

HEWAY

通用型水质检测控制器 UC1000

氨氮、硝氮、氟离子、氯离子、浊度、SS、COD、DO、pH/ORP.....

在线水质检测仪



CE

FC

用户手册

User Manual
2024, Edition 3

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1 安全说明

1.1 设备说明

UC1000 是专门针对 HEWAY 公司数字系列电极开发的控制器。产品采用金属外壳，防护等级更高。UC1000 适用于污水处理、电厂、地表水等的氨氮、硝氮、氟离子、氯离子、溶解氧、浊度、SS/MLSS、COD、Ph/ORP、电导率、余氯……等参数的测量。

 因其他应用而造成的人身伤害等，我公司不承担相关责任。

技术参数

重量	1.35KG (A)、1.05KG (B)
外壳材料	铸铝喷粉
防水等级	IP65
存储温度	-20 到 70℃
操作温度	-15 到 60℃
电源	直流：24VDC 交流：220VAC
输出	单路 4-20mA 模拟输出，注：最大负载 500 欧姆，提供 12VDC 及 24VDC 输出；
继电器	选配
显示输出	240*180 图形点阵液晶，带 LED 强背光可阳光直射下操作，可视面积 70.7*38.8
实时时钟	独立电池，可使用三年
语言	英文/中文
尺寸	160*128*93mm(A)、160*128*63mm(B)

1.2 安装安全说明

- 安装、运行、维护等操作需专业人员进行（或经由 HEWAY 厂商指导培训后的人员）。
- 电气连接需专业人员进行。
- 技术人员在操作设备前请详细阅读本说明书。
- 在进行测量前，请确认所有的连接正确，所有的接头线缆等没有破损。
- 请不要操作损坏的设备，如果发现损坏，请标记下来并联系我们的客服。
- 数值测量及分析须经专业人士。

1.3 使用安全说明

设备在出厂前会做相关的检测。客户在使用前请遵守本说明的内容。

1.4 返修

返修前，请您咨询我们的工程师。

2 产品安装

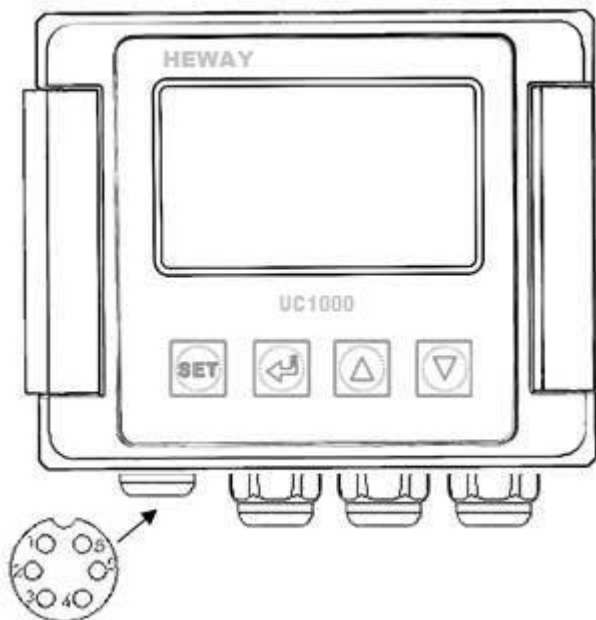
2.1 接收、运输、储存

- 接收前保证包装完整！告知供货方任何损坏并保留破坏的包装；
- 确保包装内设备无损坏；告知供货商包装内设备是否损坏；
- 确保发送内容与订单一致；
- 包装内应包含防冲击泡沫等。如果有其他任何问题，请咨询当地的供应商。

2.2 安装说明

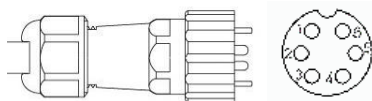
2.2.1 电气安装

- 数字电极在使用时，请首先详细阅读电极对应的说明书，并按照说明书内规定的步骤进行操作。
- 数字电极的线缆接头，请按照特定方向插入 UC1000 控制器的对应端子，并避免用力插拔，以防止连接件损坏。
- 数字电极在出厂时，已连接相应的端子。在未有特殊说明时，数字电极都可以直接与 UC1000 连接。系统会自动探测数字电极的地址，并调用对应的电极界面。



