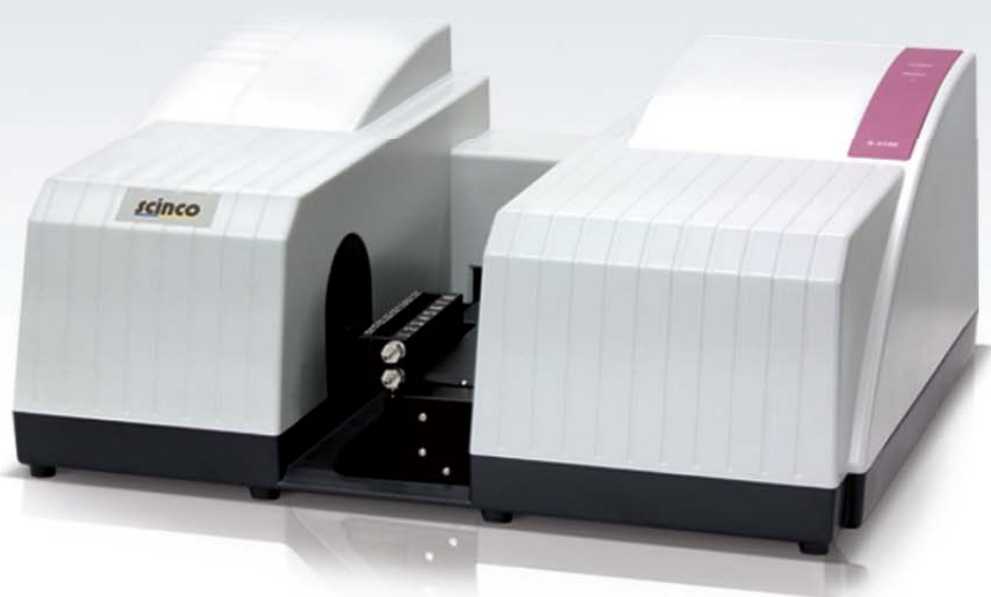# S-3100

Photodiode Array UV-Vis Spectrophotometer

scinco

S-3100
Photodiode Array
UV-Vis 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 20 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 application demands in a wide range of R&D and QA/QC laboratories.

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

FEATURES

See-Through Optics

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. High signal-to-noise performance is achieved using user-selectable integration parameters. With the combination of optimized optical design and PDA technology, excellent wavelength reproducibility and resolution are assured.
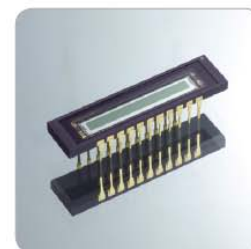
Various Accessories

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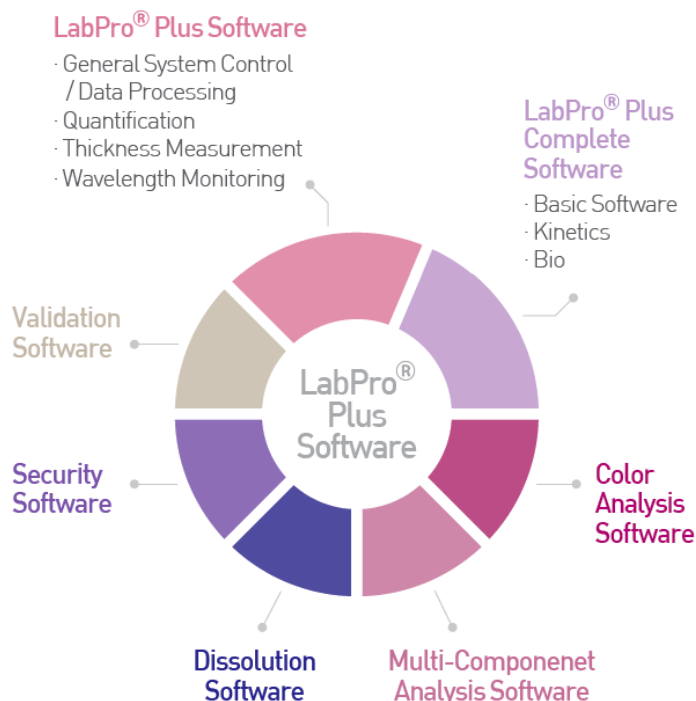
Interface

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 Software is 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 minimizing potential down-time. The reversed optical design allows experiments to be run using an open sample compartment without affecting the quality of your data.

