

# Photodiode Array UV-Vis Spectrophotometer **S-3100**



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# S-3100

## Photodiode Array UV-Vis Spectrophotometer

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PDA UV-Vis  
PDA UV-Vis Spectrophotometer  
Spectrophotometer

The continuing convergence of science and technology has created the need for a new generation of UV-Vis instrumentation - a complete analytical environment that rapidly delivers more accurate results and efficiently manages data, all at a low cost of ownership.

As a leading manufacturer of UV-Vis Spectrophotometers for 10 years, SCINCO now presents the S-3100 PDA UV-Vis Spectrophotometer which offers maximum reliability and very fast analysis time. The S-3100 together with LabPro® Plus Software has many features designed to meet market demands in a wide range of R&D and QC/QA applications.

Ultra fast data processing technology ensures reliable data under any PC environment, thereby maximizing laboratory efficiency.

### Features

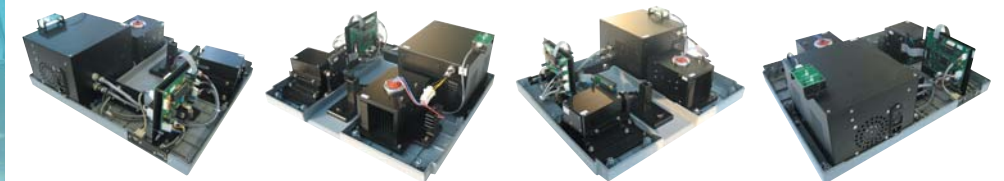
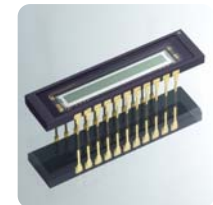
#### Dual Lamp Source ●

The "See-through" optical design of the Deuterium and Tungsten dual lamp system ensures high-intensity light over the whole UV and Visible wavelength range, resulting in high sensitivity data with minimal baseline noise.

The use of the "see-through" optical design provides increased reliability, durability and also a perfect, seamless transition from UV to visible ranges. Photometric accuracy is thus assured, giving you maximum confidence in your results. In addition, the life time of the lamps is increased using the on/off switch in the software which enables a lamp to be turned off when not in use.

#### Photodiode Array (PDA) Detector ●

Using the Photodiode Array (PDA) detector, data can be simultaneously acquired over the full wavelength range, 190~1100 nm, in as little as 0.02 sec. A high Signal to Noise ratio is achieved using the integration function. With the combination of optimized optical structure and PDA, excellent wavelength reproducibility and resolution are assured.



#### Various Accessories ●

The sample compartment of the S-3100 is designed to make it easy to install and replace various accessories for special applications. This greatly broadens the application range of the S-3100 Spectrophotometer.

#### Interface ●

The S-3100 can process data from the 1024 channels PDA detector in a very short time and is connected to the PC using a USB port for ultra fast communication. Analysis and storage of data using LabPro® Plus S/W are very efficient.

#### Modular Structure ●

All parts of the S-3100, including Power Supply and Lamps, are designed as a unique modular system. This modular design facilitates easy maintenance and service which is minimal. The Reversed Optic structure makes it possible to run experiments using an open sample compartment without any stray-light effects.

## Wide Range of Applications

### Wide Range of Applications

Designed for high precision, the S-3100 ensures superior results and reliability for a wide range of applications, including many in the Environmental, Pharmaceutical and Biochemical industries. The following are some examples:

#### ● **Pharmaceutical / Clinical / Cosmetics**

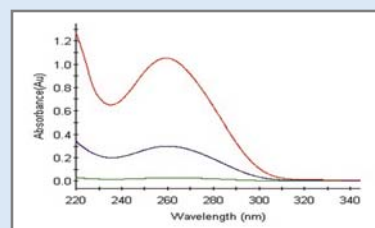
Used in R&D, QC and in the Dissolution Testing of materials and products to meet government legislation.

