

Compact NIR PL lifetime spectrometer C12132 Series

For measuring photoluminescence (PL) lifetime of PV materials

The compact NIR PL lifetime spectrometer C12132 series is designed for measuring photoluminescence (PL) spectrum and PL lifetime in the NIR region.

Applicable to measure PL lifetime and PL spectrum of material which is related to the conversion efficiency of solar cell, PL lifetime of organic compound and PL spectrum of singlet oxygen.

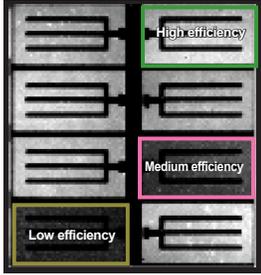
Features

- Lifetime measurement from VIS to NIR (up to 1650 nm)
- Measures PL lifetime down to 200 ps using deconvolution
- Measures PL spectrum as the standard function
- Multipoint measurement (Option)
- Low temperature measurement (Option)

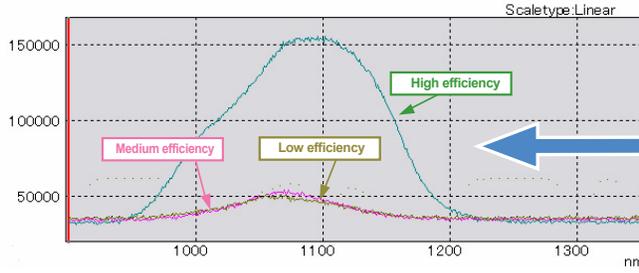


Measurement of PL spectrum and PL lifetime of thin-film, compound-semiconductor photovoltaic materials.

The measurement of PL spectrum and PL lifetime are closely related to conversion efficiency. PL carrier lifetime indicates the difference in conversion efficiency, which cannot be distinguished through PL spectrum.

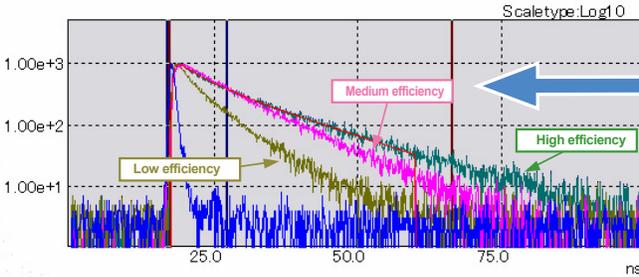
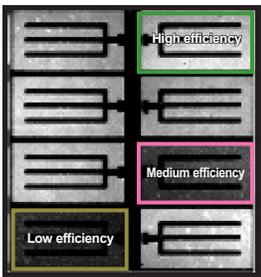


CIGS materials



PL spectrum

With this CIGS sample, the PL spectrum does not clearly show dependence on conversion efficiency.



PL lifetime

The PL carrier lifetimes clearly show dependence on conversion efficiency.

Standard configuration

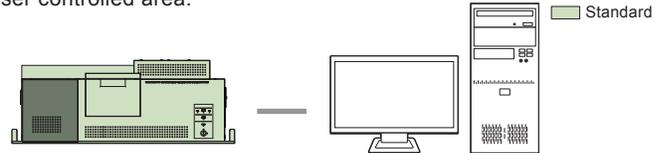
The standard configuration includes an excitation light source (YAG laser) and a detector.



C12132-36 Standard configuration

Laser class 1

The C12132-36 complies with laser class 1. It can be used outside of a laser controlled area.



Compact NIR PL lifetime spectrometer C12132-36

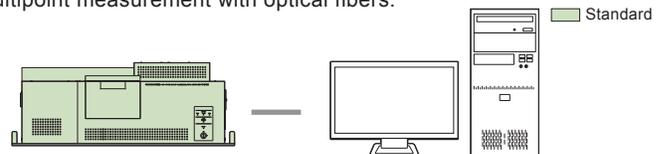
Data analysis system



C12132-37 Standard configuration

Laser class 3B

The C12132-37 complies with laser class 3B. It is upgradable for multipoint measurement with optical fibers.



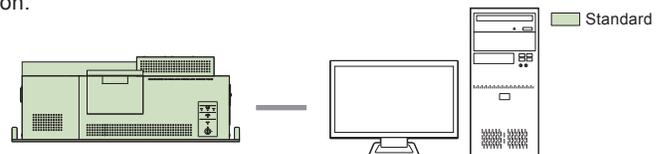
Compact NIR PL lifetime spectrometer C12132-37

Data analysis system



C12132-38 Standard configuration

C12132-38 uses an external laser as the excitation light source. Adding the PLP-10 laser diode head as an excitation light source is an option.



Compact NIR PL lifetime spectrometer C12132-38

Data analysis system

Multipoint measurement

Add multipoint measurement capability.

