

Ultrospec 2100 *pro*

Product code: 80-2112-21, 80-2112-22, 80-2112-27, 80-2112-28

Description

The Ultrospec™ 2100 *pro* UV/Visible spectrophotometer has an integral high-resolution graphics display and easy-to-use software making it ideal for use in the modern laboratory. It is available in a range of colors – classic, yellow, plum, apple – and has both exciting styling and design (registered design protection applied for) that place it at the forefront of its class. Furthermore, it uses xenon lamp technology so annual running costs are minimized.

In addition to the basic modes of absorbance, transmission and concentration, there are routines for wavelength scanning, simple kinetics, reaction rate, standard curve and equation entry for multi-wavelength applications. There are also stored routines for nucleic acid quantification and purity assessment; the large informative display shows all relevant results at the same time, and a nucleic acid scan routine enables visual inspection of sample integrity.

Eighteen methods can be saved in three groups of six, making the instrument very practical in a multi-user laboratory. With a range of output modes - direct to Microsoft™ Excel, control by SWIFT II software, output to Seiko DPU-414 printer – and self test diagnostics for GLP purposes, the Ultrospec 2100 *pro* is an excellent addition to any laboratory bench.



Fig 1. Ultrospec 2100 *pro*

Features

- Xenon lamp

- Available in four colors: classic, yellow, plum, apple

- GLP self test diagnostics

- Integral VGA display with graphics

- Built in applications software that is complete

- Stored methods for Nucleic Acid Quantification

- < 3 nm bandwidth

- 18 user stored methods in three customizable groups

- Integral sipper accessory option

- Spreadsheet interface software option

Benefits

- Press to read system means low cost of ownership during product lifetime; a 3 year lamp warranty is offered

- Greater customer choice

- Prove performance of instrument at any time and at no extra cost

- Intuitive and easy to use

- No additional expense for software modules

- No possibility of losing software cards

- Nucleic acid analysis is easy

- Optimum resolution for scanning bio-molecules

- Simplifies filing and is ideal for multiple-users

- Ideal for high throughput

- Direct download of data to Microsoft Excel



Display and keypad

The 240 x 160 pixel high resolution, graphical, liquid crystal display provides the user with set up parameters and experimental results in either English, German, French, Spanish or Italian. To optimize viewing of the display, the back light can be turned off and the contrast adjusted. Using the instrument is very easy; press the soft key on the keypad directly below the corresponding option on the display (F1, F2 and F3) to select that option. Pressing the red stop key acts as an escape mechanism in most situations. Text entry is very easy, since the keypad has an alphanumeric function at the appropriate menu options, and letter entry is in the same manner as when using a mobile telephone.

Basic Modes

The measurement of sample absorbance, transmittance and concentration using a factor is fundamental in UV/Visible spectrophotometry. The Ultrospec 2100 *pro* can do these easily and efficiently, plus more complex multi-wavelength measurements that are frequently used in Quality Control situations.

Wavelength Scanning

The measurement of an absorption spectrum, together with identification of peak height and position, for a sample can be done easily. With a survey scan speed of 3000 nm/minute and a wavelength range of 190–900 nm, the Ultrospec 2100 *pro* is ideal for routine scanning applications. Spectra can be viewed and printed out.

Simple Kinetics

The measurement of the change of absorbance over time, particularly at 340 nm for NAD/NADH assays, is an important application in UV/Visible Spectrophotometry. Results are displayed graphically in either seconds or minutes on the Ultrospec 2100 *pro*.



