

67 Series Spectrophotometers Operating Manual



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67 Series Spectrophotometers

Models 6700, 6705 & 6715

Operating Manual

Safety

This is important information; please read carefully before installing or using this instrument.

1. The 67 Series Spectrophotometers are designed for operation by **trained personnel** who are aware of the principles and applications involved. For further help and advice please contact your local distributor, e-mail sales@jenway.com or visit www.jenway.com
2. The spectrophotometer is a sensitive electronic and optical instrument designed for use in a laboratory environment. Careful adherence to the installation instructions must be observed. If in doubt contact a **relevant and competent authority** for advice before proceeding.
3. In addition to observing the instructions detailed in the Operating Manual and Service Manual for this instrument all installation, operating and service personnel must be aware of, and employ, a **safe system of work**.
4. Voltage levels hazardous to life are present in this instrument, for personal safety only **trained engineers** aware of the risk and avoidance of electric shock should remove protective covers from the instrument.
5. This instrument is designed for minimal maintenance, which must be carried out carefully following the **procedures detailed in this manual**. All safety instructions in these procedures, as well as those defined locally for the **area or environment** where the work is being carried out must be observed.
6. Other than for those items defined in the maintenance procedures herein there are **no user serviceable** items in this instrument. Removal of covers and attempted adjustment or service by unqualified personnel will invalidate any warranty and incur additional charges for repair.
7. Reference should always be made to the **Health and Safety Data** for any chemicals or reagents used. All available information, advice and warnings on the handling, storage, use and disposal of such must be carefully observed. When not available this data must be requested from the supplier before proceeding in any way.
8. It is important that **good laboratory practice** is observed when handling samples, chemicals, reagents and ancillary equipment in order to carry out measurement and analysis with this instrument. Suitable **safety and personal protective equipment** must be used at all times.
9. If it is suspected that safety protection has been impaired in any way, the spectrophotometer must be made **inoperative and secured** against any intended operation. The fault condition must be reported to the **appropriate servicing authority**. In all such reports the **model number and serial number** of the spectrophotometer must be quoted.

Guarantee

Please read this important guarantee information:

Notwithstanding the description and specification(s) of the instruments contained in the Operating Manual, Jenway hereby reserves the right to make changes as it sees fit to the instruments or to any components of the instruments.

This Manual has been prepared solely for the convenience of Jenway customers and nothing in this Manual shall be taken as a warranty, condition or representation concerning the description, merchantability, fitness for purpose, or otherwise of the instruments or components.

The 67 Series spectrophotometers are guaranteed for a period of 3 years from the date of purchase.

Within this period we undertake to supply replacements free of charge for parts that may on examination prove to be defective, provided that the defect is not the result of misuse, accident or negligence.

On all correspondence, please quote the model and serial number in full and/or the sales order number.

Any instrument requiring service under this guarantee should be taken to the supplier through whom it was purchased, or, in the case of difficulty, it should be carefully packed in its original packaging and consigned, carriage paid, to us. Jenway takes no responsibility for returned goods damaged in transit.

Returned goods will not be processed without a Returns Authorisation Number.

Call the Service Administrator +44 (0) 1371 820122 for the relevant documentation.

Please write the Returns Number on the outside of any packaging and ensure that a copy of a Decontamination Certificate is visible.

Please register online (www.jenway.com) or complete and return the Registration Document by fax or mail.

The Guarantee will be rendered invalid if any specified non-serviceable parts within the instrument are tampered with (i.e. the monochromator).

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Section 1

Introduction

1.1 Instrument Description

The 67 Series offer a range of unique features and functions to help in the management of methods and data at both individual and multi-user levels.

These units have a specially designed user interface based on a high quality, colour TFT LCD with touch screen technology and QWheel™ support to provide ease-of-use for all operations from set-up to measurement and data handling.

Five main measuring modes are available: Photometrics, Spectrum, Kinetics, Quantitation and Multi-Wavelength.

The 67 Series have dual memory options that enable you to store settings and data to either internal memory or on a removable SD/Multi-Media memory card. By saving to the removable SD card all settings, methods and results specific to the user can be retained by the individual, offering additional security and allowing easy transfer of data to a PC for storage, manipulation or off-line review. The SD card can also be used in any similar model, giving complete flexibility to use any available instrument. A simple back-up procedure enables easy transfer of all information from the internal memory to the removable media while quickly enabling a group of instruments to be cloned with identical settings.

It is possible for any user to perform simple measurements (Free Operation) at any time, however, logging-in with your own PIN code will allow you to create methods, change settings or store results. Each method can be designated as **Public** (for open user access), **Read-Only** (available for all users as read-only information) or **Personal** (only accessed through your PIN code).

A number of sampling accessories are available as complete, easily interchangeable modules. These include a Sipper Pump, Sipper/Peltier, Automatic Cell Changer, plus a comprehensive range of passive cuvette and test tube holders, which can be fitted in the single cell holder accessory.

The PC Software supplied enables the transfer of data from the instrument or SD card to the PC with rapid copy and paste into spreadsheets or other computer programmes.

Advanced software packages are also available for method creation, editing and memory management.

1.2 Instrument Specifications

Technical Specification

	6700	6705	6715
Light Source	Tungsten Halogen	Xenon	Xenon
Spectral Bandwidth	4nm	4nm	1.5nm
Stray Light	<0.1% at 340nm	<0.05% at 220nm	<0.05% at 220nm
Wavelength Range	320-1100nm	190-1100nm	190-1100nm

Common Specifications

Optics	Sealed, MgF Coated, Split Beam
Wavelength Resolution	0.1nm
Wavelength Accuracy	±1.0nm
Wavelength Repeatability	±0.2nm
Photometric Ranges	-0.300 to 3.000A & 0 to 199.9%T
Photometric Resolution	0.001A & 0.1%T
Photometric Accuracy	±0.005 at 1A
Photometric Stability	<0.001A per hour
Quantitation Range	-99999 to +99999
Number of Standards	20 with up to 5 replicates of each
Curve Fit Algorithms	Linear, Quadratic and Cubic Functions
Multi-wavelength Data Points	Up to 4 wavelengths
Calculations	Difference and ratio
Kinetics Time Limits	0 to 9999 seconds
Kinetics Calibration	Standard or factor
Scan Speed	1500nm/minute at 0.1nm data steps
Post Scan Analysis	Peak/Valley pick, Peak Ratios, Area, Zoom, Wavelength Table, Derivatives, Smoothing
Configuration	Secure Multi-User and Free Access
Number of Users	10 + Supervisor
Number of Methods	>1000 (on internal flash memory or removable media)
Results Storage	>1000 (on internal flash memory or removable media)
Removable Media	MM/SD Memory Card or SD/USB memory card
Interface	USB, Centronics, Analogue
PC Software	Supplied on CD-ROM with USB interface cable
Mains Supply	100 to 230V ac 50 or 60Hz
Sample Compartment	150mm (max. height) x 130mm (w) x 210mm (d)
Size	490x390x220mm
Weight	7.5Kg

Environmental Operating Conditions:

The 67 Series is designed to work safely under the following conditions:

Temperature	15 to 40°C
Humidity	0 to 90%RH

Accessory Specifications

Peltier

Range	Ambient +2°C to 60°C
Resolution	0.1°C
Regulation	±0.1°C
Accuracy	±0.5°C
Control System	PID

Sipper Pump

Modes:

Continuous Aspiration	Flow rate dependent on tube ID. 12ml/min with supplied tube
Timed aspiration	sample/air-gap/wash
sample volumes	75µl min / 9.5ml max.
segment run time	48 secs max.
Memory	Non-volatile

1.3 Good Practice Guidelines

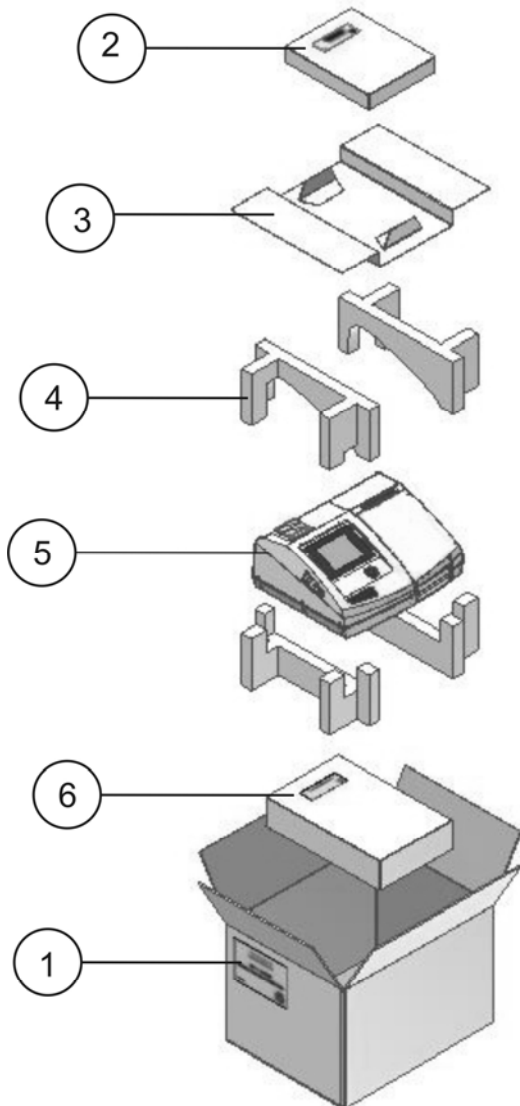
- 1) For optimum performance all spectrophotometers should be sited in a clean, dry, dust free atmosphere. When in use ambient temperature and light levels should remain as constant as possible.
- 2) Adherence to Standard Operating Procedures (SOP) and Good Laboratory Practice (GLP) should be monitored with regular calibration checks and a suitable Quality Control (QC) programme.
- 3) The sample chamber lid must be fully closed during measurement and before any readings are recorded or printed.
- 4) The correct selection of sample containers is imperative for accurate and reproducible results:
 - a) Check that the material of the sample container is compatible with the wavelengths to be used for measurement. In general glass can only be used down to 360nm or 320nm depending on quality. Standard plastic cuvettes can be used down to 320nm. Special UV versions can be used down to 260nm. Below this level quartz cuvettes must be used.
 - b) Plastic disposable cuvettes should be used ONCE only.
 - c) Glass cuvettes should be thoroughly cleaned after use. Discard when scratches become evident in optical surfaces.
 - d) Care should be taken when selecting semi-micro or micro cuvettes. The cuvette window on the inner chamber (the area filled with sample) must be wider than the aperture in the sample holder or light will reach the detector without passing through the sample. In this case, semi-micro or micro cuvettes with self-screening black surrounds must be used or alternative holders for these cuvettes fitted.
 - e) Glass test tubes and other sample tubes should be used with care. Where possible, matched tubes should be used and any index mark set to the correct position before measurements are made.
 - f) Ensure any sample containers used are compatible with the constituents of both the samples and standards they are to hold. Plastic cuvettes are not compatible with organic solvents.
 - g) All sample containers must be handled with care; by the top and non-optical surfaces only. Any finger marks evident must be removed using a suitable cleaning process.
 - h) Flow-through cuvettes must be selected with care and consideration for the sample type, sample volume, pumping system, rinse, sample and waste handling to be used.
- 5) Samples and standards should not be stored in open cuvettes or sample containers as evaporation will change the value and lead to staining of the walls which may be irreversible. If stored in stoppered and sealed cuvettes, they should be filled with little or no air space and the values regularly checked against a reference standard or quality control material.
- 6) Cold samples should be allowed to equilibrate to ambient temperature before measurement (unless a suitable temperature controlled sample holder is in use). Temperature change during measurement may cause air bubbles to form on the walls of the sample holder. This is a common cause of drift during measurement.
- 7) In the preparation of samples and standards high grade borosilicate glass and AR grade chemicals and reagents must be used. Good quality deionised water or other suitable solvent must be used for dissolving or diluting samples, chemicals and reagents.

- 8) All measurements require calibration to a blank, for maximum accuracy this should be prepared with care using the same deionised water or solvent used for dissolving or diluting the sample. Where reagents are added to the sample to produce a colour proportional to its concentration a 'sample based' blank should be used. In this case the blank should consist of the sample plus any reagents or chemicals to be used, **except** those that produce the colour to be measured.
- 9) Deviations from the Beer-Lambert Law may occur at high and low concentrations giving non-linear response during sample concentration measurements. For all new methods a linear range should be defined by the preparation of a calibration curve. The quantitation mode may be used to construct such a curve against which sample results are automatically measured.
- 10) Cuvettes and sample holders must be filled to a minimum level which covers the light path.

Section 2

Getting Started

2.1 Unpacking Instructions



Refer to the Instruction Manual to ensure accessories are installed correctly before using the instrument for the first time.

Disposal of Packaging

It is recommended that the Instrument packaging be retained for possible future long-term storage or transportation. Please note that the Manufacturer or Distributor cannot be held responsible for any damage incurred as a result of transportation of an inadequately packed instrument.

- Refer to label ① on carton exterior and ensure instrument type and options/accessories supplied are correct. Refer to Distributor in the event of any discrepancy.
- Check each item as it is removed from the packaging to ensure it is correct and undamaged. Refer to Distributor if any item is missing or damaged.
- Remove Documentation carton ②. Note that this contains the Instruction Manual and other important documents, which **MUST** be retained for future reference. Other small items (CD ROM, SD Card etc) will also be found inside this carton.
- Please take some time to familiarise yourself with the contents of the Instruction Manual before using the instrument for the first time.
- Remove the cardboard packing piece ③ and place to one side.
- Remove the two foam packing pieces ④ and place these to one side.
- Grasp the instrument ⑤ (which will be sealed in a polythene bag) firmly at each end, and lift out of the carton to place on an adjacent flat, firm and clean surface. The instrument weighs approximately 10 Kgs. **PLEASE TAKE CARE WHEN LIFTING.**
- Remove the Accessory carton ⑥. Note that this contains the Power and USB cables together with any sample cells or other items that may have been ordered.

If you wish to dispose of the instrument packaging, please do so in an environmentally responsible manner. Please refer to the following guidelines: -



Cardboard packing items are made from paper sourced from recycled fibres or managed forests and can be 100% recycled where appropriate facilities exist. Ensure cartons are crushed or flattened before disposal.



Foam packing pieces are manufactured with a reprocessed polyethylene content and can be easily recycled with other low-density polyethylene (LDPE) materials. Polyethylene foam is manufactured by a CFC and HCFC free process and contains less than 100ppm heavy metal content. The European Union Packaging Directive confirms that recovery by means of waste-to-energy is a sensible waste management alternative. The Polyethylene foam burns cleanly and contributes a high calorific value.

2.2 Installation

2.21 Location

In ideal circumstances the installation environment will be clean, dry and dust free with the instrument protected from extreme variations in ambient lighting and temperature change. Ensure the unit is positioned so that the mains on/off switch is accessible. If a safety problem should be encountered, switch off at the mains socket and remove the plug from the supply.

Where conditions are less than ideal, maintenance and cleaning must be carried out regularly and additional protection offered where possible.

The optional dust cover should be used to protect the instrument when not in use.

2.22 Supply Voltage

The 67 series spectrophotometers are powered by a universal switch-mode power supply that operates from a 90-264Vac mains supply. The correct lead for your supply should be selected.

2.23 Mains Connections

The leads supplied have a moulded on plug. However, if this is removed for any reason the wires in the mains lead are colour coded to conform to the internationally recognised standard such that:

UK CONNECTIONS

BROWN	LIVE
BLUE	NEUTRAL
GREEN/YELLOW	EARTH

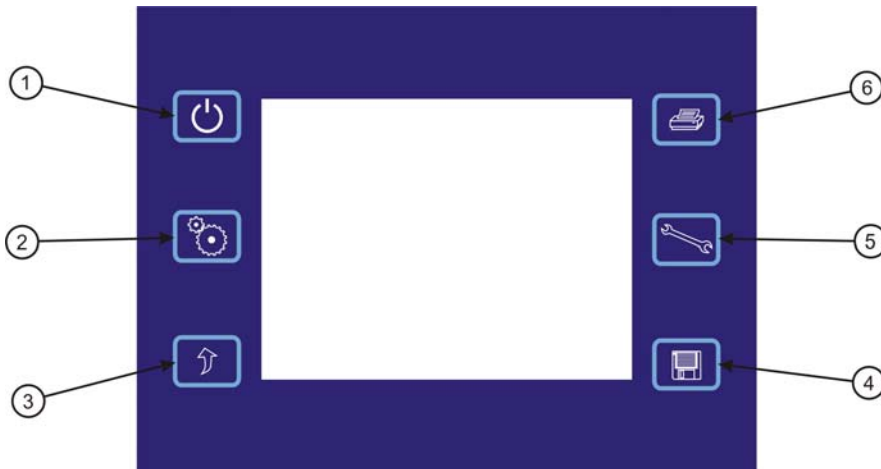
US CONNECTIONS

BLACK	LIVE
WHITE	NEUTRAL
GREEN	EARTH

Safety

When disposing of any removed plug the connectors must be removed or made incapable of insertion into a mains socket.

2.24 Touch Screen Functions



1. Standby – this key can be used to enter the standby mode during operation.



2. Instrument Settings – this key can be used to access instrument set up parameters including user creation, PIN codes, language options, date and time settings, administrative functions and instrument identification details.



3. Back key – this is used to return to a previous menu level.



4. Save key – pressing this key saves methods and/or data. If an external card is not fitted then methods/data will automatically be saved to internal memory. If an SD card is inserted or removed during operation relevant messages and options are given to select the desired media.



5. Toolbar key – this key is only functional on the completion of measurements and gives access to the available data manipulation options. The function of this key is context sensitive, enabling different sets of tools depending on the mode of operation in use.

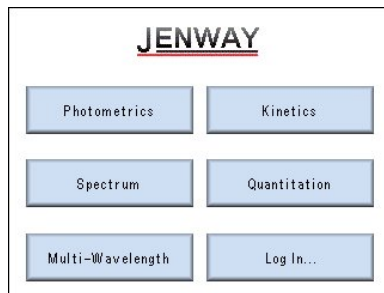


6. Printer key – this key will initiate a print out to either the internal or external printer unit via the selected settings options in each mode of operation.



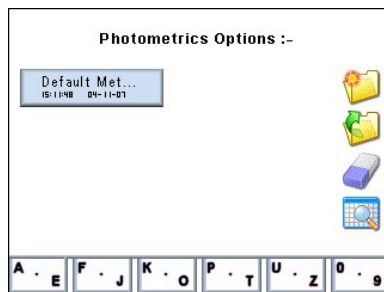
2.25 Toolbar Icons

The spectrophotometer can be used for making measurements at any time without the need for logging in; but many benefits will be lost and results cannot be saved, only printed.



The Method Screen options will only be displayed if the logs in. If the user is not logged in the instrument will automatically display the main measurement screen, with settings at their last used levels.

Method Screens



Methods are stored sequentially by measurement mode. Once the first page is full (8 methods for the selected mode) cursor arrows are displayed enabling the user to browse to subsequent or previous pages of 8 methods.

Alternatively, pressing one of the alphanumeric keys along the bottom of the screen will display all available methods with the initial character that is highlighted.

Note: Repeated pressing of a key sequentially highlights the characters between those displayed.



Create a New Method

For the following functions first touch a method or result to select it.



Open the Selected Method



Erase the Selected Method

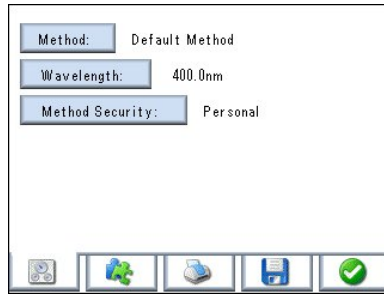


Browse Results – linked to the selected method



Open specific results in the selected batch

Photometrics Mode



Mode settings – method name, wavelength, method security (if logged in)



Accessory options – varies with type of accessory module fitted



Allows selection of internal or external printer

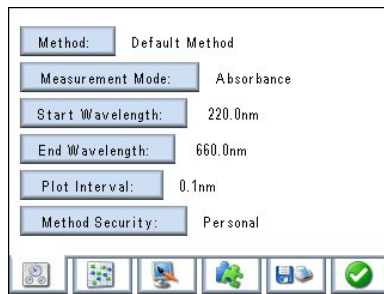


Allows set-up of batch ID and the Auto Save options



Press to accept settings entered

Spectrum Mode



Mode settings – method name, measurement mode, wavelength range, plot interval, method security (if logged in)



Analysis Points – up to 30 wavelengths at which absorbance will be reported



Measurement display – auto scaling, axis setting, colour selection



Accessory options – varies with type of accessory module fitted

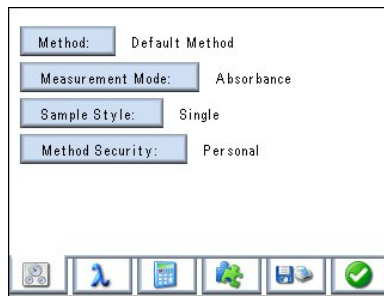


Allows selection of internal or external printer, graph details, batch ID and enables or disables the Auto Save feature



Press to accept settings entered

Multi-Wavelength Mode



Mode settings – method name, measurement type, dwell time, reading type, sample style, method security (if logged in)



Setting wavelengths – allows from 2 to 4 wavelengths to be set



Calculations - allows the selection of calculations and constants



Accessory options – varies with type of accessory module fitted

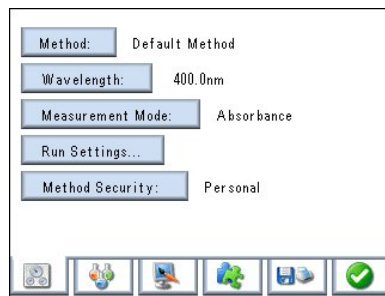


Allows selection of internal or external printer, graph details, batch ID and the Auto Save options



Press to accept settings entered

Kinetics Mode



Method: Default Method
Wavelength: 400.0nm
Measurement Mode: Absorbance
Run Settings...
Method Security: Personal



Mode settings - method name, wavelength, measurement mode, run settings, method security (if logged in)



Calibration – allows setting of Concentration cal standard, factor, resolution and units of measurement



Measurement display – allows auto scaling, axis setting, colour selection



Accessory options – varies with type of accessory module fitted

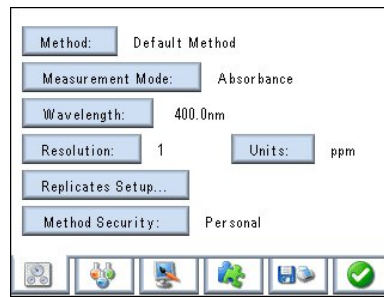


Allows selection of internal or external printer, graph details, batch ID and the Auto Save options



Press to accept settings entered

Quantitation Mode



Mode settings – method name, measurement mode, wavelength, resolution, units of measurement, replicates set up, method security (if logged in)



Calibration – allows the number and levels of standards to be set



Measurement display - - allows auto scaling, axis setting, colour selection



Accessory options – varies with type of accessory module fitted



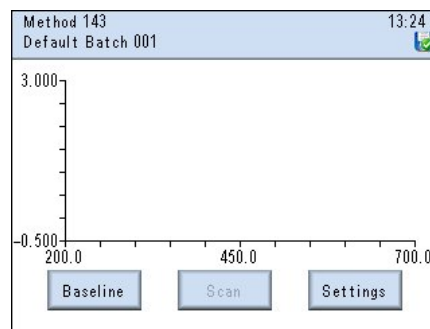
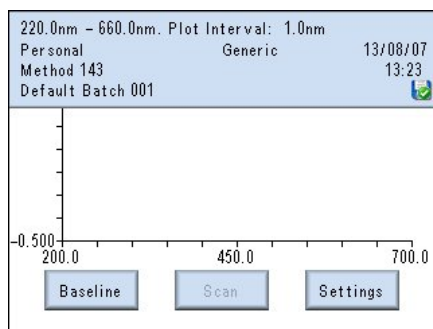
Allows selection of internal or external printer, graph details, batch ID and the Auto Save options



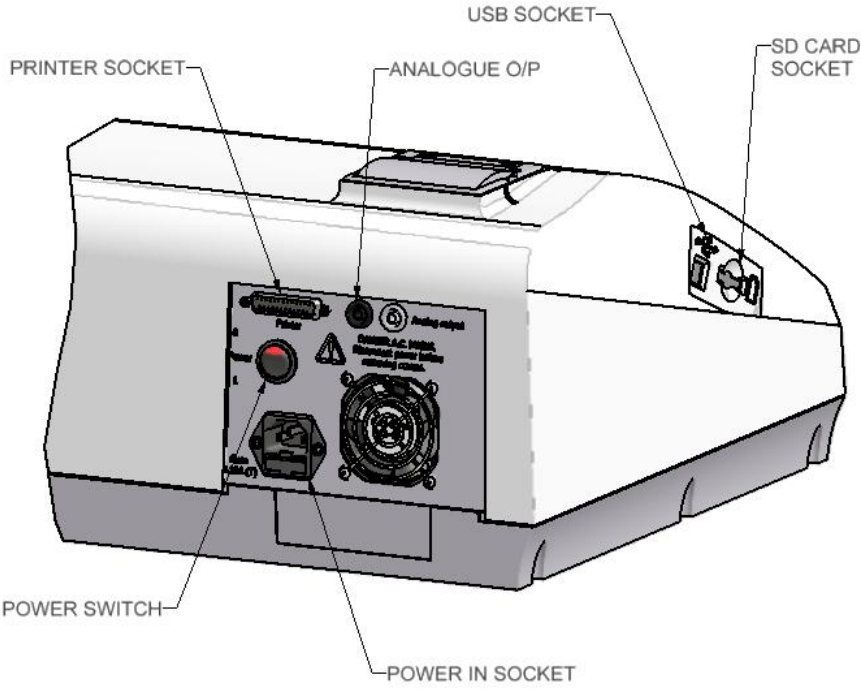
Press to accept settings entered

Status Bar

To view the set parameters in any of the measurement modes press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.



2.26 Rear Panel Layout



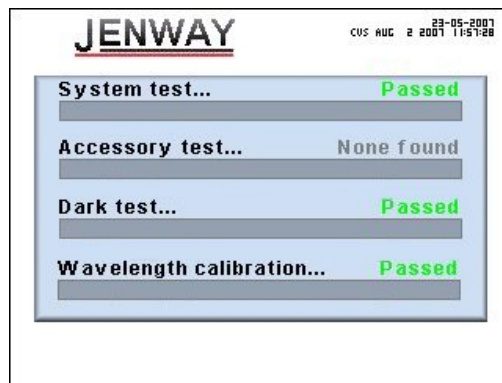
- Power Switch - On/Off switch for the unit.
- Power In Socket - IEC type connection socket for the mains supply cable.
- Power Out Socket - IEC type connection socket for auxiliary equipment.
- Printer Socket - 25 way Centronics parallel output socket compatible with Postscript printers.
- Analogue Output - 2 x 4mm pin sockets for analogue devices.
- USB Socket - type B connector for communication to PC.
- SD Card Socket - will accept 128MB to 2GB SD or Multi-media memory cards.

2.27 Power on and Self-Tests

Connect the mains supply cable to the rear panel mains input socket and plug the other end into a suitable mains supply socket.

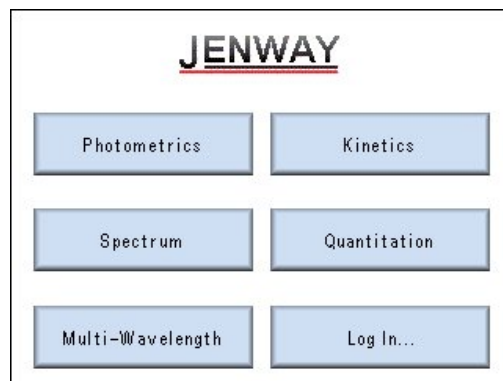
Lift the sample chamber lid on the instrument and ensure that there is no sample or other item present in the sample holder, close the lid.

Switch on the supply socket, then the instrument, using the Power switch located on the rear panel. The instrument will then perform the power on self-test protocol. The power on and self-test screen will be shown:



System test...	Checks internal connections / Checks internal and external memory status
Accessory test...	Checks for fitted 'active' accessories / Verifies communication and response
Dark test...	Checks detector and light seal on sample chamber
Wavelength calibration...	Performs a wavelength calibration

followed by the **Main Menu** Screen:



This screen gives you access to the five operating modes that can be used directly for making measurements without logging in. It should be noted that if the user is not logged in results can only be viewed and printed but not stored. In addition, methods cannot be created or retrieved.

Section 3

Systems of Operation

3.1 Multi-User and Free Operation

The 67 Series spectrophotometers focus on secure, multi-user operation, but to ensure that anyone can acquire quality results in an emergency or when otherwise required (stat or free operation), they may also be used without the operator having to log in. Such free operation is restricted to making measurements with no access to methods while results will only be displayed or printed.

Secure, multi-user operation requires each designated user to enter a PIN code to access methods and results. When creating methods a user can opt to share them with other users, as **Public** (can be modified) or **Read-Only** (can be used but not modified), or to keep them **Personal**. Up to 10 users and a Supervisor with administrative rights can be set up on each instrument but by using the removable media (see below) an almost infinite number of users can be securely accommodated.

3.2 Memory Structure

The 67 Series spectrophotometers have a dual memory structure based on removable media and fixed internal memory. The capacity of the internal memory can be selected when an instrument is purchased; further up-grade to this internal memory is only possible by a trained and qualified Service Engineer. The removable media is based on SD or Multi-Media memory cards with a wide range of capacities available as well as dual function SD/USB cards that can be used to directly transfer data from the SD card to the USB port of a personal computer.

For both internal memory and removable media the following table of memory capacity and data storage can be used as a guide to the files that can be stored:

Memory Size	Methods	Results	Total Files
256 MB	1000	1000	2000
512 MB	2000	2000	4000
1 GB	4000	4000	8000
2 GB	8000	8000	16000

The following table gives details of the removable media available (subject to change by manufacturers range consolidation):

Card Capacity	SD Card Part Number	SD/USB Card Part Number
256 MB	019 130	Not available in this size
512 MB	019 131	019 134
1 GB	019 132	019 135
2 GB	019 133	019 136

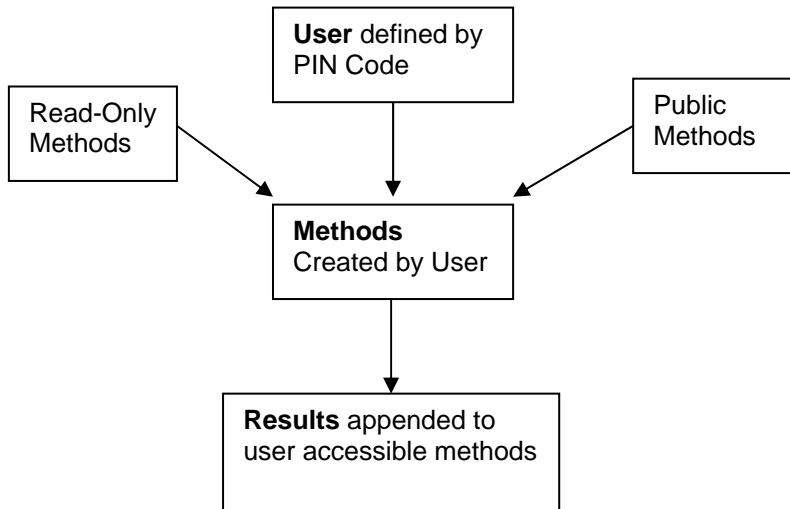
3.21 Memory Selection

If a removable media memory card is fitted when the power is turned on this becomes the default memory location and any methods and results saved will be sent to this card. Should the card be removed during use a warning message will be displayed and the internal memory will then be set as the default location.

If no removable media is fitted when the power is turned on the internal memory becomes the default memory location. Should a removable media memory card be fitted during use a message is displayed giving the option to switch the default location to the removable media memory card.

3.22 Memory Hierarchy

The top level of the memory hierarchy is the user, defined by a user name and recognised by their unique PIN code. In general it is considered that this will be an individual but in practice this can be made more flexible by considering the user as a group sharing the same PIN code. For instance different departments or shifts could be identified by their own PIN codes.



Different types of tests could also be separated by PIN codes with only users trained in carrying out specific tests given the relevant PIN codes to access the tests for which they have been trained. In education a PIN code for each semester or part of the curriculum would restrict students or year groups access to only the current work, protecting that to be used in the future. The implementation and benefits of this function are only limited by the imagination.

Below the user level are the Methods created by that user or for that group, and those with **Public** or **Read-Only** status that all users can access, below each method are the results stored by the user for that method.

3.3 Creating Methods

The ability to create and re-call methods is only available to logged in users.

To log in touch the **Log In...** key on the bottom right-hand side of the **Main Menu** screen that is displayed after completion of the start-up tests.

A table of users is then displayed, touching your name (department, user group or other identifier) then brings up a numeric entry screen for inputting the four digits of the relevant PIN code.

For first time use the only user in the table will be the Supervisor with a default PIN Code of 1234 (once logged in this can subsequently be changed to a number combination of the Supervisor's choice).

By pressing the **Settings** key on the display surround and selecting the **Administrative Functions** option the Supervisor can create new users. On creation a new user has a default PIN Code of 0000 that, like the Supervisor's, can be changed by selecting User Preferences, then Adjust PIN Code.

NOTE: Once the Supervisor's PIN CODE is changed it must be kept safe as there is no other way of accessing this function – however the Supervisor does have the right to re-set other users' PIN Codes back to the default.

For further information on these functions see the Section on **Instrument Settings** and **Administrative Functions**.

When successfully logged in the user is returned to the main menu screen from which the required mode of measurement can be selected.

The Browse screen is then displayed from which an existing method can be re-called using the alphanumeric search keys along the bottom menu bar. If insufficient methods have been created to fill the first page all available methods will be shown.

3.4 File & Data Management



Save



Tools



Print



Settings



Erase



Search
Results



Open
Results



Save

Saving Methods

Having entered all your required settings on the tabbed pages the method can be saved by simply pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Sharing Methods

Methods can be shared with other users by setting the security level at either **Read-Only** where other users can use but not modify the method or, **Public** where they can use and modify the method. Other users must then ensure that under **Method View Settings** (Settings/User Preferences/Method View Settings) they have enabled **Public** and/or **Read-Only** methods or turned **All Methods** on.

Recalling Methods

Following selection of the operating mode from the main menu the method browse screen is displayed. This will show all methods that the current user has access to, based on their selections in the **Method View Settings** (refer to Sharing Methods). If the first page is full, cursor arrows will be displayed to enable navigation to and from additional pages.

Alternatively, selection may be made using the alphanumeric menu bar at the bottom of the screen. Repeated pressing of each character set will display the full alphanumeric range and the screen will show all methods starting with the highlighted character.

Touch the required method when it is displayed on the screen to highlight it, touch the **Open File** icon to display the main measurement screen for that method.

Editing Methods

Use the Recalling Methods procedure to recall the required method. With the measurement screen displayed touch the **Settings** option. Adjust the settings as required and touch the **Enter** icon on completion. The modified method can then be saved by pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Note: If the Method name was not changed during editing it will be saved with the same name but with a new date and time to ensure traceability. If the old method is no longer required it should be deleted as detailed in Deleting Methods.

Deleting Methods

To delete methods highlight the required method in the Browse screen as described in Recalling Methods and then touch the **Erase** icon.

A warning message will be displayed to ensure this action is required. On confirmation the selected file will be deleted.

If the current user does not have the required privileges to delete the selected message then an information message will be displayed advising that the method cannot be deleted.

Privileges required for deleting designated methods:

Public Methods – only the Supervisor can delete these.

Read-Only Methods – only the Supervisor and Originator can delete these.

Personal Methods – Only the Originator can delete these methods. (The Supervisor can delete these by re-setting the Originator's PIN code and then logging in as the Originator).

Saving Results

After completion of a measurement the result can be saved by simply pressing the **Save** key on the display surround. The result is saved under the method that created it, with the entered Batch ID and an incremental number along with the time and date of the measurement. Results can also be saved as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Printing Results

After completion of a measurement the result can be printed, by simply pressing the **Print** key on the display surround. The result will be printed to either the internal or external printer, as selected by the user in the **Printer Settings** option.

The first result of any new batch is preceded by a print header, which gives details of the method settings and Batch ID. Results can also be printed as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Recalling Results

Stored results are always directly linked to the method that created them. To access results first recall the method as described in Recalling Methods (page xx). With the method highlighted touch the **Search Results** icon. This will open a screen detailing all results available to the current user. Touch the required result or batch (depending on the mode) and then the **Open Specific Result** icon. This will display the results on the screen. The **Tools** option can then be used to work on these results (depending on mode). It is also possible to print the result by simply pressing the **Print** key on the display surround. Options to print to the Internal or External printer or to the Data Card will be displayed. Printing to the Data Card will save an EPS (Encapsulated Postscript) file to the Data Card. This is in printer ready format and can be viewed and printed in a number of software packages, including Adobe PhotoShop[®], Corel Draw[®], Ghostscript[®] and many other file management systems.

Sharing Results

Results attached to **Personal Methods** cannot be accessed by any other user.

Results attached to **Read-Only** and **Public Methods** can be accessed by all users, based on their current **Method View Settings**.

Deleting Results

Results can only be deleted by the Originator or the Supervisor through **Administrative Functions**. Recall the required result without opening it. Highlight the result (or batch of results) and then press the **Erase** icon. A warning message will be displayed to ensure this action was intended. On confirmation the results will be permanently deleted.

Section 4

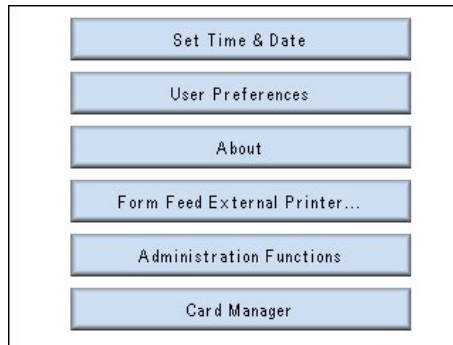
Instrument Settings

4.1 Menu Options

A number of settings can be stored for each signed in user including language, method view settings, display brightness and time/date display choices so that these do not have to be reset each time a new user logs in. These can be found under **User Preferences**.

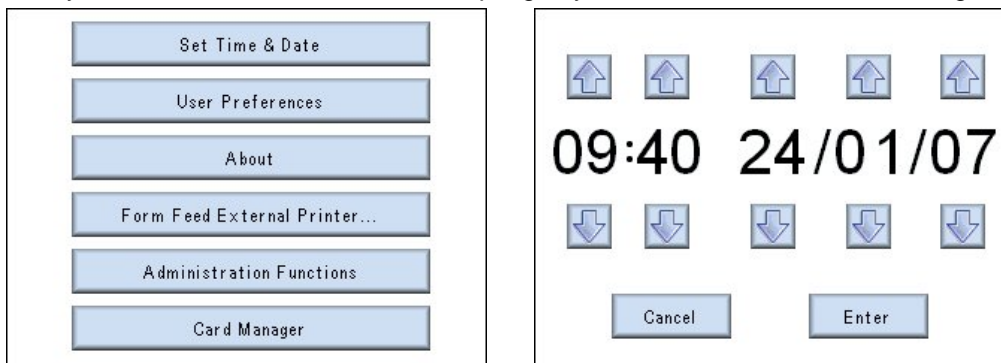


– When switching on the product for the first time, or if the previously entered settings need to be checked, this key should be pressed to give access to the following display:



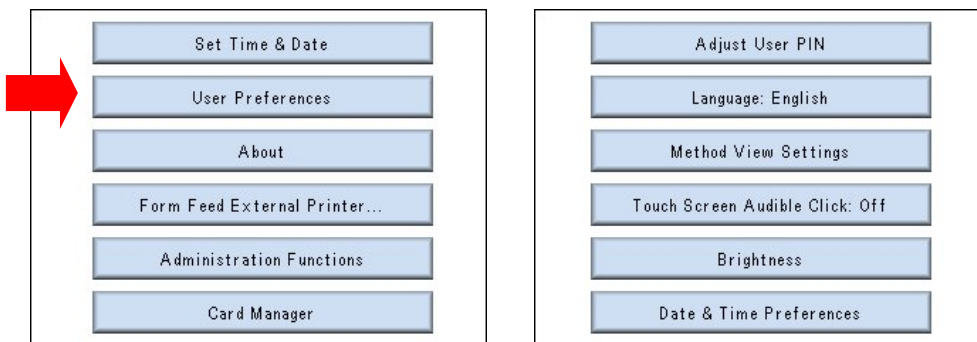
4.2 Set Time & Date

To set the correct date and time select the **Set Time & Date** key. The time and date can be reset using the up and down arrows. To accept the new settings press the **Enter** key. Pressing the **Cancel** key will return you to the main menu without accepting any alterations to the current settings.



