High Performance Spectroradiometer

With the increased emphasis on ISO 9001, product quality has become a focal point in many companies. At the same time, in-house production departments are requiring systems that calibrate their measurement instruments. CS-1000 series Spectroradiometer supports these activities.

High-Speed

- Use of polychromator enables high-speed measurements.  
- Fast measurement for the low luminance target.
  
  1. Measurement speed varies depending on the luminance of the light source.
  2. Fast Mode. Using CS-S1W

High-Accuracy

- Repeatability of 0.1%+1 digit for Luminance, 0.0002 for Chromaticity.
  
  The other measurement conditions: based on Minolta standard test method.

- Measurements can be synchronized with a display device.
- Low polarization error-ideal for measuring LCD's.
- Aperture mirror eliminates misalignment between the finder target and actual measuring spot.

Low Luminance

- Specifications are guaranteed even at 1 cd/m². (Repeatability for illuminant A)
- Sensor cooling improves S/N ratio, enabling measurement of low-luminance subjects.
Display Examples

Display Operation panel AC Adapter socket Power switch RS-232C terminal Vertical sync. terminal

Standard Lens, Macro Lenses, Small Measuring Area Lens, Small Measuring Angle Lens

Display
Finder
Operation panel
Measurement area

<table>
<thead>
<tr>
<th>Measuring distance (from front end of the lens)</th>
<th>Standard Lens</th>
<th>Macro Lens</th>
<th>Small Measuring Area Lens</th>
<th>Small Measuring Angle Lens</th>
</tr>
</thead>
<tbody>
<tr>
<td>25mm (At 3X zoom for Small Measuring Area model)</td>
<td></td>
<td></td>
<td>ø0.45mm</td>
<td></td>
</tr>
<tr>
<td>40mm (At 1X zoom for Small Measuring Area model)</td>
<td></td>
<td></td>
<td></td>
<td>ø1.1mm</td>
</tr>
<tr>
<td>94mm (Minimum distance for macro lens)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>254mm (Minimum distance for Small Measuring Angle model)</td>
<td>ø7.9mm</td>
<td></td>
<td></td>
<td>ø1.2mm</td>
</tr>
<tr>
<td>362mm (Minimum distance for Standard model)</td>
<td>ø11.1mm</td>
<td>ø11.2mm</td>
<td></td>
<td>ø2.5mm</td>
</tr>
<tr>
<td>500mm</td>
<td>ø22.3mm</td>
<td>ø22.4mm</td>
<td></td>
<td>ø5.3mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Integral time (second)</th>
<th>60</th>
<th>30</th>
<th>15</th>
<th>1</th>
<th>0.5</th>
<th>0.1</th>
<th>0.04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luminance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(cd/m²)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Lens</td>
<td>7</td>
<td>14</td>
<td>27</td>
<td>409</td>
<td>817</td>
<td>4,086</td>
<td>10,215</td>
</tr>
<tr>
<td>Macro Lens</td>
<td>70</td>
<td>139</td>
<td>278</td>
<td>4,174</td>
<td>8,348</td>
<td>41,742</td>
<td>104,355</td>
</tr>
<tr>
<td>Small Measuring Area Lens</td>
<td>62</td>
<td>124</td>
<td>248</td>
<td>3,720</td>
<td>7,440</td>
<td>37,200</td>
<td>93,000</td>
</tr>
<tr>
<td>Small Measuring Angle Lens</td>
<td>71</td>
<td>142</td>
<td>284</td>
<td>4,260</td>
<td>8,520</td>
<td>42,600</td>
<td>106,500</td>
</tr>
</tbody>
</table>
3 Different Models for the various applications

3 different optics achieved precise measurement for the various applications. Optical design technique is developed under the photographic camera engineering.

