FISON

Autosampler for TOC Analyzer

FM-AS-A100

Index

1. Introduction

Autosampler for TOC Analyzer FM-AS-A100 is designed to simplify laboratory analyses with automated precision. It supports a measurement range of 0.1 to 30.0 mg, ensuring accurate and consistent injections. The system boosts workflow efficiency by automating sample handling. Advanced software allows seamless integration with analytical instruments.

2. Features

- ✓ Autosampler for TOC Analyzer with overall efficiency
- ✓ Compatible with both solids and liquids
- ✓ Accurate and seamless operation
- ✓ Adjustable sample capacity
- ✓ Boosting productivity and precision

3. Specifications

Model No.	**FM-AS-A100**
Type of specimen	Solid or Suspension liquid sample
Range of measurement	0.1 to 30.0 mg
Control Mode	PC software controlled
Analysis Parameter	TC, TIC, TOC (TC-IC)
TC Measurement Method	High-temperature catalytic combustion
Temperature Range	900°C, Maximum 1000°C
Measurement Time	5 to 8 min
Sample holder	Quartz boat
Gas Requirement	Oxygen, purity ≥ 99.995% (TOC analyzer provides)
Flow rate	500 mL/min
Maximum Sample	Solid: 1.0g TC liquid: 0.5 mL IC liquid: 0.3 mL
Power Supply	AC100 to 240V, 50/60 Hz
Power Consumption	1000 W
Packing Dimension	863 × 648 × 522 mm
Gross Weight	50 Kg

4. Applications

Autosampler for the TOC Analyzer is utilized in various sectors, including environmental monitoring, pharmaceuticals, food and beverage testing, water quality analysis, and industrial waste management

5. Instrument Introduction

5.1 Appearance and Size

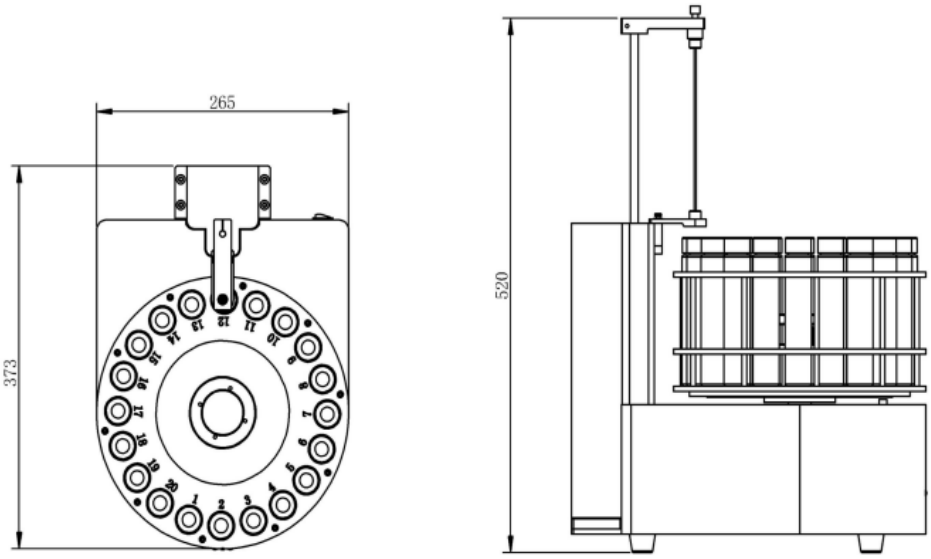


Figure-1

5.2 Injector Interface

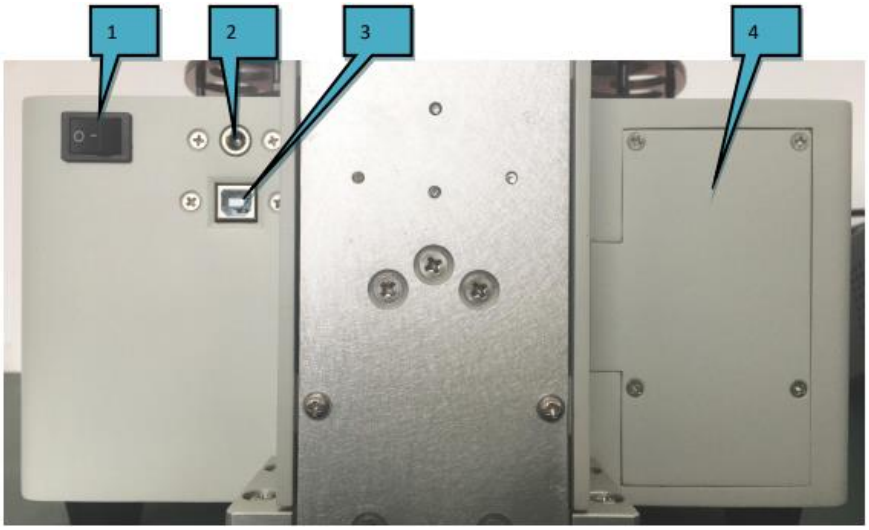


Figure-2 Sampler external interface schematic

1) Autosampler power switch
2) Power interface
3) USB communication interface
4) Control panel cover

6. Installation

6.1 Preparation

6.1.1 Power systems

A good grounding wire is needed, and the power socket must be a well-grounded three-hole socket.

Power supply	120-240VAC
Power frequency	50/60Hz±1Hz

6.1.2 Bench space

Laboratory table requirements: L ≥ 1000mm, W ≥ 600mm, H: 700mm - 800mm, the weight that the table can stand is more than 20kg. And the distance is not less than 100mm from the injector to the side of the table.

