

# پترو فرهان گستر جنوب

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The advertisement features a hand holding a white 3nh array spectrophotometer against an orange background. The device has a large touchscreen display. At the top left is the 3nh logo and website. At the top right are various certification logos including ISO 9001, CE, TÜV, and FC. A star-shaped logo with 'FGJ' and 'FARHAN GOSTAR JONOB' is overlaid on the device. The text 'Array spectrophotometer' is written in red, with model numbers 'ST1818', 'ST2020', and 'ST2222' listed below. A tagline at the bottom right reads 'Win the trust of users with excellent performance'.

3nh<sup>®</sup>  
3nh.com

Array  
spectrophotometer

ST1818  
ST2020  
ST2222

ISO 9001  
Certified

CE

TÜV

FC

FGJ  
FARHAN GOSTAR JONOB

Win the trust of users with  
excellent performance

## Product introduction

The ST2222 adopts a built-in large area silicon photodiode array (22 sets of double row) sensor, which has excellent repeatability and platform difference, and the measurement data is continuously stable, accurate and reliable. Repeatability of array spectrophotometer ST2222  $\Delta E^*_{ab}$  is easily controlled within 0.018, and the difference between platforms  $\Delta E^*_{ab}$  is controlled within 0.18, with accurate measurement, which can be used for accurate color analysis and transmission in the laboratory.



Multiple Apertures



Camera Locating



Double optical path

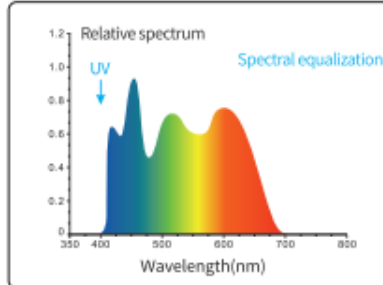


Support APP

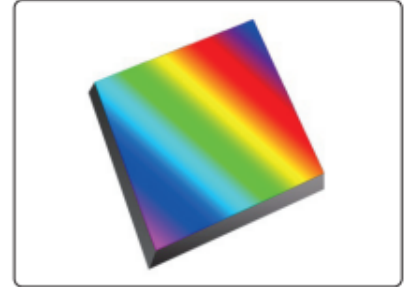
## Features



1. Silicon photodiode array (double row 22 groups) sensor, more accurate and stable measurement.



2. Full band balanced LED light source+UV light source can be used to measure fluorescent materials.



3. The plane grating light splitting technology is adopted, which has higher resolution and makes the color measurement more accurate.



4. Intelligent Automatic Calibration (Non-contact Automatic Lifting and Lowering)



5. New and fashionable appearance design based on ergonomics.



6. Equipped with five measuring calibers to meet the measurement requirements of large and small samples



7. Camera location can clearly observe the measured area



8. The error between instruments is small, ensuring the consistency of measurement data of multiple equipment, which can be used for color matching and accurate color transfer.

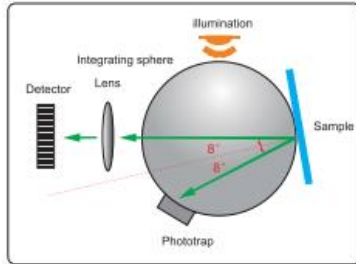


9. It provides 30+ color spaces and 40+ observation light sources, which can meet the special measurement requirements under different measurement conditions.

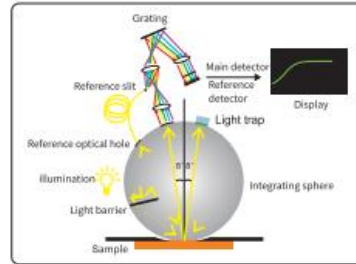


3nh.com

## Features



10. Adopt international D/8 SCI/SCE synthesis technology



11. The dual optical path system ensures more stable and accurate measurement data when the measurement environment changes.



12. The array spectrophotometer ST2222 supports Android, IOS, Windows, WeChat applet and Hongmeng system, and is suitable for quality monitoring and color data management in various industries.