LabPro® Plus SOFTWARE

LabPro® Plus Software is a powerful tool for collecting and processing data for a wide-range of applications. The software enables easy acquisition and post-run analysis of high quality data.

LabPro® Plus Software
· General System Control / Data Processing
· Quantification
· Thickness Measurement
· Wavelength Monitoring

LabPro® Plus Complete Software
· Basic Software
· Kinetics
· Bio

Validation Software

Security Software

LabPro® Plus Software

Color Analysis Software

Dissolution Software

Multi-Componenet Analysis Software

LabPro® Plus Software provides complete instrument and accessory control as well as data collection, analysis, and reporting capabilities. The software features a graphical interface with toolbars for easy navigation and quick access to commonly performed tasks. As standard tools, it consists of Wavelength Monitoring Mode providing full-spectrum and fixed wavelength analysis as well as supporting final-result user-defined equations. The advanced spectral processing features and Quantification Mode allow creation of standard curves and examination of samples at any wavelength at any time. LabPro® Plus Complete Software provides Kinetics Mode to visualize the entire absorption spectrum of your sample at every time interval and Bio Mode for analyzing proteins and nucleic acids with pre-defined biological methods.

Optional Color Analysis Software calculates L*a*b* color and color difference between samples as ΔE and individually as L*, a*, and b*. Multi Component Analysis Software provides the analysis of complex solutions and mixtures, determining the concentration of individual components in unknown sample mixtures.

LabPro® Plus Software is compatible with Windows XP and Windows 7. 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.

LabPro® Plus Dissolution Software has a variety of sampling options ranging from manual offline through full automation of up to two baths each running different Methods. Complete control of the tester and Peristaltic pump is available.

A Validation Software for LabPro® Plus is designed to verify the instrumental performance (e.g., Wavelength Accuracy, Photometric Accuracy, Resolution, Stray Light, Stability and Dark Current) using the Validation Wizard.

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

General Mode

Wavelength Monitoring

- Display the complete spectrum of the full wavelength range (190 ~ 1100 nm)
- Math function : Smoothing, Derivatives, Scalar Addition, Scalar Division, Scalar Multiplication, Log, Add, Subtract, Average
- Baseline Correction
- Zoom In / Out, Add / Edit Labels
- Export to Clip Board, CSV file, Excel file, BMP file, WMF file
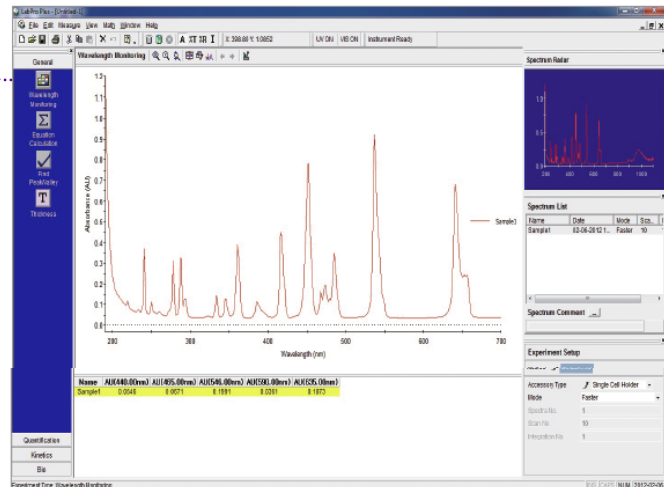
Equation Calculation

- Allows the user to enter a defined equation for the evaluation of a final result
- Support Equation : +, -, /, *, ABS, Exp, LN, LOG10, SQRT