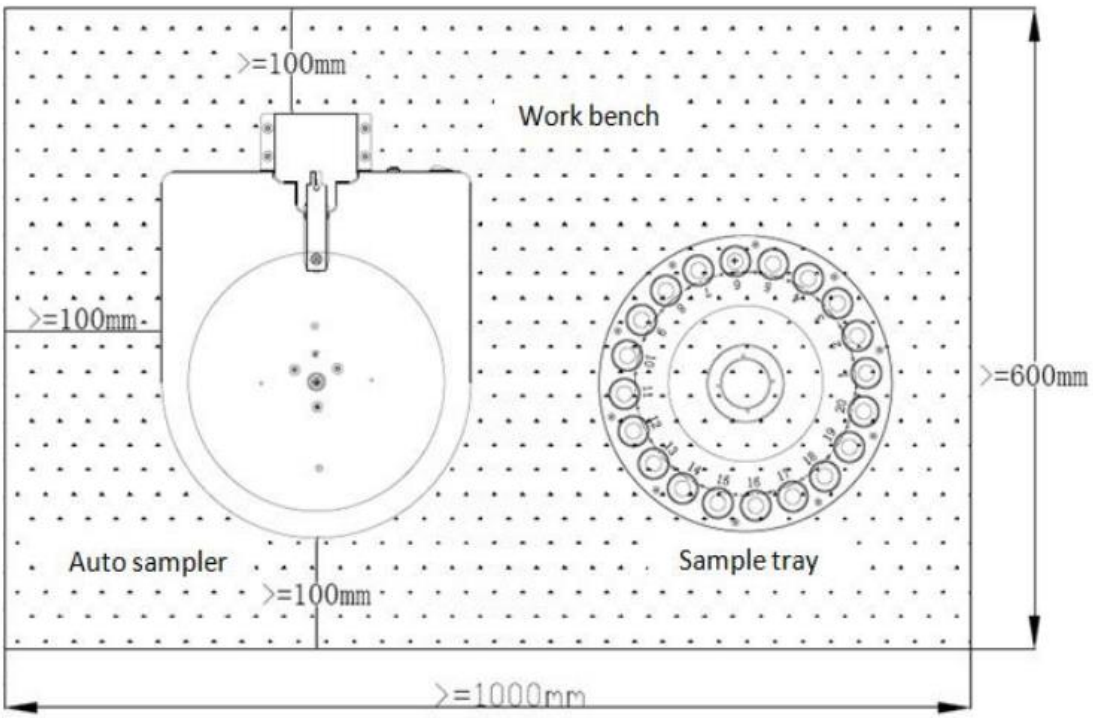


Figure-3 Experimental bench diagram

6.1.3 Environment

1) Keep away from strong electromagnetic.
2) **Ambient temperature:** 10 - 40℃.

6.2 Unpacking

6.2.1 Unpacking

Inspect the outer box of the carton for any obvious damage before unpacking. The instruction manual can be seen after unpacking. Read the instruction manual carefully to check whether the instrument and components are complete.

6.2.2 Sample Tube connection installation

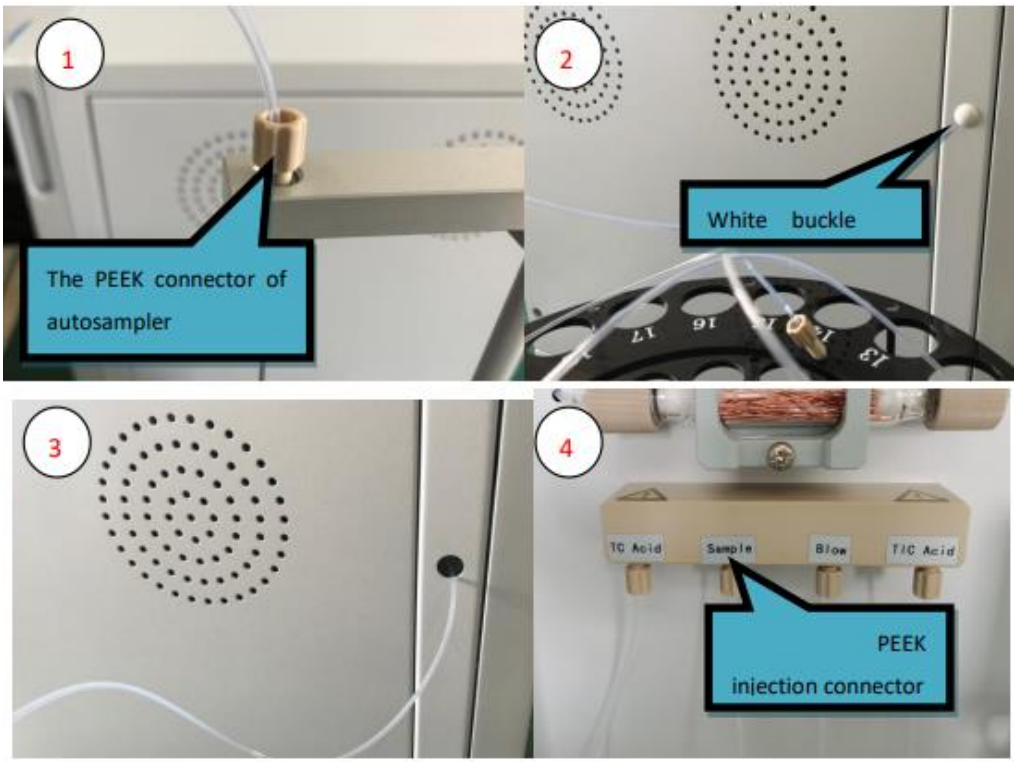


Figure-4 Sampler external interface schematic

1) Lock the PEEK connector at one end of the injection connection tube according to the position of the PEEK connector of the autosampler as shown in (1).
2) Take out the white buckle as shown in (2) and pass the PEEK connector at the other end of the injection connection tube through the hole as shown in (3).
3) Connect the PEEK connector of the injection connection tube with the injection port of the host as shown in (4) and lock it with a tool.

6.2.3 Instrument Installation

1) Place the autosampler on the bench which meets the requirements of **6.1.2 Bench space**. Attach connector 1 of the injection connection tube assembly to the syringe mount lock it and connect the connectorless end to the injection port.
2) Plug the power adapter cylindrical connector (P1M) into the power connector shown on the instrument interface.
3) Insert the USB data cable square port into the USB interface shown on the instrument interface.

