桩机施工监控系统 V3.0

Piling Monitoring System

EMS-III

使 用 说 明 书

Operating Manual

This instrument applies to Vibrator, Crawl type pile machine, Walking multifunction machine, rotary drill etc., which machines drove by electrical and hydraulic, use for the followings construction methods: vibro-replacement stone column, sand drain, sand compaction pile, grouting monitoring. To records depth, current, hydraulic pressure, air pressure and fillings automatically. Automatically to analyses, create table and pile column graph. This instrument can use USB data access, computer analyses the pile data to monitor the construction quality and control construction quality of whole process of the piling.

overview

EMS-III Piling c*onstruction monitoring system is integrated by MCU,LCD display ,advanced sensor, automatic control ,servo control and wireless communication technology to all in one a smart instrumentation, It is made of embedded system chip as a core, Design special to vibro-replacement stone column, sand pile ,sand compaction pile and grouting etc. Construction monitoring*, records,prints, wireless control and all the parameter and working mode can be via wireless transmitted to the piling recorder, it is can be connected to EM-III wireless meter to save the men power and arrangement the wire to decrease the cost. The system function are as the followings::

1.Depth measurement : this system set up 4 channels depth sensors, in which:INA and INB channel to select the AB phase rotary encoders to measure the pile depth or the sand level(on sand pile construction: another product ,servo sand level detecting system can be selected).INA and INB channel can use as the positive and negative pulse proximity switch sensor input channel。The INC channel use for the potentiometer sensor input, The INI channel use as a wireless depth sensor selected by wireless channel and address.

2.Current measurements：The IND channel is the wired current sensor input

channel ,input scope :0-5AAC,(It is exceed to the scope which we needed by current transformer, connected with 3 wires RVVP ,power supply :DC12V singal:0-5vdc, the INI channel is also use to connect the wireless sensor selected by wireless channel and address to EWM-III wireless monitoring meter. All the work type and parameter will display and recorder on the recorder meter such as current, Tamping and drilling.

3. Cooling water pressure measurement: to measure and record the cooling water pressure to ensure the vibrator work in the normal temperature working conditions, this sensor can select the channel INE and INF, the signal is 2 wires 4-20mADC input. .

4. Air pressure measurement: Some piling construction will add pressured air in the pile; the sensor can be connected to INE and INF with 2 wires 4-20mADC input and record.

5. Filing measurement:: the sensor ING： if select this sensor ,the filing accumulate one time if the sensor ING contact one time， every times accumulation set up in the system first, if choose INH sensor ,The INH channel connect with electrical scale, the ING contact when need accumulate the electrical scale signal ,the INI is also connected to wireless electrical scale selected by wireless channel and address. e.g.: the loader weighting system.

6. Working Mode: a, confirm by the keyboard of the recorder meter or input on the INI wireless channel selected by the wireless channel and address record the working mode: Tamping and drilling.

