



# Classical 3100

**USER'S MANUAL**



**Operation Manual**  
**for DAD3100 Diode Array Detector**

V1.0.6

***ELITEHPLC***

## Statement

The manual describes various contents of DAD3100 diode array detector. It is intended to help users to understand, use and maintain the instrument of DAD3100. Dalian Elite Analytical Instruments Co., Ltd. does not assume the responsibility caused by the manual.

The manual is subject to change without notice.

This manual has been published after careful review. It is believed to be accurate and complete. Dalian Elite Analytical Instruments Co., Ltd is not responsible for any error that may appear in the manual and the resulting incidental or renewal of harm.

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## Precautions

Thank you for your continue patronage. Observe the following precautions in order to ensure correct and safe use of the instrument.

According to the level of danger and harm, safety signs here are divided into the following three categories:



[Warning] Failure to properly follow the instructions and precautions indicated by this sign can result in serious injury or damage to health and property. The property damage includes the environment around and the instruments.



[Caution] Failure to properly follow the instructions and precautions indicated by this sign can result in slight injury or damage to health and property. Slight injury means no hospitalization is needed to the wounded. Slight property damage means the instruments can be recovery through simple maintenance.



[Note] The sign is used wherever information is given to ensure optimal performance of the instrument.

## 1. Precaution for usage



[Warning] DAD3100 diode array detector should only be used as a part of liquid chromatography. Do not use it for any other purpose. Except for special instructions, the instrument does not have explosion-proof function.

## 2. Ambient Conditions



[Warning] When the organic solvents are used, it is recommended that interior must be well ventilated and the firework should be prohibited. Also, a sink or equipment for washing eyes should be installed nearby in case of the organic solvent contacting with the eyes or skin.



[Note] In order to ensure high efficiency, keep the instrument away from caustic gas and dusty environment. The worktable should be neat, smooth, firm, and big enough. Ambient should be between 10°C to 30°C with a small fluctuation, and RH should be between 45% to 85%. Keep it away from cold or hot source as well as direct sunshine. The system should not be close to strong magnetic field.

## 3. Precaution for installation



[Warning] The instrument should be installed following the instructions strictly by professionals, make sure that the voltage of the power sockets the same as the power supply voltage indicated on the instrument. Using the wrong power voltage could result in danger and fire.

The accessory power cable should be used to connect the instrument to the power socket. Other cable should not be used.

Make sure the line cord is connected to a properly grounded power receptacle to prevent static and electric leakage.



[Caution] The instrument is so heavy, you should move it carefully and watch your hands at the same time.



[Note] The instrument should be connected following the instructions strictly. Wrong connection could cause communication error.

#### 4. Precaution for use



[Warning] Do not use the instrument in places where heat resource, fire seat, magnetic resource, strong vibration exist or may exist. It is prohibited to play flammable nearby.

The bottle for storing the mobile phase should have pore in cap to prevent danger caused by negative pressure in the bottle.

A gap between waste tube and the cork of waste bottle is necessary to prevent the waste bottle bursting when it is overfilled. The gap should be smaller to insure less evaporate of hazardous solvents. Even though, the waste needs to be clean up promptly.



[Caution] When using organic solvents, please wear safety goggles, special lab coats, gloves mask etc. If your body is exposed to toxic solvent accidentally, wash it immediately, and then go to hospital for specialized treatment.



[Note] When preparing mobile phase, please use HPLC-grade or equivalent at this level solvents. Solvents must be prefiltered by the manufacturer with 0.45 $\mu$ m (or smaller) filter paper. Degas all mobile phase before using it. Degassing can help to ensure a stable baseline and consistent analytical results.

Before first use, rinse the entire piping system according to the requirements of the manual, direct use is likely to block pipeline.

Before sample test, ensure that the pipeline in the system is filled with mobile phase without any bubble, otherwise it will affect the reliability of test results.

If an eluent is replaced with another eluent in which is insoluble, such as positive mobile phase (hexane) and reverse phase (methanol), be sure to operate according to the specified method in the manual, otherwise it will cause serious pipeline jam, and even system paralysis.

Do not use the following solvent: concentrated sulfuric acid, nitric acid, dichloroacetic acid, methylene chloride, chloroform, chloroform, dimethyl sulfoxide, acetone, tetrahydrofuran, etc. Such solvents always reduce the strength of the PEEK material, make it become fragile and broken, but the impact of short-term use of aqueous solution of acetone(lower than 0.5%) in gradient performance, the impact is receivable.

When using PEEK pipes, the pressure of system should be lower than the tolerance pressure of peek material, otherwise it may burst.

The bending radius of peek pipe should be more than 10mm, make the peek pipe natural relaxation during installation.

The PEEK pipe should be intercepted with professional tube cutter in order to make the pipe more smoothly. Pay attention to that there should be no cutting debris left in the pipe.

## 5. Repair, maintenance and parts replacement



[ Warning ]Before repair, maintenance and parts replacement, please turn off the power in case of leakage and electric shock.

There is no need to open the host cover while daily maintenance and repair. If the repair needs to open the host cover please entrust agents or communicate with us.

Use dry cloth to wipe the instrument. Do not use water or alcohol. The use of these liquids may erase characters or color on the panel.

Do not replace parts (e.g., fuses, deuterium lamp, etc.) from other company or other type, all accessories are required to be specified to prevent danger.

## 6. Precaution for static electricity



[Warning] As the system may use a lot of flammable, explosive organic reagents which can contaminate laboratory air. When the reagent concentration is too high, any spark or flame could cause fire or explosion accidents. Do not use the instrument near any fire resource, hot resource, and static electricity resource. To reduce static electricity, please take the following measures:

- 1) Make the instrument grounded. It is very important, please pay attention to it.
- 2) Maintain proper indoor humidity (humidity is greater than 65% can prevent static electricity effectively) and keep the environment clean.
- 3) Metal waste bottles (external conductive) should be grounded (no ground insulation). When using other materials container, you can insert one end of the wire into liquid in the bottle and make the other end earthed.
- 4) Replace a larger I.D. pipe when the flow of mobile phase flow is higher.
- 5) Wipe the instrument regularly.
- 6) Staffs should wear anti-static clothing. An anti-static bag is needed on the floor.
- 7) People and objects with static electricity is prohibited to touch the instruments.

## 7. Warning label instructions

To ensure the safety of staffs, we attach warning labels on the equipment where are dangerous. If the label is missing, please request new ones from the company, and attach to the correct position.



# Contents

<b>1. CHAPTER ONE: INTRODUCTION .....</b>	<b>1</b>
1.1 Features and Functions .....	2
1.2 Performance Specification .....	3
1.3 Physical Specifications .....	3
<b>2. CHAPTER TWO: INSTALLATION AND TRANSPORT .....</b>	<b>4</b>
2.1 Standard Accessories .....	4
2.1.1 Demolition of the Packing .....	4
2.1.2 Deliver Checklist .....	4
2.2 Installation Requirements.....	5
2.2.1 Site Requirements .....	5
2.2.2 Power and Power Line .....	6
2.2.3 Computer Requirements.....	6
2.3 Tube Connection .....	8
2.3.1 Tube Material.....	8
2.3.2 Cleaning the Connection Tube .....	8
2.3.3 EClassical 3100 System Connection Instance.....	8
2.4 The Front Panel .....	9
2.5 The Rear Panel .....	10
2.6 System Configuration .....	11
2.7 Transportation .....	11
<b>3. CHAPTER THREE: WORKING PRINCIPLE.....</b>	<b>12</b>
3.1 Basic Theory .....	12
3.2 Principle and Composition .....	13
3.3 Circuit Section .....	13

<b>4.</b>	<b>CHAPTER FOUR: BASIC OPERATION .....</b>	<b>14</b>
4.1	Power on and off .....	14
4.2	Chromsoft Workstation Frame .....	15
4.3	Main Interface Introduction of Detector Control Module in Workstation .....	16
4.4	Instrument Preheating Time.....	19
4.5	Detection Method Setup .....	19
4.6	Run the Method .....	21
4.7	Save the Method.....	21
4.8	Baseline Monitoring.....	22
4.9	Data Acquisition .....	23
4.10	Stopping Data Acquisition .....	24
4.11	Saving Collected Data .....	24
4.12	Data Viewing and Processing .....	25
4.13	Workstation structure .....	33
4.14	Installing Software .....	33
4.14.1	Selection of lotions .....	33
4.14.2	Computer network IP Settings.....	34
4.14.3	chromatography data workstation installation .....	37
4.15	<b>This section describes the Main page of the detector control module in the Kromstation .....</b>	<b>38</b>
4.15.1	Configuration Window.....	38
4.15.2	Device Monitor Window.....	43
4.15.3	Instrument Method page .....	44
4.16	<b>Access and New Construction .....</b>	<b>45</b>
4.16.1	Entering a Project .....	45
4.16.2	New Project .....	45
4.17	Instrument preheating time.....	46

<b>4.18</b>	<b>Method for Setting the instrument .....</b>	<b>47</b>
4.18.1	Setting the number of display collection channels .....	49
4.18.2	Setting the Collection frequency .....	49
4.18.3	Set the collection wavelength and reference wavelength .....	49
4.18.4	Output format.....	50
4.18.5	Method of preserving the instrument .....	50
4.18.6	How to turn on the instrument .....	51
4.18.7	Method of creating an instrument .....	51
<b>4.19</b>	<b>Setting Analysis Method .....</b>	<b>52</b>
4.19.1.	Measurement Settings .....	52
4.19.2.	Advanced Settings .....	53
4.19.3.	Point setting.....	54
<b>4.20</b>	<b>Running Detection Methods.....</b>	<b>55</b>
<b>4.21</b>	<b>Baseline monitoring .....</b>	<b>55</b>
<b>4.22</b>	<b>Data Collection .....</b>	<b>57</b>
4.22.1.	Single run data collection .....	57
4.22.2.	Serial operation data acquisition.....	58
4.22.3.	Stop data collection .....	59
<b>4.23</b>	<b>Data viewing and processing.....</b>	<b>60</b>
4.23.1.	Chromatogram viewing and processing .....	60
4.23.2.	Spectrogram viewing and processing .....	61
<b>5.</b>	<b>CHAPTER FIVE: MAINTENANCE AND REPAIR .....</b>	<b>68</b>
<b>5.1</b>	<b>Cleaning the Flow Cell Online.....</b>	<b>68</b>
<b>5.2</b>	<b>Cleaning the Tube .....</b>	<b>68</b>
<b>5.3</b>	<b>Flow Cell Replacement (Please contact Customer Service) .....</b>	<b>69</b>
<b>5.4</b>	<b>Deuterium Lamp Replacement .....</b>	<b>69</b>

<b>5.5</b>	<b>Common Failure Diagnosis and Elimination.....</b>	<b>72</b>
	<b>APPENDIX .....</b>	<b>I</b>
	<b>Consumption parts.....</b>	<b>I</b>
	<b>Renewal Parts.....</b>	<b>I</b>
	<b>Safety information .....</b>	<b>II</b>
	General safety information.....	II
	Standard of security .....	II
	<b>Absorptive character of some typical functional groups .....</b>	<b>II</b>
	<b>Features of some organic solvents .....</b>	<b>III</b>
	<b>Intermiscibility of commonly used solvents.....</b>	<b>VII</b>

# 1. Chapter One: Introduction

EClassical DAD3100 diode-array detector (The following is referred to DAD3100 detector.) is developed for the market demand, as a result of 20-year wisdom collection of Dalian Elite Analytical Instruments Co., Ltd. It can easily be used with other units such as LC pump, autosampler, column oven etc. Also it can be used as a detection tool.

DAD3100 detector has an advanced optical system differing from single wavelength uv-vis detector. The light beam from the deuterium lamp passes through a lens. The lens focuses light transmitted through the flow cell onto the slit at the entrance to the spectrographic Portion of the optic. The slit defines the size of the beam at the grating, and determines wavelength resolution and density of light striking the photodiodes. The grating disperses light into bands of wavelengths and focuses the onto the plane of the photodiode array. The detector measures the amount of light striking the photodiode array to determine the absorbance of the sample in the flow cell. The detector provides with chromatograms at any wavelength, as well as spectra at any time. In this way, users obtain 3D spectrum.

EClassical 3100 HPLC Series include P3100 constant flow pump, high pressure injector, LC column, data workstation etc. For more information, please contact Dalian Elite Analytical Instruments Co., Ltd.

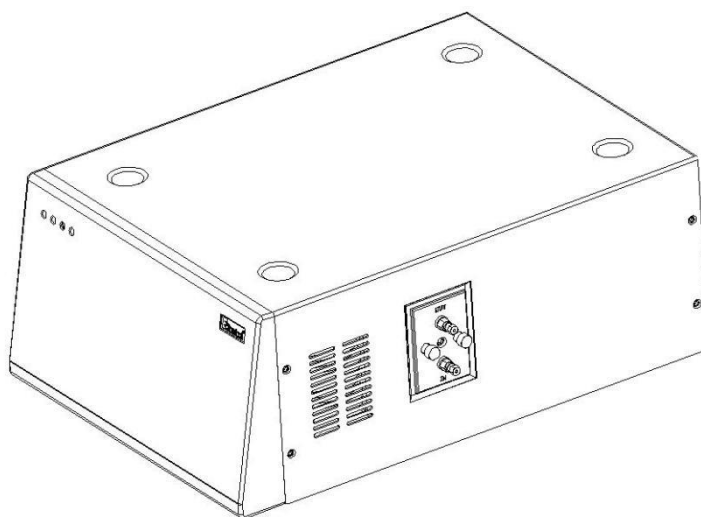


Figure1-1 EClassical DAD3100 diode-array detector

## 1.1 Features and Functions

### Excellent Design

DAD3100 detector is a dedicated multiple wavelength detector, innovated by professional team. It uses aberration corrected grating and unique wavelength calibration method. New optical system improves the detector's performance, with higher system light energy, lower baseline noise, higher S/N ratio, more excellent wavelength accuracy and wider wavelength detective range.

Equipped with imported flat field imaging grating, the detector has higher diffraction efficiency and lower stray light.

Using CMOS linear image sensor with 512 pixels, the detector has spectral resolution of 1.2 nm.

Excellent mechanical design of DAD3100 detector is carried out, including optimized airduct design to reduce baseline drift, scientific cooling mode to extend service life and closed optical system to strengthen optical stability.

Convenient operation on deuterium lamp replacement indicates that it is not necessary for users to recalibrate after that.

### Intelligent system

Fully automated power-on self-test to help users to realize circuit faults in time, avoids unnecessary damage.

Integrated into Chromsoft data workstation, the detector is easily operated. The workstation implements automatic analysis and audit trail with comprehensive function.

Real-time acquisition of both chromatograms and spectra makes it possible to obtain 3D spectrum for peak purity calculation and library searching.

It displays signals from multiple channels, with flexible sample frequency, detection wavelength range and response time, better meeting demand for separating and analysis.

The opening times and running time of deuterium lamp are recorded in the workstation so that users could get relevant information directly and easily.

## 1.2 Performance Specification

Table 1-2 Performance Specification of DAD3100 detector

Items	Specifications
Light source	Deuterium lamp and tungsten lamp
Response time	0s,1s,2s
Sample frequency	10Hz(1Hz、 2Hz、 5Hz、 20Hz、 40Hz)
Wavelength range	190-800nm
Wavelength repeatability	≤0.1nm
Wavelength accuracy	±1nm
Spectral resolution	1.2nm
Photodiode array	512 element
Noise	≤±1.0×10 <sup>-5</sup> AU (dry flow cell, 254nm, 2s rise time, 10Hz)
Drift	≤3×10 <sup>-4</sup> AU/h (dry flow cell, 254nm, 2s rise time, 10Hz, temperature change below 2 °C/hour)
Linearity range	≥2.0AU(5%)(254nm)
Maximum backpressure on flow cell	8MPa
Cell path length	10mm
Communication mode	UDP

## 1.3 Physical Specifications

Table 1-3 Physical Specification for DAD3100 detector

Dimension/Weight	420mm×300mm×175mm/18kg
Power requirements	AC 220V±10%
Typical input power	80W

## 2. Chapter Two: Installation and transport

### 2.1 Standard Accessories

DAD3100 detector is packaged with corrugated boxes and foam lined structure. When you receive the instrument, check the packaging first. If the packaging is damaged, please contact with Dalian Elite Analytical Instruments CO., Ltd. or local dealer.



[Warning] If there is any damage to the instruments when you receive it, please don't try to install it. You can ask Dalian Elite Analytical Instruments CO., Ltd to inspect and assess it.

#### 2.1.1 Demolition of the Packing

Put the detector on level ground with the face of the packing box up. Cut the tape on the top, take out the pump and accessories package, place it on the table. then, remove foam, open the instrument protective film.



[Warning] The detector is heavy, it is suggested that installation operation requires at least two people to prevent instrument slide.

#### 2.1.2 Deliver Checklist

Before installing, please check the deliver list carefully, if one or several of them omissions, please communicate with Dalian Elite Analytical Instruments CO., Ltd. Or local distributors as soon as possible.

Table 2-1 Deliver list of DAD3100 detector

NO.	Items	Quantity
1	DAD3100 diode-array detector	1 pc.
2	Certificate	1 pc.
3	Service Card	1 pc.
4	Start Package	1 pc.
5	User manual (CD)	1 pc.



[Note] If there is discrepancies between the packing list in the box and in the

specification, please refer to the packing list in the box, It is subject to change without prior notice.

## 2.2 Installation Requirements

### 2.2.1 Site Requirements

#### Environment

DAD3100 detector need to work under ambient conditions in Table 2-2 below:

Table 2-2 Environment requirements

Items	Specifications	Requirements
1	Work environment	Room should be free of dust, inflammable and explosive materials, good ventilation is also important
2	electromagnetic field	No electromagnetic noise nearby
3	Operating temperature	4~40°C (39~104°F)
4	Humidity	20%~80%, non-condensing
5	Temperature fluctuation	< ± 2°C /hour



[Caution] Do not use the detector under conditions of temperature fluctuations. If the ambient temperature is too low, make the room temperature increase slowly to avoid condensation inside caused by rapid heating.

#### Bench space

The DAD3100 detector can be placed on any normal laboratory bench. If you want to display the complete EClassical 3100 system on the bench, make sure that the table can bear the weight of all components. It needs additional space of 50mm on the left,150mm on the right,150mm on the back to facilitate the circulation of air and electrical connections.



[Warning] The instruments should be placed on a horizontal position, otherwise there is a danger of falling!

## 2.2.2 Power and Power Line

To ensure the instrument can be normal and safe, please use a dedicated power line within the specified voltage range.

Grounding, ac power to 220 v  $\pm$  10%, 50 Hz;

Please choose T2.0 A (250 v) fuse.



[Warning] The accessory power cable should be used to connect the pump with the power socket. Other cable should not be used in case of danger or damage to the instrument.

If the instrument is connected to a grid above the scope of application, it may cause electrical shock or damage to the equipment and staff.

Please unplug the power cord before replacing the fuse to avoid electric shock. The external fuse is installed in the back of instrument.

## 2.2.3 Computer Requirements

### Hardware requirements

- The lowest hardware requirement: Intel Core 2 CPU, 2G internal storage, more than 1G hard-disk space; (Refer to the use of workstation)
- The lowest resolution of displayer: 1024×800, 64K(16 bit image);
- Others: USB or RS232 interface for communication, CD-ROM driver for software installation.

### Operation system requirements

- Windows 7 or higher version (Refer to the use of workstation).

### Workstation requirements

- Use Chromsoft workstation to control the instruments.

### Communication connection

Communication management of pumps and column oven is completed by an AD adapter. Meanwhile that of the detector and autosampler is completed by a router. Control functions of all components are completed by the upper computer. The communication line is connected as follows:

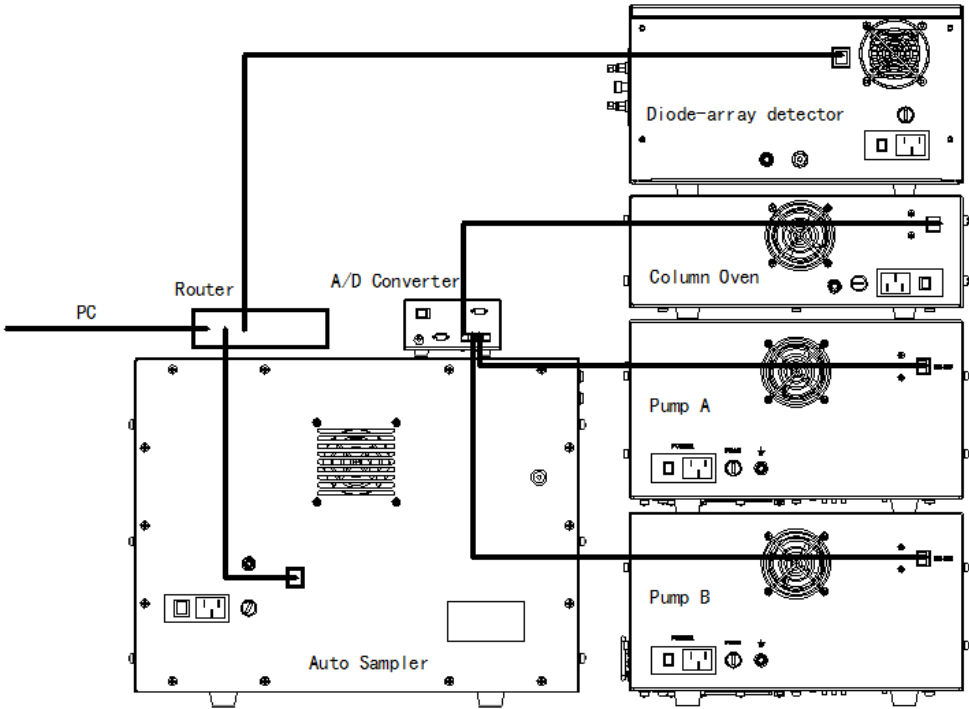


Figure 2-2 EClassical 3100 HPLC communication

## 2.3 Tube Connection

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In addition to the column system, piping, fittings and injector, detector volume are likely to cause bands broadening. Inappropriate tube material also leads to band broadening, even to degeneration of the sample. Please connect the tubes with instruments correctly to improve efficiency. The tips are as follows:

### 2.3.1 Tube Material

Different material of tube is required according to the working pressure, the kind of mobile phase and the nature of sample. The commonly used tube materials are as follows: stainless steel, polyetheretherketone (PEEK), polytetrafluoroethylene, polyethylene or polypropylene. The most commonly used material is stainless steel. The outer diameter of LC connection tube is 1.59mm (1/16 "), the inner diameter of LC tube are 0.175mm (0.007"), 0.25mm (0.01 "), 0.5mm (0.02"), 0.75 (0.03 ") mm and 1.0mm (0.04") etc., user can choose from them. Stainless steel tube is generally used for high-pressure part.

Polymer tube can be used in low-pressure part of LC System, such as from reservoir bottle to pump, detector outlet, injector discharge port, etc. The polymer tube is the most common connection tube in LC system.

PEEK tube can withstand about 30MPa pressure, it is more inert than stainless steel pipe which means it is a good choice for separation, analysis and preparation of biological samples. In bio-separation system, PEEK is alternative materials for stainless steel.

### 2.3.2 Cleaning the Connection Tube

Please wash new pipeline with solvent before use. Cleaning order: chloroform - methanol (ethanol) - Water -1 mol/L nitric acid - water - methanol – dry nitrogen stream. Also, silicone tube should be rinsed with methanol before use.

### 2.3.3 EClassical 3100 System Connection Instance

The stainless steel two way at the lower part of the detector cell is the entrance, so that the bubbles in detector cell can be excluded easily. Connect the exit of column to the entrance of detector cell with piping and screws tightly to prevent bubbles from entering the system. It is recommended that you'd better choose the patent universal joint or one-piece joint produced by our company. The outlet of the detector cell should be connected to the waste bottle with the silicone tubing (inner diameter 1.0 mm) in the accessories package.

## 2.4 The Front Panel

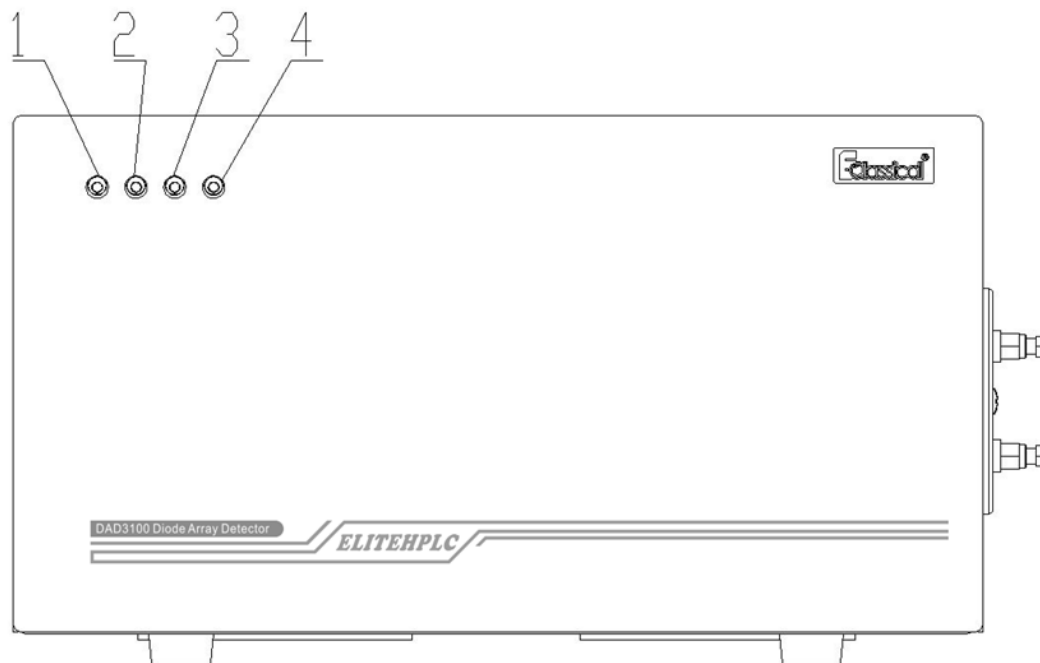


Figure 2-4 DAD3100 Front panel

Table 2-4 Front panel Function

No.	Key	Function
1	Power indicator	To indicate the power system is functioning right
2	D2 lamp indicator	To indicate the D2 lamp is on and functioning right
3	Tungsten lamp indicator	To indicate the Tungsten lamp is on and functioning right
4	Connection indicator	To indicate the connection is set up right

## 2.5 The Rear Panel

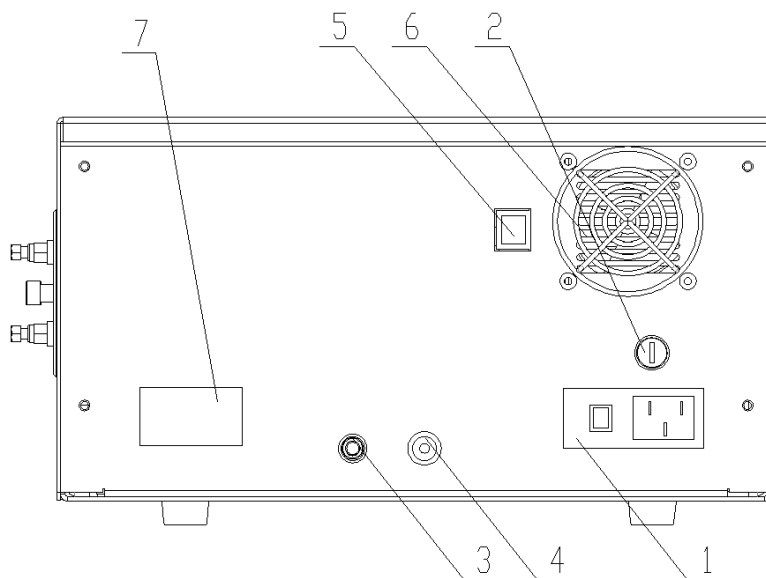


Figure 2-5 DAD3100 rear panel

Table 2-5 Rear panel function

No.	Components	Function
1	Power connector and Power switch	The power cable is connected into grounded power outlet. "I" turn on the detector power, "O" turn off the detector power.
2	Fuse	The fuse is in it
3	Ground terminal	To ground the main body of the instrument.
4	Trigger terminal	To connect injection valve for trigger signal
5	LAN	The communication interface between the instrument and workstation
6	Cooling fan vent	Cool the instrument.
7	Instrument panels	To identify the information of instrument.

## 2.6 System Configuration

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In normal instance, the instrument customers received have been tested and came with verification, the performance met our requirements in factory, users have no need to test and verify. If you have any doubt about the performance of the instrument, verify it refer to the following steps:

- 1) Take a chromatographic column, the positive phase system selected SiO<sub>2</sub> column, inverse system using C18 column.
- 2) Prepare mobile phase and samples according to evaluation report provided by the column manufacturer.
- 3) Empty air bubbles in the system, when the system is stable, detect it according to the testing requirement.
- 4) If the result and column efficiency is conformed to the information provide by column manufacturer within the error range, that means the HPLC is qualified.

## 2.7 Transportation

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The detector is a precision instrument, please gently while long-distance transportation, severe vibration, drops are likely to cause damage to the internal parts of the instrument. The random original packaging can effectively protect the instrument. When the instrument is required to move or returned for service, please follow these steps for packaging.

Turn off the power.

Unplug the power cord and communication lines.

Removing the connecting pipe and other elements between components.

Remove the detector from chromatography system, put it into special sealed bag on a large platform.

Put the detector into the original packaging foam, fix it.

Placed the fixed detector and other accessories into original packaging carefully.

Tape the box sealed to prevent liquid from entering. Cover the packaging box with plastic wrap is recommended.

Transport packaged instrument.



[Warning] Before packing, please check the box, if the original packaging has been damaged, do not use it, you should consult your local dealer or Dalian Elite Analytical Instruments Co., Ltd. customer service staff to solve!

## 3. Chapter Three: Working Principle

### 3.1 Basic Theory

Material molecular can absorb ultraviolet-visible light, which conforms to Lambert Beer law.

$I_0$  is Intensity of the Incident Light, “ $I$ ” is the transmitted light intensity (refer to figure 3-1), the Lambert Beer law can be written as:

$$I = I_0 e^{-\epsilon lc}$$

$l$  ——Optical path length of flow cell,

$c$  ——The molar concentration of the sample,

$\epsilon$  ——The molar absorption coefficient of the sample.

Definition:

$$T = I / I_0$$

$T$  is the transmittance for the sample under a particular wavelength.

So:

$$A = \epsilon lc = \log\left(\frac{I_0}{I}\right)$$

$A$  is defined as the light absorption value.

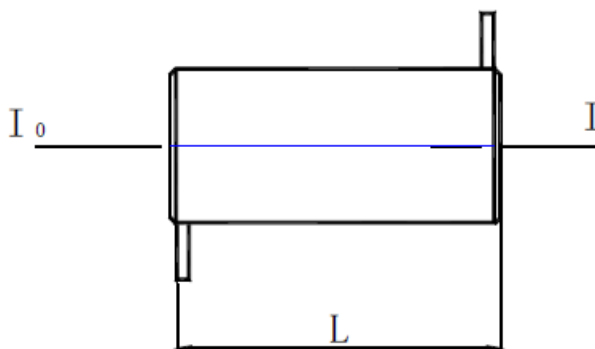


Figure 3-1: The absorption of samples in the flow cell

Thus, light absorption value  $A$  is linear to samples concentration  $c$ . The sample concentration can be obtained by measurement of light absorption value. Molar absorption coefficient is relevant to light wavelength, sample on molecular structure and solvent, it shows absorption ability of sample molecules under a particular wavelength. Annex I listed some typical groups of characteristic absorption wavelength and the corresponding  $\epsilon$  value.

### 3.2 Principle and Composition

Figure 3-2 is the general structure diagram of detector. Compound light from light source is focused by source lens, and then passes through the flow cell. The light leaves the flow cell at the other side and is focused by the spectrograph lens through the slit assembly. Under the function of spectrographic mirror, the light is reflected onto the grating. The grating disperses the light and diffracts it into wavelengths, which is then focused on the diode array plane to form spectra. Diode array contains 512 elements, each of which receives light signals from different wavelengths and then converted them into electrical digital signals. The workstation recorded data transferred from the instrument and plotted chromatograms and spectra by this means.

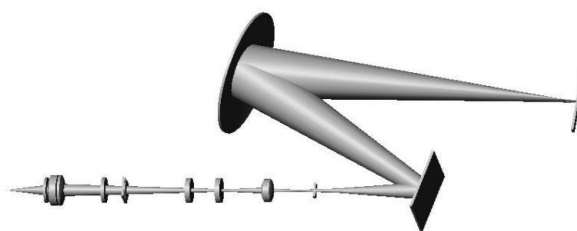


Figure 3-2 Optical system of DAD3100

### 3.3 Circuit Section

In control system of DAD3100, the photocurrent signal of photoelectric diode comes through signal processing, and it is converted into digital signals by CPU of DAD motherboard. On the other hand, DAD motherboard deals with signals controlling electric motor, lamps, optical filters, etc. DAD motherboard, monitoring failure states, communicates with Chromsoft workstation by handshake agreement, so that there will be error codes represented by workstation if abnormal situation occurs. Analog power and digital power supply stable power for the circuit section together.

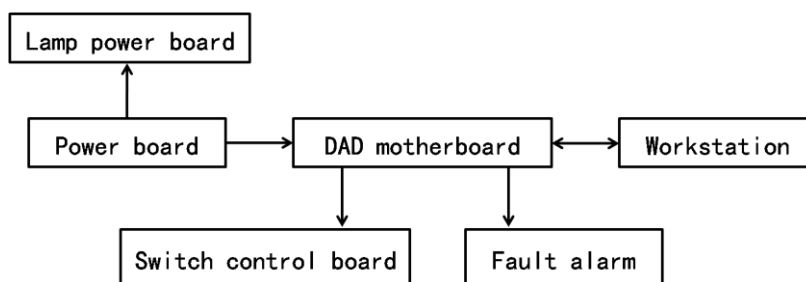


Figure 3-3 Circuit system frame

## 4. Chapter Four: Basic Operation

### 4.1 Power on and off

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**Power on:** Please plug the power cord into the power outlet.



[Note] The power switch is turned off at this time (“O” position).

Turn on the power switch (“I” means on, and “O” means off, on the rear panel).

While the power indicator light, DAD3100 begins power-on self-test.

**Power off:** Turn off the power switch (“I” means on, and “O” means off), and then the power indicator and lamp status indicator will be off, as well as the cooling fans.



[Note] The detection wavelength, wavelength range and other parameters are set as the last shutdown status.

At the first time running, all parameters are default values for factory settings.

If the instrument is shutdown, an Interval of more than 10 minutes is need before it is turned on again.

## 4.2 Chromsoft Workstation Frame

All methods and most functions of the detector are completed by Chromsoft station. The frame scheme of Chromsoft station is showed as figure 4-2.

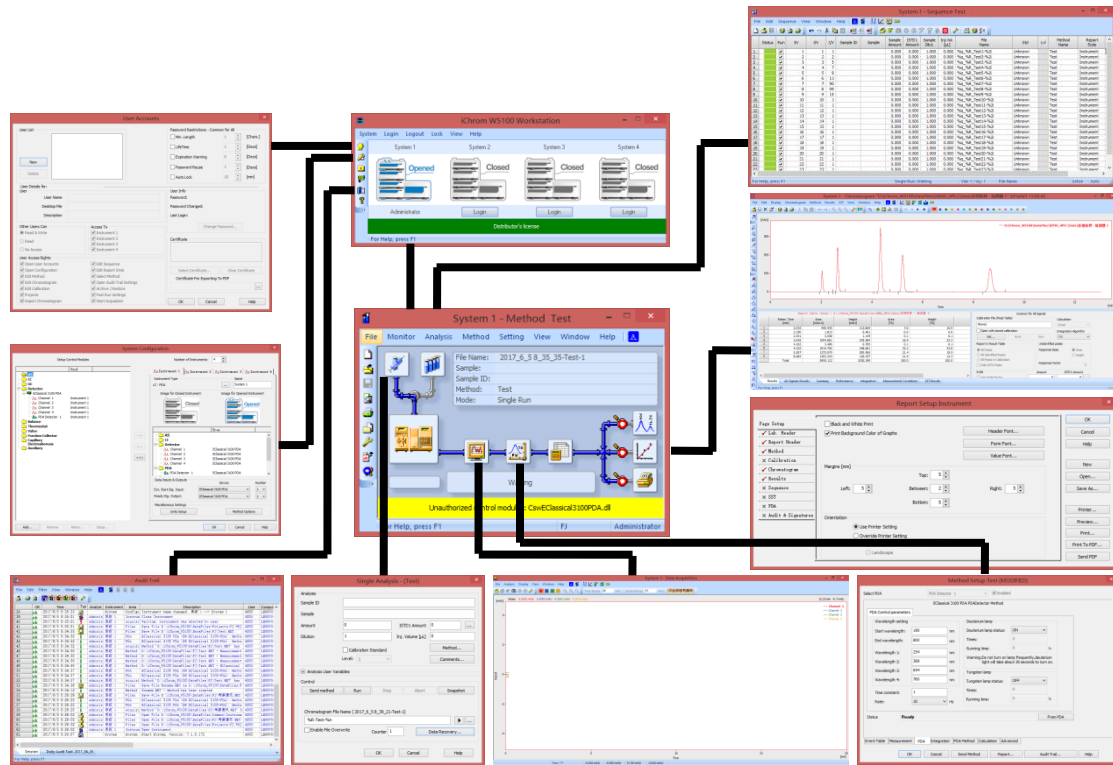



Figure 4-1 Chromsoft workstation frame scheme

## 4.3 Main Interface Introduction of Detector Control Module in Workstation

There are 3 parts of control module involved to DAD3100 detector in Chromsoft workstation.

### 1) Configuration Window

Users add DAD3100 detector control module and verify instrument communication status in the window.

Open “Configuration” window, shown as Figure 4-2. Add DAD3100 detector control module in the window: first, open “Instrument Type” as shown in Figure4-3 Step1, and click “OK” as shown in figure 4-4. Then, click “Add” button in “Configuration” window as shown in Figure4-3 Step2, to open “Available Control Modules” window. Choose “EClassical 3100-PDA” in Detector part and click “add” as shown in Figure4-5. Then enter DAD3100 serial number, channel number and names, in the pop-up“EClassical 3100-PDA Setup” window. After setting, click “AutoDetect” window to check the communication status as shown in Figure4-6. Click “OK” to return to “Configuration” window(Figure 4-3). Choose “EClassical 3100 PDA” in the left column, and click  to complete adding detector control module (Figure 4-3 Step3).

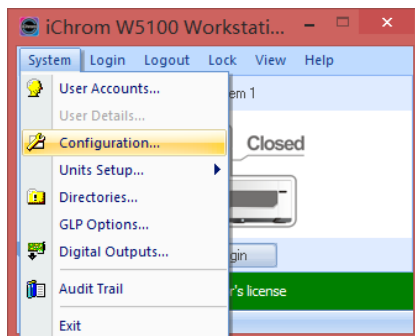


Figure 4-2 Login window

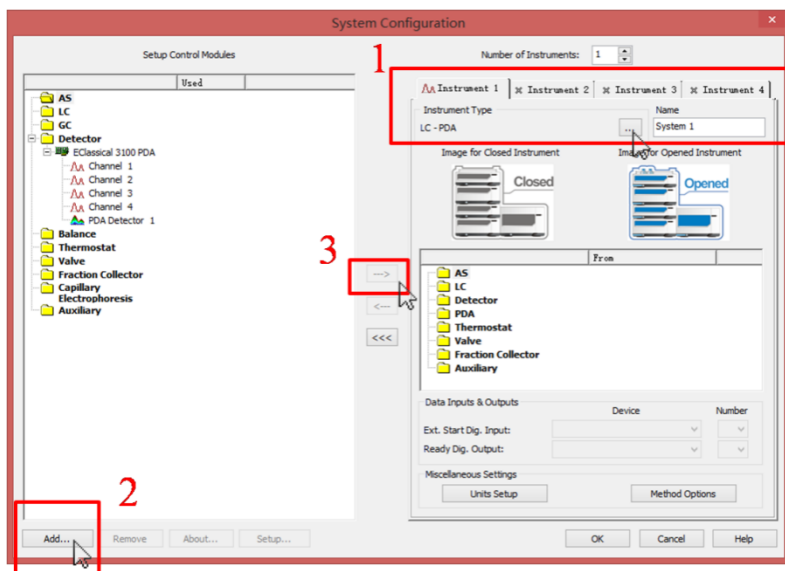


Figure4-3 System configuration window

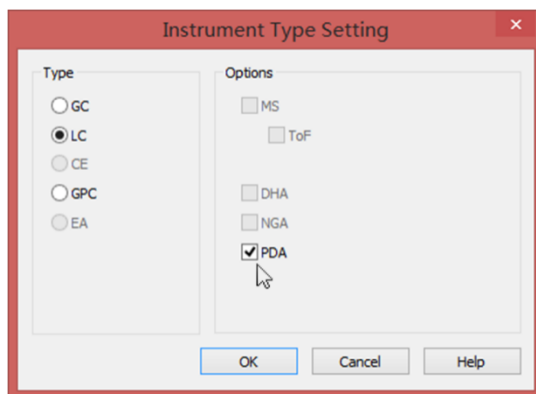


Figure 4-4 Instrument Type Setting

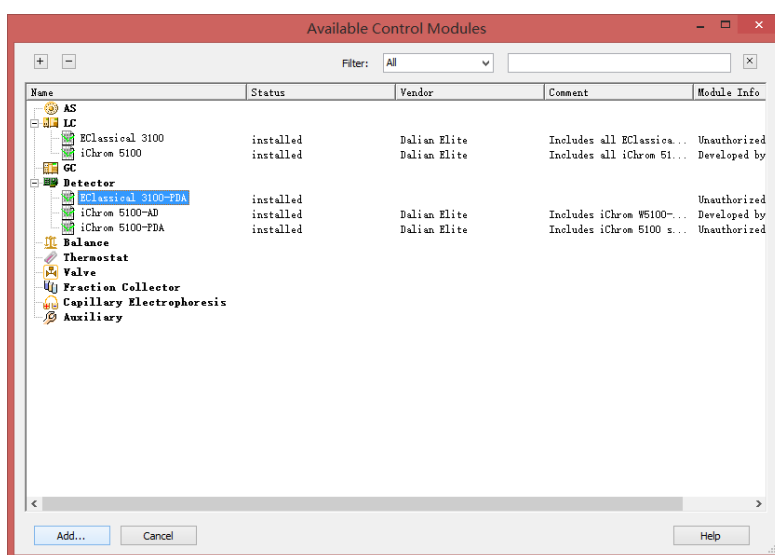


Figure 4-5 Available Control Modules

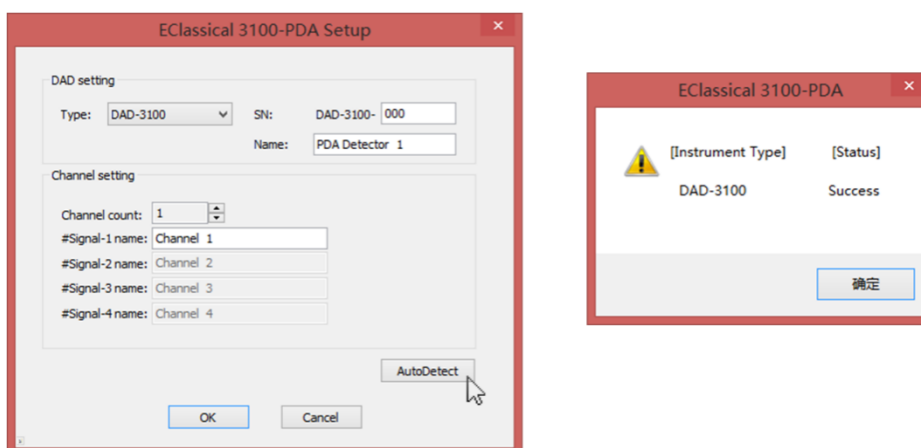




Figure 4-6 EClassical 3100-PDA Setup window

## 2) Device Monitor Window

In the instrument main menu window, click “Device Monitor” in the drop-down menu of “Monitor” or directly position the mouse pointer on the instrument icon  and click , by which you can open the device monitor window, as shown in Figure 4-7. Detection wavelength and warning information display under the monitor window,.

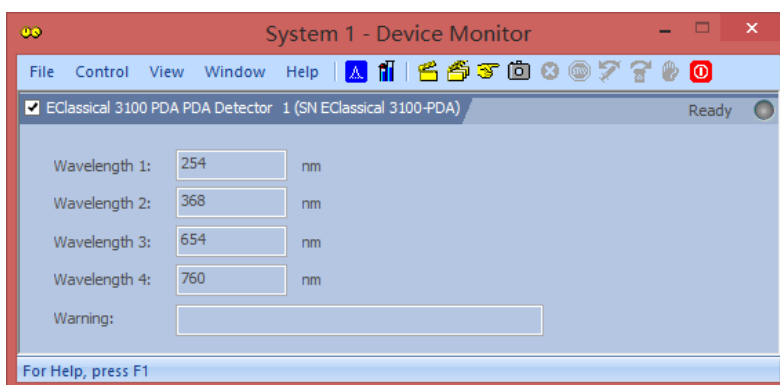


Figure 4-7 Device Monitor window

## 3) Method Setup Tab

In the instrument main menu window, click “PDA Control” in the drop-down menu of “Method”, as shown in Figure 4-8. In “PDA” tab, users can set up PDA control parameters, such as wavelength, wavelength range, sample rate, lamp status and so on. By activating functional button “From PDA”, users can monitor the opening times and running time of the lamps.

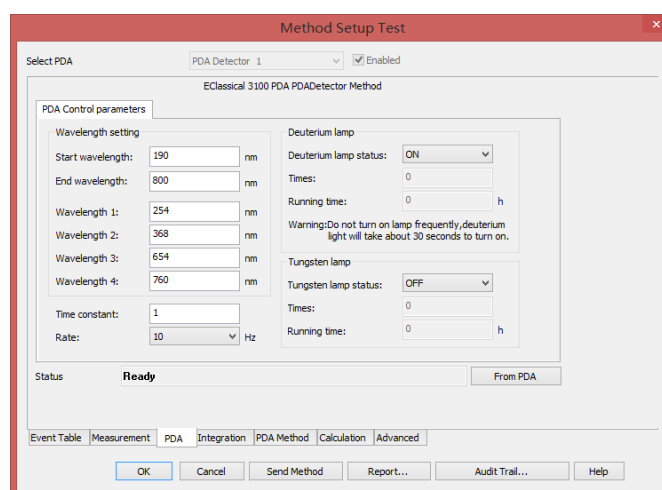


Figure 4-8 Method Setup Window-PDA

## 4.4 Instrument Preheating Time

The purpose of instrument preheating is to stabilize the circuit system and light source. According to the properties of the circuit system and the usage requirement of the lamps, it is necessary to preheat for about half an hour.

## 4.5 Detection Method Setup

### 4.5.1. Turn on and off the Light Source

In general, it takes 2-3 minutes to power-on self test by default. In the process, the deuterium lamp is turned on automatically, however the tungsten lamp is turned off. Users can set the status of the deuterium lamp and tungsten lamp through “Method Setup” in the workstation. Specific operation steps are as described below.

- 1) After login, click “PDA Control” in the drop-down menu to open the setup window.
- 2) In the method setup window, choose “PDA” tab, and set the status of both lamps (on or off) , as the red frame marked in Figure 4-9.

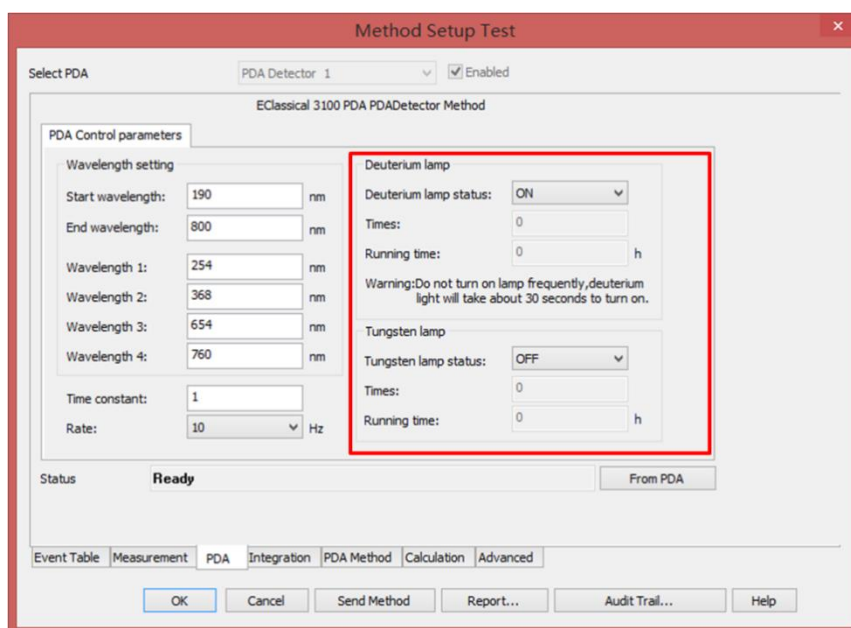


Figure 4-9 Light source setup

By activating functional button “From PDA”, users can monitor the opening times and running time of the lamps. This feature is designed to make it easier for users to observe the status of the detector and determine the life of the light source.



[Note] Please do not continuously turn on and turn off the light source, for fear that the deuterium lamp and tungsten lamp are damaged. Suggest leave at least 5-minute interval between turning on and off each lamp.

### 4.5.2. Detection Channel Number Setup

As showed in Figure 4-6 of Section 4.3, in “EClassical DAD3100 Setup” Window, channel number and name can be set.

### 4.5.3. Time Constant and Sample Rate Setup

Time constant is defined as 63.2% of the time from the sample entrance into flow cell to the signal output. As a measure of the response time of the detector after sample entrance, time constant reflects the rate of detector to track concentration changes. If time constant values too high, chromatographic peak will be distorted and the column efficiency will decrease, having a bad influence on reliability and accuracy of chromatography analysis. For rapid analysis of weak chromatographic retention component, set the detector time constant as small as possible. For DAD3100 detector, the time constant can be set as 0s, 1s, 2s.

So far, the sample rate can be set as 1Hz, 2Hz, 5Hz, 10Hz, 20Hz and 40Hz.

### 4.5.4. Peak Purity Option and Library Searching Option Setup

Choose “PDA Method” in method setup window, and set up peak purity parameters and spectral library searching conditions, as shown in Figure 4-10. The red frame in the figure displays the selectable searching libraries.

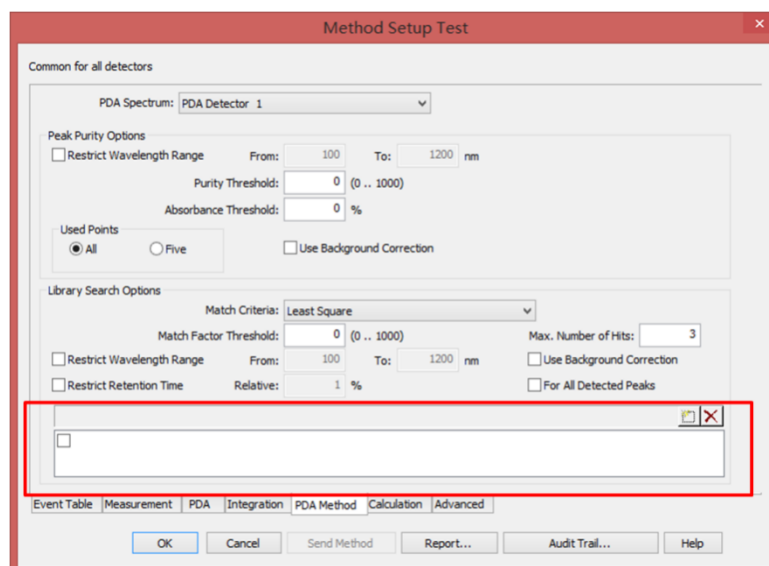


Figure4-10 Detector advanced conditions setup

## 4.6 Run the Method

After editing the detection method, click “Yes”, and then there pops up “to send method” dialog, as shown in Figure 4-11. Once click “Yes”, the workstation would send method order to lower-computer and start to run the method.

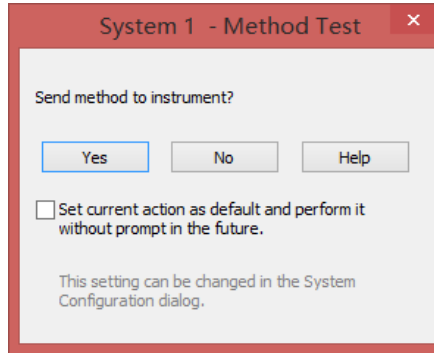


Figure 4-11 “to send method” dialog



[Note] After editing the detection method, if click “No” in the pop-up “to send method” dialog, the new setup method would only be saved without running right now.

## 4.7 Save the Method

After editing the detection method, click “OK” in the method setup window. Then click “File” in the instrument control window, and click “Save Method” or “Save Method As” in the drop-down menu, as shown in Figure4-12.

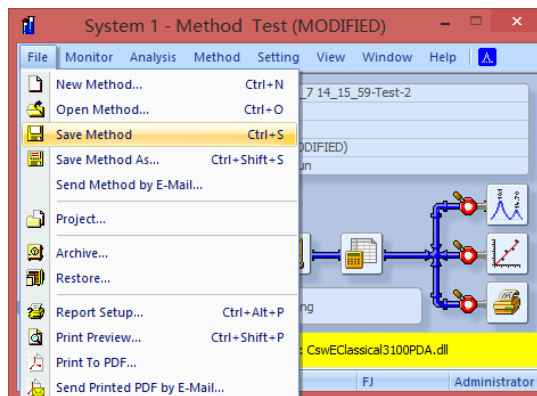


Figure 4-12 To save Method

“Save Method” refers to save and overwritten the current method without changing the file name. While “Save Method As” refers to reset the file path and name the method without changing the current method. It is shown in Figure 4-13.

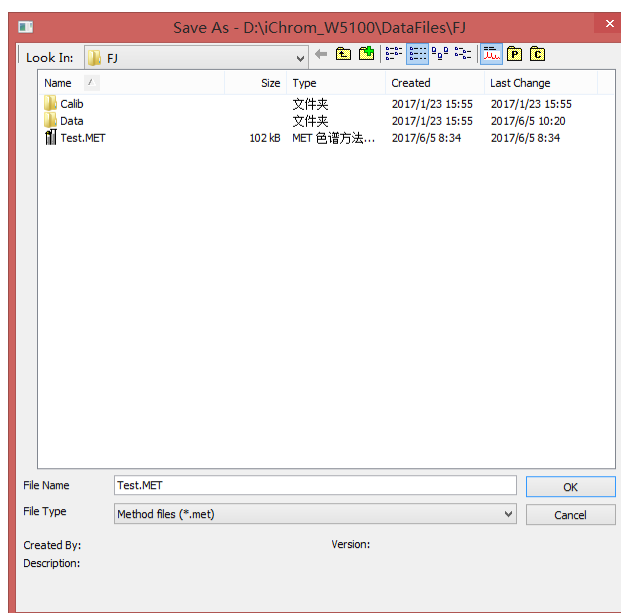


Figure 4-13 To Save Method As

Before closing the instrument control interface, there pops up “File Manager” dialog, as shown in Figure 4-14. Choose “Yes” to overwritten, or choose “No” to maintain the original method.

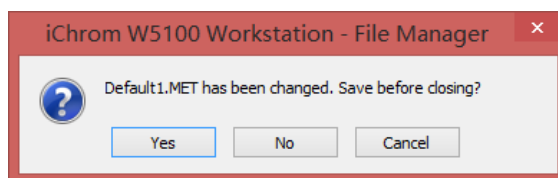



Figure 4-14 File Manager

## 4.8 Baseline Monitoring


After sending the method, click  in the instrument control window to conduct the baseline monitoring.



[Note] It takes some time for the deuterium lamp to be stable. So please use the detector after lightening the lamp for 20 minutes.

## 4.9 Data Acquisition

### 4.9.1. Open the Data Acquisition Window

As shown in Figure 4-15, in the drop-down menu of “Monitor”, choose “Data Acquisition”, or directly click data acquisition icon  to open the data acquisition window.

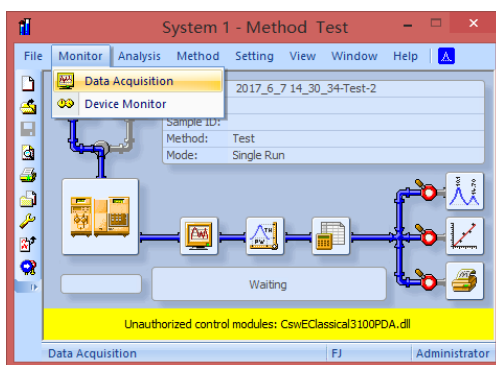



Figure 4-15 Open the data acquisition window

### 4.9.2. Data Acquisition Window

Click  in data acquisition window, and the workstation will be ready for data collection, as shown in Figure 4-16.

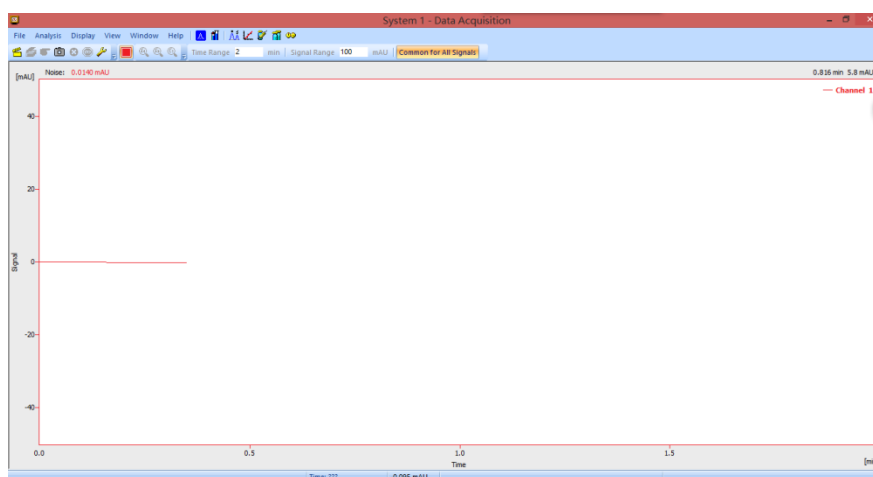




Figure 4-16 Data acquisition window

## 4.10 Stopping Data Acquisition

---

Users can stop data acquisition by the following ways:

First, click  in data acquisition window to stop data collection and save chromatogram in the same time.

Second, click  in data acquisition window to give up data collection without saving chromatogram.

Third, set run time in method setup dialog to stop data collection and save chromatogram in the same time.

## 4.11 Saving Collected Data






---


The workstation will automatically save collected data in specified path according to preset file format with a .PRM extension. Users can set chromatograms under their preset path on the basis of their requirement.

## 4.12 Data Viewing and Processing

There are both chromatogram window and PDA window in Chromsoft chromatography workstation. The former window displays chromatograms; however the latter one shows UV-VIS spectrograms.

### 4.14.2 Chromatograms Viewing and Processing

Click  in instrument control window, or data acquisition window or calibration window to open chromatogram window. If turn the icon  into  on the left side of  in instrument control window, the latest chromatogram will be opened automatically after acquisition. And the collecting chromatogram will be opened by clicking snapshot button () in data acquisition window.

It is the chromatogram window shown in Figure 4-17. Users view chromatogram data in the results table, summary table, performance table, integration table, measurement conditions, and SST results table. It is also easy for users to modify, add and delete peaks through the left-side shortcut icons. Activate the balloon help icon  to get indication of every functional button.

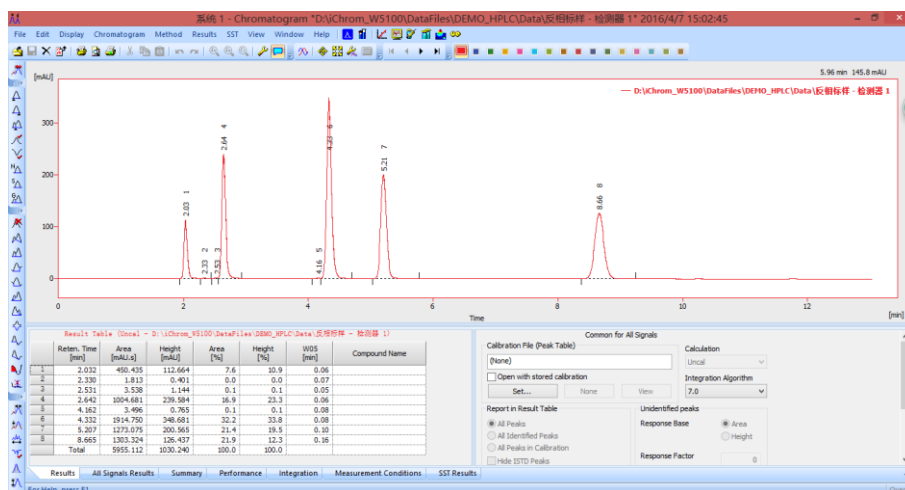


Figure 4-17 Chromatogram window

Chromatograms can be output by the following way: Click “Export” in the drop-down menu in

“File” option, then choose “Export Data”, “Export Chromatogram”, “Export Summary Table”, “Export as Picture to Clipboard” and “Export as Picture to File”, as shown in Figure 4-18.

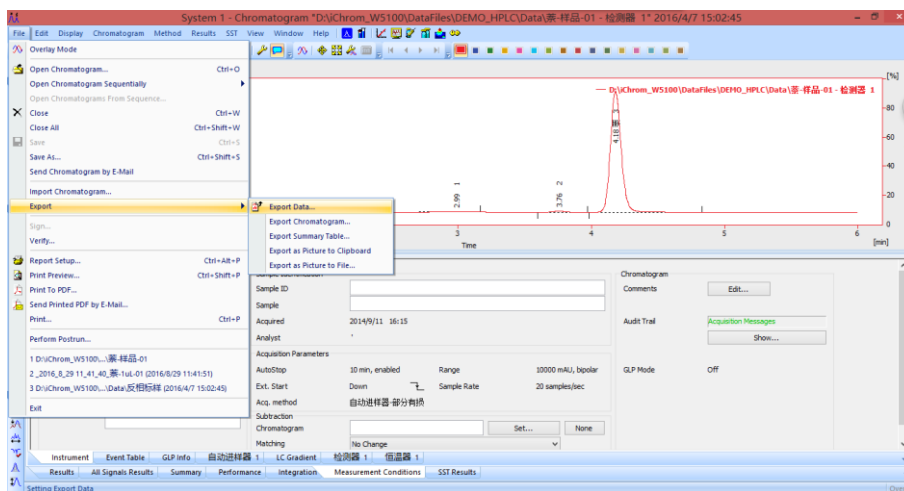



Figure 4-18 Chromatogram window- Export Data

### 4.14.2 Spectra Viewing and Processing

Click  in Chromatogram window to open PDA window to see spectra information. PDA window displays 4 views at the same time, as shown in Figure 4-19.

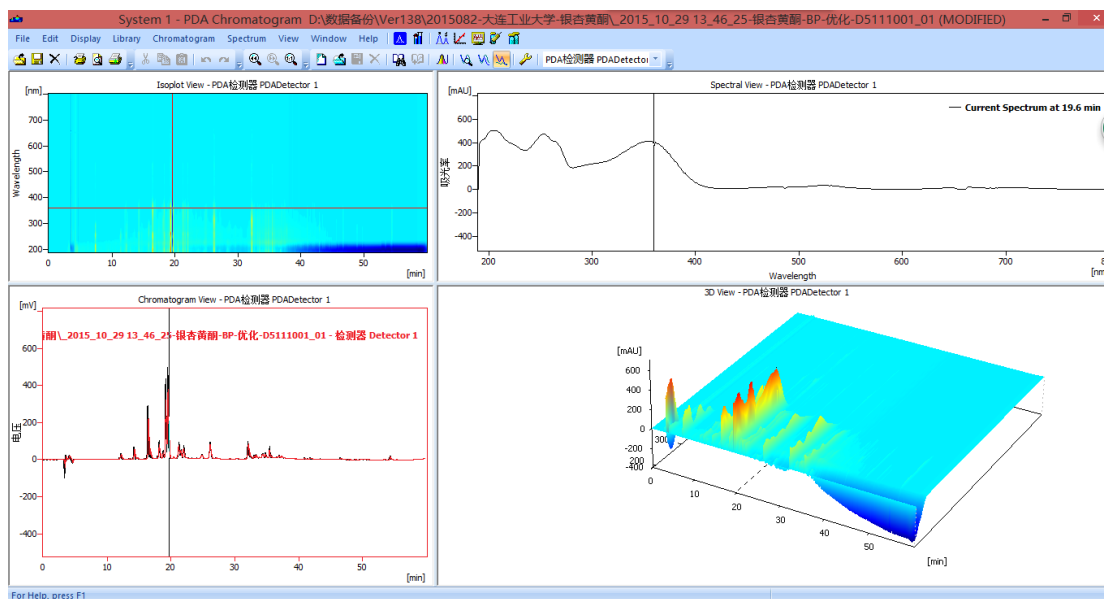








Figure 4-19 PDA Window

#### 1) Views



The PDA window can display single view or can be split into two or four panes, including Isoplot View, Chromatogram View, Spectral View, 3D View, Peak Purity View, Peak Purity Spectra View, Spectral Library View and Spectral Search View. Right-click on one view area, and then select the desired view to change the current view.

## 2) File



Related shortcut buttons function as follows:

	Open chromatogram
	Save chromatogram
	Close chromatogram
	Report setup
	Print preview
	Print

## 3) Markers

Isoplot, Chromatogram, Spectral and 3D views feature one or two markers (thin lines of inverse color crossing the data plot) depicting current position in the data. They indicated time and wavelength separately. Markers can be moved by holding the left mouse button while cursor is over the marker (cursor changes to  or ) and dragging it with the mouse, meanwhile there shows the coordinate on the top-right of the view area.

## 4) PDA Properties

Invoking the command or using the  icon opens the PDA Properties dialog to simply set the graph properties. The “Chrom&Spectral View” tab enable to decide whether to show peak purity index or active signal, and normalize the spectral view. On the other hand, on the top of PDA window, there are shortcut buttons  representing normalizing the spectra in the zoomed range, on whole wavelength axis range and turning the normalization off, separately.

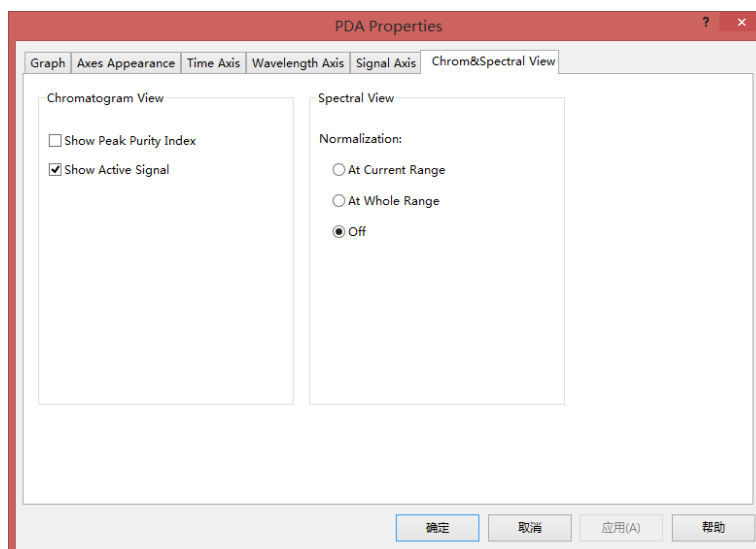







Figure 4-20 PDA Properties window

### 5) Library

Related shortcut buttons function as follows:

	Creates a new empty spectral library
	Opens the spectral library file
	Saves spectral library
	Closes the spectral library

Click “Library”, and select “ Options” to set background correction and save a description of the library.

### 6) Chromatogram View

Click “Chromatogram”, and select “Add signal” in the drop-down menu to store a cut of the PDA data on the selected wavelength/range of wavelengths as a signal in the current chromatogram. The same option can be set by right-click on the chromatogram area. “Add Chromatogram Signal” window is shown in Figure 4-21.

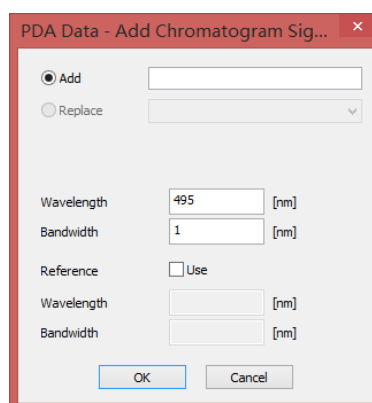


Figure 4-21 PDA Data- Add Chromatogram Signal

Right-click on the chromatogram view area, and select “Properties”. Then choose “Display Peak Purity” to display peak purity curve in upper part of the view, as shown in Figure 4-22.

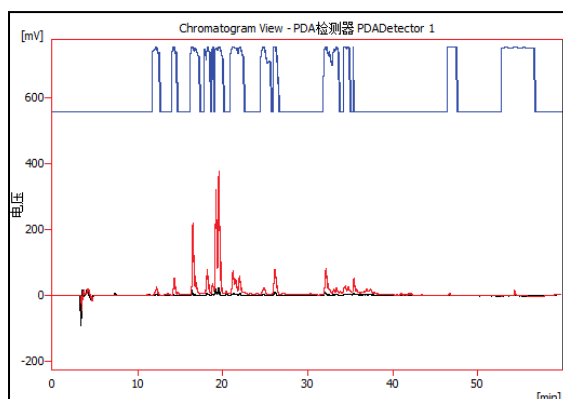







Figure 4-22 Display peak purity in Chromatogram View

### 7) Spectral View

Related shortcut buttons function as follows:

	Search in Library
	Add Spectrum
	Normalize spectra over zoomed range
	Normalize spectra over whole range
	Spectra normalization OFF

“Add Spectrum” is referred to add the selected spectrum to the spectral library. Users can name the component and add comments to it before the spectrum is added to library, as shown in Figure 4-23.

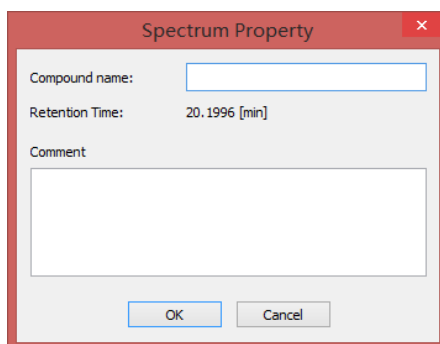


Figure 4-23 Spectrum Property

### 8) Isoplot Views

The Isoplot view is the basic view of PDA spectral data, as shown in Figure 4-23. It displays the spectral data viewed from above with the absorbance values distinguished by color. The lowest values are represented by dark blue, rising over light blue, green, yellow up to red and dark red.

being the highest.

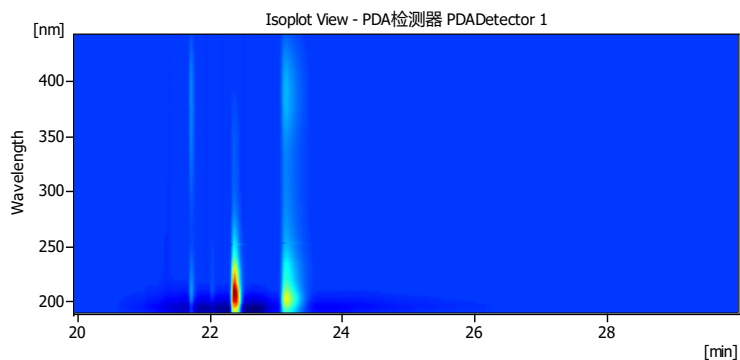





Figure 4-24 Isoplot View

Markers can be moved by holding the left mouse button while cursor is over the marker (cursor changes to  or ) and dragging it with the mouse, meanwhile the chromatogram and spectrum will display under the setting conditions.

### 9) Peak Purity View

Dragging the marker in chromatogram or isoplot on the desired chromatographic peak, and then right-click to select “Display Peak Purity” or directly click  icon. Users can get peak purity curve in the view, as shown in Figure 4-25.

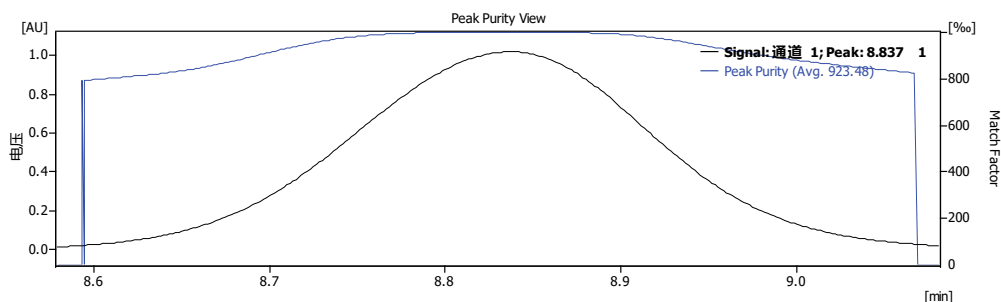


Figure 4-25 Peak Purity View

### 10) Peak Purity Spectra View

The peak selecting operation in Peak Purity Spectra View is the same as that in Peak Purity View. The Peak Purity Spectra View displays the spectra in several significant points of the peak selected in the Peak Purity View. These points contain both threshold points (first and last point in which the Match Factor is computed for the given peak), both inflexion points and the peak apex.

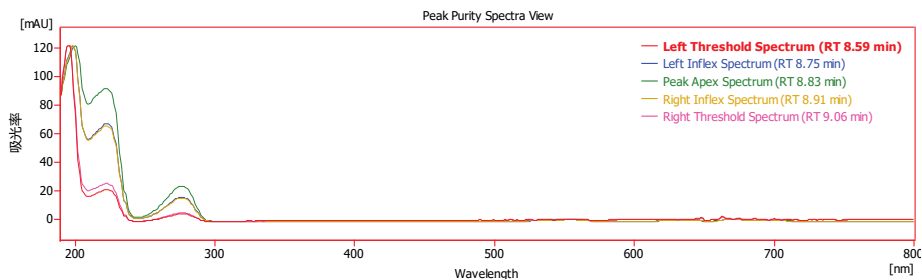


Figure 4-26 Peak Purity Spectra View

### 11) Spectral Library View

The Spectral Library View displays the spectra information from the currently opened Spectral Library, as shown in Figure 4-27. The Spectrum Name and Comment columns can be edited. To delete a spectrum from the library, select its line and press the “Delete” key. The spectra may be overlaid to the current spectrum in the Spectral View by checking the checkbox in the “Show” column.

Spectral Library: Noname								
	Show	Spectrum Name	Reten. Time	From	To	Step	Apexes	Comment
	<input type="checkbox"/>	STD1	8.684	190	800	1	199, 222, 2	
	<input type="checkbox"/>	STD2	8.684	190	800	1	199, 222, 2	
	<input type="checkbox"/>	STD3	8.684	190	800	1	199, 222, 2	

Figure 4-27 Spectral Library View

### 12) Spectral Search View

The Spectral Search View displays the matching spectra information found by the use of the Search in Library “...” command, as shown in Figure 4-28.

Library Search Result: Peak - 8.684 [min]									
	Show	Spectrum Name	Reten. Time	From	To	Step	Apexes	Data Source	Comm
	<input type="checkbox"/>	STD1	8.684	190	800	1	199, 222, 2	D:\数据备份\沙丁胺醇_2016_11_23_18	
	<input type="checkbox"/>	STD2	8.684	190	800	1	199, 222, 2	D:\数据备份\沙丁胺醇_2016_11_23_18	
	<input type="checkbox"/>	STD3	8.684	190	800	1	199, 222, 2	D:\数据备份\沙丁胺醇_2016_11_23_18	

Figure 4-28 Spectral Search View

### 13) Report Setup

The Report Setup command in the PDA Chromatogram window opens the Report Setup-PDA Dialog.

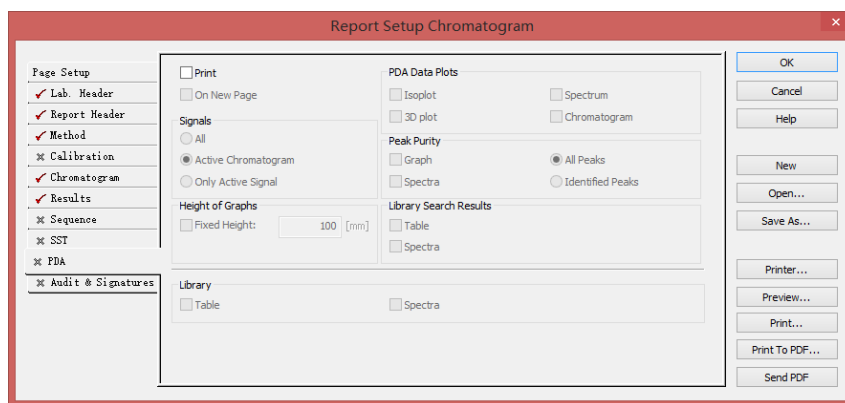


Figure 4-29 Report Setup- PDA

## 4.13 Workstation structure

All the methods and most functions of the detector can be realized by the control of chromatographic data workstation. Fig.4-30 shows the structure of the chromatographic data workstation.

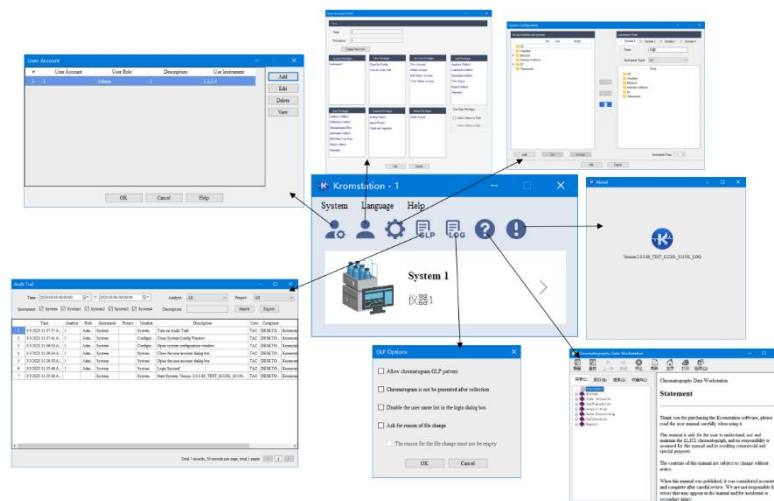


Fig.4-30 Kromstation workstation structure diagram

## 4.14 Installing Software

Diode array detector control software is divided into two types: Kromstation chromatography data workstation (including D3100 control module) and D3100 control module.

Users of our EClassical 3200 chromatographic system can use the Kromstation chromatographic data workstation (including the D3100 control module), which provides full control of the instruments and diode array detectors in the system.

Other customers can use the D3100 module to control the detector.

### 4.14.1 Selection of lotions

#### *Hardware requirements*

- Intel Core 2 CPU, more than 8G running memory (PDA module requires more than 16G memory); The data storage space in the Kromstation installation path is more than 4 GB. The recommended storage space is more than 50 GB based on the actual test amount.
- Minimum display resolution: 1024 × 800, 64K color (16-bit true color).
- Computer accessories requirements: at least one USB port for the

Hardware Key, at least one network interface (LAN) for device communication, and one USB port for software installation.

- Network management requirements: It is recommended that the computer used to connect the HPLC is not networked. If it is necessary to connect to the Internet, please complete the connection under the guidance of Dalian Yilit Analytical Instrument Co., LTD engineers.

### ***Software requirement***

- Confirm that the operating system used to run the Kromstation chromatography data workstation is genuine.
- Ensure that the firewall of the operating system is disabled.
- Sets the "Put your computer to sleep" option in your operating system to Never;
- Set the properties of the network adapter and make sure that "Allow computer to turn off this device to save power" in the Power Management option of the network adapter is not selected;
- Anti-virus software is not recommended for computers connected to the HPLC, and you must ensure that the mobile storage device used for data copying does not contain any computer viruses.

## **4.14.2 Computer network IP Settings**

- Before installing software, you should set up your computer network.
- Right-click network places on your desktop and left-click properties.

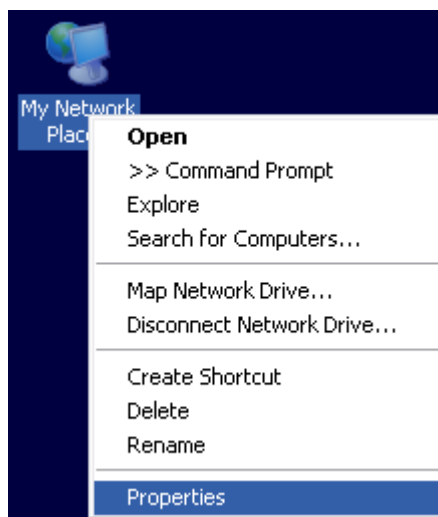


Fig.4-31 Computer network Settings picture 01

After entering the network connection window, right-click local connection and left-click properties.

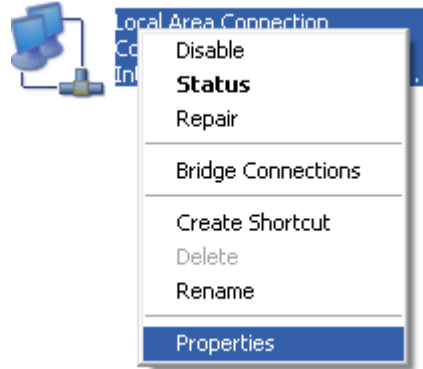


Fig.4-32 Computer network Settings picture 02

After selecting Internet protocol (TCP/IP) in “this connection uses the following items”, click “Properties”.

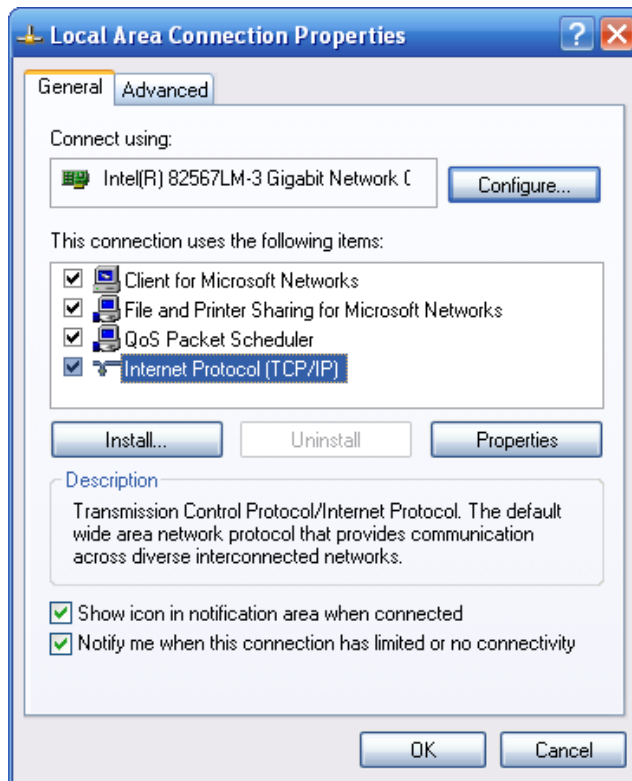


Fig.4-33 Computer network Settings picture 03

After entering the “Internet protocol (TCP/IP) properties” dialog box, set the IP address as shown in Fig.4-3. Click “ok” after setting.

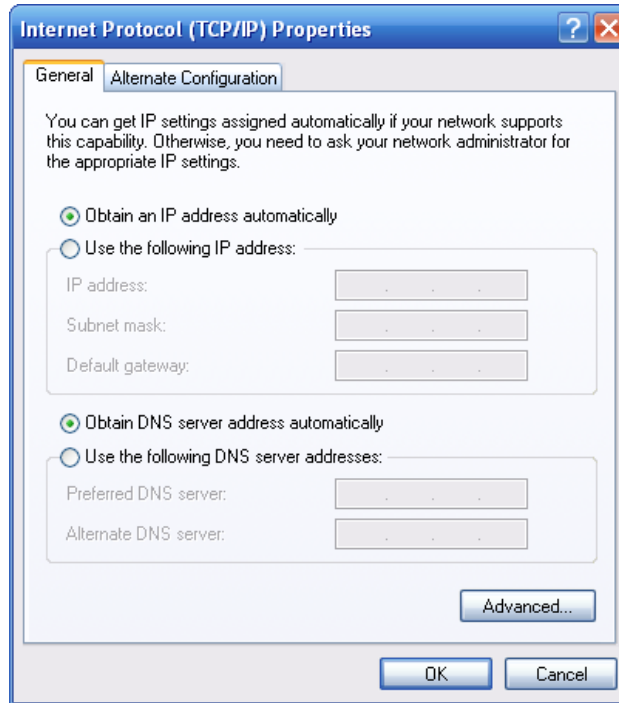


Fig.4-34 Computer network Settings picture 04

Click ok again in the local connection properties dialog box to make the system accept the above changes.

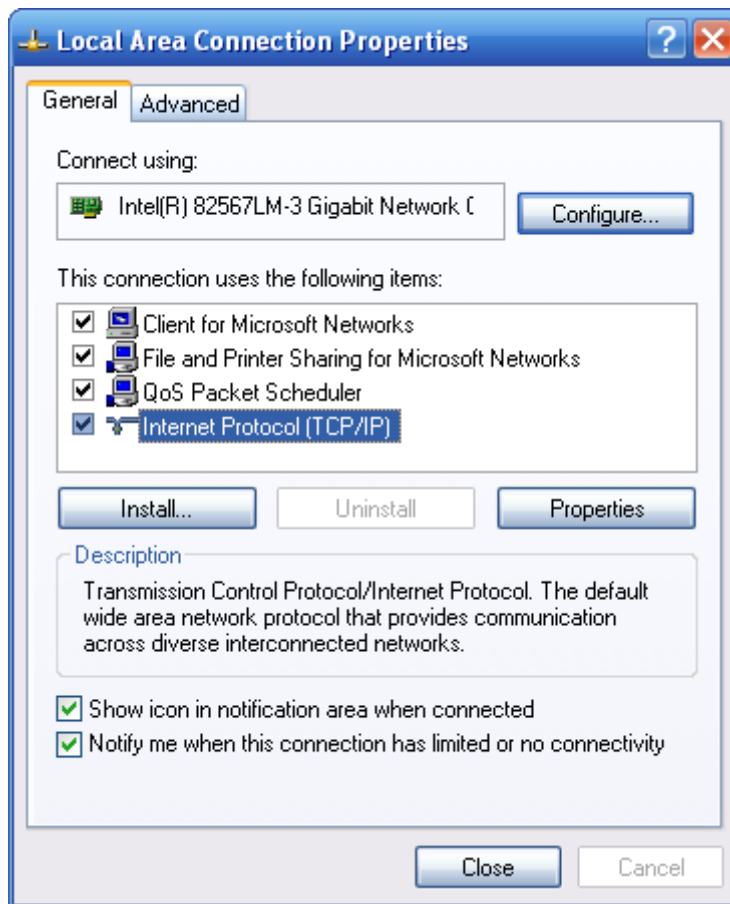


Fig.4-35 Computer network Settings picture 05



**【Caution】**

**Client-computers must be equipped with network communication and corresponding drivers in the form of LAN interfaces as hardware communication.**

### **4.14.3 chromatography data workstation installation**

The installation method of Kromstation is shown in the operating instructions attached to the disk of Kromstation.

## 4.15 This section describes the Main page of the detector control module in the Kromstation

There are three main parts of the control module related to the D3100/D3100 detector in the workstation:

### 4.15.1 Configuration Window

As shown in the Fig. below, complete the configuration of the diode array detector module step by step

Once the Kromstation workstation is installed, double-click the




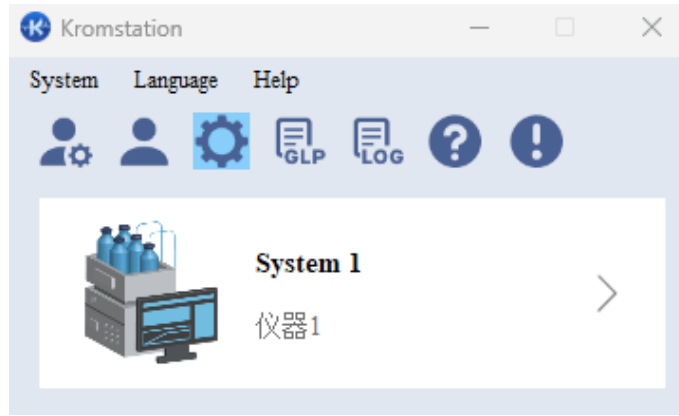
workstation **Kromstation** icon on your desktop

Enter the login page, select an account (you need to create a new account for the first login), enter the password, click the "Confirm" button, and log in to the main page of the workstation



Fig. 4-36 Kromstation login page

On the home page of the workstation, click the  icon to open the System Configuration page



Or click "System" in the upper left corner of the main page. In the expanded list, select "Configuration" and click to open the "System Configuration" page

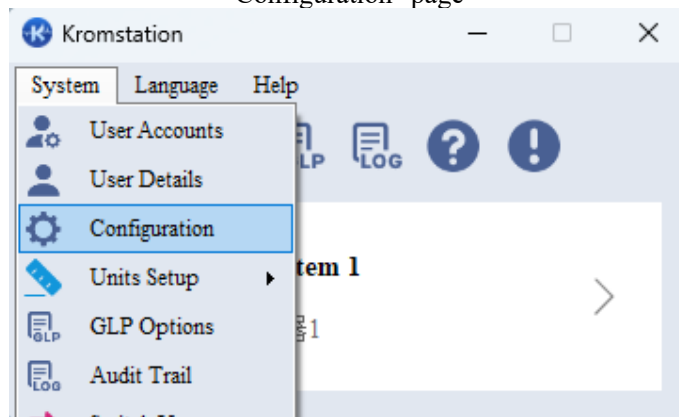


Fig. 4-37 Entering the configuration page

In the open "System Configuration" page, click the "Add" button in the lower left corner to open the "Available Control Modules" page

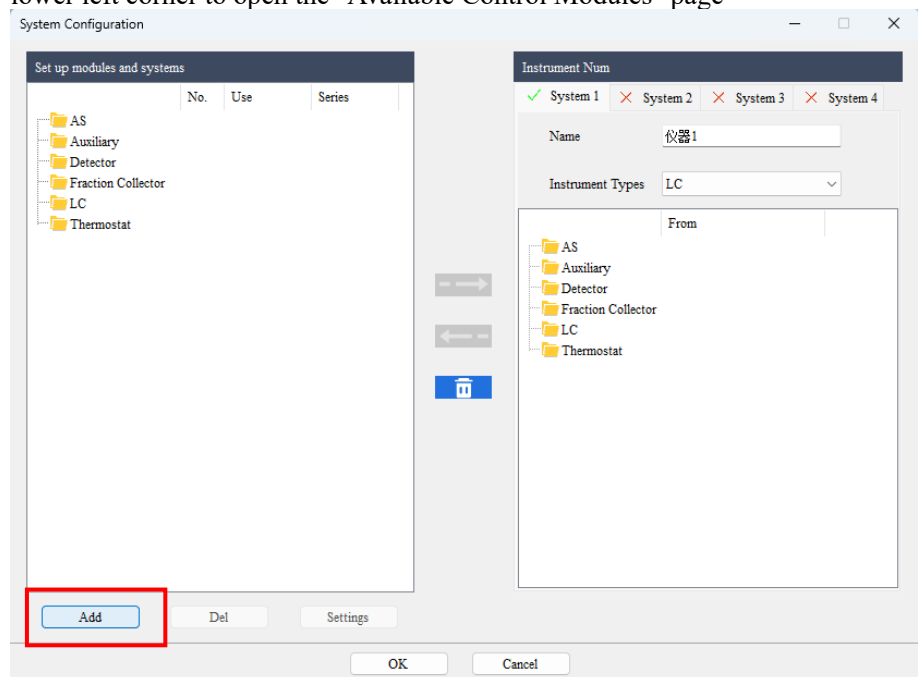


Fig. 4-38 Click "Add" to open the Available Control Modules page  
In the displayed "Available Control Modules" page, select "PDA Controller" and double-click it to open the "PDA Controller Configuration" page

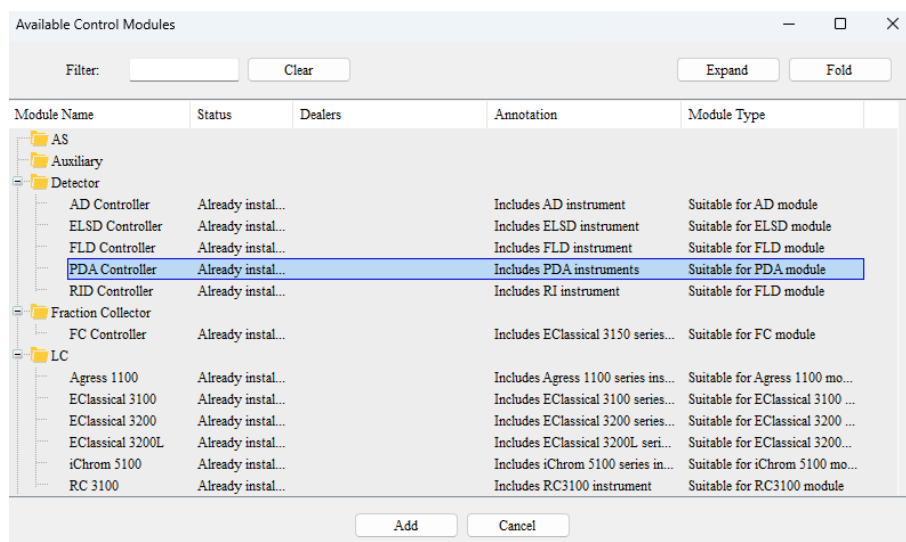


Fig. 4-39 Select PDA Controller and double-click the PDA Controller Configuration page

In the open "PDA Controller Configuration" page, click the "Type" menu, select the correct instrument model in the expanded list, such as: D3100/40 and click

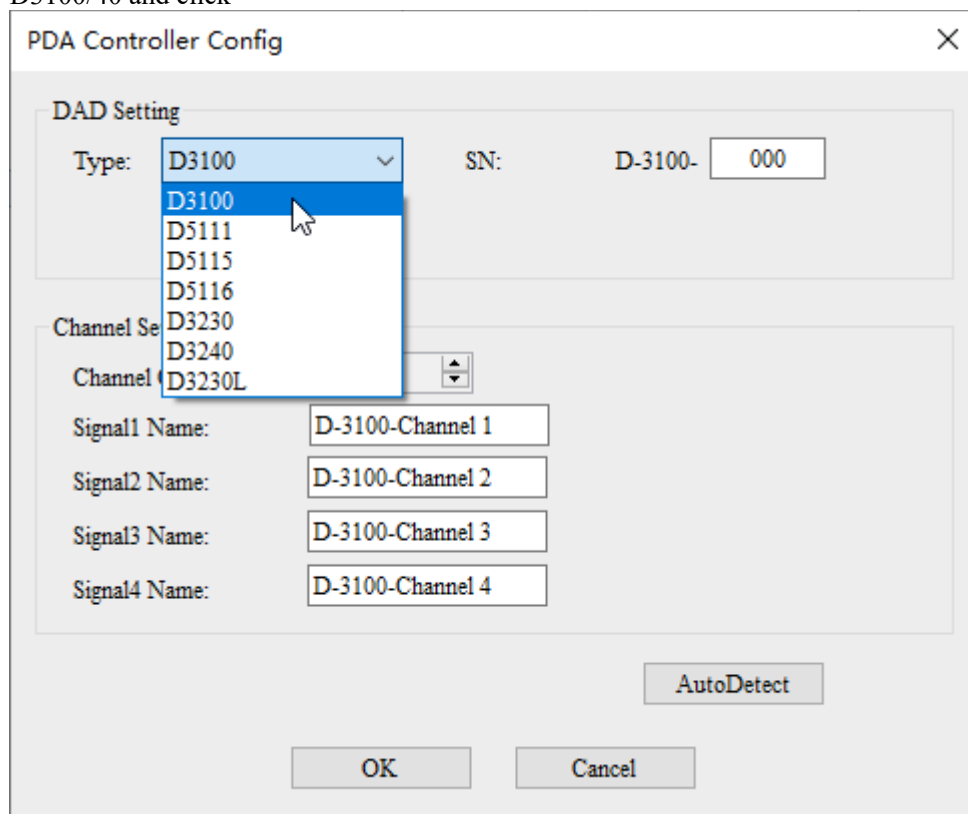


Fig. 4-40 Select a model from the drop-down list (In the user manual, take D3100 as an example)

After selecting the detector model, enter the last three digits of the serial number of the instrument in the "Serial number" input box, usually the serial number of the instrument is on the instrument nameplate on the back panel of the instrument, and add the number of detector channels as required

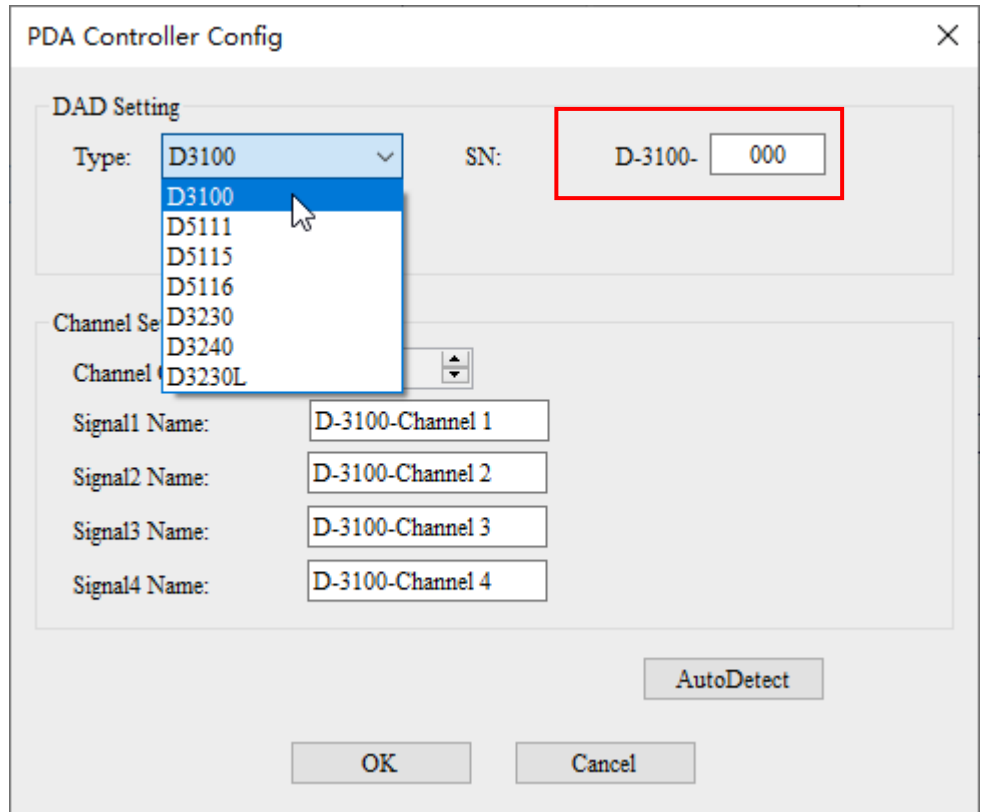


Fig. 4-41 Enter the instrument serial number and select the number of channels  
After the above steps are completed, click the "Verify System configuration" button at the lower right corner of the page. If the pop-up window "Connection Status" shows "Success", click the "OK" button to return to the page of "PDA Controller Configuration". Please confirm whether the instrument is turned on, whether the network cable is correctly connected, network configuration, serial number and other related issues, and verify the system configuration again. After completing the system configuration, click the "OK" button at the lower left of the page to exit the "PDA Controller Configuration" page

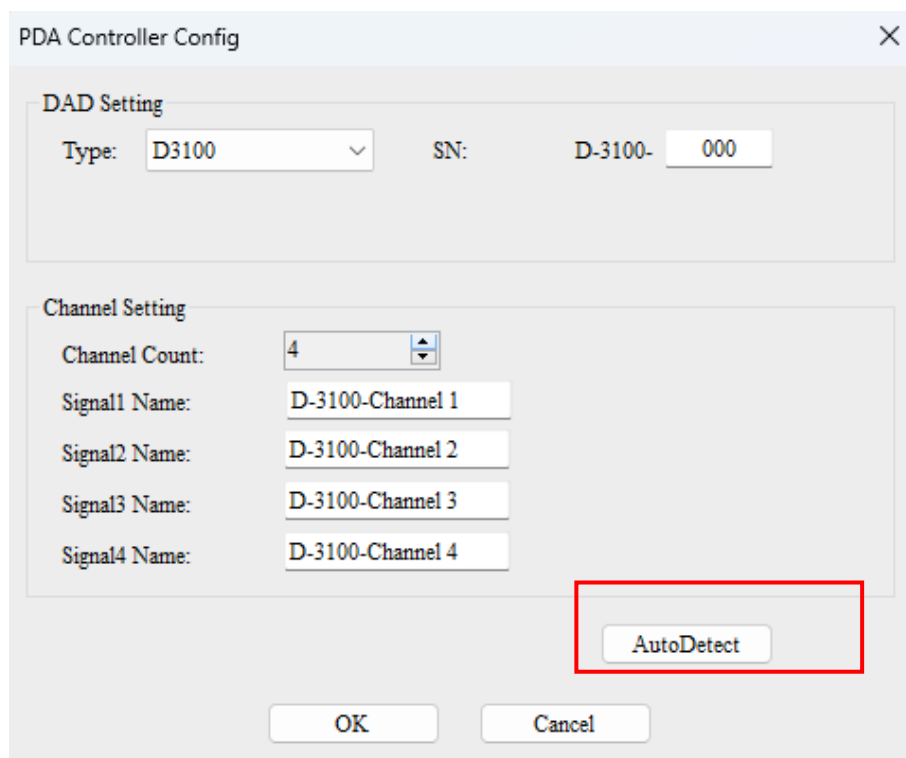





Fig. 4-42 Click Verify System Configuration to verify the connection. After the connection is successfully verified, click OK

Return to the "System Configuration" page. In the "Module configuration" list on the left, expand the "detector" folder and select the added "PDA Controller" module. Click in  the middle of the page to add the "PDA Controller" module to the list on the right. At this time, it means that the "PDA Controller" module has been conFig.d in the system. If you want to remove the conFig.d module, select the module and click in  the middle of the page, or click in  the lower middle of the page to delete it

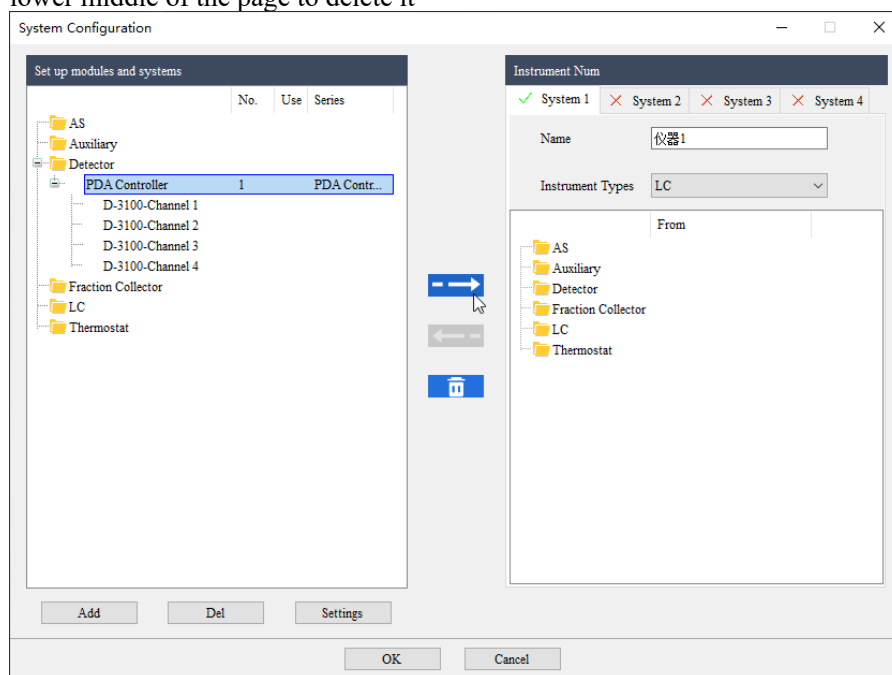


Fig. 4-43 Return to the system configuration page. The PDA module appears under the detector. Click the blue arrow in the middle of the page to import the module into the system

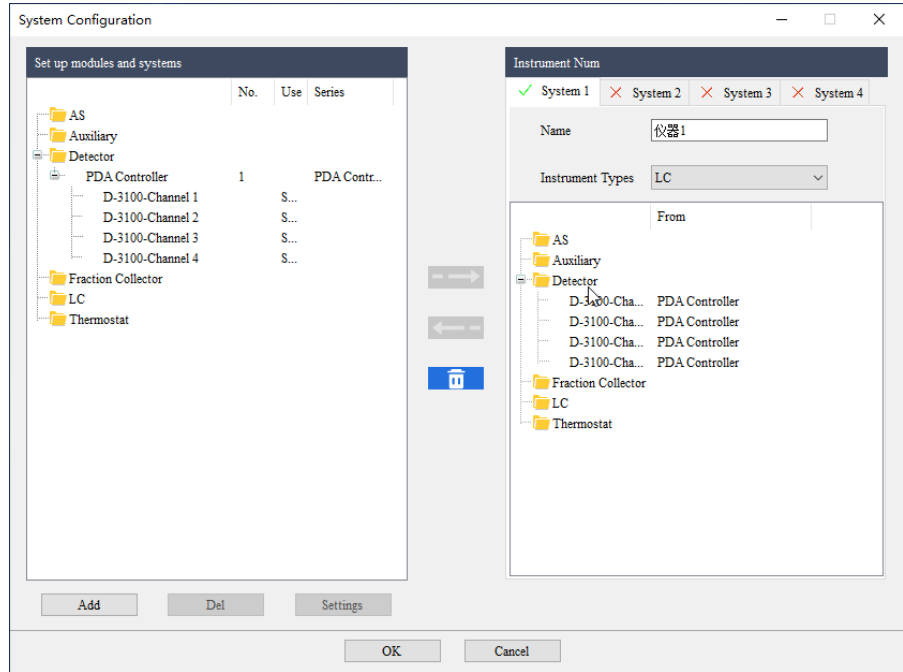


Fig. 4-44 Select four channels and insert them into the system, as shown in Fig. 4-44. After all modules are configured, click the "OK" button at the bottom of the "System Configuration" page to return to the main page of the workstation.

### 4.15.2 Device Monitor Window

The device monitor window is on the left side of the main page of the system, through which you can view the acquisition wavelength of the diode array detector, alarm information, and related information of other modules (Fig. 4-45).

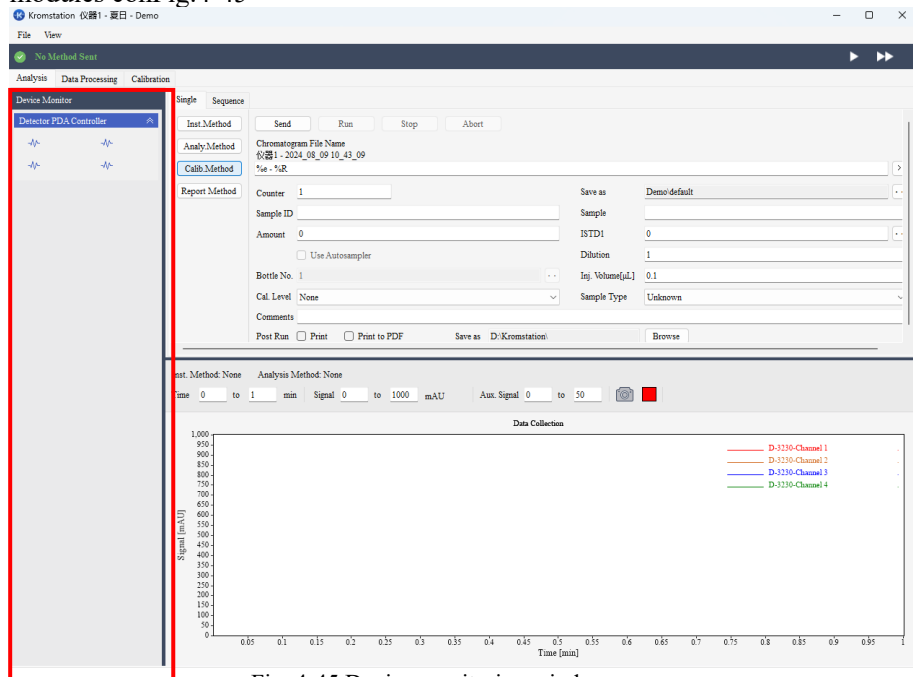


Fig. 4-45 Device monitoring window

### 4.15.3 Instrument Method page

On the main page of the system, click the button of "Instrument Method" to enter the page of "Instrument Method", and click "PDA" to enter the page of PDA parameter setting, as shown in Fig. 4-47. In the "PDA parameters" page, you can set the collection wavelength range, display collection wavelength, collection frequency, light source status, etc., and by clicking the "read light source status" button, you can monitor the number of light source, running time, etc.

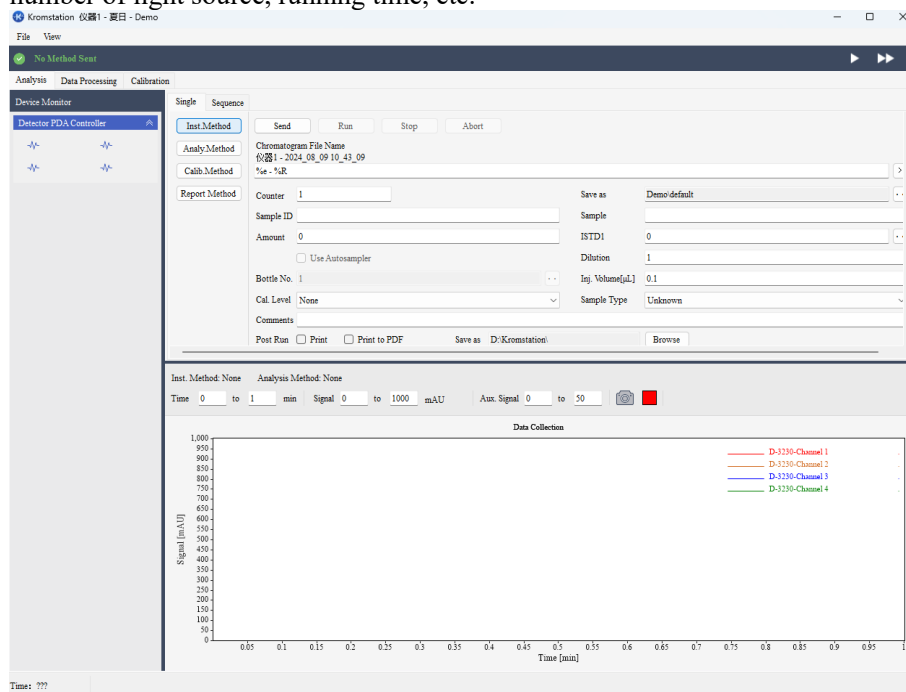


Fig. 4-46 Opening the device

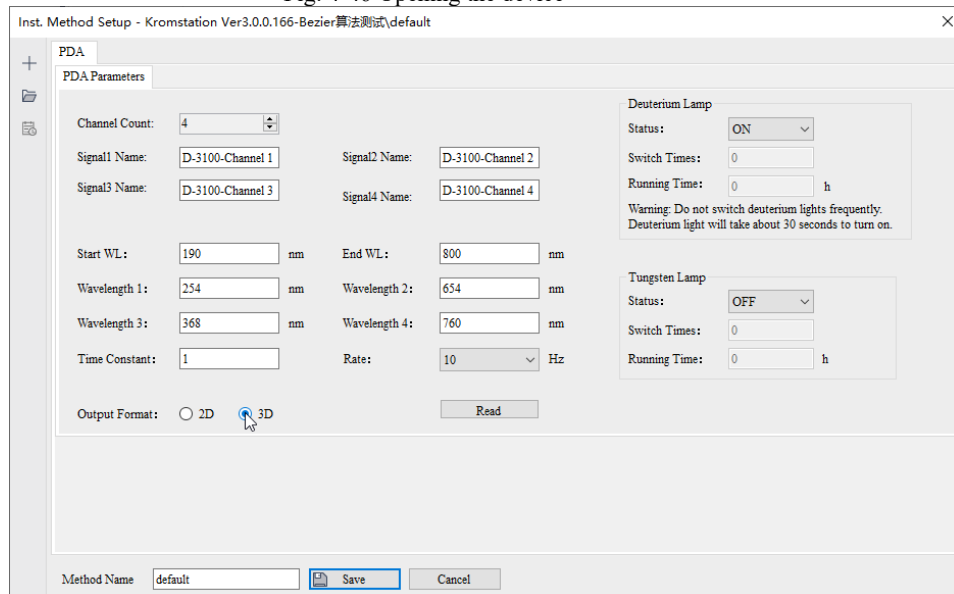


Fig. 4-47 Device Method page PDA parameter Settings

## 4.16 Access and New Construction

### 4.16.1 Entering a Project

On the main page, click in the system at the bottom of the page. Select a project from the pop-up page and click "Confirm" for a moment to enter the project

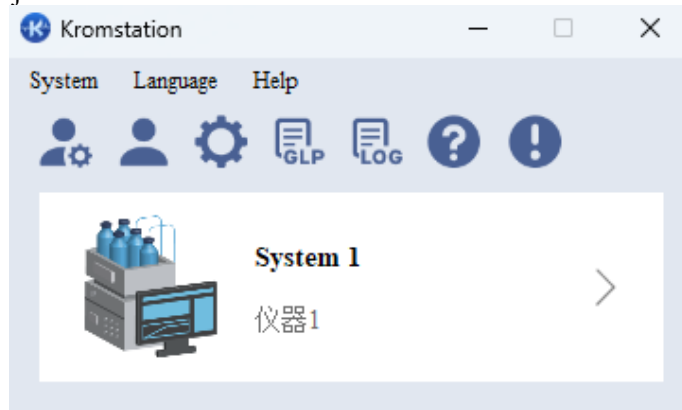


Fig. 4-48 On the home page, tap System to select a project and click OK

### 4.16.2 New Project

On the home page, click in the system area at the lower part of the page.  
On the displayed page, click Project Management to enter the Project Management page

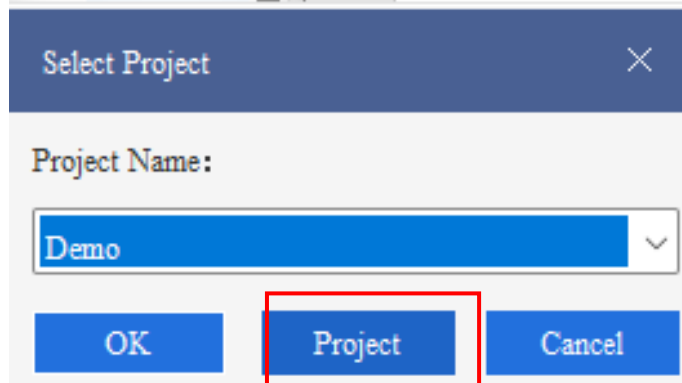


Fig. 4-49 Click the Project Management button

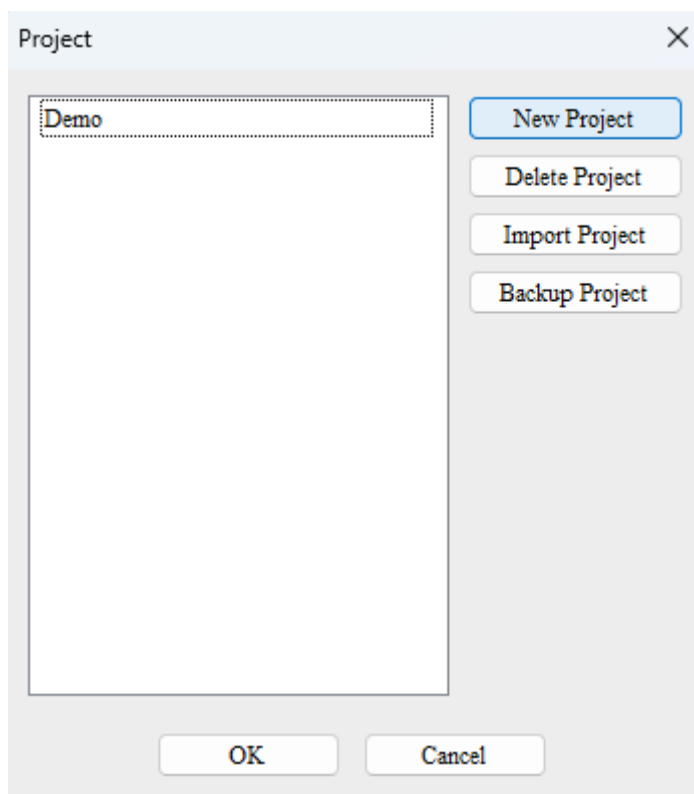


Fig. 4-50 Project Management page

On the Project Management page, click the New Project button in the upper right corner. In the New Project window that is displayed, enter a project name and click OK to create a project. You can also delete, import, and back up a project by clicking Delete Project, Import Project, and Backup Project

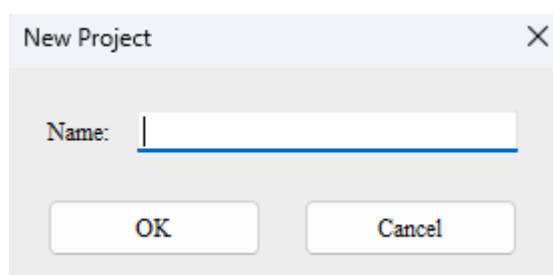


Fig. 4-51 New project

## 4.17 Instrument preheating time

The purpose of detector preheating is to make the circuit system and the light source reach a stable state. Circuit board electrical performance and light source to achieve a stable state, the general preheating time takes about 30 minutes.

## 4.18 Method for Setting the instrument

Under normal circumstances, the system defaults that after the detector is turned on, the deuterium lamp is automatically lit, while the tungsten lamp is not lit. The deuterium lamp and tungsten lamp on state can usually be set by the "instrument method" in the workstation, the setting method is as follows:

- 1) After entering the project, click the "Instrument Method" button on the page to enter the "Instrument Method Setting" page.

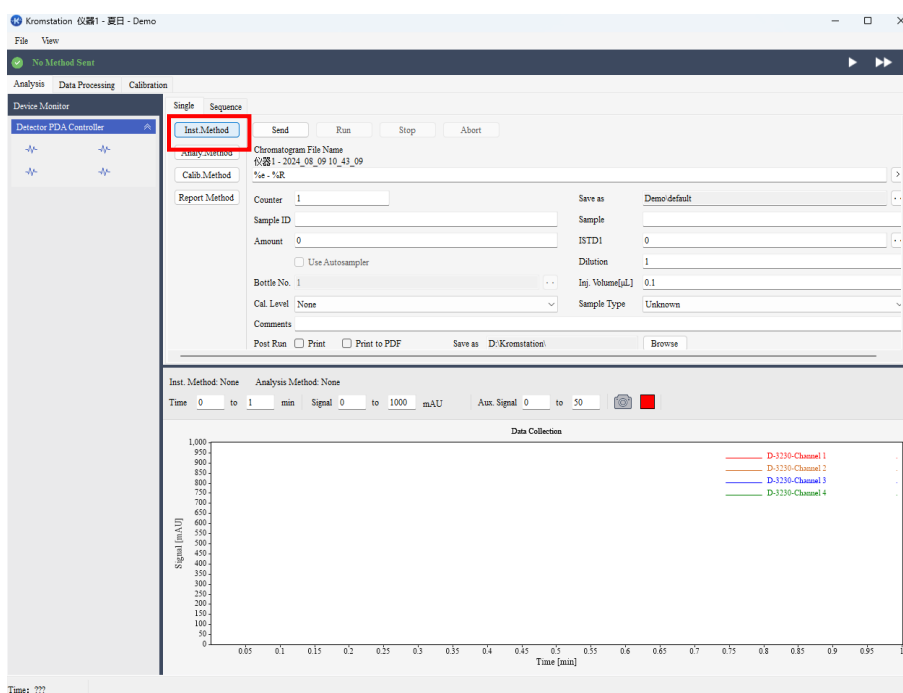


Fig 3-51 Device method

- 2) In the "Instrument Method Settings" page, select the "PDA" TAB, you can set the light source status (on or off) in the "PDA Parameters" page, as shown in the red box in Fig. 4-52.

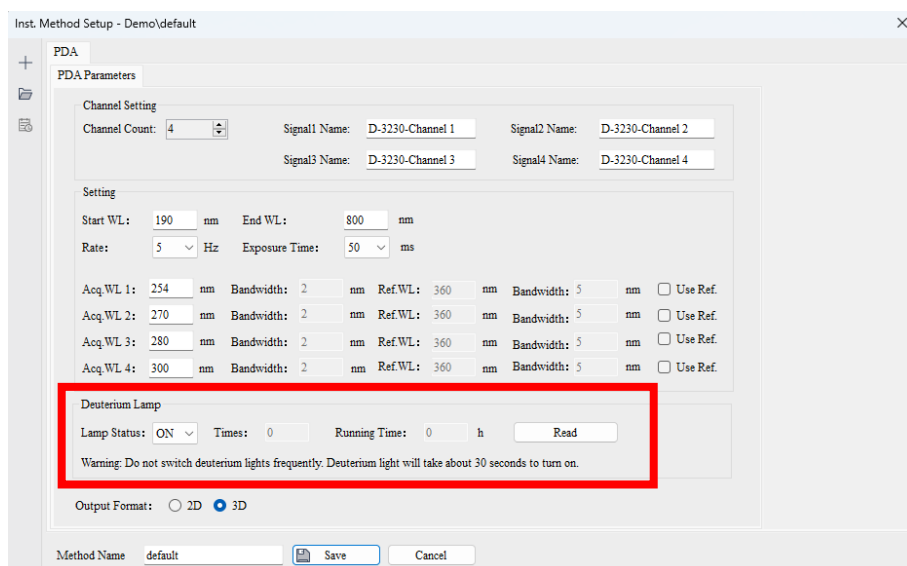


Fig.4-52 Setting light source status

By clicking the "Read light source status" button, you can monitor the opening times and running time of the light source. This part of the function is mainly to facilitate the user to observe the use of the detector and judge the life of the light source.



**【Note】**

Do not turn on or off the light source continuously to avoid damage to the deuterium lamp and tungsten lamp. It is recommended to turn on and off the time interval of more than 5 minutes.

After completing the light source setting and clicking "OK" to save it, the detector will turn on and off the light source according to the light source state set by the method after sending the method

### 4.18.1 Setting the number of display collection channels

On the PDA Parameters page, set the number of channels and channel name, as shown in Fig. 4-53.

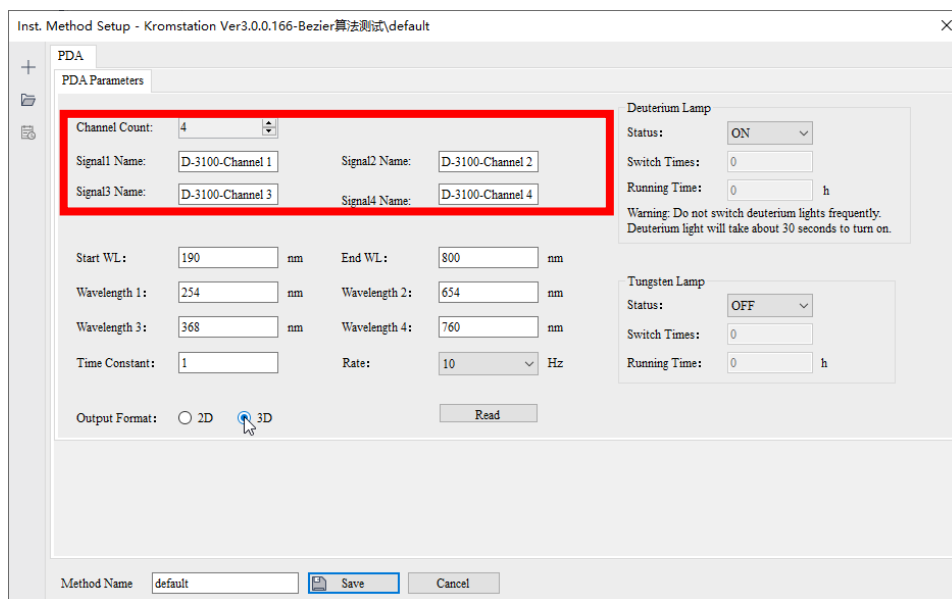


Fig. 4-53 Setting the number of collection channels

### 4.18.2 Setting the Collection frequency

As shown in Fig. 4-53, the collection frequency of the D3100 detector can be set to 1, 2, 5, 10, 20 and 40 Hz. 1, 2, 5, 10, 20 and 40 Hz. The SNR of the detector is different with different acquisition frequency, so the user should select the appropriate acquisition frequency according to the actual detection requirements.

### 4.18.3 Set the collection wavelength and reference wavelength

As shown in Fig. 4-53, the multi-channel acquisition wavelength can be set for the D3100 detector, and the corresponding reference wavelength can be set respectively. Appropriate setting of reference wavelength can reduce detector drift and deviation. However, it is necessary to ensure that there is no absorption of the analytical sample in the selected reference wavelength region.

## 4.18.4 Output format

As shown in Fig. 4-54, the user selects the output format of the data according to the actual analysis and experiment requirements. If the user wants to view the spectrogram information of the sample, the output format needs to be selected as "3D"; otherwise, the spectrogram window cannot be opened in the data processing stage.

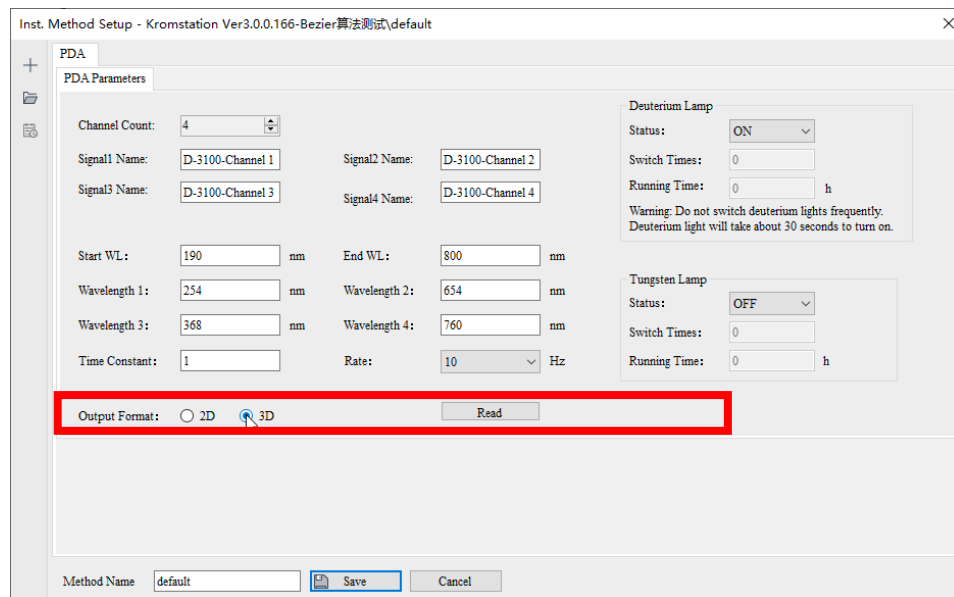


Fig. 4-54 Output format Settings




**【Note】** If you want to view the spectrogram of the sample during data processing, you need to check "3D" in the output format below when setting parameters.

## 4.18.5 Method of preserving the instrument

As shown in Fig. 4-54, after setting all detector parameters and parameters of pump, automatic sampler and other modules in the system, enter the method name you want to name in the "Method Name" input box, and click the "OK" button on the right to save the instrument method. If you want to save the method, enter the new method name in the "Method Name" input box. Click the "OK" button again to save the method.

## 4.18.6 How to turn on the instrument

Click the icon on the left  of the "Instrument Method Settings" page, select in the "Instrument Method List" that opens or search for the instrument method file that you want to open in the search bar above, and click "Confirm" to open the method

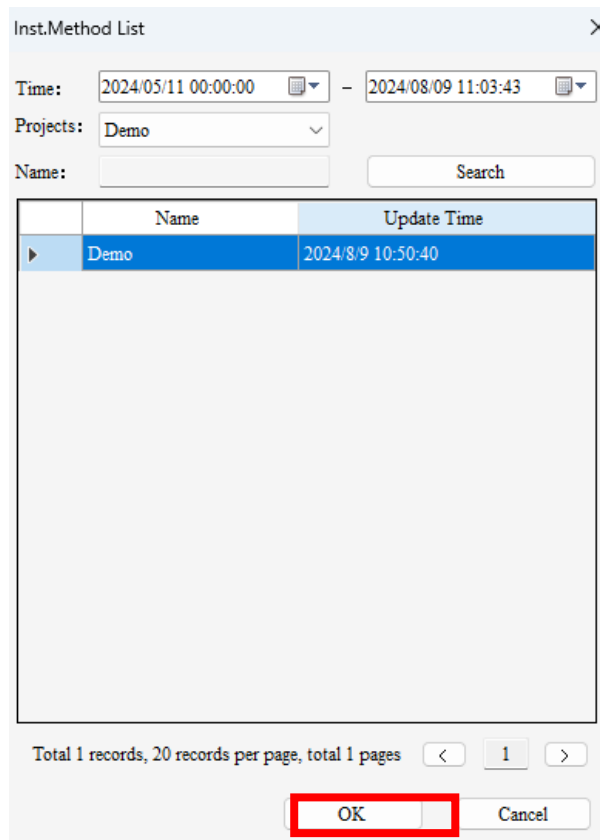



Fig. 4-55 List of device methods

## 4.18.7 Method of creating an instrument

Click the icon  on the left of the "Instrument Method Settings" page to create a new method

## 4.19 Setting Analysis Method

### 4.19.1. Measurement Settings

After entering the project, click the "Analysis Method" button to enter the "Analysis Method Setting" page, as shown in Fig. 4-56.

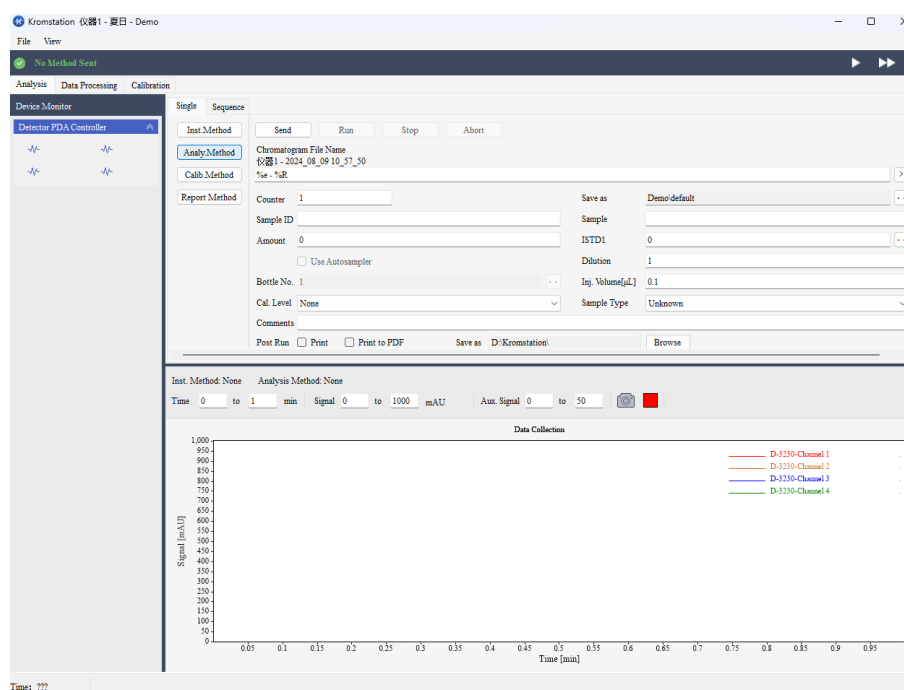


Fig. 4-56 Establishing an analysis method

On the Measurement page of Analysis Method Settings, enter column, column length, and pressure, as shown in Fig. 4-57.

If the detector is used with the EC3200 system, check "Enable automatic stop" in the upper right corner and set the running time. Generally, it is recommended to set the running time for unknown samples to be longer to ensure that all sample peaks are detected. The running time of subsequent experiments should be appropriately adjusted according to the experimental results. Enter the method name you want to name in the "Method name" input box, and click the "Confirm" button on the right, you can save the analysis method.

The method of opening and creating the analytical method is the same as the instrument method

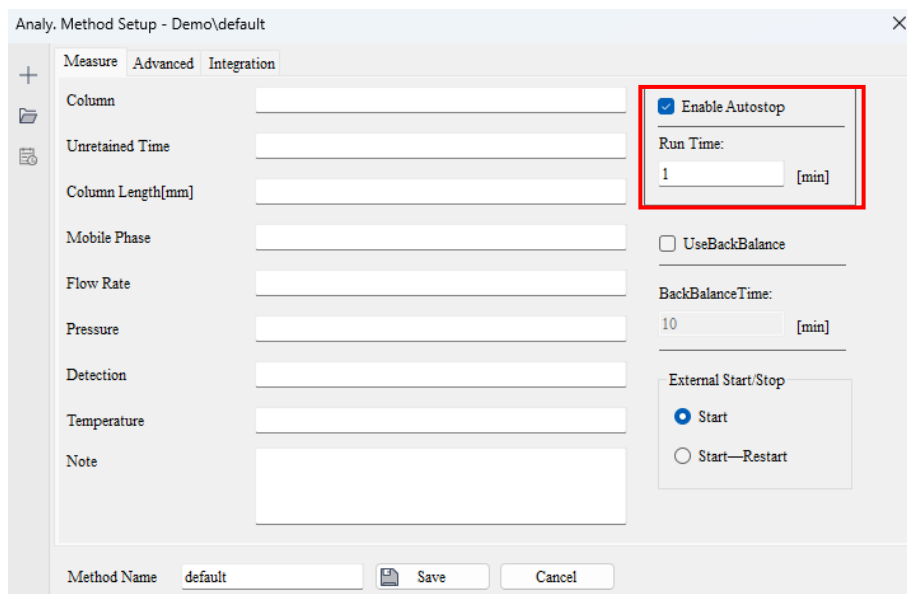


Fig. 4-58 Setting analysis methods



**【Note】** Column length is a required field, and the entered column length value will affect the calculation result of column efficiency during data processing

## 4.19.2. Advanced Settings

As shown in Fig. 4-59, if the system is equipped with other modules, you can select the auxiliary signals that you want to observe on the collection page in the Advanced page of "Analysis Method Settings", such as the pressure curve of the pump and the temperature curve of the column temperature tank, and click "OK" to save the selected signals.

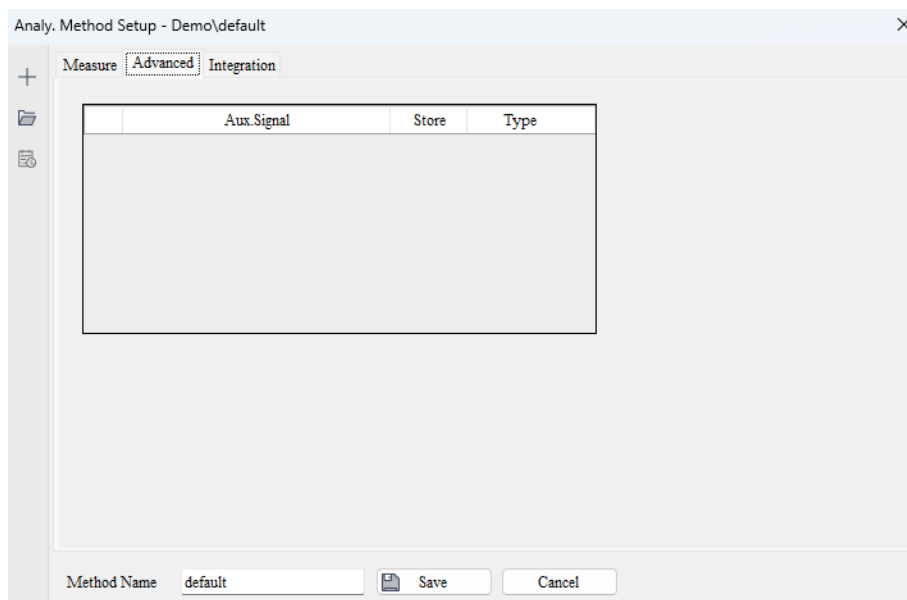


Fig. 4-59 Advanced Settings

### 4.19.3. Point setting

As shown in Fig. 4-60, you can set the integration event in "Analysis Method Setting", select the desired integration event in the drop-down list of "Chromatogram Operation", such as: noise calculation, drift calculation, peak start and fall point, etc., enter the start and end time of the integration time and the corresponding judgment value in the column of "Time A and B", and click "OK" button to save.

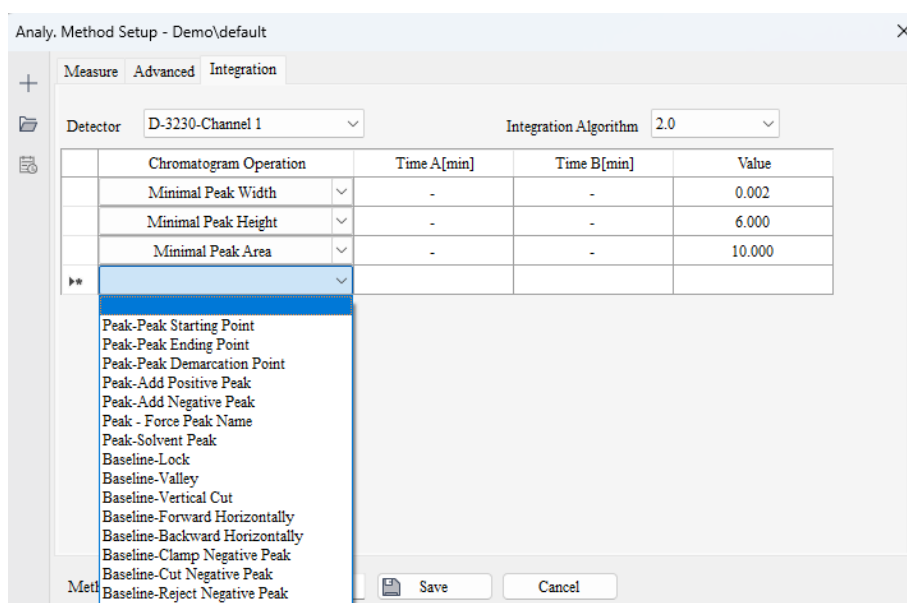


Fig. 4-60 Integral Settings

## 4.20 Running Detection Methods

As shown in Fig. 4-61, open and select the instrument method and analysis method you want to use respectively, click the "Send method" button on the main page, and the workstation will immediately send the method command to the next computer and start running.

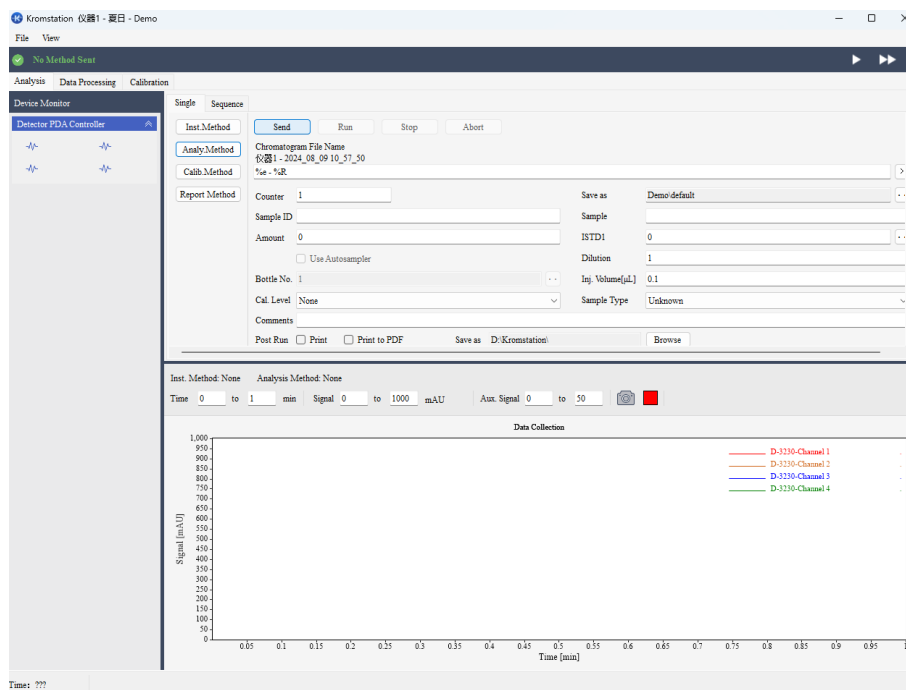


Fig. 4-61 Running detection method



### 【Note】

Method After setting, only click "OK" and do not click "Send method". After setting, the method is to save the not send state.

## 4.21 Baseline monitoring

As shown in Fig. 4-62, after the detection method is run, the detector and other modules start to run according to the set parameters. At this time, the baseline appears on the collection page. Generally, the system is considered to be balanced if the baseline fluctuations are stable.

In the collection page, the coordinate size of the collection page and the coordinate size of the auxiliary signal can be adjusted through the input box of "time source" and "signal" at the top, or the data of the current



time can be captured through the click icon and opened on the data processing page for users to analyze and process the experimental results in advance

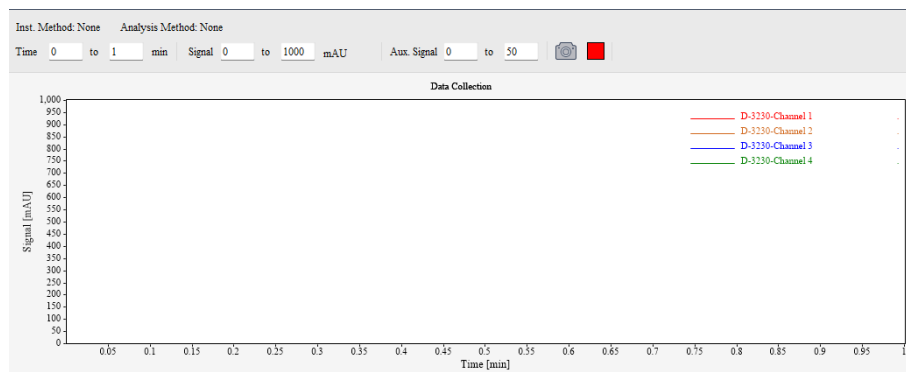


Fig. 4-62 Baseline monitoring

## 4.22 Data Collection

### 4.22.1. Single run data collection

1) In the single analysis page, after the method is set, click "Send method", the system begins to balance, and the collection page starts baseline monitoring.

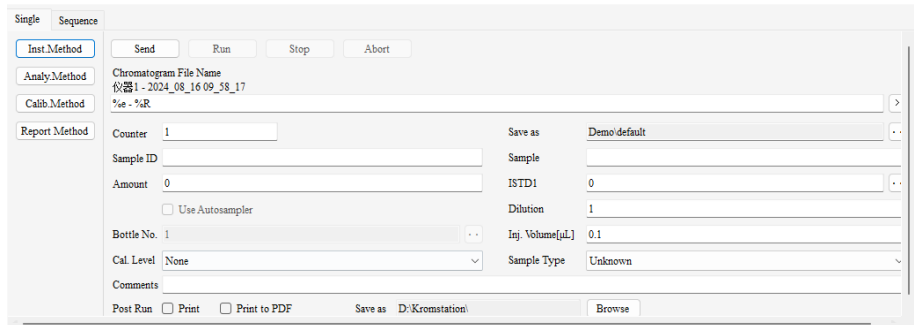

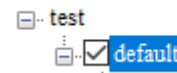



Fig. 4-63 Single analysis page

2) At the bottom of the single analysis page, use the "Chromatogram file name" input box to name the experimental spectrum to be analyzed.

3) As shown in Fig. 4-64, click the  icon behind the display box of "Storage Location", and the page of "Select Storage Location" will pop up. On this page, click the right mouse button to prompt "Add Directory", click "Add Directory", enter the folder name in the pop-up dialog box,



and click "OK" to generate a folder. Check the  box in front of the folder to save the diagram file in this directory

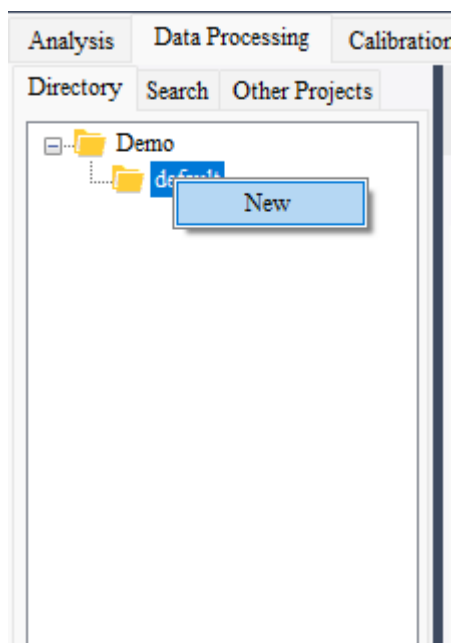


Fig. 4-64 Add storage directory

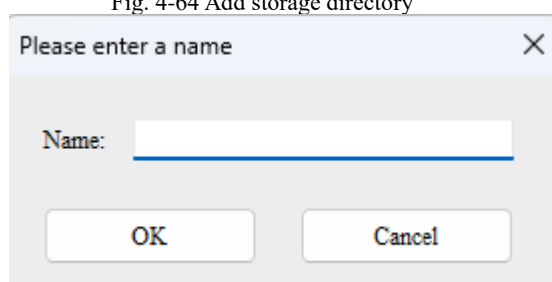


Fig. 4-65 Naming a folder

4) If automatic sampler is conFig.d in the system, select the check box before "Whether to use automatic sampler" to use automatic sampler, otherwise the parameters related to injection are invalid, select and set the parameters such as injection volume and sample type, and click "Run" to start sample analysis after the system is balanced.

## 4.22.2. Serial operation data acquisition

1) For the same single analysis, after the method is set, click "Send method", the system begins to balance, and the collection page starts baseline monitoring.

#	Status	Run	SV[Inj.]	EV[Inj.]	LV	Inj. Volume	Sample ID	Sample	Sample Type	File Name	Storage Location	Instrument Method	Analysis Method
1	Green	<input checked="" type="checkbox"/>	1	1	1	10.0			Unkn...	Demo-1-%q_%R_%n	Demo default	Demo/Demo	Demo Demo
2	Red	<input checked="" type="checkbox"/>	2	2	1	10.0			Unkn...	Demo-2-%q_%R_%n	Demo default		
3	White	<input type="checkbox"/>											

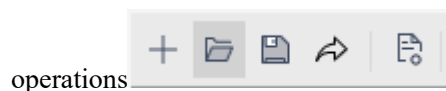
Fig. 4-66 Sequence analysis - Data collection

2) Check "Run" in the sequence table to add a new line, and enter the location of sample bottle, sample volume, sample number, sample type, spectrum name, etc., in the order of the list

3) Click the mouse "spectrum saving location", "instrument method", "analysis method" and then select the file saving location, instrument method, analysis method and so on in the pop-up page.

4) If all the sequences are normal, the color of the sequence status display is green, otherwise there are problems in the current sequence, please check.



5) Through the upper toolbar, you can create a sequence, open a sequence, save a sequence, export a sequence, report Settings and other



operations

### 4.22.3. Stop data collection

Data collection can be stopped in several ways:

- On the data collection page, click the  icon to stop data collection and save the spectrum;
- On the data collection page, click the  icon to give up data collection but not save the spectrum;
- In the analysis method, the running time is shortened, the data acquisition is ended earlier, and the spectra are saved.

## 4.23 Data viewing and processing

### 4.23.1. Chromatogram viewing and processing

After the collection, click "Data processing" in the upper left corner of the main page to enter the data processing page.

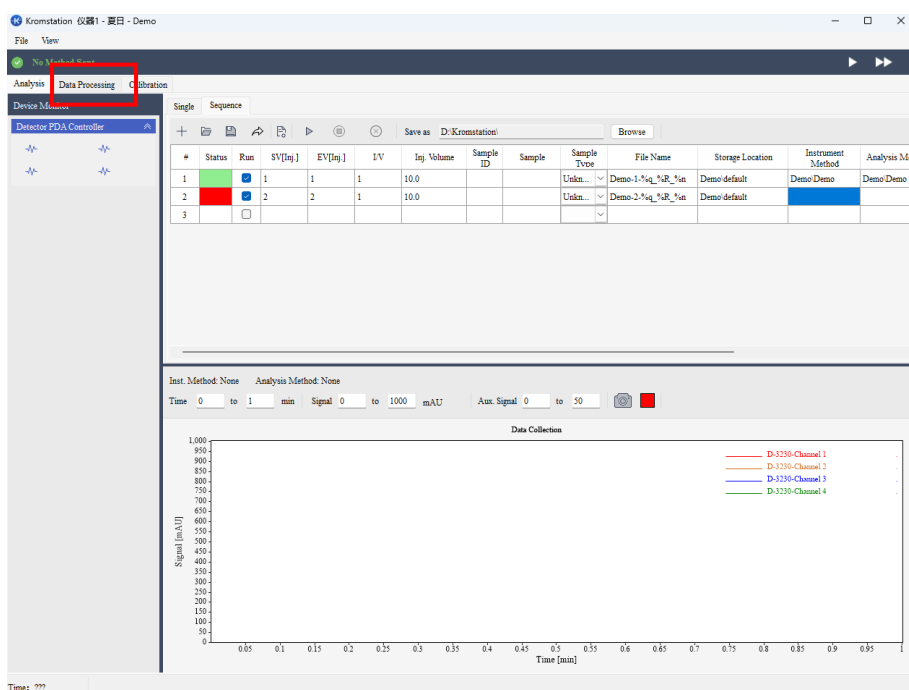


Fig.4-67 The data processing page is displayed

Find the spectrum you want to view or work with in the folder on the left and open it.

The chromatogram can be integrated through the right toolbar, and the processing file can be saved, exported, and printed through the upper toolbar. For details, see the Kromstation Chromatographic Data Workstation user manual.

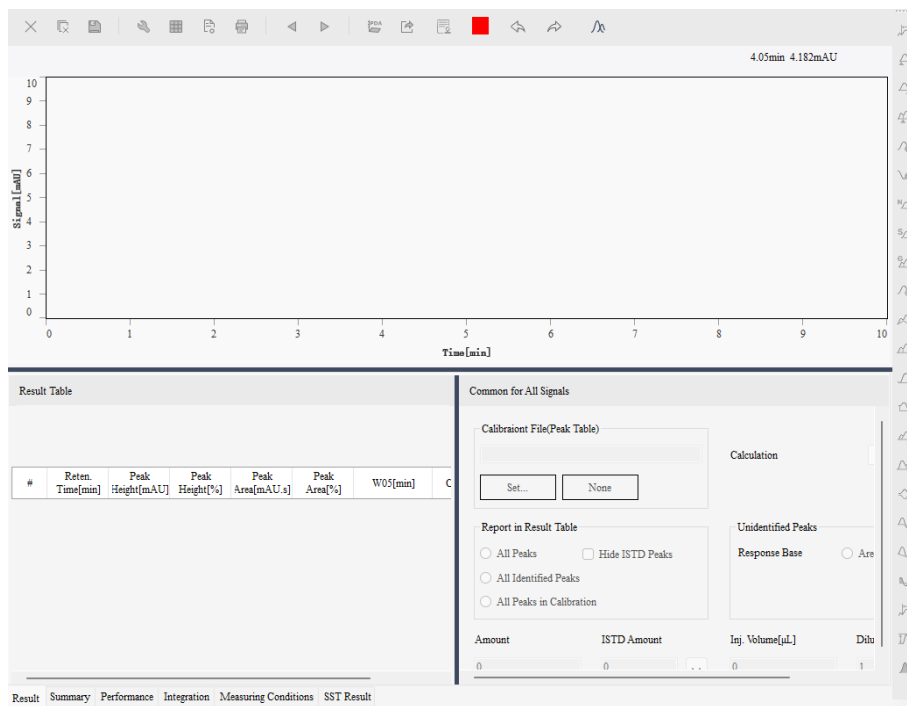



Fig. 4-68 Spectrum diagram page

## 4.23.2. Spectrogram viewing and processing

### (1) PDA Chromatogram Interface

Click button  in the status bar above the chromatogram of the "Data Processing Interface" to open the "PDA chromatogram" interface. The PDA chromatogram interface is shown in Fig.4-69. By default, only chromatogram, spectrum, contour line view and peak purity spectrum view are enabled in this interface.

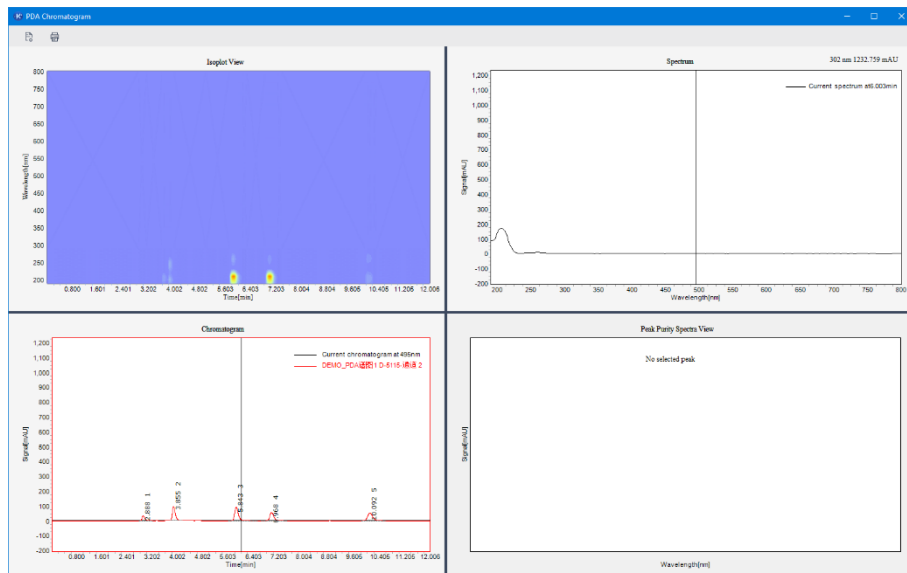


Fig.4-69 PDA Chromatogram Interface

(2) 3D View

Right-click in the "Chromatogram" area of the "PDA Chromatogram" interface - select "Show 3D View" to open the "3D View" interface (as shown in Fig. 4-70). The 3D view interface is shown in Fig. 4-71.

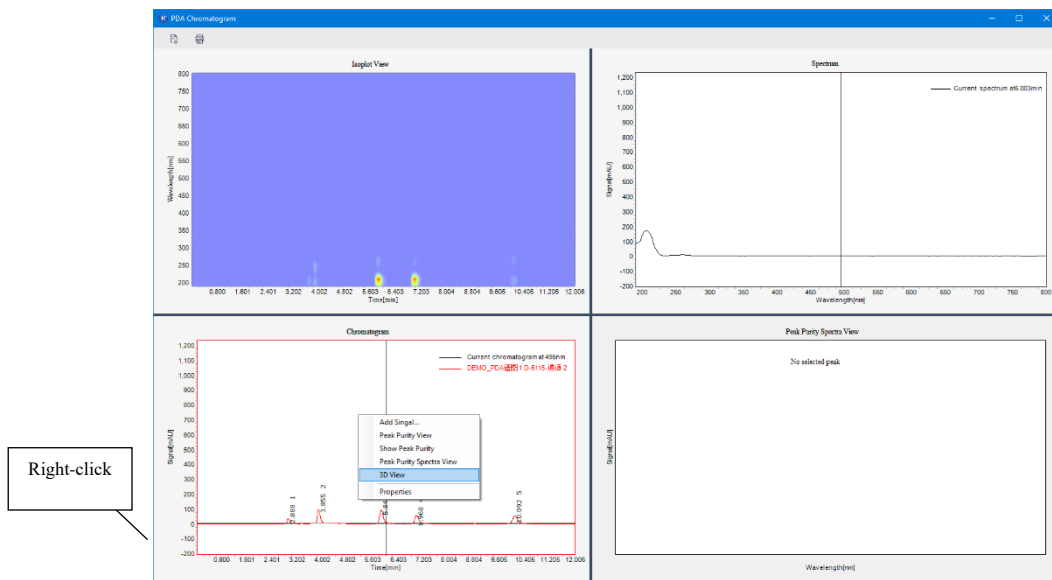


Fig. 4-70 Open the 3D View Interface

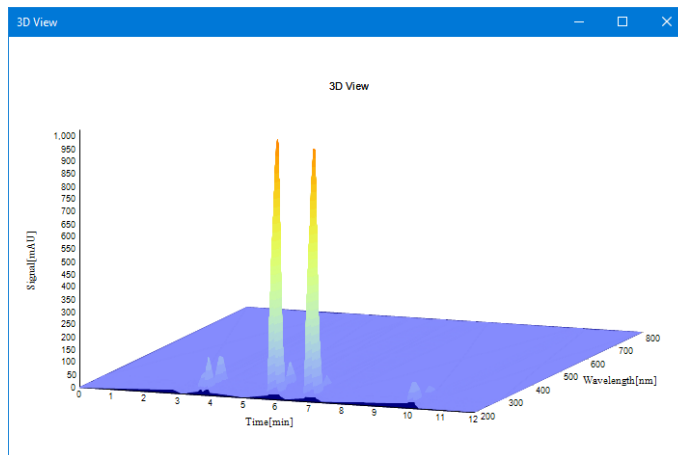


Fig.4-71 3D View Interface

(3) Peak Purity Spectrum View

Drag the marker line in the "Chromatogram" area to move the selected peak, then right-click in the "Chromatogram" area, and select Show Peak Purity Spectral View to open it.

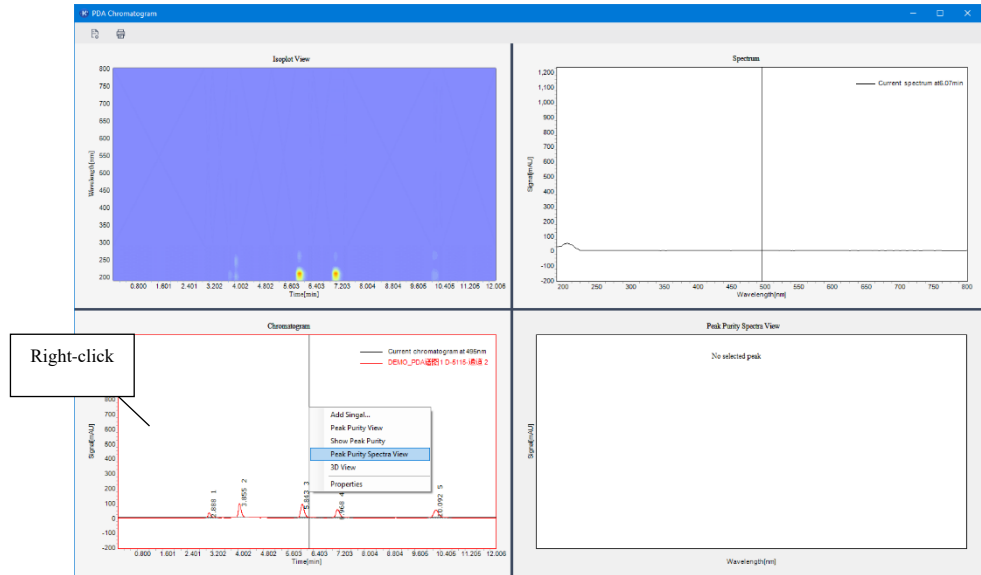


Fig. 4-72 Display Peak Purity Spectra

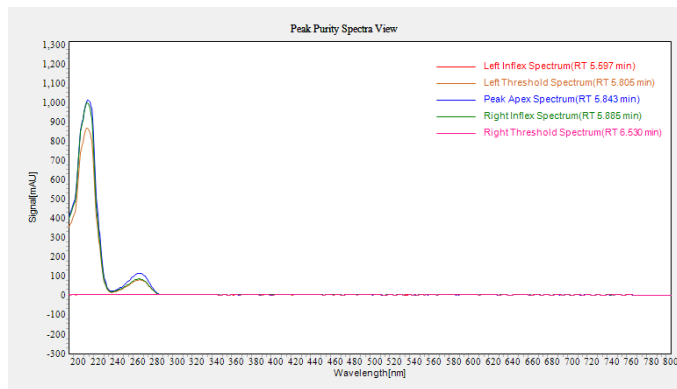


Fig.4-73 Peak Purity Spectrum

(4) Peak Purity Curve

Right-click in the "Chromatogram" area and select "Peak Purity Curve" to display the peak purity curve in the chromatogram, as shown in Fig.4-74 and 3-75.

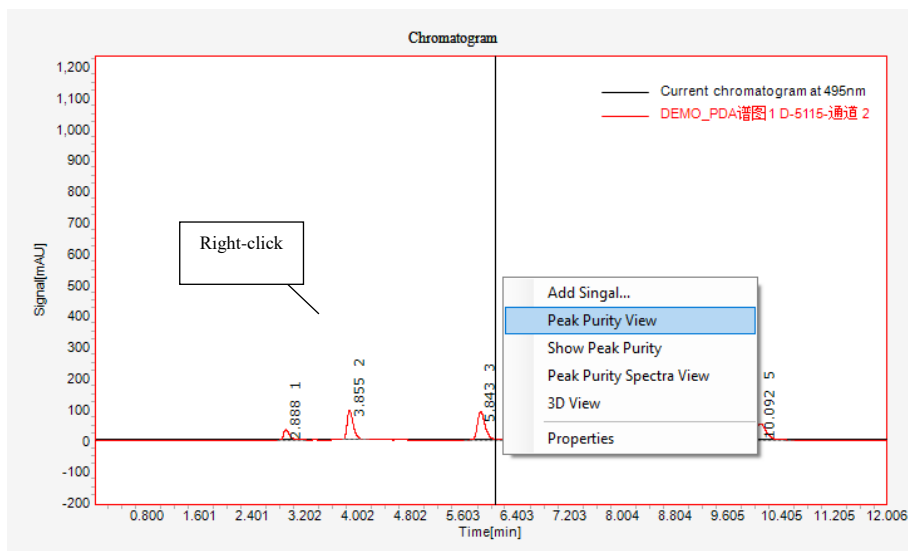


Fig. 4-74 Display Peak Purity Curve

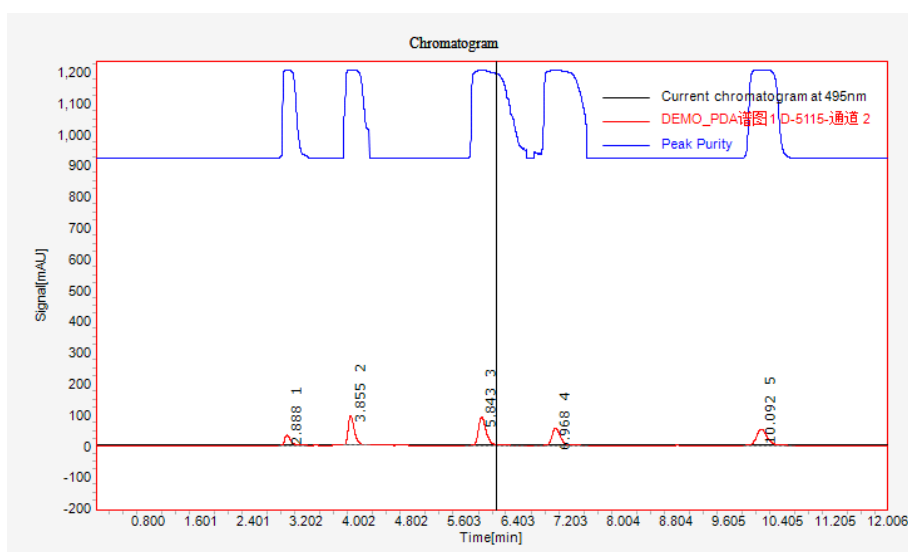


Fig.4-75 Peak Purity Curve

(5) Peak Purity View

Right-click in the "Chromatogram" area and select "Display Peak Purity" to pop up the "Peak Purity View" window, as shown in Fig. 4-75.

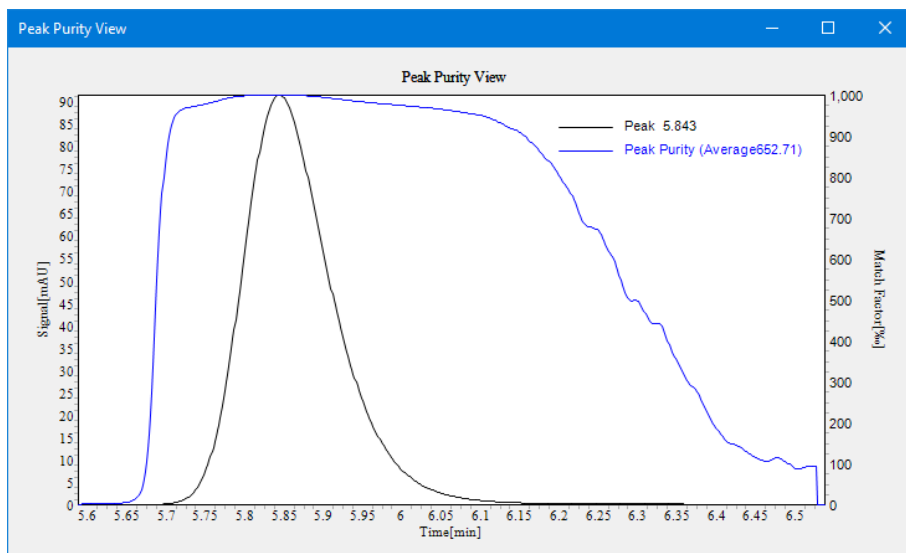


Fig. 4-76 Peak Purity View

(6) Add Chromatogram Signal

Right-click in the "Chromatogram" area and select "Add Signal" to pop up the "Add Chromatogram Signal" window, as shown in Fig. 4-77. In this window, you can set the wavelength, reference, etc. to increase the chromatogram.

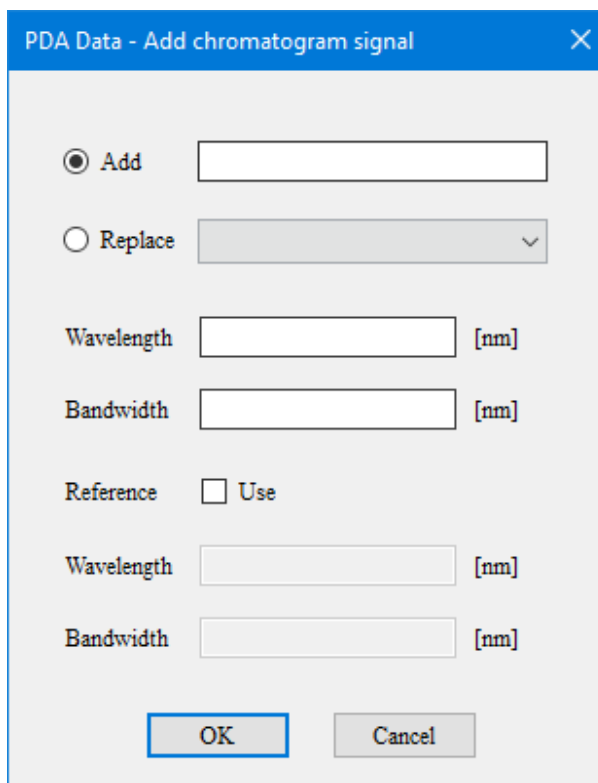


Fig.4-77Add Chromatogram Signal

(7) Attributes

Right-click in the "Chromatogram" area or the "Spectrum" area, and

select the "Attributes" option to pop up the "PDA Attributes" setting window, as shown in Fig. 4-78. In this window, you can set the coordinate axis parameters, etc.

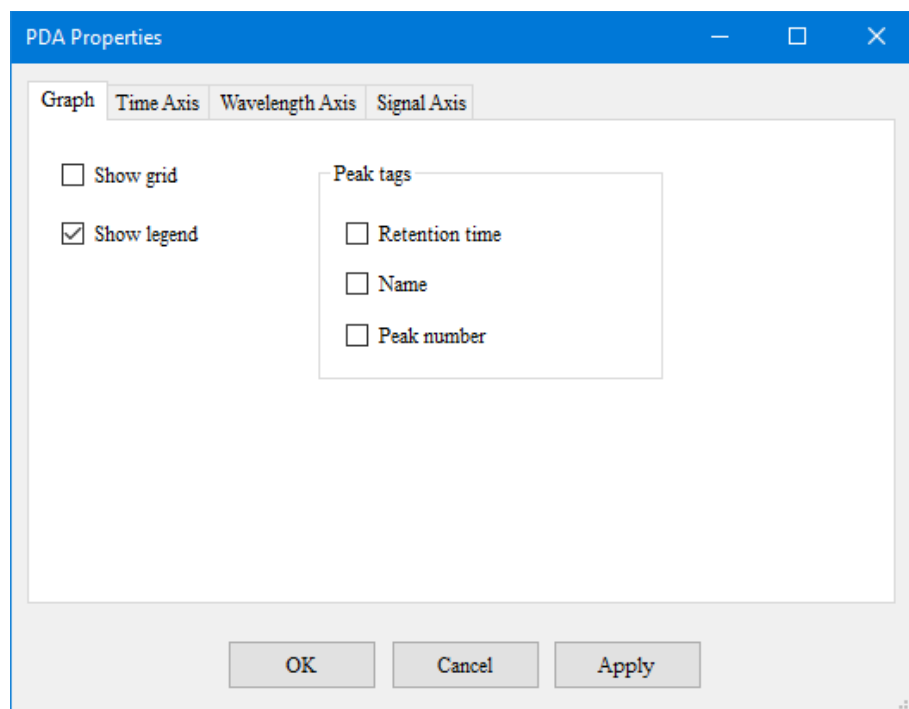


Fig. 4-78 PDA Attributes window

(8) Spectral Library

Right-click in the "Spectrum" area, and the related options of the spectral library will pop up. Contains functions such as creating a new library, opening a library, adding to a library, and searching in a library. As shown in Fig. 4-79.

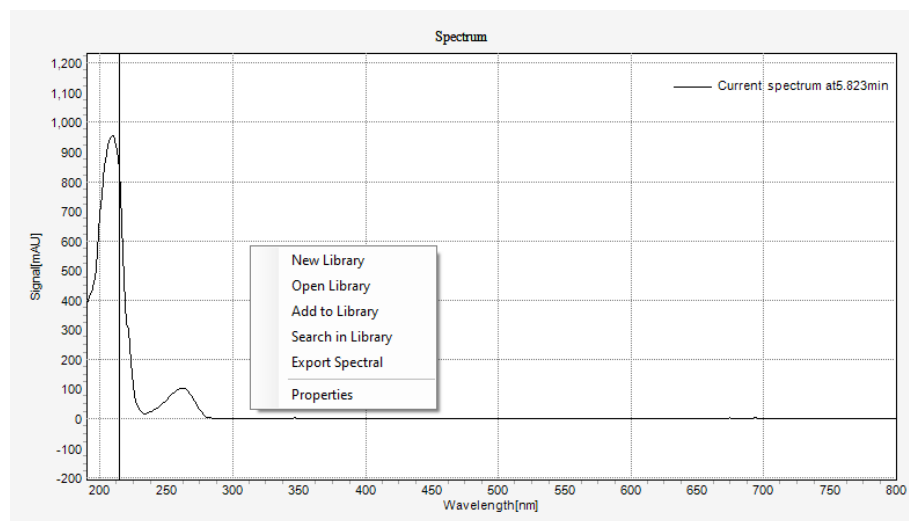


Fig. 4-79 Right-click function in the "Spectrum" area

(9) Spectral Library View

This view displays spectral information for an open spectral library. Spectrum names and annotations can be changed in this view. If "Show Spectrum" is checked, the library spectrum and instant spectrum can be displayed in the spectrum view at the same time. As shown in Fig. 4-80

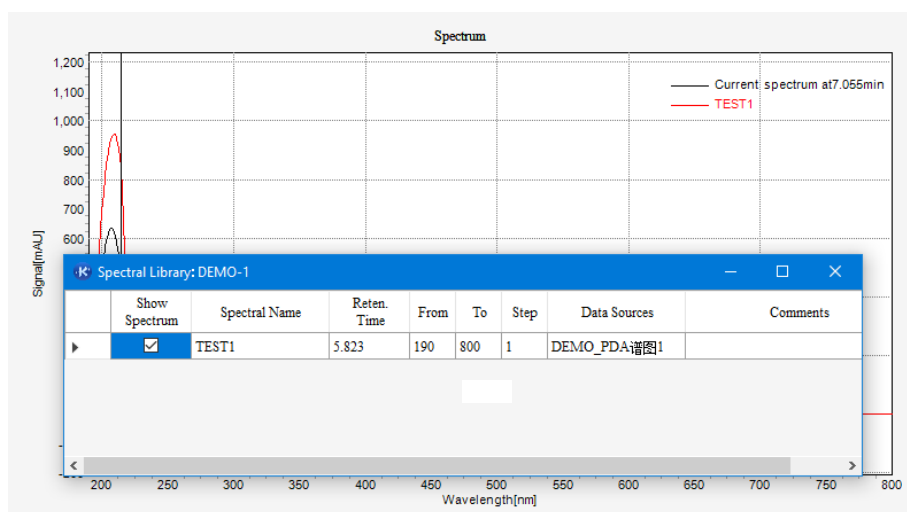


Fig. 4-80 Spectral Library View

(10) Spectral Library Search Results View

This view displays the spectral library search results. As shown in Fig. 4-81.

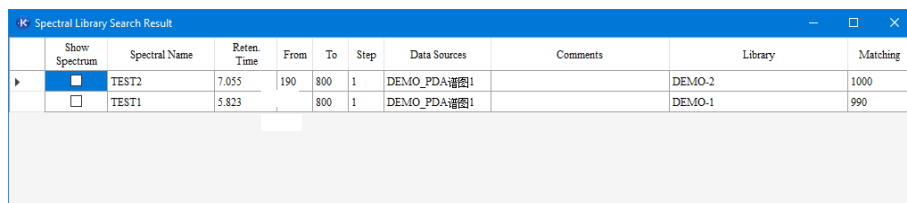


Fig.4-81 Spectral Library Search Results View

## 5. Chapter Five: Maintenance and Repair

In order to guarantee the normal run of the detector, it is necessary to maintain and repair some devices. Maintenance is referred to easy repair operations, where there is no need to open the cover. However repair is referred to get rid of the cover and change internal parts.

If you encounter any repair issue, contact with Dalian Elite Analytical Instrument Co., Ltd.



[Note] Without guidance, please do not open the detector cover, in case of any damage to body or instrument.

### 5.1 Cleaning the Flow Cell Online

---

Please follow these steps to clean the flow cell online:

- 1) Turn off the pumps, and take off the column.
- 2) Connect the flow cell entrance to the sampler export, and then pump miscible solvent or water (for example, mobile phase is with water miscibility) into the flow cell and rinse it. If mobile phase is immiscible with water, rinse it with transitional solvent.
- 3) Add the column again.
- 4) If impurities cannot be cleared, please contact with Dalian Elite Customer Service.

### 5.2 Cleaning the Tube

---

Newly acquired tube needs to be cleaned before use.

Solvent for cleaning stainless tube should be in the following sequence: CCl<sub>3</sub>-Methanol (or absolute alcohol)- water- 1.0mol/L HNO<sub>3</sub> aq.- Methanol- Nitrogen. For PTFE, clean with methanol before use.

## 5.3 Flow Cell Replacement (Please contact Customer Service)

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- 1) Unpack and check the new flow cell.
- 2) Please keep the detector power off, and then remove the entrance/ export connection tubing.
- 3) Unscrew the two thumb screws and gently remove the flow cell.
- 4) Install the new flow cell in the proper direction.
- 5) Tighten the two thumb screws.
- 6) Once again connect the entrance/ export tubing and clean it with suitable solvent.
- 7) Turn on the detector.

## 5.4 Deuterium Lamp Replacement

---

Depending on the self-property of deuterium lamp, lamp energy decreases while the working time increases. As a result, the signal to noise ratio decreases. To keep the optimum performance of the lamp, once it runs more than 2000 hours, users have to consider changing a new one. If the testing consequence is not influenced, users may go on using it with periodic maintenance and observation. It is suggested to get good prepared for the lamp replacement, avoiding a bad influence on experiments.

When the following conditions are met, please replace the deuterium lamp:

- The deuterium lamp cannot be lit while starting the detector.
- The baseline noise is too high, meanwhile the sensibility is too low.



[Note] If the deuterium lamp cannot be lit for many times, it is suggested to replace it. In general, the service life of the lamp is 2000 hours.



[Warning] Before take off the deuterium lamp, please make sure the detector is powered off. Because there will be intense ultraviolet radiation directly harm eyes or skin if you do not do this.



[Caution] The temperature of the lamp box and around is so high to burn skin. So, please take off the deuterium lamp after turning off the detector power for 30 minutes.

Please replace the deuterium lamp as following:

- 1) Take off the flow cell, and unscrew the housing fixing screws (8), open the cover, as shown in Figure 5-1.

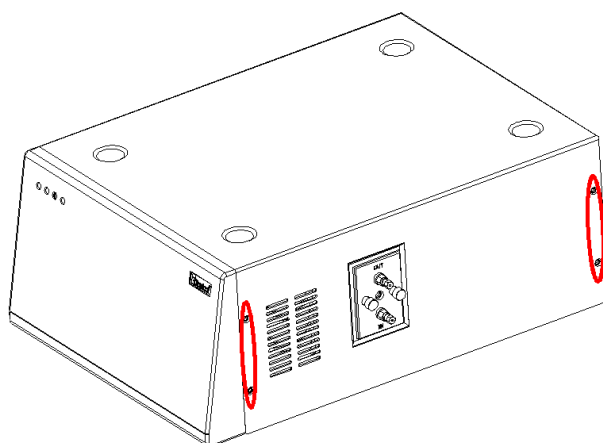


Figure 5-1 Schematic diagram of housing fixing screws position

- 2) Unscrew the 3 lamp connecting terminals, as shown in Figure 5-2.

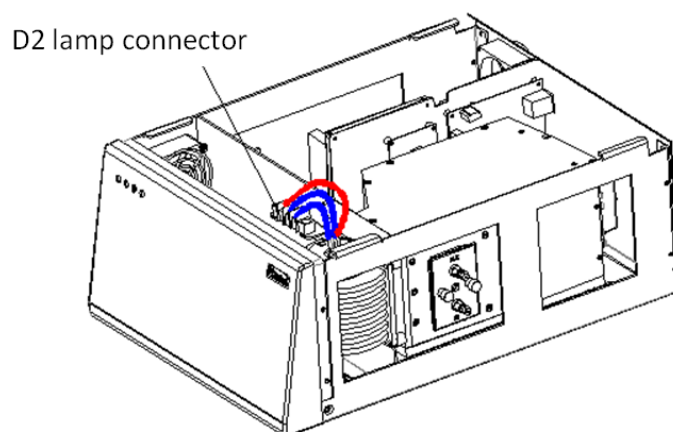


Figure 5-2 Take off the deuterium lamp

- 3) Take off the lamp.
- 4) Put in and fix the deuterium lamp in the right way.
- 5) Tighten the screws in step 2), finishing the replacement.



[Note] Glass covers the deuterium lamp, so please handle it gently. Fingers and other hard things can not touch the lamp aperture. Do not touch the lamp glass directly. Hold its lamp lines or flange.

Never observe alight deuterium lamp with naked eye. Please put on UV protective goggles while observing it. Make a short observation after replacing a new deuterium lamp.

- 6) Reload the light cover, and cover the instrument shell. And tighten the fixing screws.



[Note] Make sure that the detector power is cut off during replacement of the deuterium lamp. After the replacement, make sure to turn on the detector and preheat for at least 10 minutes.

## 5.5 Common Failure Diagnosis and Elimination

The use of chromatograph involves machinery, electronics, optics and computer knowledge. If the instrument works abnormally, please check it in the following way.

Table 5-1: A summary of most common problems affecting system operation

Symptoms	Cause	Solutions
Noise	Detector flow cell contaminated	Wash the flow cell with 1mol/L nitric acid, water, and a new solvent. Unload the flow cell, clean or replace quartz window of it.
	Air bubbles in detector flow cell	Increase the flow rate suddenly, drive out the bubbles. Connect a backpressure (0.2-0.3 MPa) parts, or even a stainless steel tube( ID0.007mmx0.5-1m) at the outside of the flow cell to increase the pressure in the flow cell.
	Detector or data acquisition system improperly grounded	Take away the original grounding line, to reconnect.
	Detector lamp failure	Check the deuterium lamp set state; Check that the light use time, light energy, opening times; Replace the deuterium lamp.
	Fluid leakage	Tighten or replace the fittings.
	Small bubbles traveling through the flow cell	Degas the mobile phase carefully; Increase the back pressure of the cell.
	Particles in detector flow cell	Cleaning the cell; Check the sieve plate of column exports.
Baseline drift	Detector flow cell contaminated	Wash the flow cell with 1 mol/L nitric acid, water, and a new solvent. Unload the flow cell, clean or replace quartz window of it.
	Chromatographic column contamination or loss of stationary phase	Clean or exchange the column. Use protect column.
	The cell leakage	Change quartz window of flow cell. Tighten gland nut.
	Detector temperature changes	Make the system temperature constant.
	Detector lamp failure	Replace the deuterium lamp.
	The original mobile phase was not fully removed	Thoroughly replace the system with new mobile phase or compatible solvent.
	Solvent storage bottle contamination	Clean the solvent bottle, equilibrate system with a new mobile phase.
	Strong adsorption component is eluted from the column	Flush the column with strong elution solvent before the next separation. Use solvent gradient.

Symptoms	Cause	Solutions
Noise spikes	Small bubbles traveling through the flow cell	Degas the mobile phase carefully; decrease the temperature around.
	Detector or data acquisition system improperly grounded	Take away the original grounding line, and reconnect it.
Negative peaks	Polarity of output signal is not correct	Reverse detector output signal wiring.
	Sample injection failure	Use injection valve, confirm there is no air bubbles in sample ring during injection.
	The mobile phase is not pure	Use chromatographic pure mobile phase, or purify the solvents.
Signal stepped up; Flat peak; The baseline can't back to zero	Improper recorder gain and damping control	Adjust the gain and damping; Repair the recorder.
	Incorrect detector setting of output range	Reset the detector output range.
	Detector or data acquisition system improperly grounded	Take away the original grounding line, and reconnect it.
Recorder, integrator or workstation is not balanced in zero	Fault recorder, integrator or workstation	Maintain.
	Small bubbles in the flow cell	Degas the mobile phase carefully; Increase the back pressure of the cell.
	The energy of light out from flow cell is weak	Check the light path, unclog. Clean the flow cell or replace cell window.
	Detector lamp failure	Replace the deuterium lamp.
	Poor contact between the detector, recorder, integrator or workstation	Check and tighten connection wire.
	The column stationary phase erosion is serious	Replace the column; Change the mobile phase.
	The original mobile phase contamination	Rinse the system thoroughly.
	Mobile phase absorption is too strong	Convert ultraviolet through solvent; Change detection wavelength.
Baseline noise arise along with the pump reciprocating	Strong air or fluid pulsation is around the instrument	Place the instrument in right environment. Reduce the pulsation of the pump with a regulator or damper.
noise spikes arise along with the pump reciprocating	Air bubbles in flow cell	Unload the column, impel methanol from outlet of detector with a syringe to remove air bubbles.
Detector is not working	<b>Fuse burn-out</b>	Replace fuse.
	The power supply is turned off	Turn on the power supply.
Indicator for deuterium lamp is not bright	End of deuterium lamp life	Replace deuterium lamp.
	Improper deuterium lamp connection	Rewiring.
	The power supply problem	Check the power supply.
	deuterium lamp is turned off	Turn on the deuterium lam.



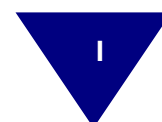
## Appendix

### Consumption parts

NO.	Describe	PN
1	Trigger line	18080168
2	FEP tube OD1/16"×0.2m	13010031
3	PEEK tube OD1/16"~ID0.007"	13010014
4	1/16"Stainless steeltwo-way joint	14990115
5	T2.0A/250V fuse	15080014
6	Power line	17000001
7	Cable(3m)	17000036
8	Cable(1m)	17000035
9	Pipe holder	14040755
10	Finger TightI (PEEK)	3215F-120X
11	Silicon Tube	13010033
12	Cable Router	15500027

### Renewal Parts

NO.	Describe	PN
1	Deuterium Lamp	16010005
2	Tungsten Lamp	16020004
3	Tungsten Lamp Fixing Screws	14070229
4	Deuterium Lamp Fixing Screws	14992352




## Safety information

### General safety information

At different stages of the instrument operation, maintenance and repair, everyone should abide the following general safety rules. Breaking these rules may cause damage to instruments or staffs, Dalian Elite Analytical Instruments Co., Ltd. will not be responsible for the impacts caused by non-standard operation.

### Standard of security

For marked with this symbol of the equipment, the user should refer to the instruction manual, so as not to cause harm to the operator and equipment damage.

Symbols	Descriptions
	Please do not operate beyond the scope of caution, unless you have been fully understand and meet the required conditions.
[Warning]	Casualties may appear. Please do not operate beyond the scope of warning, unless you have been fully understand and meet the required conditions.
[Caution]	Data loss or equipment damage may appear. Please do not operate beyond the scope of caution, unless you have fully understood and met the required conditions.
[Note]	Unsatisfactory experimental data and instrument failure may appear. Please do not operate beyond the scope of note, unless you have been fully understand and meet the required conditions.

## Absorptive character of some typical functional groups

Name	Groups	$\lambda_{max}$	$\epsilon_{max}$	$\lambda_{max}$	$\epsilon_{max}$	$\lambda_{max}$	$\epsilon_{max}$
------	--------	-----------------	------------------	-----------------	------------------	-----------------	------------------

ether	-O-	185	1000				
thioether	-S-	194	4600	215	1600		
amine	-NH <sub>2</sub>	195	2800				
mercaptan	-SH	195	1400				
disulphide	-S-S-	194	5500	255	400		
bromide	-Br	208	300				
monoiodide	-I	260	400				
oximido	-NOH	190	5000				
nitrine	>C=N-	190	5000				
ethylene	-C=C-	190	8000				
keto-	>C=O	195	1000				
thioketone	>C=S	205	Strong	270-285	18-30		
aldehyde	-CHO	210	Strong				
acid	-COOH	200-210	50-70				
sulfoxide	>S→O	210	1500				
nitro	-NO <sub>2</sub>	210	Strong				
Nitrous acid ester	-ONO-	220-230	1000-2000				
	(no-loop)						
	-(C=C) <sub>3</sub> -	260	25000				
	-(C=C) <sub>4</sub> -	300	52000				
	-(C=C) <sub>6</sub> -	330	118000				
	-(C=C) <sub>8</sub> -	230-260	3000-8000				
	(annulate)						
	C=C-C≡C	219	6500				
	C=C-C=N	220	23000				
	C=C-C=O	210-250	10000-20000				
	C=C-NO <sub>2</sub>	229	9500				
benzene		184	46700	202	6900	255	170
biphenyl		246	20000				
naphthalene		220	112000	275	5600	312	175
anthracene		252	199000	375	7900		
pyridine		174	80000	195	6000	251	1700
quinoline		227	37000	270	3600	314	2750
isoquinoline		218	80000	266	4000	317	3500

**【State】** When choosing the best absorption wavelength, the lowest wavelength getting through mobile phase ought to be considered at the same time (UV cutoff wavelength in the appendix 2). To sample who have multiple characteristic absorption wavelength, the wavelength corresponding to the biggest  $\epsilon_{max}$  is the best choice.

## Features of some organic solvents

Solvent* 7<.5cP,<45	source	UV Cutoff	R.I. 25°C	boiling point °C	viscosity cP,25°C	p'	ea	w%	e	p'+ 0.25e
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Operation Manual for DAD 3100 Diode Array Detector

1	FC-78* FC-75(fluorous solvent ) F-43	LC chara cter	210 (Opaque or below)	1.267 1.276 1.291	50 102 174	0.4 0.8 2.6	< -2 < -2 < -2	-.25 -.25 -.25		1.88 1.86 1.9	p' And the dielectric constant
2	isooctane*	LC	197	1.389	99	0.47	0.1	0.01	0.011	1.94	0.1
3	n-heptane*	LC	195	1.385	98	0.40	0.2	0.01	0.010	1.92	0.5
4	n-hexane*	LC	190	1.372	69	0.30	0.1	0.01	0.010	1.88	0.5
5	n-pentane**	LC	195	1.355	36	0.22	0.0	0.00	0.010	1.84	0.5
6	cyclohexane	LC	200	1.423	81	0.90	-0.2	0.04	0.012	2.02	0.5
7	cyclopentane	LC	200	1.404	49	0.42	-0.2	0.05	0.014	1.97	0.6
8	1-chlorobutane*	LC	220	1.400	78	0.42	1.0	0.26		7.4	2.8
9	carbon disulfide	LC	380	1.642	46	0.34	0.3	0.15	0.005	2.64	1.7
10	2- chloride**	LC	230	1.375	36	0.30	1.2	0.29		9.82	3.7
11	carbon tetrachloride	LC	265	1.457	77	0.90	1.6	0.18	0.008	2.24	2.3
12	n-butyl ether		220	1.397	142	0.64	2.1	0.25	0.19	2.8	2.4
13	triethylamine			1.398	89	0.36	1.9	0.54		2.4	2.4
14	bromoethane*			1.421	38	0.38	2.0	0.35		9.4	4.3
15	isopropyl ether*		220	1.365	58	0.38	2.4	0.28	0.62	3.9	3.2
16	methylbenzene	LC	285	1.494	110	0.55	2.4	0.29	0.046	2.4	2.9
17	P-xylene		290	1.493	138	0.60	2.5	0.26		2.3	3.0
18	chlorobenzene			1.521	132	0.75	2.7	0.30		5.6	4.1
19	bromobenzene			1.557	156	1.04	2.7	0.32		5.4	4.1
20	iodobenzene						2.8	0.35			
21	diphenyl ether			1.580	258	3.3	3.4			3.7	3.7
22	phenetole			1.505	170	1.14	3.3			4.2	4.9
23	diethyl ether*	LC	218	1.350	35	0.24	2.8	0.38	1.3	4.3	4.0
24	benzene	LC	280	1.498	80	0.60	2.7	0.32	0.058	2.3	3.6
25	phosphotriester(p-to lyl)			1.510	72	0.57	2.2			7.8	4.2
26	iodoethane			1.510	72	0.57	2.2			7.8	4.2
27	n-caprylic alcohol		205	1.427	195	7.3	3.4	0.5	3.9	10.3	5.8
28	fluorobenzene			1.46	85	0.55	3.1			5.4	4.6
29	benzyl oxide			1.538	288	4.5	4.1				
30	dichloromethane**	LC	233	1.421	40	0.41	3.1	0.42	0.17	8.9	5.6
31	anisole			1.514	154	0.9	2.8			4.3	4.6
32	isoamyl alcohol			1.405	130	3.5	3.7	0.61	92	14.7	7.3
33	2-Dichloroethane	LC	228	1.442	83	0.78	3.5	0.44	0.16	10.4	6.3
34	tert-butyl alcohol			1.385	82	3.6	4.1	0.7	Dissolved	12.5	
35	n-butyl alcohol	LC	210	1.397	118	2.6	3.9	0.7	20.1	17.5	8.3
36	n-propyl alcohol	LC	240	1.385	97	1.9	4.0	0.82	Dissolved	20.3	
37	tetrahydrofuran*	LC	212	1.405	66	0.46	4.0	0.57	Dissolved	7.6	
38	propylamine*			1.385	48	0.35	4.2		Dissolved	5.3	
39	ethyl acetate	LC	256	1.370	77	0.43	4.4	0.58	8.8	6.0	5.8
40	isopropyl alcohol	LC	205	1.384	82	1.9	3.9	0.82	Dissolved	20.3	
	<b>Solvent* 7&lt;.5cP,&lt;45</b>	<b>source</b>	<b>UV Cutoff</b>	<b>R.I. 25°C</b>	<b>boiling point °C</b>	<b>viscosity cP,25°C</b>	<b>p'</b>	<b>ea</b>	<b>w%</b>	<b>e</b>	<b>p'+ 0.25e</b>
41	chloroform*	LC	245	1.443	61	0.53	4.1	0.40	0.072	4.8	5.6

42	acetophenone			1.532	202	4.8				17.4	8.7
43	MEK*	LC	329	1.376	80	0.38	4.7	0.51	23.4	18.3	9.1
44	cyclohexanone		215	1.450	156	20	4.7			18.3	9.1
45	nitrobenzene			1.550	211	1.8	4.4			34.8	13.2
46	phenylcyanide			1.536	191	4.8				25.2	10.9
47	dioxane	LC	215	1.420	101	1.2	4.8		Dissolved	2.2	
48	tetramethylurea	LC	265	1.449	175		6.0	0.56		23.0	10.7
49	quinoline			1.625	237	3.4	5.0			9.0	7.4
50	pyridine			1.507	115	0.88	5.3		Dissolved	12.4	
51	nitroethane		380	1.390	114	0.64	5.2		0.9		
52	acetone*	LC	330	1.356	56	0.30	5.1	0.71	Dissolved		
53	phenethyl alcohol			1.538	205	5.5	5.7			13.1	8.8
54	tetramethyl guanidine						6.1	0.6			
55	methyl cellosolve	LC	210	1.400	125	1.60	5.5		Dissolved	19.9	
56	CIS Cyanide Oxide	GC					6.6				
57	1,2-Propyl carbonate	LC					6.1				
58	ethyl alcohol	LC	210	1.359	78	1.08	4.3		Dissolved	24.6	
59	diether	GC					6.8				
60	aniline			1.584	184	3.77	6.3			6.9	8.1
61	acetic acid			1.370	118	1.1	6.0		Dissolved	6.2	
62	acetonitrile*	LC	190	1.341	82	0.34	5.8		Dissolved	37.5	
63	dimethylacetamide	LC	268	1.436	166	0.78	6.5	0.88		37.8	
64	dimethylformamide	LC	268	1.428	153	0.80	6.4			36.7	
65	dimethyl sulfoxide	LC	268	1.477	189	2.00	7.2	0.62	Dissolved	4.7	
66	N-methyl-2-pyrrolid one	LC	285	1.468	202	1.67	6.7			32	
67	Hexamethylphosphoric triamide			1.457	233	3	7.4	0.65		30	
68	methyl alcohol*	LC	205	1.326	65	0.54	5.1		Dissolved	32.7	
69	nitromethane		380	1.380	101	0.61	6.0		2.1		
70	m-cresol			1.540	202	14	7.4			11.8	10.0
71	n-methyl formamide			1.447	182	1.65	6.0		Dissolved	182	
72	ethanediol			1.431	182	16.5	6.9		Dissolved	37.7	
73	methyl aldehyde			1.447	210	3.3	9.6		Dissolved	111	
74	water	LC		1.333	100	0.89	10.2			80	

**【State】**

1. Organic solvent have low boiling point ( $\leq 45^{\circ}\text{C}$ ), low viscosity ( $\leq 0.5\text{cp}$ ) is easy to use. Marked with (\*) number of organic solvents is preferred for high performance liquid chromatography (HPLC) mobile phase solvent. Marked with (\*\*\*) is with very low boiling point and low viscosity solvent.

2. In the "source" column with LC means the mobile phase can be purchased from the following companies: Burdick & Jackson, Baker Chemical, Mallinkrodt Chemical, Fischer Scientific, Manufacturing Chemicals, inc. etc.

3. In the "source" column with GC means the mobile phase can be used as gas chromatographic stationary phase, and can be purchased from the distribution company and GC column stationary phase

4. "UV Cutoff" — Mobile phase is ultraviolet transparent over the wavelength

5. "R.I.25" the index of refractive index (25 °C).
6. "p" the polarity parameters of mobile phase.
7. "ea" Flow intensity parameter when alumina is use for liquid - solid adsorption.
8. "w%" Water Solubility w% in 20 °C Solvent.
9. "e" Dielectric Constant  $\epsilon_0$ .
10. "p+0.25E" Electric constant function.







# ***ELITEHPLC***

## **About Elite**

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