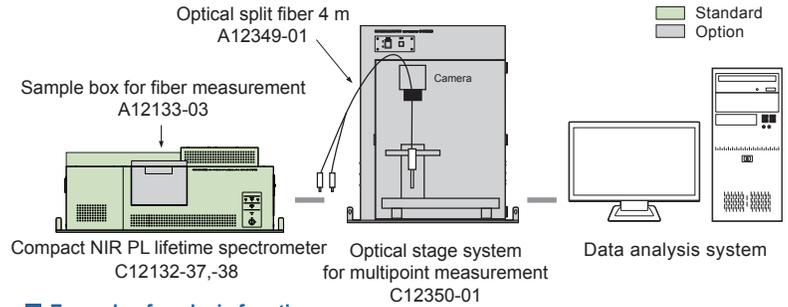
Analyzing multiple points on a test sample or thin film is possible by integrating an optical fiber. This method detects any lifetime differences among the test points to check the uniformity of a sample.



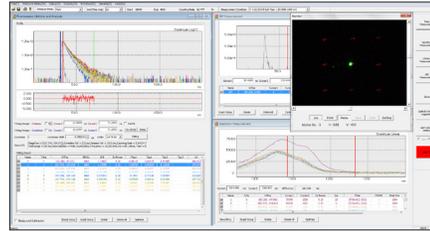
Optical stage system for multipoint measurement C12350-01



Sample box for fiber measurement A12133-03



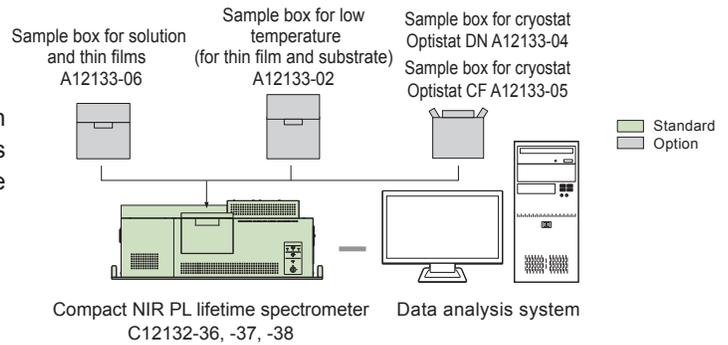
Example of analysis function



Solution , Thin film measurement / Low temperature measurement

Add the capability to measure solution / thin film samples and cooled samples.

The A12133-06 sample box handles solution and thin film samples. The A12133-02 sample box enables measurement at liquid nitrogen temperatures. Sample boxes for Oxford Instruments cryostats are an option.



Sample box for solution / thin films A12133-06



Sample box for low temperature (for thin film and substrate) A12133-02 (sample box, dewar unit and sample holder)



Sample box for cryostat Optistat DN A12133-04
Sample box for cryostat Optistat CF A12133-05

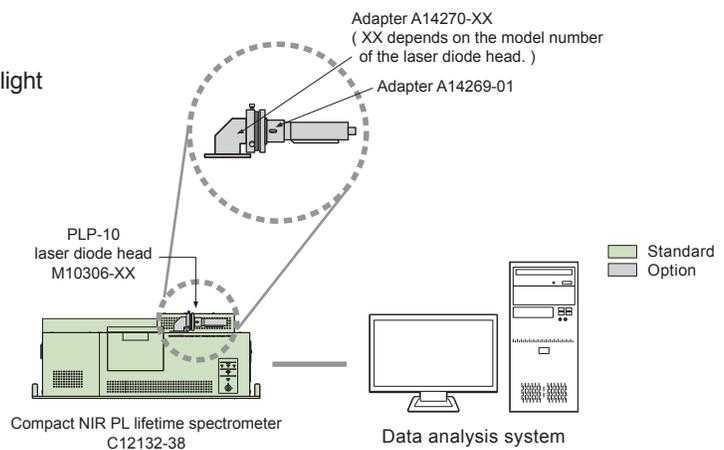
External light source

Add an external light source.

Adding the PLP-10 laser diode head as an excitation light source is an option. A connection adapter is required.