Technical Parameter

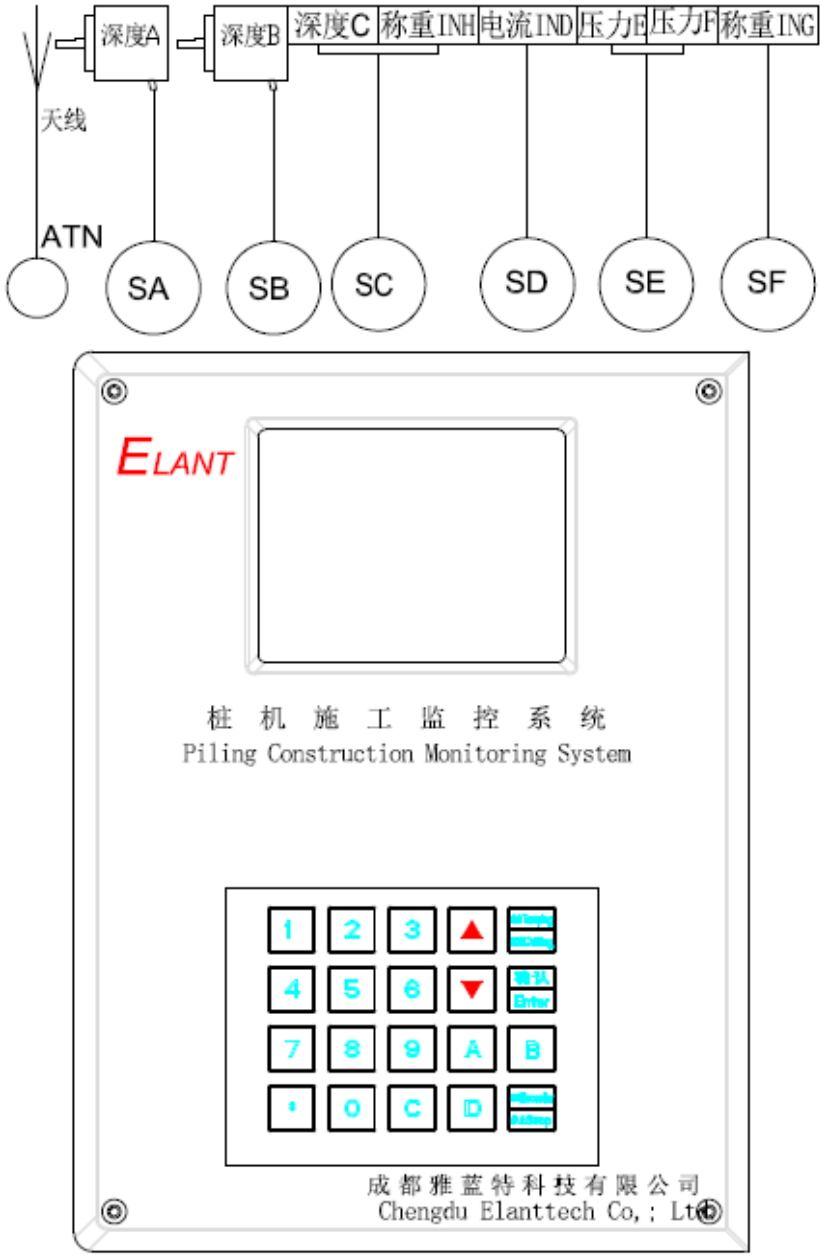
1. Power Supply:AC220V or DC12V power dissipation :Max.:10W 功耗：10W
2. Depth:0-100m(can be extend to cover any kind of pile）. When Choose INA and INB , to connect the rotary encoders (both NPN and PNP) power supply :12VDC， 2 pulleys depth measuring, accuracy 0.001m， INC: depend on the accuracy of the potentiometer
3. Current：0-10000A (Depends on the ratio of the current transformer) wired sensor needs 12vdc power supply. Working connects the wireless monitoring meter to connect the EWM-III, accuracy: 0.1%.
4. Water pressure: 0-2.5Mpa (can be extend) 2 wired 4-20mA input， accuracy :0.5%.
5. Air pressure: 0-2.5Mpa (can be extend) 2 wired 4-20mA input, accuracy : 0.5%.
6. Filing （Stone）： 0-2Ton/time，adjustable ， wired sensor ore wireless sensor input ,it depends on the scale of the extension scale. Filing accumulation, accuracy :<1%.
7. Working mode： keyboard of the record meter or through wireless connect to *EWM —III's Key : Tamping/Drilling*
8. Project name and Pile code input: keyboard of the record , English or Chinese options.
9. Store capacity :8G Flash Rom if store 1 row data /per second ,this meter will continuous store more than 1 year. Access with USB port.
10. Real time print: on site print: project name ,pile code, data time current trend and depth trend.
11. Wireless dater acquisition: Frequency 315 433,475,490 MHz，8wireless channels and 16 addresses, Distance 1600m 开阔地， 3db antenna .
12. LCD display ：320X240Blue LCD，Brightness and contrast adjustable by the keyboard of the meter.
13. Keyboard:5X4menbrance keyboard， working mode and record mode with LED indicator.
14. Size of the recorder： 240mmX180mmX60mm
15. Software :piling quality analyses systemV3.0 桩机数据分析系统软件 V3.0, hardware requirement::windows95 32bit， intel586CPU,64MRom， 8GHD or above.

System configration

Piling construction monitoring system standard configuration:

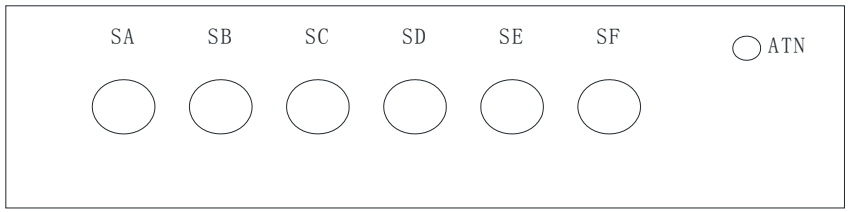
1. Piling construction recorder meter
2. Depth sensor：Wired 2 pulleys depth detector with spring pressing, equipment rotary encoder use for theΦ12-Φ32mm steel wire rope.
3. Current sensor.
4. Water pressure sensor (option).
5. Air pressure sensor (option).
6. Filling switch (option).

7. Portable printer (option).
8. *EWM-III* wireless monitoring meter (option).



Installation:

1. Sensors connect to the recorder meter: By air plugs, 220VAC power supply or DC12V power supply.The sensor air plug as the followings drawing



Air plugs on the record meter

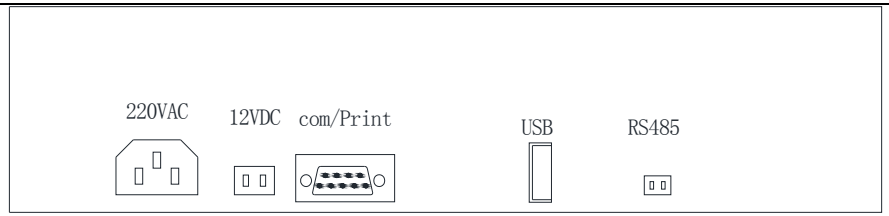
Air plugs connections

插头接线表

插头	型号	引脚	定义	传感器	
SA	GX12-5P	1	+12V电源	深度A（旋转编码器)	INA
		2	Z		
		3	B		
		4	A		
		5	0v		
SB	GX12-5P	1	+12V电源	深度B（旋转编码器)	INB
		2	Z		
		3	B		
		4	A		
		5	0v		
SC	GX12-6P	1	+5V电源	深度C	INC
		2	0-5V信号		
		3	0V		
		4	+12V电源	称重	INH
		5	0-5V信号		
		6	0V		
SD	GX12-3P	1	+12V电源	电流(三线)	IND
		2	0-5V信号		
		3	0V		
SE	GX12-4P	1	+12V电源	水压(二线制压	INE
		2	4-20mA		
		3	+12V电源	气压(二线制压	INF
		4	4-20mA		
SF	GX12-2P	1	称重开关量	称重(无源常开)	ING
		2	信号地		
ATN		无线信号			INI

