peloris™ rapid tissue processor

user manual

intended use statement

The Peloris™ dual retort rapid tissue processor prepares tissue samples for sectioning by transforming fixed samples into wax embedded samples. This is achieved by exposing the tissue samples to a sequence of reagents in the processing retorts.

The Peloris™ tissue processor has been designed to safeguard the operator and specimens, provided it is operated according to the instructions in the accompanying documentation.

Repairs must only be carried out by qualified service personnel authorized by Vision BioSystems™.

trademarks

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important information for all users

Due to a policy of continuous improvement, Vision BioSystems reserves the right to change specifications without notice.

Warranty claims can be made only if the system has been used for the specified application and operated according to the instructions in this document. Damage resulting from inappropriate handling and/or misuse of the product will invalidate the warranty.

Vision BioSystems cannot assume liability for any such damage.

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revision record

Rev.	Issued	Detail
A01	Dec 2003	Initial release of Peloris: software IT, hardware PPU-B
B	Aug 2004	For Peloris tissue processor software IT18.
B02	Dec 2004	Update for software IT18.
C01	July 2005	Revised for Peloris tissue processor software 1.19.
D01	Oct 2005	Revised for Peloris tissue processor software 1.20
E01	Aug 2006	• Revised for Peloris software 1.3 • Removal of lid-lock functionality for new systems • Pre-defined protocols • Manual reformat

software licence terms

1 defined terms & interpretation

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safety

The Peloris™ tissue processor is designed to provide safe, trouble-free operation when used in accordance with this document. Follow all safety precautions to avoid personal injury and equipment damage. Always clean and maintain the instrument as specified in Chapter 3 "cleaning and maintenance".

safety precautions

biological and chemical hazards

- Some of the reagents used in tissue processing are hazardous.
- Wear gloves when handling reagents or tissue samples and when cleaning the instrument.
- Clean all spills with 70% alcohol.
- Handle and dispose of reagents and condensate in accordance with all relevant procedures and government regulations that apply at the laboratory site.

WARNING
Chloroform vapors may cause severe injury, incapacitation, or death.
When using chloroform with the Peloris tissue processor, Vision BioSystems™ recommends that an external fume extraction system be installed. Chloroform vapors may accumulate during normal operation or in the unlikely event of a spill. The extraction system must keep these vapors below dangerous levels.
Never open a retort that contains chloroform or chloroform residue.

electrical hazards

- The Peloris tissue processor must be connected to an earthed mains power outlet socket.
- Dangerous voltages are present inside the Peloris tissue processor. Only service technicians approved by Vision BioSystems should remove any of the instrument's covers or access the internal components.
- The instrument's operating voltage is factory set and it must not be changed.
- Severe damage will occur if an instrument is connected to an incorrect power supply voltage.
- Do not pull out the mains cable whilst the instrument is operating unless there is an emergency situation and both the front panel power button and the mains wall switch are inaccessible.

instrument setup

- The instrument must be installed and configured by an approved service representative.
- Always use suitably rated lifting equipment (such as a trolley or forklift) when moving a Peloris tissue processor more than a few metres. Never use the instrument's castors to move a Peloris tissue processor.
- The instrument's castors may only be used to position an instrument for service access.
- Do not use the instrument without installing the drip tray.
- Either the carbon filter or an external fume extraction system must be properly installed at all times. Running the instrument without the carbon filter or external fume extraction will release potentially dangerous fumes into the laboratory atmosphere.

reagents

- Only use the recommended reagents to avoid instrument damage.
- Do not heat reagents above their boiling points. Boiling reagents will release large quantities of fumes that may overload the internal carbon filter or (if fitted) the external filtering system. Boiling reagents are also likely to lead to excessive pressures within the instrument, increased reagent contamination and reagent spills.
- Reagent boiling points are lower when in a retort operating with a vacuum or with pressure/vacuum cycling.
- Do not use acetone or other ketones.
- Do not use fixatives that contain either concentrated acids or mercuric salts as they will corrode metallic components.
- Do not use fixatives containing picric acid as picric acid is explosive when dry.

operation

- Press the front panel power button to stop the instrument in an emergency.
- If the touch-screen goes blank or is unreadable, turn off the instrument immediately.
- Ensure that all reagent bottles and the condensate bottle are present and properly inserted into the connection manifolds. Missing or loose bottles will cause fluid spills and vapor leaks.
- To reduce the risk of fluid spills, always keep the reagent cabinet doors closed during instrument operation unless actually changing a reagent or emptying the condensate bottle.
- Do not fill a reagent station when its contents are in a retort as this may cause fluid spills.
- Tightly fit lids to all reagent and condensate bottles to avoid fluid spills and vapor leaks.
- Wipe up all spills immediately.
- Never open a retort that contains chloroform or chloroform residue.
- Do not open a retort while a protocol is running as the retort could be pressurized and may contain hot reagent and fumes. Always follow the retort access instructions detailed in "pausing, abandoning and resuming protocols" on page 75 if you need to access a retort during processing.
- Do not open a retort while it is being used for a manual fill or drain operation as the retort could be pressurized and may contain hot reagent and fumes. Allows the fill or drain to complete or abandon the process before opening the retort.
- Do not open a retort if has been filled with hot reagent and pressurized using the manual operations functions. Always use the manual operations functions to de-pressurize a retort before opening and wear suitable protective clothing (including eye protection) if the retort contains hot reagent.
- Take care when opening hot retorts as reagent fumes may be trapped inside. Be particularly careful when chloroform has been used.

- Do not open the wax bath lids when there is wax in either retort or if wax is being transferred.
- Take care when opening wax bath lids as there may be reagent fumes trapped in the wax chambers. Be particularly careful when chloroform has been used.
- Molten wax is hot and may cause burns. Use caution when handling wax and removing baskets.
- The open retort and wax bath lids are a crush hazard as they may fall if knocked. Take care not to knock retort and wax bath lids when they are open.
- During a remote fill, do not remove the remote fill/drain hose from the instrument or a container until the software indicates the process is complete or a container change is required.
- During a remote drain, do not remove the remote fill/drain hose from the instrument or a container until the software indicates the process is complete and pressurized air has cleared the hose. A cessation of reagent flow is not an indication that the procedure is complete.
- Do not remove the wax drain container or hose until the software indicates that the drain has completed. A cessation of wax flow is not an indication that the drain procedure is complete.
- Always run a cleaning protocol after a wax step.

cleaning and maintenance

- Clean and maintain the instrument as specified in Chapter 3 "cleaning and maintenance".
- Do not use solvents on painted surfaces, plastic covers or the touch-screen.
- The retorts and wax baths may be hot and may cause burns. Take care when working near these items.
- Do not clean reagent bottles in an automatic dishwasher as they will be damaged.
- When replacing reagent bottles, ensure they are pushed fully home and their lids are tight. Failure to correctly insert reagent bottles will cause an interruption to the processing run and may result in reagent spillage.
- You must check the level of fluid in the condensate bottle before each protocol run and always ensure the bottle is emptied before it becomes full. Running the instrument with a full condensate bottle may lead to fluid spills and damaged tissue.
  Refer to “condensate bottle” on page 30.
- Replace the carbon filter when the software indicates that it’s expired. Running the instrument with an out-of-date carbon filter may release potentially dangerous fumes into the laboratory.
  Refer to “carbon filter” on page 31.

warning symbols

Warning symbols alert service personnel to potential hazards.

A warning symbol means:

> Attention. Consult the appropriate documentation or accompanying text before proceeding. Personal injury or instrument damage may occur if correct instructions are not followed.

Warning terminology and symbol definitions follow:

Symbol/Word	Explanation/details
WARNING	Hazard that could result in moderate to serious injury.
CAUTION	Hazard that could result in minor injury.

Heat hazard
Hot surfaces will cause severe burns if touched.

Toxic hazard
There is a danger of severe health impacts if proper precautions are not followed.

Chemical hazard
There is a danger of severe health impacts if proper precautions are not followed.

Biological hazard
There is a danger of severe health impacts if proper precautions are not followed.

Attention
Damage to the system or personal injury may occur if an instruction is not followed. Consult accompanying text or appropriate documentation before proceeding.

Electrical hazard
Switch off the instrument and unplug it from the mains power source prior to continuing.

Electrostatic hazard
Fit an earthing strap to the wrist of service personnel before continuing.

contents

1

introduction

This chapter provides an general introduction to the Peloris™ tissue processor hardware and software. To find the information you require, refer to the sections described in the following text.

- Section 1.1 "hardware" (page 19)
  This section describes the Peloris tissue processor hardware.
- Section 1.2 "using the software" (page 38)
  This section provides an overview of the software and describes the general navigation methods.
- Section 1.3 "terms" (page 43)
  This section explains important terms used by the software.
- Section 1.4 "reagent compatibility" (page 48)
  This section provides an overview of the reagent compatibility issues.
- Section 1.5 "reagent management system" (page 49)
  This section provides an overview of the advanced reagent management system used by the Peloris tissue processor.
- Section 1.6 "retort scheduling" (page 51)
  This section provides an overview of the scheduling methods that allow both retorts to run protocols simultaneously.

1.1 hardware

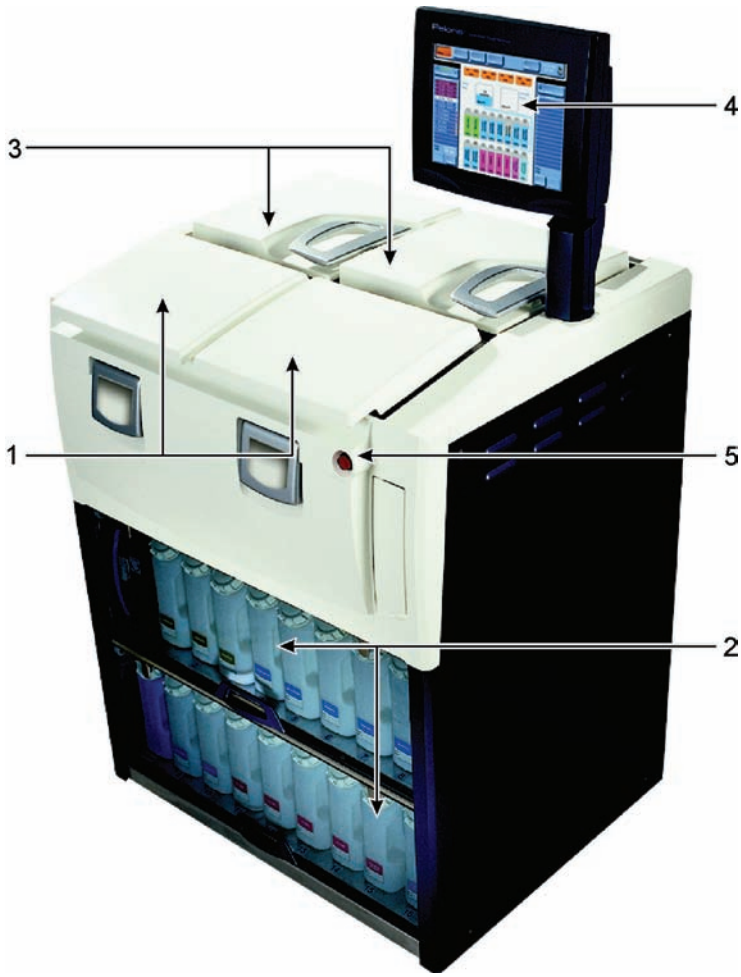


Figure 1: Peloris tissue processor hardware

The Peloris tissue processor is a free-standing processor with two retorts (1), sixteen reagent stations (2) and four wax stations (3). You operate the instrument using the touch-screen (4). Use the power button (5) to start the instrument and for emergency shutdown.

1.1.1 switching on and shutting down

- Press the power button to start the instrument (see item 5 in Figure 1).
- For a normal shutdown, follow the instructions listed below.
  (i) First use the software's **Shutdown instrument** button to shut down all software functions in an orderly manner (refer to Section 2.9.1 "instrument settings").
  (ii) Wait for the touch-screen to go blank then press the power button to remove all power from the instrument (see item 5 in Figure 1).
- For emergency shutdown, press the power button immediately (see item 5 in Figure 1).

1.1.2 retorts

The Peloris tissue processor has two independent processing retorts with each retort holding up to 300 tissue samples in three Peloris cassette baskets. Each retort operates independently with separate temperature, pressure/vacuum and stirrer speed control. The Peloris tissue processor schedules resources to ensure both retorts operate efficiently with one set of reagents.

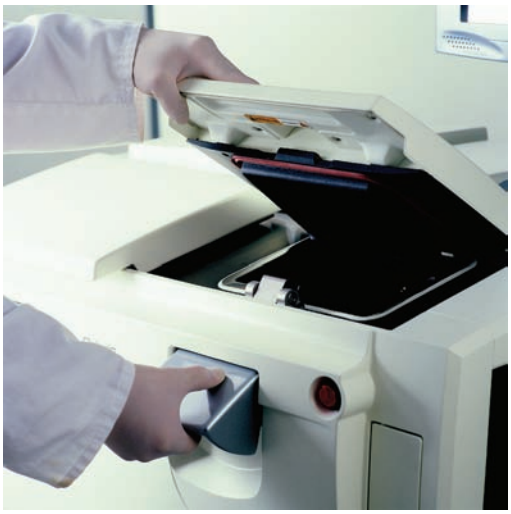


Figure 2: Opening a retort lid

liquid level sensors

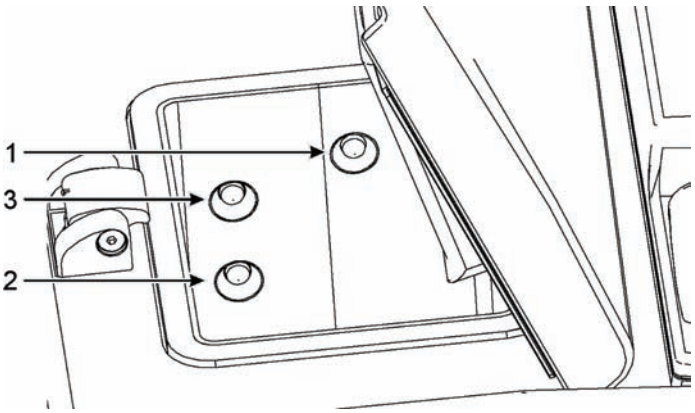


Figure 3: Liquid level sensors for—
maximum (1), three-basket (3) and two-basket (2) retort fill levels

Each retort has three Liquid Level Sensors (LLS) to monitor fluid levels. The maximum sensor responds to a fluid level of 5.3 liters; the three-basket sensor responds to a fluid level of 5 liters; and the two-basket sensor responds to a fluid level of 3.8 liters. The sensors may occasionally be affected by a buildup of condensation. If this occurs the software will direct you to wipe the appropriate sensor.

magnetic stirrer

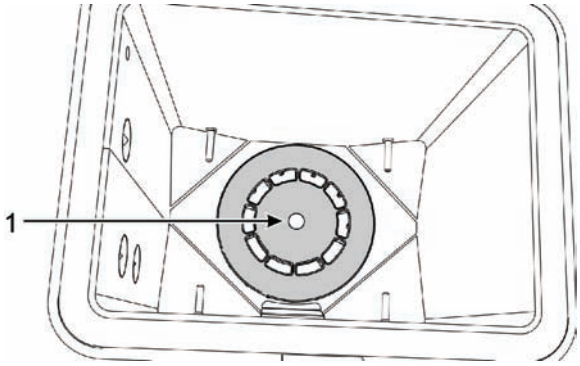


Figure 4: Magnetic stirrer (1)

Each retort has as magnetic stirrer that stirs the reagent or wax to ensure temperature consistency and good tissue penetration. The stirrer is driven by a magnetically-coupled external motor. The stirrer speed may be independently controlled for each protocol step (refer to Section "protocol step parameters") and it is easily removed for cleaning (refer to Section 3.1.4 "cleaning the retorts").

opening and closing the retort lids

Use the handles on the front of the instrument to latch and unlatch the retort lids (see Figure 2).

Always be aware of the contents, temperature and pressure of a retort before opening it. In some cases you may need to set the retort pressure and temperature manually before you can safely open it (see “venting a retort” on page 22).

WARNING
Retorts may contain very hot fluid that could cause severe burns.
Wear suitable protective clothing when opening a retort.

WARNING
Retorts may contain hazardous reagents and vapors.
Wear suitable protective clothing and ensure adequate ventilation when opening a retort.

You may see a warning dialog if the retort temperature is greater that either the retort empty access temperature (refer to Section 2.8.5 "retorts") or the safe access temperature associated with the reagent in the retort (refer to Section 2.5 "reagent types").

Some instruments have retort latch locks to disallow opening retorts when a protocol is running or the retort temperature is high (see “retort locks” on page 22).

venting a retort

You must ensure there is no pressure or vacuum inside a retort before you open the lid. The retorts automatically vent at the start and end of a protocol, and also during a pause in a protocol. However, you may need to manually vent a retort if an automatic vent fails or if you wish to access a pressurized or evacuated retort at other times.

Use the Manual operations screen to manually vent the retorts. For instruments without latch locks, set the **Pressure** button to Ambient for the retort that you want to open. You may need to wait up to one and a half minutes for the pressure to equalize.

If your instrument has retort latch locks, select the **Lock/Unlock retort** button from the appropriate control panel to lock then unlock the retort lid. The retorts vent on the unlock cycle. If the retort does not vent immediately repeat the lock/unlock cycle again; it may take several cycles to successfully vent a retort.

If you leave a hot retort closed for an extended time, the air in the retort will cool and create a vacuum. You must then vent the retort using the **Pressure** or **Lock/Unlock retort** button before attempting to open the lid.

retort locks

Some instruments include a locking mechanism that locks the retort lids when a protocol is running or the retort temperature is above the safe access temperature. To check if your instrument has lid locks open the Manual operations screen: systems with locks have a **Lock/Unlock retort** button for each retort; systems without locks do not have this button.

During protocol runs the locks engage and disengage automatically, however, following manually controlled drain and fill operations the retorts are left locked and must be unlocked with the **Lock/Unlock retort** button. The **Unlock retort** button automatically vents the retort before it is unlocked. Sometimes it may be necessary to run multiple lock and unlock cycles to overcome blockages in the vent line.

The retort latch locks can be overridden if you need to retrieve cassettes from a retort that will not unlock due to a system shutdown or a vent failure.

To override the retort lock, insert a small screwdriver (or similar tool) into the latch override hole located behind the latch handle (see Figure 5). When you feel the tool press against the internal mechanism,

stand back and lift the retort handle to unlatch the lid. If the latch is still locked, press harder on the tool or try wiggling it before again attempting to open the lid.

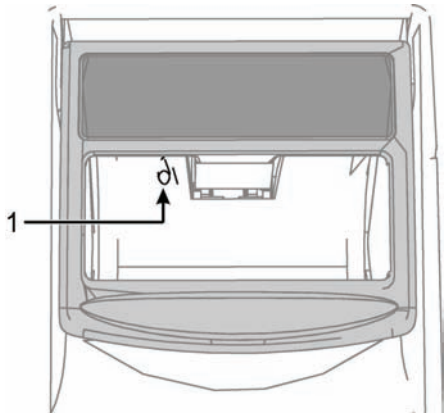


Figure 5: Lid lock override hole (1)

1.1.3 fill level

The fill level determines the reagent volume used to fill the retorts and bottles. Fill level is defined by basket number. You set up your instrument so the reagent volumes are sufficient to process either two or three cassette baskets. The two basket fill volume is 3.8 liters (1 gallon US) and the three basket fill volume is 5 liters (1.32 gallon US). Refer to Section 2.9.1 "instrument settings" to learn how to set the fill levels.

Markings on the reagent bottles (Figure 6) and wax stations (Figure 7) allow you to visually check the reagent volume. The minimum levels must be considered as absolute levels and you should always keep the reagent or wax volume well above the markings. Reagent levels below the minimum will cause protocols to either fail or use a sub-optimal reagent sequence.

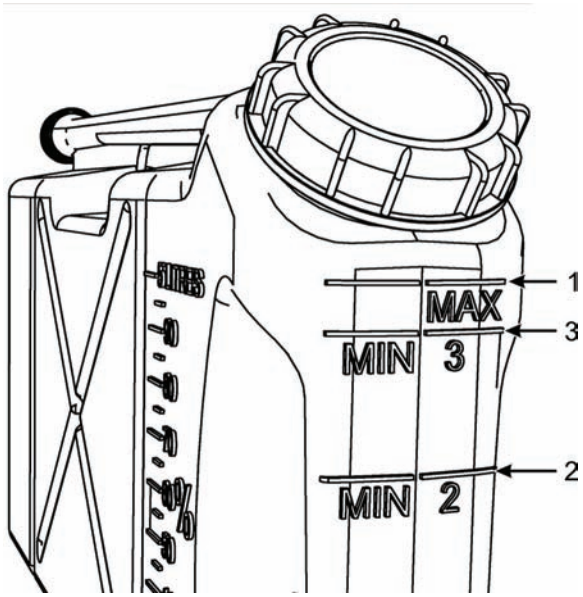


Figure 6: Reagent bottle level markings:
maximum (1), minimum for two baskets (2), and minimum for three baskets (3)

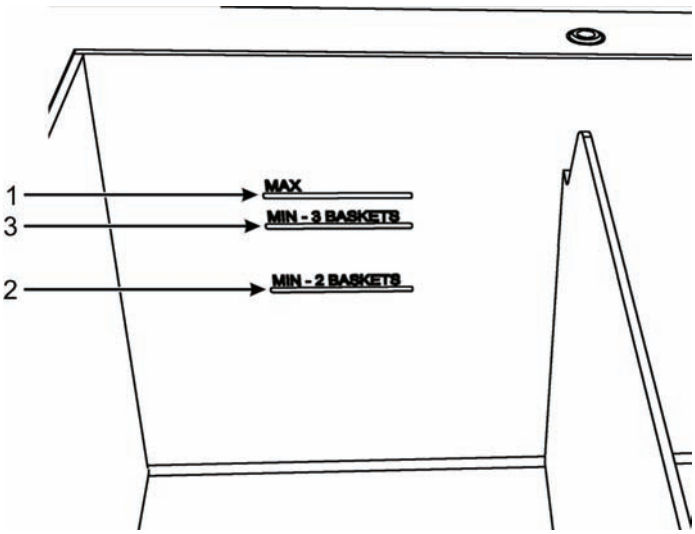


Figure 7: Wax station level markings:
maximum (1), minimum for two baskets (2), and minimum for three baskets (3)

1.1.4 cassette baskets

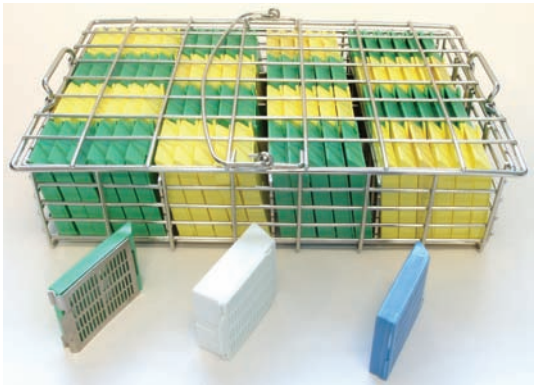


Figure 8: Peloris high capacity basket with some of the compatible cassette types

There are two Peloris basket types: the configurable high-capacity basket that accommodates the maximum number and type of cassettes; and the spaced basket that ensures optimal reagent flow. Both basket types include a removable lid to assist with cassette insertion and removal and a drop-down handle that makes it simple to place and retrieve the basket from a retort.

The high-capacity cassette baskets accept most common cassette types and includes configurable dividers that allow for different cassette sizes and packing densities.

The spaced basket includes a fixed divider that ensures optimum reagent flow with minimal carry-over. This basket type accepts 72 standard cassettes and it must be used for all xylene-free protocols.

To avoid dropped cassettes or failed processing, you must ensure the correct basket type is used and that the lid is fitted correctly and each basket is correctly inserted into a retort. The correct procedures are explained in the following sections:

- "opening and closing the lid" on page 25
- "inserting baskets into the retorts" on page 25
- "high-capacity baskets" on page 26
- "spaced baskets" on page 28

Always use the spaced basket for xylene-free protocols. Do not use the high-capacity basket as this may lead to wax build-up that will eventually require service intervention.

Always ensure the cassettes are correctly inserted into the baskets and that the baskets are correctly placed in the retorts. Incorrectly placed cassettes or baskets may lead to samples being destroyed as some tissue may not be fully covered by reagent during processing.

Never place three baskets into a retort when the instrument is configured with a two-basket fill level. If this occurs, reagent will not cover the top basket and tissue samples will be destroyed.

opening and closing the lid

The lid is held by two catches and is completely removable to aid cassette access.

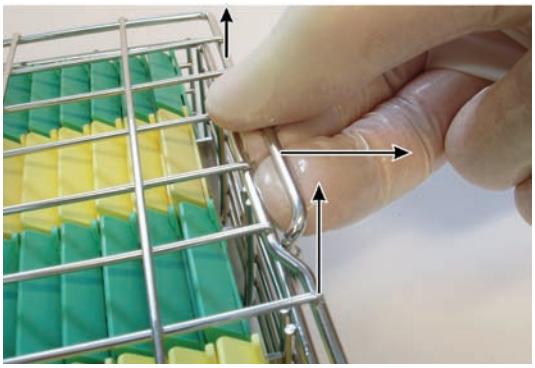


Figure 9: Releasing the lid

Figure 10: Replacing the lid

- To remove the lid, release one catch then swing the lid up and off the basket (see Figure 9).
- To replace the lid, insert one end into a catch then swing the other end down so it firmly engages the second catch (see Figure 10).
- Make sure the lid is firmly held by both catches or the body and cassettes may fall when the basket is lifted.

inserting baskets into the retorts

The cassette baskets stack into the retorts with their lids upwards and their handles dropped flat. You must ensure the baskets slide smoothly into the retort and sit flat. A crooked basket may leave cassettes exposed to air and cause their destruction. Place your baskets into the retorts as described in the following text.

- Use the basket handles to insert the baskets as shown in Figure 11. Make sure the lid is uppermost.

- Make sure the first basket sits flat on the retort p
- Once the basket is in place, let the handle fall so
- Stack additional baskets so they sit flat on the lov ecure with their handles folded flat.

Figure 11: Placing a basket into a retort

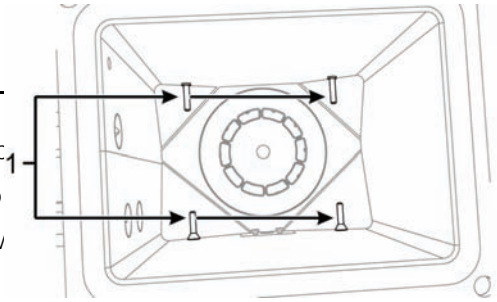


Figure 12: Retort pins (1)

high-capacity baskets

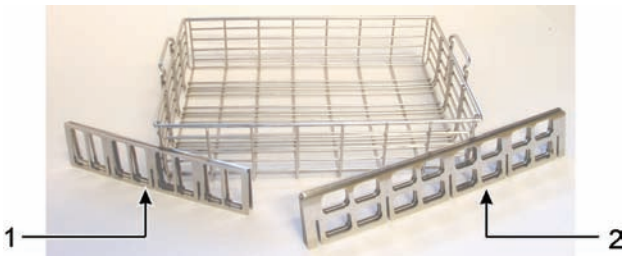


Figure 13: Open cassette basket with short dividers (1) and long dividers (2)

For standard protocols, you can use the standard dividers to configure your baskets for either orderly packing (up to 88 cassettes) or for tight packing (up to 100 cassettes).

Please note that as packing density increases, the time required for processing will also increase. Faster processing can be achieved using the spaced basket configuration.

For orderly packing, insert both the long and short dividers into the basket. This arrangement makes it easier to insert and remove the cassettes (see Figure 14 and Figure 15). 6 standard cassettes can be placed in the end sections of each row and 5 in the middle sections, giving 88 cassettes per basket.

Figure 14: Basket arranged for orderly packing

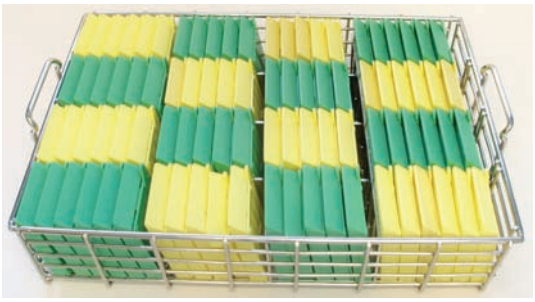


Figure 15: Basket packed with 88 cassettes

For tight packing, insert only the long dividers. This allows you top pack the maximum number of cassettes — 25 per row (see Figure 16 and Figure 17).

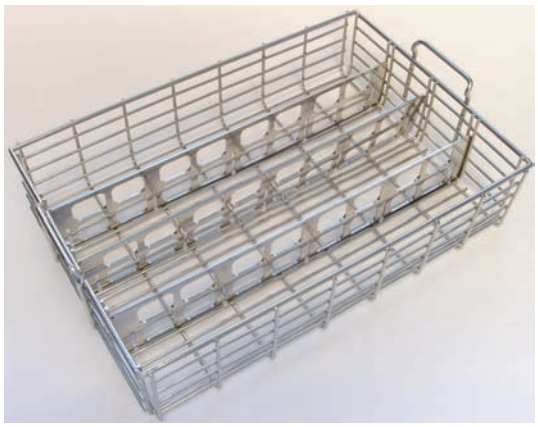


Figure 16: Basket arranged for tight packing

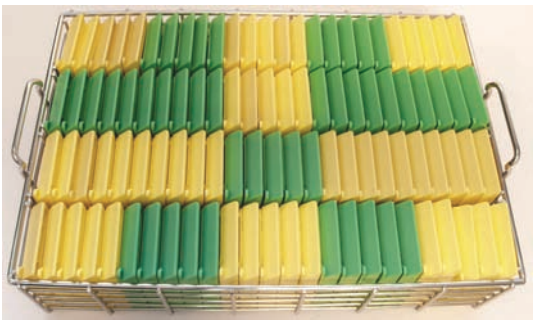


Figure 17: Basket packed with 100 cassettes

For large or unusually shaped cassettes, you may use the baskets with all dividers removed.

spaced baskets

Figure 18: Spaced cassette basket

The spaced baskets include a fixed divider that ensures that the cassettes are correctly spaced for optimal processing. Each spaced basket can fit up to 72 standard cassettes inserted into the spacing springs as shown in Figure 19.
You must use spaced baskets when running xylene-free protocols.

Do not use the high-capacity baskets for xylene-free protocols as this may lead to a wax build-up that will eventually require service intervention.

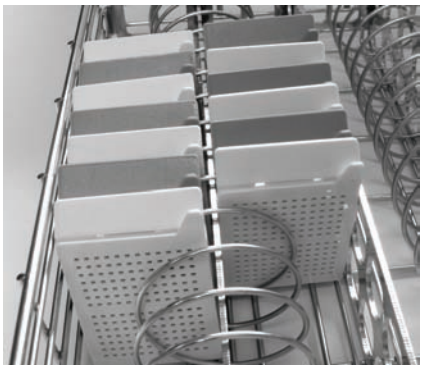


Figure 19: Detail of cassettes packed into a spaced basket

1.1.5 wax bath

The wax bath houses four wax stations. Each station acts independently and holds sufficient wax to fill a single retort. The current temperature of each wax station is displayed in the wax section of the reagents station screen (refer to Section 2.4 "reagent stations"). The Peloris tissue processor continuously cleans the wax in bath when the wax clean function is enabled (refer to Section 2.8.3 "wax bath settings").

The two wax bath lids latch when pushed closed. Use the lid handles to open the wax baths (see Figure 20). If the wax bath is pressurized or evacuated, you must use the wax vent function to neutralize the pressure so the lids can be opened easily and safely. You can vent the wax bath when you pause a

running protocol or from the manual operations screen. Refer to either Section 2.1.10 "pausing, abandoning and resuming protocols" or to Section 2.7 "manual operations".

Figure 20: Opening a wax bath lid

You must use the remote fill/drain functions to drain used wax from the baths (refer to Section 2.6 "remote fill/drain"). You directly fill wax stations with either molten wax or solid wax pellets. You must then reset the station history and set the appropriate station state.

- If using molten wax, set the state to full.
- If using pellets, set the state to "Not molten" to begin the wax heating process.
  You require four kilograms of wax pellets to fill a wax chamber to the three basket level.
  You will need to add the pellets in stages as the volume of the wax decreases as it melts.
  The station's state will automatically change to "Full" when the wax is ready to use.

Ensure you fill the wax station with sufficient volume for the retort fill level (see Figure 7).

WARNING
Never open a wax bath lid when there is wax in a retort or wax being transferred as hot wax may splash from a wax station.
Never open a pressurized wax bath as hot wax may splash from a station; vent a pressurized wax bath before opening.

WARNING
If you attempt to force open the lid of an evacuated wax bath you may cause an injury if the lid flies open when the vacuum releases.
You may also damage the lid if you use excessive force when opening.
Always vent an evacuated wax bath before opening.

1.1.6 reagent cabinet

Figure 21: Reagent cabinet

The reagent cabinet houses the reagent stations (1), carbon filter (2), and condensate bottle (3). The cabinet has two glass doors that retract into the cabinet when open.

reagent stations

The reagent cabinet holds sixteen reagent bottles (one at each station). This is three more than standard tissue processors and it ensures there are sufficient reagents to simultaneously schedule protocols in both retorts while also having ample cleaning reagents on board and ready to use. The bottle at each station holds sufficient reagent to fill a single retort. To remove the bottles, simply lift open the cabinet door and pull out the required bottle. To fit a new bottle, simply push it into position. After replacing a bottle you must manually enter the station's details using the reagent stations screen (refer to Section 2.4 "reagent stations").

You can fill and drain the stations manually (that is by removing the bottle from the instrument) or using the remote fill/drain functions (refer to Section 2.6 "remote fill/drain").

Some chemicals may cause the bottles to expand over time, this is normal and will not impact the performance of the instrument.

Caution Never run the instrument with missing bottles or with loose or missing bottle lids as fluid spills and vapor leaks will occur.

condensate bottle

A separate bottle collects condensate fluid. It sits beside the reagent bottles in the lower section of reagent cabinet (see item 3 in Figure 21). Check the bottle before each run and empty it if it is more than half full. Do not allow the bottle to overflow as condensate fluid will spill from the instrument.

Caution Never run the instrument with the condensate bottle missing or its lid either loose or missing as fluid spills and vapor leaks will occur.

carbon filter

The carbon filter absorbs reagent fumes to prevent them from entering the laboratory atmosphere. To ensure the filter is operating effectively, it must be replaced periodically. Use the **Carbon filter threshold** button to set the replacement interval (refer to Section 2.9.1 "instrument settings").

If you prefer to use an external vapor removal system, the carbon filter may be bypassed and the instrument connected directly to the external system. This is described in the Section 1.1.7 "external vapor removal systems".

WARNING
Unless you are using an external vapor removal system, running the instrument without the carbon filter will release potentially dangerous fumes into the laboratory environment.

The filter must be installed with the direction arrow pointing up and the locking mechanism must be closed (see Figure 25).

Use the following procedure to replace a used filter.

1. Unlock the filter by turning the latch 1/4 turn clockwise (see Figure 22).

Figure 22: Unlocking the filter

Figure 23: Removing the filter

2. Slide the old filter out (see Figure 23).
3. Remove the plastic wrap from the new filter.

Procedure continues on the next page…

…procedure continuing from previous page.

4. Slide the new filter into the housing with the direction arrow pointing up (see Figure 24).

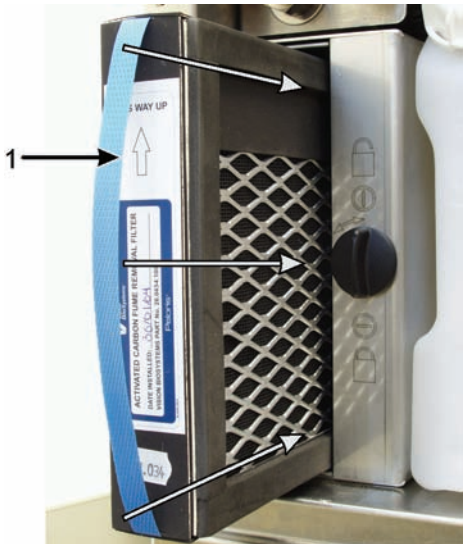


Figure 24: Replacing the carbon filter with direction arrow (1) pointing up

Figure 25: Locking the filter

5. Turn the latch 1/4 turn anti-clockwise to lock the filter in place (see Figure 25).
6. Make sure the filter is unwrapped, fully inserted, and that it is locked into the housing.
7. Reset the carbon filter age from the "Instrument settings" screen of the software. Refer to Section 2.9.1 "instrument settings" for details.

1.1.7 external vapor removal systems

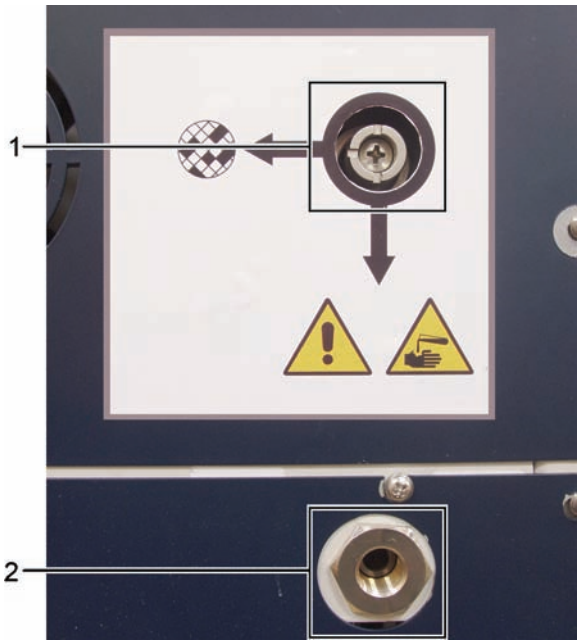


Figure 26: Vapor select valve (1) and vapor outlet (2)

The outlet for instrument vapors can be switched between the internal carbon filter and an external vapor extraction system. At the rear of each instrument there is a valve that directs vapors to either the carbon filter or to an outlet that can be connected into the external system.

- For instructions on changing to an external vapor system, refer to "connecting to an external system" on page 33.
- For instructions on returning to the internal carbon filter system, refer to "returning to the internal filter system" on page 34.

Some instruments do not have the vapor select valve fitted. However your service organization can easily connect these instruments to an external vapor system.

connecting to an external system

WARNING
When the vapor select valve is in the external position, you must ensure an external vapor system is correctly installed or potentially dangerous fumes will be released into the laboratory environment.

Use the following procedure to connect the instrument to an external vapor system.

1. Connect the instrument's vapor outlet into the external system (see item 2 in Figure 26).

2. Turn the vapor select valve anticlockwise to direct vapors to the vapor outlet (see Figure 27). Note: to access the valve you may need to remove a blanking plug.

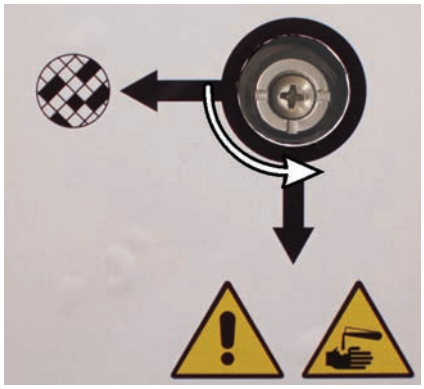


Figure 27: Vapor select valve in the external system position

3. Set the carbon filter threshold to one of the following options.
   (i) The inspection interval for the external system (refer to Section 2.9.1 "instrument settings").
   (ii) The maximum value (1000) to limit the number of unwanted warnings (refer to Section 2.9.1 "instrument settings").
   (iii) Overridden (contact your service organization to arrange this setting).

returning to the internal filter system

WARNING
When the vapor select valve is in the internal position, you must ensure the carbon filter is correctly installed or potentially dangerous fumes will be released into the laboratory environment.

Use the following procedure to reconfigure an externally connected instrument to internal carbon filter use.

1. Ensure a new carbon filter is correctly installed (refer to the carbon filter instructions in section "carbon filter" on page 31).

2. Turn the vapor select valve clockwise to direct the vapors to the internal carbon filter (see Figure 27).
   Note: to access the valve you may need to remove a blanking plug.

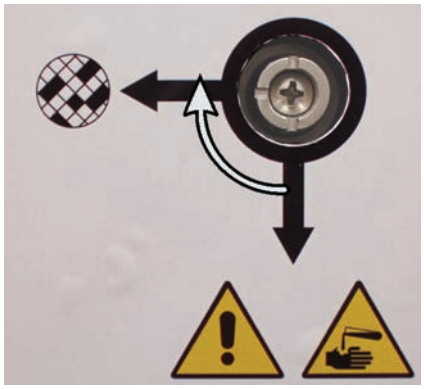


Figure 28: Vapor select valve in the internal filter position

3. If required, disconnect the external system from the vapor outlet (see item 2 in Figure 26).
   You may leave the external system connected as the vapor valve effectively isolates this outlet.
4. Set the carbon filter threshold to a value appropriate for your instrument's work load.
   We recommend an initial threshold of 60 days with adjustments only if you are sure the carbon filter is becoming saturated earlier or is still in good condition after this time.
   Refer to Section 2.9.1 "instrument settings" for details.

If the carbon filter threshold has been overridden the carbon filter buttons will not be available. Arrange for your service organization to cancel the override.

1.1.8 alarm connections

Figure 29: Remote alarm (1) and local alarm (2) connectors

Each Peloris tissue processor has two external alarm connections — a local alarm connection and a remote alarm connection (see Figure 29). These connections may be used to control a range of alarm indication devices including audible alarms, visual alarms or automatic phone dialers.

The actual alarm behavior and the events that trigger the alarms can be set using the functions in the software's Alarms screen (refer to Section 2.9.5 "alarms").

alarm connector specifications

The load connected to either alarm connector must not exceed the following specifications.

