

HUD-2000 抬头显示器光学特性测量系统

HUD-2000 Head Up Display Optical Characteristics Measurement System

- HUD-2000是一体化的抬头显示（HUD）综合光学特性测量分析系统，配置有多维自动转台以及模拟人眼成像的高精度亮度测量设备，通过专业的测控分析软件能快速准确地测量HUD的虚像距离、眼盒大小、亮度和色度均匀性、成像畸变等光学特性。系统测试满足SAE J 1757-2、IDMS等标准的测量要求，广泛应用于HUD总成厂家、挡风玻璃厂家、主机厂、HUD芯片厂等等。

HUD-2000 is an integrated head up display (HUD) integrated optical characteristic measurement and analysis system, equipped with multi-dimensional automatic turntable and high-precision brightness measurement equipment simulating human eye imaging, which can quickly and accurately measure the virtual image distance, eye box size, brightness and chromaticity uniformity, imaging distortion and other optical characteristics of HUD through professional measurement and analysis software. The system test meets the measurement requirements of SAE J 1757-2, IDMS and other standards, and is widely used in HUD assembly manufacturers, windshield manufacturers, host manufacturers, HUD chip manufacturers, etc.

- 针对产线或现场测量HUD产品，远方也推出HUD光学测量模块配套专业分析软件的方案，既方便客户在产线上集成HUD光学测量模块对HUD产品进行快速测试，也便于客户在现场或驾驶舱内对HUD光学特性进行检验。

For HUD products measured on the production line or in the field, the scheme of supporting professional analysis software for HUD optical measurement modules is also launched remotely, which not only facilitates customers to integrate HUD optical measurement modules on the production line for rapid testing of HUD products, but also facilitates customers to inspect HUD optical characteristics on the site or in the cockpit.



特点与优势 Characteristics and advantage

- 搭配高精度亮度测量设备模拟人眼采集测量HUD虚像的光色质量
It is equipped with high-precision brightness measurement equipment to simulate human eye to collect and measure the light color quality of HUD virtual image
- 多轴自动化转台，模拟汽车不同驾驶位置，实现HUD光学特性的全方位测试，满足不同型号汽车、不同驾驶人群的需要；灵活配置，适用客户不同需求（实验室或生产流水测试），具体配置方案可咨询销售经理。
Multi axis automatic turntable, which simulates different driving positions of vehicles, realizes all-round testing of HUD optical characteristics, and meets the needs of different models of vehicles and different driving groups; Flexible configuration, applicable to different customer needs (laboratory or production flow test), specific configuration scheme can be consulted with the sales manager.
- 智能化分析软件支持单点及序列化测试，且支持各项参数的多样化分析，包括亮度、色度切面分布、3D分析等等
Intelligent analysis software supports single point and serial testing, and supports diversified analysis of various parameters, including brightness, chromaticity slice distribution, 3D analysis, etc

特点与优势 Characteristics and advantage

- 高端配置，全新测量体验

测量范围宽，测量精度高

国际专利保护：SFIM-400采用具有国际专利的SBCT技术，大幅拓宽光度测量范围和提高精度。

光度测量范围：0.01lx~200klx (A光源)

SBCT：分光-积分相结合方法，是世界公认的光度/辐射度测量的高精度的方法。

采用专利的复变矩阵杂散光校正技术，使光谱测量中的杂散光控制能力提高1~2个数量级。

High end configuration, new measurement experience

Wide measuring range and high measuring accuracy

International patent protection: SFIM-400 adopts the SBCT technology with international patents, greatly expanding the photometric measurement range and improving the accuracy.

Photometric measurement range: 0.01lx~200klx (A light source)

SBCT: Spectrometric integration method, which is recognized worldwide as a high-precision method for photometric/radiometric measurement.

The patented complex matrix stray light correction technology is adopted to improve the stray light control ability in spectral measurement by 1~2 orders of magnitude.



- 毫秒级超快智能测量

光谱、闪烁、光度、色度等毫秒级智能测量分析，快捷高效。

数据可以excel,jpg等多种格式输出

多语言操作系统

Millisecond class ultra fast intelligent measurement

Millisecond intelligent measurement and analysis of spectrum, scintillation, luminosity, chroma, etc., fast and efficient.