表 1

2. Power supply ,communication ,print/programing, USB port installations



Power supply: Connect the D plug or the special DC12Vplug to the recorder meter

COM/Print：Connect the portable printer (if need real time printing）or use as a programing port. Printer:9 needles com port printer or other ESC printer

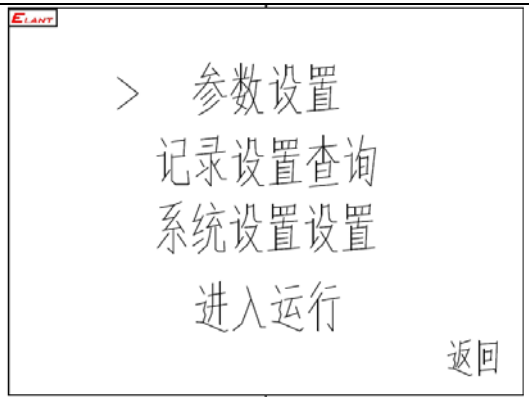
USB port:the USB port, Data access port ,to transfer the piling data fromrecoder meter to the USB disk and transfer to the computer. Read analyses ,print ,store on the computer.

RS485 port: Connect to computer or GPRS wireless DTU (option) protocol: Modbus-rtu. If then the piling machine will be monitoring online everywhere.

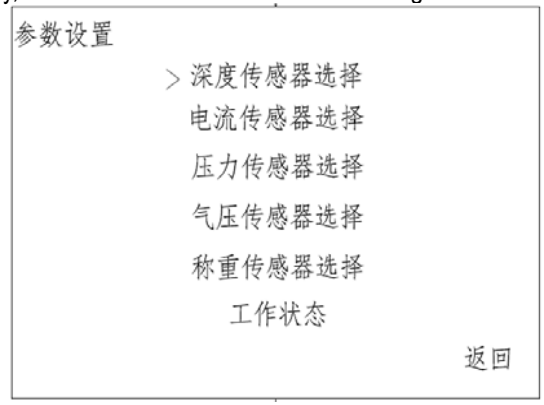
Settings Guide

1. Connect the sensors , and power on , the recorder meter display as：

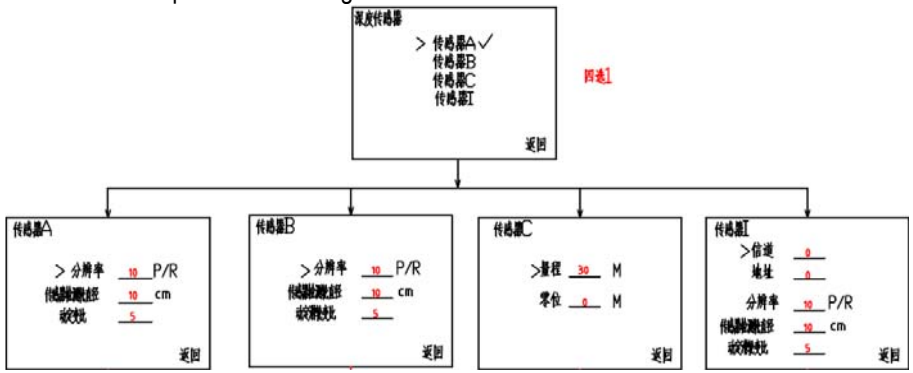
To choose the language, Chinese or English , Choose English and press the enter:



In this menu, use the direction key to move the cursor to the menu we will set, and press enter key, enter the next menu. Parameter setting:



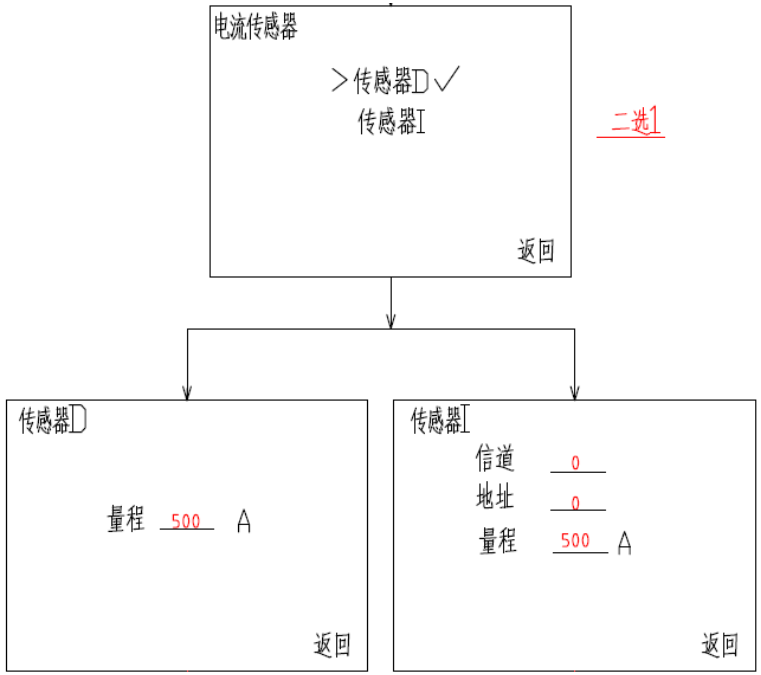
2. Interface of the depth sensor setting:



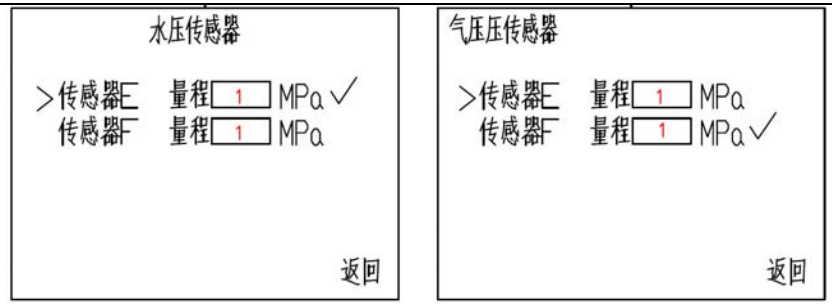
Sensor selecting：Move the cursor to the sensor we needed , press D, we have

already selected the sensor. the choose sensor will .

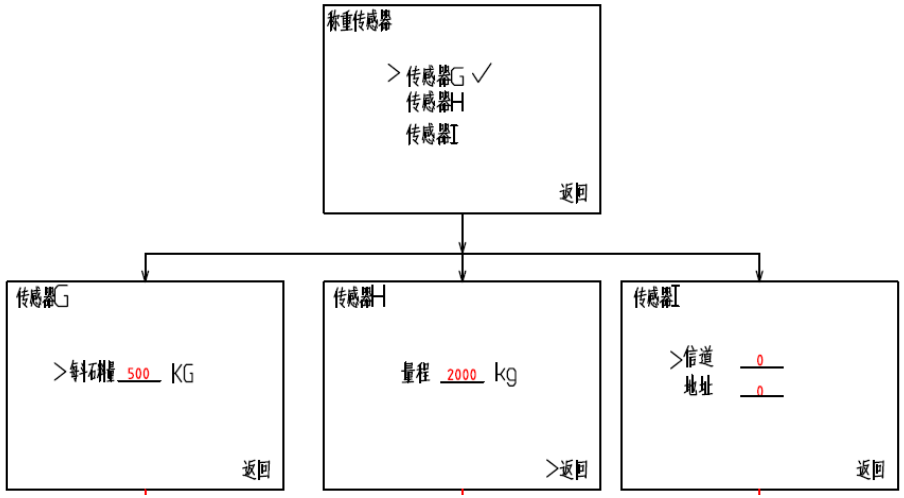
3. Interface of the current sensor settings:
   Move the cursor to the back and press the enter key ,back to the parameter setting interface ,move the cursor to the current sensor setting ,and press the enter key: move the cursor to the sensor and press the D key to confirm to choose this sensor. press enter to enter the setting interface as the following pictures:



4. Water pressure sensor setting: Move the cursor to the back and press the enter key ,back to the parameter setting interface ,move the cursor to the water pressure sensor setting ,and press the enter key:
5. Air pressure sensor settings: Move the cursor to the return and press the enter key ,back to the parameter setting interface ,move the cursor to the air pressure sensor setting ,and press the enter key:

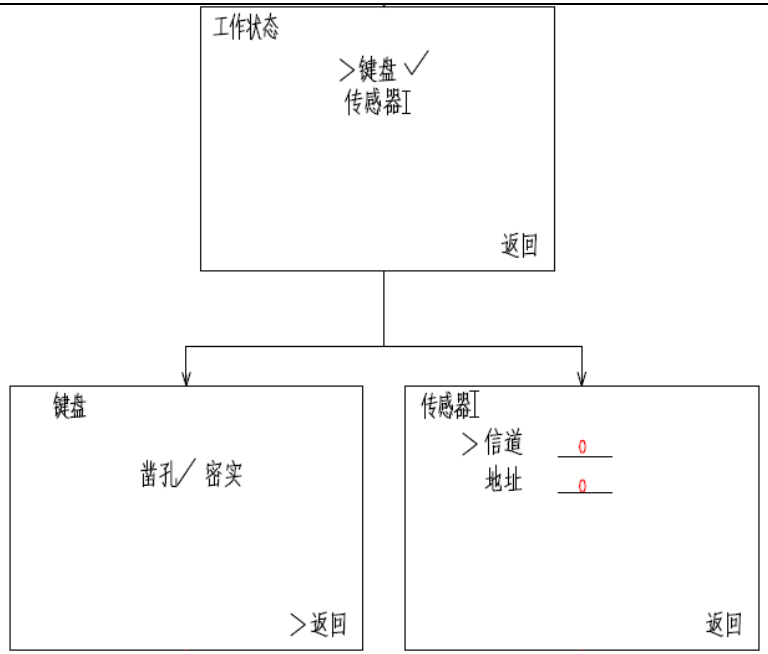


6. Weighting sensor setting:

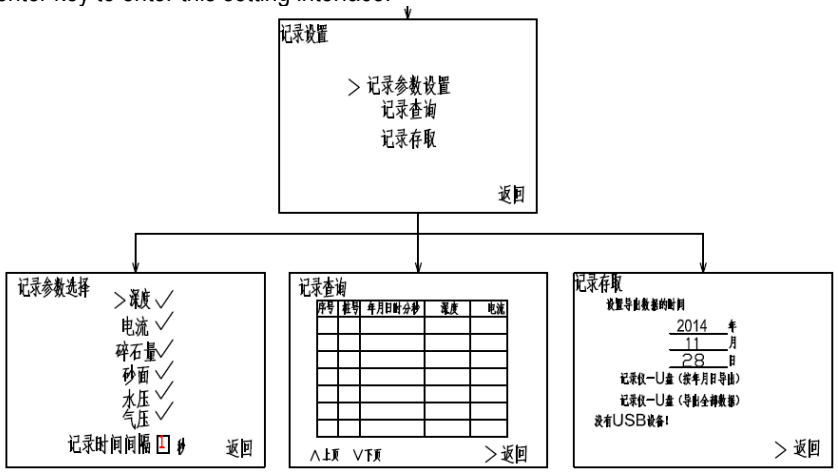


Sensor G，the weight/time，Sensor H is extend weighting sensor to measure the weight of the filings in real time and input in the recorder meter ,Sensor I，selected the sensor by wireless weighting sensor by wireless channel and address.

7. Working mode setting： Tamping /Drilling have 2 options. Keyboard of the recorder meter or EWM-III wireless monitoring meter. (INI).

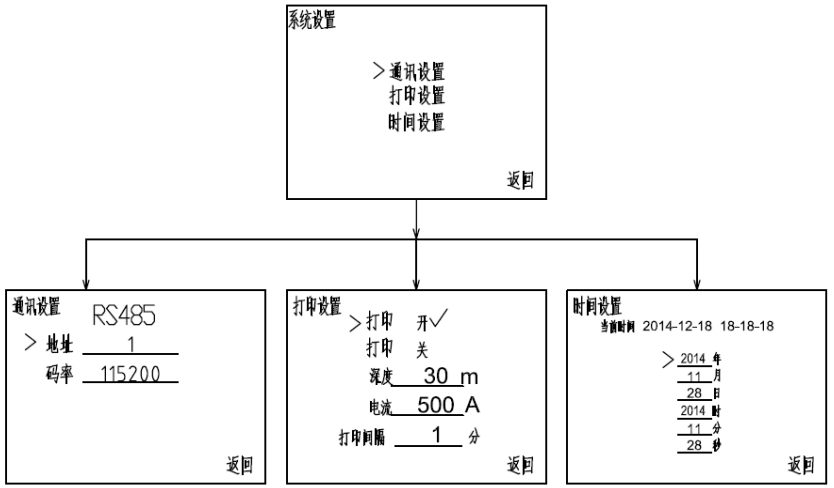


8. Move cursor to the return to main menu:seletct the record setting menu, press the enter key to enter this setting interface:



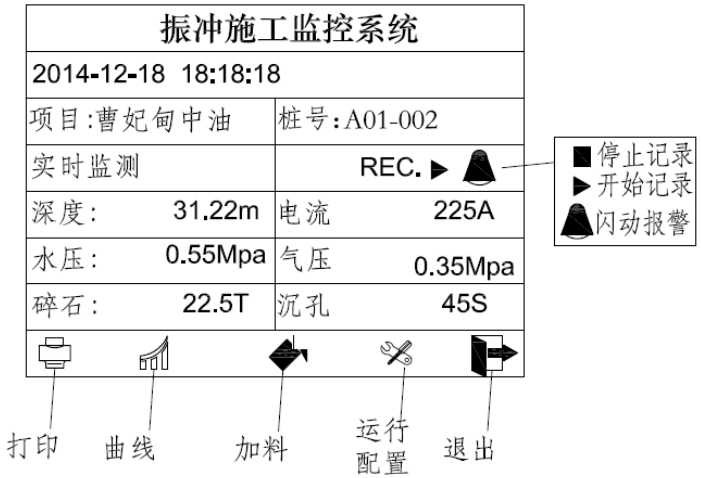
Record setting menu: ①select the parameter if we need record, select all is default , Recording interval between 1-65536second adjustable , if set to 1 second ,it means that every 1s will store 1 row data to the flash memory. ② select the query : Recorder meter will display a table with date time depth and current on the LCD. ③data access :Plug the U-disk to the recorder USB port, the instrument will warning automatic display and ask if download all the data or part of the data in the recorder meter. Press return to previous menu

9. Return to the main menu and select the system settings: press the enter key to enter the system setting menu:

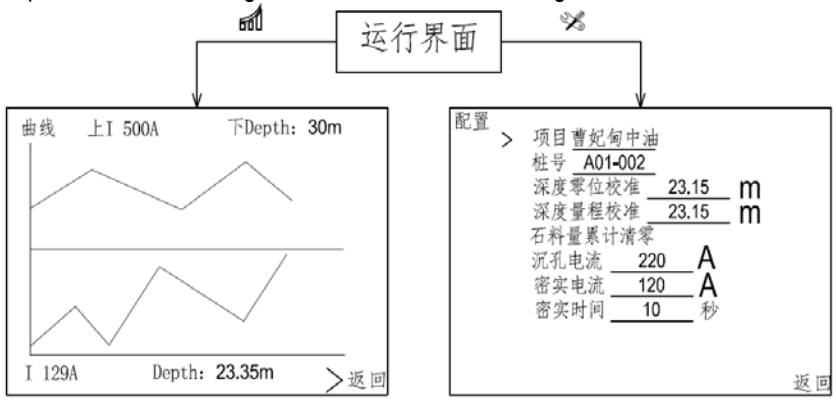


① Communication setting: Modbus protocol ,address means that this is the address in the control network., choose the bps to adapt the network.②print setting: setting for the real printing on site ,choose the print option on or off., the depth current the max. display on the print paper ， print interval mean every how long to print a row in real time.③ time setting