- Maximum voltage: 30 DC
- Maximum current: 1 A (resistive load)
- Maximum current: 0.5 A (inductive load)

alarm connector pins

Each alarm connector has three pins as follows (see Figure 30):

- Pin 1 — Normally open (item 1)
- Pin 2 — Normally closed (item 2)
- Pin 3 — Common (item 3)

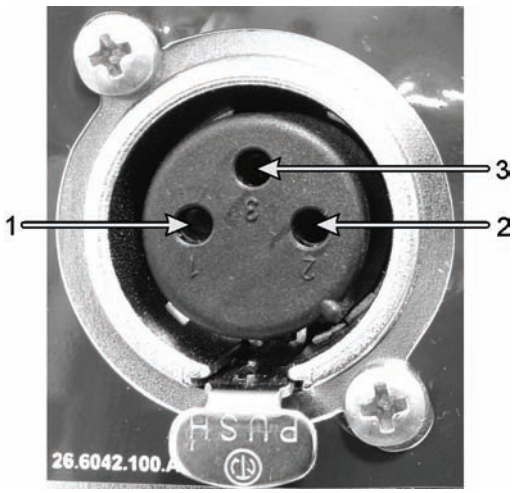


Figure 30: Alarm connector pins

pin schematic during normal operation

When the instrument is operating normally (no alarm) the alarm pins connect as shown in Figure 31 below.

- Pin 1 (N/O) is open.
- Pin 2 (N/C) is connected to Pin 3 (common).

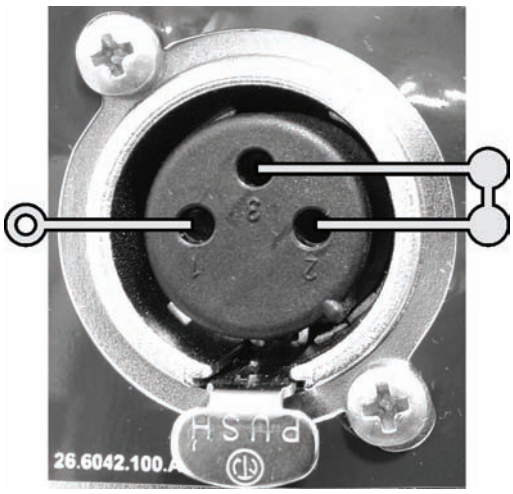


Figure 31: Alarm pins in normal state

pin schematic during alarm conditions

When the instrument has an active alarm, the alarm pins connect as shown in Figure 32 below.

- Pin 1 (N/O) is connected to Pin 3 (common).
- Pin 2 (N/C) is open.

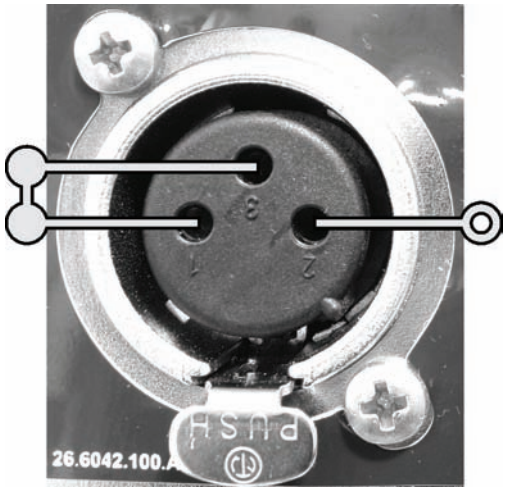


Figure 32: Alarm pins in alarm state

1.2 using the software

You control all instrument functions with the Peloris tissue processor software. The touch-screen displays the software and you select commands by touching on-screen buttons, icons or table cells. On-screen keypads appear when required to provide a convenient way to enter numbers and text.

1.2.1 basic operation

buttons

The software uses various sized buttons to indicate a selectable function. All buttons have three states: available, selected and unavailable. The available buttons are blue and appear raised. The selected button is orange and appears sunken. Unavailable buttons appear dimmed.

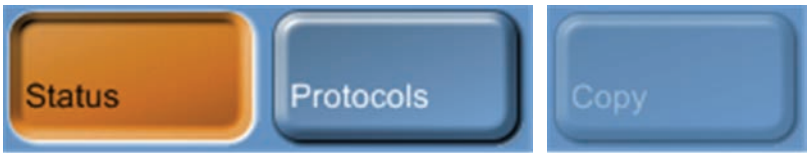


Figure 33: Button states—selected, available and unavailable

icons

Icons represent various Peloris tissue processor elements including reagent stations and retorts. These icons have three states: selectable, selected and not selectable. Selectable icons appear raised. A selected element appears raised with a red outline. Nonselectable elements appear flat and are used for indication only. You select an element by touching the icon as you would a button.

Figure 34: Reagent station—selectable, selected, not selectable

tables

Tables display configuration information such as reagent station and protocol setup. You may edit some table cells (1) but others are locked (2). The background color of locked cells is dimmed. You select editable table cells by touching within the cell boundaries.

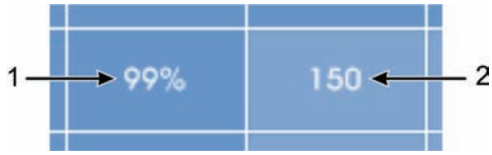


Figure 35: Table cells—editable (1) and locked (2)

option lists

Where you are required to choose between several options such as picking a protocol or a reagent, you will see the available options as raised objects. You select the item you require by touching it as you would a button. The selected item is displayed with a red outline.

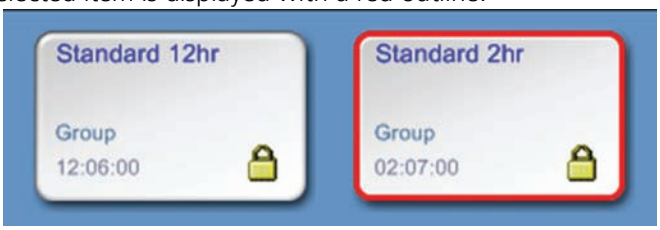


Figure 36: Protocols—available and selected

using keypads

Keypads appear as needed to allow you to enter text and numbers. There are two types of keypad: alphanumeric (text and numbers) and numeric (numbers only). The keypads are analogous to a computer keyboard with on-screen buttons acting as keys (1). Enter text and numbers by selecting the appropriate buttons in order and use the **Caps Lock** button (4) or **Shift** button (5) to select upper or lower case characters. As you type, the characters you select are displayed in the text window (6). The alphanumeric keypad has a **Back Space** button (7) to delete the last character while all keypads include a **Clear** button (3) to remove all characters. When you have finished, select the **Esc** button (2) to exit without saving or the **Enter** button (8) to confirm your entry.

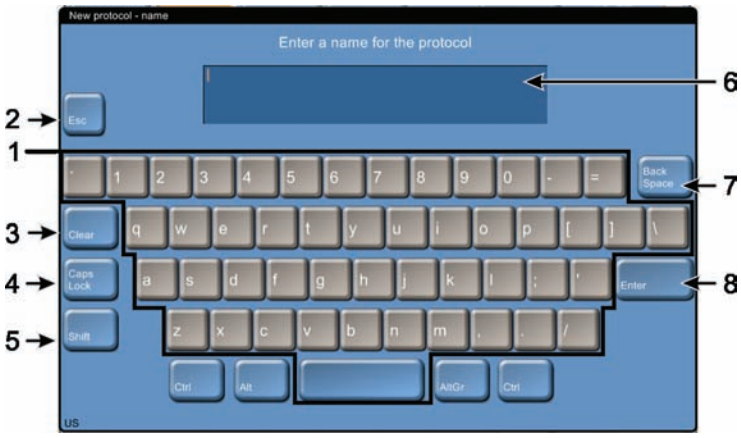


Figure 37: Alphanumeric keypad

1.2.2 navigation

The software has two main areas: the Function bar (1) containing the navigation buttons and useful system information; and the work area (2) that displays the various instrument setup and control screens. The Function bar is always visible and you use it to select the screens you wish to view.

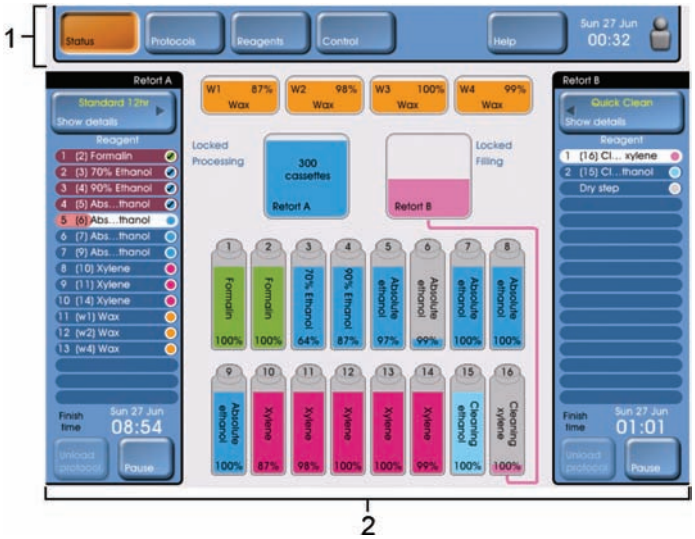


Figure 38: Peloris tissue processor software with Function bar (1) and work area (2)

function bar

Use the buttons on the Function bar to select the work area you wish to view. Selecting a button will either display a new screen or will call a menu from where you can select from a number of screen options. Once you have chosen a button it will remain in the selected state to indicate the screen or sub-menu you have activated.

The Function bar menus appear below the initiating button (see Figure 40). The operation of the menu buttons is identical to the main buttons except the menus disappear after you select a screen.

The information area shows the current date and time (see item 1 in Figure 39) and also the access level (see item 2 in Figure 39 and refer to Section 1.2.3 "access levels" for details).

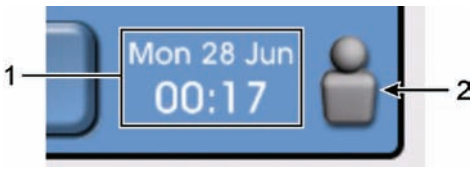


Figure 39: Function bar information area

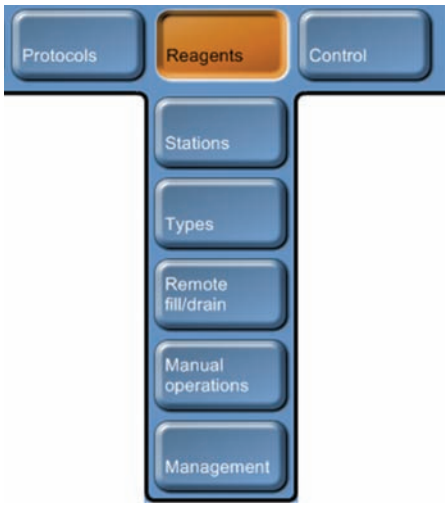


Figure 40: The Function bar Reagents menu

work area

The work area displays the various setup, control and information screens selected by the Function bar buttons. The following table details the available screens and the buttons used to select them. Find more details about each screen by reading the document sections referred to.

Function bar button	Menu buttons	Screen purpose	Refer to:
Status	—	Use this screen to load and run protocols while viewing system status.	Section 2.1 "status screen"
Protocols	—	Use this screen to select, create, edit and manage protocols.	Section 2.2 "protocols"
Reagents	Stations	Use the Stations screen to allocate reagent types to stations and to set initial reagent concentration. You can also view the current reagent concentration and wax bath temperature.	Section 2.3 "reagents"
	Types	Use the Types screen to manage your list of active reagent types.	
	Remote fill/drain	Use this screen to fill or drain reagent bottles via the remote fill/drain line and to drain wax stations using the waste wax line.	
	Manual operations	Use this screen to manually control reagent, wax and retort functions.	
	Management	Use the Management screen to specify system-level reagent functions and to set retort states.	
Control	Instrument settings	Use this screen to: Shut down the instrument Set device thresholds Set reagent fill levels View and set formatting options.	Section 2.9 "control"
	Device settings	This screen allows supervisors to alter sound, touchscreen and alarm settings.	
	Service settings	This screen details system information and allows a supervisor to name the instrument and provides a system test function.	
	Event log	Use the event log to view a list of all system events.	
	Alarms	Use this screen to set up and manage alarms.	
	Access level	Use this screen to set the access level.	
	File transfer	Use this screen to transfer files to and from the instrument.	
Help	—	The help system provides on-line assistance for Peloris tissue processor operation.	Section 2.10 "help"

1.2.3 access levels

The access level determines the screens and functions available to the current user. There are two levels available to laboratory staff: operator and supervisor. You automatically begin at the lowest level (operator) when you start the software. You may change to the higher supervisor level at any time provided you know the correct password. You can also change the supervisor level password.

The current access level is indicated by an icon on the Function bar (see Figure 41). Refer to Section 2.9.6 "access level" for access level procedures.

Figure 41: Access level icons with operator (1) and supervisor (2)

The service and manufacturer access levels are reserved for use by service personnel and authorized representatives of the manufacturer. They are not available to laboratory personnel and are not covered in this manual.

1.3 terms

The Peloris tissue processor software uses a number of terms and concepts in very specific ways to describe instrument status and operation. The following sections describe these terms; familiarize yourself with them to aid your understanding of Peloris tissue processor operation.

1.3.1 station

The term "station" indicates a reagent source. The Peloris tissue processor has 20 reagent stations: the 16 reagent bottles and the 4 wax chambers.

1.3.2 reagent groups, types and stations

The Peloris tissue processor manages reagents by groups (1), types (2) and stations (3) as depicted in Figure 42 and described in the following text.

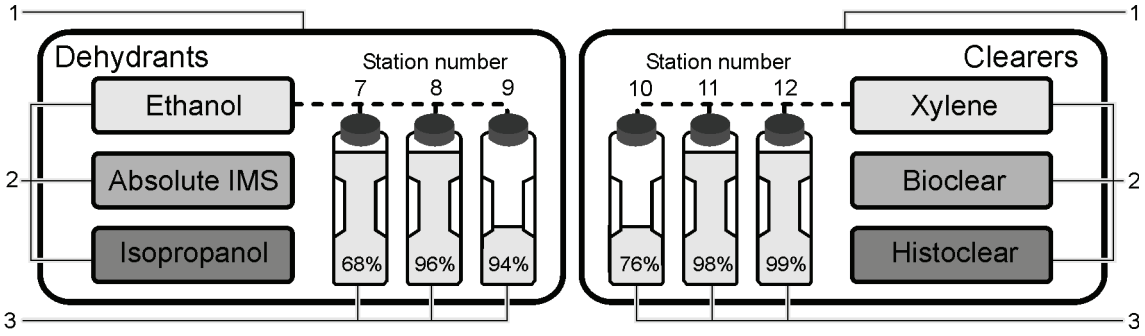


Figure 42: Reagent groups (1), types (2) and stations (3)

group

Group refers to the reagent's function (for example dehydrants). There are nine fixed reagent groups with each group represented by a color. Refer to the following table for a list of the groups and their colors and functions.

Group	Function	Color
Fixatives	Tissue preservative.	Green
Dehydrants	Removes fixative reagents from tissue.	Blue
Defat	Removes fat deposits from tissue.	Yellow
Post defat	The dehydrant used after a defatting step.	Purple
Clearers	Clears the dehydrants from the tissue.	Red
Wax	The embedding medium used to facilitate tissue sectioning.	Orange
Cleaning solvents	First cleaning reagent.	Pink
Cleaning alcohols	Second cleaning reagent.	Light blue
Cleaning water	Third retort cleaning reagent (not needed or recommended).	Grey

type

Type refers to a particular reagent within a group. Each reagent type is unique with its own name and attributes for default concentration, purity thresholds, and temperature thresholds. The Peloris tissue processor provides a set of factory reagent types and you are free to create your own reagent types. Use the **Types** screen from the **Reagents** menu to define and edit reagent types (refer to Section 2.5 "reagent types").

Reagent type names do not affect reagent concentration. Reagent concentration defaults to the type's default concentration value but is ultimately determined by the concentration management options set (refer to Section 1.5 "reagent management system"). For example, when assigning a reagent type called "Ethanol 70%" to a station, the initial value would be the type's default value (probably 70%) but you could set the initial concentration to any value between 0 and 100%.

station

Station refers to an actual reagent and its container. Each station is set to a reagent type and has a concentration, use history and status. Each station is identified by its location (stations 1 to 16 for the reagent bottles and chambers W1 to W4 for the wax). The Peloris tissue processor automatically tracks and updates station properties based on use. The same reagent type may be used in multiple stations, however concentration, use history and status are unique for each station. Use the **Stations** screen from the **Reagents** menu to define reagent stations and to monitor their use history and concentration (refer to Section 2.4 "reagent stations").

1.3.3 concentration

Concentration is the proportion of a reagent that is of the group to which the reagent is assigned. Please note that the reagent type and reagent name have no effect on reagent concentration. The following examples illustrate how the concentration is determined.

- A dehydrant that is 80% Ethanol (a dehydrant) and 20% water (not a dehydrant) has a concentration of 80%.
- A dehydrant that is 80% Ethanol (a dehydrant) and 20% IPA (also a dehydrant) has a concentration of 100%.
- An absolute Ethanol (100% dehydrant) that is contaminated by carry over from an absolute IMS (100% dehydrant) would still have a concentration of 100% as both the original reagent and the contaminate are dehydrant.
- A new xylene (100% Clearer) contaminated by carry over from an absolute Ethanol (100% dehydrant) would have a reduced concentration — typically around 94% after one cycle — as it will now consist of 94% Xylene (a Clearer) and 6% Ethanol (a dehydrant).

A reagent that is used early in a sequence of the same group will have a rapid concentration decline as most of the contamination it receives will be from the previous group. A reagent that is used late in a sequence will have a slow concentration decline as most of the contamination it receives will be from the same group.

The reagent management system manages the reagent concentration at each station based on the concentration management options set (refer to Section 1.5 "reagent management system").

1.3.4 states

The term "state" indicates the fill level of a station or retort. The state of an item determines which actions are permissible—for example a "Clean" retort may be filled with any reagent while an "Empty" retort may only be filled with a compatible reagent. Each item has a unique set of states with corresponding graphic representations.

As well as the state information, the retort, wax station and reagent station graphics include additional status information. Refer to Section 2.1.1 "status area" for details.

Refer to the following three tables for a description of each state term.

Retort states		
State	Means	Graphic
Full	The retort contains the correct amount of wax or reagent for the specified basket level.	
Part full	The reagent or wax level is between full and empty, this usually occurs during a fill or drain operation.	

Retort states		
Empty	The retort empty state indicates that it is drained of reagent and wax but it still contains some residue.	
Clean	A clean state indicates that there is no reagent residue in the retort. This only occurs after a cleaning protocol.	
Retort inoperative	A red cross over a retort indicates that a hardware failure has occurred and the retort is unavailable. Contact your service representative.	

Wax station states		
State	Means	Graphic
Full	The station holds sufficient wax to fill a retort to the specified basket level.	

Wax station states		
Part full	A wax transfer is in progress or has abandoned. The wax level is between full and empty.	
Empty	The station has been drained to fill a retort. There is still wax in the station.	
Not molten	The wax in the station has not melted and is unavailable.	

Reagent station states						
State	Full	In use	Empty	Dry	No bottle	Unknown
Means	The bottle holds sufficient reagent to fill a retort.	A reagent transfer is in progress or has abandoned. The reagent level is between full and empty.	The bottle has been drained to fill a retort. There is still reagent in the bottle.	The bottle has been completely drained leaving only a small amount of residue.	The bottle has been removed.	A previously missing bottle has been replaced. Enter reagent and state details before using this station.
Graphic						

1.4 reagent compatibility

As tissue processing requires the use of incompatible reagents, the Peloris tissue processor software uses a set of rules to ensure that only compatible reagents are allowed to mix. Reagent mixing usually occurs when a reagent enters an "Empty" retort containing residual amounts of the previous reagent. This may happen as part of a protocol, during manual operations or during remote and fill/drain procedures.

The software will not allow you to create a protocol that has an incompatible reagent sequence and you are also prevented from mixing incompatible reagents during remote fill/drain procedures. You cannot run a protocol where the first reagent is incompatible with the retort residue. You can however load a protocol with an incompatible first step but the reagent sequence must be edited during scheduling to select a new first step that is compatible with the retort residue (refer to Section 2.1.9 "skipping initial steps").

Reagent compatibility varies depending on the action or protocol being undertaken. Use the reagent tables in Section 4.6 "reagent compatibility tables" to check reagent compatibility before creating protocols, conducting manual operations or initiating remote fill/drain procedures.

1.5 reagent management system

The Peloris tissue processor uses an advanced reagent management system that controls reagent use to achieve the best possible tissue processing results whilst also maximizing reagent life. The system has two parts: concentration management and reagent selection.

1.5.1 concentration management

The reagent concentration at each station is used to select reagent stations for protocol steps as described in Section 2.2.4 "reagent selection method". There are three options for reagent concentration management ("by calculation", "by cycles" and "by position") as described in the following sections. You set the management method from the reagents management screen as described in Section 2.8.1 "general".

by calculation

Managing reagent stations using the calculation method produces the best tissue processing results as all factors that affect concentration are considered. It uses an initial station concentration (usually set to the reagent type's default value) then tracks station use to calculate the current concentration. You can use the reagent stations screen to view and set the calculated concentration value for each station (refer to Section 2.4 "reagent stations").

To calculate the concentration, the Peloris tissue processor uses known amounts of reagent carry-over from the retort walls, baskets, cassettes and biopsy pads. It also considers the compatibility of each reagent group and the effect of wax cleaning (when enabled). The following reagent components are tracked: water, fixative, dehydrant, clearer, and wax.

The calculated concentration is updated after each retort drain. The calculation is based on reagent carry-over and the number of baskets, cassettes and biopsy pads processed. There is no reagent carry-over from a clean retort so the concentration of a reagent used in a clean retort will not alter.

For each protocol step:

- The number of baskets is determined by the retort fill level
- The number of cassettes is either the default or the number entered when starting the protocol
- The number of biopsy pads is determined by the protocol's cassette to biopsy pad ratio.

For manual operations:

- The number of baskets is determined by the system's fill level
- The number of cassettes is the default set by the laboratory supervisor
- The number of biopsy pads is determined by the cassette to biopsy pad ratio.

Refer to Chapter 2 "the software in detail" to learn how to set the fill level, the default number of cassettes and biopsy pad ratio.

The Peloris tissue processor always calculates the reagent concentration. However, the calculated value is ignored when the "by position" and "by cycles" modes are selected.

by cycles

This method uses the number of cycles each station has completed to determine the concentration ranking of each reagent within a group or type. A cycle is defined as a retort fill and drain. This method may produce good results if the reagents are changed on a rotating partial-change basis so that the number of cycles correlates to the degree of reagent contamination. However this method is not recommended as it does not account for the number of cassettes and biopsies processed during each cycle nor the interaction with preceding reagents.

You can use the Reagent stations screen to view and reset the number of cycles each station has processed (refer to Section 2.4 "reagent stations").

by position

This method uses the station position to determine the concentration ranking of each reagent within a group or type. When "By position" is selected, the Peloris tissue processor assumes that concentration increases with reagent station number. This method is not recommended as it will only produce good results when reagents are manually shuffled after each run to ensure they are correctly ordered within the reagent cabinet and wax bath.

1.5.2 reagent selection

The reagent management system is able to select the best reagent for each protocol step based on reagent station concentration. The protocol selection method determines the way stations are assigned (either by group, type or station). The protocol selection methods and the associated station assignment details are covered in Section 2.2.4 "reagent selection method".

1.6 retort scheduling

The Peloris tissue processor allows you to simultaneously run protocols in both retorts. The automatic scheduling function attempts to assign reagent stations and start times so that there are no clashes and it may alter your requested end time by starting the protocol early or by inserting a delay time (refer to Section 1.6.1 "delayed end times and initial fills").

Also, when starting a second protocol you may notice that the reagent stations assigned when a protocol was loaded change as it begins to run. This occurs when the instrument must alter the assignment to allow for the first protocol's current reagent requirements.

It is sometimes not possible to schedule a second protocol. This situation and possible remedies are discussed in Section 1.6.2 "unavoidable reagent clashes". Also, protocols will sometimes fail if a reagent station unexpectedly becomes unavailable. Section 1.6.3 "unavailable reagents" describes the best ways to avoid this situation.

1.6.1 delayed end times and initial fills

Protocols do not need to start immediately and it is possible to set a required end time that necessitates a delay before the actual protocol begins. This delay period can extend to many days. Also, when selecting the ASAP (As Soon As Possible) scheduling option, or if you have requested an end time that is not achievable, the Peloris tissue processor may be forced to delay the start of the protocol. During the protocol delay period the Peloris tissue processor will protect your cassettes by covering them with reagent; this process is called an initial fill.

During the initial fill, the retort is filled with the first scheduled reagent (usually a fixative) to protect the samples but (unless the reagent is wax) no reagent heating or agitation occurs and the first step will not advance until the delay period is finished. If the initial step is wax (for reprocessing or wax only protocols), the retort temperature will be set to wax standby, and the stirrer will be set to the first step's speed. Once the initial fill period is over the protocol will run normally and will finish at the predicted end time.

We recommend that all protocols start with a fixative step (even if only very short) so that a fixative is used for any initial fill. If there is no fixative step, an initial fill may leave your tissue covered with dehydrant for a long period and this can cause the tissue to become hard and brittle.

1.6.2 unavoidable reagent clashes

Unavoidable clashes often occur when there are insufficient reagent stations available for both protocols to satisfy the reagent selection rules (refer to Section 2.2.4 "reagent selection method"). This occurs more frequently when using "by type" and "by station" protocols as they have limited station assignment flexibility.

Also, when scheduling protocols, you must consider the initial fill requirement as a protocol can not be scheduled, even with a delay, if there is no initial fill reagent available. Always ensure sufficient stations of the first reagent group or type so a station is available for an initial fill.

1.6.3 unavailable reagents

Once a protocol starts, group and type select protocols may reassign stations to recover from errors caused by unavailable reagents (for example when a bottle is removed or if a station contains insufficient reagent). This reassignment may use reagents assigned to the other protocol.

Select by station protocols will fail if an assigned reagent becomes unavailable. Select by type protocols will fail if there is only one station with an assigned type and it becomes unavailable.

Some common causes of station unavailability, and ways to avoid them, are described below.

- The reagent station contains insufficient reagent volume.
  Prior to each run, check the reagent level in each station is sufficient for the current fill level.
  Refer to Section 1.1.3 "fill level" for correct levels.
- A bottle scheduled for use is removed from the reagent cabinet.
  For safety reasons you should not remove any bottle whilst a protocol is running. However if you choose to do so, you must make sure the bottle you intend to remove is not scheduled for use in either retort.
- A wax station is not molten at the time it is required.
  Make sure there is adequate time for the wax to melt and that the correct wax station state is set.
  Refer to Section 2.6.5 "filling wax stations".

2

the software in detail

This chapter of the Peloris™ tissue processor user documentation provides detailed operating instructions for the Peloris tissue processor software. It covers all aspects of the software from managing the system to running routine tasks. To find the information you require, refer to the sections described in the following text.

- Section 2.1 "status screen" (page 54)
  Load, run and monitor protocols and view instrument status.
- Section 2.2 "protocols" (page 81)
  Set up and manage protocols.
- Section 2.3 "reagents" (page 98)
  An overview of reagent setup and management.
- Section 2.4 "reagent stations" (page 100)
  Set up and manage the reagent stations.
- Section 2.5 "reagent types" (page 106)
  Set up and manage reagent types.
- Section 2.6 "remote fill/drain" (page 114)
  Use the instrument to fill and drain reagent bottles and to drain wax from the wax stations.
- Section 2.7 "manual operations" (page 127)
  Use this screen to manually control reagent, wax and retort functions.
- Section 2.8 "reagent management" (page 131)
  Manage system-level reagent, retort and wax functions.
- Section 2.9 "control" (page 136)
  Alter hardware settings, view event logs, manage alarm settings and set the access level.
- Section 2.10 "help" (page 173)
  This section describes the software's user help system.

Refer to Chapter 1 "introduction" for basic software concepts and navigation instructions.

2.1 status screen

Use the status screen to control processing and to monitor the instrument status. View the status area to check the current state of the retorts (1), reagent stations (2), and wax stations (3). Use the protocol panels (4 and 5) to load, run and monitor protocols. The flow indicators (6) indicate the source and destination of any current fluid transfers.

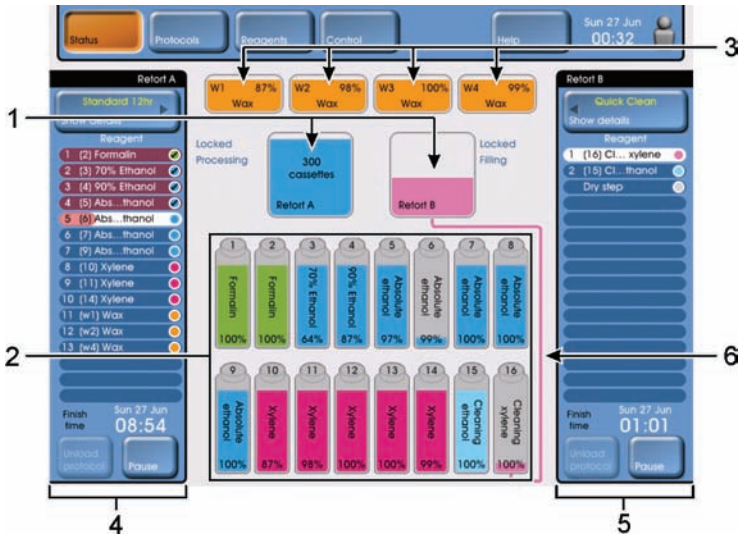


Figure 43: Status screen

Refer to the following sections for detailed status screen information and functions:

- Section 2.1.1 "status area"
- Section 2.1.2 "protocol panels"
- Section 2.1.3 "loading a protocol"
- Section 2.1.4 "running a protocol"
- Section 2.1.5 "completing a run"
- Section 2.1.6 "scheduling protocols"
- Section 2.1.7 "setting the required end time"
- Section 2.1.8 "setting step times"
- Section 2.1.9 "skipping initial steps"

2.1.1 status area

The status area provides a visual guide to the status of the reagent stations, retorts, and wax stations as described in the following sections.

reagent station details

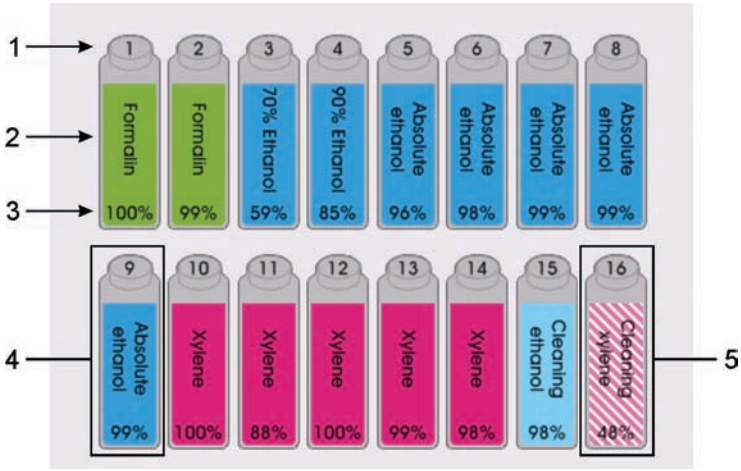


Figure 44: Reagent station details

The status area displays the following details for each reagent bottle (refer to Figure 44).

- The station number (item 1).
- The reagent type (item 2).
- The current reagent concentration (item 3).
  This may be turned off by supervisor (refer to Section 2.8 "reagent management").
- The current state of each station (item 4).
  Refer to Section 1.3.4 "states" for details.
- The reagent group (item 4).
  The group is indicated by station color.
- The condition of the reagent in each station with out-of-threshold stations hatched (item 5).

retort condition

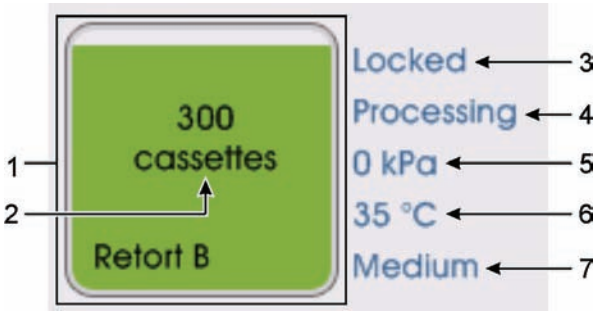


Figure 45: Retort condition details

The status area displays the current retort state and condition. The state is indicated by the graphical representation of the retort (1) and the retort's condition is indicated by text inside or beside the retort symbol (2 to 6). The state and condition information determine the actions that are valid for each retort. Items 5, 6, and 7 are only visible when the access level is "Supervisor".

The following information is available for each retort (refer to Figure 45).

- The group of the current or last reagent in the retort (indicated by reagent color).
- The retort state (item 1). Refer to Section 1.3.4 "states" for details.
- The number of cassettes currently being processed (item 2).
  This is either the default number or the number entered at the start of the run (refer to Section 2.8 "reagent management"). It is only visible when a protocol is running.
- For instruments with retort locks, the lid condition (item 3), either locked or unlocked.
- Current retort use (item 4):

  Ready — the retort is available for any new action

  Reserved — a protocol is loaded but has not yet started

  Processing — the retort is currently running a protocol

  Completed — the retort has completed the loaded protocol

  Drying — the retort is being dried as the final step of a cleaning protocol

  Filling — the retort is currently filling

  Draining — the retort is currently draining

  Pending (drain or fill) — the retort is waiting for resources so if can perform a fill or drain

  Abandoning — the retort is abandoning the current action

  Unavailable — the retort cannot be used, contact your service organization.
- The current retort pressure (item 5). This is only visible at supervisor access level.
- The current retort temperature (item 6). This is only visible at supervisor access level.
  Note that the temperature displayed may differ from the set temperature as there will be a settling period after a reagent change. The displayed temperature may be higher or lower than the set temperature depending on the initial retort and fluid temperatures.
- The current stirrer speed (item 7). This is only visible at supervisor access level.

wax station details

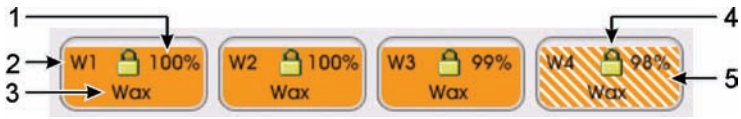


Figure 46: Wax station details

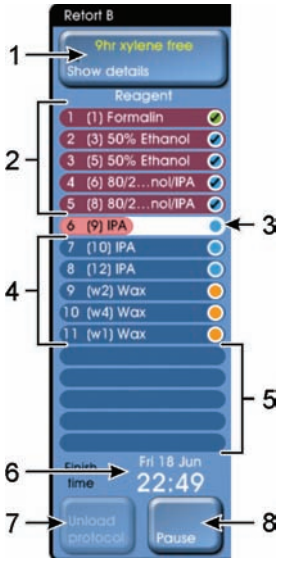
The status area displays the following information for each wax station (refer to Figure 46).

- The current state of each station (refer to Section 1.3.4 "states").
- The concentration of the wax, may be turned off by supervisor (item 1).
- The station number (item 2).
- The type of wax in each station (item 3).
- The locked symbol (item 4) appears when there is a vacuum within the wax bath (for example during a wax clean cycle).
  When the bath is evacuated it must be vented before being opened (refer to Section 2.7 "manual operations").
- The condition of the wax in each station with out-of-threshold stations hatched (item 5).

2.1.2 protocol panels

Each panel provides protocol information and control for a particular retort (the left panel for retort A, the right panel for retort B). Use the panels to load and unload protocols, to initiate a processing run and to monitor protocol progress. The control buttons vary according to protocol status and you can view the panels in two modes: standard and expanded. Standard mode is shown in Figure 47 and expanded mode in Figure 48. Protocol step details are shown in Figure 49.

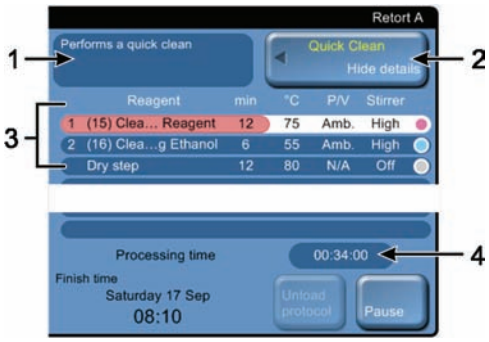
In standard mode the protocol panel displays the protocol name, finish time and progress as well as the reagent station, type and group for each step.



Item	Description			
	No protocol	**Protocol loaded**	**Protocol running**	**Protocol completed**
1	Show details	**Show details** Protocol name	**Show details** Protocol name	**Show details** Protocol name
2	—	—	Completed steps	Completed steps
3	—	—	Current step progress	—
4	—	Steps to run	Steps to run	—
5	No step loaded	No step loaded	No step loaded	No step loaded
6	Blank	Estimated finish time	Estimated finish time	Approximate time completed
7	**Select** protocol	**Unload** protocol	Dimmed	**Unload** protocol
8	Dimmed	**Run** protocol	**Pause** protocol	Dimmed

Figure 47: Standard protocol panel

Expanding the protocol panel allows you to view additional protocol information. Use the expanded mode to view extra step details and also the total protocol time. The controls are identical to those in standard mode except for the **Hide details** button.



Item	Description
1	Protocol description
2	**Hide details** Protocol name
3	Expanded protocol step details
4	Processing time (The sum of the step and fill/drain times)

Figure 48: Expanded protocol panel

The protocol step details displayed in the protocol panels depends on the panel's mode. Standard mode displays a limited set of details whilst Expanded mode displays all step information.

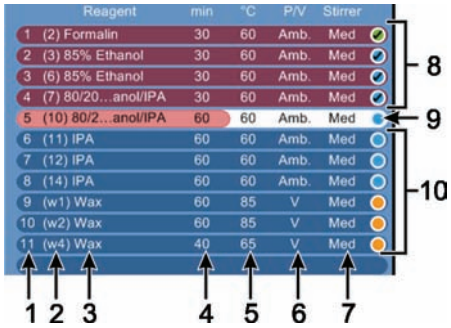


Figure 49: Protocol step information

Item	Description	Options	Display mode
1	Step number	1 to 16	Both
2	Station number	1 to 16 (reagent bottle) W1 to W4 (wax station)	Both
3	Reagent type	Any active reagent type	Both
4	Step duration	0 to 5940 minutes (99 hours)	Expanded only
5	Step temperature	Range dependent on reagent type	Expanded only
6	Pressure/vacuum setting	**Amb.**Ambient **P**Pressure **V**Vacuum **P/V**Cycling	Expanded only
7	Stirrer speed	Off, Low, Medium or High	Expanded only
8	Completed step (indicated by tick) and reagent group (indicated by color)	For reagent group colors, See Section 1.3.2 "reagent groups, types and stations"	Both
9	Current step progress (indicated by moving red highlight) and reagent group (indicated by color)		Both
10	Pending step (indicated by an empty circle) and reagent group (indicated by color)		Both

2.1.3 loading a protocol

Loading a protocol reserves a retort and checks resources in preparation for a processing run. You can load a protocol from either the status screen or the protocol screen. Use the following procedure to load a protocol from the status screen. Refer to Section 2.2.11 "loading a protocol" to load a protocol from the protocol screen.

Before loading a wax only protocol, use the manual operation functions to pre-heat the retort and wax path so there is no delay before the initial wax fill (refer to Section 2.7 "manual operations").

1. Open the status screen by selecting the **Status** button from the Function bar.
2. Select the **Select** button from the protocol panel of the retort you wish to use (see Figure 50).

Figure 50: Protocol panel Select buttons for retort A (1) and retort B (2)

3. You will now jump to the protocol screen (see Figure 51).

Figure 51: Protocol screen with available protocols (1), selected protocol (2) and Load button (3)

4. Select the protocol you wish to load.
   Once selected the protocol will have a red outline (see Figure 51).
5. Select the **Load** button (3 in Figure 51).

Procedure continues on the next page…

…procedure continuing from previous page.

6. You will now jump back to the status screen and the protocol will be loaded in the protocol panel (see Figure 52).

Selecting the **Show details** button (1) increases the panel size to display additional information.

Selecting the **Hide details** button (2) returns the panel to normal size.

In the reagent column, the bracketed numbers (3) indicate the preliminary station assignment for each step. Note that the station assignment may change during protocol scheduling.

Figure 52: Protocol loaded in retort A protocol panel

2.1.4 running a protocol

Use the following procedure to run a protocol from the status screen.

1. Prepare your cassettes and load them into baskets as described in Section 1.1.4 "cassette baskets".
2. Load the desired protocol as described in Section 2.1.3 "loading a protocol".
3. Select the **Run** button from the protocol panel associated with the retort you wish to use (see Figure 53).

Figure 53: Protocol panel Run buttons — retort A (1) and retort B (2)

4. You may be presented with a list of protocol run warnings.
   Review this list.
   Select the **Cancel** button if you wish to abandon the run.
   Select the **Continue** button if you wish to proceed with the run.

Procedure continues on the next page…

…procedure continuing from previous page.

Warnings are often due to reagents being out of threshold or due to an incompatible first reagent. You may stop the run to replace the reagents or clean the retort.
Runs using out of threshold reagents may lead to reduced processing quality. To guard against this the system may be configured so that a station with an out of threshold reagent can only be used a limited number of times before it is locked out (see Section 2.8.2 "reagent threshold check").
If you choose continue with an incompatible first reagent, you must use the "Edit steps" function during scheduling to select a new initial step that is compatible with the retort residue (refer to Section 2.1.9 "skipping initial steps").

5. If prompted, enter the number of cassettes you are processing then select **OK** (see Figure 54). This step will not occur if the "Prompt for cassettes" option is disabled (refer to Section 2.8.1 "general").

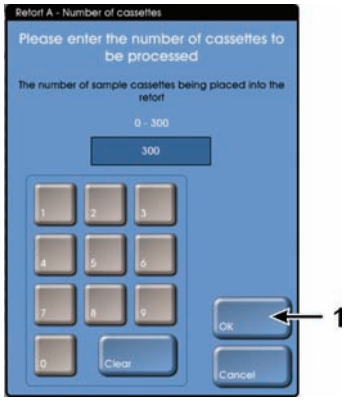


Figure 54: Number of cassettes dialog box with OK button (1)

6. Open the retort lid and insert your cassettes as directed by the "Insert cassettes" dialog box (see Figure 55).

Figure 55: Insert cassettes dialog box with Done button (1)

Do not insert three baskets into a retort when the retort fill level is set to two baskets as the top basket will not be covered by reagent and your tissue samples will be destroyed. Fill level information is contained in Section 2.9.1 "instrument settings".

