

Instruction For Use



General colorimeter
AMT507

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1 Summarize

1.1 Introduction:

The AMT507 is developed according to international CIE1931, 1976 and other relevant standards and national standards, it is a new economic and practical general colorimeter, we introduce the latest imported LED light source and sensor from other countries, and it has stable, durable, the characteristics of the economy.

The interface we design the menu type, because it is simple and easy to understand. Our AMT507 is not only widely used on Quality department about the color difference, but also used on the school teaching, scientific research, and color design.

1.2 Feature:

- Button & menu operation, easy to understand, reasonable price.
- Commonly used of two measurement modes: Lab & Lch, easy to switch measurement.
- Automatically display the color difference between the sample and standard sample, also display the color trend degree.
- The color difference software can analysis, exchange the color difference graph and data.
- The optional Micro-printer can output the color difference data in time.

1.3 Range:

- Color matching in injection and quality control in production process
- Color-difference detection and color-difference batch control in printing process
- Color-difference analysis of spray paint surface and electroplate surface
- Color-difference of different areas of the metal treating surface
- Quality control in color difference in sample and the product
- Color difference inspection of batch products in outdoors
- On-line monitoring of color difference in production process

1.4 Accessory:

| | No. | Accessories name | Pieces | Remark |
|----------------------|-----|------------------|--------|--------|
| | 1 | instrument | 1 | |
| | 2 | bag | 1 | |
| | 3 | AC adapter | 1 | |
| | 4 | USB cable | 1 | |
| Standard accessories | 5 | software | 1 | |
| | 6 | hard case | 1 | |
| | 7 | instruction | 1 | |
| | 8 | certificate | 1 | |
| | 9 | warranty card | 1 | |
| Optional accessory | 10 | micro-printer | | |

1.5 Condition:

- Operating temperature: 0 to 40° C, relative humidity 80% or less, no condensation
- Storage temperature: 10 to 30° C, relative humidity 70% or less
- Do not store the AMT507 in areas where with strong vibration, magnetic field interference, corrosive medium and severe dust

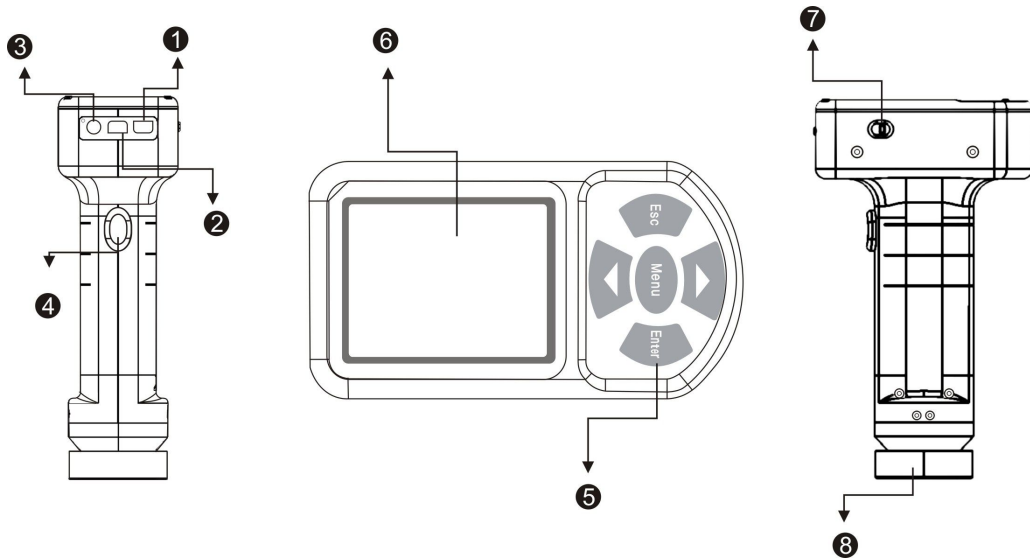
1.6 Note:

- This instrument should use our own AC adapter and qualified AA battery only, otherwise, the instrument may damage, battery leakage, fire and even explosion.
- The instrument should not put on the high temperature environment longterm, this would cause instrument accuracy reduced and performance fault.
- Do not use the AMT507 in areas where dust, smoke, corrosive gases into the instrument inside, it may cause the damage of instrument.
- Do not use the AMT507 near equipment which produces a strong magnetic field, it would cause data exception of instrument.
- The instrument belongs to precision instrument, other person is not allowed to disassemble it except our company person, or if the instrument damaged, we may not warranty it.

