HUD-3000 抬头显示器光学特性测试系统
HUD-3000 Head Up Display Optical Characteristics Testing System

● HUD-3000光学特性测试系统，搭载成像（彩色）亮度计、多维转台、挡风玻璃支架和HUD专业测量分析软件等，可实现常规HUD和AR-HUD的光学特性测试。HUD-3000紧跟HUD的发展变化，为HUD虚像提供完整的亮度、尺寸和颜色测量解决方案，可满足HUD产品的质检、研发和生产中的测量需求。基于SAE J1757-1、SAE J1757-2和ISO15008等国际标准，HUD-3000可实现FOV视场角、虚像距离(VID)、亮度、色度、虚像对比度（MTF）、重影等光学特性的测量。

The HUD-3000 optical characteristic test system, equipped with imaging (color) luminance meter, multi-dimensional turntable, windshield bracket and HUD professional measurement and analysis software, can realize the optical characteristic test of conventional HUD and AR-HUD. The HUD-3000 closely follows the development and changes of HUD and provides a complete brightness, size and color measurement solution for HUD virtual images, which can meet the measurement requirements in quality inspection, research and development and production of HUD products. Based on SAE J1757-1, SAE J1757-2, ISO15008 and other international standards, HUD-3000 can measure FOV field angle, virtual image distance (VID), brightness, chromaticity, virtual image contrast (MTF), ghost and other optical characteristics.

特点与优势 Characteristics and advantage
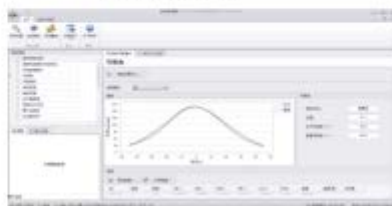
● **软件界面:**
Software interface:

GAMMA 曲线

白平衡测试

亮度色度均匀测试

色域测试

视角测试

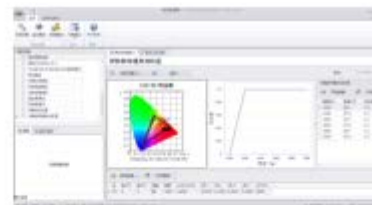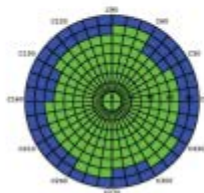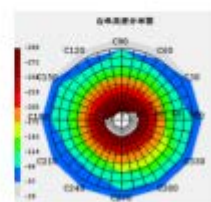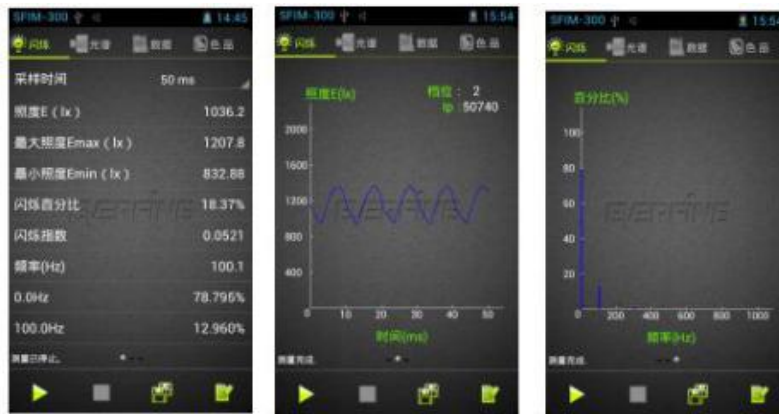
串扰测试

环境光对比度测试

反射率测试
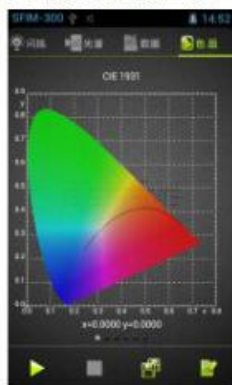

评估环境光对比度

灰阶响应时间测试

色偏测试

亮度分布图

● **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
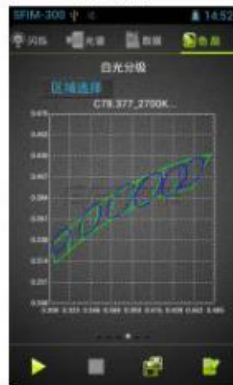 Real time reading of one key operation data of 5.0 inch large display screen
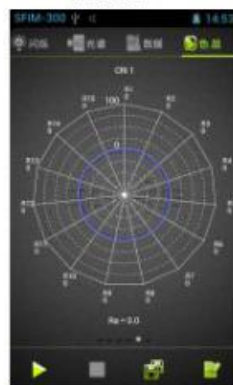

