

Camspec M500 Series Scanning UV/Visible Spectrophotometers

Double or Single Beam
- the choice is yours



M550 Double Beam

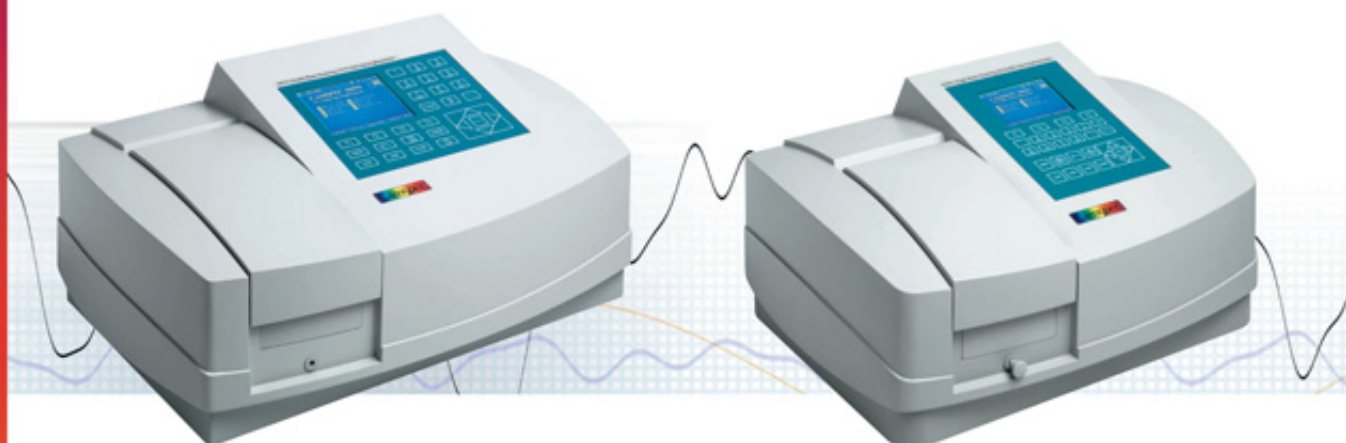
- designed for precision wavelength scanning
- European Pharmacopoeia 5.2 compliant



M501 Single Beam

- more performance and features than you need
at a price less than you expect

Camspec



The M550 is a high performance true double beam spectrophotometer with parallel sample and reference beams.

Two silicon photodiodes are used for measuring the two beams simultaneously for optimizing measurement accuracy and stability. The reference beam is especially useful for measuring samples where the reference changes with time.

The specification is as expected from a top-of-the-range instrument designed for research as well as routine use.

The M501 is now an established world beating single beam spectrophotometer

It has many components and features in common with the M550.

Technical Specifications

All instruments are supplied with 4 glass cells, 2 silica UV cells, mains lead, dust cover and user manual

	M550	M550 & M501	M501
Display		¼ VGA 320x240 pixels backlit LCD	
Light Sources		Tungsten-Halogen and Deuterium	
Monochromator		Littrow type with 1200 lines/mm holographic grating	
Detector	2 Silicon Photodiodes		Silicon Photodiode
Wavelength Range		190 – 1100nm	
Wavelength Accuracy	± 0.3nm		± 1nm
Wavelength Resolution		0.1nm	
Wavelength Repeatability		± 0.05nm	
Bandpass	1.8nm		4nm (2nm Option)
Scan Speed		Up to 2500nm/min (return 3000nm/min)	
Noise	< 0.0001A @ 500nm 0A		< 0.001A @ 500nm 0A
Zero Drift	< 0.001A per hour after warm-up		< 0.003A per hour after warm-up
Baseline Flatness		± 0.002A	
Stray Light (A.S.T.M.)	< 0.05%T @ 220nm and 340nm		< 0.1%T @ 220nm and 340nm
Photometric Accuracy		Better than ± 0.005A @ 1A	
Photometric Range		-0.3 to 3A, 0 to 200%T, 0 to 9999 Conc	
Printer Interface		Parallel for A4 HP and Epson Printers	
Computer Interface		Bi-directional RS232C for PC control	
Power Requirements		110/120V, 220/230V, 50/60Hz, 110VA	
Dimensions	630 x 410 x 280mm		550 x 420 x 270mm
Weight	24Kg		18Kg
Sample Compartment	245 x 115 x 125mm high		225 x 113 x 118mm high
Standard Fittings	Precision 10mm cell holders x 2		4-cell manual changer – 10mm cells
Optical Height		15mm above cell base	

Local Control Software

- M550 & M501

All methods are included, thus eliminating the confusion of software options



Basic Mode

Measures Absorbance, %T and Concentration with entry of Concentration Factor or the Concentration of the standard.

