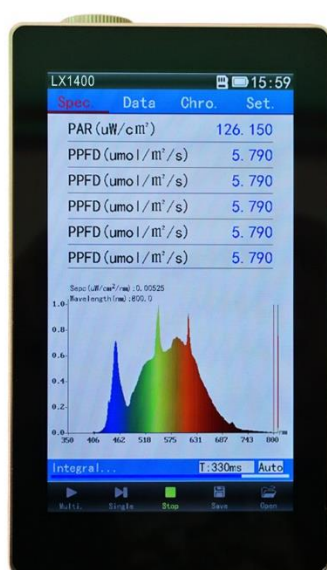


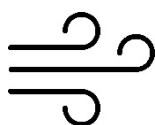


USER MANUAL



LX1400

PAR/SPECTROMETER



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Preface

Thank you very much for purchasing our product. This user manual contains the functions, methods of operation and safety regulations of instruments. In order to ensure the correct use of the instrument, please read this manual carefully before operating the instrument and use it as required.

Statement:

Our company has the copyright ownership of the product, including the appearance, software, hardware, manuals, packaging and other products of all parts. Without permission, it shall not be imitated, copied, translated or reproduced in any form.

Please read this manual carefully before you start using the device and follow the instructions. The company does not assume any responsibility for safety accident caused by operating no according to the manual. The company is also not responsible for the damage to the equipment and the connecting equipment without manual operation.

Safety tips:

In order to avoid damage caused by improper use of equipment or damage to personal property, please read the following carefully before using the equipment, according to the provisions of the operation.

1. Do not use it in flammable, explosive, high temperature, high humidity, high pressure, dust and other harsh environment;
2. Don't put anything on the instrument;
3. In the test instrument, do not plug the measuring probe, TF card, communication lines and other accessories;
4. This product contains a glass display screen, in the process of using gently, do not beat, lest the screen fragmentation caused personal injury;
5. Non authorized personnel of the company shall not carry out open shell maintenance in order to avoid failure or injury.

Warranty coverage

Our company guarantees that each equipment which you buy has been rigorously tested before delivery. The quality of the equipment and the calculation of the data fully meet the requirements, but could not guarantee the equipment due to transport, misuse, accidents and other abnormal conditions caused by damage. The equipment from the date of shipment, if there is a fault, can be replaced within 15 days of the host, free maintenance within two year (parts of the warranty period of 90 days). During the warranty period, due to improper operation or artificial damage, the maintenance cost shall be borne by the user; more than the warranty period, We will provide maintenance services in a charged manner. If you find the instrument malfunction during your use, please contact our company's customer service or agent first, after confirm the solution and then repair or replace the equipment according to the plan. Repair or replacement within the warranty period, the user only need to pay the postage, Non-warranty period or man-made damage. We will inform the user after the maintenance cost is evaluated, the maintenance costs and postage is borne by the user.

In warranty period, equipment maintenance or replacement, continue to carry out the original warranty plan; Beyond warranty period, if the fault is the same, the warranty for 30 days after maintenance, New accessories guarantee for 90 days. The wearing parts and accessories are not covered by the warranty.

Instrument list

Thank you for purchasing. In order to protect your rights, please check the list for the first time. Such as the discovery of equipment models, accessories and list discrepancy, please contact the supplier exchange or replacement.

Product list:

GOODS	QUANTITY	REMARKS
LX1400	1	Built in lithium battery
ACCESSORIES		
8G TF Memory card 1	1	(already loaded into the slot)
5V/1A power adapter	1	USB interface
Micro USB data line (1 meter)	1	≥1A Current carrying capacity
Instrument bag	1	Color random
Wrist strap	1	Color random
Quick guide	1	Please read carefully before use (complete manual download from website)

Power requirements:

Charging adapter: input: AC110V~220V ±10% output: DC5V/1A ±5%

Built in lithium battery: charging voltage 4.2V capacity: 4000mAh size: 60*60*8.2mm

Data line: Micro USB Interface Current carrying ≥1A

Storage environment:

1. Storage humidity: <70%RH; Storage temperature:-20°C~+50°C;
2. Keep away from water, oil, chemicals, corrosive liquid gas, high temperature and high pressure;
3. Shade avoidance.
4. Avoid long-term or severe vibration, avoid falling height, avoid heavy extrusion.

Use environment:

Whole machine : -10°C~+40°C 0~70%RH (can not be placed in water) Away from strong magnetic field, strong electric field and vibration. In order to ensure the accuracy of the instrument measurement, the best working environment, temperature: 20°C-25°C, humidity: 50%RH~75%RH.

Quantity calibration:

In order to ensure the accuracy of long-term use of the instrument, it is recommended that the user will be sent the instrument on a regular basis to our company to testing and calibration, or send to other calibration laboratories with photometric calibration qualification; calibration cycle proposal: once a year.

Appearance size:

Host: width × height × thickness: 81* 138.5*23mm Weight: 430g

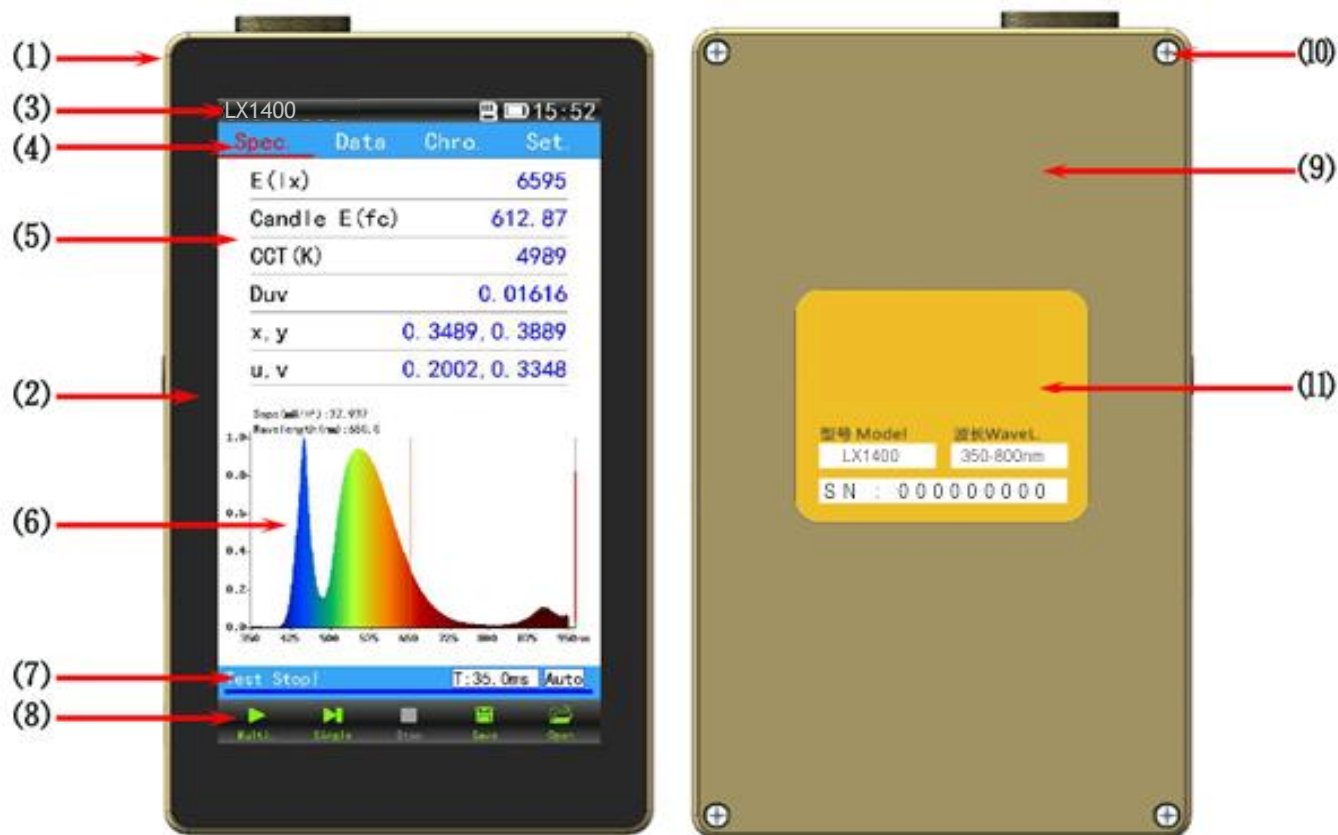
Screen: whole: 78.6*135.6mm Display Area: 62.6* 110.6mm (5 inch HD touch screen)

Cleaning method:

Wet towel scrub, can also be used for medical alcohol tampon (can not be washed, not available corrosive solvent scrubbing).

Instrument introduction

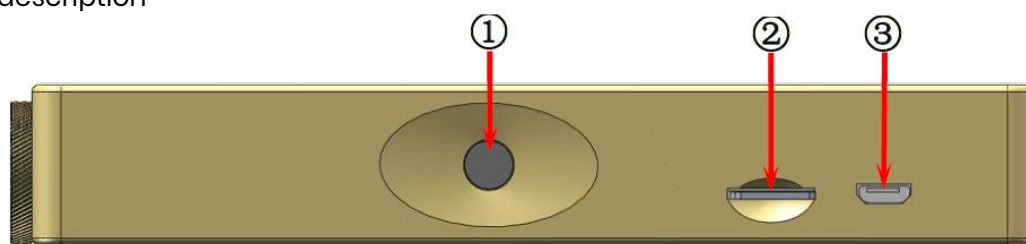
Front, rear panel and display interface description



Front, rear panel and display interface diagram

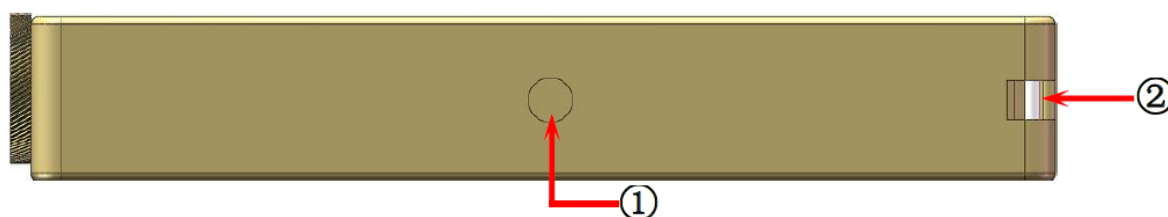
- (1) Metal alloy shell (2) 5"Capacitive touch screen (3) Device status area (4) Menu bar
 (5) Data display area (6) Graphic display area (7) Test status display area (8) Touch-key operation area
 (9) Alloy rear cover (10) Back cover screw holes (11) Instrument nameplate

Side panel description



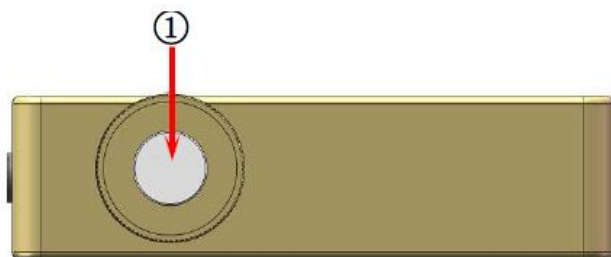
Left panel

- ① Power and test keys ② TF Memory card slot ③ Micro USB Communication and charging interface

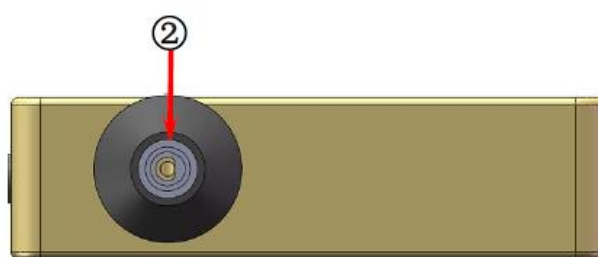


Right panel

- ①three foot mounting hole ② wrist mounting groove



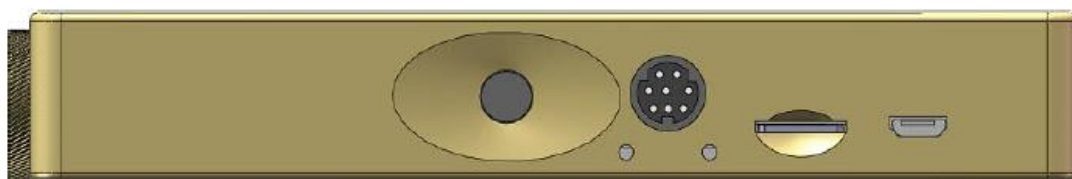
LX1400 upper side panel



other upper side panel

① Spectra sampling channel
(receptor window is diffuse transmission material/
optical fiber can also be installed in this position)

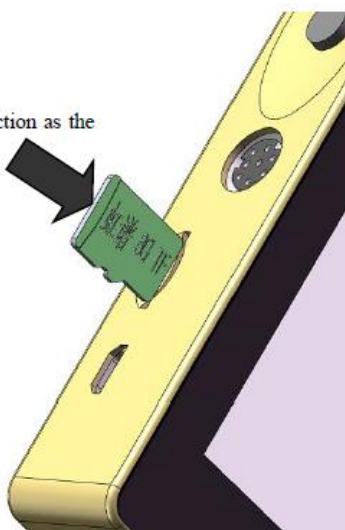
② Brightness probe with lens inside.



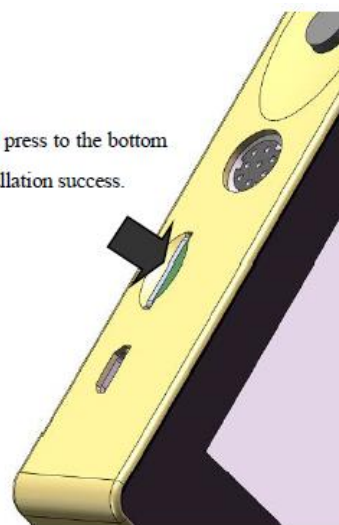
Customized version: customizable add MD8 interface (485 Communication and industrial control)
and Indicator light

TF card installation and disassembly

Insert the TF card in the same direction as the
screen to insert the TF card slot.

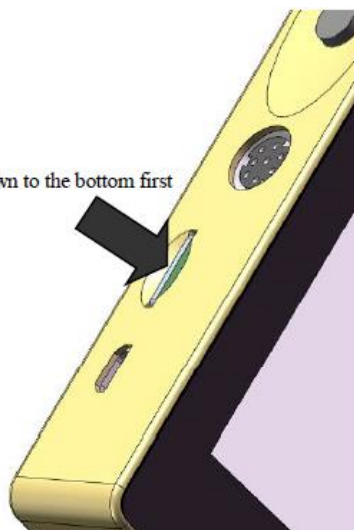


After the TF card press to the bottom
then release. Installation success.

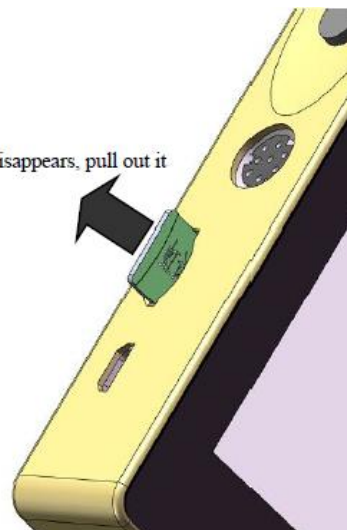


TF Memory card installation.

Take out, presses TF card down to the bottom first



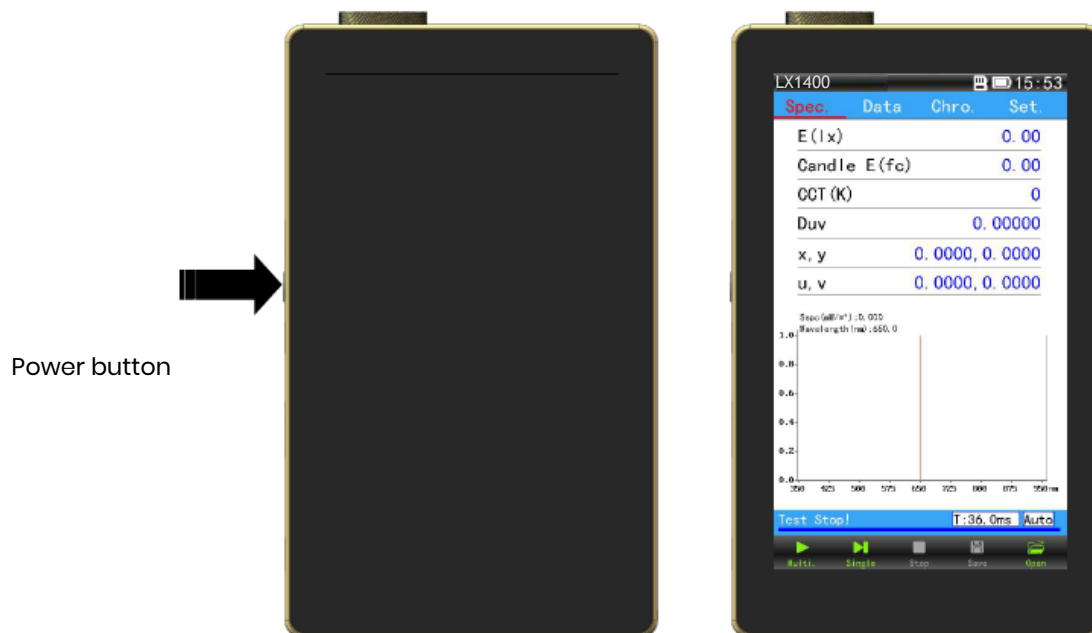
rebound force disappears, pull out it



Operation guide

Instrument boot

boot: Press the device power button (the black knob on the left side of the instrument). Enter the test interface after 3 seconds.



3 seconds boot

Instrument shutdown

Hold down the power button for 2 seconds (the black knob on the left side of the instrument). Click [shutdown], the device shutdown at once.