7. Close the retort lid then select the **Done** button (see Figure 55).

Procedure continues on the next page…

…procedure continuing from previous page.

8. The "Scheduling" dialog box will now appear (see Figure 56).
   The required end time will initially be set to the retort's default end time.
   You can change the required end time, the retort's default end time, the initial step and individual step times using the Scheduling dialog box.
   Refer to section Section 2.1.6 "scheduling protocols" for details.

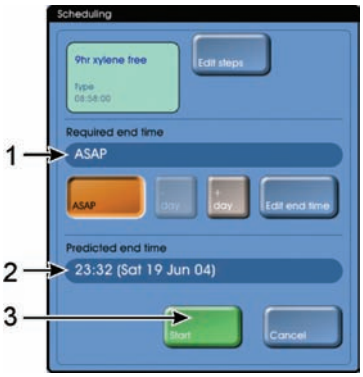


Figure 56: Scheduling dialog box with Required end time (1), Predicted end time (2) and the Start button (3)

9. Enter the required end time or continue with the default end time.
   Refer to "setting the required end time" on page 69 for detailed instructions.
10. Check that the predicted end time is acceptable (see item 2 in Figure 56).
11. When satisfied with the scheduling details, select the **Start** button (see item 3 Figure 56).
12. If the system is unable to schedule the protocol, you will see a list of errors.
    Select the **OK** button then correct all errors before attempting to run this protocol again.
    Refer to Section 1.6.2 "unavoidable reagent clashes" for scheduling difficulties.
13. If the system was able to schedule the run, the protocol will begin.
    If you have selected a delayed end time, an initial fill condition will occur. Refer to Section 1.6.1 "delayed end times and initial fills" for a description of the initial fill condition.
    View the progress of the protocol in the "Status" screen and protocol panels.
14. While a protocol is running, you may pause processing and add additional cassettes or abandon protocols. Refer to Section 2.1.10 "pausing, abandoning and resuming protocols".

2.1.5 completing a run

Use the following procedure to retrieve your cassettes and clean a retort after a run has completed.

1. The "Protocol complete" dialog appears and the alarm sounds when the run is finished; select the **OK** button to continue.
2. You may now choose to either:
   Drain the retort before retrieving your samples (Work flow A)
   Retrieve your samples without draining the retort (Work flow B).

Work flow A — Drain before access

A1 Select the **Drain retort before accessing** option from the “Drain/Access retort” dialog box (see Figure 57).

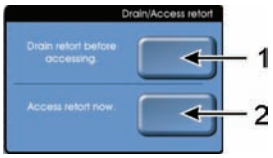


Figure 57: Drain/Access retort dialog box with "Drain retort before accessing" option (1)

A2 The retort will now drain.

A3 When the “Remove cassettes” dialog box appears, open the retort lid and remove your cassettes then select the **OK** button to continue (see Figure 58).

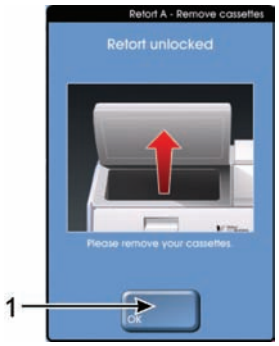


Figure 58: Remove cassettes dialog box with OK button (1)

Work flow B — Access without drain

B1 Select the **Access retort now** option from the “Drain/Access retort” dialog box (see Figure 59).

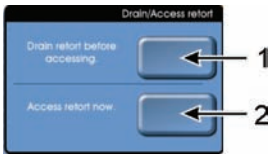


Figure 59: Drain/Access retort dialog box with "Access retort now" option (2)

B2 When the “Retort unlocked” dialog box appears, open the retort lid and remove your cassettes (see Figure 60).

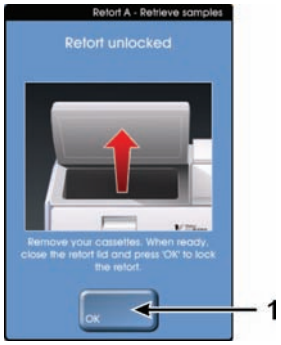


Figure 60: Retrieve samples dialog box with OK button (1)

B3 When you have removed all your cassettes, select the **OK** button to continue (see Figure 60).

B4 The retort will remain full until you either run a cleaning protocol or you manually drain the retort using manual operation functions (refer to Section 2.7.4 "filling and draining retorts").

Procedure continues on the next page…

…procedure continuing from previous page.

3. The "Run cleaning protocol" dialog box will now appear (see Figure 61).
   It is recommended you run a cleaning cycle now as the retort will be unavailable for standard processing protocols until it is cleaned.
   Select the **Clean later** button if you wish to end this procedure without cleaning the retort.

If you do not run a cleaning protocol immediately, the retort and wax valves will either be covered with wax residue (if you drained the retort) or the retort will contain wax (if you chose not to drain the retort). Therefore, to prevent wax solidification, the retort and wax valves will continue to be heated until you run a cleaning protocol.

Remove all tissue as the cleaning protocol will destroy any tissue left in the retort.

4. To clean the retort, select the desired cleaning protocol from the presented list (scroll through the list using the **Prev** and **Next** buttons).
   The selected protocol has a red outline.
   To change the default cleaning protocol, make the required protocol visible then select the **Set as default** button.
   Select the **Clean now** button to start the selected protocol.

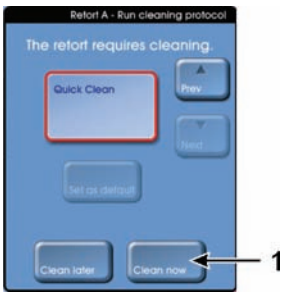


Figure 61: Run cleaning protocol dialog box with Clean now button (1)

5. Place your used cassette baskets into the retort when prompted by the "Insert baskets" dialog box (see Figure 62).

Figure 62: Insert baskets dialog box with Done button (1)

6. Close the retort lid then select **Done** from the "Insert baskets" dialog box (see Figure 62).

Procedure continues on the next page…

…procedure continuing from previous page.

7. Alter scheduling details if required then select the **Start** button to begin the run (see Figure 63). Refer to Section 2.1.6 "scheduling protocols" if you wish to change the scheduling details.

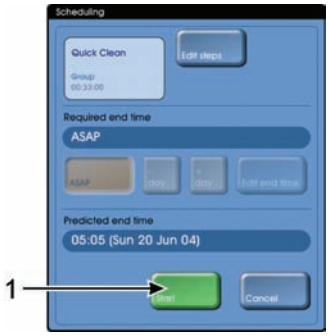


Figure 63: Scheduling dialog box with Start button (1)

8. The cleaning protocol will now begin. View the protocol's progress in the protocol panel.
9. The "Protocol complete" dialog appears when the run is finished; select the **OK** button to continue (see Figure 64).

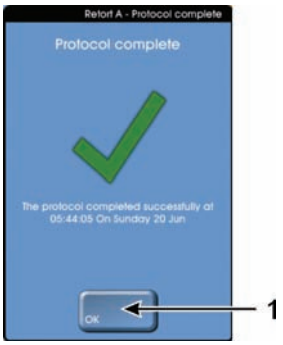


Figure 64: Protocol complete dialog with OK button (1)

10. When the "Remove baskets" dialog box appears, open the retort lid and remove your baskets then select the **OK** button to continue (see Figure 65).

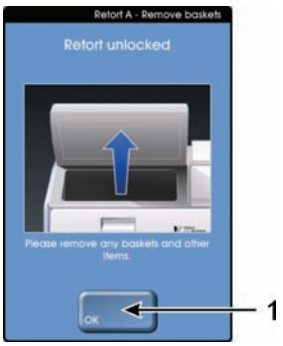


Figure 65: Remove baskets dialog box with OK button (1)

Procedure continues on the next page…

…procedure continuing from previous page.

11. Select the **Unload protocol** button from the appropriate protocol panel so the retort is available for the next protocol (see Figure 66).

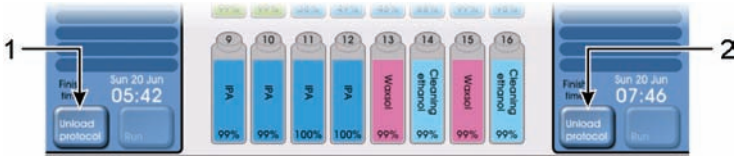


Figure 66: Unload protocol buttons — retort A (1) and retort B (2)

12. This procedure is now complete and you can prepare for the next protocol.

2.1.6 scheduling protocols

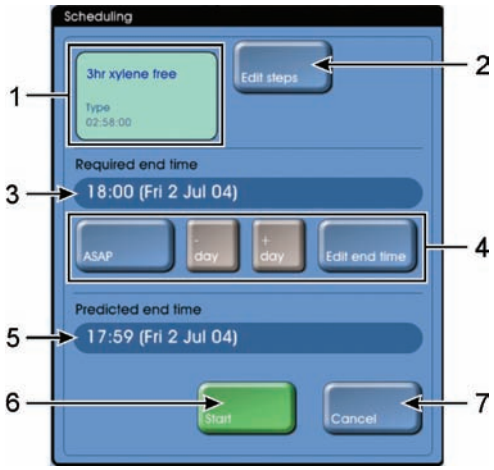


Figure 67: Scheduling dialog box

When you start a protocol you are able to use the "Scheduling" dialog box to edit the protocol's steps, set a required end time, check the predicted end time and set a default end time for the current retort.

The dialog box contains the information and controls detailed in the following table (refer to Figure 67 for item locations).

Item	Name	Description
1	Protocol details	Shows the protocol type, name, station selection method and processing time (refer to Section 2.2 "protocols" for details).
2	Edit steps	Select this button to skip initial protocol steps. Refer to Section 2.1.9 "skipping initial steps". Select this button to change step times. Refer to Section 2.1.8 "setting step times".
3	Required end time	The time at which you would like the protocol to finish. This is initially set to the retort's default end time. Use the end time buttons to change this time.
4	End time buttons	Use these buttons to set the required end time and retort default end time. Refer to Section 2.1.7 "setting the required end time"
5	Predicted end time	This is the predicted end time after scheduling and it may differ from the required end time. The system considers the required end time as the latest acceptable protocol completion time. To avoid resource clashes, protocols may be scheduled to finish earlier than the required end time. A red highlight indicates that the required end time was not possible and a later end time has been selected. Refer to Section 1.6.1 "delayed end times and initial fills" for a description of delayed end times and the initial condition.
6	Start	Select this button to begin the protocol.
7	Cancel	Select this button to terminate the run protocol sequence.

2.1.7 setting the required end time

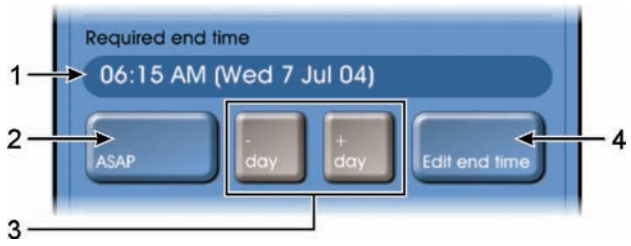


Figure 68: Required end time controls with:
Required end time (1), ASAP button (2), change day buttons (3) and set end time button (4)

The "Scheduling" dialog box, has six functions for setting the required end time.

- You can use the default end time (each retort has its own default time).
  Refer to "using the default end time" on page 69.
- You can shift the required end date.
  Refer to "changing the required end date" on page 70.
- You can select the ASAP (As Soon As Possible) option so that the protocol will finish at the earliest possible time.
  Refer to "setting the end time to ASAP" on page 70.
- You can manually enter the exact time and date you wish the protocol to end.
  Refer to "manually entering the required end time and date" on page 70.
- You can set the default end time for the current retort.
  Refer to "setting the default end time" on page 71.

using the default end time

When you first enter the "Scheduling" dialog box the required end time is automatically set to the retort's default end time. The default end time may be either ASAP or a specific time.

If the default end time is set to ASAP the protocol will be scheduled so that it ends at the earliest possible time. Refer to "setting the end time to ASAP" on page 70 for more information.

If the default is a specific time, the required end time will be set to that time and the end date will be set to the following day. You may then adjust the end date using the **+ day** and – **day** buttons. If you wish to have the protocol finish at the default time on the current day, you will need to use the – **day** button to move the end date back from the following day to the current day. Setting the end date is explained in "changing the required end date" on page 70.

Always check the predicted end time to ensure it is suitable before starting a protocol.

For instructions on setting the default end time, refer to "setting the default end time" on page 71.

The default end time relates to a particular retort (not a protocol) and each retort has an independent default end time.

changing the required end date

You can use the **+ day** and – **day** buttons to shift the required end date forwards or backwards. These buttons are shown as item 3 in Figure 68.

If the required end time is set to an actual time and date, these buttons will not change the time but will shift the date forwards (**+ day**) or, where possible, backwards (**– day**) a day at a time.

If the required end time is set to ASAP (As Soon As Possible), the first time you select the **+ day** button, the required end time will be set to the current time and the date will be set to the next day. Subsequent button selections will shift the date forwards (**+ day)** or, where possible, backwards (**– day)** a day at a time.

setting the end time to ASAP

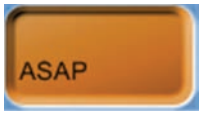


Figure 69: Required end time set to ASAP

You can set any protocol to end at the earliest possible time by setting the required end time to ASAP (As Soon As Possible). You do this by selecting the **ASAP** button. When ASAP is selected, the ASAP button remains in the selected state and the predicted end time window shows ASAP (see Figure 69). The required end time for cleaning protocols is always set to ASAP.

When ASAP (As Soon As Possible) is selected the protocol will normally start immediately. However, if there is a reagent clash caused by a protocol running in the other retort the actual start of the protocol may be delayed. Refer to Section 1.6.1 "delayed end times and initial fills" for details.

manually entering the required end time and date

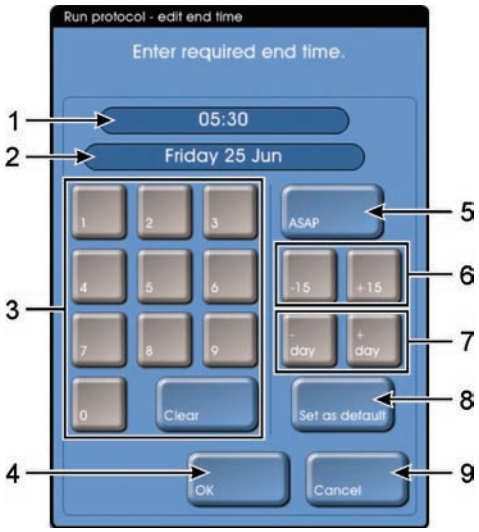


Figure 70: Edit end time dialog box

You can set the required end time and date using the "Run protocol – edit end time" dialog box.

Use the following procedure to manually enter the required end time from the "Scheduling" dialog box (refer to Figure 70 for item references).

1. Select the **Edit end time** button from the "Scheduling" dialog box (see Figure 68).
2. The edit end time dialog box displays the required end time (in 24 hour format) and the required end date (see items 1 and 2 in Figure 70).
3. Enter the new time (in 24 hour format) using the on-screen keypad (3).
   You must select each digit in turn (including leading zeros if required).
4. Use the +/-15 buttons (6) to adjust the time forward or backwards in 15 minute steps.
5. Use the +/- day buttons (7) to shift the required end date forwards or backwards.
6. Select the **OK** button (4) when you have entered the required time or select the **Cancel** button (9) to leave the dialog box without changing the end time (see Figure 68).

Note: the **ASAP** button (5) and the **Set as default** button (8) are described in the following section: "setting the default end time" on page 71.

setting the default end time

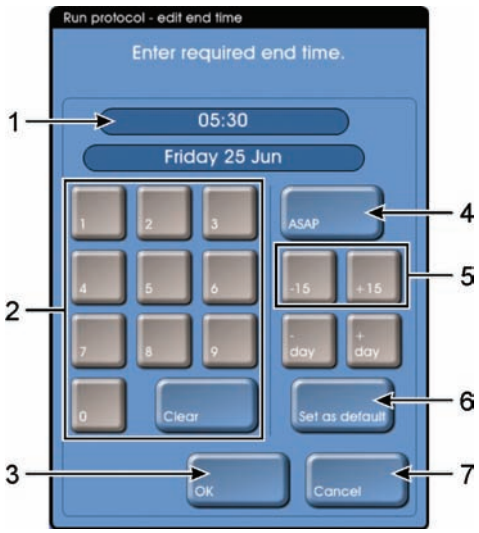


Figure 71: Edit end time dialog box

You set the default end time for each retort from the "Scheduling" dialog box as described in the following procedure (refer to Figure 71 for item references).

The default end time relates to a particular retort (not a protocol) and each retort has an independent default end time.

To set a default end time:

1. Select the **Edit end time** button from the "Scheduling" dialog box (see Figure 68).
2. If you require an exact time as the default, enter the time using the keypad (2) and time-adjust buttons (5).
   Refer to the previous section "manually entering the required end time and date" on page 70 for detailed instructions.
   Note: The default end time has no date component so the selected day will be ignored.
3. Select the **ASAP** button (4) if you wish the default end time to be As Soon As Possible.
   Refer to "setting the end time to ASAP" on page 70 for information on the ASAP end time.
4. Select the **Set as default** button (6) to lock in the indicated end time (1) as the default end time.
5. Select the **OK** button to return to the "Scheduling" dialog box with the new default time as the "Required end time" for protocol currently loaded.
6. Select the **Cancel** button to return to the "Scheduling" dialog box without altering the "Required end time" for protocol currently loaded.
   Note that the new default time is already locked-in so the **Cancel** button does not restore the old default.

2.1.8 setting step times

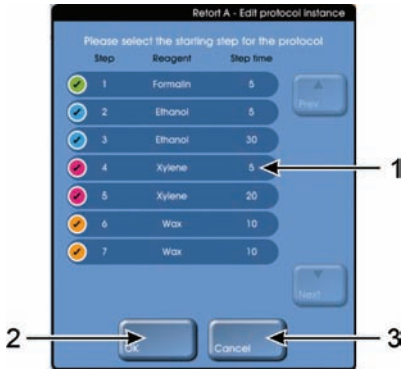


Figure 72: Edit protocol instance dialog box with step time cell (1), OK button (2) and Cancel button (3)

Use this procedure to alter step times for the current run of the loaded protocol.

1. Select the **Edit steps** button from the "Scheduling" dialog box (see Figure 67).
2. Select the step time cell of the step you wish to alter (see item 1 in Figure 72).

Procedure continues on the next page…

…procedure continuing from previous page.

3. Enter the new duration using the "Duration" keypad (see Figure 73).

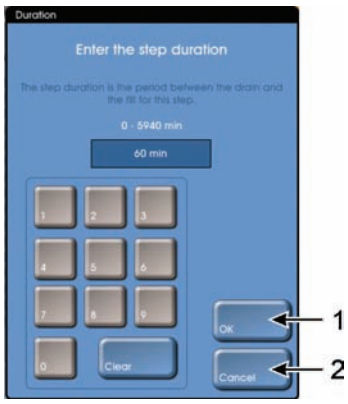


Figure 73: Duration dialog box with OK button (1) and Cancel button (2)

4. From the "Duration" dialog box, select the **OK** button when finished or the **Cancel** button if you wish to exit without making changes.
   You will now return to the "Edit protocol instance" dialog box and the duration of the changed step will be highlighted.
5. When you have made all step changes required, select the **OK** button from the Edit protocol instance dialog box (see Figure 72).
   Or, if you wish to exit without saving the changes, select the **Cancel** button (see Figure 72).
6. You will now return to the "Scheduling" dialog box.
7. Altering step time will affect protocol scheduling so you must confirm the new "Predicted end time" is acceptable (see item 2 in Figure 67).
   Adjust the required end time if necessary (refer to "setting the required end time" on page 69).
8. When you are satisfied with all scheduling options, select the **Start** button to begin the run.

2.1.9 skipping initial steps

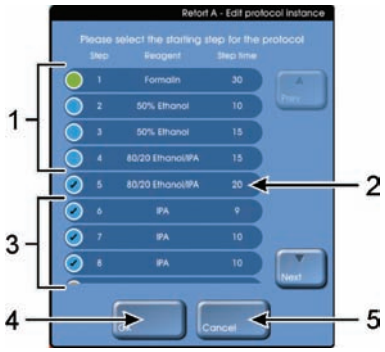


Figure 74: Edit protocol instance dialog box — first step highlighted

Use this procedure to skip one or more of the initial steps for the current run of the loaded protocol.

1. Select the **Edit steps** button from the "Scheduling" dialog box (see Figure 67).
2. Select the step you wish to become the first step (see Figure 74).
   You select the new first step by selecting any part of its row except the step time cell.
   The skipped steps will not be ticked (1) to indicate that they will not run.
   The new first step will be the first step with a tick (2).
   All subsequent steps will be ticked to indicate that they will run (3).
3. When you have made all step changes required, select the **OK** button (4).
   Or, if you wish to exit without saving the changes, select the **Cancel** button (5).
4. You will now return to the "Scheduling" dialog box.
5. Skipping protocol steps will affect protocol scheduling so you must confirm that the new "Predicted end time" is acceptable (see item 2 in Figure 67).
   Adjust the required end time if necessary (refer to "setting the required end time" on page 69).
6. When you are satisfied with all scheduling options, select the **Start** button to begin the processing run.

The reagent selected as the new first step will be used for an initial fill if required.
Refer to Section 1.6.1 "delayed end times and initial fills" for details.

2.1.10 pausing, abandoning and resuming protocols

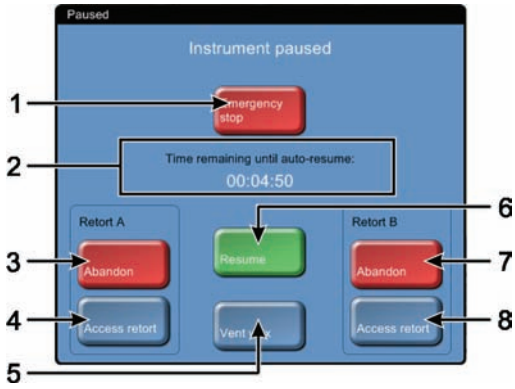


Figure 75: "Paused" dialog box

You can pause protocols at any time (refer to "pausing protocols" on page 76). When the protocol(s) pause, the "Paused" dialog box appears. The dialog box functions are detailed in the following table (see the referred sections for detailed instructions).

Item	Name	Description	Refer to
1	Emergency stop	Select this button to immediately abandon all processing.	"emergency stop procedure" on page 76
2	Automatic resume countdown	This section displays the resume timer. Processing automatically resumes after five minutes unless an option is selected.	N/A
3	Abandon (A)	Abandon the protocol in retort A. A protocol running in retort B will resume.	"abandoning a protocol in one retort" on page 76
4	Access retort (A)	Vent retort A to allow temporary access. This allows you to add or remove cassettes during a protocol or initial fill. Instruments with retort latch locks show **Unlock retort** on this button.	"access drained retort" on page 77 or "access full retort" on page 79
5	Vent wax	Vent the wax bath to allow access to the bath if it is currently evacuated.	"venting the wax bath" on page 80
6	Resume	Select this button to return to normal processing.	"resuming paused protocols" on page 80
7	Abandon (B)	Abandon the protocol in retort B. A protocol running in retort A will resume.	"abandoning a protocol in one retort" on page 76
8	Access retort (B)	Vent retort B to allow temporary access. This allows you to add or remove cassettes during a protocol or initial fill. Instruments with retort latch locks show **Unlock retort** on this button.	"access drained retort" on page 77 or "access full retort" on page 79

After abandoning a protocol you may wish to run a reprocessing protocol to recover your cassettes. In this case do not remove your cassettes or run a cleaning protocol when prompted to do so.

If the last reagent was a fixative you may skip the cleaning protocol as the residue will not prevent you running a typical processing protocol. If you decide to run a cleaning protocol, set the first step to a cleaning alcohol. Cleaning solvents are incompatible with fixatives.

pausing protocols

Use the following procedure to pause running protocols.

1. Select the **Pause** button from an active protocol panel (see Figure 47 or Figure 48).
2. The "Paused" dialog box will now appear (see Figure 75).
3. The **Emergency stop** button will be immediately available.
   Only select this button if you require a rapid processing shutdown in an emergency situation. Otherwise wait for all the dialog box options to become available (this may take a small amount of time while all current fluidics actions are finalized).
4. Once all options become available select the required command.

emergency stop procedure

After processing is paused, use this procedure to immediately stop and abandon all protocols.
Note that this does not shut down or remove power from the instrument. Refer to Section 1.1.1 "switching on and shutting down" for instrument shutdown instructions.

1. Select the **Emergency stop** button from the "Paused" dialog box (see Figure 75).
2. The Peloris tissue processor immediately abandons all running protocols.
3. Follow the prompts and remove your cassettes if required.
   If the retort is above the safe access temperature a warning dialog box will appear; carefully read the message and take appropriate precautions before continuing.
4. A cleaning cycle prompt now appears.
   Select the **Clean now** button to clean the retort.
   Select the **Clean later** button if you prefer not to run a cleaning protocol.

abandoning a protocol in one retort

After you have paused processing, use this procedure to abandon one protocol and resume processing in the other retort (if previously running).

1. To end processing in retort A, select the left **Abandon** button from the "Paused" dialog box.
   To end processing in retort B, select the right **Abandon** button from the "Paused" dialog box.
   See Figure 75 for "Paused" dialog box details.
2. The protocol in the selected retort will end immediately.
   A protocol running in the other retort will resume.
3. Follow the prompts and remove your cassettes if required.
   If the retort is above the safe access temperature a warning dialog box will appear; carefully read the message and take appropriate precautions before continuing.
4. A cleaning cycle prompt now appears.
   Select the **Clean now** button to clean the retort.
   Select the **Clean later** button if you prefer not to run a cleaning protocol.

access drained retort

The paused dialog box allows you to temporarily access a retort during processing so you can add or retrieve samples. You may choose to drain the retort before access (this procedure) or you may access the retort while it still contains reagent (refer to "access full retort" on page 79).
If you choose to drain the retort, the instrument's down-draft fume extraction system will remove vapors from the retort before allowing access.

Take care when adding fixed samples to a running protocol. The additional fixative will contaminate the reagent used in the current step and this contamination will not be tracked by the reagent management system.
Also, the further a protocol progresses before you add the additional samples, the more compromised the processing quality will be for those samples.
We therefore recommend that you only add samples during fixative steps or during the first dehydrant step.

After you have paused processing, use this procedure to drain and access a retort.

1. To access retort A, select the left **Access retort** button (**Unlock retort** for instruments with latch locks) from the "Paused" dialog box.
   To access retort B, select the right **Access retort** button (**Unlock retort** for instruments with latch locks) from the "Paused" dialog box.
   See Figure 75 for "Paused" dialog box details.
2. The "Temporary access drain" dialog box will now appear; select the **Yes** option to drain the retort prior to access (see Figure 76).

Figure 76: Temporary access drain" dialog box with Yes option

3. Wait while the retort drains.
   You can select the **Abandon** button from the "Draining" dialog box to abandon the protocol (see Figure 77).

Figure 77: Draining dialog box with Abandon button

Procedure continues on the next page…

…procedure continuing from previous page.

4. When the "Retrieve samples" dialog box appears, open the retort lid and add or remove cassettes as required (see Figure 78).

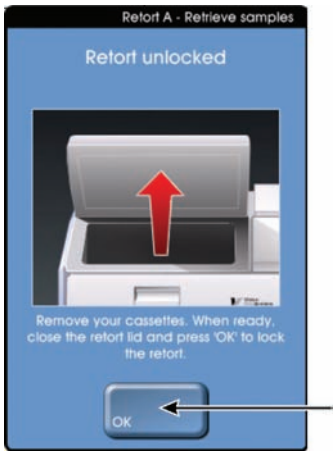


Figure 78: Retrieve samples dialog box with OK button

5. When you have finished adding or removing cassettes, close the retort lid and select the **OK** button (see Figure 78).
6. If prompted, enter the new number of cassettes in the "Number of cassettes" dialog box and select **OK** when done (see Figure 79).
   This step will not occur if the "Prompt for cassettes" option is disabled (refer to Section 2.8.1 "general").

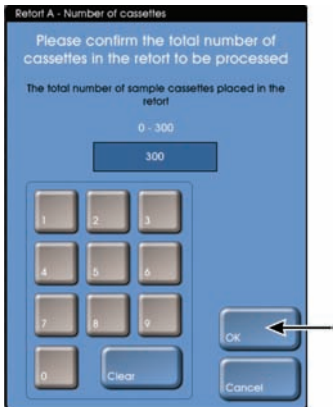


Figure 79: Number of cassettes dialog box with OK button

7. Wait while the retort fills.
   You can select the **Abandon** button from the "Filling" dialog box to abandon the protocol (see Figure 80)

Figure 80: Filling dialog box with Abandon button

8. You will now return to the "Paused" dialog box, select the **Resume** button to restart protocols.

access full retort

The paused dialog box allows you to temporarily access a retort during processing so you can add or retrieve samples. You may choose to access the retort while it contains reagent (this procedure) or you may drain the retort before access (refer to "access drained retort" on page 77).
If you choose to drain the retort, the instrument's down-draft fume extraction system will remove vapors from the retort before allowing access.

Take care when adding fixed samples to a running protocol. The additional fixative will contaminate the reagent used in the current step and this contamination will not be tracked by the reagent management system.
Also, the further a protocol progresses before you add the additional samples, the more compromised the processing quality will be for those samples.
We therefore recommend that you only add samples during fixative steps or during the first dehydrant step.

After you have paused processing, use this procedure to access a full retort.

1. To access retort A, select the left **Access retort** button (**Unlock retort** for instruments with latch locks) from the "Paused" dialog box.
   To access retort B, select the left **Access retort** button (**Unlock retort** for instruments with latch locks) from the "Paused" dialog box. See Figure 75 for "Paused" dialog box details.
2. The "Temporary access drain" dialog box will now appear; select the **No** option to access the retort without draining the reagent (see Figure 81).

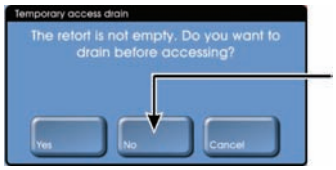


Figure 81: "Temporary access drain" dialog box with No option

3. If the retort temperature is above the reagent's safe access temperature a warning dialog box will appear; carefully read the message and take appropriate precautions.
4. When the "Retrieve samples" dialog box appears, open the retort lid and add or remove cassettes as required (see Figure 82).

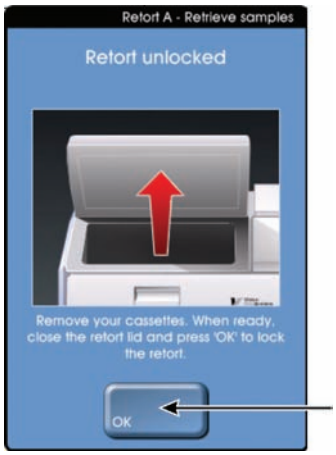


Figure 82: Retort unlocked with OK button

Procedure continues on the next page…

…procedure continuing from previous page.

5. When you have finished adding or removing cassettes, close the retort lid and select the **OK** button (see Figure 82).
6. If prompted, enter the new number of cassettes in the "Number of cassettes" dialog box and select **OK** when done (see Figure 83).
   This step will not occur if the "Prompt for cassettes" option is disabled (refer to Section 2.8.1 "general").

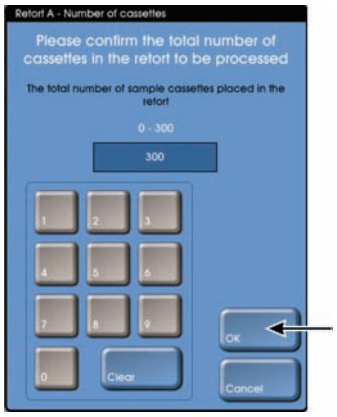


Figure 83: Number of cassettes dialog box with OK button

7. You will now return to the "Paused" dialog box, select the **Resume** button to restart protocols.

venting the wax bath

You can vent the wax bath from the "Paused" dialog box (see Figure 75). Venting the bath releases any pressure or vacuum in the bath so you can easily and safely open the wax bath lids. To vent the bath, select the **Vent wax** button from the "Paused" dialog box.

resuming paused protocols

To resume paused protocols, select the **Resume** button from the "Paused" dialog box (see Figure 75). All paused protocols will immediately recommence.

2.2 protocols

Use the protocols screen to create, edit, view and load protocols. Select the **Protocols** button from the Function bar to open the protocols screen.

2.2.1 protocol screen

The protocol screen is shown in Figure 84 and the items are described in the table that follows. To manage your protocols, use the controls detailed in the table and apply the information and instructions listed in the following sections:

Figure 84: Protocols screen

Item	Description	Function
1	Active protocol	Select a protocol to make it active. The active protocol is highlighted.
2	Protocol list	The protocol list displays an information icon for each protocol installed on your instrument.
3	Load	Use this button to load the selected protocol in preparation for a processing run.
4	Edit	Use this function to modify the selected protocol.
5	View	Use this function to view the details of the selected protocol.
6	New	Use this function to create a new protocol.
7	Copy	Use this function to create a copy of the selected protocol.
8	Delete	Use this function to delete the selected protocol.
9	Prev	Select this button to scroll up through the protocols list.
10	Next	Select this button to scroll down through the protocols list.

2.2.2 protocol icons

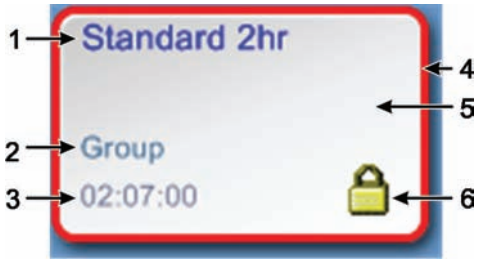


Figure 85: Protocol icons

On the protocols screen each protocol is represented by a selectable icon. Each icon contains the following protocol details (refer to Figure 85).

- Protocol name (item 1).
- Reagent selection method (item 2).
  Refer to Section 2.2.4 "reagent selection method".
- The processing time (item 3).
  This is the minimum time the protocol will take to complete.
  The processing time is the sum of the individual step times, the estimated fill/drain times and (for cleaning protocols) the dry step time.
- Currently selected protocol (item 4).
  Indicated by a red highlight around the icon.
- The type of protocol as indicated by the icon's background color (item 5).
  Refer to Section 2.2.3 "protocol types".
- The protocol's edit status (item 6).
  The padlock symbol indicates that the protocol can only be edited or deleted by a supervisor.

2.2.3 protocol types

The Peloris tissue processor uses five protocol types to accommodate different processing functions. Each protocol type has a reagent compatibility sequence that complies with the intended use (refer to Section 4.6 "reagent compatibility tables"). The allowable temperature range for each protocol step is also dependent on the protocol type (refer to Section 4.5 "protocol step temperatures"). When you create or edit protocols, you must choose an appropriate protocol type to allow your desired reagent sequence. Each protocol type is described in the following sections.

standard protocols

Figure 86: Standard protocol icon

Standard protocols use a conventional tissue processing sequence and are suitable for normal processing requirements. These protocols can be constructed with or without defatting steps.

standard reprocessing protocols

Figure 87: Standard reprocessing protocol icon

Use standard reprocessing protocols to recover tissue processed using standard protocols. These protocols start with cleaning reagents before moving to a standard tissue processing sequence.

During reprocessing protocols there is significant reagent carry-over following the cleaning stages. After running a reprocessing protocol you should replace the first three processing reagents that are used after the last cleaning reagent.

xylene-free protocols

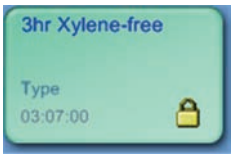


Figure 88: Xylene-free protocol icon

Xylene-free protocols do not require clearing steps so potentially dangerous clearing reagents such as xylene are not required. The protocols use high temperature wax steps and advanced processing techniques to remove the dehydrant from the tissue. The processing quality is equal to standard protocols so they are suitable for all normal processing requirements. As they use two sets of dehydrants, xylene-free protocols are not suitable for the "Group" reagent selection method.

When running xylene-free protocols you must use the “spaced” cassette baskets. Refer to Section 1.1.4 "cassette baskets" for details.

Take care when opening the wax bath after a xylene-free protocol as the protocol will leave very hot wax in the bath. Use the reagent stations screen to check wax bath temperature (refer to Section 2.4 "reagent stations").

xylene-free reprocessing protocols

Figure 89: Xylene-free reprocessing protocol icon

Use xylene-free reprocessing protocols to recover tissue processed using xylene-free protocols. These protocols start with cleaning reagents before moving to a xylene-free tissue processing sequence.

During reprocessing protocols there is significant reagent carry-over following the cleaning stages. After running a reprocessing protocol you should replace the first three processing reagents that are used after the last cleaning reagent.

cleaning protocols

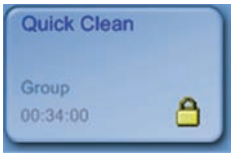


Figure 90: Cleaning protocol icon

Cleaning protocols use dedicated cleaning reagents and a dry step to return the retort and reagent lines to a "Clean" state. Typically a cleaning protocol will use a cleaning solvent followed by a cleaning alcohol. Cleaning protocols always finish with the "dry step" that applies high temperature, vacuum and air flow to evaporate all reagent residue.

Cleaning protocols do not require an initial fill so you can start two cleaning protocols simultaneously with only one set of cleaning reagents. In this situation the second protocol will have a delayed start as its waits for the stations to become available.

The cleaning protocols do not require a water step and work well with conventional cleaning reagents. Also, if you wish to completely remove xylene from your instrument, Vision Biosystems™ can supply Waxsol™, a xylene-free cleaning solution.

Do not reuse contaminated dehydrants as cleaning alcohol. The contaminated dehydrants will contain formalin (or other fixatives) and the "dry step" will cause the fixative to crystallize on the retort's internal surfaces.

You must remove all tissue from the retort before running a cleaning protocol as the dry step will destroy the tissue.

Do not use cleaning protocols for reprocessing as the dry step will destroy the tissue.

2.2.4 reagent selection method

The reagent selection methods determine the way the Peloris tissue processor selects reagent stations for protocol steps. There are three selection methods: by group, by type and by station. When creating a protocol you must decide which method best suits your processing needs and reagent management strategy. Once you have chosen a selection method, it cannot be altered. The following sections describe the three selection methods in detail. Refer to Section 1.3.2 "reagent groups, types and stations" for an introduction to the terms group, type and station.

selecting reagents by group

Selecting reagents by group ensures optimum reagent usage so tissue processing quality and reagent life are both improved. Also use this selection method to give the instrument the maximum flexibility when assigning reagent stations. This method is ideal for most protocols but cannot be used for xylene-free or xylene-free reprocessing protocols.

When scheduling protocols that use the group select method, the Peloris tissue processor automatically selects between all reagents in a particular group to decide the best station to use for each step. Reagent type details are ignored (except to ensure temperature compatibility) when using the group select method and stations assigned according to reagent group and concentration only. The

concentration of each station is dependent on use and position as defined by the concentration method currently in use (refer to Section 2.8.1 "general").

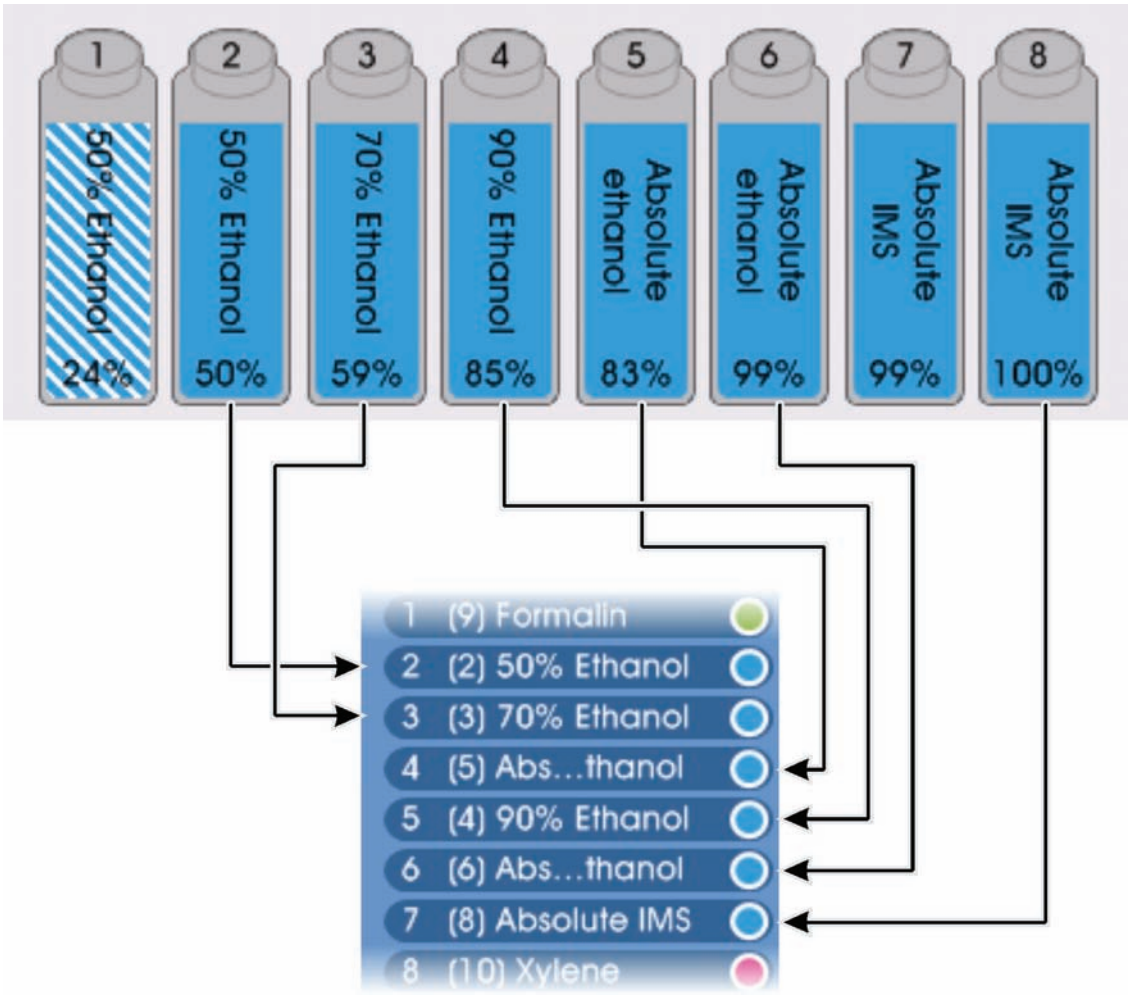
For a sequence of reagents within the same group, the group selection method assigns stations of the appropriate group to each protocol step according to the following rules.

