C101-E168A

SHIMADZU
Excellence in Science

UV-VIS Spectrophotometer

UV-1900i


SHIMADZU
Ready
Administrator
02/26 10:15
Kinetics
Time Course
Bio Method

Navigate Your Way

Easy to Operate, Obtain Answers Easily and Rapidly

Easy-to-use user interface design
Ergonomic touch-screen display

High Performance to Meet Diverse Needs

The instrument is equipped with an ultra high-speed scan, which can acquire a spectrum in a few seconds, with the lowest level of stray light and noise in its class

Advanced Regulatory Compliance

Validation functions enable checks in accordance with Pharmacopeia (JP, USP, and EP) to be performed easily
In combination with LabSolutions™ DB/CS, comply with FDA 21 CFR Part 11 and PIC/S GMP guidelines

UV-i Selection

UV-1900i | UV-2600i/2700i | UV-3600i Plus | SolidSpec™-3700i

reddot award 2019 winner

Easy to Operate, Obtain Answers Easily and Rapidly

The instrument is equipped with a stylus pen, allowing operation by this pen or a finger.

Easy-to-Use Interface
Grasp the Current Status and Operating Procedures at a Glance

The UV-1900i on-screen user interface includes large, easy-to-see icons deployed on a black background, so the instrument settings are evident at a glance. In addition, the large, easy-to-see icons improve intuitive understanding, which enables users to quickly become familiar with the operations. Furthermore, the user interface is designed to minimize transitions between windows, so users do not get confused during the operations.

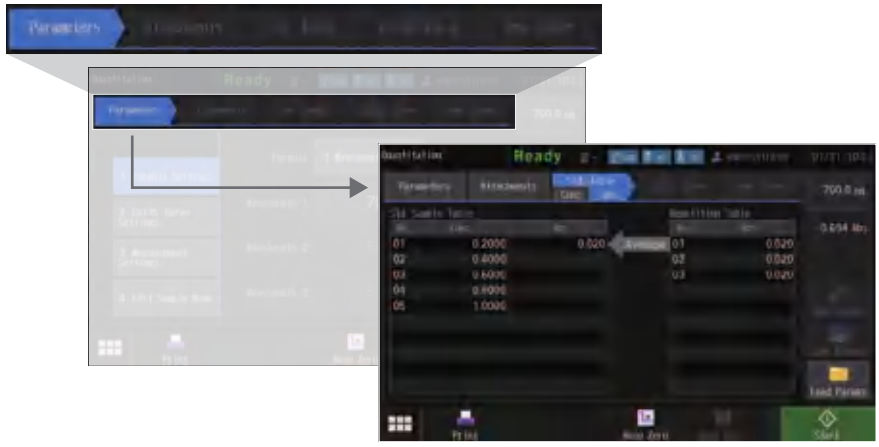
Display languages are available in eight languages (Japanese, English, Chinese, Spanish, Portuguese, German, French, Russian).

Ergonomic Hardware Design

The control panel is ergonomically designed and positioned at the optimum viewing angle for the user. Users can operate easily with any posture. Since the panel is pressure-sensitive, the device can be operated with gloved fingers or a stylus pen. The stylus pen can be stored right next to the control panel.

Navigation Tabs Improve Usability

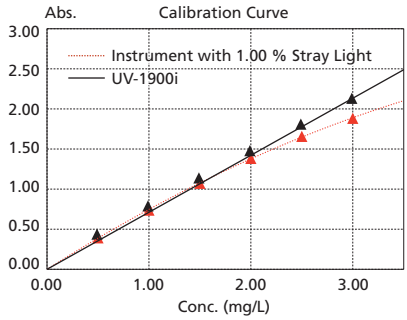
In quantitation mode on the UV-1900i, the stages of the entire measurement process and the current status are always shown on the display. As a result, users know immediately what to do in the next step.