6.2.4 Sample tray installation and removal

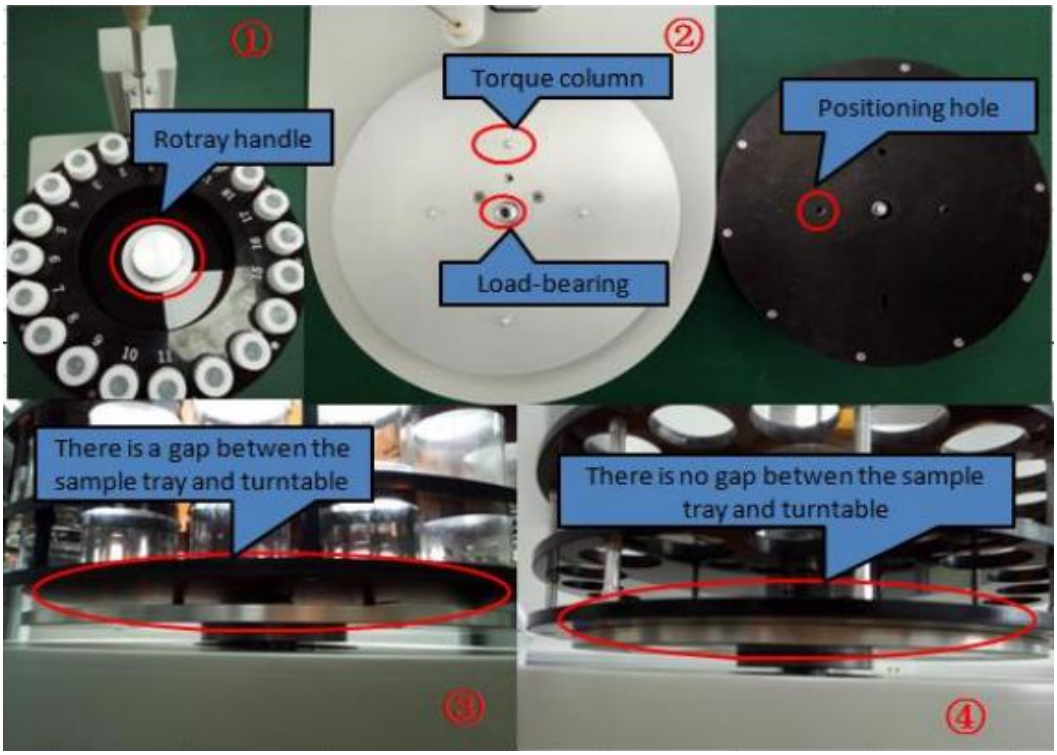


Figure-5 Sample tray installation

1) **Sample tray installation**
   Insert the sample tray into the load-bearing base on the turntable and rotate the sample tray to ensure the syringe is directly above the middle of the No. 1 bottle. Insert four turntable torque columns into the four positioning holes and ensure no gap between the turntable and the sample tray, as shown in (4). The torque column has not been inserted into the positioning hole, and there is a gap between the sample tray and the turntable, as shown in (3). Tighten the round handle clockwise after ensuring no gap.
2) **Sampler tray removal**
   Rotate the round handle counterclockwise and place the sample tray on a workbench.
   Notice: Ensure the syringe is in the home position (the needle is at the top) before the sample tray is removed and installed, and the host computer has no unfinished instructions.

6.2.5 Autosampler Usage Precautions

1) Check whether the height of each sample bottle is the same after placing the sample bottle. If the height is not the same, the needle will hit the bottom of the bottle, which may cause abnormalities such as a broken bottom of the bottle and damage to the needle.
2) It is forbidden to put the hand near the injection needle and disassemble the sample tray during the autosampler operation.

7. Software Installation

7.1 Driver installation

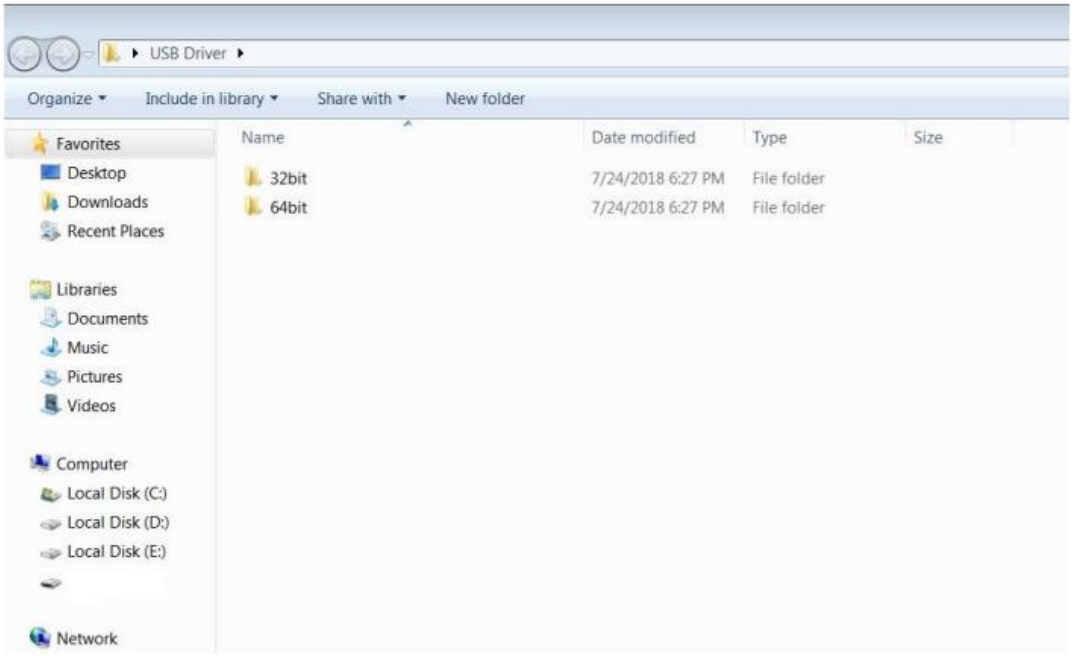


Figure-6 Drive file selection

There are two files in the above figure. Select the driver in the 32-bit folder if the operating system is 32-bit and select the driver in the 64-bit folder if the operating system is 64-bit system.