4.3 User Preferences

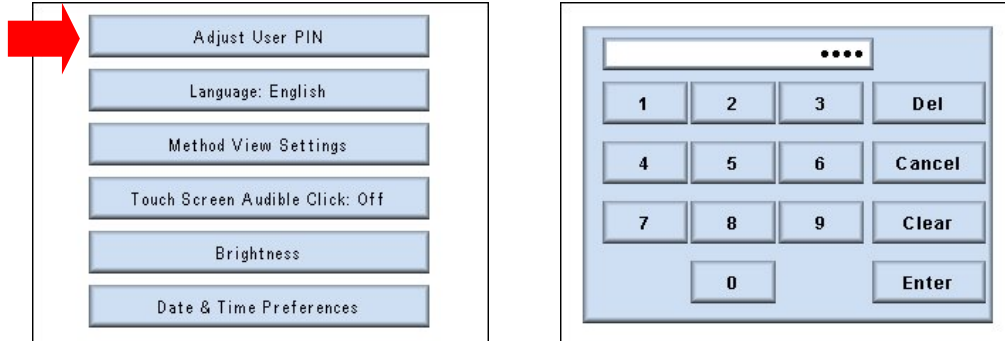
Selecting **User Preferences** gives access to the following options:



These settings are saved for each user and the individual's selections are retained when that user logs in.

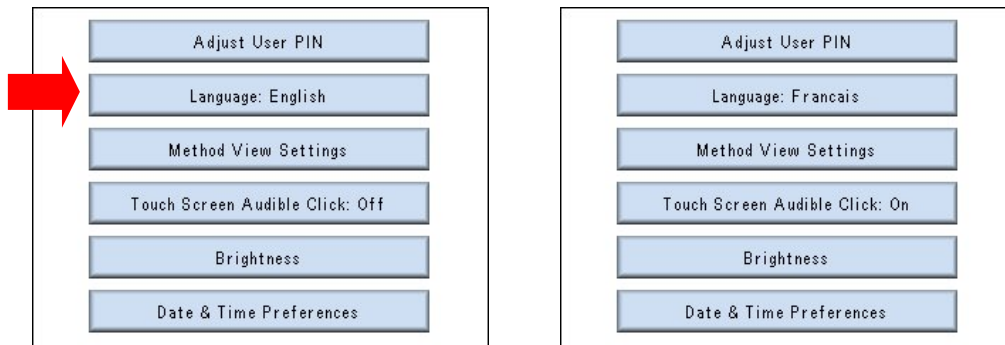
4.4 Adjust User PIN

To alter your User PIN select the **Adjust User PIN** key. Enter your new 4 digit code using the numeric keypad as shown below. The **Del** key allows individual digits to be changed. The **Cancel** key will return you to the previous menu without altering the original PIN code. The **Clear** key will clear all digits entered from the screen. The **Enter** key accepts the new code and returns you to the previous menu.



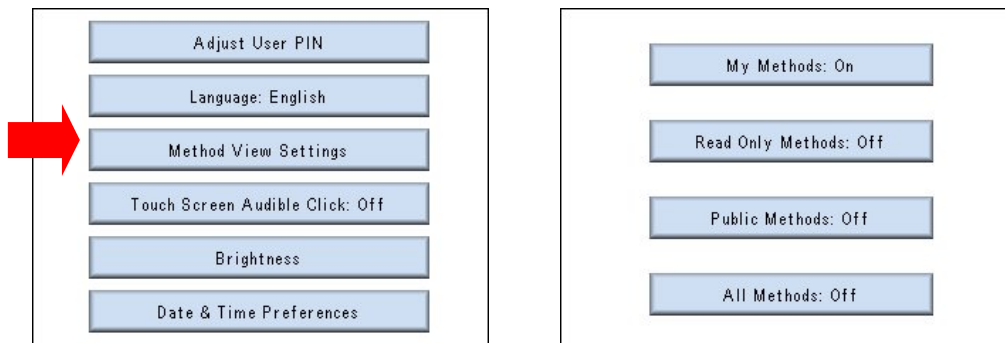
4.5 Language

The preferred language can be selected by pressing the **Language: English** key. Each time this key is pressed the instrument will update to show the next available language in the following sequence: English, Francais, Deutsche, Italiano, Espanol. Once the preferred language option is selected, pressing the **Back** key on the main panel twice will return you to the **Main Menu** options.



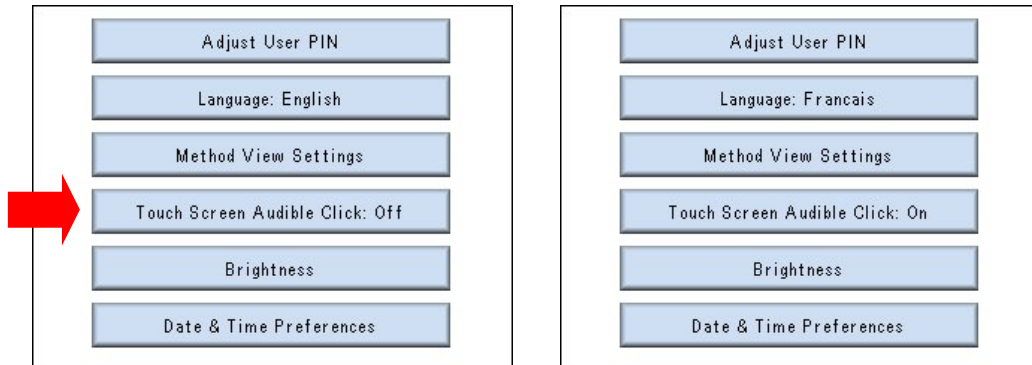
4.6 Method View Settings

To simplify operation it is possible to restrict the methods displayed by their allocated category. Selecting **Method View Settings** enables **My Methods** (Personal) to be hidden (Off) or displayed (On). Similarly, **Read Only Methods** and **Public Methods** can be hidden or displayed. To simply display all method categories toggle **All Methods** to the On status.



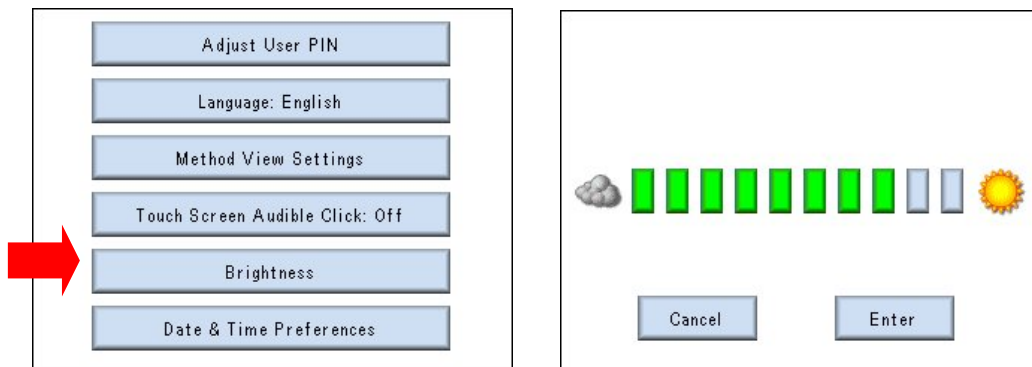
4.7 Touch Screen Click

The touch screen can be operated with or without an audible click each time a key is pressed. The click can be toggled on or off via the **Touch Screen Audible Click: Off** key.



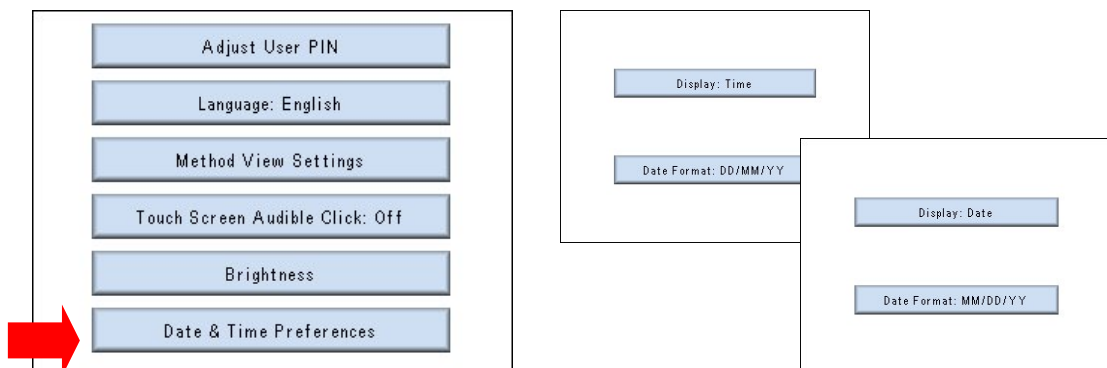
4.8 Brightness

Selecting the **Brightness** key and then using the left and right arrows on the display shown below can adjust the brightness of the display. Pressing the **Save** key will update the display setting and return the instrument to the previous display.



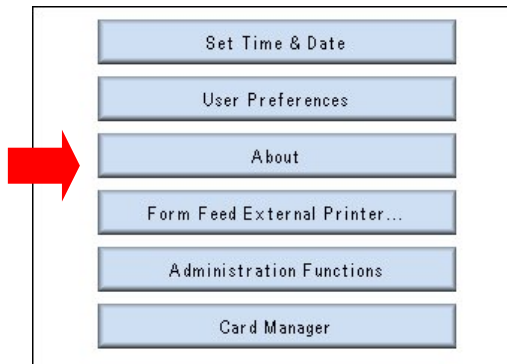
4.9 Adjust Date & Time

Selecting the **Date & Time Preferences** key allows the user to display either the time or date. In addition the date format can be set to either DD/MM/YY or MM/DD/YY. Once the preferred option is selected, pressing the **Back** key on the main panel once will return you to the previous menu. Pressing the **Back** key twice returns the instrument to the **Main Menu**.



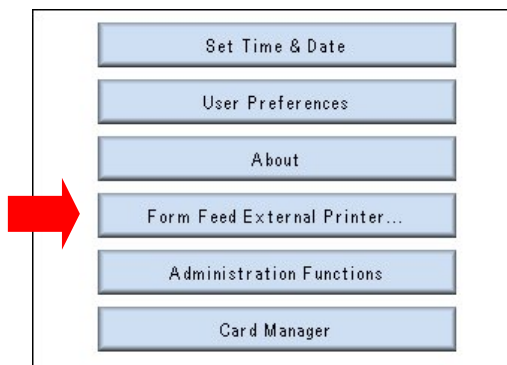
4.10 About

Selecting the **About** key provides information relating to instrument ID and signed in user details. Pressing the **OK** key returns the instrument to the previous menu.



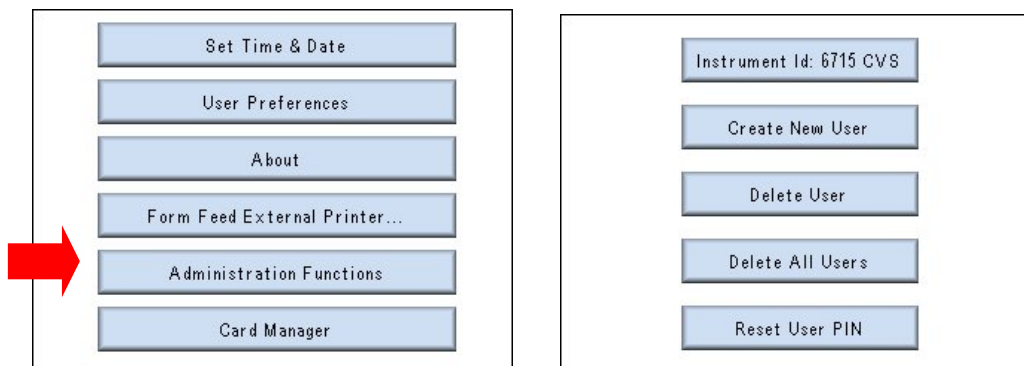
4.11 Form Feed

Selecting the Form Feed key will feed additional paper through the mechanism of the connected printer to separate results or enable a clean area for tearing off. If no internal printer is fitted this option defaults to external printer.



4.12 Administration Functions

This function is only available to the supervisor. It gives access to all user related information. It allows the Supervisor to create new users, delete an individual or all users and reset user PIN codes. If the Supervisor is not logged in this option will be greyed out and unavailable.



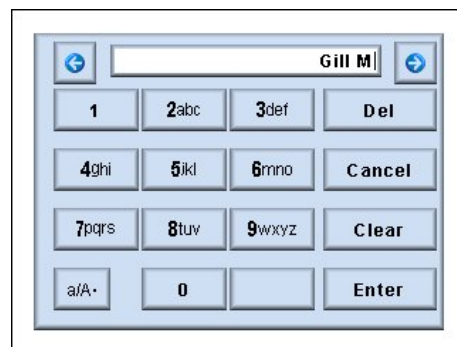
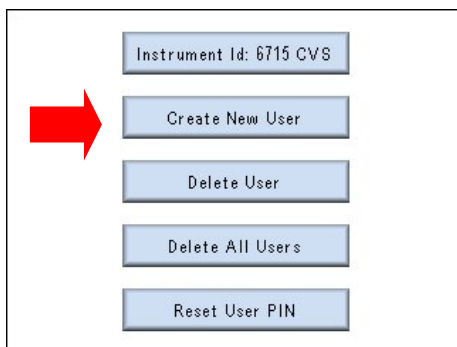
4.13 Instrument ID

Selecting the **Instrument Id: 67XXCVS** key allows the supervisor to alter the instrument identification code. This is entered by use of the alphanumeric keypad. The **Cancel** key will return you to the previous menu without altering the original ID. The **Del** key allows individual letters or digits to be removed. The **Clear** key will clear all digits entered from the screen. The **Enter** key accepts the new ID and returns you to the previous menu. For laboratories with more than one 67 series spectrophotometer it is useful to change this ID to the serial number, department or other unique identifier for easy recognition of different instruments.



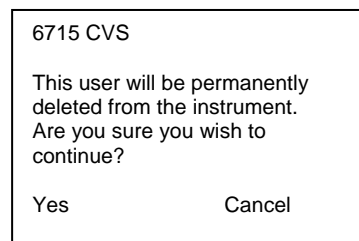
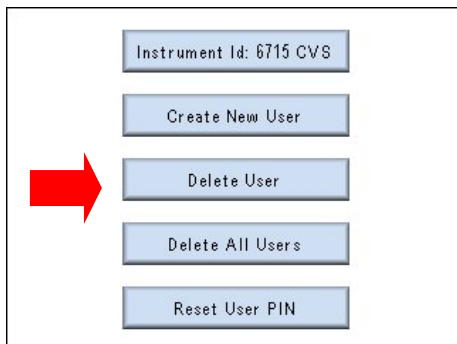
4.14 Create New User

Selecting the **Create New User** key allows the supervisor to enter an additional user on to the instrument using the alphanumeric keypad as shown. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu without adding a new user. The **Enter** key accepts the new ID and returns you to the previous menu.



4.15 Delete User

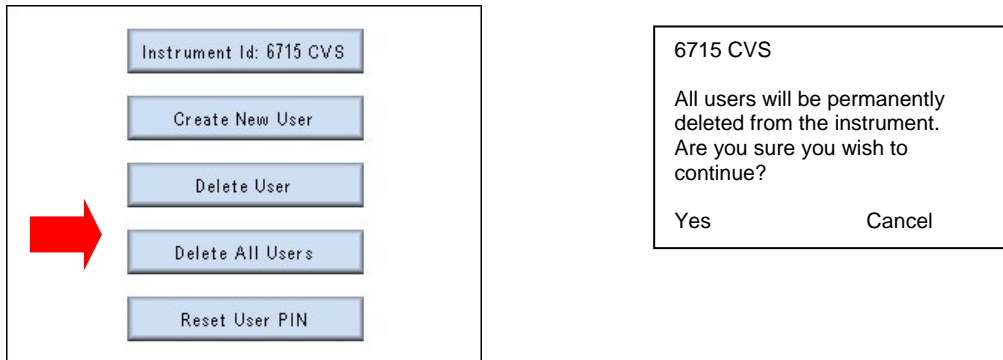
Selecting the **Delete User** option allows the supervisor to delete a specific user from the instrument. When the user name is selected from the list the following warning message is displayed:



If the **Yes** key is pressed the instrument will update and the user will be removed from the instrument. If the **Cancel** key is pressed the user will not be deleted from the instrument.

4.16 Delete All Users

Selecting this option allows the supervisor to delete all current users (except the supervisor) from the instrument. The following warning message is displayed:

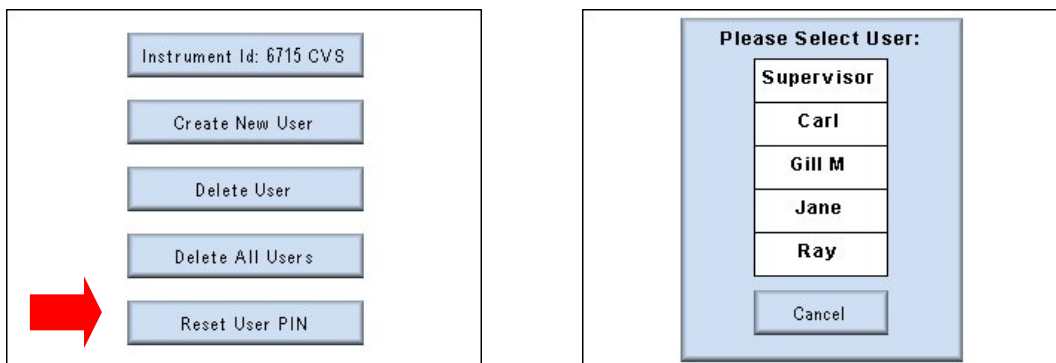


If the **Yes** key is pressed the instrument will update and all users will be removed from the instrument. If the **Cancel** key is pressed all users will remain on the instrument.

4.17 Reset User PIN

This option allows the supervisor to reset an individual users PIN code.

Select the **Reset User PIN** option from the screen. The list of current users will then be displayed on screen. Select the user. The warning message: '**Are you sure you wish to continue**' will be displayed with the options to accept or cancel.

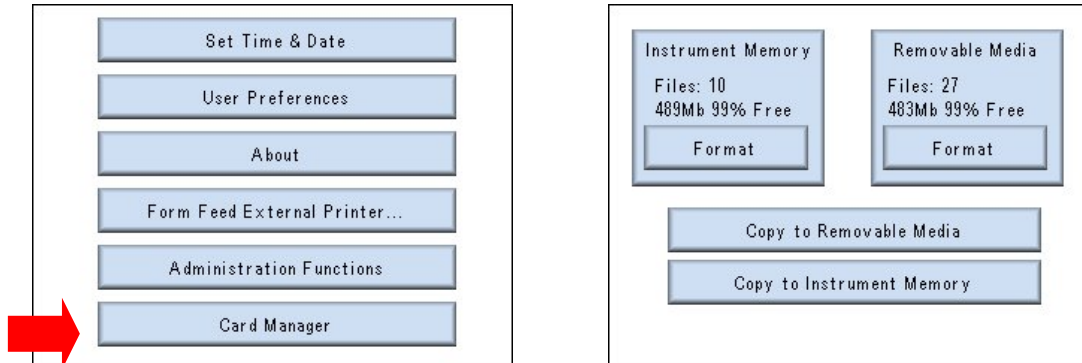


If the **Yes** key is pressed the user PIN will be reset to the default value and the supervisor has access to all information relating to that user.

If the **Cancel** key is pressed no changes will be made to the user codes and the instrument will return to the Main Menu.

4.18 Card Manager

This option is available only to the supervisor and allows transfer of data, methods and user preferences to and from the instrument memory. This enables backup of information stored in the instrument memory and on any removable media used. Both memory locations can also be formatted. **WARNING – this will permanently delete all information stored in the location being formatted.**



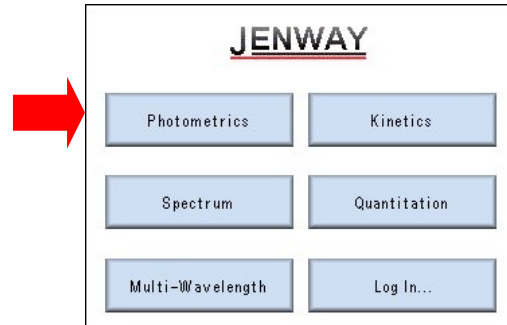
Section 5

Photometrics Mode

5.1 Principles of Measurement

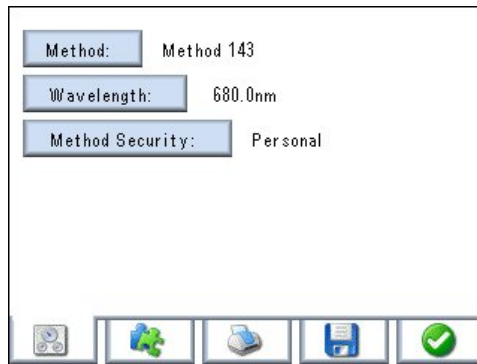
The simplest mode of the spectrophotometer is Photometrics. A measurement is made of either the absorbance or transmittance of a sample. The measurement is at a single wavelength, at one point in time, with no additional calculations.

Select **Photometrics** from the **Main Menu**:



If the user is not logged in (Free Operation) the main measurement screen will be displayed (refer Section 5.3).

5.2 Mode Menus and Icons



Mode settings – method ID, wavelength, method security (if logged in)



Accessory options – varies with type of accessory module fitted



Allows selection of internal or external printer



Allows set-up of batch ID and enables or disables the Auto Save feature

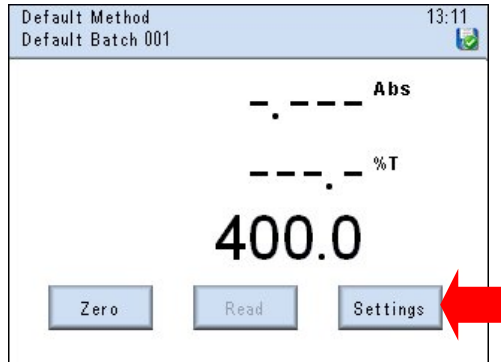


Press to accept settings entered

5.3 Free Operation

Settings

If the user is not logged in then the main measurement screen will automatically be displayed when the **Photometrics** Mode is selected from the **Main Menu**:



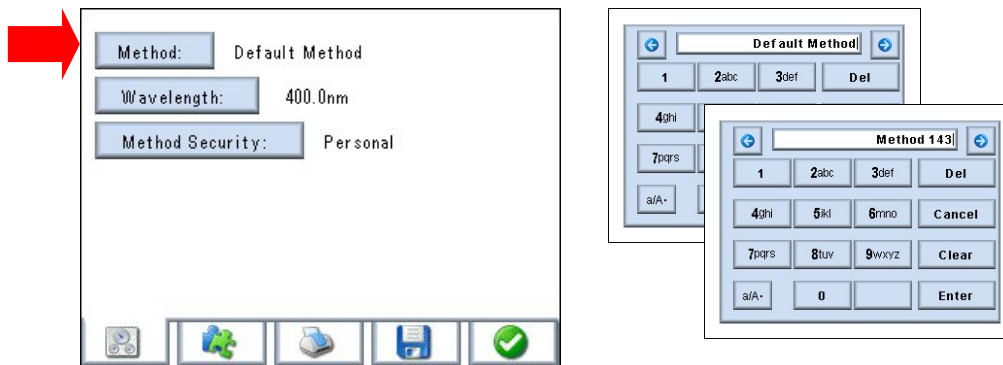
To enter the appropriate wavelength for the sample(s) to be tested select the **Settings** key and the instrument will display the following screen:



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.

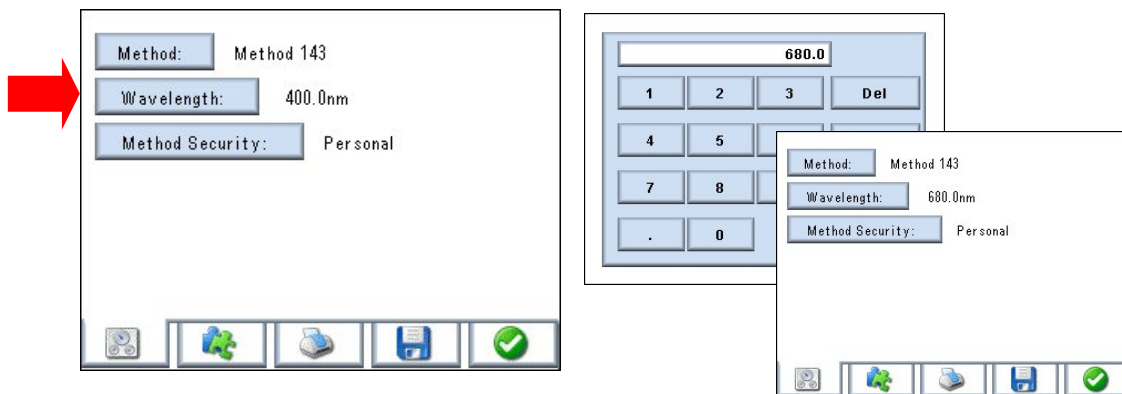
Note: The new Method ID can only be used to identify the method on a printout to the internal or external printer module. The generic user has no additional facility to store or recall results or methods.





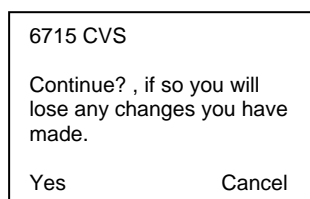
Setting Wavelength

Select the **Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out). Press the **Enter** key to confirm. The display will momentarily flash the message 'Going to Wavelength' and the display will update to show the new wavelength.



Using the **Back** arrow to escape settings will display:

If **Yes** is selected all set information will be lost and the instrument will return to the main measurement screen. If **No** is selected the instrument returns the **Settings** screen as shown.



To accept all entered information press the **Enter** key to confirm. The instrument will show the main measurement screen with the updated information. **Batch ID** and **Auto Logging** can also be entered via the **Save** icon.



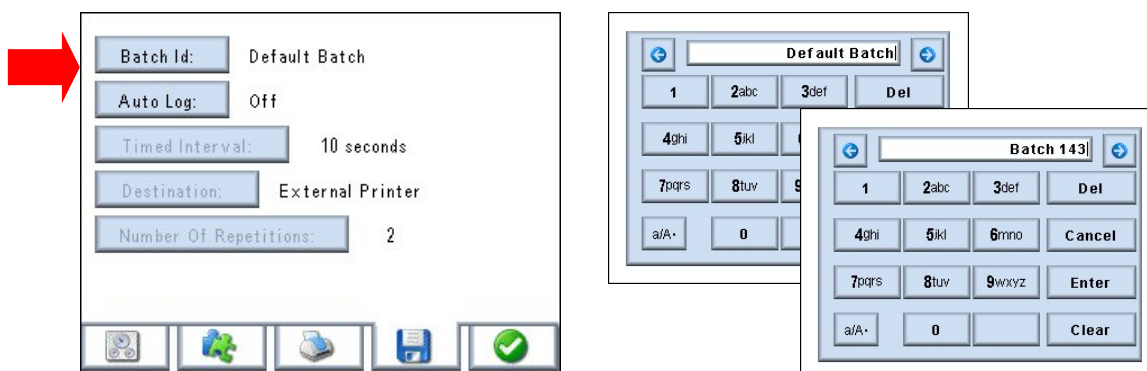
Setting Method Security

If the user is not logged in (i.e. Free Operation), this feature is non functional.



Setting Batch ID

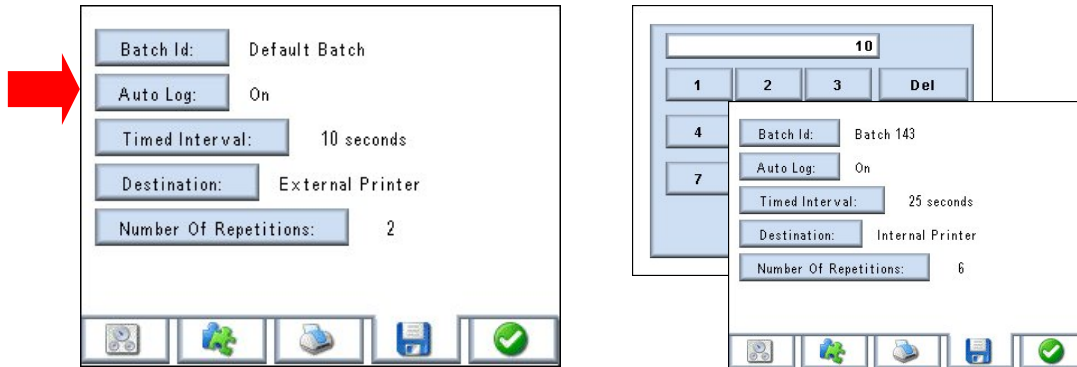
Select the **Batch ID** key and enter the Batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.





Auto Log Settings...

Selecting **Auto Log Settings...** opens a dedicated sub-menu.



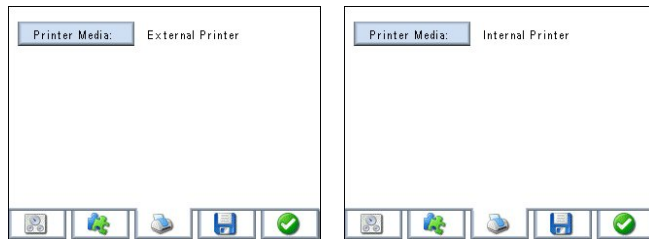
This option can be toggled between **On/Off**. When the **Auto Log** option is selected to **On** the user can set the following options:

the timed interval between 10 and 9999 seconds using the numeric keypad;



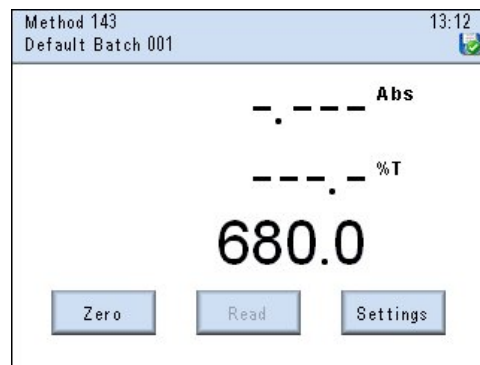
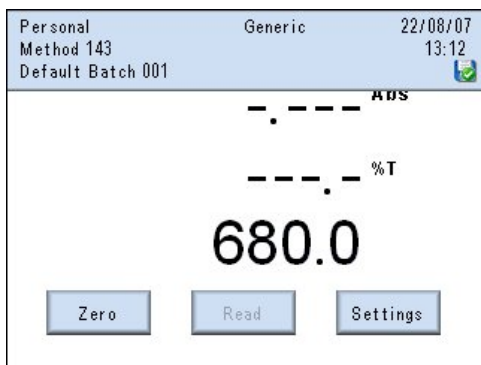
the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.



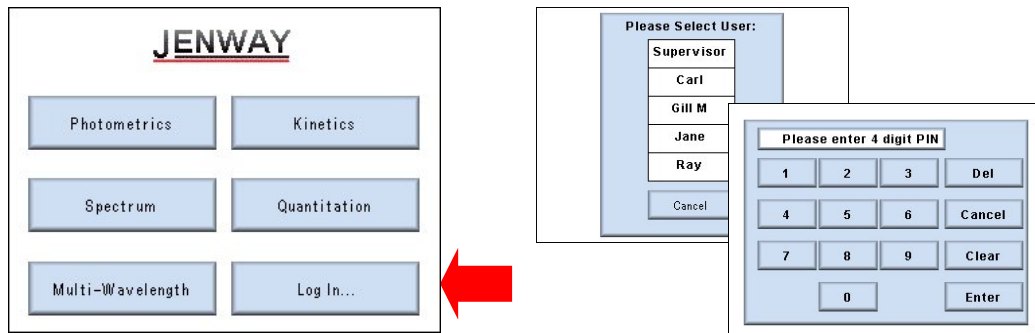
Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear giving this detail. Pressing the bar again will return it to its original position.

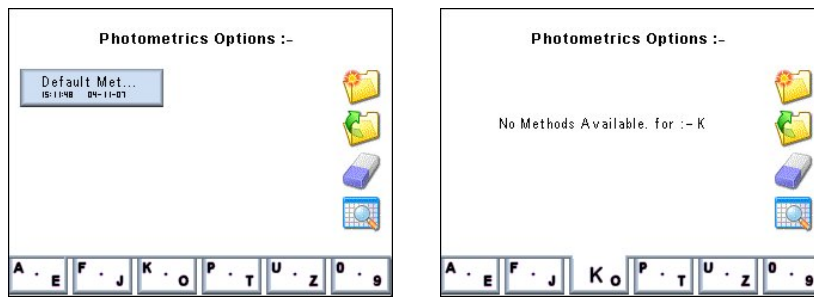


5.4 Logged In Measurement

PIN Codes – each user is allocated a 4 digit PIN code that is required when logging in. Select **Log In...** from the **Main Menu** and a list of users will be shown. Select the appropriate user name and a numeric keypad will be displayed. Enter your 4 digit PIN code and press the **Enter** key to confirm.



Once logged in method screen options will be displayed:



Methods are stored sequentially by measurement mode. Once the first page is full (8 methods for the selected mode) cursor arrows are displayed enabling the user to browse to subsequent or previous pages of 8 methods.

Alternatively, pressing one of the alphanumeric keys along the bottom of the screen will display all available methods with the initial character that is highlighted.

Note: Repeated pressing of a key sequentially highlights the characters between those displayed.



Create a New Method

For the following functions first touch a method or result to select it.



Open the Selected Method



Erase the Selected Method



Browse Results – linked to the selected method



Open specific results in the selected batch



Creating a New Method

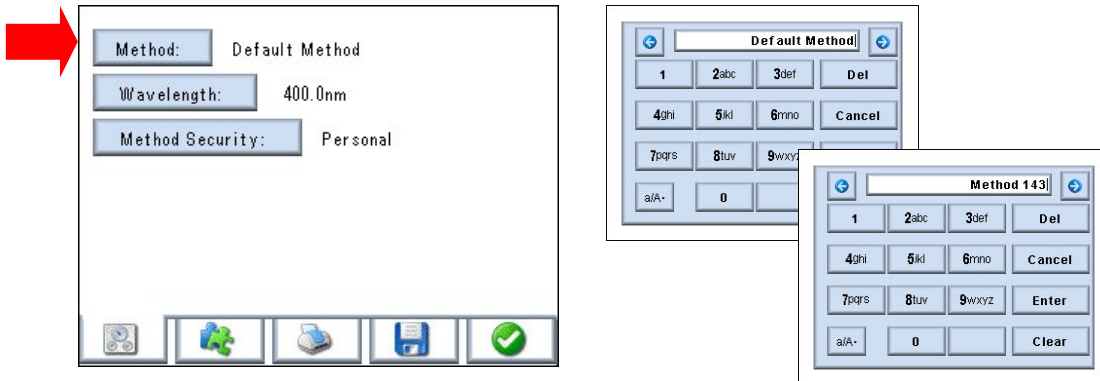
Settings

To enter the Method ID, appropriate wavelength for the sample(s) to be tested and the level of Method Security required for the method being created select the **New File** icon



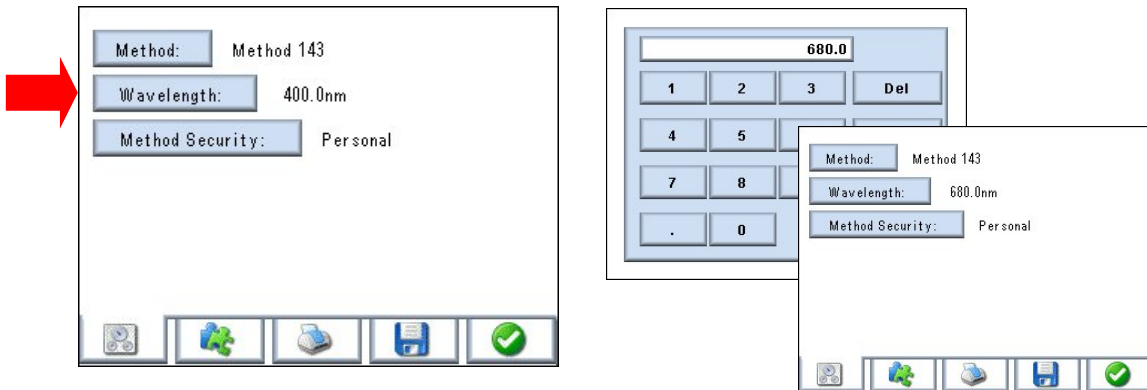
Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.



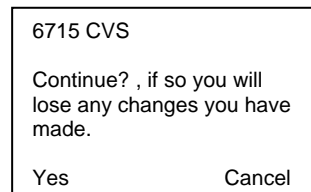
Setting Wavelength

Select the **Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out). Press the green tick to confirm. The display will momentarily flash the message 'Going to Wavelength' and the display will update to show the new wavelength.



Using the **Back** arrow to escape settings will display:

If **Yes** is selected all set information will be lost and the instrument will return to the main measurement screen. If **No** is selected the instrument returns the **Settings** screen as shown.





Setting Method Security

The 67 Series spectrophotometers can support up to 10 individual users plus one Supervisor who has full administrative rights.

Logged in users can create methods with three levels of security options:

Personal – these methods are only accessible by the originator.

Public – these methods are available for use and modification by any logged in user.

Read-Only – these methods can be accessed by all logged in users, but can only be modified by the originator.

The preferred level of protection can be achieved by selecting the **Method Security** key that toggles between **Personal**, **Public** and **Read-Only** options.

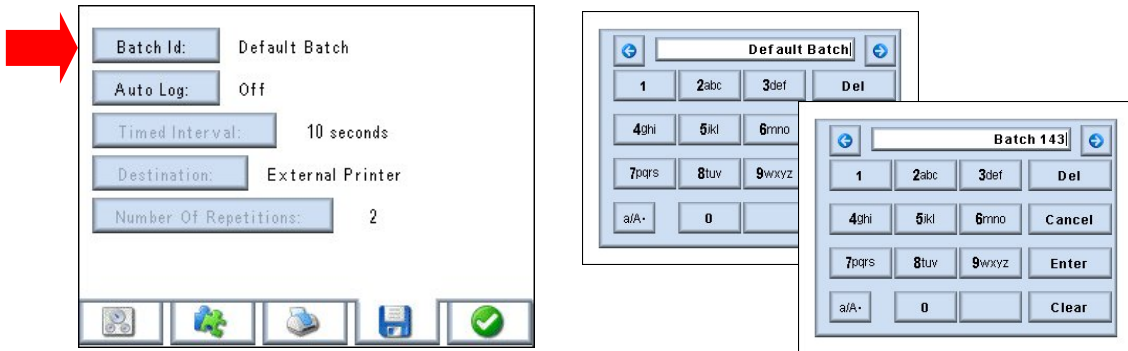


To accept the selected options press the **Enter** key to confirm. The instrument will show the main measurement screen with the updated information.



Setting Batch ID

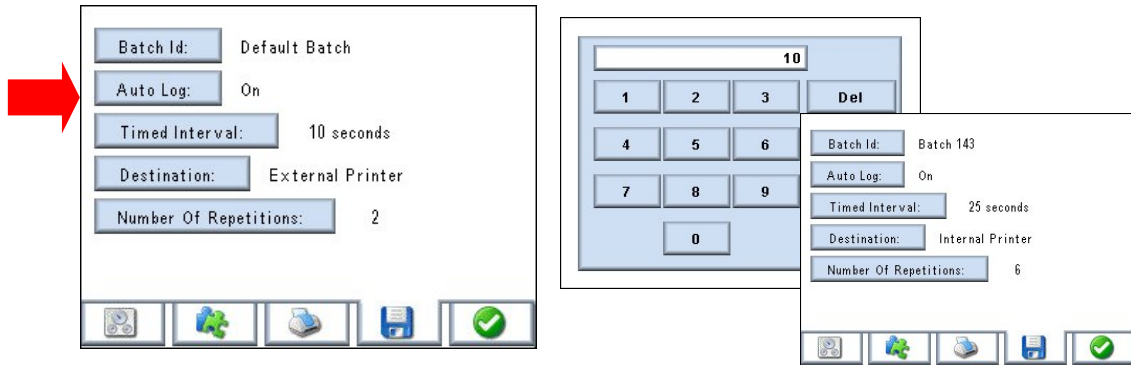
Select the **Batch ID** key and enter the Batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.





