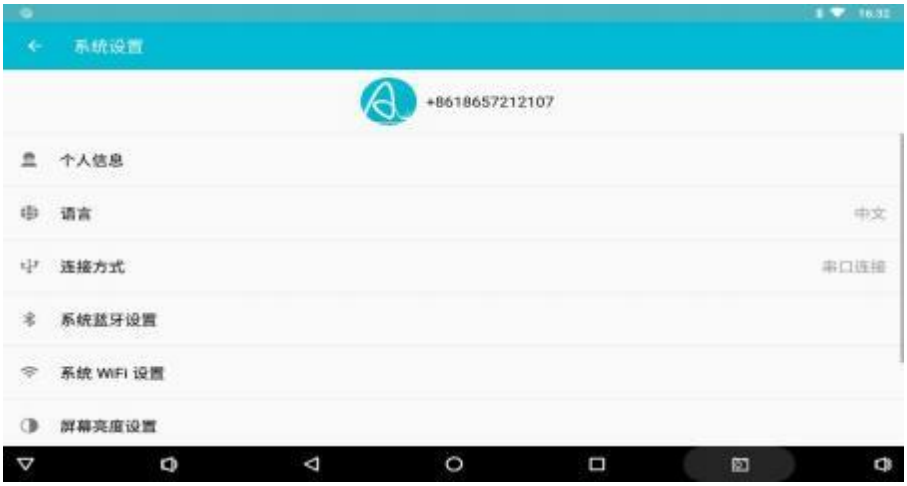


图 64

个人信息：点击“个人信息”可查看、编辑个人资料。

语言：点击“语言”可以选择多种系统语言。

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”，仪器一般出厂时已设置好连接方式，无需更改。

系统蓝牙设置：点击“系统蓝牙设置”，可以跳转至系统蓝牙设置页面。

系统 WIFI 设置：点击“系统 wifi 设置”，可以跳转至系统 wifi 设置页面。

屏幕亮度设置：点击“屏幕亮度设置”，可以跳转至系统屏幕亮度设置页面。

关于：点击“关于”，可以查看本仪器 app 版本号，注册协议、隐私保护政策、检查更新等操作，公司非常注重用户使用仪器相关隐私保护，检查更新：在有网络状态下点击可“检查更新”可以查询本软件是否属于最新版本，建议更新到最新版本软件。

扫码登录：点击“扫码登录”可开启仪器主机上配置有摄像头，可以扫描艾都 WEB 智能数据处理系统来登录。

十三、仪器野外连接方法

13.1 单通道连接方式

有线电极连接方式：仪器开机后按上图所示连接仪器（如图 65），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 66）。以此类推，直至完成整条剖面测量。

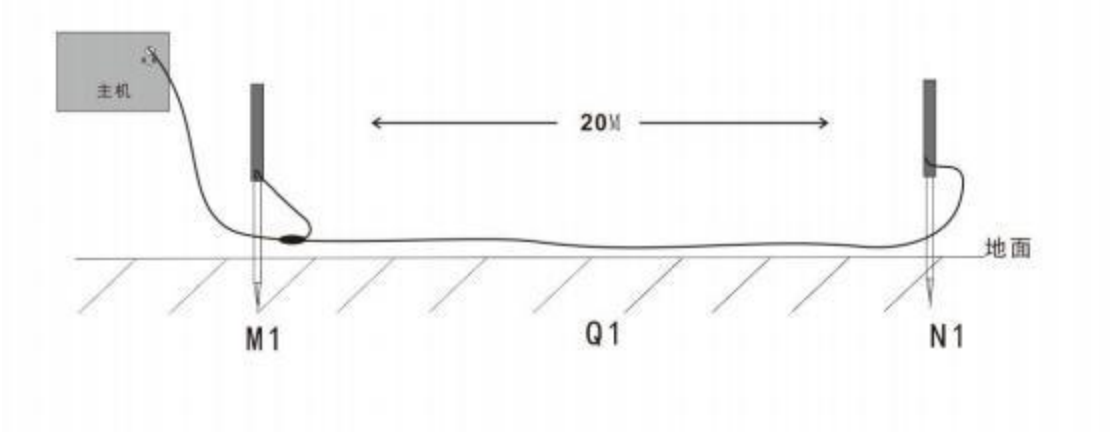


图 65

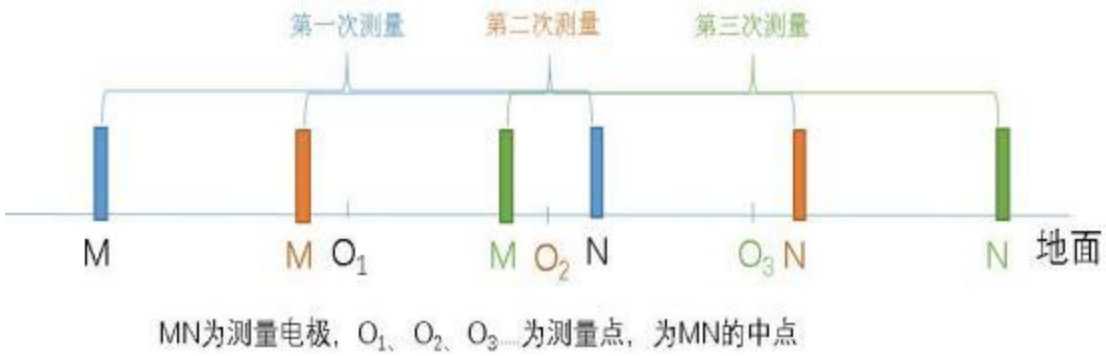


图 66

有线磁探头连接方式（选配）：仪器开机后按上图所示连接仪器（如图 67），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。

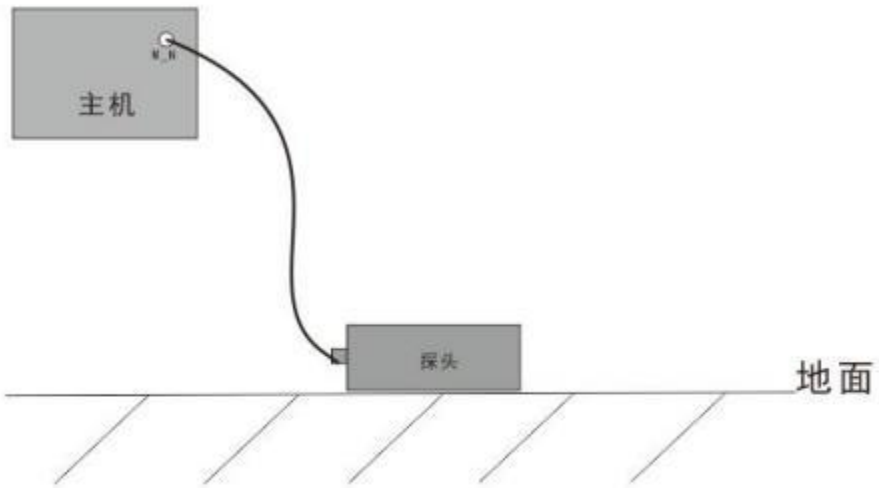


图 67

还可以选配置无线磁探头，连接方式为：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 68）。以此类推，直至完成整条剖面测量。

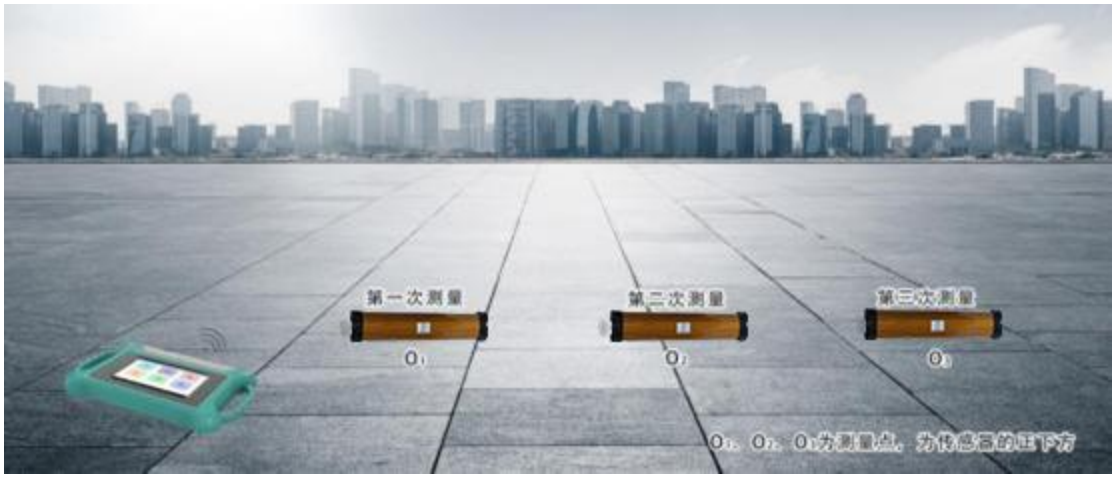


图 68

13.2 16 通道仪器连接方式

16 通道系列基本连接方法：仪器开机后按上图所示连接仪器（如图 69）,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。

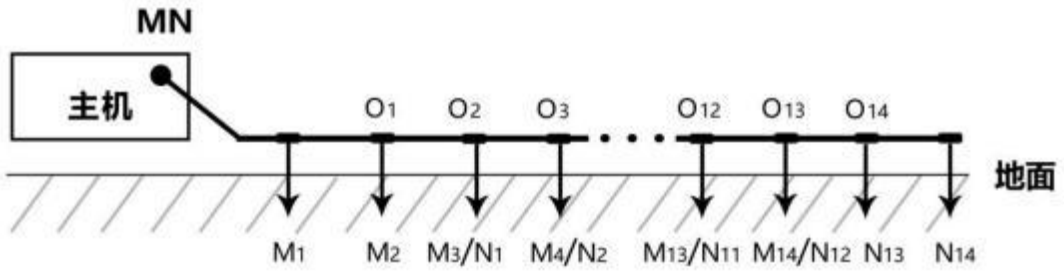


图 69

16 通道仪器有线电磁探头连接方式：仪器开机后按上图所示连接仪器（如图 70），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。

图 70

13.3 32 通道仪器连接方式

32 通道仪器基本连接方法：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 71、72）。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。

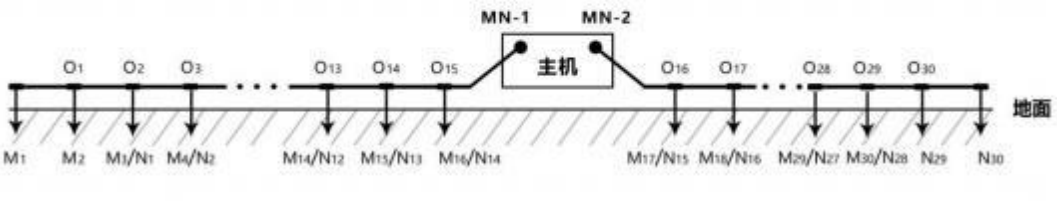


图 71

图 72

32 通道仪器有线电磁探头连接方式：仪器开机后按上图所示连接仪器（如图 73），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。

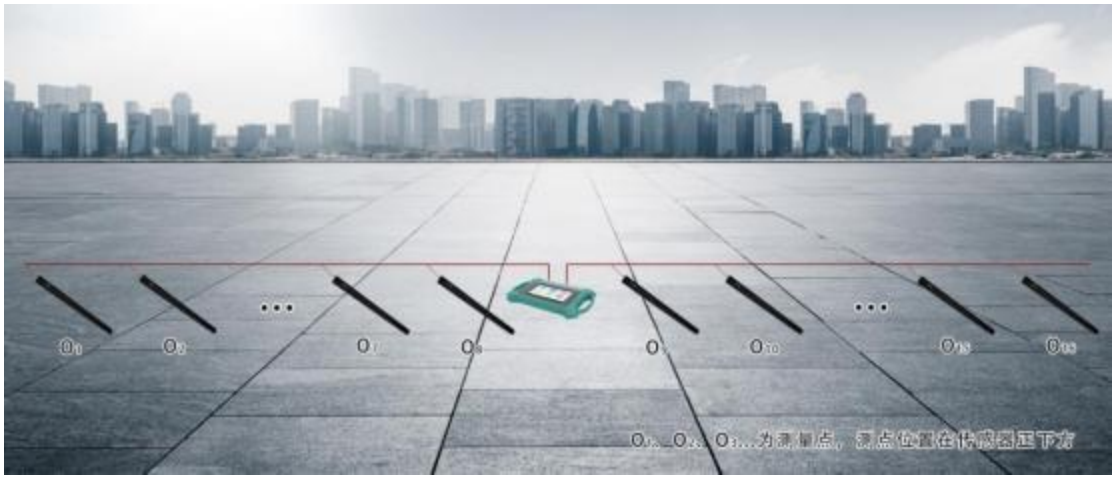


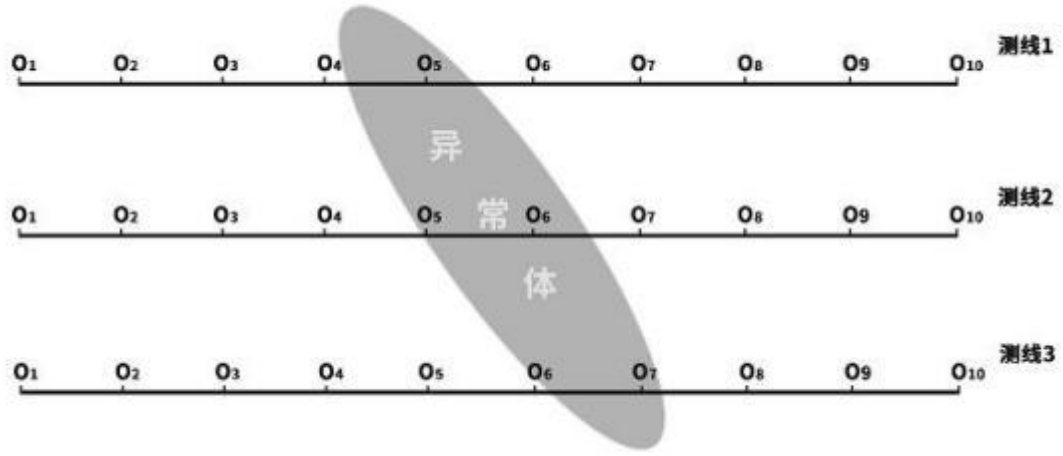
图 73

十四、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。

14.1 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 74）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 74

14.2 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 75）或斜线交叉（如图 76）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。

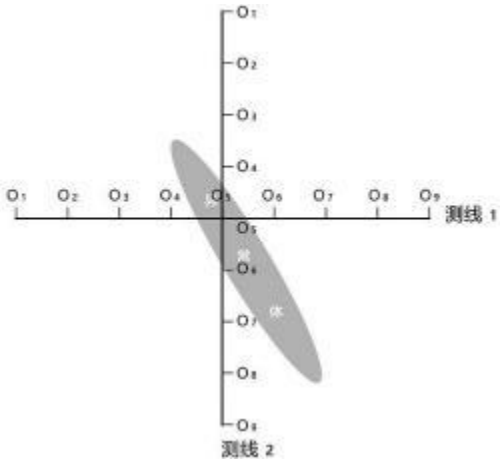


图 75

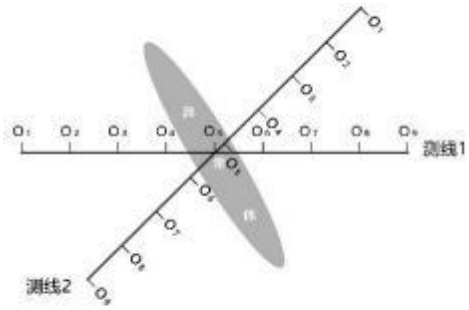


图 76

14.3 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 77）或半圆形（图 78）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。

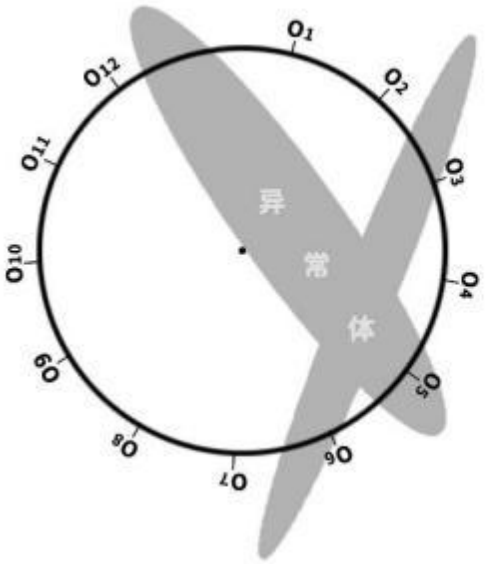


图 77

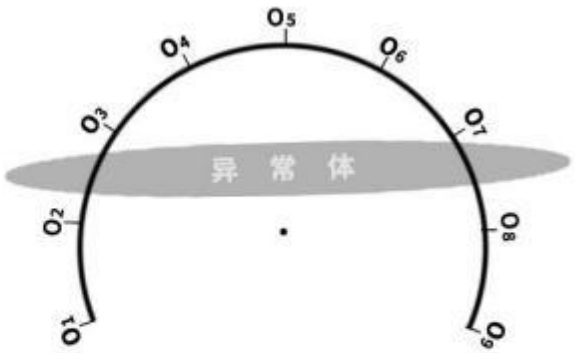


图 78

14.4 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。

14.5 布线原则

14.5.1 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。

14.5.2 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。

14.5.3 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。

14.5.4 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。

14.5.5 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。

14.5.6 MN 电极模式测量时尽量保持 M、N 电极接地一致性。

十五、使用仪器的注意事项

15.1 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。

15.2 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。

15.3 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。

15.4 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。

15.5 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。

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 1-10 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

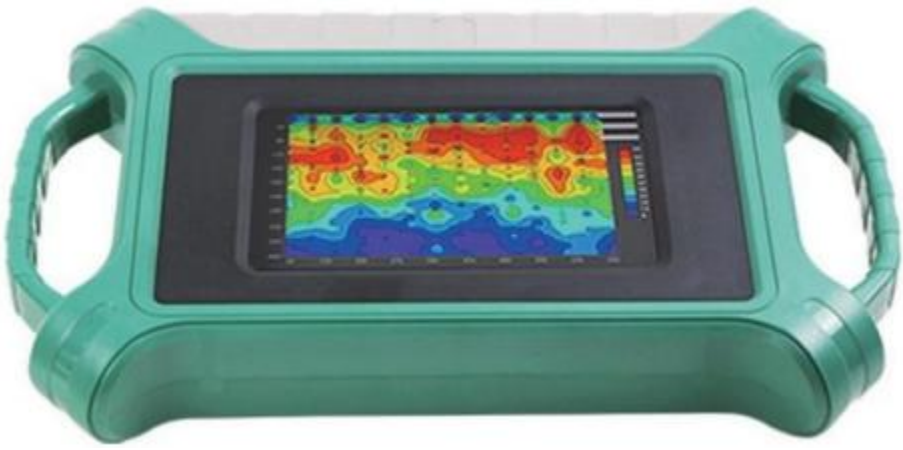


Figure 2

4.2 16 channels instrument instruction

Figure 3

4.3 32 channels instrument instruction

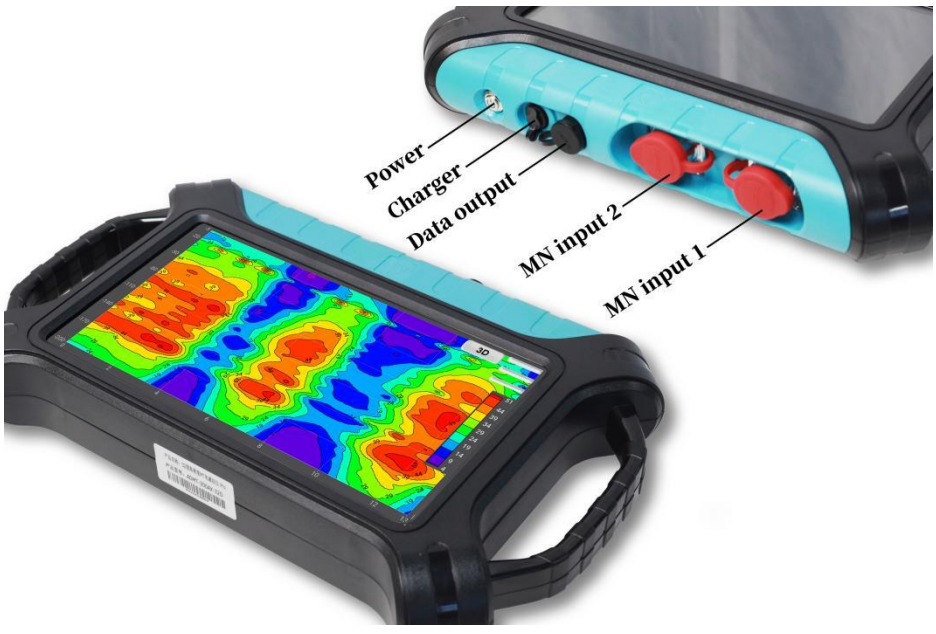


Figure 4

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-A78-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, standard maximum electrode spacing of 2.5m, optional maximum electrode spacing of 5m/7.5m/10m				
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-A78-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 , standard maximum electrode spacing of 2.5m, optional maximum electrode spacing of 5m/7.5m/10m				
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-A78-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-A78-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 , standard maximum electrode spacing of 2.5m, optional maximum electrode spacing of 5m/7.5m/10m					
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-A78-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 , standard maximum electrode spacing of 2.5m, optional maximum electrode spacing of 5m/7.5m/10m						
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 (optional4G)						
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-A78-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 System login and registration

5.1 System introduction and network connection

After the instrument is powered on, the screen displays the main interface of the six menus of serial port connection, touch export, folder, new measurement, system setting and data processing (as shown in Figure 5).