2 Architectural feature and working principle

2.1 Architectural feature

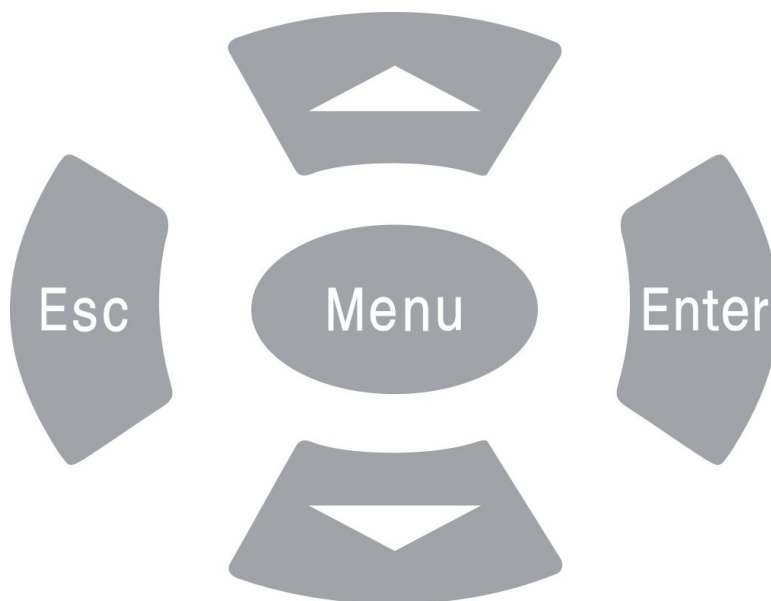
2.1.1 Colorimeter



- 1 USB port
- 3 AC adapter port
- 5 Keyboard
- 7 On/off

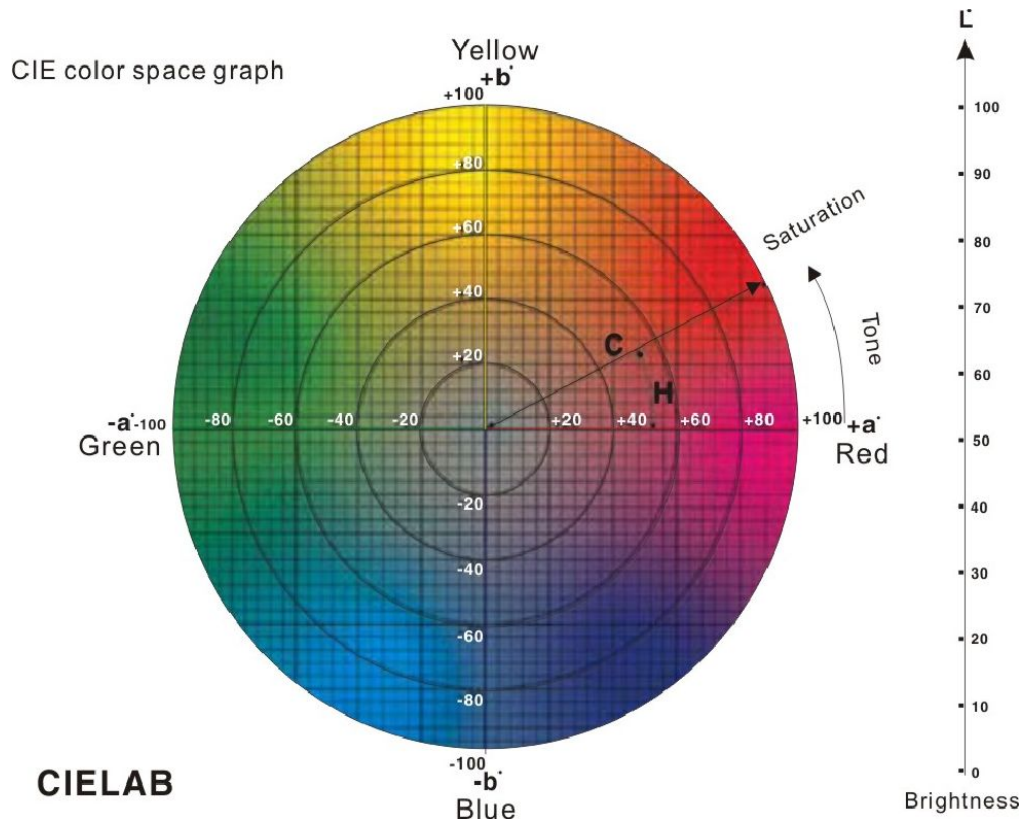
- 2 Micro- printer port
- 4 Test key
- 6 Screen
- 8 Dust cap

