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Photodiode Array  
UV-Vis Spectrophotometer

# S-3100 Series

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# S-3100 Series

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Photodiode Array

Photodiode Array UV-Vis Spectrophotometer

UV-Vis Spectrophotometer

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S-3100 Series

S-3100 Series Photodiode Array UV-Vis Spectrophotometer

Photodiode Array UV-Vis Spectrophotometer



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 Series 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.

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# S-3100 Series

## → Features

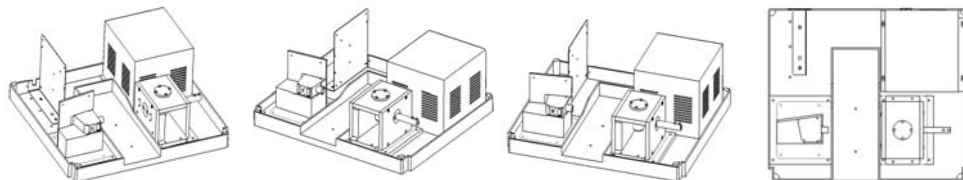
### Dual Lamp Source ●

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 the 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.

### Various Accessories ●

The sample compartment of the S-3100 Series 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 series Spectrophotometer.



### 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.

### Interface ●

The S-3100 Series can process data from the 1024 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 Series, 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.



S-3100 Series





## ➔ Wide Range of Applications

### Wide Range of Applications

Designed for high precision, the S-3100 Series 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 / Cosmetic field**

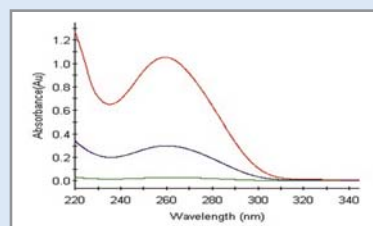
Used in R&D, QC and in the Dissolution Testing of materials and products to meet government legislation.

#### ● **Biochemical / Genetic field**

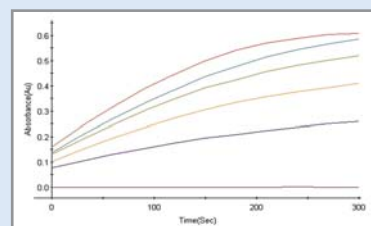
Quantification of DNA and Protein <①>

Enzyme activity and mechanism <②>

Thermal Denaturation of DNA



<DNA Analysis-①>



<Enzyme Mechanism-②>



## S-3100 Series



⇒ S-3100 Series  
PDA UV-Vis Spectrophotometer

- **Analytical Chemistry**

Research centers/Universities/Laboratories

- **Dye / Ink / Paint industry**

QC in the development and production of dyeing reagents/  
inks / paints and to meet legislation requirements.  
Analysis of intermediate dyeing reagents

- **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

- **Petrochemical sector**



Wide Range of Applications



S-3100 Series



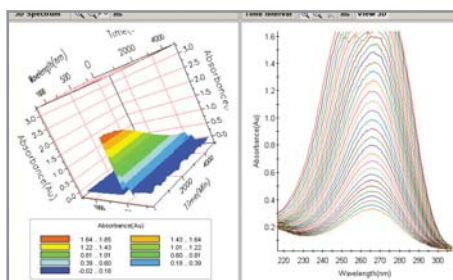
# LabPro® Plus Software

## 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 >



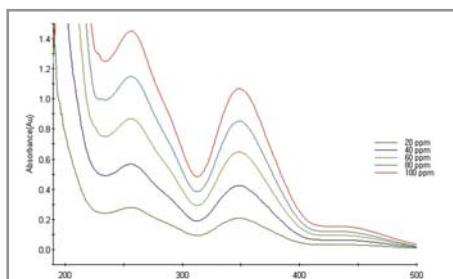
<Kinetic data & 3D graphic spectrum— ① >

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

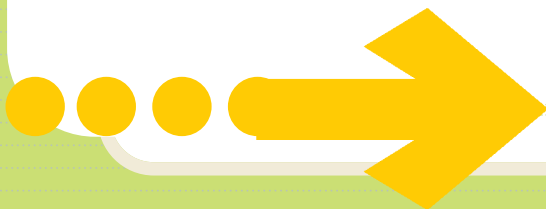
● LabPro® Plus Software is compatible with Windows 98/ME/2000 or XP. Built-in data conversions and formats efficiently support LabPro® and LabPro® Easy files, CSV, XLS, BMP and WMF. LabPro® Plus data is easily exported into Excel and other Windows programs

● 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 >



<Photometric Accuracy Test with Potassium Dichromate— ② >



# S-3100 Series



## General Mode

<b>Wavelength Monitoring</b>	<ul style="list-style-type: none"> <li>• Display the complete spectrum of the full wavelength range (190-1100nm)</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>
<b>Equation Calculation</b>	<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>
<b>Find Peak &amp; Valley</b>	<ul style="list-style-type: none"> <li>• Find up to 20 peaks or valleys automatically or manually</li> </ul>

## Quantification Mode

<b>Quantification Standard/Sample</b>	<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

<b>Time Interval</b>	<ul style="list-style-type: none"> <li>• 3D Display: Time Display (X Axis), Zoom In/Zoom Out, Rotate Chart</li> <li>• Time Unit: Second, Minute</li> </ul>
<b>Time Based Kinetic</b>	<ul style="list-style-type: none"> <li>• 3D Display: Time Display (X Axis), Zoom In/Zoom Out, Rotate Chart</li> <li>• Linear, Quadratic, 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>
<b>Temperature Based Kinetic</b>	<ul style="list-style-type: none"> <li>• 3D Display: Time Display (X Axis), Zoom In/Zoom Out, Rotate Chart</li> <li>• Ramp Rate: 0.5, 1 and 2 min/ °C</li> <li>• Peltier temp. Controller is required</li> </ul>
<b>Ultra Kinetic</b>	<ul style="list-style-type: none"> <li>• Time Unit: ms</li> </ul>