High Performance to Meet Diverse Needs

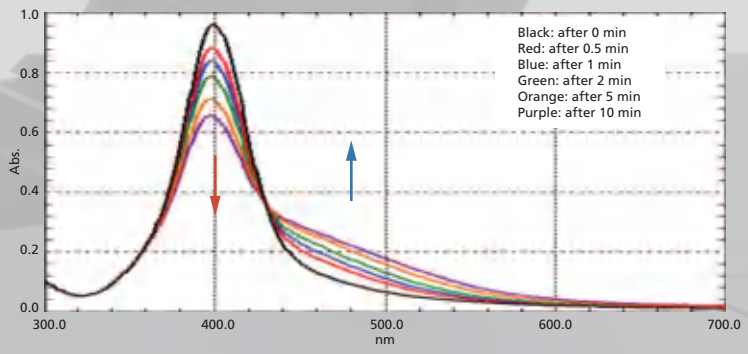
Low Stray Light

Stray light is at 0.5 % max. (198 nm), making accurate measurements are possible up to the vicinity of 2 Abs even in the ultraviolet region. In addition, high-concentration samples can be quantified accurately.
The figure on the right is a calibration curve for acetic acid, created with absorbance at 200 nm.
The correlation coefficient is 0.9997 and correct measured values are obtained even in the vicinity of 2 Abs. Linearity will be lost in the high absorbance region due to the stray light.

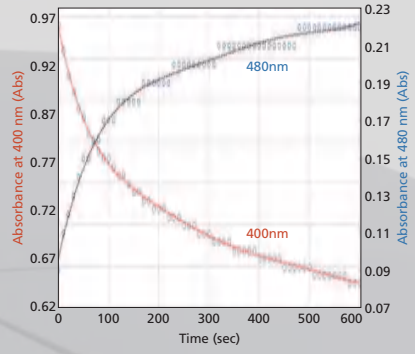


Ultra-Fast Scan

Spectra can be acquired as fast as 29,000 nm/min. Ultra-fast scan is effective in tracking chemical reactions in a short time. In addition to the absorbance change at specified wavelengths, spectra can also be acquired in a short time with the UV-1900i. Therefore, more detailed behavior can be investigated by observing spectra with the UV-1900i.
The figures below show the analysis of the particle agglomeration process when salts are added to silver nanoparticles. Measurements of the 300 to 700 nm region were performed in ultra-fast scan mode. In addition to the decrease of absorbance at 400 nm and the increase of absorbance at 480 nm, the temporal changes of spectra can also be observed.



Absorption Spectra of Silver Nanoparticles



Temporal Changes of Absorbance at 400 and 480 nm

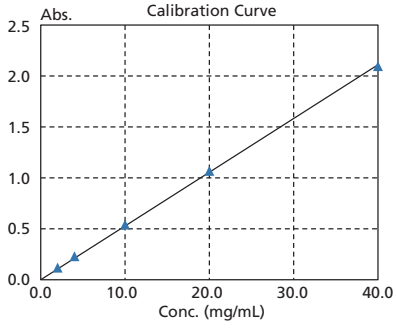
High Reproducibility and Repeatability Accuracy

The photometric repeatability accuracy is 0.0002 Abs max. (0.5 Abs and 1.0 Abs). With this high photometric repeatability accuracy, variance in the measurement results is suppressed, enabling more accurate quantitation and the detection of low-concentration samples.

The figure on the right is a calibration curve for caffeine, created with absorbance at 273 nm. The calibration curve has an Abs = 0.0528 Conc. The lower limit of quantitation determined from the standard deviation is 0.0051 mg/L.

Note: One method of determining the lower limit of quantitation is to use ten times the standard deviation. This is an actual measured value and is not guaranteed.

No.	Absorbance of Blank Solution (273 nm)
1	-0.00001
2	0.00001
3	-0.00002
4	0.00002
5	0.00001
6	-0.00003
7	0.00001
8	-0.00004
9	0.00001
10	0.00005
Standard Deviation σ	0.000025

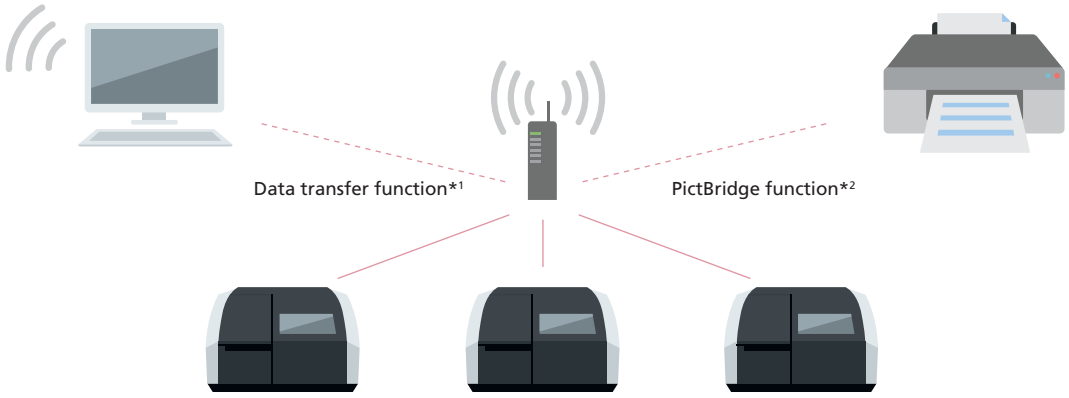


Various Functions for Comfortable Daily Measurement

Network Connectivity Function

The UV-1900i provides network access via wireless connectivity.

