



# **User's Manual**

## **Pocket CCD Spectroradiometer (LMS-6000)**

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## PREFACE

Thanks for purchasing & using our products. When opened the carton, please check items according to “packing list” in chapter 1 of this manual. If something missed, please contact us or our dealer as soon as possible, in order to protect your rights.

This is precise instrument. Please read this user manual carefully first in order to avoid improper operation hurting the instrument or tested object. Please keep the user manual for reference when needed. If any question, please contact our local dealer or our technical engineer for further consultation.

Announcement:

- Explanation of our technical department as the standard explanation.
- What is written in the user manual maybe does not include all contents of the instrument. We reserve the right to change or develop its outlook, function, appendix, packing etc without previous notify.
- Copyright reserved by Lisun Group. None is authorized to copy this manual.

## Chapter 1 Packing List

After receiving the goods, please open the carton and check items according to “packing list”. If something missed, please contact us or our dealer. Please keep the carton box for next possible delivery. Each set of CHROMA-2 includes following items:

1	Main Instrument	1
2	Software CD	1
3	Charger	1
4	SD Card	1
5	USB cable	
4	User's Manual	1
5	Calibrate Certificate	1
6	Guarantee Card	1

## Chapter 2 Characteristic & Specification

### 2.1 Items to be tested

- luminance and Color Test Data: Lumi (lx), Duv, Candle E(fc), CCT(k), Coor (x, y), Coor (u, v), Int. time (Integrating Time), PeakSig (Peak Signal), DarkVol (Dark Voltage), ZeroVal (Zero Value), Ra, SDCM,  $\lambda$ Peak (Peak Wavelength), Half Width (Half-bandwidth),  $\lambda$ main (Dominant Wavelength), Purity,  $\lambda$ Cente (Center Wavelength),  $\lambda$ centr (Centroid Wavelength),  $\Delta$ Tota dE\* (Total Color Difference),  $\Delta$ Brig dL\* (Brightness Difference), %RdGr da\* (Red-Green Degree), %YeBl db\* (Yellow-Blue Degree),  $\Delta$ CCT (CCT Difference), Coor (dx,dy), Coor (du,dv)
- LMS-6000S can measure the TM-30
- LMS-6000F can measure the Flicker parameters
- SDCM Diagram
- Spectrum Diagram

### 2.2 Specifications:

- Spectral platform: telephoto asymmetrical crossed CT system.
- Wavelength range: 380~780nm, FWHM: 2nm, Spectral resolution:  $\pm 0.2$ nm
- Sensor: CCD with 3648pix
- Integration time: 0.1ms~5s
- Stray light: <0.015%(600nm) and <0.03%(435nm)
- Illuminance range: 5~200000lx
- CCT range: 1000~100000K
- Color coordinates accuracy:  $\pm 0.005$
- Zero calibration: automatically self calibration
- Test mode: single/continuous
- LCD screen: 5inch high definition IPS capacitive touch screen and resolution is up to 480\*854
- With 4000mAh rechargeable Li-ion battery continuous working time 20 hours max.
- Structure: aluminum alloy carving
- Size is similar as Iphone 6S and thickness is like diameter of 1RMB coin

## Chapter 3 Introduction

### 3.1 System structure

CHROMA-2 Pocket Chroma Meter contains as below:



You need to hold the LMS-6000 and let the Milky piece sensor towards to the light source, keep about **5 seconds** if do single test, then you will get the accuracy test results.

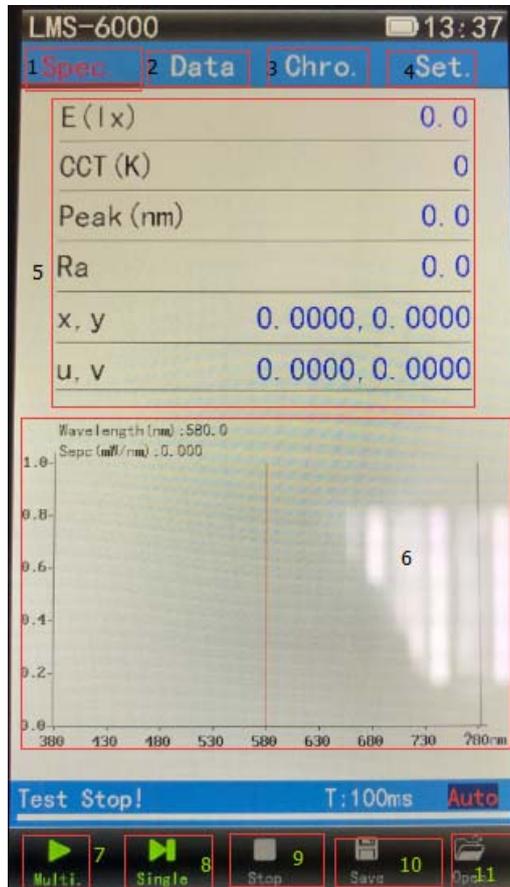
If you do series test, the test results will be changeable according to the different light source.