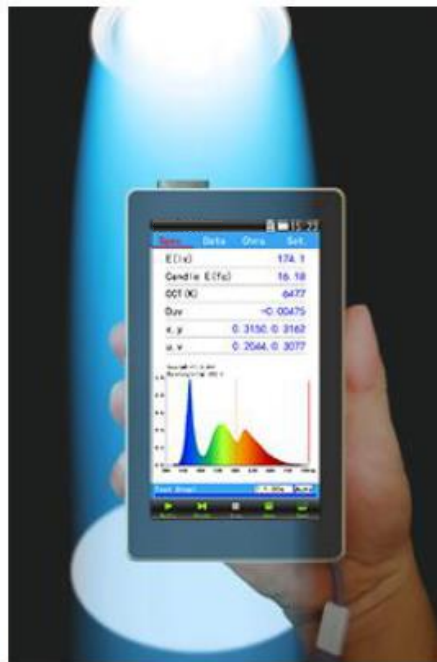


Instant shutdown

Stand-alone test



Place the instrument in the test position



Press the "power button" or "continuous" icon to start the test



Press the "power button" or "stop" icon to stop the test

***** Note: please wipe the surface of the sampling hole before using it to prevent the fingerprint and dust from affecting the test results!**

Test steps:

step 1: Place the instrument in the measured position. (If you need to estimate the intensity of light, you should also pay attention to the distance between the spectral sampling hole and the light source);

Light intensity calculation formula: light intensity (I) = illuminance (E) × Distance squared (d²),



Step 2: Press the "power button" or click the continuous icon **Multi** and single icon **Single** to start test ("single test": after the test, the test will be stopped automatically, and step 3 can be omitted.).

Step 3: Wait for test data to be stable, press the "power button" on the left side of the instrument again



or click the stop icon **Stop**. Testing is completed.

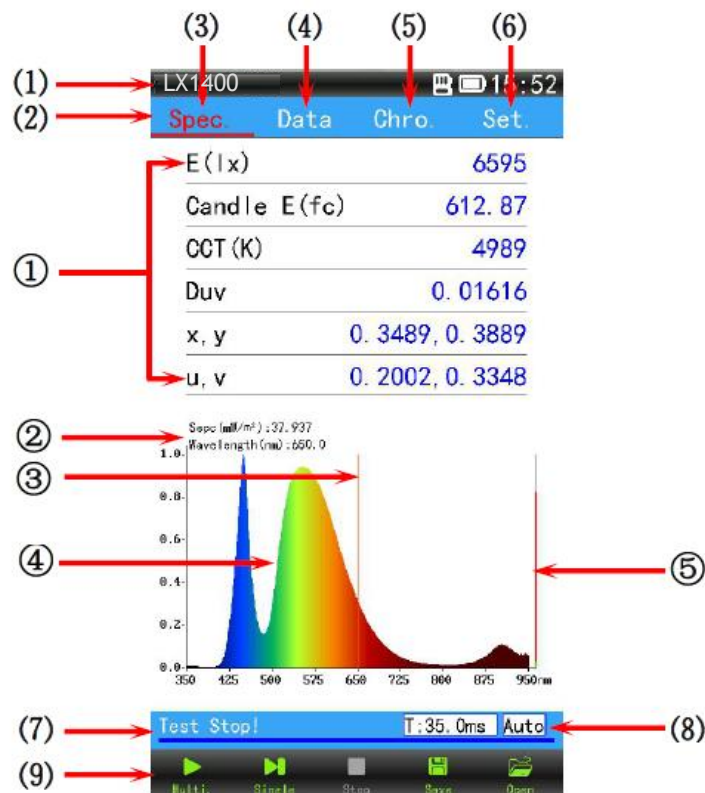
*Note: After the boot by Press the power button, if you test directly, the default is a single test.

If you click on a continuous test icon, then test by press the power button, it becomes a continuous test. If you click on the single test icon once again, you will single test again with the power button.



Step 4: Click the "save" icon **Save** to save test data. See the file save section for the save method.

Detailed interface function (LX1400 for example)



LX1400 Wavelength range 350-800nm

- (1) Device status bar (2) Menu bar (3) Spectrum of the interface (4) Data interface
(5) Graphical interface (6) Set interface (7) Tests the status bar (8) Integral time regulation state
(9) Touch button bar

Spectral interface

(1) Device status bar:

Following figure:

The device status bar displays the hardware information of the current device, such as: equipment type "LX1400", USB Online Icon, SD Card Icon, Battery power icon ($\leq 10\%$ to red, $11\% \sim 20\%$ to orange, $21\% \sim 100\%$ to white; charging time $\leq 10\%$ to red, $11\% \sim 20\%$ to orange, $21\% \sim 95\%$ to white, $96\% \sim 100\%$ to green), system time 12:39 etc.

(2) Menu bar:

Following figure:

The menu bar contains the "Spec", "Data", "Chro", "Set".

(3) Spectral interface:

Click on the "Spec." menu, as shown above, "spectral interface", "spectral interface" contains the data area and the graphics area of two parts.

① Data area to provide users with 6 replaceable display data to facilitate users to view the most concerned about the project data.

Replacement method: click on the data to be replaced, and then pop up the box to replace the data items, click on the 【ok】 icon to replace the success.

As shown below:



Click on the required data item Upper and lower sliding to Turn green then click ok】 Replace success Item select the required items

- ② Wavelength and spectral power at the spectral vernier;
- ③ Spectral vernier;
- ④ Spectral pattern;
- ⑤ The upper red area indicates the peak intensity of the measured signal; green area at bottom indicates dark current (zero signal).

(4) Data interface:

Click on the "data" menu to display the data interface as shown below. interface displays all the data items and test dates, test time; press any data item for 2 seconds, which will pop up the noun explanation for this data item (Figure 4).

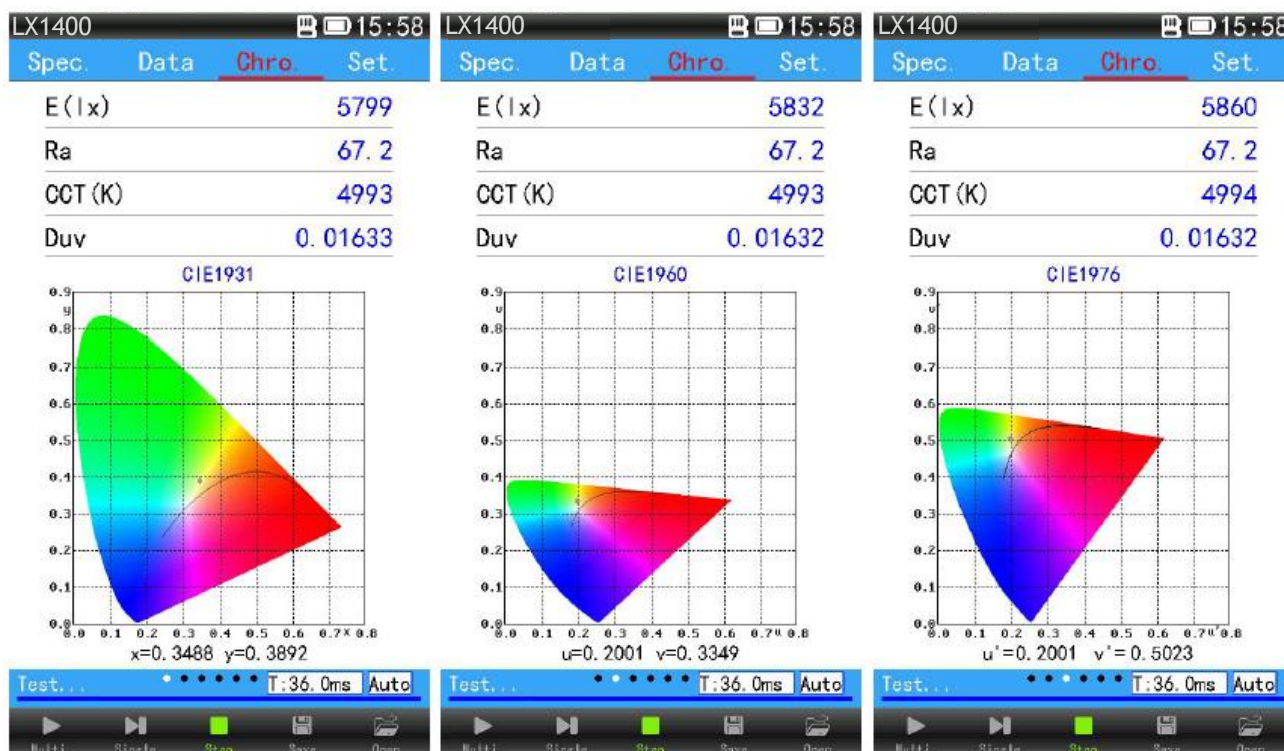


Data interface

(5) Chromaticity diagram interface:

Click on the "Chro.", as shown in figure 1. "Chro interface" contains two parts: data area and graphics area. The data area displays the first 4 data items in the spectral interface (which cannot be changed here); the user can use a finger in the graphics area sliding around the screen display of the CIE chromaticity diagram (contains CIE1931, CIE1960 and CIE1976 chromaticity diagram), Standard Deviation of Color Matching, Radar chart of color rendering index, Histogram of color rendering index.

Three CIE chromaticity diagram can be measured by the light source position location in the chromaticity coordinates of chromaticity diagram.



CIE1931

CIE1960

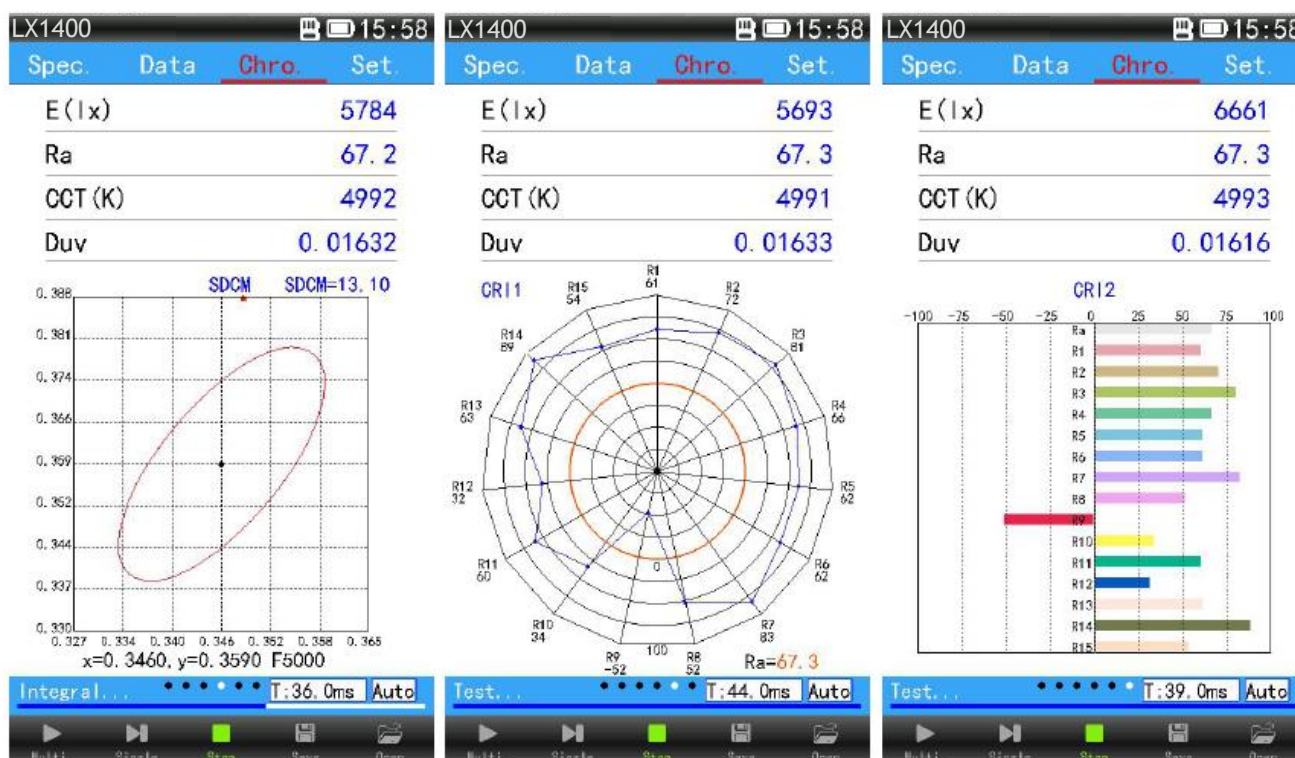
CIE1976

Graphical interface - chromaticity diagram

SDCM can be automatically judged and calculated the results according to the color coordinates.

The color rendering index CRI1 and CRI2 display the parameters of R1-R15 in two different ways.

SDCM graph Radar chart of color rendering index Histogram of color rendering index



(6) Set interface:

Click the "Settings" menu to show the following settings.

"Settings interface" in the "test setting", "file management", "illuminance setting", "system setting", "version information"; advanced mode will also be "spectral calibration" and "change password".



Regular mode settings interface



Advanced mode settings interface

① Test settings:

click "test settings", popup dialog (as figure 1), "test settings" can be used to set up the file storage mode, the file storage interval, the automatic integration time limit, the average number of measurement data, the frequency synchronization, the wavelength measurement range and so on.

Click "save mode" after the "blue character" will pop up the file save mode dialog box (pictured below).

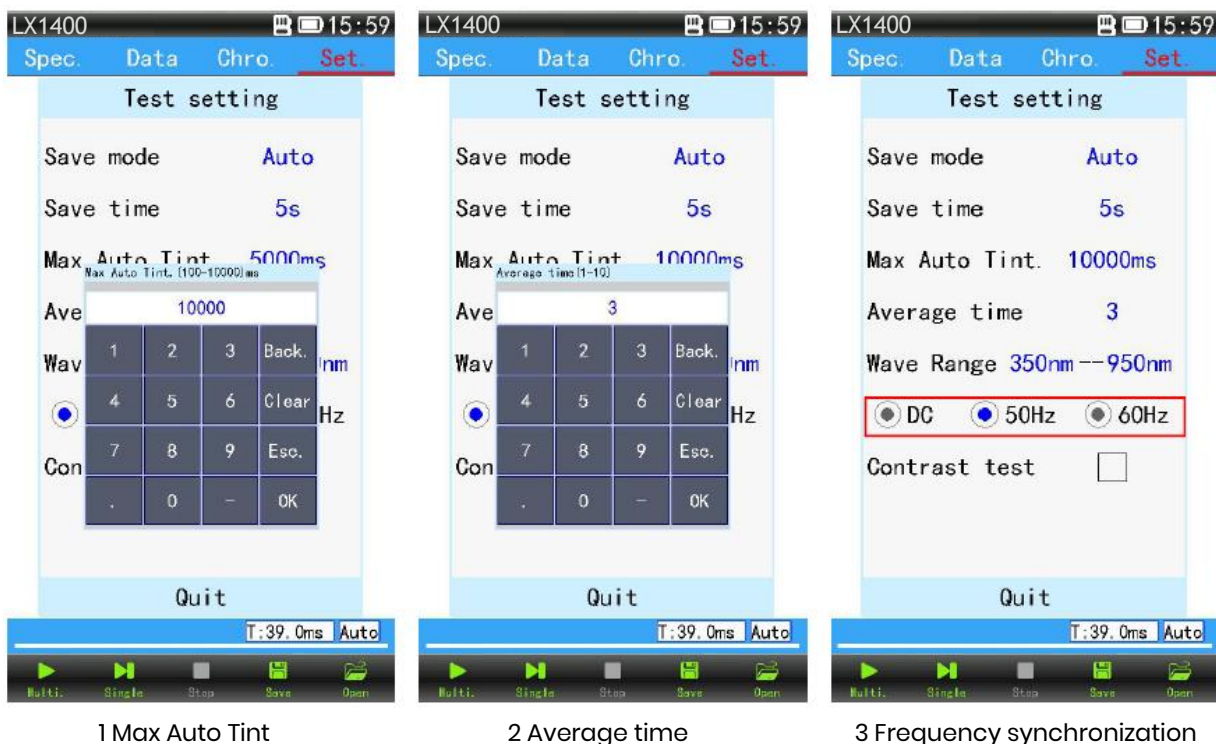
Select "manual" or "automatic", after select "manual" if you need to save the test data only by clicking on



the save icon **Save**. After selecting "automatic", click the save interval after the blue character will pop up the input box. According to the demand, enter the time interval to save data automatically (1-60000S). When continuous test, press the set interval the instrument will automatically save a test data to TF card. After single test, it will automatic save test data to TF card.



- ◆ After click “Max Auto Tint” (means the upper limit of automatic integration) then Pop-up input box (as figure 1), according to the demand, enter the number (100-10000ms), after setting up, the integral time of the instrument is adjusted automatically under the upper limit.
- ◆ After click “Average time” then Pop-up input box (as figure 2), according to the demand, enter the number (1-10) if the number is 3 times, and the equipment will calculate the sample data of 3 times as the final result of the test, click [ok], then setting up.
- ◆ “Frequency synchronization” is the synchronization of sampling frequency and light source frequency. When the light source is AC power or pulse power supply or stroboscopic light source for frequency synchronization using this function.



◆ Click “Wave range” to set the wavelength range of the instrument sampling. (*note: Can only be set in the maximum measurement range.) For example, the user only wants to measure the parameters within the range of a certain band of the measured light source, and the measurement result of the ordinary spectrometer can be disturbed by other band signals, which can be used in this function (as shown in the figure below).