⚠ 注：

- 传感器安装地点需要容易进行施工操作；
- 选择的安装地点需要具有代表性的浓度以及足够的流量。
- 如果控制器需要户外安装，那么必须安装一个保护套。



在安装点进行设备安装

1. 正确安装控制器，如墙壁等；
2. 正确连接线缆，并保证线缆不会有机机械损伤或被其他线缆造成的交叉干扰。

注： 1:12V； 2:GND； 3:485A； 4:485B； 5:24V； 6:接地；

2.2.2 机械安装

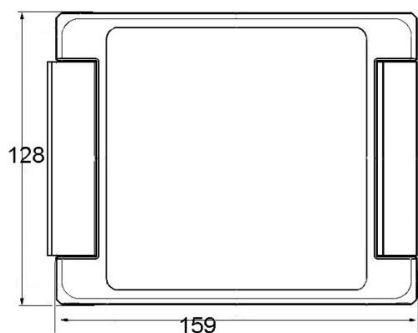
UC1000 支持多种安装方式（盘装、管道安装以及轨道安装）。随包装会附送两安装片，用于固定 UC1000，如下图所示：



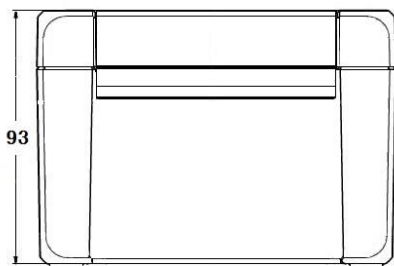
位于 UC1000 表面右侧的亮金属部分可以用手打开。打开后可以看到两个固定螺丝。客户如果需要连接 UC1000 的开关量输出以及模拟量输出，就需要旋下这两个固定螺丝，再将电气线连接到对应的端口处。



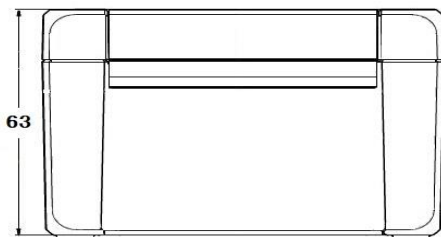
⚠ 用户在旋紧或旋下固定螺丝时，请勿过分用力。否则壳体的螺纹会受到损伤。同时客户须使用相应的工具进行操作。



前盖尺寸



底座尺寸 (A)



底座尺寸 (B)

2.3 安装后检测

- 设备安装后，检查所有的连接。
- 检查线缆是否有破损
- 检查线缆是否会存在被电磁干扰的可能。

3 连线

- 电气连接请具有资质的操作人员进行；
- 操作人员需阅读使用手册。
- 在连接前关闭电源。

3.1 电气连接（接线端子从左到右）

端子	标识	功能	接线说明
1	V1（V12）	电源输出 12V+	直流输出+
2	V2（V12）	电源输出 12V+	直流输出+
3	A	传感器通讯 RS485A	传感器信号输入
4	B	传感器通讯 RS485B	
5	V0	电源输出 12-	直流输出-
6	V0	电源输出 12-	直流输出-
7	I1-	0/4~20mA 模拟输出 1 负	默认第 1 路
8	I1+	0/4~20mA 模拟输出 1 正	
9	I2-	0/4~20mA 模拟输出 2 负	备用 离子仪专用
10	I2+	0/4~20mA 模拟输出 2 正	
11	A	Modbus 通讯 485A	控制器对外通讯
12	B	Modbus 通讯 485B	
13	S1	输出继电器 1	
14	S2	输出继电器 2	
15	EARTH	仪表接地	电源接地
16	L	电源输入火线或正极	220VAC 或 24VDC+
17	N	电源输入零线或负极	220VAC 或 24VDC-

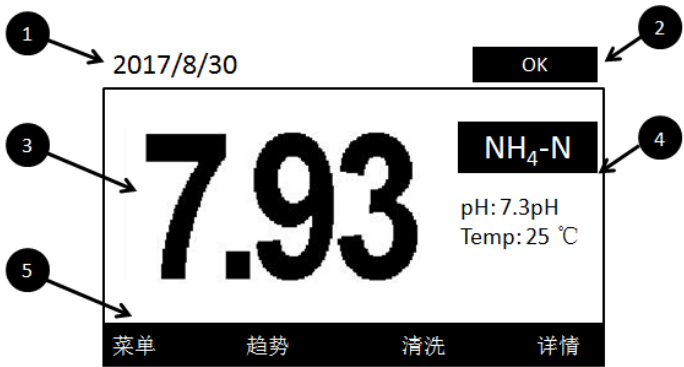
备注：仪表仅支持单一电源输入，当采用直流供电时，正负电源不可反接，否则会损坏仪表。