Auto Log Settings...

Selecting the **Auto Log Settings...** option opens a dedicated sub-menu. This option can be toggled between **On/Off**. Switching the Auto Log to **On** allows timed intervals to be set internal or external printer selection and the number of repetitions required.



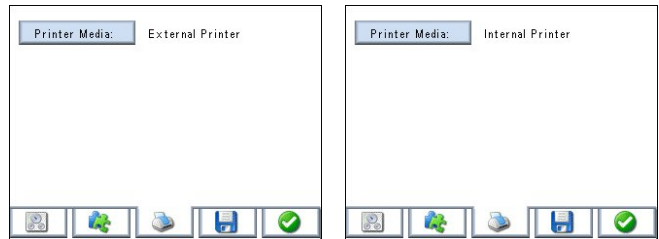
This option can be toggled between **On/Off**. When the **Auto Log** option is selected to **On** the user can set:

the timed interval between 10 and 9999 seconds using the numeric keypad;



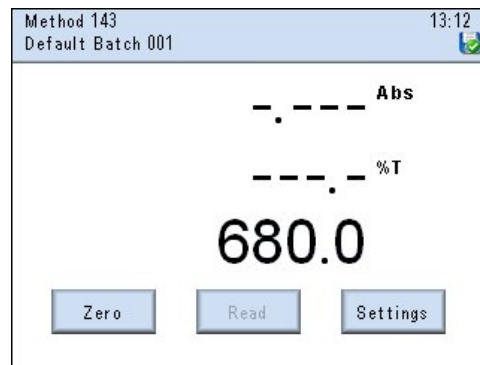
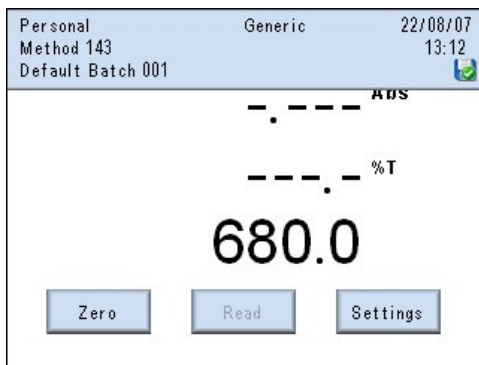
the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.



Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear giving this detail. Pressing the bar again will return it to its original position.



File & Data Management



Save



Tools



Print



Settings



Erase



Search
Results



Open
Results



Save

Saving Methods

Having entered all your required settings on the tabbed pages the method can be saved by simply pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Sharing Methods

Methods can be shared with other users by setting the security level at either **Read-Only** where other users can use but not modify the method or, **Public** where they can use and modify the method. Other users must then ensure that under **Method View Settings** (Settings/User Preferences/Method View Settings) they have enabled **Public** and/or **Read-Only** methods or turned **All Methods** on.

Recalling Methods

Following selection of the operating mode from the main menu the method browse screen is displayed. This will show all methods that the current user has access to, based on their selections in the **Method View Settings** (refer to Sharing Methods). If the first page is full, cursor arrows will be displayed to enable navigation to and from additional pages. Alternatively, selection may be made using the alphanumeric menu bar at the bottom of the screen.

Repeated pressing of each character set will display the full alphanumeric range and the screen will show all methods starting with the highlighted character.

Touch the required method when it is displayed on the screen to highlight it, touch the **Open File** icon to display the main measurement screen for that method.

Editing Methods

Use the Recalling Methods procedure to recall the required method. With the measurement screen displayed touch the **Settings** option. Adjust the settings as required and touch the **Enter** icon on completion. The modified method can then be saved by pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Note: If the Method name was not changed during editing it will be saved with the same name but with a new date and time to ensure traceability. If the old method is no longer required it should be deleted as detailed in Deleting Methods.

Deleting Methods

To delete methods highlight the required method in the Browse screen as described in Recalling Methods and then touch the **Erase** icon. A warning message will be displayed to ensure this action is required. On confirmation the selected file will be deleted.

If the current user does not have the required privileges to delete the selected message then an information message will be displayed advising that the method cannot be deleted.

Privileges required for deleting designated methods:

Public Methods – only the Supervisor can delete these.

Read-Only Methods – only the Supervisor and Originator can delete these.

Personal Methods – Only the Originator can delete these methods. (The Supervisor can delete these by re-setting the Originator's PIN code and then logging in as the Originator).

Saving Results

After completion of a measurement the result can be saved by simply pressing the **Save** key on the display surround. The result is saved under the method that created it, with the entered Batch ID and an incremental number along with the time and date of the measurement. Results can also be saved as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Printing Results

After completion of a measurement the result can be printed, by simply pressing the **Print** key on the display surround. The result will be printed to either the internal or external printer, as selected by the user in the **Printer Settings** option.

The first result of any new batch is preceded by a print header, which gives details of the method settings and Batch ID. Results can also be printed as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Recalling Results

Stored results are always directly linked to the method that created them. To access results first recall the method as described in Recalling Methods (page xx). With the method highlighted touch the **Search Results** icon. This will open a screen detailing all results available to the current user. Touch the required result or batch (depending on the mode) and then the **Open Specific Result** icon. This will display the results on the screen. The **Tools** option can then be used to work on these results (depending on mode). It is also possible to print the result by simply pressing the **Print** key on the display surround. Options to print to the Internal or External printer or to the Data Card will be displayed. Printing to the Data Card will save an EPS (Encapsulated Postscript) file to the Data Card. This is in printer ready format and can be viewed and printed in a number of software packages, including Adobe PhotoShop[®], Corel Draw[®], Ghostscript[®] and many other file management systems.

Sharing Results

Results attached to **Personal Methods** cannot be accessed by any other user.

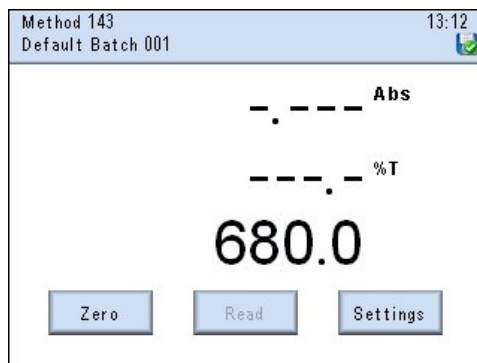
Results attached to **Read-Only** and **Public Methods** can be accessed by all users, based on their current **Method View Settings**.

Deleting Results

Results can only be deleted by the Originator or the Supervisor through **Administrative Functions**. Recall the required result without opening it. Highlight the result (or batch of results) and then press the **Erase** icon. A warning message will be displayed to ensure this action was intended. On confirmation the results will be permanently deleted.

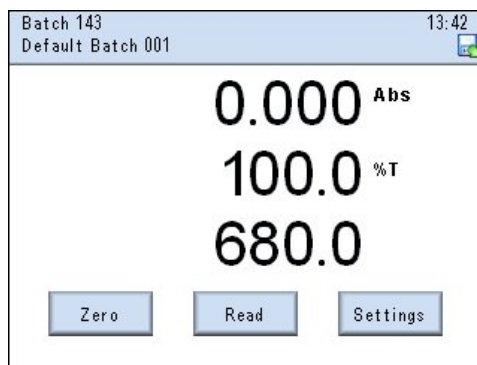
5.5 Performing Measurements – all users

Once the required settings have been confirmed the main **Photometrics** measurement screen will be shown. This screen shows the absorbance value, followed by the Transmittance value and then the selected wavelength. At the top of the screen Method ID and Batch no., time or date is displayed.



Zeroing the Instrument

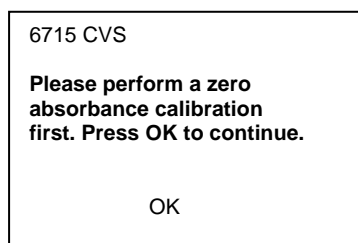
Insert a cuvette containing a blank solution into the sample holder and close the sample chamber lid. (Test tubes or other sample containers may be used depending on the sample holder accessory fitted). Press the **Zero** key. The messages '**Calibrating Dark Level... and Calibrating Light Level...**' are displayed momentarily. Once the measurement is completed the screen will update to show:



Note: In general the blank solution should contain everything that is in the sample except the colour-producing component. For specific information reference should be made to the procedure or application being followed. For enhanced reproducibility matched cuvettes should be used.

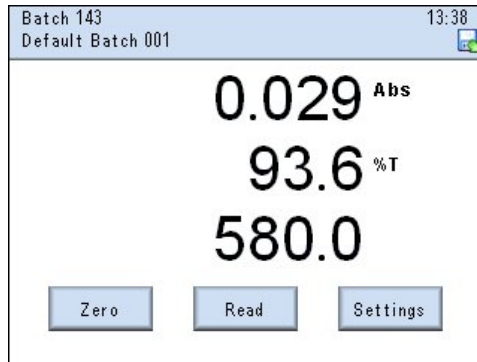
Attempting to initiate a **Read** before zeroing the instrument displays the message:

Pressing **OK** returns the instrument to the measurement screen.



Measuring the Sample

Remove the cuvette containing the blank solution and insert the first sample into the sample holder and close the sample chamber lid. Press the **Read** key. The screen will momentarily display '**Taking reading. Please wait...**' Once the measurement is completed the screen will update to show the measured value.



Additional individual samples can be measured by inserting them in the single sample holder and pressing **Read**. Alternatively, multiple samples can be measured with the optional 8-cell changer or sequentially with the sipper pump accessory.

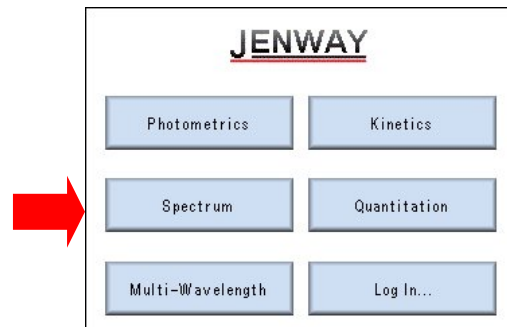
Section 6

Spectrum Mode

6.1 Principles of Measurement

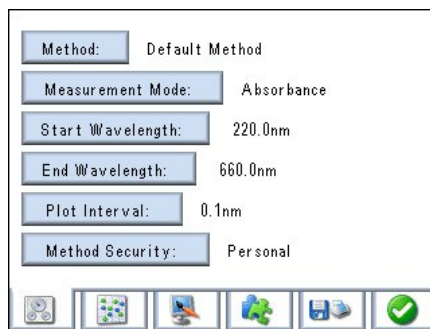
By examining the absorbance or transmittance of the sample over a wavelength range we can partially characterise the sample. Readings of the sample over a range of wavelengths are made and a graph is plotted of the absorbance or transmittance at each wavelength. As well as observing good practice (see Good Practice Guidelines) it must be ensured that the sample is stable for the period of the scan (maximum 70 seconds).

Select the **Spectrum** Mode from the **Main Menu** options.



The method screen options will only be displayed if the user logs in. If the user is not logged in the instrument will automatically display the main instrument screen, with settings at their last used levels.

6.2 Mode Menus and Icons



Mode settings – method name, measurement mode, wavelength range, plot interval, method security (if logged in)



Analysis Points – up to 30 wavelengths at which absorbance will be reported



Measurement display – auto scaling, axis setting, colour selection



Accessory options – varies with type of accessory module fitted



Allows selection of internal or external printer, graph details, batch ID and enables or disables the Auto Save feature

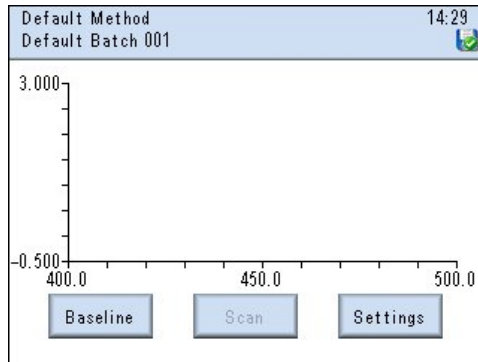


Press to accept settings entered

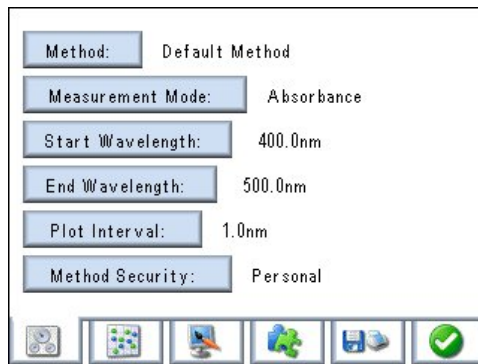
6.3 Free Operation

Settings

If the user is not logged in then the main measurement screen will automatically be displayed when the **Spectrum** mode is selected from the **Main Menu**:



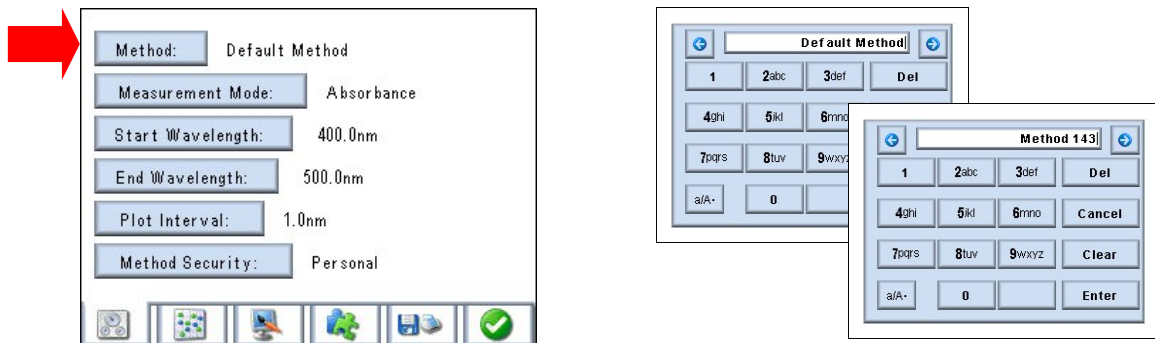
To enter the required parameters for the sample(s) under test, select the **Settings** key and the instrument will display the following screen:



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.

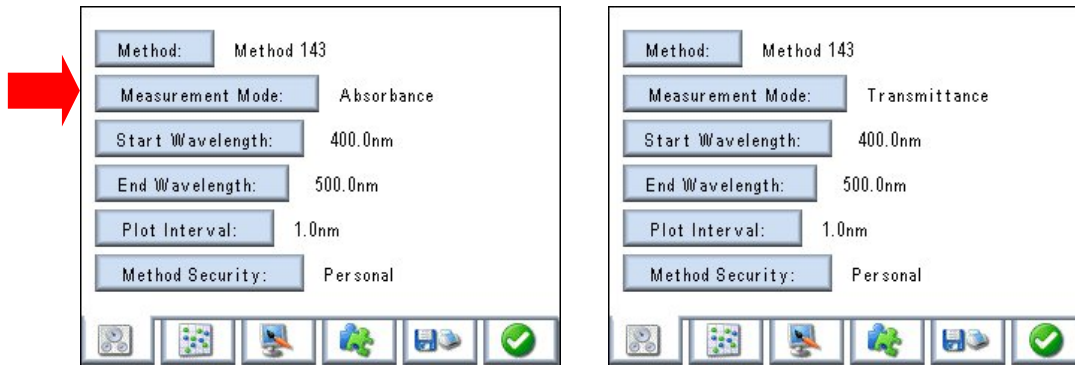
Note: The new Method ID can only be used to identify the method on a printout to the internal or external printer module. The generic user has no additional facility to store or recall results or methods.





Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.



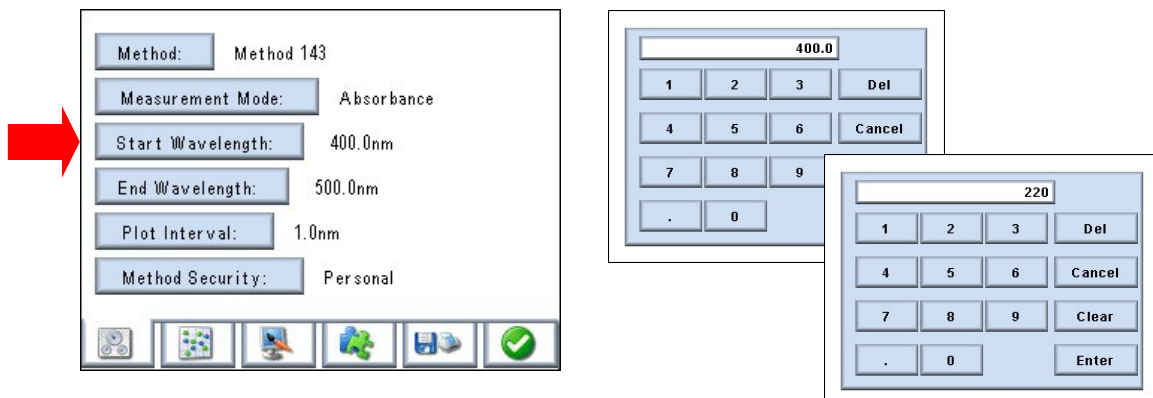
Setting Wavelengths

It should be noted that if the start or end wavelength is adjusted so that they are closer than twice the plot interval then the previously set wavelength will be automatically reset to give a minimum of two measurement points.



Setting Start Wavelength

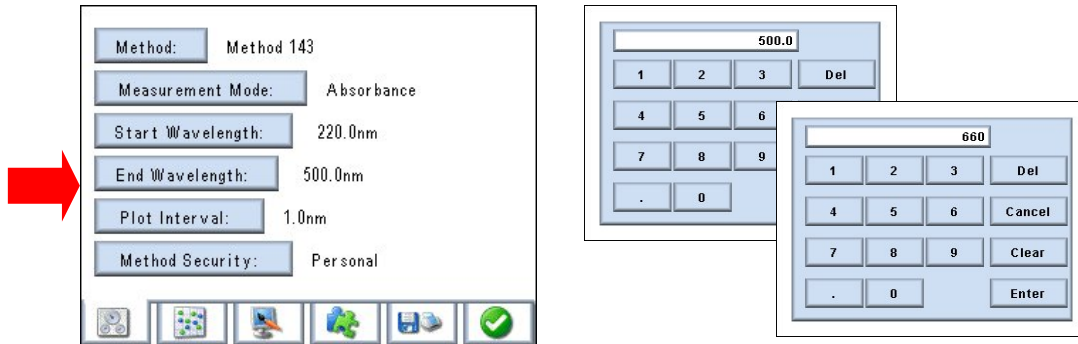
Select the **Start Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out). Press the **Enter** key to confirm. The display will show the entered wavelength.





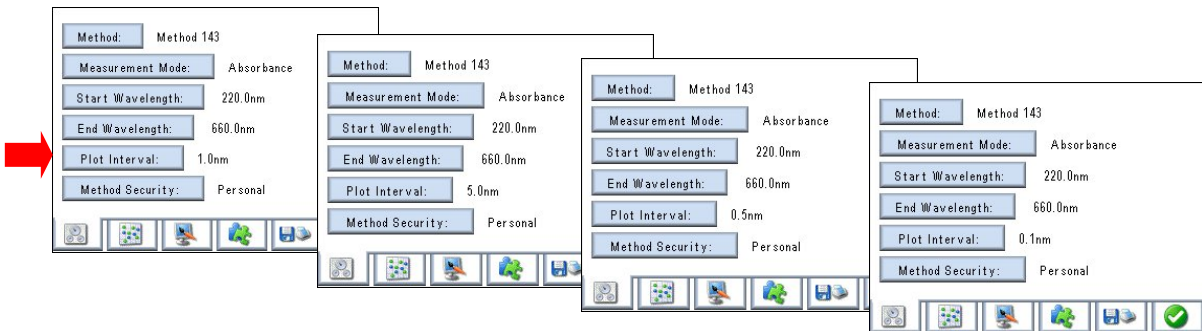
Setting End Wavelength

Select the **End Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out). Press the **Enter** key to confirm. The display will show the entered wavelength.



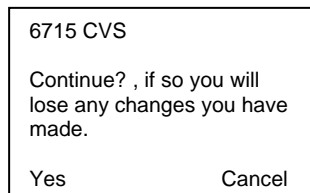
Selecting Plot Interval

Selecting the **Plot Interval** key allows the user to toggle between 1.0nm, 5.0nm, 0.1nm and 0.5nm.



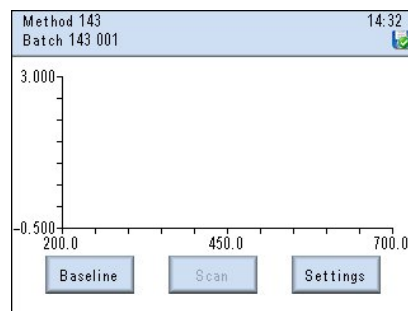
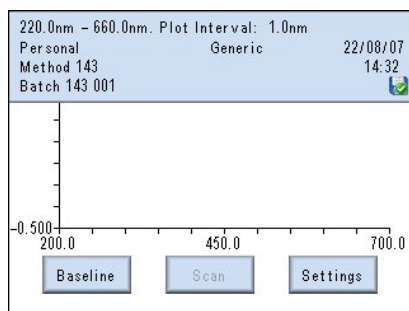
Using the **Back** arrow to escape settings will display:

If **Yes** is selected all set information will be lost and the instrument will return to the main measurement screen. If **No** is selected the instrument returns the **Settings** screen as shown.



To accept the entered information at any time press the **Enter** key to confirm. The instrument will show the main measurement screen with the updated information.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.





Setting Method Security

This option is only available to logged in users.

Setting Additional Set-up Parameters using the Toolbar Icons

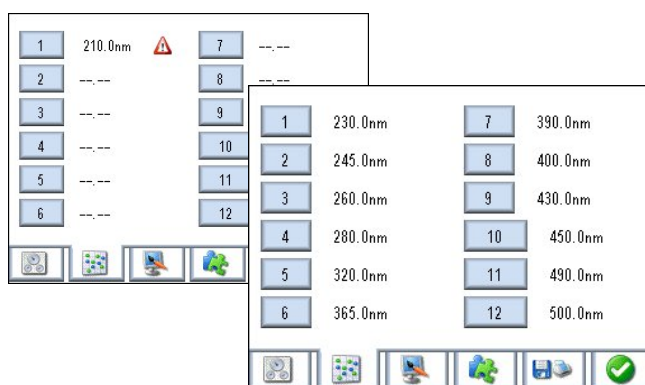
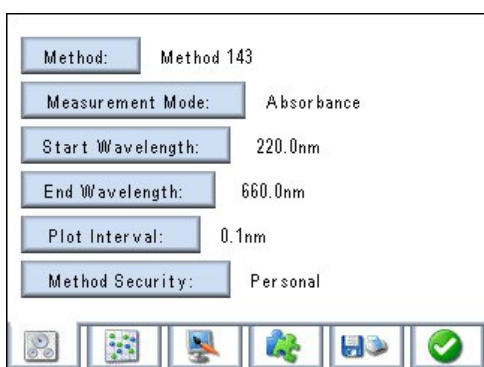
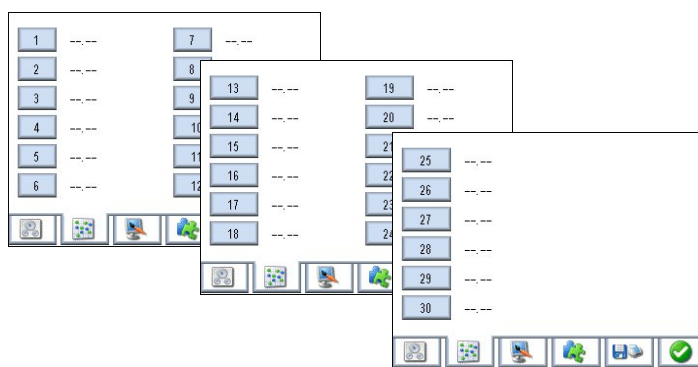
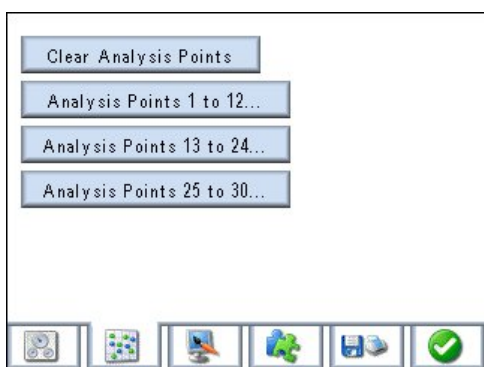


Setting Analysis Points

Up to 30 analysis points can be set by selecting the **Analysis Points** keys and entering the required wavelength value via the numeric keypad.

It should be noted that a warning message will be displayed if the analysis point(s) set are outside the spectrum scan range and a warning symbol will be shown next to the entered value.

The **Clear Analysis Points** option will clear all previously set analysis points.



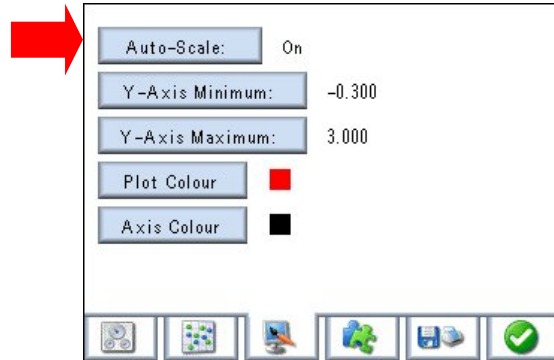
If an attempt is made to set an analysis point outside the start and end wavelength values the error message '**Wavelength for analysis out of spectrum scan range**' will be displayed momentarily and a triangular symbol will be shown to the side of the incorrect value. This value can be deleted or edited by selecting the analysis point (in this example 1) and entering a new value within the specified limits.

The analysis points will appear on tags at the relevant point on the spectrum display. They will also be printed with any printout to the internal or external printer if the **Print Data Points** option has been selected.

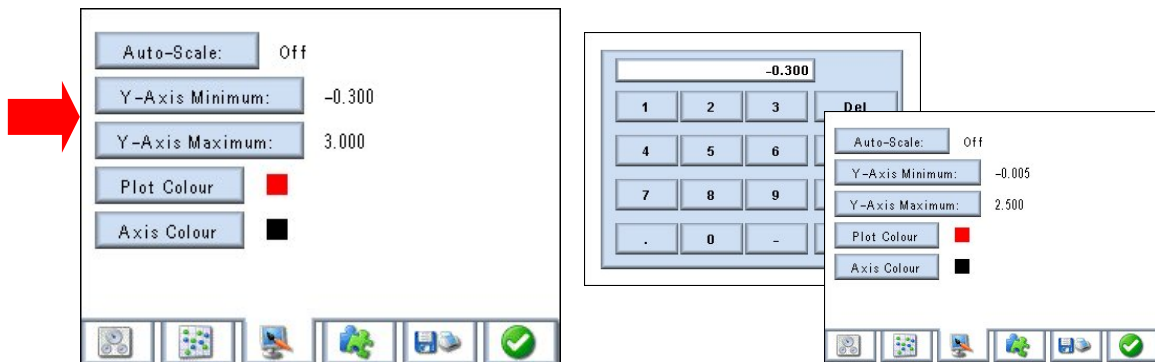


Setting Auto-Scale

The **Auto-Scale** key toggles between **On** and **Off**. With the **Auto-Scale** function **On** the instrument will automatically set the Y-axis maxima to a level that will fit the largest peak and lowest valley in the display area. This is the best option to choose if the user is uncertain of the limits of the scan. When set to **On** the manual settings for Y-axis maximum and minimum are non-functional. These settings can be changed with **Post Scan** analysis tools to enable alternative views and printouts after the scan has been completed.

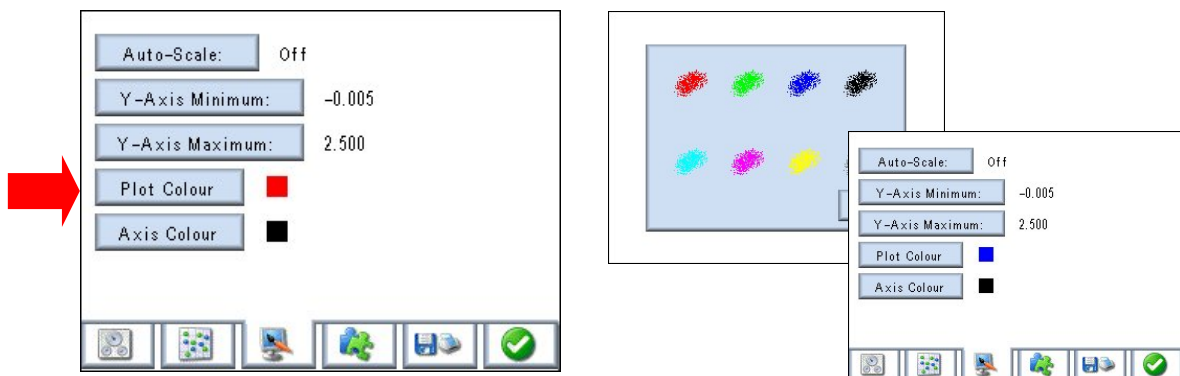


With the **Auto-Scale** function set to **Off** the **Y-Axis Minimum** enables the lowest displayed level for the Y-axis to be manually set. Press the **Y-Axis Minimum** key and a numeric keypad will be displayed for entry of this value. This value can be between -0.300 and 2.999 . The **Y-Axis Maximum** enables the highest displayed level for the Y-axis to be manually set. Press the **Y-Axis Maximum** key and a numeric keypad will be displayed for entry of this value. This value can be between 3.000 and -0.299 .



Selecting Plot Colour

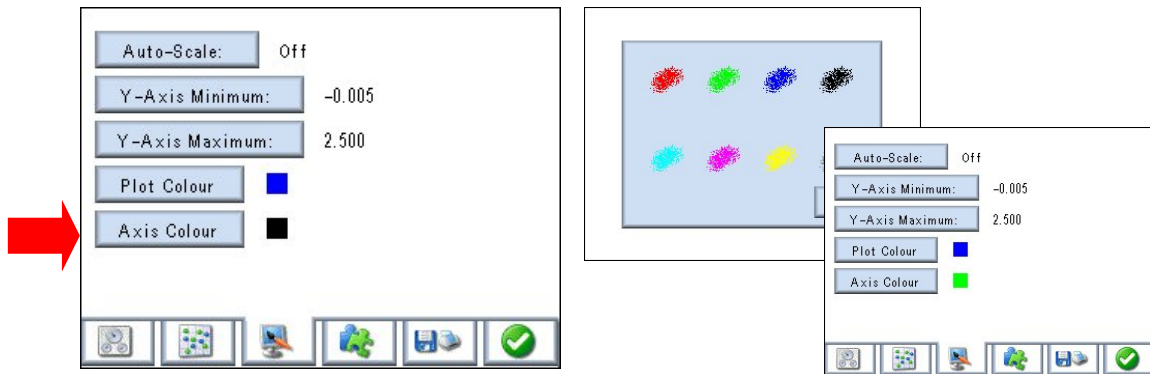
Pressing the **Plot Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred plot colour. Once selected, the instrument will update to show the selected colour.





Selecting Axis Colour

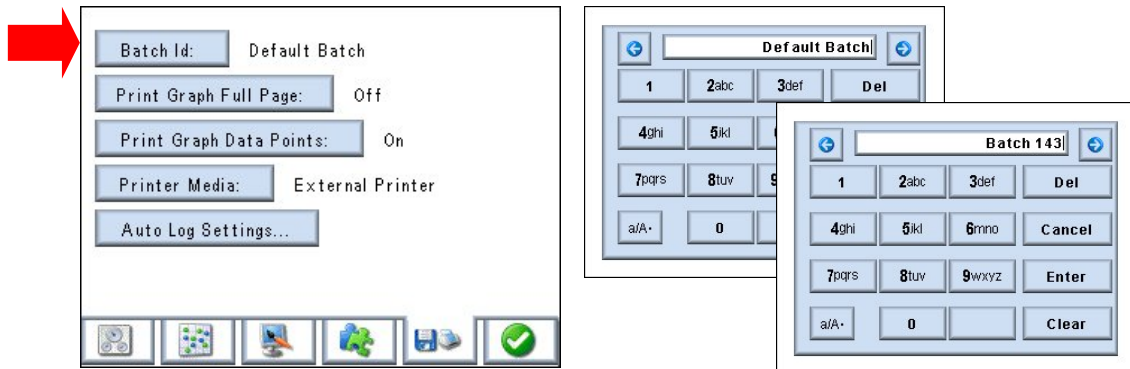
Pressing the **Axis Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.



Setting Batch ID



Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.



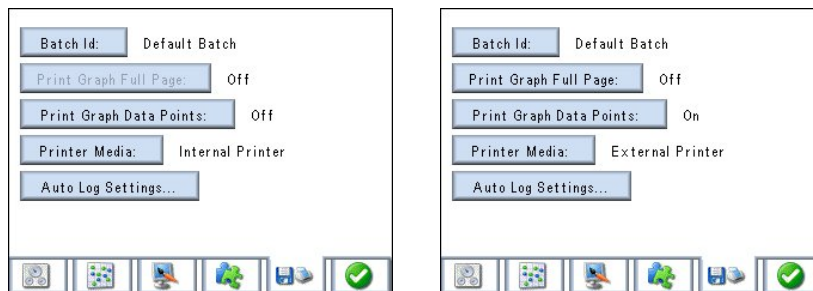
Setting Graph Data Points

The option to print graphs on a full page is only available if the **External** printer is selected. If available and set to **On** the scan will be printed on one page (typically A4 landscape format) with the data on following pages.

If available and set to **Off** the scan will be printed with the data below it (typically top half A4 portrait).

The **Print Graph Data Points** key toggles between **On** and **Off**.

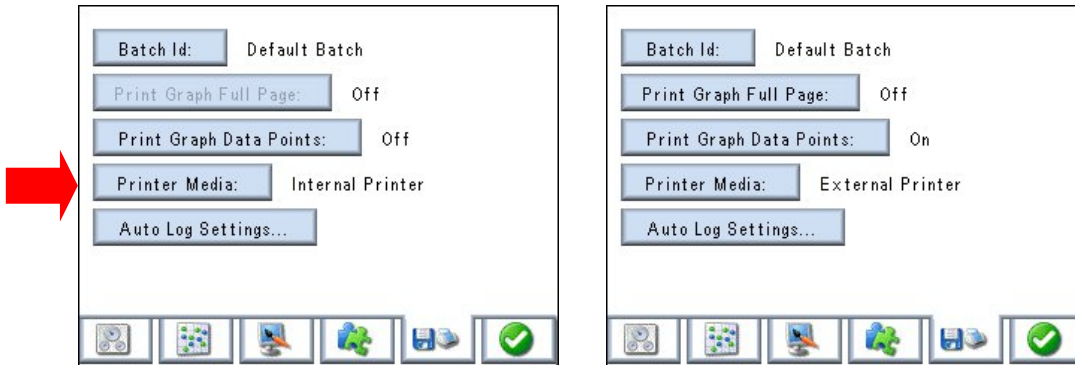
With this key set to **On** all the data points that make up the graph will be printed in a table following the scan. For a long scan at 0.1nm resolution this can result in many pages of data. It is recommended that careful consideration should be given to this and that this feature should be set to the **Off** position in this instance.





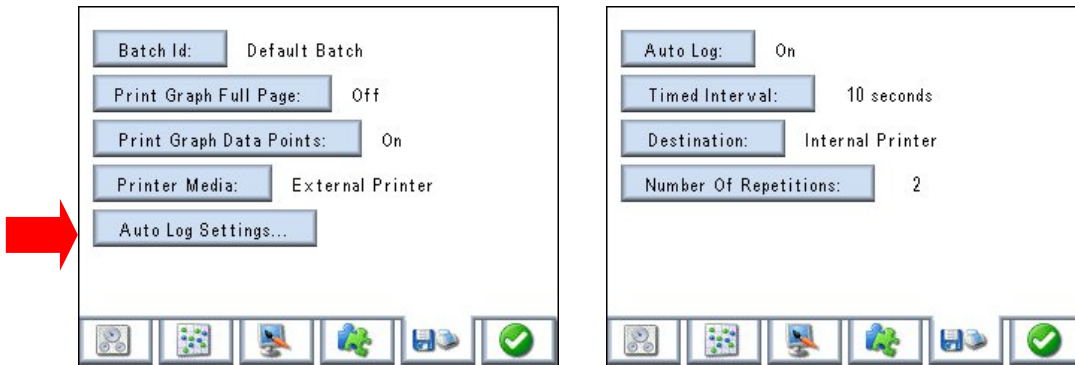
Selecting Printer Media

The **Printer Media** options toggle between Internal and External Printers.



Auto Log Settings...

Selecting **Auto Log Settings...** opens a dedicated sub-menu. This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:



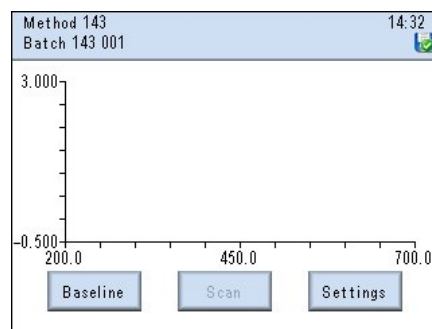
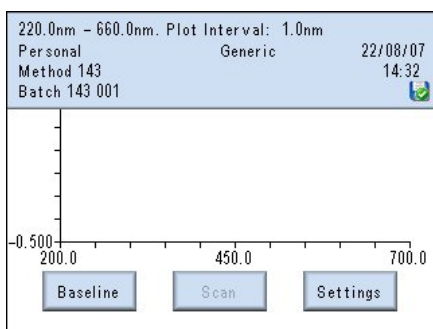
the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.

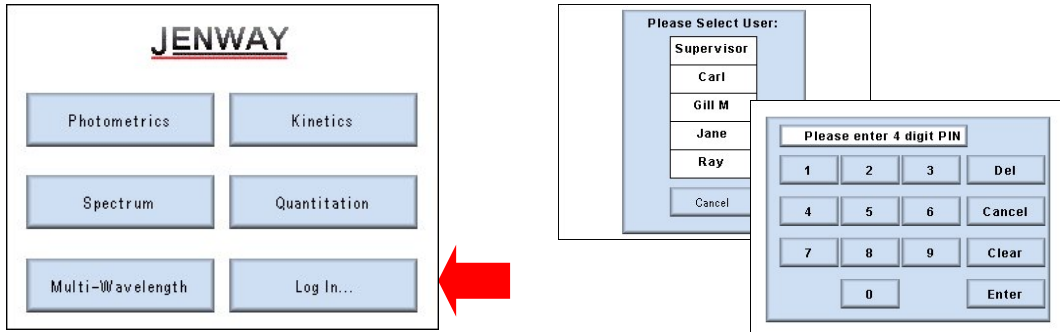


6.4 Logged In Measurement

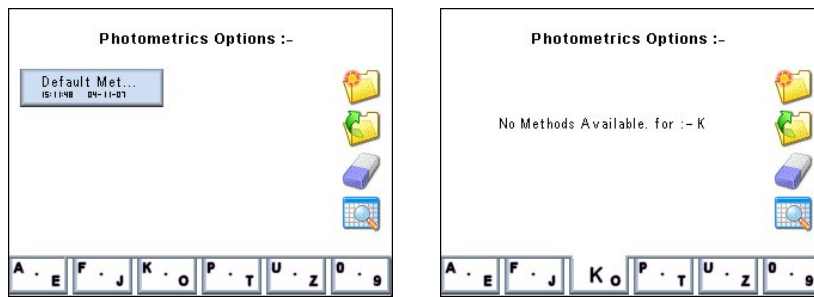
PIN Codes – each user is allocated a 4 digit PIN code that is required when logging in.

Select Log *In...* from the **Main Menu** and a list of users will be shown. Select the appropriate user name and a numeric keypad will be displayed.

Enter your 4 digit PIN code and press the **Enter** key to confirm.



Once signed in method screen options will be displayed:



Methods are stored sequentially by measurement mode. Once the first page is full (8 methods for the selected mode) cursor arrows are displayed enabling the user to browse to subsequent or previous pages of 8 methods.

Alternatively, pressing one of the alphanumeric keys along the bottom of the screen will display all available methods with the initial character that is highlighted.

Note: Repeated pressing of a key sequentially highlights the characters between those displayed.



Create a New Method

For the following functions first touch a method or result to select it.



Open the Selected Method



Erase the Selected Method



Browse Results – linked to the selected method



Open specific results in the selected batch



Creating a New Method

To enter the Method ID, appropriate measurement parameters and the level of Method Security required for the method being created select the **New File** icon.