#### ● **Biochemical / Genetics**

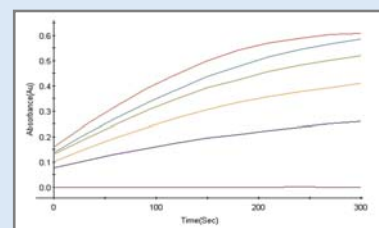
Quantification of DNA and Protein <①>  
Enzyme activity and mechanism <②>  
Thermal Denaturation of DNA

#### ● **Analytical Chemistry**

Research centers / Universities / Laboratories  
Multi Component Analysis



<DNA Analysis-①>



<Enzyme Mechanism-②>



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PDA UV-Vis Spectrophotometer

#### ● **Dye / Ink / Paint**

QC in the development and production of dyeing reagents / inks / paints and to meet legislation requirements.  
Analysis of intermediate dyeing reagents  
Measuring the color difference values and color indices

#### ● **Environmental / Agriculture**

Quantification of organic materials / heavy metals in Freshwater, Seawater, Atmosphere and Soils

#### ● **Metals / Films**

Semiconductors, Mining industry, Metal Refining  
Measuring the film thickness and coating material  
Transmittance and Reflectance

#### ● **Petrochemical**



Wide Range of Applications

0013-S



➔ LabPro® Plus Software

LabPro® Plus  
LabPro® Plus Software  
Software

● LabPro® Plus Software is a powerful tool for collecting and processing data for a wide variety of applications. The software enables the easy acquisition and post-run analysis of high quality data from the S-Series PDA UV-Vis Spectrophotometer.

● Software packages range from the Standard Package for general Quantification/Qualification to the Bio Package which provides various analytical methods for protein, DNA/RNA analysis and the automatic calculation of Enzyme Activity and Mechanism; and from the Kinetic Package for measuring the changes in a sample according to time and temperature to the Ultra Kinetic Package for ultra fast measurement (0.02sec). Any of these packages can be selected to optimize a particular application.

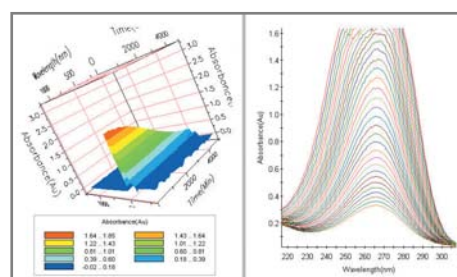
<Kinetic Data & 3D Graphic Spectrum- ①>

● LabPro® Plus software controls various SCINCO accessories such as the 8-Position Multi-Cell Holder, Automatic Referencing Stage, Autosipper, Autosampler, Reflectance Module, Diffuse Reflector and Peltier temp. Control unit.

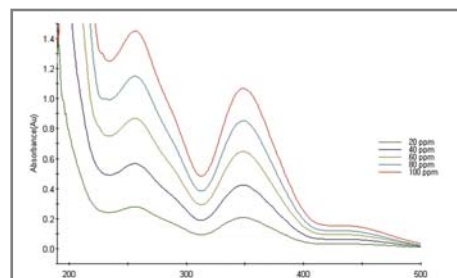
● LabPro® Plus Software is compatible with Windows 98/ME/2000 or XP. Built-in data conversions and formats efficiently support LabPro® and LabPro® Easy files, CSV, XLS, BMP and WMF. LabPro® Plus data is easily exported into Excel and other Windows programs

● A Validation Package for LabPro® Plus has been developed to meet the requirements of 21 CFR Part 11, specified by the US FDA, to guarantee the reliability and conformity of the system for the Pharmaceutical, Food and Environmental Industries.

<Photometric Accuracy Test with Potassium Dichromate- ②>



<Kinetic Data & 3D Graphic Spectrum- ①>



<Photometric Accuracy Test with Potassium Dichromate- ②>

General Mode

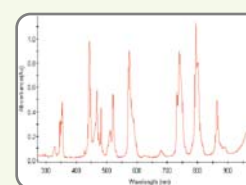
Wavelength Monitoring	<ul style="list-style-type: none"> <li>• Display the complete spectrum of the full wavelength range (190–1100 nm)</li> <li>• Math function: smooth, derivative, scalar add, scalar divide, scalar multiply, log, add, subtract, average</li> <li>• Baseline correction</li> <li>• Zoom In / Out, Add / edit Labels</li> <li>• Export to clip board, CSV file, Excel file, BMP file, WMF file</li> </ul>
Equation Calculation	<ul style="list-style-type: none"> <li>• Allows the user to enter a support equation for the evaluation of data</li> <li>• Support Equation: +, -, /, *, ABS, Exp, LN, LOG10, SQRT.</li> </ul>
Find Peak & Vally	<ul style="list-style-type: none"> <li>• Find up to 20 of peaks or vallys automatically or manually</li> </ul>
Thickness Measurement	<ul style="list-style-type: none"> <li>• Measure the thickness of thin film</li> <li>• Reflectance Module is required</li> </ul>