4 操作说明

4.1 显示及操作单元



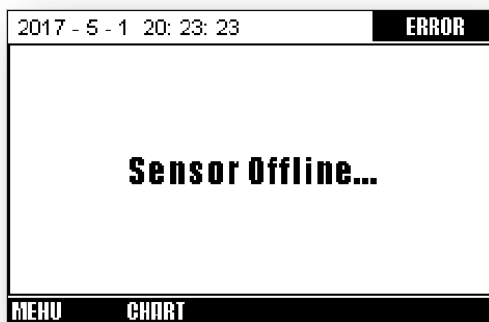
4.2 按键说明



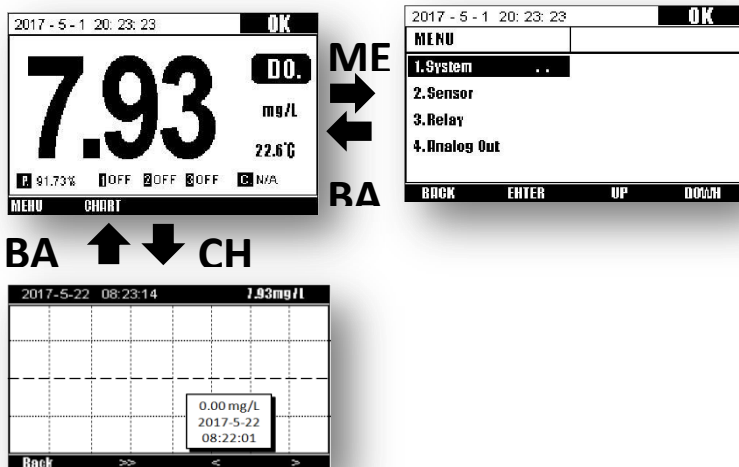
- 1、日期提示；
- 2、屏幕右上角“OK”为状态提示。如果设备处于非正常状态，会有如“ERROR”等提示。
- 3、当前测量值显示。
- 4、从上至下分别为当前测量参数、单位以及温度信息（具体显示内容会根据电极类型不同而有所差异）。
- 5、屏幕下方带有功能提示，用户仅需按照提示的内容选择对应的按键。

4.3 局部操作

4.3.1 界面及界面操作



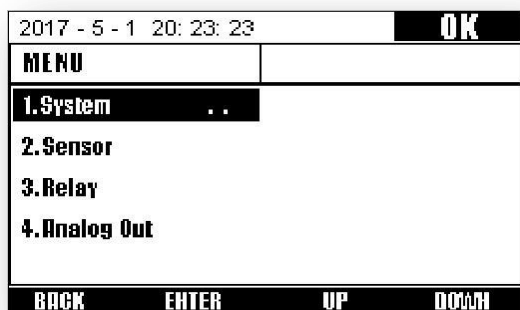
未连接传感器提示



可以通过图示中按键在界面之间进行切换。

4.3.2 菜单

通过主界面，按下菜单键 ，并输入正确的密码后即进入了设置界面。密码在初始状态时为 0000



。

功能	设置参数	描述
系统（System）		
时 间 日 期 (DateTime)	年（year）	设置年份
	月（Month）	设置月份
	日（Day）	设置天
	时（Hour）	设置小时
	分（Minute）	设置分钟
	秒（Second）	设置秒
背光（Back Light）	设置 LCD 背光模式	定时（1 分，2 分，5 分，10 分），常亮，常闭；
语言（Language）	设置设备显示语言	中文、英文
曲线周期（Chart Period）	设置曲线图，数值记录的间隔时间	曲线图内数值将按照本设置内的时间间隔记录数值（共可存储 200 个点）。如设置为 1 分，则每隔 1 分钟存储一个测量值，并连续记录 200 个点。随后随着新测量值的记录，一开始记录的数值将被自动丢失。
地址（Modbus Addr）	设置通讯地址	请勿修改
波特率（Modbus Baudrate）	设置通讯波特率	请勿修改
密码（password）	设置设备菜单密码	四位密码
载入默认配置（Load Default）	恢复设备出厂状态	系统将重启以恢复设置。
软件版本（Version）	当前软件版本	
发布日期（Release）	对应软件版本的编辑时间	
传感器（Sensor）		
注：菜单会因传感器类型而存在差异		
		选择当前传感器的类别：氟离子、氯离子、

传感器类型 (Sensor Type)	传感器类型 仅参考 (以版本为准)	氨氮、硝氮、溶解氧，溶解氧 P、浊度，悬浮物，低浊度，低浊度 P……等。 O2: LDO H MLSS: TS LINED SS: TC LINE D 浊度:TCS LINE D 低浊度 P: TU80S 氟/氯/氨氮/硝氮: Lyter 更多传感器可选，详细请咨询！
标定 (Calibrate)		传感器标定，不同电极采用标定方法不同。请按照屏幕提示进行操作。
标定 (Calibrate)		依传感器而异 请按照屏幕提示进行操作。
传感器初始化 (Sensor Initialization)		初始化传感器设置。
标定重设 (Reset Calibration)	重置标定的数据	这时恢复原厂设置的标定数值。客户可重新标定。
温度校正 (Temp. Offset)	设置温度的偏移值 (针对 pH 以及电导)	设置显示温度与实际温度之间的偏移量；如显示温度为 20 摄氏度，实际温度是 21 摄氏度，那么设置偏移量为+1 度。
单位 (Unit)	设置输出数值的单位 pH: 可选 pH 或 mV； 电导率: 自动切换； 溶解氧: %或 mg/L； 浊度: 固定 NTU	单位被固定后，主界面数字以及模拟量输出等会发生相应改变。
刮刷周期		设置悬浮物/浊度传感器的刮刷间隔时间；
时间因子 (Response Factor)		设置传感器响应时间，建议客户保持出厂状态；

