Labotronics

User Manual

Infrared Oil Content Analyzer LB-100CA

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1. Introduction

Infrared Oil Content Analyzer LB-10OCA offers a range of 0.001 to 2000 mg/L for precise oil content analysis in various applications. It provides a detection limit of less than 0.12 mg/L for extraction agents and < 0.0012 mg/L for oil in water, ensuring reliable trace detection. It incorporates an integrated optical system for improved performance and stability. Our analyzer ensures fast analysis with full-spectrum scans in 40 seconds and non-dispersive scans in just 2 seconds.

2. Features

- Efficient heat dissipation system
- High signal-to-noise ratio (SNR)
- Compatible with diverse solvents
- Simplified structure with high integration
- Automatic zero calibration
- Easy operation and powerful data software

3. Specifications

Model	LB-10OCA
Measurement Range	0.001 to 2000 mg/L (4 cm cuvette)
Detection Limit	< 0.12 mg/L (direct measurement) < 0.0012 mg/L (oil in water)
Measurable Concentration	≤ 640000 mg/L (dilution)
Accuracy	± 0.5% (<10 mg/L) ± 2% (10 to 80 mg/L)
Repeatability	RSD ≤ 1%
Linear Range	R > 0.999
Wave Number Range	3400 to 2400 cm^{-1}
Wave Number Accuracy	± 2 cm^{-1}
Wave Number Repeatability	± 2 cm^{-1}
Absorbance Range	0.0000 to 2.000 AU
Baseline Drift	Absorbance < 0.001 AU/60 min
Analysis Time	Full Spectrum: 40 seconds Non-dispersive: 2 seconds
Cuvette Size	1 to 5 cm
Temperature Range	5°C to 35°C
Relative Humidity	20% to 80% (no condensation)
Magnetic Interference	None
Power Supply	220 V / 50 Hz
Dimensions	540 × 360 × 150 mm
Weight	15 kg

4. Applications

Infrared Oil Content Analyzer LB-10OCA is used in environmental monitoring, petrochemicals, wastewater treatment, and R&D for determining oil content in water, soil, and other samples. Ideal for the automotive, marine, and academic sectors.

5. Installation

5.1 Instrument Setup

Open the packing carton and remove the instrument, then place it on a well-ventilated workbench. Remove the cuvette and store it in a safe location. If the instrument is used with a computer, connect them using the communication cable. Finally, plug the power cord into a suitable power outlet.

5.2 Software Installation

Open the packing carton and remove the instrument, then place it on a well-ventilated workbench. Remove the cuvette and store it in a safe location. If the instrument is used with a computer, connect them using the communication cable. Finally, plug the power cord into a suitable power outlet.

6. Operations

6.1 Warm-up

Before the corresponding operation, the instrument must advance at least 30 minutes warm-up for this purpose is to allow the instrument to work in the best state. Interface as follows:

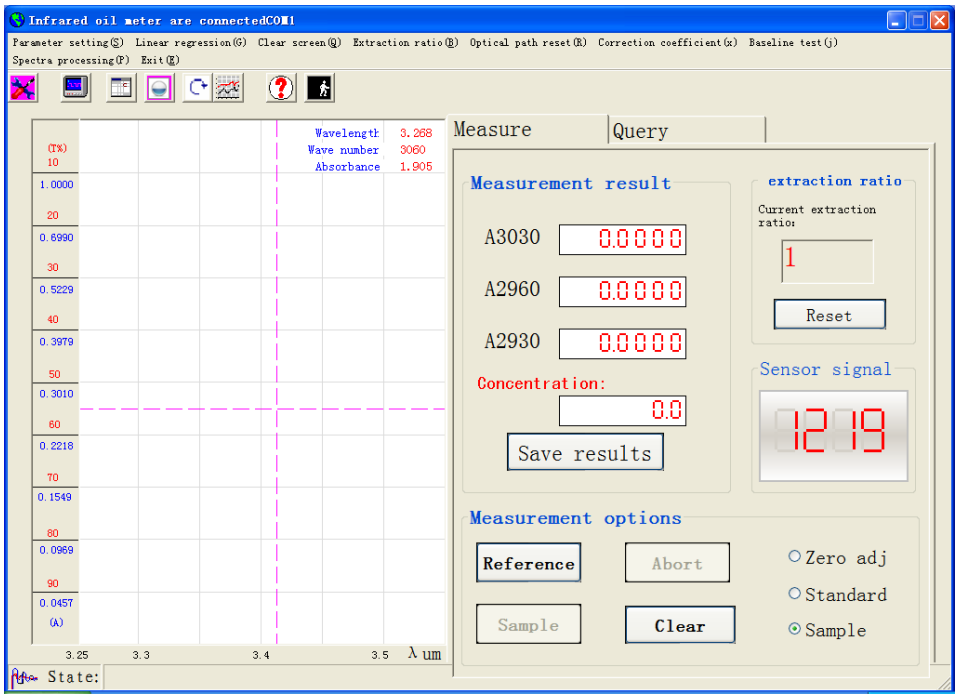

Figure 1

The software will automatically find the communication interface, and automatically determine whether the connected instrument. Such as the following dialogue appears, check the communication cable is connected correctly.

6.2 Standard Configuration

The take 10mL1000mg/L standard solution of oil in carbon tetrachloride, poured into a 10mL volumetric flask, constant volume by CCl4 to get the concentration of 100mg/L intermediate solution, and then were to measure the intermediate solution 2.5mL, 5mL, 10mL15mL, 20mL into the 50mL of flask in the with CCl4 constant volume, constant volume concentration of 5mg/L, 10mg/L, 20mg/L, 30mg/L, 40mg/L of oil standard sample, respectively, stand for test.

6.3 Wavelength zero-point setting

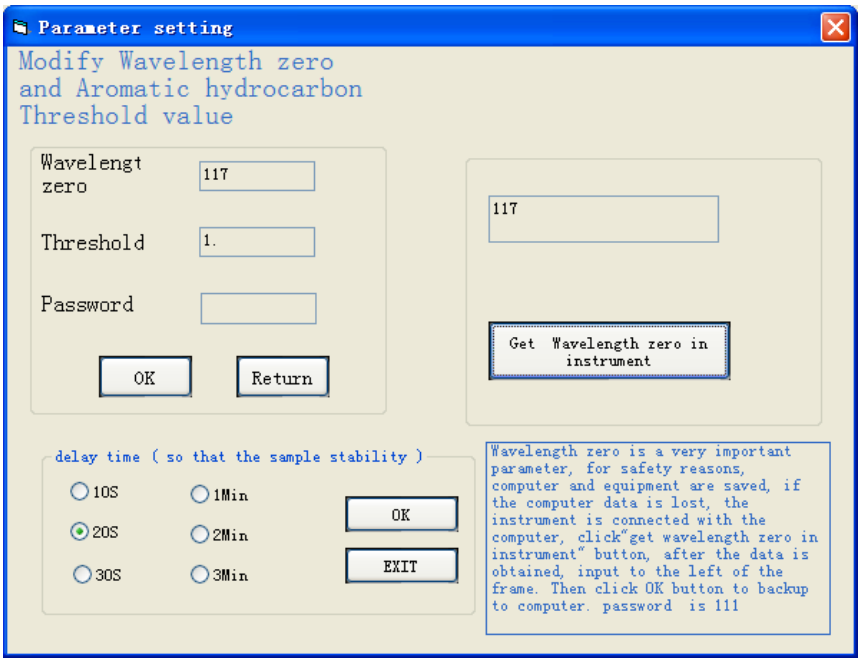

Figure 3

When using the instrument for the first time, the wavelength zero point must be reset. To do this, measure an oil standard with a concentration greater than **30 mg/L** (refer to the sample measurement steps). After the measurement is completed, locate the highest point of the absorption peak in the spectrum and left-click on it. The wavelength **λ** at this highest point will appear in the upper-right corner of the screen. Under normal conditions, the wavelength should display **3.413 μm**.