Data can be output in excel, jpg and other formats

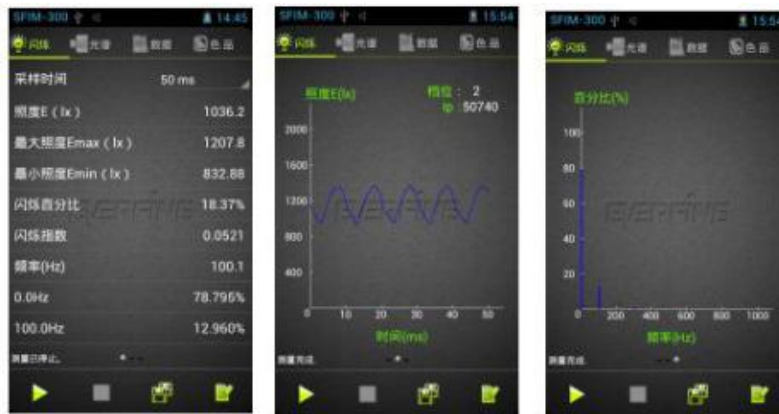
Multilingual operating system

特点与优势 Characteristics and advantage

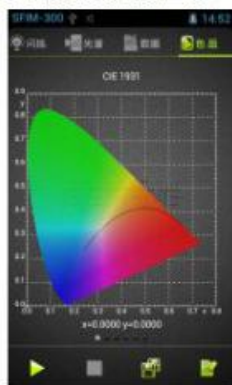
- 精致轻巧 界面直观 易读易用
Delicate and lightweight interface, intuitive, easy to read and use



- 5.0寸超大显示屏一键式操作数据实时读取
Real time reading of one key operation data of 5.0 inch large display screen

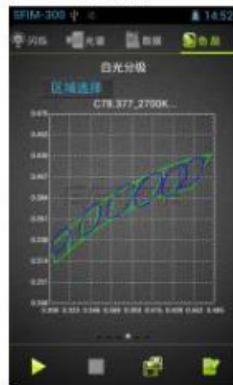


主机主界面（默认闪烁显示）



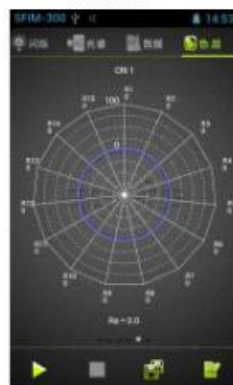
色品图界面

照度曲线



白光分binning

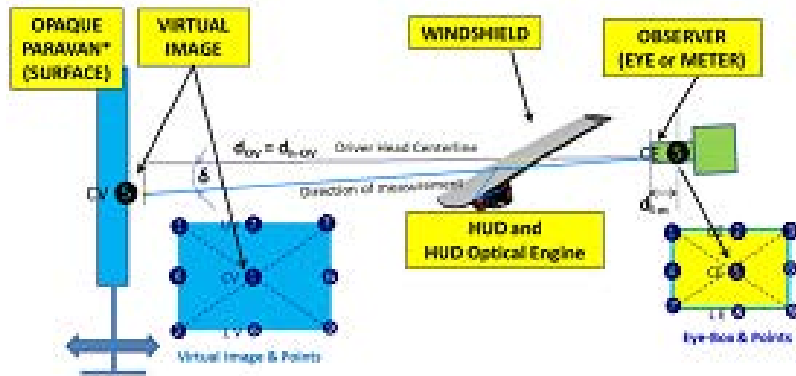
FFT 频谱图



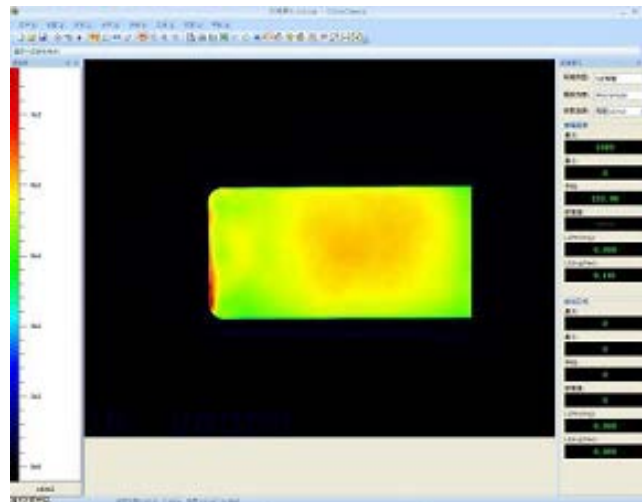
显色指数雷达图

技术参数 Specifications

- 1) 虚像距离、虚像大小尺寸、俯视角的测试
 1) Test of virtual image distance, virtual image size and top view angle

