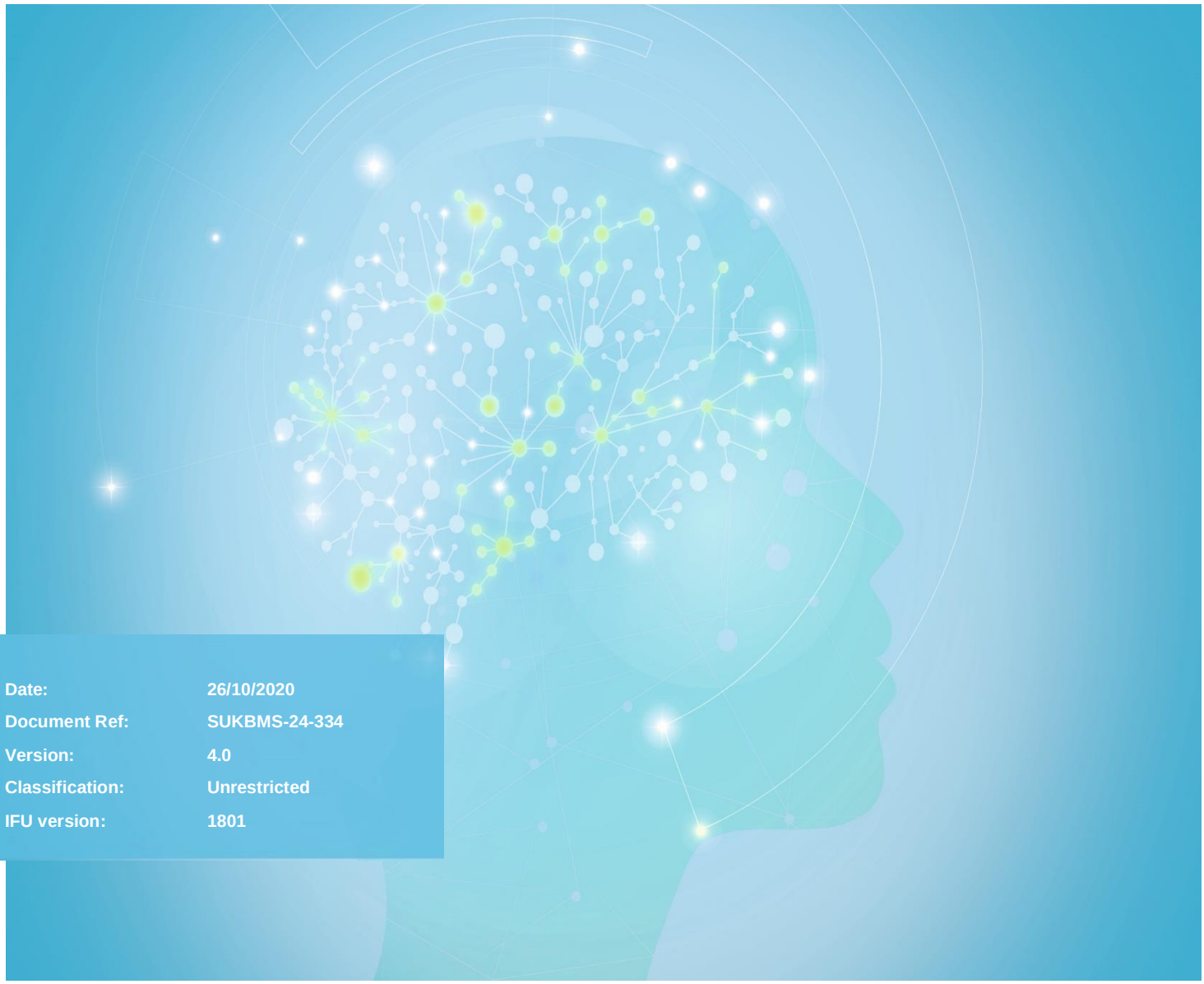
Lighting the way with diagnostics

Routine Use Training Workbook

SP-50



Date:	**26/10/2020**
Document Ref:	**SUKBMS-24-334**
Version:	**4.0**
Classification:	**Unrestricted**
IFU version:	**1801**

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Contents

Disclaimer

Please note the information in this presentation, workbook or training session provided by Sysmex should not be used as an alternative to your sites Standard Operating Procedure (SOP)/Contract. If you have any particular questions regarding any site specific use of reagents, consumables and/or equipment please contact your Management Team.

Revision History

Revised section	Alteration	Name	Date
Daily maintenance	Added wipe stain bath	K. Elgerton	January 2019
Weekly maintenance	Amended weekly schedule	K. Elgerton	January 2019
Reagents	Amended changing stain	K. Elgerton	January 2019
Audit logs	Added exporting CSV	K. Elgerton	January 2019
Reagents	Amended changing Buffer	K. Elgerton	January 2020
Front cover	New logo added	K. Elgerton	January 2020
Contacts	Reagent hotline updated	K. Elgerton	January 2020
Maintenance	Shutdown times updated	K. Elgerton	January 2020
Title page	Workbook name changed to include routine use.	N. Bowen	October 2020

Reference Documents

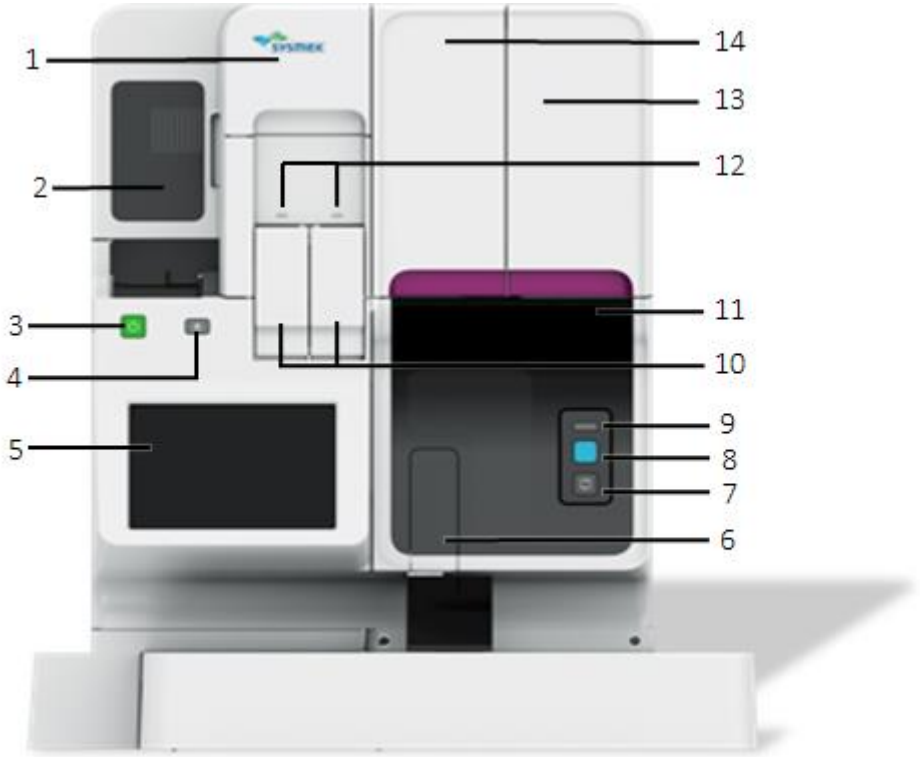
Document title	Version	Date
SP-50_BO (IFU)	1801	January 2018
SP-50_GI (IFU)	1801	January 2018
SP-50_TS (IFU)	1801	January 2018

SP-50 Overview

Facts and Figures	
SP-Series analysers	SP-1000i SP-10 SP-50
Throughput	SP-50 S – 30 samples/hr SP-50 H – 75 samples/hr
Capacity	Standalone analyser – 50 samples Tracked analysers – racks are automatically sent to the SP if a smear is requested.
Sample Type	Whole blood
Sampler Mode	Regular tube Raised bottom tube (RBT) – requires RBT rack
Manual Mode	Manual (Closed) Manual (Open) Manual (RBT) Manual (Micro)
Aspiration Volumes	Sampler mode - 70µl Manual (Closed) mode - 70 µl Manual (Micro) mode - 38 µl
Staining Protocols	May-Grunwald-Giemsa stain Wright single stain Wright-Giemsa stain

Analyser components

Outside the analyser



1. **Main Power Switch Cover –** Open this cover to turn the main power switch ON/OFF, and to regulate the pressures if required.

2. **Stain Unit Cover –** Open this cover to inspect the interior of the stain unit. Access can be gained for cleaning or maintenance tasks. Locked during operation.

3. **Start-up (Power) Switch –** Press to start up the instrument.

4. **Eject Switch –** Press to eject magazines from the stain unit.

5. **IPU Touchscreen –** Use to operate the instrument and configure settings.

6. **Sample Tube Holder –** Used to set samples for manual analysis.

7. **Mode Switch –** Press to switch between manual analysis and sampler analysis. Pressing it opens and closes the sample holder.

- When the sample holder is open: Manual preparation
- When the sample holder is closed: Sampler preparation

8. **Start Switch –** Press to start manual analysis.

9. **Status Indicator LED -** Shows the current status of the analyser.

LED Indicator Light	Description
Green	Ready (Analysis or maintenance is possible)
Flashing Green	Starting up / Analysis in progress / Maintenance in progress
Orange	Sample analysis stopped / not possible. An error has occurred, but the instrument is still operational.
Flashing Orange	Starting up/Preparing a slide/Switching the slide preparation mode/ Shutting down/Sleeping
Red	Stopped - Error (without alarm) / initialising system / Analyser ready to be turned off at the end of shutdown
Flashing Red	Stopped - Error(with alarm)
Not Lit	Powered OFF

10. **Manual Magazine Holders -** This is used for loading manual slides into the analyser for manual staining.

11. **Lower Front Cover -** Open this cover to inspect the interior of the main unit to perform cleaning or maintenance tasks. Analyser must be turned off.