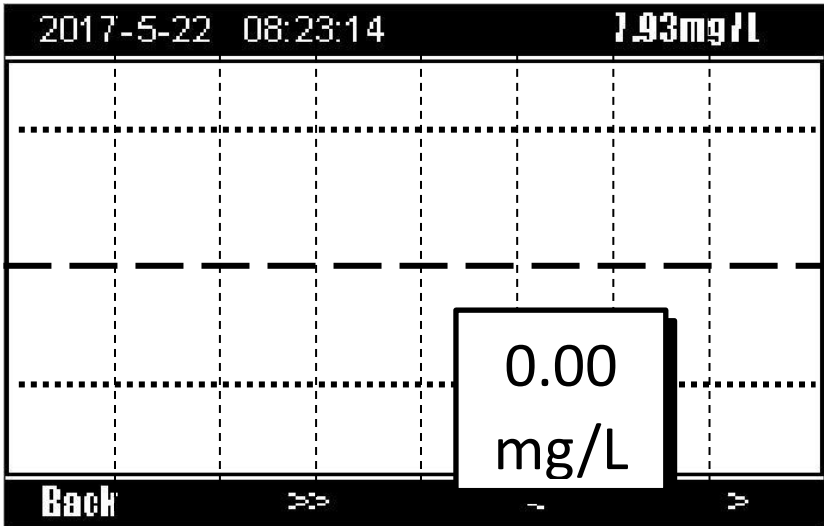
开关量 (Relay)		
R1 模式 (R1.Mode)	继电器 R1 模式设置 (上限接通 Higher ON, 下限接通 Lower ON, 保持接通 Always ON, 保持断开 Always Off, 错误时接通 ON in error, 错误时断开 Off in error, 冲洗开关)	上线接通: 当测量值达到设定的上限值时, 继电器开通; 当测量值低于设定的下限值时, 继电器关闭; 此时设定的上限值必须大于设定的下限值。 下限接通: 当测量值达到设定的上限值时, 继电器关闭; 当测量值低于设定的下限值时, 继电器开通; 此时设定的上限值必须大于设定的下限值。 保持接通: 常开 保持断开: 常关 错误时接通: 系统错误时开 错误时断开: 系统错误时关 冲洗开关: 将当前继电器设置为压缩气控制开关。
R1 下限 (R1.Lower Level)		设置下限值的具体数值
R1 上限 (R1.Higer Level)		设置上限值的具体数值
R2 模式 (R2.Mode)	继电器 R2 模式设置 (上限接通 Higher ON, 下限接通 Lower ON, 保持接通 Always ON, 保持断开 Always Off, 错误时接通 ON in error, 错误时断开 Off in error, 冲洗开关)	上限接通: 当测量值达到设定的上限值时, 继电器开通; 当测量值低于设定的下限值时, 继电器关闭; 此时设定的上限值必须大于设定的下限值。 下限接通: 当测量值达到设定的上限值时, 继电器关闭; 当测量值低于设定的下限值时, 继电器开通; 此时设定的上限值必须大于设定的下限值。 保持接通: 常开 保持断开: 常关 错误时接通: 系统错误时开 错误时断开: 系统错误时关

		冲洗开关：将当前继电器设置为压缩气控制开关。
R2 下限 (R2. Lower Level)		设置下限值的具体数值
R2 上限 (R2. Higer Level)		设置上限值的具体数值
冲洗周期 (Rinsing Period)	设置两次冲洗之间的间隔时间	
冲洗时长 (Rinsing Duration)	设置每次冲洗的时长	
保持周期 (Holding Time)	设置冲洗后系统维持冲洗状态的时长	在保持周期内，数值显示停止更新。模拟量输出维持为冲洗之前的数值。
模拟量输出 (Analog Out)		
模式 Mode	设置毫安信号输出模式 (OFF, 4-20mA, 0-20mA)	设置模拟量信号输出的模式。 OFF: 暂停输出;
高值 High Scale		根据 Unit (单位) 设置，设置 20mA 对应的测量值。
低值 Low Scale		根据 Unit (单位)，设置 0 或 4mA 对应的测量值。(某些测量模式下，低值被固定设置为 0ppm 或 mg/L)。
失效模式 Fail Out		设置系统错误时模拟量的输出值。