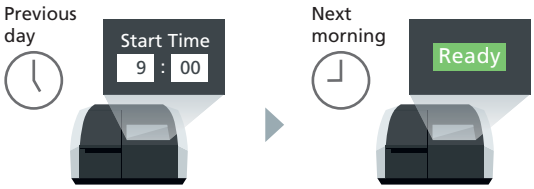
Data can now be transferred to a PC via a network.
Thanks to wireless printing, multiple UV units can print from a single printer.
(A router and other network equipment must be installed to use a network.)



*1: Optional expanded memory is required. The instrument is not compatible with control via a network.
*2: A PictBridge compatible printer is required.

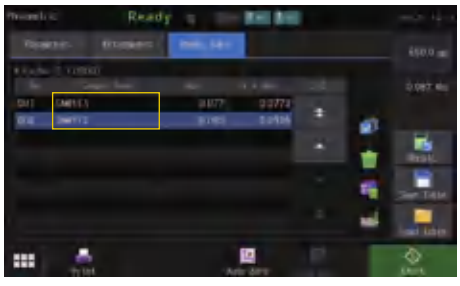
Sleep Mode and Wakeup Function

Analysis can start the instant the user arrives at the laboratory in the morning. The instrument requires no time to warm up.



Bar-Code Reader and Keyboard Entry Function

Sample names and numerical values can be entered by a bar-code reader or from the keyboard.
This saves time when entering sample names for a multiple sample analysis, and prevents sample misidentification and other human errors.*3



*3: Use a bar-code reader and keyboard with a USB connection.

A Diversity of Measurement Modes

Photometric

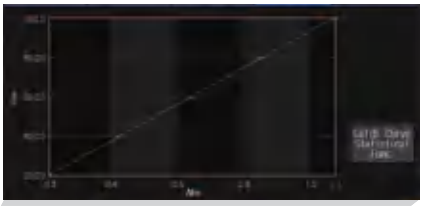
Measures the photometric value at a single wavelength or multiple (up to eight) wavelengths.

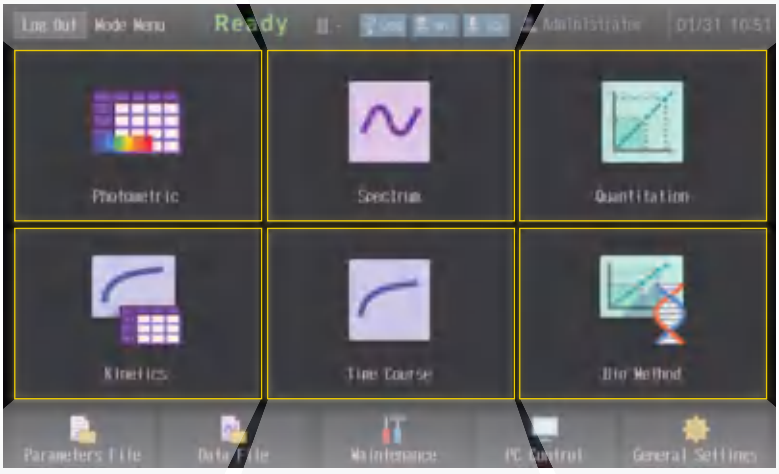
Spectrum

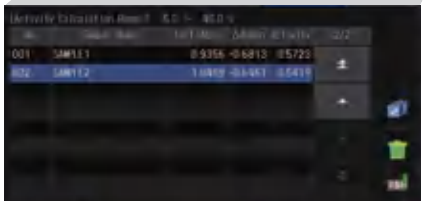
Measures a sample spectrum using wavelength scanning.

Quantitation

Generates a calibration curve from the measurement of standards, and then calculates the concentrations of unknowns.

