System Diagram

[Probe]

- High Sensitivity Probe CA-VP427
- CA-VP410
- Normal Probe *CA-P427
- *CA-P410
- Mini Probe *CA-MA410
- Other Probes CA-P427C, CA-P410C, CA-VP402, CA-VP404, CA-VP410T
  * High-luminance models capable of measurement even at luminance levels as high as 30,000 cd/m² are also available.

- CA-VP410T
- CA-VP404
- CA-VP402
- CA-P410C
- CA-P427C
- Other Probes

SAFETY PRECAUTIONS

- For correct use and for your safety, be sure to read the instruction manual before using the instrument.
- Never connect the instrument to the specified power supply voltage. Improper connection may cause a fire or electric shock.
- Always connect the instrument to the specified power supply voltage. Improper connection may cause a fire or electric shock.

- ISO Certifications of KONICA MINOLTA, Inc., Sakai Site manufacturing management, calibration, and service of measuring instruments

High-speed, high-accuracy color analyzer that meets the measurement needs of today’s ever-evolving displays
4 key features for measuring the latest displays

1. **Accuracy guaranteed from low to high luminance**
   High-performance sensors and circuitry design combine to realize a wide accuracy guaranteed luminance range that stretches from super-low to high emissions. This enables the CA-410 to meet the requirements for accurate measurement and tuning of chromaticity and gamma characteristics of OLED and HDR displays which require super-low to low luminance measurements. Moreover, the CA-410 can be paired with a lineup of high-luminance probes for measuring backlight modules equipped with new technologies like Mini-LEDs.

2. **High accuracy comparable to spectroradiometers in chromaticity measurements**
   The CA-410 features highly accurate XYZ filters that push its spectral sensitivity close to the CIE 1931 color-matching functions. Moreover, because the calibration light source replicates the emission spectrum of LED displays, tristimulus chromaticity measurements can yield a high level of accuracy comparable to a spectroradiometer. This allows users to more accurately measure and tune the chromaticity and white balance of displays that have a wide color gamut.

3. **High-speed measurements for enhanced productivity**
   Owing to high sensor sensitivity and high-speed computing, measurements with the CA-410 are fast in a way that shortens the time needed to conduct multiple measurements for luminance and chromaticity evaluation and adjustment such as for gamma testing. For even faster speed performance, the CA-410 offers LTD. AUTO mode that increases measurement speed while keeping the same or better accuracy than the predecessor CA-310. Also, Single-Frame mode which allows users to set the shortest integration time for synchronized measurements has been added. It is designed to improve productivity in processes where measurement speed is critical, such as in-line color adjustments of OLEDs.

4. **Designed for incorporation into automatic systems**
   The CA-410 is designed for incorporation and use in automatic systems. This includes a motorized zero-calibration shutter, synchronization detection function, and probe-PC direct connection which allows full functionality with USB bus power. Both RS-232C and USB ports are provided, and when using USB, the virtual COM port allows quick and easy connections to probes without the need to install drivers. For convenience when incorporating the CA-410 into automatic systems developed for predecessor models CA-210/310, the basic communication commands of CA-410 are kept the same. Also, CA-SDK2* includes as standard a COM registration tool which makes it possible to easily use the CA-410 with programs created for CA-210/310 using the previous CA-SDK. And various cables for incorporation into systems are available as optional accessories.

* Software development kit of the CA-410

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**Example system configuration**

**Example probe lineup**

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**Example probe lineup**

**Example system configuration**

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* Example using the CA-VH410 high-sensitivity probe.
Probes for measuring various kinds of displays

The measurement area of these probes is suited for measuring large smartphones, in-vehicle displays, PC monitors, TVs, etc. 3 models are available: CA-V427 high-sensitivity probe for high-speed measurements from extremely low luminance, CA-P427 Normal Probe with its wide accuracy-guaranteed luminance range, and CA-P427H high-luminance probe that can measure luminance up to 30,000 cd/m².

