PMA-20

Photonic multichannel analyzer C10494 series

Continuous spectrum measurement with 100 µs temporal resolution

The PMA-20 Photonic multichannel analyzer C10494 series measures spectral change of emission, absorption and reflection with high sensitivity 100 µs temporal resolution.

The PMA-20 is capable of measuring a wide spectrum range from 200 nm to 1100 nm with high wavelength resolution within 3 nm. Using an optional fiber for light collection, spectrum can be obtained easily by directing the fiber close to the sample. As the wavelength axis and the spectral response characteristic are calibrated at the factory, spectral measurements can be carried out easily and accurately.

Features

- **Single shot spectrum measurement with 100 µs temporal resolution**
- **High speed integration**
- **A compact unit with a spectrometer, a photo-detector and a power supply**
- **Easy measurements by optical fiber**
- **Factory calibrated spectral response and wavelength axis characteristics**

Applications

- **Time resolved spectrum measurement for emission**
- **Protein-protein interaction analysis with absorption spectrum**
- **Chemical reaction tracking with a stopped-flow method**
- **Photo physics and laser spectroscopy with submillisecond temporal resolution**

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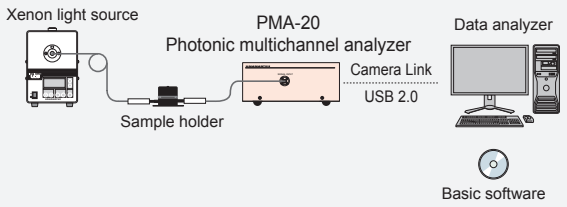
Example of Measurement

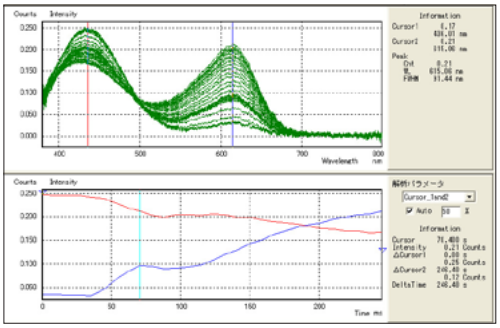
1 Absorption spectrum measurement of BTB solution (pH indicator)

● **Absorption measurement system**



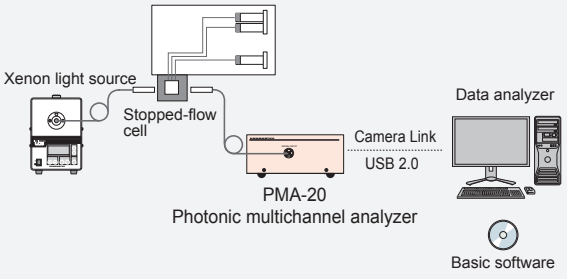
The PMA-20 measures the spectrum change of the weak acid BTB solutions from yellow to blue by adding sodium bicarbonate with 100 µs temporal resolution.

● **Absorption spectrum measurement of BTB solution (pH indicator)**



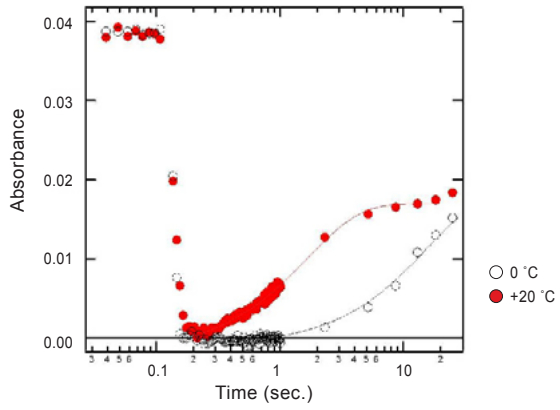
2 Spectrum change measurement with stopped-flow method

● **Stopped-flow method measurement system**



The PMA-20 measures the reproduction process of rhodopsin as opsin and retinal are mixed with the stopped-flow method.

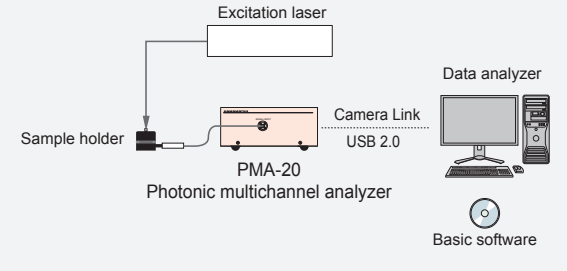
● **Change in absorption**



* Data is provided by courtesy of Department of biophysics Division of biological sciences Graduate school of science Kyoto university.

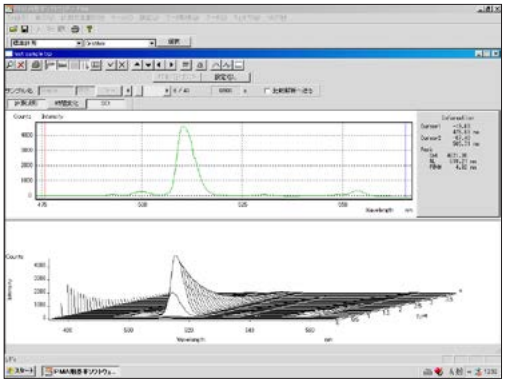
3 Phosphorescence measurement

● **Phosphorescence measurement system**



The PMA-20 measures the attenuation process of phosphorescence materials excited by YAG laser in single shot. It also measures by single shot to excite the materials with YAG laser (266 nm, 3 mJ).

● **Phosphorescence measurement**



Options

Sample Holder for transmission and fluorescence measurement A6751

This is a dedicated holder with an integrated condensing lens for the use with vials.