## Powerful

- Applicable to color difference quality control in plastic electronics, paint and ink, textile and garment printing, printing, ceramics and other industries
- Support spectral reflectance, CIE Lab, CIE LCh, HunteLab, CIE-Luv, XYZ, Yxy, RGB, Chromatic aberration  $\Delta E^*ab$ ,  $\Delta E^*cmc$ ,  $\Delta E^*94$ ,  $\Delta E^*00$ , Whiteness (ASTM E313-00, ASTM E313-73, CIE/ISO, AATCC, Hunter, Taube Berger Stensby), yellowness (ASTM D1925, ASTM E313-00, ASTM E313-73), blackness (My, dM), Color fastness, color fastness, Tint (ASTM E313-00), Color density CMYK (A, T, E, M), homochromatic heterochromatic index Milm, Munsell, hiding power, strength (dye strength, tinting power)

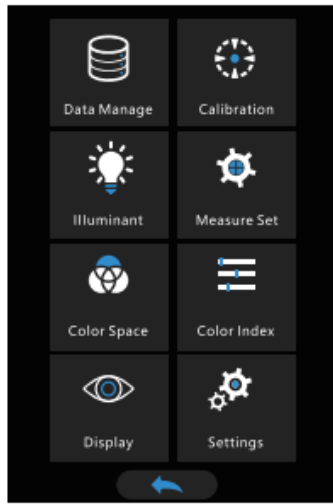
## Efficient

- Ideal for laboratory and factory use
- Multiple measuring apertures, supporting plane and curved surface measurement, Measurement of small items under different conditions
- Support USB cable and Bluetooth wireless transmission, data Instant test and transmission, convenient and fast
- The measurement is fast and accurate, and the SCI is measured at the same time. It only takes 1s for SCE

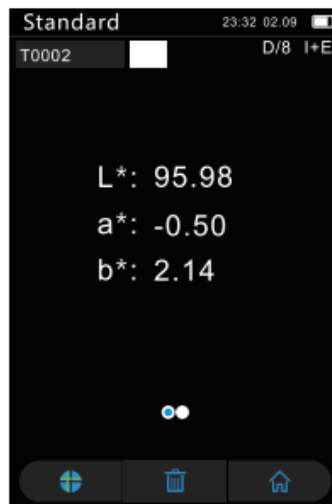
## Accurate reading

- Measurement accuracy 0.01
- The repeatability standard deviation is  $\Delta E^*ab \leq 0.018$
- Support multiple national and international standard measurements

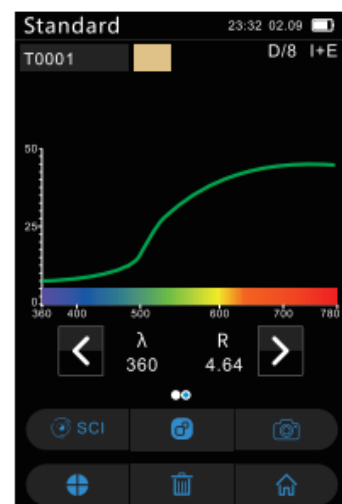
## Function display



Main Menu



Standard sample measurement



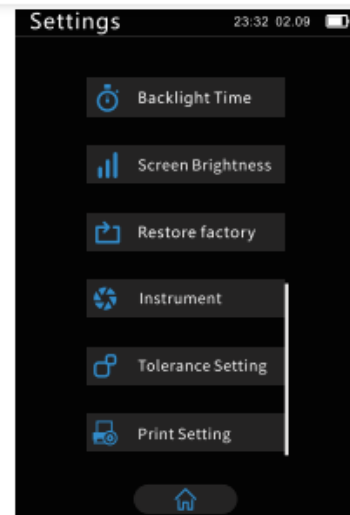
Standard sample measurement and color difference



illumination setting



Metamerism



System settings



### Multi functional intelligent charging base

The multi-functional intelligent charging base is a smart base that we independently developed and integrates charging and automatic calibration. It uses the self-developed 3.0 fast charging technology and is equipped with an imported standard white board. The white board automatically rises and falls (national patent) when starting automatic calibration to ensure that the white board is not easy to get dirty and is stable and accurate for a long time.

## Optional accessories

The instrument comes with 2 optional accessories; Such as micro printer, powder test box; Meet measurement needs.

### Microprinter

Easy to carry, without computer can be continuously printed out the measurement of various parameters, easy to save.

