**Skin Analysis Software**

**CM-SA**

For applications in the R&D divisions of cosmetic, functional food, and pharmaceutical companies developing products with “skin-lightening” effects, commissioned clinical testing organizations, and research institutes for dermatology, plastic surgery, etc.

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**Simultaneous Measurement of Skin Color and Melanin Index**

Used in combination with a Konica Minolta spectrophotometer, the CM-SA enables highly accurate measurement of skin color simultaneously with a numerical display of the Melanin Index, Hb (Hemoglobin) Index, and Hb SO2 (Hemoglobin oxygen saturation) Index (%).
Realizing Simultaneous Measurement of Skin Color and Melanin Index!

In the field of skin research and development, there is an increasing demand to measure the color and pigmentation of skin as it provides valuable information on a number of factors. For example, where cosmetics are concerned companies are aiming to make products that more closely match or complement the skin tone of clients. In pharmaceutical research and development, skin measurement can be used to determine the effects of suntanning on skin and in the prevention of sunburn.

The software provides important factors of skin data: color, melanin, hemoglobin and oxygen saturation. This software employs an original algorithm to separately calculate Melanin Index, Hb Index, and Hb SO₂ Index (%) based on the spectral reflectance data measured by a spectrophotometer, enabling highly accurate measurement of melanin pigmentation level of the skin without being affected by skin redness.

Combining the Melanin Measurement Function with a Spectrophotometer

By using this software in combination with a spectrophotometer, Melanin Index, Hb Index, and Hb SO₂ Index can be measured simultaneously with spectral reflectance and colorimetric values in a single operation. There is no need to separately measure the color of skin and Melanin Index using different instruments, as was previously necessary.
The handheld CM-700d/CM-600d enables simple operations while standing.

**Simple measurement**

Measurement can be performed by simply placing the head of spectrophotometer against the skin and pressing the button. Measurement by just applying light to the face, arm, or other desired part of the body will not put undue stress on the examinees.

**Featuring Bluetooth®**

The Bluetooth® function of Spectrophotometer CM-700d/CM-600d enables wireless transmission of measured data to the PC, offering greater flexibility for measurements without the constraints of communication cables.

**Data can be easily grouped by examinee**

The CM-SA features a function to automatically switch groups by examinee. When a preset number of measurements is reached, the next measurement data can be linked to the next group. (Useful for consecutive measurements on a number of examinees)

**Example**

When there are Examinees 1, 2, and 3, and the number of measurements is set to 3, the group is automatically changed to the next one every three measurements, and the data is linked to the relevant group (examinee).

**Output of measured data in CSV text format**

The measurement results can be output in CSV text format to be utilized for further analysis or data management using Excel® or other spreadsheet applications.
<Major specifications of CM-SA>

Skin data display
- Melanin Index
- Hb Index [Total hemoglobin (oxidized + reduced) index]
- Hb SO2 Index [% Hemoglobin oxygen saturation index (%)]

Colorometric data display
- L*, a*, b*, Munsell value (Hue, Value, Chroma)\(^1\)

Graph display
- Hue–Value Graph
- Hb Index–Melanin Index Graph

Data handling
- Saving/reading data in CM-SA original format
- Saving data in text (CSV) format
  - [Melanin Index, Hb Index, Hb SO2 Index (%), L*, a*, b*, Munsell value (Hue, Value, Chroma), Spectral reflectance (400-700 nm)]\(^2\)

*1 Munsell data are calculated for 2° observer and Standard Illuminant C.

*2 The spectral reflectance data that are output are the reflectance obtained in SCI ( specular component included) mode.

<PC operating environment>

OS
- Windows\(^7\) Professional 32-bit, 64-bit, Windows\(^8\) 8 Pro 32-bit, 64-bit, Windows\(^10\) Pro 32-bit, 64-bit

CPU
- Pentium\(^\text{TM}\) III 600 MHz or equivalent (recommended)

Memory
- 128 MB or more (256 MB or more is recommended)

Hard disk
- 100 MB or more free disk space is required.

Display
- Display capable of displaying 1,024 x 768 pixels or above/16-bit color or above

Other
- CD-ROM drive (required for software installation), USB port or serial port (required for connecting the PC with the instrument)

<Main specifications of compatible spectrophotometers>

* Some instrument functions not available when using instrument with CM-SA.

<table>
<thead>
<tr>
<th>Model</th>
<th>CM-700d</th>
<th>CM-600d</th>
<th>CM-2600d</th>
<th>CM-2500d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength range</td>
<td>400 nm to 700 nm</td>
<td>360 nm to 740 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength pitch</td>
<td>10 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light source</td>
<td>Pulsed xenon lamp (with UV cut filter)</td>
<td>Pulsed xenon lamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement time</td>
<td>Approx. 1 second</td>
<td>Approx. 1.5 seconds</td>
<td>Approx. 1.5 seconds</td>
<td></td>
</tr>
<tr>
<td>Minimum measurement interval</td>
<td>Approx. 2 seconds for SCI or SCE measurement</td>
<td>3 seconds for SCI/SCE measurement</td>
<td>3 seconds for SCI/SCE measurement</td>
<td></td>
</tr>
<tr>
<td>Battery performance (max. measurement count)</td>
<td>Approx. 2,000 measurements with alkaline dry batteries</td>
<td>Approx. 2,000 measurements with fully charged nickel-metal-hydride rechargeable batteries (2300mAh)</td>
<td>Approx. 1,000 measurements with alkaline dry batteries</td>
<td>Continuous measurements at 10-second intervals at 23°C</td>
</tr>
<tr>
<td>Measurement/illumination area</td>
<td>MAV : Ø8 mm/ Ø11 mm</td>
<td>MAV : Ø8 mm/ Ø11 mm only</td>
<td>MAV : Ø8 mm/ Ø11 mm only</td>
<td>MAV : Ø8 mm/ Ø11 mm only</td>
</tr>
<tr>
<td>Power</td>
<td>4 AA-size alkaline dry batteries or nickel-metal-hydride rechargeable batteries</td>
<td>Special AC adapter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Repeatability
- Spectral reflectance: Standard deviation within 0.1% (standard deviation within ΔE*ab 0.04)
- Colorimetric value: Standard deviation within ΔE*ab 0.04

Inter-instrument agreement
- Within ΔE*ab 0.2 (MAG/SCI) *Average of 12-color measurement with the BCRA Series II compared to values measured with a master body at 23°C

No. of averaging measurements
- 1 to 10 measurements (automatic averaging)
- 1 to 30 measurements (manual averaging)

Interface
- USB,1.1 and Bluetooth\(^*\) standard version 1.2

Size
- 73 (W) x 211.5 (H) x 107 (D) mm
- 69 (W) x 96 (H) x 193 (D) mm

Weight
- Approx. 550 g (without white calibration cap and batteries)
- Approx. 670 g (with Measuring Base/without batteries)

* Applicable Bluetooth\(^*\): Serial Port Profile, Output: Bluetooth\(^*\) Power Class 1

The communication distance may depend on the obstacles and radio wave conditions between the devices.

Successful wireless communication is not guaranteed with all Bluetooth\(^*\) ready equipment.

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