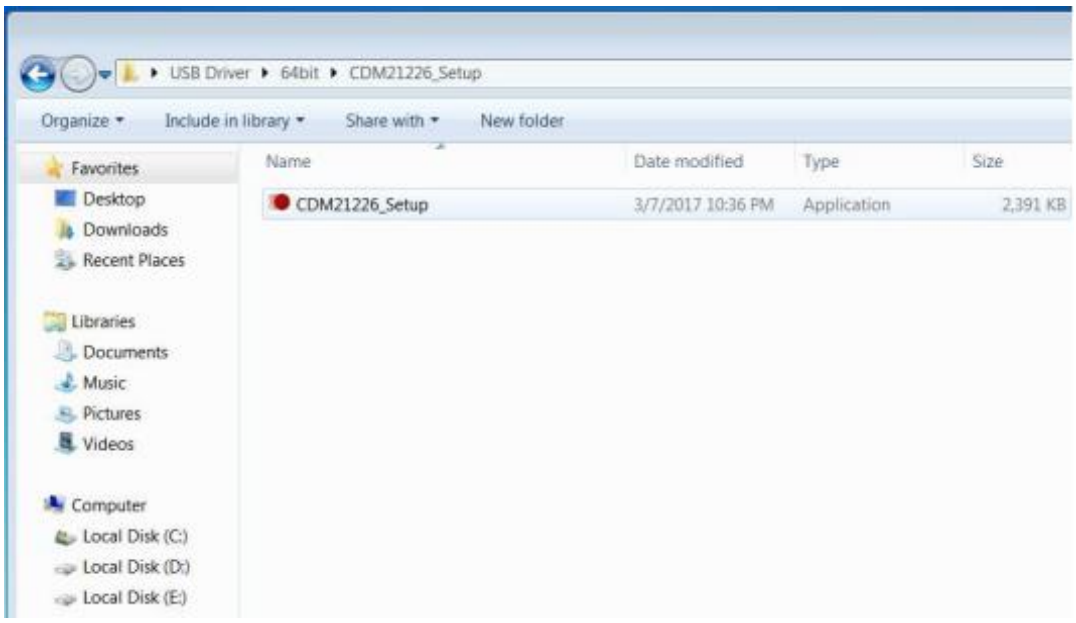


Figure-7 Serial port driver file

Double-click the CDM21226.exe file in the above figure to install the driver, as shown in **Figure 7.**

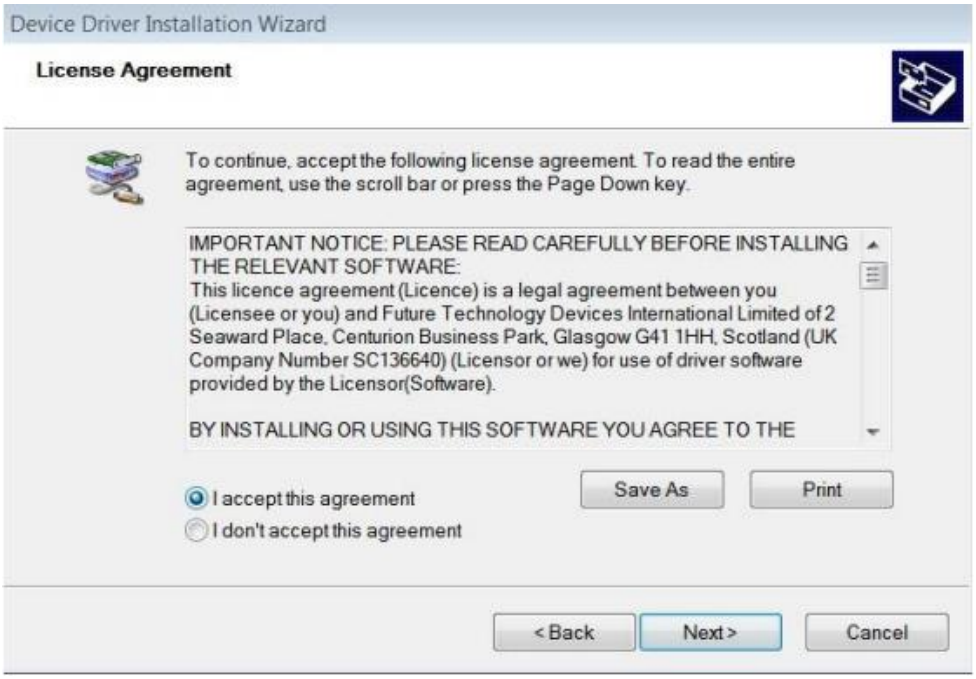


Figure-8 Installation process

Choose **"I accept",** then click the **"Next"** button, as shown in **Figur**e 8.

Figure-9 Completing installation

Click **"Finish"** when the installation is complete, as shown in **Figure 9.**

7.2 Modify Port Number

Modifying the computer serial port number is only for the new computer or the new replacing host.