Wavelength measurement range setting

Set up and click Exit

Test results for wavelength range

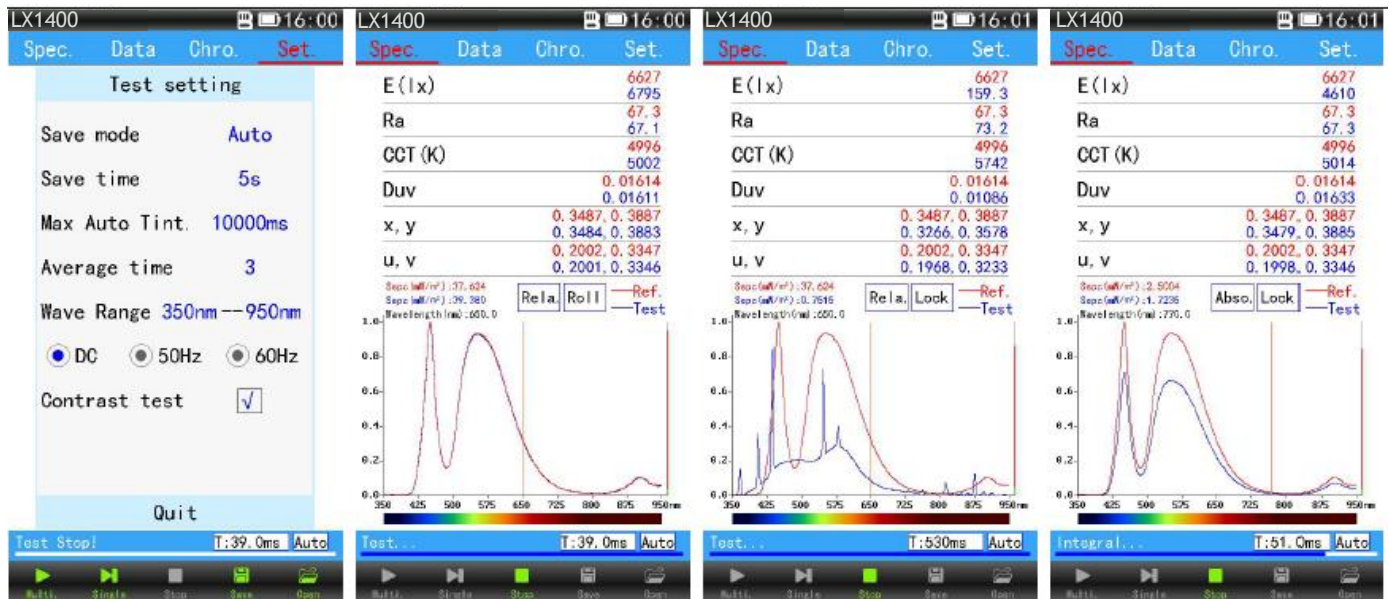
Contrast test: will be 2 groups comparing test data show that in the same interface (below), pls click the box to activation contrast test function, then come back to the test interface, at this time will be two test data shown in the one interface, the user can clearly see the difference between two test data, the red reference data for the previous test, blue for the real time test data.

Rolling contrast: when single test, the data of the previous test will be updated once per test.

Lock comparison: lock a data as reference value, and then the test value is compared with the reference value.

Relative display: the reference spectrum curve and the test spectrum curve are all displayed according to the maximum energy value 100%.

Absolute display: the reference spectrum curve and the test spectral curve spectrum energy absolute value is 100%. Small absolute values are shown in proportion.



② File management:

"File management" can open or delete the data that has been saved by the device. RecFile is a folder which saves the testing data

◆ File open: Click on the "file" pop-up dialog box, click 【OHS-SD CARD】 into 【RecFile】 , then select a folder with a date. (test data folder suffix named .OHS, Excel folder suffix named .CSV). Double-click the file you want to open (steps are as follows figures 1, 2, 3, 4).

◆ Delete files or folders: long press the file or folder to delete for 3 seconds, the file or folder is checked, click "delete" button, complete. (Cannot recover after deletion, please operate carefully.) (as figure 5, 6, 7, 8).

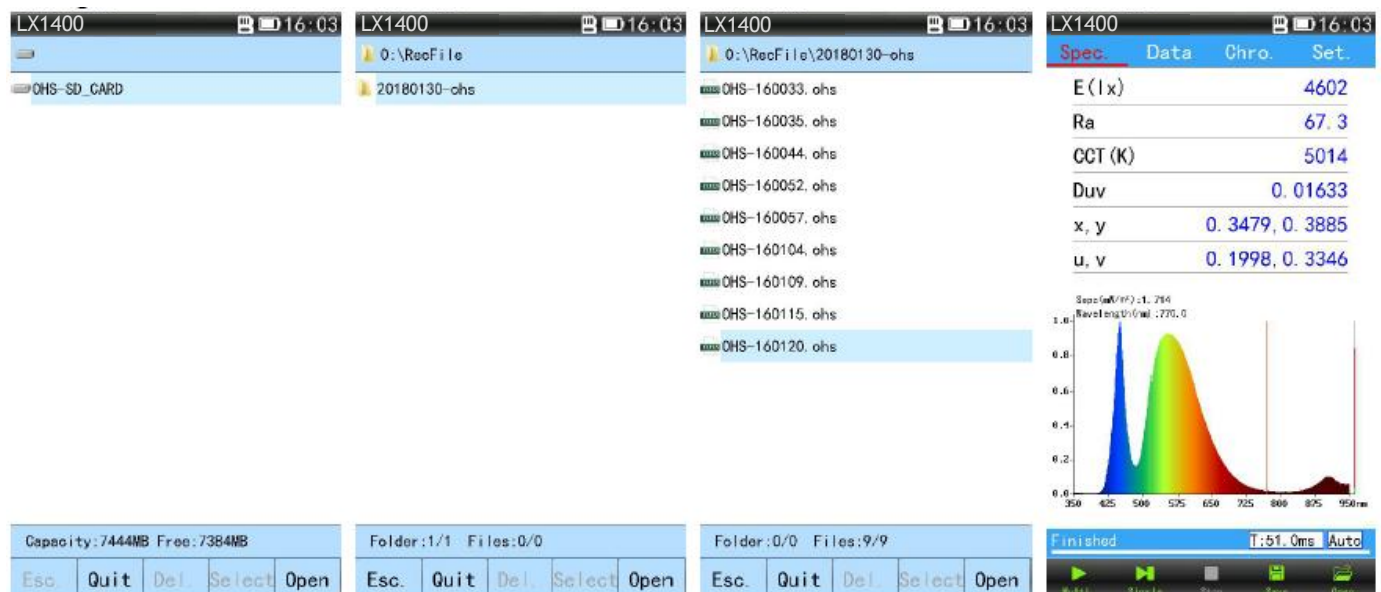


Fig.1 Click into the disk drive

Fig.2 Entering the test data folder

Fig.3 Double click the file to open

Fig.4 The file is opened

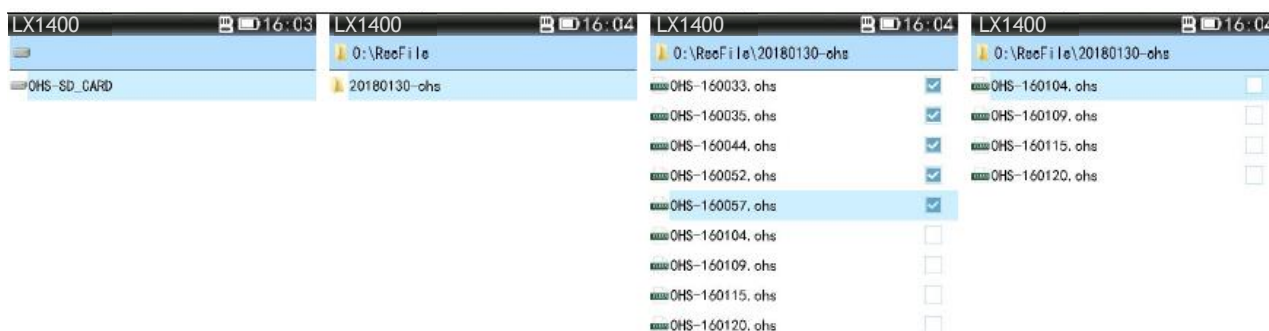


Fig.5 Click into the disk drive

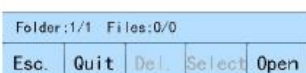


Fig.6 Files to be deleted by long press

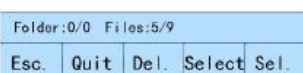


Fig.7 When the file is checked, click [delete]

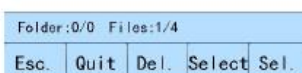
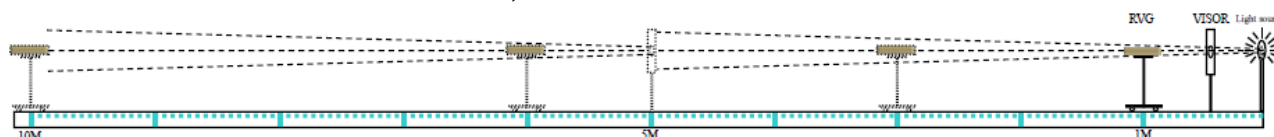


Fig.8 File delete

③ Lux calibration:

The illuminance has been calibrated before leaving the factory, and the user can use it directly. If the deviation of the test results is large, the user can be calibrated or corrected in the calibration. There are two methods of illuminance calibration, which are illuminance calibration and illumination correction.



Light rail diagram of Lux calibration

◆ The calibration method of lux: the illuminance calibration needs in light rail of darkroom lab's (light rail as shown above). The first step is to light the standard light source, wait for the light source to be stable, then put the equipment on the platform, the lighting hole is right at the center of shade board, move the car to 1 meters away from the light source, then click on the "illuminance calibration" pop-up dialog box (see Figure 1), in the "E (LX)" to enter the standard illuminance value and then click the 【calibration】 (as figure 2), wait for the data to be stable and click 【stop】 (as figure 3) then click 【save】 (as figure 4), Respectively in 1 meters, 2 meters, 3 meters..... Test the standard light source and record the data to determine the accuracy.

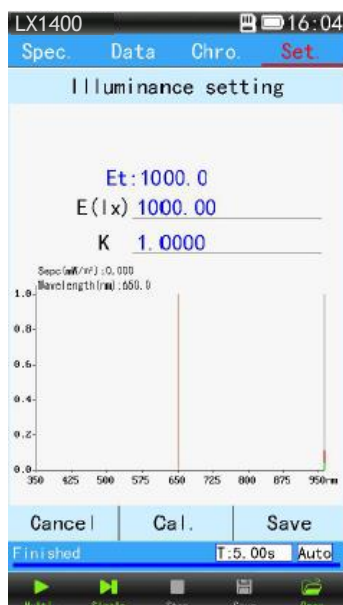


Fig.1 interface

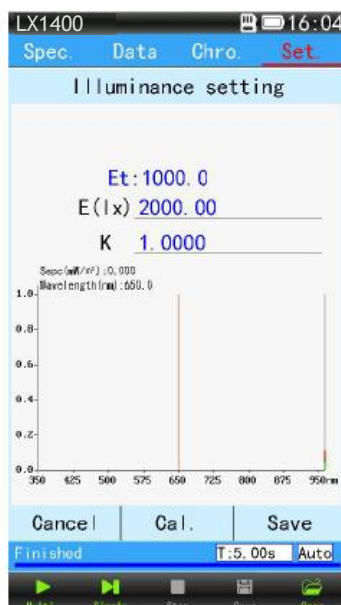


Fig.2 input values, click 【calibration】

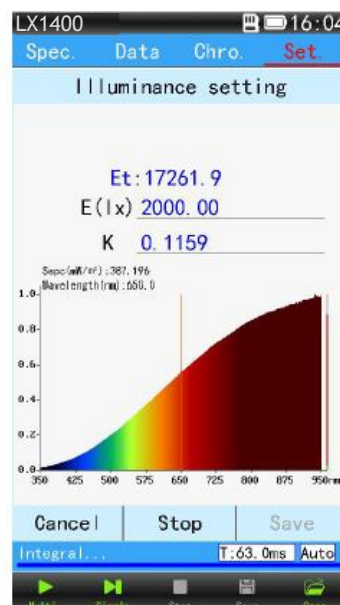
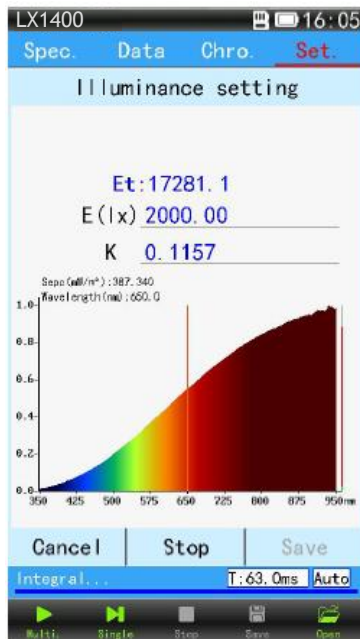


Fig.3 In the calibration



Wait for data to stabilize and click 【Stop】

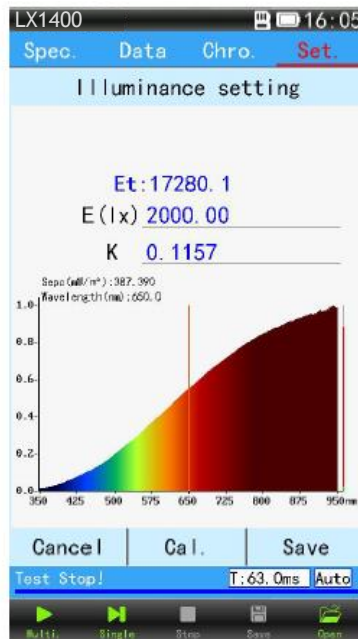
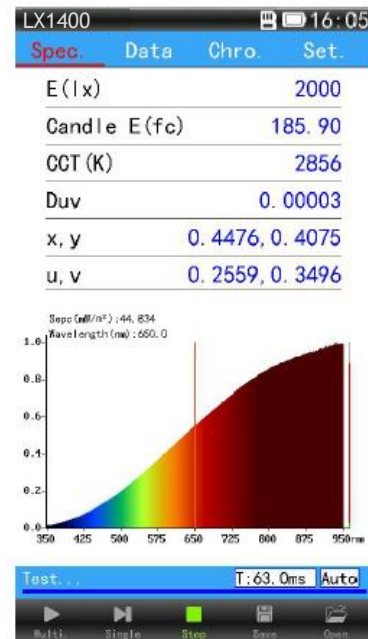


Fig.4 Click 【save】

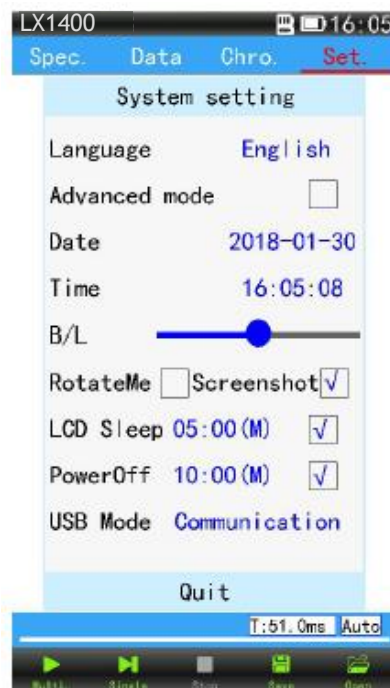


Test standard light source to judge accuracy.

◆ **Illumination correction:** click "Lux calibration" Popup dialog (as 1). Enter a factor (multiplier) at K, click 【save, such as: illumination measurement result is 10% lower than the actual illumination value, and we can change the coefficient to 1.1000 and save it so that the device will automatically measure the illumination measurement result by 1.1000 to achieve the purpose of illumination correction.

④ System Settings:

Click on "system setting", pop up the settings dialog (see figure below). In system settings, including "language," advanced mode ", "date", "time", "screen brightness(BL)", "Screen rotation", "Automatic shutdown" and "USB mode".



System Settings interface

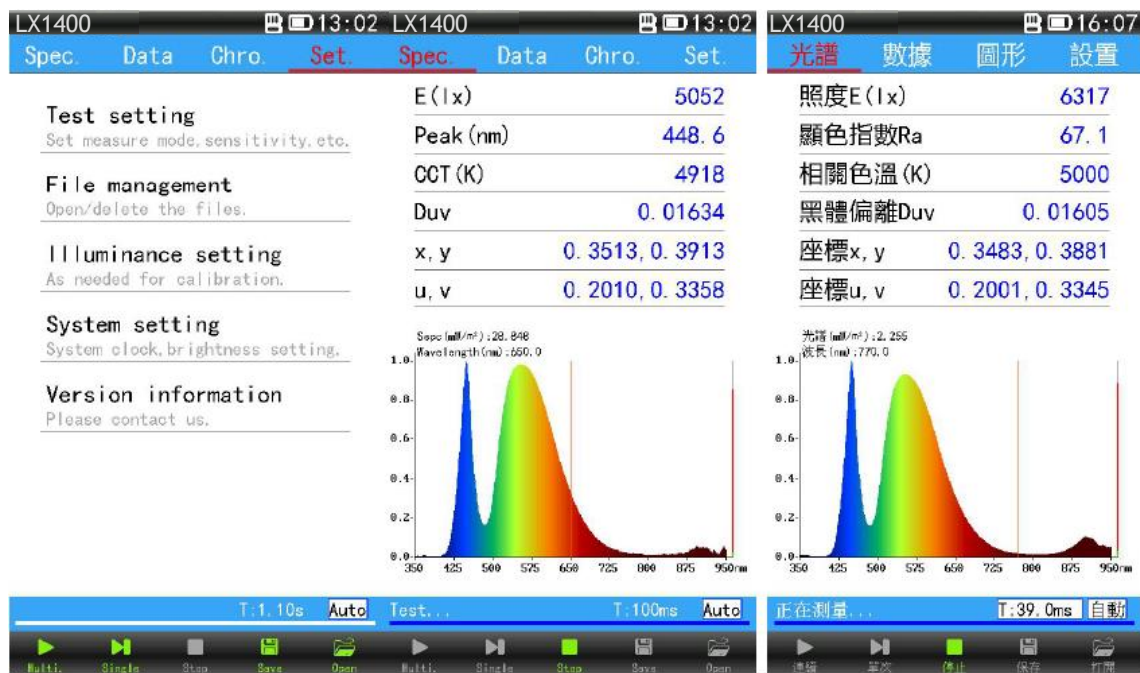
System language: click "system language" pop up the system language selection dialog box; click on the type of language you want (selected green); And then click [confirm], and then click [exit], set the success (English click [Quit]) (pictured below).



System language setting interface

Choose language, click 【OK】

Click 【Quit】



Language setting done

English interface display

Traditional Chinese interface display

◆Advanced mode: click the check box in the “advanced mode”, pop up the password input dialog box, enter the initial password: 123456 (if the password has been changed, please enter the changed password).

Click [OK], such as the hook is said to set success. Click "exit", set up the interface to increase the "spectral calibration" and "modify the password" two set of items (pictured below). If you want to close the advanced mode, simply click the check box in the advanced mode to remove the hook.