Quantification Mode

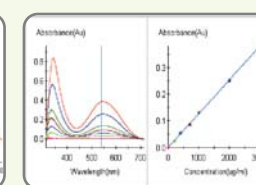
Quantification Standard/Sample	<ul style="list-style-type: none"> <li>• Concentration Unit: All units user-specifiable</li> <li>• Calibration Curve Dimension: up to 3</li> <li>• Support Zero offset of Calibration Curve</li> <li>• Calculation of % Error for calibration diagnostics</li> </ul>
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Kinetic Mode

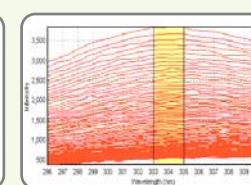
Time Based Kinetic	<ul style="list-style-type: none"> <li>• 3D Display: Time Display (X Axis), Zoom In / Zoom Out, Rotate Chart</li> <li>• Full Spectrum</li> <li>• Initial Rate, Zero Order, First Order, Delta AU</li> <li>• Data from single wavelength (using multi-cell) or multiple wavelengths (using single cell) can be extracted for rate calculation</li> </ul>
Temperature Based Kinetic	<ul style="list-style-type: none"> <li>• 3D Display: Time Display (X Axis), Zoom In / Zoom Out, Rotate Chart</li> <li>• Ramping Rate: 0.5, 1 and 2 °C/min</li> <li>• Peltier temp. Control unit is required</li> </ul>
Ultra Kinetic	<ul style="list-style-type: none"> <li>• Time Unit: ms</li> </ul>



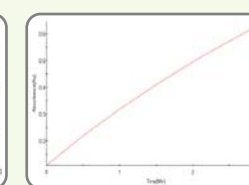
<General Mode>



<Quantification Mode>



<Kinetic Mode>



<Bio Mode>

# S-3100

## ⇒ LabPro® Plus Software



### Bio Mode

Protein Analysis	<ul style="list-style-type: none"> <li>• Predefined Protein methods: Bradford, Bicinchoninate (BCA), Biuret, Lowry, Trinitrobenzene Sulfonate, Direct UV methods</li> </ul>
Nucleic Acid Analysis	<ul style="list-style-type: none"> <li>• General Ratio with user specified two wavelengths for calculation of ratios.</li> <li>• Protein and nucleic acid concentrations using coefficients determined by Warburg-Christian.</li> <li>• User defined two Protein Factors and two Nucleic Acid Factors</li> </ul>
Enzyme Activity	<ul style="list-style-type: none"> <li>• Calculation of enzyme activity</li> <li>• Zero Order, Initial Rate, First Order, Delta Au</li> <li>• User Specified One Activity Factor</li> </ul>
Enzyme Mechanism	<ul style="list-style-type: none"> <li>• Michaelis-Menten / Lineweaver-Burk / Hanes-Woolf / Eadie-Hofstee</li> <li>• Calculate Km, Vmax from each plot</li> </ul>
Thermal Denaturation	<ul style="list-style-type: none"> <li>• Ramping Rate: 0.5, 1 and 2 °C/min</li> <li>• Tm calculated with average method</li> <li>• Volume correction with user specified equation</li> <li>• Normalization with user specified factor</li> <li>• User defined equation allows calculation from Tm value (ex: %G-C)</li> <li>• Peltier temp. Control unit is required</li> </ul>

### Optional Functions

Color Analysis	<ul style="list-style-type: none"> <li>• Color Difference Formula</li> <li>• Measure Various Color Index</li> </ul>
Multi Component Analysis	<ul style="list-style-type: none"> <li>• Defines the concentration of each component</li> <li>• Contents of standard components in unknown sample</li> </ul>

### Validation

Validation & 21 CFR Part 11	<ul style="list-style-type: none"> <li>• 4Q document for the Design, Installation, Operation, Performance Qualifications</li> <li>• Automatic Validation Wizard</li> <li>• Enhanced Security based on Windows 2000/XP</li> <li>• Electronic Signature and Traceability</li> </ul>
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## ⇒ Various Accessories

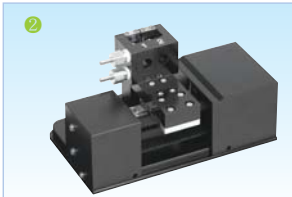
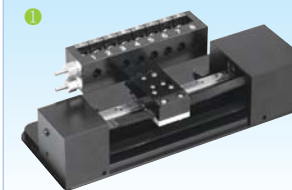


Analysis under optimum conditions can be achieved using various accessories for a range of applications. The wide open sample compartment ensures fast and easy installation of the accessories.