- The last step of a sequence uses the highest concentration station available.
- The first step of the sequence uses the lowest concentration station available.
- Each of the intermediate steps within the sequence uses the lowest concentration station that is still available.
- The concentration of the assigned stations can never decrease as step number increases.
- Where the sequence has only a single step the highest concentration station is used.
- Stations that have exceeded any of their use thresholds will not be selected unless there is no other station available.

The advantage of group selection is that the Peloris tissue processor has the largest possible number of reagents from which to select. This enhances processing as the Peloris tissue processor is better able to balance reagent concentrations. Group select protocols do not have fixed station assignment so scheduling conflicts are minimized and the instrument may reassign steps when a station's state changes unexpectedly and other stations of the same group are available.

You must however take some care when using group selection as the Peloris tissue processor may use a reagent type you wished to reserve for a particular purpose. In these cases you should either use the type or station selection method or, for one-off instances, you may temporarily block a station by setting its state to "In use" (refer to Section 2.4.4 "setting the station state").

A typical station assignment using the group select method is shown in Figure 91 on the following page.



assignment sequence:

1. Bottle 8 is the highest concentration so it is assigned to step 7.
2. Bottle 1 is out of threshold so it is ignored.
3. Bottle 2 is the lowest concentration so it is assigned to step 2.
4. Bottle 3 is the next lowest so it is assigned to step 3.
5. Bottle 5 is the next lowest so it is assigned to step 4.
6. Bottle 4 is the next lowest so it is assigned to step 5.
7. Bottle 6 is the next lowest so it is assigned to step 6.

Figure 91: By group reagent selection for dehydrants

selecting reagents by type

Use this selection method if you wish to control the reagent types used whilst still allowing the instrument flexibility when assigning reagent stations.

When scheduling protocols that use the type select method, the Peloris tissue processor automatically selects between all reagents of a particular type to decide the best station to use for each step. The Peloris tissue processor identifies suitable reagents by the type name then assigns stations according to reagent concentration. The concentration of each station is dependent on use and position as defined by the concentration method currently in use. (refer to Section 2.8.1 "general").

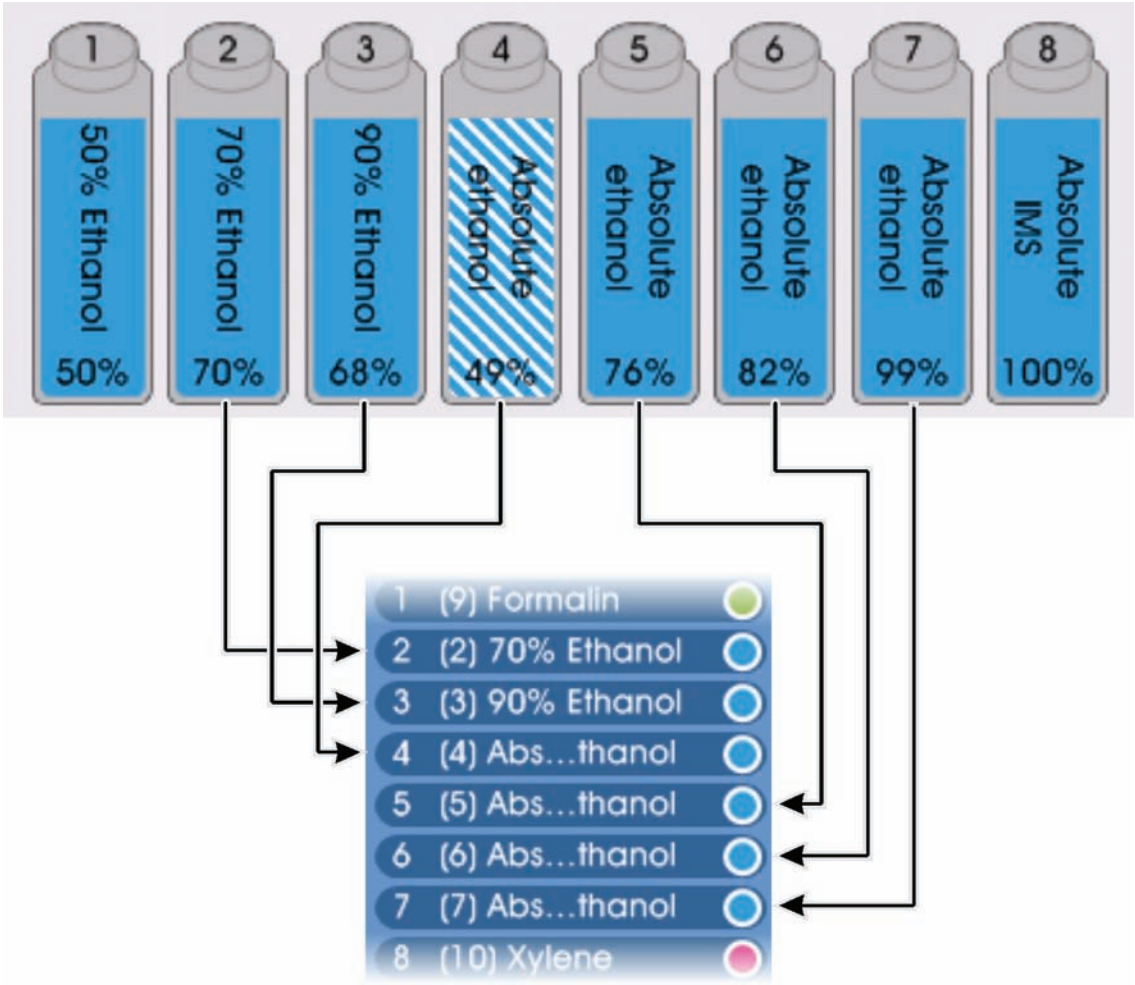
For a sequence of reagents of the same type, the type selection method assigns stations of the appropriate type to each protocol step according to the following rules.

- The last step of a sequence uses the highest concentration station available.
- The first step of the sequence uses the lowest concentration station available.
- Each of the intermediate steps within the sequence uses the lowest concentration station that is still available.
- The concentration of the assigned stations can never decrease as step number increases.
- Where the sequence has only a single step the highest concentration station is used.
- Stations that have exceeded any of their use thresholds will not be selected unless there is no other station available.

The type selection method is preferred for xylene-free protocols and is also useful when you wish to force a protocol to use a particular type of reagent for a particular step or sequence. This method allows the Peloris tissue processor to manage reagent use but does not offer the same degree of reagent selection flexibility as the group selection method.

Type select protocols do not have fixed station assignment so scheduling conflicts are reduced and the instrument may reassign steps when a station's state changes unexpectedly and other stations of the same type are available.

A typical station assignment using the type select method is shown in Figure 92 on the following page.



assignment sequence:

1. Bottle 2 is the only "70% Ethanol" so it must be used for step 2.
2. Bottle 3 is the only "90% Ethanol" so it must be used for step 3 (see note 2).
3. Bottle 7 is the highest concentration "Absolute ethanol" so it must be used for step 7.
4. Bottle 4 is the lowest concentration "Absolute ethanol" so it is assigned to step 4 (see note 3).
5. Bottle 5 is the next lowest "Absolute ethanol" so it is assigned to step 5.
6. Bottle 6 is the next lowest "Absolute ethanol" so it is assigned to step 6.

assignment notes:

1. Bottles 1 and 8 are not used as their types are not called in the protocol.
2. There is a decrease in concentration between steps 2 and 3 but this is unavoidable as there is only one "90% ethanol" available.
3. Even though Bottle 4 is out of threshold, it must be used otherwise there would not be a sufficient number of "Absolute ethanol" bottles. This causes a decrease in concentration between steps 4 and 5.
4. The bottle arrangement shown is for illustrative purposes only and is not meant to convey a realistic setup.

Figure 92: By type reagent selection for dehydrants

selecting reagents by station

Use this selection method if you wish to have complete control of reagent use and you do not want the instrument to have any reagent assignment flexibility.

When scheduling protocols that use the station select method, the Peloris tissue processor always uses the reagent station you specify.

The Peloris tissue processor will not be able to automatically select the best possible reagent when scheduling station select protocols. Also, as reagents degrade, you will need to either alter your protocol or your reagent stations to ensure reagents with suitable concentrations are used. The station select method does not allow the instrument any flexibility when scheduling protocols and it will not be able to recover from a processing error caused by unexpected reagent unavailability.

Station select protocols are not recommended for overnight processing as they are unable to recover from errors caused by reagent unavailability.

When running station select protocols always check the concentration of the assigned stations prior to starting a run as the concentrations may not be correctly ordered if other protocols have run.

2.2.5 viewing a protocol

Figure 93: Protocol view screen

To view a protocol's settings, first open the protocols screen by selecting the **Protocols** button from the Function bar. Then select the protocol to view and select the **View** button from the control panel (see Figure 84 on page 82). The view protocol screen displays general protocol details on the right of the screen, as listed in the following table (refer Figure 93 for item numbers).

Item	Description	Function
1	The step details	Displays the details for each protocol step.
2	Name	Displays the protocol's name.
3	Protocol type	Displays the protocol's type. Refer to "protocol types" on page 83 for details.
4	Notes	Displays the protocol's description.
5	Reagent selection method	Displays the protocol's reagent selection method. Refer to Section 2.2.4 "reagent selection method" for details.
6	Last modified	Displays the time and date the protocol was last altered.
7	Biopsy pads	Displays the biopsy pad percentage for this protocol. Refer to "biopsy pads" on page 133 for more details.
8	Processing time	This is the time the protocol will take to complete (with no initial fill). The processing time is the sum of the individual step times, the estimated fill/drain times and (if applicable) the dry step time.
9	Done	Select this button to close this screen and return to the main protocol screen.

protocol step parameters

For each step of the protocol, seven step parameters are displayed in the table in the left of the View protocol screen, as listed below.

Parameter	Description	Options
Step	The number of the step within the protocol.	A maximum of 16 steps.
Reagent	The reagent used for the step.	Specify the group, type or station as per protocol selection method.
Step time	The step time measured from the end of the fill to the start of the drain.	0 to 5940 minutes (99 hours).
Temp.	The step temperature.	The available range corresponds to reagent thresholds and protocol type.
P/V	The retort pressure or vacuum used for the step.	Pressure, vacuum or cycle. (Cycle alternates between pressure and vacuum.) Note that vacuum and cycle options will not be available if the step temperature is above the reagent's "Vacuum" temperature threshold.
Stirrer	The retort's stirrer speed.	Off, low, medium or high.
Drip time	The time allowed for reagent to drip from the cassettes and retort walls before ending a drain.	0, 5, 10 or 30 seconds.

Select the **Done** button when finished.

2.2.6 editing a protocol

Use this screen to modify existing protocols. All of a protocol's step details may be altered but you cannot alter its type or reagent selection method. Only supervisors can edit locked protocols.

To edit an existing protocol, open the protocols screen by selecting **Protocols** from the Function bar, select the protocol, then press **Edit**. Modify the protocol using the controls described in Figure 94 and the associated table. Refer to the next section "protocol editing instructions" on page 93 for detailed assistance.

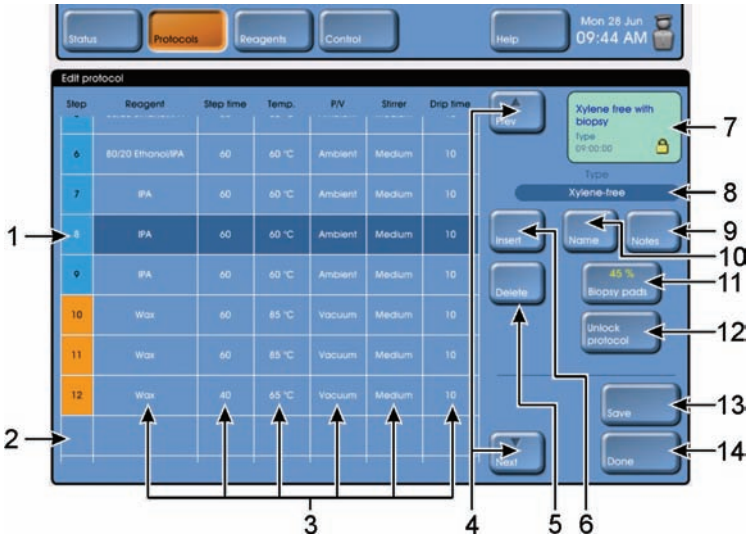


Figure 94: Edit protocol screen

Item	Description	Function
1	Selected step	Select a step number to select the entire step. You can delete a selected step or insert a new step above it.
2	Blank row	Select any blank row to insert a new step below the current last step.
3	Parameter cells	Select a cell to change its parameter value.
4	**Prev** and **Next**	Select these buttons to scroll through the protocol steps.
5	Delete	Select this button to delete the currently selected step.
6	Insert	Select this button to insert a new step above the selected step.
7	Protocol icon	This is the protocol icon as it will appear on the main protocol page. Refer to "protocol icons" on page 83 for details.
8	Protocol type	This displays the protocol's type. Refer to "protocol types" on page 83 for details.
9	Notes	Add a protocol description (displays in an expanded protocol panel).
10	Name	Change the protocol's name.
11	Biopsy pads	Select this button to set the biopsy pad percentage for this protocol. Refer to "biopsy pads" on page 133 for more details.

Table continues on the next page…

Item	Description	Function
…table continuing from previous page.		
12	Lock/Unlock protocol	Select this button to lock or unlock a protocol (requires supervisor level access). Locked protocols can only be edited by supervisors.
13	Save	Select this button to save the protocol.
14	Done	Select this button to end the protocol editing session.

protocol editing instructions

Use the following instructions to modify a protocol from the "Edit protocol screen".
Refer to Figure 94 and the preceding table for item numbers and function descriptions.

- Scroll through the protocol steps by selecting the **Prev** and **Next** buttons (item 4).
- Select a step by selecting the step number cell (item 1).
- Add a new step by selecting a step number then selecting the **Insert** button (item 6).
  The new step will appear above the selected row.
  Insert parameters as directed by the automatic dialog boxes then (if required) modify those parameters that automatically copy the previous step's values.
- To modify a parameter within a step, select the parameter's table cell (item 3).
  A keypad or selection dialog box will automatically open; use it to enter the required value.
- When selecting a reagent, the options presented will conform to the protocol's reagent selection method (group, type or station).
  You may choose to view compatible reagents (**Show compatible**) or all reagents (**Show all**).
  If you choose an incompatible reagent, an asterisk will precede the reagent name and you will not be able to load or run the protocol.
- Remove a step by selecting the step number then selecting the **Delete** button (item 5).
- As you alter steps you can view the protocol's processing time in the icon display (item 7).
  The processing time is the time the protocol will take to complete if there is no initial fill.
  The processing time is the sum of the individual step times, the estimated fill/drain times and (for cleaning protocols) the dry step time.
- Select the **Name** and **Notes** buttons (items 9 and 10) to edit the protocol name and description.
- Specify the average proportion of biopsy pads you expect to process with this protocol by selecting the **Biopsy pads** button (item 11) and entering the value using the keypad that appears.

Please note that the biopsy pads parameter has a significant effect on reagent concentration calculations so you must endeavour to set an accurate value.

- Lock or unlock a protocol by toggling the **Lock protocol /Unlock protocol** button (item 12).
  This function is available to supervisors only.
- Save changes to the protocol by selecting the **Save** button (item 13).
- End the editing session by selecting the **Done** button (item 14).
  If there are unsaved changes a dialog box will appear.
  Select the **Yes** button to save the changes and exit.
  Select the **No** button to exit without saving the changes.
  Select the **Cancel** button to resume editing.

2.2.7 creating a new protocol

You can create many new protocols to perform specific processing tasks. Before creating the protocol you must decide the protocol type and the reagent selection method as these settings cannot be altered once set.

New protocols can be created from scratch, or you can select an existing or pre-defined protocol to base a new protocol on. The instructions below describe how to create new protocols from scratch. See “copying a protocol” on page 95 for instructions to copy an existing or pre-defined protocol.

Use the following procedure to create a new protocol.

1. Open the protocols screen by selecting the **Protocols** button from the Function bar.
2. Select the **New** button from the protocols screen (see Figure 84 on page 82).
3. Select the type of protocol you wish to create (refer to Section 2.2.3 "protocol types").
   If you click on the yellow “Pre-defined” icon a range of protocols supplied by Vision BioSystems for copying is displayed (see “copying a protocol” on page 95).
   The protocol type that you select now cannot later be changed.
4. Select a reagent selection method (refer to Section 2.2.4 "reagent selection method").
   This cannot be changed.
5. Automatic dialog boxes will now guide you through the creation of the first step.
6. Add additional steps (or modify the first step) as required.
   Refer to Section 2.2.6 "editing a protocol" for detailed instructions.
7. Select the **Name** button to name your protocol.
   You cannot save a protocol without a name.
8. Select the **Notes** button to give your protocol a description.
9. Select the **Biopsy pads** button to set the proportion of biopsy pads you expect to process with this protocol.
   This Biopsy pads value will be set to the system’s default value if you elect not to set a value.
   Refer to “biopsy pads” on page 133 for more details.
10. Select the **Lock protocol** button to lock this protocol (you require supervisor access for this).
    Locked protocols can only be edited by supervisors.
11. Select the **Save** button to save the protocol.
12. Select the **Done** button to finish.

Your new protocol will now be available in the protocol selection list.

2.2.8 copying a protocol

You can copy any protocol displayed on the Protocols screen in order to create a new one based on it.

Use the following procedure to make a copy of a protocol.

1. Open the protocols screen by selecting the **Protocols** button from the Function bar.
2. Select the protocol you wish to copy.
3. Select the **Copy** button from the control panel.
4. Use the keypad to enter a new name for your protocol.
   Select the **Enter** button when satisfied with the name.
5. You will now jump to the "Edit protocol" screen.
   Use this screen to modify the protocol as described in Section 2.2.6 "editing a protocol".
6. Select the **Save** button to save the protocol.
7. Select the **Done** button to finish.

Your new protocol will now be available in the protocol selection list.

2.2.9 pre-defined protocols

Each Peloris system includes a set of pre-defined protocols. Access the pre-defined protocols from the Protocols screen by selecting **New** and then selecting the "Pre-defined" icon.

Pre-defined protocols can be copied to appear in the Protocols screen where they become available for use. They can be copied as they are, even keeping the name unchanged, or once copied you can modify them to suit your purposes. The original versions cannot be changed.

In new Peloris systems the pre-defined protocols are all provided, ready for use, in the Protocols screen. In case these versions are edited or deleted, however, the original versions remain available under the "Pre-defined" icon accessed with the **New** button.

The pre-defined protocols include some standard and xylene-free protocols, and a cleaning protocol (see "pre-defined protocols list" on page 184 for a complete list).

Use the following procedure to make a copy of a pre-defined protocol.

1. Open the protocols screen by selecting the **Protocols** button from the Function bar.
2. Select **New** in the control bar.
3. Select the yellow "Pre-defined" icon.
   The "Copy a pre-defined protocol" screen opens showing the pre-defined protocols.
   Individual protocols can be viewed by selecting each and pressing **View**.
4. Select the protocol you wish to copy.
5. Select the **Copy** button from the control panel.
6. Use the keypad to enter a name for the protocol copy (you can use its existing name if you do not already have a protocol with that name).
   Select the **Enter** button when satisfied with the name.
7. The pre-defined protocol is now copied to the main Protocols screen under the name you gave it.
8. If you wish, modify the protocol as described in Section 2.2.6 "editing a protocol".

2.2.10 deleting a protocol

Deleted protocols cannot be retrieved unless you have copied them to an external device using the file transfer functions (refer to Section 2.9.7 "file transfer"). You must be certain that you wish to delete a protocol before proceeding.

Use the following procedure to delete any user created protocol (only supervisors can delete locked protocols).

1. Open the protocols screen by selecting the **Protocols** button from the Function bar.
2. Select the protocol you wish to delete.
3. Select the **Delete** button from the control panel.
4. A confirmation dialog box will now appear.
   Take care before continuing as only service personnel can retrieve deleted protocols.
5. If you decide to retain the protocol, select the **Cancel** button.
   This procedure will now end.
6. If you are sure you wish to delete the protocol, select the **OK** button.
7. The protocol will no longer be available in the protocol selection list.

2.2.11 loading a protocol

Loading a protocol reserves a retort and checks resources in preparation for a processing run. You can load a protocol from either the status screen or the protocol screen. Refer to Section 2.1.3 "loading a protocol" to load a protocol from the status screen.

Before loading a wax only protocol, use the manual operation functions to pre-heat the retort and wax path so there is no delay before the initial wax fill (refer to Section 2.7 "manual operations").

Use the following procedure to load a protocol from the protocol screen.

1. Select the **Protocols** button from the Function bar to open the protocols screen.
2. Select the protocol you wish to load.
   Once selected the protocol will have a red outline (see Figure 95).

Figure 95: Protocol screen with available protocols (1), selected protocol (2) and Load button (3)

3. Select the **Load** button (see Figure 95).
   If you select an invalid protocol, the **Load** button will be dimmed.

Procedure continues on the next page…

…procedure continuing from previous page.

4. The "Select retort" dialog box will now appear.
   Select the retort **A** icon to load the protocol in to retort A.
   Select the retort **B** icon to load the protocol in to retort B.
   Select the **Cancel** button to end this procedure.
5. You will now jump to the status screen and the protocol will be loaded in the protocol panel (see Figure 96).

Selecting the **Show details** button (1) increases the panel size to display additional information.

Selecting the **Hide details** button (2) returns the panel to normal size.

In the reagent column, the bracketed numbers (3) indicate the preliminary station assignment for each step. Note that the station assignment may change during protocol scheduling.

Figure 96: Protocol loaded in retort A protocol panel

6. Refer to Section 2.1.4 "running a protocol" to learn how to run the loaded protocol.

2.3 reagents

The five reagent screens allow you to manage the reagents used on your instrument. You select the required reagent screen by first selecting the **Reagents** button on the Function bar and then selecting appropriate screen from the menu. The reagents screens are described in the following text.

- reagent stations (refer to Section 2.4)
  Use this screen to allocate reagent types to stations and to set initial reagent concentration.
- reagent types (refer to Section 2.5)
  Use this screen to manage your list of active reagent types and to set reagent type attributes.
- remote fill/drain (refer to Section 2.6)
  Use this screen to fill or drain reagent bottles and to drain wax stations.
- manual operations (refer to Section 2.7)
  Use this screen to manually control reagent, wax and retort functions.
- reagent management (refer to Section 2.8)
  Use this screen to specify system-level reagent functions and to view and modify retort status.

2.3.1 reagents overview

Use this section to gain a general understanding of how to set up reagents and how the Peloris tissue processor uses those reagents. For an understanding of reagent terms you should consult Section 1.3 "terms".

The following list details the basic elements of the reagent system.

- Reagent groups specify reagent function (e.g. Fixatives).
  There are nine factory-defined groups.
  The reagent group determines reagent compatibility.
- Reagent types are specific reagents within a group (e.g. Formalin).
  Use the reagent types screen to create reagent types.
  Reagent types have the following attributes: reagent group, a unique name, a default concentration, concentration threshold, use thresholds and temperature limits.
- Reagent stations hold the actual reagents in a particular bottle or wax chamber.
  Reagent stations are managed using the stations screen.
  Reagent stations have the following characteristics: reagent group, reagent type, station number, a calculated concentration, a use history and a current fill state.
- The reagent management system tracks the use of each reagent station and (for select by group or type protocols) automatically assigns the best reagent station to each protocol step.
  Set reagent management options using the management screen (refer to Section 2.8 "reagent management").
  For reagent selection details, refer to Section 2.2.4 "reagent selection method".

reagent setup

The following text describes a typical reagent setup procedure and documents reagent management functions.

1. Create reagent types using the **Add reagents** button from the reagent types screen.
   Assign each type to a reagent group and provide a unique name.
   Refer to Section 2.5 "reagent types" for details.
2. Modify the default concentration and the threshold values for each new type using the reagent types screen.
   Refer to Section 2.5 "reagent types" for details.
3. Assign reagent types to reagent stations using the reagent stations screen.
   Refer to Section 2.4 "reagent stations" for details.
4. Set the initial reagent concentration for each station.
   Refer to Section 2.4 "reagent stations" for details.
5. Create your protocols using the desired reagent selection method.
   Group select allows you to choose a reagent group for each step.
   Type select allows you to choose a reagent type for each step.
   Station select allows you to choose a particular station for each step.
   Refer to Section 2.2 "protocols" for details.
6. As you run protocols, each station's use history will update and the concentration management system will reduce each station's concentration accordingly.
   Refer to Section 1.5 "reagent management system" for details.
7. When reagent station concentration or use falls outside the reagent type thresholds, you will receive appropriate warning messages.
   Refer to Section 2.8.2 "reagent threshold check" for details.

2.4 reagent stations

Use the reagent stations screen to set up and manage the reagents (including wax) loaded into your Peloris tissue processor. From this screen you can designate a reagent type for each station, alter the initial concentration and set the station's state. This screen also displays the use history and calculated concentration for each station and the current chamber temperature for the wax stations. You also use this screen to reset the reagent concentration and history details when you replace used reagents with fresh reagents.

The reagent screen has two sections: reagent bottles and wax chambers. The reagent bottle section allows you to set up and view the 16 reagent bottles housed in the reagent cabinet. The wax chambers section allows you to set up and view the four wax chambers within the wax bath. Use the **Reagent bottles** and **Wax chambers** buttons to select the section you require.

CAUTION
Do not run protocols unless all 16 reagent bottles and the condensate bottle are fitted. Missing bottles will cause fluid spills and vapor leaks.

When you first receive your Peloris tissue processor, all reagent stations are blank. You should assign a reagent to each station and you must insert all reagent bottles before running protocols. Once you assign a reagent to a station the station cannot return to an unused state. If you do not wish to use a particular station, set its state to "Dry" and (for non wax stations) insert an empty bottle into the station's reagent cabinet location.

The reagent station screen is shown in the next section — "reagent stations screen" on page 101 — as Figure 97 (the reagent bottles view) and Figure 98 (the wax chambers view). A table in "reagent stations screen" on page 101 details the items in these images. To manage your reagent stations, use the controls detailed in the table and apply the instructions listed in the following sections:

- Section 2.4.2 "assigning a reagent type"
- Section 2.4.3 "setting the concentration"
- Section 2.4.4 "setting the station state"
- Section 2.4.5 "resetting a reagent station"
- See also Section 4.4 "suggested station configurations" for configurations suitable for the default protocols.

If you use graded dehydrants, you only need one set to service both retorts. If there are excess graded dehydrants the Peloris tissue processor may be forced to assign a low-concentration dehydrant to a step late in the dehydrant sequence and this will lead to very poor tissue processing results. For the best results, assign only one station to each graded dehydrant type and assign no more than two graded types (i.e. 70% and 90%) in total. Always ensure there are sufficient high-concentration dehydrants.

Always ensure the actual reagent in any reagent station is consistent with the reagent station configuration. A station containing reagent fluid that is different to that specified in the reagent stations setup could damage or destroy tissue samples.

Altering reagent station configurations while protocols are running may cause abandoned protocols.

2.4.1 reagent stations screen

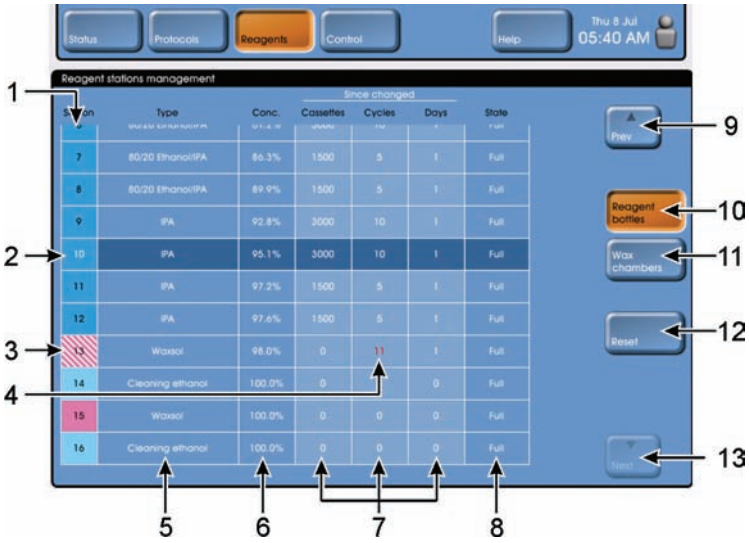


Figure 97: Reagent stations screen—reagent bottles view

Figure 98: Reagent stations screen—detail of wax chamber view

Item	Description	Function
1	Station cell	This indicates the actual station position within the instrument. The background color indicates the reagent group.
2	Highlighted row	Select a station number to highlight a row. You can reset the concentration and use history of a highlighted row.
3	Hatched station	Out-of-threshold stations are cross-hatched for easy identification.
4	Red attribute	Out-of-threshold attributes are shown in red for easy identification.
5	Reagent type	Displays the station's reagent type. Select the cell to change the station's reagent type.
6	Conc.	Displays the calculated reagent concentration. Select the cell to set the initial concentration.
7	Station use	Shows the station's use since the last reset. Includes the number of cycles, the number of cassettes processed and the days in use. Select any cell to enable the station reset function.
8	State	Shows the current station state. Select the cell to alter the state.
9	Prev	Select this button to scroll up through the stations.
10	Reagent bottles	Select this button to view and set the reagent bottles.
11	Wax chambers	Select this button the view and set the wax chambers.
12	Reset	Select this button to reset a station's concentration and history.
13	Next	Select this button to scroll down through the stations.
14	Temp.	The current wax chamber temperature.

2.4.2 assigning a reagent type

You can assign any active reagent type to a reagent station. You must always update the reagent type when you change the actual reagent used in a reagent station. Refer to Section 2.5 "reagent types" for more information on active reagent types.

Use the following procedure to assign a reagent type to a reagent station (refer to Figure 97 and Figure 98 on page 101 for reagent stations screen item references).

1. Select the **Reagents** button from the Function bar then select **Stations** from the menu.
2. Select the **Reagent bottles** button (item 10) to set up the reagent bottles.
   Select the **Wax chambers** button (item 11) to set up the wax chambers.
3. Use the **Next** and **Prev** buttons (item 9 and 13) to make the required reagent station visible.
4. Select the station's **Type** cell (item 5).
5. The "Reagent selection" dialog box will now appear (see Figure 99).
   This dialog box lists all the active reagent types specified in the reagent types screen (refer to Section 2.5 "reagent types").

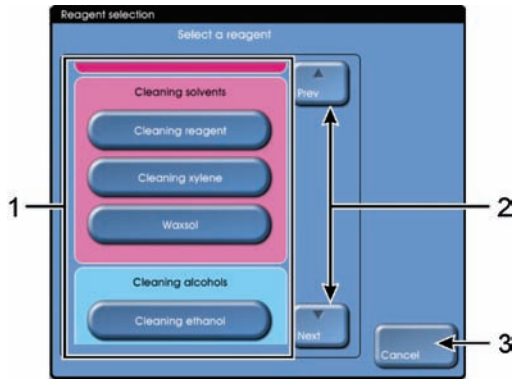


Figure 99: reagent selection dialog box with a available reagent types (1), scroll buttons (2) and Cancel button (3)

6. If you do not wish to proceed, select the **Cancel** button (see Figure 99).
7. Use the **Next** and **Prev** buttons to scroll through the list of reagent types (see Figure 99).
8. Select the required reagent type from the list (see Figure 99).
   It is immediately assigned to the station and you return to the reagent stations screen.
   The station's history is reset and the concentration is set the reagent type's default value.
9. Check the station's **Conc.** cell (item 6).
   Select the cell and enter a new concentration value if required.
10. Check the station's **State** cell (item 8).
    Select the cell and change the state if required.
11. Visually inspect the reagent station to confirm that the actual reagent type and station state match the information you have entered.

2.4.3 setting the concentration

You can set a station's "calculated" concentration value.

Do not alter the concentration of a used reagent unless you are able to verify the actual concentration. If the concentration is incorrect a reduction in tissue processing quality may result.

Use the following procedure to set reagent concentration (refer to Figure 97 and Figure 98 on page 101 for reagent stations screen item references).

1. Select the **Reagents** button from the Function bar then select **Stations** from the menu.
2. Select the **Reagent bottles** button (item 10) to set up the reagent bottles.
   Select the **Wax chambers** button (item 11) to set up the wax chambers.
3. Use the **Next** and **Prev** buttons (item 9 and 13) to make the required reagent station visible.
4. Select the station's **Conc.** cell (item 6).
   A keypad will now appear.
5. Use the keypad to enter the appropriate reagent concentration.
6. Select the **Cancel** button if you wish to end this procedure without altering the concentration.
7. Select the **OK** button to set the new station concentration.

2.4.4 setting the station state

You must manually change the station state if you fill or drain a reagent bottle off the instrument or if you add wax to a wax station.

You must set the reagent station state to the actual condition of the station. An incorrect reagent station state may cause fluid leaks or abandoned processing runs. Refer to Section 1.3.4 "states" for detailed information on reagent station states.

Use the following procedure to set a reagent station's state (refer to Figure 97 and Figure 98 on page 101 for reagent stations screen item references).

1. Select the **Reagents** button from the Function bar then select **Stations** from the menu.
2. Select the **Reagent bottles** button (item 10) to set up the reagent bottles.
   Select the **Wax chambers** button (item 11) to set up the wax chambers.
3. Use the **Next** and **Prev** buttons (item 9 and 13) to make the required reagent station visible.
4. Select the station's **State** cell (item 8).

Procedure continues on the next page…

…procedure continuing from previous page.

5. The "Station state" dialog box will now appear (see Figure 100).

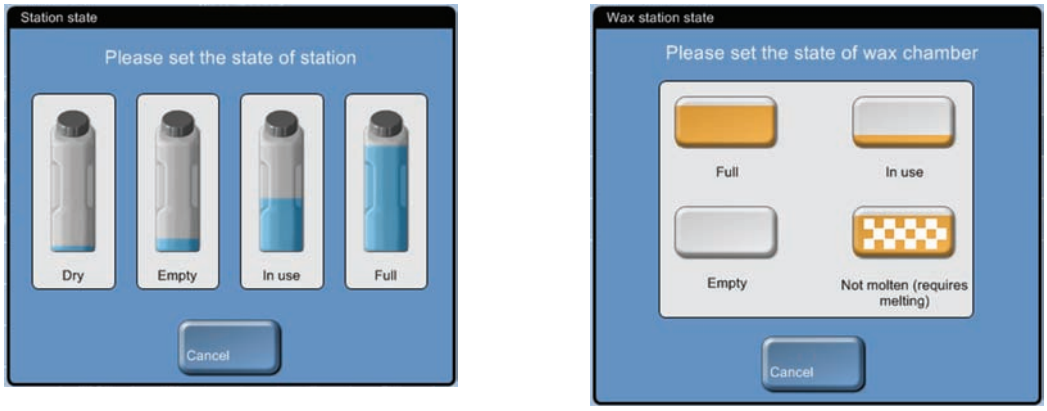


Figure 100: Station state dialog box for reagent stations (L) and wax stations (R)

6. Select the **Cancel** button if you wish to end this procedure without changing the state (see Figure 100).
7. Select the appropriate state icon to immediately set the station's state (see Figure 100).
   You will now return to the stations screen and the new state will be set.
8. Visually inspect the reagent station to ensure the actual state corresponds to the state you set.

2.4.5 resetting a reagent station

Resetting a reagent station removes all reagent history details and resets the calculated concentration to the reagent type's default concentration. You should reset the reagent station when replacing used reagents.

If you reset the reagent details but do not replace used reagents, the reagent management system will be unable to correctly assign the station and a reduction in tissue processing quality may result.

Use the following procedure to reset a reagent station (refer to Figure 97 and Figure 98 on page 101 for reagent stations screen item references).

1. Fill the reagent station with the fresh reagent.
   Replace the reagent bottle (unless filling a wax station).
2. Select the **Reagents** button from the Function bar then select **Stations** from the menu.
3. Select the **Reagent bottles** button (item 10) to set up the reagent bottles.
   Select the **Wax chambers** button (item 11) to set up the wax chambers.
4. Use the **Next** and **Prev** buttons (item 9 and 13) to make the required reagent station visible.
5. Select either the appropriate station cell (item 1) or one of the station's history cells (item 7).
6. Select the **Reset** button (item 12).

Procedure continues on the next page…

…procedure continuing from previous page.

7. The "Reset station" dialog box will now appear (see Figure 101).

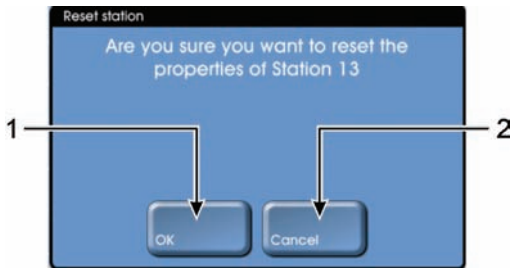


Figure 101: Reset station dialog box with OK (1) and Cancel (2) buttons

8. Check that the correct station is selected.
9. Select the **Cancel** button if you wish to end this procedure without resetting the selected station (see Figure 101).
10. Select the **OK** button to reset the station's history and concentration.
    This procedure cannot be undone (see Figure 101).
11. Check the station's **Conc.** cell (item 6).
    Select the cell and enter a new concentration value if required.
12. Check the station's **State** cell (item 8).
    Select the cell and change the state if required.
13. Visually inspect the reagent station to confirm that the actual reagent type and station state match the information you have entered.

2.5 reagent types

Use the "Reagent types" screen to set up and manage your active reagent types. The screen lists all active reagent types and their attributes. If you have supervisor level access you can also edit, add, remove and create reagent types. There are two "Reagent types" views: the "Purity threshold" view for history attributes and the "Temperature threshold" view for temperature attributes.

Launch the "Reagent types" screen by selecting the **Reagents** button from the Function bar then select the **Types** button from the menu. Use the **Purity thresholds and Temperature thresholds** buttons to switch between the two views. The "Purity threshold" view is shown in Figure 102 and the "Temperature threshold" view is shown in Figure 103. A table in "reagent type screen functions" on page 108 details the items in these images. To set up and manage your reagent types, use the controls detailed in the table and follow the instructions in these sections:

- Section 2.5.2 "using purity thresholds"
- Section 2.5.3 "editing active reagent types"
- Section 2.5.4 "adding reagent types".

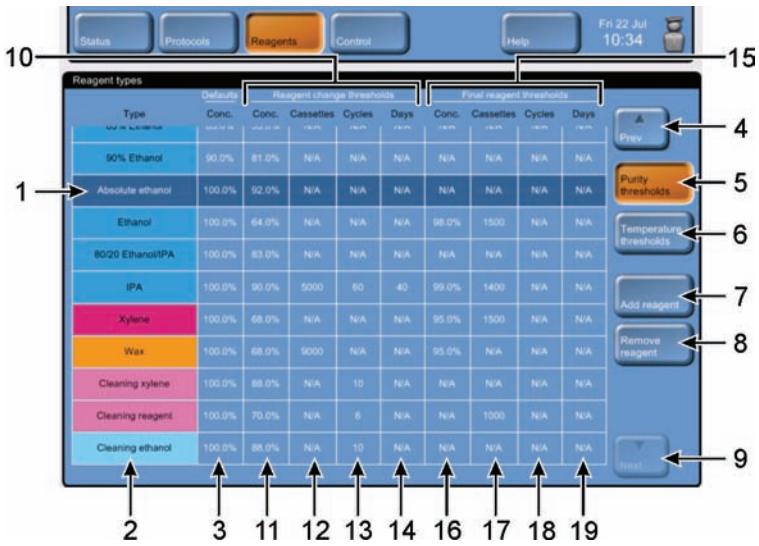


Figure 102: Reagent types screen — purity thresholds view

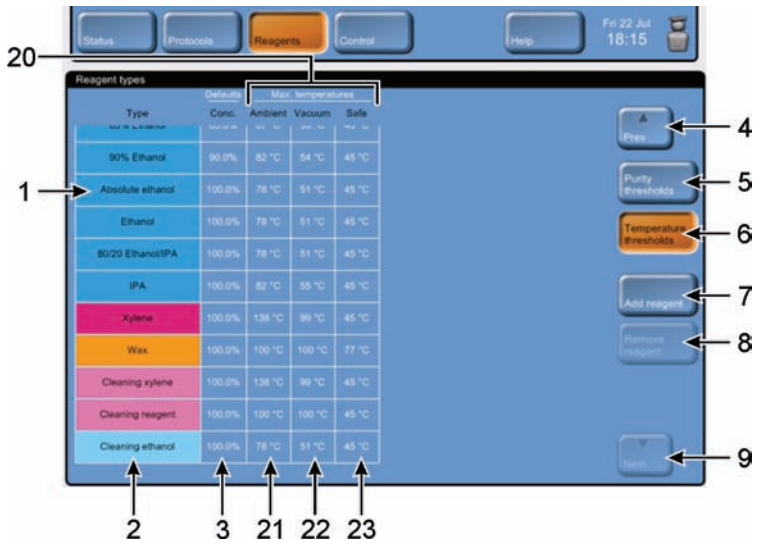


Figure 103: Reagent types screen — Temperature thresholds view

2.5.1 reagent type screen functions

The following table describes the functions available from the "Reagent types" screens. See Figure 102 and Figure 103 for item references.