PLP-10 laser diode head M10306



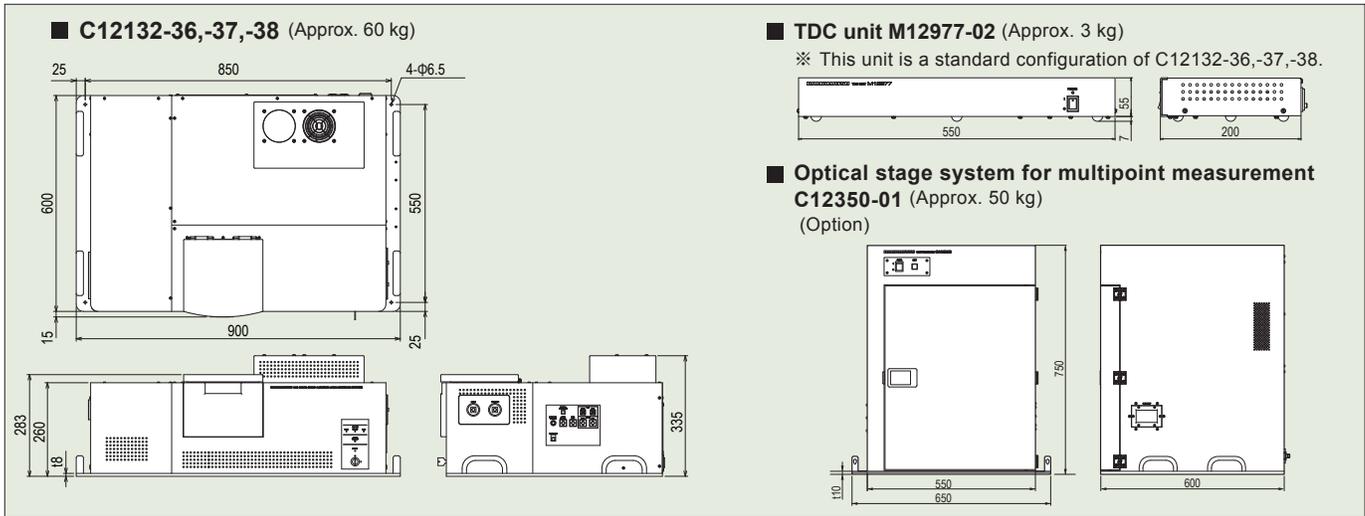
Specifications

Type number	C12132-36	C12132-37	C12132-38
Excitation light wavelength	532 nm		— *
Output	30 mW		— *
Pulse width	<1.0 ns		— *
Repetition rate	15 kHz		— *
Excitation light level adjustment function	Automatic control by software		— *
Sensitivity wavelength range	380 nm to 1650 nm (as detector alone)		
Measurement wavelength range	580 nm to 1650 nm (with YAG LASER 532 nm)		380 nm to 1650 nm
Time resolution	< 1.0 ns FWHM		
Measurement time range	4 ns to 10 s (with YAG LASER 532 nm 4 ns to 50 μs)		4 ns to 10 s
Time axis channel	1024 ch	512 ch, 1024 ch, 2048 ch, 4096 ch	
Total time resolution	< 1.0 ns FWHM (as FWHM of IRF with YAG LASER 532 nm)		
Laser class	Class 1	Class 3B	— *
OS	Windows 7 (32 bit) , (64 bit) Windows 10 (64 bit)		
Ambient operating temperature	+10 °C to +30 °C		
Ambient operating humidity	30 % to 80 % (with no condensation)		
Ambient storage temperature	-10 °C to +50 °C		

*The specifications of excitation light vary depending on the external light source such as the PLP-10 laser diode head.

Dimensional outlines

(Unit: mm)



● PLP-10 Laser diode head M10306 (Option)

PLP-10 is a picosecond light pulser using a temperature-controlled laser diode, and its output is very stable for a long time.



	Unit	M10306 -27	M10306 -29	M10306 -31	M10306 -33	M10306 -35	M10306 -37	M10306 -11	M10306 -15	M10306 -17	M10306 -19
Wavelength	nm	375	405	445	465	483	510	655	785	850	980
Spectral half-width	nm	< 10	< 10	< 10	< 10	< 10	< 10	< 5	< 10	< 5	< 20
Pulse width	ps	50	60	70	70	80	130	70	100	70	70

LASER SAFETY

Hamamatsu Photonics classifies laser diodes, and provides appropriate safety measures and labels according to the classification as required for manufacturers according to IEC 60825-1. When using this product, follow all safety measures according to the IEC.



Class 3B Description Label (Sample)



Class 1 Description Label (Sample)



Caution Label

Product and software package names noted in this documentation are trademarks or registered trademarks of their respective manufacturers.
 • Subject to local technical requirements and regulations, availability of products included in this promotional material may vary. Please consult your local sales representative.
 • Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions.
 Specifications and external appearance are subject to change without notice.

© 2017 Hamamatsu Photonics K.K.

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Systems Division

812 Joko-cho, Higashi-ku, Hamamatsu City, 431-3196, Japan, Telephone: (81)53-431-0124, Fax: (81)53-433-8031, E-mail: export@sys.hpk.co.jp

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01 E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-935-81-733, Fax: (39)02-935-81-741 E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)03-659-0080, Fax: (886)07-811-7238 E-mail: info@tw.hpk.co.jp

Cat. No. SDSS0015E09
 NOV/2017 HPK
 Created in Japan