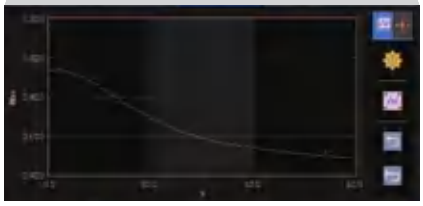






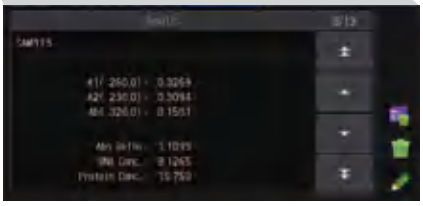
Kinetics

Measures absorbance changes as a function of time, and obtains the enzymatic activity values. The kinetics measurement method or the rate measurement method can be selected.



Time Course

Measures changes over time in photometric values at a specified wavelength.



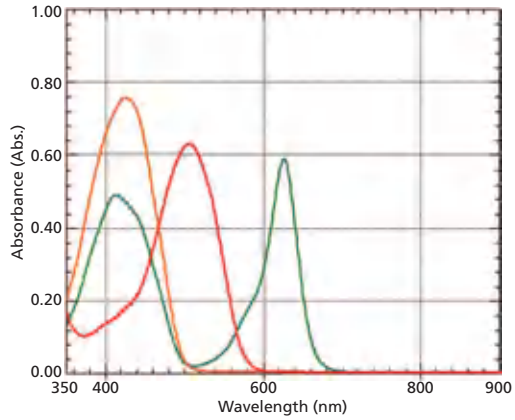
Biomethod

Quantifies DNA or protein concentrations.

Applications

Foods

This is an example of the analysis of food dyes. By using ultra-fast scan mode, the time needed for routine spectral checks can be shortened. The 350 nm to 900 nm region can be measured at 1 nm intervals in approx. 4 seconds.



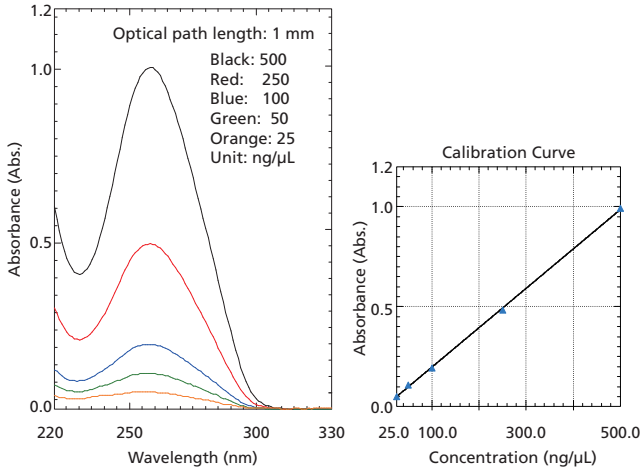
Absorption Spectra of Food Dyes

Pharmaceuticals and Life Sciences

This is an example of the analysis of λDNA. Trace quantities (on the order of a few µL) can be measured by combining the instrument with Nano Stick and TrayCell®.
Using TrayCell, a calibration curve for 4 µL of λDNA was obtained in the range between 25 ng/µL and 500 ng/µL.

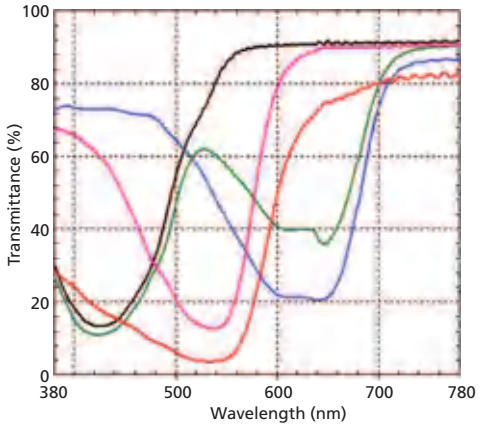
TrayCell

Nano Stick

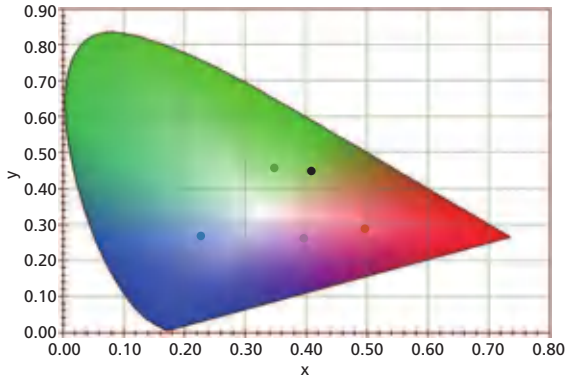


Chemistry

This is an example of the analysis of colored cellophane tape. Materials can be confirmed quantitatively by using LabSolutions UV-Vis and color measurement software.