备注：以上菜单仅作参考，以最新版本为准！

5 系统运行

5.1 曲线操作



控制器 UC1000 可以存储测量参数对应的 200 个测量点数值，每个测量点的时间间隔可以在菜单内进行设置。控制器内的曲线功能可以将 200 个点的数值显示在图表内。

用户无需对显示范围进行设置，控制器可以根据选择的参数类型进行自适应扩展，以适应多种测量显示任务。

>>、>、< 控制键用于设置光标的位置。光标对应处会显示当前测量点的时间以及测量值信息。

5.2 清洗操作

控制器 UC1000 的清洗功能是通过 R3 继电器实现的(R3 继电器被固定设置为清洗用)。这时用户设置冲洗周期、冲洗时长等实质是控制 R3 继电器被激活

的周期以及持续时间等。通过 R3 继电器的作用，用户可以控制外部的电磁阀，从而完成整个清洗任务。

注：针对氨氮、硝氮传感器（Lyter 系列），传感器内部已集成了电磁阀，这时无需 R3 继电器即可完成冲洗任务。但用户仍需在菜单的冲洗周期、冲洗时长等位置进行相关设置。

5.3 电极标定

UC1000 控制器根据不同的传感器提供针对性的标定方法。用户只需根据屏幕提示的内容操作即可方便的完成标定过程。一般而言，pH 传感器、氨氮传感器、硝氮传感器需要进行两点标定；溶解氧传感器、电导率传感器以及浊度传感器需要进行单点标定；具体标定的原理用户需查询传感器的使用说明。

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1 Safety Instructions

1.1 about the Instrument

UC1000 is specifically designed controller for our digital series electrodes. It has a metal shell, so the protective grade is much higher. UC1000 is specially for the analysis and measurement of NH₄-N, NO₃-N, DO(dissolved oxygen), TUR(turbidity), SS/MLSS, pH and Conductivity, which are suitable for sewage treatment, power plants, surface water and so on.

 We are not responsible for the personal injury caused by other applications.

Technical parameter

Weight	1.35KG (A)、1.05KG (B)
Shell Material	Aluminum with Powder
Class	IP65
Storage Temp.	-20 to 70℃
Operating Temp.	-15 to 60℃
Power Supply	AC220V、50HZ
	Supply 12V and 24V DC
Output	0/4-20mA Output, max load 500 Ω
Relays	2-Relays, 220VAC/30VDC/2A

Display	240*180 Dot-Array, visible area 70.7*38.8
Timer	Single battery, for 3 years
Language	English / Chinese
Size	160*128*93mm / 160*128*63mm

1.2 Installation safety instructions

- Installation, Operation, Maintenance are required by the professional (or the personnel trained by the manufacturer).
- Electrical connections are required by professional personnel.
- Please read this instructions in detail before the operating of the equipment.
- Before making the measurement, please confirm that all the connections are correct and all the joint cables are not damaged. ◦
- Please do not operate the damaged equipment. If the damage is found, please mark it and contact our customer service.
- Numerical measurements and analysis are required by the professional.

1.3 Use safety instructions

UC1000 will be tested ex-factory . Please comply with the contents of this note before the use of the customer.

1.4 Repair

Please consult our engineer before returning to repair.

2 Installation

2.1 Receive, transport, Store

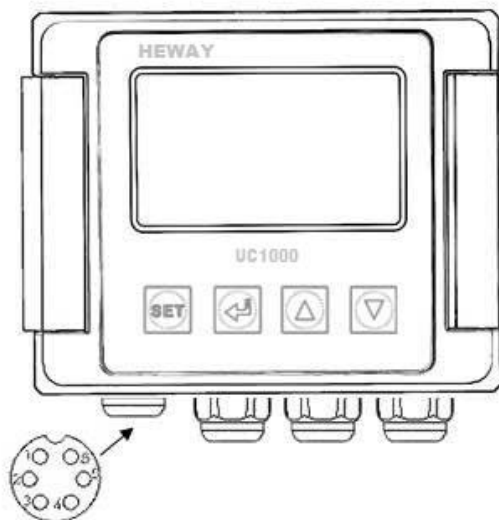
- Ensure the packing completely before receiving it. Inform the supplier of any damage and keep the destruction of packaging.
- Ensure no damage to the equipment in the packaging. Inform the supplier whether the equipment is damaged in the package.
- Ensure that the content is consistent with the order.
- The packaging should contain foam, which protect the equipment. If there are any other questions, please consult the local supplier.