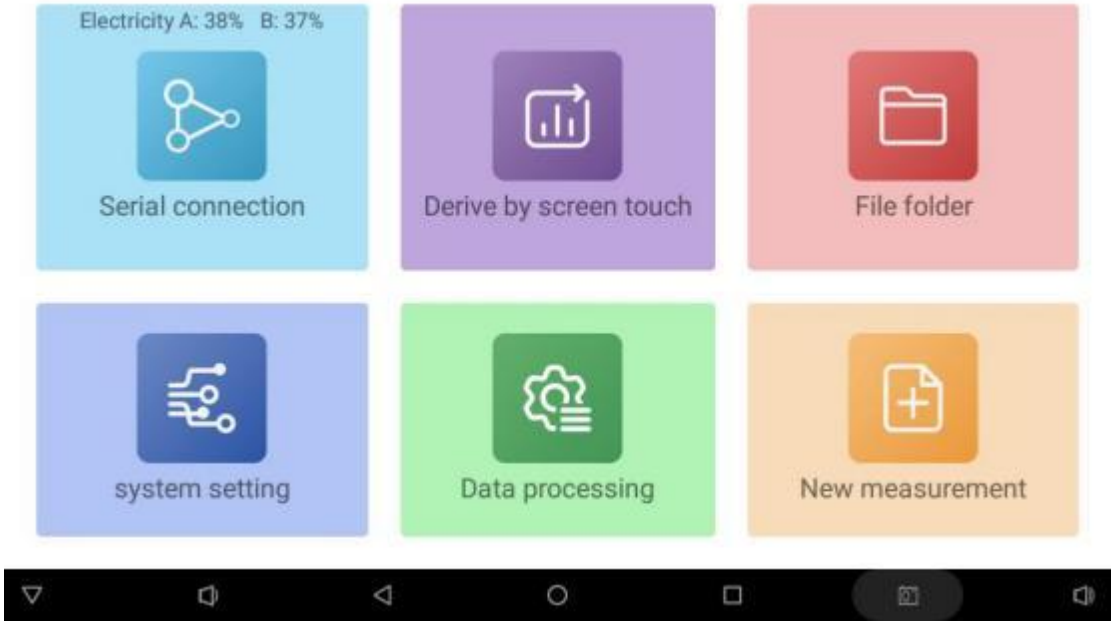


Figure 5

To use this instrument for the first time, you need to use the mobile phone number to send the password to log in in the network environment. After logging in, the mobile phone number and password can be used to log in the Aidu Exploration Mobile Phone APP or WEB Aidu Intelligent Data Processing System to achieve multi-terminal data synchronization. The login password sent by the mobile phone can be retained, as long as the password is not resent in the future, the password is permanent. You can also use your email account or WeChat to log in to the system. If the instrument is not equipped with 4G network as standard, it is necessary to provide wireless network for the instrument in an environment with WiFi or by using the WiFi hotspot function of the mobile phone.

The connection method is as follows: click the "System Settings" button on the main page, enter the system settings menu, and click "System WiFi Settings" to search and connect to the nearby WiFi network. Refer to 13.2.5 System WiFi Settings in this manual. After registration, except for data backup and synchronization, no network is required for other operations.

After the instrument is connected to the network, click any icon to log in and register. You can select three login modes: "mobile phone number quick login", "mailbox quick login" and "WeChat quick login". It is recommended to select "mobile phone quick login" to facilitate multi-terminal data sharing.

Special note: Be sure to connect to the WiFi network or mobile phone WiFi hotspot to keep the instrument network unblocked. It is only valid to send the verification code and log in. If the network is not connected or the network is abnormal, it will prompt the failure to send the verification code.

You can also switch the language in (Figure 6): click "Language Switch" in the upper right corner of the screen to switch to the corresponding national language interface as required.

Figure 6

5.2 Mobile phone number quick login

Click "Mobile Phone Number Quick Login" to input the mobile phone number (as shown in Figure 7), click "Obtain Login Password" to input the login password received by the mobile phone, and click Login to log in to the main interface of the system.

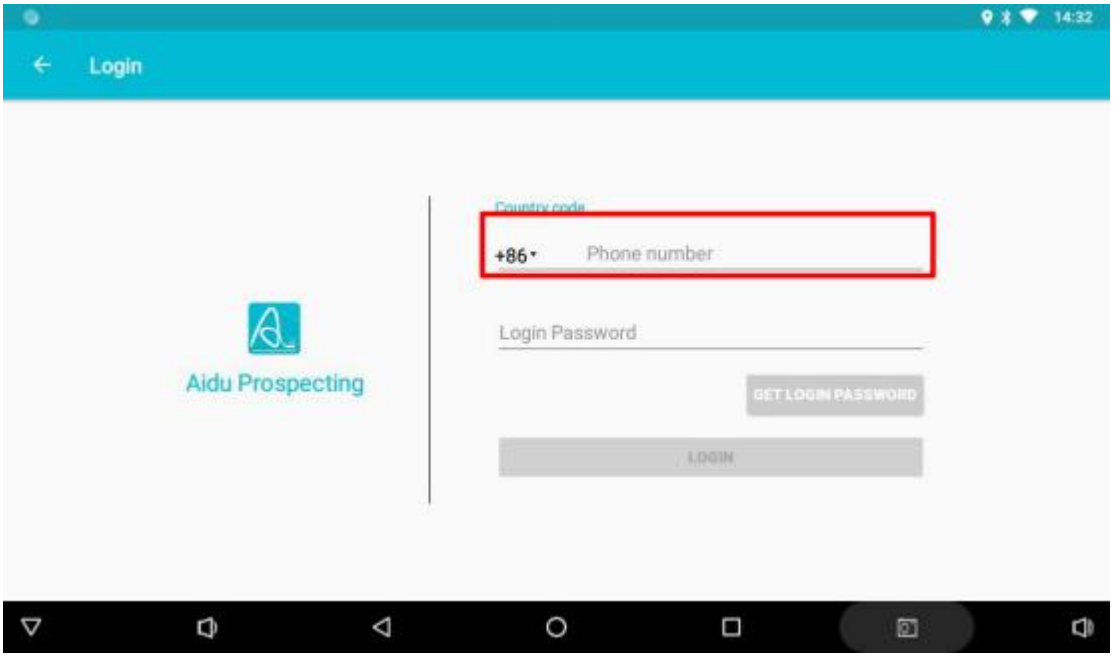


Figure 7

5.3 Mailbox Quick Login

Click "Mailbox Quick Login" to jump to the login interface (as shown in Figure 8). After entering the email address, click "Obtain Login Password" and enter the login password received in the mailbox to log in to the main page of the system.

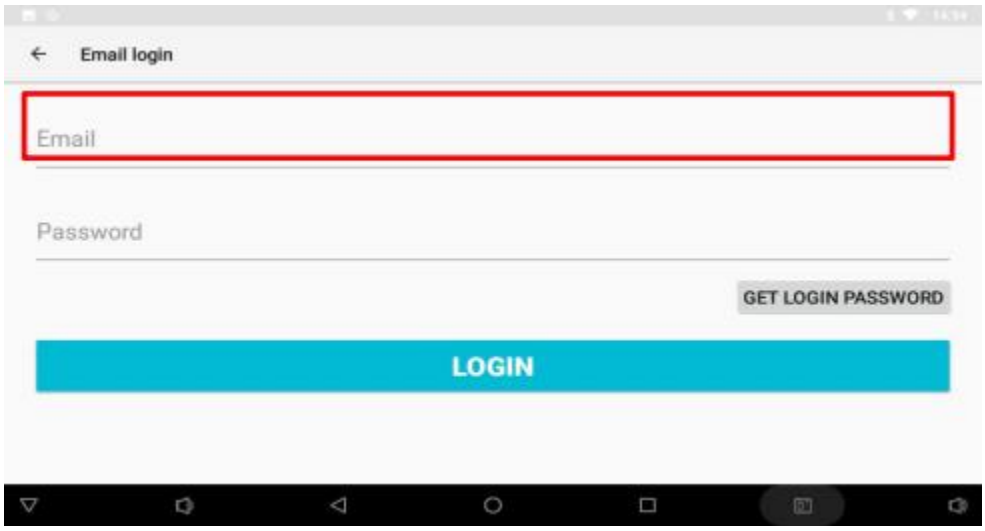


Figure 8

5.4 Wechat Quick Login

"Wechat Quick Login" is generally applicable to the login operation of installing the software on the mobile phone, and the instrument host is generally not available. Mobile phone users need to confirm that they have downloaded Wechat and logged in to their Wechat account when using "Wechat Quick Login". After clicking "Wechat Quick Login" in the login interface (Figure 9), it will automatically jump to the Wechat page for login operation, and then it will jump back to Aidu Exploration APP.

Figure 9

6 Data processing operation method

6.1 Automatic setting of parameters

Click "Data processing" in the main interface of the software to enter the data processing interface (Figure 10), click "Download the latest parameters" to download the latest parameter settings, the currently connected instrument model will be displayed in the "Instrument model", the parameters are in the "Default" state, and the instrument will process the data according to the default data processing mode of the model set by the manufacturer. The data processing method covers such functions as data correction, data arrangement, data smoothing and similar resistivity inversion. After these data processing functions, the original data measured by the instrument can remove the interference noise to a great extent, and restore the characteristics of relatively real underground geological strata and abnormal bodies. Users who use the instrument for the first time are generally recommended to use this parameter setting.

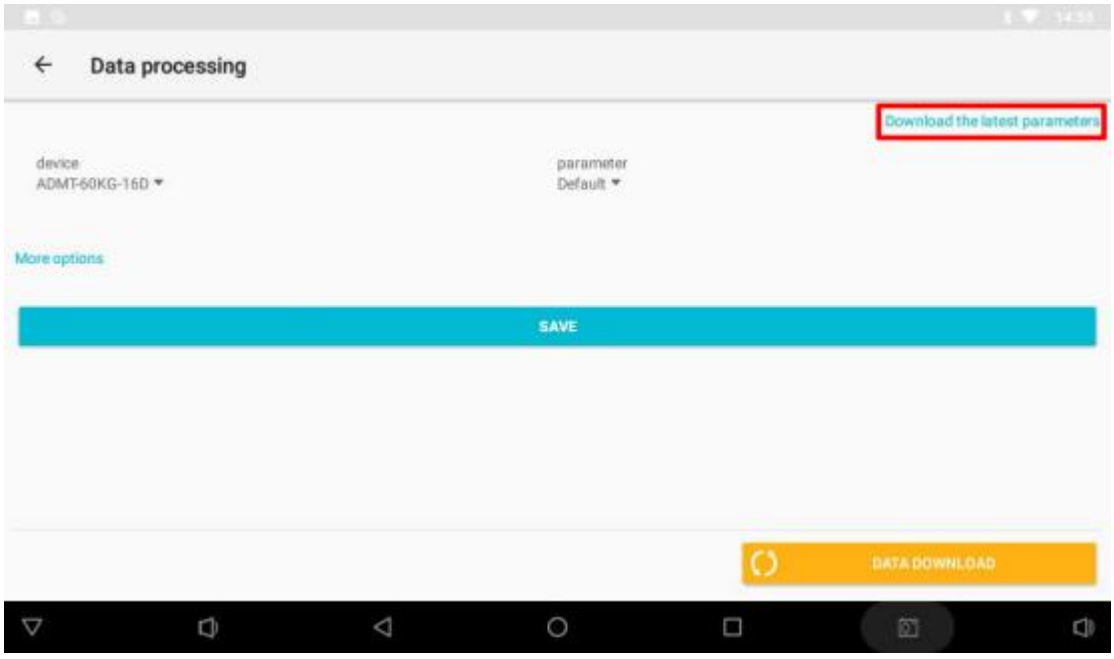


Figure 10

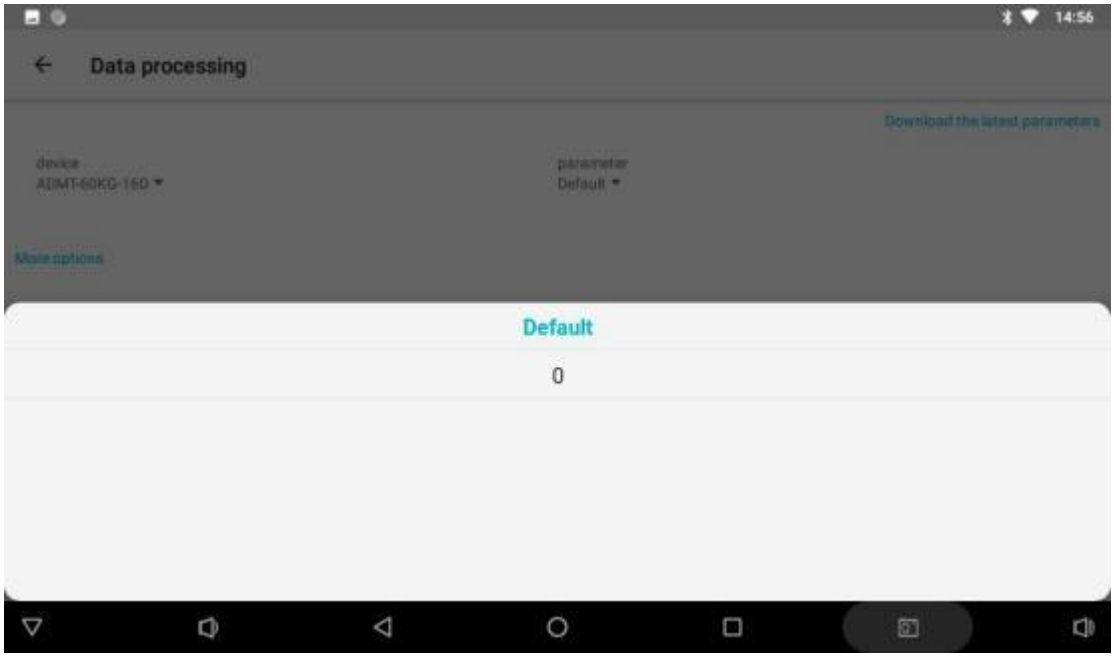


Figure 11

Of course, because some old users of Aidu are accustomed to using the previous data processing method, they can click "Default" (Figure 11) to display "Default" and "0" to select the "0" state. This is the old data processing method. Compared with the "Default" data processing method, there are fewer functions such as data collation, data smoothing and resistivity inversion.

6.2 Setting parameters manually

When the instrument is used skillfully to a certain extent, or the data processing effect of this parameter is not very satisfactory, you can adjust the parameter by yourself. After the adjustment is completed, you can click "Add Parameter Type" to input the parameter name to save the parameter to the Aidu server. The added parameter name can be used by logging in the account on the instrument, web page or mobile phone and other devices. To delete the parameter, click "Delete Parameter Configuration" to delete the set parameter (Figure 12-13).

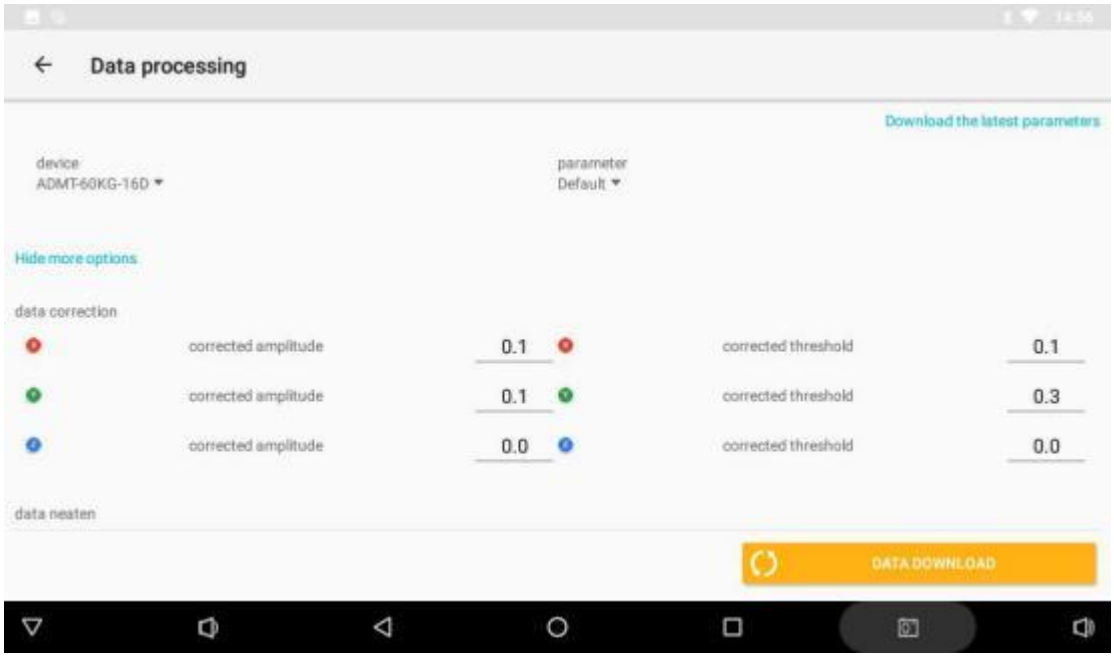


Figure 12

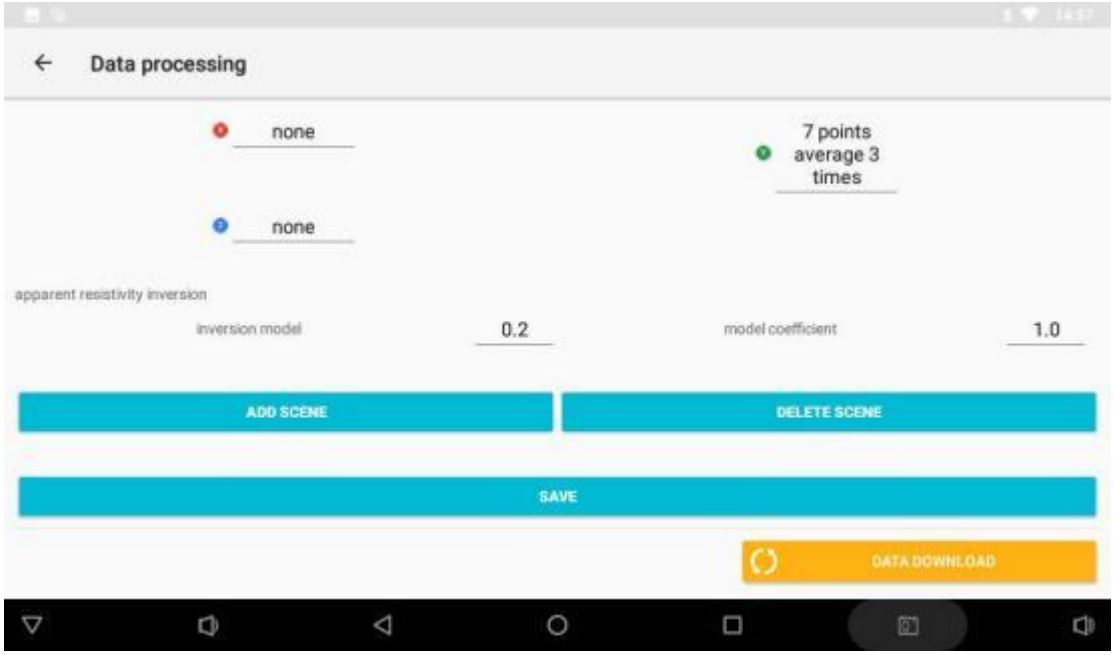


Figure 13

Description of Data Processing Related Settings

[Data correction] is to remove part of the abnormal measuring point data that is too high or too low caused by environmental interference or other interference in the measurement process. The larger the correction amplitude is, the larger the fluctuation range of the corrected data is. For example, if the correction amplitude is 0.2 or 0.3, the corrected data may fluctuate within 20% or 30% of the original data; the larger the correction threshold input value is, the larger the deviation of the corrected data is. If the correction threshold is too large,

the data is prone to obvious deviation; if the threshold is too small, the correction data may be quite different from the real data. And the data correction is divided into X, Y, Z three axial correction, X is the horizontal direction, generally refers to between the measuring points, Y is the vertical direction, generally is the depth or measuring line direction, Z is the dimension of the overall data.

[Data collation] refers to the overall filtering processing according to the three dimensions of X, Y and Z. If it is set to 0, it is not collated; if it is set to 1, it is collated. X is the horizontal direction, which generally refers to the distance between the measuring points. Y is the vertical direction, which generally refers to the depth or the direction of the measuring line. Z is the dimension of the overall data.

[Data smoothing] 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 silky. You can select 3-point, 5-point, 7-point, 3-time 5-point, 3-time 7-point and other smoothing methods as required.

[Quasi-resistivity inversion] In quasi-resistivity inversion, the original data are normalized and modeled, and the original measured electric field or electromagnetic values are inverted into formation resistivity according to a certain model algorithm. This is not the real resistivity, but similar to the resistivity, so it is named "quasi-resistivity", which can also be understood as apparent resistivity. The 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 executed when it is set to 0.

6.3 Data reorganization

In the main screen, click "Parameter Configuration", and there are three data processing buttons below, which are "Data Reorganization", "Format Conversion" and "Data Download" (as shown in Figure 14). "Data Reorganization" can reorganize the survey line data of different sections and the survey data at the same depth to draw a plane profile. Click "Data Reorganization" to enter the data reorganization operation interface (as shown in Figure 15), click the "+" sign on the right to select multiple survey line data to be processed, input the survey depth to be reorganized, and click "OK" to complete the data reorganization.