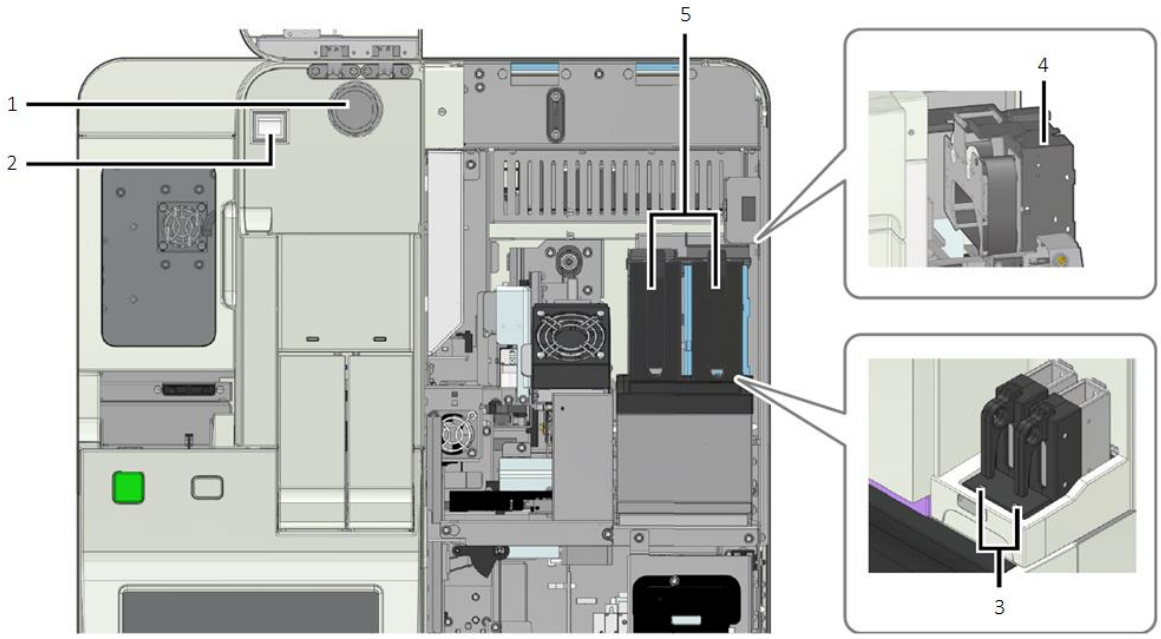
12. **Manual Magazine Holder Status LED –** Shows the current status of the manual magazine holder. A magazine cannot be loaded or removed while the LED is flashing.

LED Indicator Light	Description
Green	Containing magazine
Red	Error
Not Lit	Powered OFF

13. **Slide Unit Cover** - Open to load glass slides. Locked during operation.

14. **Smear Unit Cover -** Open this cover to inspect the interior of the smear unit to perform cleaning or maintenance tasks. The smear unit cover and the slide set cover are one piece. To open the smear unit cover, remove the slide supply cassette first. Locked during operation

Front Components

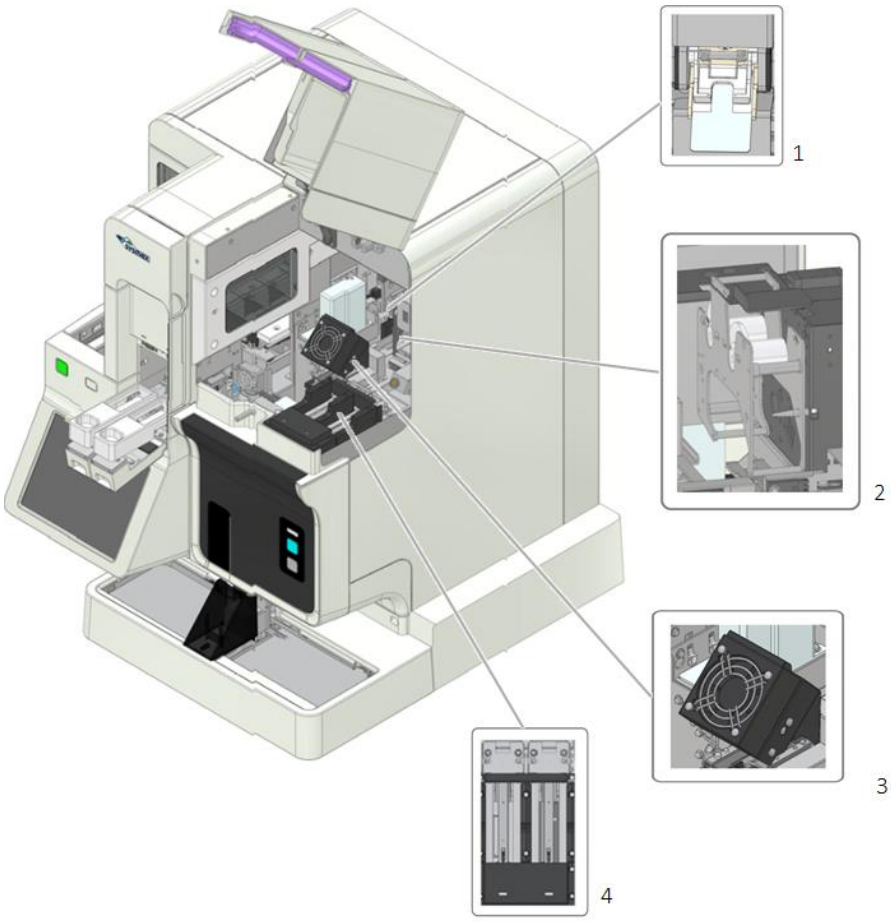


1. **0.07 MPa Regulator –** Regulates the source pressure to 0.07 MPa
2. **Main Power Switch –** Press to turn the main power of the main unit on/off
3. **Slide Supply Cassette Status LED –** Shows the current status of the supply cassettes. A cassette cannot be loaded or removed while the LED is flashing.

LED Indicator Light	Description
Green	Slides loaded
Red	No slides/error
Not Lit	Powered OFF

4. **Printer –** Prints sample information and patient demographics onto glass slide.
5. **Slide Supply Cassettes –** Loads/stores glass slides for use on the SP-50.

Smear Unit



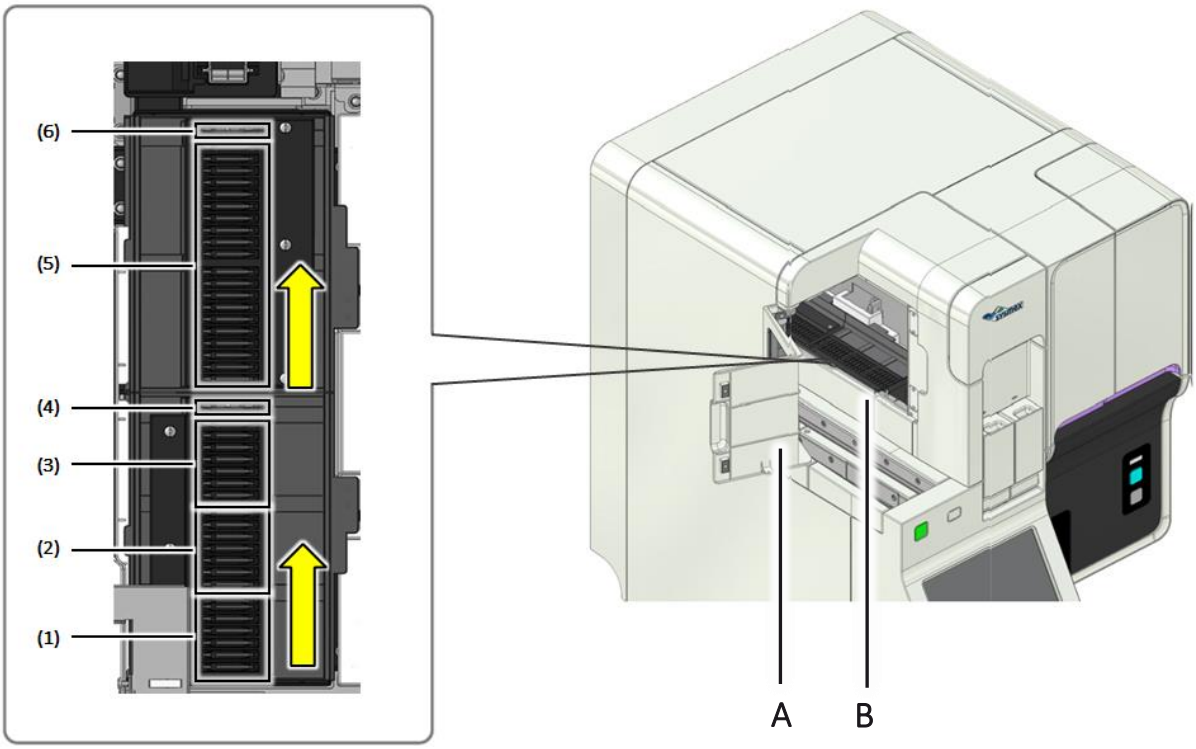
1. **Smear Unit –** Spreads the dispensed sample onto glass slide. Contains spreader glass unit.

2. **Print Unit –** Prints sample information and patient demographics onto glass slide. Contains the ink ribbon.

3. **Smear Dryer Unit –** Dries the smeared sample.

4. **Slide Supply Unit –** Takes out glass slides from the supply cassettes.

Stain Unit



A. Stain Unit Cover – Open this cover to inspect the interior of the stain unit. Access can be gained for cleaning or maintenance tasks. Locked during operation.

B. Stain Unit – Depending upon protocol; fixes, stains, rinses and dries the prepared slides.

There are 7 staining pools which are filled up with the following reagents. The types of reagent varies depending on the staining method. Samples move through the staining pool in the direction of the arrow as illustrated above.