10. Move the cursor to return enter the main menu, select the operating:



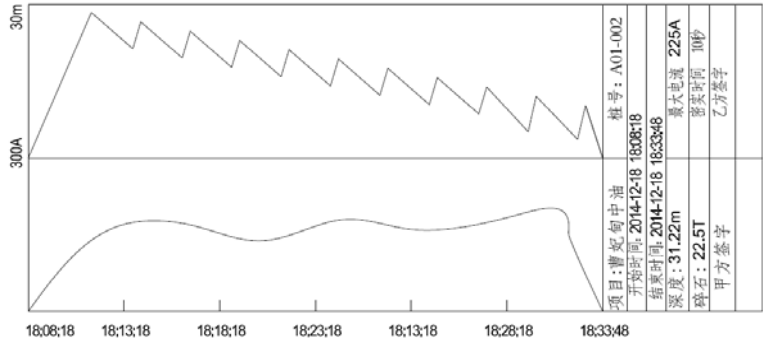
Move cursor to the bottom of the LCD: Choose print, if connect the printer ,this recorder meter will print the real time trend with the depth and current, move the cursor to the trend and press enter :the instrument will display the treed with depth and current ,configurations menu as the followings:



① Trend display the current and the depth the parameter display on the bottom of the LCD is the max. Current and depth. ② configuration menu: move the cursor to the project name ,press the enter key to enter the project name and pile code menu, this system can input Chinese and English as the followings pictures:

黄色框——拼音输入显示区域，从上到下依次是选中拼音，待选汉字，汉字选择数字；红色框——因键盘没有印对应的字母，因此显示一个虚拟键盘，按键按下，对应虚拟键盘也会模拟按下；

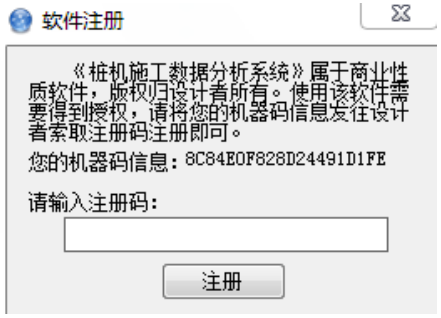
Input the project name and pile code.③ Depth calibration method: a : Zero calibration: Move the cursor to the zero calibration, in the same time to move the piling machine head to just touch the ground (0m), if this time the zero isn't 0 m ,press enter key to calibrate the data to 0 m. b: Depth scope calibration: if the measuring data is different to the real depth, e.g.: recorder meter display :23.15m, moreover the real depth is 25m ,if then to move the cursor to the depth scope calibration and press enter key and type in 25.00,press enter key again ,in this time the depth is calibrated ,it means to automatic modify the ratio of the depth in the recorder meter. Automatic calibration. Warning :use this method to calibrate the depth scope , please choose big data (far away from the 0 point),this will be more accuracy .④ Trend print:



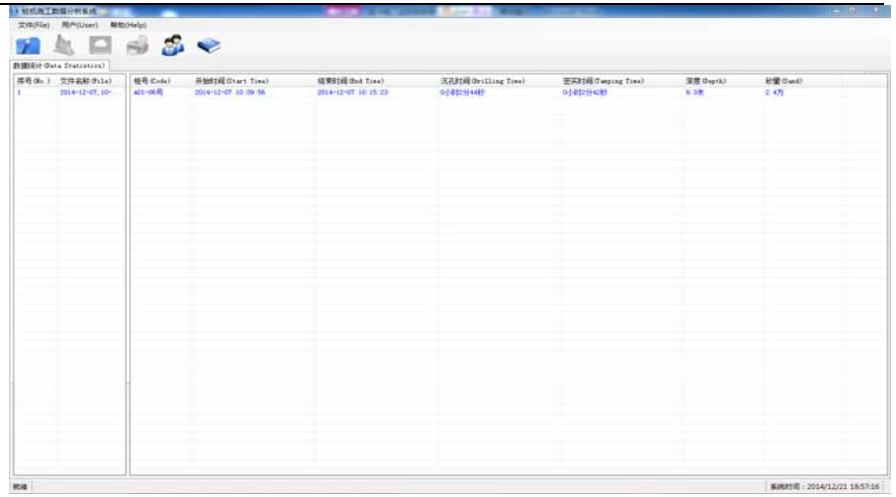
11. Wireless sensor setting: please refer to the EWM-III Piling construction wireless monitoring meter user manual. In the same time only one wireless sensor can be connected.