# S-3100 Series

➔ LabPro® Plus Software

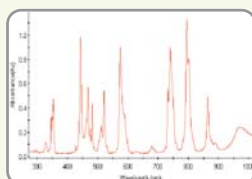


## Bio Mode

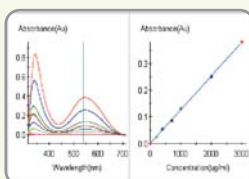
<b>Protein Analysis</b>	<ul style="list-style-type: none"> <li>• Predefined Protein methods: Bradford, Bicinchoninate (BCA), Biuret, Lowry, Trinitrobenzene Sulfonate, Direct UV methods</li> </ul>
<b>Nucleic Acid Analysis</b>	<ul style="list-style-type: none"> <li>• General Ratio with user specified two 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>
<b>Enzyme Activity</b>	<ul style="list-style-type: none"> <li>• Calculation of enzyme activity</li> <li>• Linear, Quadratic, First Order, Delta Au</li> <li>• User Specified One Activity Factor</li> </ul>
<b>Enzyme Mechanism</b>	<ul style="list-style-type: none"> <li>• Michaelis-Menten</li> <li>• Calculate Km, Vmax from each plot</li> </ul>
<b>Thermal Denaturation</b>	<ul style="list-style-type: none"> <li>• Ramp Rate: 0.5, 1 and 2 min/°C</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. Controller is required</li> </ul>

## Validation

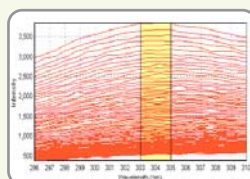
<b>Validation &amp; 21 CFR Part 11</b>	<ul style="list-style-type: none"> <li>• 4Q document for the Design, Installation, Operation, Performance Qualifications</li> <li>• Automatic Validation Wizard</li> <li>• Enhanced Security based on Windows 2000/XP</li> <li>• Electronic Signature and Traceability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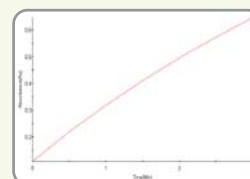
<General Mode>



<Quantification Mode>



<Kinetic Mode>



<Bio Mode>





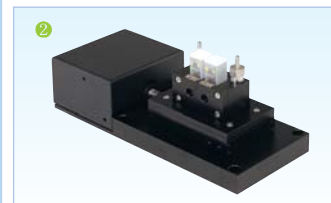
## ➔ Various Accessories

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 Various Accessories

#### Cells and Cell Holders – ①, ②

- Various cells are available
- Single Cell Holder
- Water Jacketed Single Cell Holder
- Automatic Water Jacketed 8-Position Multi-Cell Holder
- Automatic Referencing Stage
- Variable Pathlength Cell Holder (5 mm to 100 mm)
- Magnetic Film 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 Controller – 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 and gases
- Useful for unusual sample sizes and shapes



#### Reflectance Module – ⑦

- Measuring of the film thickness



#### Integrating Sphere

- Measurement of diffuse reflectance

#### 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.



# ➔ Specifications

## Specifications

<b>Model</b>	• S-3130 (S-3150)
<b>Source</b>	• Pre-aligned Tungsten & Deuterium Lamp
<b>Detector</b>	• 1024 Channels PDA
<b>Wavelength range</b>	• 190 – 850 nm (1100 nm)
<b>Wavelength resolution</b>	• 0.75 nm (0.95 nm)
<b>Resolution test</b>	• > 1.5 (EP <sup>a</sup> )
<b>Wavelength accuracy</b>	• ±0.4 nm(0.5 nm) with Holmium oxide glass filter • ±0.4 nm(0.5 nm) with D <sub>2</sub> peaks, 486.0 nm and 656.1 nm
<b>Wavelength reproducibility</b>	• < 0.02 nm
<b>Photometric range</b>	• -3.0 ~ +3.0 AU
<b>Photometric accuracy</b>	• ±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 • ±0.01 AU at 440, 590 nm with 1.0 AU of Neutral density glass filter
<b>Photometric Reproducibility</b>	• < 0.002 AU with 60 ppm Potassium Dichromate • < 0.001 AU at 440, 590 nm with 0.5 AU of Neutral density glass filter • < 0.002 AU at 440, 590 nm with 1.0 AU of Neutral density glass filter
<b>Photometric noise</b>	• < 0.0003 AU at 500 nm
<b>Photometric stability</b>	• < 0.003 AU/hr at 0 AU, 500 nm • < 0.0015 AU/hr at 0 AU, 500 nm using the Automatic Referencing Stage
<b>Stray light</b>	• < 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> )
<b>Baseline flatness</b>	• < 0.0005 AU
<b>Measurement time</b>	• 1 s
<b>Shortest measurement time</b>	• 0.02 s for Ultra Kinetic Mode, full wavelength range

<sup>a</sup> European Pharmacopoeia

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

# S-3100 Series

## Physical Requirement ●

- Physical Dimensions: 521 mm (W) x 450 mm (D) x 231 m(H)
- Weight: 14kg
- Power Requirement: 110 or 220 V 10%, free of spikes
- Operating Temperature: 5℃~ 40℃
- Humidity: Less than 95% relative, non-condensing

## LabPro® Plus Specifications ●

- Operating System: Microsoft Windows 98/ME/2000 or XP
- Interface: USB port
- Control Accessories: 8-Position Multi-Cell Holder, Automatic Referencing Stage, Autosipper, Autosampler, Peltier Temperature Controller, Reflectance Module and Integrating Sphere
- 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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