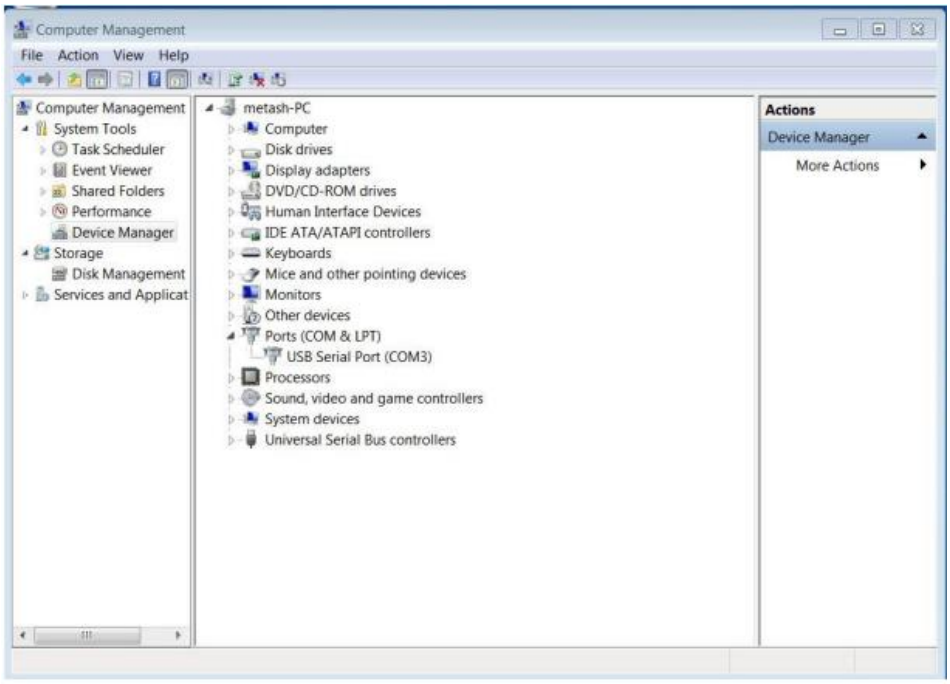


Figure-10 Device Manager Interface

Right-click on **my computer**, click on **Device Management**, and the USB serial Port (COM3) will be displayed.

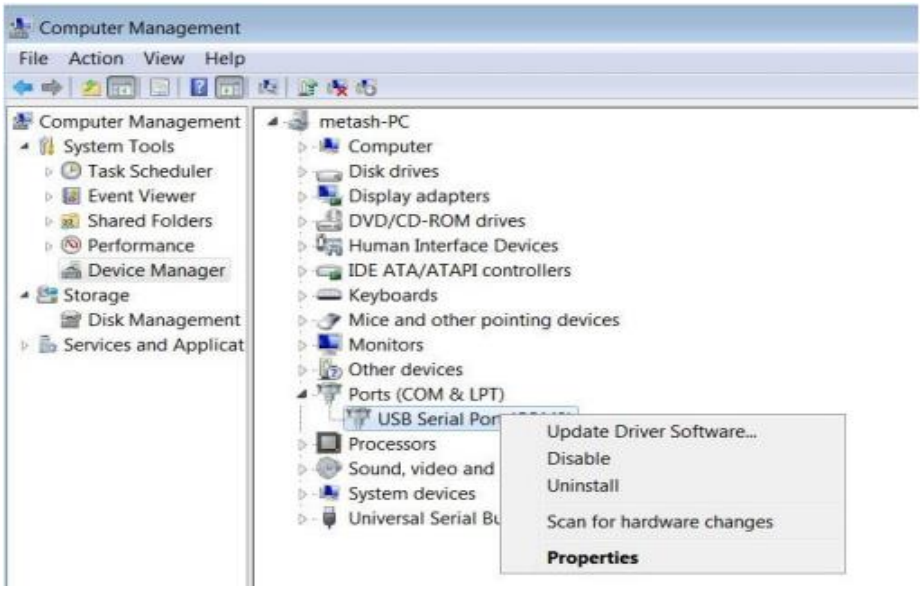


Figure-11 Appeared menu bar after right-clicking the serial

Click the **"Properties"** button in the appeared menu bar after right-clicking the **USB Serial Port (COM3).**

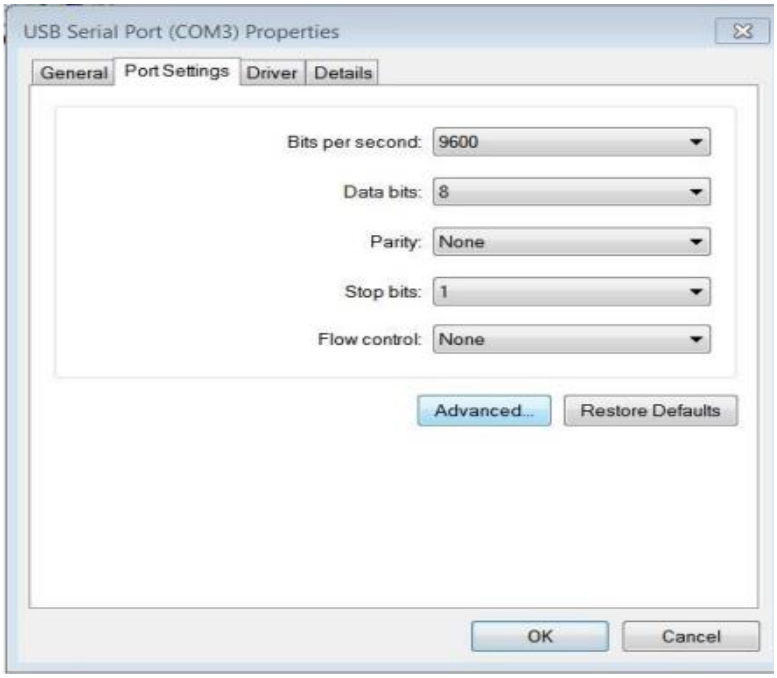


Figure-12 Serial port attribute

Click the **"Port Settings"** button in the Properties dialog box, then click the **"Advanced"** button, as shown in **Figure 12.**