Fig 2. Ultrospec 2100 *pro* display and keypad

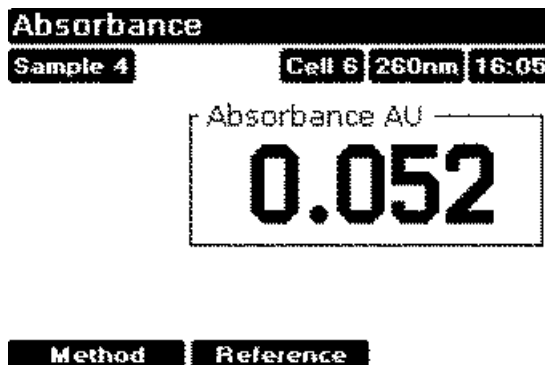


Fig 3. Absorbance mode

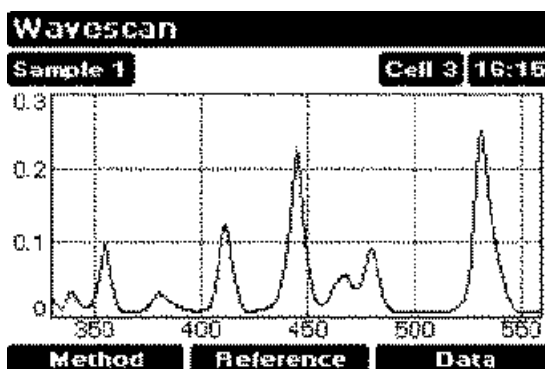


Fig 4. Typical wavelength scan

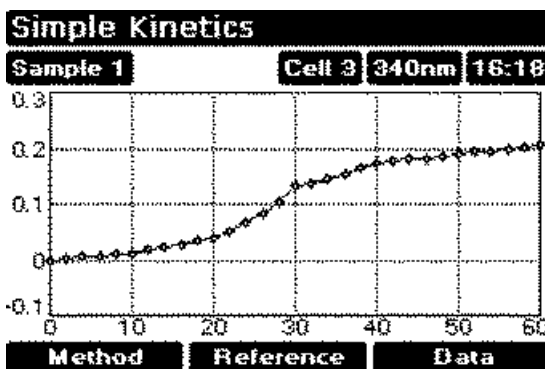


Fig 5. Typical simple kinetics assay

Reaction Rate

The use of reagent test kits for the enzymatic determination of compounds in clinical and industrial laboratories is ubiquitous. These experiments are readily performed on the Ultrospec 2100 *pro* with absorbance change over the specified time period (multiplied by an appropriate factor) being displayed at the end with the slope and line quality of the assay.

Standard Curve

The construction of a multi-point calibration curve from standards of known concentration to quantify unknown samples is a fundamental use of a UV/Visible spectrophotometer. A common assay is the BCA determination for proteins. Using the Ultrospec 2100 *pro*, nine standards replicates can be used to build the standard curve. This can of course be saved and retrieved as a method. Slope and intercept are calculated automatically.

Multiple Wavelength/Equation Entry

Many quality control and development processes require the use of absorbance values in equations to determine a meaningful parameter. The Ultrospec 2100 *pro* can measure five absorbances at specified wavelengths and then use these values in a user defined equation so that post measurement calculations are done automatically. Thus the instrument can be customized to suit your individual needs.

Nucleic Acids

The Ultrospec 2100 *pro* has stored routines for measuring DNA, RNA and oligonucleotide samples. Absorbance measurements (230, 260, 280 and 320 nm), absorbance ratios (A260/A280 and A260/A230) and concentration are shown on the easy-to-read display together. Sample dilution and cell pathlength are compensated for automatically. In addition, a wavelength scan can be obtained for a visual inspection of sample integrity which is particularly useful for RNA samples.

Volumes as low as 3 μl and 7 μl can be accommodated using the capillary and the ultra micro-volume cell with the appropriate cell holder, respectively. In addition, the UViMicro UV transmitting disposable cell (volume 20–2000 μl , standard 15mm optical height) is compatible without the need for adaptors.

