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Hospital

Sterilizer and Washer Monitoring system

[OPERATOR GUIDE]

Document approved by:

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I.System operation

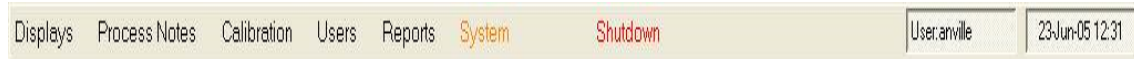
This handbook is intended to give operators, supervisors and engineers a guide to the operation of the system. Some of the more complex functions available are omitted. These may be found in the Prodigy Users Guide.

A.General

The system is started automatically when power is applied to the computer and data loggers. After start up and upon logging on to the computer, at the top of the screen the menu bar is displayed. This is used to access different displays, alter system functions, calibrate the transducers, manage authorised users, view reports, stop the system etc. Critical system functions require an authorised user, as these are password protected. The information is presented via a series of displays that are updated in real time. The trend displays allow real time and also historical data to be viewed. Reports can be obtained for each machine for every cycle processed. In addition the cycle reports are automatically stored in pdf format on the SDU tracking system server. System operation is completely automatic and commences as soon as the computer has started.

1. The Menu bar

Menu Bar



The menu bar provides access to functions that are not frequently required. Most of these require an authorised user to logon to the system.

a)Display

This menu is used as an alternative method of changing the display. When clicked a list of the available displays is shown. To select one click the name required.

b)Process Notes

This menu is used to access this document and also a table showing the various fault codes and their likely cause.

c)Calibration

The calibration menu allows engineering personnel to calibrate the various transducers connected to the system. This is described later on in the text.

d)Users

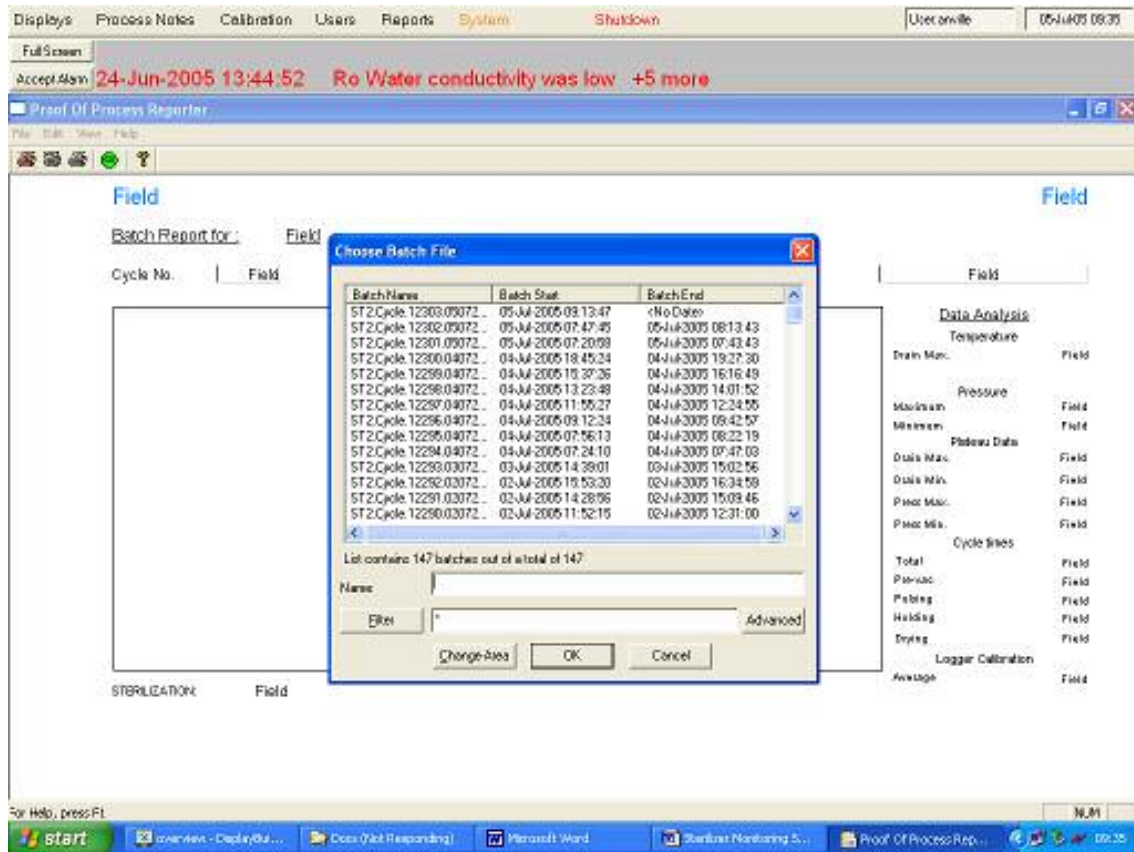
The users menu selects the user management utility. With this you can create, modify or delete users, allow them access to parts of the system and alter passwords. A description of the user editing function is to be found later in this document.

e)Reports

The reports menu is used to display previously stored compartment or basket reports. To display a report click the reports button then select the machine then the required report from the list. A pre-formatted report form will appear together with a dialog box listing the available batches for the report selected. A sub-menu for engineering reports gives access to reports for Ro water and data logger calibration. The reports all use the Prodigy Batch Reporter the operation of which is described on the following page.

Batch Reporter

When you select a report from the reports menu the batch reporter is started. You will see a list of the available batches in the current database.



You can sort the batches in a different order by clicking the column titles or by entering characters into the filter box using the keyboard and clicking the filter button. Choose the required report by clicking the batch name in the left hand column then click the OK button. The blank form will be filled in with the data. Clicking the printer button at the top of the Batch Reporter window will print the report. If you want a new batch click the green 'Go' button. When you have finished click the small cross at the top right hand corner of the window to close. It is possible to view reports that have been archived by using the Change Area button and searching the local disk or network for the archived data.

f)System

With the exception of the System sub menu this menu is for configuration of the system only. The System sub menu allows access to the archive configuration facility, software license information and daylight saving times table.

g)Shutdown

The shutdown menu enables authorised users to re-start the Prodigy application or shut down the computer.

2. Logging on

Many of the menu selections are password protected. To save time when using these functions it is better to log on to the system. To logon click the User panel next to the time display at the right hand end of the menu bar or click System followed by Tools followed by LogOn in the menu bar. A logon dialog box will appear.

LogOn dialog



The screenshot shows a standard Windows-style dialog box titled "Logon". The dialog has a blue title bar with a close button (X) in the top right corner. The main content area is light beige and contains the instruction "Enter your logon name and password." Below this instruction are two text input fields: "Username" and "Password". To the right of the "Password" field is a button labeled "Change...". At the bottom of the dialog, there are four buttons: "OK", "Logoff", "Cancel", and "Help".

Check that the cursor is flashing in the Username box. If not click the Username box then type in the user name, click the tab key, then type in the password and click the enter key or the OK button. The logged on user name will appear in the box next to the time. It is a good idea to remember to log off after you have accessed the password-protected functions required. Following the instructions for logging on but clicking the Logoff button instead achieves this.

B.Alarm Banner

The alarm banner is immediately below the menu near the top of the screen. When the software believes that a cycle has failed sterilization or if any other alarm or event occurs it will be displayed as a line in the alarm banner.



In this example you can see that the sterilization was faulty for ST4. The date and time that the event occurred is also noted. If, as in this case, you see the words +x more this indicates that there are other alarms also present on the system; x will be the number of other alarms – in this case 4. To view the other alarms you should click on Full Screen.

