DW-DI1500

User Manual

DRAWELL

Artist of Science

Please read the manual before installation and operation.

Drawell International Technology Limited

Chongqing Drawell Instrument CO,.Ltd
Add:Suite 2705,Building No.12,Shiyou Road No.1,Yuzhong District, Chongqing,China
Tel: 0086-023-63268643

Shanghai Drawell Scientific Instrument Co.,Ltd
Add : Suite 1117,Lane561 XiuChuan Rd.,PuDong New Area,Shanghai,China

Web : www.drawell.com.cn
Email : sales05@drawell.com.cn

Identity Record

Device No.: _____

(Displayed on the label at the back of the analyzer)

Date of Receiving & Installing the Analyzer: _____

Content

Revision History Records

Document Version	Software Version	Date
DW-TOC-006 ⑱-2016/A	V1.0	September, 2016 -
DW-TOC-006 ⑱-2018/B	V1.22	June, 2018

Service Commitment

Service Commitment:

For the product manufactured and sold by Shanghai Drawell Scientific Instrument Co., Ltd will provide the high-quality after-sales service, and help users solve various problems.

Warranty Matters:

1. Warranty Time Limit: Drawell Company will provide one-year device warranty period free of charge. The warranty period will be calculated from your purchase date (the purchase date is subject to the invoice).

2. Special Explanation: Under the following circumstances, the product is out of the warranty & replacement range.

◎ The product material or manufacturing is not improper;

◎ The product is used under the abnormal condition;

◎ The product is stored under the abnormal condition, exposed in the humid environment, or exposed to corrosive gases;

◎ The product is repaired without permission, misused, neglected, abused, involved in an accident, or refitted;

◎ The product is incorrectly installed;

◎ The product is damaged due to force majeure events like flood and lightning stroke;

◎ The product is faulted due to the improper operation by the user, like liquid penetration, extrusion by the external force, damage arisen from falling down, mildew and corrosion;

◎ The product is naturally consumed, worn and aged;

◎ The product adopts the parts which are not manufactured and sold by Drawell Company;

◎ The product is damaged due to improper transportation;

◎ The outer package of the returned product is not complete and the parts & attached documents are not complete;

◎ The invoice of the returned product is lost, altered or damaged

◎ The device is out of the warranty period

◎ The consumable materials have been away from the factory for more than three months;

◎ The product is not confirmed by the after-sales service department prior to maintenance and replacement;

◎ The product is not produced and provided by Drawell.

Note: Provide the paid service for the user whose product is out of the warranty period. The service charge shall be determined according to the practical situation. After the user enjoys the maintenance or replacement service, the warranty time limit cannot be extended, but the user may obtain the "re-maintenance obligation guarantee". The device parts and spare parts cannot enjoy the above-mentioned the warranty time limit, but the "re-maintenance obligation guarantee" may be obtained.

3. Warranty Voucher: Invoice

4. Service Mode: Drawell Company will provide the lifetime product service for the user. The service mode offered by the company refers to "technical support service by telephone", "maintenance service by mail", "part service by mail" and "door-to-door service". You may select the appropriate mode to enjoy the service.

For any problem you encounter, please call the customer service hotline of Drawell Company at 021-50966080.

◎ Drawell Company provides all customers with the "technical support service by telephone" of the product. (The service by telephone includes fax, e-mail, etc.)

◎ You may directly send the faulted device or parts to the after-sales service department of Drawell Company for maintenance. The implementation rules on the maintenance service by mail shall be explained by the after-sales service department of Drawell Company.

◎ Company may send the spare parts to you in order to solve your urgent needs – part service by mail "Part service by mail" refers to the service that, when the device is faulted, Drawell Company sends the normal parts for replacement, and then takes back the faulted parts. The device may enjoy such service within the warranty period free of charge. Please call the customer service hotline of Tailin Company for maintenance as required.

Note: You need to return the faulted parts within seven days after receiving the normal parts. If you don't want return the faulted parts, you may purchase them from Tailin Company.

◎ If you need the door-to-door service, please call the customer service hotline for maintenance. The engineer will carry out the analysis for your situation and then make the service order for you. If you need the temporary or urgent door-to-door service, you may apply to the after-sales department of Tailin Company and the expedited service charge may be required to be paid.

Note:

A. We would like to ask you for your understanding that, for the physical damage, Tailin Company cannot provide the door-to-door service free of charge.

B. We would like to ask you for your understanding that, for the simple faults involved in the fault solutions described in the product manual, the company cannot provide the door-to-door service free of charge.

C. Living in the very remote areas (peak, island, forest, etc.), the customer is required to provide the traffic assistance and the service may be delayed.

D. Even though the door-to-door service is purchased, when the customer needs the urgent or overtime service, the customer is still required to pay the additional service charge according to the number of times.

E. In order to protect the intellectual property rights, if Tailin engineer finds that the customer opens the main

device without permission, the related service will not be provided.

F. In order that other customers may also enjoy the prompt service, please give the necessary assistance so as to reduce the waiting time when the service personnel cannot enter the site, as well as the stay time after the maintenance is completed.

Special Attention:

A. We would like to ask you for your understanding that, the "physical damage" is not applicable to the service mode free of charge.

B. During the process of service, the part replacement cannot affect the warranty period of the complete device.

5. Physical Damage: The following circumstances belong to the "physical damage". For the physical damage, Drawell Company cannot provide the warranty service free of charge, even though such damage occurs during the warranty period purchased.

1) The product is faulted due to bad grounding;

2) The product is damaged due to force majeure events like flood and lightning stroke;

3) The product is faulted due to improper operation or maintenance, like liquid penetration, extrusion by the external force, damage arisen from falling down, mildew and corrosion;

4) The product is naturally consumed, worn and aged;

5) The product is refitted, like drilling and painting;

6) The product's all or some components are lost.

6. Disclaimer: Except the responsibilities and obligations specified in the Law of China, Drawell Company

states that it will not undertake any responsibility under the following circumstances.

1) Any joint liability arisen from product fault, including production suspension losses, property losses, casualties, etc.;

2) Service delay arisen from natural disasters, wars or emergency restrictions by the government;

3) Commodity delay arisen from atrocious weather or carrier reasons;

4) As the misunderstanding that may occur during the language communication process cannot be controlled, Drawell Company will not be responsible for any consequence arisen from the technical support service by telephone.

7. Re-maintenance Obligation: For all the service, Drawell Company will provide a certain period of "re-maintenance obligation" guarantee, so that the customer can enjoy the perfect product service.

Within one month after the maintenance service by mail or part service by mail, if the product suffers from the same problem and such problem doesn't belong to the physical damage, the after-sales service department of Drawell Company will provide the same service free of charge.

Complaints and Suggestions:

The after-sales service department of Drawell Company is responsible for acceptance of customer complaints. If

you have any complaint or suggestion, please call the customer service hotline of Drawell Company. Drawell Company apologizes and sympathizes for the problem you encounter. Thank you for your complaints. Your complaints are the concern for Drawell Company, and the best suggestion to promote our work improvement!

Packing List Check Procedure:

Firstly, before use, please check if the actual configuration of the complete device is consistent with the packing list, and inspect if attached documents are complete. If you have any objection, please immediately contact our company. If you don't raise an objection within one week, our company will deem this circumstance as the default.

Notice: Please do not throw away the original packing carton of the product. If the product is required to be carried out the maintenance, the product shall be placed in the original packing carton when being returned. This packing carton has the shake-proof function.

Safety Precautions:

1. The external power supply shall be disconnected before the device is cleaned.
2. It is ensured that the power supply voltage meets the device requirements.
3. The power supply shall be disconnected when the device is not used for a long time.
4. The liquid is not allowed to enter the device case.
5. In order to ensure the safety, the non-professional personnel are not allowed to open the device case. Only the professional personnel are authorized to open the device case.
6. When the following problems occur, please ask the maintenance personnel to carry out device check.
   A. The power cord or socket is damaged.
   B. The liquid enters the device.
   C. When the device is not normally operated, after the user refers to the product manual, the device is still not normally operated.
   D. The device is damaged.
   E. There are abnormal signals on the device.
7. Avoid collision and knock during the process of transportation.
8. Pay attention to all warnings and precautions.

Attentions

In order to ensure your safety and avoid unnecessary losses, before the unpacking, installation and operation of the device, please carefully read this operation manual, and especially pay attention to the explanation information on dangerous & cautious matters. Otherwise, it may lead to operating personnel injury and device damage.

Follow all safety tips described in this manual, and pay attention to all information & tips displayed on the control software interface.

1. Installation and Debugging

Before the first startup (debugging), or after the device is not used for a long time or the device is carried out the maintenance, the operator shall ensure that the device and its protective device are in good condition.

2. Safety Guide for Parts

As the protective glass of the UV reactor is used to protect the operator from ultraviolet radiation, please do not remove or destroy the protective glass during the process of operation.

Notice: Please do not stare at the protective glass for a long time, so as to avoid affecting the vision!

Before the UV lamp or peristaltic pump pipe is replaced, the power supply shall be disconnected, so as to avoid electric shock risk.

3. Safety Guide for Repair and Maintenance

3.1 The maintenance personnel or authorized professional personnel who don't belong to our company are not allowed to remove the parts & circuit boards in the device case. Otherwise, the personnel involved in this mater shall be responsible for the device damage consequences.

3.2 This product needs the I-grade safety protection. The power supply must be reliably grounded. Otherwise, it may lead to electric shock accidents or device damage.

3.3 Please use the fuse with the same specification, so as to avoid short circuit or device damage.

3.4 Before the on-line mode is used, it is required to wash the pipe and calibrate the device in the off-line mode.

3.5 After the device is used to test the high-concentration water sample, it is required to wash the pipe with the high-purity water or deionized water with low organic carbon concentration, and the washing time refers to the manual.

3.6 When the device is used, if the water sample contains visible insoluble particles, please carry out the pretreatment for the sample, so as to avoid that the pipe in the device is blocked. If the content of suspended solid is very high in the water sample which is carried out the on-line test, it is required to regularly replace the filter.

I. Product Introduction

DW-DI1500-OL TOC analyzer is specially used to test the total organic carbon in purified water, water for injection, ultrapure water and other deionized water.

The device is controlled by the software  installed on the computer, so as to carry out the analysis and processing for data.

1.1 System Composition

DW-DI1500-OL TOC analyzer is composed of 5 main parts.

(1) Shunt

(2) Oxidation reactor

(3) Carbon dioxide sensor

(4) Peristaltic pump

(5) Control software installed on the external computer TOC-Multi & Simult

1.2 Shunt

The water sample enters the device through the sample inlet pipe. Then, it is divided into two equal flow paths. One passes through the delay coil and enters the carbon dioxide sensor, and the signal value of the water sample which is not oxidized may be tested. The other passes through the oxidation reactor, and enters the carbon dioxide sensor after the organic substance is decomposed into carbon dioxide under the photo-catalytic oxidation of the UV lamp, and the signal value of the water sample which is oxidized may be tested.

1.3 Oxidation Reactor

The oxidation reactor is composed of the UV lamp and quartz glass. The UV radiation source is directly placed in the reactor. The wavelength adopted by the UV lamp selects 185nm and 254nm, so as to ensure high radiation density and effective decomposition capacity.

The device uses the UV ray to oxidize an organic compound into carbon dioxide. The oxidation reactor is a UV lamp wrapped by the spiral quartz tube. The UV lamp can emit 185nm & 254nm UV ray, so that the water is carried out the photolysis.

$H_2O + h\nu\ (185nm) \rightarrow OH\cdot + H\cdot$

The hydroxyl radical (OH·) can completely oxidize an organic compound into carbon dioxide.

Organic Substance + OH → CO_2 + H_2O

1.4 Carbon Dioxide Sensor

The device has two carbon dioxide sensors which are composed of sensor and temperature sensor. When the sample is measured, the double-precision technology is adopted, so as to achieve automatic calibration and temperature compensation.

1.5 Peristaltic Pump

The peristaltic pump is located at the rear end of the device. Its purpose is that, for each measurement, the sample solution is transported to the shunt by the pump, until the liquid is discharged to the liquid waste bottle.

1.6 Control Software

The control software is installed on the computer (provided by the user company), offers the data processing, and ensures the test data completeness, traceability, and electronic signature, as well as the security permission confirmation of computer system.

1.7 Temperature Sensor

The test unit is equipped with the temperature sensor which is used to measure the environmental temperature in the test unit.

1.8 Key Parts

No.	Name	Specification	Place of Production
1	UV Lamp	UV-2, 185nm, 254nm	China
2	Teflon Pipe	Outer Diameter 1/16" ×Inner Diameter 0.02"(0.75mm)	USA
3	Peristaltic Pump Pipe	Inner Bore 0.8mm ×Wall Thickness 1.6mm UK Watson-Marlow	UK