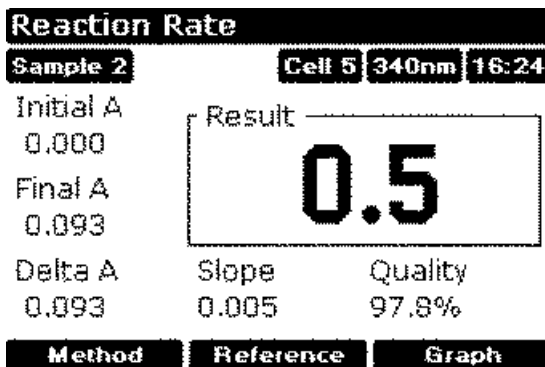


Fig 6. Typical reaction rate result

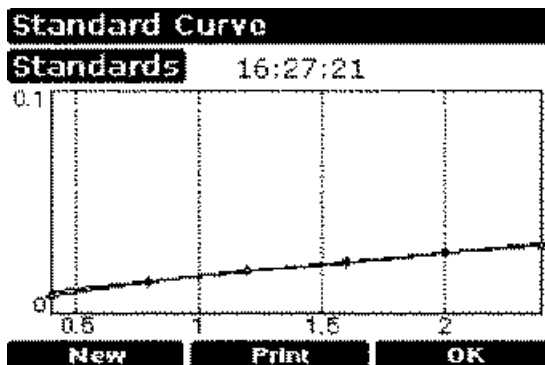


Fig 7. Typical standard curve experiment

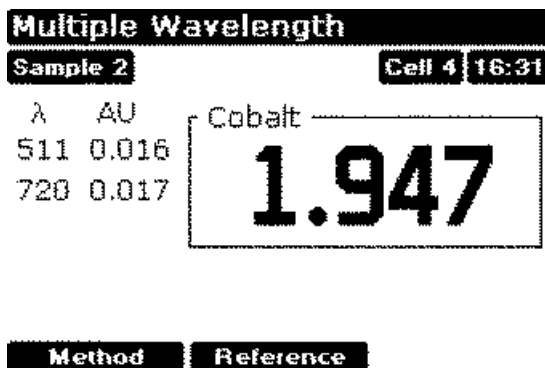


Fig 8. Equation entry result

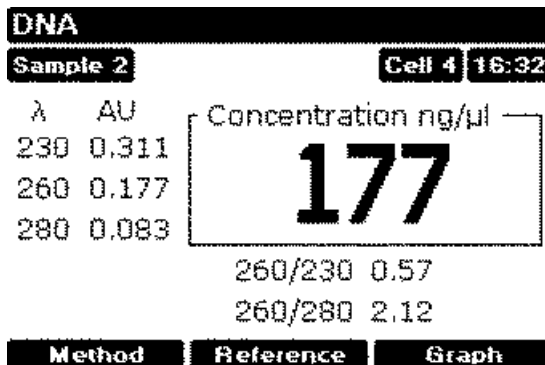


Fig 9. Typical DNA result

Good Laboratory Practise

Being able to check that an instrument is working to its published specification is an essential pre-requisite for GLP. The Ultrospec 2100 *pro* performs GLP self-diagnostic tests for bandwidth, absorbance accuracy, wavelength accuracy and stray light and compares them with the values obtained during instrument manufacture (or last accredited engineer service). The GLP calibration interval can be set by the user to be always, daily, weekly, monthly or quarterly.

UViMicro disposable cell

The use of disposable, UV transmitting capillaries is popular in sequencing labs, where primers and templates are available in high concentrations. The capillary is not ideal, however, for more dilute solutions. These require the longer pathlength of a standard cell.

UViMicro has been designed to address this need. A minimum volume of 20 µl can be accommodated in a 10mm pathlength cell. The cells are supplied individually wrapped and are sterile and DNase/RNase free. Since expensive quartz cells are no longer needed, the tedious washing and autoclaving procedures to maintain sample sterility are eliminated. They are particularly attractive to scientists working with RNA but are also ideal for standard DNA and oligonucleotide quantification procedures since the maximum sample volume is 2000 µl.

UViMicro offers great flexibility to researchers, particularly since the 15 mm optical height of the cells has been designed to fit the light path of the majority of spectrophotometers available. The cells are self-masked, offering the advantages that no adapter is needed to use them and that the optical surfaces are protected against accidental fingerprints.