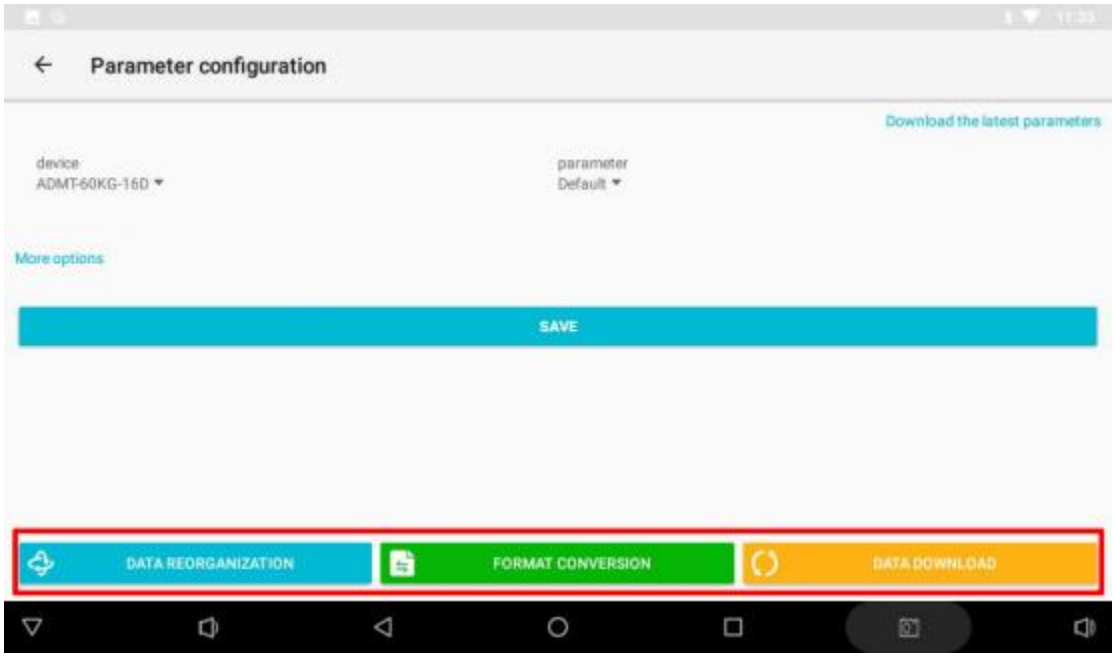


Figure 14

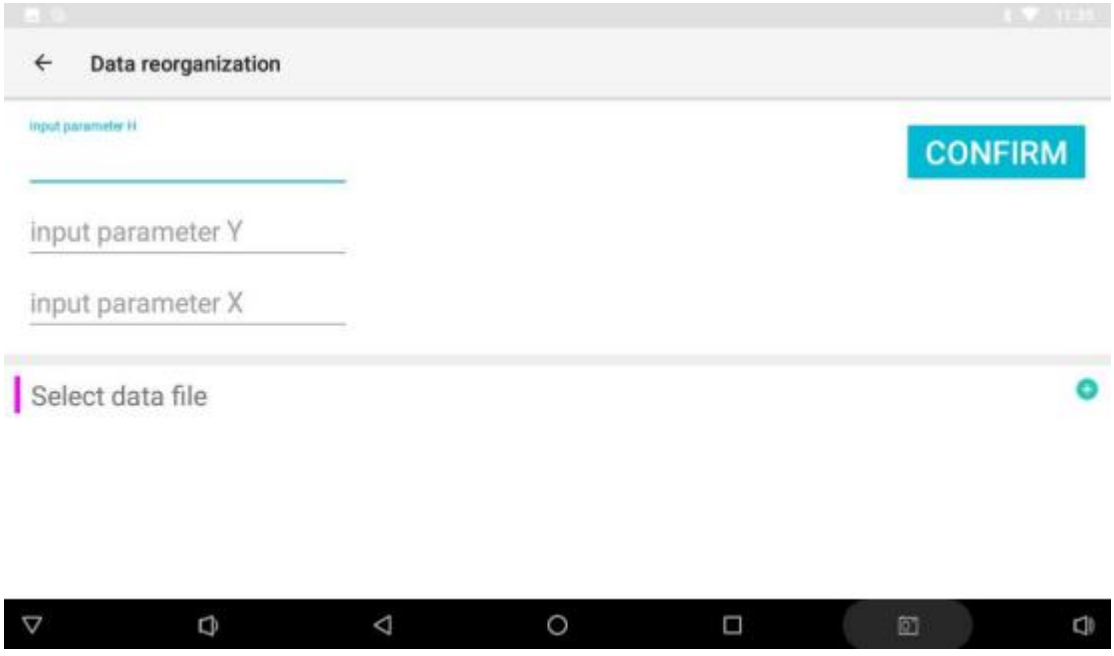


Figure 15

6.4 Format conversion

This function can convert the measurement data format into the inversion data format required by the Swedish Res2dinv high-density instrument, which is convenient for further inversion mapping on the computer.

6.5 Data download

Click "Data Download" to download all the data backed up to the cloud in the current account to the local, so as to realize multi-terminal data synchronization. The function of data cloud backup can ensure that the data will not be lost when the device, mobile phone and other accidents occur. At the same time, the data that others share with you can also be obtained through data download.

7 New Survey Operation

7.1 New survey

Click "New Survey" to enter the survey interface (as shown in Fig. 16). The name of the survey line file can be input in Chinese, number or English. Special input is not supported. It can belong to the corresponding remark information.

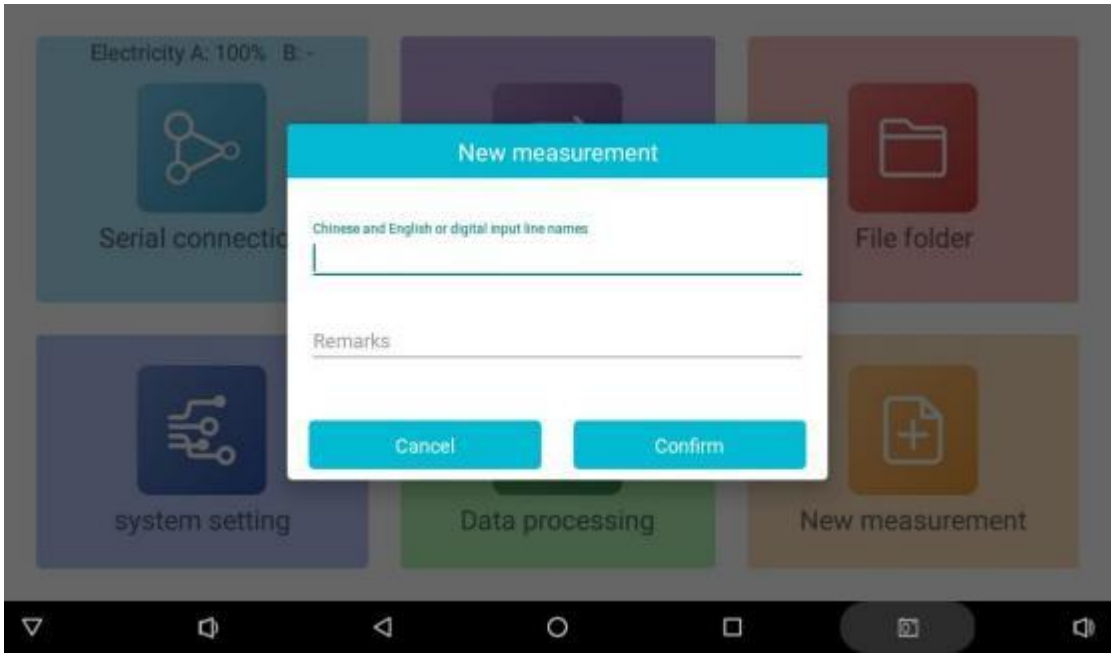


Figure 16

Click OK to enter the measurement setting interface, and then the measurement parameter interface will pop up to set the relevant parameters (as shown in Figure 17).

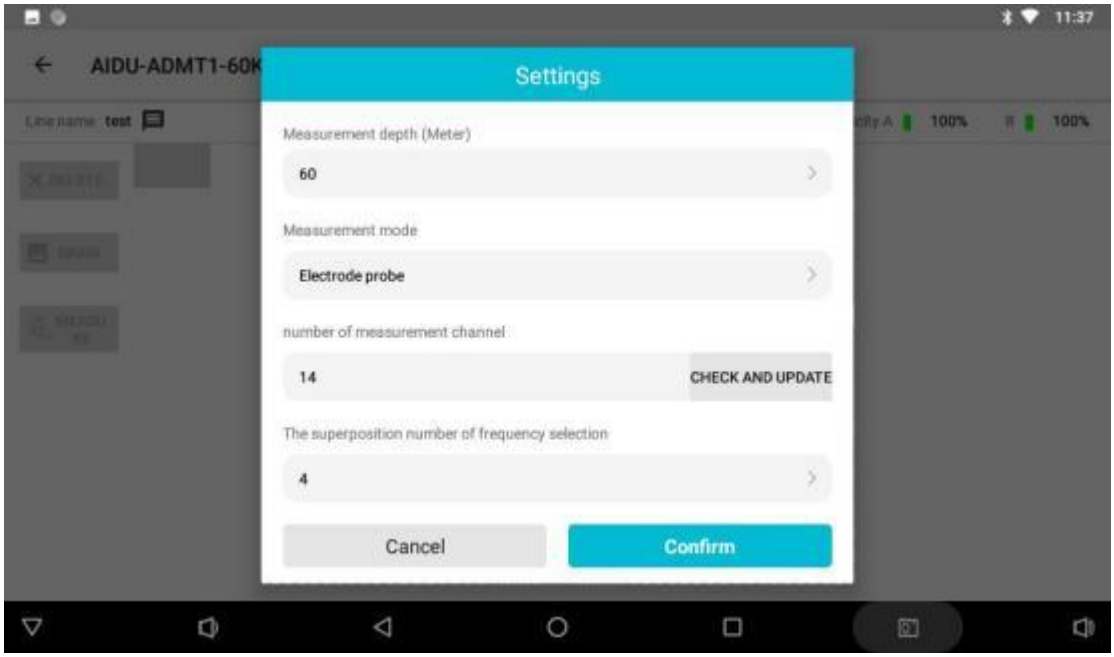


Figure 17

7.2 Parameter setting description

7.2.1 Measuring depth (m): Select the depth you need to measure. Generally, the default value is the maximum depth that this model can measure. Various depths are provided within the maximum depth range for the user to select.

7.2.2 Measurement mode: TT (electromagnetic probe) and MN (electrode) measurement modes can be selected, and the user can select according to the actual signal input type.

7.2.3 Number of measurement channel:the number of channels for single-channel instruments is 1 by default and does not need to be changed; the number of channels for 16-channel instruments is 14 by default, which can be arbitrarily selected from 1-14 channels; The default channel number of the 32-channel instrument is 30. You can select any channel from 1-30, or click "Check for Update" to update the channel number.

7.2.4 The superposition of frequency selection: different types of products can be selected for different times, generally 4-6, 4-10 and 4-16 times. Generally, the larger the number of superposition times, the longer the measurement time, the stronger the anti-interference ability, and the more stable and reliable the data.

Click "OK" to enter the measurement interface.

7.3 Instrument self-test

Click "Measurement" to enter "Instrument self-test" (Fig. 18). If there is no problem, it will enter

the measurement stage normally. If there is an error prompt (as shown in Fig. 19), please click "Check Channel" to return to the measurement interface, and check whether the MN electrode is grounded well, or check whether the measurement cable is connected well with the instrument and the electrode. If there is no problem with the connection, It may be that the local grounding resistance is too large. You can pour some water on the connection between the electrode and the ground to establish a good connection. Of course, you can also choose to "continue to measure". In this way, the instrument will measure the data normally. Whether the measured data is reliable or not is generally controlled by the on-site personnel. If you can't solve it, please contact the manufacturer and distributor.

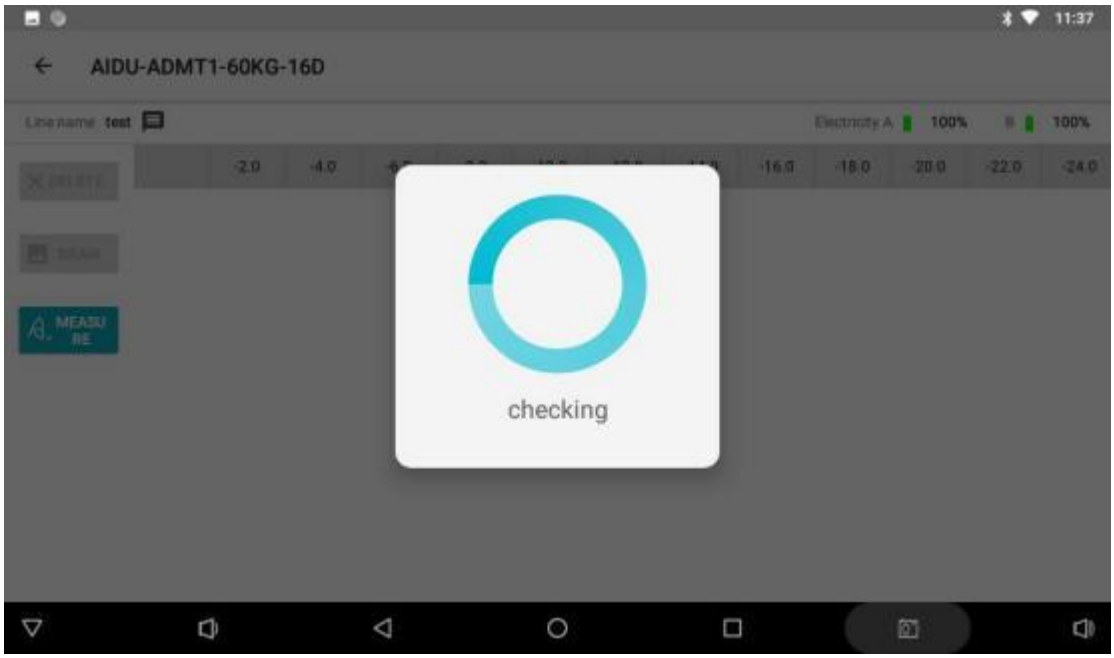


Figure 18

Figure 19

7.4 Data measurement

After entering the measurement interface, click the "Measurement" button on the left side of the screen to collect data, and the measurement progress bar reaches 100% to complete the data collection of the current measuring point (as shown in Figure 20).

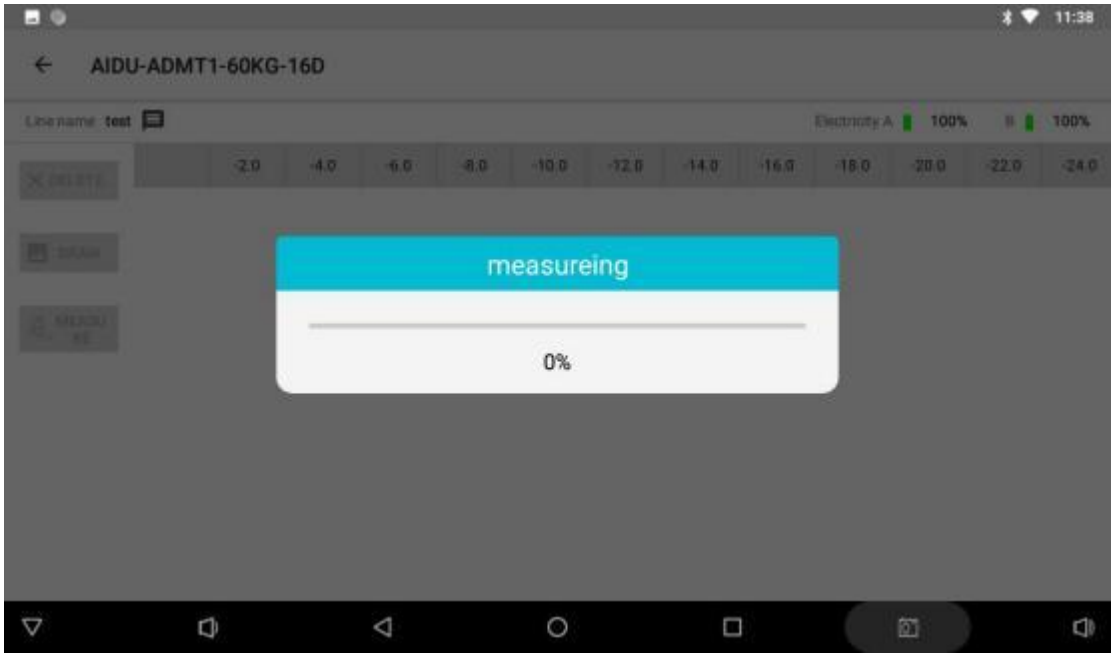


Figure 20

Click "Confirm" to save the data, and click "Re-measure" to re-measure the point (as shown in Figure 21).

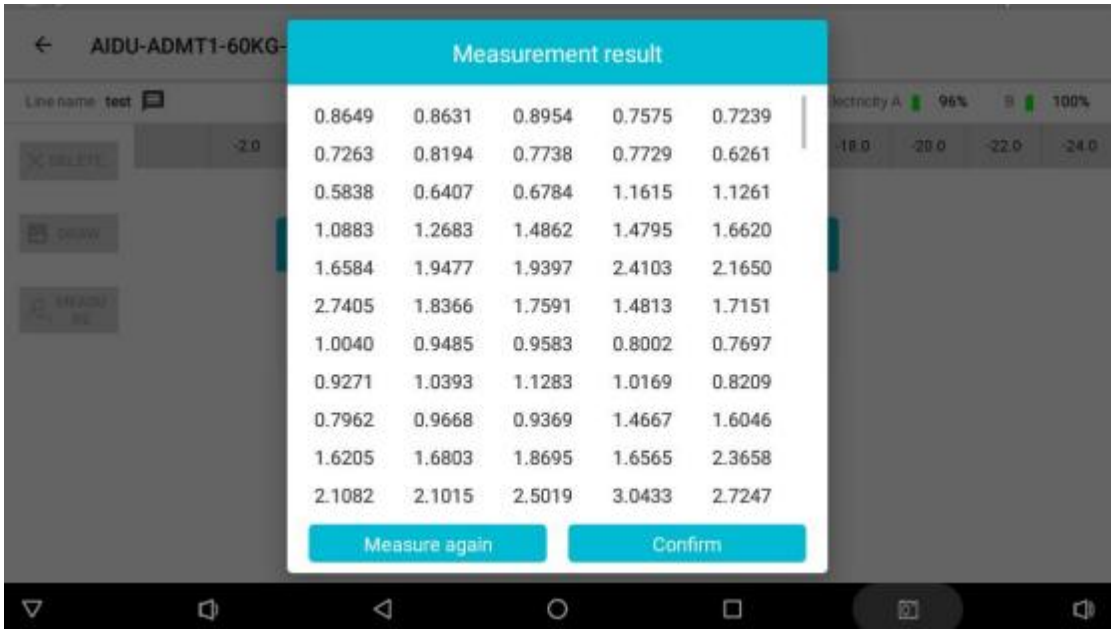
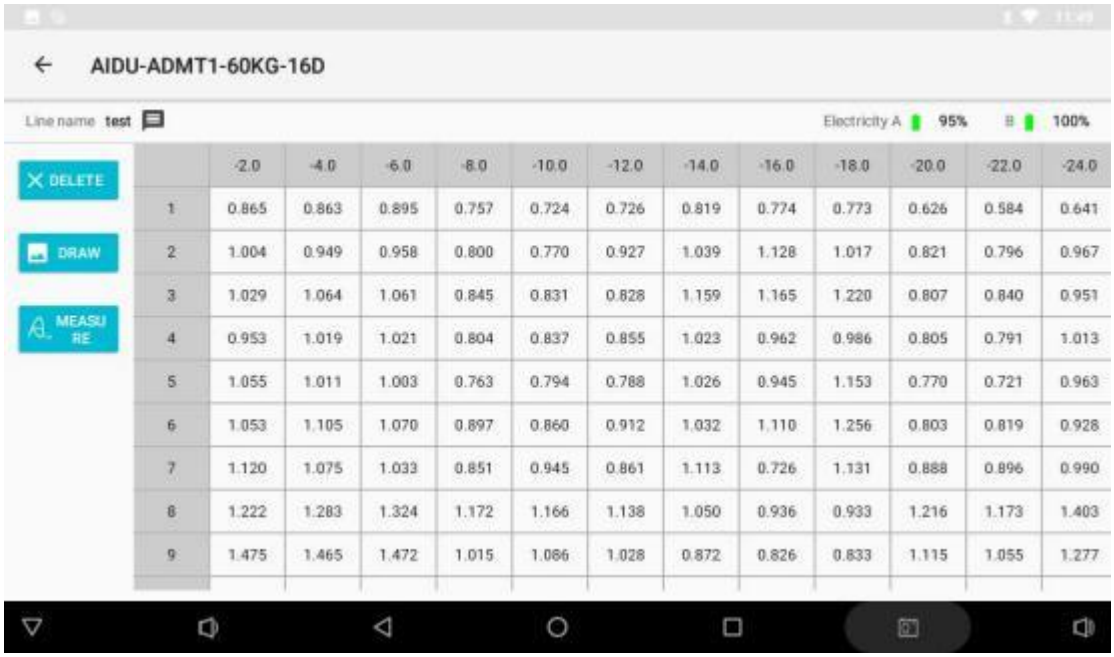


Figure 21

Select Delete to delete the last measurement data. If there is no need to delete, move the equipment to the next measuring point and click "Measure" to measure the next set of data, and so on to complete the measurement and acquisition of the whole profile (as shown in Figure 22).



	-2.0	-4.0	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-18.0	-20.0	-22.0	-24.0
1	0.865	0.863	0.895	0.757	0.724	0.726	0.819	0.774	0.773	0.626	0.584	0.641
2	1.004	0.949	0.958	0.800	0.770	0.927	1.039	1.128	1.017	0.821	0.796	0.967
3	1.029	1.064	1.061	0.845	0.831	0.828	1.159	1.165	1.220	0.807	0.840	0.951
4	0.953	1.019	1.021	0.804	0.837	0.855	1.023	0.962	0.986	0.805	0.791	1.013
5	1.055	1.011	1.003	0.763	0.794	0.788	1.026	0.945	1.153	0.770	0.721	0.963
6	1.053	1.105	1.070	0.897	0.860	0.912	1.032	1.110	1.256	0.803	0.819	0.928
7	1.120	1.075	1.033	0.851	0.945	0.861	1.113	0.726	1.131	0.888	0.896	0.990
8	1.222	1.283	1.324	1.172	1.166	1.138	1.050	0.936	0.933	1.216	1.173	1.403
9	1.475	1.465	1.472	1.015	1.086	1.028	0.872	0.826	0.833	1.115	1.055	1.277

Figure 22

8 Graphing operation method

8.1 Basic operation of graphing

During measurement, the "Plot" button on the left side of the screen will turn blue when the number of measurement points exceeds 6. At this time, click Plot (as shown in Figure 23). It is recommended not to plot halfway before the measurement of the whole profile is completed, because this operation may affect the accuracy of the data.