Method:	Default Method
Measurement Mode:	Absorbance
Start Wavelength:	400.0nm
End Wavelength:	500.0nm
Plot Interval:	1.0nm
Method Security:	Personal



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.

Method: Default Method

Measurement Mode: Absorbance

Start Wavelength: 400.0nm

End Wavelength: 500.0nm

Plot Interval: 1.0nm

Method Security: Personal

Method 143



Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.

Method: Method 143

Measurement Mode: Absorbance

Start Wavelength: 400.0nm

End Wavelength: 500.0nm

Plot Interval: 1.0nm

Method Security: Personal

Method: Method 143

Measurement Mode: Transmittance

Start Wavelength: 400.0nm

End Wavelength: 500.0nm

Plot Interval: 1.0nm

Method Security: Personal

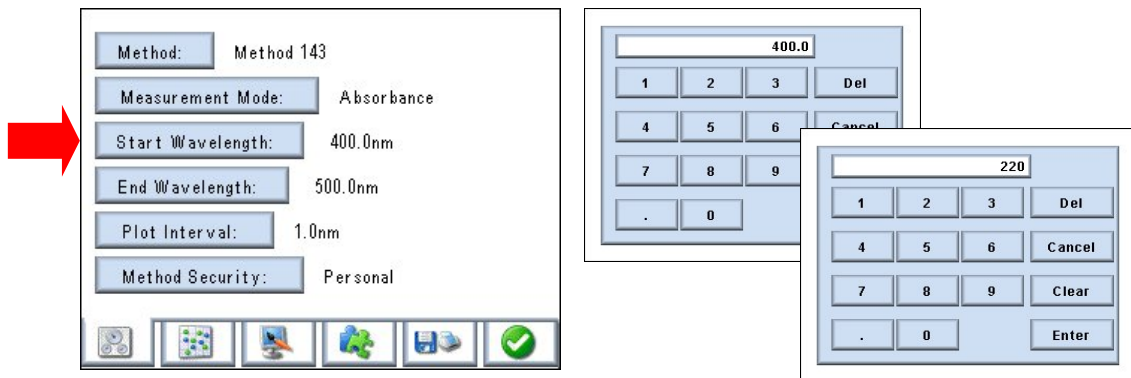
Setting Wavelengths

It should be noted that if the start or end wavelength is adjusted so that they are closer than twice the plot interval then the previously set wavelength will be automatically reset to give a minimum of two measurement points.



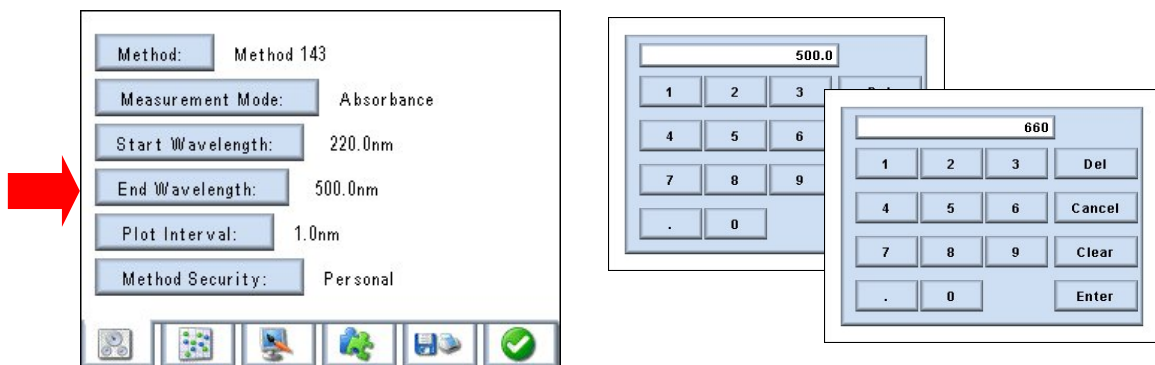
Setting Start Wavelength

Select the **Start Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out). Press the **Enter** key to confirm. The display will show the entered wavelength.



Setting End Wavelength

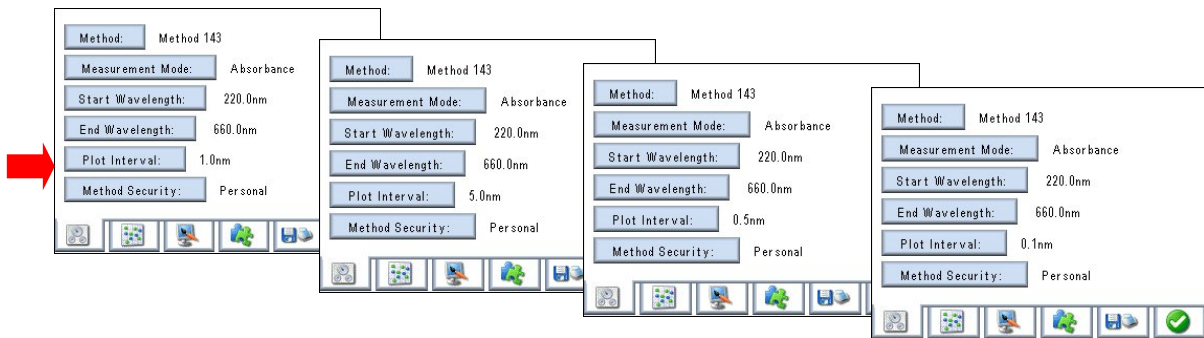
Select the **End Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out). Press the **Enter** key to confirm. The display will show the entered wavelength.





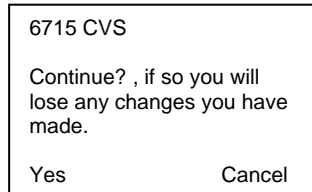
Selecting Plot Interval

Selecting the **Plot Interval** key allows the user to toggle between 1.0nm, 5.0nm, 0.1nm and 0.5nm.



Using the **Back** arrow to escape settings will display:

If **Yes** is selected all set information will be lost and the instrument will return to the main measurement screen. If **No** is selected the instrument returns to the **Settings** screen as shown.



Setting Method Security

The 67 Series spectrophotometers can support up to 10 individual users plus one Supervisor who has full administrative rights.

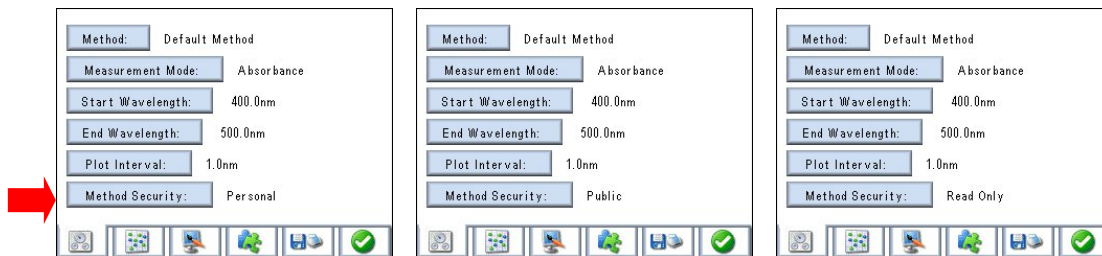
Logged in users can create methods with three levels of security options:

Personal – these methods are only accessible by the originator.

Public – these methods are available for use and modification by any logged in user.

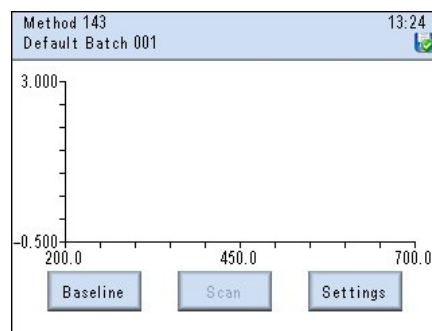
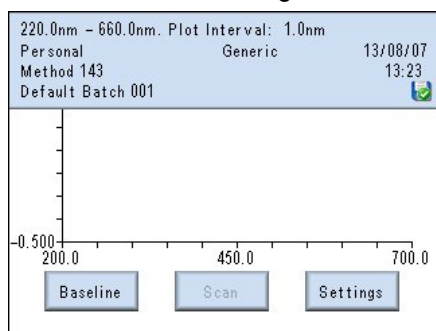
Read-Only – these methods can be accessed by all logged in users, but can only be modified by the originator.

The preferred level of protection can be achieved by selecting the **Method Security** key that toggles between **Personal**, **Public** and **Read-Only** options.



To accept the selected options press the **Enter** key to confirm. The instrument will show the main measurement screen with the updated information.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.



Setting Additional Set-up Parameters using the Toolbar Icons



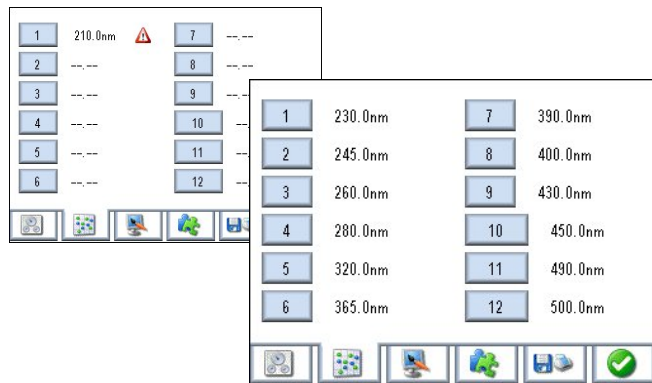
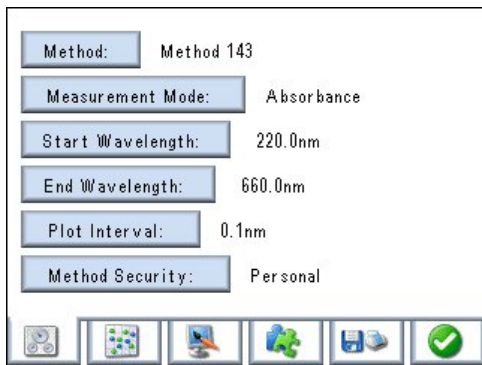
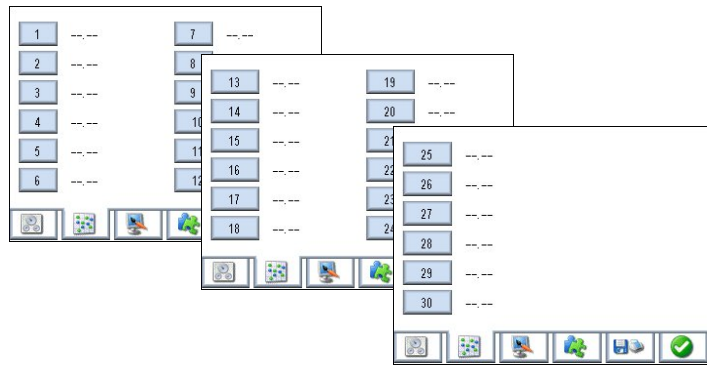
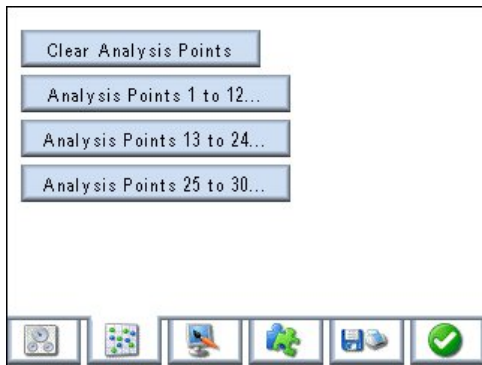
Setting Analysis Points

Up to 30 analysis points can be set by selecting the **Analysis Points** keys and entering the required wavelength value via the numeric keypad.

The **Clear Analysis Points** option will clear all previously set analysis points.

If an attempt is made to set an analysis point outside the start and end wavelength values the error message **'Wavelength for analysis out of spectrum scan range'** will be displayed momentarily and a triangular symbol will be shown to the side of the incorrect value. This value can be deleted or edited by selecting the analysis point (in this example 1) and entering a new value within the specified limits.

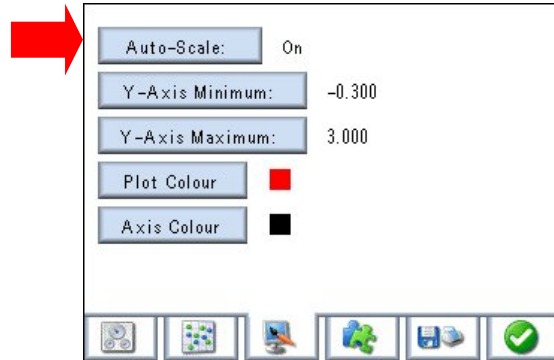
The analysis points will appear on tags at the relevant point on the spectrum display. They will also be printed with any printout to the internal or external printer if the **Print Data Points** option has been selected.



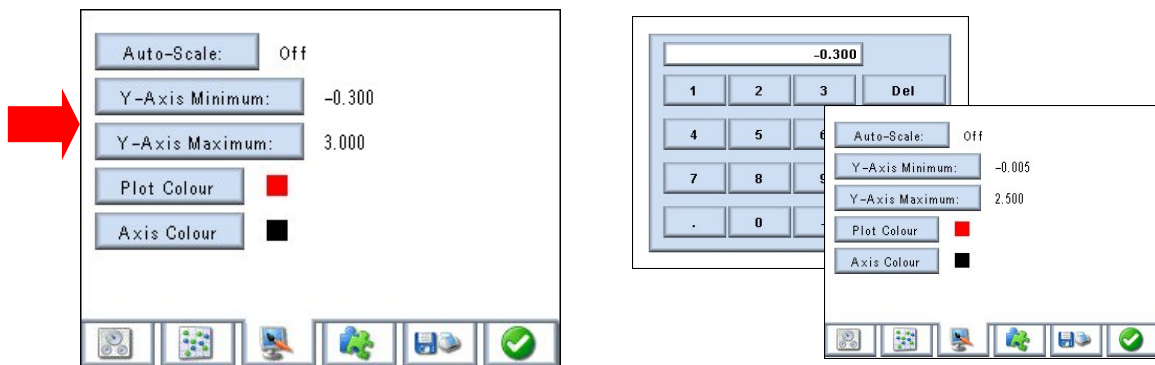


Setting Auto-Scale

The **Auto-Scale** key toggles between **On** and **Off**. With the **Auto-Scale** function **On** the instrument will automatically set the Y-axis maxima to a level that will fit the largest peak and lowest valley in the display area. This is the best option to choose if the user is uncertain of the limits of the scan. When set to **On** the manual settings for Y-axis maximum and minimum are non-functional. These settings can be changed with **Post Scan** analysis tools to enable alternative views and printouts after the scan has been completed.

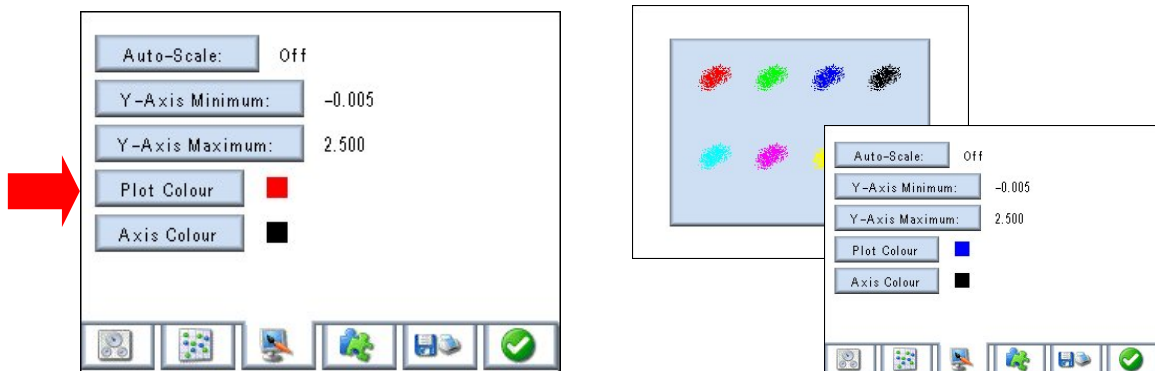


With the **Auto-Scale** function set to **Off** the **Y-Axis Minimum** enables the lowest displayed level for the Y-axis to be manually set. Press the **Y-Axis Minimum** key and a numeric keypad will be displayed for entry of this value. This value can be set between -0.300 and 2.999 . The **Y-Axis Maximum** enables the highest displayed level for the Y-axis to be manually set. Press the **Y-Axis Maximum** key and a numeric keypad will be displayed for entry of this value. This value can be set between 3.000 and -0.299 .



Selecting Plot Colour

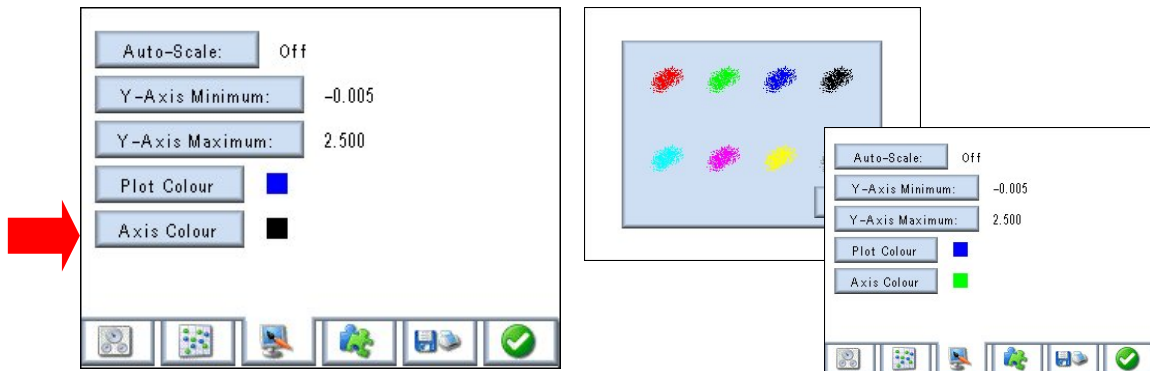
Pressing the **Plot Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred plot colour. Once selected, the instrument will update to show the selected colour.





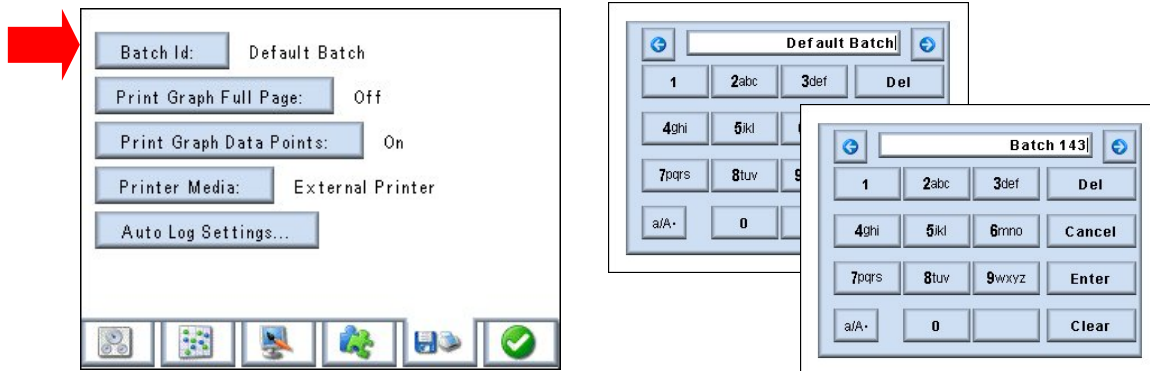
Selecting Axis Colour

Pressing the **Axis Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.



Setting Batch ID

Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.



Setting Graph Data Points

The option to print graphs on a full page is only available if the **External** printer is selected. If available and set to **On** the scan will be printed on one page (typically A4 landscape format) with the data on following pages.

If available and set to **Off** the scan will be printed with the data below it (typically top half A4 portrait).

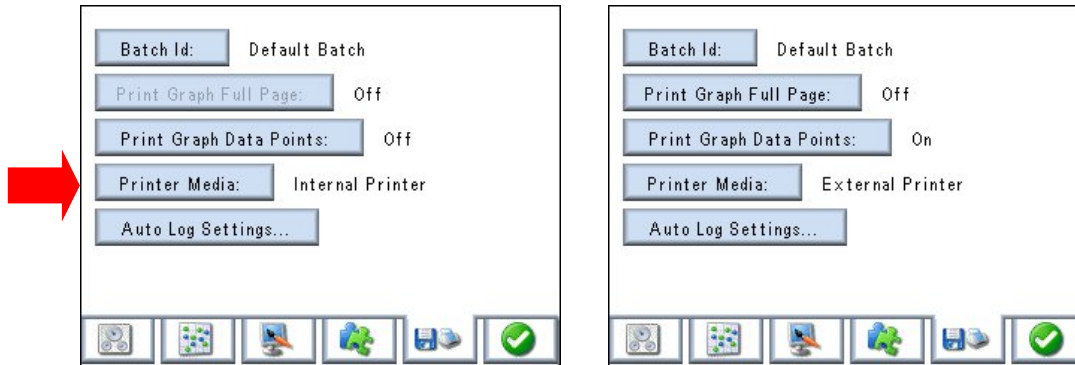
The **Print Graph Data Points** key toggles between **On** and **Off**.

With this key set to **On** all the data points that make up the graph will be printed in a table following the scan. For a long scan at 0.1nm resolution this can result in many pages of data. It is recommended that careful consideration should be given to this and that this feature should be set to the **Off** position in this instance.



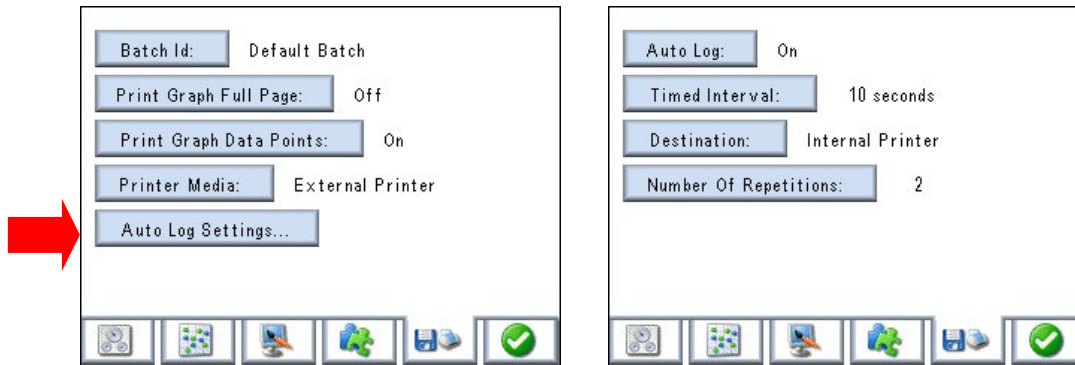
Selecting Printer Media

The **Printer Media** options toggle between Internal and External Printers.



Auto Log Settings...

Selecting **Auto Log Settings...** opens a dedicated sub-menu. This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:



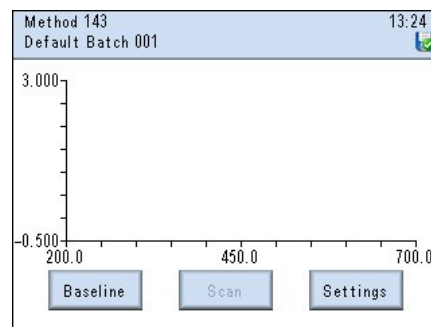
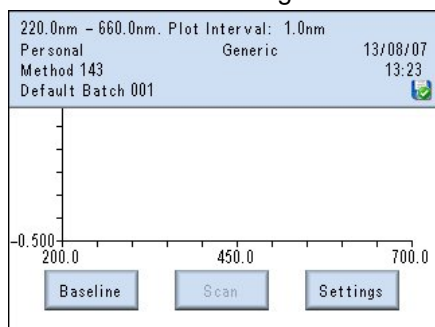
the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.



File & Data Management



Save



Tools



Print



Settings



Erase



Search
Results



Open
Results



Save

Saving Methods

Having entered all your required settings on the tabbed pages the method can be saved by simply pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Sharing Methods

Methods can be shared with other users by setting the security level at either **Read-Only** where other users can use but not modify the method or, **Public** where they can use and modify the method. Other users must then ensure that under **Method View Settings** (Settings/User Preferences/Method View Settings) they have enabled **Public** and/or **Read-Only** methods or turned **All Methods** on.

Recalling Methods

Following selection of the operating mode from the main menu the method browse screen is displayed. This will show all methods that the current user has access to, based on their selections in the **Method View Settings** (refer to Sharing Methods). If the first page is full, cursor arrows will be displayed to enable navigation to and from additional pages.

Alternatively, selection may be made using the alphanumeric menu bar at the bottom of the screen. Repeated pressing of each character set will display the full alphanumeric range and the screen will show all methods starting with the highlighted character.

Touch the required method when it is displayed on the screen to highlight it, touch the **Open File** icon to display the main measurement screen for that method.

Editing Methods

Use the Recalling Methods procedure to recall the required method. With the measurement screen displayed touch the **Settings** option. Adjust the settings as required and touch the **Enter** icon on completion. The modified method can then be saved by pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Note: If the Method name was not changed during editing it will be saved with the same name but with a new date and time to ensure traceability. If the old method is no longer required it should be deleted as detailed in Deleting Methods.

Deleting Methods

To delete methods highlight the required method in the Browse screen as described in Recalling Methods and then touch the **Erase** icon.

A warning message will be displayed to ensure this action is required. On confirmation the selected file will be deleted.

If the current user does not have the required privileges to delete the selected message then an information message will be displayed advising that the method cannot be deleted.

Privileges required for deleting designated methods:

Public Methods – only the Supervisor can delete these.

Read-Only Methods – only the Supervisor and Originator can delete these.

Personal Methods – Only the Originator can delete these methods. (The Supervisor can delete these by re-setting the Originator's PIN code and then logging in as the Originator).

Saving Results

After completion of a measurement the result can be saved by simply pressing the **Save** key on the display surround. The result is saved under the method that created it, with the entered Batch ID and an incremental number along with the time and date of the measurement. Results can also be saved as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Printing Results

After completion of a measurement the result can be printed, by simply pressing the **Print** key on the display surround. The result will be printed to either the internal or external printer, as selected by the user in the **Printer Settings** option.

The first result of any new batch is preceded by a print header, which gives details of the method settings and Batch ID. Results can also be printed as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Recalling Results

Stored results are always directly linked to the method that created them. To access results first recall the method as described in Recalling Methods (page xx). With the method highlighted touch the **Search Results** icon. This will open a screen detailing all results available to the current user. Touch the required result or batch (depending on the mode) and then the **Open Specific Result** icon. This will display the results on the screen. The **Tools** option can then be used to work on these results (depending on mode). It is also possible to print the result by simply pressing the **Print** key on the display surround. Options to print to the Internal or External printer or to the Data Card will be displayed. Printing to the Data Card will save an EPS (Encapsulated Postscript) file to the Data Card. This is in printer ready format and can be viewed and printed in a number of software packages, including Adobe PhotoShop[®], Corel Draw[®], Ghostscript[®] and many other file management systems.

Sharing Results

Results attached to Personal Methods cannot be accessed by any other user.

Results attached to **Read-Only** and **Public Methods** can be accessed by all users, based on their current **Method View Settings**.

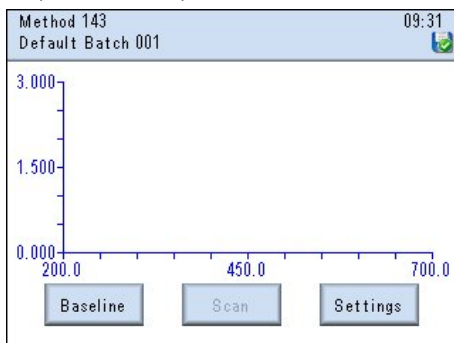
Deleting Results

Results can only be deleted by the Originator or the Supervisor through **Administrative Functions**. Recall the required result without opening it. Highlight the result (or batch of results) and then press the **Erase** icon. A warning message will be displayed to ensure this action was intended. On confirmation the results will be permanently deleted.

6.5 Performing Measurements – all users

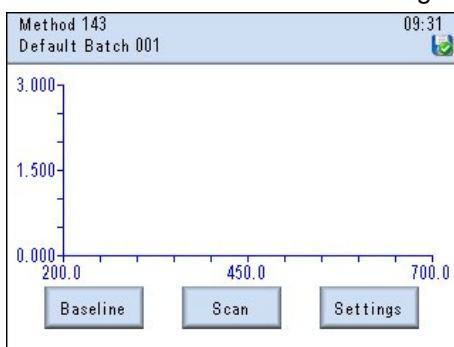
Performing a Scan

Once the required settings have been confirmed the main **Spectrum** measurement screen will be shown with the **Scan** key inactive (blacked out):



Performing a Baseline

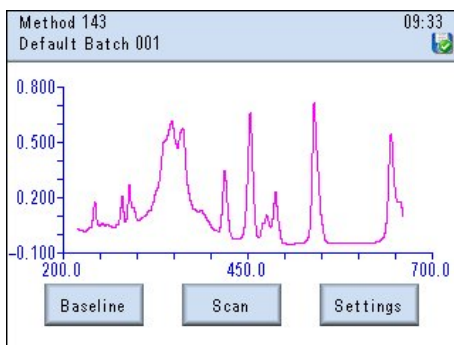
Insert a cuvette containing a blank solution into the sample holder and close the sample chamber lid. (Test tubes or other sample containers may be used depending on the sample holder accessory fitted). Press the **Baseline** key. The messages '**Performing baseline scan. Please wait...**' are displayed momentarily. Once the baseline measurement and storage is completed the screen will update to show:



Note: In general the blank solution should contain everything that is in the sample except the colour-producing component. For specific information reference should be made to the procedure or application being followed. For enhanced reproducibility matched cuvettes should be used.


Scanning the Sample

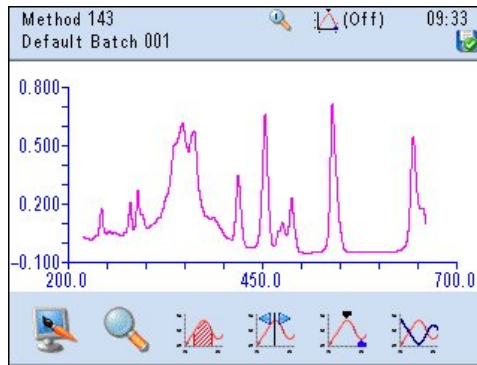
Once the baseline has been performed the **Scan** key will be active. Remove the cuvette containing the blank solution and insert the sample into the sample holder and close the sample chamber lid. Press the **Scan** key, if **Auto Scale** has been selected once the scan is completed, the screen will blank and the scan will be re-drawn to the optimum scaling.



Additional individual samples can be measured by inserting them in the single sample holder and pressing **Read**. Alternatively, multiple samples can be measured with the optional 8-cell changer or sequentially with the sipper pump accessory.

Analysing the Scan

Selecting the  icon gives access to post scan analysis options, as detailed below:

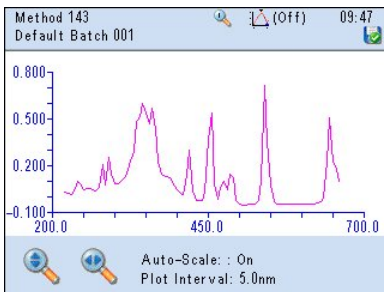


Note: All tools functions are available for use on recalled results in exactly the same manner as described hereafter.

Toolbar Icons



Display Settings



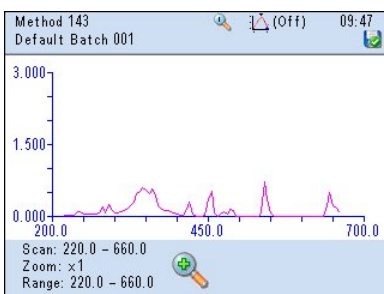
Toggles **Auto Scale** (Y Axis) **On** or **Off**. If **Off** Y axis defaults to manual settings entered in the method.



Cycles round **Plot Interval** settings of 0.1, 0.5, 1.0 and 5.0nm



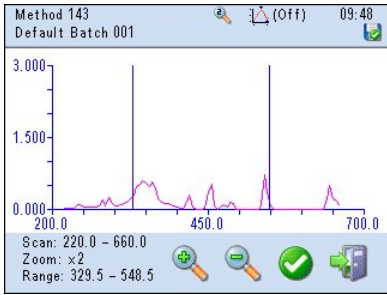
Zoom



Activates the zoom area select cursors that can be positioned using the QWheel™ over the area required. Repeated presses increase the zoom up to 5 times.



Returns the zoom to the next lower level. At x1 this icon is disabled.



Accepts and re-scales the selected area to the current zoom setting. Pressing the **Back** key or the **Exit Door** once maintains the zoom display and gives access to the tools for manipulation and analysis of the zoomed portion. A further press of the **Back** key returns the original scan.

Area Under Curve

Toolbar Icons



Area Under Curve



Cursor Select



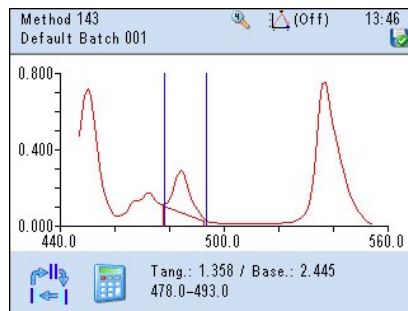
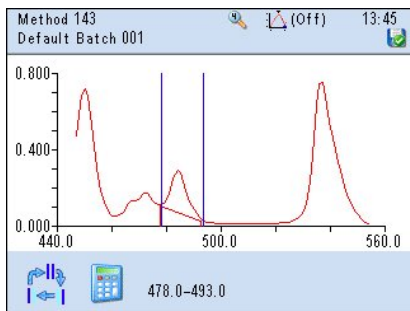
Calculator

Pressing the **Area Under Curve** icon displays the area select cursors. This can be carried out on zoomed or recalled spectra as well as the current result. Initially both cursors are active.

Use the QWheel™ to position the right hand cursor at the right hand side of the curve to be analysed. Press the **Cursor Select** icon to fix this position, enabling the QWheel™ to move the left hand cursor to the other side of the required curve.

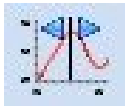
A further press of the **Cursor Select** icon fixes this position but frees the right hand cursor for further fine adjustment. (A further press enables both cursors again and so on round the cycle).

When the required area has been defined pressing the **Calculator** icon displays the area under the curve, both as the displayed tangent (**Tang.**) to the valleys, and as a continuum to the X-axis (**Base**). The wavelengths at the start and end of the curve are also displayed.



Co-ordinate Tagging

Toolbar Icons



Co-ordinate Tagging



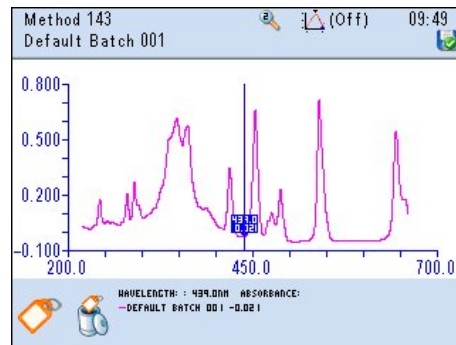
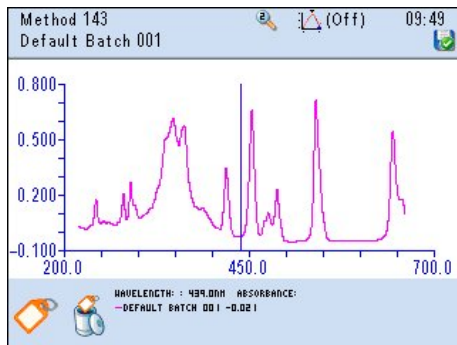
Tag



Delete Tag

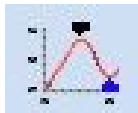
Peaks, valleys or any other points of interest can be selected (on the current, zoomed or recalled spectra) and have a co-ordinate tag added for future reference.

Pressing the **Co-ordinate Tag** icon enables the QWheel™ to control the displayed cursor. With the cursor on the required point pressing the **Tag** icon will add a tag at this point. Tags can be removed by pressing the **Delete Tag** icon.



Auto Peak & Valley Tagging

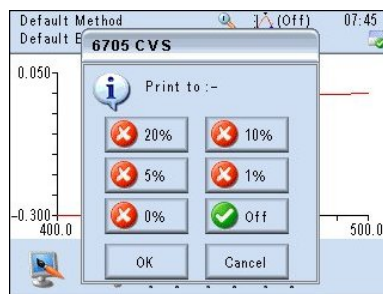
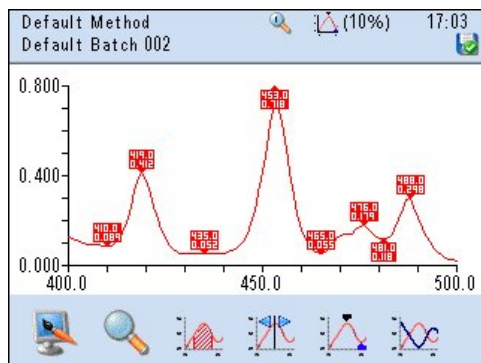
Toolbar Icon



Peak & Valley Tagging

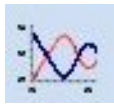
Peaks and valleys can be automatically identified on current, zoomed or recalled spectra. Pressing the **Peak and Valley** icon will cause the scan to be re-drawn with all peaks and valleys identified with co-ordinate tags.

The initial display is with a setting of 20% (defined as any turning point where the maximum or minimum value reached is 20% greater or less than the previous turning point). Further presses increase the sensitivity to 10%, 5%, 1%, 0% and finally to Off.



Overlaying Scans

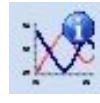
Toolbar Icon



Spectral Overlay



Add Scans



Information

Note: Scans cannot be overlaid unless the user has signed in, as access to stored data is required.

To overlay scans first measure and store the scans for each sample required in the overlay, to a maximum of 8 scans.

Note: The same Batch ID must be used for all of them.

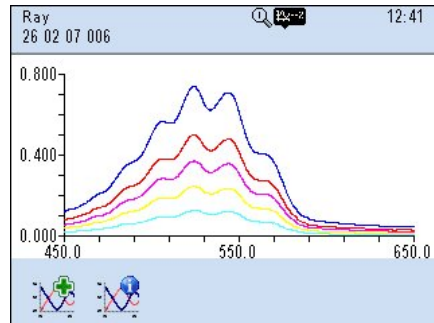
Pressing the **Spectral Overlay** icon displays the overlay screen with the current scan.

Pressing the **Add Scan** icon opens a window detailing all available scans in the current batch.

Pressing the key detailing the required scan will re-draw the screen with the two scans overlaid. Further scans from the batch can be added in a similar way.

Pressing the **Information** icon opens a window enabling the colours of each displayed scan to be changed; by pressing the colour swatch next to the details of each scan it will cycle through the 8 available alternatives. Similarly, any overlaid scan can be removed by pressing the **Delete** icon alongside it.

Press the **Back** key to exit from either screen.



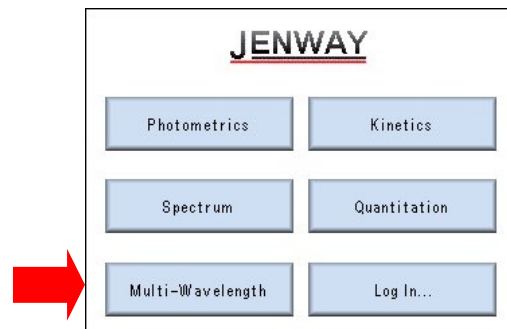
Section 7

Multi-Wavelength Mode

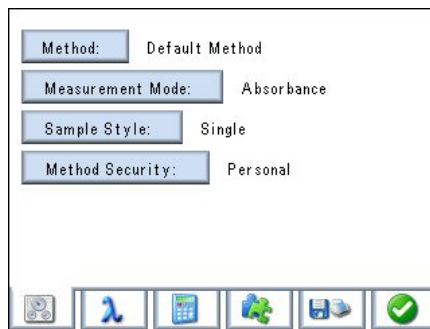
7.1 Principles of Measurement

The multi-wavelength mode is used to measure absorbance or transmittance at up to four distinct wavelengths. There are two ways in which this mode can then be used, one sample at four wavelengths or four samples each at a different wavelength. This mode is used for specific tests when one sample is examined and a ratio of absorbance values (or difference between absorbance values) at different wavelengths can reveal the purity or the composition of the sample. The ratio or difference calculations are automatically made by the spectrophotometer. The measurements are made almost simultaneously so the sample must be stable. Easily constructed methods for DNA or RNA purity/concentration can be implemented, with options for automatic or manual calibration and measurement.