Stain Pool	Role	Reagent
1*	Fixing	Methanol
2	Fixing	Stain 1
3	Staining	Stain 1/buffer
4	Rinsing	Rinse
5	Staining	Stain 2/buffer
6	Rinsing	Rinse & dry

*Use depends upon protocol

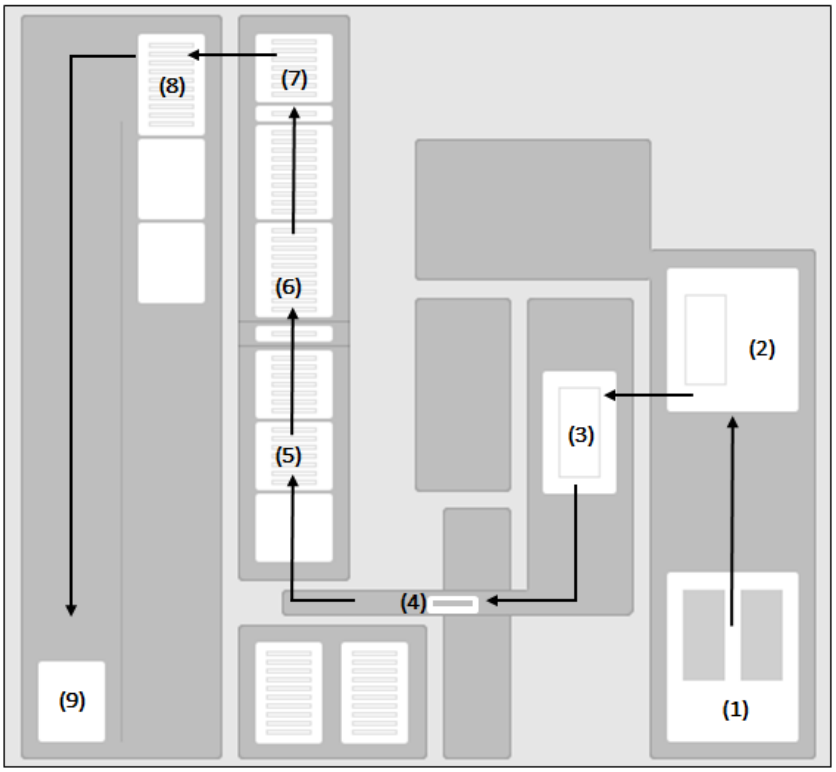
Reagents On-board the SP-50

The number of on-board reagents on the SP-50 depends on the staining protocol used. The table below summarises the reagents recommended for use on the SP-series.

Reagent Name	Function	On-board Stability
Cell Pack DCL	Rinse solution used for rinsing the whole blood aspiration line.	60 days
May-Grunwald stain	Used for staining blood smears.	N/A*
Giemsa stain	Used for staining blood smears.	N/A*
Buffer solution pH 7.0	Used in the preparation of blood smears.	N/A*
Methanol	Used in staining process depending on protocol and during maintenance procedures.	N/A*
CellClean	Alkaline detergent used for internal cleaning of the SP-50	60 days

*See product insert and/or container for specific data.

Smear Production



1. Once the barcode has been read the first step in smear production is for a slide to be removed from either slide supply cassette (1).

2. The slide is transported to the slide print position where the print unit (2) prints sample information on the frosted end of the slide.

3. Next, slides are transported to the dispensing and smear position (3). The dispensing pipette dispense blood evenly over a wide area. The flexible suspension plate prepares the smear by adjusting the angle and speed of the spreader glass according to the HCT value.

4. Once prepared, the smear is transported via the conveyance block (4) to the staining block. During this process the smear passes a drier unit where it is dried.

5. Once at the staining block the (depending upon protocol) smear is placed in stain block 1 (5), followed by stain block 2 (6). Then finally on to the rinse block (7).

6. Once dry, the slides are transported to the magazine feeder unit (8).

7. The prepared slides are placed into an empty magazine and fed out to the magazine storage unit (9).

Staining Principles

Romanowsky stains, such as Giemsa, Leishman and May-Grunwald, are used widely for the routine staining of peripheral blood films. Whichever combination of stains is used the distinction in staining is achieved due to the balance of basic and acidic components within the stains.

The colour and particular cellular component stains, is dependent on the binding that occurs between the staining compounds and chemical structures within the cell, as well as interaction between dye molecules, pH and time.

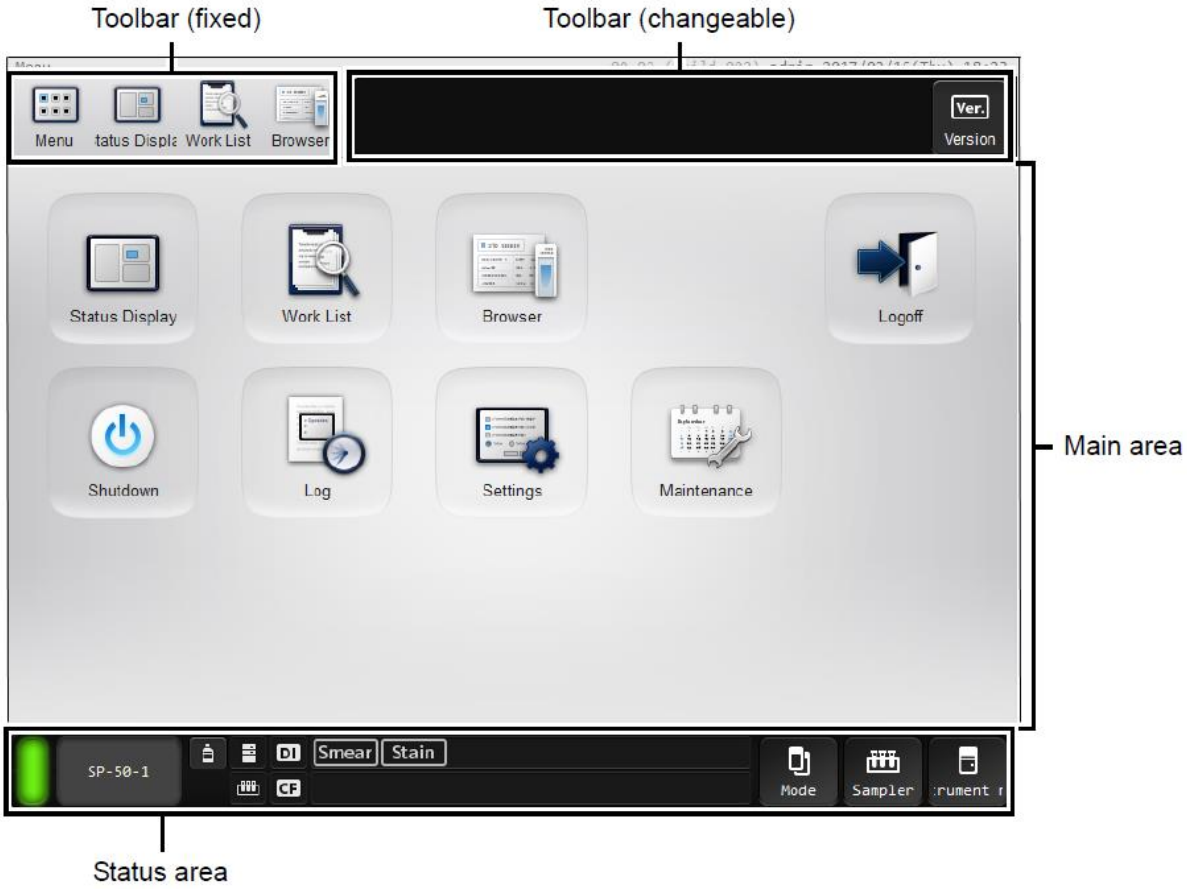
Cellular Component	Staining Principle
Proteins and Nucleic Acids	Both bind to the basic component of the stain. This results in a blue-violet or blue colour.
Haemoglobin	Has a high affinity for the more acidic components of the stain resulting in a red or orange colour.
Eosinophil Granules	Eosinophil granules have a basic components which have a strong affinity for acidic components of the stain resulting in a red or orange colour.
Basophil Granules	Basophil granules contain heparin which are strongly acidic and therefore have a strong affinity for the basic component resulting in dark purple colour.

Whichever combination of stains are used the process must be carried out at the correct pH. If the pH is too acidic the basophilic components appear too pink. If the pH is too alkaline conversely there is over staining as too much basic stain is taken up.

These reaction are also dependent on time as DNA binds to staining compounds more rapidly than RNA and Haemoglobin is even slower. As a results incorrect concentration of stains and/or timings will result in poor stains.

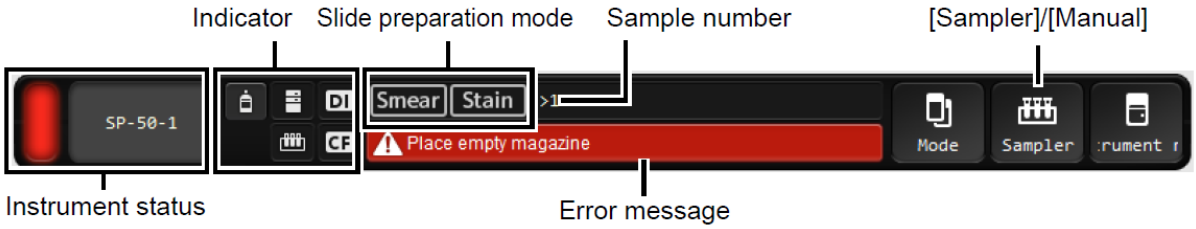
SP-50 – IPU Layout

Main Screen



Area	Function
Toolbar (fixed)	Most frequently used functions are displayed here.
Toolbar (Changeable)	Displays options that can be used in the currently displayed screen.
Main area	The various options and areas for use within the SP-50 are displayed here.
Status area	Displays the current status of the instrument. In addition, you can perform operations such as slide preparation and maintenance.

Status Area



Instrument Status

LED Indicator Light	Description
Green	Ready (Analysis or maintenance is possible)
Flashing Green	Starting up / Analysis in progress / Maintenance in progress
Orange	Sample analysis stopped / not possible. An error has occurred, but the instrument is still operational.
Flashing Orange	Starting up/Preparing a slide/Switching the slide preparation mode/ Shutting down/Sleeping
Red	Stopped - Error (without alarm) / initialising system / Analyser ready to be turned off at the end of shutdown
Flashing Red	Stopped - Error(with alarm)
Not Lit	Powered OFF

Indicator

The statuses of the instrument, connected reagents and peripheral devices are displayed by icons. If a reagent or device is not connected, an icon does not appear.

Icon	Indication
 Reagent Status	Touch to display the [Reagent Replacement] dialog box. Changes to orange when reagent volume is low. Changes to red when reagent has run out.
 Host	Changes to red if there is a connection error.
 DI-60	Present on analysers connected to the DI-60. Changes to red if there is a connection error.
 Sample	Changes to red if there is a sampler error.
 CF-70	Present on analysers connected to a CF-70. Changes to red if there is an error occurs.