Ultrospec 2100 *pro* GLP Report

Instrument	Ultrospec 2100 <i>pro</i>	
Operator	A T Dadd	
Date	22 September 2000	
Time	10:00:17	
Serial No.	79500	
Version	4190 V1.0	
Calibrated	21 September 2000	
Instrument Life	25.6 Hours	
Lamp Energy	100%	
Service	10 September 2000	
Bandwidth (2.0 - 3.0nm)	2.9	PASS
Wavelength Accuracy 881.9nm (± 1 nm)	881.9	PASS
Absorbance Accuracy 220nm (1.763 - 1.781A)	1.772	PASS
340nm (1.633 - 1.665A)	1.649	PASS
500nm (1.477 - 1.491A)	1.484	PASS
Stray Light 220 nm (<0.05%)	0.021	PASS

Fig 10. Ultrospec 2100 *pro* GLP self diagnostics print out



Fig 11. UViMicro disposable cell

Output to Printer

The Ultrospec 2100 *pro* is compatible with the industry standard Seiko DPU-414 printer for print out of both text and graphics. When combined with the printer stand, a compact system that will suit any laboratory is obtained.

Download to Spreadsheet

The ability to download directly to Microsoft Excel from the Ultrospec 2100 *pro* is a very powerful feature. Results can easily be archived in this common format or exported to other compatible applications for presentation or further manipulation. Data is downloaded via a serial interface into a macro that has to be loaded onto the PC; both the cable and the macro are available as accessories.

Control by SWIFT II software

Although Ultrospec 2100 *pro* is a stand-alone instrument for discrete measurements on the laboratory bench, it can also be controlled from a PC using SWIFT II software. SWIFT II is compatible with Windows™ 95, 98 and NT and comprises of sophisticated application software for Wavelength Scanning, Enzyme Kinetics, Time Drive, Quantification, Multi Wavelength and Fraction Analysis applications, providing extensive post run manipulations on data acquired using the spectrophotometer.