主机主界面（默认闪烁显示）　　　　亮度曲线　　　　FFT 频谱图

色品图界面　　　　白光分 binning　　　　显色指数雷达图
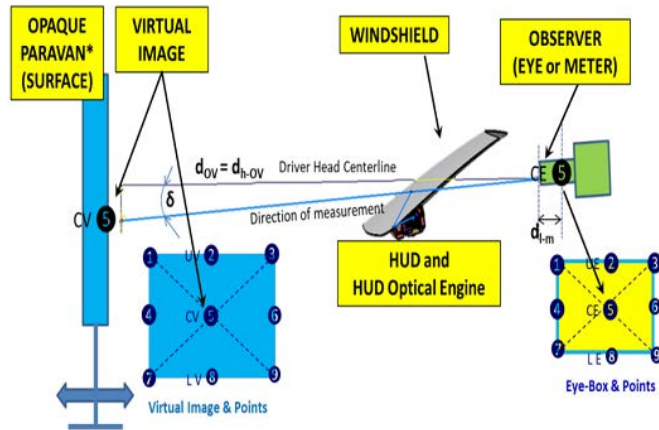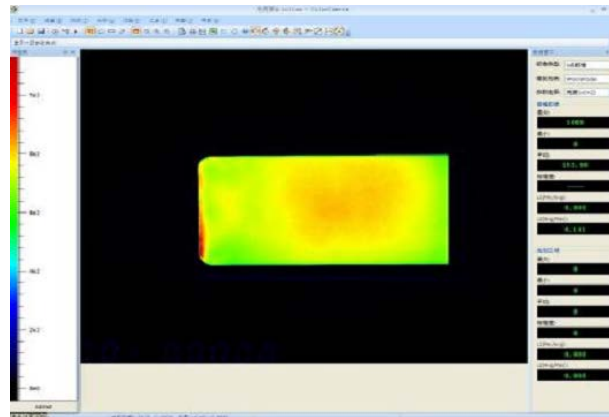
技术参数 Specifications

● 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
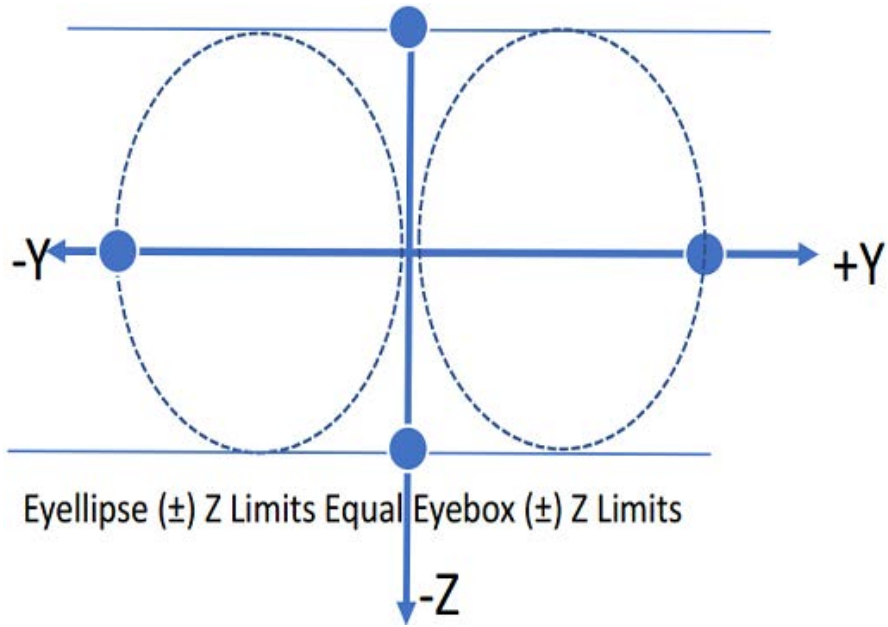

● 2) 亮度均匀度、色度参数
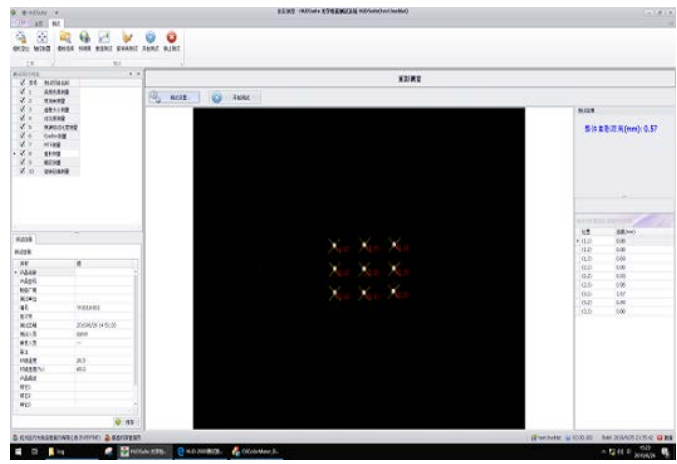   2) Luminance uniformity and chromaticity parameters