- Power/Test button: Press for 2s, it will power off the device. Press for once, it will start a single test.
- USB cable port: For charging and PC communication
- SD Card: Insert the SD Card

## Chapter 4 Operation Interface

### 4.1 Spec:

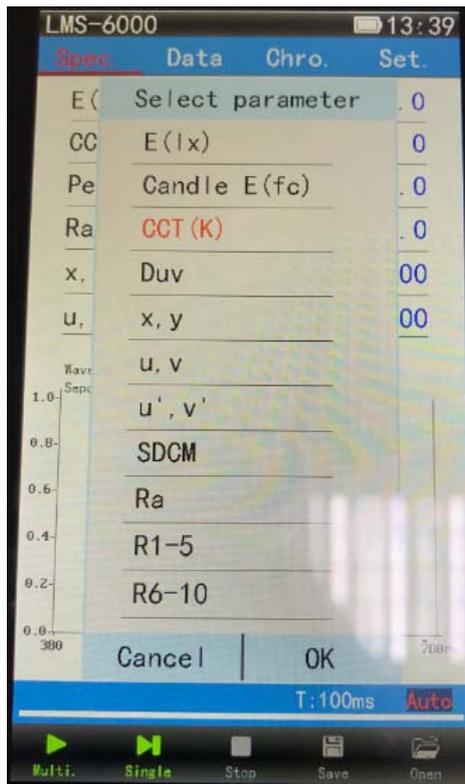
Press Power button, it will display:



And test data will display after about 2 seconds.

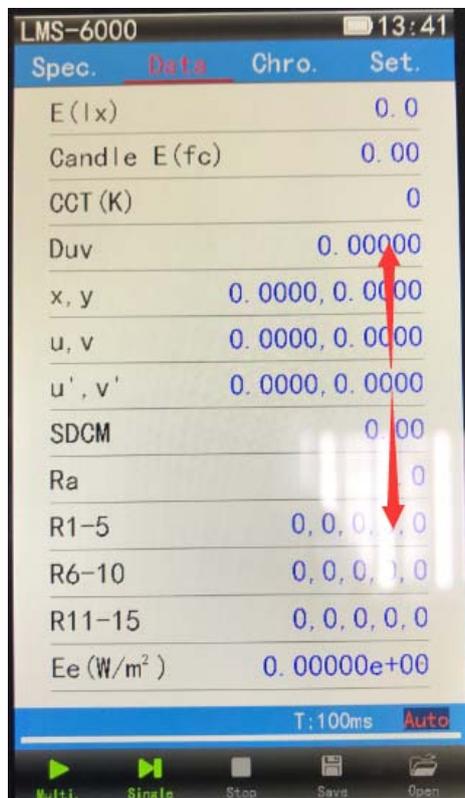
1. Spec: Test interface
2. Data: Light test result
3. Chro: Color test result
4. Set: System setting
5. Test result
6. Test result
7. Multi: Start Continues test
8. Single: Start Single test
9. Stop
10. Save: When the SD Card is inserted, the result can be saved to it
11. Open: Open the test record on the SD card.