Select the **Multi-Wavelength** Mode from the **Main Menu** options.



7.2 Mode Menus and Icons



Mode settings – method name, measurement type, dwell time, reading type, sample style, method security (if logged in)



Setting wavelengths – allows from 2 to 4 wavelengths to be set



Calculations - allows the selection of calculations and constants



Accessory options – varies with type of accessory module fitted



Allows selection of internal or external printer, graph details, batch ID and the Auto Save options

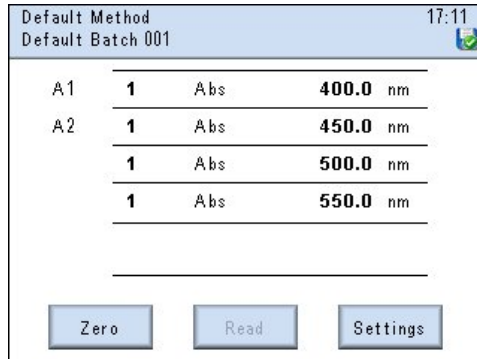


Press to accept settings entered

7.3 Free Operation

Settings

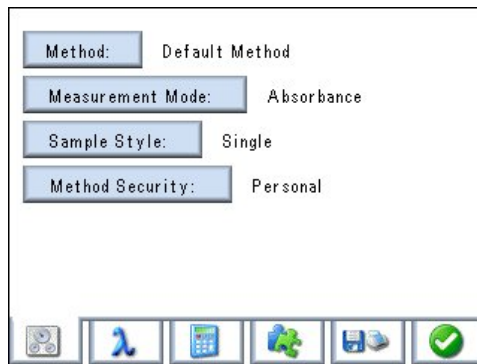
If the user is not logged in then the main measurement screen will automatically be displayed when the **Multi-Wavelength** mode is selected from the **Main Menu**:



Sample ID	Wavelength (nm)	Absorbance
A1	400.0	Abs
A2	450.0	Abs
	500.0	Abs
	550.0	Abs

Buttons: Zero, Read, Settings

To enter the required parameters for the sample(s) under test, select the **Settings** key and the instrument will display the following screen:



Method: Default Method
Measurement Mode: Absorbance
Sample Style: Single
Method Security: Personal

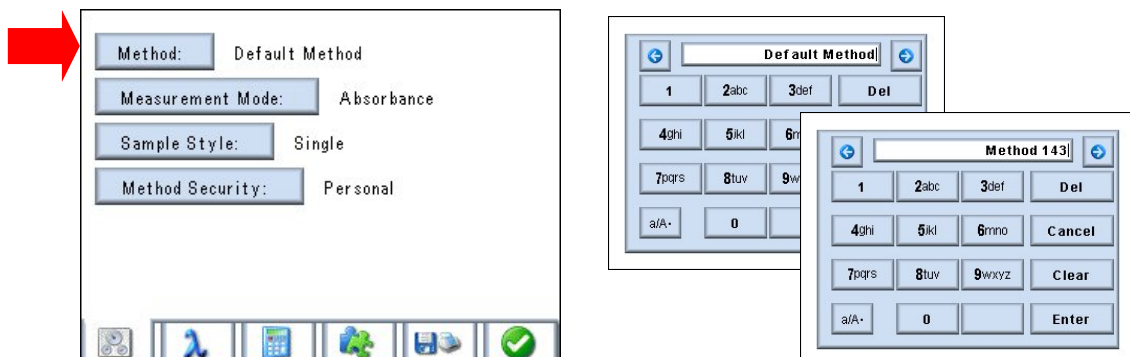
Toolbar: [Icons for various functions]



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.

Note: The new Method ID can only be used to identify the sample or batch on a printout to the internal or external printer module as a single reading or a set of multiples if the Auto Log facility is used. The generic user has no additional facility to store or recall these results or the method settings.



Method: Default Method
Measurement Mode: Absorbance
Sample Style: Single
Method Security: Personal

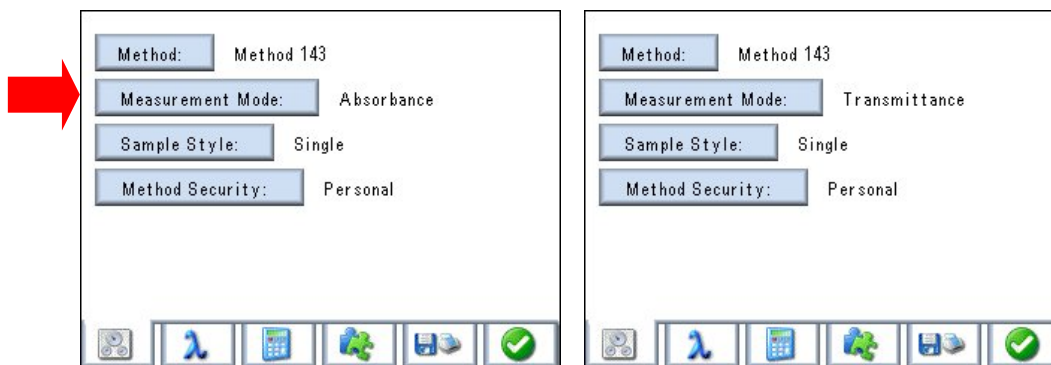
Method ID Input: Method 143|

Keypad: 1, 2abc, 3def, Del, 4ghi, 5ikl, 6mno, Cancel, 7pqrs, 8tuv, 9wxyz, Clear, a/A-, 0, Enter



Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.

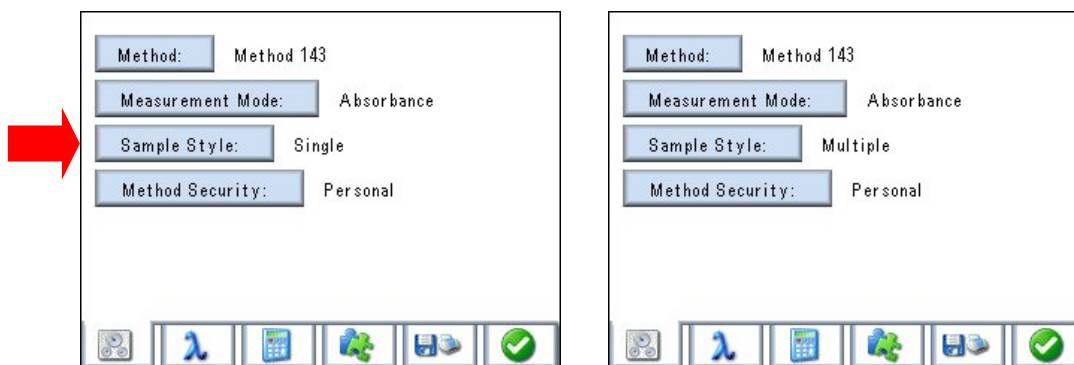


Selecting Sample Style

This option allows the user to select to measure one sample at up to four wavelengths, or to measure up to four samples at different wavelengths when the 8-position cell holder is fitted. This parameter is used in conjunction with setting wavelengths; i.e. in multiple option Sample 1 = Wavelength 1, Sample 2 = Wavelength 2, etc, with Position 0 reserved for a common blank.

Single – allows a single sample to be measured at up to 4 wavelengths.

Multiple – allows up to 4 samples to be measured at single different wavelengths.



Setting Method Security

This option is only available to logged in users.



Setting Wavelengths

Up to four wavelengths can be set for each measurement parameter. The primary and secondary wavelengths can be selected using any combination e.g. Wavelength #1 as the primary and Wavelength #3 as the secondary. Values can be set by selecting the appropriate wavelength (#1-4) and entering the new value via the numeric keypad.

The number of wavelengths to be measured can be set at 2, 3 or 4 by successive presses of the wavelength button. Entering the minimum number for the application will speed up analysis.

Wavelength#1: 400.0nm
 Wavelength#2: 450.0nm
 Wavelength#3: 500.0nm
 Wavelength#4: 550.0nm
 Wavelengths: 4



Calculations

The calculations option allows the user to specify which calculations they would like to see performed with the readings taken at selected wavelengths and with specific samples.

Sum: A1/A2 & A1-A2
 Primary Wavelength: Wavelength#1
 Secondary Wavelength: Wavelength#2
 K1: 1.0
 K2: 1.0 K4: 1.0
 K3: 1.0 K5: 1.0



Sum allows the user to specify which of the following sums is performed:

Sum: A1/A2 & A1-A2
 Primary Wavelength: Wavelength#1
 Secondary Wavelength: Wavelength#2
 K1: 1.0
 K2: 1.0 K4: 1.0
 K3: 1.0 K5: 1.0

Sum: (K1A1 + K2A2 + K2A3 + K4A4) x K5
 Primary Wavelength: Wavelength#1
 Secondary Wavelength: Wavelength#2
 K1: 1.0
 K2: 1.0 K4: 1.0
 K3: 1.0 K5: 1.0

Sum: K5 x (K1A1 + K2A2) / (K3A3 + K4A4)
 Primary Wavelength: Wavelength#1
 Secondary Wavelength: Wavelength#2
 K1: 1.0
 K2: 1.0 K4: 1.0
 K3: 1.0 K5: 1.0

A1/A2 & A1-A2 ratio and difference will allow the user to see the ratio between any two readings – in this case the primary value divided by the secondary value, and the difference between two readings – the primary value minus the secondary value.

$$(K1A1 + K2A2 + K3A3 + K4A4) \times K5$$

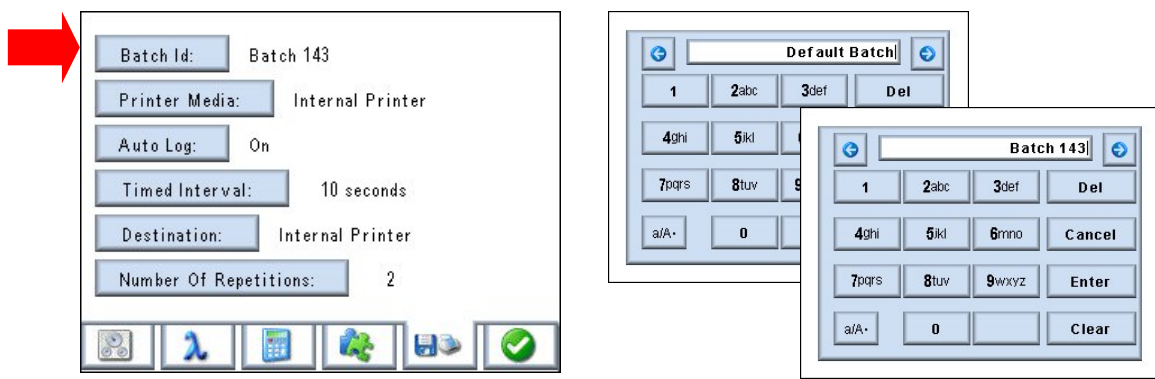
$$K5 \times (K1A1 + K2A2) / (K3A3 + K4A4)$$

Primary Wavelength allows the user to select which of the (up to) four wavelengths selected is to be used as the primary wavelength in the Ratio and Difference calculation.

Secondary Wavelength allows the user to select which of the (up to) four wavelengths selected is to be used as the secondary wavelength in the Ratio and Difference calculation. It is not possible to set the primary and secondary wavelengths to the same value.

K1 to K5 allow the user to set the required constants for the calculations.

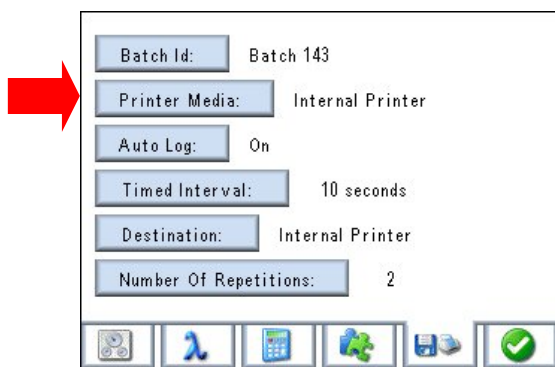
Setting Batch ID



Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.

Selecting Printer Media

The **Printer Media** key toggles between Internal and External Printer options.





Auto Log Setting...

Selecting the **Auto Log Settings...** opens a dedicated sub-menu.

This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:

Batch Id: Batch 143
 Printer Media: Internal Printer
 Auto Log: On
 Timed Interval: 10 seconds
 Destination: Internal Printer
 Number Of Repetitions: 2

the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

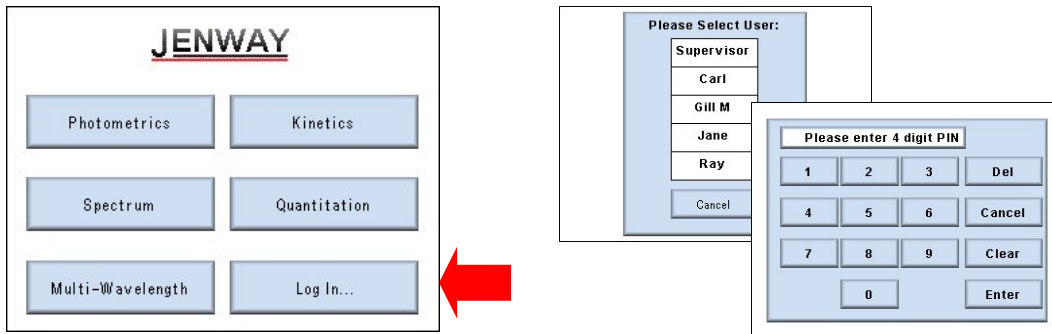
To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.

Personal		Generic		22/08/07	
Method 143				13:48	
Default Batch 001					
A1	1	Abs	400.0	nm	
A2	1	Abs	450.0	nm	
	1	Abs	500.0	nm	
	1	Abs	550.0	nm	
<div style="display: flex; justify-content: space-around;"> Zero Read Settings </div>					

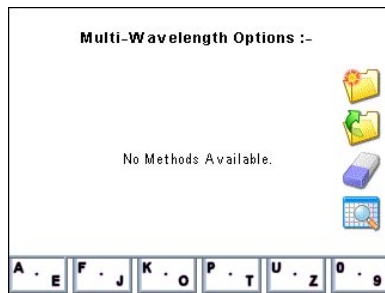
Method 143				13:48	
Default Batch 001					
A1	1	Abs	400.0	nm	
A2	1	Abs	450.0	nm	
	1	Abs	500.0	nm	
	1	Abs	550.0	nm	
<div style="display: flex; justify-content: space-around;"> Zero Read Settings </div>					

7.4 Logged In Measurement

PIN Codes – each user is allocated a 4 digit PIN code that is required when logging in. Select **Log In...** from the **Main Menu** and a list of users will be shown. Select the appropriate user name and a numeric keypad will be displayed. Enter your 4 digit PIN code and press the **Enter** key to confirm.



Once logged in method screen options will be displayed:



Methods are stored sequentially by measurement mode. Once the first page is full (8 methods for the selected mode) cursor arrows are displayed enabling the user to browse to subsequent or previous pages of 8 methods.

Alternatively, pressing one of the alphanumeric keys along the bottom of the screen will display all available methods with the initial character that is highlighted.

Note: Repeated pressing of a key sequentially highlights the characters between those displayed.



Create a New Method

For the following functions first touch a method or result to select it.



Open the Selected Method



Erase the Selected Method



Browse Results – linked to the selected method



Open specific results in the selected batch



Creating a New Method

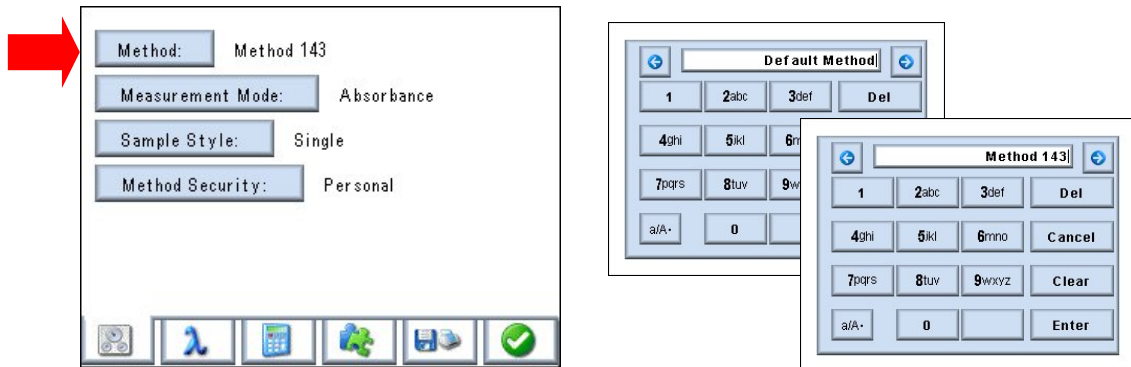
Settings

To enter the Method ID, appropriate wavelength for the sample(s) to be tested and the level of Method Security required for the method being created select the **New File** icon



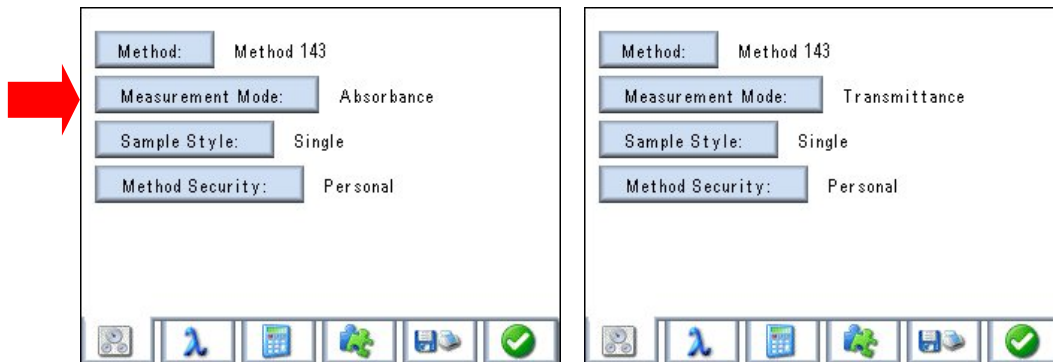
Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.



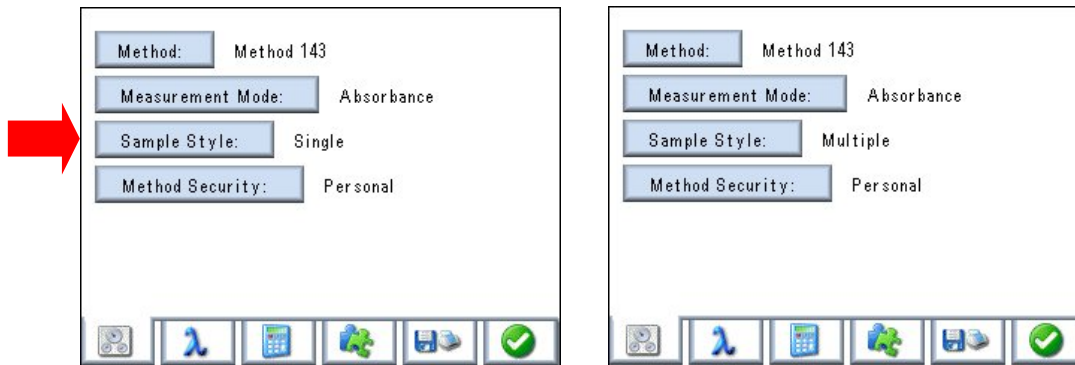
Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.





Selecting Sample Style



This option allows the user to select to measure one sample at up to four wavelengths, or to measure up to four samples at different wavelengths when the 8-position cell holder is fitted. This parameter is used in conjunction with setting wavelengths; i.e. in multiple option Sample 1 = Wavelength 1, Sample 2 = Wavelength 2, etc, with position 0 reserved for a common blank.

Single – allows a single sample to be measured at up to 4 wavelengths.

Multiple – allows up to 4 samples to be measured at single different wavelengths.



Method Security

The 67 Series spectrophotometers can support up to 10 individual users plus one Supervisor who has full administrative rights.

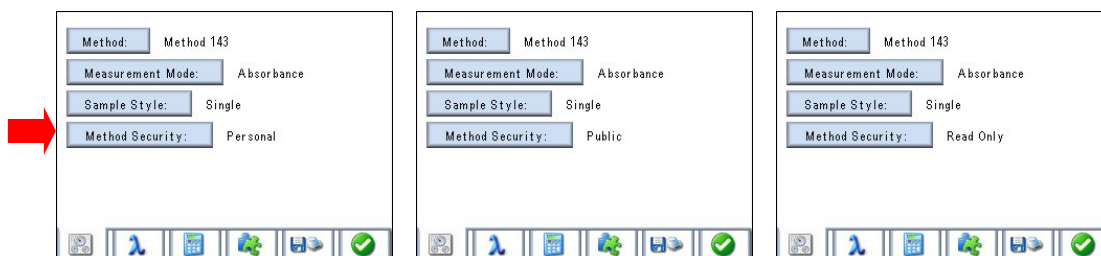
Logged in users can create methods with three levels of security options:

Personal – these methods are only accessible by the originator.

Public – these methods are available for use and modification by any logged in user.

Read-Only – these methods can be accessed by all logged in users, but can only be modified by the originator.

The preferred level of protection can be achieved by selecting the **Method Security** key that toggles between **Personal**, **Public** and **Read-Only** options.





Setting Wavelengths

Up to four wavelengths can be set for each measurement parameter. The primary and secondary wavelengths can be selected using any combination e.g. Wavelength #1 as the primary and Wavelength #3 as the secondary. Values can be set by selecting the appropriate wavelength (#1-4) and entering the new value via the numeric keypad.

The number of wavelengths to be measured can be set at 2, 3 or 4 by successive presses of the wavelength button. Entering the minimum number for the application will speed up analysis.

Wavelength#1: 400.0nm
 Wavelength#2: 450.0nm
 Wavelength#3: 500.0nm
 Wavelength#4: 550.0nm
 Wavelengths: 4

500.0

660

Calculations



The calculations option allows the user to specify which calculations they would like to see performed with the readings taken at selected wavelengths and with specific samples.

Sum: A1/A2 & A1-A2
 Primary Wavelength: Wavelength#1
 Secondary Wavelength: Wavelength#2
 K1: 1.0
 K2: 1.0
 K3: 1.0
 K4: 1.0
 K5: 1.0



Sum allows the user to specify which of the following sums is performed:

Sum: A1/A2 & A1-A2

Sum: $(K1A1 + K2A2 + K2A3 + K4A4) \times K5$

Sum: $K5 \times (K1A1 + K2A2) / (K3A3 + K4A4)$

A1/A2 & A1-A2 ratio and difference will allow the user to see the ratio between any two readings – in this case the primary value divided by the secondary value, and the difference between two readings – the primary value minus the secondary value.

$(K1A1 + K2A2 + K3A3 + K4A4) \times K5$

$K5 \times (K1A1 + K2A2) / (K3A3 + K4A4)$

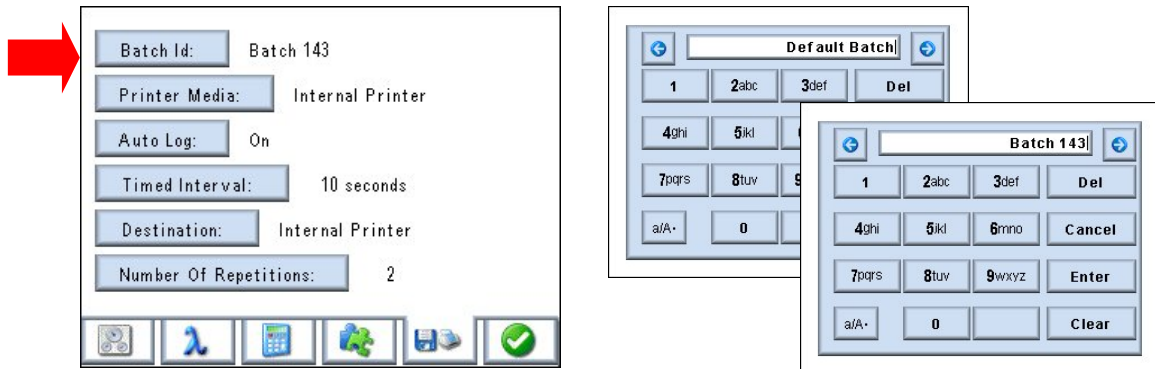
Primary Wavelength allows the user to select which of the (up to) four wavelengths selected is to be used as the primary wavelength in the Ratio and Difference calculation.

Secondary Wavelength allows the user to select which of the (up to) four wavelengths selected is to be used as the secondary wavelength in the Ratio and Difference calculation. It is not possible to set the primary and secondary wavelengths to the same value.

K1 to K5 allow the user to set the required constants for the calculations.



Setting Batch ID

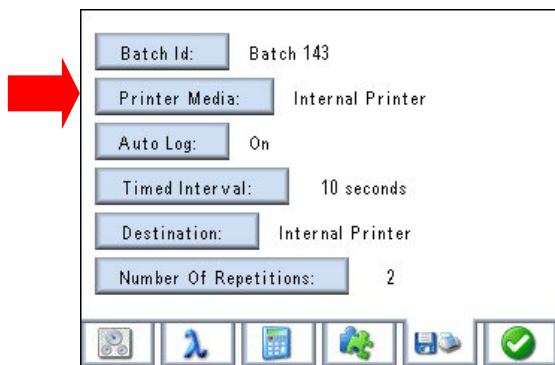


Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a Default.



Selecting Printer Media

The **Printer Media** key toggles between Internal and External Printer options.





Auto Log Settings...

Selecting the **Auto Log Settings...** opens a dedicated sub-menu.

This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:

Batch Id: Batch 143
 Printer Media: Internal Printer
 Auto Log: On
 Timed Interval: 10 seconds
 Destination: Internal Printer
 Number Of Repetitions: 2

Navigation icons: Home, Back, Forward, Print, Help, Confirm.

the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.

Personal		Generic		22/08/07	
Method 143				13:48	
Default Batch 001					
A1	1	Abs	400.0	nm	
A2	1	Abs	450.0	nm	
	1	Abs	500.0	nm	
	1	Abs	550.0	nm	
<div style="display: flex; justify-content: space-around;"> Zero Read Settings </div>					

Method 143				13:48	
Default Batch 001					
A1	1	Abs	400.0	nm	
A2	1	Abs	450.0	nm	
	1	Abs	500.0	nm	
	1	Abs	550.0	nm	
<div style="display: flex; justify-content: space-around;"> Zero Read Settings </div>					

File & Data Management



Save



Tools



Print



Settings



Erase



Search
Results



Open
Results



Save

Saving Methods

Having entered all your required settings on the tabbed pages the method can be saved by simply pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Sharing Methods

Methods can be shared with other users by setting the security level at either **Read-Only** where other users can use but not modify the method or, **Public** where they can use and modify the method. Other users must then ensure that under **Method View Settings** (Settings/User Preferences/Method View Settings) they have enabled **Public** and/or **Read-Only** methods or turned **All Methods** on.

Recalling Methods

Following selection of the operating mode from the main menu the method browse screen is displayed. This will show all methods that the current user has access to, based on their selections in the **Method View Settings** (refer to Sharing Methods). If the first page is full, cursor arrows will be displayed to enable navigation to and from additional pages.

Alternatively, selection may be made using the alphanumeric menu bar at the bottom of the screen. Repeated pressing of each character set will display the full alphanumeric range and the screen will show all methods starting with the highlighted character.

Touch the required method when it is displayed on the screen to highlight it, touch the **Open File** icon to display the main measurement screen for that method.

Editing Methods

Use the Recalling Methods procedure to recall the required method. With the measurement screen displayed touch the **Settings** option. Adjust the settings as required and touch the **Enter** icon on completion. The modified method can then be saved by pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Note: If the Method name was not changed during editing it will be saved with the same name but with a new date and time to ensure traceability. If the old method is no longer required it should be deleted as detailed in Deleting Methods.

Deleting Methods

To delete methods highlight the required method in the Browse screen as described in Recalling Methods and then touch the **Erase** icon.

A warning message will be displayed to ensure this action is required. On confirmation the selected file will be deleted.

If the current user does not have the required privileges to delete the selected message then an information message will be displayed advising that the method cannot be deleted.

Privileges required for deleting designated methods:

Public Methods – only the Supervisor can delete these.

Read-Only Methods – only the Supervisor and Originator can delete these.

Personal Methods – Only the Originator can delete these methods. (The Supervisor can delete these by re-setting the Originator's PIN code and then logging in as the Originator).

Saving Results

After completion of a measurement the result can be saved by simply pressing the **Save** key on the display surround. The result is saved under the method that created it, with the entered Batch ID and an incremental number along with the time and date of the measurement. Results can also be saved as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Printing Results

After completion of a measurement the result can be printed, by simply pressing the **Print** key on the display surround. The result will be printed to either the internal or external printer, as selected by the user in the **Printer Settings** option.

The first result of any new batch is preceded by a print header, which gives details of the method settings and Batch ID. Results can also be printed as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Recalling Results

Stored results are always directly linked to the method that created them. To access results first recall the method as described in Recalling Methods (page xx). With the method highlighted touch the **Search Results** icon. This will open a screen detailing all results available to the current user. Touch the required result or batch (depending on the mode) and then the **Open Specific Result** icon. This will display the results on the screen. The **Tools** option can then be used to work on these results (depending on mode). It is also possible to print the result by simply pressing the **Print** key on the display surround. Options to print to the Internal or External printer or to the Data Card will be displayed. Printing to the Data Card will save an EPS (Encapsulated Postscript) file to the Data Card. This is in printer ready format and can be viewed and printed in a number of software packages, including Adobe PhotoShop[®], Corel Draw[®], Ghostscript[®] and many other file management systems.

Sharing Results

Results attached to **Personal Methods** cannot be accessed by any other user.

Results attached to **Read-Only** and **Public Methods** can be accessed by all users, based on their current **Method View Settings**.

Deleting Results

Results can only be deleted by the Originator or the Supervisor through **Administrative Functions**. Recall the required result without opening it. Highlight the result (or batch of results) and then press the **Erase** icon. A warning message will be displayed to ensure this action was intended. On confirmation the results will be permanently deleted.

7.5 Performing Measurements – all users

Place the zero solution in the sample chamber and close the lid.

Pressing the **Zero** key will start the cycle, setting zero at each wavelength in turn. A series of information boxes will advise of the progress.

When completed all displayed absorbance values will be set to zero (or 100% Transmittance).

Replace the zero solution with the sample to be measured and close the sample chamber lid.

Pressing the **Read** key will start the measure cycle, measuring at each wavelength in turn. A series of information boxes will advise of the progress.

When completed the measured absorbances will be displayed.

The results of the selected calculation will be displayed below the Wavelength/Absorbance data.

Section 8

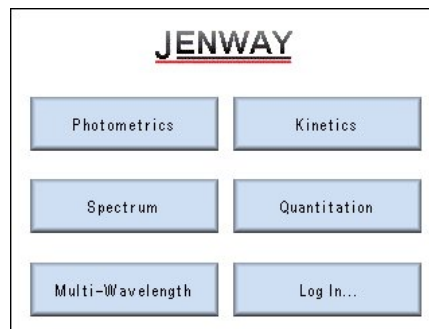
Kinetics Mode

8.1 Principles of Measurement

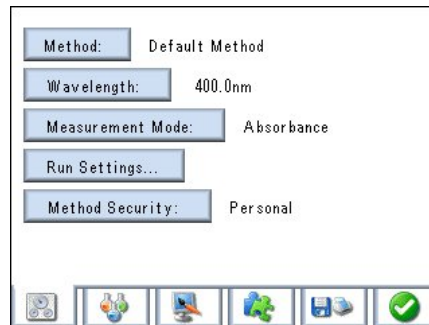
A number of tests run on a spectrophotometer involve an active ingredient. On addition of this active ingredient, the absorbance or the transmittance of the sample, will be seen to either increase or decrease. The absorbance or transmittance is recorded at regular intervals at a preset wavelength for a set time.

A graph is then plotted to show how the absorbance or transmittance changes over time. From the graph, the concentration of the sample can be calculated. This mode is ideal for continuous monitoring as well as the calculation of concentration in enzyme activity studies, with calibration possible against a standard or known factor.

Select the **Kinetics** Mode from the **Main Menu** options:



8.2 Mode Menus and Icons



Mode settings - method name, wavelength, measurement mode, run settings, method security (if logged in)



Calibration – allows setting of Concentration cal standard, factor, resolution and units of measurement



Measurement display – allows auto scaling, axis setting, colour selection



Accessory options – varies with type of accessory module fitted



Allows selection of internal or external printer, graph details, batch ID and the Auto Save options

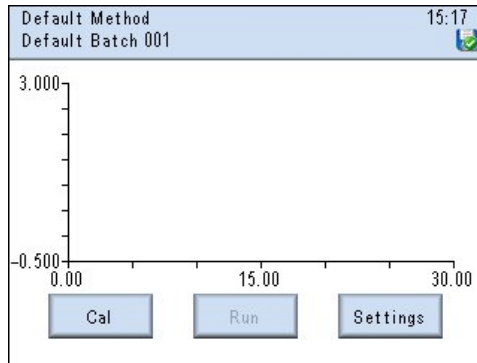


Press to accept settings entered

8.3 Free Operation

Settings

If the user is not logged in then the main measurement screen will automatically be displayed when the **Kinetics** mode is selected from the **Main Menu**.



To enter the required parameters for the sample(s) under test, select the **Settings** key and the instrument will display the following screen:

The settings screen displays the following parameters: Method: Default Method, Wavelength: 400.0nm, Measurement Mode: Absorbance, Run Settings..., and Method Security: Personal. At the bottom, there is a row of icons including a dial, a flask, a computer monitor, a gear, a printer, and a green checkmark.



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.

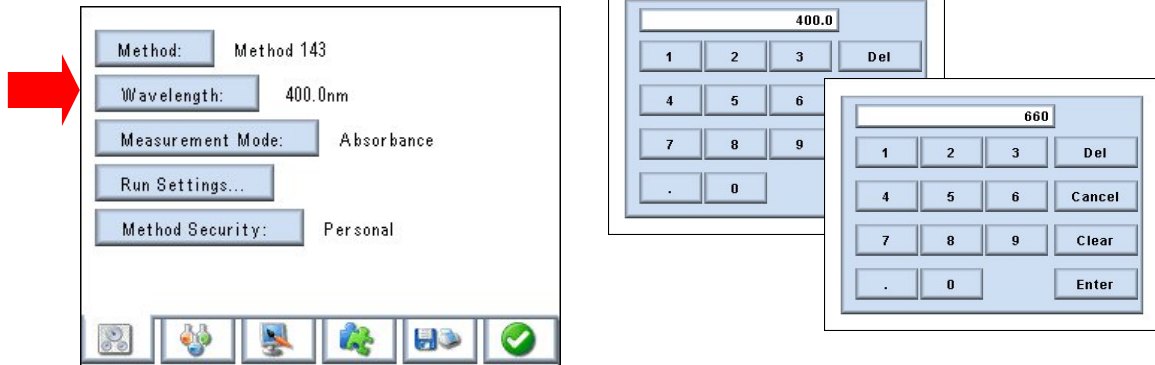
Note: The new Method ID can only be used to identify the method on a printout to the internal or external printer module. The generic user has no additional facility to store or recall these results or the method settings.

The diagram illustrates the process of setting a Method ID. A red arrow points to the "Method:" field in the settings screen, which currently shows "Default Method". A keypad is shown with "Default Method" in the input field. A second keypad shows "Method 143" in the input field, with "Del" and "Clear" keys highlighted.



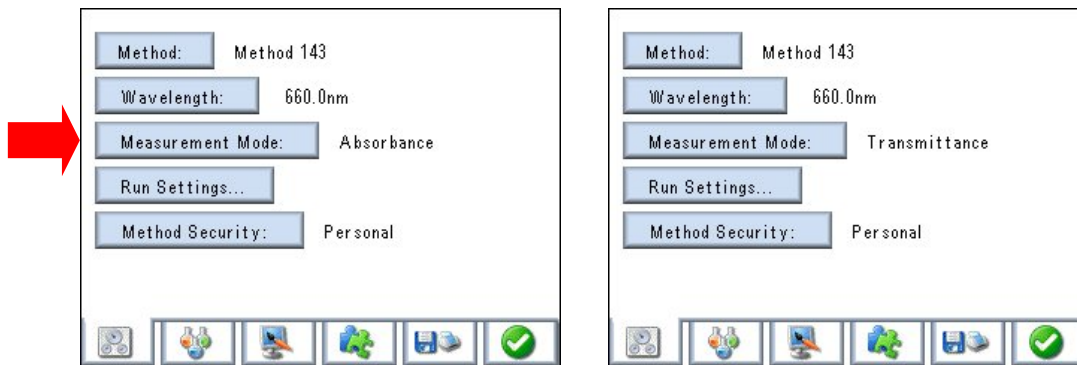
Setting Wavelength

Select the **Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out).



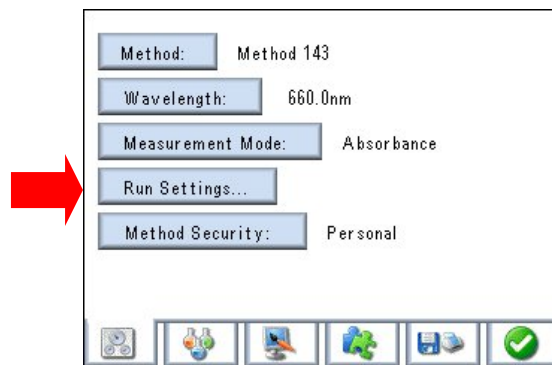
Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.



Run Settings...

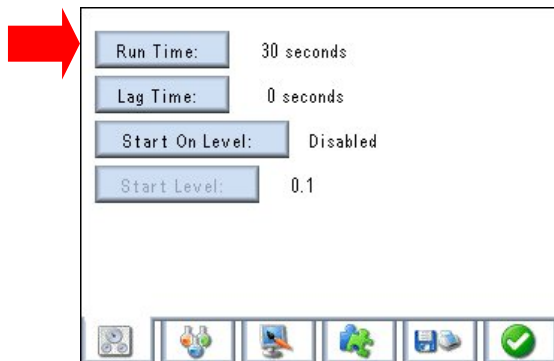
Selecting **Run Settings...** opens a dedicated sub-menu.





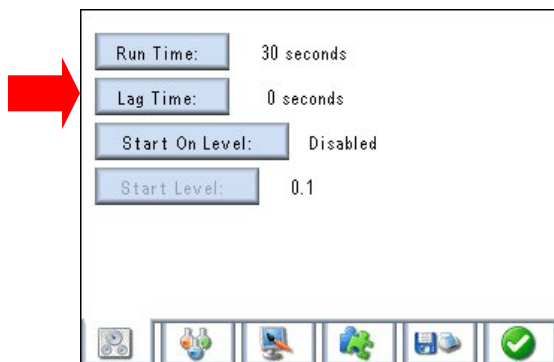
Setting Run Time

Pressing the **Run Time** key displays a numeric keypad. Clear the current setting and enter the required time, in seconds, for the measurement period. The limits for this setting are from 30 to 9999 seconds (2.75 hours).



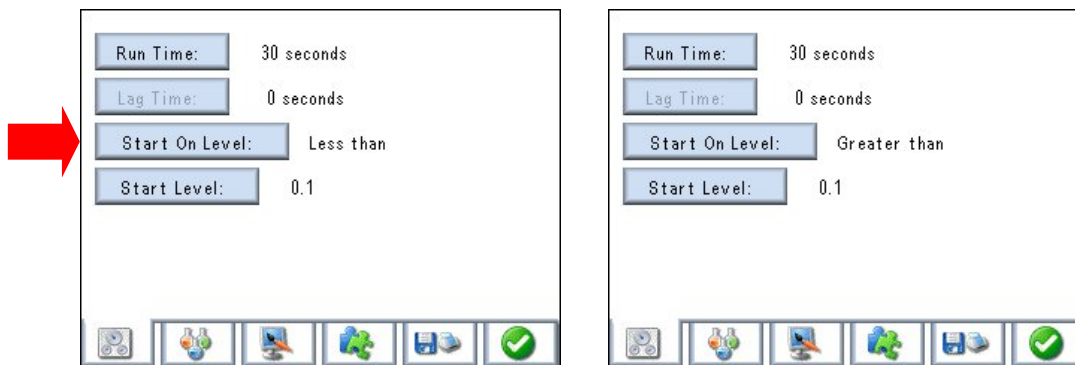
Setting Lag Time

Pressing the **Lag Time** key displays a numeric keypad. Clear the current setting and enter the required lag time in seconds. The lag time is a portion of the run time over which no data is collected, starting from the beginning of the run time. This allows for any latency or non-linear reaction to be disregarded. Setting this to zero means data will be collected over the full run time. The limits for this setting are from 0 to 9999 seconds.