2.1.2 Keyboard



2.2 Working principle

According to the light of tristimulus principle established by CIE, the standard illuminant irradiates to the object surface, it would spread to the micro-computer to calculation and analysis after the sensor receives the reflected light information. The color space would display the digital color data at the same time, and calculate the color difference between the standard and sample, formula as follows:



$$\Delta E^* = [(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]^{1/2}$$

ΔE^* : The total color difference

$$\Delta L^* = L^*_{\text{Sample}} - L^*_{\text{Standard}}$$

ΔL^+ Whitish, ΔL^- Blackish

$$\Delta a^* = a^*_{\text{Sample}} - a^*_{\text{Standard}}$$

Δa^+ Reddish, Δa^- Greenish

$$\Delta b^* = b^*_{\text{Sample}} - b^*_{\text{Standard}}$$

Δb^+ Yellow, Δb^- Bluish

Basic judgment of Color-difference

| Color-difference range | Basic judgment of Color-difference |
|------------------------|--|
| 0 - 0.25 ΔE | Very small or none, exact match |
| 0.25 - 0.5 ΔE | Very small, acceptable match |
| 0.5 - 1.0 ΔE | Small to middle, acceptable in some occasions |
| 1.0 - 2.0 ΔE | Middle, acceptable in some specific occasions |
| 2.0 - 4.0 ΔE | Large, acceptable in specific occasions |
| 4.0 ΔE | Very large, can not acceptable in most occasions |

3 Technical characteristic

Technical parameters:

| | |
|--------------------------|--|
| Illuminant/light system: | 45/0 |
| Measuring aperture: | Ø8mm |
| Display model: | L*a*b*、L*C*H*、ΔE^*ab、$\Delta (L^*a^*b^*)$、$\Delta (L^*C^*H^*)$ |
| Operating language: | Chines or English |
| Measurement model: | Single mode, Average mode |
| Standard illuminant: | D65 |
| Observe: | 10° |
| Repeatability: | Standard deviation:within $\Delta E^*ab:0.1$ (When the white calibration plates is measured 30 times, and averaged) |
| Measurement spacing | About 2 seconds |
| Power source: | 4 AA-size battery or AC adapter |
| Operating temperature: | 0-40℃ (32-104°F); Relative humidity 85% or less |
| Size(WxHxD) | 110 ×60 ×190mm |
| Weight | 310g(Without batteries) |
| Standard Accessories | Bag, Protection cap, Software, AC adapter, USB cable, Instrument, Hard case |
| Optional accessory | Micro-printer |

4 Using the AMT507

Operating instruction of AMT507(General colorimeter)

4.1 Turning the Power ON:

Insert 4 AA size batteries or connect the AC/DC adapter, and turn the power ON in the side face, the AMT507 would enter the operation interface after a “ beep” tone.

4.2 Standard measured

When turn it on, the instrument would automatically enter the test interface, the default mode, Illuminant and Color space is single mode, D65/10° and L*a*b.

The measuring aperture should closely fit the measured object, then press the "Test" key to start standard test, as shown below:

| Standard: D65 | |
|-------------------------|------|
| L*: | 55.7 |
| a*: | 1.7 |
| b*: | -3.1 |
| ΔL*: | 0.0 |
| Δa*: | 0.0 |
| Δb*: | 0.0 |
| ΔE*: | 0.0 |
| "Enter" the sample test | |

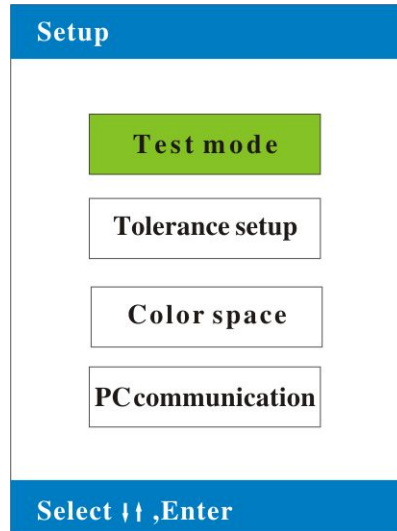
4.3 Sample measured

Press the "Test" key to test sample after you enter the sample measured interface, and it would show the color difference between the standard data and sample data, if you have connected the micro-printer, press "▲" key to print the current color difference.

| Color difference D65 | | |
|----------------------|----------|-----------|
| | Standard | Sample |
| L*: | 55.7 | 55.7 |
| a*: | 1.7 | 1.7 |
| b*: | -3.1 | -3.2 |
| ΔL*: | 0.0 | Normal |
| Δa*: | 0.0 | Normal |
| Δb*: | -0.1 | Bluish |
| ΔE*: | 0.1 | Qualified |
| Sampling finish | | |

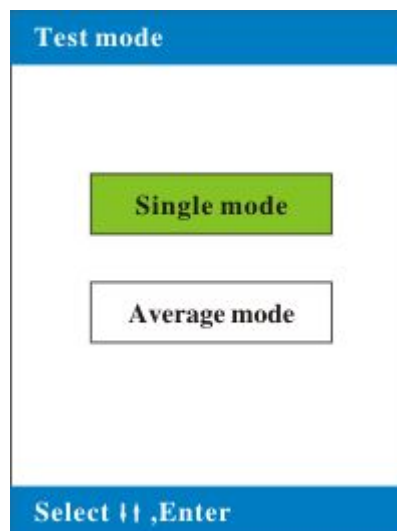
5 Function menu

Press the “Menu” key to enter the function menu interface, four functions to select, <<Test mode>>, <<Tolerance setup>>, <<Color space>>, <<PC communication>>.