Click advanced mode, enter password

Click [exit]

Set interface in advanced mode

◆ **Set the date and time:** After click “Date”, pop up dialog box, click the up and down arrows to adjust the date to the correct date, click 【ok】 ; Use the same method to set the device time to the correct time (see figure below). After the end of the set click [exit]

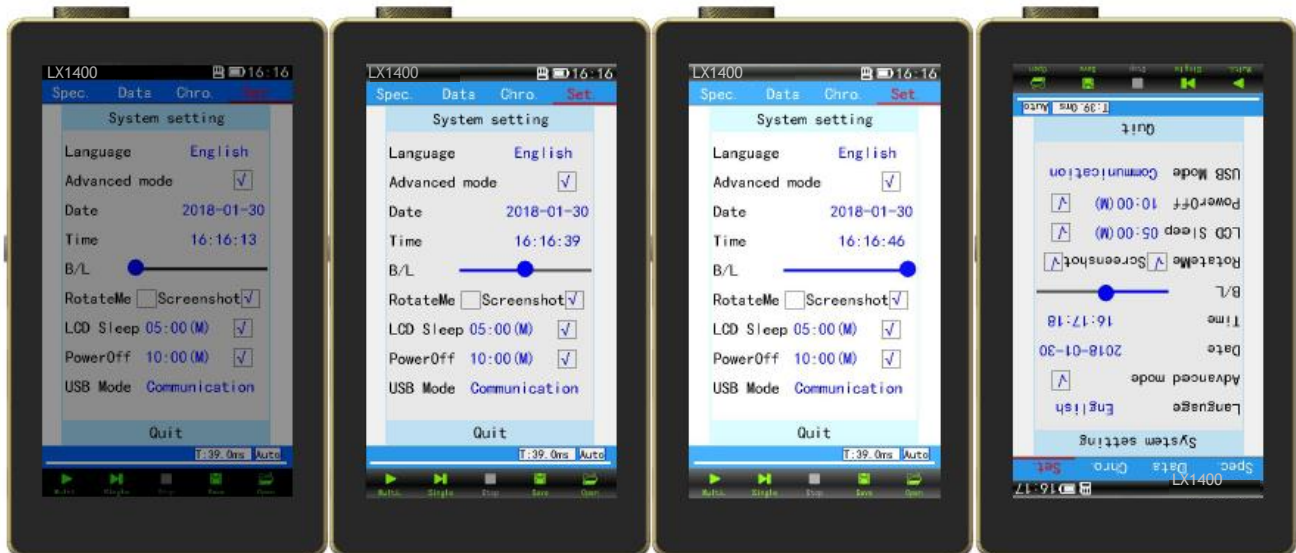


Set the date

Set the time

Exit

◆ **The screen brightness adjustment:** Left and right sliding brightness bar can adjust the brightness of the screen, and then click [exit], adjust the completion (as shown below).



Lowest brightness

Moderate intensity

Highest brightness

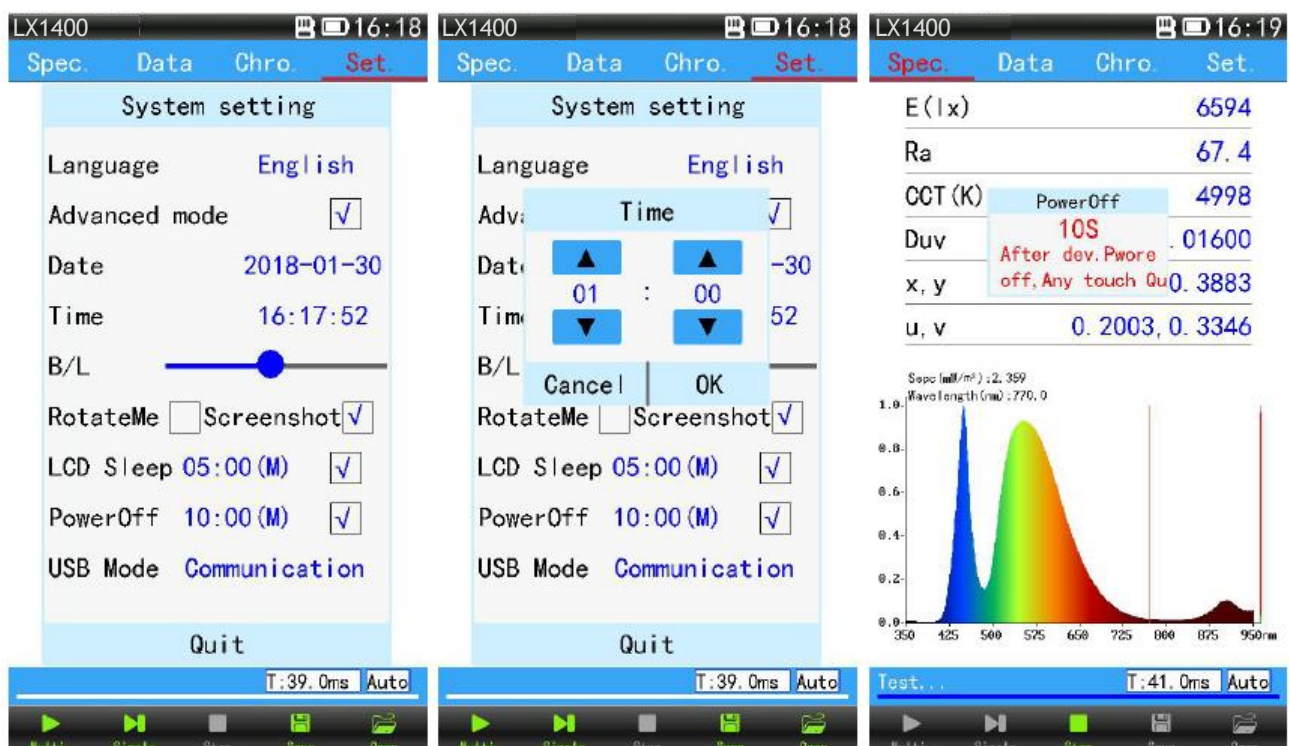
Scroll up and down

Left and right sliding brightness bar can adjust the brightness of the screen by figures

◆ **“Screen saver” Settings:** click the blue time after "screensaver" to set Screen saver time, When the instrument has no operation, the screen backlight automatically decreases after 5 minutes.(close the screen saver, simply click the check box after "screensaver Settings").

◆ **“Screen rotation” Settings:** click on the order : setting-system setting- Screen rotation. If the box is hook, the screen rotation function opens, if not, the function is not opened.

◆ **“Auto shutdown” Settings:** click the blue time after "auto shutdown" to set wait time for shutdown (such as 01:00), auto shutdown after 1 minute when the instrument is not operated. (as follows) If you need to cancel the auto shutdown mode, click the box after "automatic shutdown", the box shows no hook, operation is completed (When USB power supply, auto shutdown will not take effect.)



Hook means auto shutdown mode open

Auto shutdown time for 1 minute countdown, any operation can be cancelled.

When Auto shutdown 10 seconds

◆ “USB mode” setting: click the blue font after “USB mode”, and pop up the USB mode selection box. (as follows). Users can choose [communication mode] or [U disk mode]. When selecting communication mode, the computer software can be used for testing after connecting the computer with USB data cable. When choose U disk mode, USB communication cable is used to connect the computer to the computer to read the data files of the TF card in the instrument.

(* Set U disk mode first, then Connect the USB cable)



Set U disk mode first

Connect the instrument and computer with USB cable

Enter the U disk mode in about 20 seconds

Devices with Removable Storage



OHS-SD_CARD (E:)

USB icon appears on the computer



RecFile



PC software and Manuals

TF card file.

⑤ Version information:

In the version information, display the instrument model, instrument name, instrument number, system version, company name, website, copyright information, etc.



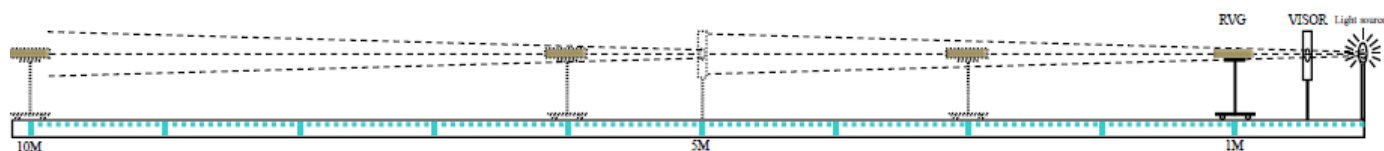
Version information

⑥(advanced mode function) spectral calibration:

Before leaving the factory, the spectral parameters have been calibrated and the user can use it immediately. If the test result is biased, the user can be redefined in the "spectral calibration".

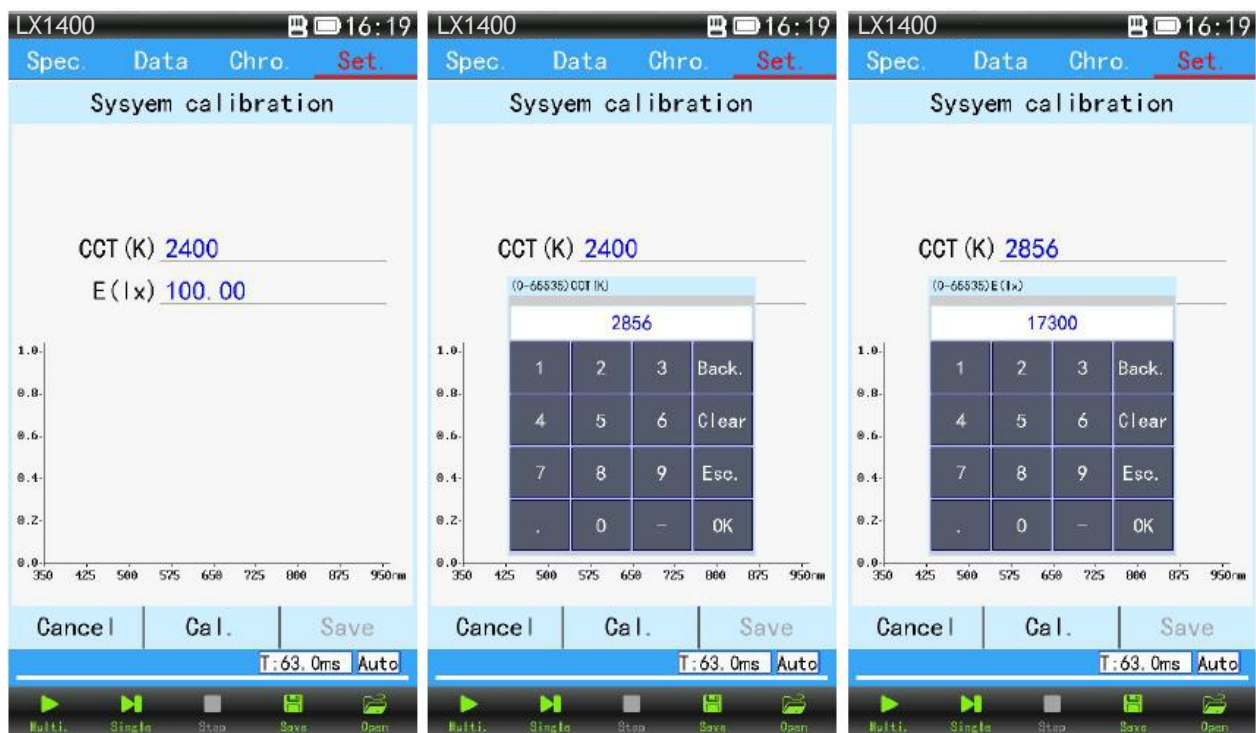
LX1400 spectrum illuminance analyzer, including the spectrum and illuminance of two parameters need to be calibrated, so the use of 2856K standard light source, light rail in the darkroom lab on the two parameters to perform a calibration. If your standard light source has no standard data of spectrum and illuminance, illumination and spectrum need to be calibrated in two times.

(The spectrum is completed in the "spectral calibration" and the illuminance is completed in the "illumination calibration")



The spectral calibration method:

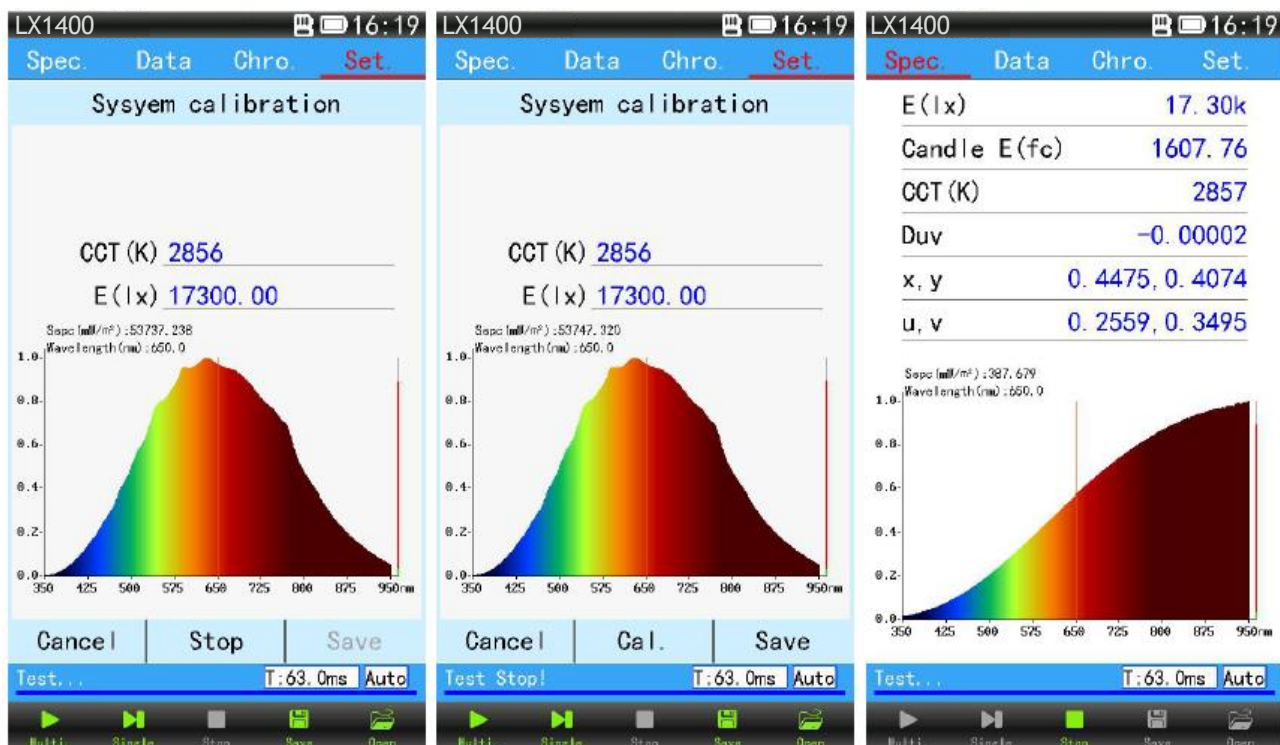
The illuminance calibration needs in light rail of darkroom lab's (light rail as shown above). The first step is to light the standard light source, wait for the light source to be stable, then put the equipment on the platform, the lighting hole is right at the center of shade board, move the car to 1 meters away from the light source, then click on the "illuminance calibration" pop-up dialog box (see Figure 1), in the "E (LX)" to enter the standard illuminance value and then click the 【calibration】 (as shown in Figure 2), wait for the data to be stable and click [stop] (see Figure 3), Click 【save】 (see Figure 4 below), calibration completion. Respectively in 1 meters, 2 meters, 3 meters.....Test the standard light source and record the data to determine the accuracy.



1 Calibration interface

2 input values of CCT

Enter the standard illuminance value



Waiting for data stabilization, Click 【stop】

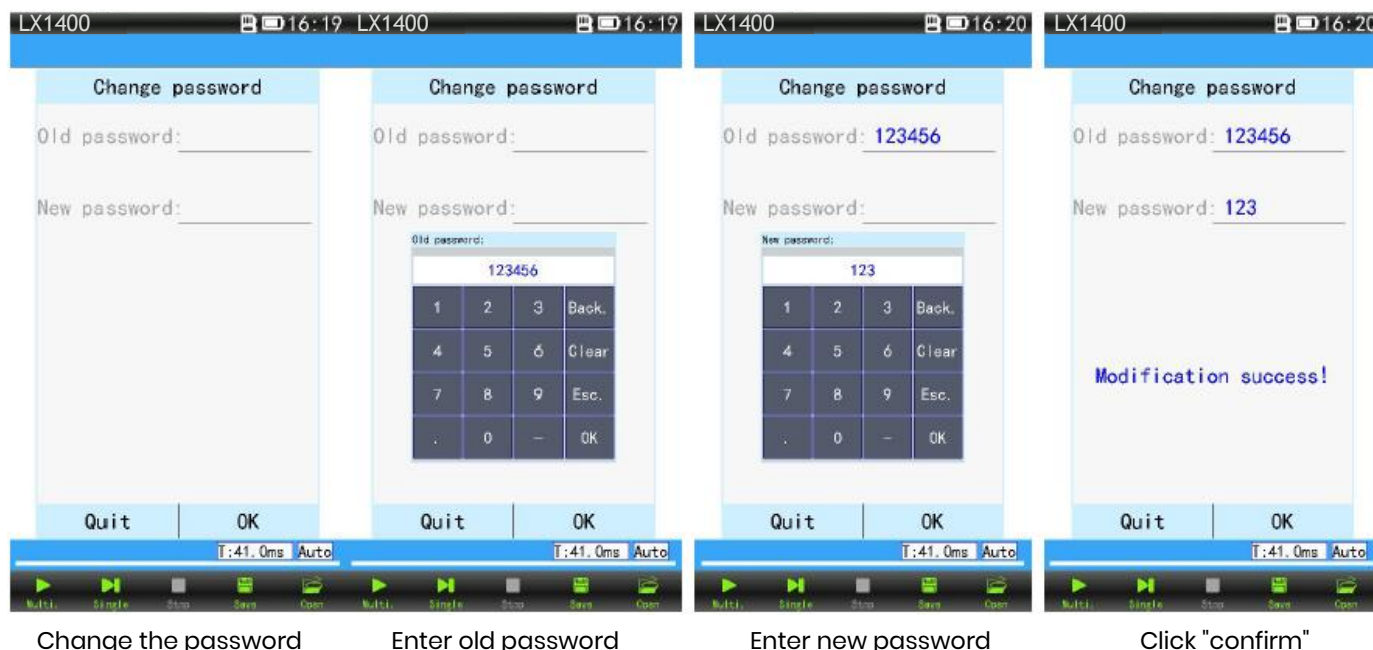
4 Click 【save】

Test standard light source to judge accuracy.

⑦ (advanced mode function) change password:

You can modify the initial password for advanced mode (not recommended). Modify the way is to click on the "change password", pop-up password dialog box. Then enter the old password and the new

password, click [confirm], the password to modify the success. Click back to return to the settings menu (see figure below).



(7) Test status bar:

Test status bar display test status, integral time, integral regulation.