Setting Start On Level

Pressing the **Start On Level** key disables the lag time option. Repeated presses of this key cycle through the **Greater Than**, **Less Than** and **Disabled** options. With **Greater Than** or **Less Than** selected data collection will start when the measured value (Absorbance or Transmittance) is above or below the value entered in the **Start Level** setting.





Setting Start Level

Pressing the **Start Level** key displays a numeric keypad. Clear the current setting and enter the required level above or below which data collection is required. Limits for this setting are – 0.299 to 2.999Abs and 0.1 to 199.1%T.



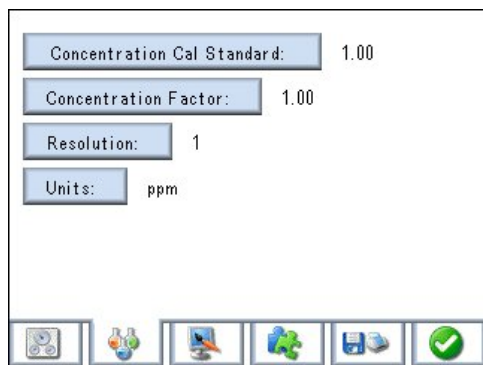
Setting Method Security

This option is only available to logged in users.



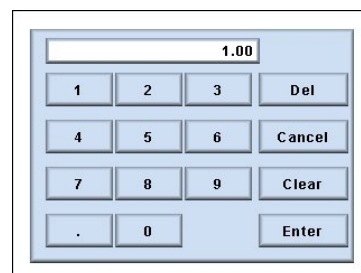
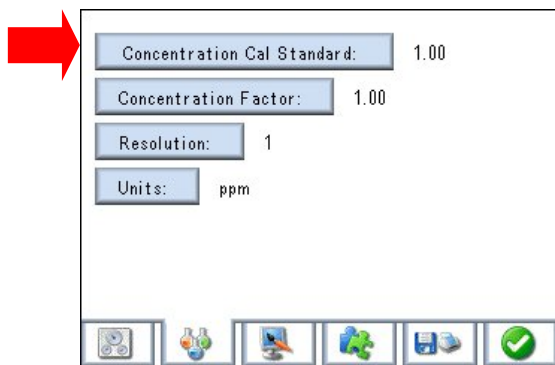
Setting Concentration Parameters

The rate of change of absorbance can be converted to concentration using a known factor or reference concentration value. Whichever is not required should be set to unity so that it is ignored in the calculation.



Concentration Cal Standard

Select the Concentration Cal Standard key and enter the concentration value of the calibration standard. Values from 0.01 to 9999 can be entered. If a concentration value is not to be used then this should be set to 1.00.





Concentration Factor

This is the value by which the rate of change is multiplied to give the concentration. Select the Concentration Factor key and enter the factor value. Values from 0.01 to 9999 can be entered. If a Concentration Factor is not to be used this value should be set to 1.00.

Concentration Cal Standard: 1.00
Concentration Factor: 1.00
Resolution: 1
Units: ppm



Selecting Resolution

This enables the resolution of the result to be set. Resolution can be set using the **Resolution** key to scroll through the available options.

Resolution options are: 1, 0.1, 0.01 and 0.001.

Concentration Cal Standard: 1.00
Concentration Factor: 1.00
Concentration Offset: 0.00
Resolution: 1
Units: ppm



Selecting Units

Selection of units is made using the **Units** key to scroll through the available measurement options. The following units are available:- mEq/l, ppm, mg/l, g/l, %, µg/ml, mg/ml, g/dl, mg/dl, µg/l, ng/l, µg/dl, M, mM, µM/l, U/l, mU/IU/ml, blank.

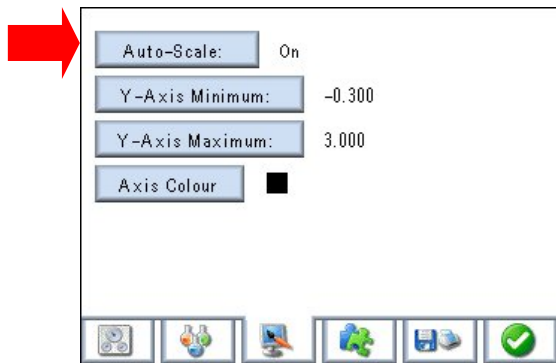
Note: The unit is simply a name tag added to the result. Due to the variety of samples that may be measured it is impossible to enable any direct conversion between units.

Concentration Cal Standard: 1.00
Concentration Factor: 1.00
Concentration Offset: 0.00
Resolution: 1
Units: ppm



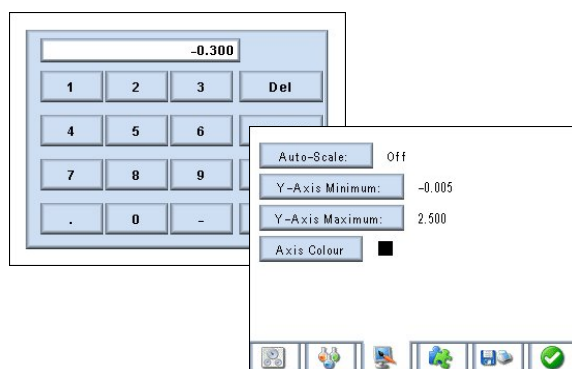
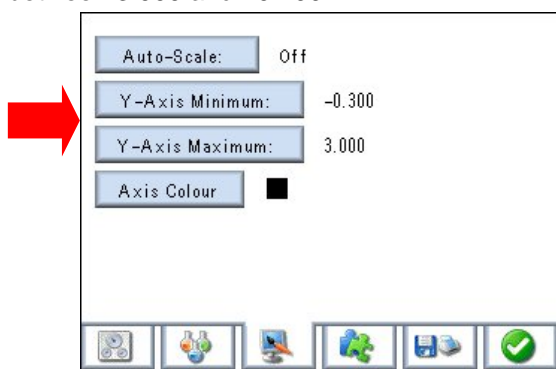
Setting Auto-Scale

The **Auto-Scale** key toggles between **On** and **Off**. With the **Auto-Scale** function **On** the instrument will automatically set the Y-axis maxima to a level that will fit the graph of the kinetics run. When set to **Off** the manual settings for Y-axis maximum and minimum are non-functional. These settings can be changed with post run analysis tools to enable alternative views and printouts after the run has been completed.



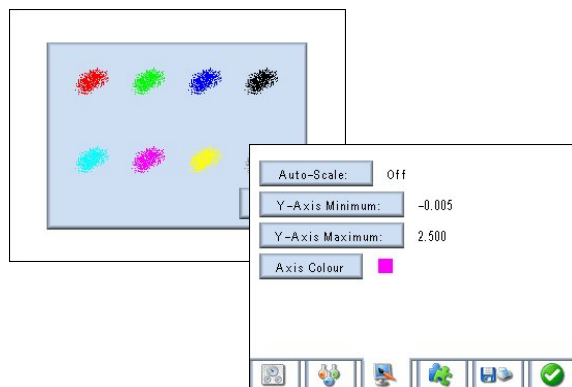
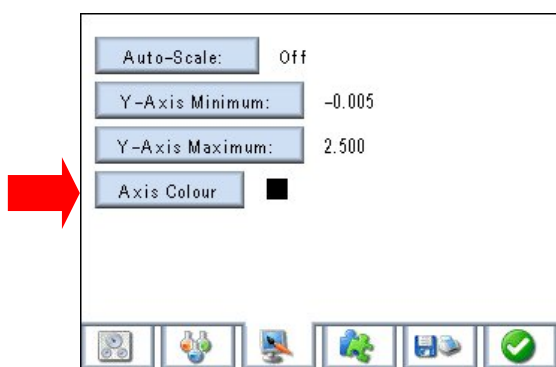
With the **Auto-Scale** function set to **Off** the **Y-Axis Minimum** enables the lowest displayed level for the Y-axis to be manually set. Press the **Y-Axis Minimum** key and a numeric keypad will be displayed for entry of this value. This value can be between -0.300 and 2.999 .

The **Y-Axis Maximum** enables the highest displayed level for the Y-axis to be manually set. Press the **Y-Axis Maximum** key and a numeric keypad will be displayed for entry of this value. This value can be between 3.000 and -0.299 .



Selecting Axis Colour

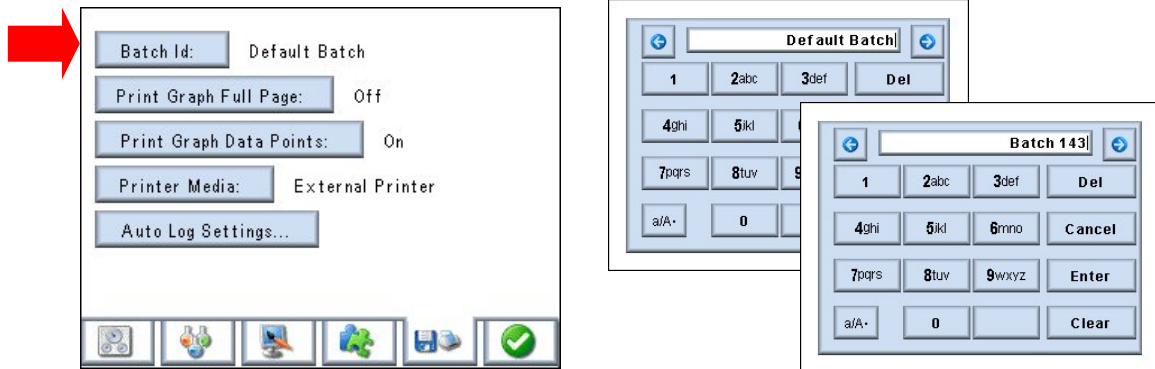
Pressing the **Axis Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.





Setting Batch ID

Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.



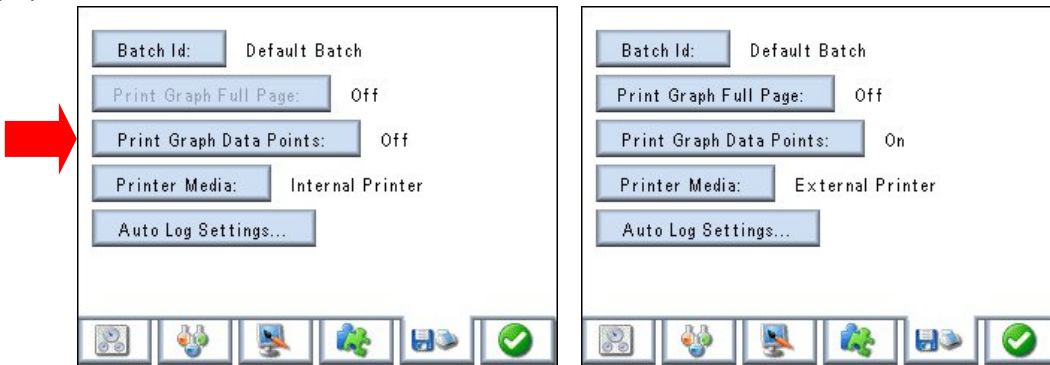
Setting Graph Data Points

The option to print graphs on a full page is only available if the **External** printer is selected. If available and set to **On** the graph will be printed on one page (typically A4 landscape format) with the data on following pages.

If available and set to **Off** the graph will be printed with the data below it (typically top half A4 portrait).

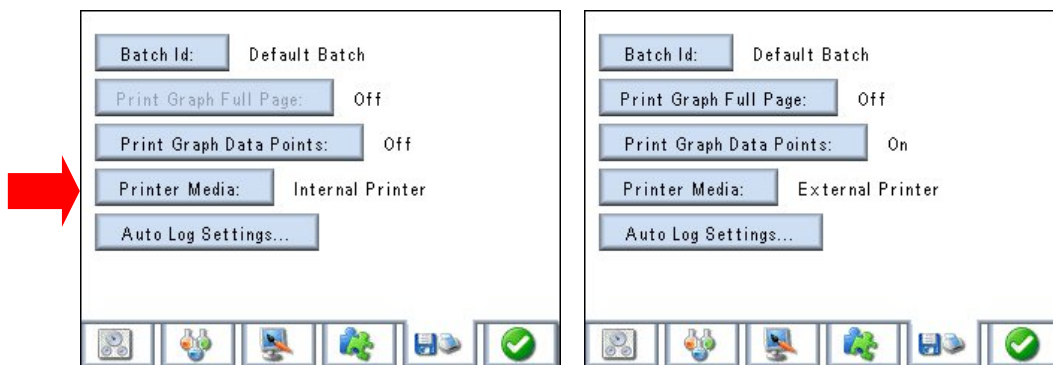
The **Print Graph Data Points** key toggles between **On** and **Off**.

With this key set to **On** all the data points that make up the graph will be printed in a table following the graph.



Selecting Printer Media

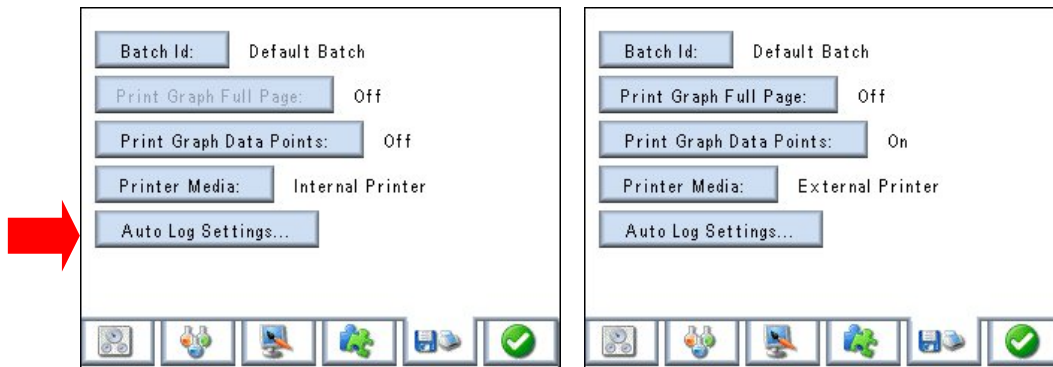
The **Printer Media** options toggle between Internal and External Printers.





Auto Log Settings...

Selecting **Auto Log Settings...** opens a dedicated sub-menu. This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:



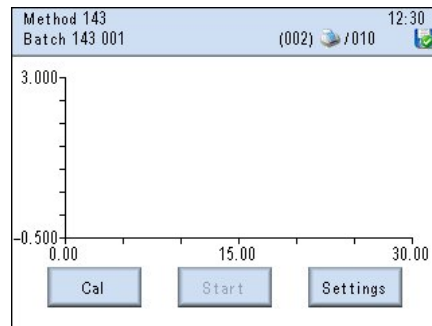
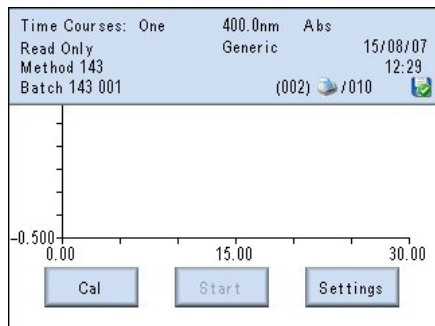
the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

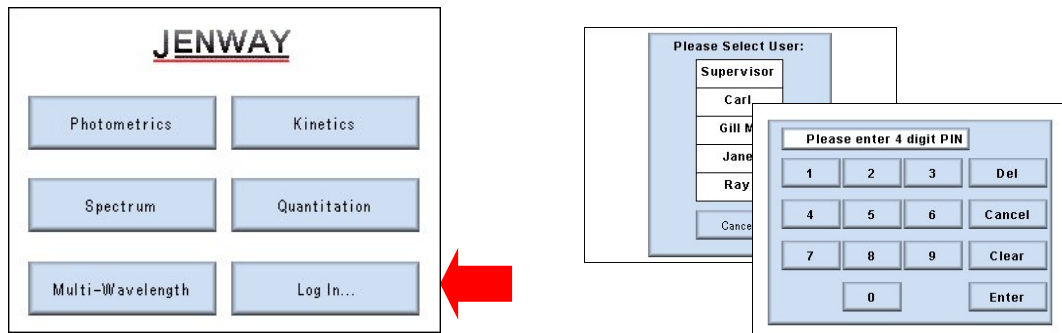
Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.

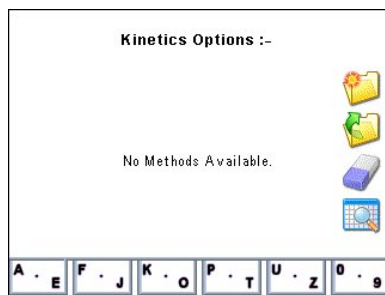


8.4 Logged In Measurement

PIN Codes – each user is allocated a 4 digit PIN code that is required when logging in. Select **Log In...** from the **Main Menu** and a list of users will be shown. Select the appropriate user name and a numeric keypad will be displayed. Enter your 4 digit PIN code and press the **Enter** key to confirm.



Once logged in method screen options will be displayed:



Methods are stored sequentially by measurement mode. Once the first page is full (8 methods for the selected mode) cursor arrows are displayed enabling the user to browse to subsequent or previous pages of 8 methods.

Alternatively, pressing one of the alphanumeric keys along the bottom of the screen will display all available methods with the initial character that is highlighted.

Note: Repeated pressing of a key sequentially highlights the characters between those displayed.



Create a New Method

For the following functions first touch a method or result to select it.



Open the Selected Method



Erase the Selected Method



Browse Results – linked to the selected method



Open specific results in the selected batch



Creating a New Method

To enter the Method ID, appropriate measurement parameters and the level of Method Security required for the method being created select the **New File** icon.



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.



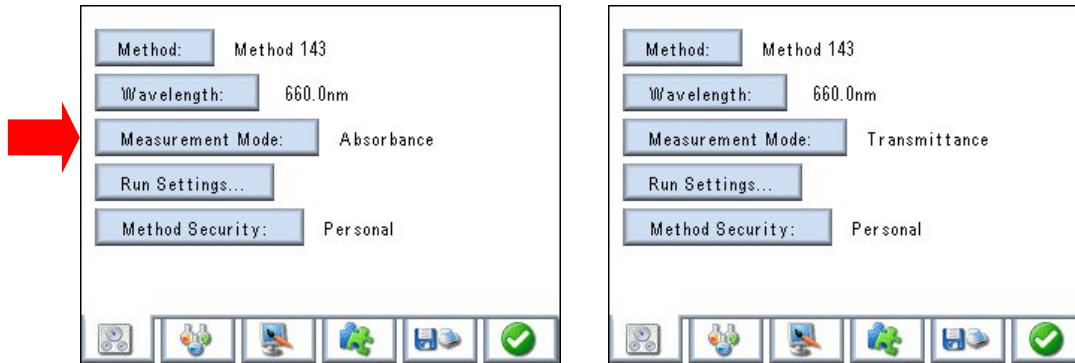
Setting Wavelength

Select the **Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out).



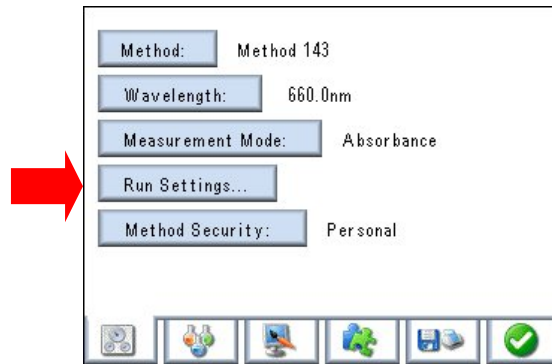
Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.



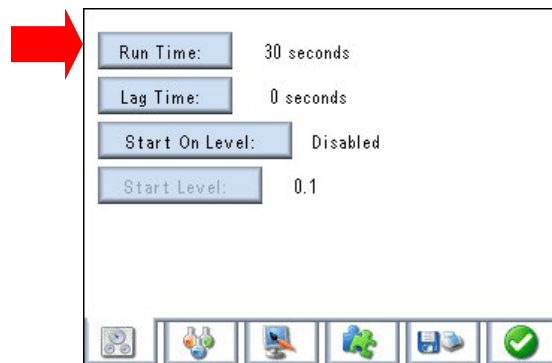
Run Settings...

Selecting **Run Settings...** opens a dedicated sub-menu.



Setting Run Time

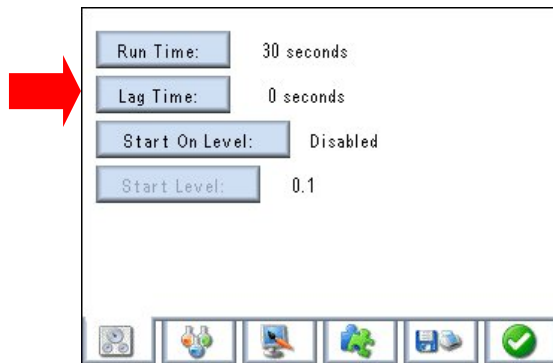
Pressing the **Run Time** key displays a numeric keypad. Clear the current setting and enter the required time, in seconds, for the measurement period. The limits for this setting are from 30 to 9999 seconds (2.75 hours).





Setting Lag Time

Pressing the **Lag Time** key displays a numeric keypad. Clear the current setting and enter the required lag time in seconds. The lag time is a portion of the run time over which no data is collected, starting from the beginning of the run time. This allows for any latency or non-linear reaction to be disregarded. Setting this to zero means data will be collected over the full run time. The limits for this setting are from 0 to 9999 seconds.



Setting Start On Level

Pressing the **Start On Level** key disables the lag time option. Repeated presses of this key cycle through the **Greater Than**, **Less Than** and **Disabled** options. With **Greater Than** or **Less Than** selected data collection will start when the measured value (Absorbance or Transmittance) is above or below the value entered in the **Start Level** setting.



Setting Start Level

Pressing the **Start Level** key displays a numeric keypad. Clear the current setting and enter the required level above or below which data collection is required. Limits for this setting are – 0.299 to 2.999Abs and 0.1 to 199.1%T.





Setting Method Security

The 67 Series spectrophotometers can support up to 10 individual users plus one Supervisor who has full administrative rights.

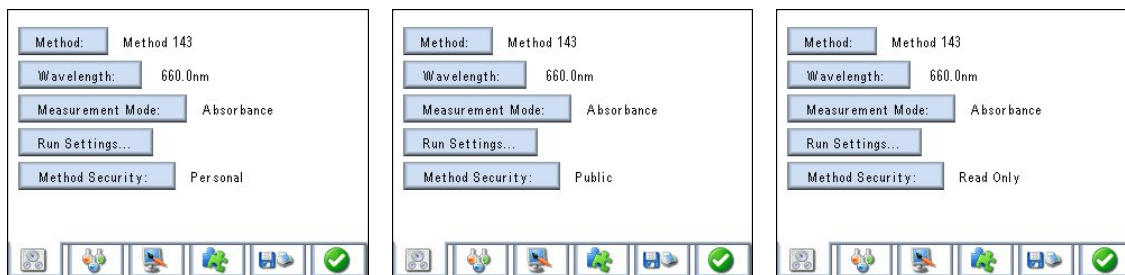
Logged in users can create methods with three levels of security options:

Personal – these methods are only accessible by the originator.

Public – these methods are available for use and modification by any logged in user.

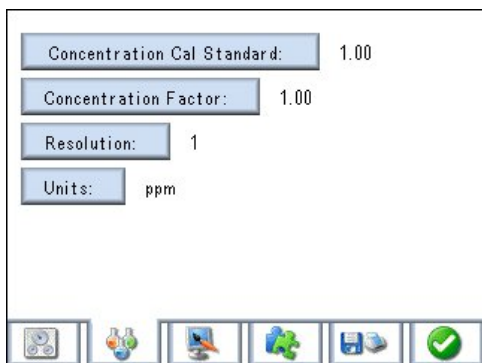
Read-Only – these methods can be accessed by all logged in users, but can only be modified by the originator.

The preferred level of protection can be achieved by selecting the **Method Security** key that toggles between **Personal**, **Public** and **Read-Only** options.



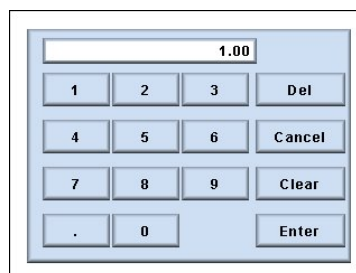
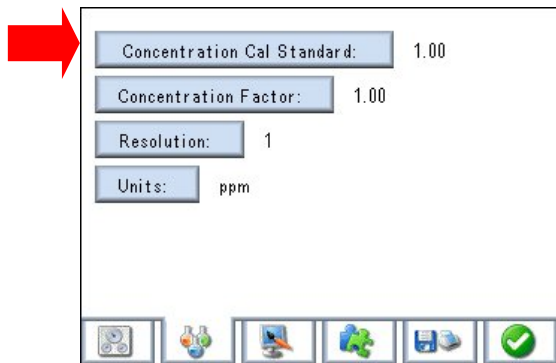
Setting Concentration Parameters

The rate of change of absorbance can be converted to concentration using a known factor or reference concentration value. Whichever is not required should be set to unity so that it is ignored in the calculation.



Concentration Cal Standard

Select the Concentration Cal Standard key and enter the concentration value of the calibration standard. Values from 0.01 to 9999 can be entered. If a concentration value is not to be used then this should be set to 1.00.





Concentration Factor

This is the value by which the rate of change is multiplied to give the concentration. Select the Concentration Factor key and enter the factor value. Values from 0.01 to 9999 can be entered. If a Concentration Factor is not to be used this value should be set to 1.00.

Concentration Cal Standard: 1.00
Concentration Factor: 1.00
Resolution: 1
Units: ppm

Navigation icons: Home, Test Tubes, Arrow, Green Plus, Print, Green Checkmark



Selecting Resolution

This enables the resolution of the result to be set. Resolution can be set using the **Resolution** key to scroll through the available options and pressing the **Enter** key to accept. Resolution options are: 1, 0.1, 0.01 and 0.001.

Concentration Cal Standard: 1.00
Concentration Factor: 1.00
Concentration Offset: 0.00
Resolution: 1
Units: ppm

Navigation icons: Home, Test Tubes, Arrow, Green Plus, Print, Green Checkmark



Selecting Units

Selection of units is made using the **Units** key to scroll through the available measurement options. The following units are available:- mEq/l, ppm, mg/l, g/l, %, µg/ml, mg/ml, g/dl, mg/dl, µg/l, ng/l, µg/dl, M, mM, µM/l, U/l, mU/IU/ml, blank.

Note: The unit is simply a name tag added to the result. Due to the variety of samples that may be measured it is impossible to enable any direct conversion between units.

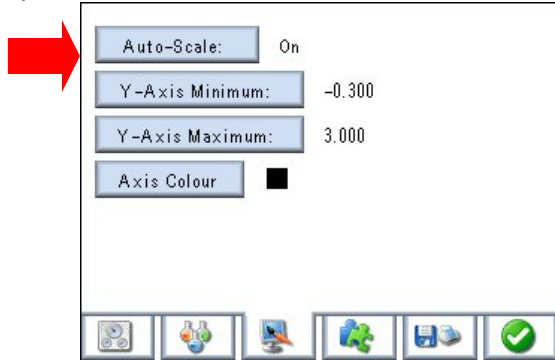
Concentration Cal Standard: 1.00
Concentration Factor: 1.00
Concentration Offset: 0.00
Resolution: 1
Units: ppm

Navigation icons: Home, Test Tubes, Arrow, Green Plus, Print, Green Checkmark



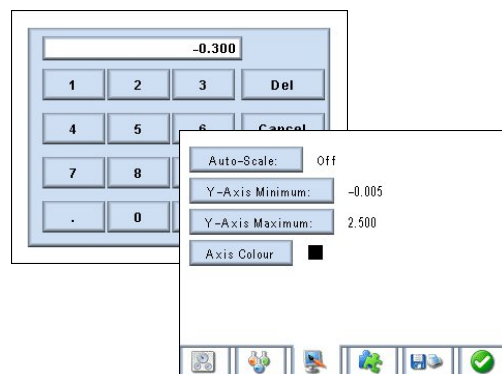
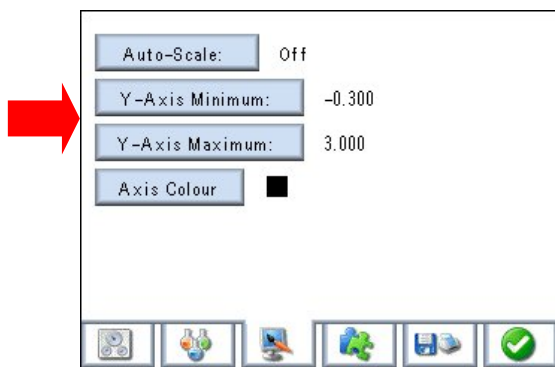
Setting Auto-Scale

The **Auto-Scale** key toggles between **On** and **Off**. With the **Auto-Scale** function **On** the instrument will automatically set the Y-axis maxima to a level that will fit the graph of the kinetics run. When set to **On** the manual settings for Y-axis maximum and minimum are non-functional. These settings can be changed with post run analysis tools to enable alternative views and printouts after the run has been completed.



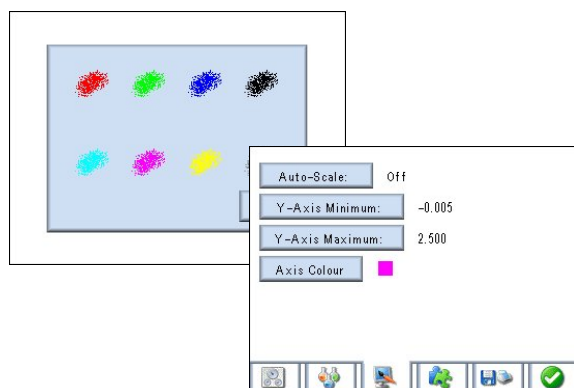
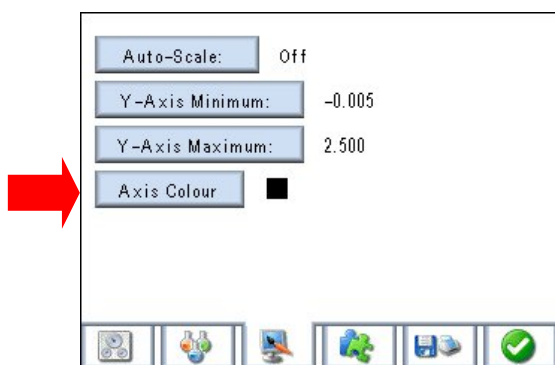
With the **Auto-Scale** function set to **Off** the **Y-Axis Minimum** enables the lowest displayed level for the Y-axis to be manually set. Press the **Y-Axis Minimum** key and a numeric keypad will be displayed for entry of this value. This value can be between -0.300 and 2.999 .

The **Y-Axis Maximum** enables the highest displayed level for the Y-axis to be manually set. Press the **Y-Axis Maximum** key and a numeric keypad will be displayed for entry of this value. This value can be between 3.000 and -0.299 .



Selecting Axis Colour

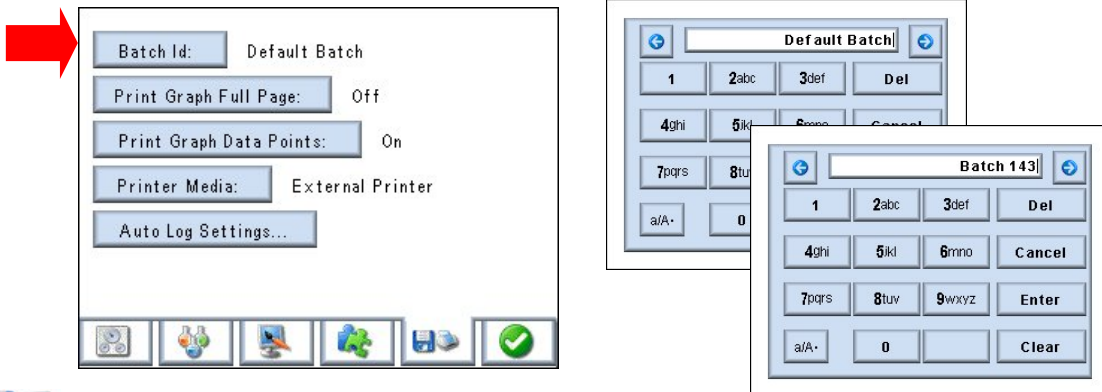
Pressing the **Axis Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.





Setting Batch ID

Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.



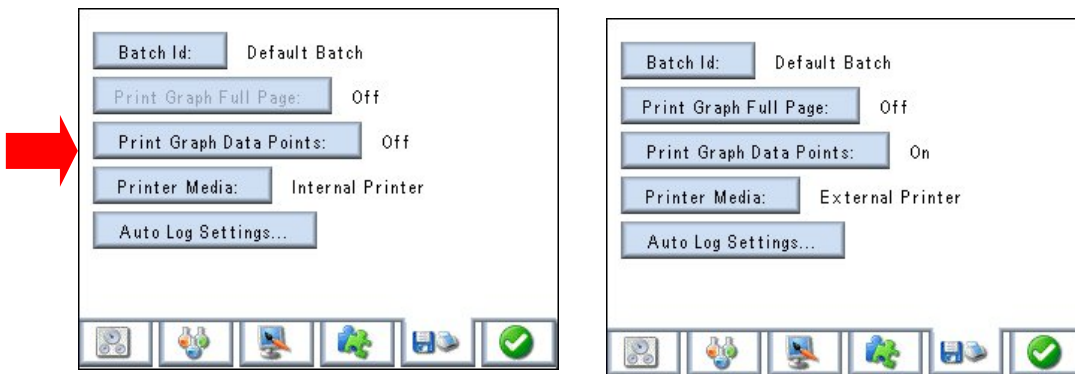
Setting Graph Data Points

The option to print graphs on a full page is only available if the **External** printer is selected. If available and set to **On** the graph will be printed on one page (typically A4 landscape format) with the data on following pages.

If available and set to **Off** the graph will be printed with the data below it (typically top half A4 portrait).

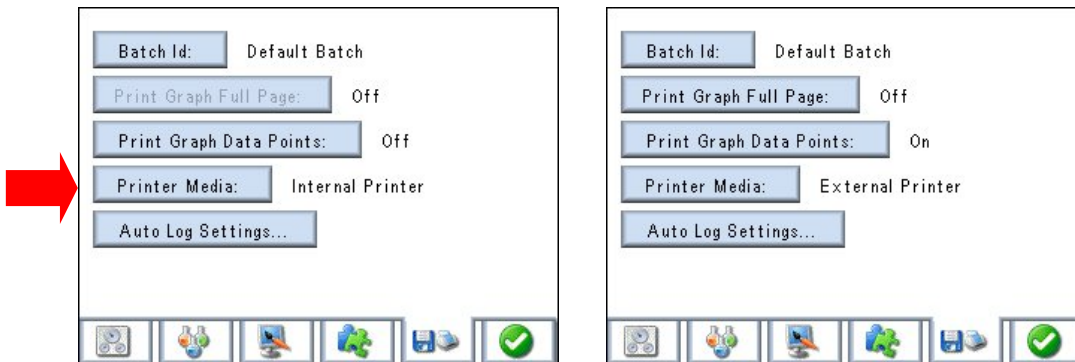
The **Print Graph Data Points** key toggles between **On** and **Off**.

With this key set to **On** all the data points that make up the graph will be printed in a table following the graph.



Selecting Printer Media

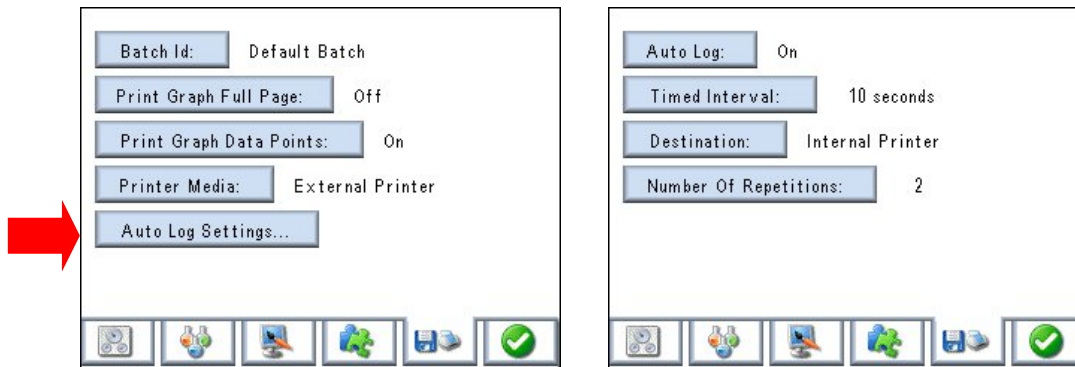
The **Printer Media** options toggle between Internal and External Printers.





Auto Log Settings...

Selecting **Auto Log Settings...** opens a dedicated sub-menu. This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:



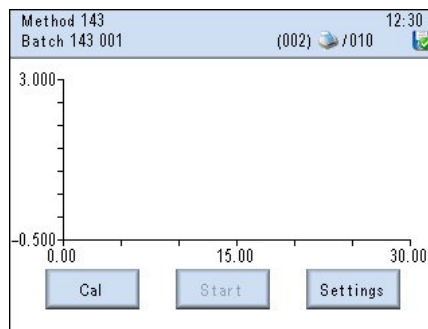
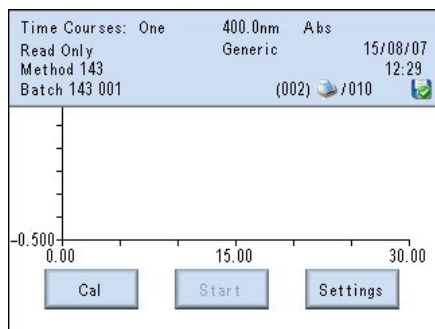
the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.



File & Data Management



Save



Tools



Print



Settings



Erase



Search
Results



Open
Results



Save

Saving Methods

Having entered all your required settings on the tabbed pages the method can be saved by simply pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Sharing Methods

Methods can be shared with other users by setting the security level at either **Read-Only** where other users can use but not modify the method or, **Public** where they can use and modify the method. Other users must then ensure that under **Method View Settings** (Settings/User Preferences/Method View Settings) they have enabled **Public** and/or **Read-Only** methods or turned **All Methods** on.

Recalling Methods

Following selection of the operating mode from the main menu the method browse screen is displayed. This will show all methods that the current user has access to, based on their selections in the **Method View Settings** (refer to Sharing Methods). If the first page is full, cursor arrows will be displayed to enable navigation to and from additional pages.

Alternatively, selection may be made using the alphanumeric menu bar at the bottom of the screen. Repeated pressing of each character set will display the full alphanumeric range and the screen will show all methods starting with the highlighted character.

Touch the required method when it is displayed on the screen to highlight it, touch the **Open File** icon to display the main measurement screen for that method.

Editing Methods

Use the Recalling Methods procedure to recall the required method. With the measurement screen displayed touch the **Settings** option. Adjust the settings as required and touch the **Green Tick** icon on completion. The modified method can then be saved by pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Note: If the Method name was not changed during editing it will be saved with the same name but with a new date and time to ensure traceability. If the old method is no longer required it should be deleted as detailed in Deleting Methods.

Deleting Methods

To delete methods highlight the required method in the Browse screen as described in Recalling Methods and then touch the **Eraser** icon.

A warning message will be displayed to ensure this action is required. On confirmation the selected file will be deleted.

If the current user does not have the required privileges to delete the selected message then an information message will be displayed advising that the method cannot be deleted.

Privileges required for deleting designated methods:

Public Methods – only the Supervisor can delete these.

Read-Only Methods – only the Supervisor and Originator can delete these.

Personal Methods – Only the Originator can delete these methods. (The Supervisor can delete these by re-setting the Originator's PIN code and then logging in as the Originator).

Saving Results

After completion of a measurement the result can be saved by simply pressing the **Save** key on the display surround. The result is saved under the method that created it, with the entered Batch ID and an incremental number along with the time and date of the measurement. Results can also be saved as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Printing Results

After completion of a measurement the result can be printed, by simply pressing the **Print** key on the display surround. The result will be printed to either the internal or external printer, as selected by the user in the **Printer Settings** option.