✧ In the No. 5 area, you can press any one of it then change the showing parameter like the picture below:



## 4.2 Data

Press 'Data' on the top tools. It will show the interface like below:

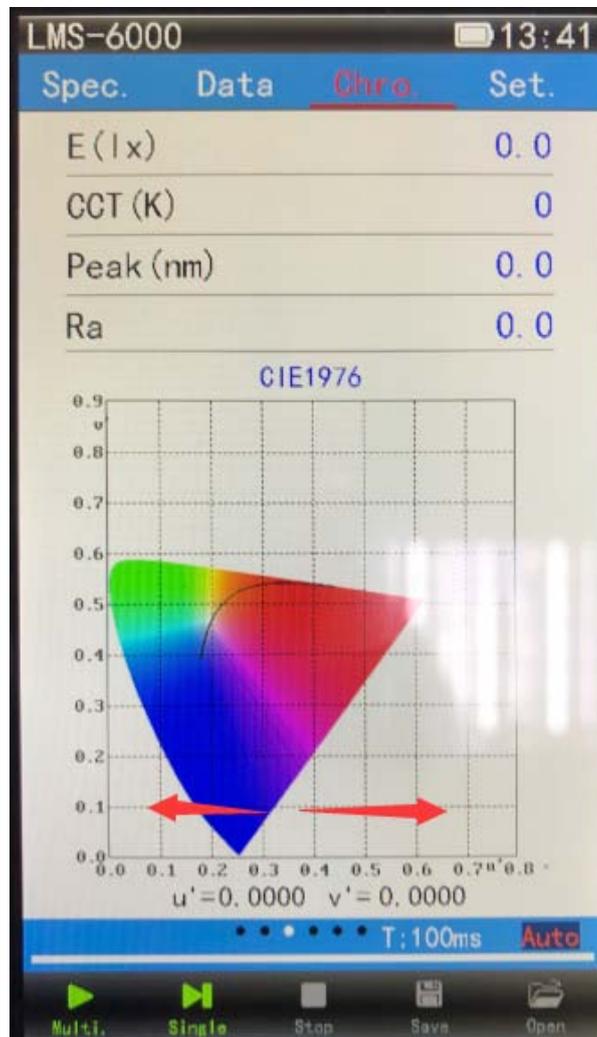


Under this interface, the operator can check the all the results by using finger touch

the screen.

### 4.3 Chro

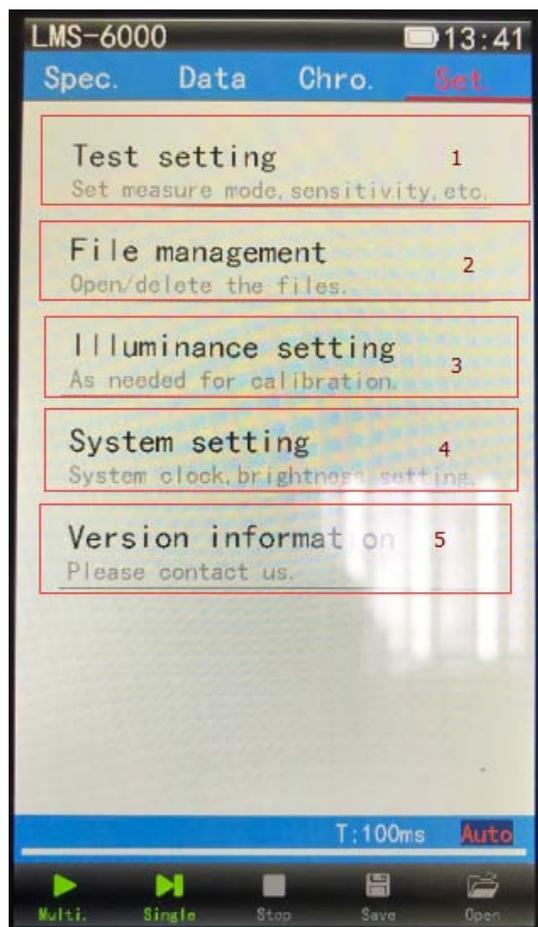
Press "Chro", system displays the menu:



It will show the color test result. The operator can use finger slip to right side or left side and check the different CIE coordinate system.