Standard Model CS-1000A

<table>
<thead>
<tr>
<th>Measuring area</th>
<th>1.15mm~ (with macro lens)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.9mm~ (with standard lens)</td>
</tr>
<tr>
<td>Measuring angle</td>
<td>1°</td>
</tr>
<tr>
<td>Measuring distance</td>
<td>94mm~ (with macro lens)</td>
</tr>
<tr>
<td>(distance from front end the lens)</td>
<td></td>
</tr>
</tbody>
</table>

<Applications>
General application for the medium or large measuring size, Display monitor such as LCD, CRT and OLED, Illumination light source and lamps.

Small Measuring Area Model CS-1000S

<table>
<thead>
<tr>
<th>Measuring area</th>
<th>0.45mm (by 3 times zoom)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.10mm (by 1 time zoom)</td>
</tr>
<tr>
<td>Measuring distance</td>
<td>25mm (by 3 times zoom)</td>
</tr>
<tr>
<td>(distance from front end the lens)</td>
<td></td>
</tr>
</tbody>
</table>

<Applications>
Very small measuring size, Car audio indication lamp, Indicator panel of the vehicle.

Small Measuring Angle Model CS-1000T

<table>
<thead>
<tr>
<th>Measuring area</th>
<th>1.2mm~</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring angle</td>
<td>0.14° (in the minimum distance 254mm)</td>
</tr>
<tr>
<td>(Measuring angle depends on measuring distance)</td>
<td></td>
</tr>
<tr>
<td>Measuring distance</td>
<td>254mm~ (distance from front end of the lens)</td>
</tr>
</tbody>
</table>

<Applications>
Device with strong directivity, Small LCD for cellular phone.
Data Processing Software CS-S1w

Data management software CS-S1w controls CS-1000 series through PC and displays measured data in numerical and graphical form. It comes with CS-1000 series as a standard accessory. It assists the measurement work with powerful functions such as user calibration, mathematical processing, interval measurement, average measurement and data transfer to the spread sheet software.

- **Timed Measurements**: Interval measurement, Averaged measurement
- **Display**: XYZ, Lvxy, LVuv, LV\'UV', ТΔuv, Le, dominant wavelength, stimulus purity
- **Display Functions**: Display of spectral graph, Display of color space graph
- **Calculation Functions**: Mathematical operations between spectral data, Mathematical operations between spectral data and numerical values Processing of spectral data

Computed data can be processed in the same way as measured data.

- **Data Memory**: Measured data : 500; Reference data : 10
- **Data Output**
  Can be exported to Microsoft Excel and Lotus 1-2-3.

---

**Measuring Data Display**

- Overall Display
- Spectral Graph
- Spectral Data
- Chromaticity Diagram
- Colorimetric Data

**User-Calibration**

- Wavelength Calibration
- Intensity Calibration

**Calculation**

- Transferring data to Worksheet Programs

**Interval Measurement**

**Average Measurement**

---

**System Requirement**

PC Type: PC/AT compatible
CPU: Pentium 100MHz or higher
Memory: 16MB or more
CRT: 800 X 600 to 1024 X 768 resolution (recommended)
(Minimum 640 X 480)
OS: MS-DOS + Windows® 3.1 / 95 / 2000

*Windows® is a trademark of Microsoft Corporation in the USA and other countries.*
Enables matrix calibration of CA-210/CA-100Plus using the US-1000A/S/T as the standard instrument.

PC Software for Color Analyzer CA-SDK (Standard accessory of DISPLAY COLOR ANALYZER CA-210/CRT COLOR ANALYZER CA-100Plus)

Using the PC Software for Color Analyzer CA-SDK (included with the CA-210/CA-100Plus as a standard accessory), you can easily create your own special software for CA-210/CA-100Plus to meet various needs. The CA-SDK also includes some sample software. With the "Cat" sample software, you can perform matrix calibration of the CA-210/CA-100Plus using the US-1000A/S/T as the standard instrument.

Konica Minolta Sensing, Inc.

3-91, Daisennishimachi, Sakai, Osaka 590-8551, Japan

© 1996, 2003 KONICA MINOLTA SENSING, INC.

9242-4857-43 Printed in Japan