Item	Description	Function
Common items (see Figure 102 and Figure 103)		
1	Highlighted reagent	Select a reagent name cell (2) to highlight that reagent type. Highlighted reagents can be removed from the active list.
2	Reagent name	Displays the reagent type's unique name. The background color indicates the associated reagent group.
3	Default concentration	This is the type's default concentration. The default concentration determines the initial concentration for reagent stations using this type. Select this cell to edit the default concentration.
4	Prev	Select to scroll up through the reagent types.
5	Purity thresholds	Select this button for the Purity thresholds view. The button remains selected when the Purity thresholds view is active.
6	Temperature thresholds	Select this button for the Temperature thresholds view. The button remains selected when the Temperature thresholds view is active.
7	Add reagent	Select this button to access the dormant reagents list. From the dormant list you can create new reagent types and add a type to the active list.
8	Remove reagent	Select this button to remove the highlighted reagent type.
9	Next	Select to scroll down through the stations.
Purity threshold items (see Figure 102) Refer to Section 2.5.2 "using purity thresholds" for additional details.		
10	Reagent change thresholds	These thresholds determine the minimum acceptable condition of each reagent type and relate to all protocol steps except the last step of a group. Items 11 to 14 are reagent change thresholds.
11	Concentration threshold (R change)	The minimum concentration allowed for this reagent type when it is used in any step except the last step of a group. Select the table cell to edit the concentration threshold.
12	Cassettes threshold (R change)	The maximum number of cassettes this reagent type may process when it is used in any step except the last step of a group. Select the table cell to edit the cassettes threshold.
13	Cycles threshold (R change)	The maximum number of processing cycles allowed for this reagent type when it is used in any step except the last step of a group. Select the table cell to edit the cycles threshold.
14	Days threshold (R change)	The maximum number of installed days allowed for this reagent type when it is used in any step except the last step of a group. Select the table cell to edit the days threshold.

Table continues on the next page…

Item	Description	Function
…table continuing from previous page.		
15	Final reagent thresholds	These thresholds determine the minimum acceptable condition of each type when it is used as the last step of a group. Items 16 to 19 are reagent change thresholds.
16	Concentration threshold (Final)	The minimum concentration allowed for this reagent type when it is used as the last step of a group. Select the table cell to edit the concentration threshold.
17	Cassettes threshold (Final)	The maximum number of cassettes this reagent type may process when it is used as the last step of a group. Select the table cell to edit the cassettes threshold.
18	Cycles threshold (Final)	The maximum number of processing cycles allowed for this reagent type when it is used as the last step of a group. Select the table cell to edit the cycles threshold.
19	Days threshold (Final)	The maximum number of installed days allowed for this reagent type when it is used as the last step of a group. Select the table cell to edit the days threshold.
Temperature threshold items (see Figure 103)		
20	Max. temperatures	These thresholds determine the maximum allowable temperatures for each reagent type. The reagent cannot be used for any protocol step that exceeds these thresholds. Note that the maximum temperatures may be set to levels higher than allowable retort temperatures. Allowable retort temperatures are determined by protocol type (refer to Section 4.5 "protocol step temperatures") and manual operation constraints (refer to Section 2.7.2 "setting retort conditions").
21	Ambient temperature	The maximum retort temperature for this reagent type when the retort is at ambient pressure. Select the table cell to edit the maximum ambient temperature.
22	Vacuum temperature	The maximum retort temperature for this reagent type when the retort is evacuated. Select the table cell to edit the maximum vacuum temperature.
23	Safe temperature	The maximum temperature at which it is safe to open a retort containing this reagent type. Select the table cell to edit the safe temperature.

2.5.2 using purity thresholds

The purity threshold values apply to all reagents stations of a particular type. Once a station exceeds any threshold value, it will not be selected for a protocol step unless there is no other station available. You will receive a warning if the system is forced to use a station that has exceeded its purity limits.

The "Reagent change thresholds" apply to all protocol steps except the final step of the particular group. The "Final reagent thresholds" apply only to the final step of a particular group.

You can disable each threshold check for all reagent types by disabling the check in the "Reagents threshold check" section of the "Reagent management screen" (refer to Section 2.8.2 "reagent threshold check"). You can disable the check for a particular reagent type by setting the threshold value to "N/A" (Not Applicable) in the reagent types table.

If you receive warnings that an out-of-threshold reagent has been selected for a protocol it is strongly recommended that you do not proceed with the protocol run — especially if there are multiple out-of-threshold warnings — as out-of-thresholds reagents will result in poor quality processing.

If you believe that any reagent purity threshold value is too high, and that the out-of-threshold reagent is still suitable for use, you should adjust the threshold values as described in Section 2.5.3 "editing active reagent types".

2.5.3 editing active reagent types

Supervisors can edit the default concentration, purity thresholds, and temperature thresholds for all active reagent types.

You edit a type's attributes by selecting the appropriate table cell then entering the required value using the resultant keypad. The attributes update immediately and are applied to all reagent station's and protocols that use the reagent type. The changes will not affect running protocols.

The changes you make are permanent and the values are retained even if you delete the reagent from the active list. You cannot reset reagents to the factory values, however default values for common reagents are shown in Section 4.1 "reagent threshold guidelines".

Lowering temperature thresholds may make protocol steps invalid. You must lower the step temperature to comply with the new reagent threshold before you can load or run the protocol.

2.5.4 adding reagent types

You can add reagent types to the active reagents list by selecting the **Add reagent** button to launch the Add reagent screen. This screen has a list of dormant reagent types (both factory and user defined) that you can select and add to the active list. You can add to the dormant list using the **Create reagents** button. Use the **Delete** button to remove user defined reagent types from the dormant list. You must have supervisor level access to use these functions.

Use the controls shown in Figure 104 and follow the subsequent procedures to create or delete dormant reagent types and to add a dormant type to the active list.

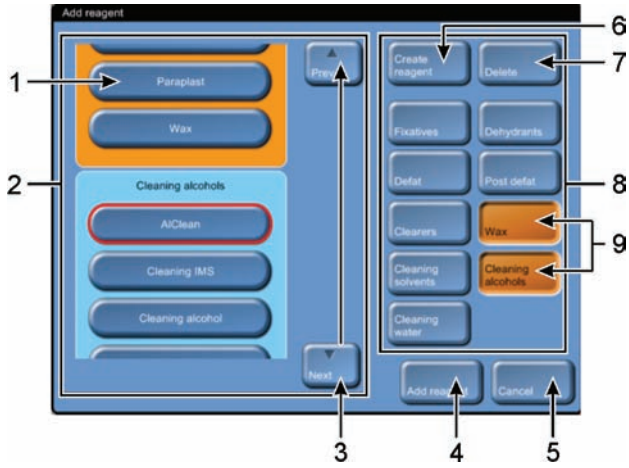


Figure 104: Add reagent screen

Item	Description	Function
1	Selected dormant type	Select a type from the dormant list so it can be added to the active list or deleted from the dormant list (if user defined).
2	List of dormant reagent types	This list shows the dormant reagent types. It is sorted by groups and you can choose which groups to view.
3	Scroll buttons	Use the scroll buttons to scroll through the list of dormant reagent types.
4	Add reagent	Select this button to add the selected dormant type to the list of active reagent types.
5	Cancel	Select the cancel button to exit without adding to the list of active reagent types.
6	Create reagent	Select the create reagent button to create a new reagent type.
7	Delete	Select the delete button to remove a user defined reagent type from the list of dormant reagent types. This button is dimmed when a factory type is selected.
8	Group view buttons	Use these buttons to choose the groups you wish to see in the list of dormant reagent types.
9	Selected groups	Reagent types belonging to the selected groups are displayed in the list of dormant reagent types.

creating reagent types

Use the following procedure to create a new reagent type and add it to the dormant reagents list.

1. Open the Add reagent screen by selecting the **Add Reagent** button from the reagent types screen.
2. Select the **Create reagent** button.
3. Select the reagent group for the new reagent type.
   Use the **Prev** and **Next** buttons to scroll through the groups list.
4. Use the keypad to enter a name for the reagent type.
   Each type must have a unique name.
   Select the **OK** button when finished.
5. The new type will now be included in the dormant reagents list and it will be the currently selected reagent.
   To view the new type, select the appropriate group view button; the new type will be the last reagent listed for its group.
6. To add the new type to the active reagents list, ensure it is selected then select the **Add reagent** button.
   You will immediately return to the active reagents list.
7. Edit the new type in the active list to set the type's attributes.
   The attributes are saved with the type definition and are retained even if the new type is removed from the active list.

deleting reagent types

You can delete user defined reagents from the dormant list. Factory defined types cannot be deleted and if a factory type is selected, the **Delete** button will be dimmed and inactive. Also, you cannot delete a reagent type that is currently being used in a reagent station. Deleting a reagent type from the dormant list automatically removes it from the active reagent list.

Use the following procedure to delete a reagent type from the dormant reagents list.

1. Open the Add reagent screen by selecting the **Add reagent** button from the reagent types screen.
2. Select the appropriate group view button so the required reagent group is visible in the dormant reagents list.
3. Select the required reagent type from the list.
4. Select the **Delete** button.
5. A confirmation dialog box will now appear.
   Select the **Cancel** button to end this procedure without deleting the reagent type.
   Select the **OK** button to permanently remove the reagent type from the dormant reagents list.

add to active list

Use the following procedure to add a dormant reagent type to the active reagents list.

1. Open the Add reagent screen by selecting the **Add reagent** button from the reagent types screen.
2. Select the appropriate group view button so the required reagent group is visible in the dormant reagents list.
3. Select the appropriate reagent type from the list.
4. Select the **Add reagent** button.
5. The reagent type will now appear in the active reagents list.
   If it is a new user-defined reagent, all temperature and purity threshold attributes default to zero and the default concentration is set to 100%. You must edit the attributes as described in Section 2.5.3 "editing active reagent types".
   If the added type is factory-defined you may also alter any of the preset temperature and purity attributes.

2.6 remote fill/drain

The remote fill and drain screen allows you to drain the wax baths and to fill and drain reagent bottles without removing them from the instrument. You are able to fill/drain stations individually or as a group of compatible stations in a single operation. There are three separate fill/drain systems — retort A, retort B and the wax system — and you can independently and concurrently schedule operations using each one. You can also fill and drain retorts from this screen to enable recovery from partially completed fill/drain operations.

Launch the remote fill/drain screen by selecting the **Reagents** button from the Function bar then select the **Remote fill/drain** button from the menu. Always use the Vision BioSystems remote hose for reagent bottle operations. Always ensure the wax chambers drain to a suitable container.

The remote fill/drain screen is shown in Figure 105 (the main screen) and Figure 105 (status panel detail). A table in "remote fill and drain functions" on page 115 details the items in these images. To fill and drain reagent stations, use the controls detailed in the table and apply the instructions listed in the following sections:

- Section 2.6.2 "remote fill/drain connections"
- Section 2.6.3 "draining reagent bottles"
- Section 2.6.4 "filling reagent bottles"
- Section 2.6.5 "filling wax stations"
- Section 2.6.6 "draining wax stations".

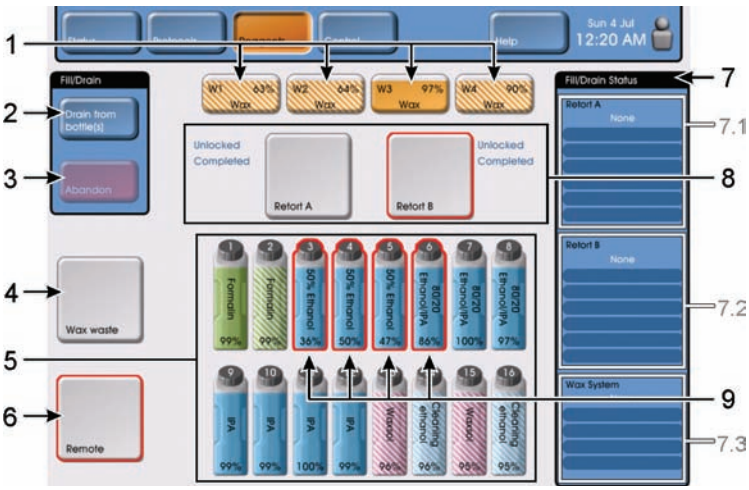


Figure 105: Remote fill and drain screen

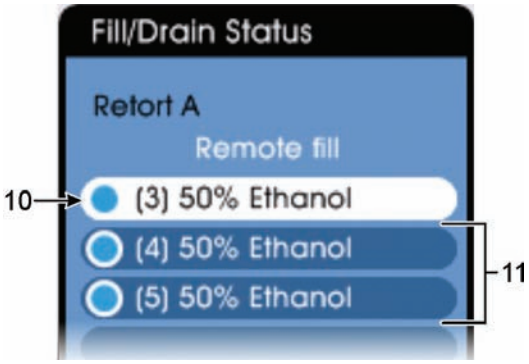


Figure 106: Status panel detail

2.6.1 remote fill and drain functions

Item	Description	Function
Remote fill and drain screen items (refer to Figure 105)		
1	Wax stations	Displays the wax stations with state and status details. Select one or more wax stations to drain. Refer to and Section 2.1.1 "status area".
2	Start process	Use this button to start an operation. The button's text changes depending on the icons selected and the operation available. Full bottle(s), retort and remote icon selected: **Drain from bottle(s)**. Dry bottle(s), retort and remote icon selected: **Fill to bottle(s)**. Full wax station(s) and wax waste icon selected: **Drain to waste**. Dry wax bath or bottle and full retort selected: **Drain retort**. Full wax bath or bottle and empty retort selected: **Fill retort**.
3	Abandon	Select this button to immediately end the current and all pending operations.
4	Wax waste	This icon represents the wax waste line. Select it for wax drain operations.
5	Reagent bottles	Displays the reagent bottles with state and status details. Select one or more bottles to fill or drain. Refer to and Section 2.1.1 "status area".
6	Remote	This icon represents the remote fill/drain line. Select it to fill or drain reagent bottles.
7	Status panel	Details the current and pending fill/drain operations. 7.1 shows the retort A status. 7.2 shows the retort B status. 7.3 shows the wax system status. See items 10 and 11 for more detail.
8	Retorts	Select a retort to use for the operation (not required for wax drains).

Table continues on the next page…

Item	Description	Function
…table continuing from previous page.		
9	Selected stations	Select one or more compatible stations to fill or drain. You may select either bottles or wax chambers.
Status panel items (refer to Figure 106)		
10	Current action	The top item in the list is the action currently underway. Once an action is complete it is removed from the list.
11	Pending actions	These are actions that will automatically start when preceding actions are complete. Note that each retort may have a separate list of pending actions.

2.6.2 remote fill/drain connections

The remote fill/drain line and the wax drain outlet sit above the carbon filter in the reagent cabinet (see Figure 108). A protective flap covers the outlets. This flap is designed to prevent reagents or wax spraying into the laboratory should a drain action be started without a hose attached. The wax waste line is heated to ensure that the wax does not solidify during the drain.

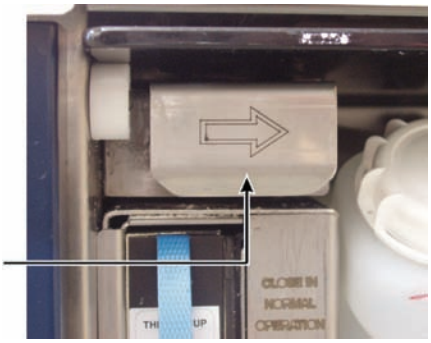


Figure 107: Remote fill/drain flap closed

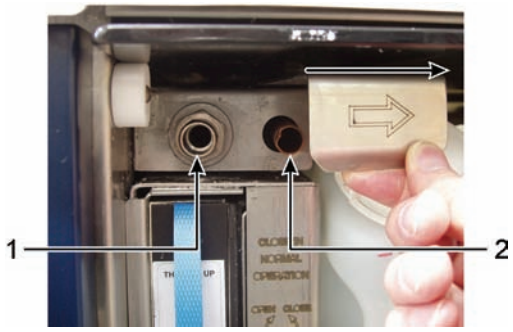


Figure 108: Remote fill/drain flap open with reagent line (1) and wax waste line (2).

Always ensure that you fill from or drain to a large stable container. The fill/drain functions include a strong purge which may cause an unstable container to tip over and spill. The container must also be of sufficient volume to easily accommodate all of the drained fluid.
If you need to use a small container you must support the container and hose during the fill or drain (always wear eye protection in case there are fluid splashes).

- Before draining a wax station, open the upper reagent cabinet door, slide back the fill/drain flap then fit the wax waste hose to the wax waste line (see item 2 in Figure 108).
  Ensure the wax waste hose drains into a suitable container.
  Ensure the hose remains out of the drained wax so that wax can't solidify on the end of hose.
- Before filling or draining reagent bottles, connect the remote fill/drain hose (see Figure 109) to the remote fill/drain line (see item 1 in Figure 108). The hose has a push-fit coupling that ensures a secure connection to the line.

To fit the hose, open the upper reagent cabinet door, slide back the fill/drain flap, and push the coupling onto the end of the line. To remove the hose, slide back the locking ring (item 1 in Figure 109) and pull the hose off the remote fill/drain line.

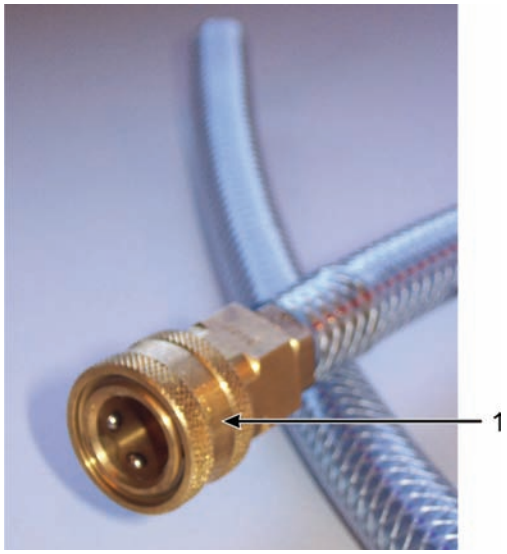


Figure 109: Remote fill/drain hose with locking ring (1)

2.6.3 draining reagent bottles

This function allows you to drain reagent bottles to an external waste container. The process drains each bottle to a retort then drains the retort to the remote fill/drain line.

Were recommend that the waste container be reasonably large and have a stable base. Small or unstable containers may be knocked over by the force of the reagent line purge at the end of the drain. Standard 1 US gallon containers are not suitable.

remote drain preconditions

Before you begin a remote drain, you must satisfy the following conditions.

- You must connect the remote fill/drain hose and it must drain into a suitable container. Refer to Section 2.6.2 "remote fill/drain connections".
- You must choose an available retort (it must not have a protocol loaded or running).
- The retort must be clean or empty and its lid must be closed.
- The retort residue (if any) must be compatible with the reagent in the bottle(s). Refer to Section 4.6 "reagent compatibility tables".
- All selected bottles must be of the same group.

remote drain sequence

The following reagent sequence is recommended when draining multiple bottles:

1. Fixatives
2. Cleaning alcohols
3. Dehydrants
4. Defatters
5. Cleaning solvents
6. Clearers.

remote drain procedure

Once you have satisfied the preconditions, use the following procedure to drain reagent bottle(s).

Do not remove the remote fill/drain hose until the software indicates the process is complete and pressurized air has cleared the hose. A cessation of reagent flow is not an indication that the procedure is complete.

1. From the remote fill/drain screen, select the following (see Figure 110):
   - The retort you wish to use (2)
   - The remote drain line (3)
   - The bottle(s) you wish to drain (4).

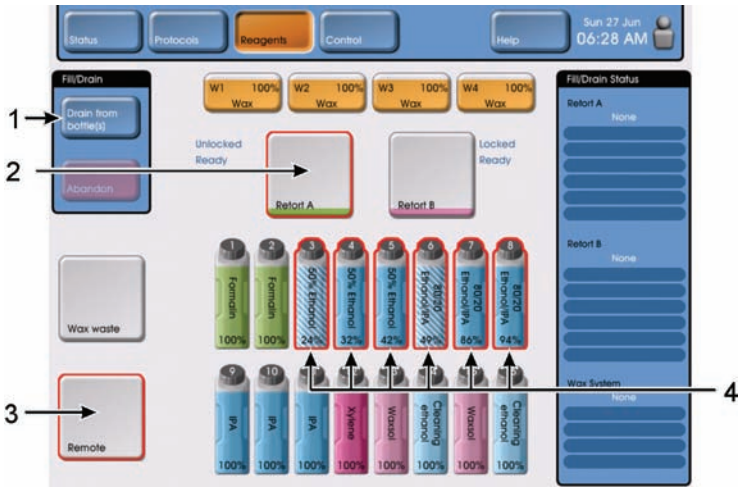


Figure 110: Remote fill/drain setup for draining bottles

2. Select the **Drain from bottle(s)** button (1) to begin the drain (see Figure 110).
3. When prompted, check that the retort lid is closed and the remote fill/drain hose is connected.
   Select the **Cancel** button if you wish to end this procedure without draining the bottle.
   Select the **OK** button to begin the drain.

Procedure continues on the next page…

…procedure continuing from previous page.

4. The instrument will now drain the bottle(s) via the selected retort.
   Monitor the drain progress in the status panel.
   Select the **Abandon** button to terminate all current and pending fill/drain operations.
   Refer to "remote fill and drain functions" on page 115 for status panel and **Abandon** button details.

If you abandon a drain such that both the retort and bottle are left partially full, you must drain the retort back to the original bottle to continue. To drain the retort, deselect the "Remote" container then select the **Drain retort** button.

5. When the drain completes a momentary alarm will normally sound.
   An alarm popup indicating a "Remote drain complete" event will then appear (see Figure 111).
   Below the alarm popup an event dialog box will also indicate a "Remote drain complete" event (see Figure 112).
   Note that the actual alarm behavior may be modified. Refer to Section 2.9.5 "alarms".

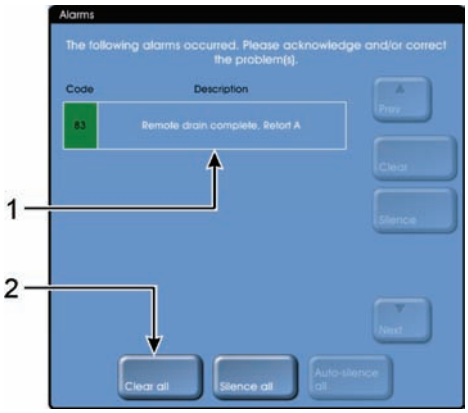


Figure 111: Alarm popup with drain complete event (1) and Clear all button (2)

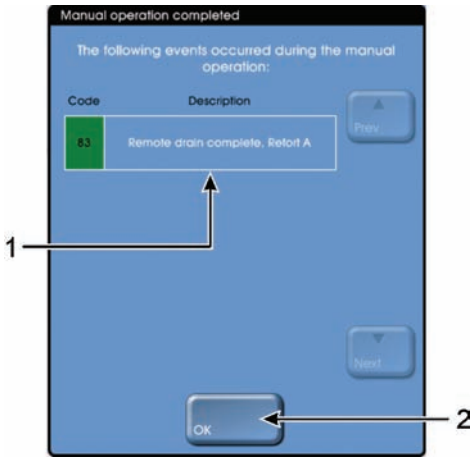


Figure 112: Event dialog box with drain complete event (1) and OK button (2)

6. Select the **Clear all** button from the alarm popup (if active) then select the **OK** button from the dialog box to complete this procedure (see Figure 112).
   When the drain completes, the retort state will be "Empty" and the bottle state "Dry".

2.6.4 filling reagent bottles

This function allows you to fill reagent bottles from an external container. The process first fills a retort via the remote fill/drain line then drains the retort to the bottle. The fill volume is determined by the bottle fill level set in the instrument settings screen (refer to Section 2.9.1 "instrument settings"). Follow the correct reagent sequence when filling multiple bottles.

remote fill preconditions

Before you begin a remote fill, you must satisfy the following conditions.

- You must connect the remote fill/drain hose and place its inlet in the reagent source. Refer to Section 2.6.2 "remote fill/drain connections".
- The reagent source must be above 5 °C to ensure that all reagent sensors operate correctly.
- You must choose an available retort (it must not have a protocol loaded or running).
- The retort must be clean or empty and its lid must be locked.
- Any retort residue must be compatible with the new reagent. Refer to Section 4.6 "reagent compatibility tables".
- If any new bottles are being filled, make sure their reagent type is set using the reagent station screen (refer to Section 2.4 "reagent stations").
- The state of each selected station must by "Dry".
- All selected bottles must be set to the same reagent type.
- The bottle residue must be compatible with the new reagent. Refer to Section 4.6 "reagent compatibility tables".

remote fill sequence

The following reagent sequence is recommended when filling multiple bottles:

1. Cleaning solvents
2. Clearers
3. Defatters
4. Cleaning alcohols
5. Dehydrants
6. Fixatives.

remote fill procedure

Once you have satisfied the preconditions, use the following procedure to fill reagent bottles from a remote source.

1. From the remote fill/drain screen, select the following (see Figure 113):
   - The retort you wish to use (2)
   - The remote drain line (3)
   - The bottle(s) you wish to fill (4).

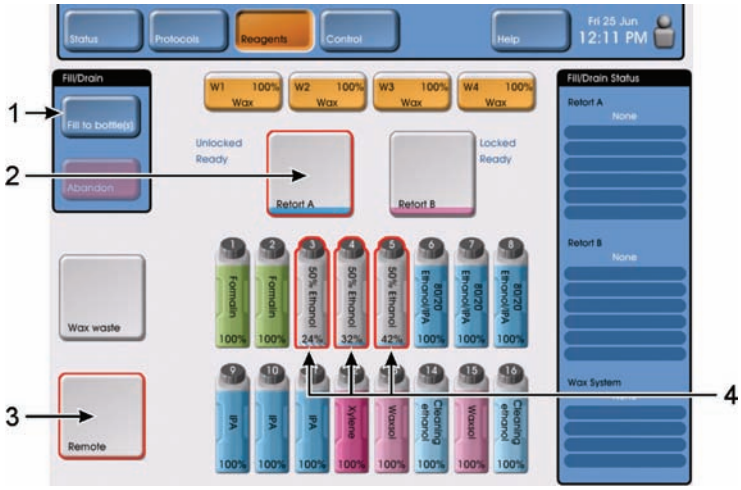


Figure 113: Remote fill/drain setup for filling bottles

2. Select the **Fill to bottle(s)** button (1) to begin the fill function (see Figure 113).
3. When prompted, check that the retort lid is closed and the remote fill/drain hose is connected.
   Select the **Cancel** button if you wish to end this procedure without filling the bottle.
   Select the **OK** button to begin the fill.
4. The "Remote fill/drain - Reagent details" dialog box will now appear (see Figure 114).

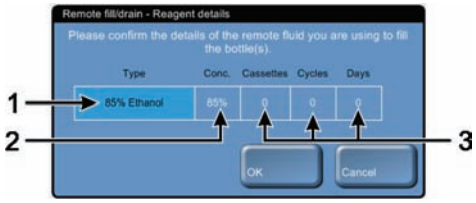


Figure 114: Reagent details dialog box with reagent type (1), concentration (2) and history cells (3)

5. If you wish to change the reagent type, select the "Type" cell from the dialog box then select a reagent type from the list (see Figure 114).
   The new reagent type must be compatible with the retort and bottle residue.
6. If you wish to change the initial reagent concentration, select the "Conc." cell then enter the required value using the keypad (see Figure 114).
7. If you wish to change the history details, select the appropriate cell then enter the required value using the keypad (see Figure 114).

Procedure continues on the next page…

…procedure continuing from previous page.

8. When you are satisfied with the reagent details, select the **OK** button to start the fill.
   Select the **Cancel** button if you wish to end this procedure without filling the bottle.
9. The instrument will now fill the bottle(s) via the selected retort.
   Monitor the fill progress in the status panel.
   Select the **Abandon** button to terminate all current and pending fill/drain operations.
   Refer to "remote fill and drain functions" on page 115 for status panel and **Abandon** button details.
10. When the fill completes, a momentary alarm will normally sound and an event dialog box will indicate a "Remote fill complete" event (see Figure 115).
    Note that the actual alarm behavior may be modified. Refer to Section 2.9.5 "alarms".

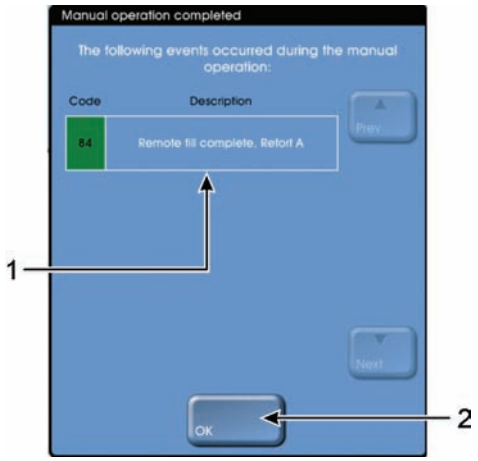


Figure 115: Event dialog box with fill complete event (1) and OK button (2)

11. Select the **OK** button from the dialog box to complete this procedure (see Figure 115).
    The retort will have an empty state and the bottle will have a full state.

2.6.5 filling wax stations

You do not use the remote fill/drain functions to fill a wax station. You directly fill wax stations with either molten wax or solid wax pellets. You must then set the appropriate station state. To learn how to set the station state, refer to Section 2.4.4 "setting the station state".

- If using molten wax, set the state to full.
- If using pellets, set the state to "not molten" to begin the rapid wax heating process.
  Whilst in the "not molten" state the wax bath chamber temperature will be higher than normal to ensure a rapid wax melt.
  You will need to add extra pellets as the wax melts.
  The station's state will automatically change to "full" when the wax is ready to use.

2.6.6 draining wax stations

You can drain the wax stations via the waste wax line. Always ensure the wax drains into a suitable container. This function does not fill a retort, but it does use retort scheduling resources. The retort is automatically chosen but at least one retort must be available.

WARNING
The wax leaving the waste wax line will be hot and may cause burns. Make sure the wax drains to a suitable container and stand clear while it drains.

wax drain preconditions

Before you begin a wax drain you must satisfy the following conditions.

- All selected wax stations must be in a molten state.
- The wax waste hose must be connected to the waste wax line (refer to Section 2.6.2 "remote fill/ drain connections").
- The wax waste hose must drain to a suitable container.
- A retort must be available (no protocol loaded or running).
  Note that the retort does not need to be clean as the retort is not actually used.
- The drain hose must be free of blockages.
  Remove blockages by flexing the tube or soaking it in hot water to melt any wax deposits.

wax drain procedure

Once you have satisfied the preconditions, use the following procedure to drain a wax bath.

Wax drains may take up to three minutes. Do not remove the wax drain container or hose until the software indicates that the drain has completed. A cessation of wax flow is not an indication that the drain procedure is complete.

1. Select the wax station(s) you wish to drain (item 3 in Figure 116).

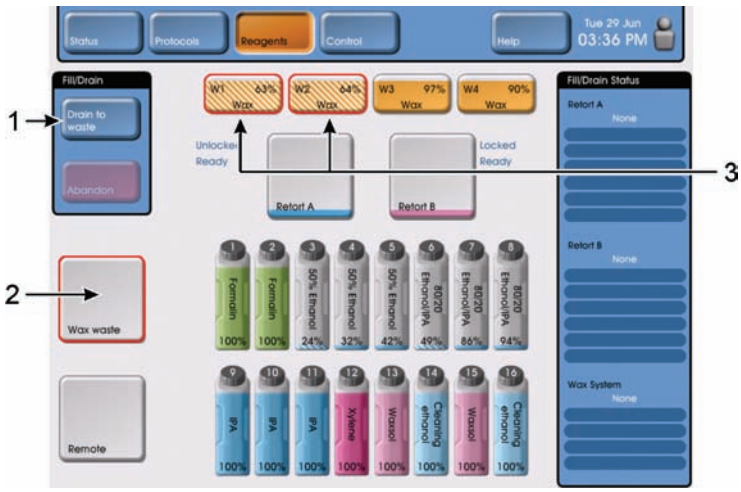


Figure 116: Remote fill/drain setup for draining wax stations

2. Select the **Wax waste** icon from the remote fill/drain screen (item 2 in Figure 116).
3. Select the **Drain to waste** button to begin the drain operation (item 1 in Figure 116).
4. When prompted, check that the wax waste line drains to a suitable container.
   Select the **Cancel** button if you wish to end this procedure without draining the wax station.
   Select the **OK** button to begin the drain.
5. The instrument will now drain the wax station. This may take up to three minutes.
   Monitor the fill progress in the status panel.
   Select the **Abandon** button to terminate all current and pending fill/drain operations.
   Refer to "remote fill and drain functions" on page 115 for status panel and **Abandon** button details.
6. When the fill completes, a momentary alarm will normally sound and an event dialog box will indicate that the wax has transferred successfully.
   Note that the actual alarm behavior may be modified. Refer to Section 2.9.5 "alarms".
7. Select the **OK** button from the dialog box to complete this procedure.
   When the drain completes, the wax station(s) will have an empty state.
8. To stop wax solidifying in the drain hose, promptly remove the hose from the drained wax.

If no wax drains from the wax drain hose, do not remove the hose until the software indicates that the wax drain has abandoned. A likely cause of drain failure is a blocked wax drain hose. If you remove a blocked hose before the drain is abandoned hot wax will spurt from the front of the instrument.

2.6.7 filling and draining retorts

The remote fill/drain screen allows you to fill and drain the retorts to assist recovery from incomplete remote fill/drain operations. The retort fill and drain functions operate with a series of rules designed to avoid reagent contamination, reagent overflow spills and reagent overheating. You can override some rules but this will often result in reduced reagent concentration. You can also fill and drain retorts using the manual operations screen (refer to Section 2.7 "manual operations").

manual fill and drain rules

The rules for manually filling and draining retorts are as follows.

- The retort must be clean or empty before you commence a retort fill operation.
- When filling a retort, the selected reagent station must be compatible with the retort residue. Refer to Section 4.6 "reagent compatibility tables".
- You cannot fill a retort with a reagent that has a temperature threshold below the set retort temperature.
- When draining a retort, the reagent should return to its original station.
- You cannot drain wax to a reagent bottle or non-wax reagents to a wax station.
- When draining a retort, the station must have sufficient capacity for the retort contents.

To avoid fluid spills, ensure adequate station capacity before overriding insufficient capacity errors.

filling a retort

Use the following procedure to fill a retort using the remote fill/drain screen.

1. Check the retort status and condition to ensure it is suitable for the intended operation.
2. Select the retort and reagent station from the remote fill/drain screen.
3. Select the **Fill retort** button.
4. If there are errors, a dialog box listing the errors will appear.
   After reviewing the list of errors, select the **OK** button to abandon the fill.
   Fix the cause of the error(s) before attempting another manual fill.
5. To stop the fill at any stage, select the **Abandon** button.
6. If there are no errors, the retort will now fill.

draining a retort

Use the following procedure to drain a retort using the remote fill/drain screen.

1. Select the retort and reagent station from the remote fill/drain screen.
   This station should be the source of the fluid in the retort.
2. Select the **Drain retort** button from the appropriate control panel.
3. If there are errors, a dialog box listing the errors will appear.
   After reviewing the list of errors, select the **OK** button to abandon the drain.
   Fix the cause of the error(s) before attempting another manual drain.

Procedure continues on the next page…

…procedure continuing from previous page.

4. If there are no errors, the retort will now drain to the selected station.
   The drip time is set from the instrument settings screen (refer to Section 2.9.1 "instrument settings").
5. To stop the drain at any stage, select the **Abandon** button.

2.7 manual operations

The manual operations screen allows you to manually control the instrument. The manual operations screen displays the current instrument status including station states, the retort states and the retort condition (refer to Section 2.1.1 "status area" for details). You control the instrument by selecting instrument elements from the status area and control functions from the control panels. Launch the manual operations screen by selecting the **Reagents** button from the Function bar then select the **Manual operations** button from the menu.

From the manual operations screen you can set the condition of each retort. You can fill and drain the retorts using any of the reagent stations and you can preheat the wax path prior to a retort wax fill. Use the wax vent function to neutralize the pressure in the wax bath so the wax bath lids can be opened easily and safely.

You cannot override a running protocol from the manual operations screen and you cannot fill or drain a retort that has a loaded protocol.

The manual operations screen is shown in Figure 117. The table in "manual operation functions" on page 128 details the items in these images. For manual instrument operations, use the controls detailed in the table and apply the instructions listed in the following sections:

- Section 2.7.2 "setting retort conditions"
- Section 2.7.3 "wax preheat"
- Section 2.7.4 "filling and draining retorts"

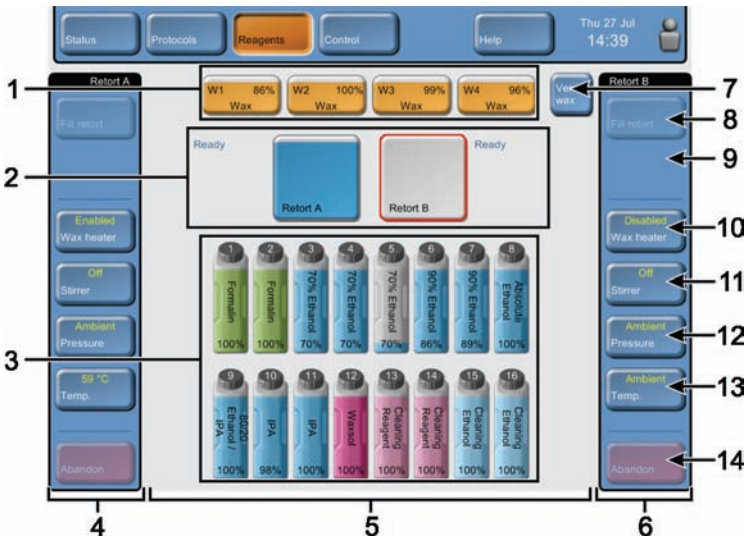


Figure 117: Manual operations screen

2.7.1 manual operation functions

Item	Description	Function
1	Wax stations	Displays the state and status for each wax station (refer to Section 2.1.1 "status area"). Select a wax station to fill to, or drain from, a selected retort.
2	Retorts	Displays the state and condition of each retort. Select an available retort to perform a fill or drain operation. Retort A is shown as unselectable as it is running a protocol. Retort B is shown as selected.
3	Reagent stations	Displays the state and status details of each reagent station (refer to Section 2.1.1 "status area"). Select a reagent station to fill to, or drain from, a selected retort.
4	Control panel Retort A	Contains the control buttons for retort A. Buttons are shown unselectable as retort A is running a protocol.
5	Status area	View the current instrument status and select instrument elements.
6	Control panel Retort B	Contains the control buttons for retort B. Control buttons shown as active as retort B is available.
7	Vent wax	Select this button to vent the wax bath. Venting the bath releases any pressure or vacuum so the wax bath lids can be safely opened.
8	**Fill retort** or **Drain retort**	This button becomes active as either **Fill retort** or **Drain retort** depending on the state of the selected retort and reagent station. Select the button to fill or drain the retort.
9	Lock retort or Unlock retort	A button appears in this position on instruments with retort latch locks (see “retort locks” on page 22). Select **Lock retort** to lock the retort lid. Select **Unlock retort** to vent the retort and unlock the lid.
10	Wax heater	Enable the wax heating system for five minutes prior to a fill to prevent wax solidification.
11	Stirrer	Select this button to set the stirrer speed.
12	Pressure	Select this button to set the retort pressure.
13	Temp.	Select this button to set the retort temperature.
14	Abandon	Select this button to stop a fill or drain operation.

2.7.2 setting retort conditions

You can control the condition of each retort from the manual operations screen. The controls are operative for all retort states but are disabled when the retort has a loaded or running protocol. Use the buttons in each control panel to set the condition of the associated retort. When you select a button, the resultant dialog box or keypad will allow you to enter the required value.

retort temperature range

The retort temperature range is limited to the following values.

- Reagent: 35 °C minimum to 85 °C maximum.
- Wax: (Wax melting point + 2°C) minimum to 85 °C maximum.
  Refer to Section 2.8.4 "global wax settings" for the current wax melting point temperature.

Also, the actual allowable temperature range depends on retort state as you cannot set an unsafe condition (e.g. setting a full retort to a temperature above the reagent's threshold).

2.7.3 wax preheat

The wax path (comprising the wax valves and the transfer pipes) and the retort must be at the wax standby temperature before you attempt to fill a retort with wax. Use the **Wax heater** buttons to enable wax path heating. You must enable wax path heating for at least five minutes before you attempt to fill a retort with wax. Use the **Temp.** button from the control panel to set the retort to the wax standby temperature and wait until the retort reaches the standby temperature before filling.

2.7.4 filling and draining retorts

The manual operations screen allows you to fill and drain the retorts using any reagent station. The fill and drain functions operate with a series of rules designed to avoid reagent contamination, reagent overflow spills and reagent overheating. You can override some rules but this will often result in reduced reagent concentration. You can also fill and drain retorts using the remote fill/drain screen (refer to Section 2.6 "remote fill/drain").

manual fill and drain rules

The rules for manually filling and draining retorts are as follows.

- The retort must be clean or empty before you commence a retort fill operation.
- When filling a retort, the selected reagent station must be compatible with the retort residue. Refer to Section 4.6 "reagent compatibility tables".
- You cannot fill a retort with a reagent that has a temperature threshold below the set retort temperature.
- When draining a retort, the reagent should return to its original station.
- You cannot drain wax to a reagent bottle or non-wax reagents to a wax station.
- When draining a retort, the station must have sufficient capacity for the retort contents.

filling a retort

Use the following procedure to fill a retort using the manual operations screen.

1. Check the retort status and condition to ensure it is suitable for the intended operation.
2. Select the retort and the reagent station from the status area.
3. Select the **Fill retort** button from the appropriate control panel.
4. If there are errors, a dialog box listing the errors will appear.
   After reviewing the list of errors, select the **OK** button to abandon the fill.
   Fix the cause of the error(s) before attempting another manual fill.
5. If there are no errors, the retort will now begin to fill.
6. To stop the fill at any stage, select the **Abandon** button from the appropriate control panel.

draining a retort

Use the following procedure to drain a retort using the manual operations screen.

1. Select the retort and reagent station from the remote fill/drain screen.
   This station should be the source of the fluid in the retort.
2. Select the **Drain retort** button from the appropriate control panel.
3. If there are errors, a dialog box listing the errors will appear.
   After reviewing the list of errors, select the **OK** button to abandon the drain.
   Fix the cause of the error(s) before attempting another manual drain.
4. If there are no errors, the retort will now drain to the selected station.
   The drip time is set from the instrument settings screen (refer to Section 2.9.1 "instrument settings").
5. To stop the drain at any stage, select the **Abandon** button from the appropriate control panel.