## Various Accessories

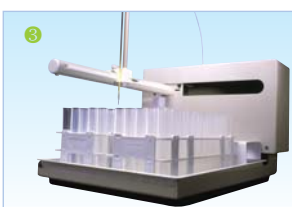
### Cells and Cell Holders - ①,②

- Various cells are available
- Single Cell Holder
- Water Jacketed Single Cell Holder
- Auto. Water Jacketed 8-Position Multi-Cell Holder
- Automatic Referencing Stage
- Variable Pathlength Cell Holder (5 mm to 100 mm)
- Magnetic Film Holder
- Advanced Transmittance Holder
- Ultra Micro to Macro sample analysis with high precision and efficiency



### Autosampler and Autosipper System - ③,④

- Automatic analysis of a number of samples for repetitive tests (up to 96 samples)
- Controlled by LabPro® Plus Software



### Peltier Temperature Control Unit - ⑤

- Peltier Temperature Control Unit for Single Cell Holder
- Temp. Range: 10-100°C
- Required for Kinetic & Bio Analysis



### Fiber Optic System - ⑥

- Dip Probe Fiber Optic
- Reflectance Probe Fiber Optic
- Remote analysis of liquids, solids
- Useful for unusual sample sizes and shapes



### Reflectance Module - ⑦

- Measurement of specular reflectance
- Measurement of the film thickness



### Diffuse Reflector

- Measurement of diffuse reflectance
- Used for Color analysis
- Range : 270 ~ 1000 nm

### Others

- Magnetic Stirrer Assembly
- Refrigerated Circulator / Circulator
- Others are available upon request



### Support

SCINCO entered the field of UV-Vis Spectroscopy in 1994 and has since been striving to produce high quality instruments and to develop new technologies. Full service support following installation ensures complete customer satisfaction.

# S-3100

## Specifications

Model	• S-3100
Source	• Pre-aligned Tungsten & Deuterium Lamp
Detector	• 1024 Channels PDA
Wavelength range	• 190 – 1100 nm
Wavelength resolution	• 0.95 nm
Resolution test	• > 1.6 (EP <sup>a</sup> )
Wavelength accuracy	• ±0.5 nm with Holmium oxide glass filter • ±0.2 nm with D <sub>2</sub> peaks, 486.0 nm and 656.1 nm
Wavelength reproducibility	• < 0.02 nm
Photometric range	• -3.0 ~ +3.0 AU
Photometric accuracy	• ±0.01 AU with 60 ppm Potassium Dichromate (EP <sup>a</sup> ) • ±0.005 AU at 440, 590 nm with 0.5 AU of Neutral density glass filter
Photometric Reproducibility	• < 0.002 AU with 60 ppm Potassium Dichromate • < 0.001 AU at 440, 590 nm with 0.5 AU of Neutral density glass filter
Photometric noise	• < 0.0001 AU at 300 nm
Photometric stability	• < 0.001 AU/hr at 0 AU, 300 nm • < 0.0005 AU/hr at 0 AU, 300 nm with Automatic Referencing Stage
Stray light	• < 0.03 % at 340 nm (NaNO <sub>2</sub> , ASTM <sup>b</sup> ) • < 0.05 % at 220 nm (NaI, ASTM <sup>b</sup> ) • < 1 % at 200 nm (KCl, EP <sup>a</sup> , ASTM <sup>b</sup> )
Baseline flatness	• < 0.0005 AU
Measurement time	• 1 s
Shortest measurement time	• 0.02 s for Ultra Kinetic Mode, full wavelength range

<sup>a</sup> European Pharmacopoeia

<sup>b</sup> American Standard Testing Method

## Physical Requirement ●

- Physical Dimensions: 521 mm (W) x 450 mm (D) x 231 mm (H)
- Weight: 15 kg
- Power Requirement: 100 ~ 240 VAC (50/60 Hz), Free Volt
- Operating Temperature: 5°C~ 40°C
- Humidity: Less than 95% relative, non-condensing

## LabPro<sup>®</sup> Plus Specifications ●

- Operating System: Microsoft Windows 98/ME/2000 or XP
- Interface: USB / RS-232 Auto Select
- Control Accessories: 8-Position Multi-Cell Holder, Automatic Referencing Stage, Autosipper, Autosampler, Peltier Temperature Control Unit, Reflectance Module and Diffuse Reflector
- Computer Requirements: IBM Compatible PC (Pentium 133 MHz or greater Processor), 64 MB RAM, 100 MB Free Hard Disk Space, Color Monitor(1024 x 768 pixel), CD ROM Drive, Mouse & Keyboard

## Warranty ●

One year full warranty for the complete system and three years warranty for the spectrograph.

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