Find Peak / Valley

- Find up to 30 of peaks or valleys automatically or manually

Thickness

- Measures the thickness of a thin film coating

Quantification Mode
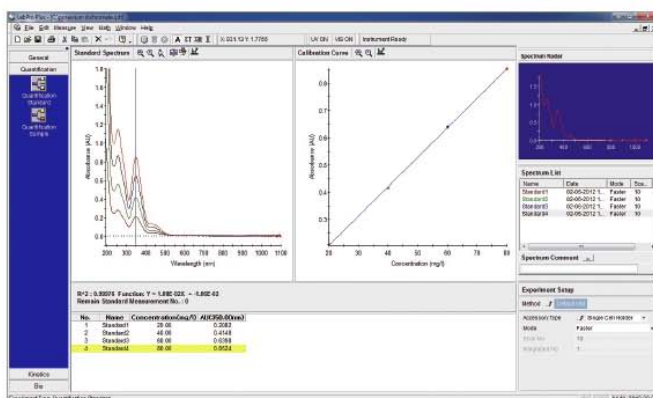
Quantification Standard / Sample

- User specified concentration units
- Apply First, Second and Third Order curve fit to data
- Zero offset for Calibration Curve
- Automatic concentration calculation of unknown sample
- Available to change the wavelength for making a calibration curve after standard sample measurements
- Available to SAVE calibration curves and OPEN to reuse
- Available to calculate the original concentration by the dilution factor

Kinetics Mode

Time Based Kinetics

- Perform time based analyses
- Analyze and present data in 3D graphical displays with full zoom and rotation capabilities
- Initial Rate, Zero Order, First Order, Delta AU
- Data from single wavelength (using multi-cell) or multiple wavelengths (using single cell) can be extracted for rate calculation
- Visualizing the entire absorption spectrum of sample at every time interval

Temperature Based Kinetics

- Perform temperature based analyses
- Peltier Temp. Control Unit is required.
- Temperature range : -10 ~ 100℃
- Analyze and present data in 3D graphical displays with full zoom and rotation capabilities

Ultra Kinetics

- Acquire a spectrum of full wavelength range for every time interval
- Maximum number of spectra : 50,000
- Display real time changes for a specified wavelength
- Minimum time interval : 20 ms
- Reaction rate calculation for each of the two selected wavelengths
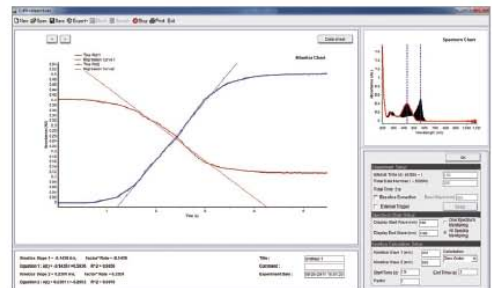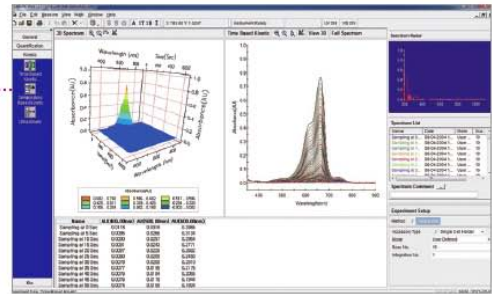
Bio Mode
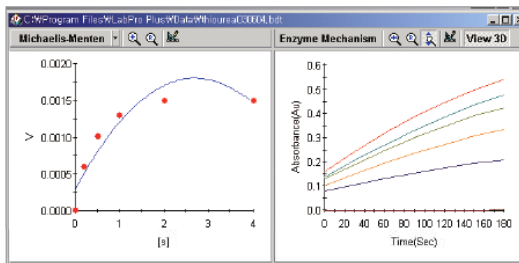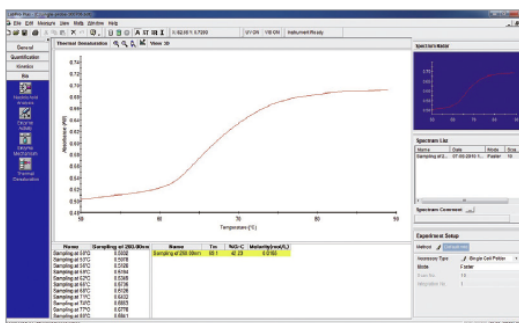
Protein Analysis