2.2 Installation

2.2.1 Electrical Installation

- Before the digital electrode is used, read the instructions of the electrode in detail. Operate the equipment according to the steps specified in the instructions.
- The connector of the digital electrode is inserted in the corresponding terminal of the UC1000 controller in a specific direction. Avoid the force plugging in order to prevent the damage of the connector.
- The electrodes have been connected to the corresponding

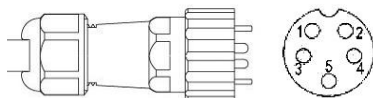
terminals when they are out of the factory. These digital electrodes can be directly connected to UC1000. Before the connection, user should choose the correct electrode-Type, so that the system will call the corresponding electrode



interface.



- The installation ort should be easy to be operated.
- The selected location requires a representative concentration and sufficient flow rate.
- If the controller needs to be installed outdoors, a protective sleeve must be installed. 。



1. Install the controller correctly, such as Wall, etc.

2. Connect the cable correctly, and ensure that the cable will not be mechanical damaged. There should also not be cross interfered by other cables.

1:12V; 2:GND; 3:485A; 4:485B; 5:24V;

2.2.2 mechanical installation

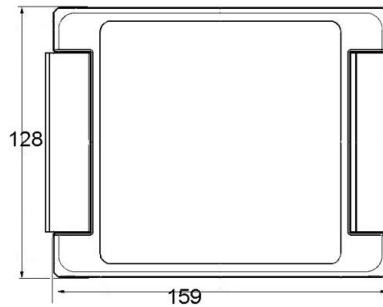
UC1000 supports a variety of installation methods (disk-, pipeline– and track installation). Two mounting pieces are attached to the package to fix the UC1000, as shown in the following figure:



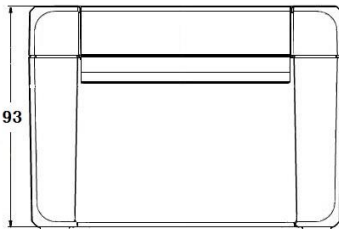
The bright metal part on the right side of the UC1000 surface can be opened by hand. After opening, you can see two screws. If customers need to connect UC1000, it is needed to unscrew these two fixed screws. Then connect the electrical lines to the corresponding ports.



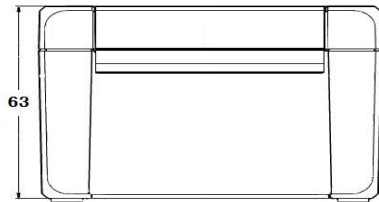
 The screw should not be with much force, otherwise the screw of the shell will be damaged. At the same time, the customer must use the corresponding tools to do the operation.



Front cover size



Base size (A)



Base size(B)

2.3 Testing after installation

- After the device is installed, check all the connections.
- Check whether the cable is damaged or not.
- Check whether the cable is likely to be interfered by electromagnetic interference.

3 Wiring

- Electrical connections are requested by qualified operators;
- Operators need to read the Handbook.
- Turn off the power before connection.

3.1 Electrical connection

All connection-interfaces use 5.08 terminals, and are divided into 2 rows. (From left to right)

Terminal	Sign	Function
1	V1 (V12)	DC 12V+(Power for sensor)
2	V2 (V12)	DC 12V+(Power for sensor)
3	A	Sensor 485 A
4	B	Sensor 485 B
5	V0	DC12V- (Power for sensor)
6	V0	DC12V- (Power for sensor)

7	I1-	mA Output 1- (default)
8	I1+	mA Output 1+ (default)
9	I2-	mA Output 2- (reserved/ION)
10	I2+	mA Output 2+ (reserved/ION)
11	A	Modbus 485 A
12	B	Modbus 485 A
13	S1	Relay 1
14	S2	Relay 1
15	EARTH	Power GND
16	L	Power L / 24VDC+
17	N	Power N / 24VDC-

Note: When using DC power supply, the positive and negative power cannot be reversed, otherwise it will damage the instrument.