5.1 Test mode

Select the <<Test mode>> in Function menu and press “Enter” key to enter the test mode interface, it has two modes to select: Single mode and Average mode.



5.1.1 Single mode

It would enter the sampling test interface after you select the <<Single mode>>, you can do sampling test directly, the default mode is Single mode.

| Standard: D65 | |
|----------------|----------------------------------|
| L*: | <input type="text" value="0.0"/> |
| a*: | <input type="text" value="0.0"/> |
| b*: | <input type="text" value="0.0"/> |
| ΔL^* : | <input type="text" value="0.0"/> |
| Δa^* : | <input type="text" value="0.0"/> |
| Δb^* : | <input type="text" value="0.0"/> |
| ΔE^* : | <input type="text" value="0.0"/> |

Single mode: TEST

5.1.2 Average mode

Now we are enter the average times interface, the Average mode is suitable for testing uneven color and large areas surface. According to the actual situation, we can press the arrow key to select the appropriate average times, as shown below:

Times setup

times

Select () ,Enter

After select the desired average times, press the "Enter" key to enter the <<Average mode>> interface for testing.

Notes: The times and the sample measurement times is same, as shown below:

| Standard | |
|----------------|------|
| L*: | 55.7 |
| a*: | 1.6 |
| b*: | -3.1 |
| ΔL^* : | 0.0 |
| Δa^* : | 0.0 |
| Δb^* : | 0.0 |
| ΔE^* : | 0.0 |

Standard times: 1/3

5.2 Tolerance setup

Tolerance setup is setting the qualified color difference data, which should be the maximum, allowable; after you setup, it would automatically determine if the measured item is qualified or unqualified.

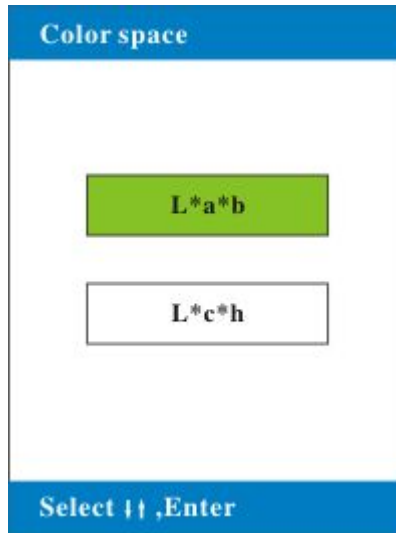
Select the <<Tolerance setup>>, press the "Enter" key to enter the tolerance setup interface, the default data is 0.5, you can press arrow keys to adjust the tolerance.

| Tolerance setup | |
|-----------------|-----|
| Setup | 0.5 |

Select ↑,Enter

5.3 Color space selection

Here are two color spaces to select after you enter this interface, L^*a^*b , L^*c^*h , you can choose the color space according to the situation, it would enter the relevant color space test mode after you press "Enter" key.



5.4 PC communication

The AMT507 can connect the computer through our software, it would extend more functions of the instrument.

Check the software instructions carefully about the function details of the PC communication and computer connection.



5.5 Micro-printer to print

The Composite Key “▲” is the printer key, only the AMT507 connects the micro-printer and enters the test interface can you print out the test data, as shown below:

Notes: We don't provide the Micro-printer, you need purchase it in addition.

| Standard: D65 | |
|----------------|------|
| L*: | 55.7 |
| a*: | 1.7 |
| b*: | -3.1 |
| ΔL^* : | 0.0 |
| Δa^* : | 0.0 |
| Δb^* : | 0.0 |
| ΔE^* : | 0.0 |

"Enter" the sample test

| Color difference D65 | | |
|----------------------|----------|-----------|
| | Standard | Sample |
| L*: | 55.7 | 55.7 |
| a*: | 1.7 | 1.7 |
| b*: | -3.1 | -3.2 |
| ΔL^* : | 0.0 | Normal |
| Δa^* : | 0.0 | Normal |
| Δb^* : | -0.1 | Bluish |
| ΔE^* : | 0.1 | Qualified |

Sampling printing

6 Other functions explaining

6.1 Standby and wake up

In order to save the battery power, the AMT507 would enter the standby state of black screen if you don't use it for 5 minutes. The instrument will wake up to the previous interface for press any key.