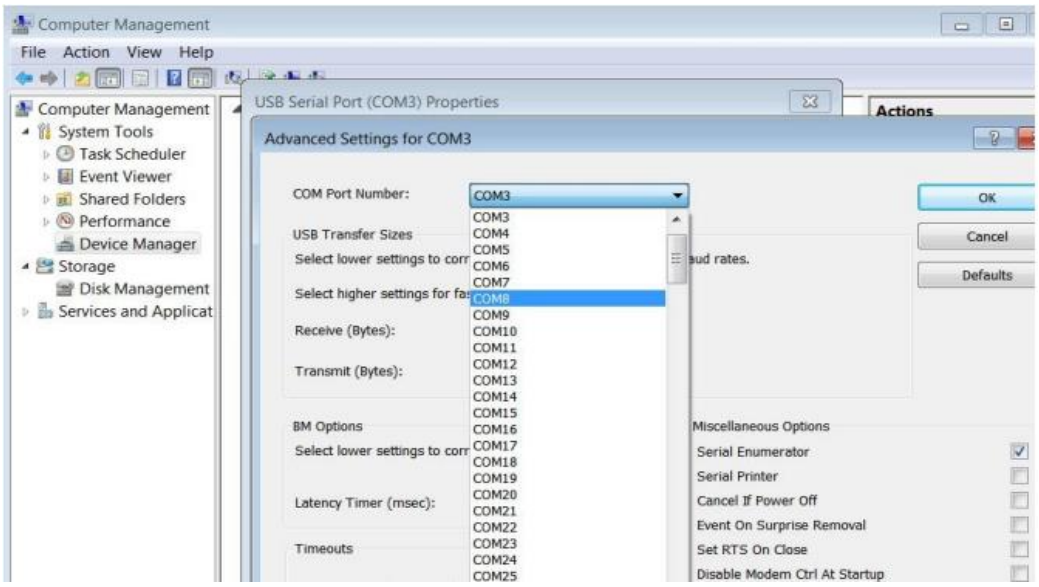


Figure-13 Selecting serial port number

In the advanced settings dialog box, click **COM12**, select **COM8**, and then click the **"OK"** button. If there is (use) behind **COM8,** log off the computer or restart the computer after the setting is completed.

8. Software Operations

8.1 Opening Software

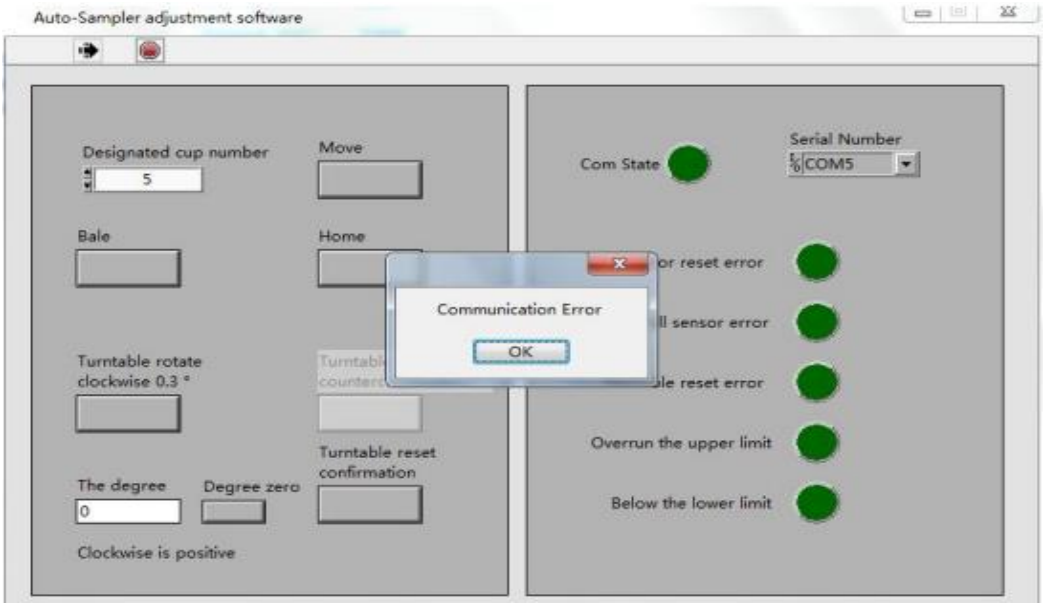


Figure-14 Autosampler adjustment software interface

Open the autosampler adjustment software.exe file, click the **"OK"** button in the **"communication error"** dialog box, confirm the dialog box, and select confirm.

8.2 Setting port number

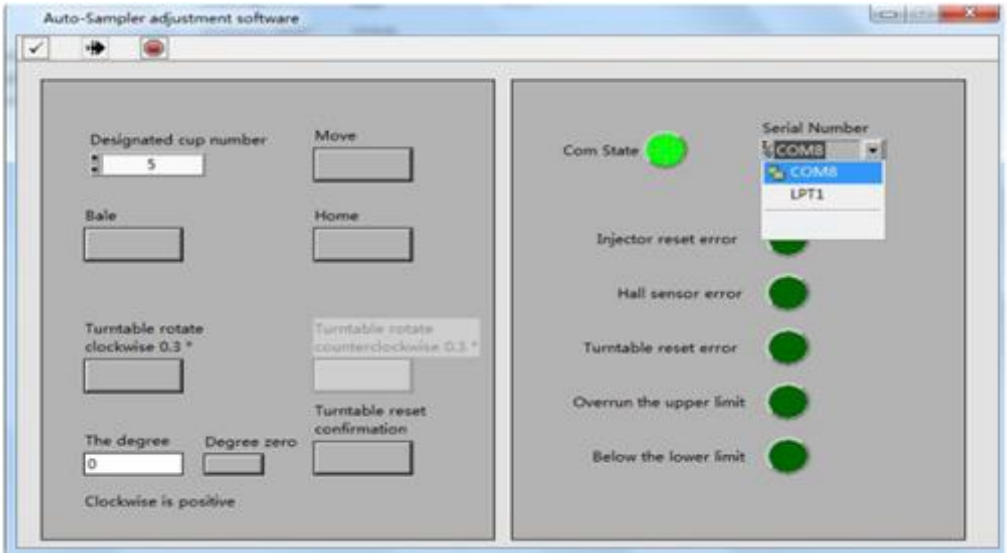


Figure-15 Selecting port

Click the **serial port number** to select the serial port 8. The communication status light will light up, as shown in **Figure 16.**