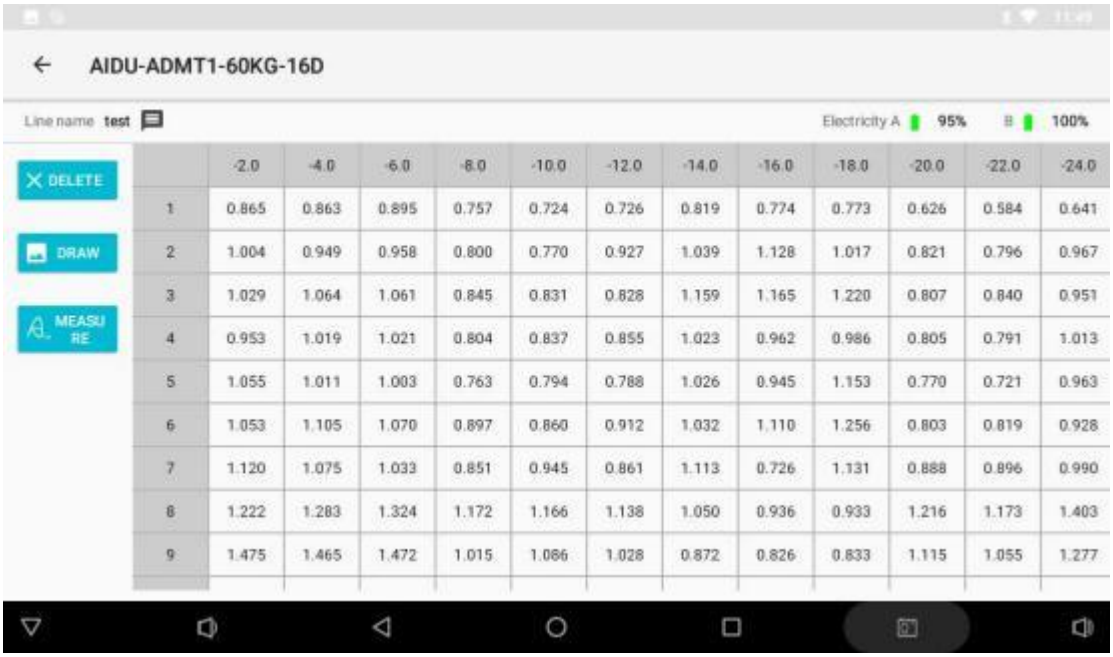


Figure 23

After selecting the drawing, you can select to draw "Classic", "New Edition", "Graph 1", "Graph 2" and "AI Analysis" (as shown in Figure 24), and select the type of graph according to actual needs. "Classic" and "New Edition" belong to two different ways of drawing contour maps, which can be selected according to the needs. "Curve 1" and "Curve 2" belong to two different ways of drawing curves. "AI analysis" is a combination of AI technology, which is popular at present, to realize the function of automatic picture analysis. It takes only 2 seconds to analyze 24 hours online.

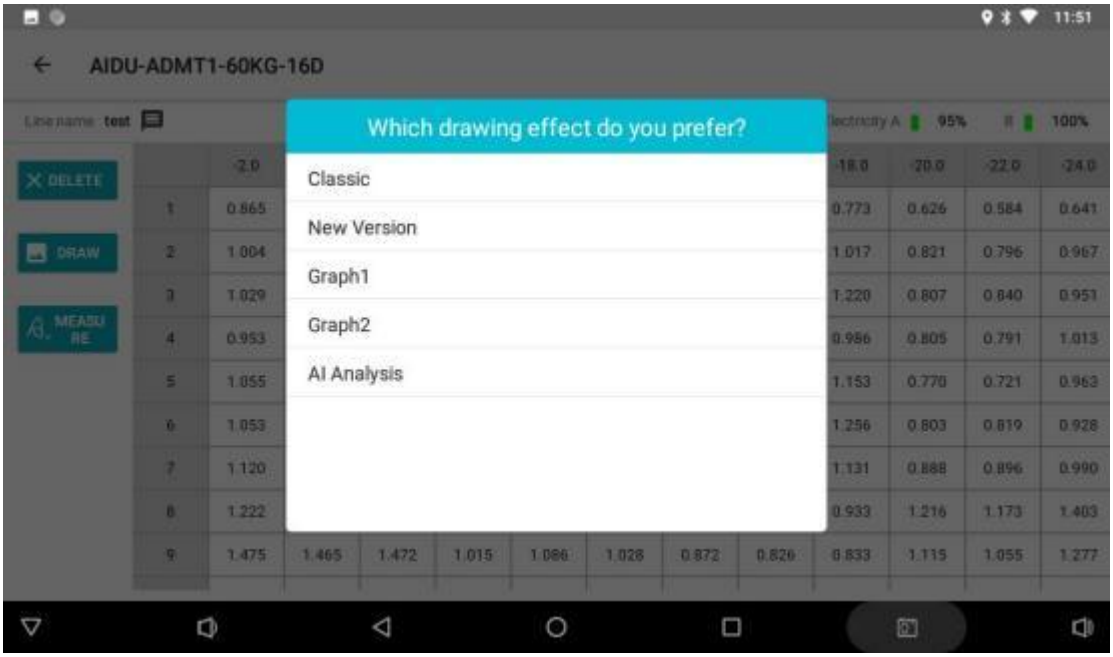


Figure 24

8.2 Plotting the classical contour map

If "Classic" is selected, the system will automatically generate an iso-linear graph (as shown in Figure 25).

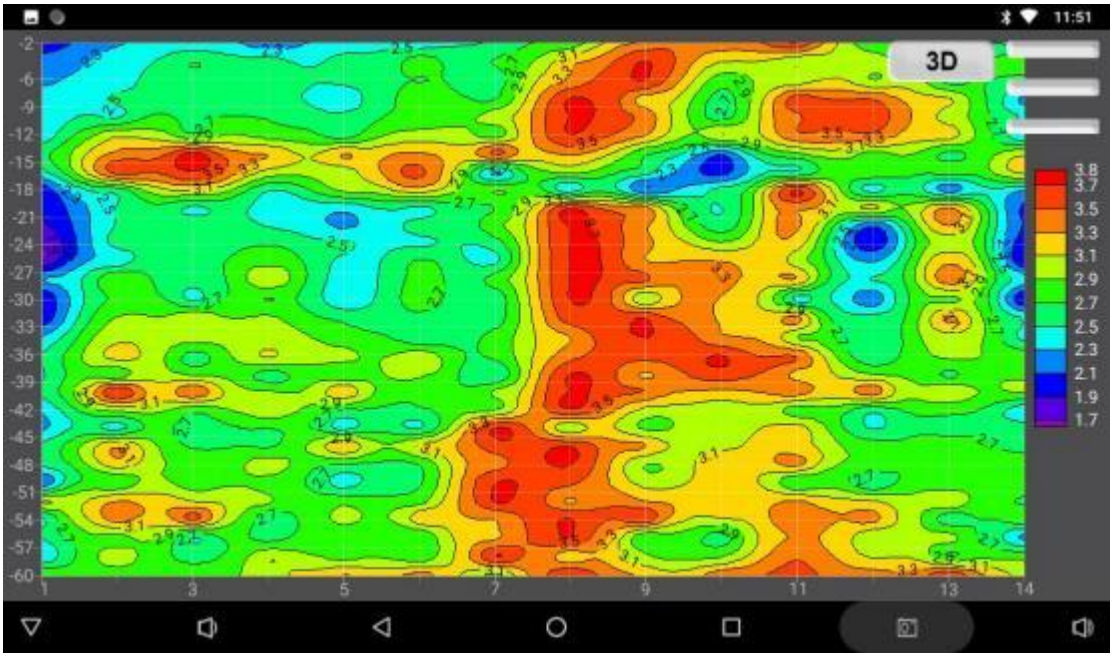


Figure 25

Click the "3D" or "2D" icon on the top of the drawing interface to switch between 2D and 3D images (as shown in Figure 26). Click the icon on the upper right corner of the drawing interface to click "" and confirm to save the effect image directly to the name of the system file device. Click "X" to return to the measurement data interface (Figure 27).

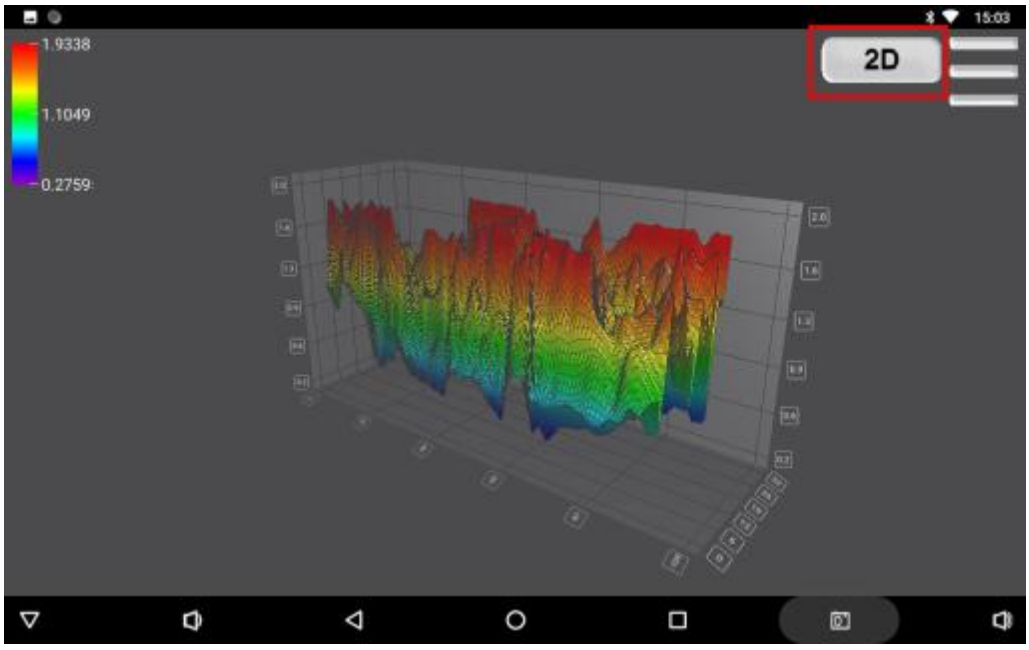


Figure 26

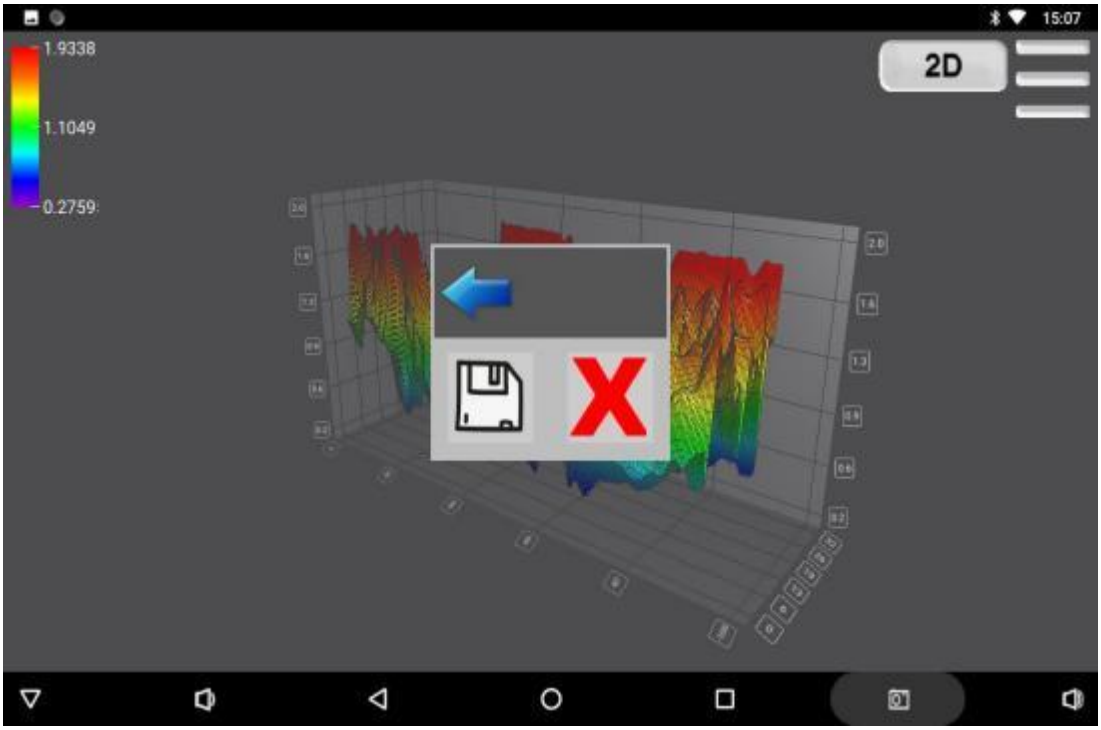


Figure 27

8.3 Plotting contour maps (new version)

Select "New version" to automatically generate a new version of contour map, as shown in Figure 28. Click the position in the figure to display the X (measuring point No.), Y (depth) and Z (resistivity value) data of the point. Pull your fingers apart to zoom in, and double-click to return to the default page. Click the red box icon to save the image.

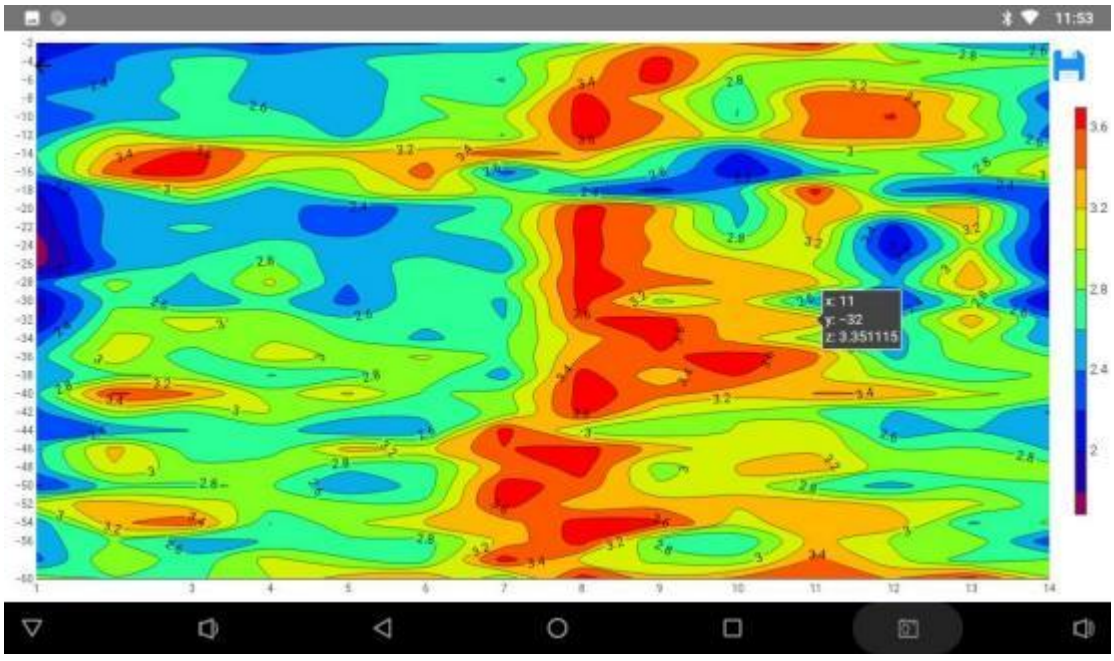


Figure 28

8.4 Plotting curve

If "Graph 1" or "Graph 2" is selected, the system will automatically generate a graph (as shown in Figure 29).

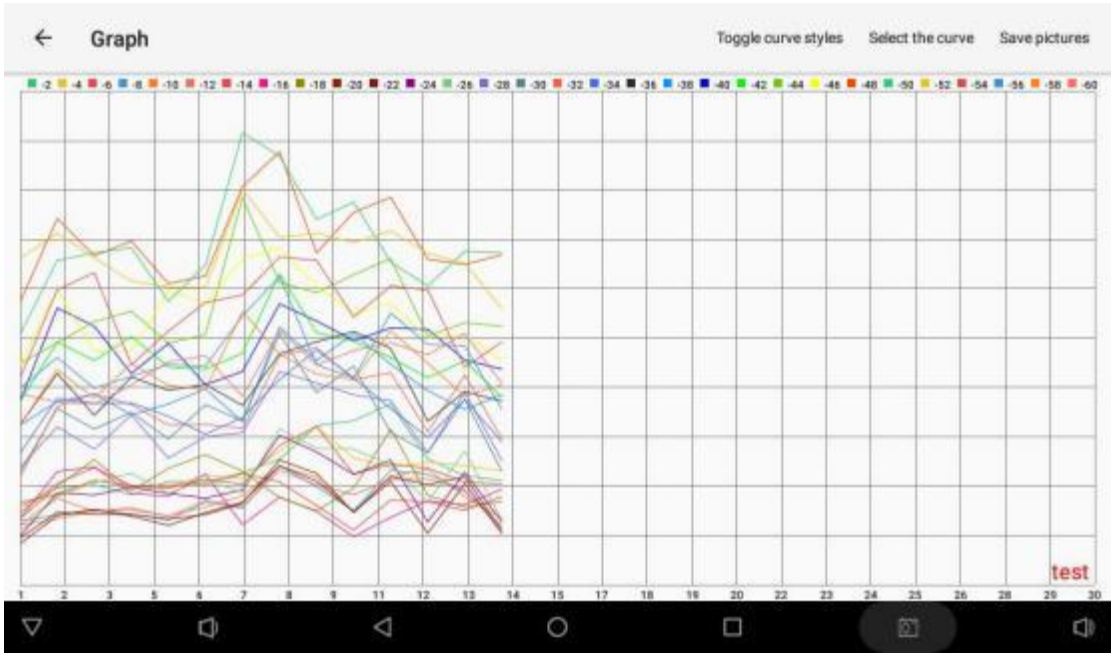


Figure 29

By clicking "Depth Selection" in the upper right corner, you can independently select the curve display of the corresponding depth (as shown in Figure 30).

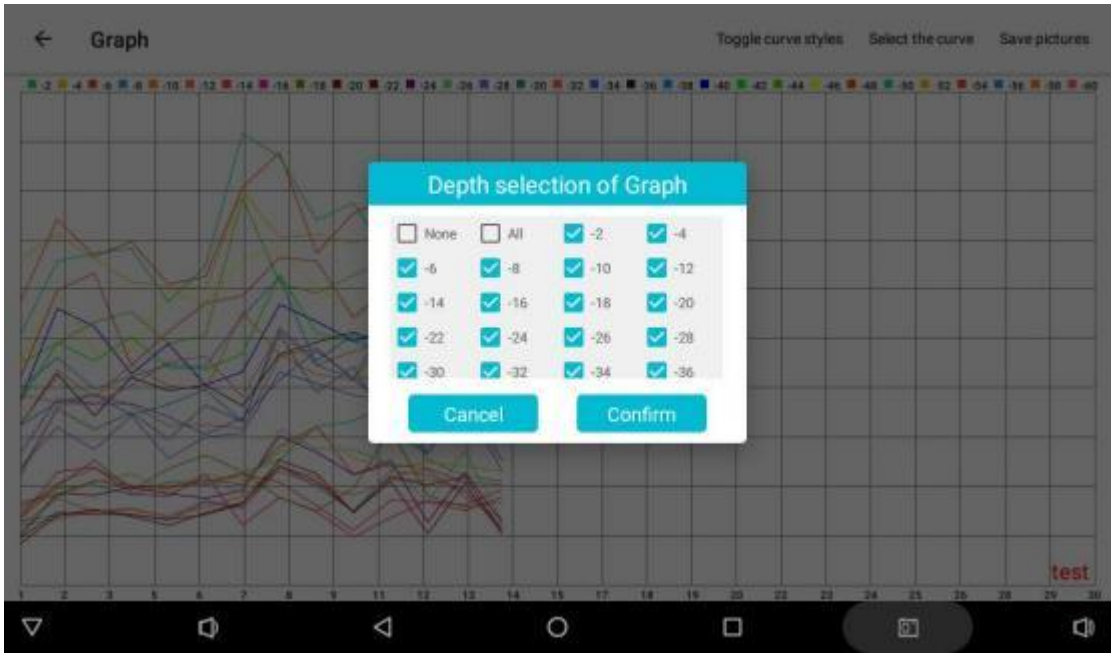


Figure 30

Click "Switch Curve CCTV" to switch to "Curve 2", and select "Save Picture" to save the curve to the folder (as shown in Figure 31).

Figure 31

8.5 AI Analysis

As shown in Figure 32, after selecting "AI analysis", the AI automatic analysis function of Aidu will automatically analyze the data measured this time, and the instrument of this model will quickly display the analysis result "the abnormal area considered by AI for you is in the black box marked area with a depth of -20.0 ~ -10.0 meters near the measuring point of 2.0 ~ 5.0" (as shown in Figure 33), which is intelligent and efficient. However, "AI Analysis" must be used when there is a network. For specific operation, the connection method of "System WiFi Settings" in Section 13.2.5 of this manual is as follows: click the "System Settings" button on the main page to enter the system settings menu, and click "System WiFi Settings" to search and connect to the nearby WiFi network. For the relevant setting operation of "AI analysis", please refer to "AI setting" in Article 9 of this manual.