6.2 Battery test

It would lead to the test data anomalies if the working battery has not enough power, and the AMT507 will automatically popup a prompt interface, remind us to change the battery. Now we should change the battery immediately, or it may affect the measure accuracy.

6.3 Safety instruction

If the AMT507 would not use for a long time, disconnect the AC outlet to prevent battery damage and corrosion the instrument. If it is DC power, also need remove the battery, it may damage the AMT507.

7 Software driver installation

7.1 Driver description

When you connect the computer for the first time, you must install the AMT507 USB driver provided by our company.

7.2 Connection the AMT507

Enter the <<PC communication>> interface and select the PC communication, it would appear the USB connection interface when you press Enter key.



7.3 USB installation

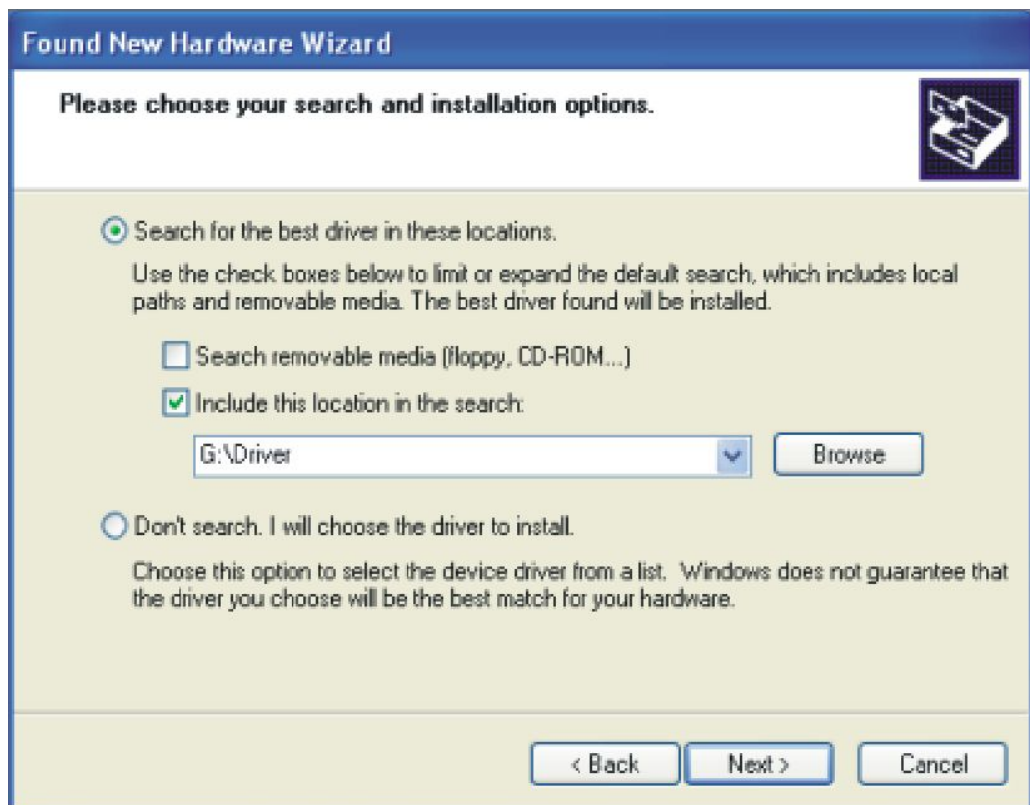
1 Put the CD to the CD-ROM, and the USB cable insert the USB port of AMT507, it would appear "Found new hardware", as shown below,