"integral..." indicates that the instrument is adjusting the integral time according to the intensity of the light source;

"Test..." indicates that the instrument is measuring the light source data;

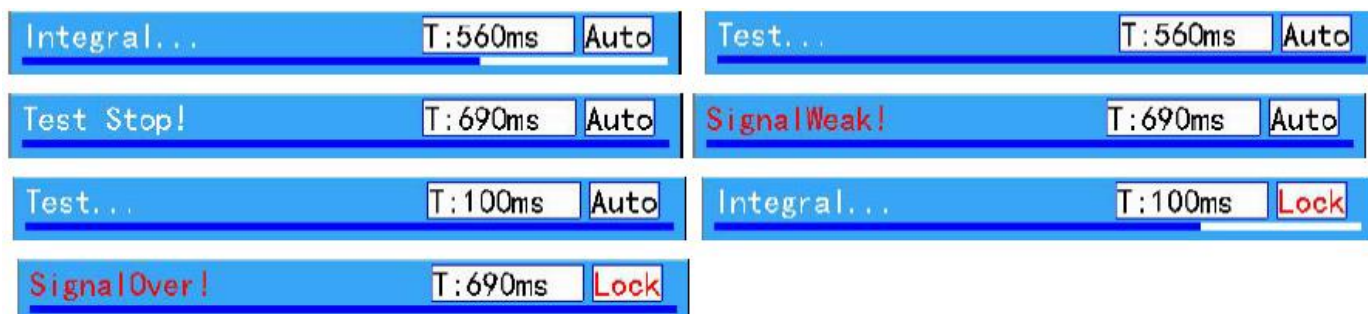
"Test Stop!" It indicates that the test is terminated.

"Signal weak!" The light source signal is too weak or the integral time is locked the instrument cannot adapt to the current intensity light signal test;

"Auto" integration time automatically adjusts;

"Lock" indicates that the integration time is locked.

"Signal over!" Indicates that the light source is beyond the measurement range or the integration time is not suitable for the test of the current intensity light signal



Measurement status bar

(8) Integral adjustment state:

There are two kinds of "auto" and "lock" in the integral adjusting state. When "automatic" state, the instrument will automatically adjust to the appropriate integral time according to the light source;

"Lock" locking" lock the current integral time" and "input integral time locking" click on the "auto" instrument will lock the current integral time, "auto" change to "lock" if the same or similar measure light source, can not influence the test results. The advantage is to reduce the integration time to speed up

the test, the disadvantage is that when the brightness of the larger changes, signal overflow or signal is too weak to cause the measurement results inaccurate (as figure 1-3). User also can click“【T: xxxms】” to enter a fixed integration time, input range 1-10000ms (figure 4 below). Integral time setting (for light sources with very short lighting time).

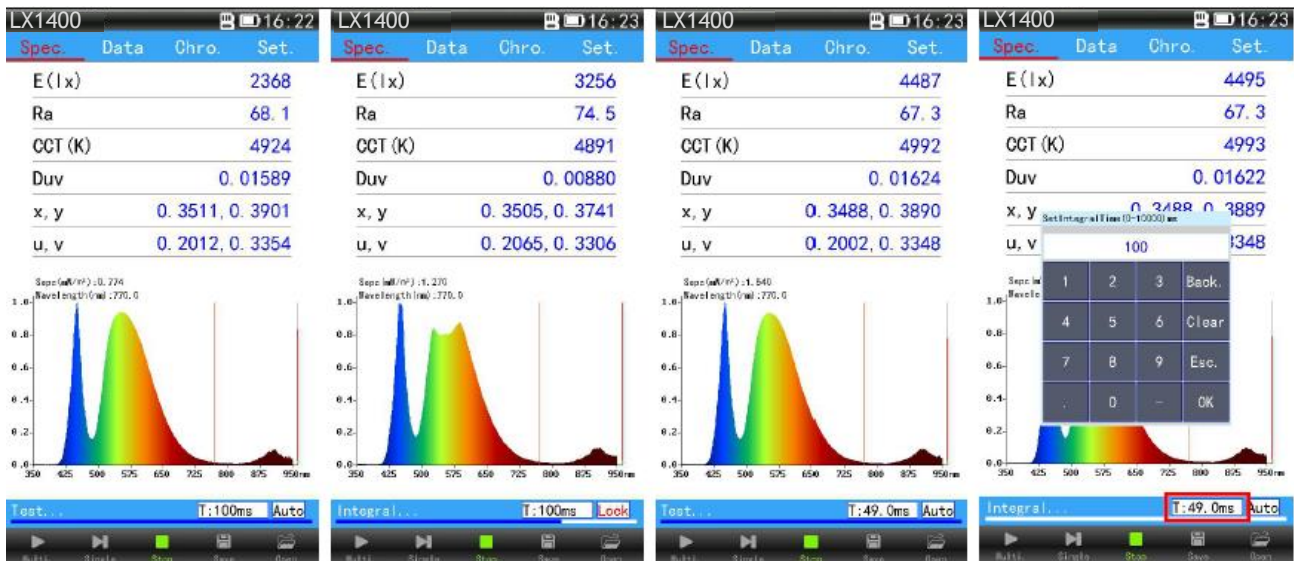


Fig.1

Auto integration time

Fig.2

A more intense light signal will overflow when it is locked.

Fig.3

It is normal after the integration time.

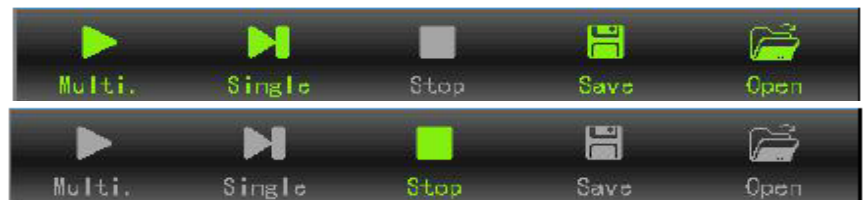
Fig.4

Input integration time lock

(9) Touch buttons:

Touch button column has 5 icons: "continuous" test icon, "one time" test icon, "stop" test icon, "save" file icon, "open" file icon (below group).

Status bar when the state is stopped



Status bar for continuous testing

"Multiple" test icon **Multi.**: After clicking, the instrument starts to test the light source continuously. If you set up the auto save, save the test data automatically every other time To stop the test, click the

stop test icon



"Single" test icon **Single**: click on "Single" test icon, after a single measurement of the light source, the instrument stops. Click save file icon to save the file **Save** ;

" stop " test icon **Stop** : click exit test status when testing;

" save " file icon **Save** : after the test is complete, click on the icon to save the test data as a file (see figure below).

File saving method:

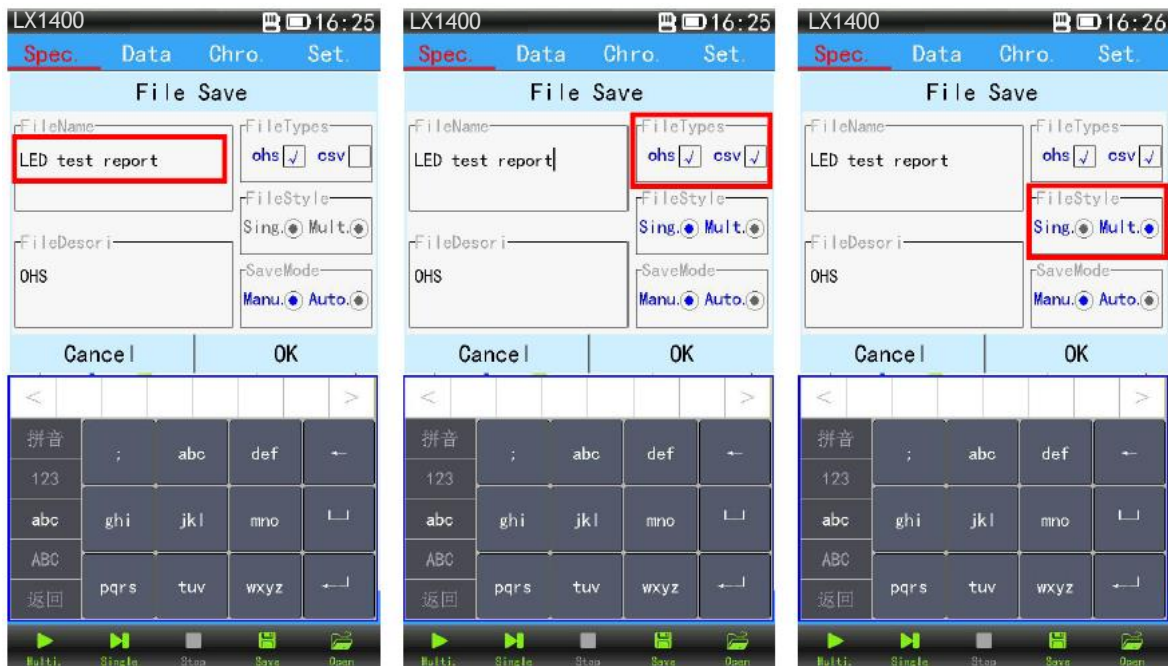


Click the "save" file icon **Save** pop-up file save dialog box. Use a different input method to enter the file to save the name, click OK to save the file to complete.

.OHS File is File format for device and software identification.

.CSV is Excel Data document format, single line of Excel file Contains spectral data also available to.opendisplay graphics.

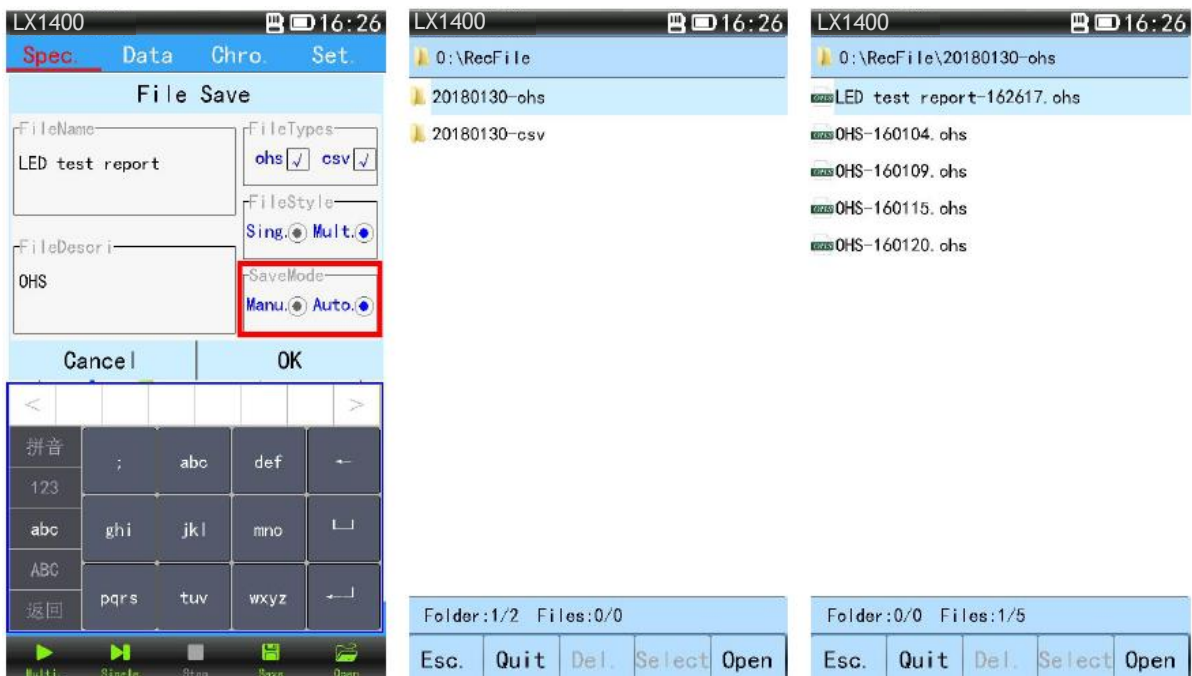
.CSV Data document format divided into single save and multiple save. Multiple data saving formats do not contain wavelength data and can only be viewed on a computer.



Different input method to input file name

Select the file save type.

Select CSV single file save/multiple save.



File save mode (manual/automatic)

Different suffix name between test data and Excel folder

Saved test files.

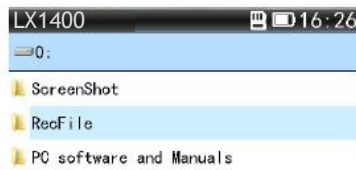
File open method:



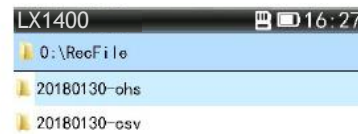
Click the "open" icon to pop up the folder list dialog box. Click into **RecFile**, then click the test date folder to enter the test file list.(test data folder which named with OHS. Excel folder which named with CSV), double-click the test file you need to open, finally open the file.(as follows).



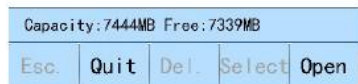
1



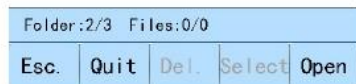
2



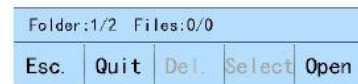
3



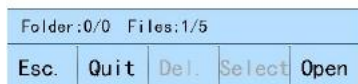
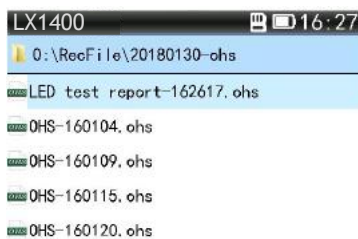
4



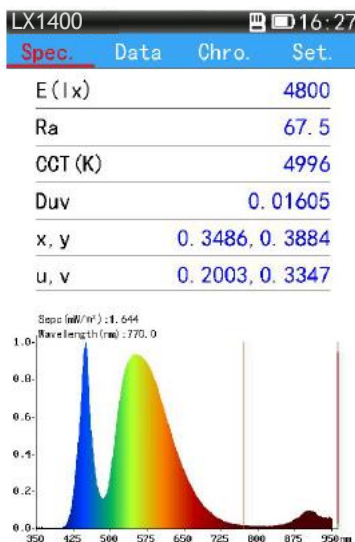
5



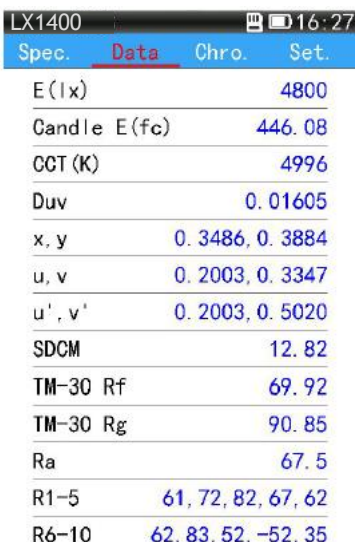
6



4



5



6

New function description:

1. Set→System setting→click the power key to complete screenshots: click box become hook, Press the instrument power test button (on the left) device will display the contents of the current screen to be

saved in the "ScreenShot" folder in the TF card  ScreenShot instrument will makes a sound for three seconds, when Screenshot. When the screen function is turned on, the power button can only be taken off the screen, and the screen can be turned off on the screen with the power of more than 3 seconds. Canceling screenshots can be removed in system Settings.

2. If the instrument has an accident, long press the instrument power button for more than 10 seconds, Instrument resetting.

Software Instructions

1. System requirements

- Operating system: Windows XP or higher version, 32 – bit or 64 – bit;
- Hard disk space: more than 200M;
- USB Interface: 1;
- Display resolving power: more than 1280×1024.

2. Software acquisition

The test software has been copied into the TF storage card in the instrument before it out of the factory.

Acquisition method 1: first, remove TF card which in the instrument card slot into the card reader, second, put the card reader insert into the USB interface, third, open software installed on the computer;

Acquisition method 2: Set the instrument as "U disk mode", then connect the instrument with the USB data line to the computer to open the software for installation;

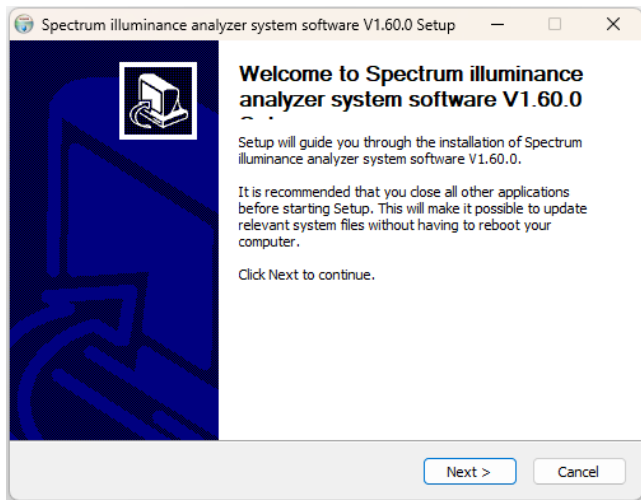
Acquisition method 3 : Download the installation software online from our website www.meten.nl, and then open the software on the computer for installation.