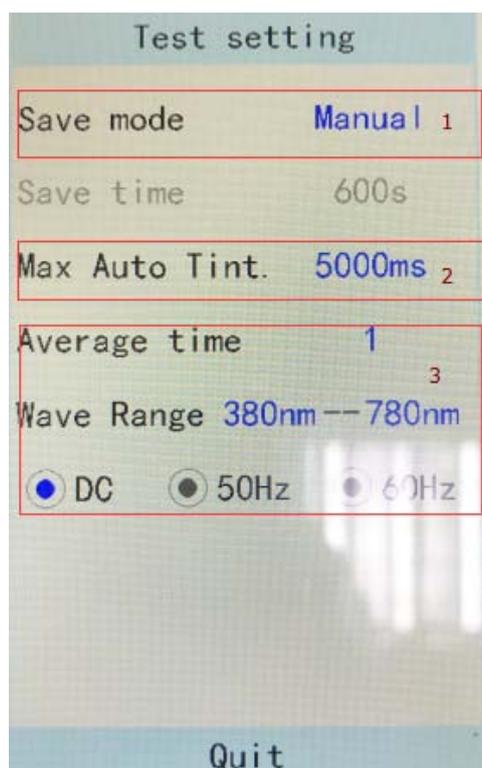
### 4.4 Set

Press "Set", system displays the menu:



#### 4.4.1 Test Setting

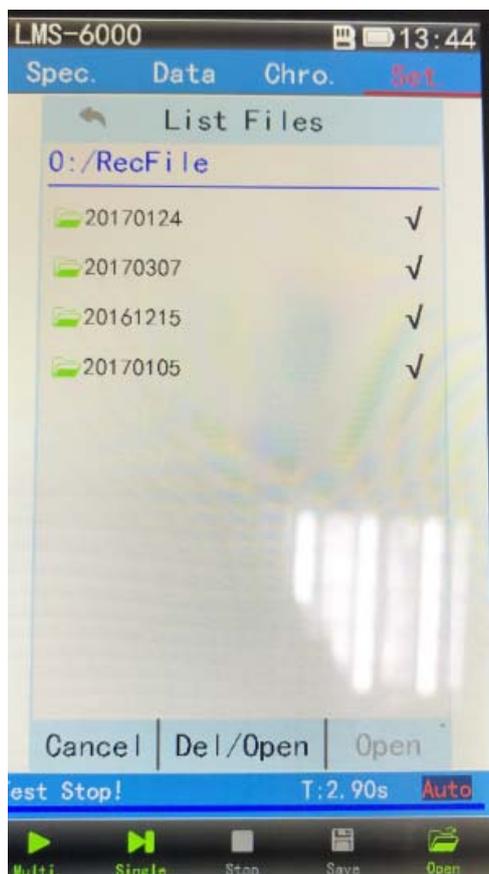
Press 'Test Setting' the screen will show the interface like below:



1. Save mode: If set 'Auto' after the test is finished, the test result will be saved in to the SD card automatically. Otherwise you need save it by manual.
2. Max Auto Tint: The maximum integrating time change from 1~10000ms
3. No need to change.

#### 4.4.2 File Management

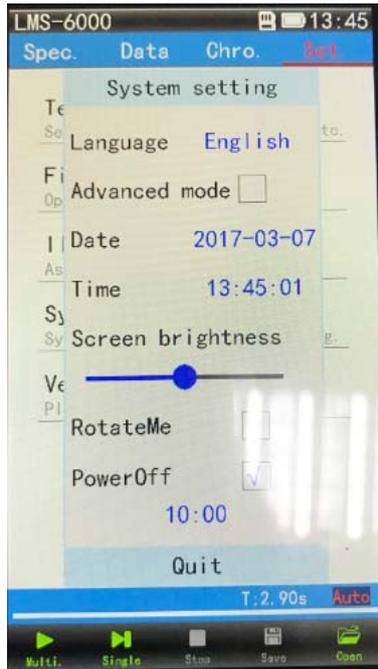
Press 'File Management' the screen will show the interface like below:



Under this interface, the operator can del/open the test record in the SD card.

#### 4.4.3 System Setting

Under this interface, the operator can change the system language/ Adjust the brightness of the screen/Change the date and time of the system



