

## Specification Sheet

# UV-1900i Plus

## UV-Vis Spectrophotometer

The UV-1900i Plus is a double-beam UV-Vis Spectrophotometer using Shimadzu's original LO-RAY-LIGH™ diffraction grating technology. In addition to its high optical performance, the UV-1900i Plus features high resolution, low stray light, high reproducibility, and an ultra-fast scan function. It also has an easy-to-use interface on a color touch-screen display. The UV-1900i Plus is designed to meet the needs of both high performance and usability.



### Hardware Specifications

| Item                        | Specification                                                                                                                                  |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Wavelength range            | 190 to 1,100 nm                                                                                                                                |
| Spectral bandwidth          | 1 nm (190 to 1,100 nm)                                                                                                                         |
| Wavelength setting          | 0.1 nm increments<br>(1 nm increments when setting scanning range)                                                                             |
| Wavelength accuracy         | ± 0.1 nm at D2 peak 656.1 nm,<br>± 0.3 nm for entire range                                                                                     |
| Wavelength repeatability    | ± 0.1 nm                                                                                                                                       |
| Wavelength slew rate        | Approx. 29,000 nm/min                                                                                                                          |
| Wavelength scanning speed   | 3,000 to 2 nm/min<br>29,000 nm/min when survey scanning                                                                                        |
| Lamp interchange wavelength | Automatic interchange linked to wavelength.<br>The interchange wavelength can be set freely in the range of 295 to 364 nm (0.1 nm increments). |
| Stray light                 | Less than 0.02 % at 220 nm (NaI)<br>Less than 0.02 % at 340 nm (NaNO <sub>2</sub> )<br>Less than 0.5 % at 198 nm (KCl)                         |
| Photometric system          | Double beam optics                                                                                                                             |
| Photometric range           | Absorbance: -4 to 4 Abs<br>Transmittance: 0 to 400 %                                                                                           |
| Photometric accuracy        | ± 0.002 Abs at 0.5 Abs<br>± 0.004 Abs at 1.0 Abs<br>± 0.006 Abs at 2.0 Abs<br>(measured using NIST930/NIST1930 or equivalent.)                 |
| Photometric repeatability   | Less than ± 0.0002 Abs at 0.5 Abs<br>Less than ± 0.0002 Abs at 1.0 Abs<br>Less than ± 0.001 Abs at 2.0 Abs                                     |

| Item                       | Specification                                                                                                                                                                                                                                   |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Baseline stability         | Less than 0.0003 Abs/Hr (700 nm, one hour after light source turned ON)                                                                                                                                                                         |
| Baseline flatness          | Less than ± 0.0006 Abs (1,100 to 190 nm, one hour after light source turned ON)                                                                                                                                                                 |
| Noise level                | Less than 0.00004 Abs (700 nm)                                                                                                                                                                                                                  |
| Light source               | 20-W halogen lamp and deuterium lamp<br>Built-in light source auto position adjustment                                                                                                                                                          |
| Monochromator              | LO-RAY-LIGH grade blazed holographic grating in Czerny-Turner mounting                                                                                                                                                                          |
| Detector                   | Silicon photodiode                                                                                                                                                                                                                              |
| Sample compartment         | Internal dimensions: W110 × D250 × H115 mm<br>Distance between light beams: 100 mm                                                                                                                                                              |
| Power requirements         | AC100,120,220,230,240 V,<br>50/60 Hz, 140 VA                                                                                                                                                                                                    |
| Environmental requirements | Temperature: 15 to 35 °C<br>Humidity: 30 to 80 %<br>(without condensation; 70 % max. at 30 °C or higher)                                                                                                                                        |
| Dimensions                 | W450 × D501 × H244 mm                                                                                                                                                                                                                           |
| Weight                     | 16.6 kg                                                                                                                                                                                                                                         |
| Output device              | USB memory (optional)<br>Extended memory (optional)<br>Data files saved in text format or UVPC format*<br>*Files in UVPC format can be read with the UVProbe file viewer, which is a function of LabSolutions™ UV-Vis, or with UVProbe software |
| PC compatibility           | LabSolutions UV-Vis software (standard)<br>External control possible via USB.                                                                                                                                                                   |
| Display                    | 24-bit color touch-screen<br>Touch pen (standard included)<br>Touch panel protective sheet (optional)                                                                                                                                           |
| Supported languages        | Japanese, English, Chinese, Spanish (Mexico), Portuguese (Brazil), German, French, Russian.                                                                                                                                                     |