Fig 12. Ultrospec 2100 *pro* with printer and printer stand

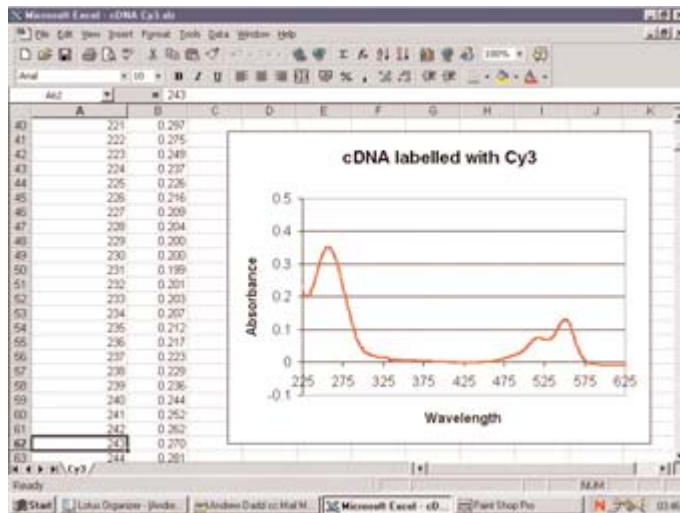


Fig 13. Download of a wavelength scan to Microsoft Excel



Fig 14. Ultrospec 2100 *pro* under PC control using SWIFT II

Technical specifications

Wavelength range	190–900 nm
Monochromator	1200 lines/mm Aberration corrected concave grating
Maximum scanning speed	3000 nm/minute
Spectral bandwidth	< 3 nm
Wavelength accuracy	± 1 nm
Wavelength reproducibility	± 0.5 nm
Light source	xenon lamp
Detectors	two silicon photodiodes
Photometric range	- 3.000 to 3.000 A, 0.01 to 9999 concentration units, 0.1 to 200 % T
Photometric accuracy	± 0.5 % or ± 0.003 A to 3.000 A at 546 nm, whichever is the larger
Photometric reproducibility	within 0.5 % of absorbance value to 3.000 A at 546 nm
Stability	± 0.001 A per hour at 340 nm at 0 A
Stray light	<0.05 % T at 220 nm using NaI and <0.05 % T at 340 nm using NaNO ₂
Digital output	9 pin serial and Centronics parallel
Sample compartment size	210 x 140 x 80mm
Dimensions	510 x 350 x 160mm
Weight	13kg
Power requirements	100–240 V AC ± 10 %, 50/60 Hz, 80 VA

Asia Pacific	Tel: +852 2811 8693	Fax: +852 2811 5251
Australasia	Tel: + 61 2 9899 0999	Fax: +61 2 9899 7511
Austria	Tel: 01 57606 1619	Fax: 01 57606 1627
Belgium	Tel: 0800 73888	Fax: 03 272 16 37
Canada	Tel: 1 800 463 5800	Fax: 1 800 567 1008
Central, East, & South East Europe	Tel: +43 1 982 3826	Fax: +43 1 985 8327
Denmark	Tel: 45 16 24 00	Fax: 45 16 24 24
Eire	Tel: 1 800 709992	Fax: 44 1494 498231
Finland & Baltics	Tel: +358 (0)9 512 3940	Fax: +358 (0)9 512 39439
France	Tel: 01 69 35 67 00	Fax: 01 69 41 96 77
Germany	Tel: 0761 4903 490	Fax: 0761 4903 405
Italy	Tel: 02 27322 1	Fax: 02 27302 212

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GE Healthcare Limited

Amersham Place
Little Chalfont
Buckinghamshire
HP7 9NA
UK



imagination at work

Specifications are measured after the instrument has warmed up at constant ambient temperature and are typical of a production unit. As part of our policy of continuous product development we reserve the right to alter specifications without notice. We supply support agreements which help you to fulfil demands of regulatory guidelines concerning GLP/GMP. These include calibration and certification using filters traceable to international standards by certificated engineers using calibrated test tools. The choice of agreement apart from break down coverage can include both preventative maintenance and certification. The manufacturer of this product designs and manufactures in accordance with an ISO 9001 approved quality system. The product is CE compliant.

Ordering Information

Ultrospec 2100 pro UV/Visible Spectrophotometer

Description	Code number
Classic	80-2112-21
Yellow	80-2112-22
Plum	80-2112-27
Apple	80-2112-28

Companion products

Description	Code number
Seiko DPU-414 thermal printer	enquire
Printer stand	80-2112-13
UViMicro disposable cells (supplied in packs of 100)	80-2110-94

Companion literature

Description	Code number
SWIFT II data file	18-1140-40
Accessories data file	18-1140-41

Japan	Tel: 81 3 5331 9336	Fax: 81 3 5331 9370
Latin America	Tel: +55 11 3933 7300	Fax: +55 11 3933 7304
Middle East & Africa	Tel: +30 210 9600 687	Fax: +30 210 9600 693
Netherlands	Tel: 0165 580 410	Fax: 0165 580 401
Norway	Tel: 815 65 555	Fax: 815 65 666
Portugal	Tel: 21 417 70 35	Fax: 21 417 31 84
Russia, C.I.S. & N.I.S	Tel: +7 (095) 232 0250	Fax: +7 (095) 230 6377
South East Asia	Tel: 60 3 8024 2080	Fax: 60 3 8024 2090
Spain	Tel: 935 944 950	Fax: 935 944 955
Sweden	Tel: 018 612 1900	Fax: 018 612 1910
Switzerland	Tel: 0848 8028 12	Fax: 0848 8028 13
UK	Tel: 0800 616 928	Fax: 0800 616 927
USA	Tel: +1 800 526 3593	Fax: +1 877 295 8102

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