- Predefined Protein methods : Bradford, Bicinchoninic Acid (BCA), Biuret, Lowry, Trinitrobenzene Sulfonate, Direct UV methods

Nucleic Acid Analysis

- Automatic calculation of the purity and concentration of nucleic acid (DNA, RNA, etc.)
- User defined Protein and Nucleic Acid factor

Enzyme Activity

- Calculation of enzyme activity
- User specified activity Factor
- Present data in 3D graphical display

Enzyme Mechanism

- Reaction rate measurements of enzyme-catalyzed reactions depending on the substrate concentration
- Calculation Km, Vmax from each plot
- Michaelis-Menten, Lineweaver-Burk, Hanes-Woolf, Eadie-Hofstee
- Present data in 3D graphical display

Thermal Denaturation

- Peltier Temp. Control Unit is required.
- Perform temperature based analyses at a specific wavelength
- Temperature range : -10 ~ 100℃
- Calculation of Tm and %G-C
- Volume correction with user specified equation
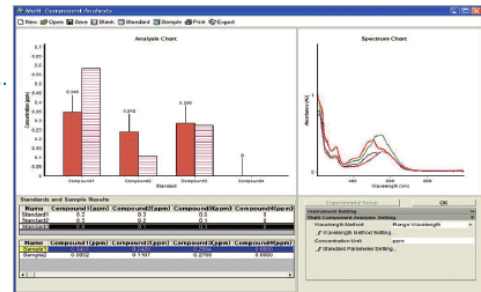- Present data in 3D graphical display

SCINCO

Color Analysis

- Color Difference Formula
- Measure Various Color Indices
- Display Yxy chromaticity diagram
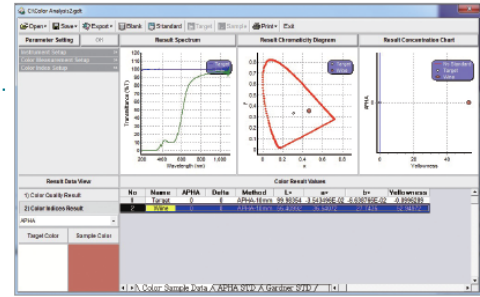
Multi Component Analysis

- Mixture composition analysis
- Determine the concentration of each component
- Possible to analyze up to 4 components
- Math function : Derivative, Baseline Correction

On-line Dissolution Software

- Automatic sampling and measurement for USP dissolution test
- FDA 21 CFR Part 11 Compliance
- Calculation of %D
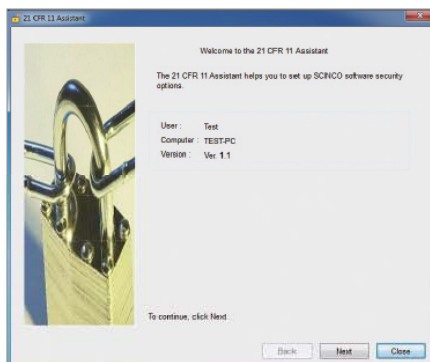- Supports online dissolution testing

Validation Software

- 4Q document for the Design, Installation, Operation and Performance Qualification
- Automatic Validation Wizard
- Photometric, Wavelength, Resolution, Stray Light, Stability and Dark Current Test

Security Software

21 CFR Part 11 Compliance

- FDA 21 CFR Part 11 Compliance
- Based on Windows XP Professional, Windows 7 Professional, Windows 7 Ultimate, Windows 7 Enterprise
- Support Electronic Record and Electronics Signature
- Strengthen security to give each user authority to access the system
- Traceable to change the data in the Audit Trail

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 followings 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
Enzyme activity and mechanism
Thermal Denaturation of DNA

Analytical Chemistry

Research centers / Universities / Laboratories
Multi component analysis

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 in the Color Analysis Mode

Water Analysis

Water quality analysis for drinking water, waste water, sea water, etc.