#### 4.4.4 Version Information

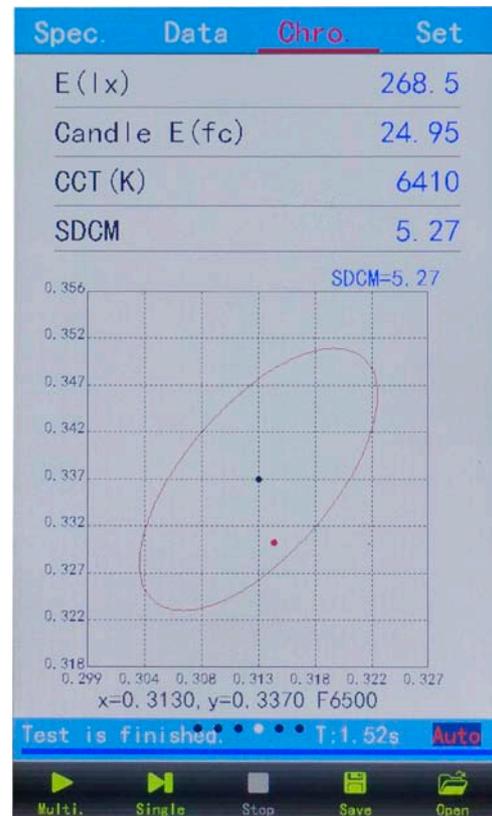
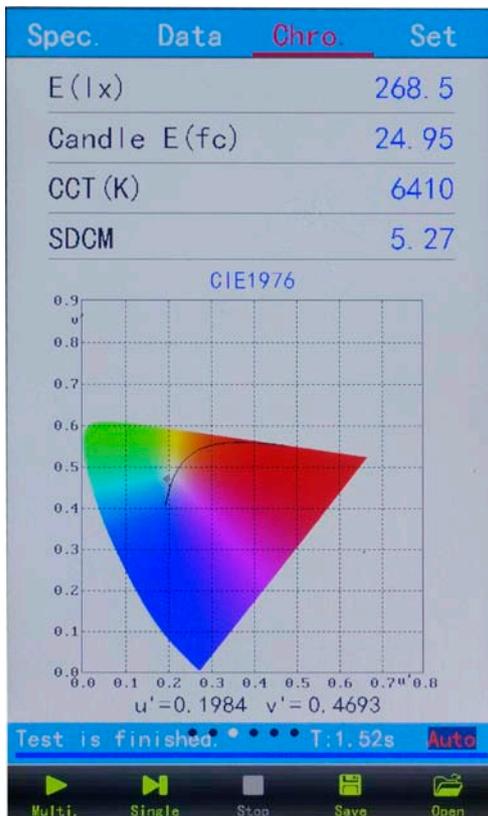
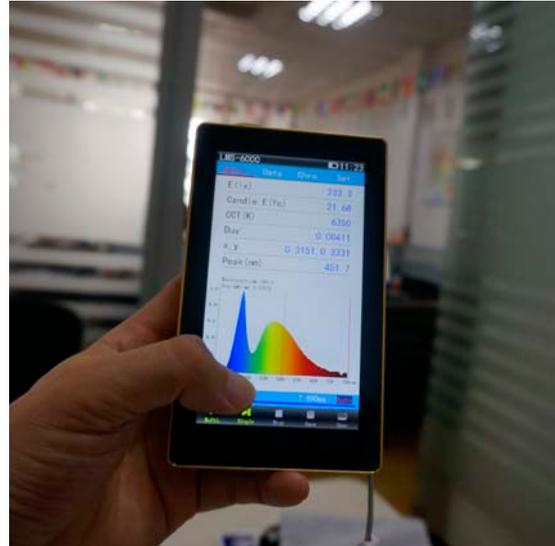
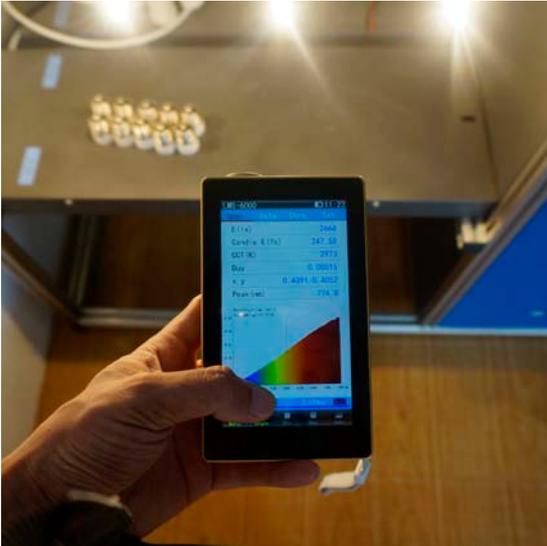
The operator can check the version information/ contact information under this interface.