Reflection measurement optics A9665

These are optics making it possible to illuminate the sample at 45˚ from the light source and measure the reflected light.

Variable angle reflection measure optics A10687

These are optics making it possible to change the angle of input and output ports at maximum 65˚ and measure the reflected light and fluorescence.

Digital delay generator C13430-01

This outputs the gate pulse necessary for an external trigger and gate operation.

C-mount fiber adapter A6399

This is an adapter for securing the fiber input optics to the C-mount of a micro-scope or the like.

C-mount adapter for positioning A9607

In addition to the function of the C-mount fiber adapter, the measurement position can be checked. Measurements in the UV.

Attenuation fiber adapter A10474-01

This adaptor is used when the light power is too strong. It can reduce the input light power by using a pin-hole.
(fading rate approx. 1 /20 to 1 /500)

OBJECTIVE LENS A4869

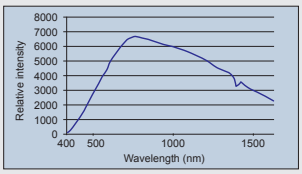
Condensing lens for UV. f=50 mm, F3.5
(A6399, A8482 required)

Integrating sphere A5640

This is the integrating sphere for getting complete diffuse light. You can get even intensity light without spread of light source or influence of directional characteristics.
(A6399 required)

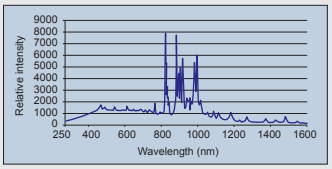
Halogen lamp L6758-11

This is a halogen light source with output wavelengths from 400 nm to 1600 nm for excitation and absorption measurements.



Xe light source High stability 150 W L6759

This is a high stability xenon light source with output wavelengths from 250 nm to 1600 nm for excitation and absorption measurements.



Data analyzer Desktop type C10471-12

Collecting and analyzing data.

OS	Windows 7 (64 bit)
Memory	2 GB or more
Hard disk	80 GB or more
Interface	Camera Link

Minilite-II

Surelite-II-10

INDI-40

Nd : YAG Laser

Nd: YAG laser is the excitation light source for transient absorption measurements.
The system can be enhanced by combining with the lasers from various manufactures.

■ Recommended laser

From Continuum : Minilite-II
Surelite-II-10

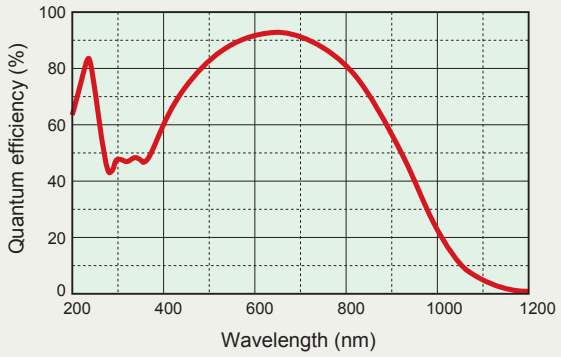
From Spectra-Physics, Inc., : INDI-40

* For details, please consult the Hamamatsu's local office of each country.

Specifications

Type number	C10494-01	C10494-02
Photo-detector	BT-CCD linear image sensor	
Wavelength	200 nm to 950 nm	350 nm to 1100 nm
Wavelength resolution (FWHM)	<3 nm	
Exposure time	0.1 ms to 1 s	
Number of photosensitive device channels	2048 ch	
Pixel size	12 µm × 972 µm	
Read-out noise	100 electrons	
Dark current	100 electrons/scan (+25 ˚C 20 ms)	
AD resolution	12 bit	
Spectrograph	Czerny-turner type	
Spectrograph F number	4	
Fiber	Quartz fiber 1.5 m	
Interface	Camera Link, USB 2.0	
Power supply	AC100 V to AC240 V, 50 Hz/60 Hz	

■ Spectral response characteristics
(BT-CCD linear image sensor)



Software

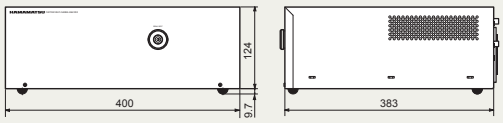
■ Basic software for PMA-20 U6039-08

- Measurement functions ····· Monitoring measurement
  Data measurement
- Time resolved spectrum measurement ··· Emission spectra
  Reflectance
  Transmittance
- Data acquisition condition settings ··· Exposure time settings
  Memory integration times setting
- Calibration/correction ····· Wavelength axis calibration
  Sensitivity inconsistency calibration
  Dark current correction
- Display functions ····· Spectrum display
  Time profile display
- Wavelength axis display ····· Wavelength, Wave number, Raman shift, Energy (eV)
- Brightness axis display ····· Linear, Logarithm
- Cursor analysis functions ····· Wavelength (wave number, etc.) vs. Intensity
  Peak detection
  FWHM measurement
  Integrated intensity
- Other analytical functions ····· Smoothing
  Differential waveform operation
  Color calculation (XYZ, xy, uv, Lab)
- Trigger functions ····· Internal trigger, Opening trigger,
  External exposure start, Optical trigger

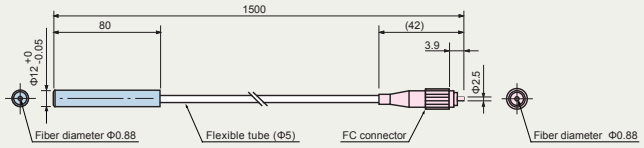
Dimensional Outlines

(Unit : mm)

■ C10494-01, -02 (Approx. 11 kg)



■ Fiber input optics (Approx. 90 g)



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