2.8 reagent management

Use the reagent management screen to specify system-level reagent functions, to set the retort state and empty access temperature and to set wax station temperatures. You must have supervisor level access to use the reagent management functions. Launch the reagent management screen by selecting the **Reagents** button from the Function bar then select the **Management** button from the menu.

The reagent management screen has five areas as shown in Figure 118 and described in table that follows.

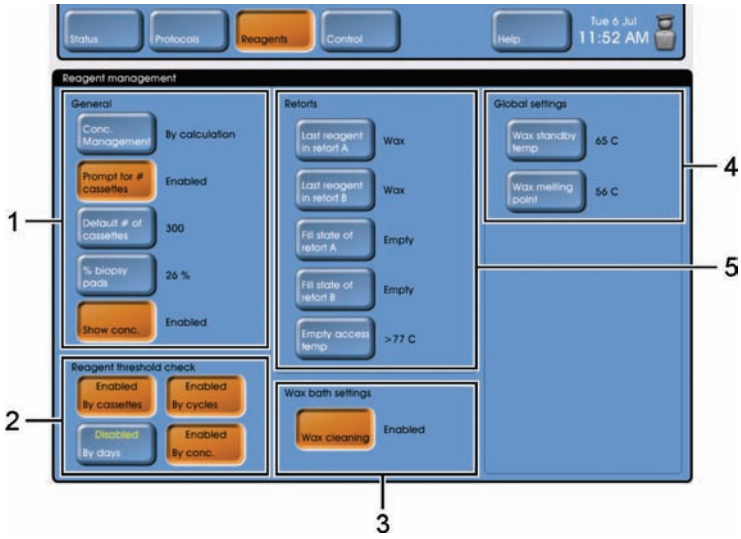


Figure 118: Reagent management screen

Item	Description	Function
1	General	This area enables you to set reagent management options.
2	Reagent threshold check	Use this area to select the active purity threshold attributes.
3	Wax bath settings	The function in this area controls the automatic wax cleaning.
4	Global settings	Set the wax bath temperatures using the functions in this area.
5	Retorts	This area allows you to set the state, the last reagent used and the safe entry temperature for each retort.

For reagent management operations, use the areas detailed in the preceding table and apply the instructions listed in the following sections:

- Section 2.8.1 "general"
  "concentration management" on page 132
  "prompt for number of cassettes" on page 132
  "default number of cassettes" on page 132
  "biopsy pads" on page 133
  "show concentration" on page 133
- Section 2.8.2 "reagent threshold check"
- Section 2.8.3 "wax bath settings"
- Section 2.8.4 "global wax settings"
- Section 2.8.5 "retorts"
  "last reagent in a retort" on page 134
  "retort state" on page 135
  "empty access temperature" on page 135

2.8.1 general

This area has four controls that influence the reagent management setup. These controls are disabled while protocols are loaded or running.

concentration management

Reagent concentration is used to assign reagent stations to protocol steps as described in Section 2.2.4 "reagent selection method". To set the management method, select the **Conc. management** button then select the required option from the dialog box. There are three options for reagent concentration management as described in the following text.

- By calculation.
  The Peloris tissue processor calculates the reagent concentration based on a starting concentration and reagent use. The concentration calculation includes the number of cassettes, biopsy pads and baskets processed as well as reagent interactions. This method is recommended as it provides the most accurate indication of actual reagent condition.
- By cycles.
  This method uses the number of cycles each station has completed to determine the concentration ranking of each reagent within a group or type. A cycle is defined as a retort fill and drain. This method is not recommended as the number of cycles does not closely correlate to the actual reagent concentration.
- By position.
  This method uses station position to determine the concentration ranking of each reagent within a group or type. The Peloris tissue processor assumes that concentration increases with reagent station number. This method is not recommended as it requires manual intervention, including regular shuffling of reagent bottles, to ensure correct reagent usage.

The Peloris tissue processor calculates the reagent concentration no matter which management option is selected. However, the calculated value is ignored when the "by position" and "by cycles" modes are selected.

For more information on the reagent management system, consult Section 1.5 "reagent management system".

prompt for number of cassettes

When this function is enabled, you are prompted to enter the number of cassettes during processing runs. The Peloris tissue processor uses this number to calculate reagent concentration and use. When the function is disabled, the system assumes that each run processes the default number of cassettes.

Select the **Prompt for number of cassettes** button to enable this function. Deselect the **Prompt for number of cassettes** button to disable this function.

default number of cassettes

The Peloris tissue processor automatically assumes that each run is processing the default number of cassettes unless you enter a different number when you start a protocol. To set the default value, select the **Default number of cassettes** button then enter the required number using the resultant keypad.

biopsy pads

The Peloris tissue processor includes a reagent contamination allowance for biopsy pads as they tend to hold around 10 times more carryover reagent — and hence cause more contamination — than cassettes. Each protocol has a "% biopsy pads" value that specifies the proportion of biopsy pads you expect to process with that particular protocol.

The "% biopsy pads" value in the "Reagent management" screen is a default value for new protocols. Set default "% biopsy pads" to the value you would like to use for most new protocols.

- To set the default value, select the **% biopsy pads** button from the "Reagent management" screen then use the keypad to enter the value as a percentage.
  Select the **OK** button to set the new value; select the **Cancel** button to keep the current value.
- The % biopsy pads value set for each individual protocol overrides the default value.
  Refer to Section 2.2.6 "editing a protocol".

Please note that the biopsy pads parameter has a significant effect on reagent concentration calculations so you should endeavour to set an accurate value for each individual protocol.

show concentration

The **Show conc.** button allows you to either display or hide station concentrations on the status screen. Select this button to show (enable) the concentrations.

2.8.2 reagent threshold check

Use this area to select the enabled reagent purity attributes. Only enabled attributes are used to determine if a station is available or out of threshold. Disabled attributes are ignored when the system evaluates the stations. You enable each attribute by selecting the associated button. The four possible threshold checks are: number of cassettes processed, number of cycles, number of days in use, and concentration.

The Peloris tissue processor checks and updates the purity attributes each time a station is used. You can view the current values in the reagent station management screen (refer to Section 2.4 "reagent stations"). The Peloris tissue processor checks each station's purity thresholds against the enabled thresholds for the reagent type (refer to Section 2.5 "reagent types") and it considers the station as out-of-threshold if any enabled attribute is exceeded.

The system may be configured with a reagent "lock-out" function. When lock-out is enabled, an out-of-threshold station may only be used a set number of times (and will only be selected when there are no suitable alternate stations). Initially a run requiring an out-of-threshold station can still be started but there is a warning advising how many more times the station can be used. When the set limit is reached the station is locked out. The station cannot be used until the reagent is replaced and it is reset. A run requiring that station cannot be started. Your service organization can configure the standard lock-out functionality for you, if required.

2.8.3 wax bath settings

This area has the **Wax clean** button that controls the wax clean function. The wax clean function improves the quality of the wax by periodically evacuating the wax bath (for around 30 seconds) to draw off any contaminants. Select the **Wax clean** button to enable this function and deselect the button to disable the function.

- We recommend that wax cleaning is always enabled when using xylene-free protocols.
- The wax clean function increases wax station concentration. Therefore, the reagent management system automatically updates the concentration of each wax station after each wax clean cycle.
- When the wax clean function is enabled you may need to periodically add small amounts of wax to the stations to replace solvents that have been removed.
- Wax cleaning is less efficient at removing xylene from the wax and has little effect on mineral oil contamination. To save unnecessary pump wear, we recommend that the wax function be disabled when mineral oils are used as clearers.

If the wax clean function is active it may occasionally delay the start of a protocol or other action. If this occurs please wait for the cleaning cycle to end as the maximum delay will only be 30 seconds.

2.8.4 global wax settings

The global settings determine the wax temperatures. The wax standby temperature is the temperature to which the instrument will heat the wax in the wax stations. The wax melting point is the temperature at which the instrument considers the wax molten.

To alter the wax standby temperature, select the **Wax standby temp** button then enter the required value using the resultant keypad. The temperature is normally set to 65 °C but may be reduced. However this will increase the wax melt time.

To alter the wax melt temperature, select the **Wax melting point** button then enter the required value using the resultant keypad.

2.8.5 retorts

This area allows you to set the state, the last reagent used and the safe entry temperature for each retort. You cannot change the state of a retort, or set its last used reagent, if it has a loaded or running protocol.

last reagent in a retort

Use this function to alter the reagent type that the system believes was last in, or is currently in a particular retort. To avoid reagent contamination we recommend that this function only be used if advised by your service organization and only if you are sure that the retort contains a reagent other than the one currently indicated. This function is not available if the retort is in a Clean state or has a protocol loaded or running.

Use this function carefully as you can cause serious reagent contamination if you enter a reagent type different to the actual reagent in the retort.

You cannot set a reagent type that is not suitable for the current retort temperature or pressure. Use the manual operations screen to set an appropriate retort condition before continuing.

Use the following procedure to change the reagent type assigned to a retort.

1. Make sure the required retort does not have a protocol loaded or running.
2. Select the **Reagents** button from the Function bar then select the **Management** button from the menu.
3. Select the **Last reagent in retort A** button to change the reagent assigned to retort A.
   Select the **Last reagent in retort B** button to change the reagent assigned to retort B.
4. The "Retort reagent selection" dialog box will now appear.
   Select the **Cancel** button to end this procedure without changing the assigned reagent.
   Select a reagent station to immediately assign the reagent to the retort.
5. The retort state will not alter but the reagent type will now be as selected.

retort state

Use this function to alter the state of a particular retort. To avoid reagent contamination and fluid leaks we recommend that this function only be used if advised by your service organization and only if you are sure that the actual retort state differs from the one indicated.

Use this function carefully as you can cause serious reagent contamination and fluid leaks if you set the retort to a state that differs from the actual state.

Use the following procedure to change the state of a retort.

1. Make sure the retort does not have a protocol loaded or running.
2. Select the **Management** button from the **Reagents** menu.
3. Select the **Fill state of retort A** button to change the state of retort A.
   Select the **Fill state of retort B** button to change the state of retort B.
4. The "Retort contents" dialog box will now appear.
   Select the **Cancel** button to end this procedure without changing the state.
   Select the required fill level to immediately set the retort state.
5. The reagent type will not alter (unless set to Clean) but the retort state will now be as selected.

empty access temperature

It is considered safe to open an empty retort at or below the empty access temperature. A warning dialog box will accompany any action that requires you to open an empty or clean retort with a temperature exceeding this value.

To change the empty access temperature, select the **Empty access temp** button then enter the required value using the resultant keypad.

2.9 control

The control screens allow you to alter hardware settings, view event logs and system information, manage alarms and set the access level. You also use the control screens to initiate an orderly instrument shutdown. You select the required control screen by first selecting the **Control** button on the Function bar and then selecting appropriate screen from the menu. Some control menus and functions require an access level higher than supervisor and will not be available. Unavailable screens and function are beyond the scope of this document and are not described.

The following text describes the functions available from the seven screens. Use the references to find detailed information on each screen.

- instrument settings (refer to Section 2.9.1)
  The screen allows you to shutdown the instrument. Also use this screen to set device thresholds, date formats and reagent fill levels. The screen also displays the system's language and unit settings.
- device settings (refer to Section 2.9.2)
  Use this screen to adjust sounds, control display settings, lock the screen for cleaning, and set behavior of the local and remote alarms when there is a power failure.
- service settings (refer to Section 2.9.3)
  Use this screen to view and set instrument information, view software version information and to run system tests.
- event log (refer to Section 2.9.4)
  Use the event log to view a list of system events.
- alarms (refer to Section 2.9.5)
  Use this screen to manage alarm behavior.
- access level (refer to Section 2.9.6)
  Use this screen to set the access level.
- file transfer (refer to Section 2.9.7)
  Use the file transfer functions to backup or retrieve various files (including event logs and protocols).

2.9.1 instrument settings

The instrument settings screen allows you to shut down the instrument. Also use this screen to set device thresholds, date formats and reagent fill levels. The screen also displays the system's language and unit settings. To access this screen, select the **Control** button from the Function bar then select the **Instrument settings** button from the menu.

The instrument settings screen is shown in Figure 119 and the items are described in the table that follows.

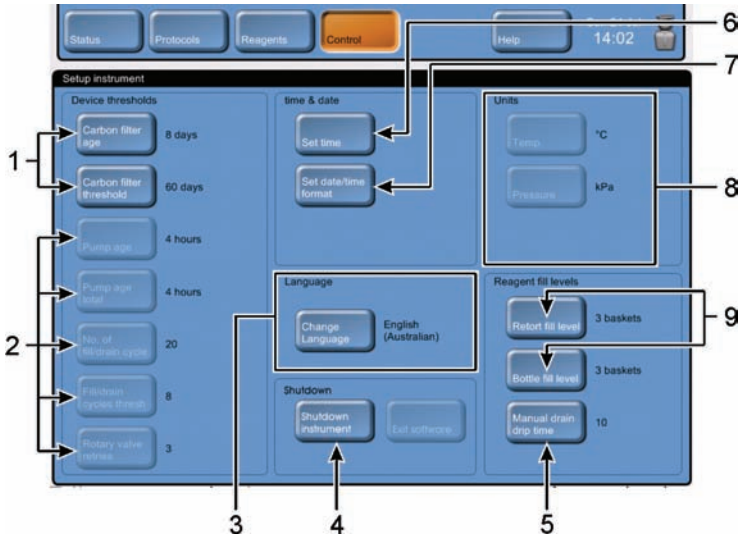


Figure 119: Instrument settings screen

Item	Description	Function
1	Carbon filter	Use these buttons to set the carbon filter parameters.
2	Advanced settings	These buttons are for service or manufacturing functions. They are not available to laboratory personnel.
3	Language	This area displays the current language setting.
4	Shutdown instrument	Use this button to shut down the instrument.
5	Manual drain drip time	Use this button to set the drip time for manual operation retort drains.
6	Set time	This function allows you to set the current time and date.
7	Set date/time format	This function allows you to set the display format for dates and times.
8	Units	This area displays the temperature and pressure units used by the system.
9	Fill level	Use these buttons to set the retort and reagent station fill levels.

Refer to the following sections for detailed instrument setup instructions:

- "instrument shutdown" on page 138
- "carbon filter settings" on page 138
- "reagent fill levels" on page 138
- "manual drain drip time" on page 139
- "setting the date and time" on page 139
- "time and date format" on page 139
- "language and unit settings" on page 140

instrument shutdown

Select the **Shutdown instrument** button on the instrument setup screen to turn off the instrument in an orderly manner. This ensures that all software functions and files are properly terminated and saved so the system will be able to restart correctly.

The **Shutdown instrument** button is only available when the access level is set to supervisor and the instrument is idle (you cannot shut down the instrument during a protocol).

For emergency shutdown, press the power button on the front of the instrument. This immediately removes power from the instrument but may leave some files in unstable states (refer to Section 1.1 "hardware" for power button location and use.

carbon filter settings

Select the **Carbon filter age** button to reset the age of the carbon filter to zero days. You should do this when replacing the carbon filter so the Peloris tissue processor can track its age and provide proper warnings when it exceeds its age threshold.

Select the **Carbon filter threshold** button to set the number of days a filter can be used before it should be replaced. When you select the button, a keypad appears that you use to enter the required value. The correct threshold value depends on the average number of protocols you run each day and the type of reagents used.
We recommend an initial threshold of 60 days with adjustments only if you are sure the carbon filter is becoming saturated earlier or is still in good condition after this time.

If you are using an external vapor removal system, set the Carbon filter threshold to either:

- The inspection interval for the external system
- The maximum value (1000) to limit the number of unwanted warnings
- Overridden (contact your service organization to arrange this setting)

Refer to Section 1.1.7 "external vapor removal systems" for more information.

reagent fill levels

The reagent fill levels determine the volume used to fill a retort and the reagent volume needed for a station to have a full state. The system specifies reagent volume by the number of baskets being processed. You configure the instrument to fill the retorts with sufficient reagent to process either two or three cassette baskets. The station fill level must be equal to, or greater than the retort fill level. This ensures that each station has sufficient reagent to fill a retort to the required level.

- To set the retort fill level, select the **Retort fill level** button then select the required value in the subsequent dialog box.
  The retort fill level must be equal to, or less than the station fill level.
- To set the reagent station fill level, select the **Bottle fill level** button then select the required value in the subsequent dialog box.
  The station fill level must be greater than, or equal to the retort fill level.

If you increase the fill volume you must visually check each reagent station to ensure it holds sufficient reagent. A protocol may be abandoned if a station does not hold sufficient reagent.

manual drain drip time

This value determines the drip time (in seconds) that occurs during manual drain operations. The drip time is the length of time the system waits for reagents to drip from cassettes and retort walls before completing the drain operation. To set the drip time, select the **Manual drain drip time** button then enter the required value using the resultant keypad.

setting the date and time

This function allows those with supervisor level access to set the current date and time. To set the date and time, first select the **Set time** button from the instrument setup screen to open the "Set date/time" dialog box (see Figure 120).

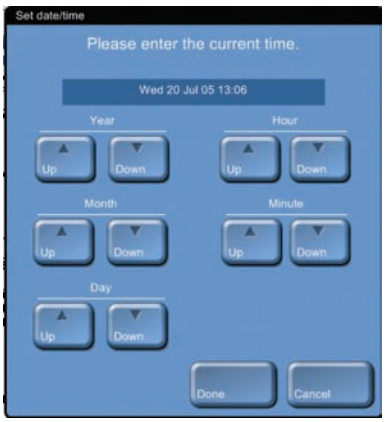


Figure 120: Set date/time dialog box

From the "Set date/time" dialog box, use the **Up** and **Down** buttons associated with the parameter you wish to alter to select the correct value. Note that the system automatically sets the day name (Monday, Tuesday etc.) so that is corresponds to the date set.

When you have set the required date/time select **Done** to confirm the changes or **Cancel** to revert to the original date and time which has continued to update normally.

time and date format

This function allows you to set the format for time and date displays. The Peloris tissue processor uses three time and date display types (shortened, normal and extended) in different parts of the software and you are able to select the format for each type. Use the following procedure to modify any time or date format from the instrument settings screen.

1. Select the **Set date/time format** button (see item 6 in Figure 119).
2. From the display format screen, select the **Modify** button associated with the time or date format you wish to alter (see Figure 121).

Time display formats (shortened, normal and extended) are shown as items 1, 2 and 3.
Date display formats (shortened, normal and extended) are shown as items 5, 6 and 7.

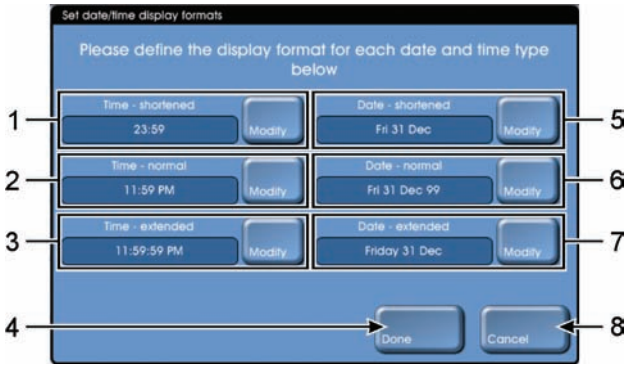


Figure 121: Display format screen

3. Select the required format from the list in the select time/date format dialog box then select the **OK** button to confirm the change (see Figure 122).
   Select the **Cancel** button if you do not wish to make any changes.

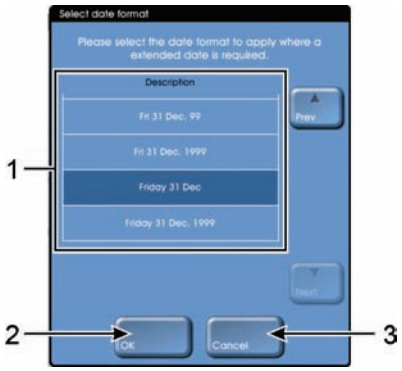


Figure 122: Select format dialog box with format list (1), OK button (2) and Cancel button (3)

4. Use the display format screen to modify other formats are required then select the **OK** button to confirm the change (see item 4 in Figure 121).
   Select the **Cancel** button if you do not wish to retain the changes (see item 8 in Figure 121).

language and unit settings

You can view the instrument's language and unit settings in the instrument settings screen. Contact your service organization if you wish to alter either setting.

2.9.2 device settings

The device settings screen allows you to adjust the sounds, control the display settings, lock the screen for cleaning, and set the power-off behavior of the local and remote alarms.

The device settings screen is shown in Figure 123 and the items are described in the table that follows.

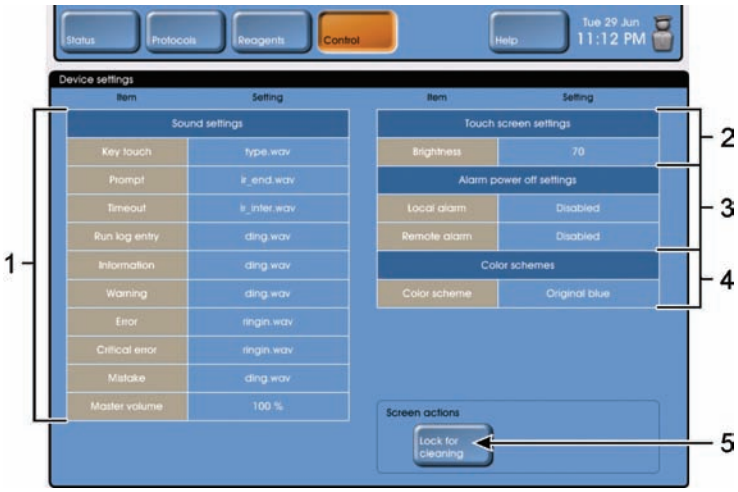


Figure 123: Device settings screen

Item	Description	Function
1	Sound settings	Set the sound for various events and also set the sound volume.
2	Touch screen settings	Set the touch screen brightness.
3	Alarm power off settings	Set the power-off behavior of the local and remote alarms.
4	Color schemes	You may choose between two software color schemes.
5	Screen actions	Select the **Lock for cleaning** button to lock the screen so it can be cleaned.

Refer to the following sections for detailed device setup instructions:

- "sound settings" on page 142
- "touch-screen settings" on page 143
- "alarm power off settings" on page 143
- "color schemes" on page 143
- "screen lock" on page 144.

sound settings

The Peloris tissue processor allows you to select from a range of sounds for different events. You can also set the master sound volume to a level suitable for your environment. These functions require supervisor access level.

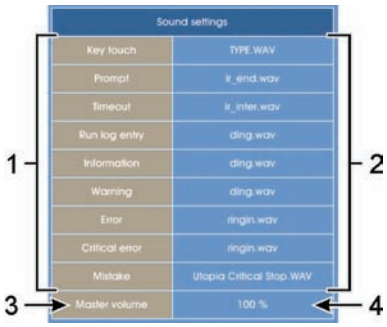


Figure 124: Sound settings with event name (1), sound value (2), master volume (3) and master volume level (4)

Use the "Sound Settings" area (see Figure 124) to change a sound for a particular event. First open the "Select sound file" dialog box by selecting the sound name cell (2) adjacent to the required event (1).

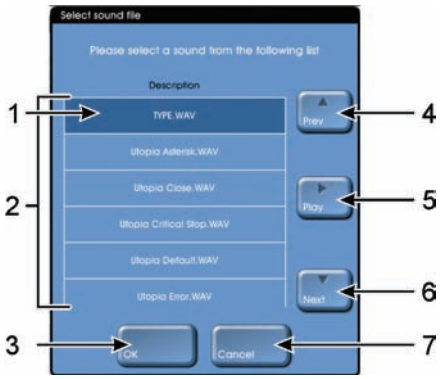


Figure 125: "Select sound dialog box

From the "Select sound file" dialog box (see Figure 125) select:

- The **Play** button (5) to preview the selected sound (1)
- The **Prev** (4) and **Next** (6) buttons to scroll through the list of available sounds (2)
- The **OK** button (3) to confirm your selection
- The **Cancel** button (7) to exit the dialog box without changing the current sound.

To change the sound volume, select the master volume level cell (see Figure 124) and enter the required value in the subsequent dialog box. Sound volume is also dependant on the actual sound file selected. If you find that a particular sound is not loud enough, try a different sound file.

touch-screen settings

Figure 126: Touch screen settings area

You can set the brightness of the touch-screen by selecting the touch screen brightness cell (1) and then entering the required value in the subsequent dialog box. The default value is 70%.

alarm power off settings

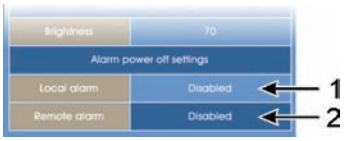


Figure 127: Power off alarm settings for the local alarm (1) and the remoter alarm (2)

Use the alarm power off settings to control the behavior of the local and remote alarms in the event of a power failure. If the "power off" state is set to "enabled" the alarm will activate (sound) if there is a power failure. To alter the setting, select the appropriate setting cell (see Figure 127) then select the OK button in the subsequent dialog box to toggle the power off alarm behavior. You require supervisor level access to alter these settings.

color schemes

Figure 128: Color scheme cell (1)

There are two software color schemes. Both effectively display the required information and you may choose either depending on your preference. Use the following procedure to alter the scheme.

1. Select the color scheme cell from the device setting screen (see Figure 128).
2. From the "Select color scheme dialog box" select either (see Figure 129):
   The **Original blue** button for the default color scheme (as used for this document)
   The **Dark blue** button for a scheme with a darker background and higher text contrast
   The **Cancel** button to end this procedure without changing the color scheme.

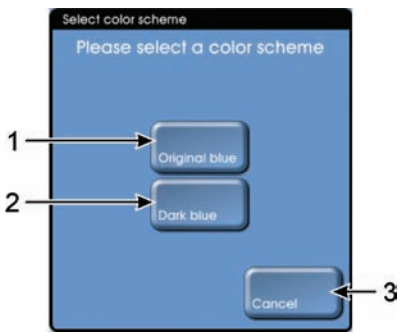


Figure 129: Select color scheme dialog box with Original blue (1), Dark blue (2) and Cancel (3) buttons

screen lock

Figure 130: Screen actions area with Lock for cleaning button (1)

Use the screen lock function to lock the touch screen for cleaning. To lock the screen, select the **Lock for cleaning** button (see Figure 130). The "Clean screen" dialog will now appear (see Figure 131). Select the "Clean screen" buttons in the correct order to unlock the screen.

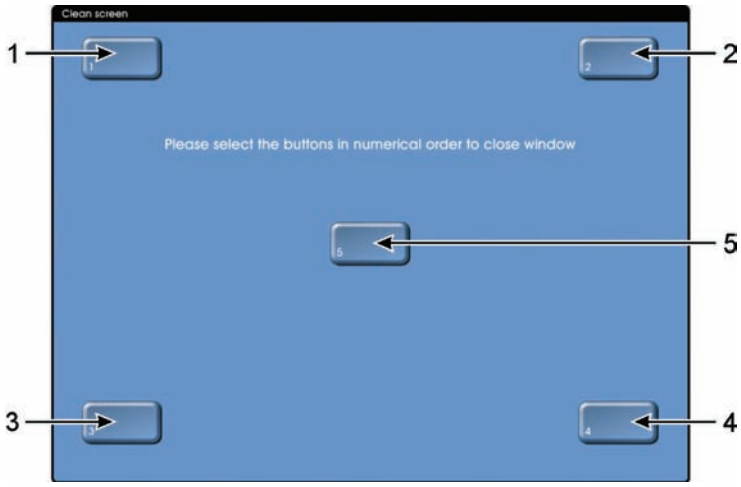


Figure 131: Clean screen with unlock buttons (1 to 5)

2.9.3 service settings

Use this screen to view and set instrument information, view software version information and to run system tests.

The service settings screen is shown in Figure 132 and the items are described in the table that follows.

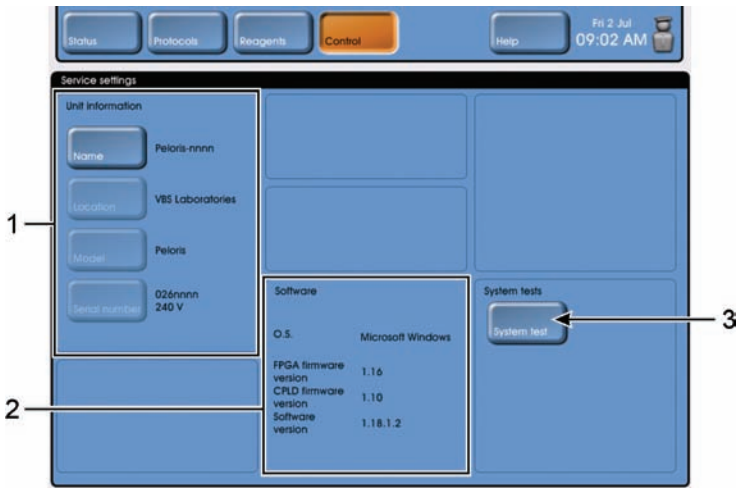


Figure 132: Service settings screen

Item	Description	Function
1	Unit information	Displays information identifying the individual instrument. Also allows supervisors to name the instrument.
2	Software versions	Displays current versions of the software used on the instrument.
3	System tests	Use this function to conduct a diagnostic test.

Refer to the following sections for detailed service settings instructions:

- "unit information" on page 145
- "software versions" on page 146
- "system tests" on page 146.

unit information

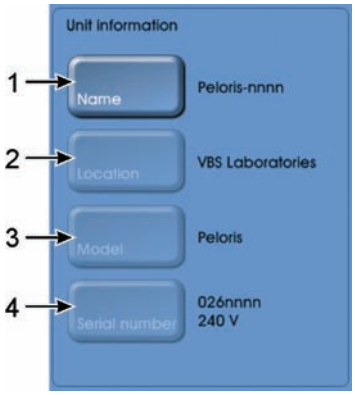


Figure 133: Unit information area

The unit information area displays information that identifies your instrument. Supervisors can also enter a name for the instrument by selecting the **Name** button and using the keypad to enter an

appropriate name to identify the instrument. The unit information area is shown in Figure 133 and the items are described in the following table.

Item	Description	Function
1	Name	Displays the instrument's name. Can be changed by a supervisor.
2	Location	Displays the instrument's location (usually the laboratory name). Contact your service organization if you wish to alter this setting.
3	Model	Displays the particular model of the instrument. This is factory set.
4	Serial number	Displays the instrument's serial number and operating voltage. These are both factory set.

software versions

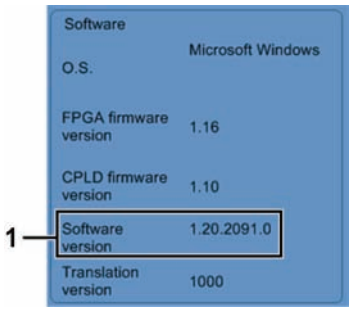


Figure 134: Software version area

The software versions area displays the current revisions of the software and firmware used on your instrument. The version of the main software is shown as item 1 in Figure 134. The remaining entries relate to the operating system and electronic firmware. These are mainly of interest to your service organization.

system tests

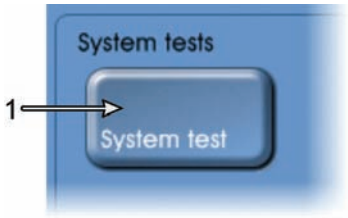


Figure 135: The system test button

The system tests area contains the **System test** button. This button initiates an automated function that tests the performance of your instrument and logs information that can be sent to Vision BioSystems for an off-site performance evaluation. Conducting regular system tests can help identify potential problems so they can be fixed before they affect processing.

Before running a system test, you must set up your instrument so that:

- There are no protocols loaded or running
- Both retorts are clean
- Both retort lids are closed and (on instruments with retort locks) locked (lock the lids from the manual operations page if necessary, refer to Section 2.7 "manual operations").

Note also that the test will complete faster if both retort temperatures start below 45 °C. If either retort is above 45 °C the automated test sequence will pause while the temperature(s) drop; however with the lids closed this will be rather slow. Therefore it is better to cool the retorts with the lids open before initiating the system test.

Use the following procedure to conduct a system test.

1. Set up your system as described above.
2. Select the **System test** button to begin the test.
   If either retort temperature is too high a dialog box will indicate that the test has paused while the retorts cool.
3. As the test starts, the system test dialog box will appear with a test progress indication.
4. You can terminate the test at any time by selecting the **Abandon** button from the system test dialog box.
5. When the test is finished, the test completed dialog box appears with the message:

   System Test completed. Please send the results to Vision BioSystems for analysis.

   (Go to "Control - File Transfer", select a "Remote connection type", then press "Transfer files".)

6. If you wish to send the results to Vision BioSystems, use the transfer files functions to transfer the "Event summaries" files to an external device. You can then send this external device to Vision BioSystems or you may e-mail the files now stored on the external device using a computer at your site.
   Refer to Section 2.9.7 "file transfer" for additional details.

2.9.4 event log

The event log displays a history of system events. You can sort the events by time or by frequency and you can also filter events so you can decide which events to view. Launch the "Event log" screen by selecting the **Control** button from the Function bar then select the **Event log** button from the menu. Toggle the **Show by time/Show by frequency** button to switch between the two views.

The "Show by time" view is shown in Figure 136 and the "Show by frequency" view is shown in Figure 137. The table in "event log functions" on page 149 details the items in these images. To control the event log functions, use the items shown the table and refer to the following sections for additional information:

- "event severity" on page 149
- "event filter" on page 150

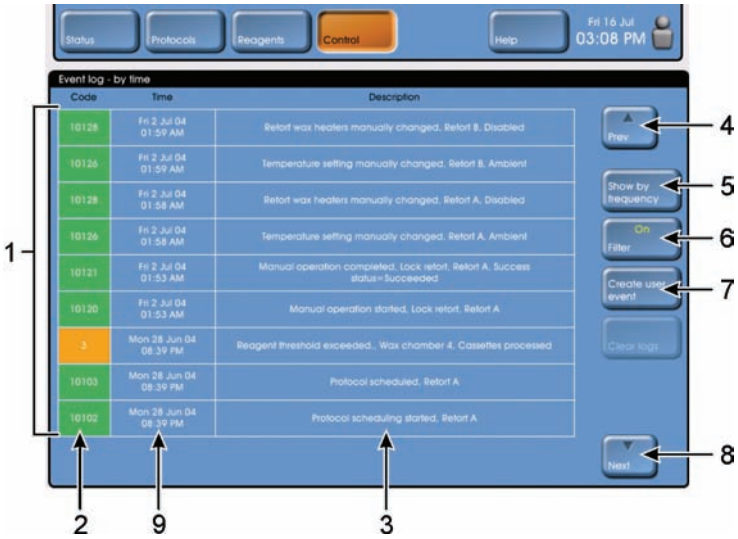


Figure 136: Event log — show by time

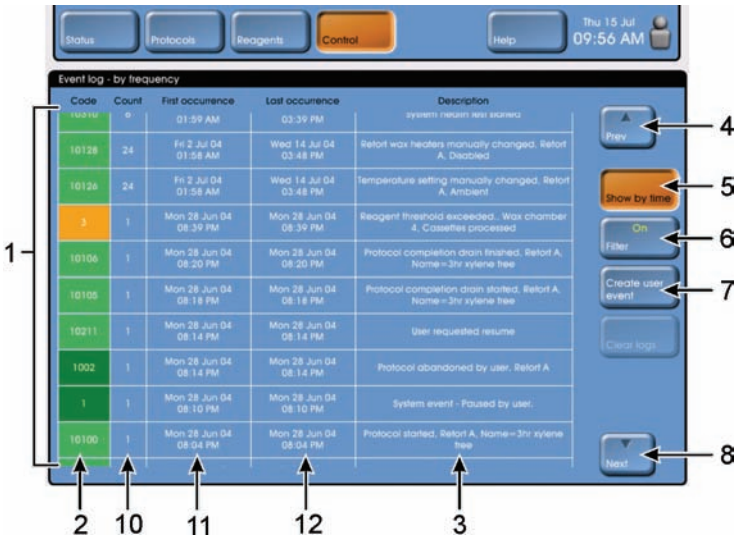


Figure 137: Detail of event log — show by frequency

event log functions

The following table describes the functions available from the "Event log" screen. See Figure 136 and Figure 137 for item references.

Item	Description	Function
Common items (see to Figure 136 and Figure 137)		
1	Events list	View the events that have occurred on your instrument.
2	Code	This is the unique code for the event. The background color indicates the severity (see "event severity" on page 149).
3	Description	This cell contains a description of the event.
4	Prev	Select this button to scroll up through the events list.
5	Show by frequency/ time	Select the **Show by frequency** button to sort the event list by event frequency. Select the **Show by time** button to sort the event list by time.
6	Filter	Select this button to configure the event filter. This button indicates the filter state. "On" indicates a filtered list. "Off" indicates a full list.
7	Create user event	This function allows you to add an event into the log. The event will include the date and time of entry and a description you enter using the on-screen keyboard. The event severity will be "run log entry".
8	Next	Select this button to scroll down through the events list.
"Show by time" items (see to Figure 136)		
9	Time	This cell contains the time and date the event occurred.
"Show by frequency" items (see to Figure 137)		
10	Count	The number of times the event has occurred
11	First occurrence	The time and date of the first occurrence of this event.
12	Last occurrence	The time and date of the last occurrence of this event.

event severity

There are five event severity levels and each level has a color code as shown in the following table.

Severity level	Description	Color code
Run log entry	Normal system events that require no response. For example, a protocol starting.	Light green
Information	A normal event that requires a response (e.g. a protocol successfully completed) or an unusual event that has no detrimental affect (e.g. a user abandoned protocol).	Dark green
Warning	An error or potential error that does not stop processing or a request for user action. For example, an out-of-threshold reagent used in a protocol.	Orange
Error	An error that causes an operation to abandon (e.g. a protocol abandons because there is no station available).	Red
Critical error	An error that makes part of the instrument (e.g. one retort) or the entire instrument unusable.	Blue

event filter

The event filter lets you select the events you wish to view. You set the filter using the "Events log filter" dialog box. Launch this dialog box by selecting the **Filter** button from the Event log screen. If you deselect an option, events associated with that option will not be visible in the events list. Thus, if you turn off all events in one section, no events will display in the list.

The event filter is shown in Figure 138 and each function is explained in the table that follows. Use the buttons listed in the table to select the events you wish to view.

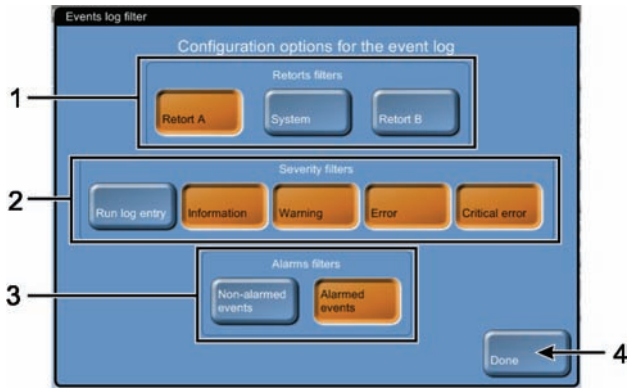


Figure 138: Events log filter dialog box

Item	Description	Options	Option description
1	Filter by retort.	Retort A	Events associated with Retort A
		System	Events that are not associated with a particular retort.
		Retort B	Events associated with Retort B
2	Filter by event severity.	Run log entry	Normal system events such that require no response.
		Information	A normal event that requires a response or an unusual event that has that had no detrimental affect.
		Warning	An error or potential error that does not stop processing or a request for user action.
		Error	An error that causes an operation to abandon.
		Critical error	An error that makes part of the instrument or the entire instrument unusable.
3	Filter by alarm initiation.	Non-alarmed events	Events that do not initiate alarms.
		Alarmed events	Events that initiate alarms.
4	Done		Apply filter and return to the event log.

2.9.5 alarms

Use the alarms screen to manage alarm behavior. The alarms screen functions allow all users to silence active alarms, clear all alarms and choose between viewing all alarms or only the active alarms. If you have supervisor level access you can also set the behavior of alarm-generating event codes. To access the alarms screen, select the **Control** button from the Function bar then select the **Alarms** button from the menu.

The alarms screen is shown in Figure 139. The table in "alarm screen functions" on page 152 details the items in this image. To manage alarm functions, use the items shown in the table and refer to the following sections for additional information:

- "setting alarm behavior" on page 153
- "alarm popups" on page 154

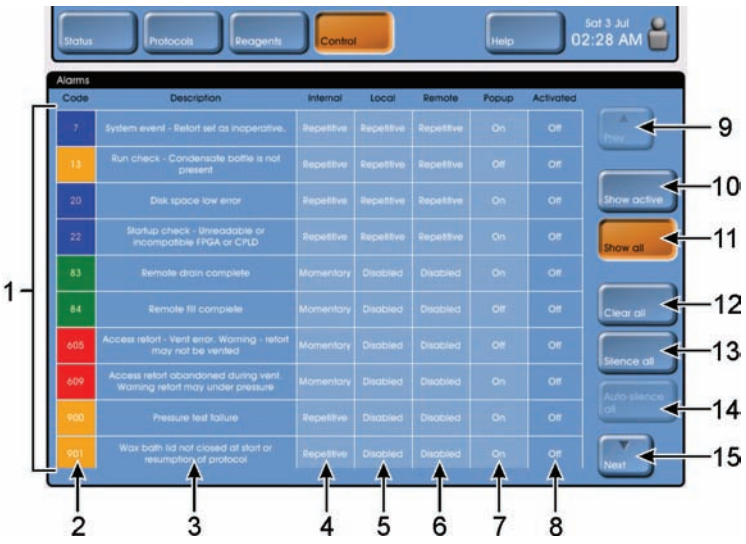


Figure 139: Alarms screen

alarm screen functions

The following table describes the alarm screen functions. See Figure 139 for item references

Item	Description	Function
1	All alarms table	This table activates with the **Show all** button and displays all alarm-generating event codes.
2	Code	Displays the event code and the alarm severity color. Refer to "event severity" on page 149 for error code descriptions.
3	Description	Displays a description of the error and may include alarm parameters when active.
4-7	Alarm behavior	The alarm behavior options are configurable as described in the following section "setting alarm behavior" on page 153.
8	Activate	This cell displays the current alarm state for each particular code. You can set the alarm state by selecting this cell. The alarm state options are: • Off — The alarm is off • On — The alarm is active and the set alarm behavior will occur. • Silence — The alarm is active but silenced. All of the set alarm behaviors will be off, but the alarm will remain in the active list.
9	Prev	Select this button to scroll up through the alarms list.
10	Show active	Select this button to display only currently active alarms (shown unselected).
11	Show all	Select this button to display all alarm-generating events (shown selected).
12	Clear all	Select this button to clear all active alarms.
13	Silence all	Select this button to silence all active alarms.
14	Auto-silence all	This function automatically silences all alarms. It is not available to laboratory staff. If enabled, contact your service organization.
15	Next	Select this button to scroll down through the alarms list.

setting alarm behavior

The alarm functions allow supervisors to set the behavior of alarm-generating event codes. We recommend that alarm behavior be configured during installation and that further changes are only made in consultation with your service organization.