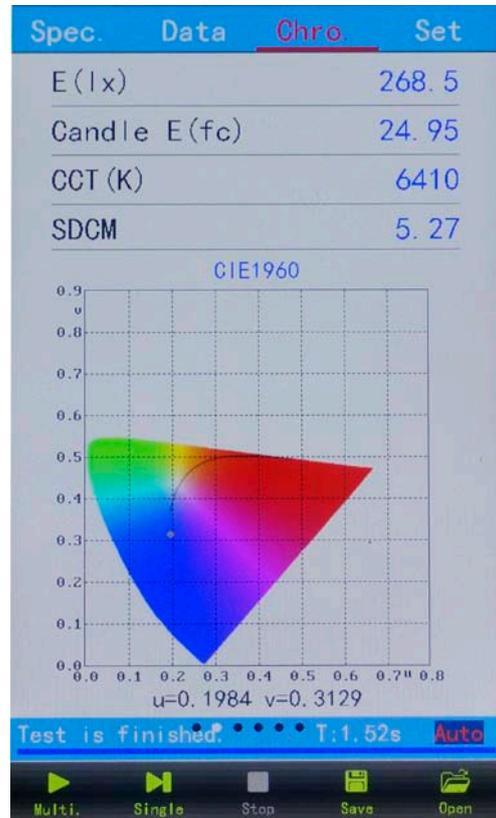
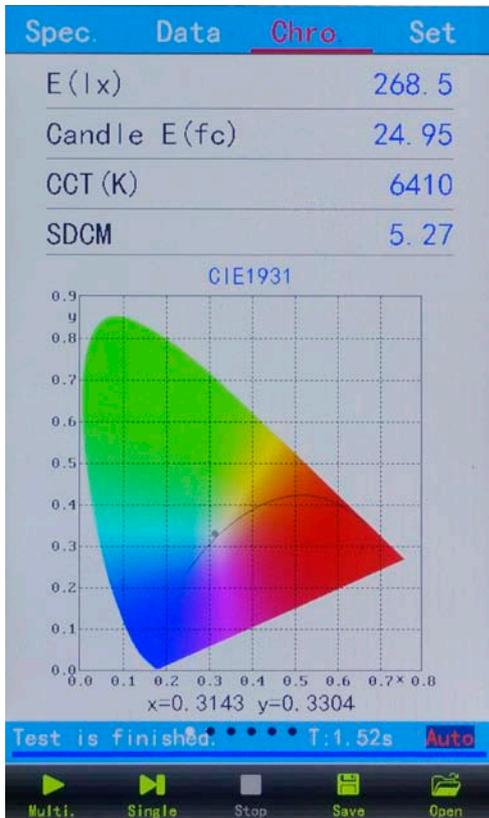
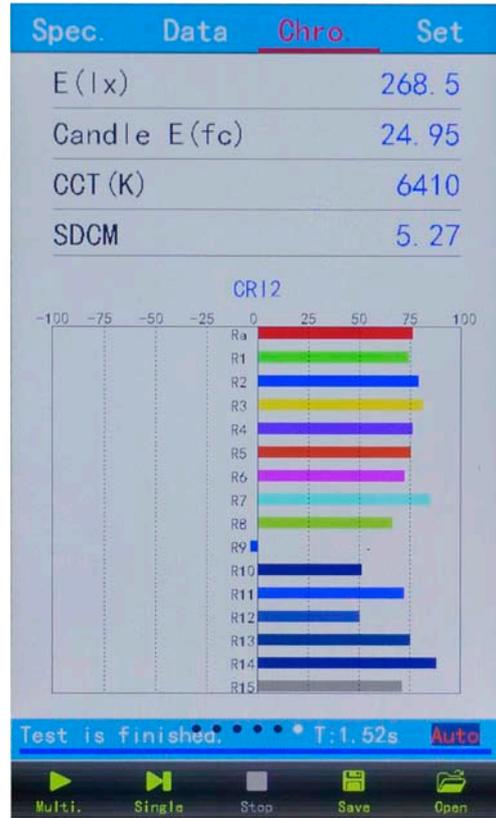
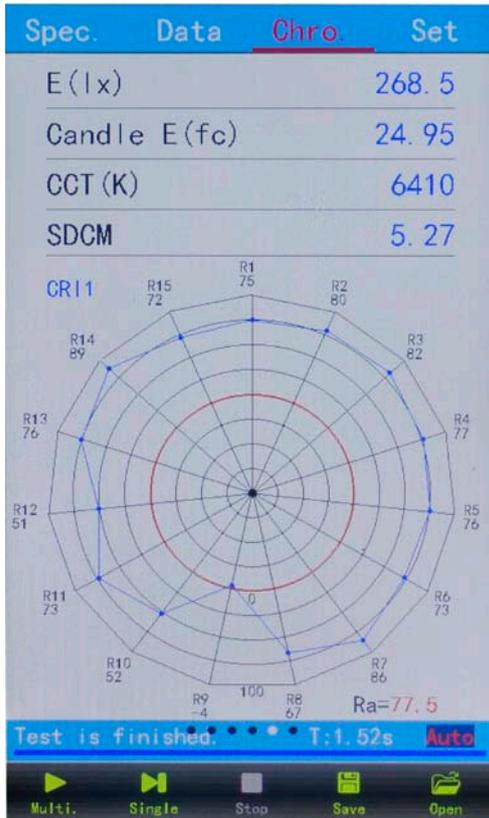