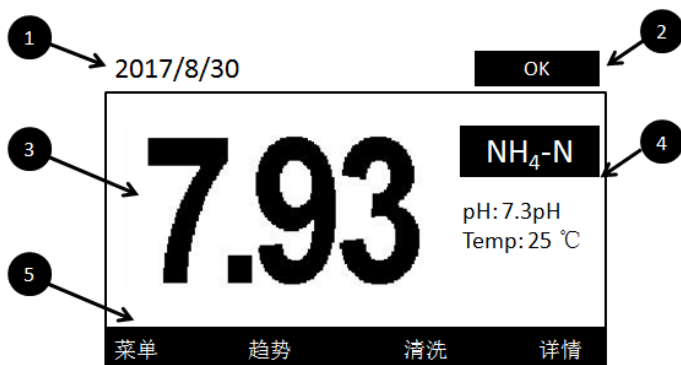
4 Operation

4.1 Display and Operation



4.2 User Interface

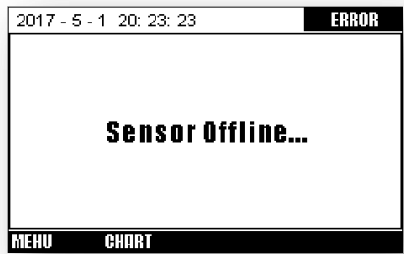




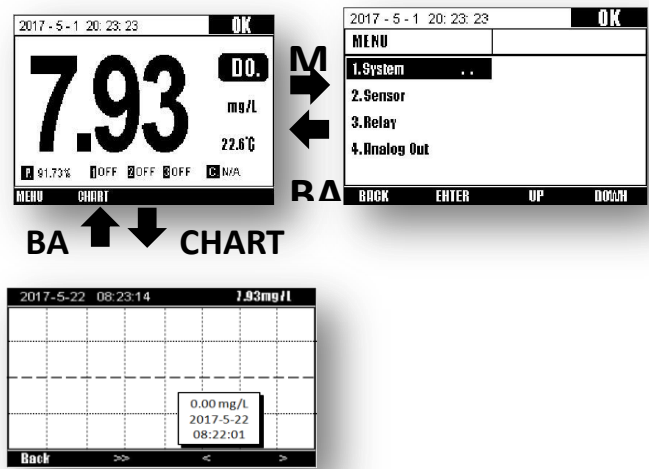
- 6、 The current time;
- 7、 Status。 OK when the equipment in normal mode; ERROR when the equipment in error mode.
- 8、 The current measured value.
- 9、 From up to down, the measured parameter, unit and temperature. This will be different, when different sensor is connected.
- 10、 Functional hint below the screen. The user needs only to select the corresponding key according to the content.

4.3 Operation details

4.3.1 Interface



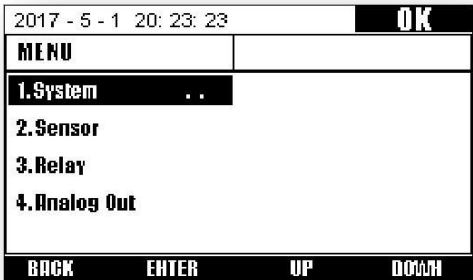
The sensor is not connected.



User can switch between the interfaces by the buttons in the diagram.

4.3.2 Menu

Press the menu button  from main display, with the correct password, it will go into the setup display. The password is 0000 from factory.



parameter		Function
System		
DateTime	year	Set the year
	Month	Set the month
	Day	Set the date
	Hour	
	Minute	
	Second	
Back Light		Timer (1min, 2min, 5min, 10min) , always on, always off;
Language		Chinese, English

Chart Period		The Plan will display the measured value in accordance with the interval record, which be set hier. (A total of 200 Points can be stored). If 1min is set, the measured value would be stored every 1 minute and 200 points are recorded continuously. Subsequently, with the record of the new measurement value, the value of the first record will be automatically lost.
Modbus Addr	Set the Modbus address	
Modbus Baudrate	Set the Baud rate	
password	Set the Password	4 Number
Load Default		System will be reloaded and all the Setting will be lost.
Version	Current software Version	
Release	Date of the software	
Sensor Menus vary with sensor types		
Sensor Type	Different controllers have different sensor types	NH4-N, NO3-N, COND, FCL, DO, pH, SS, TURB, multi-p, can be set NH4-N: ammonia nitrogen, with fix potassium compensation

		NH4-K: ammonia nitrogen, with potassium electrode compensation NO3-N: nitrate nitrogen (without chloride compensation) ; Multi-p: Multiparameter(Default to ammonia nitrogen and nitrate nitrogen) COND: conductivity; DO: dissolved oxygen; pH: PH or Orp TUR: turbidity; SS: Suspended solids
Calibration		The different electrodes are different by the calibration method. Please do the operations according to the screen prompt
pH Calibrate		pH-calibration
Sensor Initialization		Initialize the electrode
Reset Calibration		Give up the current calibration result.
Temp. Offset	Set the Offset value of the temperature (for the pH and Cond. Sensor)	Set the offset between the display temp. and the actual temp. For example, the display temp. is 20, and the actual temp. is 21, then the offset is +1.
Unit	Set the unit of the output value.	The displayed value will be changed, if the unit is changed.

	pH: pH or mV; Cond.: auto mode; DO.: % or mg/L; TUR: NTU	
Brush cycle		To set the time between two Brush-cycle, only for TUR. sensor.
Response Factor		To set the sensor response time. It is advised not to set it.
Relay		
R1.Mode	Higher ON, Lower ON, Always ON, Always Off, ON in error, Off in error, Rinse switch	High ON: When the measured value reaches the upper limit, the relay will be turned on. When the measured value is below the lower limit, the relay will be turned off. The upper limit must be greater than the lower limit. Lower ON: When the measured value reaches the upper limit, the relay will be turned off. When the measured value is below the lower limit, the relay will be turned on. The upper limit must be greater than the lower limit. Always ON; Always OFF; ON in error: turn on when error. Off in error: turn off when error.