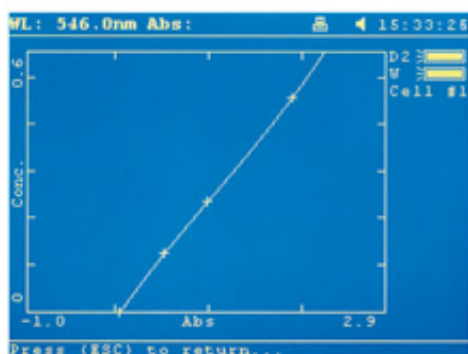
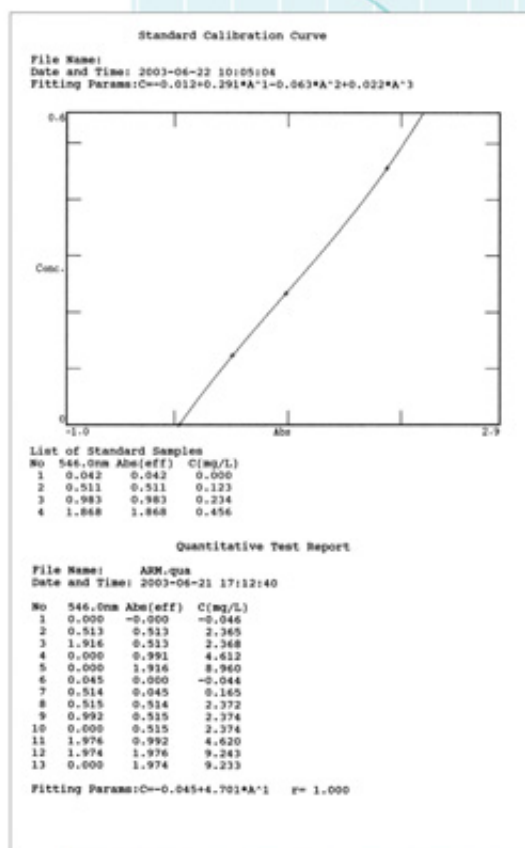
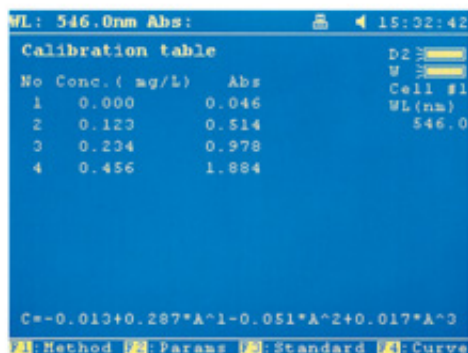
Units ug/mL, mg/mL, mg/L, g/L, ppb, ppm, %, I.U., mM/L, M/L, may be selected or other units may be entered via the keypad.

Continuous display of the result means there is no need to press a button to read.



Quantitative

Up to 10 standard solutions may be used for a calibration.



There are 3 kinds of correction method:

- 1- Single wavelength
- 2- Iso-absorbance:

the absorbance at the measurement (peak) wavelength is measured relative to the absorbance at a second (valley) wavelength. This minimises the effects of cell differences and turbidity

- 3- 3 point:

the absorbance of the peak itself is measured by subtracting the calculated tangent joining the valleys each side of the peak

There is a choice of 4 methods for fitting a curve through the calibration points: Linear fit, linear fit through zero, square fit, cubic fit

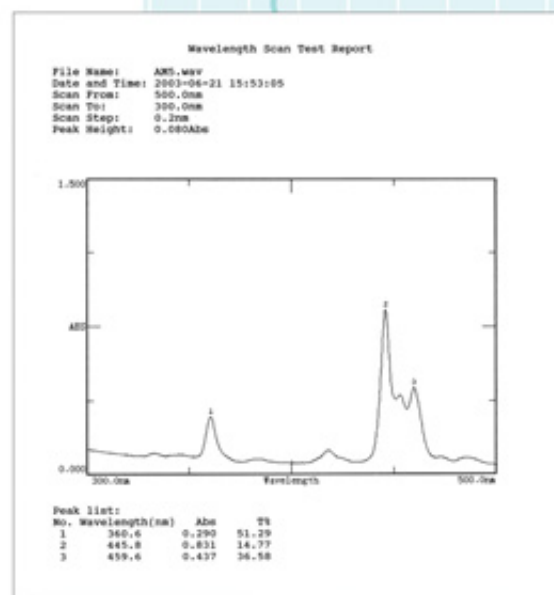
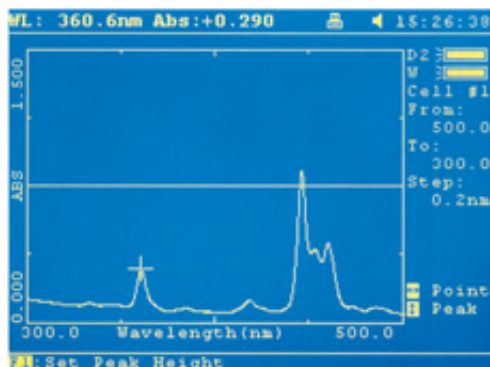
Wavelength Scanning

Precise control of filter and lamp changes means that their effects are not seen on the final scan.