- ✧ 'Illuminance setting' is for the calibration, the device has be calibrated before delivery. The operator doesn't need do this step. If need more operation, please contact Lisun engineer.

## Chapter 5 Test operation

Power on the device, hold the LMS-6000 to the light source then press test button on the screen or press power button for once. The device will start measure, wait for 2`5second. The result will show on the screen. The operator can choose if they need save the result to the SD card.





## Chapter 6 Software

### 5.1 Install the software and driver for LMS-6000

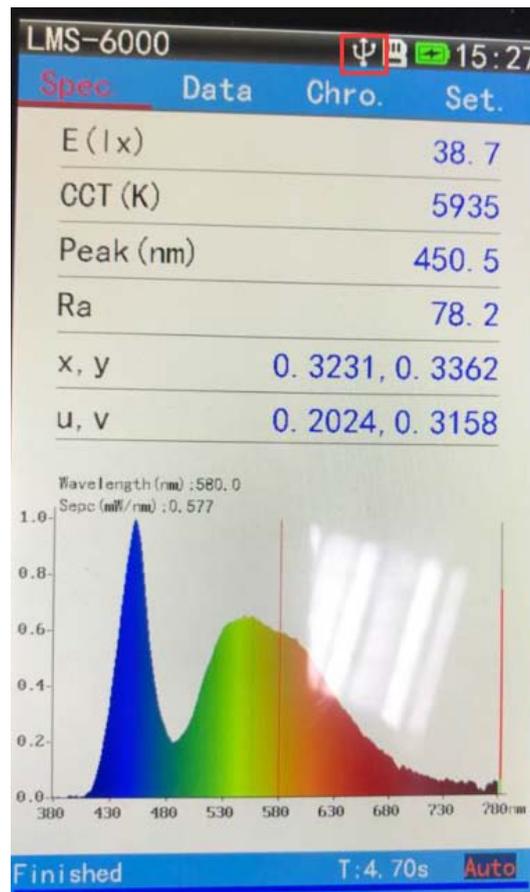
5.1.1 Connect the LMS-6000 to the PC and install the driver for it (If needed)

5.1.2 Install the software for LMS-6000

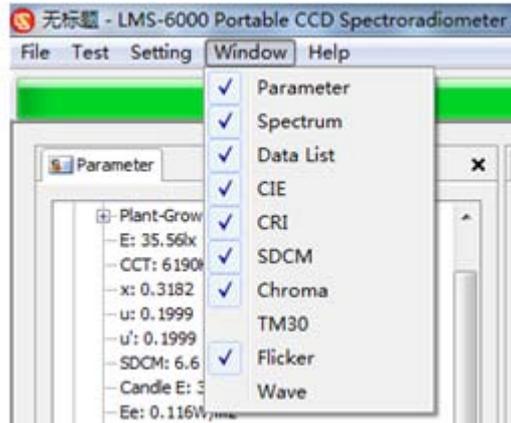
### 5.2 Software operation

#### 5.2.1 Test via software

When connected with pc, the LMS-6000 will display:



Press **Window** to set which parameters the operator need to check on the interface.



Please note the LMS-6000 can not measure TM-30 Flicker COS. They are measured by LMS-6000P.



 : Open the result record in the SD card or PC.