3. Software installation

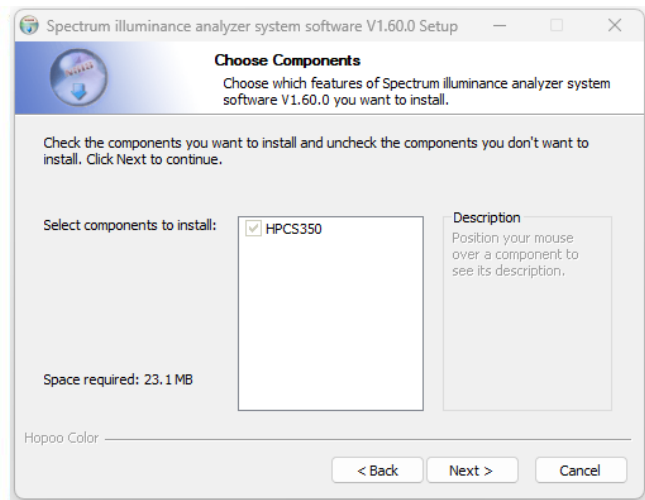
software installation diagram:



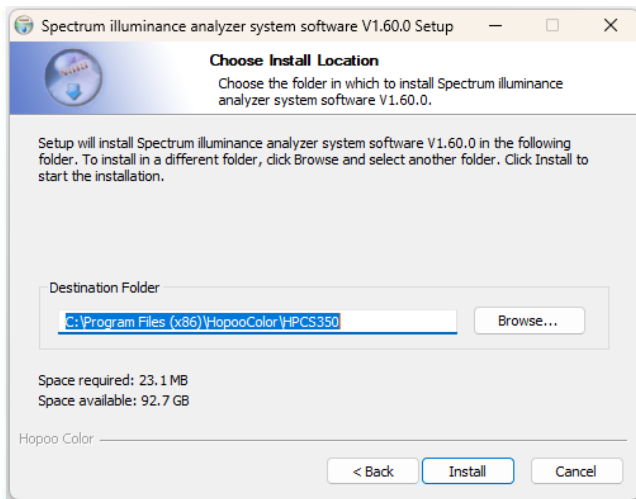
Double click the software installation package with the left mouse button Click **【OK】**



Pop-up software install interface , Click **【Next】**

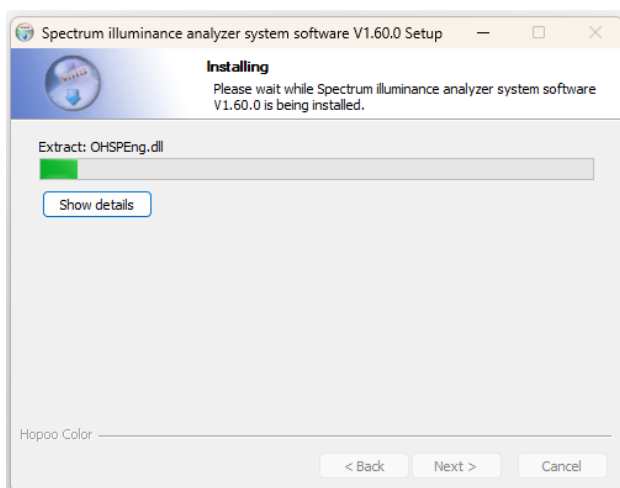


Select installation component(without other components in default) Click **【Next】**

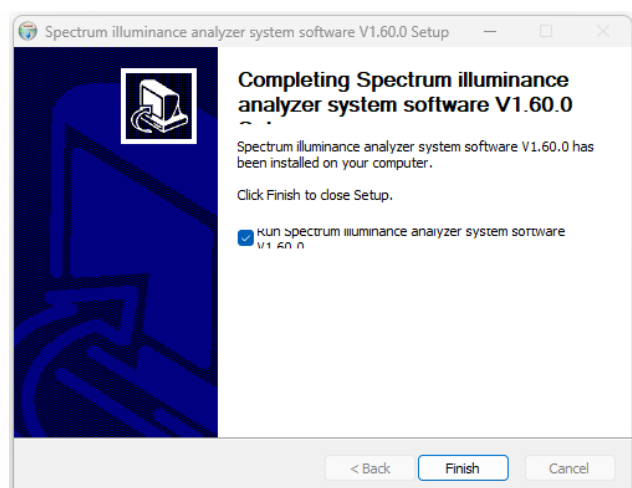


Select the location of the software installation (not change) Click **【install】**

or change software installation path.



Please wait for the software to be installed



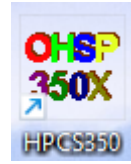
Successful installation Click **【Finish】**



4. Software introductions

1. Software startup:

After the software installation is completed, the shortcut icon will be generated on the computer desktop. Double-click the icon to open the software.

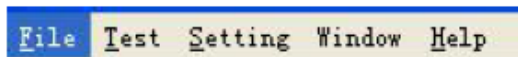
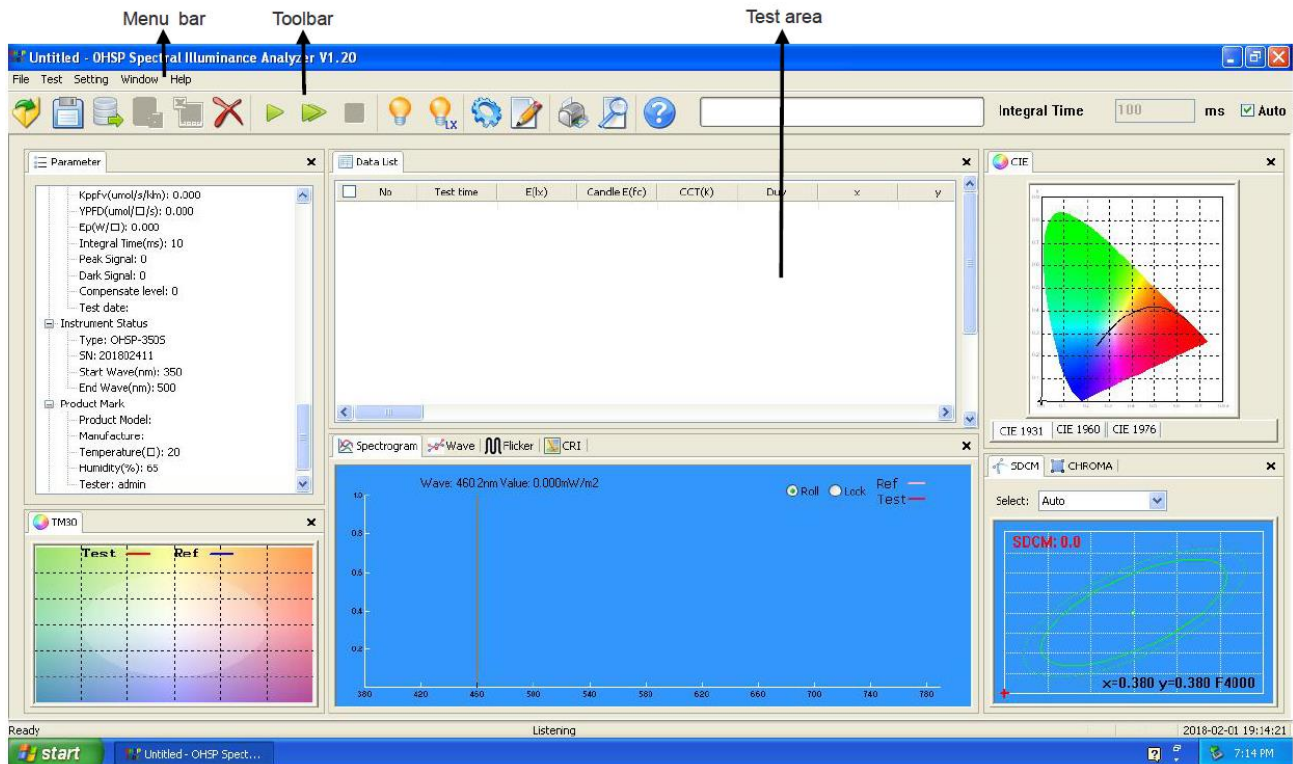


2. Software interface:

software main interface is as follows:

Menu bar:

menu bar contains five drop-down menus with File, Test, Setting, Window and Help.



File menu:

Open: it can open the test file with the suffix named .ohsp and .ohs;

Save: Save the test data currently displayed as a file, suffix named .ohsp;

Open database: can open a test file that is saved as a database, suffix named .db;

Save database: save all test data in the current window into a database file, suffix named .db;

Export Excel file: export all test data in the current window into Excel files, suffix named .csv;

Save spectral data: spectral data for all tests are exported at 1nm intervals, suffix named .csv;

Save spectral data (5nm): spectral data for all tests are exported at 5nm intervals, suffix named .csv;

Print: print the current test data;

Print preview: preview the print effect of the current display test data;

Recent: display the recently opened test file.



Test menu:

Single test: the test records one light source data and then stops;

Continuous test: continuous test and recording light source data;

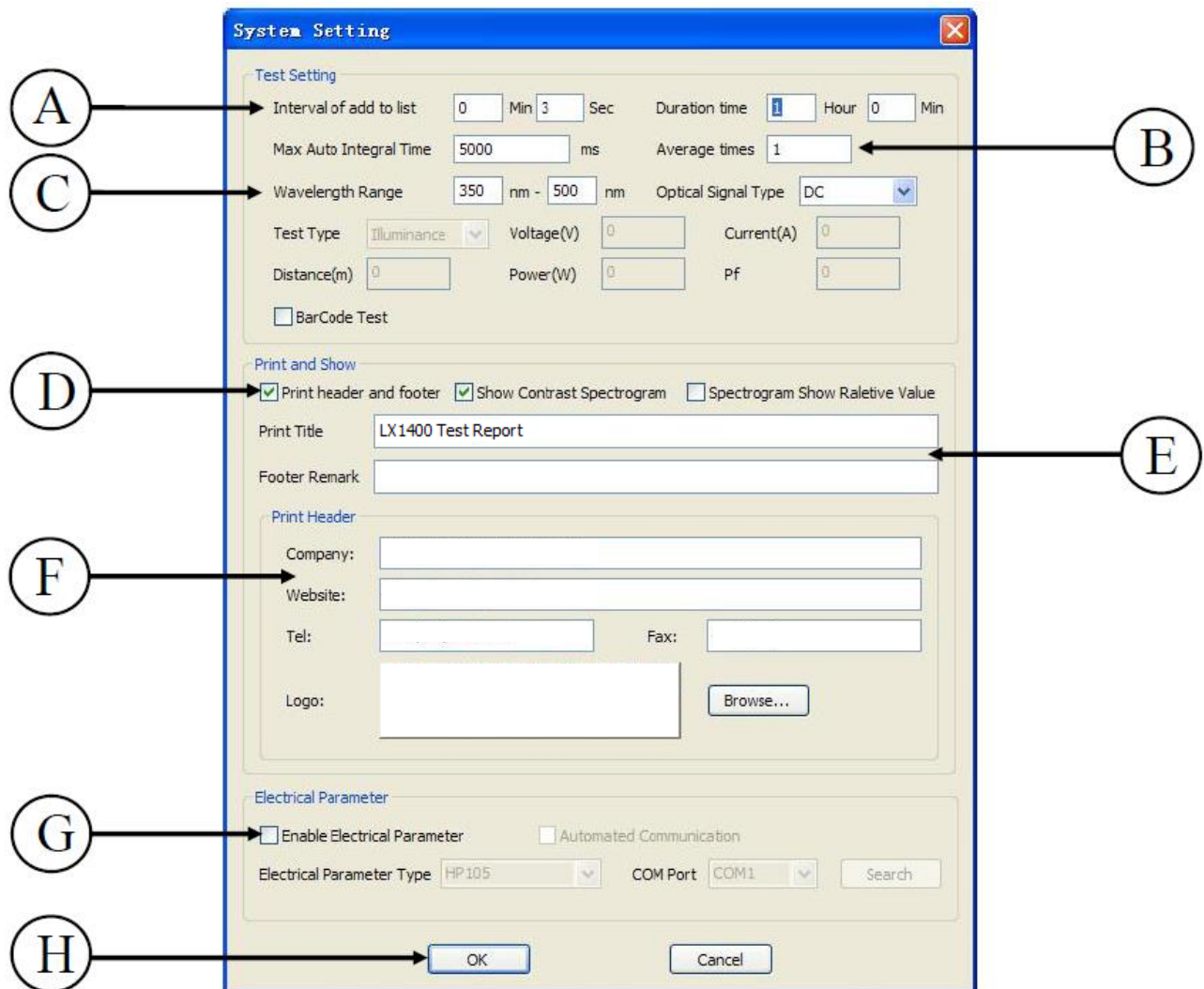
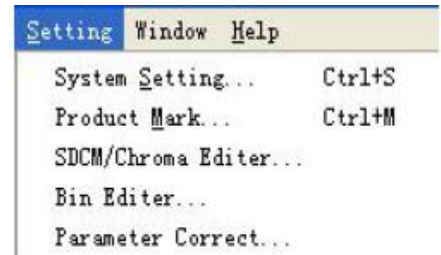
Stop test: stop continuous testing;

Calibration: need to use test instrument for calibration of standard light source (Light parameters and color parameters are calibrated simultaneously);

Lux calibration: need to use test instrument for calibration of standard light source.

Menu Settings:

System Settings: contains instrument test settings, printing and show settings, print header settings and electrical parameter settings.



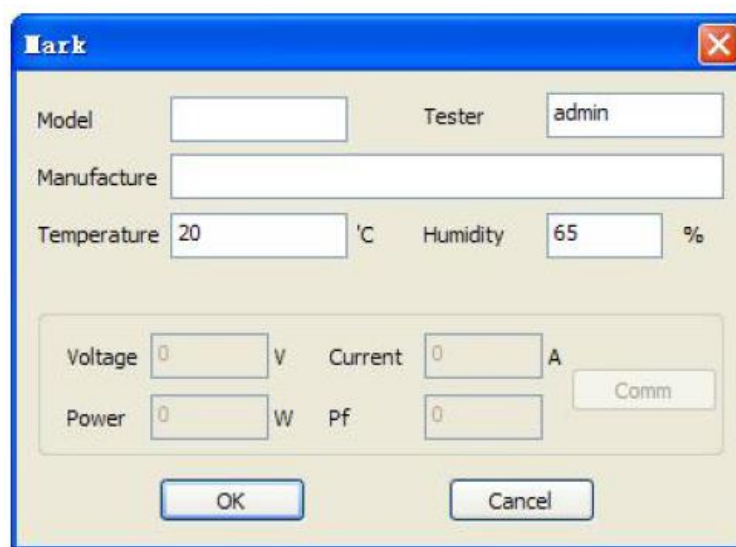
System Settings

A. Set the total test time and automatically record the interval time of the data in the continuous test state;

B. Set the time limit of instrument integral time and the number of average calculation of each test Spectral data;

- C. Set range and frequency of wavelength measurement sampling in a measuring instrument;
- D. Print item settings;
- E. Whether to print the footer of the page or carry on the chromatographic color pad printing, etc;
- F. Customize the title and footer of the printed report;
- G. Sets the text and trademark logo of the header in the printed report;
- H. Enable and close the communication of the external electrical parameter measuring instrument, models and communication ports of electrical parameters can be modified, such as: HP105 communication port choose COM(1~4), or automatic search port number;
- I. After setting, click "confirm" to save and exit.

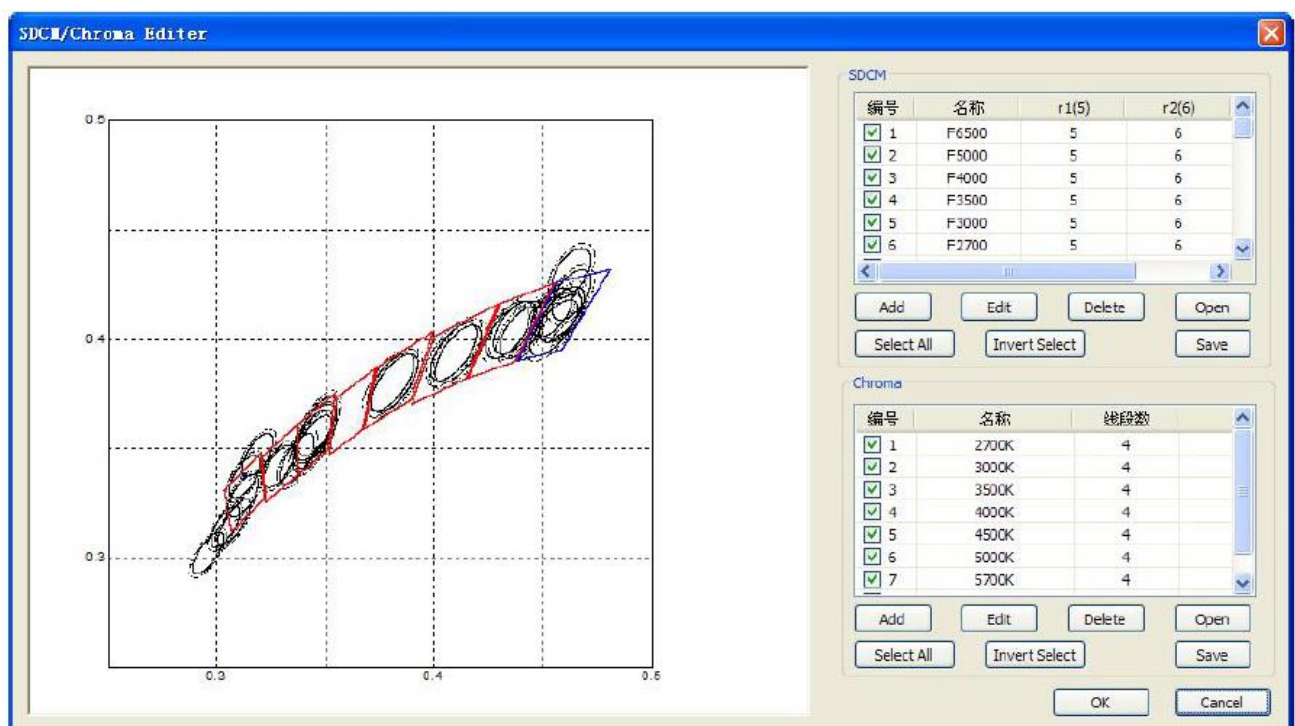
Mark: click the Mark option to pop up the mark tag, and the user can enter the relevant information of the current source. As following figure:



The Mark dialog box contains the following fields and controls:

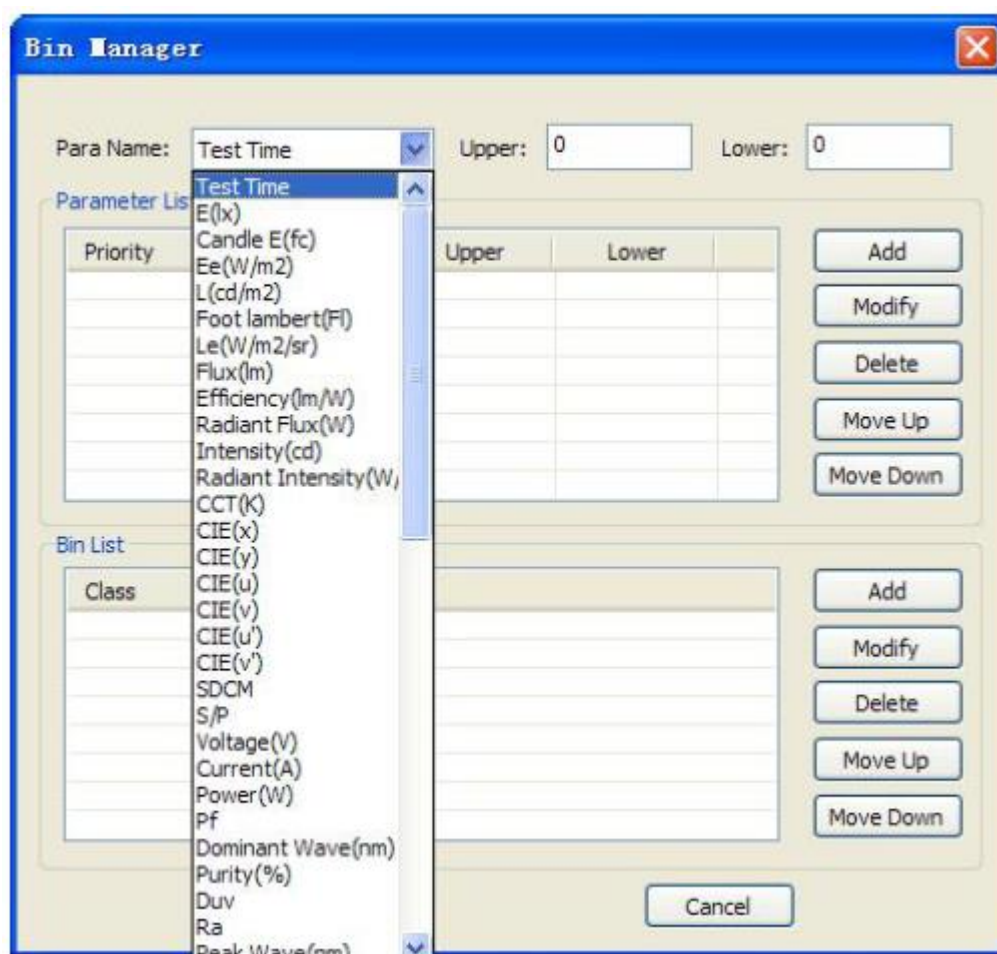
- Model:
- Tester:
- Manufacture:
- Temperature: °C
- Humidity: %
- Voltage: V
- Current: A
- Power: W
- Pf:
- Comm:
- OK:
- Cancel:

SDCM management: click on the SDCM option, open the TAB, users can add or delete the standard values of SDCM and Chroma area.