II. Structural Features and Operating Principle

2.1 Structural Features

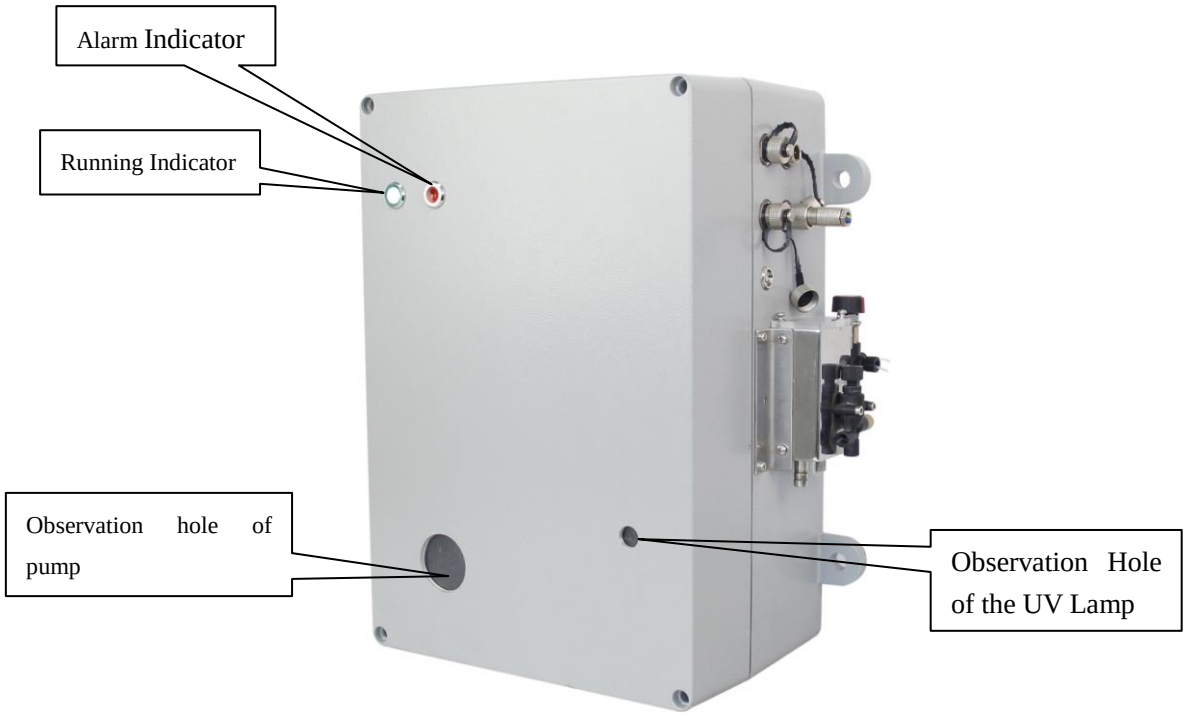


Figure 2-1 Front View of the Device

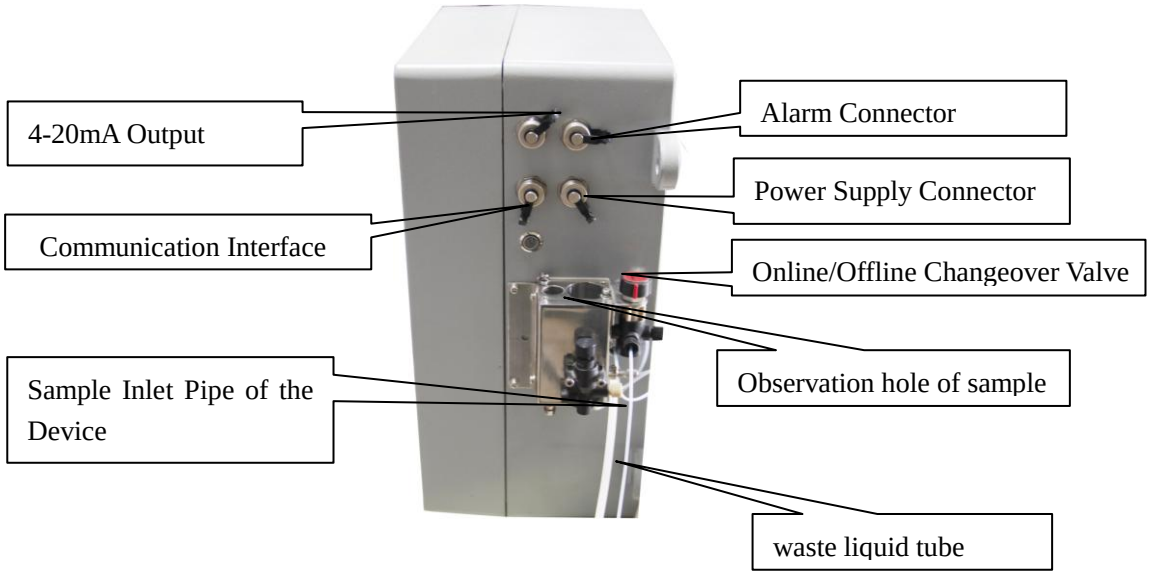


Figure 2-2 Side View of the Device

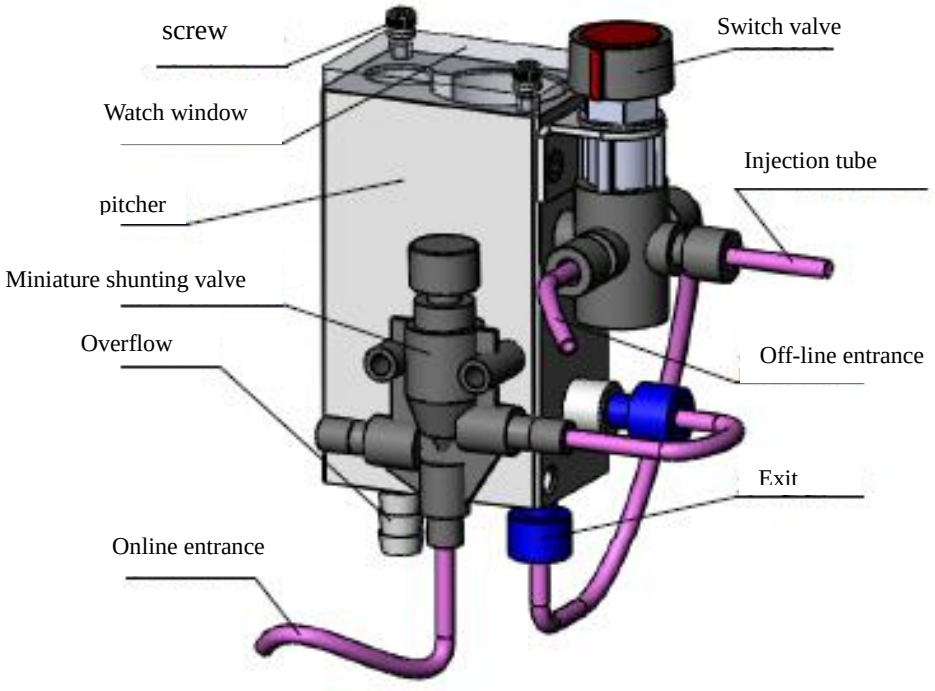
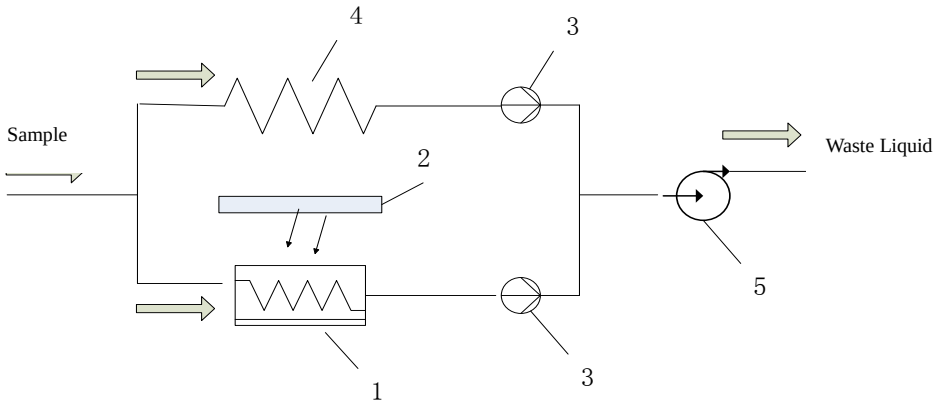


Figure 2-2 On-line sampler diageram

2.2 Operating Principle



1 —Spiral Quartz Glass Tube 2 — UV Lamp 3 —Sensor

4 — Delay Coil 5 — Peristaltic Pump

Figure 2-3 Schematic Diagram of the Operating Principle

The water sample enters the device through the inlet. Then, it is divided into two equal flow paths. One passes through the delay coil 4 and enters the sensor 3, and the response value of the sample which is not oxidized may be tested. The other passes through the spiral quartz glass tube 1, and enters the sensor 3 after the organic substance in the water is decomposed into carbon dioxide under the irradiation of the UV lamp 2, and the response value of the sample which is oxidized may be tested. According to the difference

between the response values before and after UV lamp oxidization, the TOC value may be obtained by using the corresponding formula. Finally, the liquid waste is discharged from the drain pipe through the peristaltic pump 5.

2.3. Operating Principle of Online Detection Device

2.3.1 The fundamental principle of this online detection device is to use online sample injection pipe connecting to miniature flow divider, then carry out exact split-flow and control. The flow entered into water tank from split-flow runner is adjusted by rotating miniature flow divider and regulating nut, water pressure is released after entered into water tank, which makes the pressure of water tank under the normal atmospheric pressure to facilitate device sampling. Online water intaking pipe gets the water from the bottom of water tank, while excessive water is discharged through drainage channel of water tank.

2.3.2 Changeover Valve

Rotate the changeover valve to switch the working status. It is online mode as shown in figure 4-3. When the bulge line on the changeover point at the offline sampling pipe, it is offline detection mode.

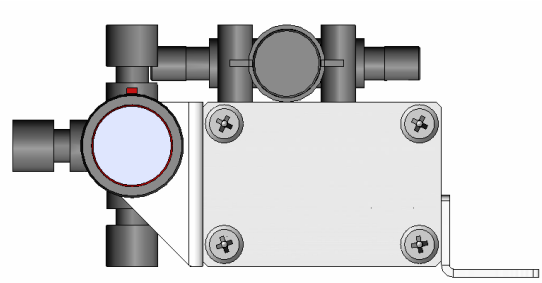


Figure 2-5 Offline Mode

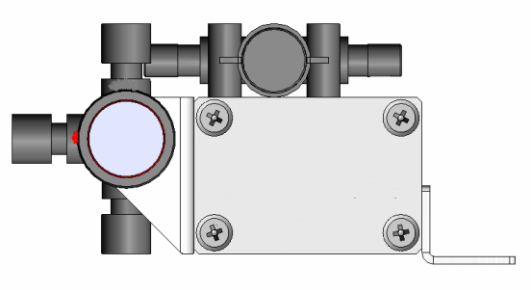


Figure 2-5 Online Mode

2.4 Application Scope

This system is used to test the TOC concentration in purified water, water for injection and high-purity water of the pharmacy industry; suitable for the TOC test of the ultrapure water in the semiconductor industry, power plants, research & development institutions, pharmacy industry, chemical industry, etc.

III. Technical Parameters and Key Parts

3.1 Main Technical Parameters

Description			
Device Type	TOC Analyzer		
Model	DW-DI1500-OL		
Basic Information			
Gross Weight	9.5kg		
Basic Dimension	34cm×24cm×16cm		
Device Connection			
Power Supply	(100~240) VAC		
Power Supply Frequency	50Hz/60Hz		
Rated Power	100W		
Installation Condition			
Environmental Temperature	(10~60) ℃		
Relative Humidity	≤100%RH		
Process Parameter			
TOC Test Range	(0~1500.0) μg/L		
Repeatability Error	≤ 3%		
Maximum Relative Error	±5%		
Decomposition Principle for Organic Substances	UV ray decomposition		
Wavelength	185nm, 254nm		
Test Liquid Temperature	(1-99)℃		
Control/Assessment	Real-time pattern, measurement results and printed reports		
Conductivity Test Range	(0~5.100) μS/cm		
	Suggestion:	TOC value of the solution to be tested	Best conductivity range
		Below 0.200 mg/L	＜1.000μS/cm
		（0.200～0.500）mg/L	＜3.000μS/cm
		（0.500～0.750）mg/L	＜5.000μS/cm
		（0.750～1.500）mg/L	＜5.100μS/cm

3.2 System Requirements of the External Computer

3.2.1 Database Server Terminal Configuration

Hard Disk	7×24-hour online detection or long-time operation, more than 500G (1T is recommended).
RAM	4GB and above
CPU	2.0GHz, dual-core and above
Network Card	100Mbps and above
Displayer	1360*768*32bit and above, with Independent Graphic Card (The RAM should be above 8GB, if it hasn't independent graphic card)
Mouse	Standard three-key and above
Keyboard	Standard keyboard

3.2.2 Client Terminal Configuration

Hard Disk	500G ordinary disk and above
RAM	4GB and above
CPU	2.0 GHz, dual-core and above
Network Card	100M and above
Displayer	1360*768*32bit and above, with Independent Graphic Card (The RAM should be above 8GB, if it hasn't independent graphic card)
Mouse	Standard three-key and above

3.2.3 Computer Software Installation Environment

Server Terminal Operating System	Windows XP、Windows 7、Windows 8.1、Windows 10 ，Windows Server 2012R2(sever side)，32Bit/64Bit （The above OS are recommended，but the home versions are not recommended）
Server Terminal System Partition	The hard disk has at least two partitions
Client Terminal Operating System	Windows XP、Windows 7、Windows 8.1、Windows 10，32Bit/64Bit （The above OS are recommended，but the home versions are not recommended）

IV. Transportation and Storage

4.1 Transportation

Notice: If there are residues in the pipe when the device is transported, this may lead to the device damage. Therefore, the device shall be completely emptied before transportation.

Importance: The improper packing material may lead to the part damage!

The device shall be placed in the original package when being transported. The sufficient measures shall be taken so as to ensure the safety of transportation.

4.2 Storage

The TOC analyzer packed shall be stored in the room which is well-ventilated, shady, cool and clean with the relative humidity of not more than 80% and has no corrosive gases. The transportaton shall meet the requirements specified in the order contract, and avoid being collided and affected with damp.

If this device is required to be removed and reinstalled, please contact the device manufacturer and ask the professional technician to give necessary assistance to solve the related problems.

V. Environment, Samples and Reagents

5.1 Environmental Requirements

The device shall be placed in the environment which is suitable for operation, with constant temperature & humidity. Avoid direct sunlight and supernormal temperature. If the temperature is too high (more than 104℉/40℃), this may lead to abnormal operation. If the temperature is too low (less than 50℉/10℃), this may lead to large measurement value errors.

Do not directly place the device beside the door or window.

Do not install the device near the electromagnetic radiation source.

Keep the device away from direct sunlight and irradiators: if necessary, it is required to install the air conditioner.

Do not obstruct the ventilation opening of the device.

Importance: Take into consideration enough space demands! The space demands include all constituent parts of workplaces, like computers, displayers, printers and other possible accessories.

⚠ Attentions

- **The original packing material of the device shall be carefully kept. The installation shall be carried out by the professional technician of the company.**
- **If the device is required to be returned and repaired for reasons, the device must be placed in the original carton so as to avoid that the device is damaged during the process of transportation.**

5.2 Sample Treatment

It is specially noted that, when the ug/L-level concentration solution is prepared and stored, CO_2 and organic gases in the air of the laboratory may lead to the solution change. In order to avoid such circumstance, it is recommended to take the following measures:

The contact area between the solution and air shall be as small as possible;

Avoid that the sample is stored for a long time. Try to immediately use the sample after the sample is obtained;

The sample storage container shall be cleaned up, so as to avoid the secondary pollution;

According to the requirements of the device test principle, try to avoid testing the water sample which has high conductivity & high TOC value and contains the visible insoluble particle, so as to protect the internal test unit of the device from damage. If the conductivity of the water sample is very high, this may cause that the test value of the device is abnormal. Please wash the pipe with the ultrapure water which has the conductivity of less than 1.0μS/cm (25℃) and TOC of below 0.04mg/L for a long time.