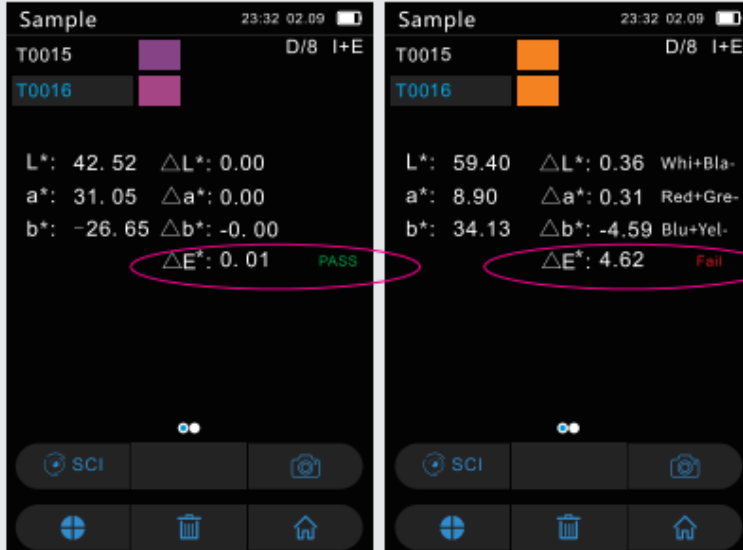


### Powder test box

Easy to use, focused on powdered target measurement.



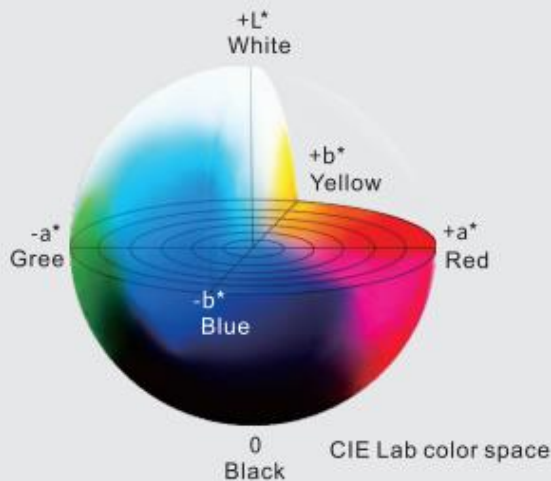
## Evaluation of test results



Comply with ISO7724-1 and ASTM E1164 standards. By setting the color values of the standard sample and sample obtained under the light source, the system will automatically calculate the formula to obtain the color difference value and color deviation. Within the set tolerance range, the system will display "qualified"; when it exceeds the set range, the system will display "unqualified".

The difference of color difference is distinguished by NBS unit, which is derived based on the unit of color difference calculation formula established by Judd Hunter. When the value of NBS unit is larger, the color difference is more obvious, and vice versa.

NBS Range	Perception
0.00-0.50	trave
0.50-1.50	slight
1.5-3	noticeable
3-6	appreciable
6+	much



CIE LAB, XYZ, Yxy, LCh, CIE LUV, s-RGB, HunterLab,  $\beta Xy$ , DIN Lab99 and other color spaces are available, such as the common CIE Lab color space:

L \* means black and white. The larger the value of L \*, the higher the brightness;  
 A \* represents red and green,+a \* represents red, and - a \* represents green;  
 B \* represents yellow blue,+b \* represents yellow, and - b \* represents blue.

Through the color bias display, we can easily adjust the color ratio.

## SQCX

Connect devices for powerful function expansion

Create instant reports using SQCX

SQCX can connect the spectrophotometer through USB cable and Bluetooth (only for instruments supporting Bluetooth), control the instrument to measure, change the instrument configuration, and operate the instrument data. At the same time, it also greatly expands the functions of the instrument, supports a variety of color systems, light sources, more complex data management, color detection, report generation, etc., and is a powerful assistant for color quality management.



## SQCA

### Connect

Via Bluetooth @ Connect the instrument to the mobile phone to see the real-time readings directly, and save them to the historical record.

### Review

Visually view historical measurement records for easy comparison.

### Management and printing

You can copy, delete and upload data to the cloud, or print the data by connecting to a Bluetooth printer.

### Rename and change

You can name data records to facilitate data modification while recording.

### Color check and color formula



The APP is built with massive color data. Through the analysis of measured colors, the software automatically finds similar color cards and obtains color formulas.

### Transmission

Transfer detection data from mobile devices to computers for further analysis, create reports or upload to the cloud.