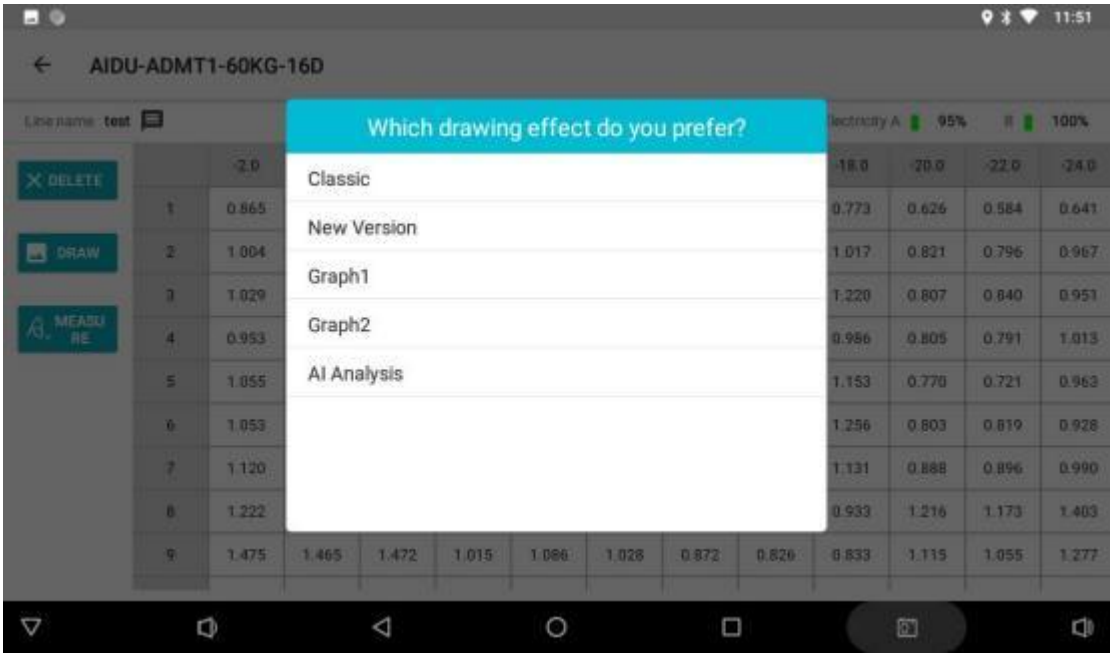


Figure 32

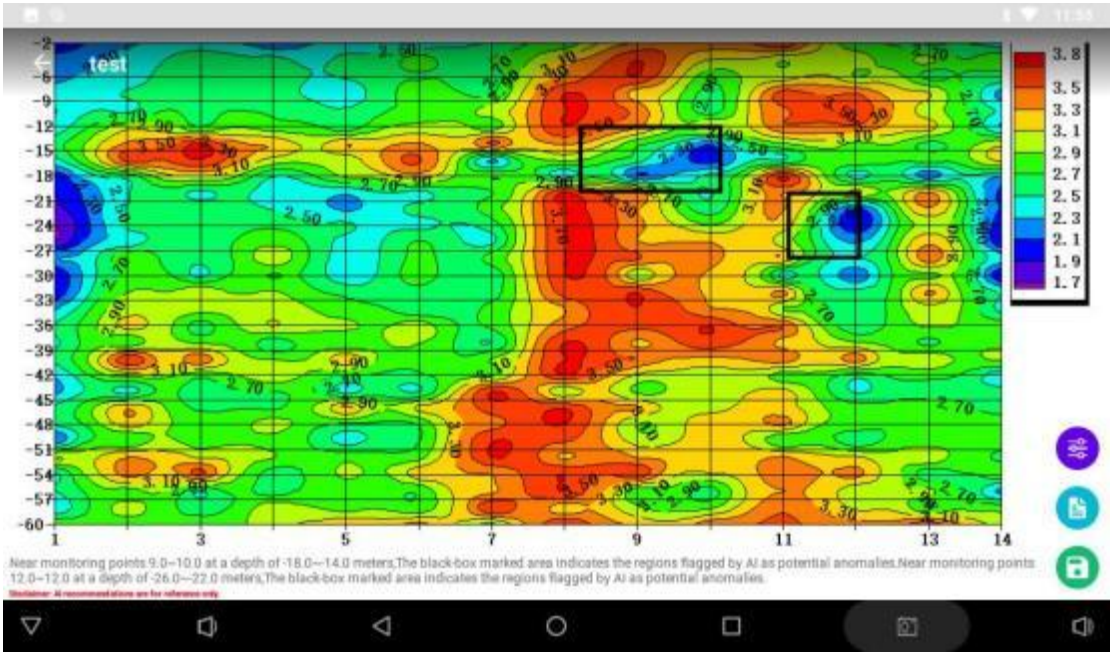


Figure 33

9 Folder operation

9.1 Basic folder operation

The file folder is the entry for all data viewing and drawing. The file is named according to the time of file creation, for example, the 20200808 represents the file content measured and operated on August 8, 2020. Data measured by the instrument, synchronized data and data transmitted by other means can be viewed, drawn, AI analyzed, backed up, shared and deleted in the "folder".

Click "Folder" to see all the files, and the data is automatically arranged according to the adding time (as shown in Figure 34). Click "←" in the upper left corner to return to the previous interface, and click "Q" in the upper right corner. The keyword of data file name can be used to search the file. Click the date folder to query all data files under the date (as shown in Figure 35).

In the network environment, you can click the icon to upload the file to be uploaded to the cloud. The file marked with the △ icon indicates that it has been backed up in the cloud. The data cloud backup function can ensure that the data will not be lost when the device, mobile phone or other accidents occur. It can also be downloaded, viewed and drawn synchronously on mobile phones and WEB computers.

There are generally two types of files in the folder. The original data file with the suffix of.dat and the file with the suffix of _ XYZ. Dat are automatically generated after clicking "Plot". The data in this file is generated after data correction, data collation, data smoothing, resistivity inversion and other data processing. It can be directly plotted or analyzed by AI.

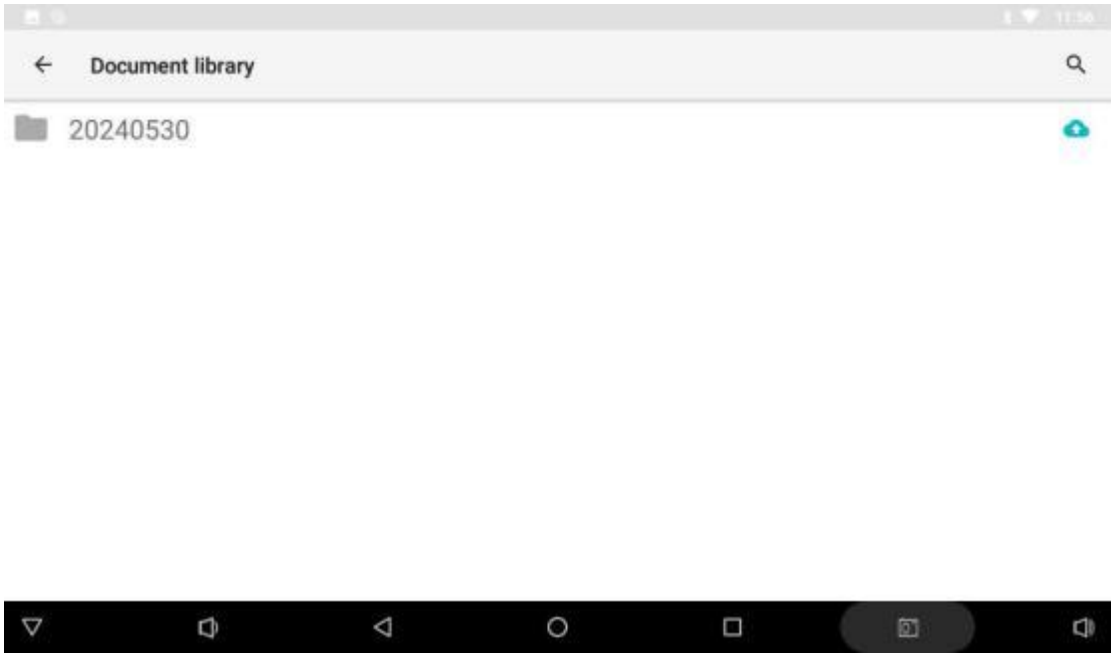


Figure 34

Figure 35

9.2 Original file. dat drawings

Select the ".dat" file (as shown in Figure 36), you can directly click "View Data" and "Connection Supplementary Measurement" (as shown in Figure 37) to perform relevant operations, select "View Data" to enter the data page (as shown in Figure 23), select "Connection Supplementary Measurement" to enter the supplementary function to continue the data measurement of the survey line, and enter the data page to perform "Measurement"

or "Drawing" operations. For detailed operation, see Article 6 and 7 of this manual. Some instruments support supplementary test, while others do not support this function.

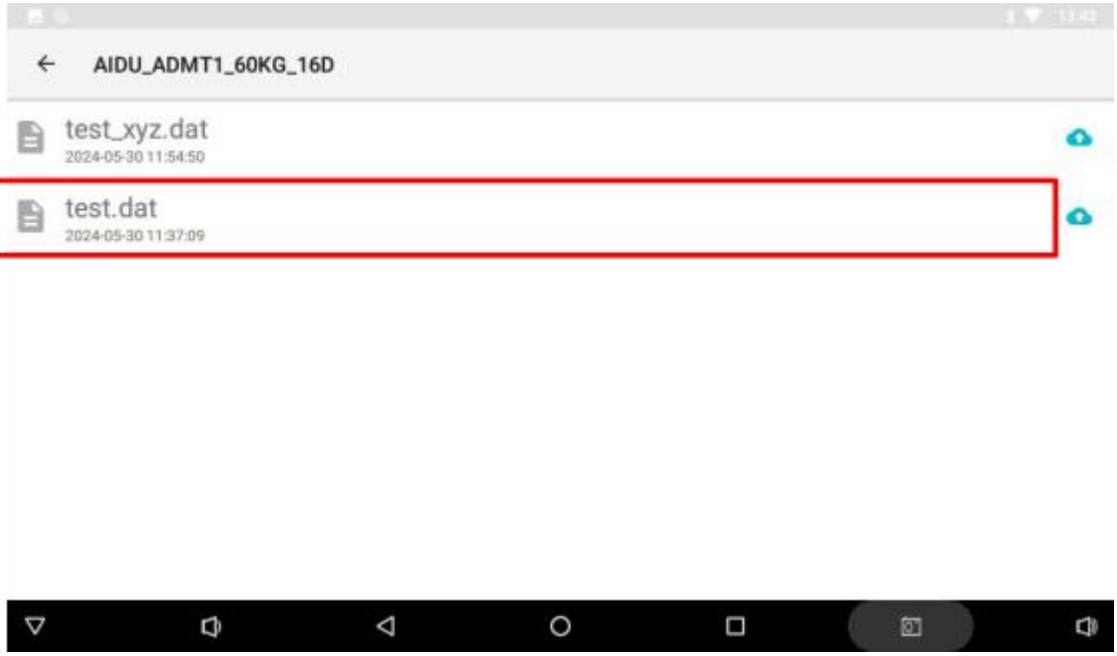


Figure 36

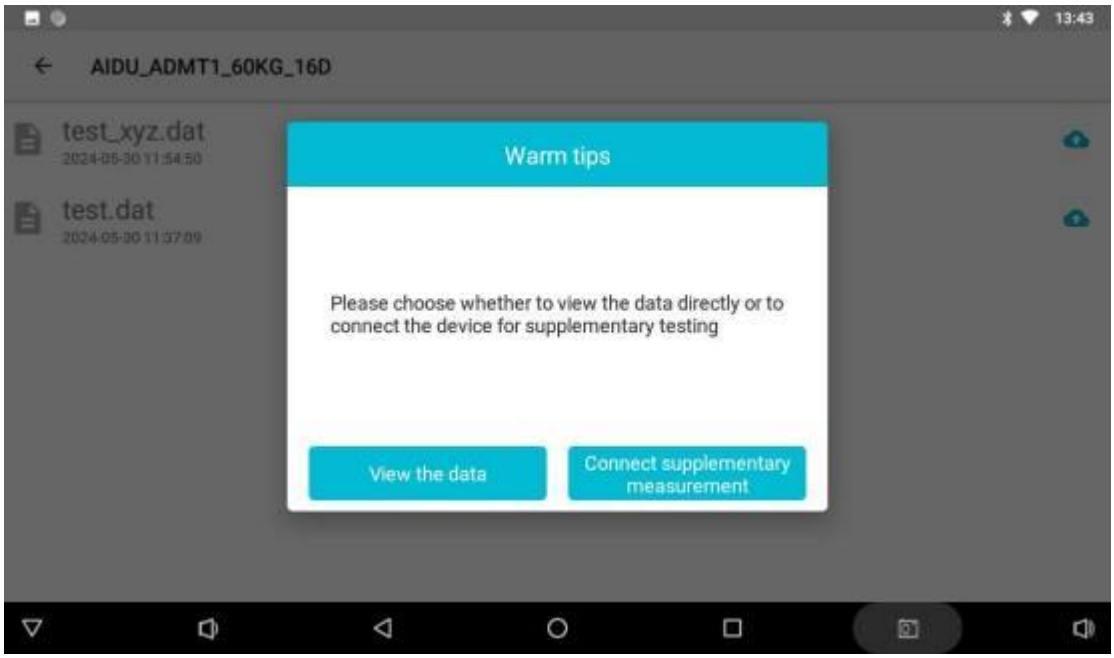


Figure 37

9.3 Plotting File _ XYZ. dat

Click the drawing file with the suffix of _ XYZ. Dat to display the pop-up boxes of "Classic", "New Version" and "AI Analysis" (Figure 38). Select "Classic" or "New Version" to directly draw the classic and new version contour maps. Please refer to the detailed operations in 7.2 and 7.3 of this manual. Select "AI Analysis" to perform AI automatic analysis on this data. Quickly analyze the measurement results, as detailed in 7.5 of these instructions.

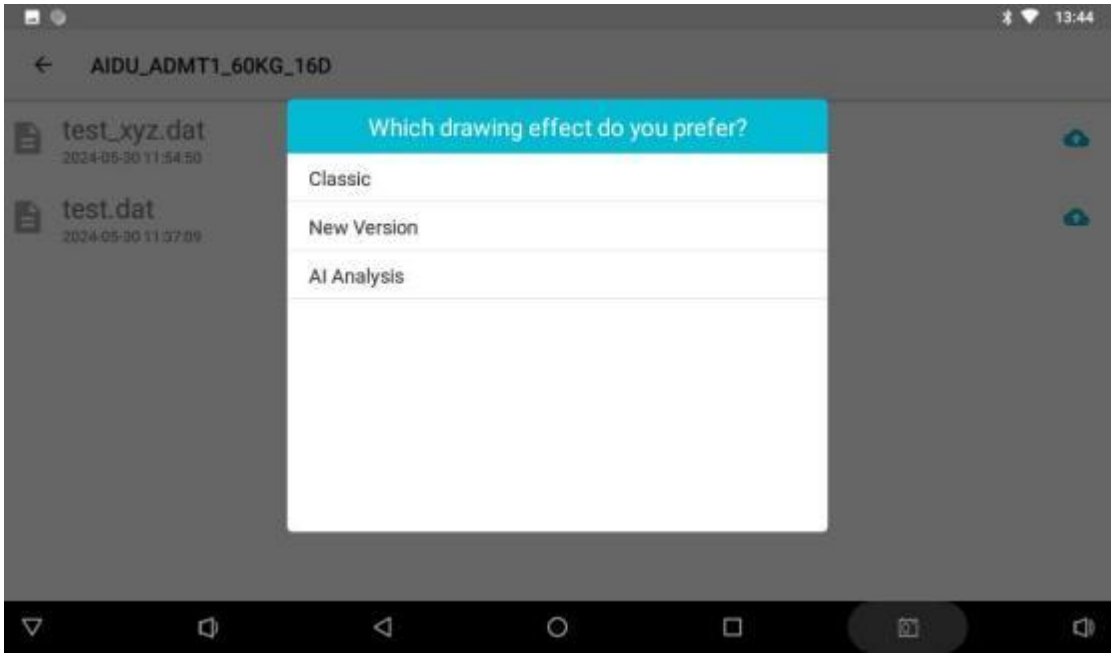


Figure 38

9.4 Data deletion and sharing

Long press the data file to be processed, and the long-pressed file will be highlighted and enter the multi-selection state at the same time (as shown in Figure 39). Select "Delete" to prompt whether to confirm the deletion (Figure 40). Select "Confirm" to prompt to select "Local Delete" and "Cloud Delete" (Figure 41). Select "Cloud Delete" to delete the cloud backup data, and select "Local Delete" to delete the data held by the device (Figure 42).

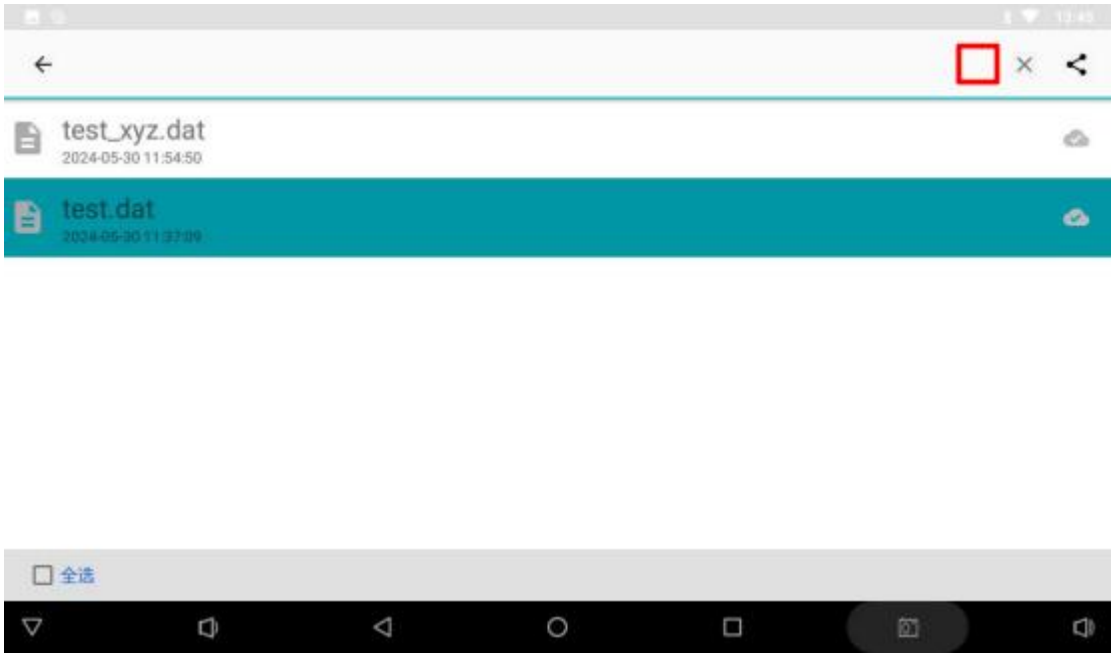


Figure 39

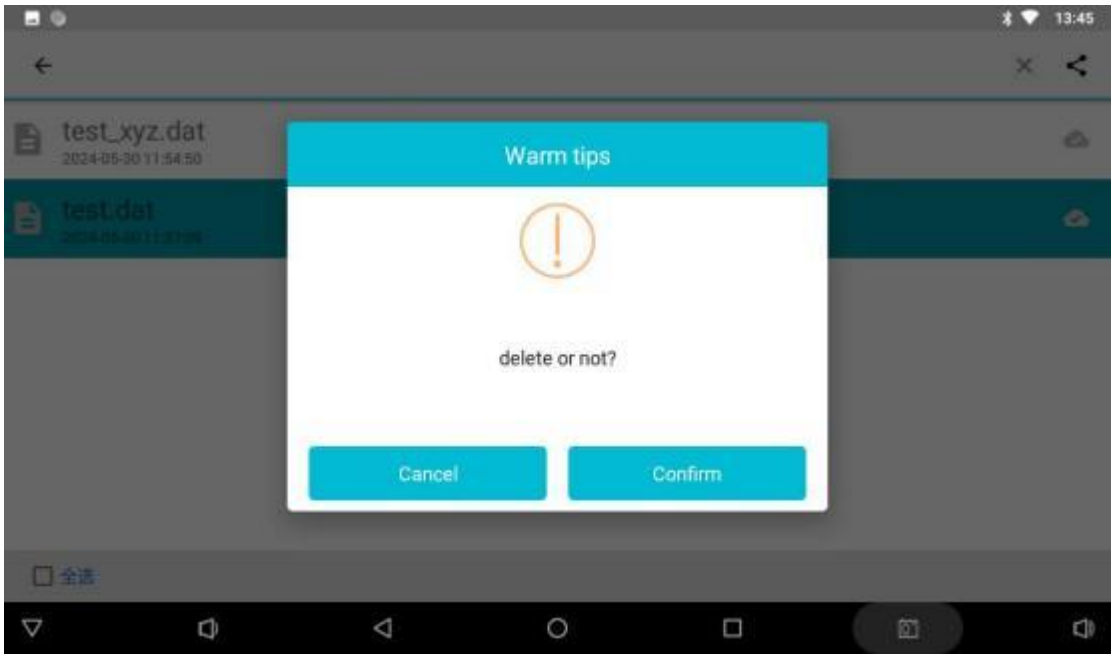


Figure 40

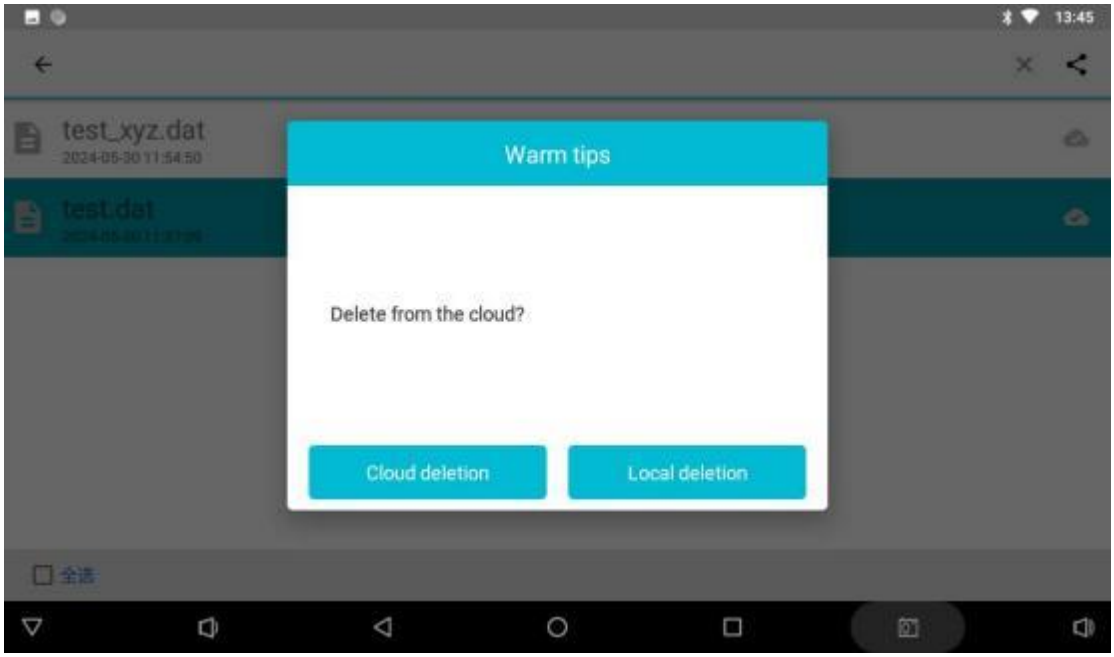


Figure 41

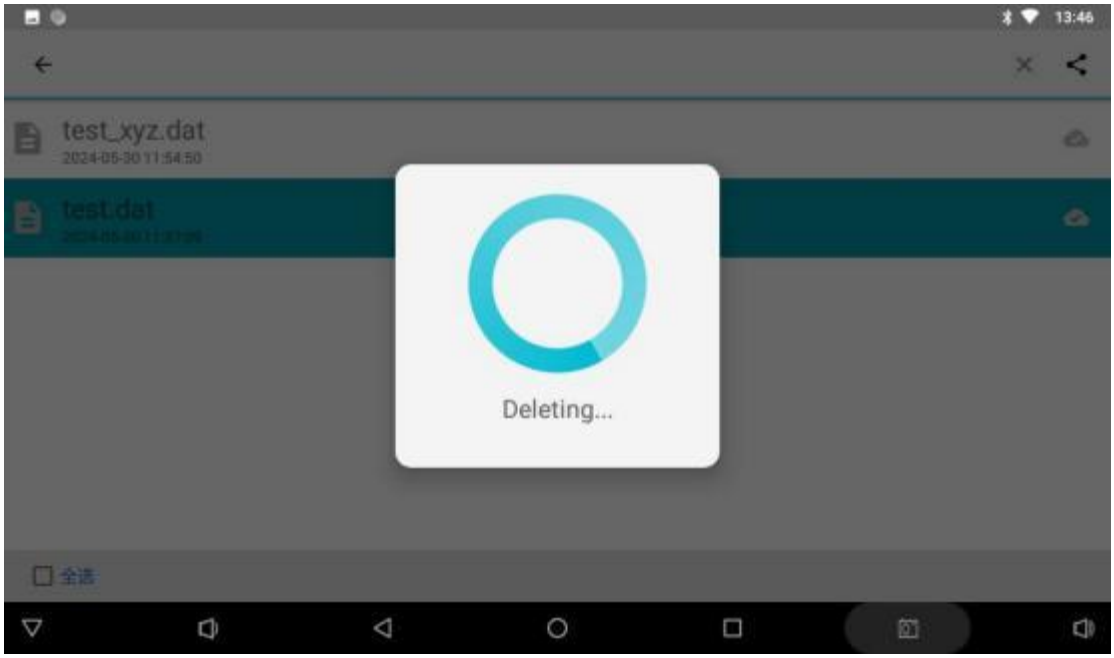


Figure 42

You can select the "Share" function for the selected data in the instrument (Figure 43), share it to the mobile phone account that has been registered or logged in on the Aidu instrument or mobile phone APP, and click "Confirm" to share it successfully after entering the mobile phone number (Figure 44). If the mobile phone account is logged in the WEB Aidu Intelligent Data Processing System, you can see the relevant data. If the mobile phone account is logged in the mobile phone Aidu Exploration APP, you need to download the data in the "Data Processing" on the main page of the software (Figure 45-46), and you can view the shared data in the folder.