Color tolerance management label.

Bin manager: click on the bin manager options, open the TAB of bin manager, users can add the items and upper-lower limit of the bin judgment.



Bin manager tab

Parameter correction:

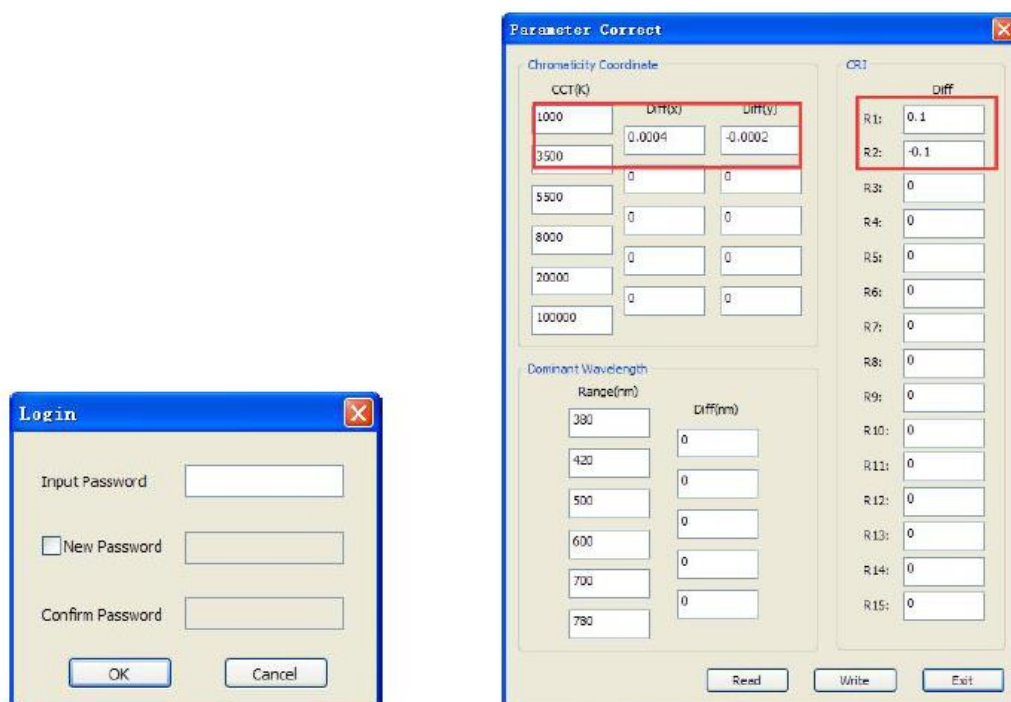
If has slight error with the light source test parameter X, Y, Ra and main wavelength, modifications can be made in this option. (User actions are not recommended)

Click the parameter correction option, pop-up login dialog box, then enter the password (original password: 123456), you will open the TAB of parameter calibration. as follows.

***Note: After entering the parameter correction TAB, need to click the "read" button once, pls click [write] and finally click [exit] After setting the parameters.**

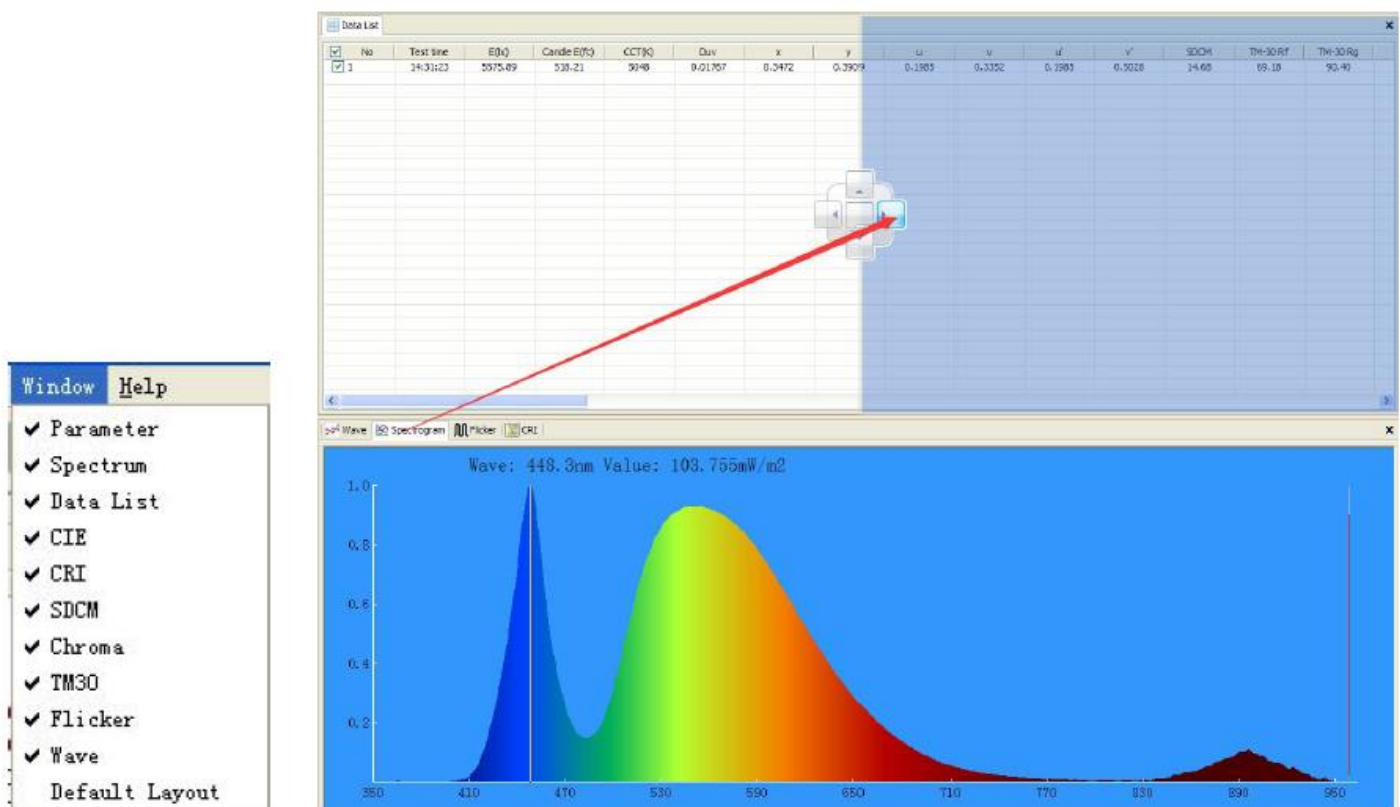
For example:

When testing the low color temperature about 1000-3500k, the X and Y coordinates are deviated, and the correction parameters can be added in the corresponding color temperature range. and the parameters will be automatically corrected after the system test is completed. "-0.0002" Indicates that the test parameter value is reduced about 0.0002.



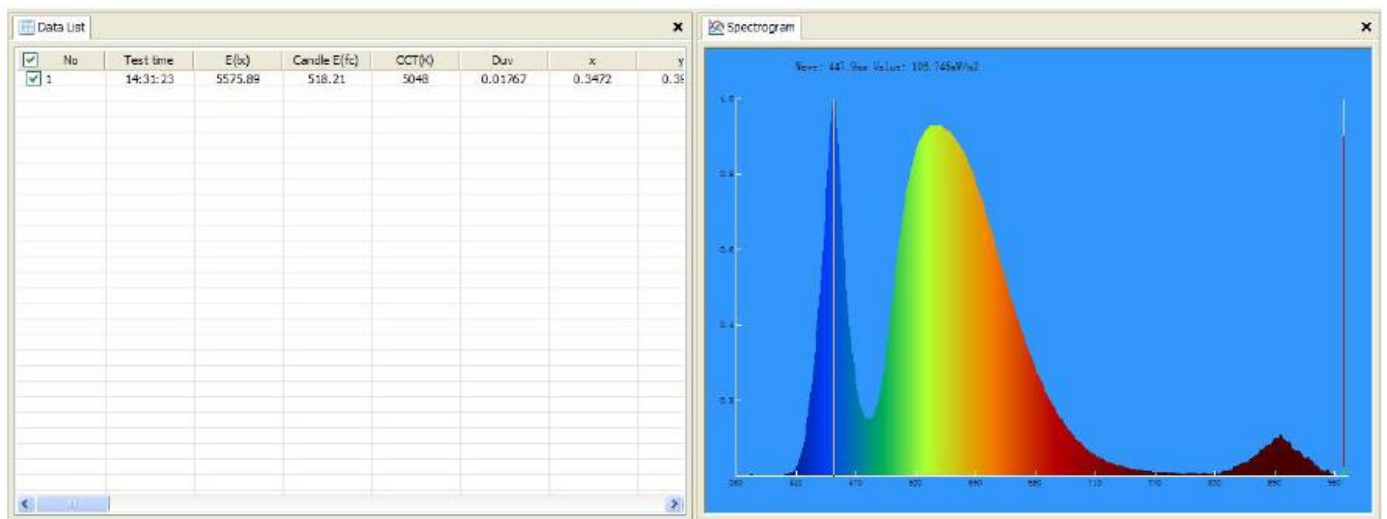
Window menu:

The box window in the test area can be towed, zoomed in, reduced, merged, and partitioned. options in the window menu are checked to indicate that the window is opened.

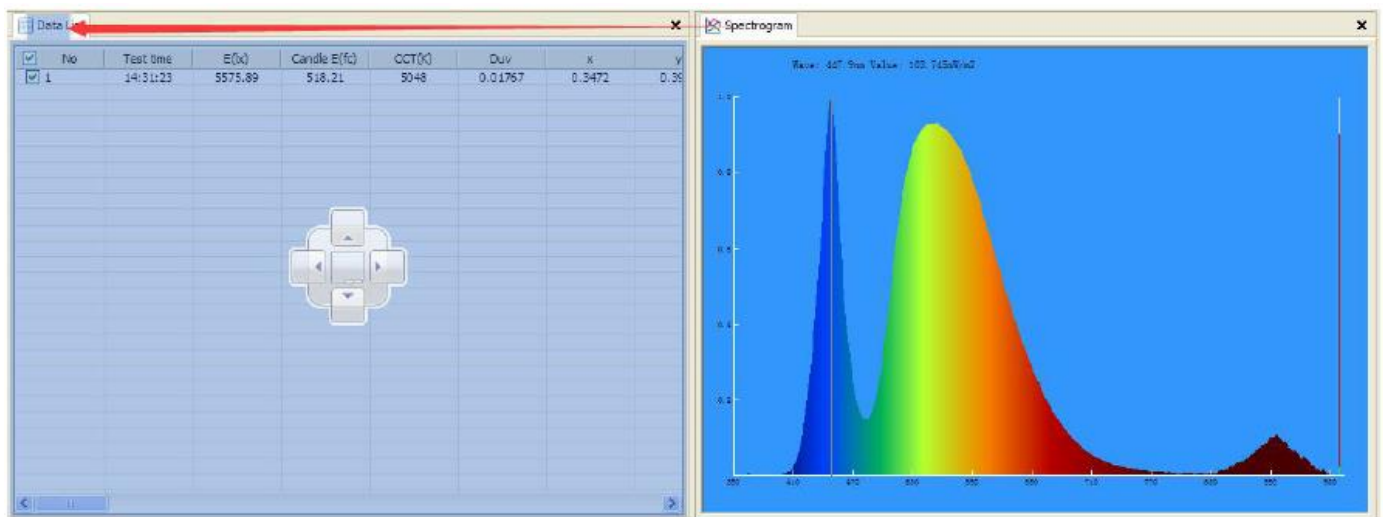


checked representation has been opened.

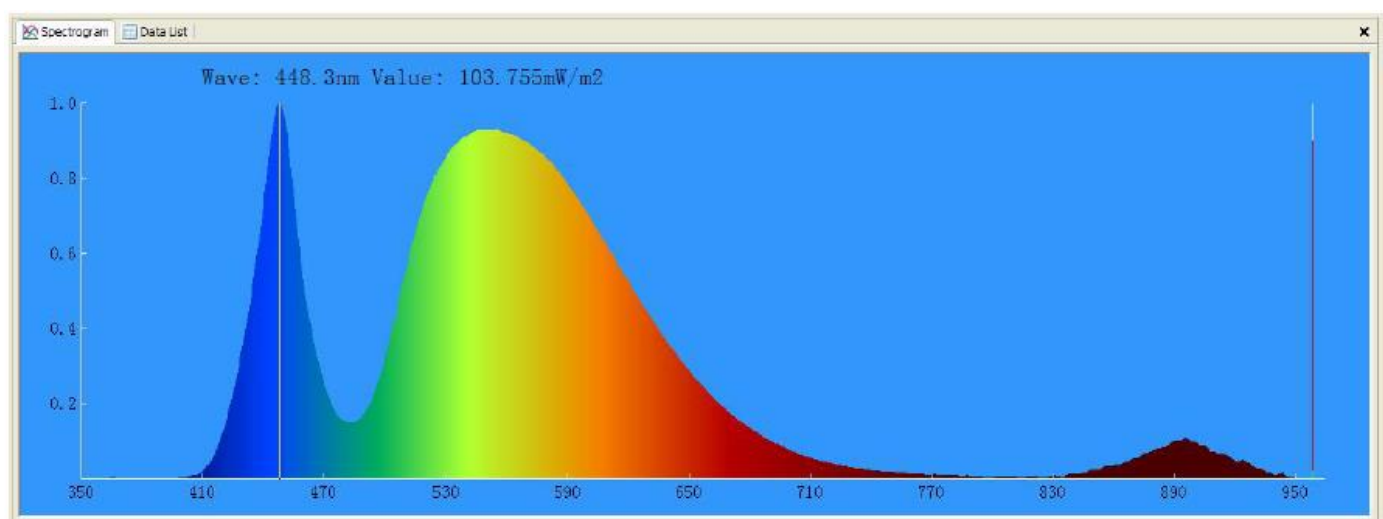
Drag and drop tabs to other Windows in the middle of the direction key can be displayed by the window.



Points window display

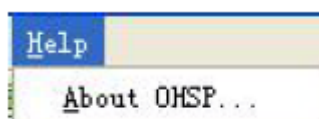


Drag and drop tags to the tag window to merge the display



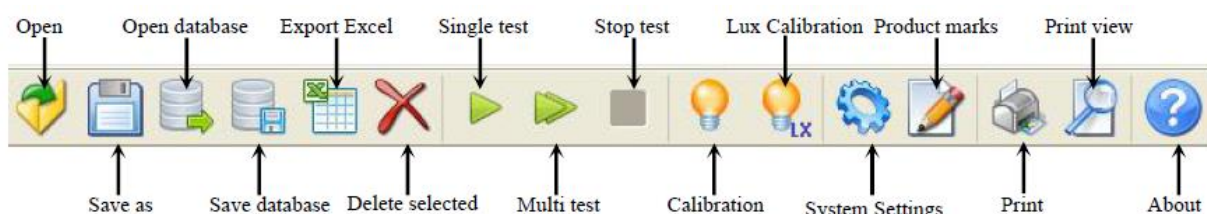
Window merge display

Help menu:



Help menu contains "about HPCS(A)" options

Toolbar:



The toolbar looks as follows. and the icon in the toolbar is the shortcut icon for the options in the menu bar, function is the same as the option in the menu bar. .