The first result of any new batch is preceded by a print header, which gives details of the method settings and Batch ID. Results can also be printed as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Recalling Results

Stored results are always directly linked to the method that created them. To access results first recall the method as described in Recalling Methods (page xx). With the method highlighted touch the **Search Results** icon. This will open a screen detailing all results available to the current user. Touch the required result or batch (depending on the mode) and then the **Open Specific Result** icon. This will display the results on the screen. The **Tools** option can then be used to work on these results (depending on mode). It is also possible to print the result by simply pressing the **Print** key on the display surround. Options to print to the Internal or External printer or to the Data Card will be displayed. Printing to the Data Card will save an EPS (Encapsulated Postscript) file to the Data Card. This is in printer ready format and can be viewed and printed in a number of software packages, including Adobe PhotoShop[®], Corel Draw[®], Ghostscript[®] and many other file management systems.

Sharing Results

Results attached to **Personal Methods** cannot be accessed by any other user.

Results attached to **Read-Only** and **Public Methods** can be accessed by all users, based on their current **Method View Settings**.

Deleting Results

Results can only be deleted by the Originator or the Supervisor through **Administrative Functions**. Recall the required result without opening it. Highlight the result (or batch of results) and then press the **Erase** icon. A warning message will be displayed to ensure this action was intended. On confirmation the results will be permanently deleted.

8.5 Performing Measurements – All Users

With a method created, or re-called and opened, the kinetics measurement screen is displayed. Before starting a run, a zero absorbance calibration must be carried out to standardise the instrument at the selected wavelength.

Press the **Cal** key and wait while the prompt advises of the calibration progress. When completed the **Run** key becomes active.

Place a prepared sample cuvette in the sample chamber and close the lid. Press the **Run** key to start the measurement. If a lag time has been programmed a countdown prompt will be displayed for its duration and then the run will commence. The plot being will be displayed as the measurements are taken over the run time.

On completion of the run a calculated concentration value is shown to the right of the graph, tagged with the units of measurement selected. Further samples can be measured in the same way.

Post Run Tools

On completion of a measurement, or with a recalled result displayed, a number of tools can be used to analyse and display the data.

Pressing the **Tools** icon on the display surround displays the bottom toolbar with icons for a number of functions:



Pressing the **Measurement Display** icon gives access to options for:



Auto-Scale – pressing this icon switches Auto-Scale on and off. When Off the Y-Axis scale is set to the manual values entered in the settings. When On it will set the Y-Axis to give the maximum resolution for the display area.



Pressing this icon decreases the resolution of the displayed concentration, cycling through 0.001, 0.01, 0.1 and 1.



Pressing this icon increases the resolution of the displayed concentration, cycling through 1, 0.1, 0.01 and 0.001.



Pressing the information icon displays details of the curve with the mean rate of change, plus the formula of the line of best fit.



When this option is selected the QWheel™ is activated to control the display cursors. Initially both cursors are active to select a portion of the curve. Pressing the Cursor Select icon activates the right and left cursor in turn to adjust the size of the selected area. The start and end times selected by the cursors are independently displayed at the right side of the toolbars.



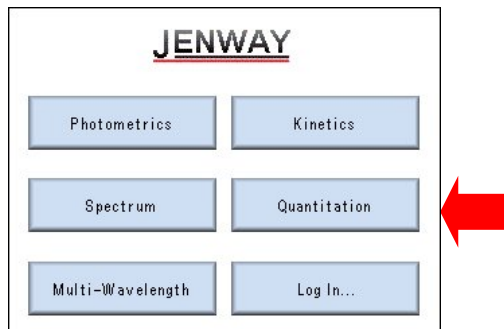
By pressing the Calculator icon the concentration value is re-calculated based on the part of the curve selected. This function can be used for method development and selecting the optimum run times, lag and incubation periods.

Section 9

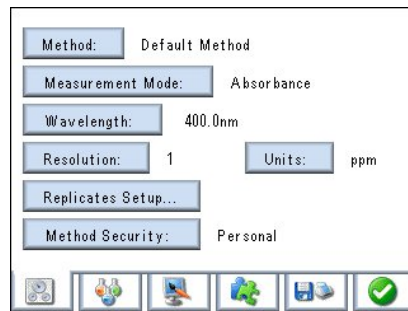
Quantitation Mode

9.1 Principles of Measurement

The concentration of a substance in a sample can be found by comparing it to prepared standardised solutions of that substance. A number of standard solutions are carefully made over a range of concentrations. These solutions are measured by the spectrophotometer at a set wavelength and a graph created of the concentration against the absorbance or transmittance. Samples can then be measured in terms of absorbance or transmittance and the concentration calculated by the spectrophotometer by comparison to the graphical plot of the known concentration standards. Linear, quadratic and cubic curve fit functions are available, plus automation with an optional 8-cell changer module.



9.2 Mode Menus and Icons



Mode settings – method name, wavelength, measurement mode, resolution, units, method security (if logged in)



Calibration – allows setting of cal standards (up to 20)



Measurement display – allows setting of curve fit, auto scaling, axis setting, colour selection



Accessory options – varies with type of accessory module fitted



Allows selection of internal or external printer, graph details, batch ID and the Auto Save options

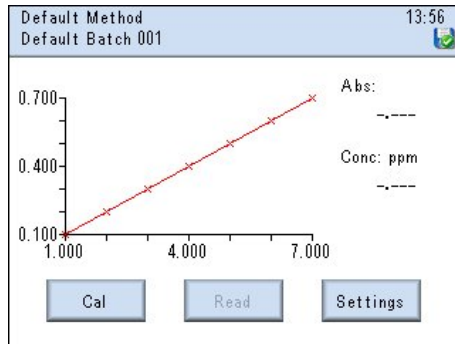


Press to accept settings entered

9.3 Free Operation

Settings

If the user is not logged in then the main measurement screen will automatically be displayed when the **Quantitation** mode is selected from the **Main Menu**.



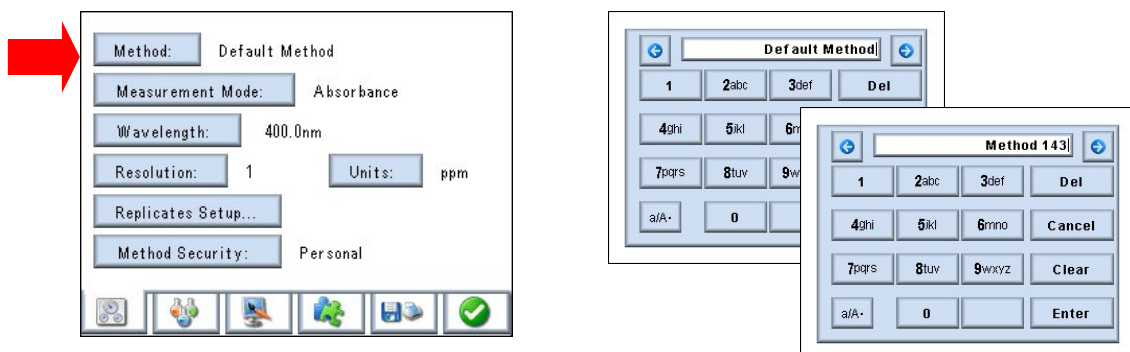
To enter the required parameters for the sample(s) under test, select the **Settings** key and the instrument will display the following screen:



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.

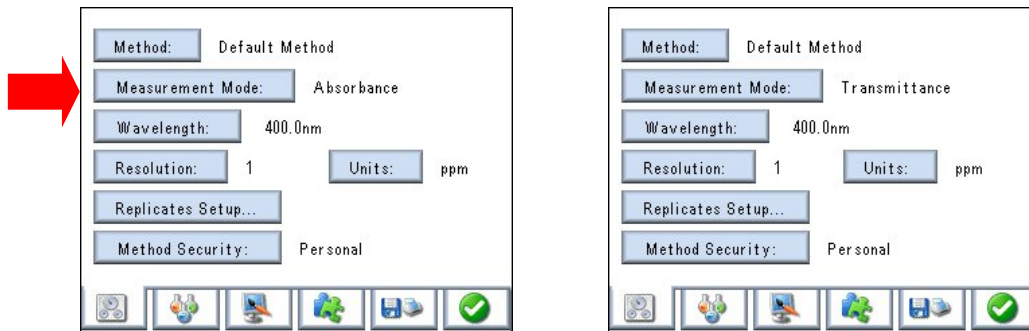
Note: The new Method ID can only be used to identify the method on a printout to the internal or external printer module. The generic user has no additional facility to store or recall these results or the method settings.





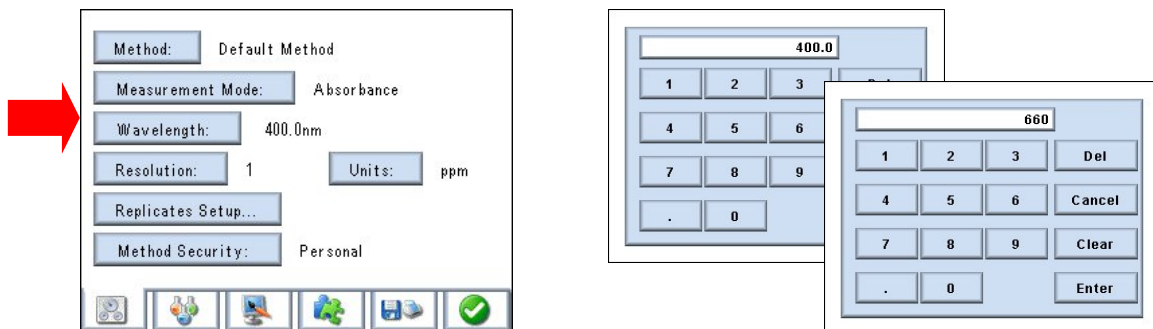
Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.



Setting Wavelength

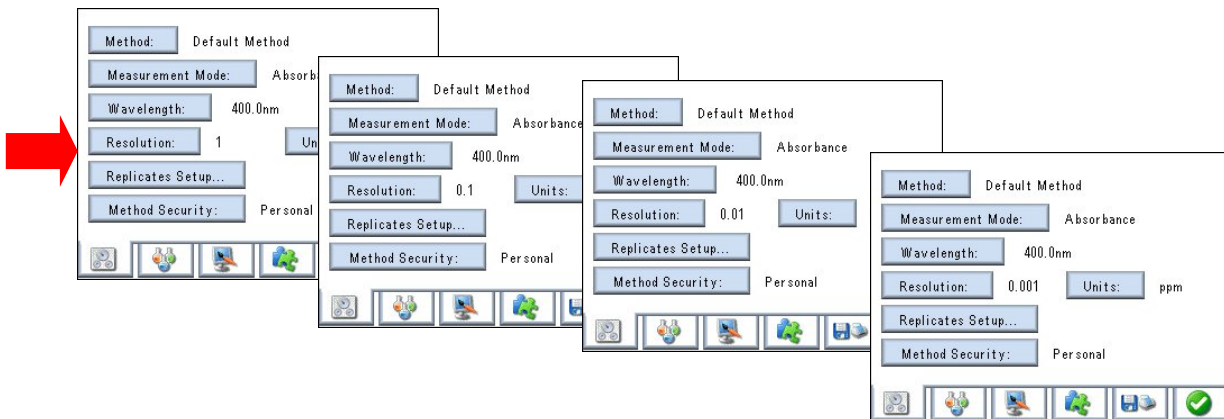
Select the **Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out).



Selecting Resolution

This enables the resolution of the result to be set. Resolution can be set using the **Resolution** key to scroll through the available options.

Resolution options are: 1, 0.1, 0.01 and 0.001.





Selecting Units

Selection of units is made using the **Units** key to scroll through the available measurement options. The following units are available:- mEq/l, ppm, mg/l, g/l, %, µg/ml, mg/ml, g/dl, mg/dl, µg/l, ng/l, µg/dl, M, mM, µM/l, U/l, mU/IU/ml, blank.

Note: The unit is simply a name tag added to the result. Due to the variety of samples that may be measured it is impossible to enable any direct conversion between units.

Method: Default Method
Measurement Mode: Absorbance
Wavelength: 400.0nm
Resolution: 1 Units: ppm
Replicates Setup...
Method Security: Personal



Replicates Setup...

Selecting **Replicates Setup...** opens a dedicated sub-menu.

Up to 5 replicates may be selected, with the recorded result being the average of the 5 or as the last measured result.

Method: Default Method
Measurement Mode: Absorbance
Wavelength: 400.0nm
Resolution: 1 Units: ppm
Replicates Setup...
Method Security: Personal

Replicates: 1
Replicates Method: Averaging

3
1 2 3 Del
4 5 6 Cancel
7 8 9 Clear
0 Enter

Replicates: 3
Replicates Method: Averaging

Replicates: 3
Replicates Method: Last



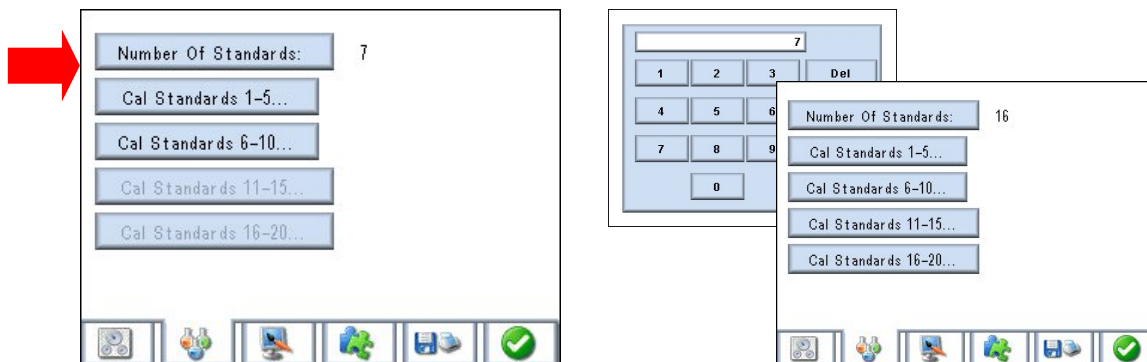
Setting Method Security

This option is only available to logged in users.



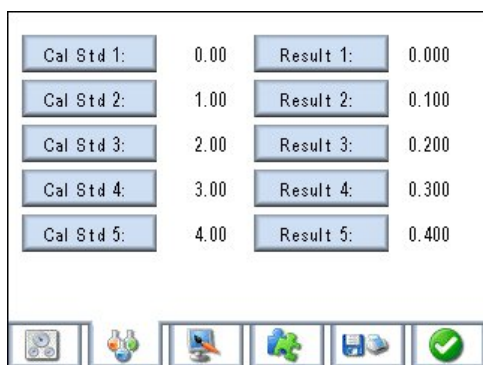
Selecting Calibration Standards

Up to 20 calibration standards may be used to plot the calibration curve (with up to 5 replicates for each). Select the **Number Of Standards** key and enter the total number of standards to be used (including the blank) via the numeric keypad. The value entered can be from 2 to 20. Depending on the number entered the subsequent keys with values beyond the requirements will be greyed out.



Pressing each of the active keys below this enables the values for each standard to be input. If working from a pre-defined calibration curve or table the corresponding absorbance value for each standard can be entered as the result. If creating the curve from a set of standards the **Results** column will be re-populated with the measured absorbances once the calibration curve has been created.

Pressing the **Cal Std 1** key opens a numeric input window. Enter the value for the first standard (this may be the blank). When completed a corresponding absorbance value can be entered in a similar manner by pressing the **Result 1** key, if working from a pre-defined calibration curve.

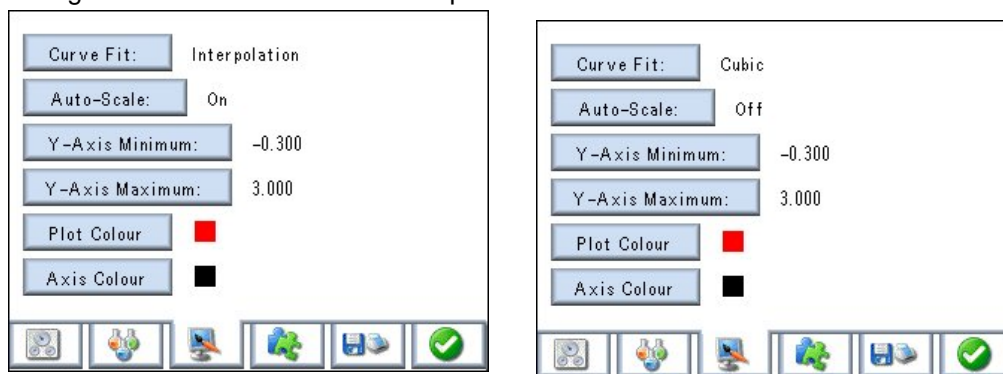


Further standard (and absorbance values, if required) can be entered in a similar manner for all the standards selected under **Number Of Standards**.



Setting Curve Fit

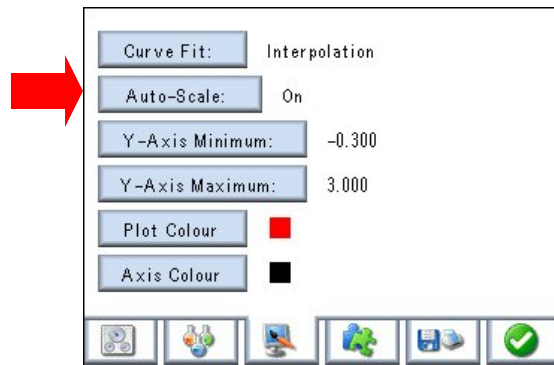
The **Curve Fit** key scrolls through the available options – Interpolation, Linear Regression, Regression through zero, Quadratic, Quadratic through zero, Cubic, Cubic through zero. The selected curve fit can be changed on recalled results and with post measurement tools.





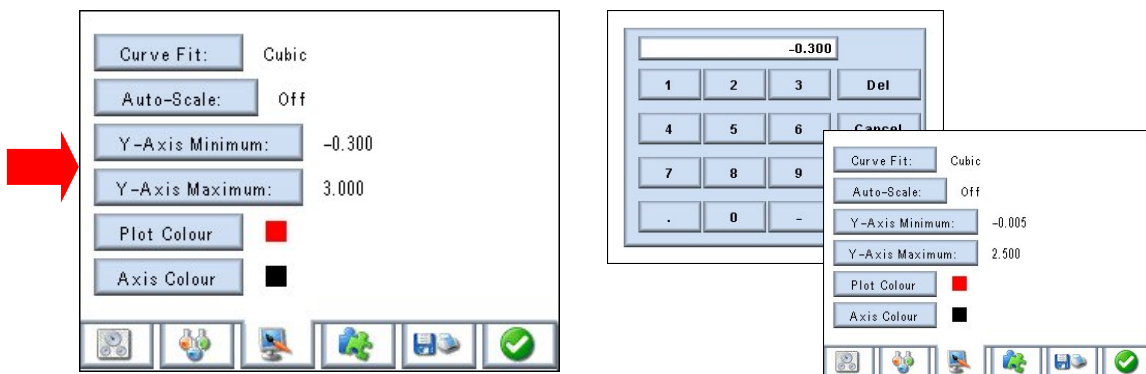
Setting Auto-Scale

The **Auto-Scale** key toggles between **On** and **Off**. With the **Auto-Scale** function **On** the instrument will automatically set the Y-axis maxima to a level that will best fit the calibration curve. When set to **On** the manual settings for Y-axis maximum and minimum are non-functional. These settings can be changed with post calibration analysis tools to enable alternative views and printouts after the scan has been completed.



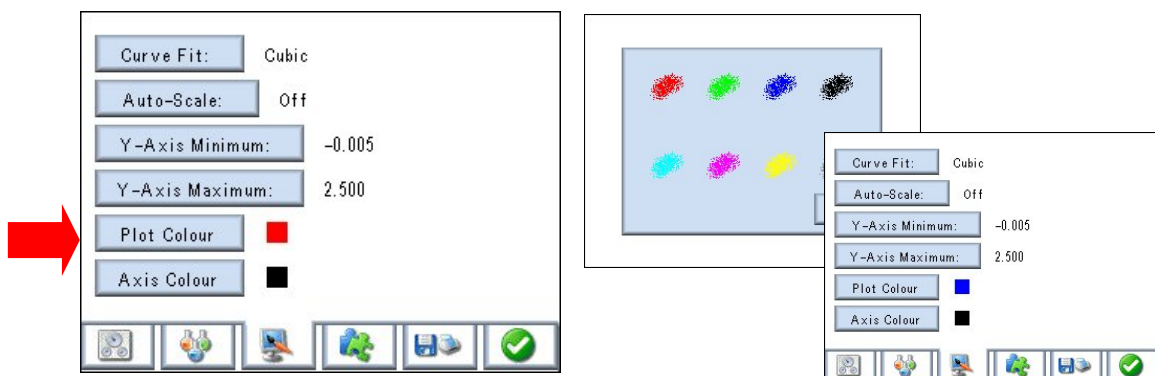
With the **Auto-Scale** function set to **Off** the **Y-Axis Minimum** enables the lowest displayed level for the Y-axis to be manually set. Press the **Y-Axis Minimum** key and a numeric keypad will be displayed for entry of this value. This value can be between -0.300 and 2.999 .

The **Y-Axis Maximum** enables the highest displayed level for the Y-axis to be manually set. Press the **Y-Axis Maximum** key and a numeric keypad will be displayed for entry of this value. This value can be between 3.000 and -0.299 .



Selecting Plot Colour

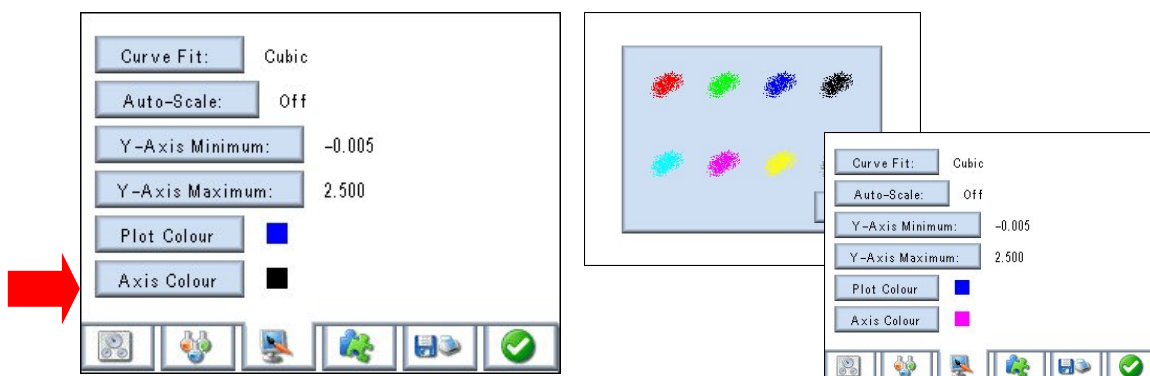
Pressing the **Plot Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.





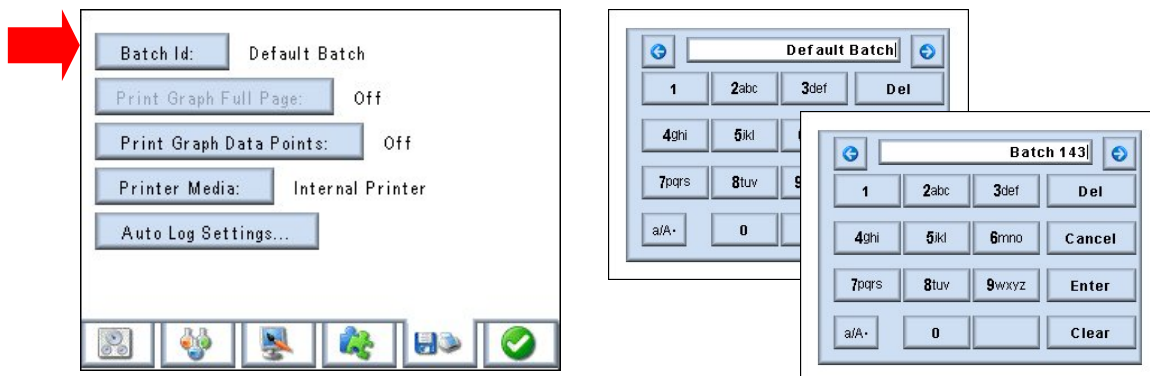
Selecting Axis Colour

Pressing the **Axis Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.



Setting Batch ID

Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.

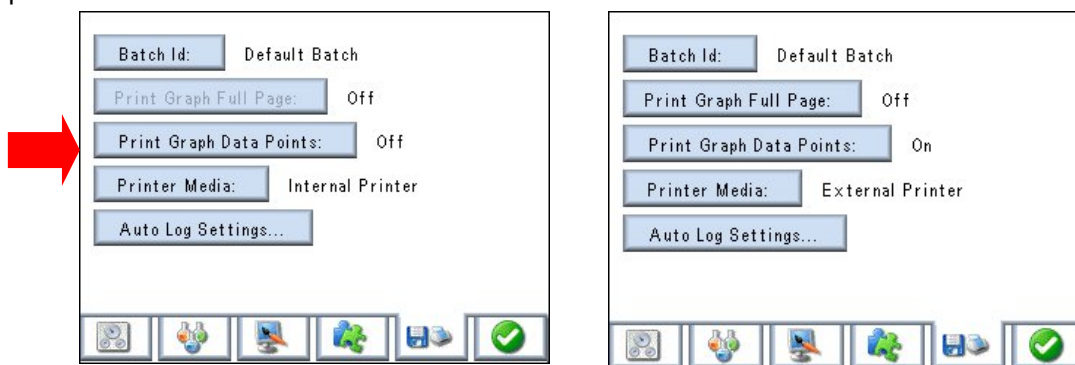


Setting Graph Data Points

The option to print graphs on a full page is only available if the **External** printer is selected. If available and set to **On** the curve will be printed on one page (typically A4 landscape format) with the data on following pages. If available and set to **Off** the curve will be printed with the data below it (typically top half A4 portrait).

The **Print Graph Data Points** key toggles between **On** and **Off**.

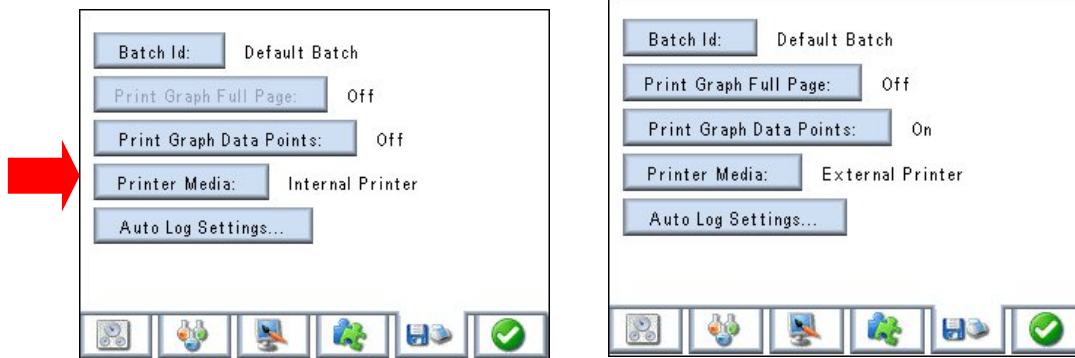
With this key set to **On** all the data points that make up the graph will be printed in a table following the graph.





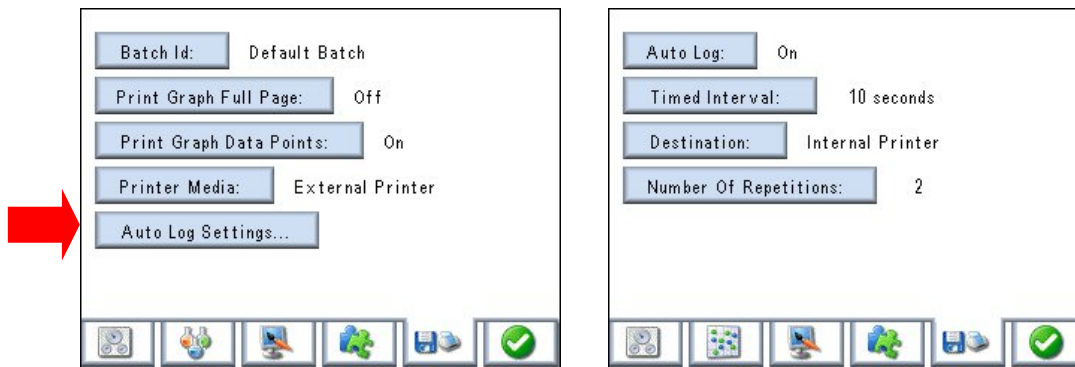
Selecting Printer Media

The **Printer Media** options toggle between Internal and External Printers.



Auto Log Settings...

Selecting **Auto Log Settings...** opens a dedicated sub-menu. This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:



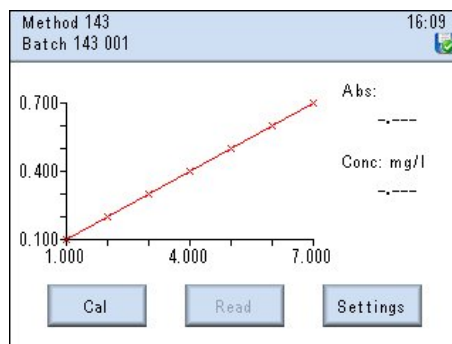
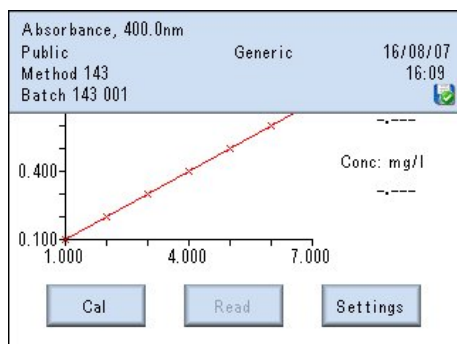
the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

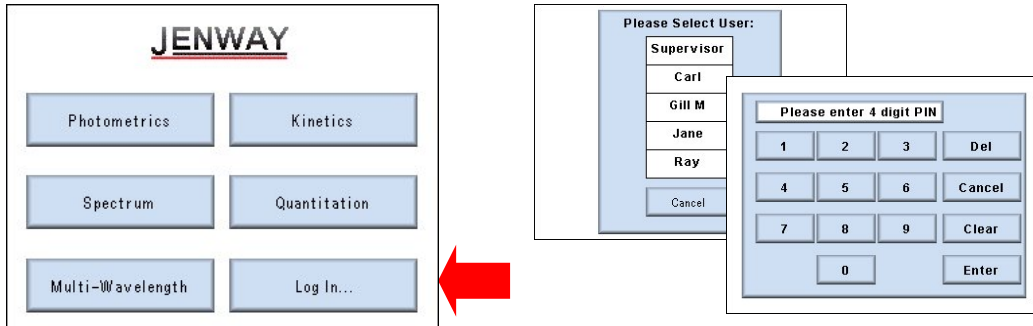
Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.

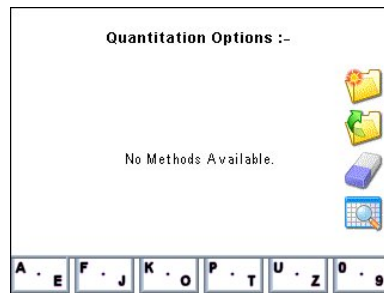


9.4 Logged In Measurement

PIN Codes – Each user is allocated a 4 digit PIN code that is required when logging in. Select **Log In...** from the **Main Menu** and a list of users will be shown. Select the appropriate user name and a numeric keypad will be displayed. Enter your 4 digit PIN code and press the **Enter** key to confirm.




Once logged in method screen options will be displayed:




Methods are stored sequentially by measurement mode. Once the first page is full (8 methods for the selected mode) cursor arrows are displayed enabling the user to browse to subsequent or previous pages of 8 methods.


Alternatively, pressing one of the alphanumeric keys along the bottom of the screen will display all available methods with the initial character that is highlighted.


Note: Repeated pressing of a key sequentially highlights the characters between those displayed.


 Create a New Method

For the following functions first touch a method or result to select it.

 Open the Selected Method

 Erase the Selected Method

 Browse Results – linked to the selected method

 Open specific results in the selected batch



Creating a New Method

To enter the Method ID, appropriate measurement parameters and the level of Method Security required for the method being created select the **New File** icon.

Method: Default Method
Measurement Mode: Absorbance
Wavelength: 400.0nm
Resolution: 1 Units: ppm
Replicates Setup...
Method Security: Personal



Setting Method ID

To allocate a Method name select the **Method** key and enter the preferred name using the alphanumeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the method name will remain as Default Method. The **Enter** key accepts the new method ID and returns you to the previous menu.

Method: Default Method
Measurement Mode: Absorbance
Wavelength: 400.0nm
Resolution: 1 Units: ppm
Replicates Setup...
Method Security: Personal

Method 143



Selecting Measurement Mode

The **Measurement Mode** key toggles between Absorbance and Transmittance.

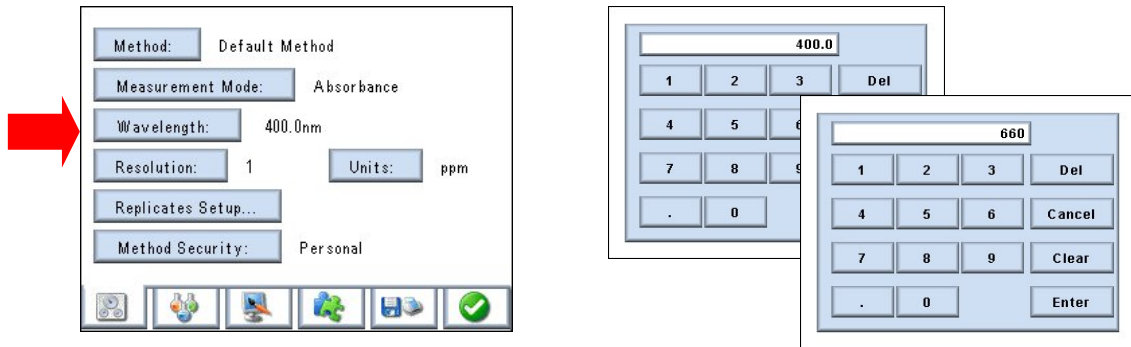
Method: Default Method
Measurement Mode: Absorbance
Wavelength: 400.0nm
Resolution: 1 Units: ppm
Replicates Setup...
Method Security: Personal

Method: Default Method
Measurement Mode: Transmittance
Wavelength: 400.0nm
Resolution: 1 Units: ppm
Replicates Setup...
Method Security: Personal



Setting Wavelength

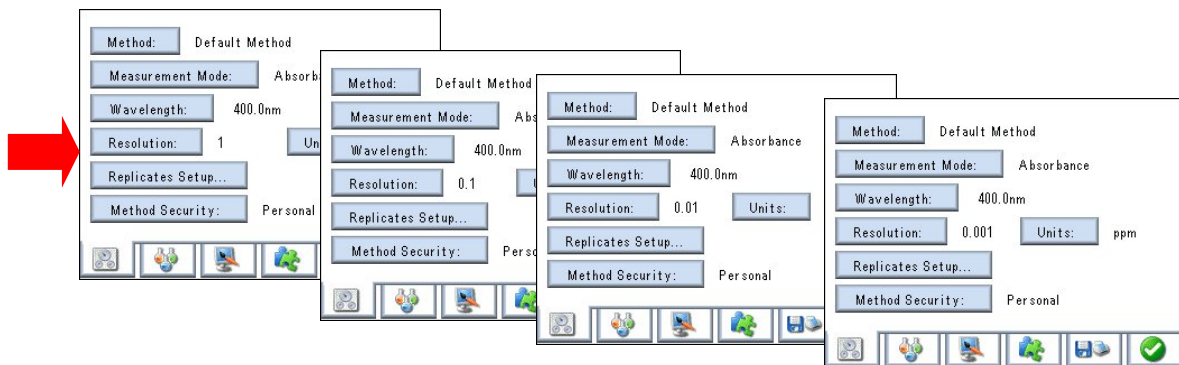
Select the **Wavelength** key and enter the wavelength using the numeric keypad. The **Clear** key will clear all information entered from the screen. The **Del** key allows individual letters or digits to be removed. The **Cancel** key will return you to the previous menu and the wavelength will not alter. The **Enter** key accepts the new wavelength and returns you to the previous menu. (At certain wavelengths order selecting filters may be heard switching in or out).



Selecting Resolution

This enables the resolution of the result to be set. Resolution can be set using the **Resolution** key to scroll through the available options.

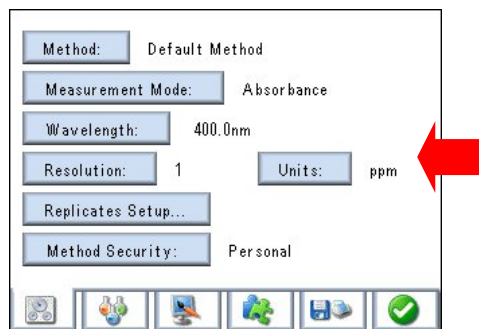
Resolution options are: 1, 0.1, 0.01 and 0.001.



Selecting Units

Selection of units is made using the **Units** key to scroll through the available measurement options. The following units are available:- mEq/l, ppm, mg/l, g/l, %, µg/ml, mg/ml, g/dl, mg/dl, µg/l, ng/l, µg/dl, M, mM, µM/l, U/l, mU/IU/ml, blank.

Note: The unit is simply a name tag added to the result. Due to the variety of samples that may be measured it is impossible to enable any direct conversion between units.

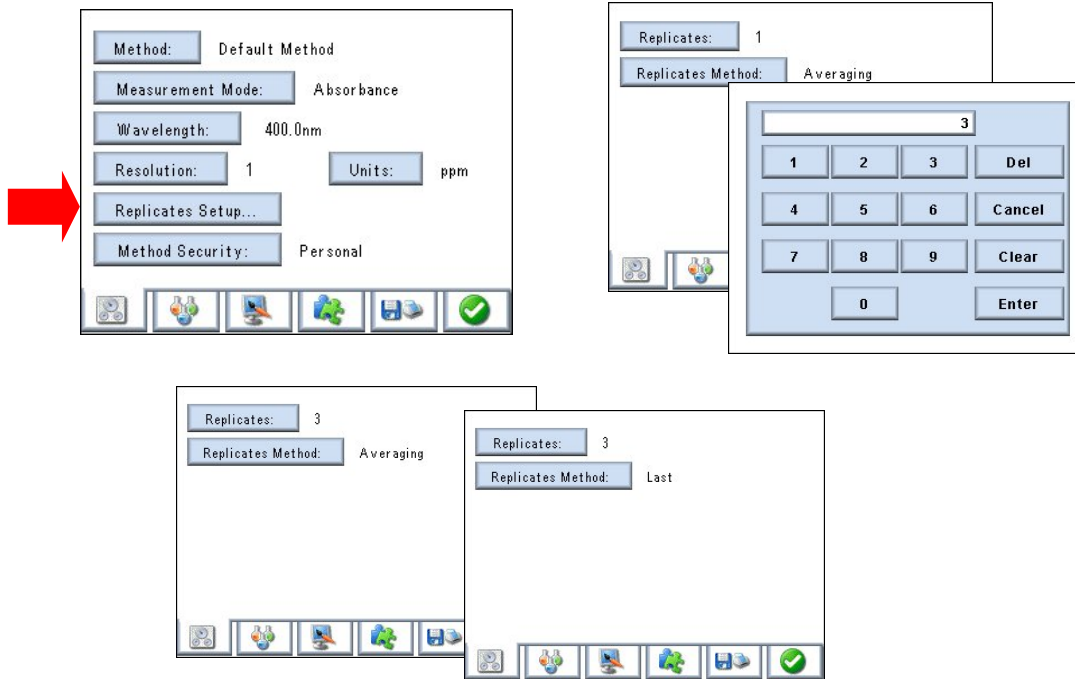




Replicates Setup...

Selecting **Replicates Setup...** opens a dedicated sub-menu.

Up to 5 replicates may be selected with the recorded result being the average of the 5 or as the last measured result.



Setting Method Security

The 67 Series spectrophotometers can support up to 10 individual users plus one Supervisor who has full administrative rights.