5.3 Reagent Requirements

*** Only the clean glass ware can be used to prepare and store the solution.**

The used reagent must meet the following requirements:

Use the chemical reagent with analytical purity or higher purity;

The ultrapure water is used for preparation of the standard solution, and regarded as the baseline water sample: conductivity＜1.0μS/cm(25℃), TOC＜0.04mg/L

When the sample is required to be diluted, the baseline value of the water for dilution shall be considered. The software TOC-Multi & Simult can carry out the independent measurement and calculation for this value. The baseline value of the water for dilution usually changes. Therefore, it is required to re-measure the baseline value of the water before measurement.

VI. Control and Measurement Software TOC-Multi & Simult

6.1 Software Introduction

TOC-Multi & Simult is able to control DW-DI1500-OL TOC analyzer, and assess the measurement record data by it.

TOC-Multi & Simult is composed of the internal programs of the device, and the external programs of the computer. When the computer is configured for the device, the computer shall install the latest version of TOC-Multi & Simult. The installation environment refers to the Section 3.2.

6.2 Software Initialization

6.2.1 Server IP Setting

--- If the data server is installed on the local machine, the IP address shall select “localhost” and click “OK”.

--- Otherwise, click “OK” after the IP address of the data server is input.

--- The client terminal setting installation is completed.

6.2.2 Database Setting (When the software is firstly installed, it is required to carry out the setting. Please carry out the operation according to the tips.)

(1) System Setting

---Click the desktop shortcut 

to start the software.

---Input the company number.

Notice: Company number input (please carefully input the related information. Otherwise, the errors caused will not be restored.)

(2) Administrator Account Addition

--- According to the tips, input the key information and click “Submit”.

--- Click the “OK” button, pop up the software login interface. On this interface, log into the system or create the new common user.

***Importance: The administrator account can carry out the management for the operation permission of the common user (refer to the Section 7.1.1). The password is the safety guarantee, so as to avoid that the unauthorized personnel operate the device.**

--- Click “OK” to complete the client terminal installation.

6.2.3 User Login/Initial Setting

Enter the login interface after software initialization. It is required to input the user name and password to validate the identity. This process reflects the program safety. Use the 

software to validate that you are an authorized user.

The user may utilize the menu item [File] ---- [Logout] (refer to the Section 7.1.1) to change the current user. In addition, the new user is required to be carried out the password validation.

6.2.4 Serial Port Selection

The computer is connected to the device by using the communication-to-serial port data line. After logging into the software, click “Setup”, select “Communication serial port setting”, choose the correct serial port, and click “OK”.

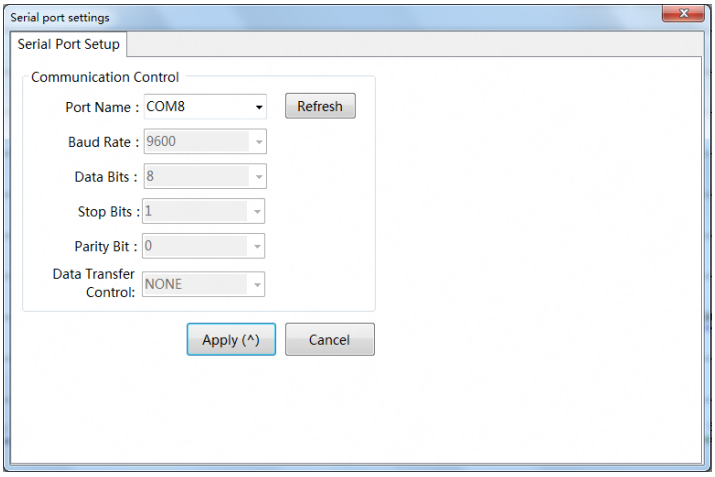


Figure 6-1

6.2.5 New-added Station

When the device is connected, it is required to input the correct information in the station management. The specific functions of the control software will be activated only when the device information is correctly input.

Notice: The device is marked with device model and number.

--- On the main interface, click “Start the serial port”

--- On the station management interface, click “Add the new station” 

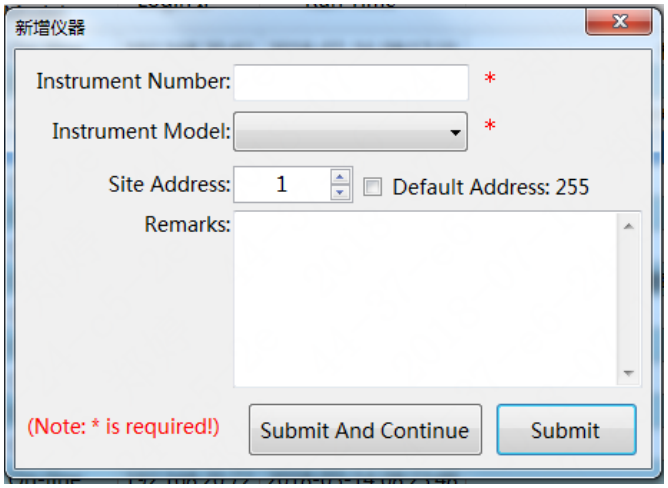


Figure 6-2

--- Input the device number, device type, station address and note

*** Do not select the default address. Please manually input the number of the station address (1-247). Otherwise, the device may not be connected. Every device address is not the same, so as to avoid device address conflict.**

--- Submit/submit and continue

--- Select the new-added station, and click the right button. Then, click "Modify the device address" by using the left button, so that the station address is corresponding to the device address.

***When the device address is modified, please ensure that only a device is carried out the on-line connection. Otherwise, other devices connected may change the device address, so as to cause that the device is not connected.**

--- View the device information, and confirm that the device parameter is correct.

VII. Operation

Turn on the switch on the left side of the device, double click 

desktop shortcut to enter the software login interface, and input the created name and password to log into the software.

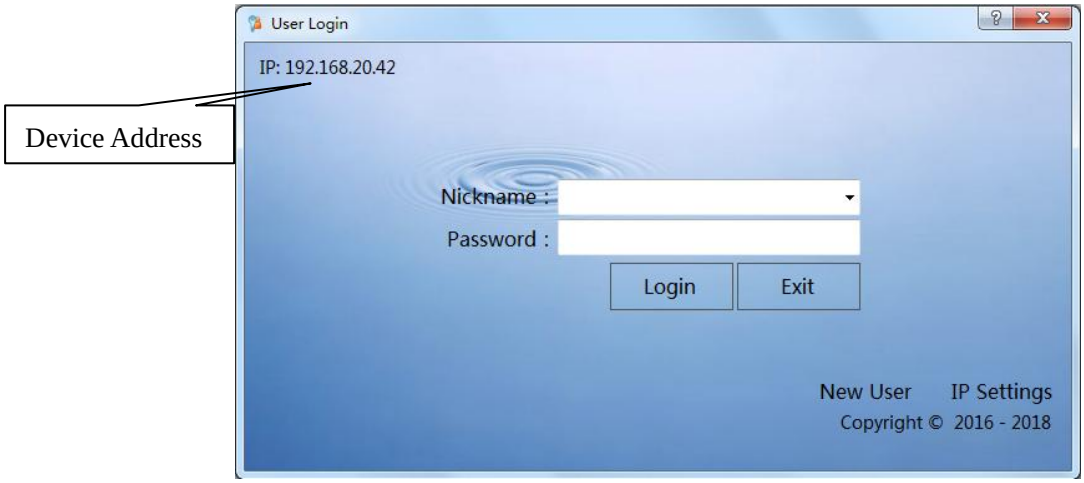


Figure 7-1

After logging into the software, click "Start the communication" - select the device station to be started by using the left button – choose "Start this station" by using the right button – enter the main interface for operation (refer to the Figure 7-2).

*If the new TOC device is required to be connected, please add a new station (refer to the Section 6.2.5).

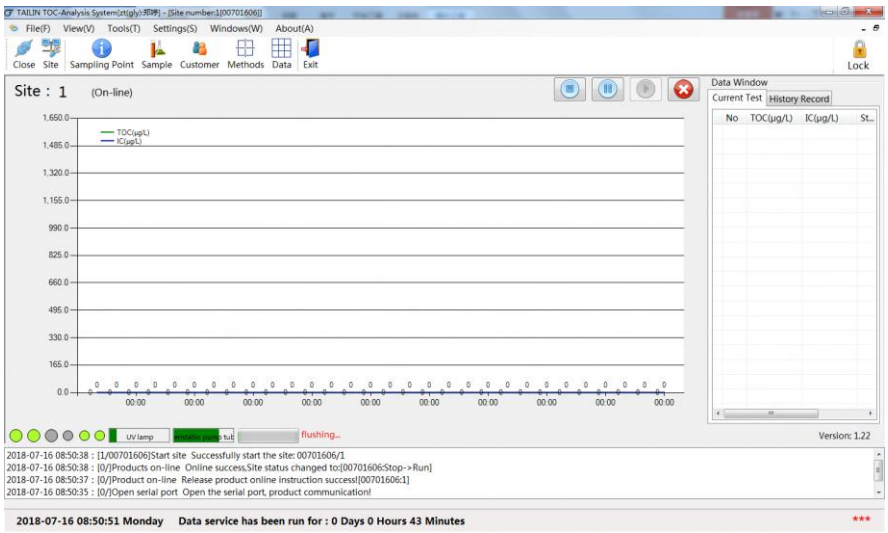


Figure 7-2

After entering the station operation, the station interface is composed of the menu, toolbar, graphic area, data window, sidebar, status window and operation log.

7.1 Menu

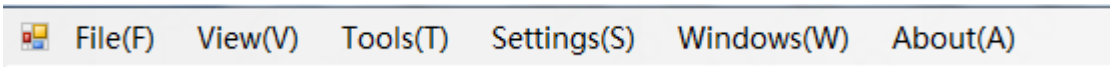


Figure 7-3

The menu includes: File, View, Window, Setup, Practical Tool and About.

7.1.1 File

The file menu contains the following menu items:

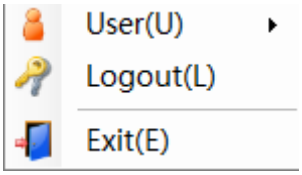


Figure 7-4

Name	Application
Logout	Change the current login user
Exit	Exit from the current login user
User	Current user information change/password modification/user management (only the administrator is authorized), as shown in the Figure 7-5.

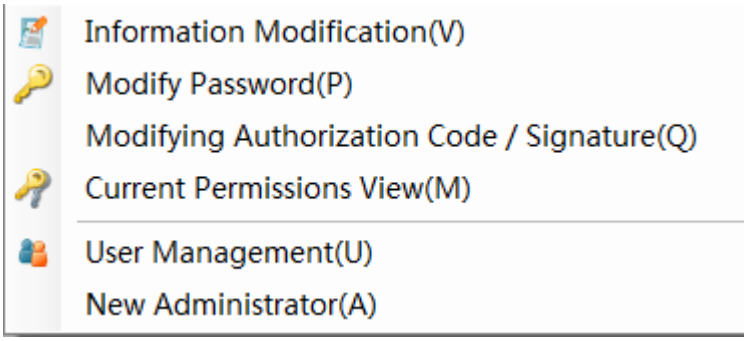


Figure 7-5

Name	Application
Information Modification	Change the basic information of current user.
Modify Password (p)	Please change the current user's password according to the password rule.
Modifying Authorization Code/Signature	After super administrator verification is enabled, the other two levels of authority should enter the authorization code before changing settings.
Current Permissions View (M)	View the current user's permission information, but cannot change it
User Management (U)	The administrator account may manage/review/forbid the user permission in the “User management” of the file menu.
New Administrator(A)	Add new administrator, activate up to 3 administrator accounts (including super administrator)

7.1.1.1 User Management *** Only the administrator is authorized**

In the user management item (refer to the Figure 7-5), by using the left button, select the account name whose permission is required to be modified. Click by using the right button:

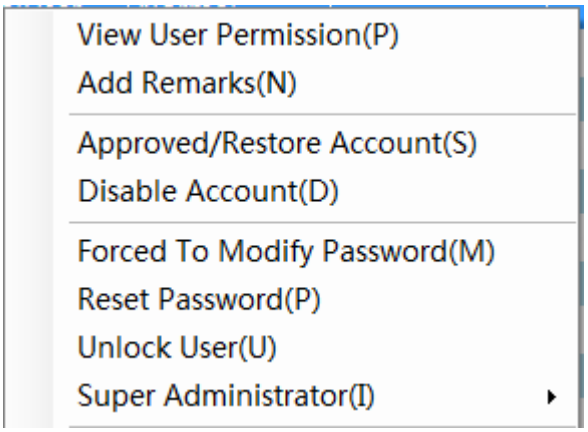


Figure 7-6

Name	Application
View the user permission	View/change the current user permission. Select the permission name. Click and change in the following permission name column.
Add a note	Add a note for common users.
Approved/Restore Account(S)	Approve the new user application/ restore the deactivated account
Deactivate account	Deactivate the current user account so that it cannot log into the software.
Forced To modify Password(M)	Force the current user to modify the password when it logs into the system next time.
Reset password	Reset the user password when the user forgets the user password. After logging into the system, modify the password according to the tips. The login password is “123456”.
Unlock User	Unlock the locked user.

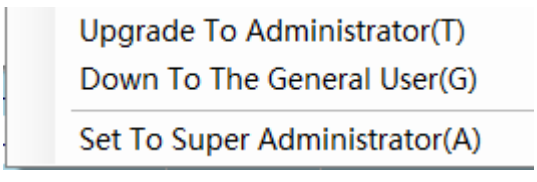


Figure 7-7

User group management: Upgrade/Degrade user group

* Only one super administrator account is allowable, so if you set a new account as a super administrator, you can only shift the permissions. After you shift the super administrator, the old super administrator will be automatically downgraded to a general administrator.