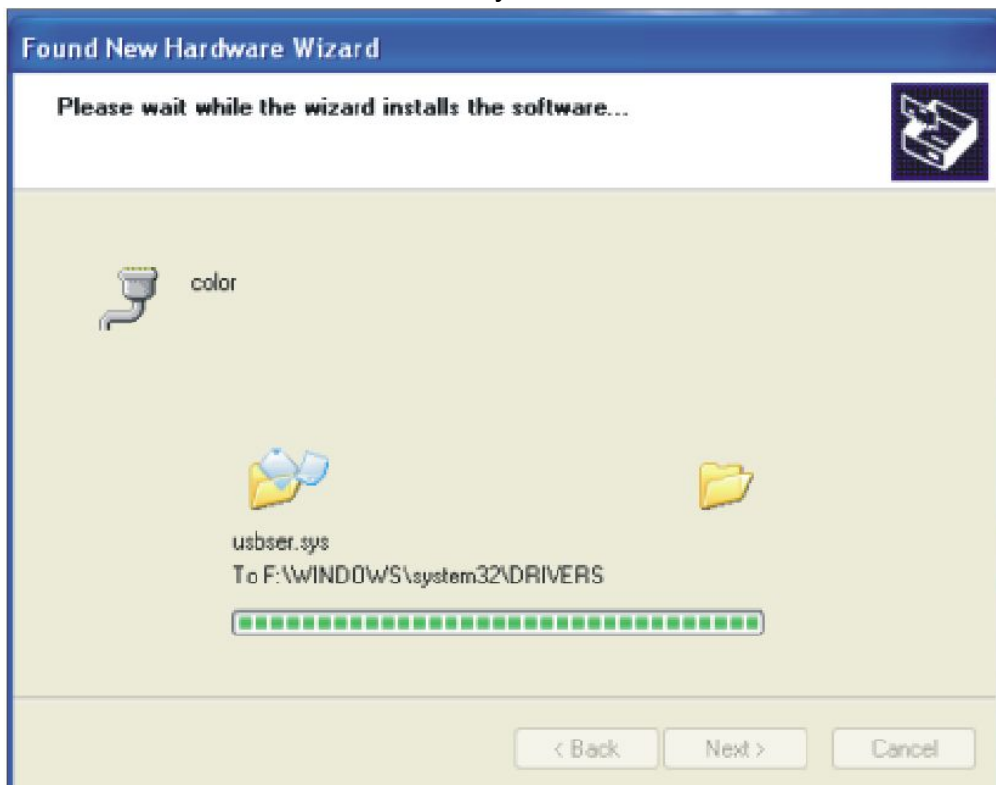
- 2 It would popup the dialog box.



- 3 Click "Next" to install, or install the specific location from the list.



- 4 “Browse” to find the “Drive file” in the CD-ROM directory, and click “Next”, the installation wizard will automatically install the driver.



- 5 Click “Finish”, the driver is installed.

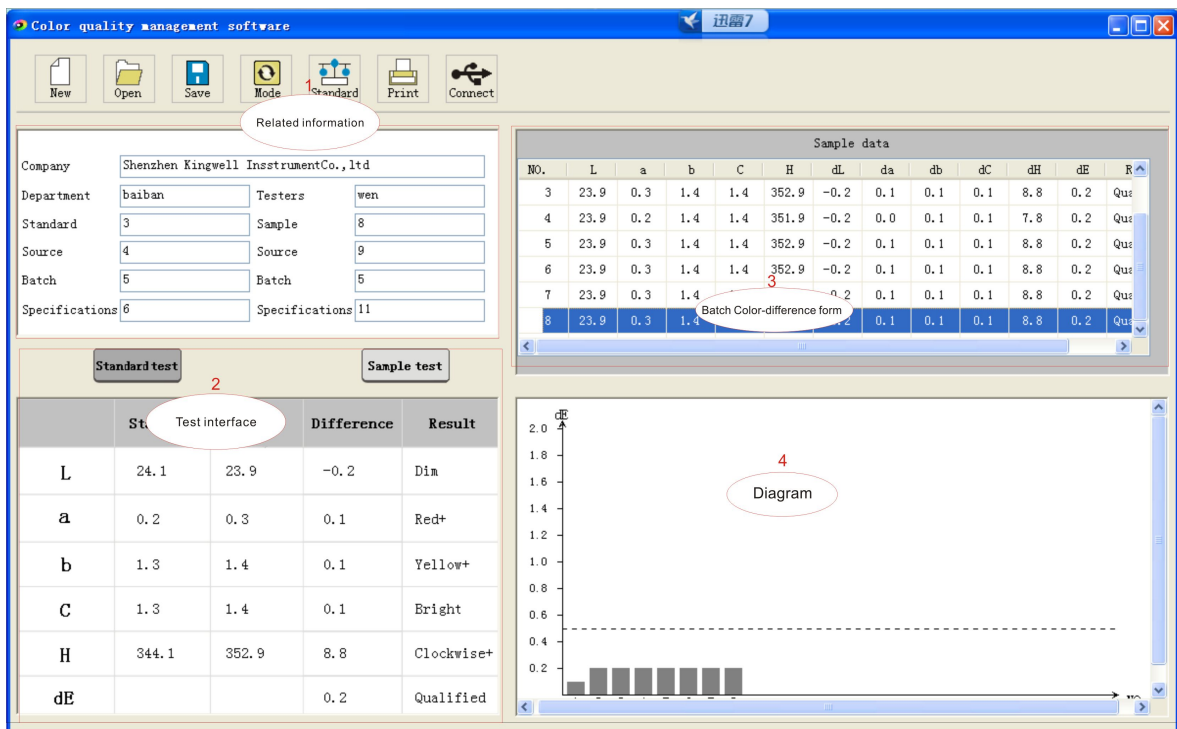


8 Software instructions

8.1 Interface description

The main software interface has two parts: toolbar and 4 functions

1. Related information: you can set it in the software system, and it would display it when you print.
2. Measurement interface: show the related data of the standard measured and sample measured.
3. Batches of color-difference data sheet
4. Color-difference histogram: show the tolerance between the sample and standard of every batch



8.2 Save and open

You can save the test data, and we have two saved formats to select:

1. Color-difference data file (*.dat), you can callout the data in next measurement.
2. Excel file(*.xls), you can edit and print it after you saved, but it can't callout again.