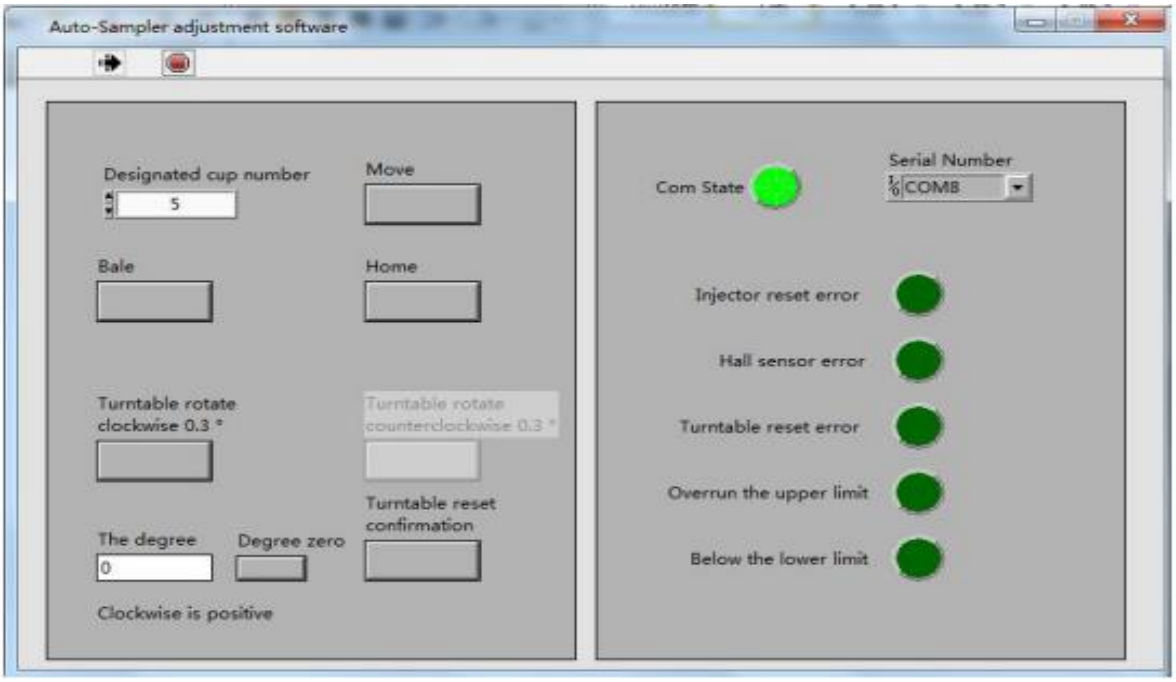


Figure-16 Setting the serial port number COM8

8.3 Software Functions

8.3.1 Moving test

1) **Running the specified sample cup position**

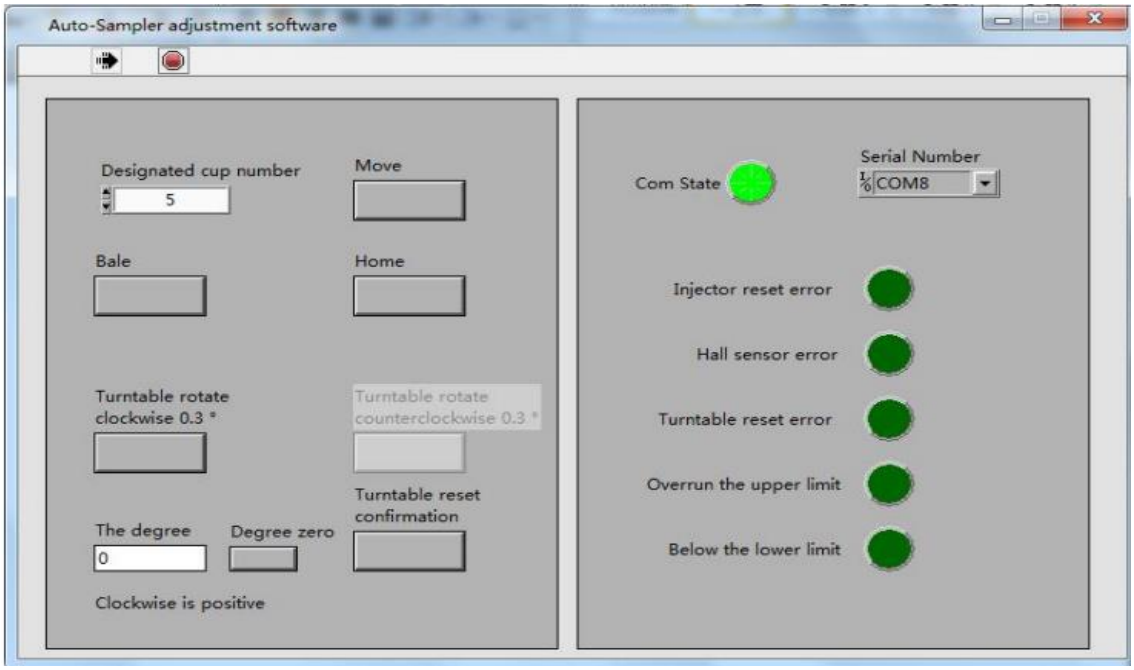
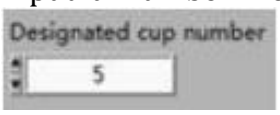


Figure-17 Setting sample cup position

Input a number from 1-20 in the specified cup number setting window 

, as shown in **Figure 17**. Then click the **start** button 

to make the autosampler run to the set cup number. The sample rod descends to the predetermined position and then returns to the upper position, and the sample tray is returned to the No. 1 cup position. When the trigger button is not clicked, the above actions will be repeated after 50 seconds.

2) **Autosampler Reset Operation**

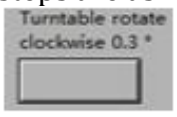
Click the **homing signal** button 

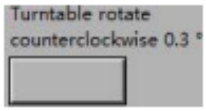
, as shown in **Figure 17.** If the injection arm is not homing, the injection arm is first up to the origin, and then the turntable is homed to the origin (the corresponding cup No. 1 on the sample tray). The homing function is mainly to check whether all the sensors are normal, and the motor can work normally, if the self-test fails, the sensor will report an error.

8.3.2 Correcting Homing Error

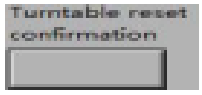
The alignment of the cup number is to calibrate the deviation between the needle and the center of the sample bottle. After the power is turned on, the autosampler automatically returns to the position, and the sample tray stops. The alignment of the cup number is to calibrate the deviation between the needle and the center position of the sample bottle. After the power is turned on, the autosampler automatically returns to the position, and the sample tray stops moving. Visually, the deviation between the syringe and the center point of the sample bottle is more than ±0.7mm, and re-calibration is needed.

The specific steps are as follows:

1) Click the 

button or 

button to adjust the deviation between the sample tray and the syringe, as shown in **Figure 17**. Observe the deviation of the turntable after the motor stops to adjust the deviation again.