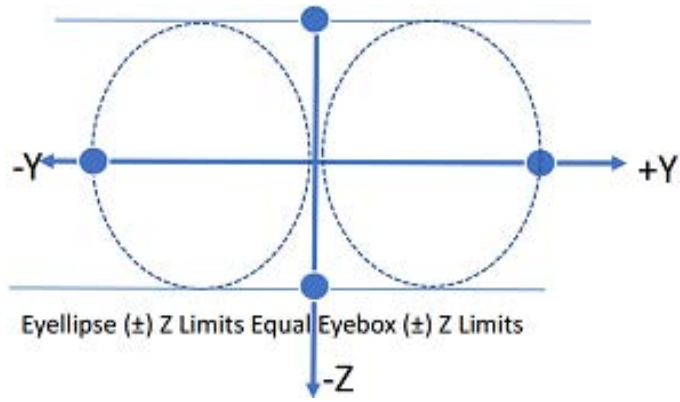


- 2) 亮度均匀度、色度参数
 2) Luminance uniformity and chromaticity parameters

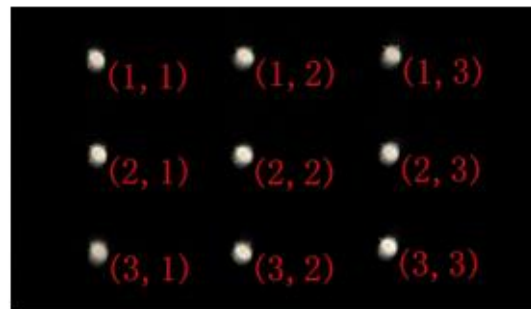
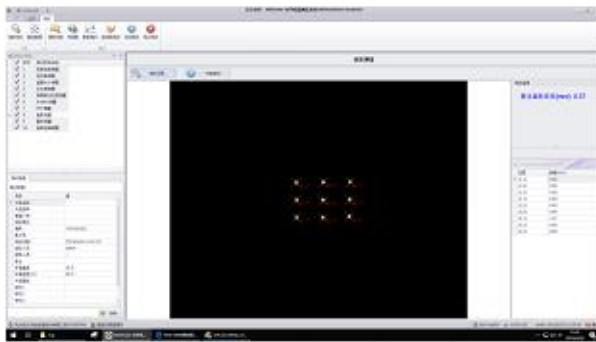


- 3) 虚像对比度 (MTF)、BlackMura分析
 3) Virtual image contrast (MTF), BlackMura analysis
- 4) 对比度、棋盘格对比度
 4) Contrast, checkerboard contrast
- 5) FOV视场、眼盒大小测试
 5) FOV field of view, eye box size test

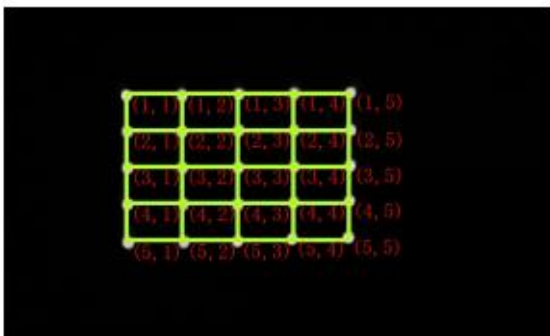
技术参数 Specifications



- 6) 图像像差测试, 包括虚像旋转角度、虚像总水平/垂直畸变、虚像水平/垂直畸变
6) Image aberration test, including virtual image rotation angle, virtual image total horizontal/vertical distortion, virtual image horizontal/vertical distortion
- 变最大值、重影 (鬼像) 测试 5) FOV视场、眼盒大小测试
Maximum change, ghost (ghost) test



重影 (鬼像) 测试



畸变(%) : 1.55

位置	畸变(%)	位置	畸变(%)	位置	畸变(%)
(1, 1)	0.46	(1, 2)	0.53	(1, 3)	0.27
(1, 4)	0.38	(1, 5)	0.92	(2, 1)	0.22
(2, 2)	0.42	(2, 3)	0.18	(2, 4)	0.30
(2, 5)	0.65	(3, 1)	0.16	(3, 2)	0.13
(3, 3)	0.00	(3, 4)	0.37	(3, 5)	0.78
(4, 1)	0.24	(4, 2)	0.24	(4, 3)	0.30
(4, 4)	0.60	(4, 5)	1.29	(5, 1)	0.91
(5, 2)	0.77	(5, 3)	0.43	(5, 4)	1.13
(5, 5)	1.55				

技术参数 Specifications

- 7) 亮度分布、横切及纵切面分布图
7) Luminance distribution, cross section and vertical section
- 8) 色度数据CIE色坐标图中显示
8) Chromaticity data displayed in CIE color coordinate diagram
- 9) 数据及图片可导出PDF、EXCEL等功能。
9) Data and pictures can be exported to PDF, EXCEL and other functions