Slide Preparation Mode

Displays the selected slide preparation mode.

Sample Number

Displays a sample number. [>] at the beginning of the sample number indicates that the instrument is ready to aspirate the next sample. If the sample number is not read, or if it has not been entered manually, a message is displayed to prompt the input of the number.

Sampler/Manual

Touch to register sample information and slide preparation conditions.
Select to display the [Manual Preparation] dialog box or [Sampler Preparation] dialog box.

The icon displayed varies depending on the selected slide preparation method and settings.

Display	Slide Preparation	Setting
	Sampler Preparation	N/A
	Manual Preparation	[Cap Open] is OFF
		[Cap Open] ON
		[RBT] is ON

Error Message

Displays the highest priority error among all current errors. DI-60 & CF-70 (if connected) errors are also displayed here.

Colour	Status
Orange background/black text	Caution
Red background/white text	Warning

Mode

Touch to select the slide preparation mode.

Quick Guide: Maintenance

Maintenance Key:
Instructions for Use (IFU) recommended maintenance in BLACK
Sysmex recommended maintenance (optional) in BLUE

As part of routine operation, maintenance must be performed on the SP-50 in order to maintain optimum instrument performance.

IMPORTANT: Failure to follow recommended maintenance protocols can lead to unnecessary downtime.

Execute maintenance according to the schedule below:

Maintenance task	
Daily Maintenance	Perform shutdown 1
	Wipe stain baths
Weekly Maintenance	Clean spreader glass
	Cleaning the smear/stain unit
	Cleaning the stain pool
Monthly Maintenance	Perform shutdown 2
As Required Maintenance	Loading glass slides
	Replacing spreader glass
	Replacing ink ribbon
	Replacing rinse
	Replacing reagents

Daily Maintenance

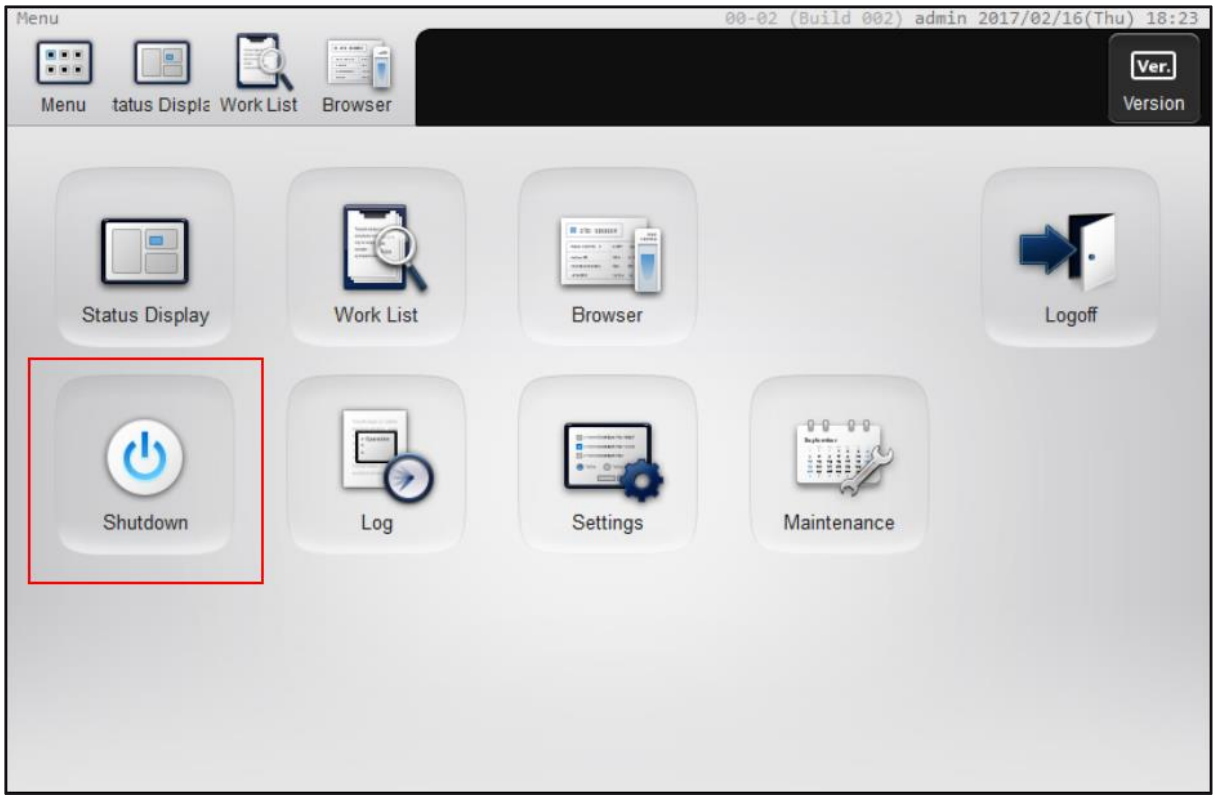
Performing Shutdown 1

Before commencing Shutdown 1 confirm the following:

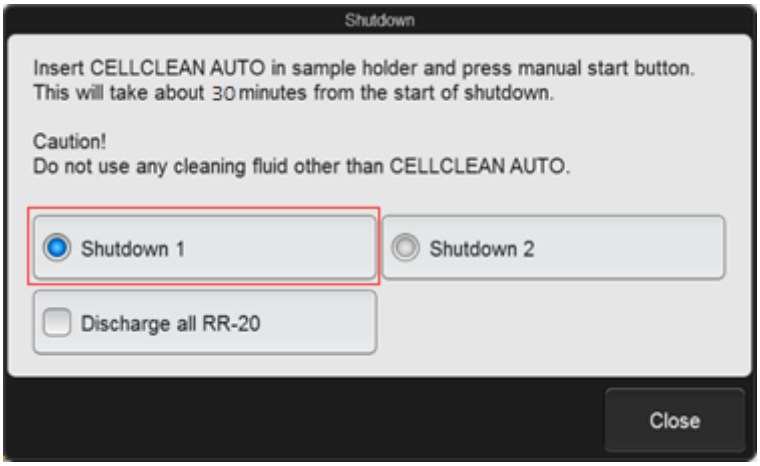
- Make sure that slide glass has been loaded. Replenish slide glass if not sufficiently loaded.
- Confirm an empty magazine is loaded in the manual magazine holder. Load an empty magazine if it is not loaded.
- Make sure that there are sufficient reagents available.
- If SP-50 is on the XN track, place the analyser into ‘offline’ mode.

To perform Shutdown 1:

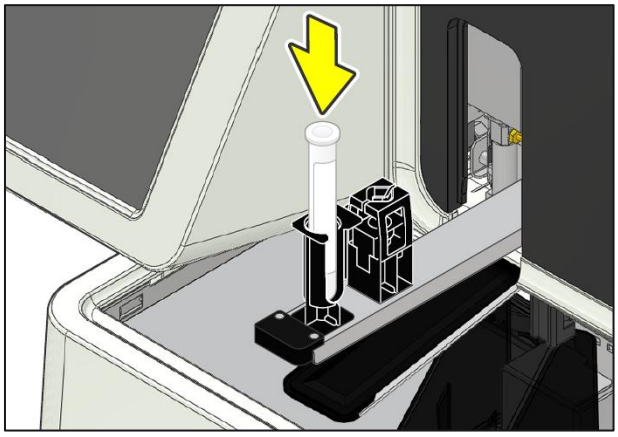
1. From the [Menu] select [Shutdown].



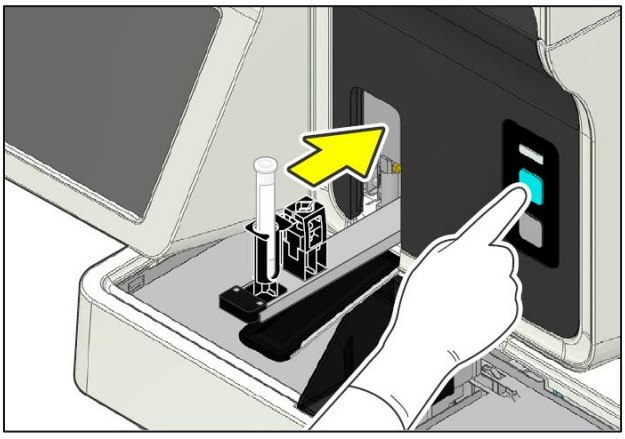
2. The Shutdown dialog box appears and the manual tube holder extends. Select [Shutdown 1].