Transmittance Spectra of Colored Cellophane Tape



Chromaticity Diagram of XY Color System

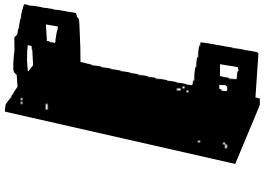
Accessories

Expanded Memory (P/N 207-23119-41)

The UV-1900i main unit can store up to 999 sets of data.
The saved data can be read out from a PC.
(A network connection is required for data readout.)

Film Holder (P/N 204-58909)

Used in transmittance measurement of thin samples such as films and filters. It holds the samples for analysis.

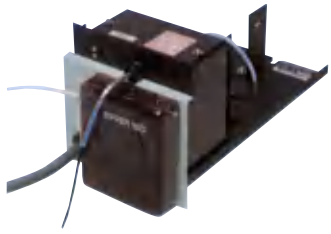


Long-Path Rectangular Cell Holder (P/N 204-23118-01)

Holds two rectangular cells with an optical path length of 10, 20, 30, 50, 70, or 100 mm.

Sipper Unit

Model	P/N	Standard Sample Volume
Sipper Unit 160L (Standard Sipper)	206-23790-51	2.0 mL
Sipper Unit 160T (Triple-Pass Sipper)	206-23790-52	1.5 mL
Sipper Unit 160C (Constant-Temperature Sipper)	206-23790-53	2.5 mL
Sipper Unit 160U (Supermicro Sipper)	206-23790-54	0.5 mL



Four types of sipper units with different flow cells are available. The stepping motor-driven peristaltic pump ensures reliable and smooth aspiration of sample solution.

(Direct driving is possible from the UV-1900i so no interface is required.)

Note: The use of a Solenoid Valve (Fluoropolymer) (P/N 204-06599-01) and the SWA-2 Sample Waste Unit (206-23820-58) are recommended when strong acids, strong alkalis, or organic solvents are to be measured.

CPS-100 Cell Positioner, Thermoelectrically Temperature Controlled (P/N 206-29500-41)

This attachment permits measurement of up to six sample cells under constant-temperature conditions. Combination of this attachment and the Kinetics mode provides measurement of temperature-sensitive enzyme kinetics of one to six samples.

- Number of cells: 6 on the sample side (temperature-controlled)
  1 on the reference side (temperature not controlled)
- Temperature control range: 16°C to 60°C
- Temperature display accuracy (difference from the true value): ± 0.5°C
- Temperature control precision (variation of temperature): ± 0.1°C
- Ambient temperature: 15°C to 35°C

Note: Square cells (P/N 200-34442) are not included, please purchase separately.
A USB adapter CPS (P/N 206-25234-91) is required.

Test Tube Holder (P/N 207-23510-41)

Holds test tube instead of sample compartment.

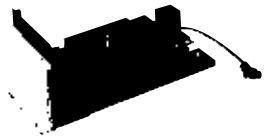
- Specifications:
  Outside diameter: φ15 to 22 mm
  Height: 75 to 115 mm
  Note: Test tube is not included.

Multi-Cell Sample Compartment (P/N 206-69160-41)

Holds up to six 10-mm square cells on the sample side. No temperature control capability.

- Number of cells: 6 on the sample side
  1 on the reference side

Note: Square cells are not included, please purchase separately.



TCC-100 Thermoelectrically Temperature Controlled Cell Holder (P/N 206-29510-41)

Uses Peltier effect for controlling the sample and reference temperature, so no thermostated bath or cooling water is required.

- Number of cells: One each on the sample and reference sides (temperature-controlled)
- Temperature control range: 7°C to 60°C
- Temperature display accuracy (difference from the true value): ± 0.5°C
- Temperature control precision (variation of temperature): ± 0.1°C

Note: Square cells (P/N 200-34442) are not included, please purchase separately.

Standard Software: LabSolutions UV-Vis

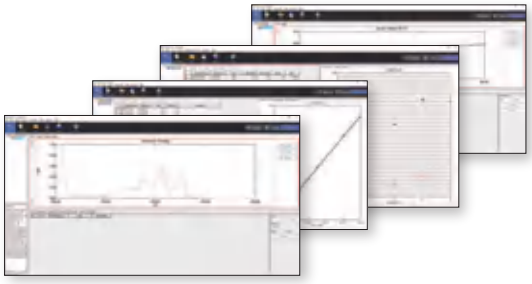
The combination of the UV-1900i, offering lower stray light levels and higher accuracy, with LabSolutions UV-Vis software, which achieves labor-saving measurements, provides a more convenient analytical environment.