Wavelengths are scanned from high to low so that the instrument waits at high wavelength. This minimises the degradation of UV sensitive samples.

The wavelength scan intervals are 0.1, 0.2, 0.5, 1, 2, 5nm, and Hi, Medium and Low scan speeds are available. Scan speeds vary from 80 to 2500 nm/min.

Post-run manipulation includes re-scaling both axes, curve tracking and peak picking.



Kinetics

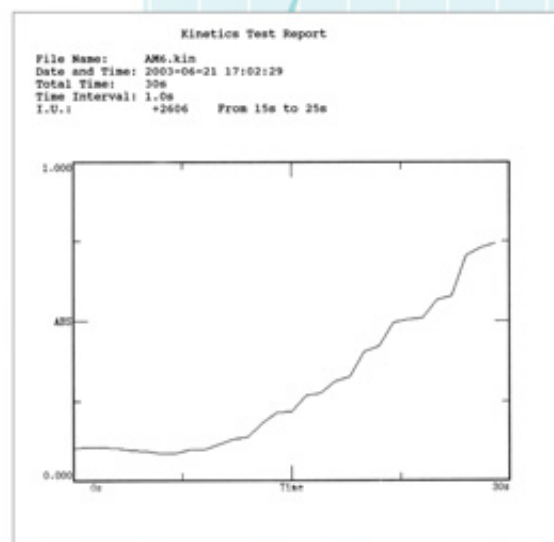
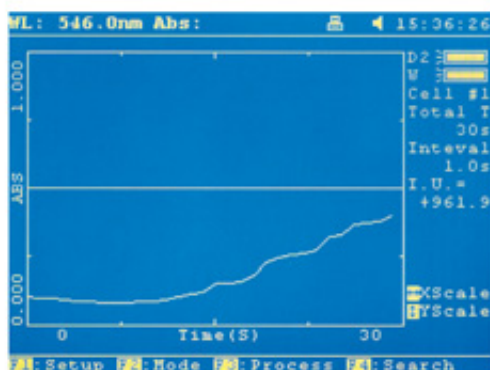
This mode may be used for time course scanning or reaction rate calculations.

Abs v time graphs are displayed on the screen in real time.

Wait times and measurement times up to 8 hours may be entered with data intervals of 0.5, 1, 2, 5, 10, 30 secs and 1 min.

Post-run manipulation includes re-scaling, curve tracking and selection of the part of the curve required for the rate calculation.

Rates are calculated using a linear regression algorithm before multiplying by the entered factor.



DNA/Protein

Concentration and DNA purity are calculated:
Absorbance ratios 260nm/280nm or 260nm/230nm
with optional subtracted absorbance at 320nm.

DNA Concentration

= $62.9 \times A_{260} - 36.0 \times A_{280}$ or $49.1 \times A_{260} - 3.48 \times A_{230}$

Protein Concentration

= $1552 \times A_{280} - 757.3 \times A_{260}$ or $183 \times A_{230} - 75.8 \times A_{260}$

Other wavelengths and factors may be entered.

DNA / Protein Test Report						
File Name: AM7.dna						
Date and Time: 2003-06-21 16:32:46						
No	260.0nm	280.0nm	320.0nm	C-DNA	C-Pro	Ratio
1	1.066	0.560	0.296	38.93	-172.9	2.913
2	1.065	0.560	0.296	38.85	-172.2	2.910
3	1.063	0.560	0.296	38.71	-170.3	2.900
4	1.063	0.560	0.296	38.72	-170.7	2.902
5	1.060	0.560	0.296	38.57	-169.3	2.897

Unit:ug/mL

DNA/Protein measurement				D2	W
No	Items	Result	Unit	Cell #1	WL (nm)
1	A1	1.066	Abs	260.0	260.0
	A2	0.560	Abs	280.0	280.0
	Aref	0.296	Abs	320.0	320.0
	C-DNA	38.93	ug/mL		
	C-Pro	-172.9	ug/mL		
	Ratio	2.913			

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Coef Mode Unit Default

Multi-Wavelength

Up to 10 wavelengths may be entered, allowing the
measurement of multiple wavelengths on a series of
samples.