The first area of buttons are: Open the file, save as, open the database, save the database, save the Excel document and delete the selected data in the list;



The second area is the test area. The buttons are: Single test, continuous test and stop test;



The third area is the calibration area. The buttons are: Spectral calibration and illumination Calibration;



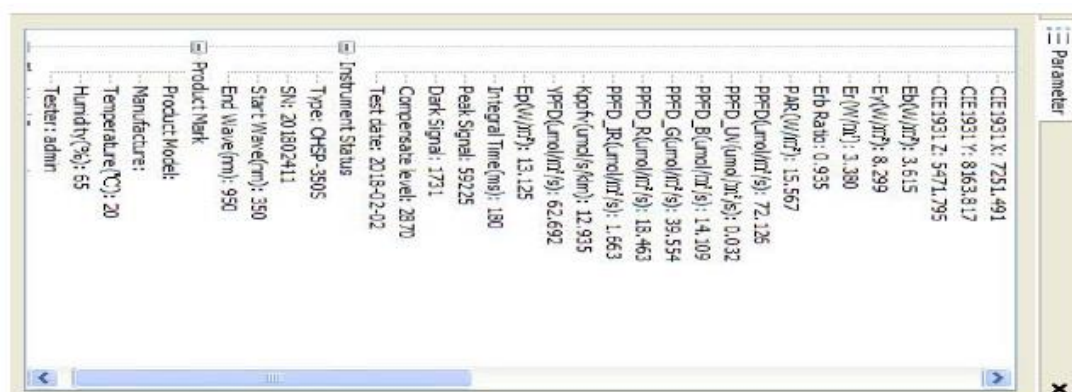
The fourth area is the setting area. The buttons are: system Settings and product identification;



The fifth area is the output area. The buttons are: print, print preview, about HPCS;

Instrument status bar:**The test area:**

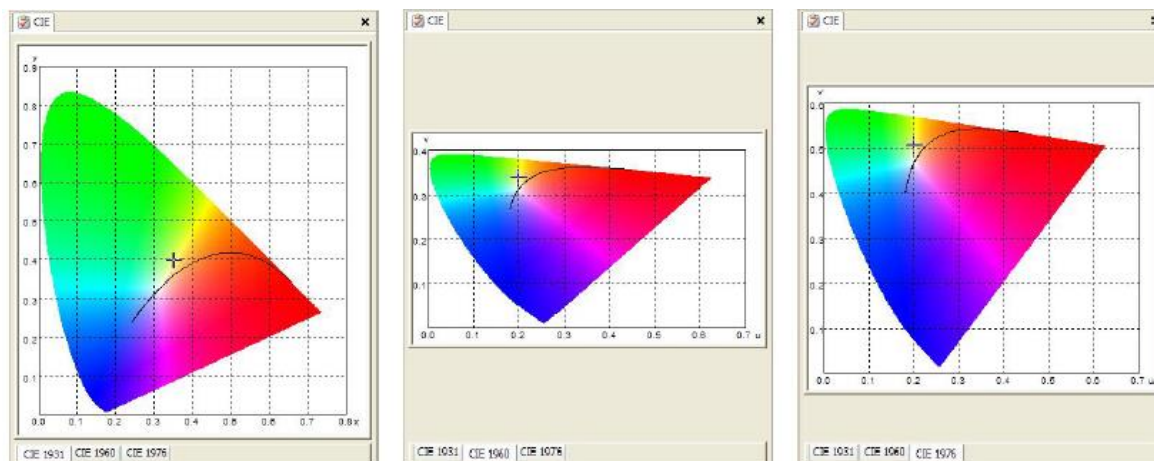
(1) parameters list: Displays the current test of All parameters, instrument status information, product identification information.



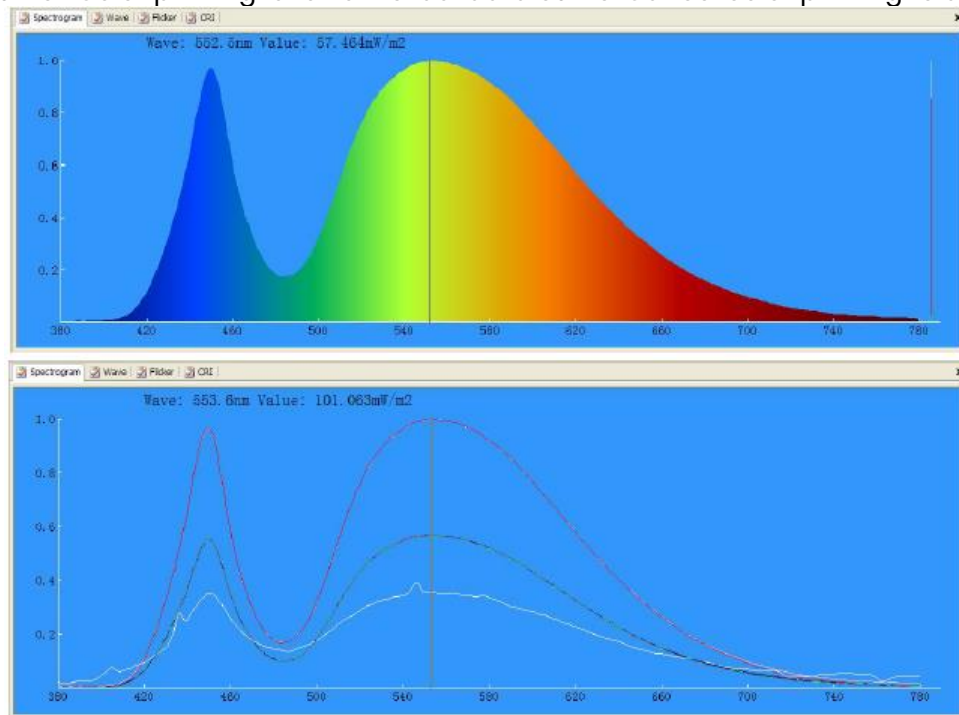
(2) Data list: The list shows multiple test parameters.

序号	测试时间	照度(μ)	色温(K)	CIE(u)	CIE(v)	CIE(u')	CIE(v')	色温(K)	光通量	光效(lm)	S/P	主波长(nm)	色度
1	13:34:43	3204.66	4900	0.3526	0.3965	0.2000	0.3373	0.2000	0.5060	14.9	297.83	1.692	565.3
2	13:34:47	3216.60	4902	0.3525	0.3957	0.2002	0.3371	0.2002	0.5056	14.6	298.94	1.699	565.4
3	13:34:50	3223.11	4904	0.3524	0.3954	0.2002	0.3370	0.2002	0.5055	14.5	299.55	1.699	565.4
4	13:34:53	3228.79	4903	0.3524	0.3954	0.2003	0.3370	0.2003	0.5055	14.5	300.07	1.698	565.4
5	13:34:56	3232.09	4901	0.3525	0.3954	0.2003	0.3370	0.2003	0.5055	14.5	300.38	1.697	565.4
6	13:35:00	3233.11	4903	0.3524	0.3954	0.2002	0.3370	0.2002	0.5055	14.5	300.47	1.696	565.4
7	13:35:02	3236.15	4902	0.3525	0.3955	0.2003	0.3370	0.2003	0.5055	14.5	300.76	1.696	565.4
8	13:35:05	3239.84	4901	0.3525	0.3955	0.2003	0.3370	0.2003	0.5055	14.5	301.10	1.698	565.4
9	13:35:09	3240.58	4902	0.3525	0.3954	0.2003	0.3370	0.2003	0.5055	14.5	301.17	1.697	565.4

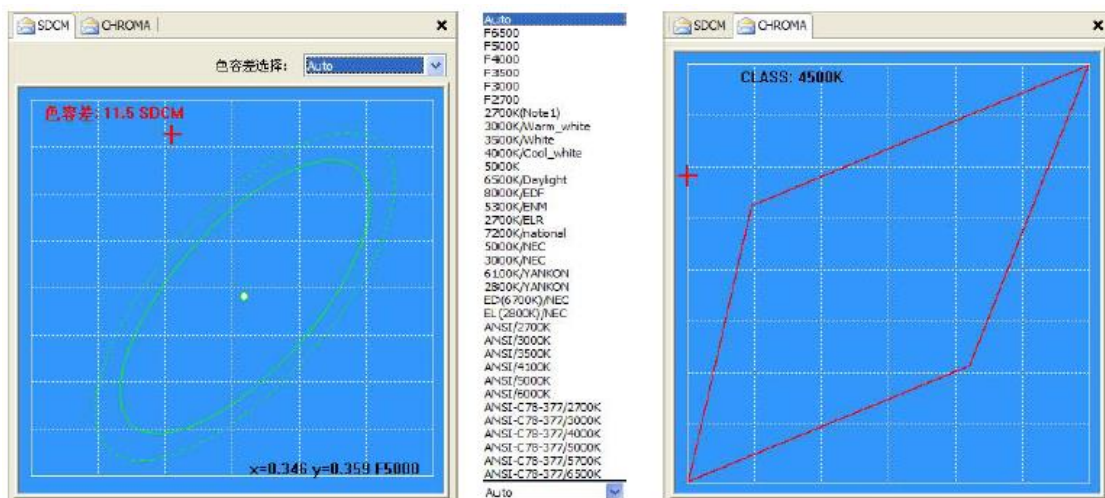
(3) Chromaticity diagram: Displays the current color coordinates. You can switch between CIE 1931, CIE 1960 and CIE 1976 through the bottom Tab button.



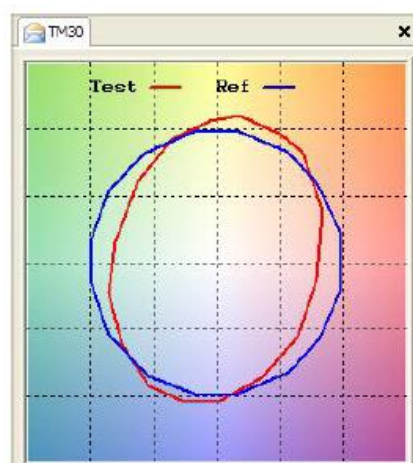
(4) Spectral curve: "Color printing" shows the last data curve. Cancel color printing to display the last ten data curves.



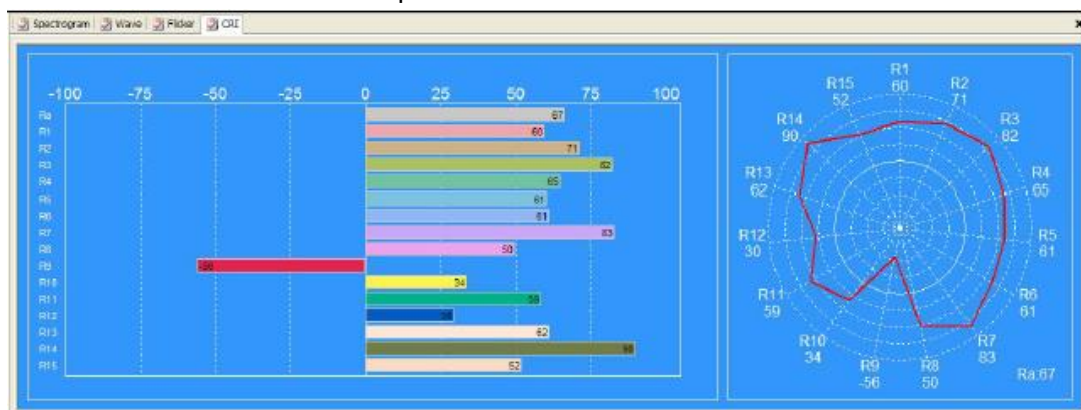
(5) SDCM and area of Chromaticity diagram:



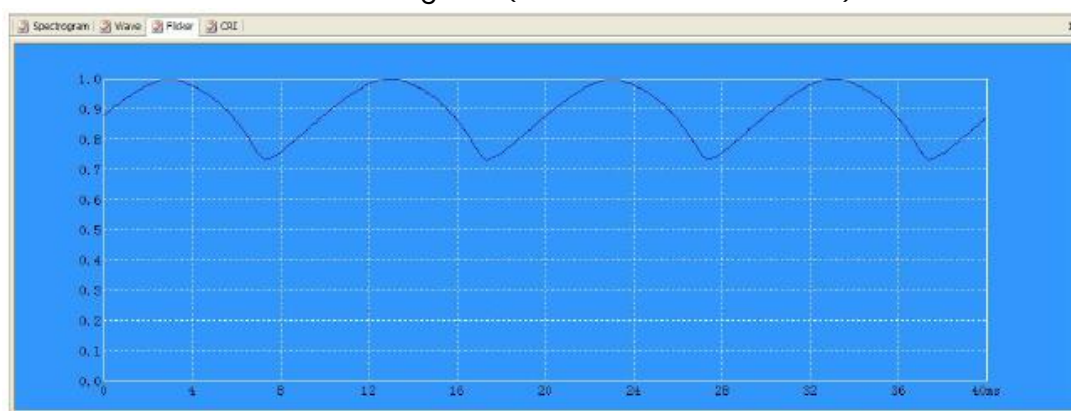
(6) The latest standard color vector map TM30-15. (Provide the model with S):



(7) Color index bar chart and radar map.:



(8) Light source and flicker waveform diagram. (Provide the model with F.):



5. System Calibration

The instrument is calibrated before delivery. user can use it without calibration. and calibration can be referred to the method on the instrument, Convenient and quick, If the user must use the software for calibration operation, pls consult our company's technical personnel for guidance.

6. Lux Calibration

The instrument is calibrated before delivery. user can use it without calibration. and calibration can be referred to the method on the instrument, Convenient and quick, If the user must use the software for calibration operation, pls consult our company's technical personnel for guidance.

7. Software test

1. Install the instrument in the test position and turn it on;

2. Use USB data line to connect the instrument to the computer USB interface;

3. Open test software on computer, click the continuous test icon in the software toolbar  or click

single test icon.  then start testing;

4. If it's a continuous test state, you need to click the stop icon in the toolbar.  to stop test;

5. Save file:



Save as icon, only can save one test data that is currently displayed as a file, suffix is called ohsp;



Save the database icon, it can save all the test data in the current window as a file, suffix is called .db;



Export Excel file, it can save all the test data in the current window as a Tabular form, suffix is called .csv, only can open with Excel.

Typical report page 1

LX1400 Test Report

Product Mark

Model:

Temperature: 20°C

Tester: admin

Manufacture:

Humidity: 65%

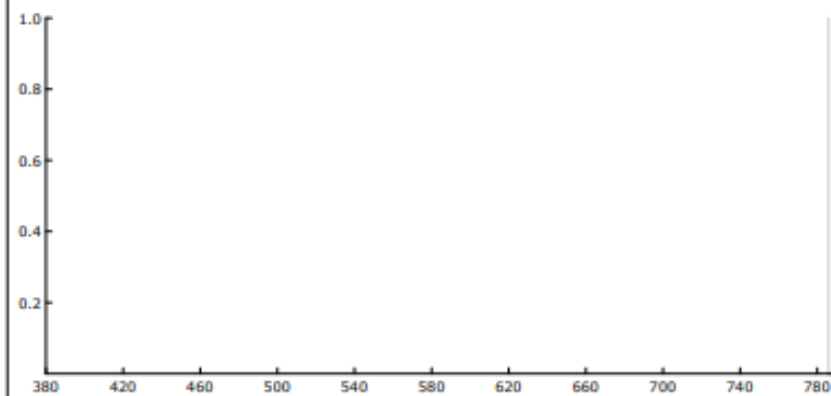
Test Date: ,

Parameter

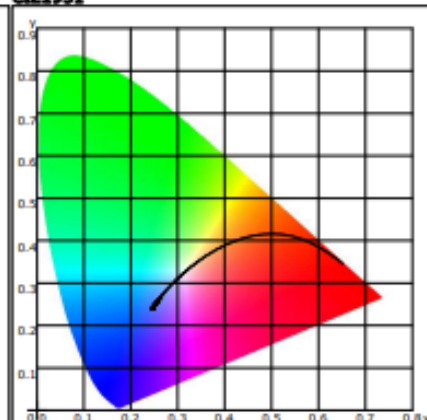
Name	Value	Name	Value	Name	Value	Name	Value
E(lx)	0.00	Centroid(nm)	0.0				
Candle E(fc)	0.00	Color Ratio(RGB)	0.0,0.0,0.0				
CCT(K)	0	CIE1931 X	0.000				
Duv	0.00000	CIE1931 Y	0.000				
x,y	0.0000,0.0000	CIE1931 Z	0.000				
u,v	0.0000,0.0000	Integral Time(ms)	10				
u',v'	0.0000,0.0000	Peak Signal	0				
SDCM	180.25	Dark Signal	0				
Ra	0.0	Compensate level	0				
Ee(mW/cm²)	0.000						
S/P	0.000						
Dominant(nm)	0.00						
Purity(%)	0.0						
HalfWidth(nm)	0.0						
Peak(nm)	0.0						
Center(nm)	0.0						

Spectrogram

Wave: 400.0nm Value: 0.000uW/cm²/nm

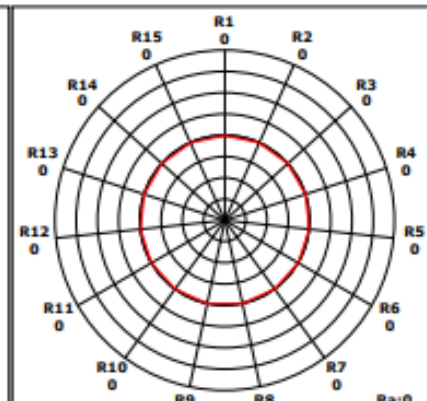


CIE1931



CRI

	-100	-75	-50	-25	0	25	50	75	100
Ra					0				
R1					0				
R2					0				
R3					0				
R4					0				
R5					0				
R6					0				
R7					0				
R8					0				
R9					0				
R10					0				
R11					0				
R12					0				
R13					0				
R14					0				
R15					0				



Instrument Status

Type:

Integral Time: 10.000ms

SN: 0

VPeak: 0

Scan Range: 380-780nm

VDark: 0

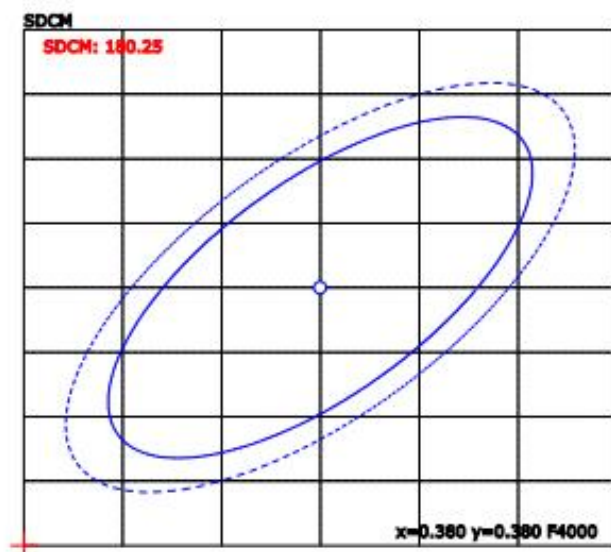
Typical report page 2

LX1400 Test Report

Product Mark

Model:
Temperature: 20°C
Tester: admin

Manufacture:
Humidity: 65%
Test Date: ,



Postadress:

TRÄDGÅRDSTEKNIK AB
Helsingborgsvägen 578, Varalöv
262 96 ÄNGELHOLM

Telefon : 0431-222 90
Bg.nr : 5743-7980
Org.nr : 556409-6120

URL:

www.tradgardsteknik.se
E-postadress:
info@tradgardsteknik.se