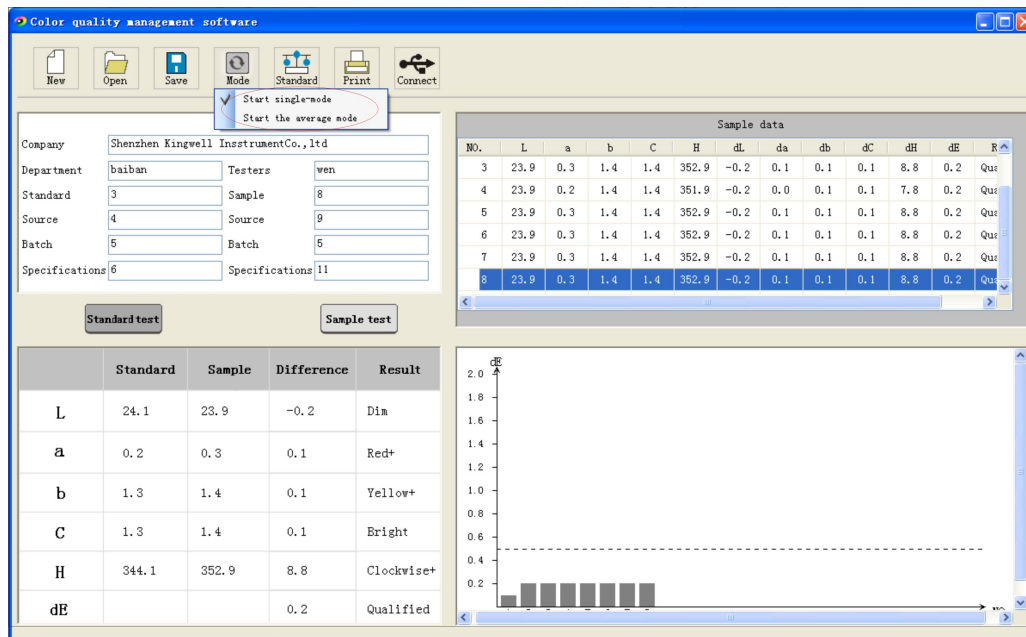
Notes: The file can only unfold after it saved.

8.3 Standard managed

Two measurement modes to choose: Single mode, Average mode

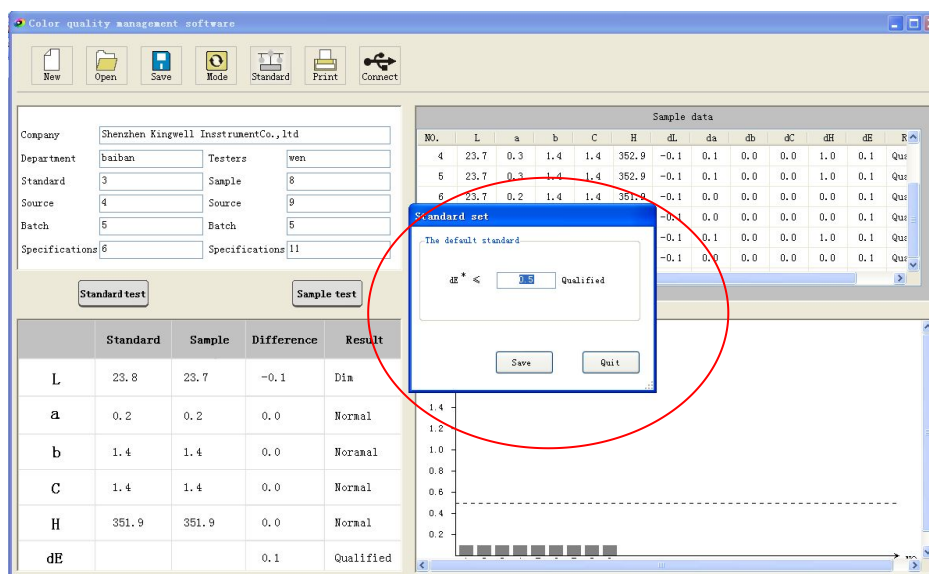
Single mode: suitable for measurement the color-difference comparison of one position, uniform color

Average mode: suitable for measurement the large areas and the comparison of uneven color



8.4 Tolerance judgment

We can set for the total color difference data of ΔE^*ab , the numeric would automatically determine whether the data meet the requirement according to your tolerance range.