To set a behavior, select the appropriate table cell then select the desired option from the options dialog box.
The following table describes the alarm behavior options (refer to Figure 139 for item numbers).

Item	Description	Options	Option description
2	Event code. The event code is factory set and can not be altered. The severity level is indicated by background color.	Run log entry (Light green)	Normal system events such that require no response.
		Information (Dark green)	A normal event that requires a response or an unusual event that has no detrimental affect.
		Warning (Orange)	An error or potential error that does not stop processing or a request for user action.
		Error (Red)	An error that causes an operation to abandon.
		Critical error (Blue)	An error that makes part of the instrument or the entire instrument unusable.
3	Event description.	N/A	Describes the nature of the event.
4	Internal alarm style. This is the alarm that sounds within the instrument.	Disabled	Alarm never sounds.
		Momentary	Alarm sounds once.
		Repetitive	Alarm sounds until cleared or silenced.
5	External alarm style. The external alarm is a relay contact used to signal an alarm within the laboratory.	Disabled	Alarm never activates.
		Momentary	Alarm activates momentarily.
		Repetitive	Alarm permanently activated until cleared or silenced
6	Remote alarm style. The remote alarm is a relay contact used to signal an alarm to a remote location.	Disabled	Alarm never activates.
		Momentary	Alarm activates momentarily.
		Repetitive	Alarm permanently activated until cleared or silenced.
7	Popup. Displays a popup dialog box when an alarm activates. Refer to "alarm popups" on page 154.	On	A popup will appear for this event.
		Off	A popup will not appear for this event.
8	Activated. You can set the alarm state by selecting this cell.	Off	The alarm is off.
		On	The alarm is on.
		Silence	The alarm is on but silenced. The internal, remote and external alarms will turn off, but the alarm will remain in the active list.

alarm popups

Alarm popups provide alarm condition details and allow you to directly respond to the alarm without opening the alarms screen. Alarm popups only appear for alarm conditions that have the popup feature enabled (refer to "setting alarm behavior" on page 153).

The alarm popup dialog box is shown in Figure 140 and each function is explained in the table that follows. Use the functions listed in the table to manage alarm popups.

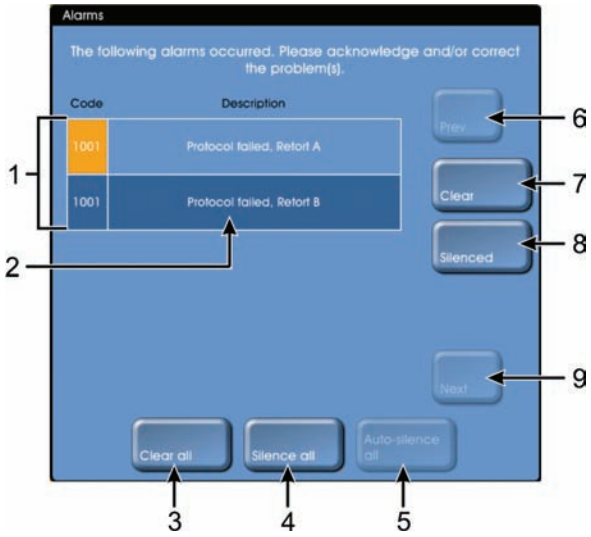


Figure 140: Alarm popup

Item	Description	Function
1	Alarms list	A list of all active alarms. Includes the event code, the severity (indicated by background color), and a description of the alarm.
2	Selected alarm	Select an alarm cell to highlight that alarm. You can individually silence and clear the highlighted alarm.
3	Clear all	Clears all active alarms and closes the alarm popup.
4	Silence all	Silence all active alarms. The alarms remain active but the internal and external alarm indicators turn off.
5	Auto-silence all	This function automatically silences all alarms. It is for service use and is not available to laboratory staff. If enabled, contact your service organization.
6	Prev	Select this button to scroll up through the alarms list.
7	Clear	Clear the highlighted alarm. Any other alarms in the list will remain active.
8	Silenced	Silence the highlighted alarm. The alarm remains active but it no longer activates the internal and external alarm indicators. The alarm indicators will remain on if there are other active alarms.
9	Next	Select this button to scroll down through the alarms list.

2.9.6 access level

This screen allows you to set the access level that determines the screens and functions available to the current user. There are two levels available to laboratory staff: operator and supervisor. You automatically begin at the lowest level (operator) when you start the software. You may change to the higher supervisor level at any time provided you know the correct password. You can also change the supervisor level password. The service and manufacturer access levels are reserved for use by service personnel and authorized representatives of the manufacturer. They are not available to laboratory personnel and are not covered in this document. An icon on the Function bar indicates your current access level.

Figure 141: Access level icons with operator (1) and supervisor (2)

Note: Contact Vision BioSystems Customer Support if you forget the supervisor password or if you require temporary access to service level functions. You can find Vision BioSystems' contact details in the "contacting vision biosystems"section on page (ii) of this manual.

changing access level

Use the following procedure to change the access level to supervisor.

1. Select the **Access level** button from the **Control** menu.
2. Select the **Supervisor** button.
3. Enter your password using the on-screen keypad.
4. Select **OK** when finished. You now have supervisor level access.

Use the following procedure to change the access level to operator.

1. Select the **Access level** button from the **Control** menu.
2. Select the **Operator** button. You now have operator level access.

changing the supervisor password

Use the following procedure to change the supervisor level password.

1. Select the **Control** button from the Function bar.
2. Select the **Access level** button from the menu.
3. Select the supervisor level **Change password** button.
4. Enter the current password using the on-screen keypad and select **OK** when finished.
5. Enter the new password using the on-screen keypad and select **OK** when finished.
   A blank password will allow anybody to select the supervisor access level without a password.

2.9.7 file transfer

The file transfer functions allow you to manage important files such as protocols, configuration files, current state files, log files and event summaries. Files can be transferred to and from either a 3.5" floppy disk or a USB memory device. You can then use these files as a backup (especially useful for protocols) or to send to Vision BioSystems or your service organization to aid system health diagnosis.

To access the file transfer screen, select the **Control** button from the Function bar then select the **File transfer** button from the menu. The file transfer screen is shown in Figure 142 and the items are described in the table that follows.

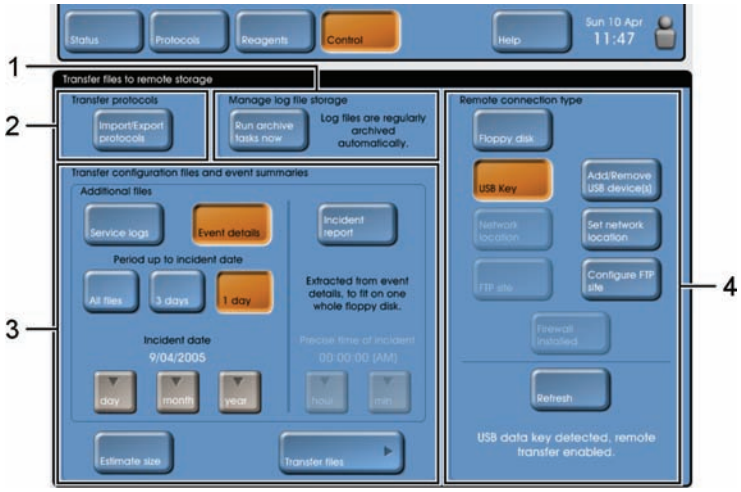


Figure 142: File transfer screen

Item	Description	Function
1	Manage log file storage	Select the **Run archive tasks now** button to archive recent event and service log files and delete very old ones.
2	Transfer protocols	Select the **Import/export protocols** button to copy protocol files to or from a remote device.
3	Transfer configuration files and event summaries	Use the functions in this area to transfer various event and status files.
4	Remote connection type	Use this area to set up the remote device you wish to transfer your files to or from.

Refer to the following sections for detailed file transfer instructions:

- "remote device overview" on page 157
- "floppy drive set up" on page 158
- "installing a USB device" on page 158
- "removing a USB device" on page 160
- "transferring protocols" on page 161
- "archiving log files" on page 165
- "transferring configuration files and event summaries" on page 165

remote device overview

Use the **remote connection type** area to set up the device you wish to transfer your files to or from. Currently you can use either a floppy disk or a standard USB memory device for file transfers. You can transfer all file types using a USB device. A floppy disk can accommodate all the file types that normally need to be transferred, including an extract from Event details (generated by the **Incident report** button). If a USB device is used, its extra capacity additionally accommodates entire files of Service logs or Event details. Refer to "remote device file structure" on page 172 for a description of the file structure on the remote device. To ensure file security the network and FTP transfer functions may only be used under instruction from Vision BioSystems or your service organization.

The device connection locations are shown in Figure 143 and the remote connection area is shown in Figure 144. The table following these images details the software and hardware items. Refer to the following sections for detailed device connection and removal instructions:

- "floppy drive set up" on page 158
- "installing a USB device" on page 158
- "removing a USB device" on page 160

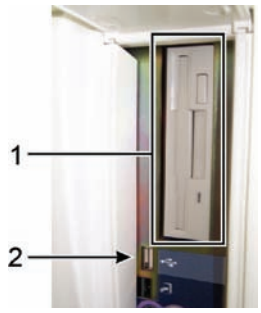


Figure 143: Front of instrument with floppy drive (1) and USB port (2)

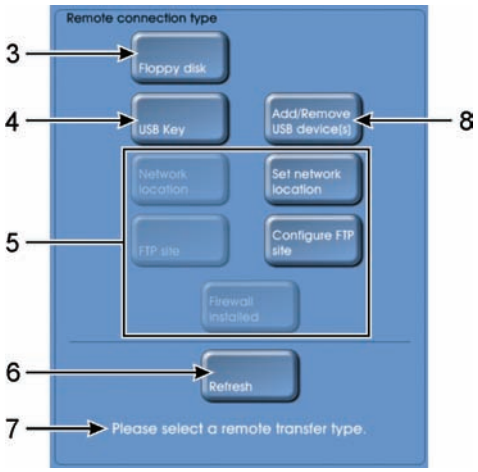


Figure 144: Remote connection area

Item	Description	Function
1	Floppy drive	The floppy disk drive is located under the communications door at the front of the instrument.
2	USB port	The USB port is located under the communications door at the front of the instrument.
3	Floppy disk	Select this button to set the floppy disk as the remote device.
4	USB key	Select this button to set the USB device as the remote device.
5	Network and FTP connections	Only use these function under instruction from Vision BioSystems or your service organization.
6	Refresh	Select this button to update the connection status after inserting a floppy disk or USB key.
7	Connection status	This area indicates the current state of the remote connection.
8	Add/Remove USB device(s)	You must select this button to prepare the instrument before connecting or removing a USB device.

floppy drive set up

Use the following instructions to set up a floppy disk as the file transfer device. Refer to "remote device overview" on page 157 for a description of the "Remote connection type" area.

A blank pre-formatted high density floppy disk (1.44 MB) is required to transfer an incident report file. This must be formatted on a separate computer, if necessary.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Insert a floppy disk into the drive at the front of the instrument (see item 1 in Figure 143).
3. Select the **Floppy disk** button from the "Remote connection type" area (see item 3 in Figure 144).
4. Check the connection status in the connection area (see item 7 in Figure 144).
   (i) If the status area indicates that a disk is detected and remote transfer is enabled, you may proceed with file transfer functions using the floppy drive.
   (ii) If the status area requests that you insert a disk, ensure a floppy disk is correctly inserted into the drive then select the **Refresh** button to update the status.
5. When you have finished transferring files, eject the disk from the drive.

installing a USB device

Use the following instructions to set up a USB device as the file transfer device. Refer to "remote device overview" on page 157 for a description of the "Remote connection type" area.

Please note that you must prepare the instrument using the **Add/Remove USB device(s)** button before connecting the USB device. Also note that any running protocols will pause while the instrument is attempting to connect to the USB device.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Select the **Add/Remove USB device(s)** button from the "Remote connection type" area to prepare the instrument prior to connecting the device (see item 8 in Figure 144).
3. The "Add/Remove devices" dialog box will now appear.
   It will initially ask you to wait whilst the instrument prepares for the device configuration change (see Figure 145).

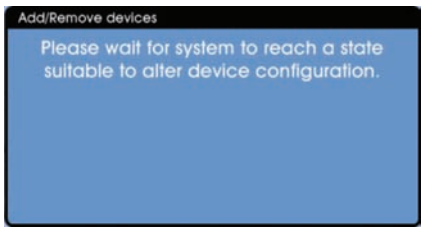


Figure 145: "Add/Remove devices" dialog box — instrument preparing for changes

Procedure continues on the next page…

…procedure continuing from previous page.

4. When the instrument is ready to accept the USB device the "Add/Remove devices" dialog box will change to indicate that you can now insert the new device (see Figure 146).

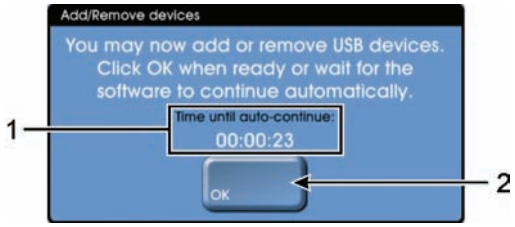


Figure 146: "Add/Remove devices" dialog box — instrument ready for changes

5. You have 30 seconds to add the new device before the function automatically times out (see item 1 in Figure 146).
6. Plug your USB device into the USB port at the front of the instrument (see item 2 in Figure 143).
7. To continue either:
   Select the **OK** button from the "Add/Remove devices" dialog box (see item 2 in Figure 146)
   Wait for the auto-continue function to activate after 30 seconds (see item 1 in Figure 146).
8. The "Updating devices" dialog box will now appear (see Figure 147).

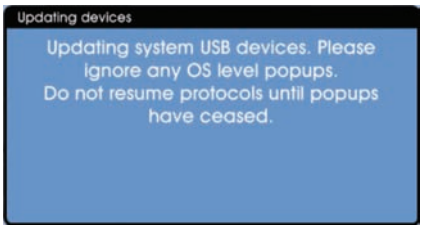


Figure 147: "Updating devices" dialog box

9. You may also see some additional dialog boxes as the instrument reconfigures for the USB device. Ignore these dialog boxes as they will cease to appear after approximately 10 seconds. Depending on the type of device you have installed, these dialog boxes may indicate that new hardware has been found, that the instrument is searching for drivers or similar messages.
10. When all dialog boxes have closed, select the **USB key** button from the file transfer screen (see item 4 in Figure 144).
11. Check the connection status in the connection area (see item 7 in Figure 144).
    (i) If the status area indicates that a USB device is detected and remote transfer is enabled, you may proceed with file transfer functions using the floppy drive.
    (ii) If the status area requests that you install a USB device, select the **Refresh** button to update the status. If this does not work, remove the device (refer to "removing a USB device" on page 160), check that it is switched on (if required) then repeat these installation instructions.
12. When you have finished transferring files, remove the USB device according to the instructions in "removing a USB device" on page 160.

removing a USB device

Use the following instructions to remove a USB device connected to your instrument. Refer to "remote device overview" on page 157 for a description of the "Remote connection type" area.

Please note that you must prepare the instrument using the **Add/Remove USB device(s)** button before removing the USB device. Also note that any running protocols will pause while the instrument is preparing for the devices removal.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Select the **Add/Remove USB device(s)** button from the "Remote connection type" area to prepare the instrument prior to removing the device (see item 8 in Figure 144).
3. The "Add/Remove devices" dialog box will now appear.
   It will initially ask you to wait whilst the instrument prepares for the device configuration change (see Figure 148).

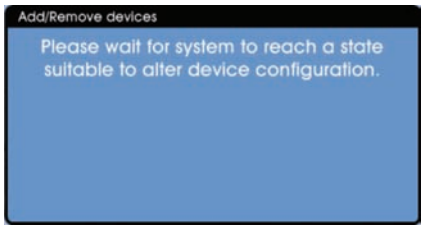


Figure 148: "Add/Remove devices" dialog box — instrument preparing for changes

4. When the device is ready, the "Add/Remove devices" dialog box will change to indicate that you can now remove the device (see Figure 149).

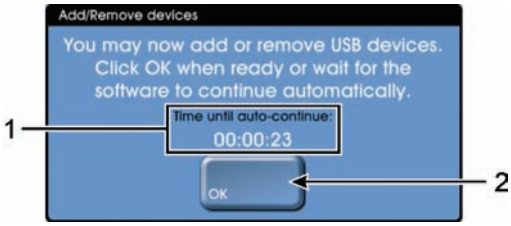


Figure 149: "Add/Remove devices" dialog box — instrument ready for changes

5. You have 30 seconds to remove the device before the function automatically times out (see item 1 in Figure 149).
6. Remove your USB device from the USB port at the front of the instrument (see item 2 in Figure 143).
7. To finalize this procedure, either:
   Select the **OK** button from the "Add/Remove devices" dialog box (see item 2 in Figure 149)
   Wait for the auto-continue function to activate after 30 seconds (see item 1 in Figure 149).

Procedure continues on the next page…

…procedure continuing from previous page.

8. The "Updating devices" dialog box will now appear (see Figure 150).

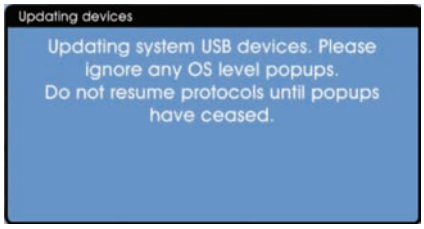


Figure 150: "Updating devices" dialog box

9. You may also see some additional dialog boxes as the instrument reconfigures. Ignore these dialog boxes as they will cease to appear after approximately 10 seconds.
10. When all dialog boxes have closed you may resume normal instrument operation.

transferring protocols

The protocol transfer functions provide an easy way to backup your protocols so they may be restored if lost. The functions also allow you to share protocols across instruments. The protocols can be transferred to and from either a floppy disk or a USB device. You access the protocol transfer functions from the file transfer screen (refer to Section 2.9.7 "file transfer"). You must have a remote device connected to activate these functions.

The "Transfer protocol files" screen is shown in Figure 151 and the items are detailed in the table that follows. Use these controls and refer to the detailed instructions presented after the table to transfer protocols to and from the instrument.

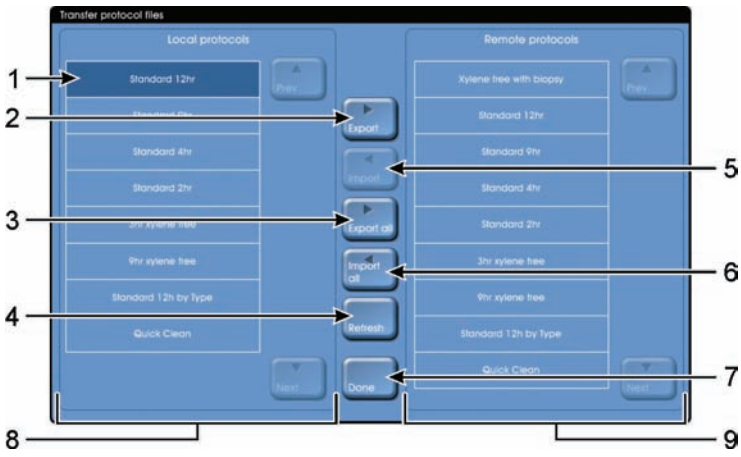


Figure 151: Transfer protocol files screen

Item	Description	Function
1	Selected protocol	Select a protocol if you wish to transfer only that file. The selected protocol will have a highlighted background.
2	Export	Select this button to copy the selected protocol from the instrument to the remote device.
3	Export all	Select this button to copy all protocols from the instrument to the remote device.
4	Refresh	Update the local and remote protocol lists.
5	Import	Select this button to import a selected protocol from the remote device onto the instrument.
6	Import all	Select this button to import all remote protocols onto the instrument.
7	Done	Select this button when you have completed all protocol transfer tasks.
8	Local protocols	This is a list of all the protocols currently on the instrument.
9	Remote protocols	This is a list of all the protocols currently on the remote device.

Use the following instructions to transfer protocols.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Set up and install the floppy disk or USB device you wish to use for protocol transfer.
   Refer to "remote device overview" on page 157 for details.

Procedure continues on the next page…

…procedure continuing from previous page.

3. Select the **Import/Export protocols** button from the "Transfer protocols" area of the file transfer screen (see Figure 152).

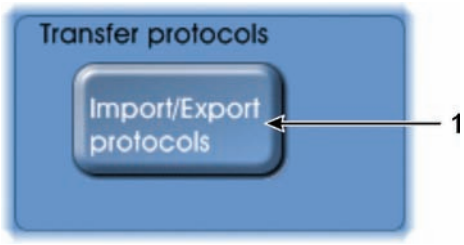


Figure 152: Transfer protocols area with Import/Export protocols button (1)

4. The "Transfer protocol files" screen will now appear (see Figure 151).
5. If you wish to copy all the protocols on your instrument to the remote device, select the **Export all** button (item 3 in Figure 151).
   (i) If the remote device does not contain any protocols with the same name as a protocol on the instrument, all protocol files will be copied to the remote device.
   (ii) If any of the protocols are already saved on the remote device, the "Files exist on target" dialog box will appear; to continue, select one of the following options (see Figure 153 for item numbers):
   Select the **Overwrite** button to overwrite a single file on the remote device (item 1)
   Select the **Overwrite all** button to overwrite all duplicate files on the remote device (item 2)
   Select the **Skip** button to skip the transfer of a single duplicated file (item 3)
   Select the **Skip all** button skip the transfer of all duplicated files (item 4)
   Select the **Cancel** button to terminate the transfer procedure (item 5).
   (iii) Once the transfer is complete the transferred protocols will be stored in the "Protocols" folder on the remote device.

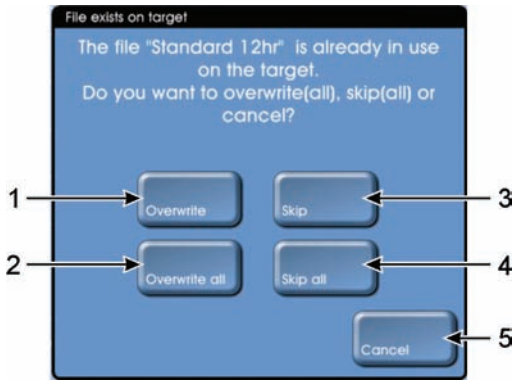


Figure 153: "Files exist on target" dialog box

Procedure continues on the next page…

…procedure continuing from previous page.

6. To transfer a single protocol to the remote device, select the protocols' cell in the "local protocols" area (item 8 in Figure 151) then select the **Export** button (item 2 Figure 151).
   (i) If the remote device does not currently contain a protocols with the same name as the protocol on the instrument, the protocol file will be copied to the remote device.
   (ii) If a protocol of the same name is already saved on the remote device, the "File exists on target" dialog box will appear; to continue, select one of the following options (see Figure 153 for item numbers):
   Select the **Overwrite** button to overwrite the file on the remote device (item 1)
   Select the **Skip** button to skip the transfer (item 3)
   Select the **Cancel** button to terminate the transfer procedure (item 5).
   (iii) Once the transfer is complete the protocol will be stored in the "protocols" folder on the remote device. See "remote device file structure" on page 172.
7. To transfer all files from the remote device onto your instrument, select the **Import all** button (item 6 in Figure 151).
   The transfer function will now attempt to copy all the remote protocols onto your instrument. It will however not copy any files that already exist on your instrument.
   When the transfer completes the new protocols will be available in the Protocols screen (refer to Section 2.2 "protocols").
8. To transfer a single protocol from the remote device onto your instrument, select the protocols' cell in the "Remote protocols" area (item 9 in Figure 151) then select the **Import** button (item 5 in Figure 151).
   The transfer function will now attempt to copy the remote protocol onto your instrument. It will however not copy a protocol that already exists on your instrument.
   When the transfer completes the new protocol will be available in the Protocols screen (refer to Section 2.2 "protocols").
9. After transferring protocols update the local and remote display areas by selecting the **Refresh** button (item 4 in Figure 151).
10. When you have finished transferring protocol files, select the **Done** button from the transfer control area (item 7 Figure 151).
    Protocols transferred to the instrument will now be available in the Protocols screen (refer to Section 2.2 "protocols").
    Protocols transferred to the remote device will be stored in the "protocols" folder on the device.

archiving log files

Archiving log files has two purposes. It compacts the files so they take up less space on your instrument. It discards any files older than three months. Archiving normally happens automatically, but you may be required to manually archive the log files if requested by your service organization. Archived files can be copied to a remote device and sent to Vision BioSystems or your service organization (refer to "transferring configuration files and event summaries" on page 165).

Use the following procedure to archive your log files.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Select the **Run archive tasks now** button from the transfer files screen (see Figure 154).

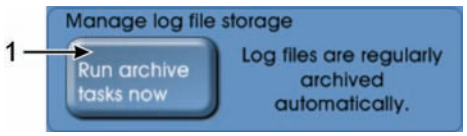


Figure 154: Archive logs button (1) on the transfer files screen

3. A confirmation dialog box will now appear (see Figure 155).
   Select the **OK** button to continue or the **Cancel** button to terminate the file archive function.

Figure 155: Confirmation dialog box with OK button (1) and Cancel button (2)

4. If you chose to continue with the archive function, the process will now occur in the background and you can resume normal instrument operation.

transferring configuration files and event summaries

The log file transfer functions allow you to copy the basic instrument condition files including configuration files, current state files, and event summaries to a remote device for backup or to assist with instrument health checks and fault diagnosis. After an instrument health check is performed, you are prompted to transfer the information (see "system tests" on page 146). You access the file transfer functions from the file transfer screen (see "file transfer" on page 156).

You can also transfer additional files, if you choose, such as service logs and event details. In particular, you can transfer the required files surrounding an incident using the preset Incident report function. This information is required for your service organization to perform a diagnosis of the incident.

You only need to choose the type of information to transfer. The system then selects the actual files to be copied.

You must have a remote device connected to activate these functions (refer to "remote device overview" on page 157). You can use either a USB device or a floppy disk.

The "Transfer configuration files and event summaries" area is shown in Figure 156 and the items are detailed in the table that follows. Use these controls and refer to the detailed instructions presented after the table to transfer files to an external device.

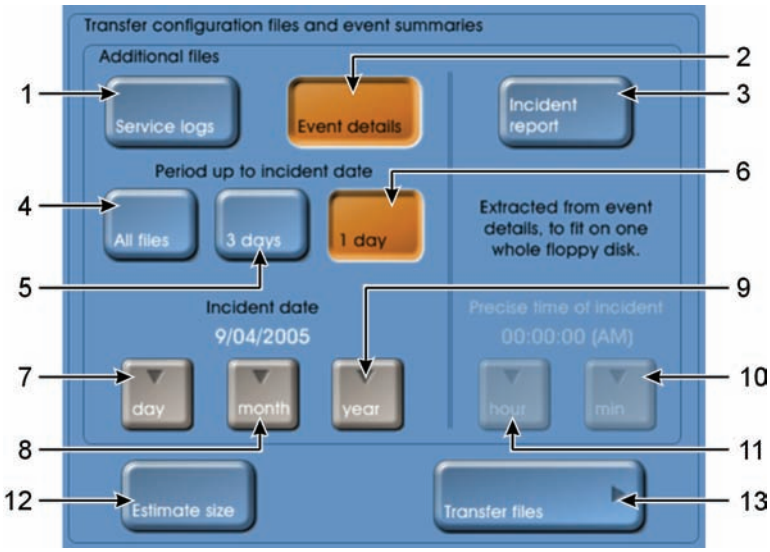


Figure 156: Transfer configuration files and event summaries area

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Item	Description	Function
additional files group		
File type select		Use the buttons in this group to select additional types of files before using the **Transfer files** button. You may select either or both **Service logs** and **Event details** buttons. Selecting **Incident report** disables **Service logs** and **Event details.**
1	Service logs	Select this button to transfer the service logs. The "Period up to incident date" and "Incident date" buttons are active. The service logs contain system performance information that may assist with instrument health checks and fault diagnosis.
2	Event details	Select this button to transfer the event details log files. The "Period up to incident date" and "Incident date" group buttons are active. These files contain detailed information on all instrument events.
3	Incident report	Select this button to transfer a snapshot of the current state files, the instrument configuration files, the event summaries, and an extract of event details log files relating to a particular incident. The "Precise time of incident" group buttons are only active while this button is active. The files are compressed so the total size is no larger than a floppy disk can hold (1.44 MB).

Table continues on the next page…

Item	Description	Function
…table continuing from previous page.		
Period up to incident date select		Use the buttons in this group to select the age of the files to transfer with reference to the incident date. Only one option may be selected. The default incident date is the current date. This can be altered using the "Incident date select" buttons. Not active while **Incident report** button is active.
4	All files	Select this button to transfer files of any age leading up to the incident date.
5	3 days	Select this button to transfer files created in the 3 days leading up to the incident date.
6	1 day	Select this button to transfer files created in the 24 hours leading up to the incident date.
Incident date select		The default setting is to transfer files containing information date-stamped up to the incident date. Use the buttons in this group to enter the incident date (as displayed above the buttons). The system uses this entered date to select the files to be transferred. The buttons work in decrement (count down) mode to the minimum value. The value then rolls over to the maximum value.
7	day	Press this button to decrement the day field. The range depends on the selected month.
8	month	Press this button to decrement the month field.
9	year	Press this button to decrement the year field. The range is 2025 – 2000.
Precise time of incident select		Use the buttons in this group to enter the Precise time of incident (as displayed above the buttons). The system uses this entered time to select the files relevant to the incident. The buttons are only active while the **Incident report** button is active. The buttons work in decrement (count down) mode to the minimum value. The value then rolls over to the maximum value.
10	min	Press this button to decrement the minute field. The range is 59–00.
11	hour	Press this button to decrement the hour field.The range is 23–00.
transfer control group		
12	Estimate size	Press this button to display (to the right of the button) the estimated total size of the files selected for transfer. Not active while **Incident report** button is active.
13	Transfer files	You are prompted to use this button after conducting a health check (refer to "system tests" on page 146). Select this button to copy the state, configuration, and event summaries files to the remote device. Select the **Incident report** button to add an extract of the event details. Alternatively, select the **Service logs** and/or **Event details** buttons to add those files.

Use the following procedures to copy files to a remote device. There is a choice of three options.

- "transferring instrument condition files" on page 168
- "transferring incident report file" on page 169
- "transferring service logs and event summaries files" on page 170

Refer to "remote device file structure" on page 172 for a description of the file structure on the remote device after files have been transferred.

transferring instrument condition files

Use this procedure to transfer the state files, configuration files, and event summaries files.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Set up and install the floppy disk or USB device you wish to transfer the files to.
   Refer to "remote device overview" on page 157 for details.
3. Do not select any of the additional file type filter buttons (items 1 to 3 in Figure 156).
4. Select the **Estimate size** button (item 12 in Figure 156) to display the total size of the files selected for transfer.
5. Select the **Transfer files** button (item 13 in Figure 156) to begin the file transfer.
6. A confirmation dialog box will now appear (see Figure 157). This box details the total size of the files selected for transfer. Make sure your remote device has sufficient capacity to store all the files then either:
   Select the **OK** button to continue with the transfer
   Select the **Cancel** button to terminate this procedure.'

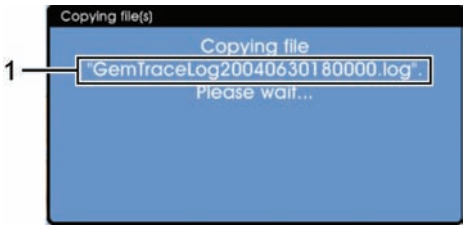

Figure 157: Confirmation dialog box with file size (1), OK button (2) and Cancel button (3)

7. As the file transfer progresses, the "Copying files" dialog box will list each file as it is copied to the remote device (see Figure 158).

Figure 158: Copying files dialog box with the file currently being copied (1)

8. When all files are copied you will return to the file transfer screen and the selected files will now be available on the remote device. Refer to "remote device file structure" on page 172 for a description of the file structure on the remote device.

transferring incident report file

Use this procedure to transfer a group of files providing information relating to a specific incident. These files can be used by Vision BioSystems or your service organization to aid system health diagnosis. All information is compressed into a single file small enough to fit on a single floppy disk that can be transferred to your service organization. Alternatively the file can be e-mailed.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Set up and install the floppy disk or USB device you wish to transfer the files to.
   Refer to "remote device overview" on page 157 for details.
   Note that an incident report will almost fill an entire floppy disk so if you are using a disk it must be blank.
3. Select the **Incident report** button (item 3 in Figure 156).
4. Use the Incident date buttons (items 7 to 9 in Figure 156) to set the incident date.
5. Use the Precise time of incident buttons (items 10 to 11 in Figure 156) to enter the exact time of the required files.

   The date and time of the incident can be obtained from the Event log screen. See "event log" on page 148.
6. Select the **Transfer files** button (item 13 in Figure 156) to begin the file transfer.
7. An information message box briefly appears (see Figure 159).

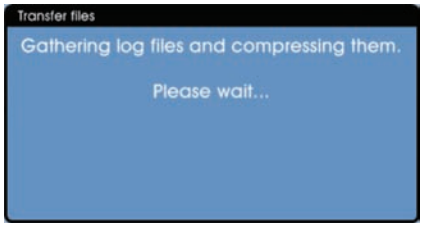

Figure 159: Information message box

8. A confirmation dialog box will now appear (see Figure 157). This box details the total size of the file ready for transfer. Make sure your remote device has sufficient capacity to store the file then either:
   Select the **OK** button to continue with the transfer
   Select the **Cancel** button to terminate this procedure.

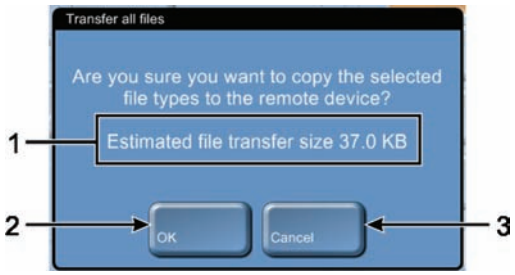

Figure 160: Confirmation dialog box with file size (1), OK button (2) and Cancel button (3)

Procedure continues on the next page…

…procedure continuing from previous page.

9. As the file transfer progresses, the "Copying files" dialog box lists the compressed file as it is copied to the remote device (see Figure 158).

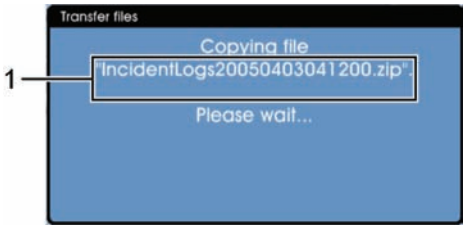

Figure 161: Copying files dialog box with the file currently being copied (1)

10. When all the information is copied you will return to the file transfer screen and the selected file will now be available on the remote device. Refer to "remote device file structure" on page 172 for a description of the file structure on the remote device.

transferring service logs and event summaries files

Use this procedure to transfer service logs and/or event summaries files as well as the instrument condition files. This is potentially a large amount of information to be transferred so the remote device must be a USB key.

1. Select the **Control** button from the Function bar then select the **File transfer** button from the menu to access the file transfer screen.
2. Set up and install the USB device you wish to transfer the files to.
   Refer to "remote device overview" on page 157 for details.
3. Use the file type filter buttons (either or both items 1 to 2 in Figure 156) to select the type of files you wish to transfer.
4. Use the file period filter buttons (items 4 to 6 in Figure 156) to select the age of the files you wish to transfer.
5. Use the incident date buttons (items 7 to 9 in Figure 156) to set the latest date of the required files. The date of the incident can be obtained from the Event log screen. See "event log" on page 148.
6. Select the **Estimate size** button (item 12 in Figure 156) to display the total size of the files selected for transfer.
7. Select the **Transfer files** button (item 13 in Figure 156) to begin the file transfer.

Procedure continues on the next page…

…procedure continuing from previous page.

8. A confirmation dialog box will now appear (see Figure 157). This box details the total size of the files selected for transfer. Make sure your remote device has sufficient capacity to store all the files then either:
   Select the **OK** button to continue with the transfer
   Select the **Cancel** button to terminate this procedure.

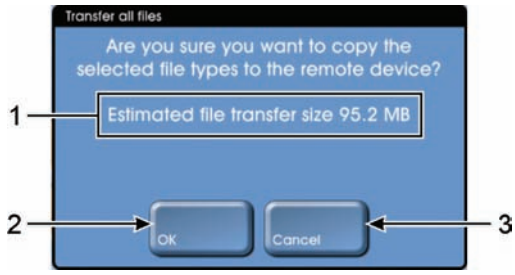

Figure 162: Confirmation dialog box with file size (1), OK button (2) and Cancel button (3)

9. As the file transfer progresses, the "Copying files" dialog box will list each file as it is copied to the remote device (see Figure 158).

Figure 163: Copying files dialog box with the file currently being copied (1)

10. When all files are copied you will return to the file transfer screen and the selected files will now be available on the remote device. Refer to "remote device file structure" on page 172 for a description of the file structure on the remote device.

remote device file structure

The file structure on the remote device is as follows.

(i) All files for a particular instrument are stored in a folder with the instrument's name (see item 1 in Figure 164).

(ii) Each file transfer operation creates a sub-directory with a name corresponding to the time and date the transfer commenced (see item 2 in Figure 164).
Incident report places a compressed file in this sub-directory

(iii) Each file type (except Incident report) has a sub-directory that contains the transferred files (see item 3 in Figure 164).

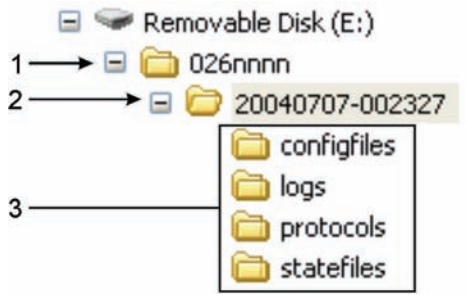

Figure 164: Remote device folder structure

The configuration files are placed in the "configfiles" folder; the protocol files are placed in the "protocols" folder; the state files are placed in the "statefiles" folder. The "logs" folder contains the additional log files, if selected.

The compressed incident report file produces the same sub-directory structure when uncompressed.

2.10 help

The help system contains information on all aspects of Peloris tissue processor operation. To start the help system, select the **Help** button from the Function bar.

You navigate through the help system using the control buttons and underlined links in the actual pages. Refer to Figure 165 and the subsequent table for navigation instructions.

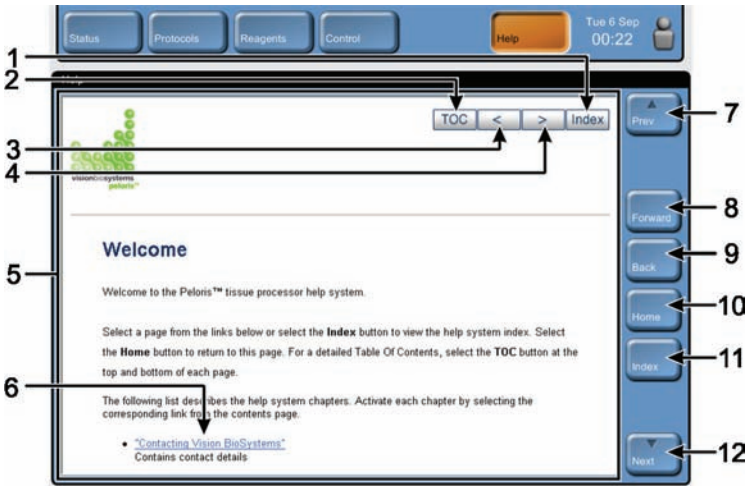

Figure 165: Help system

Item	Description	Function
1	Index	Select this button to jump to the help system's alphabetized index.
2	TOC	Select this button to jump to the help system's Table Of Contents
3	Preceding page (<)	Select this button to jump to the preceding page in the help sequence.
4	Following page (>)	Select this button to jump to the following page in the help sequence.
5	Viewing window	Displays the current help page.
6	Text links	Select an underlined text link to jump to the page, section or image indicated.
7	Prev	Select this button to scroll up through the current help page.
8	Forward	Select this button to return to a page you were viewing before selecting the **Back** button.
9	Back	Select this button to return to the last page you viewed.
10	Home	Select this button to return to the help system's Home page.
11	Index	Select this button to jump to the help system's alphabetized index.
12	Next	Select this button to scroll down through the current help page.

3

cleaning and maintenance

Before using any cleaning or decontamination method except those recommended by Vision BioSystems™, users should check with Vision BioSystems to confirm that the proposed method will not damage the instrument.

3.1 daily cleaning and maintenance

3.1.1 cleaning the top surface

Remove both retort lids then, using the supplied scraper, scrape the wax from the stainless steel surface and wipe it down to remove all solid matter from around the retorts and wax stations.

3.1.2 cleaning the retort lids

Remove wax from the inside of the retort lids with the plastic scraper provided. Take care to remove any wax from around the retort seals. For convenience, the lids may be removed during cleaning.

Caution Only use the plastic scraper provided when cleaning the retort lids to avoid damage to the retort lid seals and to the polished surfaces.

3.1.3 cleaning the touch-screen

You must lock the touch-screen before it is cleaned to avoid unintended actions (refer to Section 2.9.2 "device settings").

Wipe the touch-screen using a lint-free cloth moistened with an alcohol solution (a 70% solution is recommended). Never use abrasive cleaners or solvents on the touch-screen.