● 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

Eyellipse (±) Z Limits Equal Eyebox (±) Z Limits
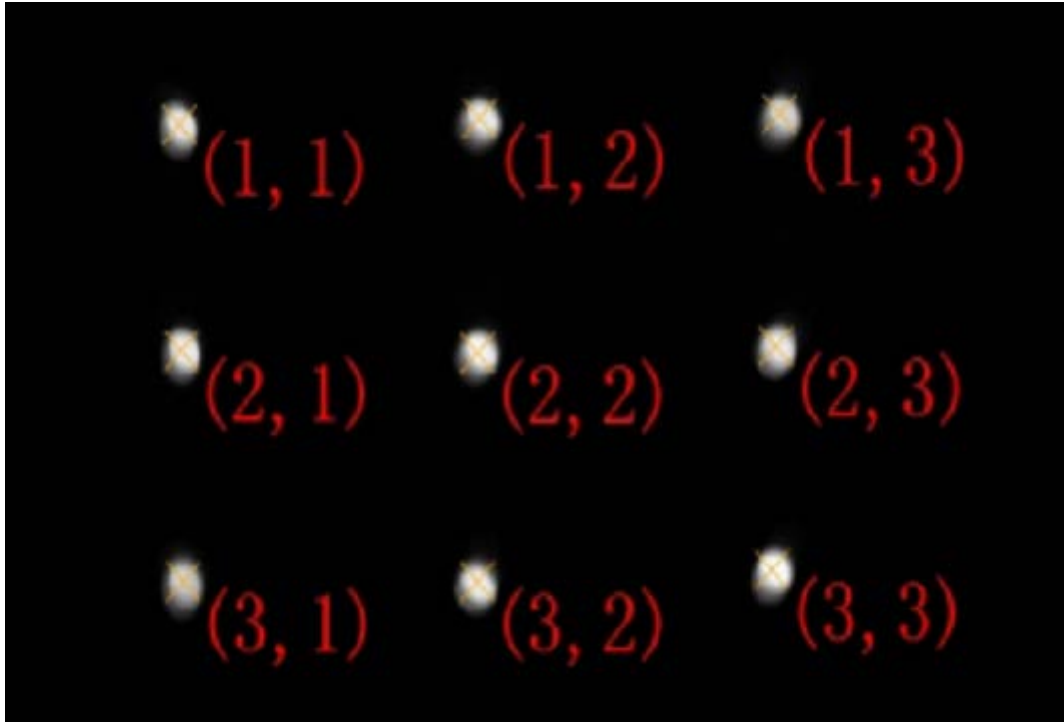
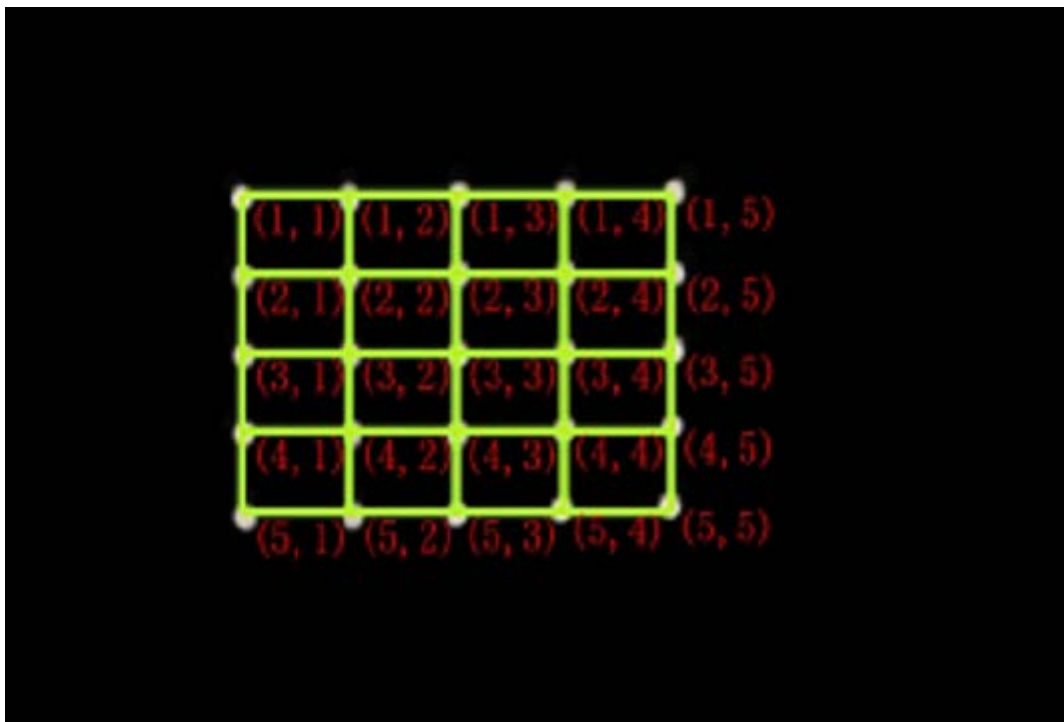- 6）图像像差测试，包括虚像旋转角度、虚像总水平/垂直畸变、虚像水平/垂直畸
  6) Image aberration test, including virtual image rotation angle, virtual image total horizontal/vertical distortion, virtual image horizontal/vertical distortion

- 变最大值、重影（鬼像）测试
  Maximum change, ghost (ghost) test

技术参数 Specifications

● 重影（鬼像）测试
Ghost test

技术参数 Specifications

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				

- 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