3. Follow the instructions on the IPU - Place 4mL CELLCLEN AUTO into the tube holder (cap removed).



4. Press the Manual Analysis Start Switch. The sample tube holder retracts into the analyser and aspiration begins.

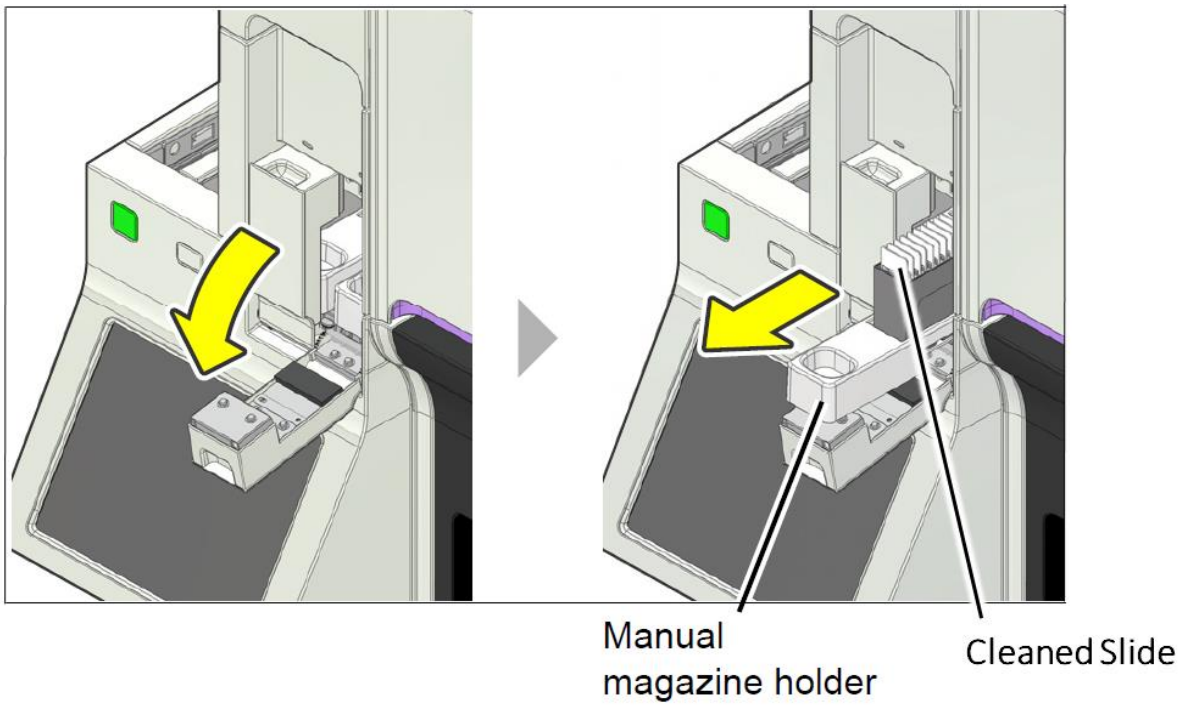


5. Shutdown 1 takes approximately 30 minutes depending upon the settings. The sample holder will eject forward once the CELLCLEAN AUTO aspiration finishes. Remove and discard CELLCLEAN AUTO tube once the sample holder ejects the empty tube. When all operations are finished, the sample holder automatically retracts into the main unit and the instrument shuts down.

6. Turn the instrument main power OFF using the main power switch located at the top of the analyser.

Note: If the CELLCLEAN AUTO is not removed before shutdown finishes, a notification that a sample tube remains in the sample holder will appear at the next startup.

7. Remove the slide glass used for cleaning. The cleaned slide will be stored in the magazine in the manual magazine holder.



Wipe Stain Baths

1. Moisten a paper towel with methanol/ethanol

2. Carefully wipe along the top of each stain bath to remove any debris present.

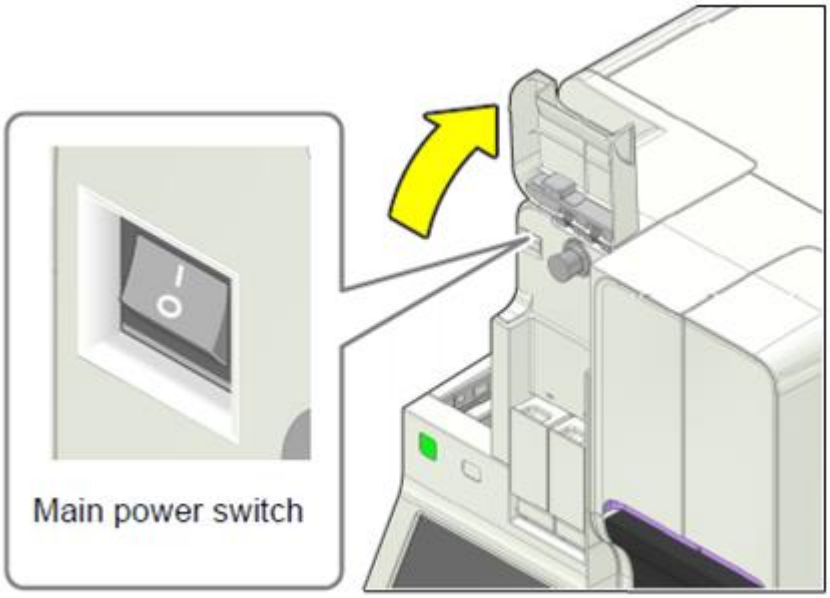
IMPORTANT: The wipe down of the top of the staining bath is to only be performed when the SP-50 is fully shutdown and is switched off to avoid the risk of injury

Performing Start-up

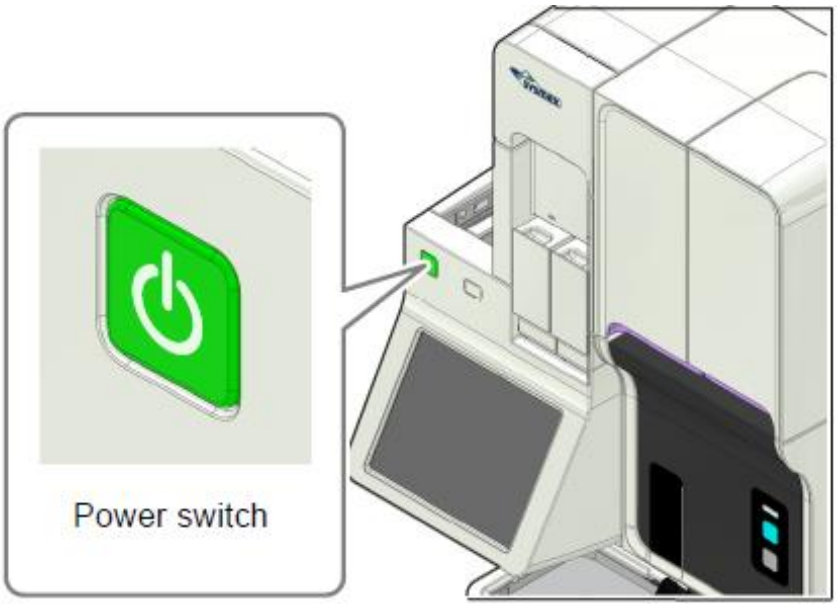
Before stating up the SP-50 check that all consumables are replenished.

To perform start-up:

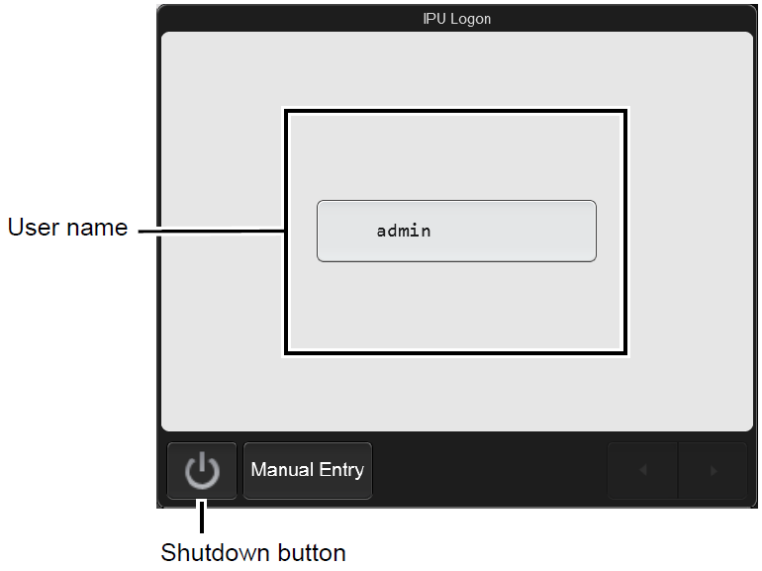
1. Make sure the main power switch is turned ON. If required, the main power switch can be kept on at all times.



2. Press the start-up power switch to start up the instrument.



3. The [IPU logon] dialog box will appear. Select the name of the user by touching the name on the screen. An onboard keyboard appears, enter the required password. Ordinarily the username is ‘admin’ and the password is ‘admin’.



4. Once logged on the analyser will perform a self-check. This is to determine if there are any errors on the analyser. The self-check takes approximately 20 minutes and performs the following tasks:

- Initialisation of the mechanical units.
- Rinsing of the hydraulic unit.
- Replenishment of the reagents.

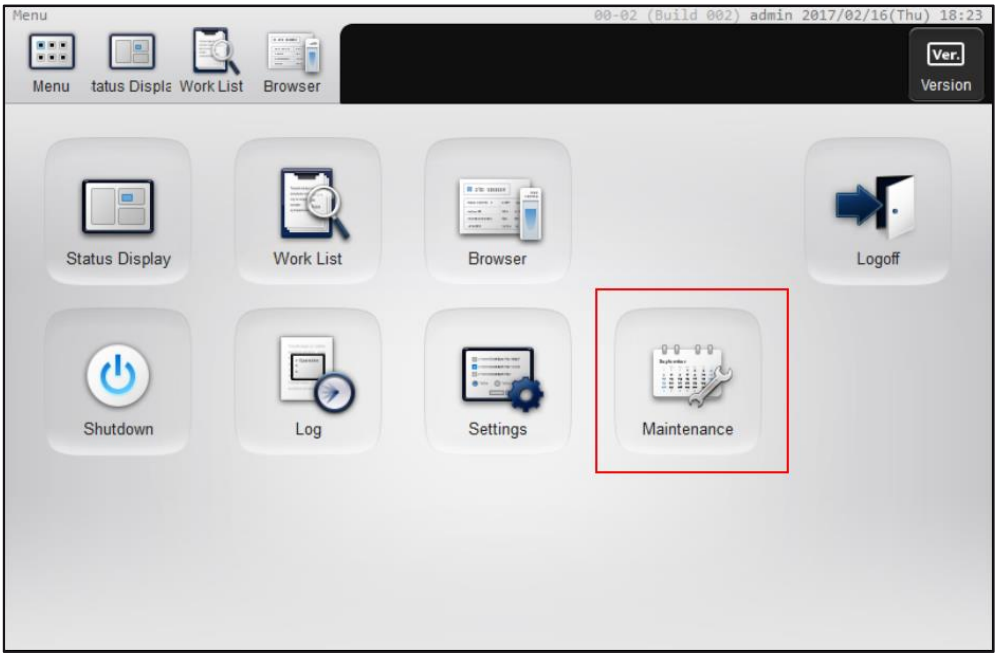
5. Once the self-check is complete the analyser will be ready for use.