7.1.2 View

The view menu contains the following menu items:

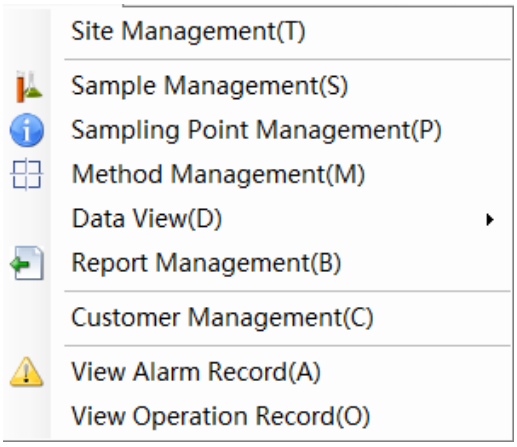
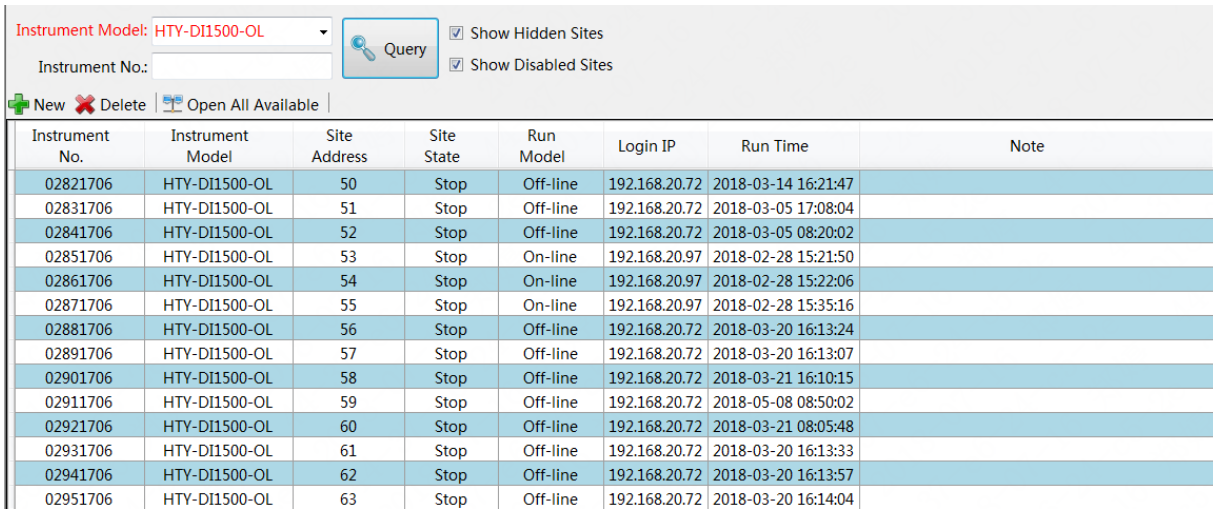


Figure 7-7

Name	Application
Site management	Manage different DW-DI1500-OL devices
Sample management	Add a new sample/view the sample information (the detailed information refers to the Section 8.3.2/8.3.3).
Sampling Point Management(P)	Sampling method management
Method Management(B)	Add a new method test/view the method information/preview and print the completed method report (the detailed information refers to the Section 8.3.4).
Data view	Query the data information of the sample whose test has been completed (the detailed information refers to the Section 8.2.3).\
Report Management(B)	Manage the generated reports（refer to 8.3.7.1）
Customer Management	Add the new client information/manage the client information (the detailed information refers to the Section 7.2.1).
*Alarm record view	View/export/print the device alarm record (only the administrator account is authorized).
*Operation record view	View/export/print the operation record of the software (only the administrator account is authorized).

7.1.2.1 Station Management



Instrument No.	Instrument Model	Site Address	Site State	Run Model	Login IP	Run Time	Note
02821706	HTY-DI1500-OL	50	Stop	Off-line	192.168.20.72	2018-03-14 16:21:47	
02831706	HTY-DI1500-OL	51	Stop	Off-line	192.168.20.72	2018-03-05 17:08:04	
02841706	HTY-DI1500-OL	52	Stop	Off-line	192.168.20.72	2018-03-05 08:20:02	
02851706	HTY-DI1500-OL	53	Stop	On-line	192.168.20.97	2018-02-28 15:21:50	
02861706	HTY-DI1500-OL	54	Stop	On-line	192.168.20.97	2018-02-28 15:22:06	
02871706	HTY-DI1500-OL	55	Stop	On-line	192.168.20.97	2018-02-28 15:35:16	
02881706	HTY-DI1500-OL	56	Stop	Off-line	192.168.20.72	2018-03-20 16:13:24	
02891706	HTY-DI1500-OL	57	Stop	Off-line	192.168.20.72	2018-03-20 16:13:07	
02901706	HTY-DI1500-OL	58	Stop	Off-line	192.168.20.72	2018-03-21 16:10:15	
02911706	HTY-DI1500-OL	59	Stop	Off-line	192.168.20.72	2018-05-08 08:50:02	
02921706	HTY-DI1500-OL	60	Stop	Off-line	192.168.20.72	2018-03-21 08:05:48	
02931706	HTY-DI1500-OL	61	Stop	Off-line	192.168.20.72	2018-03-20 16:13:33	
02941706	HTY-DI1500-OL	62	Stop	Off-line	192.168.20.72	2018-03-20 16:13:57	
02951706	HTY-DI1500-OL	63	Stop	Off-line	192.168.20.72	2018-03-20 16:14:04	

Figure 7-8

*** In the station management, carry out the management for stations. A device is corresponding to a station. Through the station operation, test the sample, view the data and manage the permission.**

Name	Application
New	Add a new device station (the detailed information refers to the Section 6.2.5).
Delete	Delete the station which is not used. *** Only the user who adds a new station may delete the station. The administrator and other users cannot delete the station. The station used cannot be deleted.**
Open All Available	Start all stations displayed on the page.
Show Hidden Sites	Display the information of hidden stations on the interface.
Show Disabled Sites	Display the information of forbidden stations on the interface.

Select the station to be operated by using the left button. Click by using the right button:

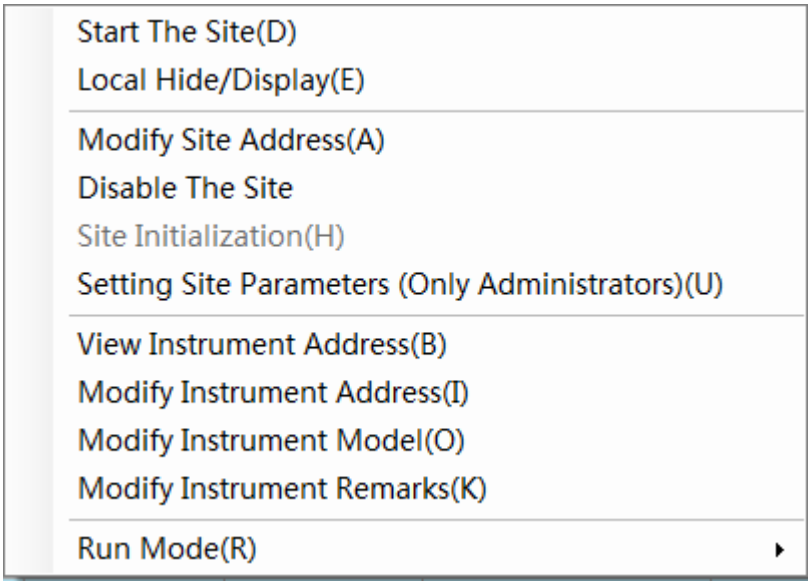


Figure 7-9

Name	Application
Start this station	Start the current station selected.
Locally hide/display	Locally hide/display this station information, and also select "Display the hidden station" on the current interface.
Modify Site Address	Modify the current station address. *** After the current station address is modified, please click the "Modify the device address" of the current menu, so that the device address is consistent with the station address, in order to avoid abnormal communication.**
Disable The Site	Forbid the current station, and hide the station in the station management. Select "Display the forbidden stations" on the current interface when it is required to view the forbidden stations.
Site Initialization	After the software abnormally quits, when the station status displays RUN (the station is operated), the station cannot be loaded, and it is required to initialize the station and restart the station. (*** The connected computer can be carried out such operation only when the software abnormally quits.**)
Site Initialization(Admin)	Initialize all stations connected to one server. (*** Only the administrator is authorized.**)
Set up the parameters of site （only for administrator）	The administrator can set up the parameters of current site
View Instrument Address	View the current device Address
Modify Instrument address	Modify the device address according to the current station address. *** Please ensure that the device address is modified only when one device is carried out the on-line connection.**
Modify Instrument model	Modify the device model (* only the administrator is authorized).
Modify Instrument Remarks	Modify the device Remarks
Run mode	Select the on-line/off-line mode.

7.1.3 Window

The window menu contains the following menu items:

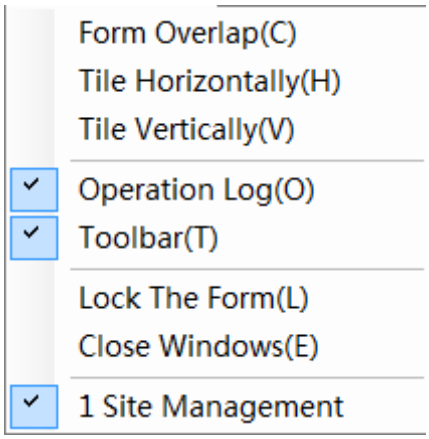


Figure 7-10

Name	Application
Form Overlap/Tile Horizontally/Tile Vertically	Arrangement mode when many interfaces are opened;
Operation log/toolbar	Display/hide the operation log on the interface;
Close the window	close the window except the station

7.1.4 Setup

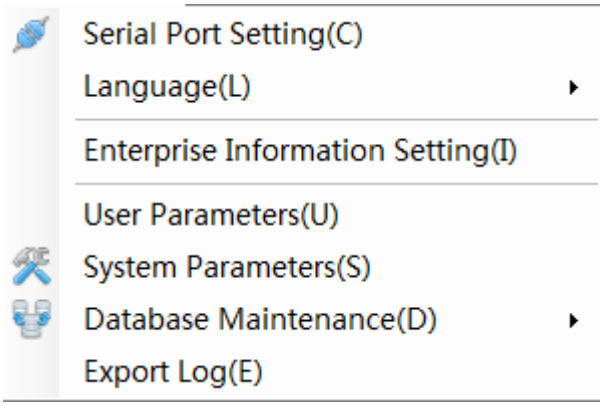


Figure 7-11

Name	Application
Serial Port Setting	Set the address of the device port connected to the PC.
Language	Chinese and English switching
Enterprise information setting	Complete and view the enterprise information of the user.
User Parameters	Set the user Parameters
System parameter	Set the system parameter
Database Maintenance	Backup, check, and restore the database
Export Log	Export the system log. *** Only the manufacturer is authorized to carry out such query**

7.1.4.1 Log Export

Click the log export, and view the log required to be exported by month. Click by using Shift+ left mouse button to select more than one date, or click the date to export the log. *** At most, select to export the log of 10 days, so as to avoid that the file is too large.**

7.1.4.2 System Parameter (*** Only the administrator is authorized to operate this item**)

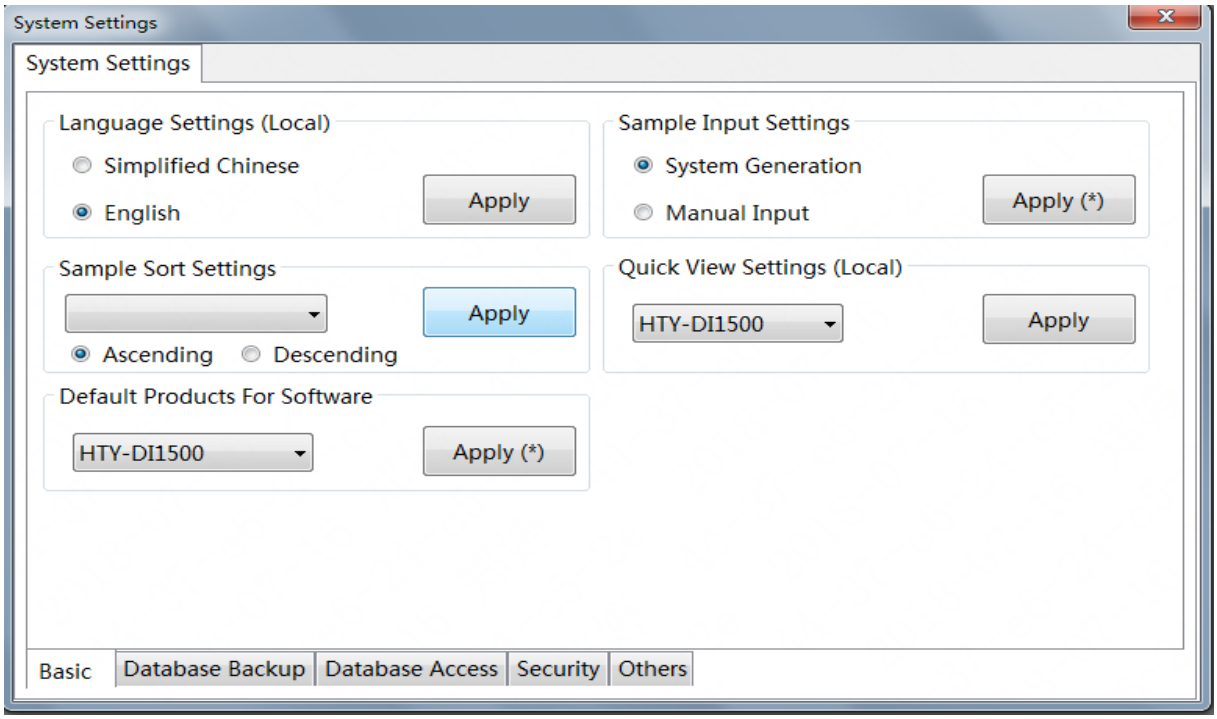


Figure 7-12

Basic	Language	Chinese and English switching
	Sample input setting	In the new-added sample information of sample management, carry out the setting that, when the sample number is input, the sample number is given priority to be input into the system and generated or manually input.
	Qucik View Settings	In the “Data view” of the toolbar, set “Only view the data of one device model”.
	Sample Sort Settings	Sort the sample list according to the set ordering rules
Database backup	Backup path	Set the backup path. ***The setting is only carried out on the computer with the server terminal.** *** When setting the backup path, please use the file name of letter or number. The Chinese folder name may cause automatic backup failure.**
	Backup Time	Set the time of daily database backup (only administrator privileges and the computer installed database are workable) *** Please make sure that the computer is started up and the database server is running before automatically backup every day. Or else, the backup maybe failure.**
	Database protection	When database protection is enabled, the deletion and change of database file and backup files is prevented.
Database Access	Database Access	Database access settings（only administrator privileges and the computer installed database are workable).
Security	Operation Lock Setting(Minutes)	When the computer is not operated within the set time, the software will be automatically locked. The unlocking needs the current login user password. The factory default is 10 minutes.
	Force Password Change Setting(days)	If the number of forced password change days are set, after the set number of days is exceeded, when the user logs into the software, the system will automatically remind the user to change the login password. The factory default is 15 days.
	Super Administrator Validation Mode	When enabled,the settiong of(^)needs the authorization validation of the superadministrator
Others	Method for calculating indication error	In the off-line test report, relative error or reference error is used to calculate the indication error. * After this change, the software under the control of the same database server adopts this calculation method to calculate the indication error
	Unit Setting	Shift the unit display among ppb,μg/L, ppm or mg/L.