- If the displayed λ is **greater than 3.413**, then the wavelength zero value must be **increased by 1000 × (λ − 3.413)**.
- If the displayed λ is **less than 3.413**, then the wavelength zero value must be **decreased by 1000 × (3.413 − λ)**.

Example:
If the displayed wavelength is **λ = 3.420**, the instrument wavelength has shifted to the right by **7**. Click the **"Get wavelength zero in instrument"** button—the current default wavelength zero value will appear in the text box.
If the original wavelength zero value is **100**, you must change it on the left-side wavelength zero box to **100 + 7 = 107**.
Enter the password **111** in the password field and click **"OK"** to complete the modification.

Important Note
In the lower-left corner of the interface, there is a **six-time radio button**. This function is designed to improve measurement accuracy by enhancing sample stability during measurement.
The system default setting is **20 seconds**, but users may adjust this value as needed.
After selecting your desired setting, click **"OK"** to confirm.

6.4 Zero Set

Two named parameters Bibi cuvette and sample cuvette cuvette, and the two are poured into the cuvette by CCl4 Bibi cuvette into the first parameter, select the "zero adj" option, as shown:

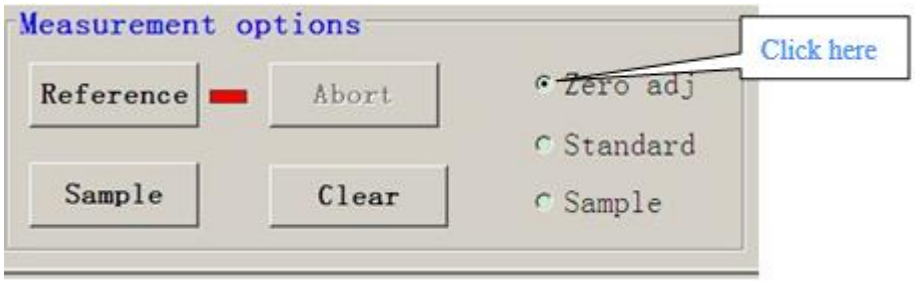

Figure 4

Click the "Reference" button to pop up a 20s delay dialog:

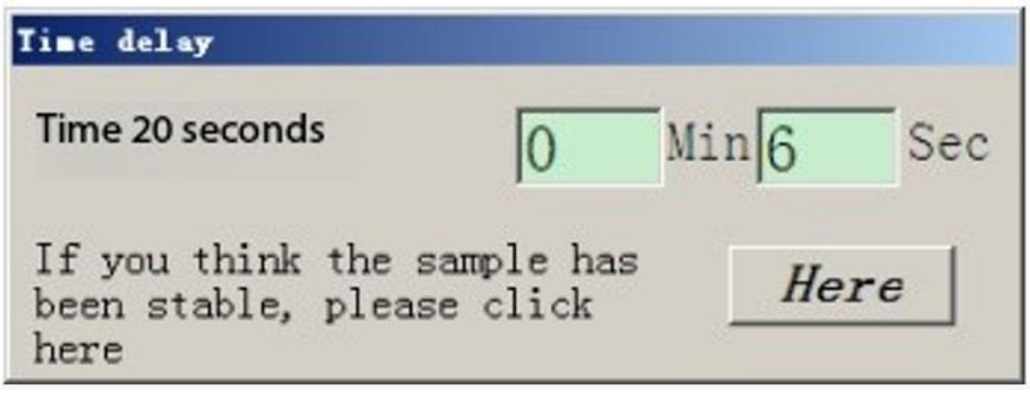

Figure 5

The delayed completion of the instrument will be issued soon. Below the instrument measurement reference, the progress bar is complete, the instrument is again updated, then a pop-up will appear waiting for the dialogue box:

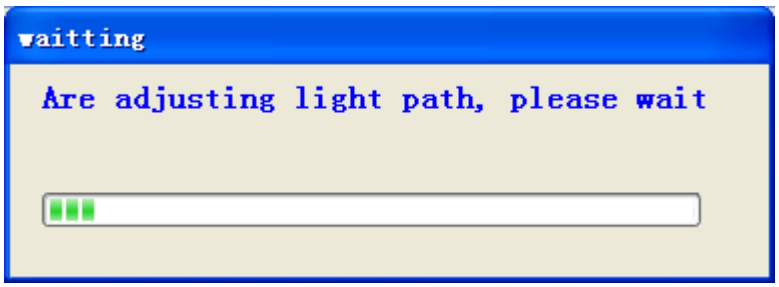

Figure 6

After the dialog box appears, the instrument will emit two beeps, indicating that the **"Reference"** process is complete.
Remove the reference cuvette and insert the sample cuvette. Click the **"Measure Sample"** button to begin the measurement.

Once the measurement is finished, the **wavenumber**, **absorbance**, and **calculated concentration** will be displayed on the screen in real time.
To save these results, click the **"Save Results"** button, as shown in the figure below.

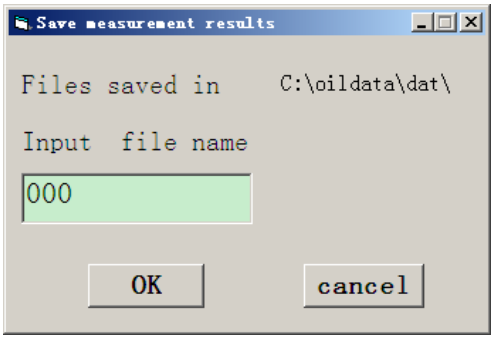

Figure 7

Click "OK", and "000" for the file name is automatically saved. If the above steps, measurement of the concentration value is zero, you should swap the order of these two cuvettes for measurement, until the measured value appears.

6.5 Standard Curve

6.5.1 Measuring the standard sample

Click on the "standard" option as shown:

Figure 8

CCl_4 solution injection parameters Bibi cuvette be placed in the cuvette pool, click the button " Reference "scanned will be equipped with 5mg/L standard sample cuvette into the cuvette pool, click the button of the measurement sample, the sample is measured, press the "Save results" button, the following interface:

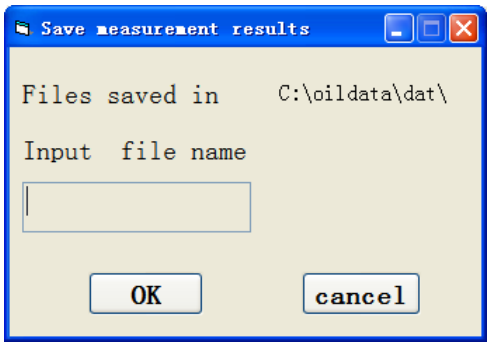

Figure 9

Saved in the file name column, enter the file name.

The above methods were used to measure the 10mg/L, 20mg/L, 30mg/L, 40mg/L standard, and save.

6.5.2 Calculate the regression equation

Click the menu bar "linear regression", 5,10,20,30,40, respectively, input to the left of C0 at the measured concentrations, corresponding to input to the CX, click the "Calculate" button to obtain the regression equation and correlation coefficient γ, if of γ> 0.999 you can use, or the need to re-measure the standard solution, the last point deposited using the function "save file, after measuring the sample using this equation to correct the measurement results. As shown:

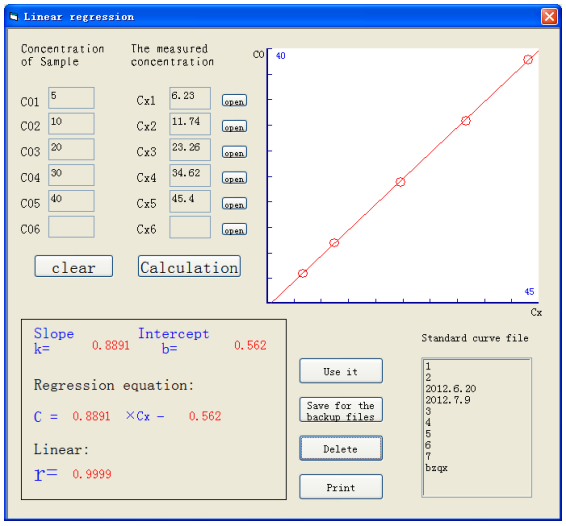

Figure 10

6.6 Measurement of samples

The "test sample" option is selected, as shown below:

Figure 11

Before the measurement, depending on the circumstances, set extraction, than the kind of volume and constant volume of carbon tetrachloride is the water volume ratio. Scan reference parameters Bibi cuvette equipped with CCl4, measured by the sample after the extraction, constant volume (using the sample cuvette). Measurement is completed, the concentration value is the water sample the CNPC concentration, then click "Save results" and enter the file name.

The above steps are for the first use of the operational processes, and the instrument by commissioning completed, followed by only 6.6 steps.

6.7 Document Management

6.7.1 Data Query

Click the "Query" button, select all the documents in the file list box, click the file name with the mouse, and the spectrum of the file, the file name, and the absorbance and oil concentration of the sample will be displayed on the screen.

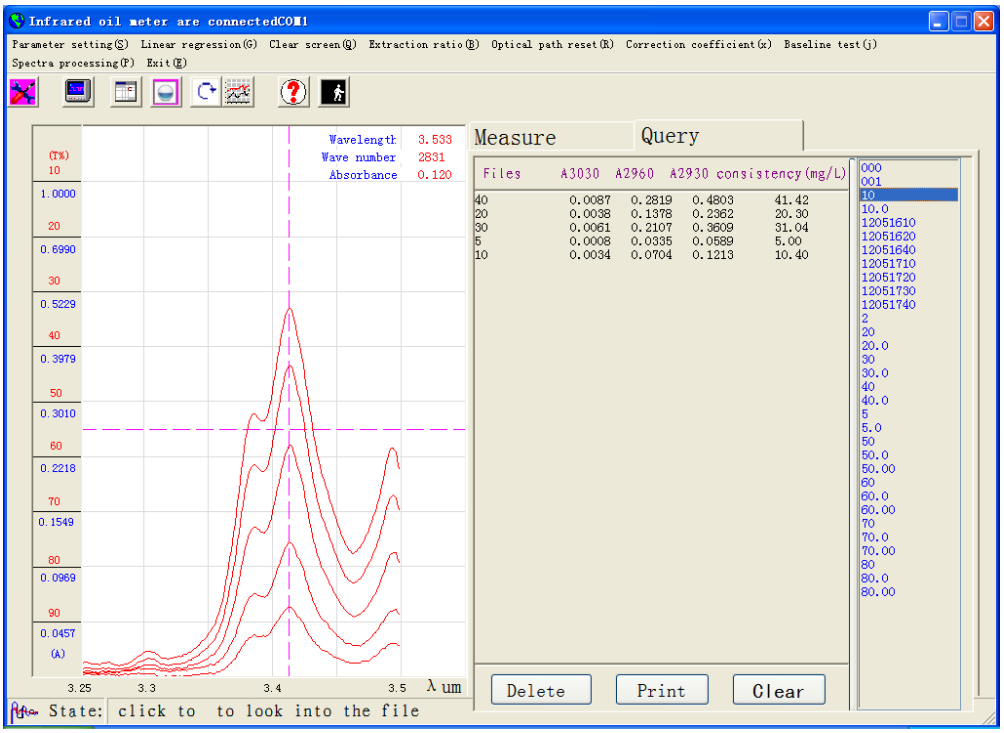

Figure 12

6.7.2 File Print

In the query interface, click the "Print " button, shown in Figure:

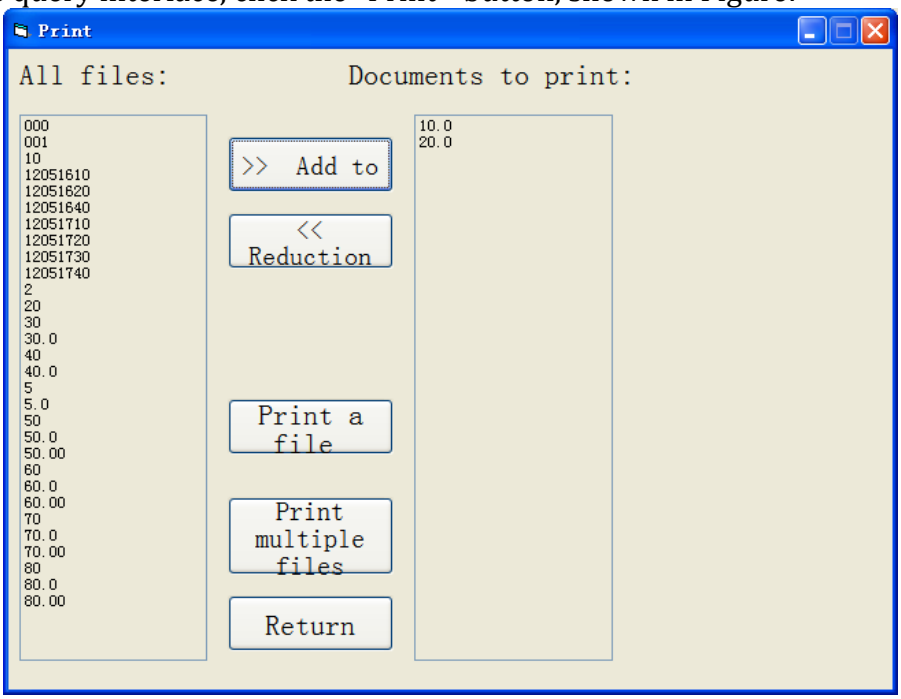

Figure 13

The left side of the box for all measurement files in the left select the file, click on "Add to" button, you want to print documents show that the right of the document window, if some files have been selected, but do not want to print can be on the right file container, select it and click on the "Reduction" button.

"Print a file", including the spectrum of the print to an A4 sheet of paper, a file a piece of paper. " Print multiple files " to print the contents of multiple files to a piece of paper can not print the spectrum, only print the file name, absorbance and concentration.

6.7.3 File Deletion

Query interface, click on the "Delete " button, and enter the file management interface:

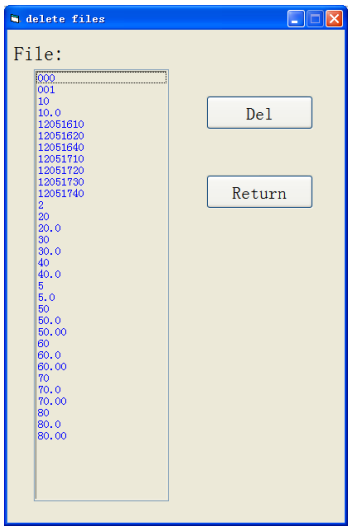

Figure 14

The saved measurement files are displayed in the left side of the document window, click on the file to be deleted, and then click the "Delete" button, you can delete the file. Hold down the Ctrl key and click on the file name with your mouse to select multiple files at once. Select the file, click the "Delete" button will permanently delete files unrecoverably, so be careful! The document called "000" Zero files are not deleted.