These probes have a measurement area suited for measuring smart watches, small smartphones, in-vehicle displays, etc. 5 models are available: CA-V410 high-sensitivity probe for high-speed measurements from low luminance, CA-P410 Normal Probe with its wide accuracy-guaranteed luminance range, CA-P410H high-luminance probe that can measure luminance up to 30,000 cd/m² and CA-MP410/MP410H Mini Probe which aims for the smallest size and best cost performance.

CA-V410T Ø10 mm LWD probe (200mm) is suitable for multi-angle measurements of OLED for smartphones and in-vehicle displays, and also evaluation of viewing angle characteristics of curved displays. It is also a viable choice when distances must be kept from measurement targets to avoid collisions in automatic measuring systems.

Cables for connecting probes with PC are available as accessories.

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<Specifications>
Measurement area: Ø27 mm
Acceptance angle: ±2.5°
Accuracy guaranteed measurement distance: 30 mm ± 10 mm
Accuracy guaranteed range for luminance measurements:
CA-V427 0.01 – 3,000 cd/m²
CA-P427 0.01 – 5,000 cd/m²
CA-P427H 0.1 – 30,000 cd/m²
Accuracy guaranteed range for chromaticity measurements:
CA-V427 0.01 – 3,000 cd/m²
CA-P427 0.01 – 5,000 cd/m²
CA-P427H 0.1 – 30,000 cd/m²

<Specifications>
Measurement area: Ø10 mm
Acceptance angle: ±4°
Accuracy guaranteed measurement distance: 200 mm ± 2 mm
Accuracy guaranteed range for luminance measurements:
CA-V410 0.001 – 5,000 cd/m²
CA-P410/MP410 0.01 – 30,000 cd/m²
Accuracy guaranteed range for chromaticity measurements:
CA-V410 0.001 – 5,000 cd/m²
CA-P410/MP410 0.01 – 30,000 cd/m²

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Detailed probe specifications are available on Konica Minolta’s website:
https://www.konicaminolta.com/instruments/download/catalog/display/index.html
CA-S40 software included with the probe

CA-S40 software is included as standard with probes. CA-S40 supports both Windows 10 and Mac OS, and allows users to connect the probe to a computer and perform measurements from there. In addition to basic operations like conducting luminance, chromaticity and flicker measurements and saving results, logging live data of emission fluctuations via a waveform function is also possible. Moreover, the application incorporates other features that users will find useful in various measurement operations, including automatic detection of the display’s emission frequency and using it for internal synchronization.

Easy-to-operate Data Processor CA-DP40

Data Processor CA-DP40 takes the “easy-to-operate” feature of the CA Series to new heights. With automatic zero calibration that allows measurement to start immediately after the power is turned ON, an easy-to-view 7-inch color display, multi-lingual support and a lithium ion battery (sold separately) that makes the unit portable, the CA-DP40 obtains measurement data quickly and reliably, making it convenient for on-the-spot measurements for R & D applications. Moreover, a maximum of 10 probes can be connected for multi-probe measurements.

Main Specifications of PC Software CA-S40

- System requirements:
  - OS: Windows® 10 Pro 32-bit or 64-bit
  - Processor: Intel® Core™ i-series or equivalent
  - Memory: 2GB or more
  - Hard disk drive: 4GB or more; at least 10GB available for internal synchronization
  - Data logging function
  - Memory: 64GB or more, depending on the number of measurement instruments
  - Display: 7-inch color LCD/1024 x 600

Main Specifications of Data Processor CA-DP40

- Display:
  - Display language: English
- Display items:
  - Luminance: 0.00 to 10.00, 16-bit color, 16-bit precision
- Measurement data storage format: TIFF
- Measurement data storage:
  - Data Processor CA-DP40: Windows 10 Pro 64-bit / Windows 10 Pro 32-bit
  - Data Processor CA-DP40: MacOS® Sierra / High Sierra / Mojave

* CA-S40 software and probe firmware can be downloaded for free from Konica Minolta’s website.

For more information, visit the below webpage.

https://www.konicaminolta.com/instruments/download/software/display/index.html