# Software Specifications (Standalone)

## Spectrum mode

1. Measurement modes: ABS, T%, E
2. Number of repeat scans: 1 to 99
3. Recording system: Selection between single spectrum and data overlay
4. Data storage and recall
5. Data processing:  
Peak/valley detection, arithmetic operations, differentiation, smoothing, area calculation, point picking, data reading at cursor-specified point

## Photometric mode

### Single-wavelength measurement

1. Photometric modes: T% or Abs
2. Quantitation using K-factor method
3. Data table storage and recall functions

### Multiple-wavelength measurement

4. Photometric modes: T% or ABS
5. Measurements at up to eight designated wavelengths (set in 0.1 mm increments)
6. Data calculation at up to four wavelengths (difference or ratio between two wavelengths, calculation between three wavelengths, etc. ) is possible.

## Quantitation mode

1. Measurement methods:  
1-wavelength, 2-wavelength, 3-wavelength, and 1st to 4th derivative methods
2. Quantitation methods:  
Automatic concentration calculation using K-factor Automatic concentration calculation using single-point calibration curve Multi-point calibration curve method (1st to 3rd order regression curves)
3. Measurement parameters:  
Number of standards (2 to 10)  
Number of repeat measurements (1 to 10 times) to obtain a mean value for quantitation.

## Kinetics mode

1. Measures absorbance changes as a function of time and calculates the enzymatic activity values.
2. Measurement time: 1 to 9,999 sec/min
3. Measurement methods:  
1-wavelength, 2-wavelength, multi-cell, and rate measurements

## Time scan mode

1. Measures changes in measured values as a function of time.
2. Measurement mode: ABS, T%, E
3. Measurement time: 1 to 9,999 sec/min
4. Data processing functions (same as spectrum mode)

## Biomethod mode

### DNA/Protein quantitation

1. Calculation of DNA/protein concentration and absorbance ratio  
DNA concentration =  $K1 \times A1 - K2 \times A2$   
Protein concentration =  $K3 \times A2 - K4 \times A1$
2. Factors and measurement wavelengths can be set freely.
3. Background correction is possible.

### Quantitation of proteins

Quantitation methods: Lowry method, BCA method, Biuret method, CBB method (Bradford method), UV method

## Maintenance

1. Baseline correction
2. Lamp usage time display and reset.
3. Security settings  
Functions can be restricted according to the user.
4. Instrument validation functions:
  - 1) Compatible with 9 JIS items  
Wavelength accuracy, wavelength repeatability, resolution, stray light, photometric accuracy, photometric repeatability, baseline flatness, baseline stability, noise level.
  - 2) Semi-automatic validation  
Validation inspections conducted interactively while inserting and removing inspection jigs.
  - 3) Fully automatic validation  
Automatic validation inspections from measurement to evaluation and printout.
  - 4) Setting inspection parameters and pass/fail criteria  
Authority to make changes can be protected by password access.
  - 5) Detailed printout of results.
  - 6) Bulk printout of results.
  - 7) Equipped with method in accordance with Pharmacopeia (JP, USP, EP).

## Shared functions

1. Automatic setting of measurement mode after instrument initialization.  
It's possible to specify standby and parameter files in the parameter setting window for each measurement mode.
2. Startup Validation Function  
Function to automatically check the instrument performance
3. Selection of displayed number of decimal places  
Absorbance: 3 or 4 decimal places  
Transmittance: 1 or 2 decimal places
4. Number of files that can be saved (built-in memory)  
Measurement parameters: 100 files max.  
Tabular data: 15 files max.  
Curve data: 16 files max.  
Validation condition: 10 files max.  
Validation result: 3 files max.
5. Number of savable files (Extended memory and options)  
Curve data files: 999 files max.
6. Keyboard and Barcode Reader Support  
File names can be entered using the keyboard or bar code reader.
7. Shutdown and Wake-up Functions  
The instrument can be shut down as soon as it has stopped being used, or after a set time, and can put the instrument into sleep mode.  
After shutdown, the instrument can also be set to start up automatically at a specified time.
8. Network Connections  
Multiple UV-1900i Plus can be connected to a single printer over the network.
9. Setting of integration time (for fixed-wavelength measurement)
10. PC control  
Spectrophotometer can be controlled by an external PC.  
This function is also used when performing operation with the standard LabSolutions UV-Vis software provided.  
\*A USB cable is required.
11. Assist Function  
With this function, the instrument assists the user to ensure that measurements are performed with the correct procedure.

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