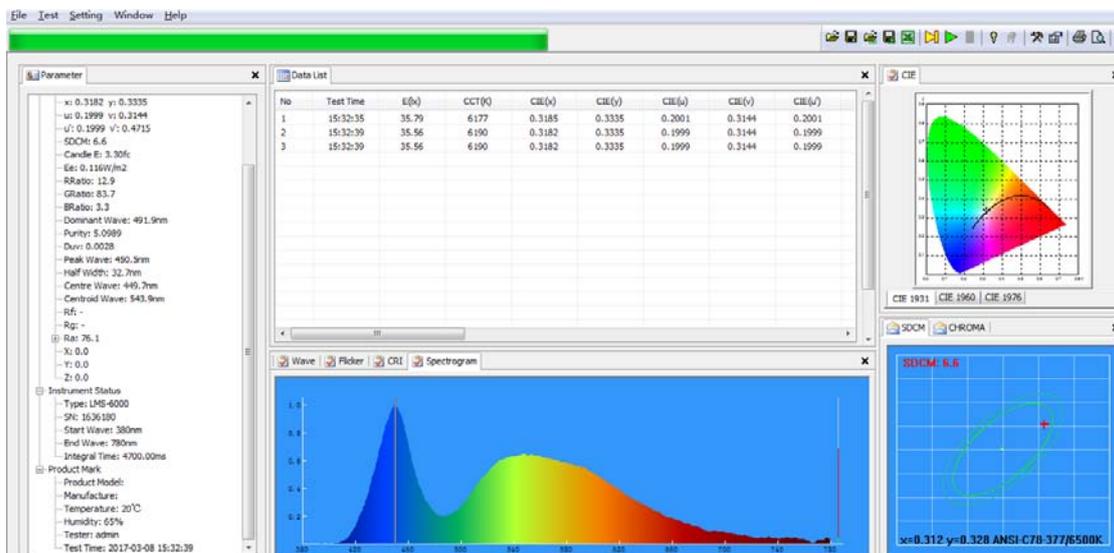
 : Save the test result.

 : Open /save the base data.

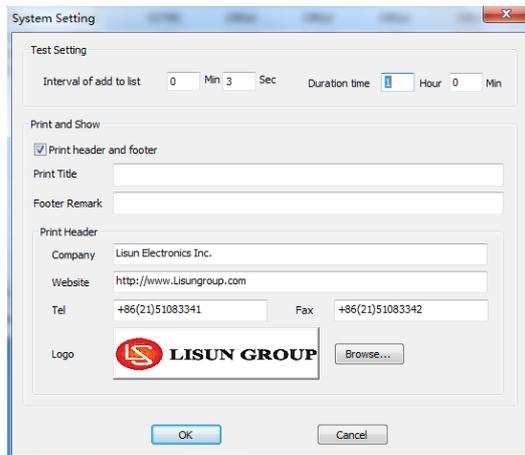
 : Export the test result via excel.

 : Continues/Single test

Click "" on software to start a test, data will display on software surface:

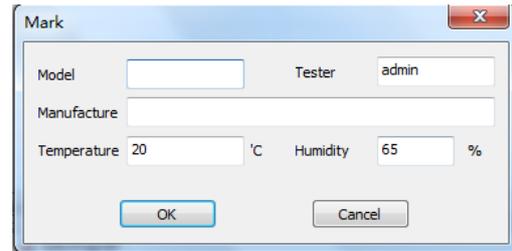


Press 'System setting' or  and 'Product Mark'  to add the test or product information.



The 'System Setting' dialog box contains the following fields and controls:

- Test Setting:** 'Interval of add to list' (0 Min, 3 Sec) and 'Duration time' (Hour 0, Min).
- Print and Show:** A checked checkbox for 'Print header and footer', and text input fields for 'Print Title' and 'Footer Remark'.
- Print Header:** Text input fields for 'Company' (Lisun Electronics Inc.), 'Website' (http://www.Lisungroup.com), 'Tel' (+86(21)51083341), and 'Fax' (+86(21)51083342).
- Logo:** A 'Browse...' button and a preview of the 'LISUN GROUP' logo.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom.



The 'Mark' dialog box contains the following fields and controls:

- Model:** An empty text input field.
- Tester:** A text input field containing 'admin'.
- Manufacture:** An empty text input field.
- Temperature:** A text input field containing '20' followed by a '°C' label.
- Humidity:** A text input field containing '65' followed by a '%' label.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom.