T8DCS

UV/VIS Spectrophotometer

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The T8DCS is a high-performance double beam spectrophotometer with a variable spectral bandwidth from 0.1-5nm, selected by a continuous variable slit. The instrument is fitted with an embedded PC for extensive local functionality via the UV-Win Software. The Czerny-Turner mono-chroma-tor with a holographic grating keeps stray light to a minimum and offers excellent optical resolution. The use of a photomultiplier tube as a detector offers exceptional sensitivity.

The T8DCS' true double beam optical system coupled with an efficient and well proven electronic control system ensures high stability and low background noise.

Features & Functions

- Photomultiplier tube detection provides exceptional sensitivity.

- Wavelength accuracy ±0.3nm (Automatic Wavelength Correction).

- User selectable spectral bandwidth between 0.1-5nm.

- User friendly design allows easy light source replacement and routine maintenance.

- Sample compartment design enables use of a wide range of optional accessories.

- UV-WIN software offers many operational and data processing capabilities and is supplied as standard with the T8DCS.

Feature

The spectral bandwidth is one of the main factors that affect the quantitative analysis error of UV/Vis Spectrophotometer. After studying the influences of spectral bandwidth on the analysis error, T. Owen pointed out that the spectral bandwidth of the UV/Visible Spectrophotometer is very important. When the spectral bandwidth (SBW) / natural bandwidth (NBW) ≤ 0.1 (natural bandwidth, which is half width of the sample absorption band), the instrument can meet the requirements of 99% sample analysis, and analysis accuracy can reach up to 99.9%.

Below is an application example in drug inspection industry:

SBW	Abs
0.2nm	0.841
0.3nm	0.840
0.4nm	0.842
0.5nm	0.840
0.6nm	0.838
0.7nm	0.839

As we can see, the peak value is the highest when the spectral bandwidth is 0.4nm, indicating that the best spectral bandwidth is 0.4nm. In addition, the most suitable spectral bandwidth for drugs, such as Penicillin Potassium and Cytochrome C solution, can be found through experiments. Thus reduce the measurement steps, reduce test-ing costs, and save measurement time.

The T8DCS features an advanced continuous variable bandwidth and excellent performance. It meets various demands for spectral bandwidth from users in different industries especially pharmaceutical industry and scientific research field.

UV-Win is a powerful, intuitive software product used for connectivity to the AceMART range of bench top UV-Vis Spectrophotometers.

The UV-Win software offers complete instrument control along with data acquisition and a whole host of mathematical tools for interpretation of measurement results. The UV-Win soft-ware is separated into four key workspaces:

- Spectral Analysis
- Quantitative Analysis
- Kinetic Analysis
- Photometric Analysis

Spectrum Workspace

- Use the spectrum workspace to scan across a user defined spectral range measuring in either absorbance or transmission.

- Use the "Peak Pick" tool to determine the wavelength at which peaks and valleys have occurred whilst also being able to determine their amplitude.

- View spectral overlay in the 3D display mode.

- Perform 1st, 2nd, 3rd and 4th order differentiation on sample scans for Derivative Spectroscopy.

- Export measurement data into Word, Excel, CSV and ASCII formats.

- Create method files for routine analysis whilst also being able to save measurement data.
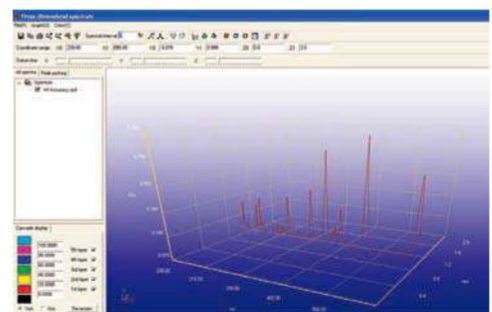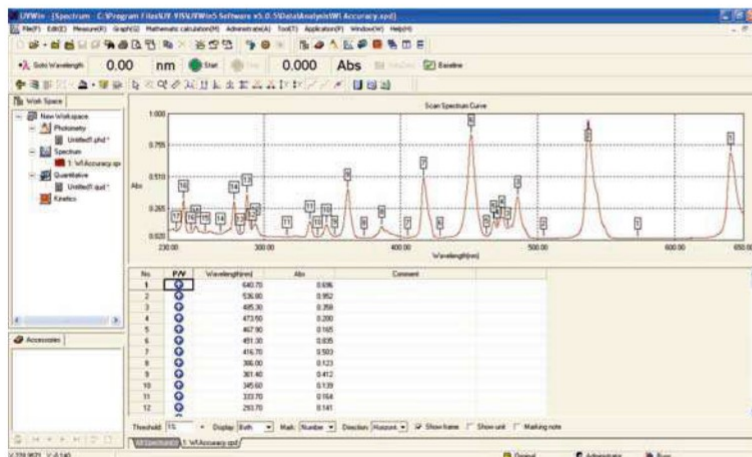
Quantitative Workspace

- Use the Quantitative workspace to determine the concentration of unknown samples.

- Create a calibration curve using a series of standard solution or by directly entering the coefficients for the calibration curve equation.

- Specify 1st, 2nd, 3rd and 4th order correlation for the best calibration curve fit.

- Set Quality Control monitors to take user specified action in the event of measurement results falling outside user defined limits.

- Export measurement data into Word, Excel, CSV and ASCII formats.

- Create method files for routine analysis whilst also being able to save measurement data.
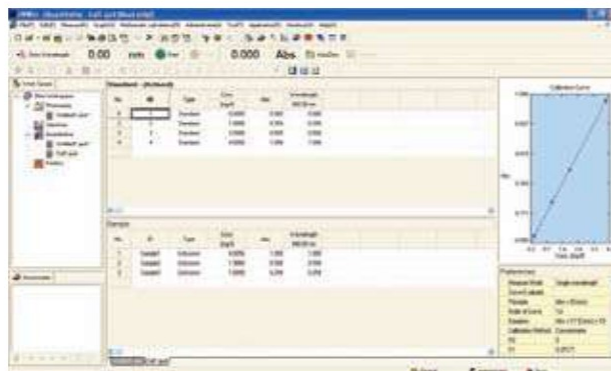
Kinetic Workspace

- Monitor the change of Absorbance or Transmission as a function of time for Enzyme type reactions.

- Use in conjunction with a Flow cell for sample introduction or Peltier water circulator for temperature control.

- Specify data intervals and acquisition time for up to 24 hour reactions.

- Export measurement data into Word, Excel, CSV and ASCII formats.

- Create method files for routine analysis whilst also being able to save measurement data.
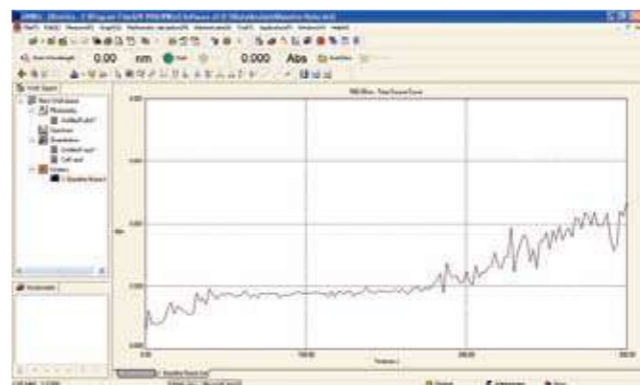
Photometric Workspace

- Perform a series of sequential fixed wavelength measurements in either Absorbance or Transmission.

- Automate sample measurements by configuring the instrument cell changer.

- Calculate concentration of unknown samples quickly using the "Simple Calculation" option where complete calibration is not required
.

- Automatically calculate statistics like standard deviation, relative standard deviation, and averages.

- Export measurement data into Word, Excel, CSV and ASCII formats.

- Create method files for routine analysis whilst also being able to save measurement data.
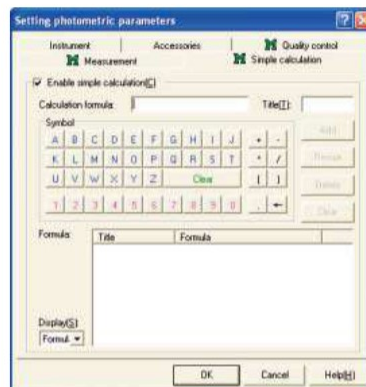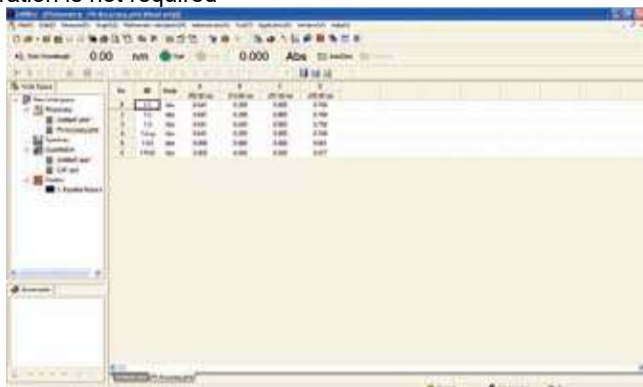
Reporting

- Produce reports for photometric, spectrum, kinetic and quantitative measurement data.

- Include or remove spectra, calibration curves along with samples measurement tables.
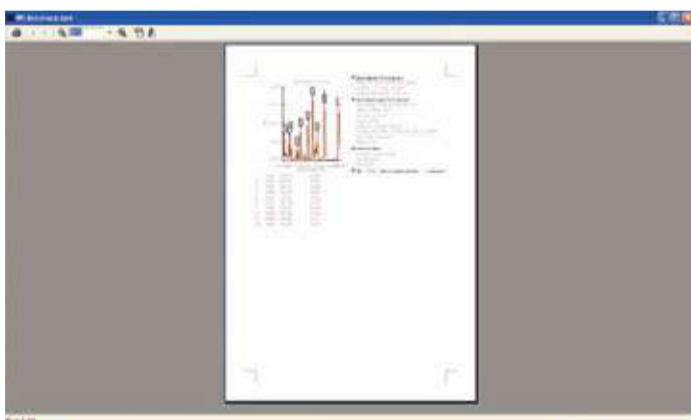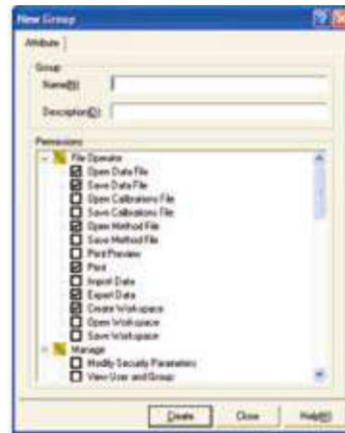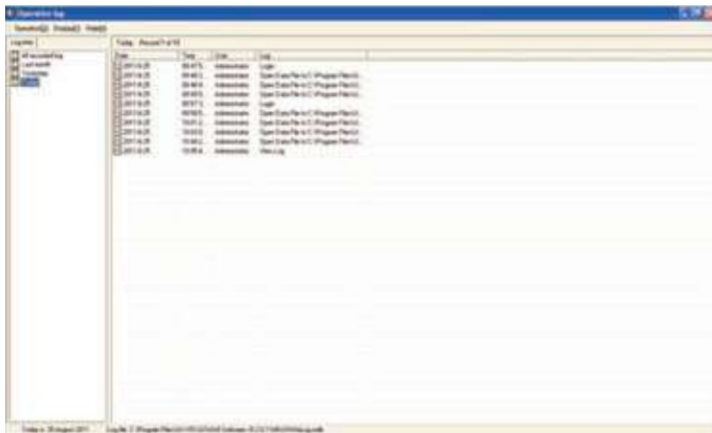
UV-Win GLP offers all of the features and functionality of UV-Win whilst also offering extensive administrative capabilities along with a detailed audit trail.

Administration

Administrative settings can be made where Analysts may require conformity to
- GLP/GMP/GRP Create User groups specifying exactly what actions they are able to perform.
- Add New Users to custom User Groups to determine their privilege settings.
- Automatically log software activity in an Audit Trail.
- Use Password control to ensure Users are logged in for instrument usage.

Certification

UV-Win GLP has been evaluated and tested by a third-party software validation specialist. As a result, it was found that UV-Win GLP offers all of the features and functions required for use in compliance with the guidance specified in:
- 21CFR Part 11- Electronic Records; Electronic Signatures
- Guidance for Industry Part 11, Electronic Records; Electronic Signatures — Scope and Application, August 2003

Spectrophotometer Liquid
IQ/OQ Qualification Package

7.8

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The purpose of the Qualification Package is to offer both laboratory analysts and regional distributors the flexibility to perform a full installation, operation and performance qualification on our spectrophotometers

The work instructions within the qualification workbook have been developed with considerations of the requirements of the European Pharmacopoeia to ensure compliance with good laboratory practice.

The documentation supplied with the package guides the user through the qualification as it offers detailed instructions on how to carry out the tests, document and record results, and perform any necessary corrective action. The package is comprehensive and offers all the materials required to complete the qualification.

The contents of the package are as follows:

Holmium Oxide Solution – For determining the wavelength accuracy (NIST srm 2034)

Potassium Dichromate Solution – For determining the photometric accuracy (NIST srm 935a)

Potassium Chloride – For determining the stray light @ 200nm

Sodium Iodide – For determining the stray light @ 220nm

De-Ionised Water – Reference solution

Two 10mm path length Quartz Cuvettes – To perform the validation Certificate for Solutions

Qualification Workbook containing, Qualification Worksheets
CD containing Qualification Workbook

NOTE: UV-Win software is a mandatory requirement for performing instrument qualification

Optional Accessories

- **PS93+** **Sipper Pump Accessory**

- **CH92+** **Constant Temperature Cell Holder**

- **PTC-2** **Peltier**

- **DS19-1** **Adjustable Angle Solid Sample Holder**

- **S19-1** **Solid Sample Holder**

- **SS19-2** **Standard Sample Holder**

- **AS91+** **Automatic 8 Position Cell Changer**

- **LS19-1** **Universal 5-100mm Path Length Cell Holder**

- **MH19-1** **Micro Cell Holder**

- **MH19-2** **Ultra Micro Cell Holder**

- **MR19-1** **Specula Reflectance Accessory**

- **IS92+Integrating Sphere**

- **TR19-1** **Test Tube Holder 13-16mm Variable**

- **SS19-1** **Short Path-length Cell Holder**

Sipper pump

Fixed position constant-temperature cell holder

Peltier

Adjustable angle solid sample holder

Solid sample holder

Automatic 8 Position Cell Changer

Long pathlength cell holder

Micro cell holder

Ultra Micro cell holder

Specular reflection accessory

Integrating Sphere

Test tube holder

Specifications

Specifications	T8DCS
Optical System	Double beam
Scan Speed	Selectable
Wavelength Range	190~900nm
Wavelength Accuracy	± 0.3nm
Wavelength Reproducibility	≤ 0.1nm
Spectral Bandwidth	Continuous slit 0.1~5.0nm with 0.1nm interval
Photometric Mode	Transmittance, Absorbance, Energy Concentration, All Using UVWin Software
Photometric Range	-4.0~4.0Abs
Photometric Accuracy	±0.002A (0~0.5A), ±0.004A (0.5~1.0A), ±0.3%T (0~100%T)
Photometric Reproducibility	±0.001A (0~0.5A)
Photometric Noise	±0.0004A (500nm) 30min warm-up
Baseline Flatness	±0.001A (200~850nm)
Baseline Stability	±0.0008A/h (500nm, 0Abs), 2hr warm-up
Stray light	≤ 0.01%T (220nm NaI, 340nm $NaNO_2$)
Standard Functionality	No stand alone function
Cell Holder	Fixed position sample and reference
Detector	Photo multiplier tube
Light Source	Tungsten Halogen and Deuterium arc lamps
Display	No display
Printer	Not available
PC Interface	USB
Software Support	UV-Win
Power Supply	Switchable 120~230VAC 50~60Hz
Weight	43Kg
Dimensions (Width, Depth, Height)	545mm, 580mm, 270mm

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