Date	Tag	Text	Priority	Trigger Value	Value	Group
24-Jun-2005 14:10:04	ST1FAULT	ST 1 STERILIZATION was FAULTY	0	0	0	ST1
24-Jun-2005 14:10:04	ST5FAULT	ST 5 STERILIZATION was FAULTY	0	0	0	ST5
24-Jun-2005 14:10:04	ST3FAULT	ST 3 STERILIZATION was FAULTY	0	0	0	ST3
24-Jun-2005 14:10:04	ST2FAULT	ST 2 STERILIZATION was FAULTY	0	0	0	ST2
24-Jun-2005 14:10:04	ST4FAULT	ST 4 STERILIZATION was FAULTY	0	0	0	ST4

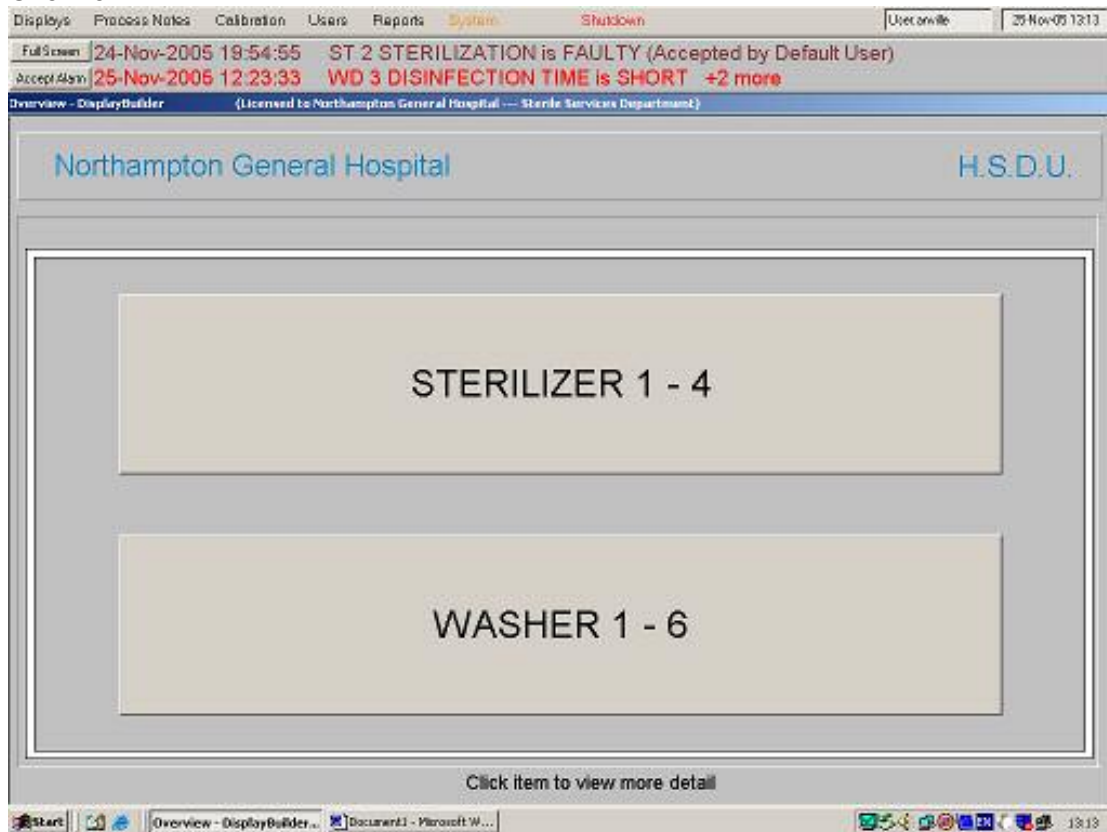
This now switches the display to the alarm page so that you can see the other alarms. Only an authorised operator will be allowed to accept alarms, to do this click on the Accept Alarm button. An alarm that has cleared will be removed from the screen, one that is still current will change colour and have the words accepted by and the operator's name next to them. To return to the normal display click again on the Full Screen button.

C.Operator Displays

Various operator displays are available; these are reached either by using the Displays menu or through various click sensitive screen areas on each display. The screen that is loaded after the system starts is called the overview. This screen has two large buttons; one to access the sterilizers display and the other the washers.

1.Overview display

Overview



2. Sterilizers display

This display is a schematic of the sterilizers in the department. Each machine is represented by a rectangle with the current cycle number below. The rectangles change colour according to the part of the cycle that the machine has reached.

Sterilizers

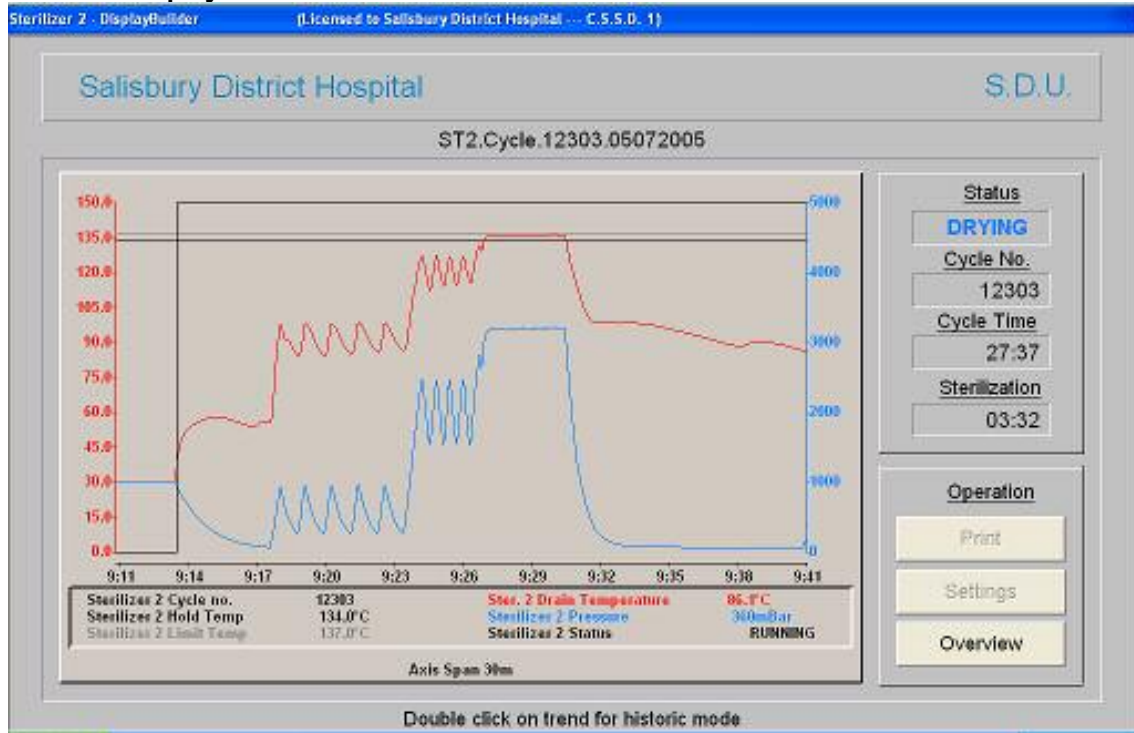


To view a detailed display for a particular machine click on the rectangle, alternatively you can select a machine from the Displays menu. The overview display can be selected again by clicking any button labelled 'Overview' or by choosing Overview from the displays menu.

3. Sterilizer display

When you click on a rectangle representing one of the sterilizers the display will change to a display showing a 30-minute trend of the temperature and pressure. To the right of the trend is a status indicator showing the current state of the machine and also run and sterilization times. Below this are some buttons. There is one of these displays for each of the sterilizers.

Sterilizer display



The trend display can be switched to historic mode by clicking twice quickly on the trend graph part of the screen. When the machine is stopped the Print and Settings buttons will be available. Clicking Print will print out the last cycle report. Clicking Settings opens a form where the cycle number can be altered if required. This facility is password protected.