Multi-Wavelength Test Report										
File Name: AM9.mul										
Date and Time: 2003-06-21 16:49:53										
No	500.0nm	475.0nm	450.0nm	425.0nm	400.0nm	375.0nm	350.0nm	325.0nm	300.0nm	275.0nm
1	0.000	0.001	0.000	0.000	0.000	-0.000	0.001	0.000	-0.000	0.000
2	0.045	0.045	0.048	0.049	0.049	0.059	0.094	0.508	2.680	2.950
3	0.526	0.508	0.531	0.539	0.565	0.826	1.342	1.413	3.635	3.596
4	1.005	0.982	1.010	1.056	1.146	1.611	2.664	4.305	4.413	4.441
5	2.000	1.950	2.006	2.101	2.309	3.267	5.000	5.000	5.000	5.000

Unit:Abs

Multi Wavelength Test			D2	W
No	WL (nm)	Abs	Cell #1	WL
2	500.0	0.045	10	WL
	475.0	0.045		
	450.0	0.048		
	425.0	0.049		
	400.0	0.049		
	375.0	0.059		
	350.0	0.094		
	325.0	0.508		
	300.0	2.680		
	275.0	2.950		

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WL Setup Mode

Performance Validation

- for the GLP compliant laboratory

The M501 and M550 may be automatically self-calibrated on switch-on, using the 656.1nm deuterium emission line. This may be repeated at any time.

The wavelength accuracy may be checked using the "WL Validity" program (calibration standards required).

The absorbance accuracy at several wavelengths may be checked using the "Accu Validity" program.

Pharmaceutical Analysis

The M550 is European Pharmacopoeia 5.2 compliant. It passes the Potassium Chloride stray light test, the Toluene in Hexane resolution test, the Holmium Perchlorate solution wavelength test and the Potassium Dichromate absorbance test.

The M550 may be controlled by Camspec Panorama software which is 21 CFR Part 11 compliant. This means that it can be used for pharmaceutical analysis requiring FDA (Food and Drug Administration) approval.

Camspec M500 Series Spectrophotometers

Other Features

- The sealed and solvent-resistant tactile keypad has alphanumeric entry for user file names and user entry of units.
- The M550 and M501 store up to 50 methods/results.
- In Basic Mode, the result is continuously displayed (no need to "press to read").
- The M550 and M501 have a real-time clock for date and time stamping of results
- Lamps may be turned off and the lamp usage may be monitored. The status of the lamps is always displayed on the screen.
- The print-out button also allows the screen display to be printed at any time.
- When a spectrophotometer arrives at the measurement wavelength, blanking is required for a single beam instrument, so the M501 performs this automatically.
- The large synthetic covers allow the M550 and M501 to run cool and this minimises warm-up effects.
- The absence of flat external surfaces or cooling vents discourages spillage onto or into the instruments.
- The rugged steel base and enclosed monochromator assembly ensure the calibration is stable for years of instrument use.

PC Control

The M550 and M501 have an RS232C output for the transfer of results to a PC and for PC control. Comprehensive Camspec Application Software is available, together with small PC programs dedicated to specialist tasks.

Accessories

An extensive range of sample compartment accessories is available:

Test-tube V-type holder (100mm or 120mm)

Adjustable micro-cell holder: 4 x 10mm manual cell changer

4-cell holder for 5-50mm cells. 4-cell holder for 100mm cells

100mm cylindrical cell holder

Thermostatted single cell holder (requires water bath)

Automatic 6-position carousel cell changer (M550 only)

Automatic 8-position cell changer (M501 only)

Thermostatted automatic 8-position cell changer (M501 only)

Sipper, processor controlled. Peltier system for 10mm cells, 15-40C

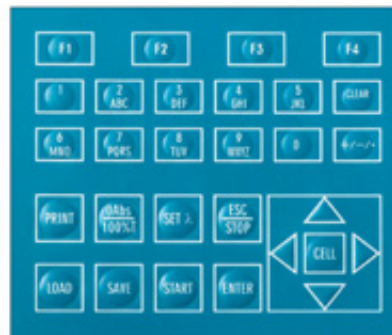
Peltier/Sipper system combined

Specular reflectance accessory (5° incident angle)

Integrating sphere (for diffuse transmittance and reflectance) (M550 only)

Calibration standards for wavelength, absorbance, stray light (traceable to NPL)

Pharmacopoeia compliance certificated test set (UKAS accredited)



Camspec is an ISO 9001:2000 company and all instruments are individually checked using wavelength and absorbance standards calibrated by the National Physical Laboratory. The M550 and M501 fully comply with CE requirements for safety and ESD/EMC emission and susceptibility. All units are guaranteed for one year.



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