7.1.4.3 User Settings

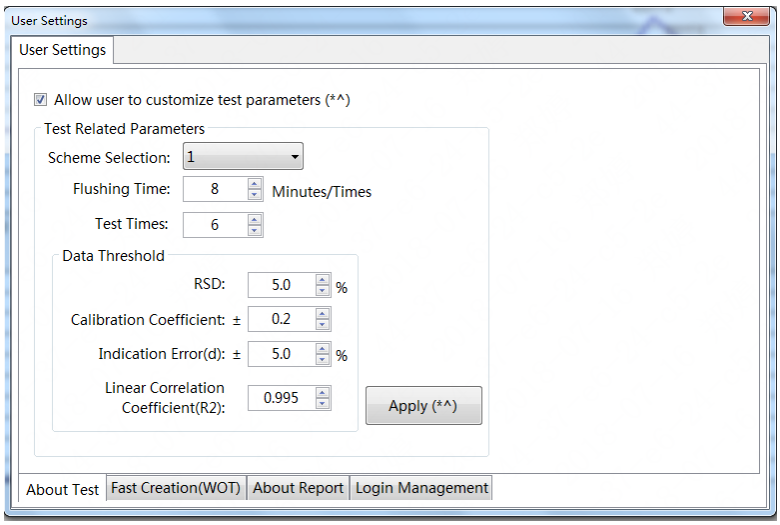


Figure 7-13

About	Allow users to customize test parameters	When increasing new test methods, the users can customize test parameters (rinsing time, test times).
	Test Related Parameters	Users can choose different test parameters according to their own requirements (5 options are available for selection), or set different rinsing time and test times. After applying this option (only for administrator rights), the test parameter scheme can be directly selected when a new test method is created。
	Data Threshold	The new created off-line test method will adopt this threshold value.
Fast Creation(WOT)	WOT Set Up	Set up the parameters of WOT series TOC analyzer.
About Report	Display Settings	Set up the report settings
Login Management	Logon List Management	Clear the user information on the login screen

7. 1. 4. 4 Database Maintenance

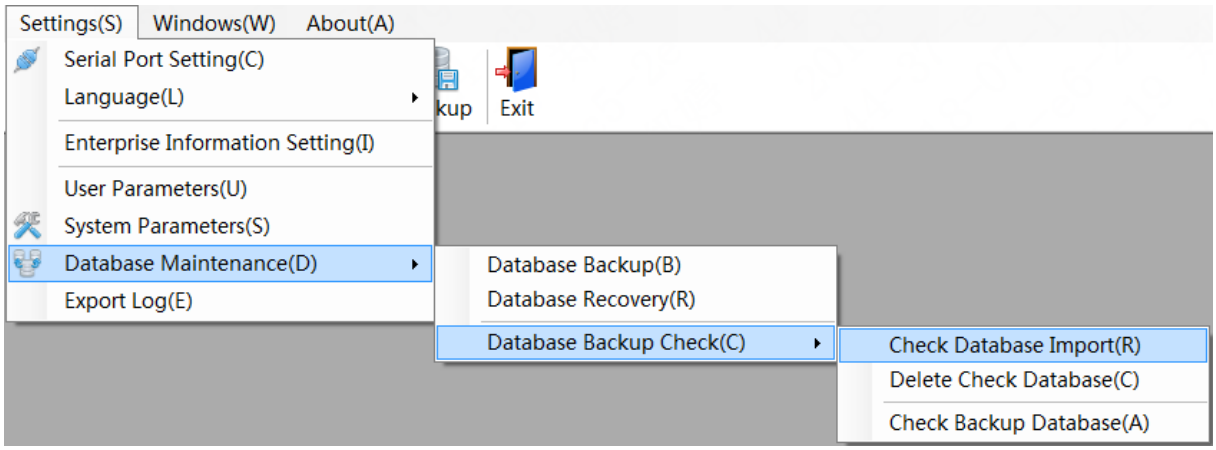


Figure 7-14

1）Database Backup

Enter the Database Maintenance, click the Database Backup, the software will automatically backup all data, including user management, site management, sample management, customer management, method management, data check, report management, and operation record check and alarm view (see figure 7-14 database maintenance) to generate the SQL file.

*Each backup automatically or manually backup content are all data and operating records. When backup automatically or manually, all content already backed up will be covered directly.

2）Database Backup Check

After the database backup is completed, the user can check the completeness of backup files.

Click the Database Backup Check (see figure 7-18 database maintenance) to check whether the backup content is complete.

----Click [Check Database Import]

----Select the backup file to be checked

----Waiting (When the backup file is large, it takes longer to check the database)

----Click OK and enter the database backup check. You can check the backup data of different projects according to the user's needs.

* This is only for checking the backup data and cannot restore the database .

3）Database Recovery

---Click the Database Recovery, select the database file need to be restored and open.

--- Waiting (When the backup file is large, it takes longer to check the database).

--- After restoring the database, the software should be restarted to complete the database recovery.

7.1.5 Practical Tool

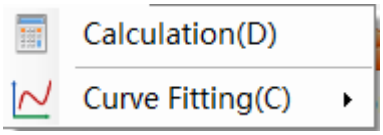


Figure 7-15

Numerical Calculation: After the numerical value is manually input, the system may automatically calculate the average value/indication error/repeatability, and carry out the abnormal value judgment.

Input the numerical value required to be calculated. Click the Add key or Enter key to obtain the average value.

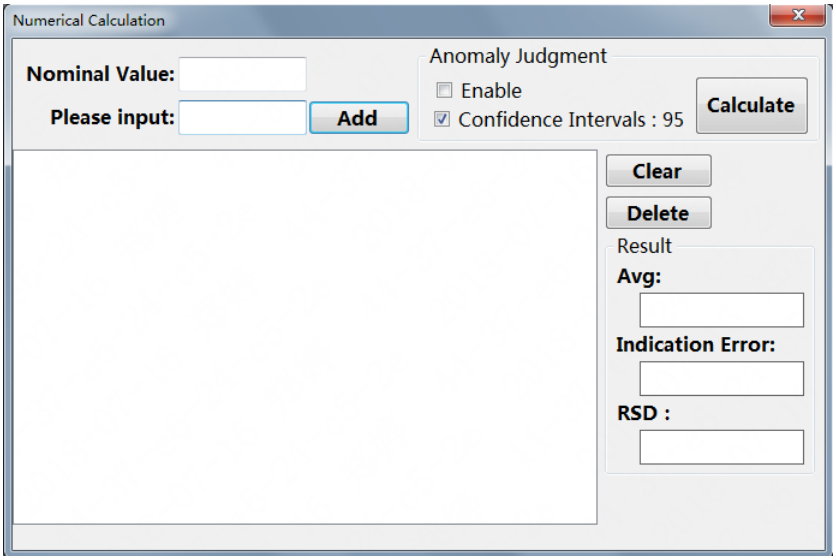


Figure 7-16

---- After the abnormal value judgment is selected, the system will automatically calculate and eliminate the abnormal values in the data.

---- After the nominal value is input, the system will automatically calculate the indication error.

---- After over 3 data are input, the system will automatically calculate the average value and RSD (relative standard deviation).

***Abnormal Value: Adopt the discrimination method of the Grubbs criterion to carry out the judgment;**

Curve Fitting The user can input the value manually, and the curve fitting degree can be calculated automatically

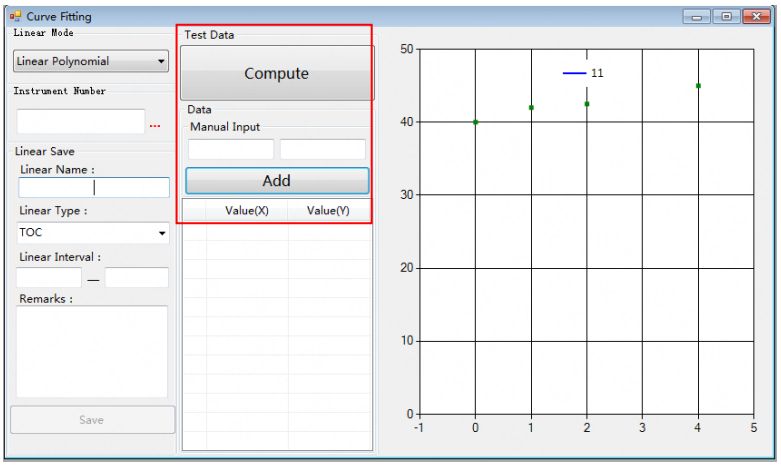


Figure 7-16

Manually Input：Manual input TOC signal value (x axis) and standard value (y axis), click [Compute], the software automatically calculates linear fitting.

7.2 Sidebar

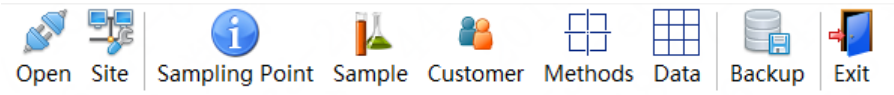


Figure 7-17

Open /Close : Connect/close the communication with the device.

Site: Add/manage the information of the device connected to the PC port software (the detailed information refers to the Section 7.1.2.1).

Sample Point: Add a new sample /manage the sample information (the detailed information refers to the Section 8.3.2/8.3.3).

Customer: Add the new client information/manage the client information (the detailed information refers to the Section 7.2.1).

Methods : Add a new method test/manage the method information/preview and print the completed method report (the detailed information refers to the Section 8.3.4/8.3.5).

Data : Query the data information of the sample whose test is completed (the detailed information refers to the Section 8.2.3).

Backup: Manually back up the data to the local hard disk or mobile hard disk (the detailed information refers to the Section 7.2.2).

*** Only the server terminal and administrator are authorized.**

Exit: Exit from the current login user.

7.2.1 Client Management (Only the administrator is authorized)

In this menu item, add the new client information, in order to be convenient for the user to carry out the management for the samples of external clients.

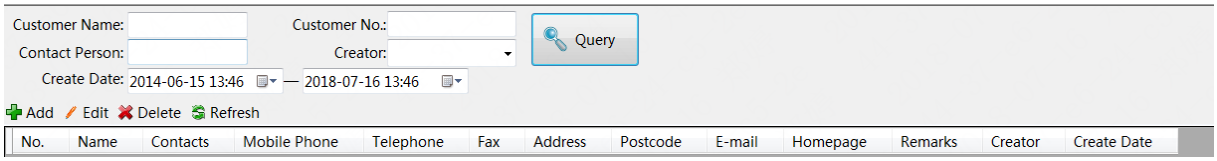


Figure 7-18

Enter the client management interface. Click Add – input the client information on the new client interface: the item with * must be filled in –click "Submit" or "Submit and continue to add" so that the new client information is successfully added.

In the added client information, modify and delete the client information.

---Delete the client information: In the new-added sample information, the associated client information cannot be deleted.

---Modify the client information: Modify the created client information: contact person, mobile phone, company telephone, fax, address, postal code, e-mail, home page and note.

--- Export the PDF, Picture and Excel formats (the content of the PDF and picture formats cannot be modified).

---Print the current page/all pages.

In the new-added sample (refer to the Section 8.3.2), input the number of the client presenting the sample, and click "Submit" so as to add the new client sample information.

In the sample management, click the pull-down item  on the right of the interface, and input the client number, sample type, configuration data and other query conditions, in order to query the sample information of the client presenting the sample, and carry out the management for samples which are not loaded.

7.2.2 Data Backup (*** only the server terminal and administrator are authorized**)

On the computer with the server terminal, the administrator is authorized to manually back up the data to the computer or hard disk.

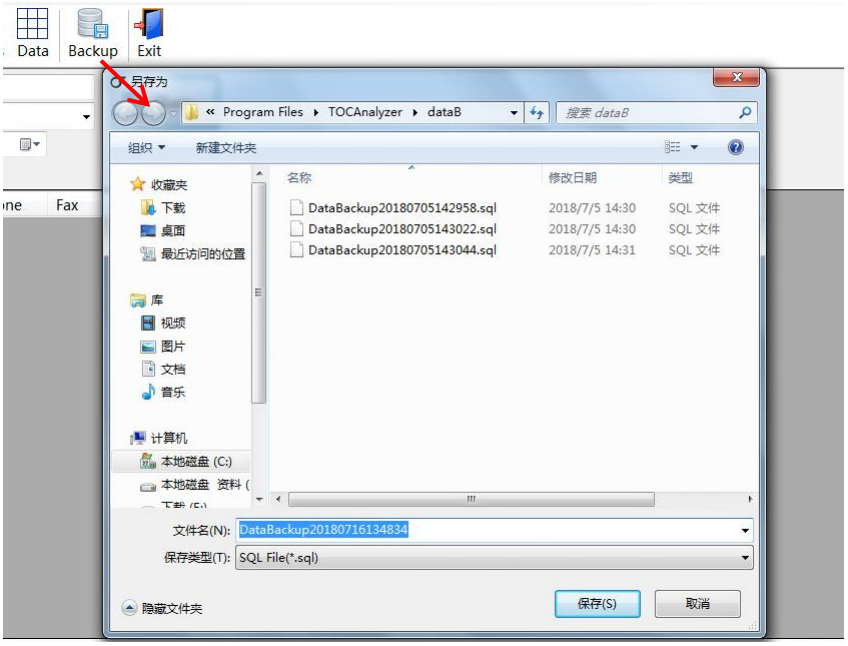


Figure 7-19

7.3 Station Operation Interface

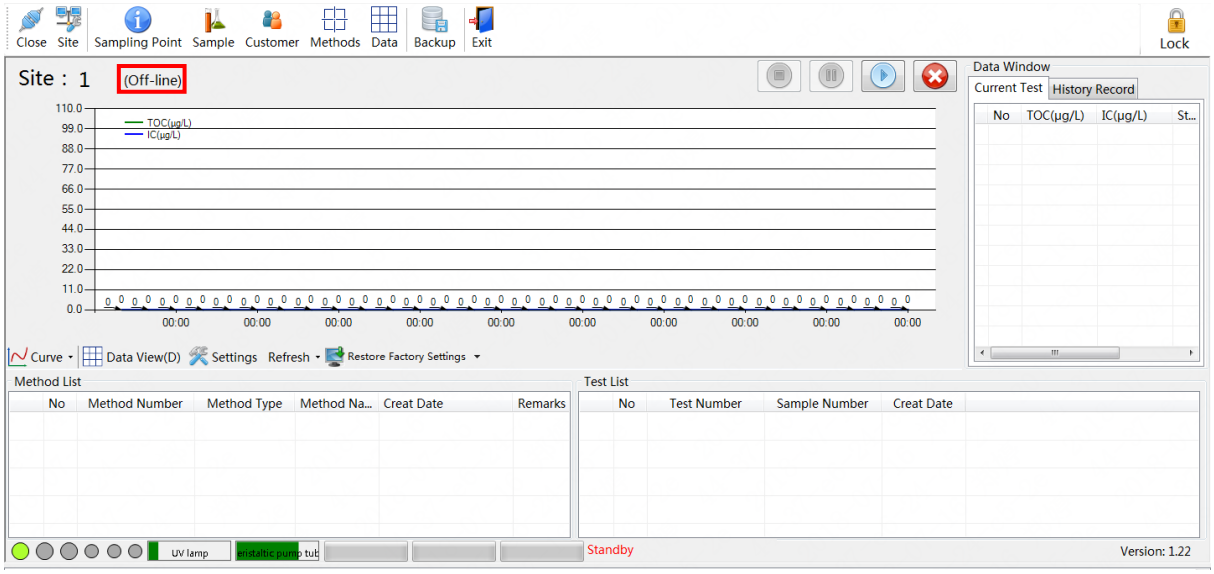


Figure 7-20

Mode Change: Move the mouse to the character (on-line mode). Click by using the right button to change the on-line mode/off-line mode.