Weekly Maintenance

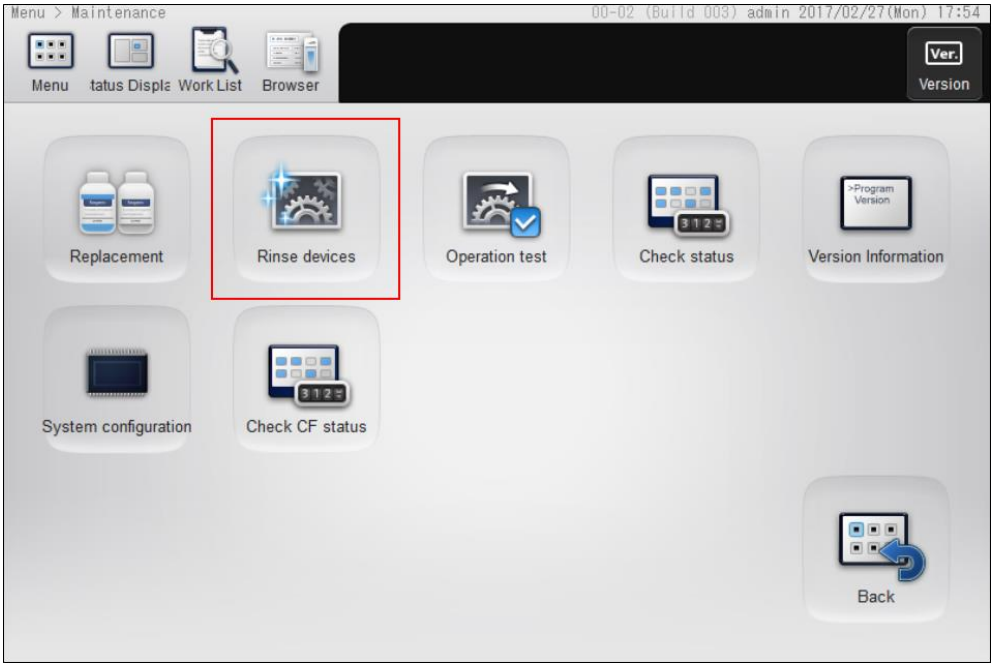
Cleaning the Spreader Glass

To perform cleaning of the spreader glass:

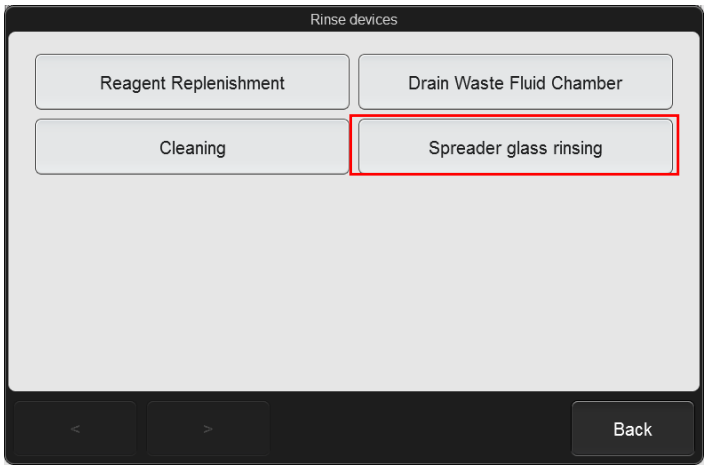
1. From the [Menu] select [Maintenance].



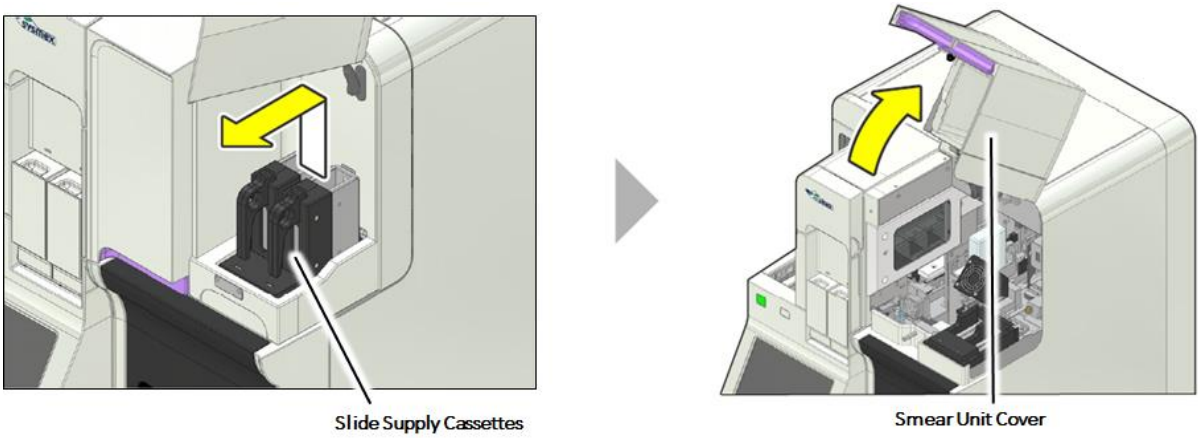
2. From the [Maintenance] menu select [Rinse devices].



3. The [Rinse device] dialog box will appear. Make sure the smear unit cover is closed and Select [Spreader glass rinsing] followed by [OK]. The smear unit will now move towards the front to an accessible position.

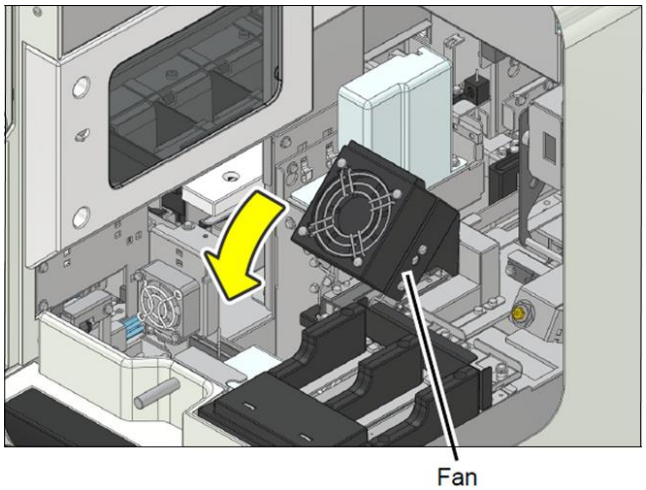


4. Open the slide unit cover and remove the slide supply cassettes. This will enable you to open the smear unit cover.

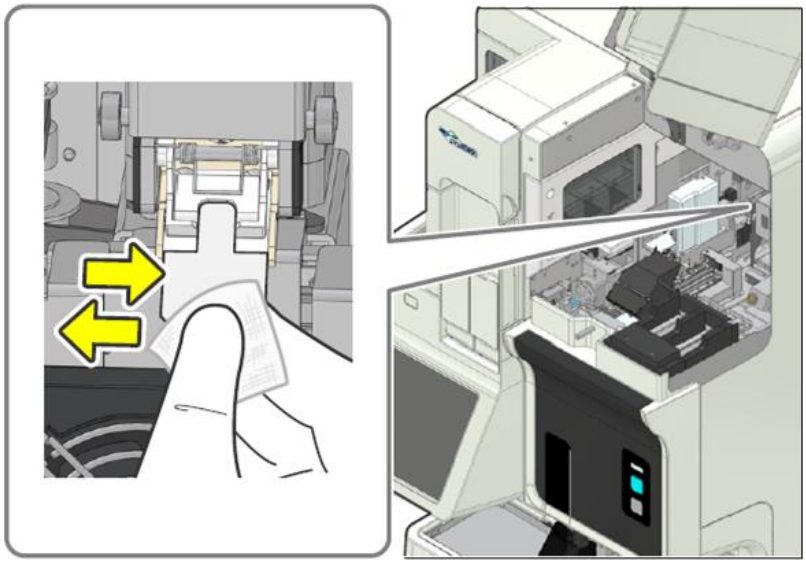


IMPORTANT: Be sure to open the all covers until they are locked in place.

5. Rotate the drying fan forward to gain access to the spreader glass.



6. Clean the surface of the spreader glass with gauze moistened with ethanol/methanol. If required, CELLCLEAN can be used to remove stubborn dirt.

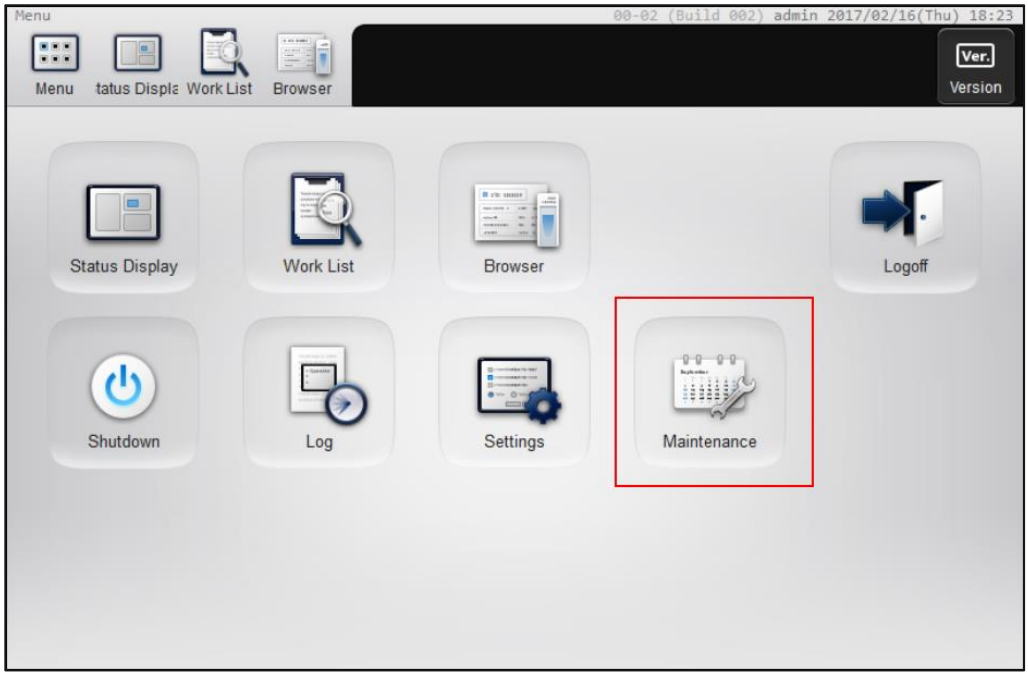


7. Once the clean is complete, restore all components back to their original position. On the IPU select [OK] to complete task.