**Product parameters**

Model	Array spectrophotometer ST1818	Array spectrophotometer ST2020	Array spectrophotometer ST2222
<b>Optical Geometry</b>	D/8 (diffused illumination, 8-degree viewing angle)		
<b>SCI/SCE</b>	SCI includes specular light	SCI/SCE includes specular light/excludes specular light;Include/Exclude UV Measurements	
<b>Conform to Standards</b>	CIE No.15,GB/T 3978,GB 2893,GB/T 18833,ISO7724-1,ASTM E1164,DIN5033 Teil7		
<b>Repeatability*</b>	$\Delta E^*ab \leq 0.038$	$\Delta E^*ab \leq 0.028$	$\Delta E^*ab \leq 0.018$
<b>Error between instruments**</b>	$\Delta E^*ab \leq 0.38$	$\Delta E^*ab \leq 0.28$	$\Delta E^*ab \leq 0.18$
<b>Display accuracy</b>	0.01		
<b>Measuring/lighting aperture***</b>	Double aperture: $\Phi 8mm/\Phi 10mm$ Flat+ $\Phi 8mm/\Phi 10mm$ Tip	3 aperture: $\Phi 8mm/\Phi 10mm$ Flat+ $\Phi 4mm/\Phi 5mm$ Flat+1*3mm	5 aperture: $\Phi 8mm/\Phi 10mm$ Flat+ $\Phi 8mm/\Phi 10mm$ Tip+ $\Phi 4mm/\Phi 5mm$ Flat+ $\Phi 4mm/\Phi 5mm$ Tip+1*3mm
<b>Measurement index</b>	Spectral reflectivity, CIE-Lab, CIE-LCh, HunteLab, CIE-Luv, XYZ, Yxy, RGB, chromatic aberration ( $\Delta E^*ab$ , $\Delta E^*CMC$ , $\Delta E^*94$ , $\Delta E^*00$ ), whiteness (ASTM E313-00, ASTM E313-73, CIE/ISO, AATCC, Hunter, Taube Berger Stensby), yellows (ASTM D1925, ASTM E313-00, ASTM E313-73), blackness (My, DM), staining fastness, colour changing fastness, tint (ASTM E313-00), color density CMYK (A, T, E, M), isochromism index Milm, Munsell, hiding power, force fraction (dye strength, coloring power)		
<b>Light source conditions</b>	A,B,C,D50,D55,D65,D75,F1,F2,F3,F4,F5,F6,F7,F8,F9,F10,F11,F12,CWF,U30,U35,DLF,NBF,TL83,TL84,ID50,ID65,LED-B1, LED-B2,LED-B3,LED-B4,LED-B5,LED-B6,LED-BH1,LED-RGB1,LED-V1,LED-V2,LED-V3,Customizable light source		
<b>Display</b>	Spectrogram/Values,Samples Chromaticity Values,Color Difference Values/Graph,PASS/FAIL Result,Color Simulation,Color Offset		
<b>Illuminants</b>	Combined Full Spectrum LED Lamp	Combined Full Spectrum LED Lamp, UV Lamp	
<b>Locating Method</b>	Stabilizer, observation	Camera observation, stabilizer, observation	
<b>Whiteboard Calibration</b>	Intelligent automatic calibration (contact type)		Intelligent automatic calibration (non-contact automatic lifting)
<b>Accuracy Guarantee</b>	Level 1 measurement qualified		
<b>Observer Angle</b>	2°, 10°		
<b>Integrating Sphere Size</b>	40mm		
<b>Spectroscopic Method</b>	Plane Grating		
<b>Sensor</b>	Large area silicon photodiode array (double row 18 groups)	Large area silicon photodiode array (double row 20 groups)	Large area silicon photodiode array (double row 22 groups)
<b>Wavelength Interval</b>	10nm		
<b>Wavelength Range</b>	400-700nm(The user can view the reflectivity of 31 wavelengths)		
<b>Reflectance Range</b>	0-200%		
<b>Reflectivity resolution</b>	0.01%		
<b>Measurement Mode</b>	Single measurement, average measurement (2~99 times)		
<b>Measuring Time</b>	about 1s		
<b>Dimension</b>	Length X Width X Height=114X70X208mm		
<b>Weight</b>	About 435g (Calibration Base not included)		
<b>Battery</b>	Lithium battery, 3.7V, 5000mAh, 8500 times measurements within 8 hours		
<b>Illuminant Life Span</b>	More than 1.5 million measurements in 10 years		
<b>Display</b>	TFT True Color 3.5inch, Capacitive Touch Screen		
<b>Data Port</b>	USB	USB, Bluetooth®	
<b>Data Storage</b>	500 standard samples and 10000 samples; PC mass storage	500 pcs standard samples, 20,000 pcs samples (one piece of data can include SCI+SCE at the same time), APP/PC mass storage	
<b>Software Support</b>	Windows	Andriod, IOS, Windows, Wechat APPIet, Harmony OS	
<b>Language</b>	Simplified Chinese, English, Traditional Chinese, Russian		
<b>Standard Accessory</b>	Power adapter,USB cable,Manual,Quality Management Software(official website download), Calibration Box, Protective Cover, Wrist Strap, Measuring Apertures		
<b>Optional Accessory</b>	Micro-printer, Powder Test Box		

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