2) After the error is corrected, click the 

button to save the correction error data, then turn off the autosampler power supply and turn the power on before applying the correction error data.

8.3.3 Intelligent Error Report Function

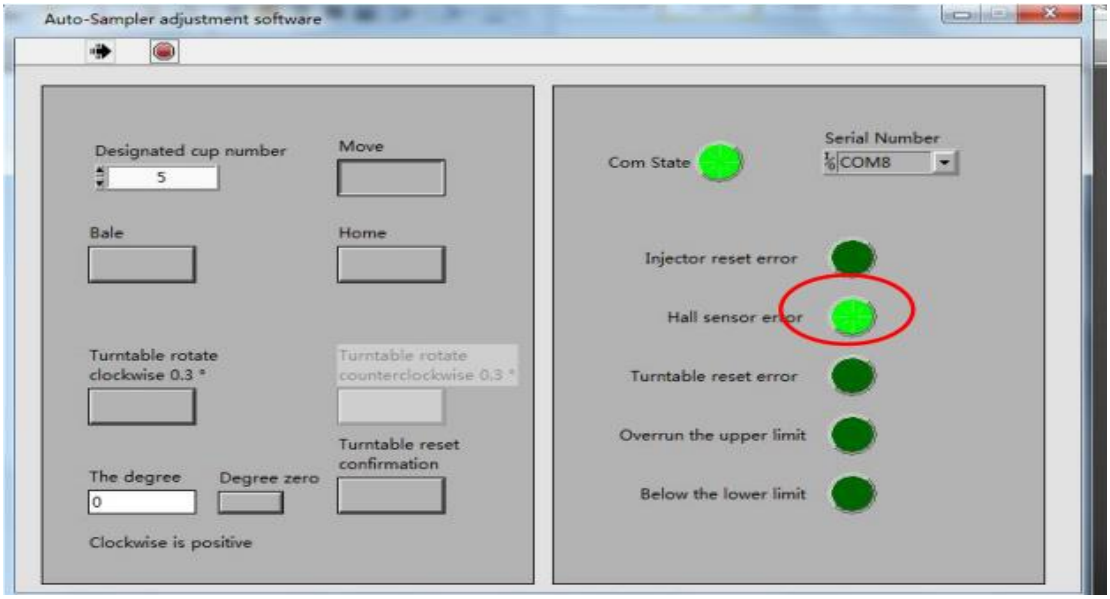


Figure-18 HALL sensor error interface

When the autosampler is running, the sensors are monitored by the processor in real-time to determine whether the motions are abnormal, thereby improving the accuracy of the fault processing. For example, the HALL sensor error light is in green, as shown in **Figure 13**, which indicates that the sample tray has not reached the set position. If the above five kinds of error messages are found, turn off the power and then turn on the power.

9. Troubleshooting

No.	Phenomenon	Cause	Solution
1	The instrument has no response.	Check if the blue indicator light of the power adapter is bright.	Check the adapter.
		Check the round connector on the backside.	Re-plug the round connector.
2	Homing is normal, but moving the cup is abnormal.	Communication is not normal.	Re-plug the USB communication cable.
			Restart the computer and open the software.
			The communication part of the control panel is invalid.
3	There is a deviation in the position of the turntable after homing.	Check if the sample turntable is loose.	Check if the turntable screw is loose.
		The turntable origin photoelectric switch has failed.	Shut down and restart.
4	The injection arm will travel up and down 10mm after homing.	The injection arm photoelectric switch has poor contact or failure.	

10. Replacement

Replacing syringe

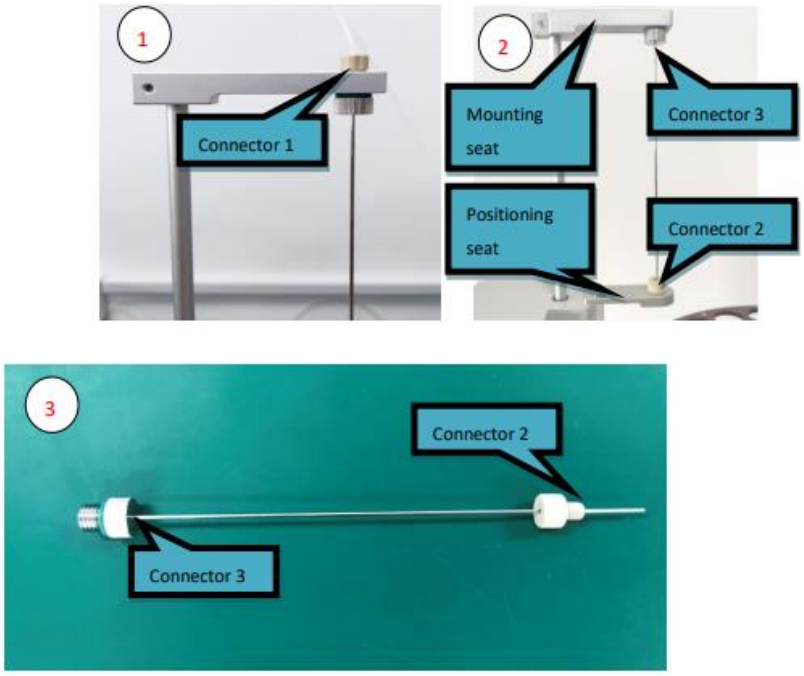


Figure-19 Syringe installation

The steps to replacing the injection are as follows:

1) Confirm if the syringe is at the top. If not, turn off the power after re-homing the injector.
2) Loosen connector 1 as shown in (1), and separate connector 1 and the injection tube from the syringe mount, as shown in (2).
3) Separate connector 2 from the positioning seat and separate connector 3 from the mounting seat of the sample injection needle after loosening it. The separated components are shown in (3).
4) After fitting connector 2 with the new injection needle, first lock connector 3 with the injection needle mounting seat, and then lock connector 2 with the injection needle positioning seat.
5) Adjust software by the autosampler, run a sample position to see if the syringe runs smoothly or the needle is tilted, and the syringe can be used when the syringe is directed at the center position of the sample.