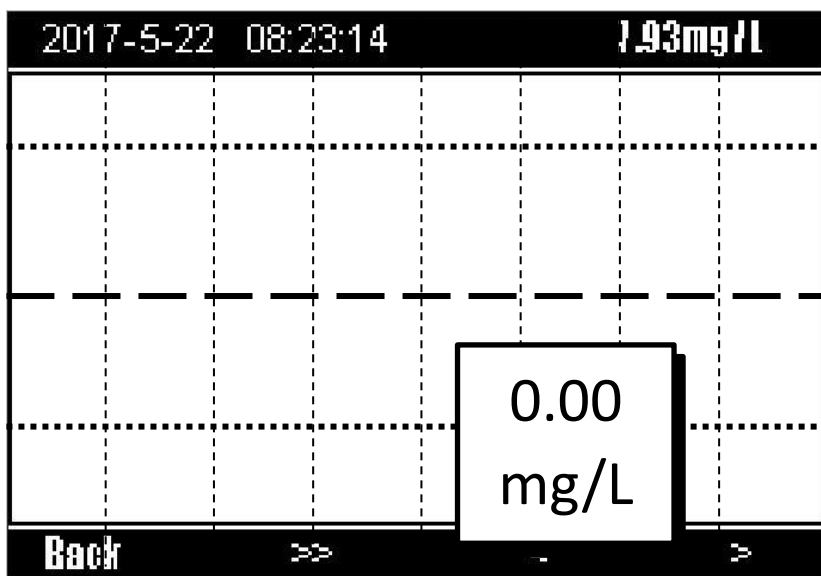
		Rinse switch: the Relay will act as switch for pressure-gas.
R1.Lower Level		Set the value of lower limit.
R1.Higer Level		Set the value of upper limit.
R2.Mode	Higher ON, Lower ON, Always ON, Always Off, ON in error, Off in error, Rinse switch	High ON: When the measured value reaches the upper limit, the relay will be turned on. When the measured value is below the lower limit, the relay will be turned off. The upper limit must be greater than the lower limit. Lower ON: When the measured value reaches the upper limit, the relay will be turned off. When the measured value is below the lower limit, the relay will be turned on. The upper limit must be greater than the lower limit. Always ON; Always OFF; ON in error: turn on when error. Off in error: turn off when error. Rinse switch: the Relay will act as switch for pressure-gas.
R2.Lower Level		Set the value of lower limit.
R2.Higer Level		Set the value of upper limit.
Rinsing Period		Set the period between two rinsing.

Rinsing Duration		Set the duration of the rinsing.
Holding Time		Set the duration after the rinsing, in this time, system will be hold, and keep the old value without new output.
Analog Out		
Mode	OFF 4-20mA 0-20mA	Set the mV-output mode; OFF: mV-output will be stopped;
High Scale		Set the value for 20mA
Low Scale		Set the value for 0 or 4mA. For some sensor the low scale is fixed.
Fail Out		Set the mV-output when error.

Note: The above menu is for reference only, please refer to the latest version!

5 System Operation

5.1 Curve



The controller UC1000 could store 200 measurement points corresponding to the measurement parameters. The time interval of each measurement point can be set within the menu. The curve function within the controller can display the values of the 200 points in the chart.

User do not need to set the display range, the controller could expand the display range automatically according the selected parameter type. Keys >>, >, < are used to set the position of the cursor. By the cursor will

show the time of the current measuring point and the measured value.

5.2 Rinsing

The cleaning function of the controller UC1000 is realized by the R3 relay (the R3 relay is set to be fixed for cleaning). So the settings, washing cycle, washing time and so on are essentially controlling the period and duration of the R3 relay being activated. Through the function of the R3 relay, the user can control the external valve to complete the whole cleaning task.

Note: for Lyter sensor, the valve is already integrated in the sensor. The rinsing task can be completed without the need of R3 relay. But the user still needs to set up the related settings.

5.3 Calibration

The UC1000 controller provides a targeted calibration method based on different sensors. The user can complete the calibration process conveniently by the content operation that is prompted on the screen. Generally speaking, two points need to be calibrated for pH sensor, ammonia nitrogen sensor and nitrate sensor. Dissolved oxygen sensor, conductivity sensor and turbidity sensor need to be calibrated single point (offset calibration); the principle of specific calibration requires users to query the instructions of sensors.



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