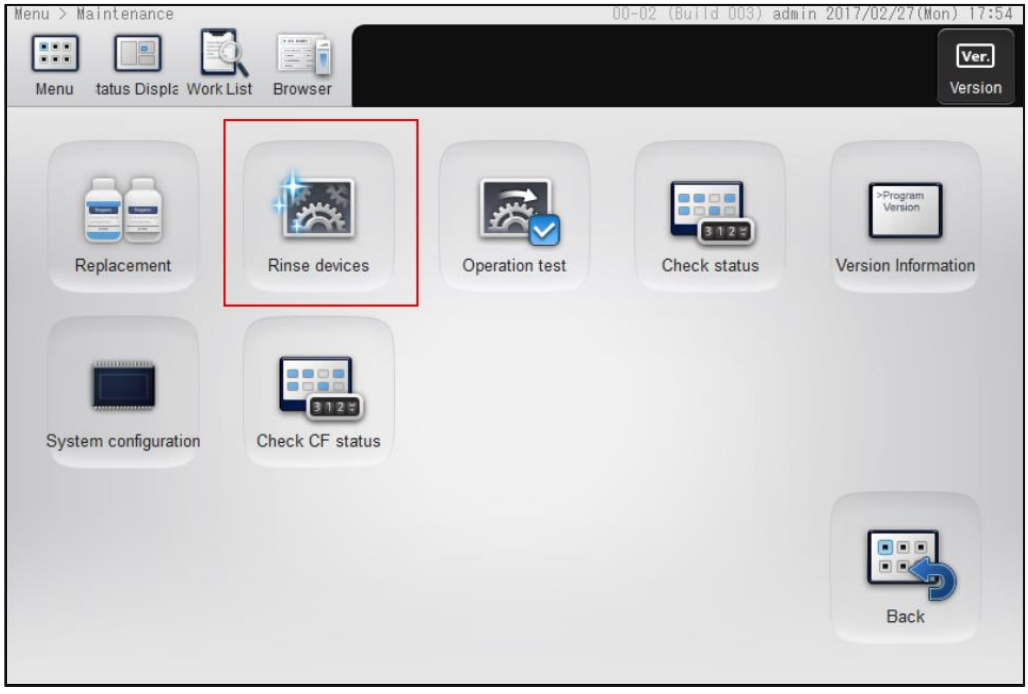
Cleaning the Smear/Stain Unit

To perform cleaning of the smear/stain unit:

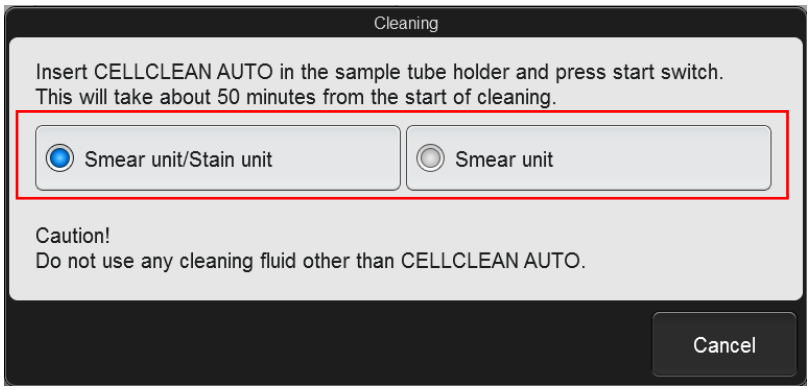
1. From the [Menu] select [Maintenance].



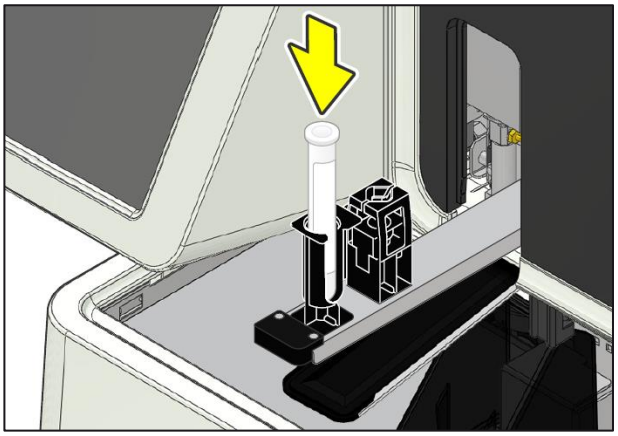
2. From the [Maintenance] menu select [Rinse devices] the [Cleaning].



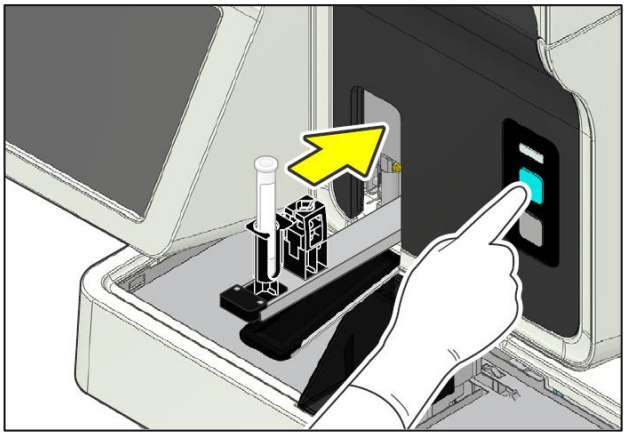
3. The [Cleaning] dialog box will appear and the manual tube holder extends. Select [Smear unit/Stain unit].



4. Follow the instructions on the IPU - Place 4mL CELLCLEN AUTO into the tube holder (cap removed).

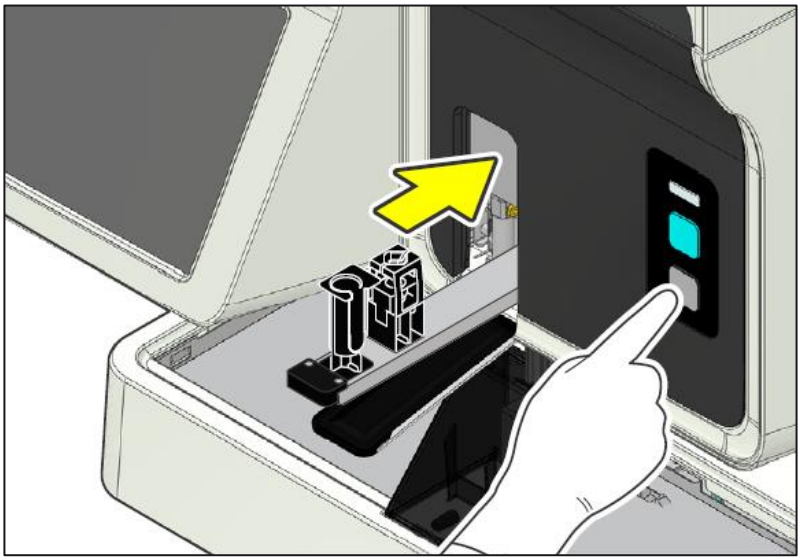


5. Press the Manual Analysis Start Switch. The sample tube holder retracts into the analyser and aspiration begins. When finished the holder is ejected forwards and the empty tube can be removed.



6. The time for cleaning is as followed: [Smear Unit/Stain Unit] approx. 50 minutes.

7. Once complete, press the mode switch on the main unit to retract the tube holder.



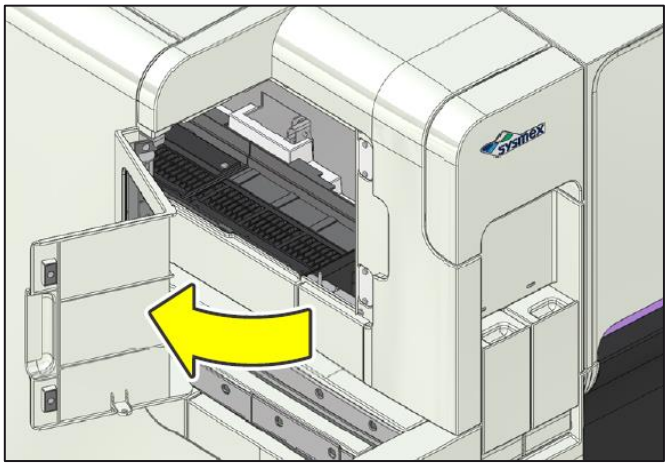
Cleaning the Stain Pool

On occasion the staining pool needs to be removed and cleaned to remove dirt or stain deposit. If using either methanol or ethanol **do not** soak for longer than 30 minutes as this could damage the staining pool.

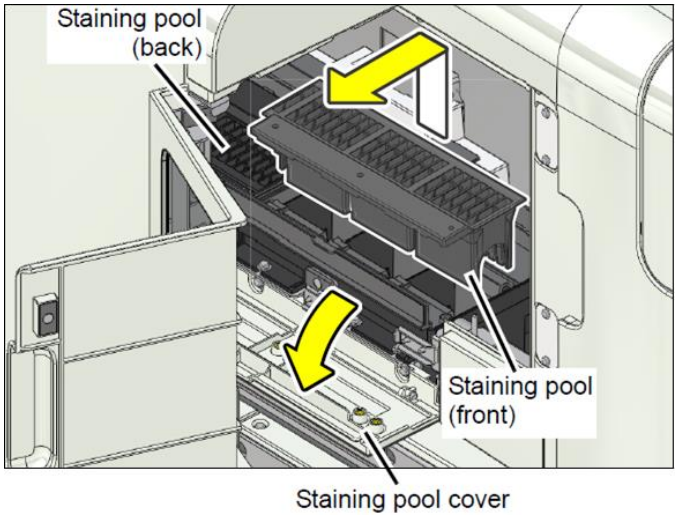
To clean the staining pool:

1. Perform [Shutdown 1] to power down the analyser before cleaning. Instruction of how to do this can be found in the [Daily Maintenance] section of this workbook.