Piling Quality Analysis System Software

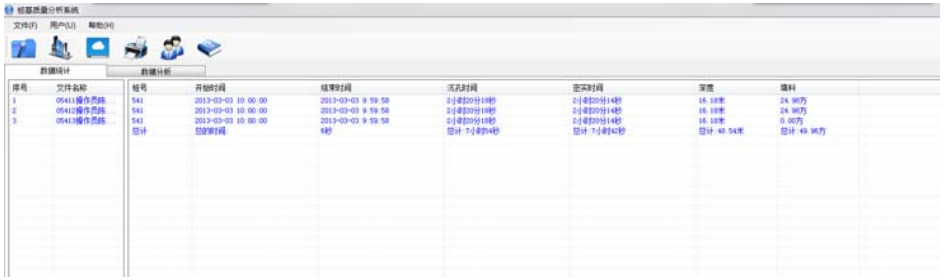
1. Download or copy the software to the computer.
2. Double click the installation file, when on process of the installation, please closed the virus protect software and set this piling quality analysis system software to trustable software.
3. After installation and start the software ,click the help—register, to display the following picture:



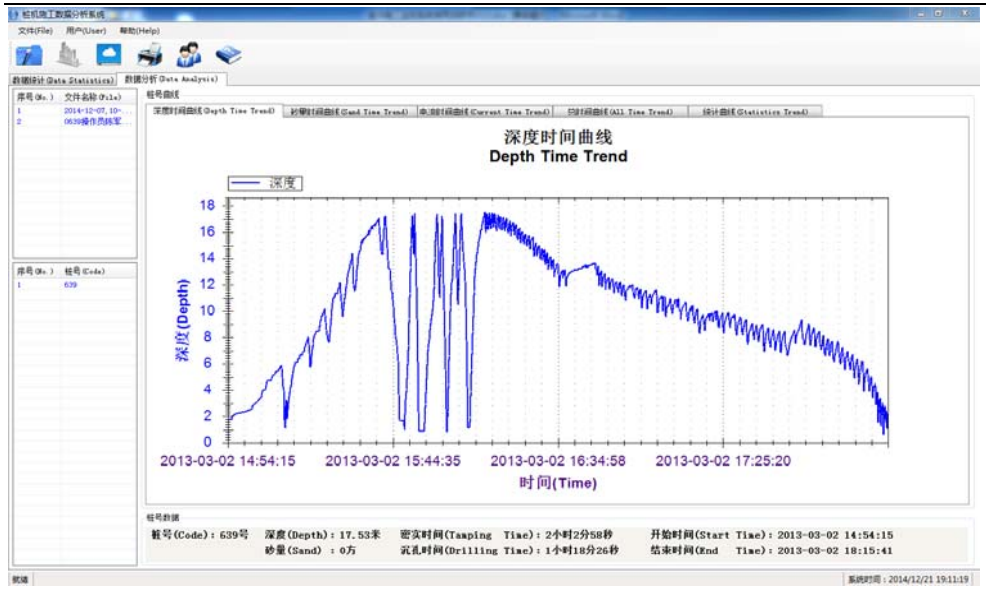
Tell the machine code to the piling monitoring system supplier, and the supplier will give you're a register code, type in the register code click the register. After then, the software can be use normally.



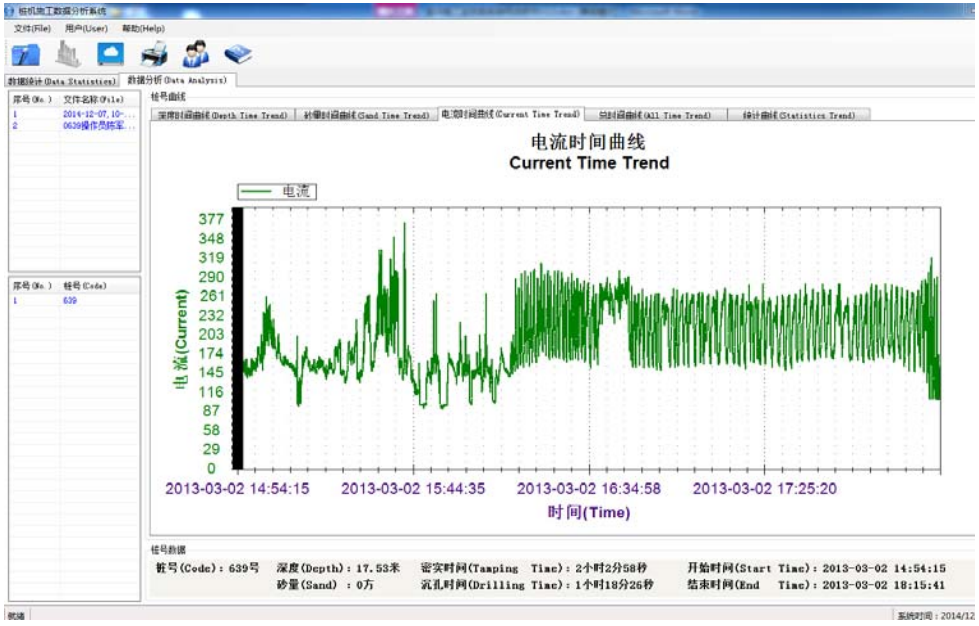
The software without registered just can be use limited ,part functions to analysis the pile data , but can't print :the trend etc.， the registered interface as following:

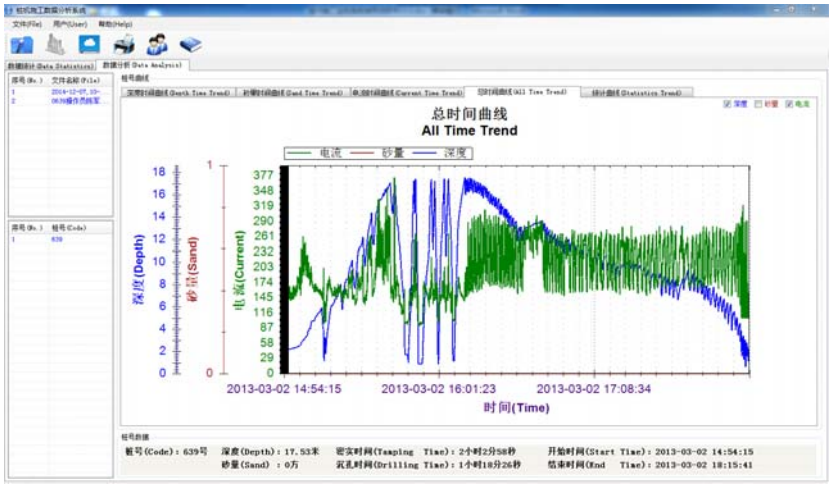


Click the file and open the data which from the recorder meter. Double click the task menu, on the screen right it will display the basic pile data: Start time, end time, pile code drilling time, tamping time, depth filing. Double click the pile code; it will display the followings pictures;

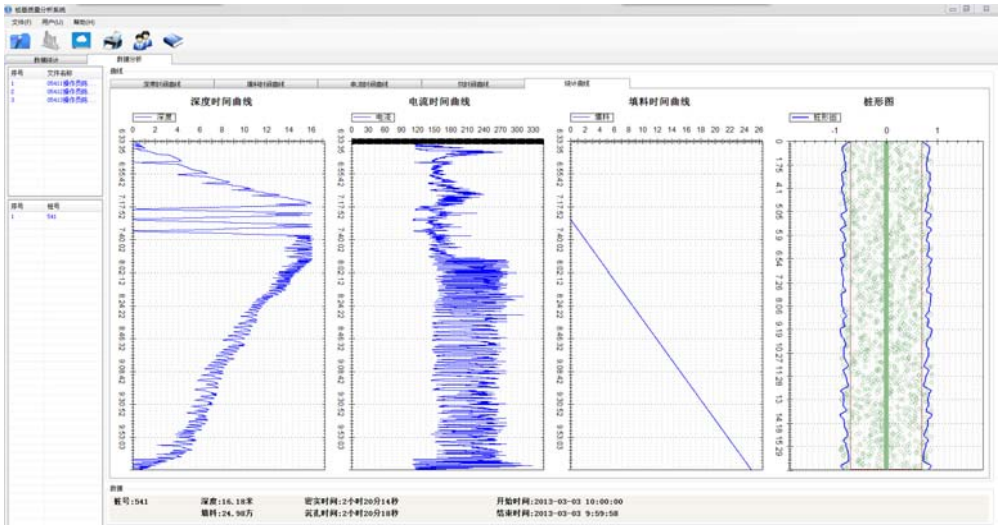


点击砂量、电流、总时间曲线、统计曲线，分别显示以下的状态：



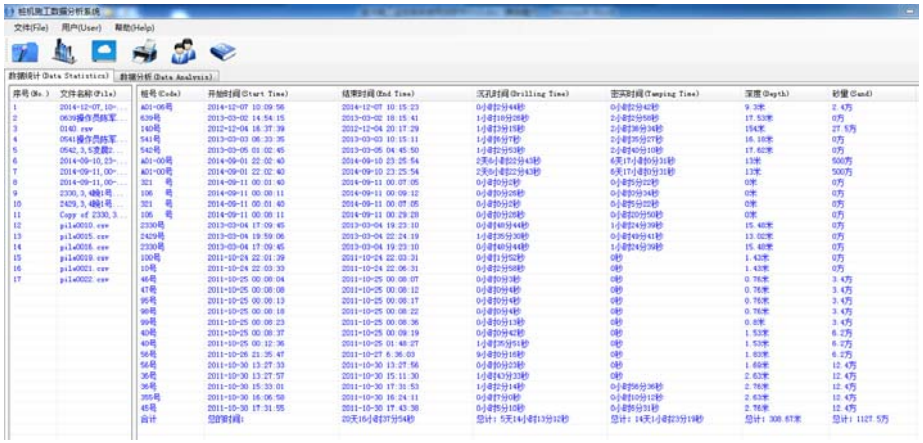


Display the trend ,time and filling,



Combination graph

This software can direct load the folder which the in a lot of pile data inside, the software will automatic find all the piles data, click the Data statistics, it will automatic the statistics all the pile in the screen and calculate the total depth filings, time etc. The statistics can be export data and save as an excel file to store in the computer .。



Whole project piles data

Packing List

1. *EMS-III* Piling construction monitoring system recorder meter 1set
2. Depth sensor unit with 2 pulleys spring press depth detector with rotary encoder 1 set
3. 3wired current sensor 1 set
4. Piling quality analysis system software , USB disk or CD-ROM 1 pcs
5. Option configuration: water pressure sensor *0-1.6Mpa*
6. Option configuration: Air pressure sensor *0-1.6Mpa*
7. Recommend configuration: *EWM-III* Piling construction monitoring meter
8. Option configuration Com port print
9. Option configuration: weighting sensors, automatic electrical scale, and loader weighting system.
10. Made in order if the special requirements.

成都雅蓝特科技有限公司

Chengdu Elanttech Co.; Ltd.

地址： 成都市金牛金丰路 6 号量力钢铁交易大夏 16 楼 15 号

Add: Room 15,16F, Building C, Liang LI Steel Trade Building, No.6 Jin Feng Road Jin Niu district, Chengdu P.R.China.

Tel： +86 28 66358046 Mobile：+86 13308184906

Fax： +86 28 66476368 QQ: 361477353

E-mail: elanttech@163.com Skype: tyjll582