Environmental / Agriculture

Quantification of organic materials / heavy metals in freshwater, seawater, atmosphere and soils

Materials

Semiconductors, Mining industry, Metal Refining
Measuring the film thickness and coating material
Transmittance or reflectance measurement of LCD

Petrochemical

Various
ACCESSORIES

The S-3100 PDA UV Vis Spectrophotometer features a complete line of accessories to help you assemble the best analytical system for your laboratory. Accessories are easy to insert and remove, allowing multi-user labs to move quickly from one experiment to the next. Automated cell holders, temperature control and solid sample accessories give you the versatility you need to measure difficult samples quickly. Whether your needs are research or routine, our accessory selection allows you to build a customized system that delivers the results you demand.

Auto. Water Jacketed 8-Position Multi-Cell Holder

Automatic Referencing Stage

Variable Pathlength Cell Holder

Reflectance Module

Advanced Transmittance Holder

Variable Angle Transmittance Holder

Magnetic Film Holder

Auto Sipper

Manual Sipper

Autosampler

Diffuse Reflector

Peltier Temp. Control Unit (Single & Multi-Cell Holder)

Dip Probe Fiber Optic

Rapid Mixing Accessory

Cryostat Accessory

Nano Stick S & D

Others
- Magnetic Stirrer Assembly (Manual & Auto)
- Refrigerated Circulator / Circulator
- Others are available upon request

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[a])
Wavelength accuracy	±0.5 nm with Holmium Oxide Solution (NIST 2034)
	±0.2 nm with D_2 peaks, 486.0 nm and 656.1 nm
Wavelength reproducibility	< 0.02 nm (NIST 2034)
Photometric range	-3.0 ~ +3.0 AU
Photometric accuracy	±0.01 AU with 60 ppm Potassium Dichromate (EP[a])
	±0.005 AU at 440.0, 465.0, 546.1, 590.0 and 635.0 nm, 1.0 AU (NIST 930e)
Photometric reproducibility	< 0.002 AU with 60 ppm Potassium Dichromate
	< 0.001 AU at 440.0, 465.0, 546.1, 590.0 and 635.0 nm, 0.5 AU
Photometric noise	< 0.0001 AU at 300 nm
Photometric stability	< 0.001 AU/hr at 0 AU, 300 nm
Stray light	< 0.03% at 340 nm ($NaNO_2$, ASTM[b])
	< 0.05% at 220 nm (NaI, ASTM[b])
	< 1% at 198 nm (KCl, EP[a], ASTM[b])
Baseline flatness	< 0.0005 AU
Measurement time	1 s
Shortest measurement time	0.02 s for Ultra Kinetics Mode, full wavelength range

[a] European Pharmacopoeia
[b] American Standard Testing Method

SCINCO

PHYSICAL REQUIREMENT

Physical Dimensions : 541 mm (W) x 450 mm (D) x 232 mm (H)

Weight : 15.9 Kg

Power Requirement : 100 – 240 V a.c., @50/60 Hz

Operating Temperature : 5 ~ 40 ℃

Humidity : Less than 95% relative, non-condensing

LabPro® Plus SPECIFICATIONS

Operating System : Microsoft® Windows XP, Windows 7

Interface : USB / RS-232 Auto selected

Min. Computer requirements for LabPro® Plus software :
1.5 GHz or faster processor, at least 1 GB RAM, 4 GB available Hard Disk space,
Color Monitor (1024 x 786 pixel), CD-ROM Drive, Mouse & Keyboard
(Microsoft® Windows 7 based)

CERTIFICATES

CE, UL, CSA, FCC

Warranty

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

627, Bongeunsa-ro, Gangnam-gu, Seoul 135-090 Korea

Tel : +82-2-2143-8200   Fax : +82-2-2143-8355

R&D Center

746, Daedeok-daero, Yuseong-gu, Daejeon 305-348 Korea

Tel : +82-42-610-7400   Fax : +82-42-610-7500

"SCientific Instrument COmpany"

ISO 9001 : 2008

scinco