Setting Parameters

Smooth Operability

Four Measurement Modes

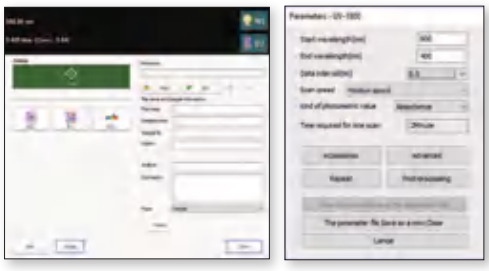
Four separate measurement modes for spectral, quantitative, photometric, time-course, and automatic measurements (optional) enable measurements to be performed using intuitive operations.



Four Measurement Mode Windows

Instrument Control Panel

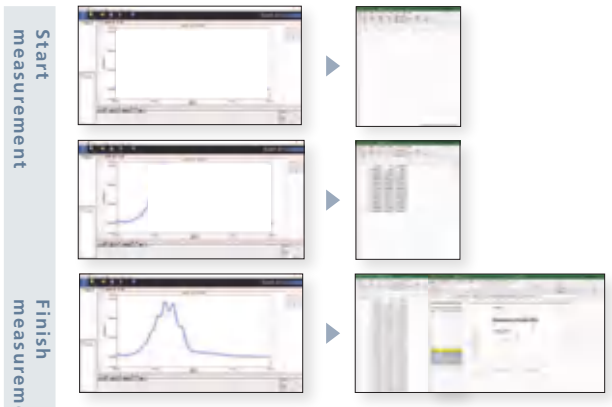
Instrument parameter settings can be specified via panels that are separate from the measurement window. The control panels include various functionality that is laid out for superior visibility. Each measurement window connects seamlessly to the corresponding parameter settings window.



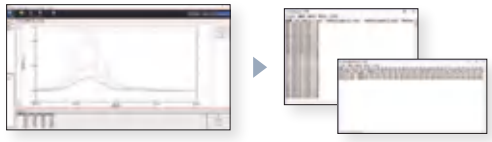
From Measurement to Data Output

Improved Productivity of Data Analysis Operations

Data analysis and data output operations can be performed at the same time (simultaneously) as data measurement. Time spent outputting or analyzing data can also be reduced by simultaneously sending data to an Excel® spreadsheet in real time or saving data as text. The software can also automatically perform post-processing of measured data, such as processing/correcting spectra, and perform pass/fail judgments of measurement results (automatic spectral evaluation).



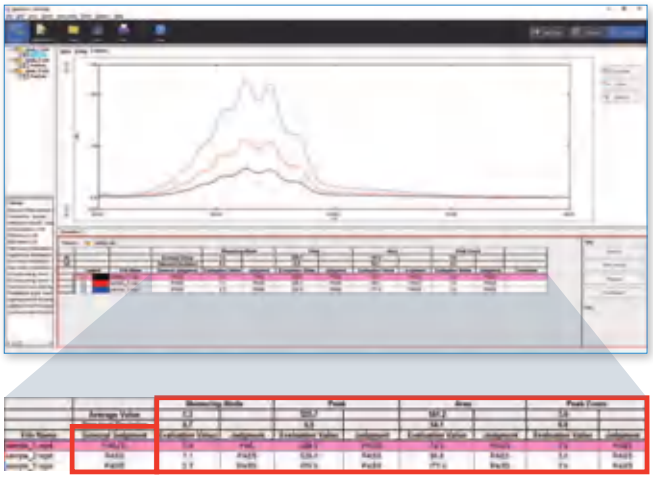
Analyze data in Excel® concurrently with data measurement (Excel® data analysis real-time transfer function)



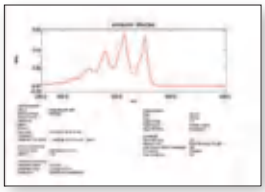
Easily transfer data to external data analysis software (simultaneous text saving and matrix output functions)

Automatic Spectral Evaluation (Spectral Evaluation Function)

By specifying various evaluation criteria for measurement results, spectra judgments can be made automatically.



In the report creation window, reports can either be prepared based on a previously specified report format or freely laid out based on various parameters, data, or other elements.