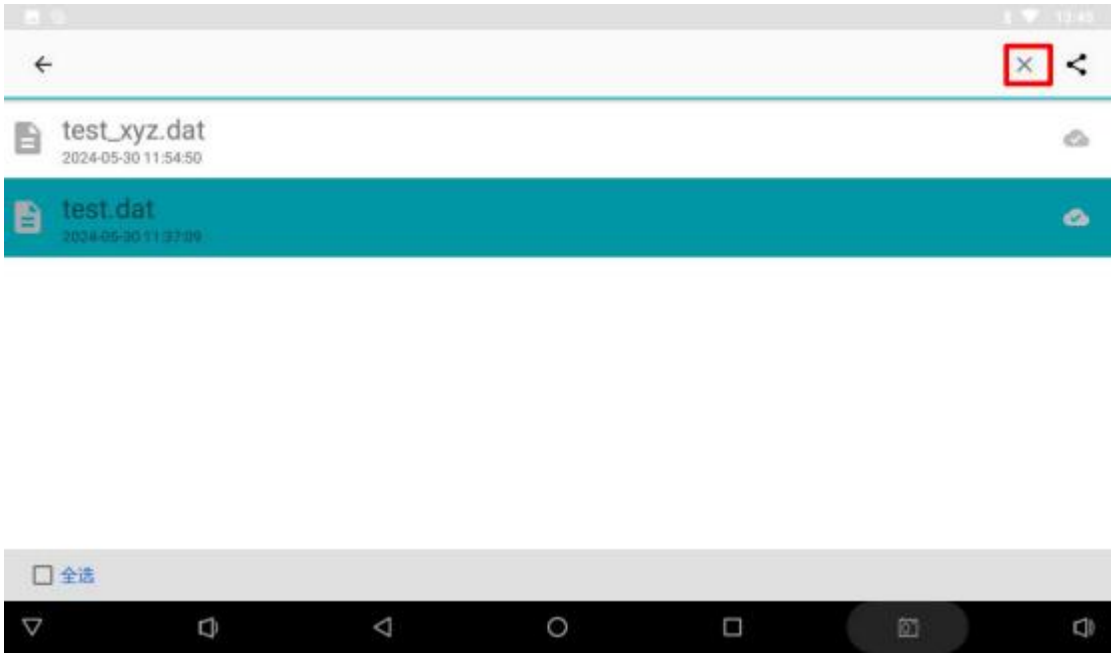


Figure 43

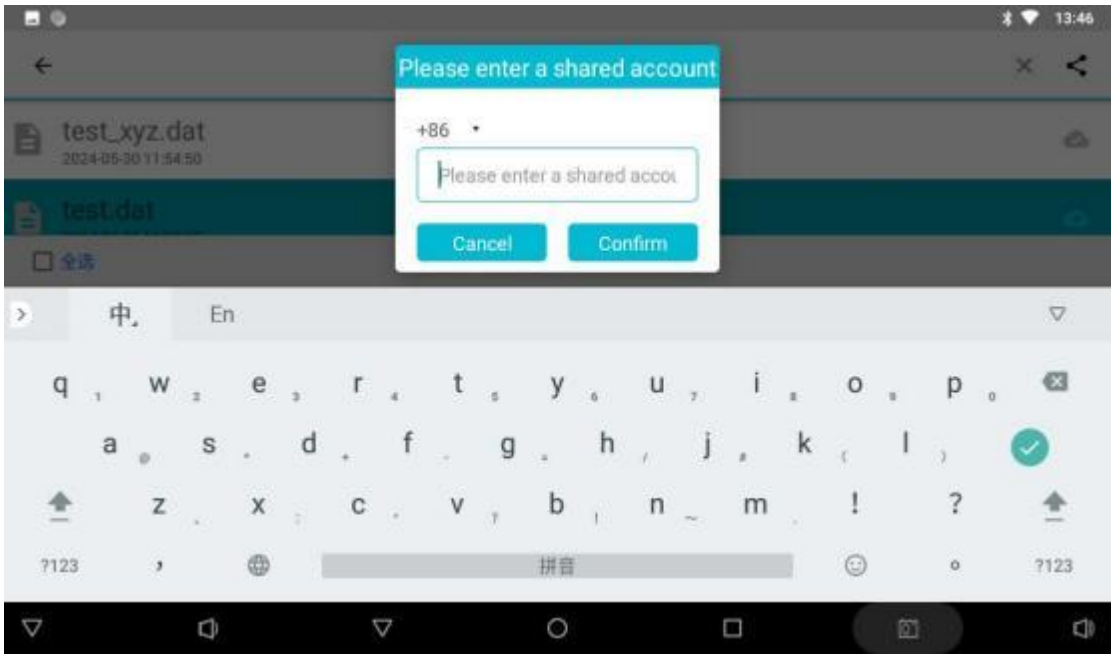


Figure 44

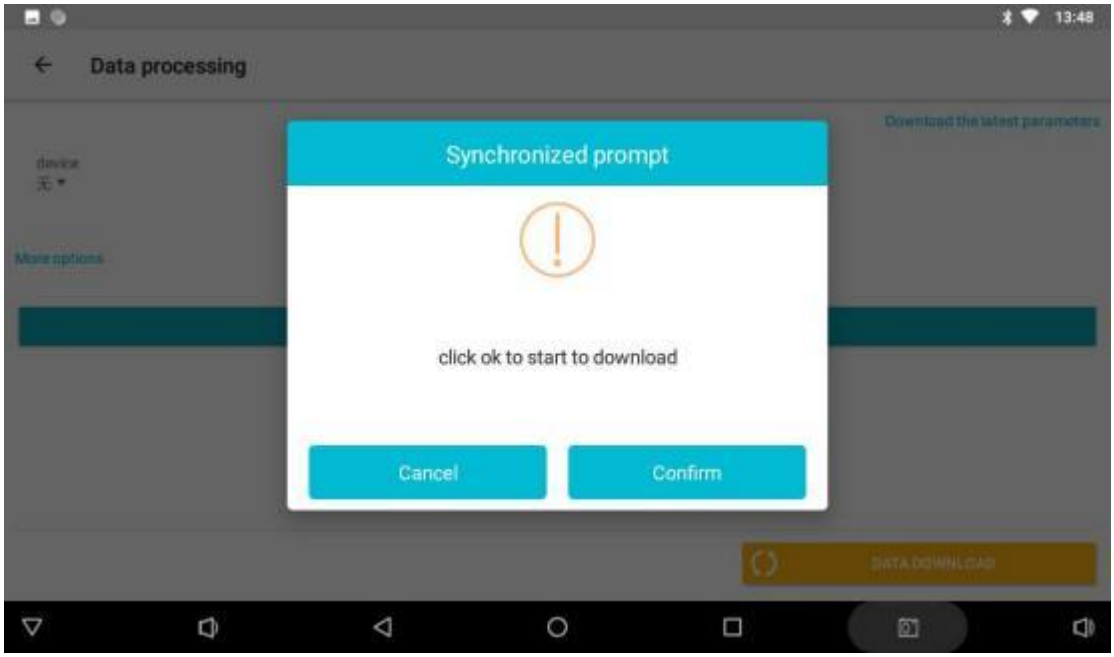


Figure 45

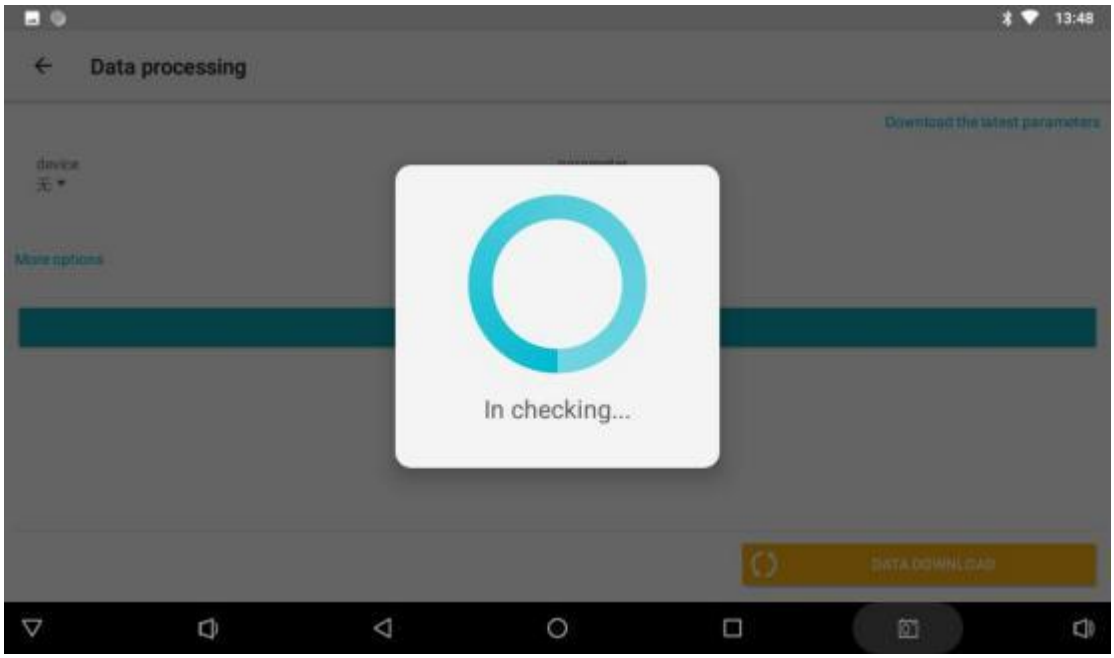


Figure 46

10 Detailed settings of AI analysis

10.1 Analysis parameter settings

Whether it is the measurement interface, the original data.dat of the folder or the interface of the drawing file _ XYZ. Dat, select "AI analysis" and the system will enter the AI analysis result interface (Figure 47). Click the first operation icon at the bottom right of the screen to enter the AI analysis setting interface (Figure 48). Click "Data Download" to download the latest AI analysis parameters, or click "Parameter Type" to select "Default" or "AI Recommendation", in which "Default" is the ideal analysis parameters set for a certain type of product under the company, and "AI Recommendation" is the AI analysis system. AI automatically learns, adjusts and generates relevant analysis parameters (Figure 49). In principle, this set of parameters is closer to the real analysis. Of course, it depends on the accuracy of the data marked by the user and the number of marks.

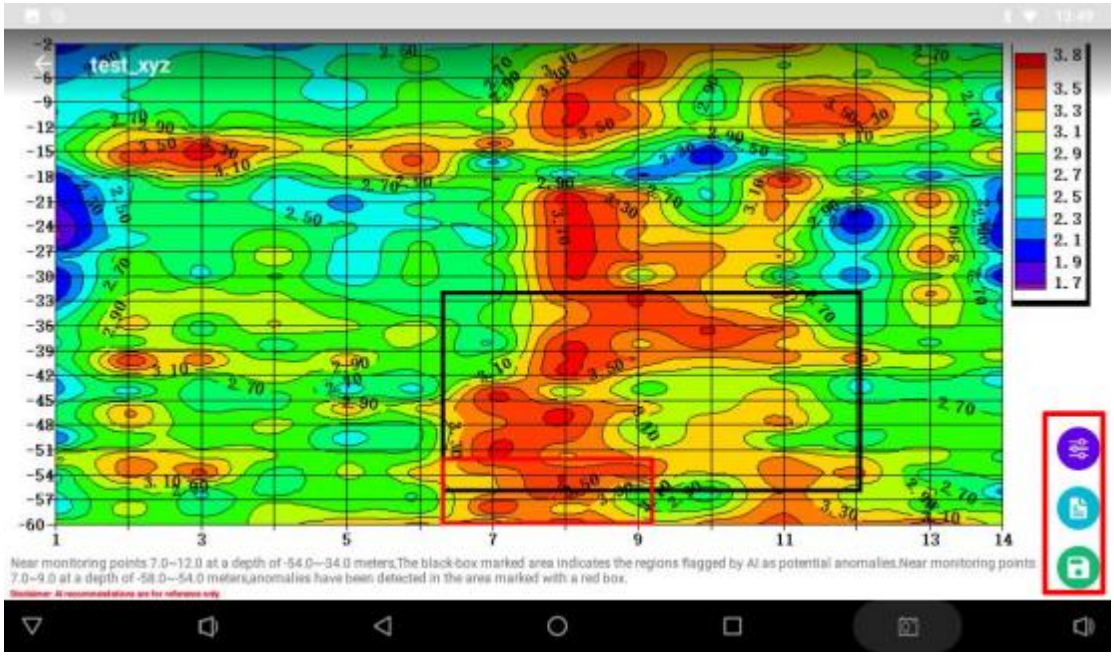


Figure 47

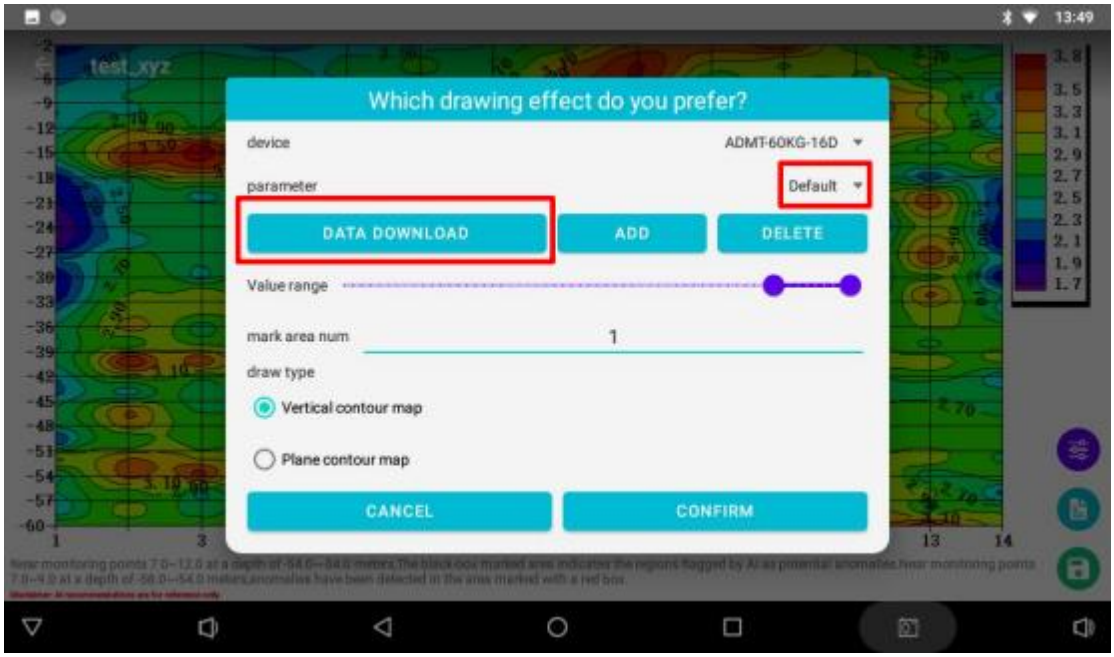


Figure 48

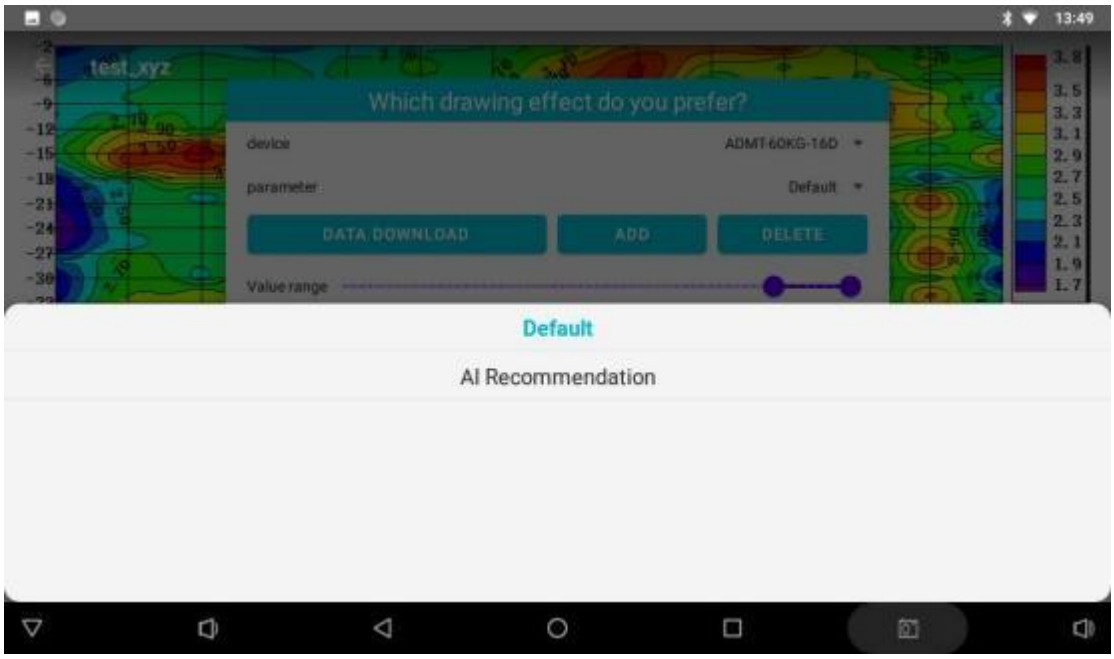


Figure 49

Select the "Add" function to manually addAI analysis parameters, and adjust the AI analysis results by manually sliding the percentage range of the value range left and right. Generally, the smaller the percentage is, the lower the value area will be displayed, and the larger the percentage is, the higher the resistance area will be displayed. It can also be a certain value in the middle, which is based on the user's actual experience. This type of instrument is set by looking for the characteristics of a certain abnormal body locally. If the primary use of this instrument, it is not recommended to use it temporarily.

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

10.2 Record feedback on AI analysis results

Click on the second operation button in the lower right corner of the AI analysis interface to find the history record interface (Figure 50), select the "Default" button in the "Validity" column behind the analyzed data file (Figure 51), and if the analysis result is consistent with the actual situation, click "Yes". At this time, the system will record valid data, and the more accurate data to record, the more accurate the data will be, AI analysis will become increasingly accurate (Figure 52).

If it does not match, click "No". After clicking "No", a drawing effect operation box will pop up (Figure 53). The AI analysis results can be adjusted by manually sliding the percentage range of the value range left and right. Generally, the lower the percentage, the lower the value area will be displayed, and the higher the percentage, the higher the resistance area will be displayed. It can also be a middle value. Adjust the analysis results to match the actual results and mark them as valid, which increases the amount of data marked as valid. If not adjusted, it will not be recorded.