7.3.1 Right Button

Move the mouse to the graphic area. Click by using the right button.

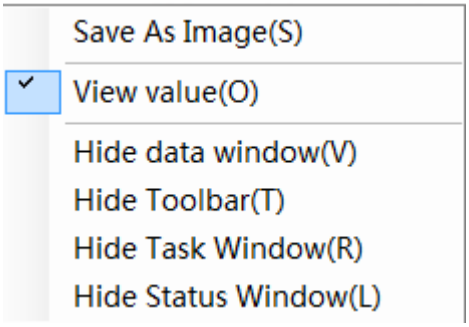


Figure 7-21

Save as Image: Save the current test curve and data as the picture.

View value: Display/hide the test value; only display the curve graph.

Hide data window: Display/hide the data window

Hide Toolbar: Display/hide the sidebar

Hide Task window: Display/hide the status window

7.3.2 Sidebar

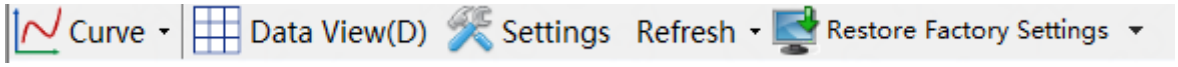
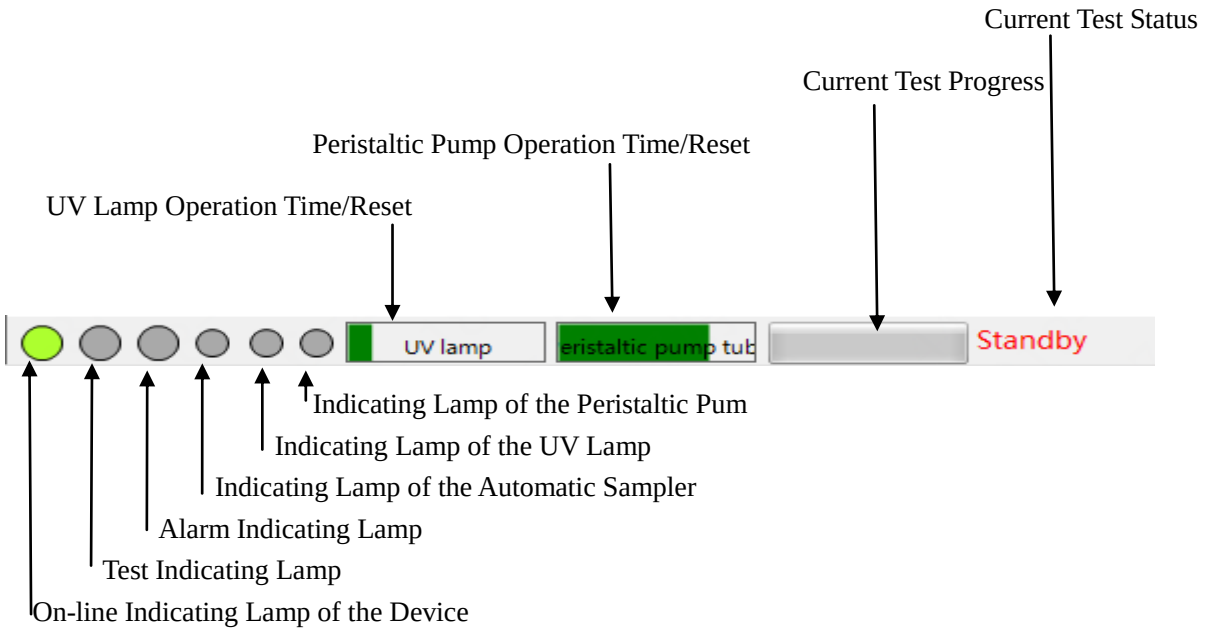


Figure 7-22

Curve		View the completed user operation curve record of the current station.
Data View		Shortcut to enter the data view
Settings	Off-line	Change the start status of the automatic sampler, as well as the abnormal value judgment information of every group of values.
		Preparation/startup of the automatic sampler.
	On-line	Change the startup information – start the test status.
		Set the on-line washing time (the washing data will not be included in the result report).
		Threshold value setting – set the threshold value range of the on-line data. When the related value exceeds the range, the system will give an alarm.
		When the related value exceeds the range, the treatment method may select to: only give the alarm output and continue the test; or give an alarm (the upper limit of alarm may be selected) and stop the test.
	Operation curve *** (Restart the station after the completion of setting)**	Select to use the system operation curve or user operation curve to calculate the test result.
		Click…input the completed user operation curve (the user operation curve plotting method refers to the Section 8.5.3.)

	Common use	Change the test time interval (second) and product preheating time (minute).
		4-20mA setting: The user may set the threshold value of the device. Click to obtain the current parameter – select the parameter to be changed – click the setting.
	Alarm setting	Alarm function: The selected item will carry out the alarm output.
Refreshing	Part status	Refresh the UV lamp & peristaltic pump status.
	Automatic sampler (optional configuration)	Refresh the status of the automatic sampler. (*** Do not refresh the status during the test process.**)
Factory Setting	Import from the file	Import the ex-factory information of the device from the file. For the file, please consult the manufacturer. **(* Only the administrator is authorized.)**
	Restore from the device	Connect the device. Import the ex-factory information of the device. **(* Only the administrator is authorized.)**

7.3.3 Status Bar



7.3.3.1 Indicating Lamp

Move the mouse to the indicating lamp to view the function of the indicating lamp;

The indicating lamp is green, which indicates that the connection is normal. The indicating lamp is red, which indicates that the system is in the alarm status. The indicating lamp is grey, which indicates that this function is not used. The indicating lamp is green and flashing, which indicates that the system is being running.

Indicating Lamp 1	On-line status of the device	
Indicating Lamp 2	Test status	
Indicating Lamp 3	Alarm status	When the indicating lamp is red, double click the indicating lamp to view the alarm and abnormal treatment suggestions (refer to the Section X Fault Maintenance); After selecting the alarm content, click by using the right mouse button and select "Have read", and then close the alarm.
Indicating Lamp 4	Automatic sampler running status	
Indicating Lamp 5	UV lamp running status	
Indicating Lamp 6	Peristaltic pump running status	

7.3.3.2 Part Status Bar

Move the mouse to the status bar to view the remaining operation time of the UV lamp & peristaltic pump pipe.

The total operation time of the UV lamp is 5,000 hours（Using time） or one year（Factory time）the total operation time of the peristaltic pump pipe is 180 days. *** The replacement method refers to the Section X.**

Using time	80%～90%	UV lamp/the light of peristaltic pump pipe turn in ***orange color***, and remind the user replace the UV lamp /peristaltic pump pipe after each login; If the online test is more than 24 hours, it will alert users to replace the UV lamp / peristaltic pump pipe once a day.
	Above 90%	UV lamp/the light of peristaltic pump pipe turn in ***red color***, and remind the user replace the UV lamp /peristaltic pump pipe after each login; If the online test is more than 24 hours, it will alert users to replace the UV lamp / peristaltic pump pipe once a day.

7.3.4 Operation Record Column

Operation record/alarm record information column: Display the software operation record & alarm record.

Importance: If the current software has many on-line devices, when the operation is carried out, the order may be delayed and it is required to wait a moment.

7.3.5 Time

The software time is corresponding to the time of the computer with the server. Before the software is started, please confirm the accuracy of computer time so as to avoid that the software makes mistakes.

7.3.6 Data Window

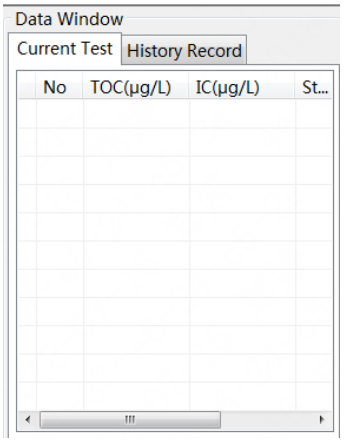


Figure 7-23

Display the current test data records and historical records. If the current station is closed, the current record information will be removed.

In the off-line mode, the completed sample data will be emptied. The related information may be queried in the historical data.

In the status bar, the item with "X" shows the washing data which will not be included in the result; if eliminating the abnormal value is selected, the eliminated abnormal value status displays "X".

7.4 Server Terminal Operation * Such operation can be only carried out on the computer with the server terminal.

Open the server terminal

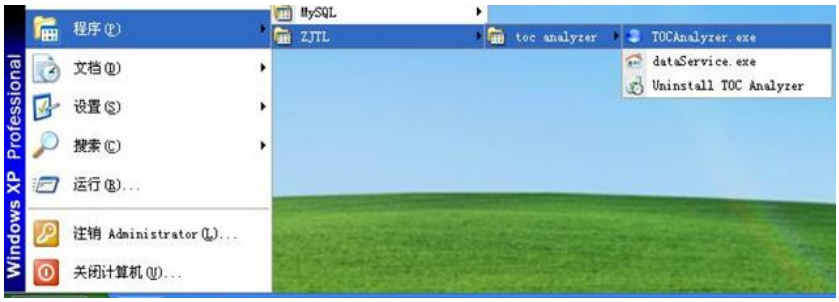


Figure 7-24

Click "Start"-"Program/all programs"---"ZJTL" folder ---click "dataservice.exe" to operate the database.

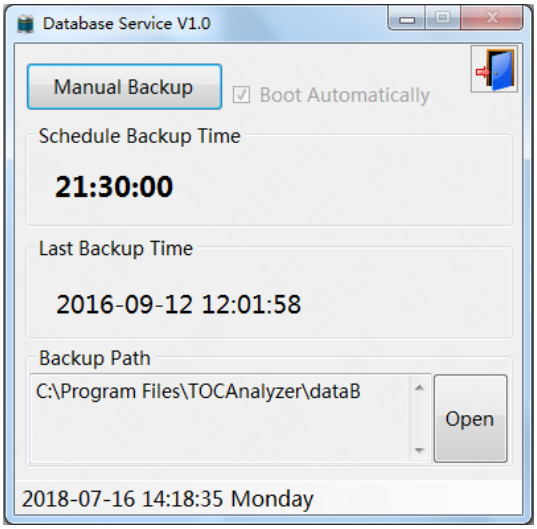


Figure 7-25

After starting the database service, manually back up the related data and select the database which can be automatically started when the device is started.

After click “Close”, minimize the database service in the system bar (refer to the following figure). Double click the server terminal icon for recovery.

Server
Terminal Icon

Figure 7-26

VIII. Startup Test

8.1 Device Preparation

8.1.1 Check Prior to Startup:

---The drain pipe is connected to the liquid waste bottle, and unobstructed. The liquid waste bottle has the sufficient volume (check when the device is normally started).

---Inspect if the water in the liquid storage tank is sufficient.

---The conduit is correctly connected, and it is in good condition.

8.1.2 Sample Preparation and Startup Steps:

---Start the computer.

---Turn on the switch on the left panel of DW-DI1500-OL device, so that the device starts to be initialized.

---Start the 

software.

Importance: After the software is started, it will take about 1 minute to initialize the key parts.

If the initialization is still not ready within 5 minutes, please check the line connection of the device, and refer to the Section X Fault Maintenance.

8.2 Off-line Mode

The off-line test is to analyze the sample based on the added sample management and method management.

8.2.1 Station Startup:

On the main interface of the 

software, click “Start the communication”. Then, the software enters the station management. Click the station required to be started: right button - operation mode - off-line, right button – start this station.

Also click the station required to be started: right button – start this station. On the station interface, change the (on-line mode)/ (off-line mode) by using the right button.

8.2.2 Sample Addition

Click the sample management (refer to the Figure 8-1) --- 

enter the sample addition (refer to the Figure 8-2).

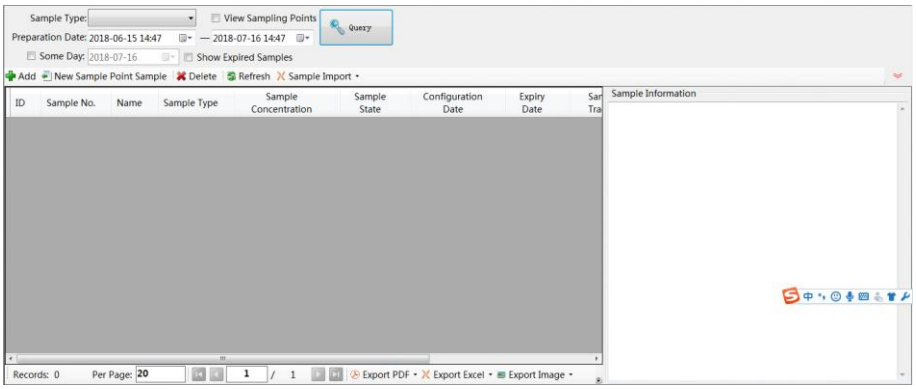


Figure 8-1

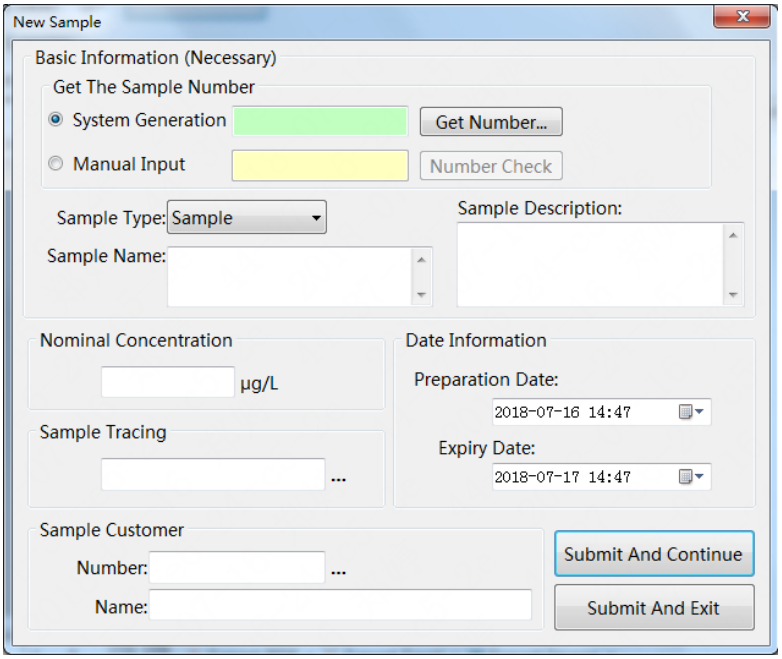


Figure 8-2

Input the basic information of the sample according to the tips.