Data Management

Stronger Data Management

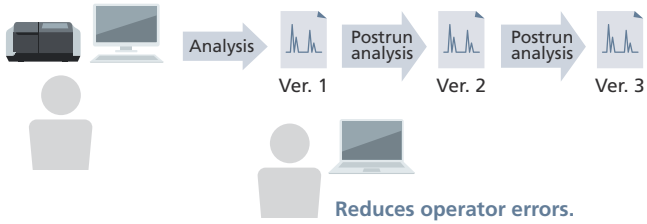
In addition to regular file management in folders on a PC, ideal solutions for saving data in a database with sophisticated security functionality and compliance with ER/ES-related regulations are also available.

Optional Software

- LabSolutions DB UV-Vis
- LabSolutions CS UV-Vis

Database Management

Managing data in a database can prevent the overwriting or deletion of analysis data. Furthermore, during postrun analysis, the data can be managed using version numbers, so there are no concerns about overwriting the data.



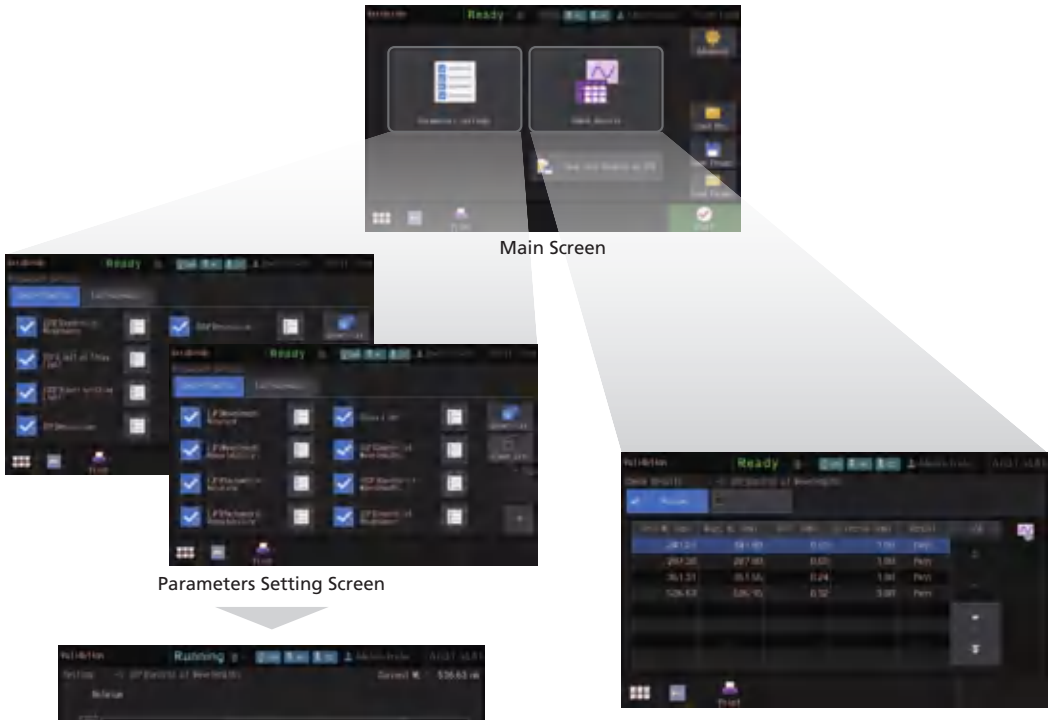
Reduces operator errors.

Advanced Regulatory Compliance

Full Support for Pharmacopeia, GLP/GMP, FDA 21 CFR Part 11 and Other Regulations

Instrument Validation Functions Compliant with JP, USP, and EP

This instrument can not only run checks for nine JIS items, but also those stipulated in the Japanese Pharmacopoeia (JP), United States Pharmacopeia (USP), and the European Pharmacopoeia (EP). Naturally, the hardware is also compliant with the specifications required by each Pharmacopeia. In addition, the check conditions can be saved. As a result, once the conditions are saved, checks can be performed easily just by calling them up as needed. Check results can also be saved.



Main Screen

Parameters Setting Screen

Check Results Screen

During Testing Screen

Improved Security Functions

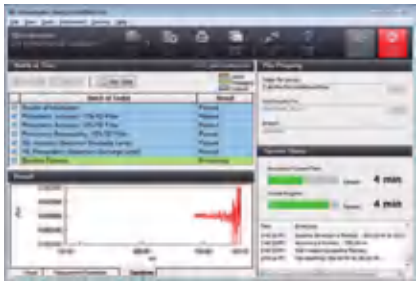
An external control security function has been added to provide more support for compliance with regulations. Three user authority levels, "Administrator", "Developer", and "Operator", can be set for instrument users.