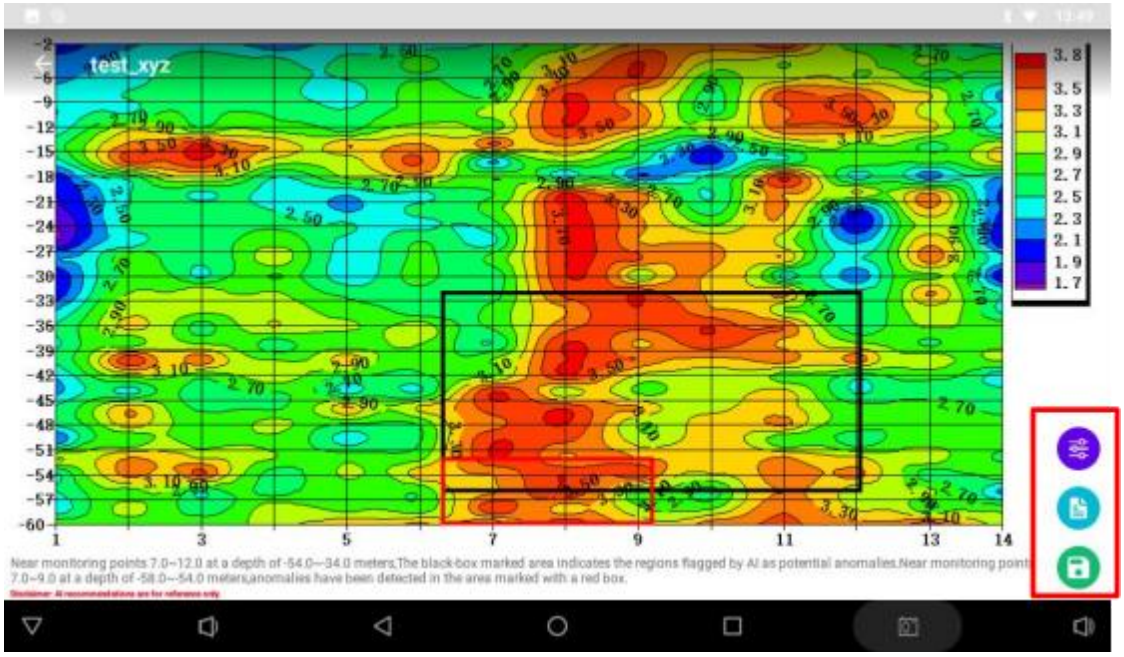


Figure 50

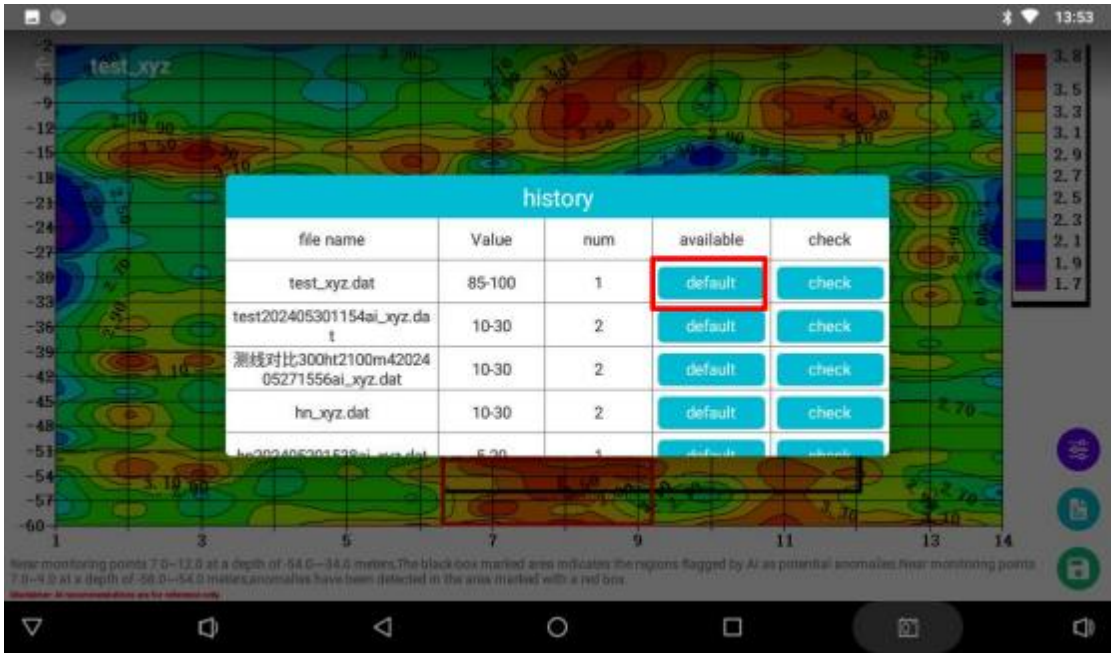


Figure 51

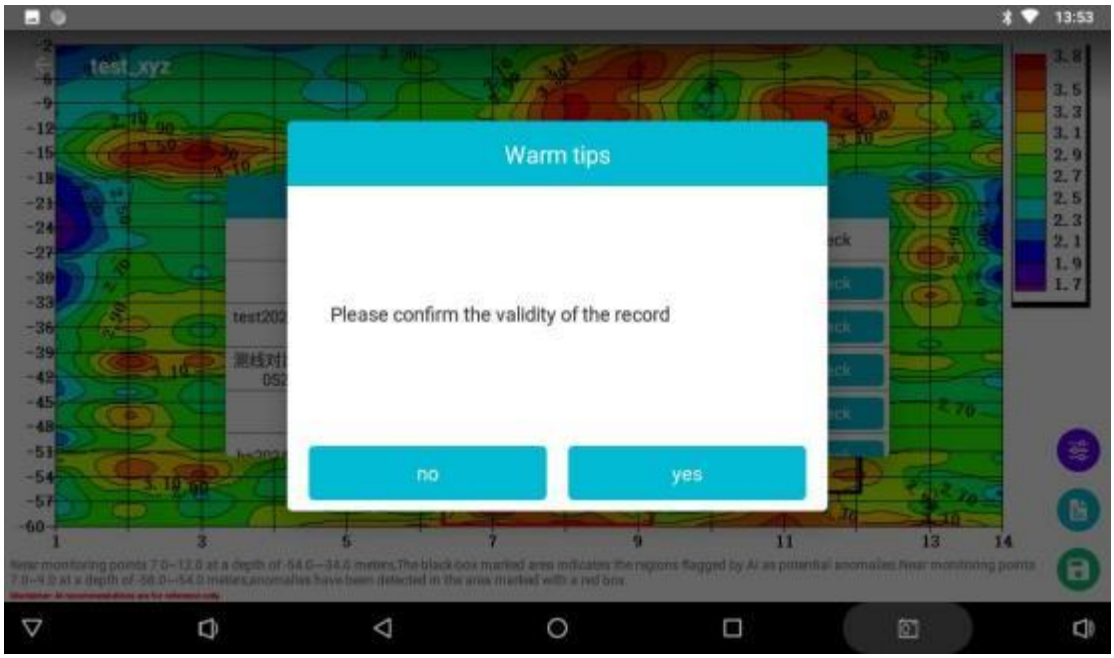


Figure 52

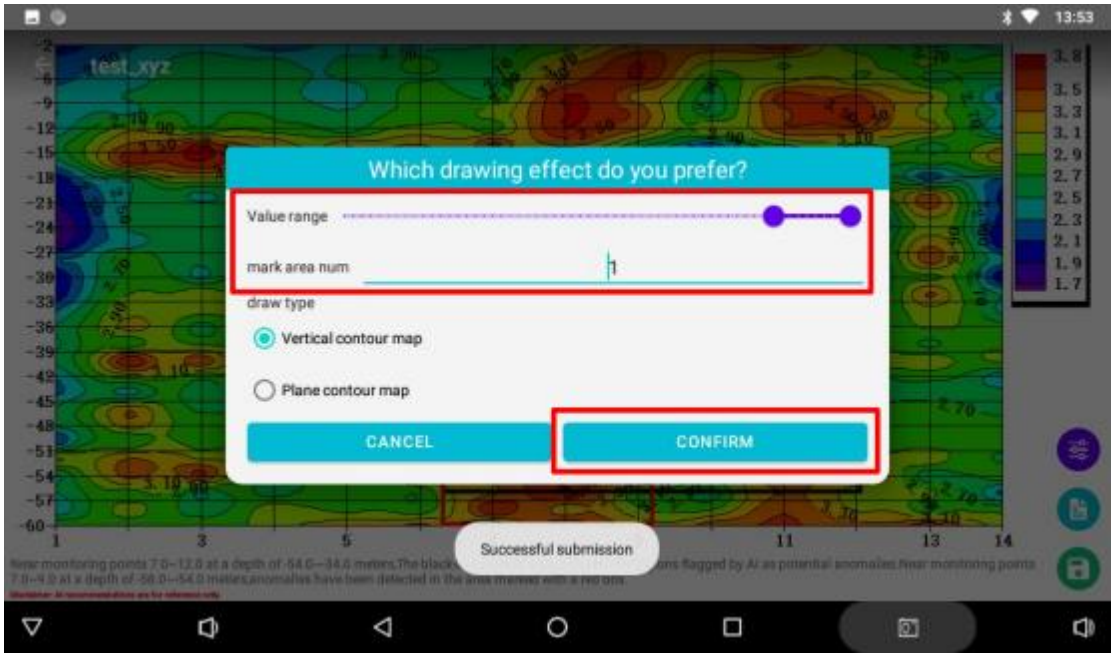


Figure 53

10.3 Saving AI Analysis Results

Click the third operation button at the bottom right of the screen in the AI analysis interface, and the picture will be automatically saved in the mobile phone album (Figure 54), which is convenient for viewing and other purposes in actual use.

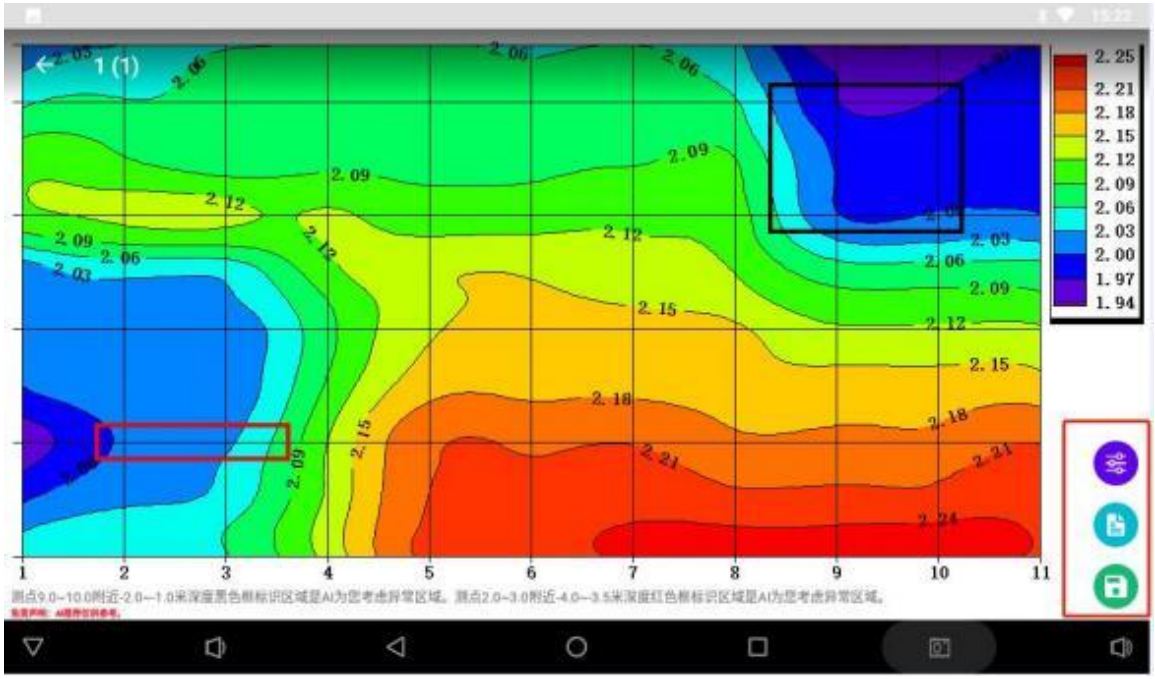


Figure 54

11 Aidu WEB Intelligent Data Processing System

11.1 Login to the Aidu WEB data processing system

Access the Aidu data processing system with a browserhttp://web.aidush.comSelect the account type of "Aidu Exploration" and log in with the same mobile phone number and password as the instrument or mobile phone, so that all data under the account can be shared. You can also log in by scanning the code through the Aidu Exploration APP in the mobile phone (Figure 55-58).

Figure 55

Figure 56

Figure 57

Figure 58

11.2 Data upload

After selecting "Data Upload" on the left, you can select " Select the data files in the computer to upload from the folder icon, click the + sign to select multiple files, and click "Data Upload" to upload the data to the cloud database of the current application type of the current account(Figure 59).

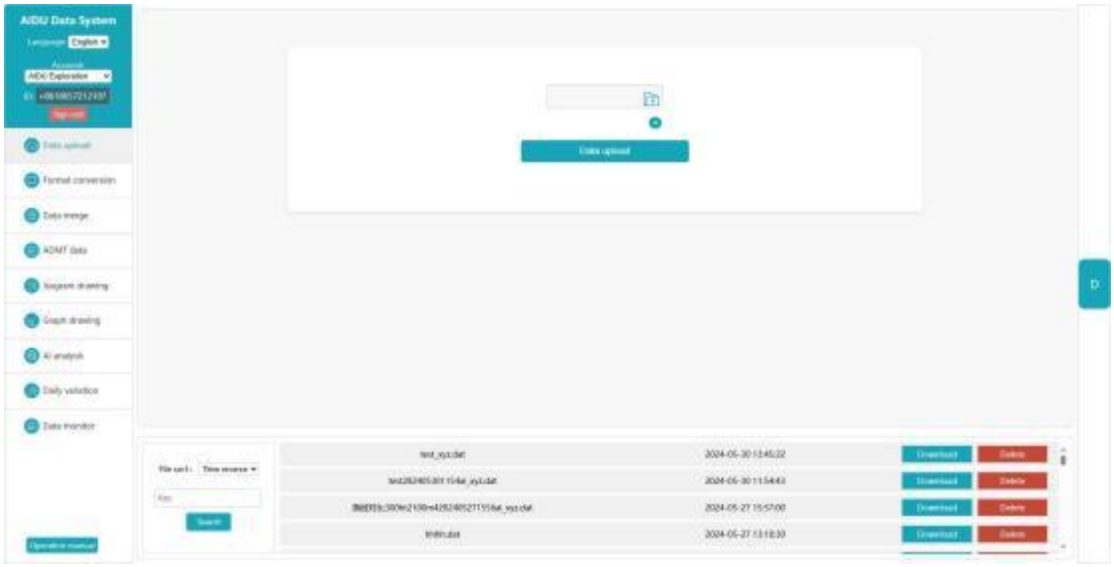


Figure 59

11.3 Data format conversion

Click "Format Conversion" and select "Old File Conversion ADXYZ" to convert the.dat file of the old Aidu instrument data into an.adxyz file (the data column of the.dat file of the old instrument data is frequency, and the row is measuring point data), and then you can operate the website function. Select the file to be converted after selecting "New file conversion ADXYZ". You can select which column of the converted file is used to compose the X, Y and Z data columns. At the same time, you can also select the range of depth and measuring point. Select "R2D data conversion" to convert the selected file into the inversion data format required by the Swedish Res2dinv high-density instrument. After selecting "Download" the data, the Swedish Res2dinv software can be used for further inversion mapping; Select "VOXLER Format Conversion" to convert the selected file to VOXLER 3D software to draw 3D drawings.

AI analysis or mapping that has been used in Aidu equipment or APP will generate _ XYZ. DAT files, which can be directly used for AI analysis of web pages (Figure 60-61).

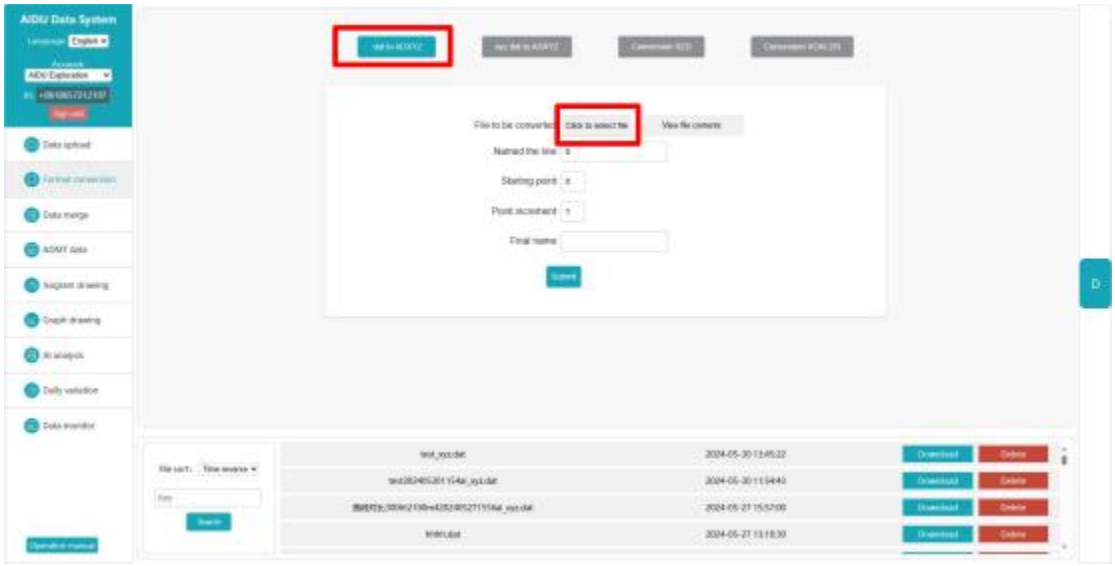


Figure 60

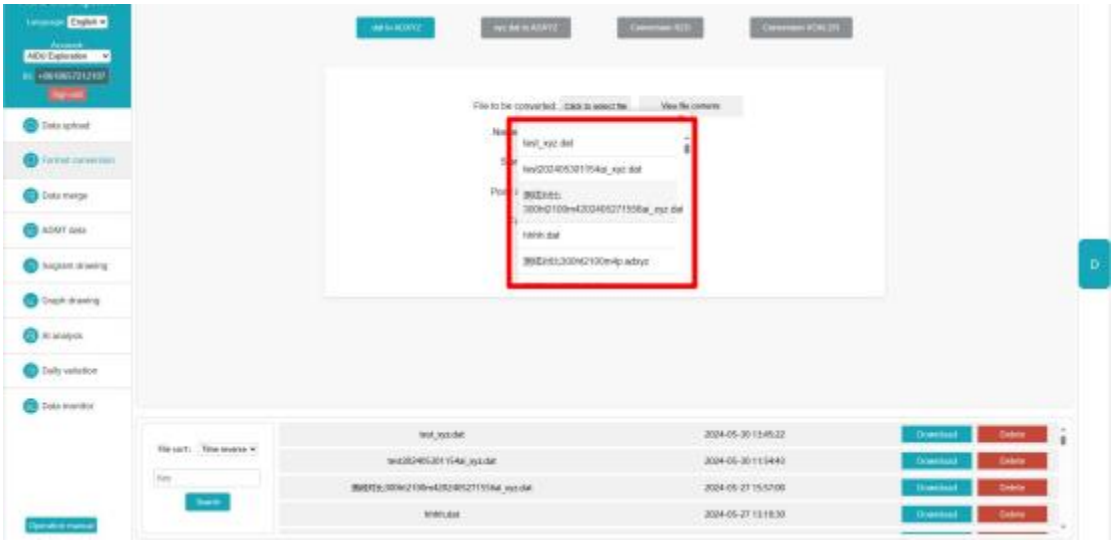


Figure 61

11.4 Data consolidation

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

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

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

11.5 ADMT data processing

The ADMT data processing function can perform corresponding data processing on the original data of the instrument. The file that can be processed is the.adxyz file. The old instrument or the new file format can be obtained by converting the data format according to Article 12.3 of this manual.

For data processing parameters, please refer to the operating instructions in 9.1 and 9.2 of this manual.

11.6 Contour mapping

The contour map can be drawn from the processed data file. The specific operation is to select the function of "drawing contour map" on the left, click the name of the file to be drawn and draw the contour map. The default is "classic contour map". You can switch to "new contour map" in the upper right corner and then select the file to draw. If it is a survey area data file, the "vertical contour map" and "plane contour map" can be switched. How to obtain the survey area data file can be obtained by setting each survey line during instrument operation and measurement, or by referring to the survey area data merging function in Article 12.4 of this manual.

11.7 Plotting the graph

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

11.8 AIAutomatic Analysis

Click the function of "AI automatic analysis" on the left, and then select adxyz or XYZ. DAT file. You can also modify the AI analysis effect in the operation bar on the right side of the webpage. The account that has been connected to the instrument in Aidu Instrument or Aidu APP has been automatically bound to the instrument, and the bound instrument will be displayed by default in "Device Model" (Figure 62).

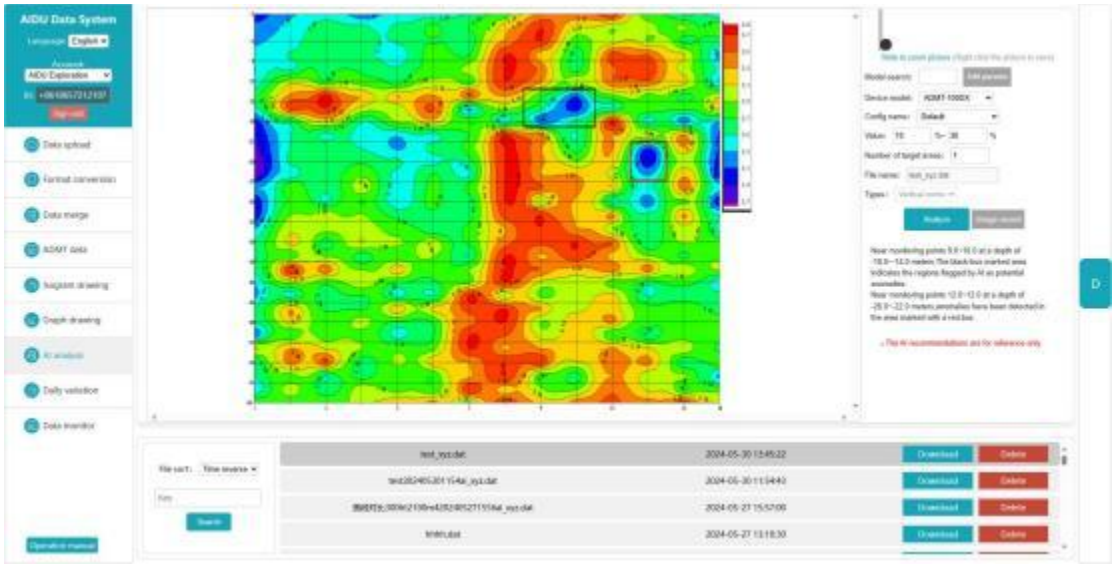


Figure 62

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

To record whether the AI analysis result is valid, click "Use Record" in the right operation bar, and select "Valid" and "Invalid" behind the analyzed data file (Figure 63).

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

If not, check "Invalid", and a prompt box will pop up. You can manually adjust the analysis result to be consistent with the actual result, and then record it again. If it is not adjusted, it will not be recorded (Figure 64).