(*** After the sample number is manually input, please check the number, so as to avoid that the number is repetitive to cause the input information dislocation of the sample.**)

Sample Type: Sample, standard sample and blank sample. *** The nominal concentration must be indicated for the standard sample.**

Sample Tracking: Track the existing sample, and show the related information in the sample information.

Click "View the sample according to the condition". Double click to add the information of the sample tracked.

Client Number: Carry out the management for client samples; reflect the client number and client name in the sample information.

Click “View the client information according to the condition”. Double click to add the client information.

8.2.2.1 Batch Import of the Sample

Enter the sample management interface (refer to the Figure 8-1). Click “Sample import” in the toolbar.

—Click “Obtain the template”.

—Load the sample import template.

-- Open the sample import template. Input the sample information and save the EXCEL table. *** indicates that the content must be input.**

Serial Number	Import the serial number of the sample.
Sample Number	Do not input the content. The system will automatically generate the number by default. Or manually input the sample number. *** If the number is manually input, please confirm that the number which is manually input is not repetitive.**
Sample Type	Select the standard sample/sample/blank sample *****
Sample Concentration	The nominal concentration must be input for the standard sample *****
Sample Description	Note information of the sample *****
Preparation Date	The date exceeding the current software time cannot be input * (The format is year-month-day, e.g. 2016/08/12)
Effective Date	The effective date cannot be earlier than the preparation date ***** (The format is year-month-day, e.g. 2016/08/12)

—Return to the software interface and click “Sample import”.

—Click “Batch import”.

—Select the edited “Sample import template”.

—Import to the database to complete the batch import of the sample data.

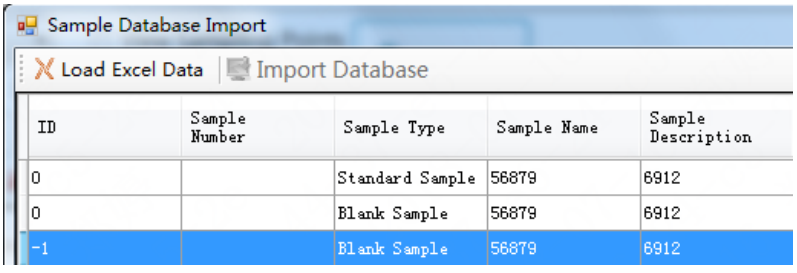


Figure 8-3

Notice: After the database is imported, the serial number column will show the import information result: 0 successful import; -1 sample information error (please check the sample information, for example, standard sample's nominal concentration and preparation date); -2 sample number repetition (please recheck the sample number).

8.2.3 Sample Information Management **(Only the administrator is authorized.)**

When there is the sample information input error, select the created sample, and click by using the right button to carry out the sample change: sample name/sample concentration/sample tracking/client presenting the sample; also select the sample, and click by using the right button to delete the sample. *** Only the sample which is not loaded may be deleted.**

8.2.4 Method Addition

Click the method management--- Add enter the new-added test method information.

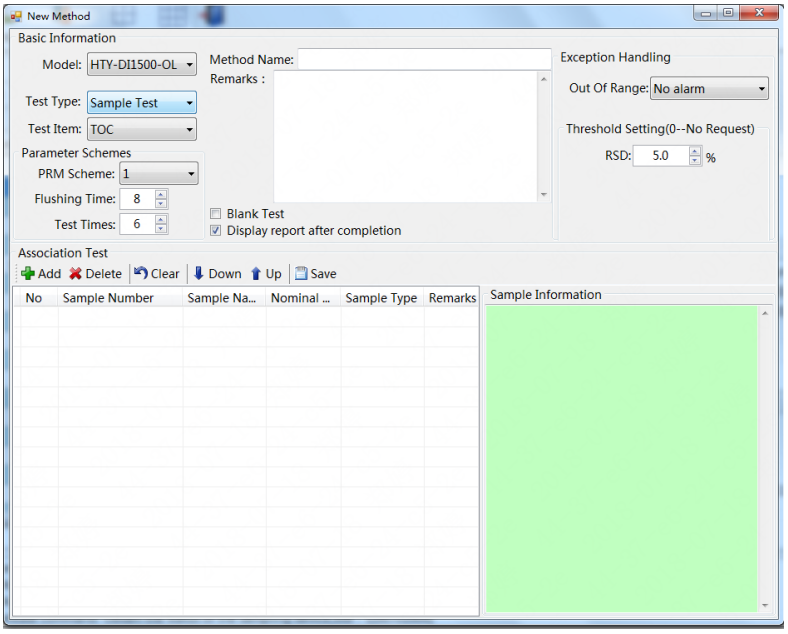


图 8-4 Figure 8-4

According to the tips, input the method information and test exception treatment information.

Test Method	**Report Treatment**
Sample Test	The system will automatically calculate the sample's average value and RSD, and the related information will be shown in the test report.
Test Calibration	After test completion, automatically calculate the calibration value.
Validation Test	The system will automatically calculate the sample's average value, indication error and RSD, and the related information will be shown in the test report.
System Applicability Test	The system will automatically calculate the sample's average value, RSD and response efficiency.
Operation Curve Plotting	The system will automatically calculate the sample's average value, RSD and operation curve plotting result, and no test report is generated.
System Washing	Wash the device: When the related value reaches below the TOC preset value, the system will automatically stop washing, and no test report is generated.

--Test exception treatment: When the related value exceeds the set value range of threshold values, the user may select that the device doesn't give an alarm, but it can only carry out the alarm output.

--Washing Time: Every time, before the test method is carried out, and after the sample is changed, the system will automatically wash the pipe. The washing data will not be included in the result.

Importance: As the internal pipe of the device is very long, in order to avoid that the pipe is not cleanly washed, please set the washing time of more than 8 minutes.

---Number of times for the test: For the number of times for sample test, the minimum number of times for the test is 3.

---Click "Add" of "Associated test" to enter the sample management.

---According to the condition, query the edited sample, press and hold the Shift key on the keyboard, continuously select more than 1 sample information item by using the left mouse button. Click by using the right button and select "Import to the test", so that the related information is imported to the "Test import" column on the right side of the interface.

Or press and hold the Ctrl key, select more than 1 sample information item by using the left mouse button. Click by using the right button and select "Import to the test", so that the related information is imported to the "Test import" column on the right side of the interface.

---After the sample addition is completed, click "Import to the test" of "Test import", so that the new-added test information is added to the method.

***In the "Test Import" column, the user may carry out the management for edited samples: delete/empty the samples in the "Test Import" column.**

---After "Associated test" is completed, the user may change the current sample sequence. Move up/move down/empty the list.

---After the method creation is completed, save the method to complete the edition work of the test method. Enter "Method management", and click "Refreshing".

8.2.5 Test Method Change

When there is the test method information input error, the user may enter "Method management" to change the edited test method.

8.2.5.1 Click and select the test method required to be changed. Select "Change the method parameter and method note information" by using the right button.

*** The user may change the method parameter only when the method status is "Not loaded".**

*** Change the associated test item: The user may change the associated test item only when the method status is "Not loaded".**

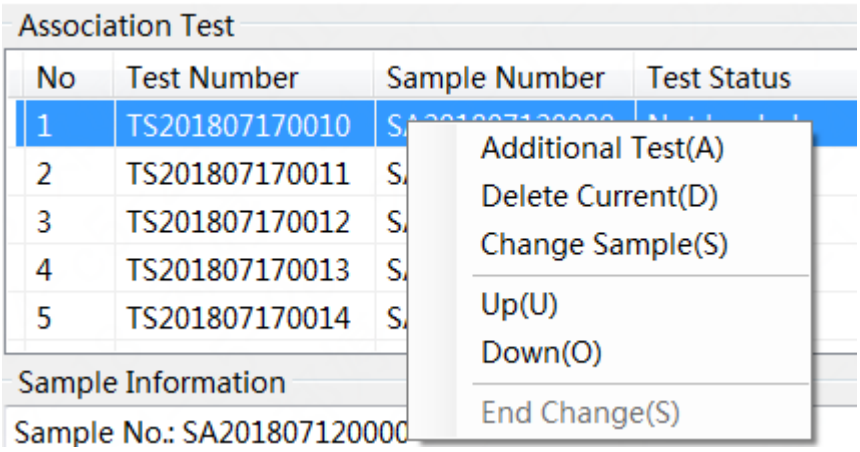


Figure 8-5

8.2.5.2 Change the Associated Test Item

Select the method required to be changed by using the left button. In the associated test item on the right side of the interface, click the sample test information required to be changed. Click by using the right button.

--- Add the test: Add the test sample: The user may add the related information to the added sample or add a new sample. (Refer to the Section 8.3.2)

--- Delete the test: Delete the selected test sample.

--- Change the sample: Change the selected test sample: The user may replace the sample required to be changed with the added sample or new-added sample (refer to the Section 8.3.2).

--- Move up/move down: Edit the test sample sequence.

After the change is completed, click "Finish the change" to complete the related operation.

8.2.6 Start the Test

After the method edition is completed, on the off-line mode interface (refer to the Figure 7-17), click in the blank of the method list by using the right button – load the method —- double click the test method required to be loaded/select the test method required to be loaded and click "OK" or click "Add" (the steps to add a new test method refer to the Section 8.3.2/8.3.4).

In the method list, the user may carry out the management for the loaded method information: delete the selected method/empty the method list/add a new method.

The user may load more than 1 method, and click the Start Button  to start the test after the user determines that the loading procedure is completed.

 Suspend: Suspend.

 Stop: Stop the current test method and empty the method list. Change the method status "**Not loaded→Testing**".

*** After the test method is suspended / stopped, when the current uncompleted test method is restarted, the system will wash the pipe again and test the uncompleted sample.**

After the test method is completed, the system will automatically pop up the analysis report conclusion. The method status will be changed to be **completed**. In the method management, the user may query the completed test method report (refer to the Section 8.2.7).

After the operation is completed, please close the station: click the upper right corner  of the station interface, and then close the software.

8.2.7 Report Query

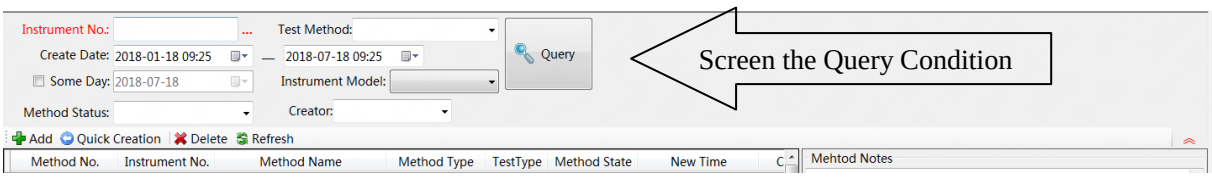


Figure 8-6

Click “Method management” → query the keyword (the user may choose more than one option): input the device number, test method, creation date/a certain day, method status, creation personnel → click the query → select the test method by using the left button → click by using the right button → view the report (the user may view/print the report only for the completed test method)

*** Click the pull-down option  on the right side of the interface, so as to screen more query conditions.**

In the sample test report preview,

Export the PDF: The user may select to export the PDF (the content of the report cannot be modified).

Export the picture: The user may select to export the picture (.JPG) format (the content of the report cannot be modified).

Print: The user may select to print the test report.

Importance: When the uncompleted method information is viewed, please do not input the device number. The user may select “Not loaded” in the method status.

Test method status:

Not loaded: Test method which is not loaded

Waiting: Test method which prepares to wait for the test

Testing: Test method which is carrying out the test

Completed: Test method which is completed

8.2.8 Test Method Data Query

Single completed data view and printing in the test method

---Click the data view 

---Select the test mode: Off-line (off-line test data).

---Select the device number: Click “---” to select the device number required to be queried.

---Select the test date: Select the data of the certain time or day required to be queried.

---Click the pull-down option  on the right side of the interfacem and select the test personnel: query the test data of different users (only the adiminstrator is authorized).

Input the related conditions required to be searched. Click Query or press the Enter key to show the single test data in the test method.

--- Click by using the left button to select the single sample information required to be queried. Click by using the right button: view the report/add the note information/view the sample information.

View the report: Enter the report preview: select to export the PDF/picture (the content cannot be modified) or print the current report.

Add the note information: Add the note information to the test information

View the sample information: View the basic information of the sample.

8.3 On-line Mode

8.3.1 Start the Station:

---After entering the software, start the communication to enter the station management. Click the station required to be started: right button – operation mode – on-line; right button – start this station.

---Or select the station: right button – start this station. On the station interface, change the (on-line mode) / (off-line mode) by using the right button.

8.3.2 Start the Test:

After entering the station, click the start button  . Click  to suspend the test. Click  to stop the current test.

8.3.3 On-line Data Query

---Click the data view 

---Select the test mode: On-line (on-line test data)

---Device Number: Click "---" to select the device number required to be queried.

--- Select the test date: Select the data of the certain time or day required to be queried.

--- Click the pull-down option  on the right side of the interfacem and select the test personnel: query the test data of different users (only the adiminstrator is authorized).

Input the related conditions required to be searched. Click Query or press the Enter key to display the data, and show the line chart.

Display per page: The user may select the number of data record items of the current page.

Export the PDF: The user may select to export the PDF of the current page or all pages (the content

of the report cannot be modified).

Export the Excel: The user may select to export the Excel format of the current page or all pages.

Export the picture: The user may select to export the picture (.JPG) format of the current page or all pages (the content of the report cannot be modified).