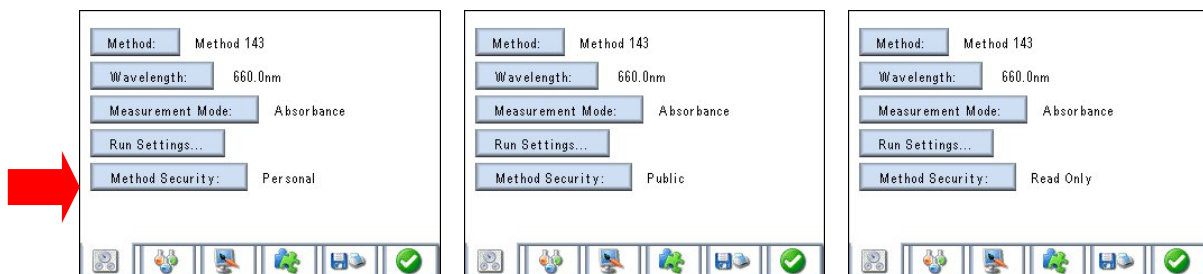
Logged in users can create methods with three levels of security options:

Personal – these methods are only accessible by the originator.

Public – these methods are available for use and modification by any logged in user.

Read-Only – these methods can be accessed by all logged in users, but can only be modified by the originator.

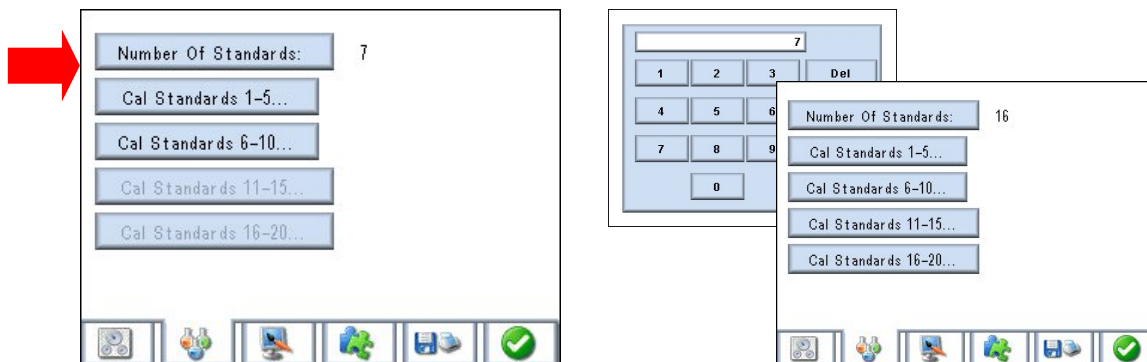
The preferred level of protection can be achieved by selecting the **Method Security** key that toggles between **Personal**, **Public** and **Read-Only** options.





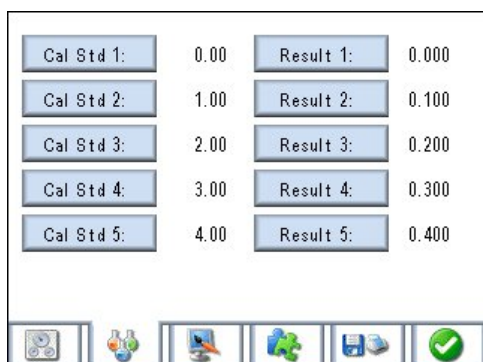
Selecting Calibration Standards

Up to 20 calibration standards may be used to plot the calibration curve (with up to 5 replicates for each). Select the **Number Of Standards** key and enter the total number of standards to be used (including the blank) via the numeric keypad. The value entered can be from 2 to 20. Depending on the number entered the subsequent keys with values beyond the requirements will be greyed out.



Pressing each of the active keys below this enables the values for each standard to be input. If working from a pre-defined calibration curve or table the corresponding absorbance value for each standard can be entered as the result. If creating the curve from a set of standards the **Results** column will be re-populated with the measured absorbances once the calibration curve has been created.

Pressing the **Cal Std 1** key opens a numeric input window. Enter the value for the first standard (this may be the blank). When completed a corresponding absorbance value can be entered in a similar manner by pressing the **Result 1** key, if working from a pre-defined calibration curve.

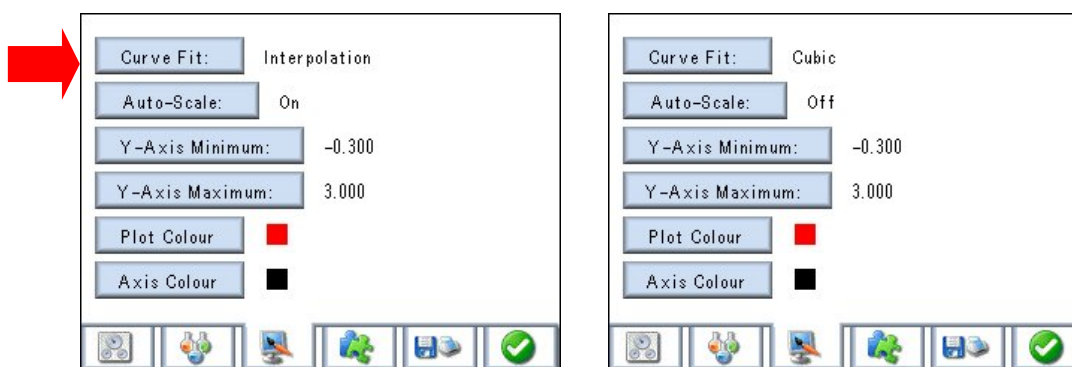


Further standard (and absorbance values, if required) can be entered in a similar manner for all the standards selected under **Number Of Standards**.



Setting Curve Fit

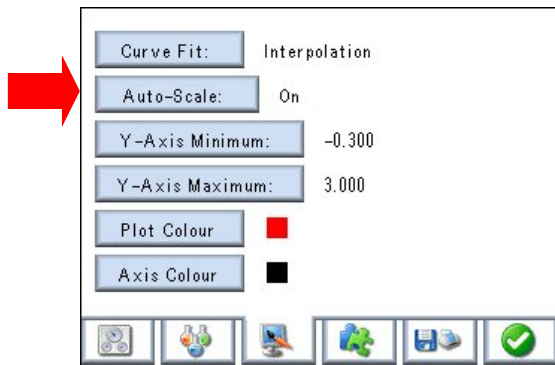
The **Curve Fit** key scrolls through the available options – Interpolation, Linear Regression, Regression through zero, Quadratic, Quadratic through zero, Cubic, Cubic through zero. The selected curve fit can be changed on recalled results and with post scan measurement tools.





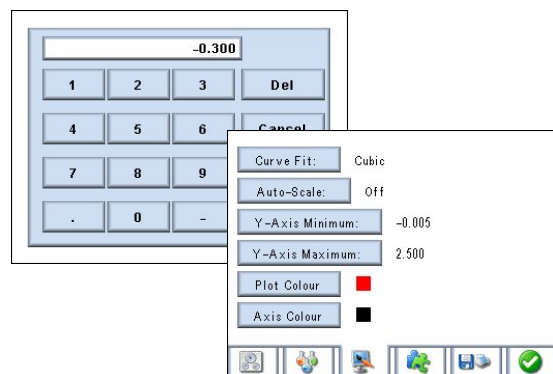
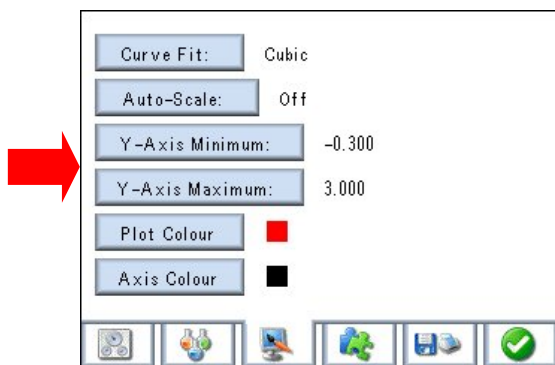
Setting Auto-Scale

The **Auto-Scale** key toggles between **On** and **Off**. With the **Auto-Scale** function **On** the instrument will automatically set the Y-axis maxima to a level that will best fit the calibration curve in the display area. When set to **On** the manual settings for Y-axis maximum and minimum are non-functional. These settings can be changed with post calibration analysis tools to enable alternative views and printouts after the scan has been completed.



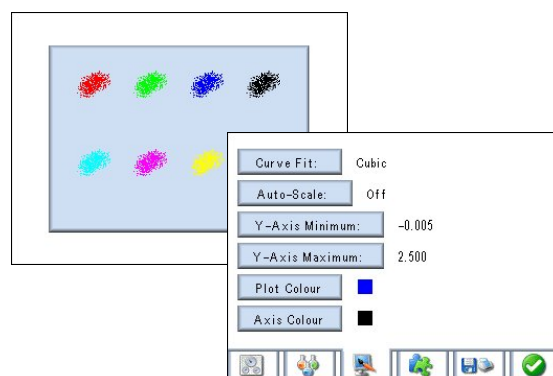
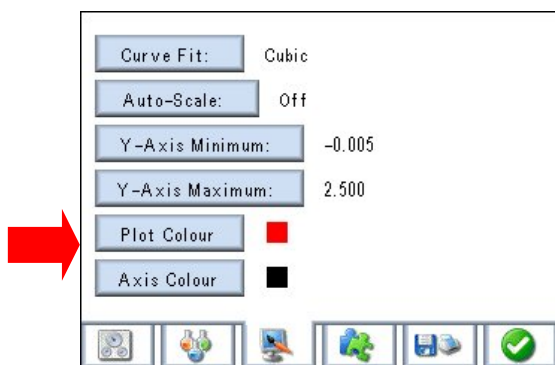
With the **Auto-Scale** function set to **Off** the **Y-Axis Minimum** enables the lowest displayed level for the Y-axis to be manually set. Press the **Y-Axis Minimum** key and a numeric keypad will be displayed for entry of this value. This value can be between -0.300 and 2.999 .

The **Y-Axis Maximum** enables the highest displayed level for the Y-axis to be manually set. Press the **Y-Axis Maximum** key and a numeric keypad will be displayed for entry of this value. This value can be between 3.000 and -0.299 .



Selecting Plot Colour

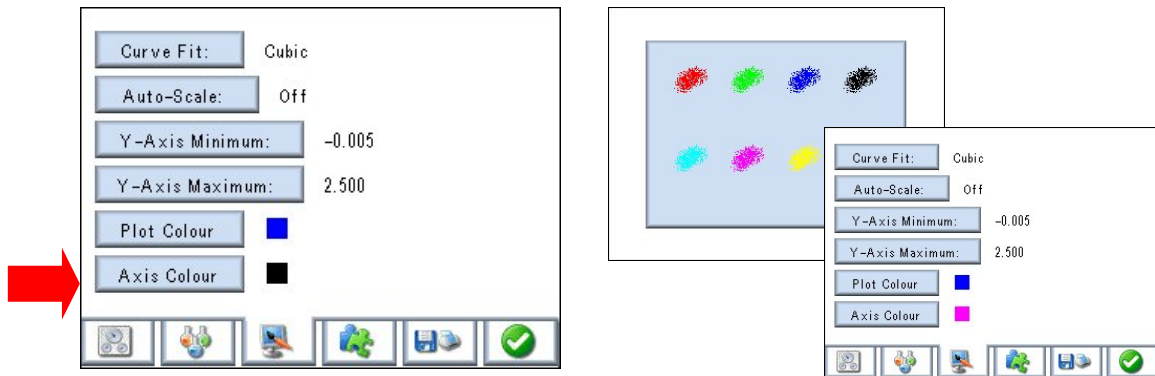
Pressing the **Plot Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.





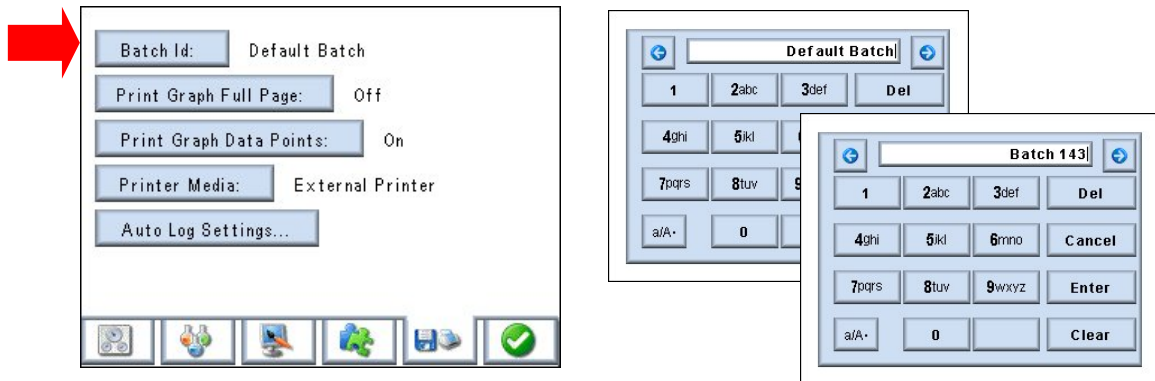
Selecting Axis Colour

Pressing the **Axis Colour** key displays a colour selection screen. Touch any one of the eight colours to select the preferred colour. Once selected, the instrument will update to show the selected colour.



Setting Batch ID

Select the **Batch ID** key and enter the batch code using the alphanumeric keypad. Press **Enter** to accept or **Cancel** to remain as a default.

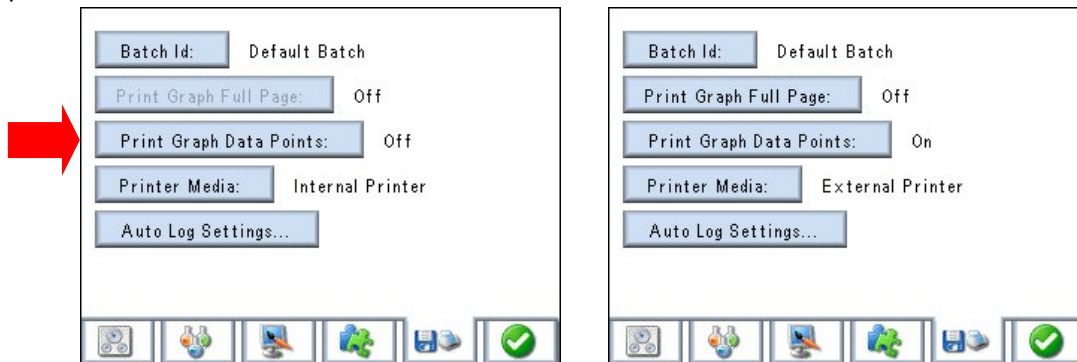


Setting Graph Data Points

The option to print graphs on a full page is only available if the **External** printer is selected. If available and set to **On** the curve will be printed on one page (typically A4 landscape format) with the data on following pages.

If available and set to **Off** the curve will be printed with the data below it (typically top half A4 portrait). The **Print Graph Data Points** key toggles between **On** and **Off**.

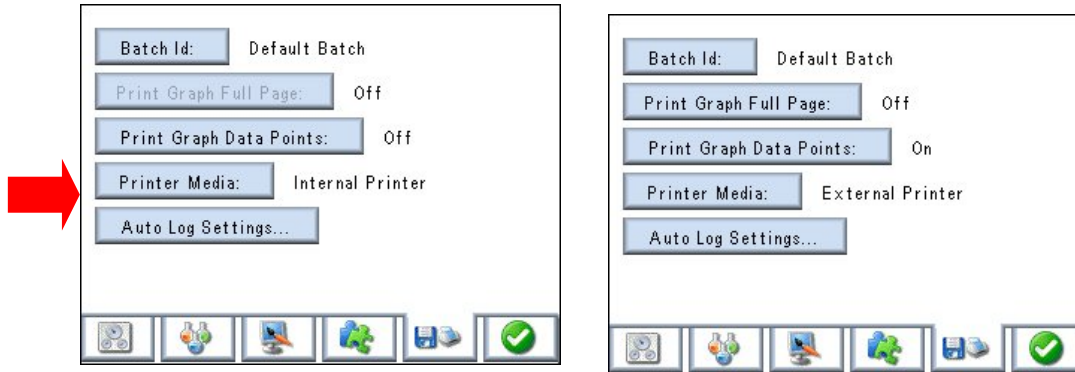
With this key set to **On** all the data points that make up the graph will be printed in a table following the graph.





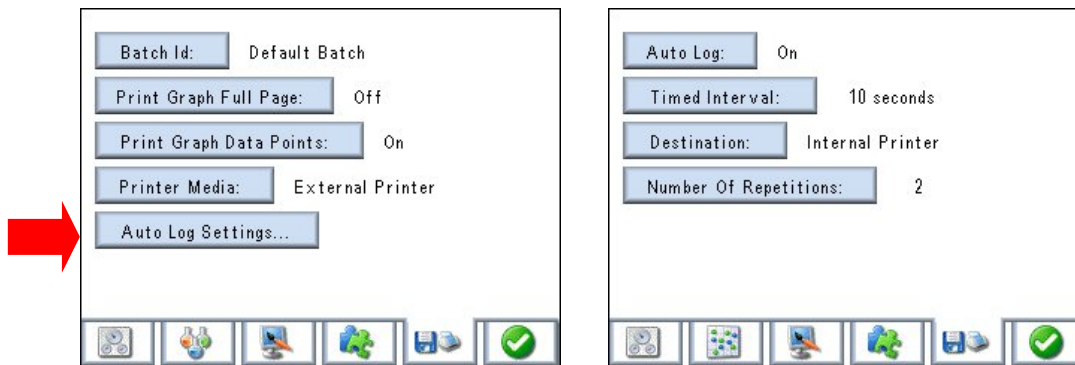
Selecting Printer Media

The **Printer Media** options toggle between Internal and External Printers.



Auto Log Settings...

Selecting **Auto Log Settings...** opens a dedicated sub-menu. This facility can be toggled between **Off** and **On**. When the **Auto Log** option is selected to **On** the user can set the following options:



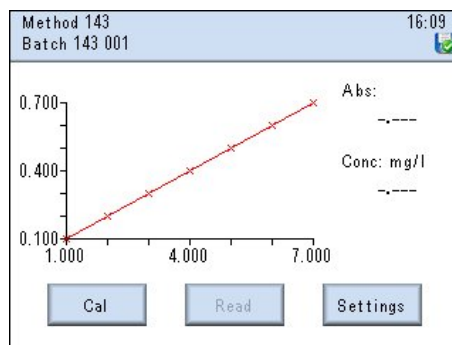
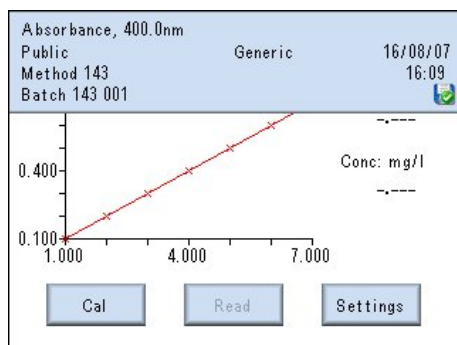
the timed interval between 10 and 9999 seconds using the numeric keypad;

the printer destination (toggles between internal or external);

the number of repetitions from 2 to 9999 using the numeric keypad.

Pressing the **Enter** key accepts the entered information and returns the instrument to the main measurement screen.

To view the set parameters press the status bar once and a drop down menu will appear. Pressing this bar again will return it to its original status.



File & Data Management



Save



Tools



Print



Settings



Erase



Search
Results



Open
Results



Save

Saving Methods

Having entered all your required settings on the tabbed pages the method can be saved by simply pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Sharing Methods

Methods can be shared with other users by setting the security level at either **Read-Only** where other users can use but not modify the method or, **Public** where they can use and modify the method. Other users must then ensure that under **Method View Settings** (Settings/User Preferences/Method View Settings) they have enabled **Public** and/or **Read-Only** methods or turned **All Methods** on.

Recalling Methods

Following selection of the operating mode from the main menu the method browse screen is displayed. This will show all methods that the current user has access to, based on their selections in the **Method View Settings** (refer to Sharing Methods). If the first page is full, cursor arrows will be displayed to enable navigation to and from additional pages.

Alternatively, selection may be made using the alphanumeric menu bar at the bottom of the screen. Repeated pressing of each character set will display the full alphanumeric range and the screen will show all methods starting with the highlighted character.

Touch the required method when it is displayed on the screen to highlight it, touch the **Open File** icon to display the main measurement screen for that method.

Editing Methods

Use the Recalling Methods procedure to recall the required method. With the measurement screen displayed touch the **Settings** option. Adjust the settings as required and touch the **Green Tick** icon on completion. The modified method can then be saved by pressing the **Save** key on the display surround. If you do not save at this point but continue to make measurements using the method, it will automatically be saved when you save the first result. If you continue without saving a result you will be prompted to save the method as you exit the operating mode or return to the settings options.

Note: If the Method name was not changed during editing it will be saved with the same name but with a new date and time to ensure traceability. If the old method is no longer required it should be deleted as detailed in Deleting Methods.

Deleting Methods

To delete methods highlight the required method in the Browse screen as described in Recalling Methods and then touch the **Eraser** icon.

A warning message will be displayed to ensure this action is required. On confirmation the selected file will be deleted.

If the current user does not have the required privileges to delete the selected message then an information message will be displayed advising that the method cannot be deleted.

Privileges required for deleting designated methods:

Public Methods – only the Supervisor can delete these.

Read-Only Methods – only the Supervisor and Originator can delete these.

Personal Methods – Only the Originator can delete these methods. (The Supervisor can delete these by re-setting the Originator's PIN code and then logging in as the Originator).

Saving Results

After completion of a measurement the result can be saved by simply pressing the **Save** key on the display surround. The result is saved under the method that created it, with the entered Batch ID and an incremental number along with the time and date of the measurement. Results can also be saved as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Printing Results

After completion of a measurement the result can be printed, by simply pressing the **Print** key on the display surround. The result will be printed to either the internal or external printer, as selected by the user in the **Printer Settings** option.

The first result of any new batch is preceded by a print header, which gives details of the method settings and Batch ID. Results can also be printed as part of the **Auto Log** function, which will vary depending on the type of sampling accessory fitted.

Recalling Results

Stored results are always directly linked to the method that created them. To access results first recall the method as described in Recalling Methods (page xx). With the method highlighted touch the **Search Results** icon. This will open a screen detailing all results available to the current user. Touch the required result or batch (depending on the mode) and then the **Open Specific Result** icon. This will display the results on the screen. The **Tools** option can then be used to work on these results (depending on mode). It is also possible to print the result by simply pressing the **Print** key on the display surround. Options to print to the Internal or External printer or to the Data Card will be displayed. Printing to the Data Card will save an EPS (Encapsulated Postscript) file to the Data Card. This is in printer ready format and can be viewed and printed in a number of software packages, including Adobe PhotoShop[®], Corel Draw[®], Ghostscript[®] and many other file management systems.

Sharing Results

Results attached to **Personal Methods** cannot be accessed by any other user.

Results attached to **Read-Only** and **Public Methods** can be accessed by all users, based on their current **Method View Settings**.

Deleting Results

Results can only be deleted by the Originator or the Supervisor using **Administrative Functions**.

Recall the required result without opening it. Highlight the result (or batch of results) and then press the **Erase** icon. A warning message will be displayed to ensure this action was intended. On confirmation the results will be permanently deleted.

9.5 Performing Measurements – all users

A minimum of a zero Absorbance calibration must be made before any measurements can be carried out. Having completed this, any pre-existing calibration curve can be used to make measurements against, or a full calibration using the settings in the method can be made as follows:

Pressing the **Cal** key will display a prompt to carry out the zero absorbance. This is not part of the calibration curve but ensures the reference levels are set correctly at this wavelength. If a blank is not used for this setting then it should be used for **Cal Std 1**.

If Interpolation is used as the curve fit, then using the blank for this and **Cal Std 1** will ensure the first segment passes through the origin.

Pressing **Yes** completes the zero absorbance setting and is followed by a prompt to continue and overwrite the calibration curve.

Selecting **No** returns the measurement screen, with the default or existing calibration curve displayed ready for sample measurement.

Selecting **Yes** continues with construction of a new calibration curve and a prompt display showing '**Please enter Standard: xx**'. Where **xx** is the first standard in the table and could be the blank. Pressing **Yes** completes the measurement of this standard.

Information on the standard and absorbance measured is then displayed along with a prompt to insert the next standard. This process continues until all standards have been measured.

For sample measurement insert the sample cuvette into the sample chamber and press the **Red** key. The measured absorbance and calculated concentration are then displayed beside the calibration curve. Results can be printed and saved, as required.

The calibration curve is stored with all results and the method for future reference and use.

Post Quantitation Tools

After construction or recall of a calibration curve the Quantitation Tools can be enabled by pressing the Tools icon on the display surround.

The function of these tools is as follows:



Information



Auto Scale On/Off



Curve Fit



Curve Fit options selection



Resolution decrease



Resolution increase



Pressing this icon displays information on the calibration curve based on the currently selected curve fit. Constants for the curve are displayed with the correlation factors, as applicable.



This icon turns the Auto-Scale on and off. (When set to Off manually entered values from the settings are invoked).



Pressing this icon opens a new menu bar.



Pressing this icon cycles through the curve fit options. Exit this function by using the Back arrow on the display surround.



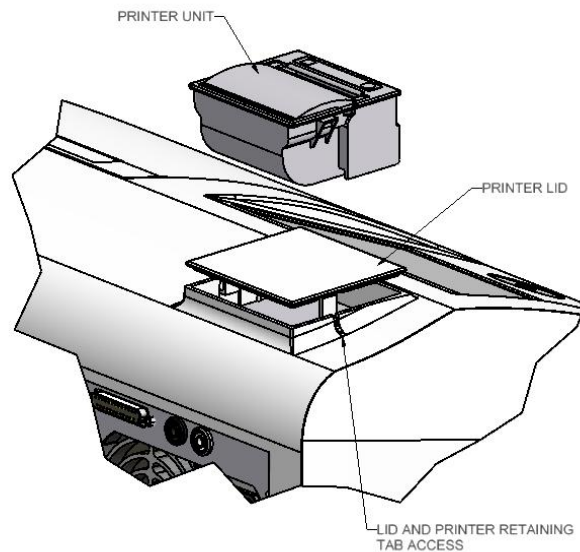
Decreases the resolution of the concentration display – 0.001, 0.01, 0.1, 0.



Increases the resolution of the concentration display – 0, 0.1, 0.01, 0.001.

Fitting Additional Accessories

Integral Printer Unit



Disconnect the instrument from the mains supply.

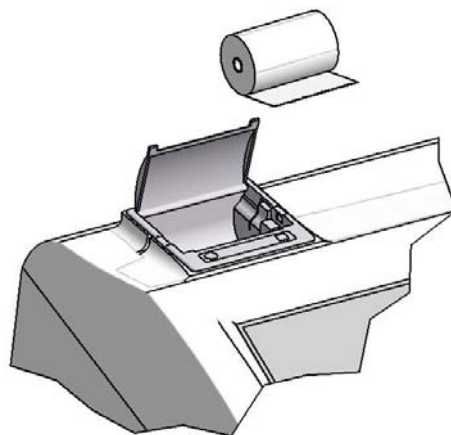
The printer lid is located on the upper left hand side of the instrument casing. Release the lid or printer by inserting a thin blade into the retaining tab access and then pressing both the tabs inwards. Carefully remove the lid and retain for possible future requirements.

The printer connection lead is attached to the inside of the lid. Care should be taken when removing the lid from the instrument to ensure no damage occurs.

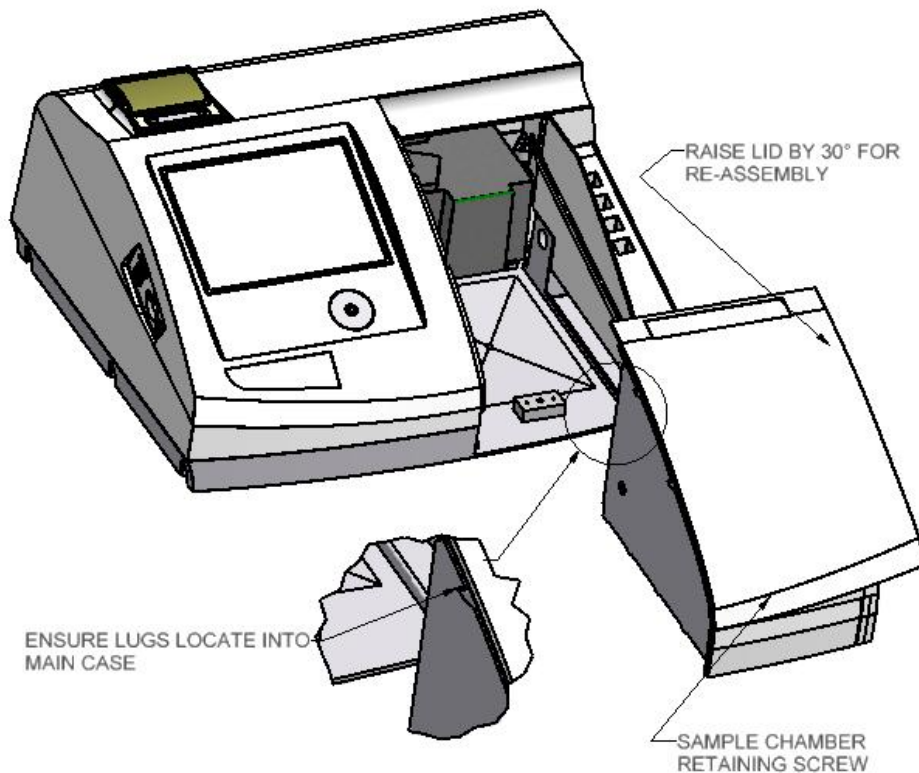
Remove the printer module from the packaging and insert into the recess taking care to secure into the retaining tabs. Detach the printer connection lead from the top of the lid and carefully fit to the printer module.

Reconnect the instrument to the mains supply via the rear panel socket. The instrument and printer are now ready for use.

Printer Roll Replacement



Cell Holder Accessories



A number of cell holder module options are available for use with these instruments:

- 10x10mm cell holder
- 8 cell turret
- Water heated turret
- Test tube holder

These are supplied as a complete plug-in module as detailed above. To fit these modules the following procedure should be used:

Disconnect the instrument from the mains supply.

Check the installed sample chamber module and remove any filled cuvettes to avoid spillage.

Raise the lid and loosen the sample chamber retaining screw located at the front of the module. Lifting the front carefully remove the module from the instrument and store safely for possible future use.

Unpack the new module and check to ensure no damage has occurred during transit.

To install the new module raise the lid by 30° and gently ease it into the instrument compartment taking care that the lugs shown in the diagram locate into the main casework.

Once the module is in position, tighten the sample chamber retaining screw.

Re-connect the mains supply to the rear panel of the instrument. The instrument is now ready for use with the new module.

Maintenance & Troubleshooting

General

The 67 Series are designed to give optimum performance with minimum maintenance. It is only necessary to keep the external surfaces clean and free from dust. The sample area should always be kept clean and any accidental spillage should be wiped away immediately.

To give added protection when not in use, the instrument should be disconnected from the mains supply and covered with the optional dust cover.

For longer-term storage or re-shipment it is recommended that the instrument should be returned to the original packing case.

Cleaning

Note: Prior to using any cleaning or decontamination solution, except those recommended below, the user should contact the dealer or manufacturer for advice/confirmation that the proposed method of cleaning will not damage the instrument.

Under no circumstances should a compressed air canister be used to clean the interior surfaces of the instrument since the resultant rapid cooling can cause damage to fragile optical components.

Casework

Do not use aggressive solvents such as acetone or abrasive cleaners for cleaning the instrument surfaces.

For general cleaning the use of a damp cloth should be sufficient. For more thorough cleaning it is possible to use a mild detergent solution, iso-propyl alcohol (a small amount on a cloth) or a dilute solution of Decon 90[®].

Touch Screen

The screen can be cleaned using a standard proprietary computer screen cleaner.

Note: The monochromator is a non-serviceable unit and no attempt should be made to repair this item. Failure to observe this recommendation will result in the loss of any Warranty Claim on this product. In the unlikely event of the monochromator requiring service or calibration, it is essential that the manufacturer or your local dealer be contacted immediately for advice.

Light Source Replacement

The only routine maintenance that may be required is the replacement of the light source. Failure of the lamp will be detected during the system test at power up of the instrument.

Note: The Model **6700** is fitted with a tungsten halogen lamp.
The Models **6705 and 6715** are fitted with a flash lamp module.

Tungsten Lamp Replacement – Model 6700

Warning: Disconnect the instrument from the mains supply prior to replacing the lamp. Care should be taken when removing the lamp from the holder.

Ensure the lamp is cool prior to handling.

Access to the lamp is gained via the base of the instrument.

Important: Prior to turning the instrument upside down the sample chamber must be checked and any samples removed to avoid spillage or damage.

Carefully turn the instrument over onto a protected work surface and locate the **2 posi-head** Lamp Module Retaining Screws and place carefully to one side, (refer second diagram).

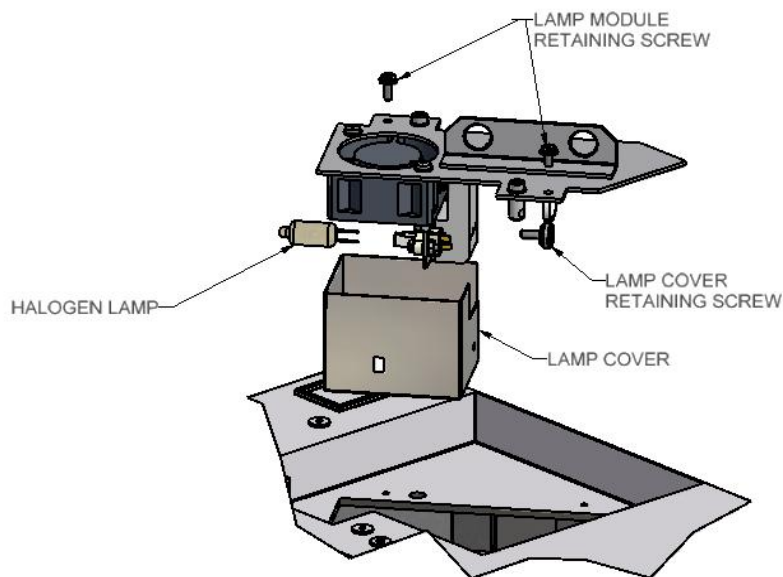
No attempt should be made to remove the 2 socket head screws from the base.

Gently withdraw the module from the base plate and remove the Lamp Cover Retaining Screw. Place carefully to one side.

Remove the Lamp Cover. Locate and carefully remove the tungsten lamp from the holder. The lamp is a plug-in fit and should be removed by gently easing it from the holder.

Carefully remove the replacement lamp from the packaging, ensuring the glass portion of the lamp is not touched.

Important: When fitting the replacement lamp it is essential that the glass envelope is not touched. Finger marks will damage the lamp. Should accidental damage with finger marks occur, the surface of the lamp can be cleaned using iso-propyl alcohol.



Gently insert the lamp into the holder ensuring it is fully pushed home.

Slide the Lamp Module into position in the Lamp Cover and refit the Lamp Cover Retaining Screw.

Refit the 2 posi-head Lamp Module Retaining Screws.

Carefully turn the instrument over. Reconnect the mains supply to the instrument and power up. The self-test power up sequence will be initiated. On successful completion the instrument is ready for use.

In the unlikely event of further failure on power up self-test, please consult the manufacturer or you local dealer for advice.

Flash Lamp Module Replacement – Models 6705 and 6715

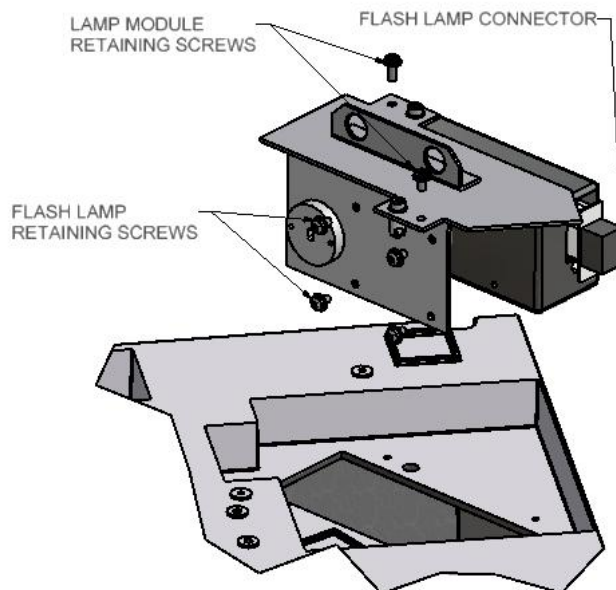
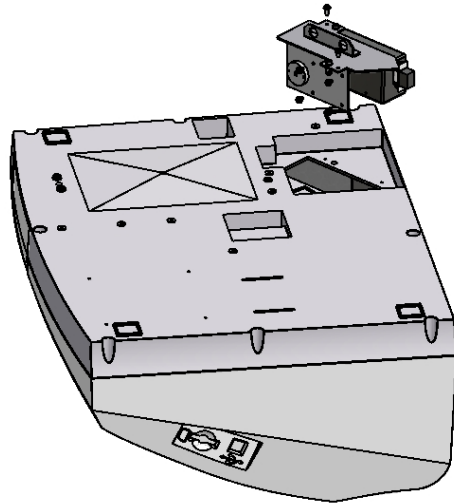
Warning: Disconnect the instrument from the mains supply prior to replacing the lamp. Care should be taken when removing the module. Ensure the module is cool prior to handling. Access to the lamp module is gained via the base of the instrument.

Safety glasses must be worn when UV emissions are present.

Important: Prior to turning the instrument upside down the sample chamber must be checked and any samples removed to avoid spillage or damage.

Carefully turn the instrument over onto a protected work surface and locate the **2 posi-head** Lamp Module Retaining Screws and place carefully to one side, (refer second diagram).

No attempt should be made to remove the 2 socket head screws from the base.



Gently withdraw the housing from the base plate and unplug the Flash Lamp Connector.

Remove the 4 Flash Lamp Retaining Screws and place carefully to one side. Locate and carefully remove the flash lamp module.

Carefully remove the replacement lamp module from the packaging, ensuring the glass portion of the lamp is not touched.

Important: When fitting the replacement lamp it is essential that the glass is not touched. Finger marks will damage the lamp. Should accidental damage with finger marks occur, the surface of the lamp can be cleaned using iso-propyl alcohol.

Gently insert the lamp module into the housing ensuring it is fully pushed home.

Refit the 4 Flash Lamp Retaining Screws. Plug in the Flash Lamp Connector.

Insert the complete assembly into the base plate and refit the 2 posi-head Lamp Module Retaining Screws.

Carefully turn the instrument over. Reconnect the mains supply to the instrument and power up. The self-test power up sequence will be initiated. On successful completion the instrument is ready for use.

In the unlikely event of further failure on power up self-test, please consult the manufacturer or you local dealer for advice.

Glossary of Icons

Touch Panel Icons



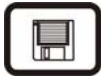
Standby



Instrument Settings



Back



Save



Toolbar



Printer

Method Screens



Create a New Method



Open the Selected Method



Erase the Selected Method



Browse Results



Open specific results in the selected batch

Touch Screen Mode Icons



Mode settings (all modes)



Accessory options (all modes)



Internal or external printer selection (Photometrics mode)



Batch ID and Auto Save (Photometrics mode)



Enter (all modes)



Analysis Points (Spectrum mode)



Measurement – auto scaling, axis setting, colour selection (Spectrum, Kinetics and Quantitation modes)



Internal or external printer selection, graph details, Batch ID and Auto Save (Spectrum, Multi-Wavelength, Kinetics and Quantitation modes)



Wavelength setting (Multi-Wavelength mode)



Calculations (Multi-Wavelength mode)



Calibration (Kinetics and Quantitation modes)

Spectrum Mode Scan Analysis Icons



Toggles **Auto Scale** (Y Axis) **On** or **Off**. If **Off** Y axis defaults to manual settings entered in the method.



Cycles round **Plot Interval** settings of 0.1, 0.5, 1.0 and 5.0nm



Zoom



Activates the zoom area select cursors that can be positioned using the QWheel™ over the area required. Repeated presses increase the zoom up to 5 times.



Returns the zoom to the next lower level. At x1 this icon is disabled.



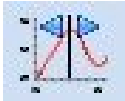
Exit Door maintains the zoom display and gives access to the tools for manipulation and analysis of the zoomed portion.



Area Under Curve



Cursor Select



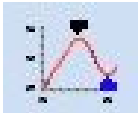
Co-ordinate Tagging



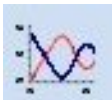
Tag



Delete Tag



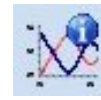
Peak & Valley Tagging



Spectral Overlay



Add Scans



Information

Quantitation Mode Analysis Icons



Information



Auto Scale On/Off



Curve Fit



Curve Fit options selection



Conc. resolution decrease



Conc. resolution increase