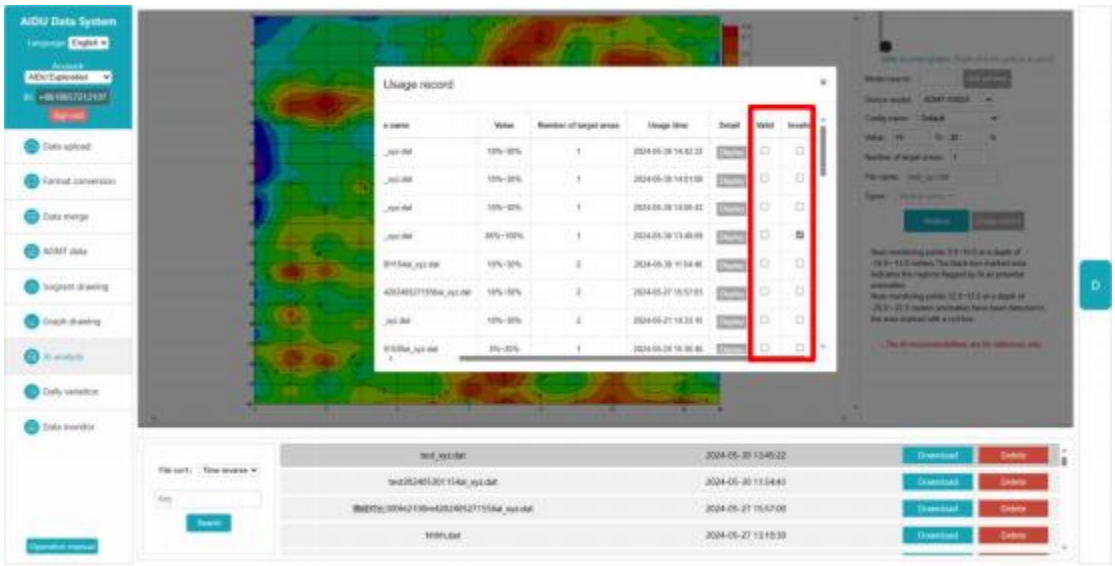


Figure 63

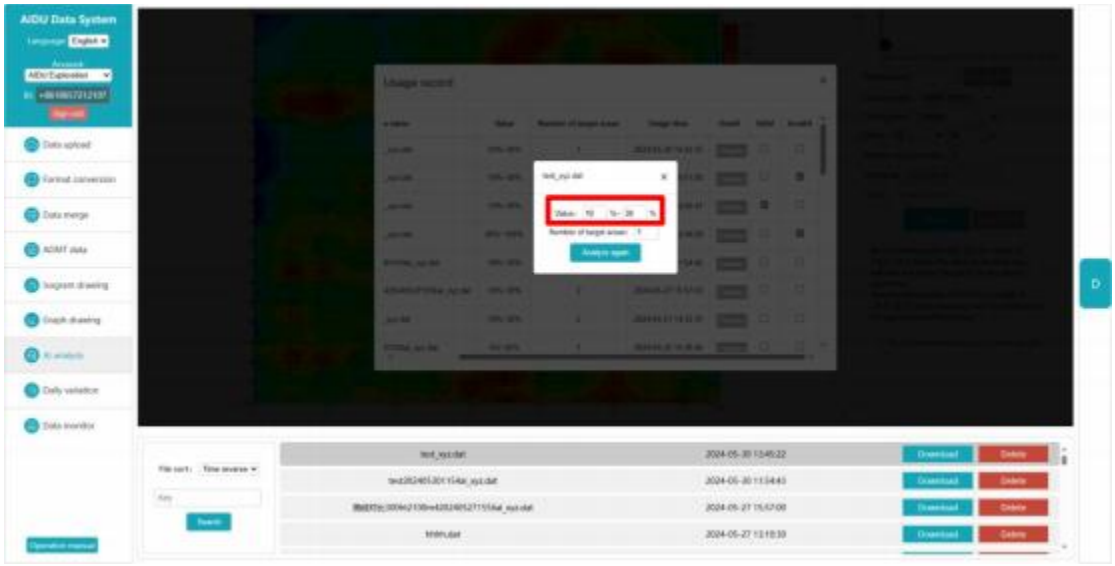

AiDU Data System
Data upload
Format conversion
Data merge
ADMT data
Isogram drawing
Graph drawing
AI analysis
Daily validation
Data monitor
Operation manual
Usage record
Analyze again
Search
Download
Delete

Figure 64

12 Operation method of other functions

12.1 Touch screen export

When the host connection mode is "serial port connection" and "WiFi connection", the touch screen export function cannot be used. When the connection mode is changed to "Bluetooth connection", After Bluetooth connection with the external measurement host with touch screen, the measurement data of the external host can be imported into the system folder of the instrument (see the introduction of "Bluetooth transmission" in the operation manual of ADMT series products for the specific export method, and contact the manufacturer).

12.2 System Settings

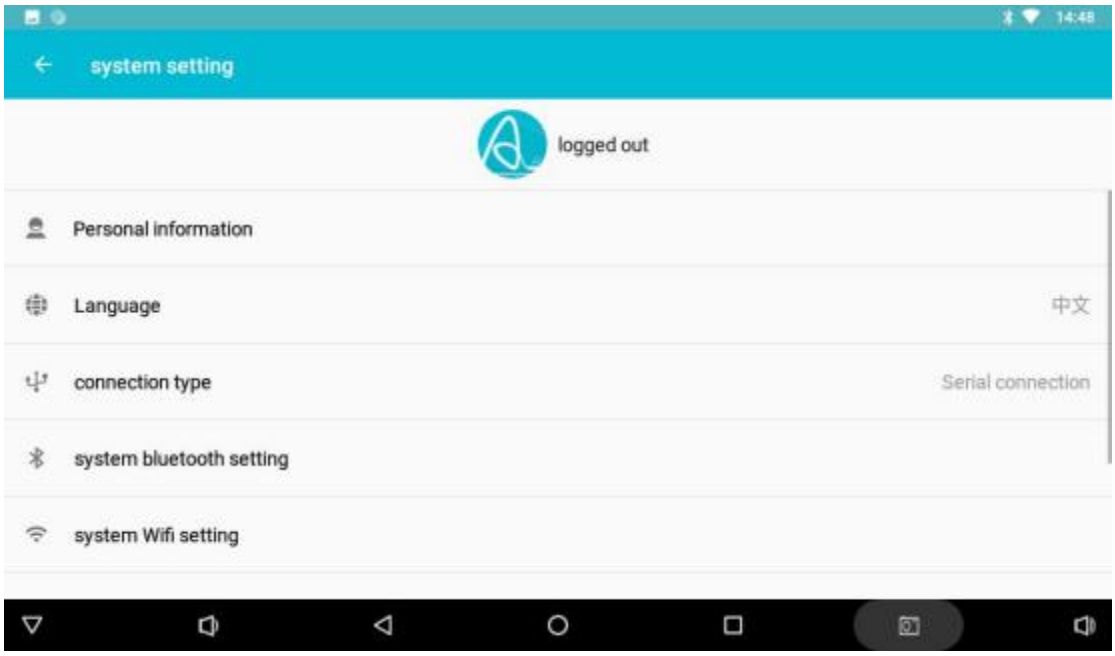


Figure 65

Click "System setting" to enter the system setting page (as shown in Figure 65).

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

Language: Click "Language" to select multiple system languages.

Connection mode: Click to select "Bluetooth Connection", "Serial Port Connection" and "WiFi Connection" according to the model and specification of the instrument. Generally, the connection mode has been set when the instrument leaves the factory and does not need to be changed.

System Bluetooth settings: Click "System Bluetooth settings" to jump to the system Bluetooth settings page.

System WIFI settings: Click "System wifi settings" to jump to the system wifi settings page.

Screen brightness setting: Click "Screen brightness setting" to jump to the system screen brightness setting page.

About: Click "About" to view the app version number, registration agreement, privacy protection policy, check update and other operations of the instrument. The company attaches great importance to the privacy protection related to the user's use of the instrument.

Check update: Click "Check Update" in the network status to check whether the software belongs to the latest version. It is recommended to update to the latest version of the software.

Scan the code to log in: Click "Scan the code to log in" to open the camera on the instrument host, which can scan the Aidu WEB intelligent data processing system to log in.

13 Field connection method of the instrument

13.1 Single channel connection

13.1.1 Wired electrode connection mode:

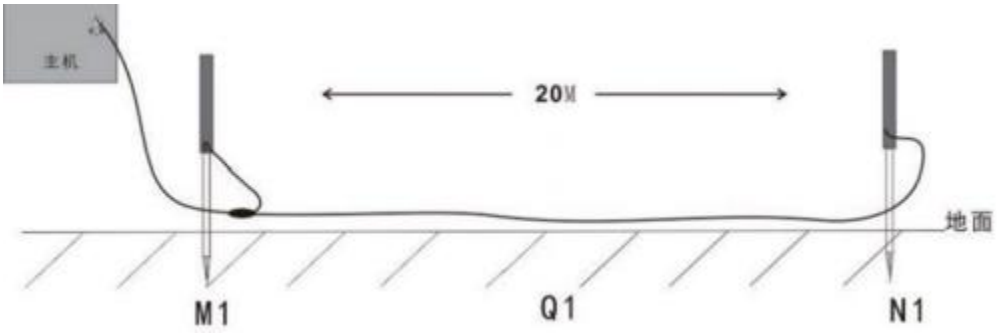


Figure 66

After the instrument is turned on,connect the instrument as shown in the figure above (Figure 66),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 67).And so on,until the entire profle measurement is completed.

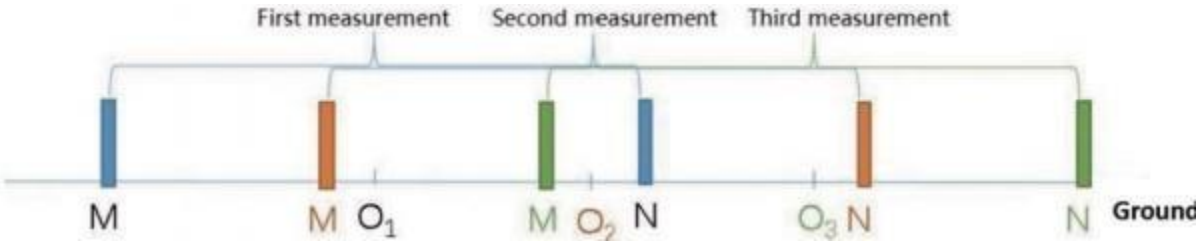


Figure 67

O_1 , O_2 , O_3 are measurement points ,which are located directly under the wireless sensor .

13.1.2 Wired magnetic sensor connection method (optional)

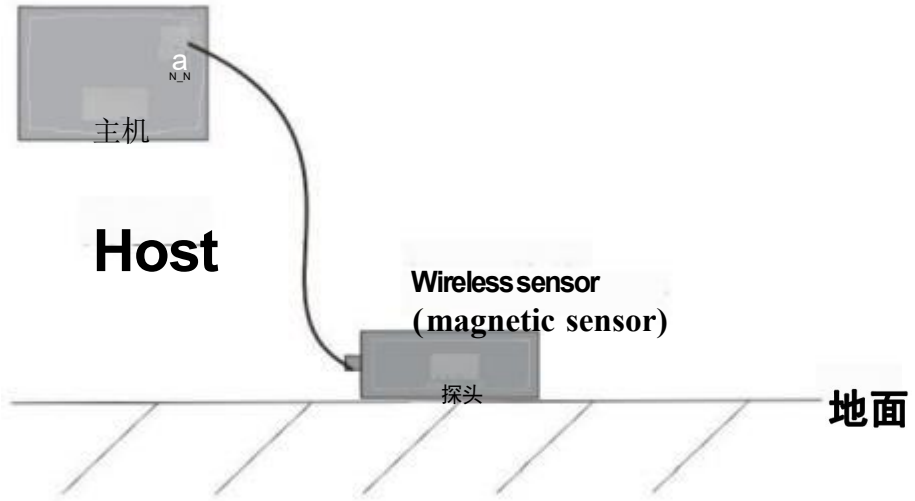


Figure 68

After the instrument is turned on,connect the instrument as shown in the figure above(Figure 68), 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.

13.1.3 Connection mode of wireless magnetic sensor(optional)

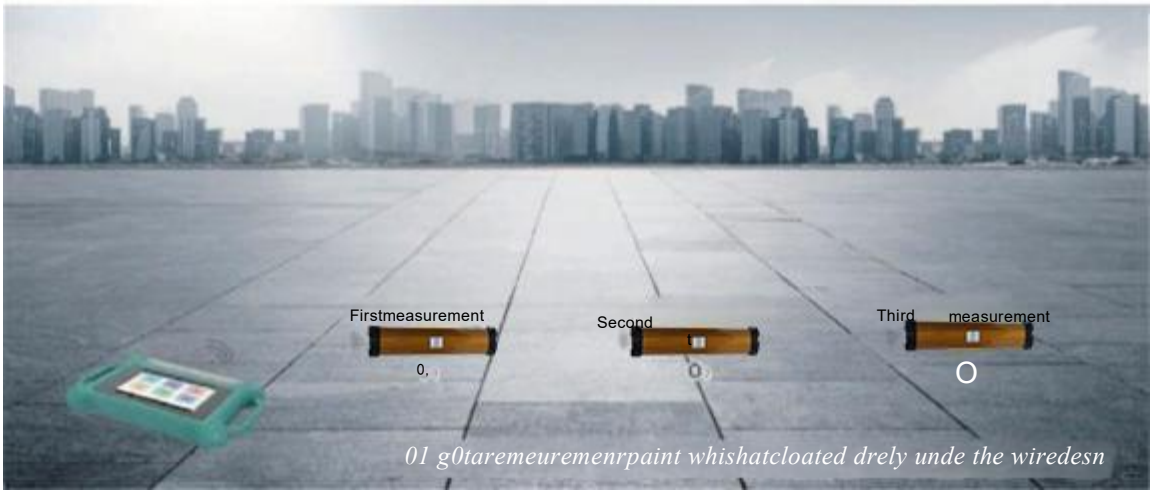


Figure 69

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 69). And so on, until the entire profile measurement is completed.

13.2 16-channel (ADMT-16D STYLE)instrument connection mode

13.2.1 Basic connection method of 16-channel series:

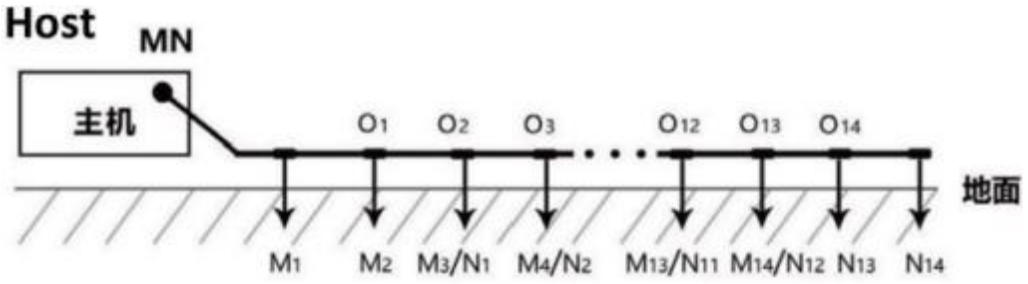


Figure 70

After the instrument is turned on,connect the instrument as shown in the figure above(Figure 70),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 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.

13.2.2 16-channel instrument wired electromagnetic sensor connection mode:

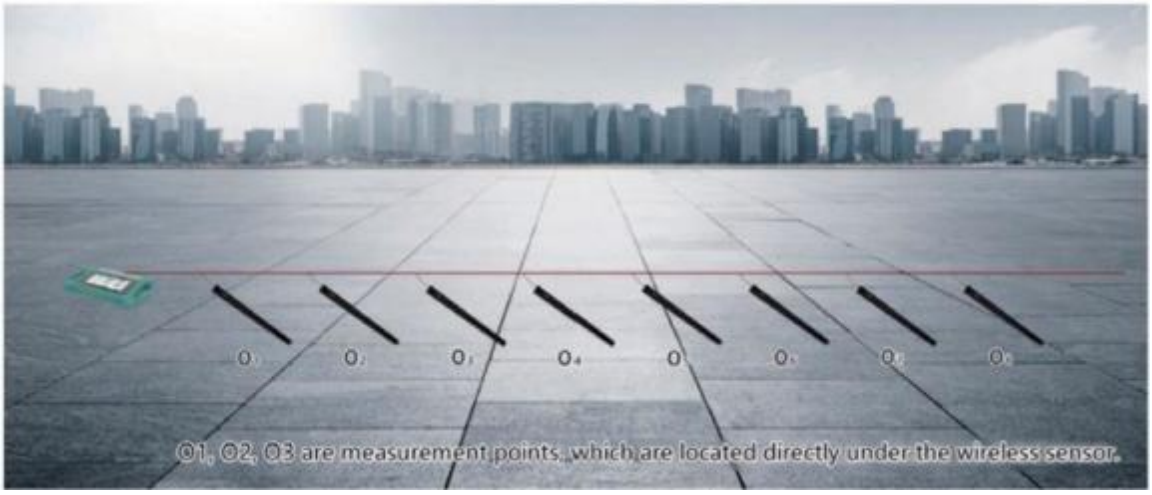


Figure 71

After the instrument is turned on,connect the instrument as shown in the figure above(Figure 71),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.

13.3 32-channel instrument connection mode

13.3.1 Basic connection method of 32-channel instrument:

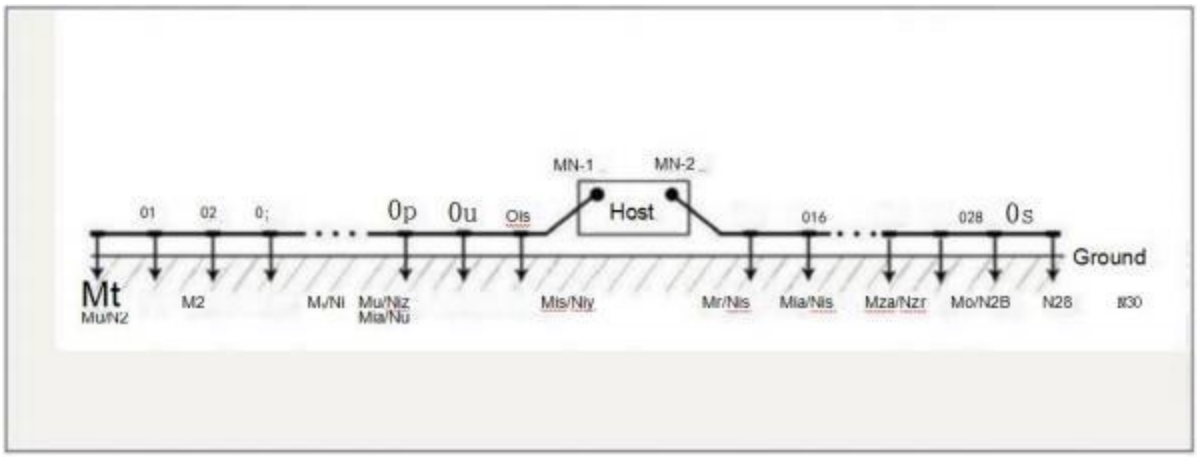


Figure 72

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 72, 73). 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 73

13.3.2 32-channel instrument wired electromagnetic sensor connection mode:

Figure 74

After the instrument is turned on,connect the instrument as shown in the figure above (Figure 74),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.

14 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.

14.1 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 75).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.

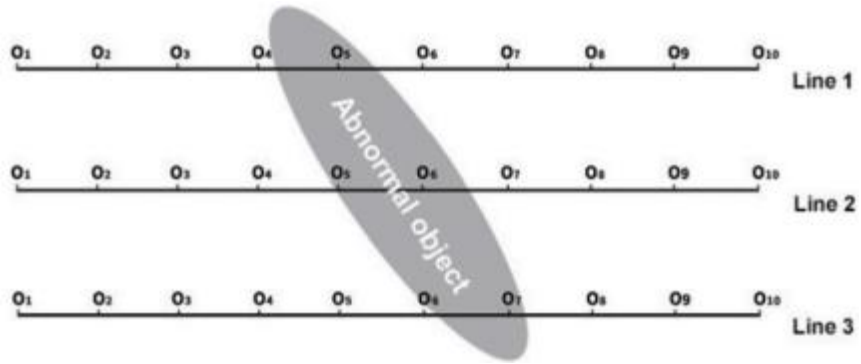


Figure 75

14.2 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 76)or diagonal crossing (Figure 77)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.

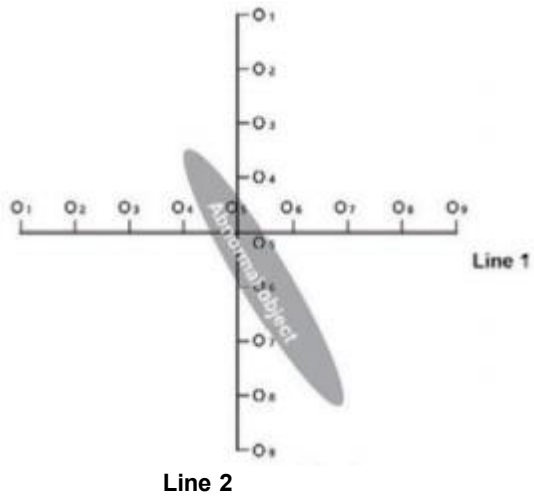


Figure 76

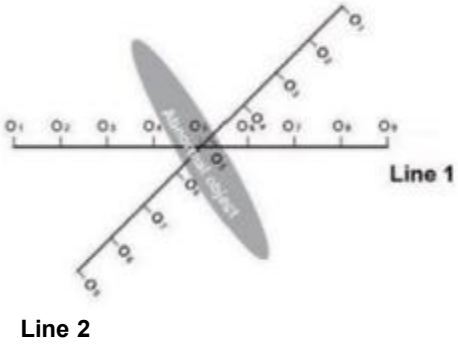


Figure 77

14.3 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 78) or semicircle (Figure 79)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.)

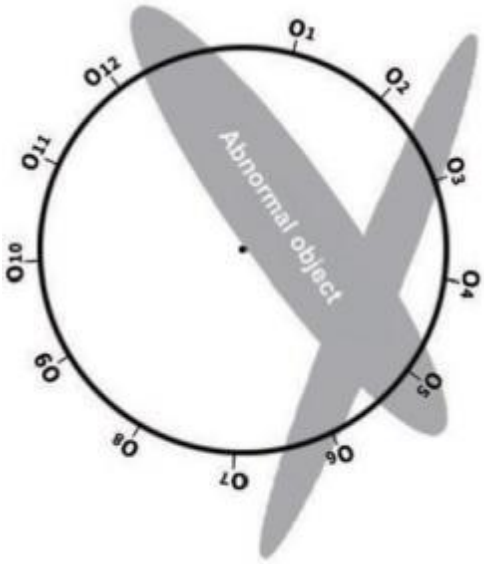


Figure 78

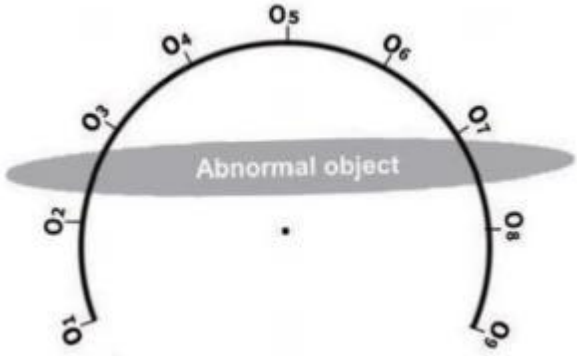


Figure 79

14.4 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.

14.5 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.

15 Precautions for using the instrument

1.Please check the batery 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 improvement of the company's products. If there is any change, the electronic version of our company's manual shall prevail.

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考古服务热线/Treasure Exploration：400-995-3656
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服务热线/Service Hotline: 021-51860763