Print: The user may select to print the data of the current page or all pages.

8.4 Parameter Setting

8.4.1 Pipe Washing

The test calibration and user curve plotting process are required to be carried out in the off-line status. It is required to carry out the test calibration, before the device is used, or when the calibration period expires and the data are not stable.

The purpose of pipe washing is to remove the residues in the pipe, as well as bubbles arisen from sample liquid flowing in the pipe. The pipe must be washed before the device is used. In general, the pipe shall be washed for 30-60 minutes. The pipe must be washed with high-purity water for over 6 hours, if the device has not been used for a long time (more than 10 days), or the device was used to test the water sample with high TOC value or high conductivity.

8.4.2 Device Calibration

8.4.2.1 Calibration Purpose

Carry out the test calibration before the initial operation and regular calibration. In order to improve the test accuracy of the device, reduce the span drift.

8.4.2.2 Calibration Period

The calibration period may be determined according to the specific operation condition. It is recommended to carry out the calibration once every 6 months. When the large data deviation occurs, after the other influence factor is eliminated, it is required to carry out the calibration again.

8.4.2.3 Calibration Solution

Test calibration water: The test calibration water adopts the high-purity water (water for the test) with the total organic carbon of less than 0.1mg/L and conductivity of below 1.0μS/cm (25℃), as the test calibration water.

Attentions: The high-purity water cannot be placed in the open-mouthed beaker to carry out the test. The contact between the liquid and air shall be as small as possible. If the

low-concentration high-purity water is exposed in the air for over 1 hour, it is very easy to be polluted by the air so that the test result is not accurate.

Test calibration solution: The test calibration adopts 0.75mg/L sucrose calibration solution (the carbon content of the sample is 0.75mg/L). The solvent used to prepare the calibration solution is the test calibration water.

According to the Section 8.3, input the sample information (the test calibration water is the blank sample, and the test calibration solution is the standard sample) and test method (test calibration), and start the test. After the completion of the test, the calibration coefficient will be automatically calculated, and the system will remind if the original calibration coefficient is replaced.

8.4.3 User Curve Plotting

According to the user demands, the user may individually use the standard sucrose solution to plot the TOC operation curve in the measuring range (0-1.500mg/L).of the TOC device.

Select the (20%, 50%, 80%, 100%)sucrose solution and standard solution background water used to make the TOC operation curve measuring range, as the concentration point of the TOC operation curve.

Attentions: When the concentration of the standard sucrose solution is very low, the TOC content in the solution will change with time. Therefore, the reagent and zero water shall be prepared on the day of being used. In order to avoid that the solution is polluted by the air, it is better to reduce the contact area between the solution and air.

1) Standard solution background water: This process adopts the water without carbonic acid. It is obtained after the high-purity water (water for the test) with the total organic carbon of less than 0.1mg/L and conductivity of below 1.0μS/cm (25℃) is boiled and the carbonic acid is removed. The water without carbonic acid is used as the background water to prepare the standard solution.

2) Standard sucrose solution: Precisely weigh 0.1489g sucrose which is dried to constant weight at 105℃, add the water for the TOC test for dissolution in a 500mL volumetric flask, and obtain 125mg/L (the carbon content is 125mg/L) sucrose original solution. Dilute the sucrose original solution with the standard solution background water to the designated scale line.

8.4.3.1 Start the Test

After entering the software, select the off-line mode. According to the **Section 8.3**, create a new test method --- operation curve plotting. Arrange the sample number based on the standard solution background water, as well as the standard sucrose solution sequence from low concentration to high concentration.

Load the method, and start the test. After the completion of the test, the system will automatically calculate the result (refer to the Figure 8-5 Operation Curve).

----Input the linear name and note information, and click “Save”.

----Enter the station which completes the operation curve. Set the operation curve (refer to the Section 7.3.2). Restart the current station. The user operation curve is finished to be plotted.

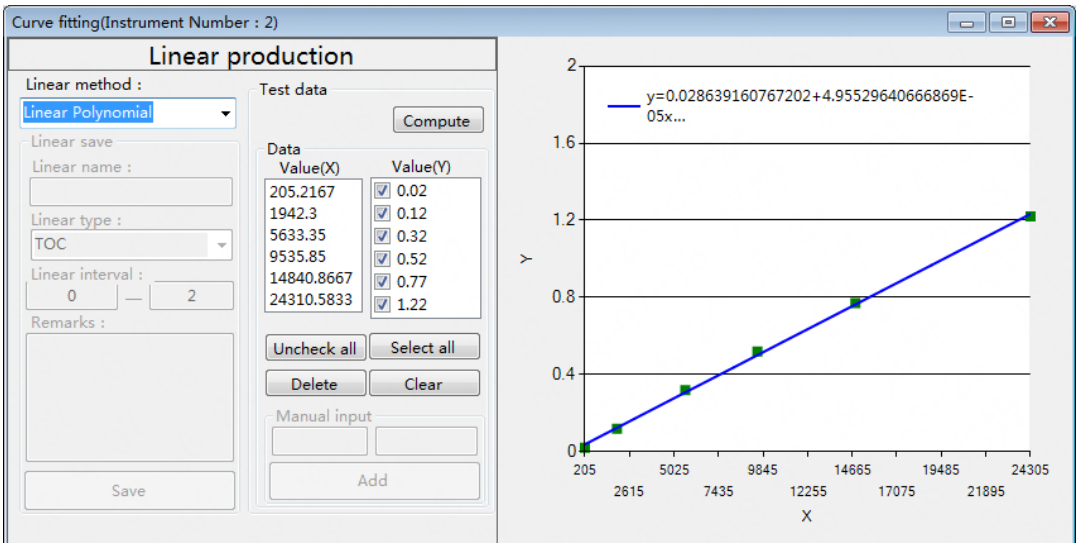


图 8-7 Figure 8-7

8.4.3.2 Change the User Operation Curve and System Operation Curve

The device’s factory default data processing procedure adopts the system operation curve to carry out the calculation. According to the user demands, the user may change the user operation curve (the plotting method refers to the Section 8.5.3) and system operation curve.

Enter the “Operation curve” in the setup (refer to the Section 7.3.2) – click the system operation curve/user operation curve – click “Change” --- restart the station to complete the such change.

IX. Maintenance

9.1 Replacement Period of Consumable Goods

The UV lamp and peristaltic pump pipe may be purchased from the company. The UV lamp is the 185nm & 254nm dual-wavelength UV lamp. The peristaltic pump pipe is the special wear-resisting pump pipe with high quality and excellent stability. The replacement period of consumable goods is shown in the following table.

Part Name	Replacement Period
UV Lamp	5,000 hours or one year
Peristaltic Pump Pipe	180 days

9.2 Replace the UV Lamp

The UV lamp's intensity, especially the short-wavelength UV ray's irradiance may be reduced with the increase of operation time. Therefore, it is required to regularly carry out the replacement. The company suggests that the UV lamp should be replaced after it is operated for 5,000 hours.

When the UV lamp is replaced, it is required to wear the special gloves, so as to avoid leaving fingerprints on the surfaces of the UV lamp tube & spiral quartz tube. The fingerprints may absorb the UV ray and reduce the oxidation property of the oxidation reactor. In addition, carefully carry out the operation, and avoid destroying the lamp tube and its surrounding spiral quartz tube.

Note: Ethyl alcohol may be used to remove fingerprints before the new UV lamp tube is installed.

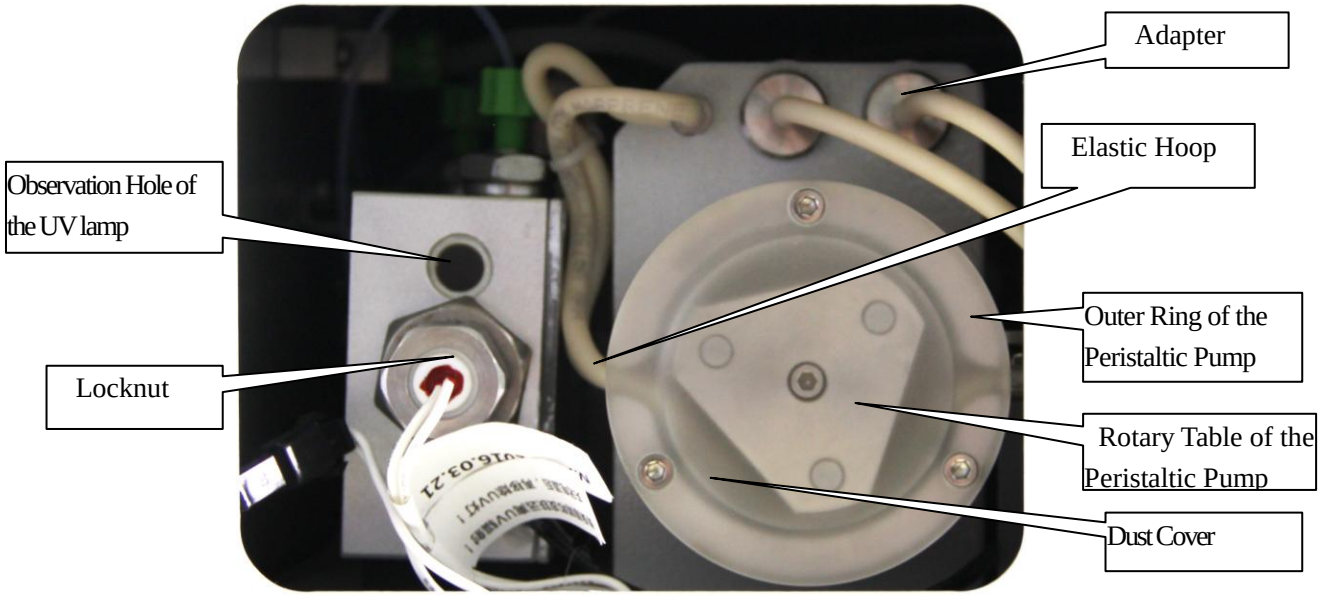


Figure 9-1

9.3 Replace the Peristaltic Pump Pipe

The peristaltic pump pipe may be worn and aged after the long-term operation. It is suggested that the pump pipe should be replaced after being used for 180 days.

Specific Operation to Replace the Pump Pipe:

① Turn off the main power switch, and take out the power cord.

② Unscrew four screws on the front end plate of the device. Open the front end plate of the device. Refer to the Figure 9-1 Replacement Diagram for Parts.

③ Unscrew three inner hexagon screws of the peristaltic pump dust cover, take down the dust cover, and pull out the pump pipe from the rotary table of the peristaltic pump.

④ The both ends of the pump pipe are pulled out from the connector. Take down the elastic hoop, so that two pump pipes may be removed as a whole.

⑤ Put the middle part of two new pump pipes into the rotary table of the peristaltic pump.

⑥ One end of the pump pipe is connected to the water outlet of the conductivity sensor, and the other end is connected to the liquid waste pipe.

⑦ Install the peristaltic pump dust cover and screw down the inner hexagon screws. Install the rear cover plate of the device, and screw down four screws.

⑧ Start the software, enter the station of the peristaltic pump pipe which has been replaced, and click the peristaltic pump pipe status bar by using the right mouse button, in order to reset the operation time of the peristaltic pump pipe. *** The reset needs the reset code. Please contact the manufacturer to obtain the reset code (resetting the operation time can be only carried out by the administrator).**

X. Fault Maintenance

This section introduces a series of potential problems which may be corrected by the user. If the user cannot solve the current problems according to the following fault information table, please inform Tailin after-sales maintenance department of details.

Device Faults	Phenomena	Solutions
The drain pipe cannot discharge the liquid	When the device is operated, observe that the peristaltic pump is running, but no liquid is discharged from the drain pipe.	Pipe blockage: The tiny particles obstruct the pipe. The user may pull out the peristaltic pump pipe (refer to the Figure 9-1), and use the disposable syringe to extract the particles from the pipe, or wash the pipe with the purified water for a long time.
		If the liquid cannot be drawn as the peristaltic pump is damaged, please contact the manufacturer for replacement of the peristaltic pump pipe, so as to solve the problem.
The test data are not stable. There is a large fluctuation.	The data exceed the threshold value.	Change the threshold value setting range (refer to the Section 7.3.2).
	The test sample contains lots of gases.	Carry out the degassing treatment for the test sample.
	The air exists in the sample inlet pipe.	Check if the air exists in the sample inlet pipe. Insert the sample inlet pipe below the liquid level.
	Check if the sample inlet pipe and waste discharge pipe have the pressing mark.	Replace the sample inlet pipe & waste discharge pipe with the pressing mark.
	Recalibrate the device.	(Refer to the Section 8.5.2)Recalibrate the device.
The TOC value is abnormal	The TOC value is the negative value or the TOC value has no change.	Observe if the drain pipe normally discharges the liquid. When no liquid is discharged from the drain pipe, the user may pull out the peristaltic pump pipe (refer to the Figure 9-1), and use the disposable syringe to extract the particles from the pipe, or wash the pipe with the purified water for a long time.
	The UV lamp is damaged/the replacement period expires.	Contact the manufacture for replacement of the UV lamp.

	The IC response value exceeds the range.	The sample conductivity exceeds the range.
The UV lamp is off.	The software displays that the UV lamp is normal, but, on the device, the UV lamp is off or the UV lamp gives an alarm.	Check if the control line of the inverter is normally connected. Pull out and then insert again (refer to the Figure 9-1).
		Contact the manufacturer for replacement of the UV lamp.
		Check if the UV lamp connector is loose. Pull out and then insert again (refer to the Figure 9-1).
The peristaltic pump is not operated.	The software displays that the peristaltic pump is normally operated, but, on the device, the peristaltic pump is not operated.	Open the dust cover of the peristaltic pump. Check if the peristaltic pump is rusty and jammed.
		Contact the manufacturer.
The on-line connection of the device is abnormal.	The station is not connected.	Check if the data line is correctly connected.
		Check if the serial port setting is correct (refer to the Section 7.14).
The database connection is abnormal.	The database connection is abnormal.	Restart the computer with the database.
The on-line data cannot be viewed.	In the data view, the on-line data are lost.	In the data view, click “Display the deleted data”.
		On the station interface, reset the threshold value setting (refer to the Section 7.3.2).
The part is not successfully initialized.	After the station is started, the part status is not successfully initialized, and the operation time is not displayed.	Check if the device is normally connected.
		Restart the station.
		Refresh the part information. Refer to the Section 7.3.2.
The bottle position of the sampler is abnormal.	Device alarm: The bottle position of the sampler is abnormal.	Check that the sample bottle of the automatic sampler is correctly placed, and there is no bottle position between two bottles.