Sterilizer Settings [X]

Sterilizer 2 - BMM WESTON

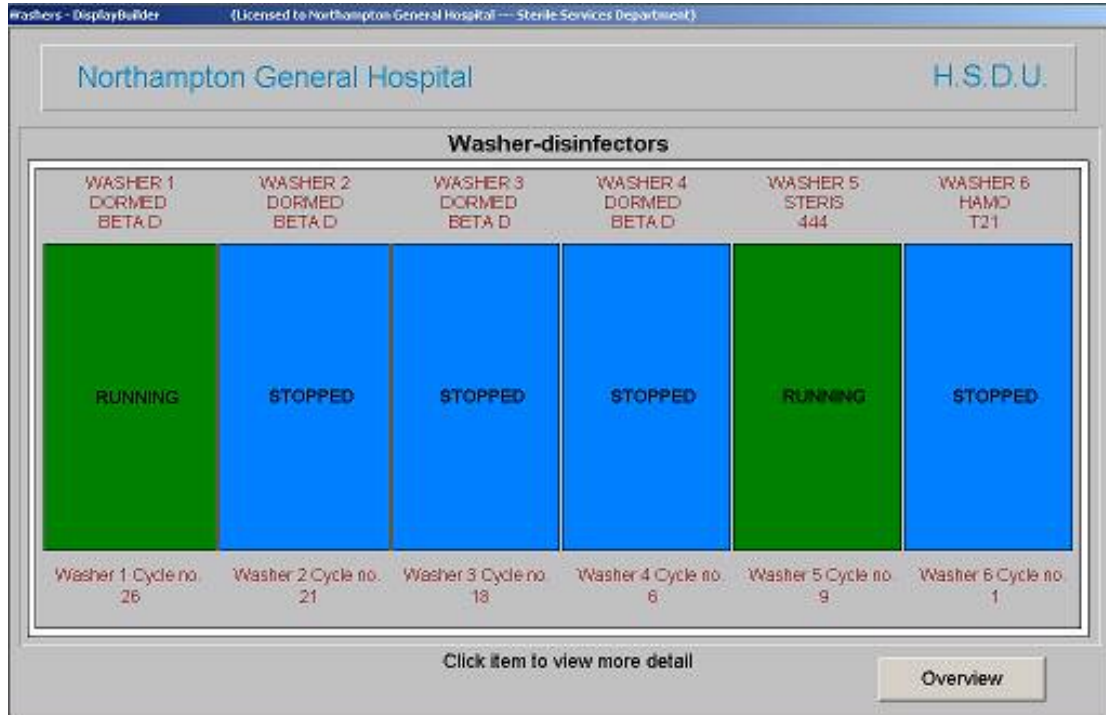
Sterilizer cycle number	<input type="text" value="12313"/>
Sterilization temperature (low temp. cycle)	<input type="text" value="121.0"/> °C
Sterilization time for low temperature cycle	<input type="text" value="15"/> min
Sterilization temperature (high temp. cycle)	<input type="text" value="134.0"/> °C
Sterilization time for high temperature cycle	<input type="text" value="3"/> min

Using this form it is possible to alter the cycle number for the machine. You are also able to view the sterilization parameters that the software is using but you cannot change them from here.

4. Washers display

This display is a schematic of the washers in the department. Each machine is represented by a rectangle with the current cycle number below. The rectangles change colour to indicate running or stopped.

Washers

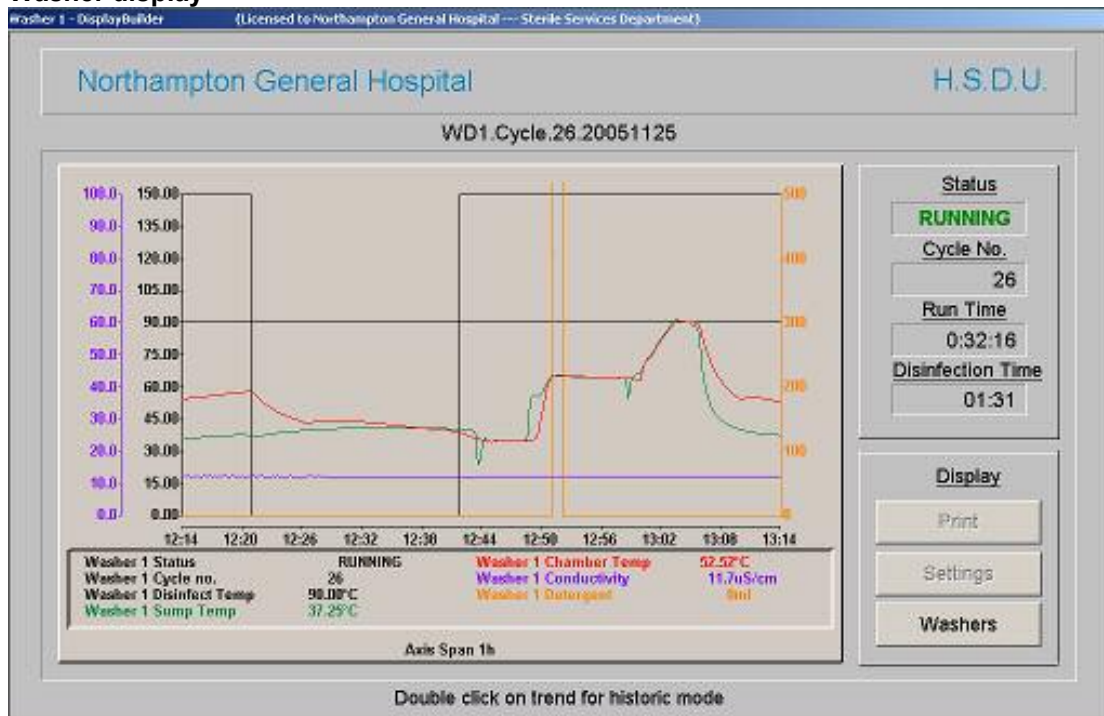


To view a detailed display for a particular machine click on the rectangle, alternatively you can select a machine from the Displays menu. The overview display can be selected again by clicking any button labelled 'Overview' or by choosing Overview from the displays menu.

5. Washer display

When you click on a rectangle representing one of the washers the display will change to a display showing a 1-hour trend of the temperature, conductivity and detergent injection. To the right of the trend is a status indicator showing the current state of the machine and also run and disinfection times. Below this are some buttons. There is one of these displays for each of the washers.

Washer display



The trend display can be switched to historic mode by clicking twice quickly on the trend graph part of the screen. When the machine is stopped the Print and Settings buttons will be available. Clicking Print will print out the last cycle report. Clicking Settings opens a form where the cycle number can be altered if required. This facility is password protected.

Washer-disinfectant Settings

Washer 1 - DORMED BETA D

Washer-disinfectant cycle number: 1234

Washer-disinfectant time at disinfection temp: 60 sec

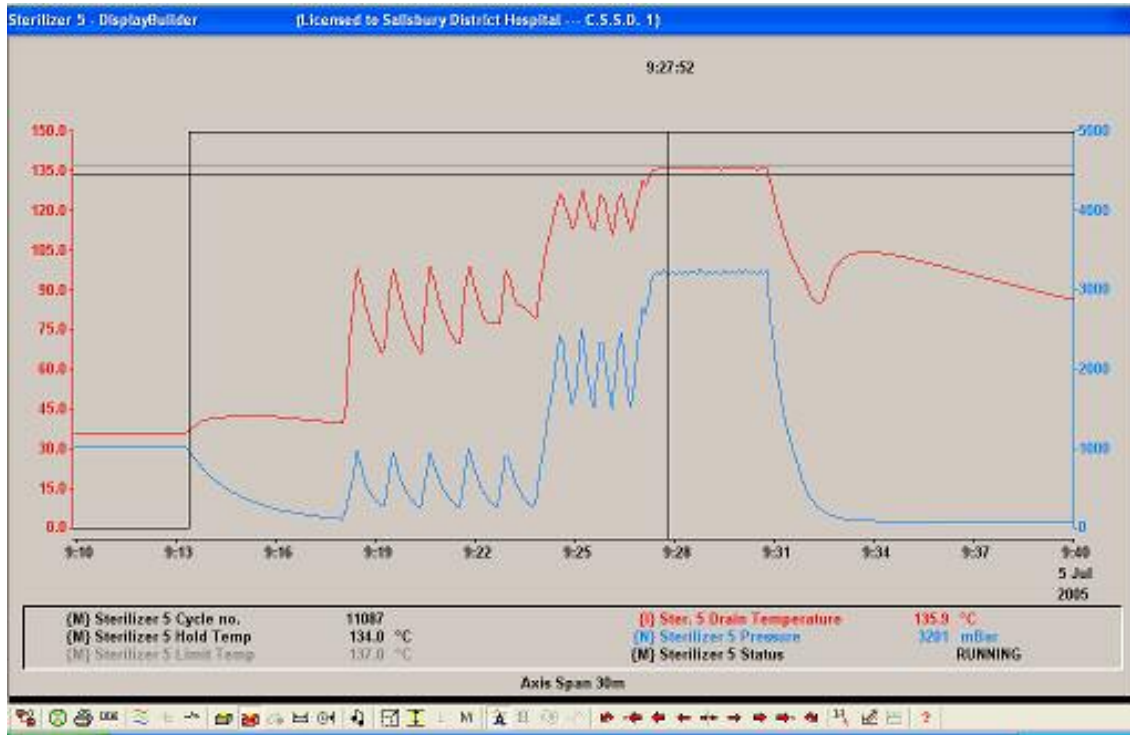
Washer-disinfectant disinfection temperature: 90.0 °C

OK Cancel

Using this form it is possible to alter the cycle number for the machine. You are also able to view the disinfection parameters that the software is using but you cannot change them from here.

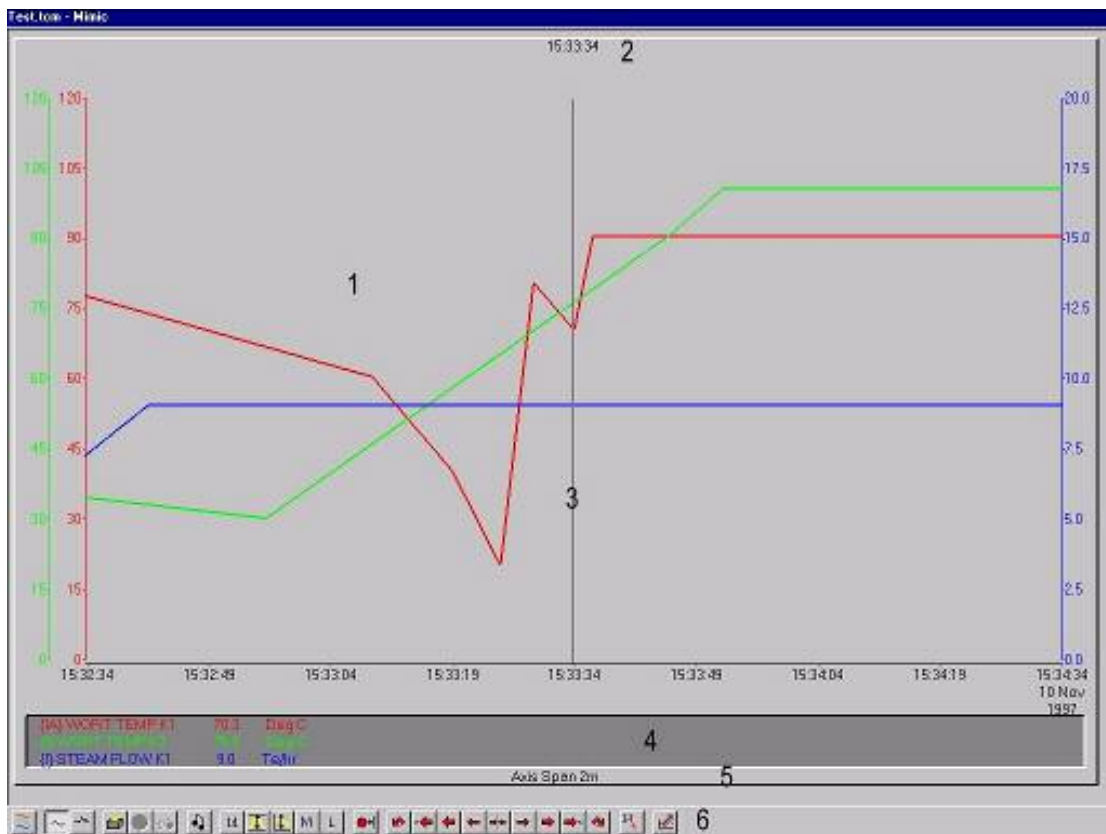
D. Historical trend display

From any of the trend displays it is possible to view data that has been recorded in the past. To enter the historical mode you must click twice on the trend display.



Above is a picture of the sterilizer trend in historical mode. A tool bar has appeared at the bottom of the page that is used to operate the features of this display. From here the trend can be scrolled back and forth, zoomed, printed or exported to a file for further analysis. To leave this display and return to the real time trend click the trend screen twice quickly or click on the icon at the extreme left of the toolbar.

1.The Parts of the Historical Trend Display



a)Graph Window (1).

All of the graphs defined for this Trend will appear in this window.

b)Cursor Time (2).

The time of the current cursor position appears in this portion of the window, directly above the cursor.

c)Cursor (3).

The cursor is positioned in time. Some of the toolbar buttons move the cursor left or right and the time at the current cursor position is shown directly above the cursor.

d)Information Window (4).

- This contains the description of each signal being graphed along with the value of that signal at the current cursor time.

e)Axis Span Information (5).

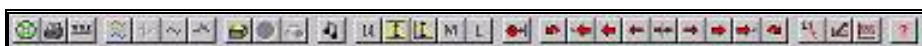
This shows the current axis span as a number of days, hours, minutes and seconds. When viewing a batch, this line also shows the current batch name, start time and end time.

f)Historical Trend Toolbar (6).

This gives access to all of the functions available within Historical Trending.

2.The Historical Trend Toolbar

When in historical mode the “Historical Trend Toolbar” is available to the operator. This controls a range of functions that are specific to historical trending.



The following features are available from the Historical Trend Toolbar, reading from left to right. Functions that are not relevant to this system are fully described in the Prodigy Users Guide document.

a)Data Location

See the Prodigy Users Guide for details.

b)Print

This brings up the Print Dialog to allow the current Trend to be printed.

c)Title

This allows a temporary title to be assigned to a Trend. This title appears underlined at the top of the Trend and will remain in place until historical Trend mode is exited.

d)Select Signals

See the Prodigy Users Guide for details.

e)Align Curve

See the Prodigy Users Guide for details.

f)Average Mode

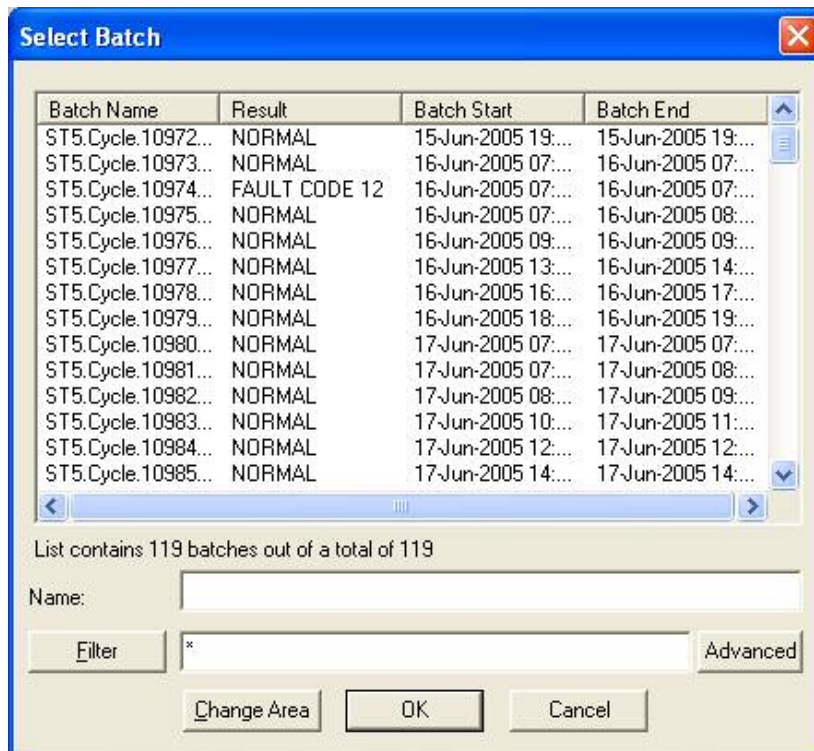
See the Prodigy Users Guide for details.

g)Peak Mode

See the Prodigy Users Guide for details.

h)Select Batch

The software creates a batch for each sterilizer cycle. Clicking the select batch symbol opens a batch selection box.



Using this you can select the batch that you want to view. You will notice that the fault code is displayed as part of the batch information. Choose the batch and click OK.

- The time span of the Trend will be adjusted to be the elapsed time of the batch.
- The relevant signal data for that time period will be displayed.
- The cursor is centred.
- A vertical line will mark the batch start time and a second line will mark the batch end time. These lines are both labelled.
- Information about the currently selected batch and its start and end times is displayed on the Trend.
- The Absolute Time and Relative Time buttons on the Historical Trend Toolbar become available.

i)Comments

See the Prodigy Users Guide for details.

j)Zooming

Zooming in is not accessed via any of the toolbar buttons but by dragging a box on the graph over the area that you wish to zoom in on. To do this click the screen and holding your finger against it move the finger to draw a box around the area of data that you wish to zoom to. As the box is dragged an outline is drawn to indicate the area selected. When you release your finger a dialog is presented informing you of the time period over which you have zoomed and asking for confirmation. If confirmation is given the graph is redrawn with the zoomed-in time frame.

Zooming in affects both the time frame (x-axis) and the signal value (y-axis) so take care to ensure that the required range of the signal is included in the drag box. If you happen not to, this can be rectified by using the "expand axes" button, described later.

k)One To One (1:1)

This cancels any zoom operation that is in effect and restores the signal scale and time axis to their full values.

l)Expand Vertical Axes

See the Prodigy Users Guide for details.

m)Restore Vertical Axes

See the Prodigy Users Guide for details.

n)More Smoothing

See the Prodigy Users Guide for details.

o)Less Smoothing

See the Prodigy Users Guide for details.

p)Go to Time

This presents a dialog which allows the operator to specify the date and time of the right hand side of the x-axis. The time span remains unchanged, so the left-hand side of the x-axis is calculated based on the axis end time and the time span.

q)Previous Period

This button has the effect of scrolling back by one complete time span.

r)Previous Value

When Prodigy draws a graph there are an arbitrary number of points per graph, which are joined by straight lines. As you move the cursor over a graph the value at the current point is displayed in the information window. It is possible that the value shown has been interpolated and is not an actual recorded value. Pressing the **Previous Value** button causes the cursor to move to the next value to the left of the current position that is an actual recorded value. Note that this may be a value from any one of the graphs being displayed. Look at the information window to see what is going on.

s)Large Left Scroll

Move the cursor to the left by an amount equivalent to $1/25^{\text{th}}$ of the current axis span.

t)Small Left Scroll

Move the cursor to the left by an amount equivalent to $1/300^{\text{th}}$ of the current axis span.

u)Centre Cursor

Redraw the display so that the current cursor position is moved to the centre of the screen.

v)Small Right Scroll

Move the cursor to the right by an amount equivalent to $1/300^{\text{th}}$ of the current axis span.

w)Large Right Scroll

Move the cursor to the right by an amount equivalent to $1/25^{\text{th}}$ of the current axis span.

x)Next Value

As for **Previous Value** but the cursor moves to the right.

y)Next Period

As for **Previous Period** but the cursor moves to the right.

z)Get New Values

If the portion of the graph that is being viewed shows the current time, it is possible that new values have been recorded but are not currently shown on the graph (because the graph was drawn before these values were recorded). Pressing this button brings any newly recorded values into the graph.

aa)CSV Data Export

See the Prodigy Users Guide for details.

E.Engineering Displays

There are five displays specifically provided for engineering personnel to check and alter the operation of the system. The engineering displays are selected from the engineering sub-menu in the displays menu.

1.Flow meter display

The flow meter display is provided to assist engineers when calibrating the detergent measuring system. Clicking the Displays menu then Engineering then Flow Meters accesses this display.

Flow Meters

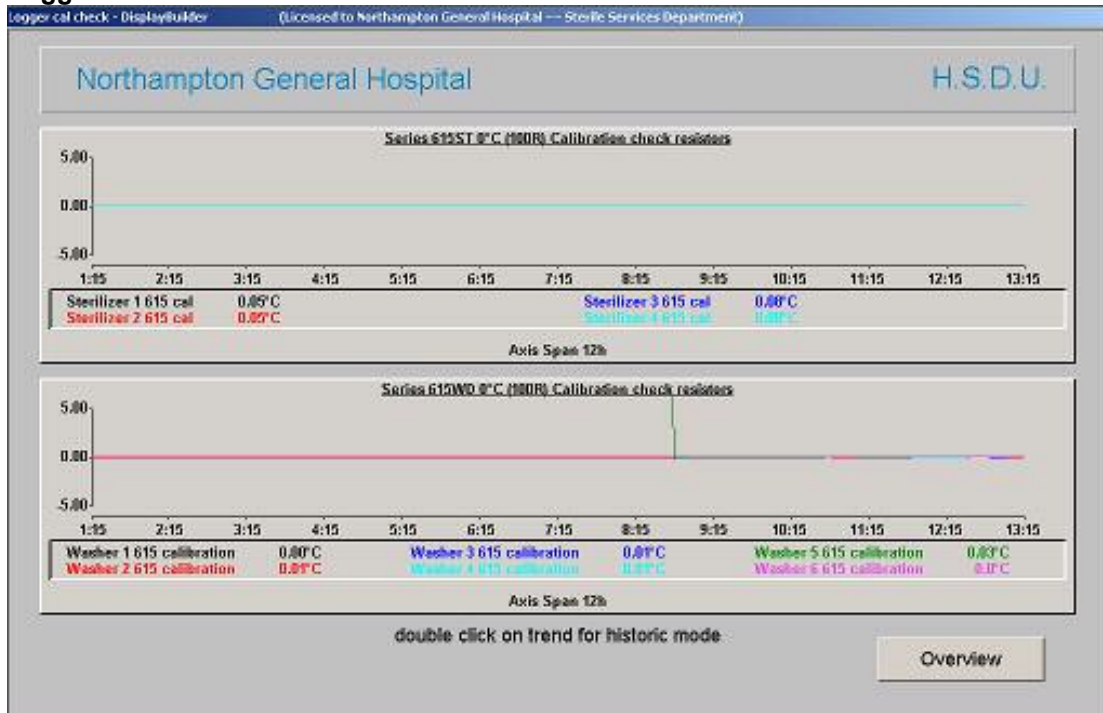


The display is a trend that also shows numerical data from the flow meters on the left and the calculated detergent dispensed on the right. Click Overview to return to the system overview. Normally the values will remain at or very near to zero. As soon as detergent is injected into the machine the flow meter reading will increase, almost simultaneously the detergent reading will also increase. After injection finishes you will see that the flow reading has returned to zero. The detergent reading will reach a peak reading that represents the total amount that flowed. This will also return to zero after a few seconds.

2.Series 615 Unit Calibration Check

Each of the Series 615 acquisition units is fitted with a calibration stability check resistor. These are logged with the rest of the data. The calibration data is also reported on each batch report as an average value for the batch run.

Logger cal Check

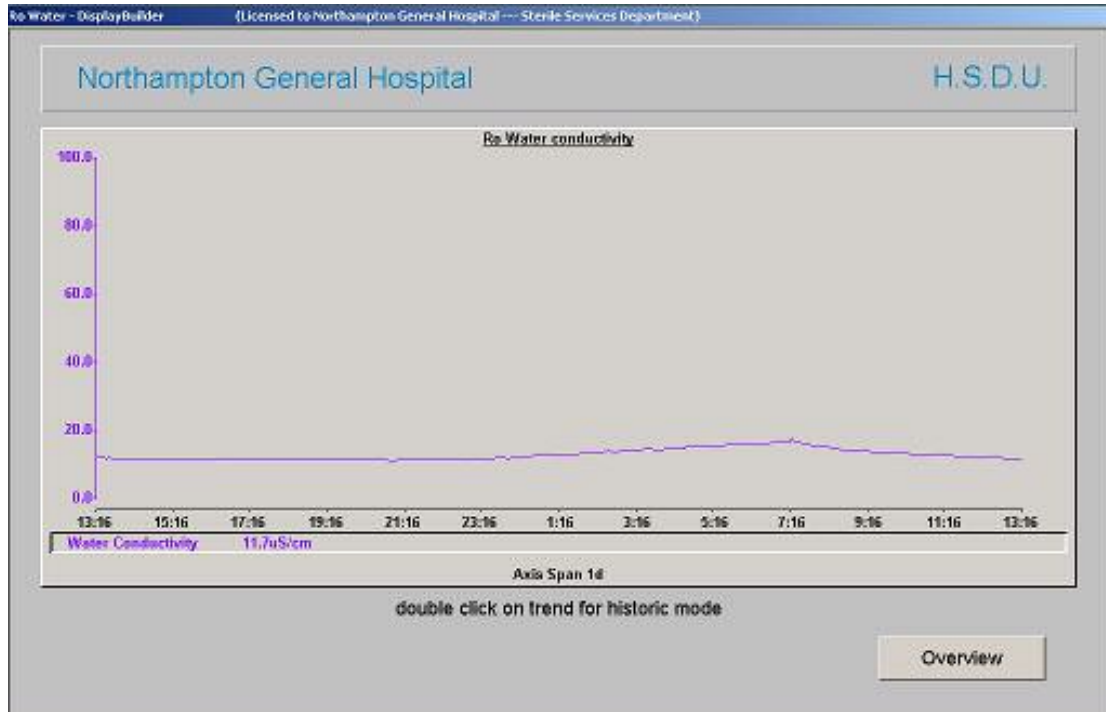


Clicking the Displays menu then Engineering then Logger cal check accesses a trend of the data logging system calibration. This has the same facilities as the other trends. The calibration resistors are logged as Pt100 sensors at 0°C. Alarm limits are applied to these readings at $\pm 0.25^\circ\text{C}$ and $\pm 0.5^\circ\text{C}$. These alarms will be announced in the alarm banner. Click the 'Overview' button to return to the system overview.

3.Ro Water

The conductivity of the Ro water supplied to the department is monitored by a conductivity meter fitted in the plant room. The readings from this unit are logged continuously by the system.

Ro Water

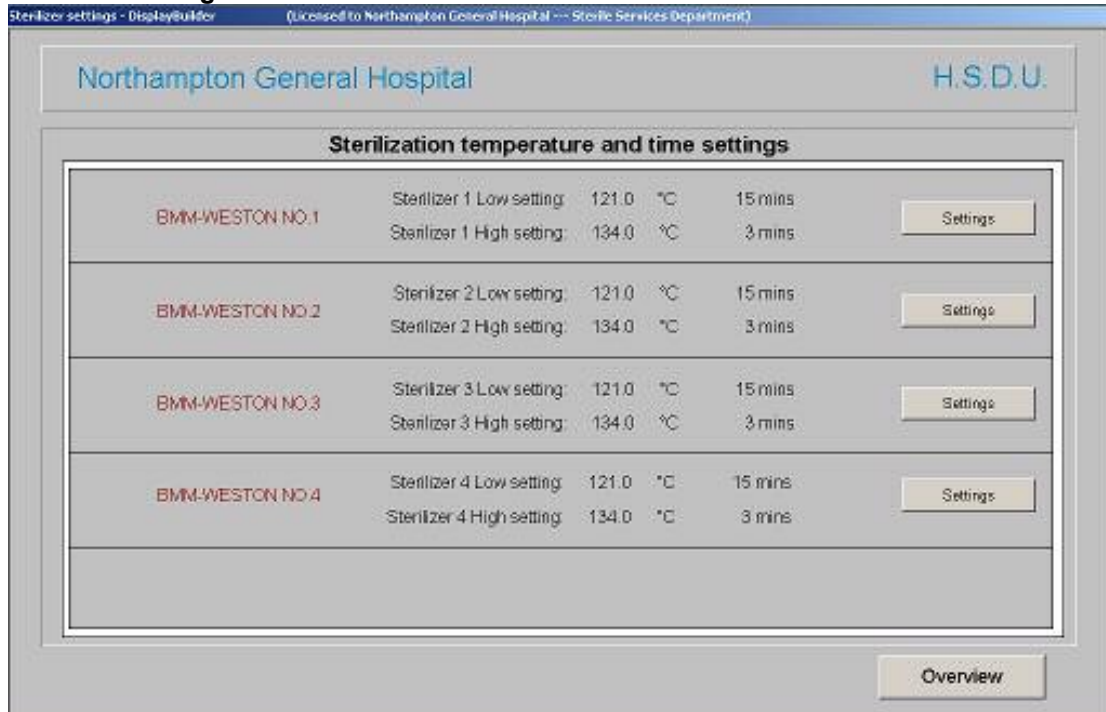


Clicking the Displays menu then Engineering then Ro Water accesses a trend of the logged Ro water data. This has the same facilities as the other trends. Click the 'Overview' button to return to the system overview.

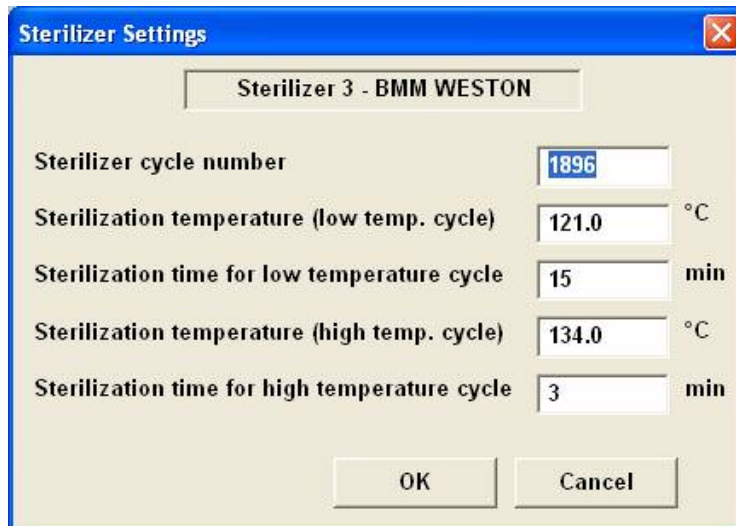
4. Sterilizer settings display

The sterilizer settings display is provided to enable engineers to alter the sterilization parameters for the software.

Sterilizer settings



The settings for sterilization temperature and time at temperature are shown for all 4 machines. To alter the machine settings click on the button to the right labelled 'Settings'. A form will appear similar to the one below.

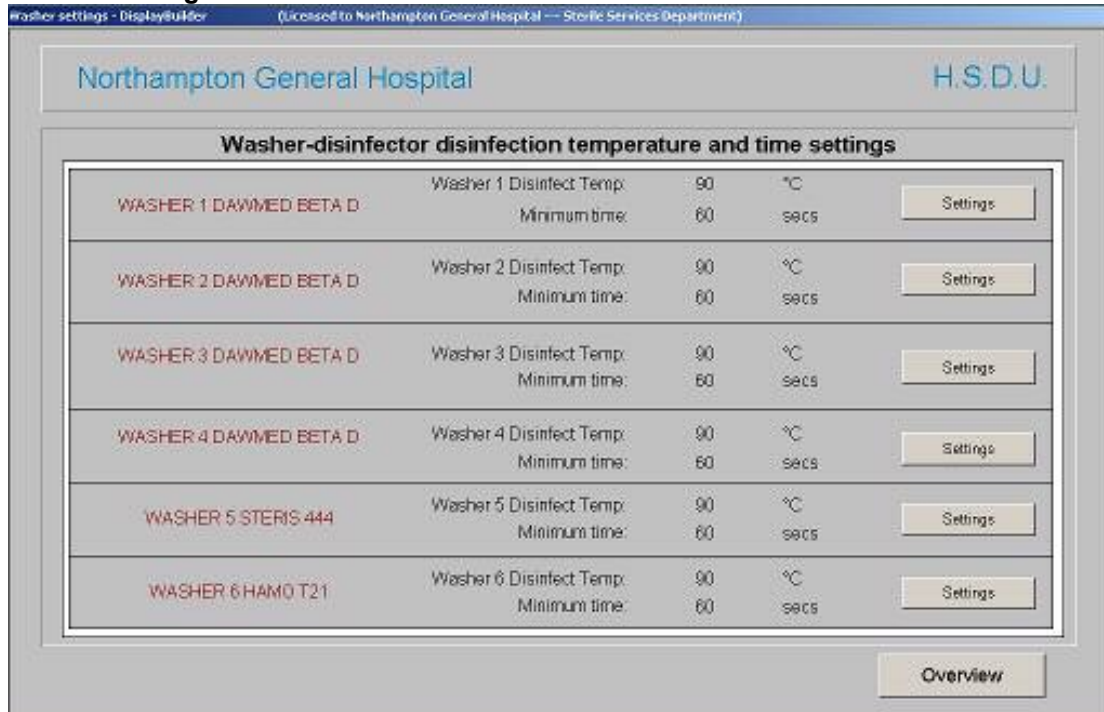


Using this form it is possible to change the cycle number, the temperature for sterilization on a 121 (low temp.) cycle and the temperature and time for sterilization on a 134 (high temp.) cycle. The software uses these parameters during the cycle to check the incoming data. Only an authorised user can alter these parameters. Note that the low temperature cycle is not presently implemented on the system.

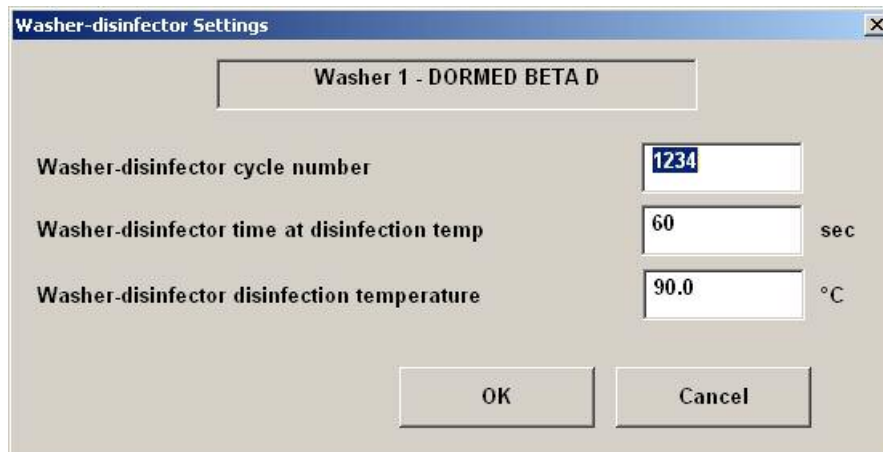
5. Washer settings display

The washer settings display is provided to enable engineers to alter the disinfection parameters for the software.

Washer settings



The settings for disinfection temperature and time at temperature are shown for all 6 machines. To alter the machine settings click on the button to the right labelled 'Settings'. A form will appear similar to the one below.



Using this form it is possible to change the cycle number, the time for disinfection and the temperature for disinfection. The software uses these parameters during the cycle to check the incoming data. Only an authorised user can alter these parameters.

F.Data archiving

To access the data archiving facility click System on the menu bar then System on the sub menu then Archive Configuration on the menu bar. The archive configuration dialog will be displayed if you have the required access rights.

Data Archive performs three important tasks; the archiving of old data, the backing up of current data and the monitoring and control of free disk space.

- Archive of Old Data.** This facility copies data from the live area to the area specified by **Archive Path**. Only data that is older than the number of months specified in **Archive After** is copied. The data is copied into a subdirectory of the Archive Path that is called BFDData_YYYY_MM where **YYYY** is the year and **MM** the month of the data that is archived. Below this directory is a directory structure that matches that of Prodigy. Batch records are copied from the live batch database into the archive area along with the corresponding continuous data. Where the batch record starts in one month and ends in a later month, the continuous data for the entire period covered by that batch is copied into the archive for that month. This ensures that each monthly archive directory contains all of the batches that started in that month, along with all of the continuous data required by any batch that started in that month. Data is deleted from the live area once it is older than the number of months specified in **Delete After**. This period should be greater than or equal to the **Archive After** period for archiving to work. If it is less than the **Archive After** period, no archiving will take place but old data will be deleted. It is conceivable that you might want to configure the system in this way. The Archive program runs at system start-up and then on the first day of every month. It also runs immediately if any aspect of the configuration is changed.
- Backup of Current Data.** This facility copies run-time data **and** configuration data from the live area to a backup area specified in **Backup Path**. The files are placed in this path under a directory structure that mirrors the Prodigy directory structure. Backups occur at the time specified by **Backup Start**, which is configured by pressing the

Interval button. Only files that are newer than the date and time given in **Backup Files Newer Than** are copied. Usually when you see this configuration dialog, the date and time shown in this field will be the date and time of the last time the backup program was run. If you press the **Reset** button, then the next time the backup program runs all data and configuration files will be copied. The backup program runs at system start-up and then at the time specified in this configuration dialog. It also runs immediately if any aspect of the configuration is changed.

- **SpaceWatch.**

This program monitors the amount of free disk space that remains on the drive used by Prodigy for its data storage. Its task is to ensure there is always enough free disk space for the new data being created by Prodigy. Hopefully there will always be enough space available if you carefully tailor your **Archive Of Old Data** so that it deletes data older than a given number of months. However, SpaceWatch can act as a backup to this, and in addition to optionally deleting old continuous data it can provide a warning by generating an alarm when disk space runs low. SpaceWatch runs at system start-up and then just after midnight each day. The parameters for SpaceWatch are as follows:

- **Min Days.**

This is the minimum number of day's worth of continuous data that Prodigy will keep. When SpaceWatch is deleting data to free up disk space, it will always keep at least this amount of days of the most recent data. If the amount of free disk space is lower than the level specified in **Free%** and SpaceWatch cannot free up space without deleting data newer than this number of days, it displays an event in the Alarm Banner.

- **Max Days.**

All continuous data older then the number of days specified here will be deleted.

- **Free%.**

This is the minimum percentage of disk space that SpaceWatch is attempting to keep free. When the amount of free space falls below this level it begins deleting continuous data starting with the oldest directory. It continues deleting newer and newer data until it has deleted sufficient that the target threshold has been reached.

- **Alarm%.**

If the amount of free disk space falls below this amount, SpaceWatch issues an event to the Alarm Banner warning of this fact.

G. User Management

To access the user management facility click on System then System then Users on the menu bar. The **Users** program allows user IDs to be created and privileges assigned to these users. It takes the form of a dialog, shown below.

The 'Users' dialog box contains the following sections:

- User List:** A table with columns: Log on name, First Name(s), Last Name, SMS Number, Act, Email Address, Act.

Log on name	First Name(s)	Last Name	SMS Number	Act	Email Address	Act
anville				N		N
Default User	Default	User		N		N
HSDU				N		N
- Buttons:** Add, Delete, Copy, Security.
- Log On:** Fields for Log on Name, First Name(s), Last name, Password.
- SMS Alarms:** Telephone Number field, SMS Alarm Sets button, Active checkbox, Restart button.
- Email Alarms:** Address field, Email Alarm Sets button, Active checkbox, Restart button.
- Privileges:**

Privilege	Reason	Allowed
Accept Alarms	No	No
Alter Advanced Alarm Properties	No	No
Alter Alarm Properties	No	No
configuration	No	No
Configure Access Databases	No	No
Configure Alarm Display	No	No
Configure Alias Tags	No	No
Configure Archive	No	No

 Buttons: New..., Delete, Requires Reason, Has Privilege, Set all, Clear all.
- Bottom Buttons:** OK, Cancel, Help.

1. User Details

At the top of the dialog is a list showing all of the users in the database. Click on the **Log on name** of one of the users to display their details.

- **Log on name.**
This is a mnemonic that the user will use to log on. It can be anything but a good idea is to use initials, names or nicknames.
- **First Name(s).**
Enter the first name or names of the user. Along with the Last name this field may be used in reports to identify the user correctly rather than by his log on name.

- **Last name.**
Enter the user's last name. This may be used in reports to identify the user, as an alternative to using his log on name.
- **Password.**
Enter the user's password here. The user must enter this password every time he logs on. If the user forgets his password, enter a new one here. Caution. Be careful not to forget the password that allows you to access the Users program. If you do there will be no way to gain access to the program other than by contacting your supplier.
- **SMS Telephone Number, SMS Alarm Sets and SMS Providers.**
These are for the SMS messaging facility – see the relevant section of the Prodigy manual.
- **Add.**
This button allows you to create a new user ID. Initially the system will create an entry called New User. Change the Log on name, password and privileges and (optionally) enter the first and last names of the new user. Once you have finished modifying the details for this user and perform some other action (add another user, select a different user from the list, etc) you will no longer be able to modify the Log on name. If a Log on name requires changing the only way to do it is to add a new entry with the correct name and then delete the old one. Use the Copy button to facilitate this.
- **Delete.**
Deletes the currently selected user from the database.
- **Copy.**
Allows you to copy all of the details from another user to this user. Pressing the Copy button presents a dialog that allows you to select the user whose details you wish to copy. It is most likely that you will only want to copy the privileges from the existing user, and the system provides a check box to allow for this.

For further information on managing users refer to the Prodigy documentation.

H. Calibration

To access the calibration functions you must have the Run Calibration user privilege.

To perform a calibration you will need a calibration source to suit the transducer that you are to calibrate. The transducer will almost certainly need to be removed from the machine and this will require the stopping of the process, isolation of water and steam supplies and draining of tanks.

Calibration allows the calibration of up to eight channels at a time using a named configuration. Each signal is calibrated by specifying two endpoint values in both external units and Engineering Units. All subsequent readings of this signal will be scaled using these calibration values. A user may check his calibration and attach notes to each signal if he wishes.

Both the external and engineering values are stored in the Signal Database and also in an Access™ database, along with other calibration information, such as the Operator/User who performed the calibration, any special notes regarding a particular signal and calibration check values for the signals. Reports may be requested and displayed on the screen or printed showing either the calibrations on all signals between two dates or the calibration on one particular signal.

1. Calibration Menu

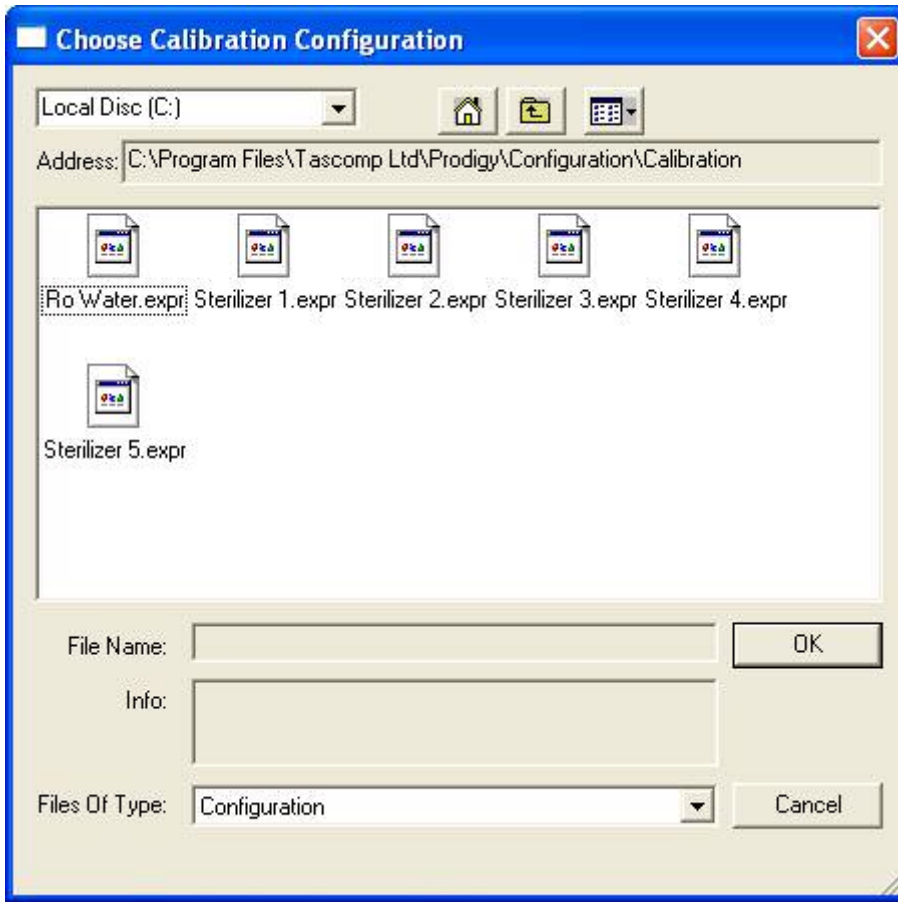
- **Run Calibration.** This starts the calibration process for the sensors.

To calibrate a sensor or group of sensors click the Calibration menu button then click Calibration in the list. The calibration window will appear.

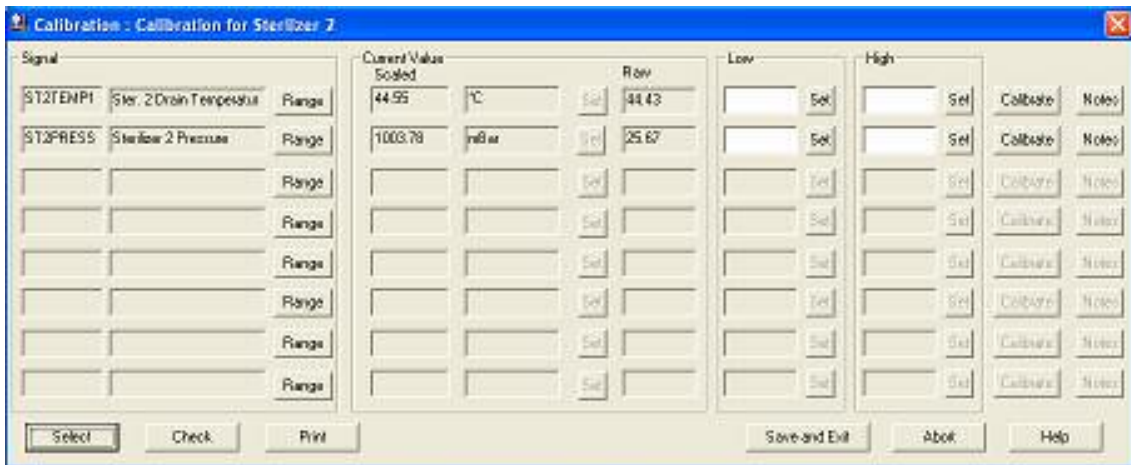
Calibration window



Click the Select button. A file dialog box will appear listing the available calibration configurations.



Click on the required configuration and click the OK button.



The display is arranged as a series of columns. The information displayed in these columns is as follows.

- **Signal.**
The signal that is to be calibrated. The signals description is shown as a **ToolTip**.
- **Scaled.**
The scaled value of the signal (i.e. the value in Engineering Units). If the signal has not been calibrated (either here or in **Signal Database Configuration**), this field will be blank.

- **Raw.**
The raw value (i.e. the value in external units) of the signal. For *input* signals, this field is read-only and the value is constantly updated as the device is polled. For *output* signals the field is editable and the user should enter a value and press the **Set** button. This value will be sent to the external device (*if Demand was specified in the configuration, the value entered here is checked against the values specified for the demand and if it is outside the range an error is displayed*).
- **Low.**
Set the device being calibrated to some known low value (e.g. for a thermometer, set it to 0°C by placing it in ice). The raw value will be displayed in the **Raw** column. Enter the engineering unit that this raw value represents in the **Low** column and press the **Set** button. The field will become read-only and the button will remain depressed. To alter the value, click the button again and then repeat the procedure described. The **Raw** value associated with this engineering value is displayed as a ToolTip when the cursor is over this field.
- **High.**
Set the device being calibrated to some known high value (e.g. for a thermometer, set it to 100°C by placing it in boiling water). The raw value will be displayed in the **Raw** column. Enter the engineering unit that this raw value represents in the **High** column and press the **Set** button. The field will become read-only and the button will remain depressed. To alter the value, click the button again and then repeat the procedure described. The **Raw** value associated with this engineering value is displayed as a ToolTip when the cursor is over this field.
- **Calibrate.**
When both the **Low** and **High** values have been specified, press the **Calibrate** button. This will calculate scaling parameters based on the **Low** and **High** values that have been entered and the **Raw** values that were associated with them. The value in the **Scaled** column will now display the correctly scaled engineering value associated with the **Raw** value alongside it.
- **Notes.**
Pressing this button displays a dialog that allows the user to enter notes about the configuration of this signal. These notes are stored in the Access database and may be displayed in reports.

Points to note.

- The **Low** and **High** values specified must not be the same.
- The **Raw** value must be different at the **Low** and **High** engineering values.
- Unsetting either of the **Low** or **High Set** buttons will cancel any calibration carried out.
- Unsetting the **Calibration** button results in the any calibration being cancelled and unsets both the **Low** and **High Set** buttons.

There are various buttons at the bottom of the dialog.

- The **Print** button allows the user to produce a printed report of any previously saved calibration data. He can choose to report on one signal or all signals between two dates.
- The **Save** button saves any new calibrations currently displayed to an access database.
- The **Done** button exits the calibration dialog, saving to an access database if necessary.
- The **Abort** button exits the calibration dialog, restoring the original calibration values that were present in the signal database before the calibration software was run.

- The **Check** button allows the user to enter check values on any signal currently being calibrated.
The following dialog is displayed.

Signals	Check Value 1	Check Value 2	Check Value 3
ST2TEMP1	<input type="checkbox"/> 43.921953	<input type="checkbox"/> 43.921953	<input type="checkbox"/> 43.921953
ST2PRESS	<input type="checkbox"/> 1004.1740	<input type="checkbox"/> 1004.1740	<input type="checkbox"/> 1004.1740
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Save Done

Check values may be entered only for signals that have been calibrated. For input signal the current value is displayed in three separate fields. Ticking the box beside one of the values holds this value and allows the user to input a manually read value as a check.