Resolution of 1 nm, the Highest in its Class

In addition to achieving a resolution of 1 nm, the highest in its class, by using a monochromator with a Czerny-Turner mounting, the UV-1900i also features a compact, bright optical system. The instrument is more than capable of meeting the wavelength resolution required in the European Pharmacopoeia.

Compatible with Validation from PC Software

Validation can be implemented with PC software by using the optionally available UV validation software.
In addition to simplifying daily inspections, this makes instrument performance checks and records management easier, enabling more secure regulatory compliance.



- Inspection results can not only be printed but also saved to a file, so the results can be called up later for confirmation.
- The inspection parameters can also be saved to separate files for periodic and routine inspections, and then called up for use.

- The user can select confirmation of instrument performance indicators as per JIS K0115 General rules for molecular absorptiometric analysis, as well as the general test methods in the Japanese Pharmacopeia, USP and various EP inspections. (Order inspection jigs and reagents separately.)

Support for FDA 21 CFR Part 11, PIC/S GMP Guidelines and Other Regulations and Guidelines

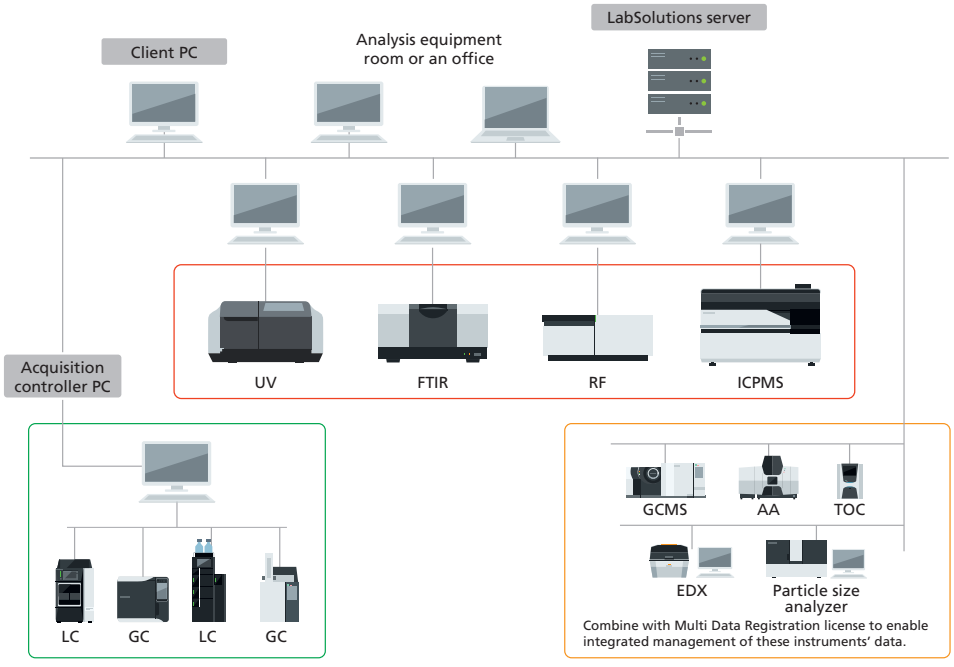
Ensuring the integrity of data (database management), including the user management, user authority management, and data audit trails required for compliance with FDA 21 CFR Part 11, PIC/S GMP guidelines, and other ER/ES regulations, is possible.

LabSolutions DB UV-Vis or UVProbe / LabSolutions DB System

The system allows for data management and user management with a database. Compliant with ER/ES regulations, the system is optimally configured for customers using a PC.

LabSolutions CS UV-Vis or UVProbe / LabSolutions CS System (Network System)

The system is optimally configured for customers who want to manage data on a server together with LC and GC data for ER/ES compliance.



ANALYTICAL
INTELLIGENCE

-Automated support functions utilizing digital technology, such as M2M, IoT , and Artificial Intelligence (AI), that enable higher productivity and maximum reliability.
-Allows a system to monitor and diagnose itself, handle any issues during data acquisition without user input, and automatically behave as if it were operated by an expert.
-Supports the acquisition of high quality, reproducible data regardless of an operator's skill level for both routine and demanding applications.

SHIMADZU

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