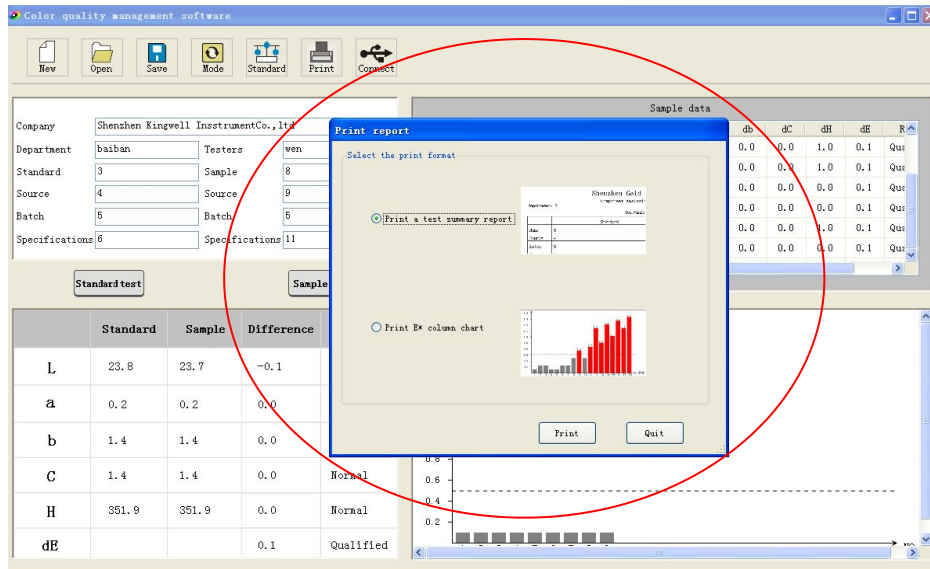


8.5 Print function

It would formation the measurement report after the data measurement completed, and we have two output modes:

Single report: Output the color difference data of sample and standard in two illuminant source modes.

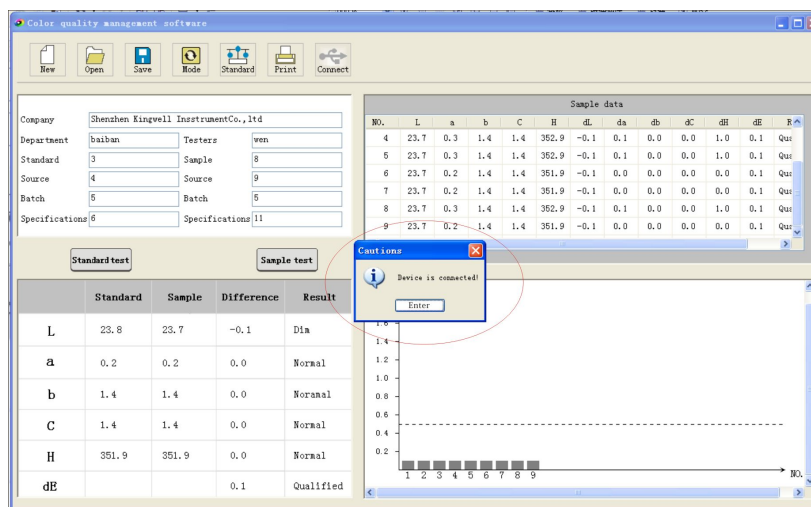
Color-difference histogram: color-difference analysis of the summary report.



8.6 Computer connection

Click the button to check the connection between JZ-300 and computer.

Note: After the AMT507 connected with the PC, press the "Connect" can communication with the computer, and you can press "Connect" to reconnection if it interrupt, no need to reopen the program.



9 Troubleshooting guide

| Condition | Checkpoint | Recommended action |
|------------------------|--|--|
| 1、 can not startup | A、 no power of the battery | A、 Change the battery. |
| | B、 wrong polarity | B、 Insert the correct polarity. |
| 2、 test data anomalies | A、 not close contact, or it may shake when measuring | A、 Close contact of the object surface, measuring smoothly. |
| | B、 the object is too thin, or it has other color in reverse side | B、 Pad the whiteboard reverse side or pad some white measurement. |
| | C、 uneven color of the object, or color mixed | C、 Avoid the uneven color position, or take the average measurement. |
| | D、 no power | D、 Change the battery or use the DC adapter |
| 3、 Crash of the AMT507 | A、 the key pressed too fast | A、 It need pause when pressed the button. |