3.1.4 cleaning the retorts

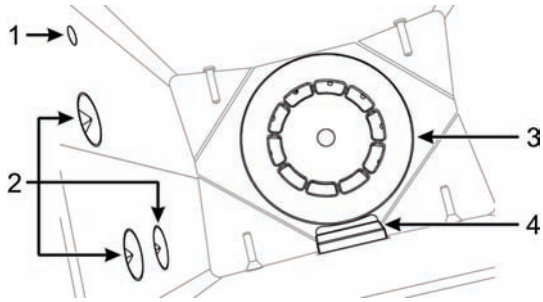

Figure 166: Retort interior with: air hole (1), level sensors (2), stirrer (3), and filter (4)

- Clean the retort walls by wiping with a cloth moistened with an alcohol solution (a 70% solution is recommended).
  If the retort has a build up of salt precipitate from formalin or other fixatives you will also need to conduct a retort acid clean as described in Section 3.2.1 "retort acid clean".

Caution Ensure the air hole (1) is unobstructed and that there is no build up of solid matter around the level sensors (2).

- Inspect the stirrer (3). If soiled, lift it out of the retort and clean with a 70% alcohol solution.
  To replace the stirrer, hold it as indicated in Figure 167 and carefully allow it to slide onto the spindle in the bottom or the retort.

Caution The force of the magnetic coupling will pull the stirrer towards the bottom of the retort. To avoid pinching your fingers, do not allow them to be trapped between the stirrer and the bottom of the retort.

Figure 167: Stirrer handling—correct (left) and incorrect (right)

- Inspect the filter (4). If soiled, lift it out of the retort and clean with an alcohol solution (a 70% solution is recommended).

3.2 periodic cleaning and maintenance

3.2.1 retort acid clean

Common fixative reagents (for example formalin) may cause a build-up of precipitate (salt crystals) on the retort walls. This must be removed as required using a a 6% solution of acetic acid. Use the following procedure to remove salt build-up from a retort.

Caution Wear suitable protective clothing when handling the acetic acid solution.

1. If the salt build-up is light, wipe the retort walls with a lint-free cloth dampened with the acetic acid solution.
2. If the build-up is heavy or is not easily removed, fill a reagent bottle with the acetic acid solution then fill the retort with the solution using the instrument's remote fill and drain functions (refer to Section 2.6 "remote fill/drain").
3. Leave the acetic acid solution in the retort for one hour at ambient temperature then drain the acid back to the bottle.
4. Remove the acetic acid solution from the instrument and clean the bottle thoroughly before using it for any other reagent.
5. Use a clean wax scraper or a lint-free cloth dampened with the acetic acid solution to remove any remaining salt build-up.
6. Run a cleaning protocol in the retort and select a cleaning alcohol as the initial step.

3.2.2 replacing the retort seals

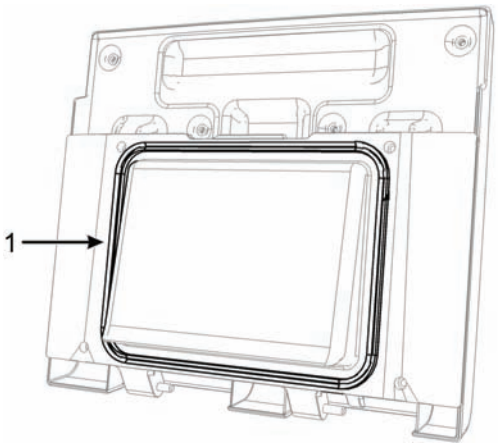

Figure 168: Retort seal

Replace the retort seals every 6 months or earlier if they are damaged.

- Remove the seals by pulling them out of the groove in lid.
- Clean out any matter that may have collected in the groove.
- Push the new seals into the grooves and ensure they are fully seated.
- Equalize the tension in each seal by running your finger around the seal to remove any tight or loose sections.

3.2.3 cleaning the reagent bottles

Empty and clean reagent bottles as required. Use a bottle brush and laboratory detergent (such as Decon) in warm water.

Caution Do not clean reagent bottles in an automatic dishwasher as they may be damaged.

Caution Failure to correctly plug reagent bottles into the manifold will cause an interruption to a processing run and may result in reagent spillage.

While the reagent bottles are removed, the stainless steel interior of the reagent cabinet can be wiped clean.

3.2.4 reagent and condensate bottle o-ring lubrication

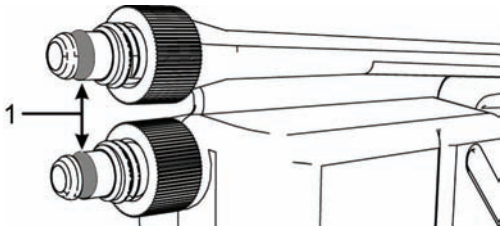

Figure 169: Bottle o-rings (1)

To ensure easy removal of the reagent and condensate bottles, lubricate the o-ring seals on the plug-in nozzles with the o-ring lubricant supplied.

Caution Ensure the lubricant does not block the reagent or air outlets.

3.2.5 general cleaning

WARNING
Take care as the walls of the wax baths are hot and may cause burns.

1. Wipe clean the wax bath interior and lids as necessary. Ensure the air holes are free from obstruction.
2. Clean the instrument exterior as required. Wipe with a damp cloth then dry with a lint-free cloth.

Caution Do not use solvents on painted surfaces or the touch-screen.

Only use the following cleaning solutions:

- Ethanol (70% — 100%);
- Isopropyl alcohol.

3.3 consumables and accessories

The following consumable items and accessories are available from Vision BioSystems.

Name	Part numb.
Cleaning Solution (20 liters)	S26.0390.110
Reagent bottle labels	S26.6001.110
Carbon filter	S26.0434.110
Touch screen protectors	S26.0389.110
Reagent bottle	S26.0802.110
Condensate bottle	S26.0812.110
Bottle caps	S26.0301.110
Bottle connector sealing caps	S26.0822.110
Bottle connector retaining caps	S26.0819.110
High capacity cassette basket (no dividers)	S26.0512.110
High capacity cassette basket dividers	S26.0516.110
Wax scraper	S26.0027.110
Reagent fill and drain hose	S26.0432.110
Wax drain hose	S26.1400.110
Drip tray	S26.0020.110
Bottle cap wrench	S26.1910.110
Remote alarm connector	S26.4098.110
Spaced cassette basket	S26.0515.110

4

reference

This chapter of the Peloris™ tissue processor user documentation contains useful reference information that will help you set up and operate your instrument. To find the information you require, refer to the sections described in the following text.

4.1 reagent threshold guidelines

The tables in this section list the recommended thresholds for commonly used reagents. There are separate tables for xylene and xylene-free processing:

4.1.1 xylene processing

For the best results, xylene-processing reagent changes should be based on concentration thresholds, while cleaning reagent thresholds should be based on cycles. Vision BioSystems™ recommends using nongraded alcohol (first table), but thresholds for graded alcohol are also provided in the second table below.

nongraded alcohol

Thresholds for xylene-processing reagents, including cleaning reagents, using nongraded alcohol are:

	Reagent change thresholds		Final reagent thresholds		Max. temperatures °C		
Type	Conc. (%)	Cassettes or cycles	Conc. (%)	Cassettes or cycles	Ambient	Vacuum	Safe
Formalin	98.6	1500 cass.	N/A	N/A	60	60	45
Ethanol	64.0	N/A	98.0	1500 cass.	78	51	45
Xylene	68.0	N/A	95.0	1500 cass.	138	99	45
Wax	68.0	9000 cass.	95.0	N/A	100	100	77
Cleaning xylene	88.0	10 cycles	N/A	N/A	138	99	45
Cleaning ethanol	88.0	10 cycles	N/A	N/A	78	51	45

graded alcohol

Thresholds for xylene-processing reagents, including cleaning reagents, using graded alcohol are:

	Reagent change thresholds		Final reagent thresholds		Max. temperatures °C		
Type	Conc. (%)	Cassettes or cycles	Conc. (%)	Cassettes or cycles	Ambient	Vacuum	Safe
Formalin	98.6	1500 cass.	N/A	N/A	60	60	45
70% ethanol	51.0	N/A	N/A	N/A	88	59	45
90% ethanol	81.0	N/A	N/A	N/A	82	54	45
Absolute ethanol	92.0	N/A	98.0	1500 cass.	78	51	45
Xylene	68.0	N/A	95.0	1500 cass.	138	99	45
Wax	68.0	9000 cass.	95.0	N/A	100	100	77
Cleaning xylene	88.0	10 cycles	N/A	N/A	138	99	45
Cleaning ethanol	88.0	10 cycles	N/A	N/A	78	51	45

4.1.2 xylene-free processing

In general, xylene-free processing reagent changes should be based on concentration thresholds, and cleaning reagent changes based on cycles.

	Reagent change thresholds		Final reagent thresholds		Max. temperatures °C		
Type	Conc. (%)	Cassettes or cycles	Conc. (%)	Cassettes or cycles	Ambient	Vacuum	Safe
Formalin	98.6	1500 cass.	N/A	N/A	60	60	45
85% ethanol	35.0	N/A	N/A	N/A	87	55	45
80/20 ethanol/IPA	83.0	N/A	N/A	N/A	78	51	45
IPA	N/A	9000 cass.	95.0	N/A	82	55	45
Wax	68.0	9000 cass.	95.0	N/A	100	100	77
Cleaning reagent	88.0	6 cycles	N/A	N/A	100	100	45
Cleaning ethanol	88.0	6 cycles*	N/A	N/A	78	51	45

*Differs from threshold in the Peloris software as in this table it follows xylene-free cleaning reagent that may not absorb as much wax as cleaning xylene.

4.2 reagent change guidelines

- A reagent change can imply a complete change of all reagents or a partial change.
- If instrument is in the standard configuration (see Section 4.4.1 "standard configuration"), look for the most used reagent in each group. For example, when performing a partial reagent change: remove the least pure alcohol, refill with pure alcohol and make 100%; remove the least pure xylene, refill with pure xylene and make 100%.
- If the instrument is in the defatting configuration (see Section 4.4.2 "defatting configuration"), change both the defatting reagents at the same time.
- If the instrument is in the xylene-free configuration (see Section 4.4.3 "xylene-free configuration"), change the least pure reagent in each group.
- The last or most pure dehydrant used in a protocol must not fall below 99%.
- The last or most pure clearer used in a protocol must not fall below 95%
- The last or most pure wax used in a protocol must not fall below 95%.
- As there are more reagent bottles on the Peloris tissue processor than on other instruments, not all reagent bottles will have equal usage.
- The cleaning bottles should be changed every six cycles (three dual retort runs), or ten cycles if using xylene.

In particular, we strongly recommend that the cleaning solvent threshold be set to no more than six cycles for xylene-free processing, or ten cycles for cleaning with xylene.

4.3 reference protocols

The following protocols have been developed and extensively tested by Vision BioSystems™ for use on the Peloris tissue processor. Some are included as pre-defined protocols with all Peloris systems. When used for the recommended tissue types the protocols all produce optimum processing quality with consistent, high-quality results. Use these protocols and the suggested station configurations (refer to Section 4.4 "suggested station configurations") as a reference point when developing protocols that suit your specific requirements and practices.

4.3.1 pre-defined protocols list

Vision BioSystems provides eight pre-defined protocols with each Peloris system. You can use these as they are, or base new protocols on them. See “pre-defined protocols” on page 95 for instructions on the use of these protocols.

Descriptions of all the pre-defined protocols are included in this section. The pre-defined protocols are:

- Standard 12hr By Type (see “standard 12 hour” on page 192)
- Standard 12hr (by group) (see “standard 12 hour” on page 192)
- Standard 2hr (see “standard 2 hour” on page 186)
- Standard 4hr (see “standard 4 hour” on page 189)
- Standard 9hr (see “standard 9 hour” on page 191)
- Quick Clean (see “quick clean” on page 202)
- 3hr Xylene Free (see “xylene-free 3 hour” on page 196)
- 9hr Xylene Free (see “xylene-free 9 hour” on page 198)

4.3.2 standard protocols

standard 1 hour

- Bottle configuration:
  standard configuration (Section 4.4.1).
- Recommended tissue:
  Biopsies up to 1.5 mm diameter.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	1	45	Amb.	Medium	10
2	Ethanol	Dehydrants	1	45	Amb.	Medium	10
3	Ethanol	Dehydrants	1	45	Amb.	Medium	10
4	Ethanol	Dehydrants	1	45	Amb.	Medium	10
5	Ethanol	Dehydrants	1	45	Amb.	Medium	10
6	Ethanol	Dehydrants	10	45	Amb.	Medium	10
7	Ethanol	Dehydrants	10	45	Amb.	Medium	10
8	Xylene	Clearers	1	45	Amb.	Medium	10
9	Xylene	Clearers	10	45	Amb.	Medium	10
10	Paraffin wax	Wax	5	60	Vac.	Medium	10
11	Paraffin wax	Wax	20	65	Vac.	Medium	10
Processing time			1:23:00				

standard 2 hour

- Pre-defined protocol.
- Bottle configuration:
  standard configuration (Section 4.4.1).
- Recommended tissue:
  All biopsies up to 3 mm diameter — gastro-intestinal biopsies, renal, prostatic, hepatic, breast cores all suitable
  Smaller colonic polyps also suitable.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	1	45	Amb.	Medium	10
2	Ethanol	Dehydrants	5	45	Amb.	Medium	10
3	Ethanol	Dehydrants	5	45	Amb.	Medium	10
4	Ethanol	Dehydrants	5	45	Amb.	Medium	10
5	Ethanol	Dehydrants	5	45	Amb.	Medium	10
6	Ethanol	Dehydrants	10	45	Amb.	Medium	10
7	Ethanol	Dehydrants	15	45	Amb.	Medium	10
8	Xylene	Clearers	5	45	Amb.	Medium	10
9	Xylene	Clearers	10	45	Amb.	Medium	10
10	Xylene	Clearers	10	45	Amb.	Medium	10
11	Paraffin wax	Wax	10	65	Vac.	Medium	10
12	Paraffin wax	Wax	10	65	Vac.	Medium	10
13	Paraffin wax	Wax	10	65	Vac.	Medium	10
Processing time			2:07:00				

standard 2 hour — alternative

- Bottle configuration:
  standard configuration (Section 4.4.1).
- Recommended tissue:
  All biopsies up to 3 mm diameter — gastro-intestinal biopsies, renal, prostatic, hepatic, breast cores all suitable
  Smaller colonic polyps also suitable.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	1	45	Amb.	Medium	10
2	Ethanol	Dehydrants	1	45	Amb.	Medium	10
3	Ethanol	Dehydrants	1	45	Amb.	Medium	10
4	Ethanol	Dehydrants	1	45	Amb.	Medium	10
5	Ethanol	Dehydrants	1	45	Amb.	Medium	10
6	Ethanol	Dehydrants	1	45	Amb.	Medium	10
7	Ethanol	Dehydrants	35	45	Amb.	Medium	10
8	Xylene	Clearers	1	45	Amb.	Medium	10
9	Xylene	Clearers	30	45	Amb.	Medium	10
10	Paraffin wax	Wax	5	60	Vac.	Medium	10
11	Paraffin wax	Wax	30	65	Vac.	Medium	10
Processing time			2:09:00				

standard 2 hour urgent with defatting bottle configuration

- Bottle configuration:
  defatting configuration (Section 4.4.2).
- Recommended tissue:
  Urgent tissue with instrument in defatting configuration.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	5	45	Amb.	Medium	10
2	Ethanol	Dehydrants	5	45	Amb.	Medium	10
3	Ethanol	Dehydrants	5	45	Amb.	Medium	10
4	Ethanol	Dehydrants	10	45	Amb.	Medium	10
5	Ethanol	Dehydrants	10	45	Amb.	Medium	10
6	Ethanol	Dehydrants	10	45	Amb.	Medium	10
7	Xylene	Clearers	10	45	Amb.	Medium	10
8	Xylene	Clearers	10	45	Amb.	Medium	10
9	Paraffin wax	Wax	15	65	Vac.	Medium	10
10	Paraffin wax	Wax	20	65	Vac.	Medium	10
Processing time			2:00:00				

standard 4 hour

- Pre-defined protocol.
- Bottle configuration:
  standard configuration (Section 4.4.1).
- Recommended tissue:
  Small specimens, 3 mm thick, of non-dense tissue
  Skin ellipses, kidney, liver, bowel, etc. all suitable
  4 mm diameter cores also suitable.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	30	45	Amb.	Medium	10
2	Ethanol	Dehydrants	10	45	Amb.	Medium	10
3	Ethanol	Dehydrants	10	45	Amb.	Medium	10
4	Ethanol	Dehydrants	10	45	Amb.	Medium	10
5	Ethanol	Dehydrants	10	45	Amb.	Medium	10
6	Ethanol	Dehydrants	20	45	Amb.	Medium	10
7	Ethanol	Dehydrants	20	45	Amb.	Medium	10
8	Xylene	Clearers	10	45	Amb.	Medium	10
9	Xylene	Clearers	10	45	Amb.	Medium	10
10	Xylene	Clearers	20	45	Amb.	Medium	10
11	Paraffin wax	Wax	20	65	Vac.	Medium	10
12	Paraffin wax	Wax	20	65	Vac.	Medium	10
13	Paraffin wax	Wax	30	65	Vac.	Medium	10
Processing time			4:06:00				

standard 6 hour

- Bottle configuration:
  standard configuration (Section 4.4.1).
- Recommended tissue:
  Suitable for most tissue types (excluding fatty tissue and brain) up to size 15 x 10 x 4.5 mm
  6mm diameter cores also suitable.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	30	45	Amb.	Medium	10
2	Ethanol	Dehydrants	10	45	Amb.	Medium	10
3	Ethanol	Dehydrants	10	45	Amb.	Medium	10
4	Ethanol	Dehydrants	10	45	Amb.	Medium	10
5	Ethanol	Dehydrants	30	45	Amb.	Medium	10
6	Ethanol	Dehydrants	30	45	Amb.	Medium	10
7	Ethanol	Dehydrants	30	45	Amb.	Medium	10
8	Xylene	Clearers	20	45	Amb.	Medium	10
9	Xylene	Clearers	20	45	Amb.	Medium	10
10	Xylene	Clearers	30	45	Amb.	Medium	10
11	Paraffin wax	Wax	30	65	Vac.	Medium	10
12	Paraffin wax	Wax	30	65	Vac.	Medium	10
13	Paraffin wax	Wax	60	65	Vac.	Medium	10
Processing time			6:06:00				

standard 9 hour

- Pre-defined protocol.
- Bottle configuration:
  standard configuration (Section 4.4.1).
- Recommended tissue:
  Suitable for all routine tissues, including brain, up to size 20 x 10 x 6 mm
  Very thick fatty specimens may require a longer protocol
  Thick specimens of brain are slightly improved by a longer protocol.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	30	45	Amb.	Medium	10
2	Ethanol	Dehydrants	15	45	Amb.	Medium	10
3	Ethanol	Dehydrants	15	45	Amb.	Medium	10
4	Ethanol	Dehydrants	30	45	Amb.	Medium	10
5	Ethanol	Dehydrants	40	45	Amb.	Medium	10
6	Ethanol	Dehydrants	50	45	Amb.	Medium	10
7	Ethanol	Dehydrants	50	45	Amb.	Medium	10
8	Xylene	Clearers	40	45	Amb.	Medium	10
9	Xylene	Clearers	40	45	Amb.	Medium	10
10	Xylene	Clearers	50	45	Amb.	Medium	10
11	Paraffin wax	Wax	50	65	Vac.	Medium	10
12	Paraffin wax	Wax	50	65	Vac.	Medium	10
13	Paraffin wax	Wax	60	65	Vac.	Medium	10
Processing time			9:06:00				

standard 12 hour

- Pre-defined protocol, (x2: configured both by type and group).
  Note that the "12hr Standard By Type" protocol cycles pressure and vacuum for the first 10 steps. In all other respects it follows the definition below.
- Bottle configuration:
  standard configuration (Section 4.4.1).
- Recommended tissue:
  Suitable for all routine tissues, including brain and fatty specimens, up to size 20 x 10 x 6 mm.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	60	45	Amb.	Medium	10
2	70% ethanol	Dehydrants	40	45	Amb.	Medium	10
3	90% ethanol	Dehydrants	40	45	Amb.	Medium	10
4	Absolute ethanol	Dehydrants	50	45	Amb.	Medium	10
5	Absolute ethanol	Dehydrants	50	45	Amb.	Medium	10
6	Absolute ethanol	Dehydrants	50	45	Amb.	Medium	10
7	Absolute ethanol	Dehydrants	60	45	Amb.	Medium	10
8	Xylene	Clearers	50	45	Amb.	Medium	10
9	Xylene	Clearers	60	45	Amb.	Medium	10
10	Xylene	Clearers	60	45	Amb.	Medium	10
11	Paraffin wax	Wax	60	65	Vac.	Medium	10
12	Paraffin wax	Wax	60	65	Vac.	Medium	10
13	Paraffin wax	Wax	60	65	Vac.	Medium	10
Processing time			12:06:00				

4.3.3 defatting protocols

9 hour protocol for fatty tissue

- Bottle configuration:
  defatting configuration (Section 4.4.2).
- Recommended tissue:
  Alternative to standard 9 hour protocol for tissue that is particularly fatty.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	20	45	Amb.	Medium	10
2	Ethanol	Dehydrants	20	45	Amb.	Medium	10
3	Ethanol	Dehydrants	20	45	Amb.	Medium	10
4	Ethanol	Dehydrants	30	45	Amb.	Medium	10
5	Ethanol	Dehydrants	40	45	Amb.	Medium	10
6	Ethanol	Dehydrants	45	45	Amb.	Medium	10
7	Defatting xylene 50/50 alc./xylene	Defat	45	45	Amb.	Medium	10
8	Post defat ethanol	Post defat	60	45	Amb.	Medium	10
9	Xylene	Clearers	40	45	Amb.	Medium	10
10	Xylene	Clearers	50	45	Amb.	Medium	10
11	Paraffin wax	Wax	40	65	Vac.	Medium	10
12	Paraffin wax	Wax	50	65	Vac.	Medium	10
13	Paraffin wax	Wax	60	65	Vac.	Medium	10
Processing time			9:06:00				

overnight protocol for fatty tissue

- Bottle configuration: defatting configuration (Section 4.4.2)
- Recommended tissue:
  Alternative to standard 12 hour protocol for tissue that is particularly fatty.

Step	Reagent type	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	Fixatives	30	45	Amb.	Medium	10
2	Ethanol	Dehydrants	45	45	Amb.	Medium	10
3	Ethanol	Dehydrants	45	45	Amb.	Medium	10
4	Ethanol	Dehydrants	40	45	Amb.	Medium	10
5	Ethanol	Dehydrants	60	45	Amb.	Medium	10
6	Ethanol	Dehydrants	60	45	Amb.	Medium	10
7	Defatting xylene or 50/50 alc./xylene	Defat	60	45	Amb.	Medium	10
8	Post defat ethanol	Post defat	60	45	Amb.	Medium	10
9	Xylene	Clearers	60	45	Amb.	Medium	10
10	Xylene	Clearers	60	45	Amb.	Medium	10
11	Paraffin wax	Wax	60	65	Vac.	Medium	10
12	Paraffin wax	Wax	60	65	Vac.	Medium	10
13	Paraffin wax	Wax	60	65	Vac.	Medium	10
Processing time			12:06:00				

4.3.4 xylene-free protocols

xylene-free 1 hour

- Bottle configuration:
  xylene-free configuration (Section 4.4.3).
- Recommended tissue:
  Endoscopies and needle biopsies
  Small skin biopsies and skin shaves.

Step	Reagent type	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	1	60	Amb.	Medium	10
2	85% Ethanol	6	60	Amb.	Medium	10
3	80/20 Ethanol/IPA	1	Amb.	Amb.	Medium	10
4	80/20 Ethanol/IPA	11	60	Amb.	Medium	10
5	IPA	1	Amb.	Amb.	Medium	10
6	IPA	11	60	Amb.	Medium	10
7	Wax	26	85	Vac.	Medium	10
8	Wax	4	65	Vac.	Medium	10
Processing time		1:17:00				

xylene-free 3 hour

- Pre-defined protocol.
- Bottle configuration:
  xylene-free configuration (Section 4.4.3).
- Recommended tissue:
  All biopsies up to 3 mm diameter — gastro-intestinal biopsies, renal, prostatic, hepatic, breast cores and small colonic polyps also suitable
  Small skin biopsies.

Step	Reagent type	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	30	60	Amb.	Medium	10
2	85% Ethanol	10	60	Amb.	Medium	10
3	85% Ethanol	15	60	Amb.	Medium	10
4	80/20 Ethanol/IPA	15	60	Amb.	Medium	10
5	80/20 Ethanol/IPA	15	60	Amb.	Medium	10
6	IPA	10	60	Amb.	Medium	10
7	IPA	10	60	Amb.	Medium	10
8	IPA	10	60	Amb.	Medium	10
9	Wax	20	85	Vac.	Medium	10
10	Wax	15	85	Vac.	Medium	10
11	Wax	15	65	Vac.	Medium	10
Processing time		3:07:00				

xylene-free 6 hour

- Bottle configuration:
  xylene-free configuration (Section 4.4.3).
- Recommended tissue:
  Suitable for all routine tissues up to size 15 x 10 x 6 mm.

Step	Reagent type	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	30	60	Amb.	Medium	10
2	85% Ethanol	15	60	Amb.	Medium	10
3	85% Ethanol	15	60	Amb.	Medium	10
4	80/20 Ethanol/IPA	15	60	Amb.	Medium	10
5	80/20 Ethanol/IPA	15	60	Amb.	Medium	10
6	IPA	20	60	Amb.	Medium	10
7	IPA	30	60	Amb.	Medium	10
8	IPA	40	60	Amb.	Medium	10
9	Wax	60	85	Vac.	Medium	10
10	Wax	60	85	Vac.	Medium	10
11	Wax	40	65	Vac.	Medium	10
Processing time		6:02:00				

xylene-free 9 hour

- Pre-defined protocol.
- Bottle configuration:
  xylene-free configuration (Section 4.4.3).
- Recommended tissue:
  Suitable for all routine tissues
  Brain, up to size 20 x 10 x 6 mm including thick brain specimens
  Thick fatty specimens are suitable but may require a longer protocol.

Step	Reagent type	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Formalin	30	60	Amb.	Medium	10
2	85% Ethanol	30	60	Amb.	Medium	10
3	85% Ethanol	30	60	Amb.	Medium	10
4	80/20 Ethanol/IPA	30	60	Amb.	Medium	10
5	80/20 Ethanol/IPA	60	60	Amb.	Medium	10
6	IPA	60	60	Amb.	Medium	10
7	IPA	60	60	Amb.	Medium	10
8	IPA	60	60	Amb.	Medium	10
9	Wax	60	85	Vac.	Medium	10
10	Wax	60	85	Vac.	Medium	10
11	Wax	40	65	Vac.	Medium	10
Processing time		9:02:00				

4.3.5 reprocessing protocols

standard reprocessing

- Bottle configuration:
  standard configuration (Section 4.4.1) or
  defatting configuration (Section 4.4.2).
- Recommended tissue:
  All tissue.

Step	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Cleaning solvents	30	60	Amb.	Medium	10
2	Cleaning alcohols	15	45	Amb.	Medium	10
3	Dehydrants	15	45	Amb.	Medium	10
4	Dehydrants	15	45	Amb.	Medium	10
5	Dehydrants	30	45	Amb.	Medium	10
6	Clearers	20	45	Amb.	Medium	10
7	Clearers	30	45	Amb.	Medium	10
8	Wax	60	65	Vac.	Medium	10
9	Wax	60	65	Vac.	Medium	10
Processing time		4:53:00				

rapid reprocessing

- Bottle configuration:
  standard configuration (Section 4.4.1) or
  defatting configuration (Section 4.4.2).
- Recommended tissue:
  For tissue requiring rapid reprocessing.

Step	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Cleaning solvents	20	60	Amb.	Medium	10
2	Cleaning alcohols	10	45	Amb.	Medium	10
3	Dehydrants	1	45	Amb.	Medium	10
4	Dehydrants	1	45	Amb.	Medium	10
5	Dehydrants	1	45	Amb.	Medium	10
6	Dehydrants	1	45	Amb.	Medium	10
7	Dehydrants	1	45	Amb.	Medium	10
8	Dehydrants	35	45	Amb.	Medium	10
9	Clearers	1	45	Amb.	Medium	10
10	Clearers	30	45	Amb.	Medium	10
11	Wax	5	60	Vac.	Medium	10
12	Wax	30	65	Vac.	Medium	10
Processing time		2:40:00				

reprocessing protocol for severely under-processed tissues

- Bottle configuration:
  standard configuration (Section 4.4.1) or
  defatting configuration (Section 4.4.2).
- Recommended tissue:
  Severely under processed tissue.

Step	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Cleaning solvents	30	60	Amb.	Medium	10
2	Cleaning alcohols	15	45	Amb.	Medium	10
3	Dehydrants	30	45	Amb.	Medium	10
4	Dehydrants	30	45	Amb.	Medium	10
5	Dehydrants	60	45	Amb.	Medium	10
6	Clearers	40	45	Amb.	Medium	10
7	Clearers	60	45	Amb.	Medium	10
8	Wax	60	65	Vac.	Medium	10
9	Wax	60	65	Vac.	Medium	10
Processing time		6:43:00				

4.3.6 cleaning protocols

quick clean

- Pre-defined protocol.
- Bottle configuration: Any
- Never run a cleaning protocol while tissue is in the retort as the dry step will destroy the tissue.

Step	Reagent group	Time (min)	Temp (°C)	P/V	Stirrer	Drip time (s)
1	Cleaning solvents	12	75	Amb.	High	10
2	Cleaning alcohols	6	55	Amb.	High	10
3	Dry step	12	80	N/A	Off	N/A
Processing time		0:34:00				

4.4 suggested station configurations

The following station configurations work well with the factory default protocols provided with each Peloris tissue processor. Use these as a guide or starting point when determining your reagent station setup.

- Section 4.4.1 "standard configuration" (page 203)
- Section 4.4.2 "defatting configuration" (page 204)
- Section 4.4.3 "xylene-free configuration" (page 205)

4.4.1 standard configuration

This is the suggested station configuration when running standard protocols (refer to Section 4.3.2 "standard protocols".

Station	Reagent type	Reagent group
Bottle 1	Formalin	Fixative
Bottle 2	Formalin	Fixative
Bottle 3	70% ethanol	Dehydrant
Bottle 4	90% ethanol	Dehydrant
Bottle 5	Absolute ethanol 1	Dehydrant
Bottle 6	Absolute ethanol 2	Dehydrant
Bottle 7	Absolute ethanol 3	Dehydrant
Bottle 8	Absolute ethanol 4	Dehydrant
Bottle 9	Absolute ethanol 5	Dehydrant
Bottle 10	Xylene 1	Clearer
Bottle 11	Xylene 2	Clearer
Bottle 12	Xylene 3	Clearer
Bottle 13	Xylene 4	Clearer
Bottle 14	Xylene 5	Clearer
Bottle 15	Cleaning xylene	Cleaning solvent
Bottle 16	Cleaning ethanol	Cleaning alcohol
Wax 1	Paraffin wax 1	Wax
Wax 2	Paraffin wax 2	Wax
Wax 3	Paraffin wax 3	Wax
Wax 4	Paraffin wax 4	Wax

4.4.2 defatting configuration

This is the suggested station configuration when running defatting protocols (refer to Section 4.3.3 "defatting protocols".

Station	Reagent type	Reagent group
Bottle 1	Formalin	Fixative
Bottle 2	Formalin	Fixative
Bottle 3	70% ethanol	Dehydrant
Bottle 4	90% ethanol	Dehydrant
Bottle 5	Absolute ethanol 1	Dehydrant
Bottle 6	Absolute ethanol 2	Dehydrant
Bottle 7	Absolute ethanol 3	Dehydrant
Bottle 8	Absolute ethanol 4	Dehydrant
Bottle 9	Absolute ethanol 5	Dehydrant
Bottle 10	Defatting xylene or 50/50 Ethanol/Xylene	Defat
Bottle 11	Post defatting ethanol	Post defat
Bottle 12	Xylene 3	Clearer
Bottle 13	Xylene 4	Clearer
Bottle 14	Xylene 5	Clearer
Bottle 15	Cleaning xylene	Cleaning solvent
Bottle 16	Cleaning ethanol	Cleaning alcohol
Wax 1	Paraffin wax 1	Wax
Wax 2	Paraffin wax 2	Wax
Wax 3	Paraffin wax 3	Wax
Wax 4	Paraffin wax 4	Wax

4.4.3 xylene-free configuration

This is the suggested station configuration when running xylene-free protocols (refer to Section 4.3.4 "xylene-free protocols".

Station	Reagent	Station	Reagent
Bottle 1	Formalin	Bottle 11	IPA
Bottle 2	Formalin	Bottle 12	IPA
Bottle 3	85% Ethanol	Bottle 13	Waxsol™
Bottle 4	85% Ethanol	Bottle 14	Cleaning ethanol
Bottle 5	85% Ethanol	Bottle 15	Waxsol
Bottle 6	80/20 Ethanol/IPA	Bottle 16	Cleaning ethanol
Bottle 7	80/20 Ethanol/IPA	Wax 1	Wax 1
Bottle 8	80/20 Ethanol/IPA	Wax 2	Wax 2
Bottle 9	IPA	Wax 3	Wax 3
Bottle 10	IPA	Wax 4	Wax 4

4.5 protocol step temperatures

The Peloris tissue processor uses five protocol types to accommodate different processing functions. Each protocol type has a set of reagent compatibility sequences that comply with the intended use (refer to Section 4.6 "reagent compatibility tables" for more information). The allowable temperature range for each step is also dependent on the protocol type. The following sections list the protocol temperature ranges and typical protocol sequences.

Protocol type	Retort temp. range for reagent	Retort temp. range for wax	Wax bath temp. range
Standard	35 °C to 65 °C	2 °C above wax melt temp. to 77 °C	55 °C to 85 °C
Standard reprocessing	35 °C to 65 °C	2 °C above wax melt temp. to 77 °C	55 °C to 85 °C
Xylene-free	35 °C to 65 °C	2 °C above wax melt temp. to 85 °C	55 °C to 85 °C
Xylene-free reprocessing	35 °C to 65 °C	2 °C above wax melt temp. to 85 °C	55 °C to 85 °C
Cleaning	35 °C to 85 °C	2 °C above wax melt temp. to 85 °C	55 °C to 85 °C

Refer to Section 2.8.4 "global wax settings" for the current wax melting point temperature.

4.6 reagent compatibility tables

The reagent compatibility tables determine the allowable reagent sequences. The sequences vary depending on the operation or protocol type.

4.6.1 manual operations

Current step	Previous step									
☑ = compatible	None	Fixatives	Dehydrants	Defat	Post defat	Clearers	Wax	Cleaning solvents	Cleaning alcohols	Cleaning water/detergent
Fixatives	☑	☑	☑						☑	☑
Dehydrants	☑	☑	☑	☑	☑	☑		☑	☑	☑
Defat	☑		☑	☑	☑	☑		☑	☑	
Post defat	☑	☑	☑	☑	☑	☑		☑	☑	
Clearers	☑		☑	☑	☑	☑		☑	☑	
Wax	☑					☑	☑	☑		
Cleaning solvents	☑		☑	☑	☑	☑	☑	☑	☑	
Cleaning alcohols	☑	☑	☑	☑	☑	☑		☑	☑	☑
Cleaning water	☑	☑	☑		☑				☑	☑

Figure 170: Reagent compatibility for manual operations

4.6.2 standard protocols

Current step	Previous step									
☑ = compatible	None	Fixatives	Dehydrants	Defat	Post defat	Clearers	Wax	Cleaning solvents	Cleaning alcohols	Cleaning water/detergent
Fixatives	☑	☑							☑	☑
Dehydrants	☑	☑	☑	☑					☑	☑
Defat	☑		☑	☑						
Post defat	☑			☑	☑				☑	
Clearers	☑		☑	☑	☑	☑				
Wax	☑					☑	☑			

Figure 171: Reagent compatibility for standard protocols

4.6.3 cleaning protocols

Current step	Previous step									
☑ = compatible	None	Fixatives	Dehydrants	Defat	Post defat	Clearers	Wax	Cleaning solvents	Cleaning alcohols	Cleaning water/detergent
Cleaning solvents	☑		☑	☑	☑	☑	☑	☑	☑	
Cleaning alcohols	☑	☑	☑	☑	☑	☑		☑	☑	☑
Cleaning water	☑	☑	☑		☑				☑	☑

Figure 172: Reagent compatibility for cleaning protocols

4.6.4 standard reprocessing protocols

Current step	Previous step									
☑ = compatible	None	Fixatives	Dehydrants	Defat	Post defat	Clearers	Wax	Cleaning solvents	Cleaning alcohols	Cleaning water/detergent
Fixatives	☑	☑								
Dehydrants	☑	☑	☑	☑	☑				☑	☑
Defat	☑		☑	☑	☑			☑	☑	
Post defat	☑			☑	☑	☑		☑		
Clearers	☑		☑		☑	☑				
Wax	☑					☑	☑	☑		
Cleaning solvents	☑			☑		☑	☑	☑		
Cleaning alcohols	☑			☑				☑	☑	
Cleaning water	☑								☑	☑

Figure 173: Reagent compatibility for standard reprocessing protocols

4.6.5 xylene-free protocols

Current step	Previous step									
☑ = compatible	None	Fixatives	Dehydrants	Defat	Post defat	Clearers	Wax	Cleaning solvents	Cleaning alcohols	Cleaning water/detergent
Fixatives	☑	☑							☑	☑
Dehydrants	☑	☑	☑	☑					☑	☑
Defat	☑		☑	☑						
Post defat	☑			☑	☑			☑		
Clearers										
Wax	☑		☑		☑		☑			

Figure 174: Reagent compatibility for xylene-free protocols

4.6.6 xylene-free reprocessing protocols

Current step	Previous step									
☑ = compatible	None	Fixatives	Dehydrants	Defat	Post defat	Clearers	Wax	Cleaning solvents	Cleaning alcohols	Cleaning water/detergent
Fixatives	☑	☑								
Dehydrants	☑	☑	☑	☑					☑	☑
Defat	☑		☑	☑	☑			☑	☑	
Post defat				☑	☑					
Clearers										
Wax	☑		☑		☑		☑	☑		
Cleaning solvents	☑			☑	☑	☑	☑	☑		
Cleaning alcohols	☑			☑	☑			☑	☑	
Cleaning water	☑								☑	☑

Figure 175: Reagent compatibility for xylene-free reprocessing protocols

4.7 specifications

4.7.1 operating specification

Dimensions (H x W x D): .....1500 x 857 x 721 mm
(59 x 33.7 x 28.4 inches)

Work surface height (from floor): .....Front — 1070 mm (42.1 inches)
Rear — 1110 mm (43.7 inches)

Cassette capacity (standard protocols): .....600 (maximum)
528 (spaced)

Cassette capacity (xylene-free protocols): 432

Retort vacuum (max): .....– 70 kPa(g)

Retort pressure (max): ..... + 45 kPa(g)

Retort agitation: ..... Magnetically coupled stirrer
(user selectable operation)

Reagent stations: 16

Reagent volume: .....3.8 L (1 US gal) min
5 L (1.32 US gal) max

Paraffin wax stations: ..... 4 (each station is capable of filling one retort)

Locate the instrument so that either the mains wall outlet or the instrument's appliance inlet socket is accessible. Users must be able to disconnect the mains power cable without moving the instrument.

4.7.2 environmental specifications

Maximum ambient temperature: .....35 °C

Minimum ambient temperature: .....5 °C

Humidity (noncondensing): .....10 to 80% RH

Altitude: .....0 to 2000 m above sea level

Sound pressure level output (at 1 m): .....< 65 dB

Maximum heating energy output: .....1450 W (100 to 120 V~)
2150 W (220 to 240 V~)

IEC 61010-1 classifications: .....Protective class 1
Pollution degree 2

4.7.3 electrical specifications

Operating voltage: ..... 100 to 120 V~
220 to 240 V~

Operating current (maximum): ..... 16 A (100 to 120 V~)
10 A (220 to 240 V~)

Mains frequency: ..... 50/60 Hz

Power consumption: ..... 1450 W (100 to 120 V~)
2150 W (220 to 240 V~)

4.8 regulatory approvals

EMC (Europe): EN61326:1998

EMC (USA): ..... FCC Part 15 Class A

Safety (UL USA): ..... UL 61010A-1

Safety (UL Canada): ..... CAN/CSA C22.2 No. 1010-1

Safety (Europe): .....IEC 61010-1
IEC 61010-2-010

4.9 regulatory notices

FCC compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Class B compliance statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio or television technician for help.

CE marking and european union notice

The CE mark on the equipment indicates compliance with the EEC Directives for Electromagnetic Compatibility (89/336/EEC) and In Vitro Diagnostic Medical Devices (98/79/EC). Marking of equipment in this manner denotes that the equipment meets the following technical standards:

IEC 61010-1	*Safety requirements for electrical equipment for measurement, control and laboratory use — Part 1: General requirements*
IEC 61010-2-010	*Safety requirements for electrical equipment for measurement, control and laboratory use — Part 2-010: Particular requirements for laboratory equipment for the heating of materials*
EN 61326	*"Electrical equipment for measurement, control and laboratory use – EMC requirements"*
EN 55011	*"Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment" – Class A*
EN 61000-3-2	*"Limits for harmonic current emissions (equipment input current < 16A per phase)"*
EN 61000-3-3	*"Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current < 16A"*
EN 61000-4-2	*"Electrostatic discharge immunity test"*
EN 61000-4-5	*"Surge Immunity Test"*
EN 61000-4-6	*"Conducted disturbances induced by radio frequency fields, immunity test"*
EN 61000-4-8	*"Power-frequency magnetic field immunity test"*
EN 61000-4-11	*"Voltage dips, short interruptions and voltage variations immunity test"*

A "Declaration of Conformity" in accordance with the preceding directives and standards has been made, and is on file at Vision BioSystems, Novocastra Laboratories Ltd, Ballilol Business Park, West Benton Lane, Newcastle upon Tyne, NE12 8EW, United Kingdom.

Note: To maintain compliance with the above CE and FCC Rules and Regulations, use only the cables supplied with the equipment.

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