2. Once the analyser has been shutdown, open the stain unit cover to gain access to the staining pools.



3. Pull the staining pool cover down and lift and remove the staining pools. Remove both pools, front & back.



4. Clean the staining pool by soaking it in a rinse solution (Methanol, ethanol or lukewarm water). Make sure the staining pool is completely dry before placing back into the analyser.

5. Once dry, reinstall the staining pool and restore all affected components back to their original position.

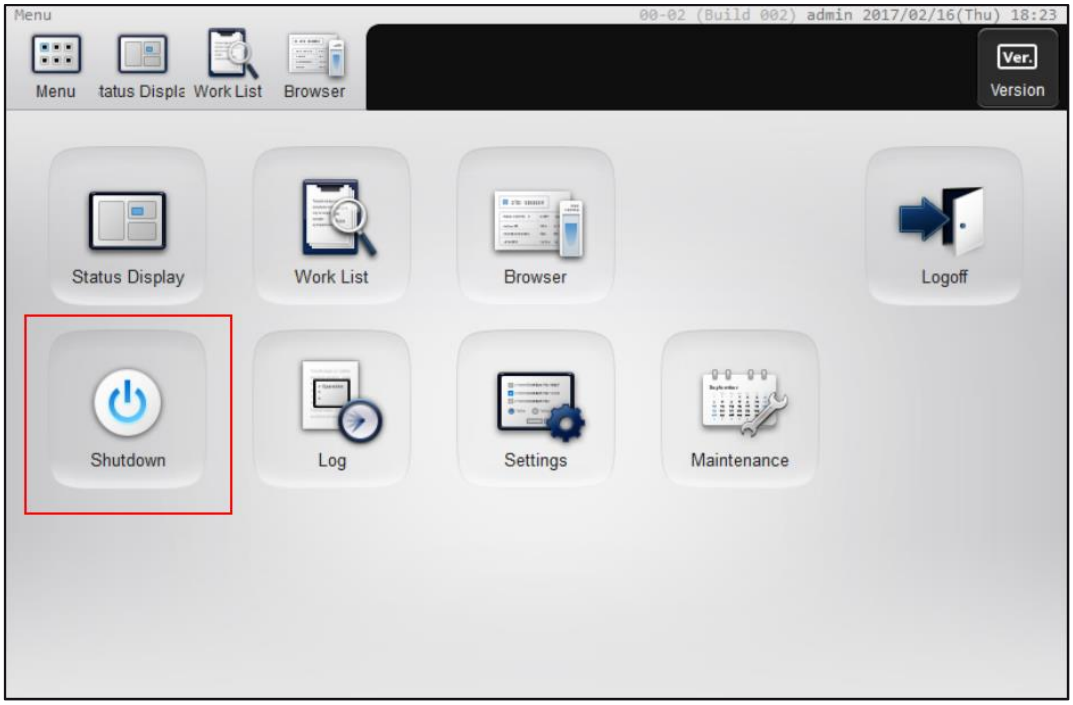
Monthly Maintenance

Performing Shutdown 2

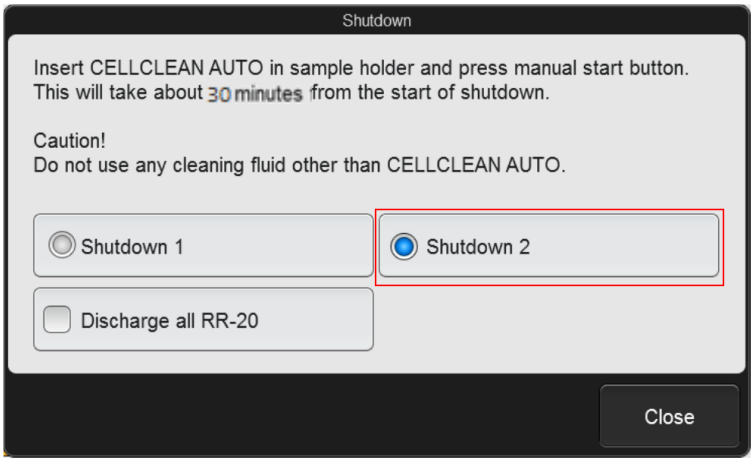
Perform Shutdown 2 once a month or when instrument will not be in use for 1 week or more.

To perform Shutdown 2:

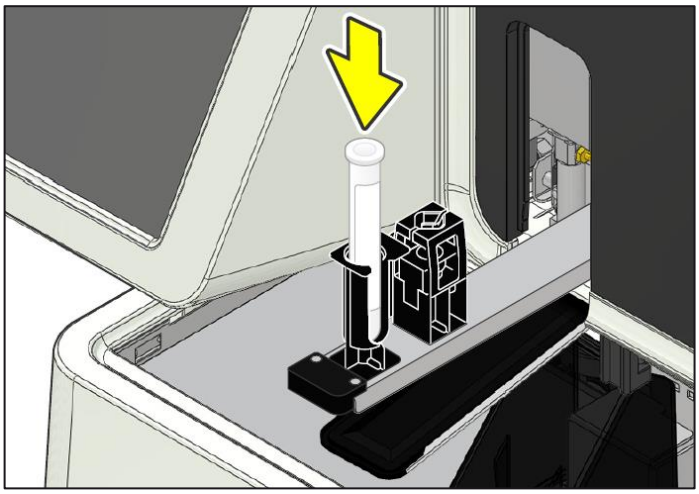
1. From the [Menu] select [Shutdown].



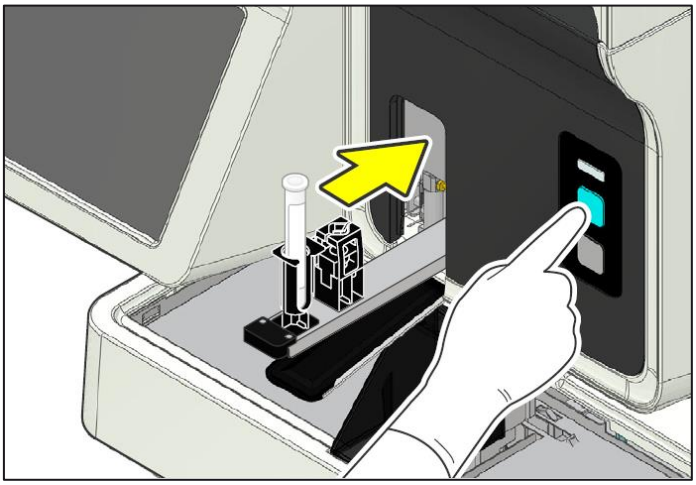
2. The Shutdown dialog box appears and the manual tube holder extends. Select [Shutdown 2].



3. Follow the instructions on the IPU - Place 4mL CELLCLEN AUTO into the tube holder (cap removed).



4. Press the Manual Analysis Start Switch. The sample tube holder retracts into the analyser and aspiration begins.

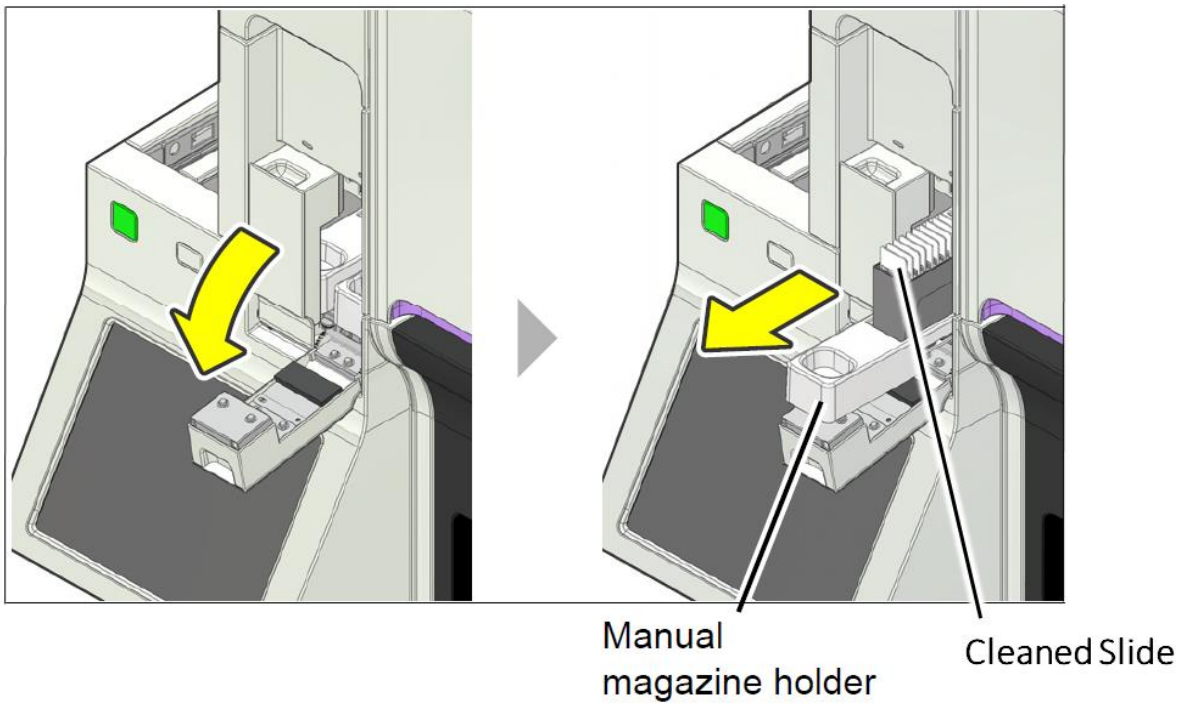


5. Shutdown 2 takes approximately 30 minutes depending upon the settings. The sample holder will eject forward once the CELLCLEAN AUTO aspiration finishes. Remove and discard CELLCLEAN AUTO tube once the sample holder ejects the empty tube. When all operations are finished, the sample holder automatically retracts into the main unit and the instrument shuts down.

6. Turn the instrument main power OFF using the main power switch located at the top of the instrument. Leave the instrument off for at least **2 hours** before performing the start-up.

Note: If the CELLCLEAN AUTO is not removed before shutdown finishes, a notification that a sample tube remains in the sample holder will appear at the next startup.

7. Remove the slide glass used for cleaning. The cleaned slide will be stored in the magazine in the manual magazine holder.



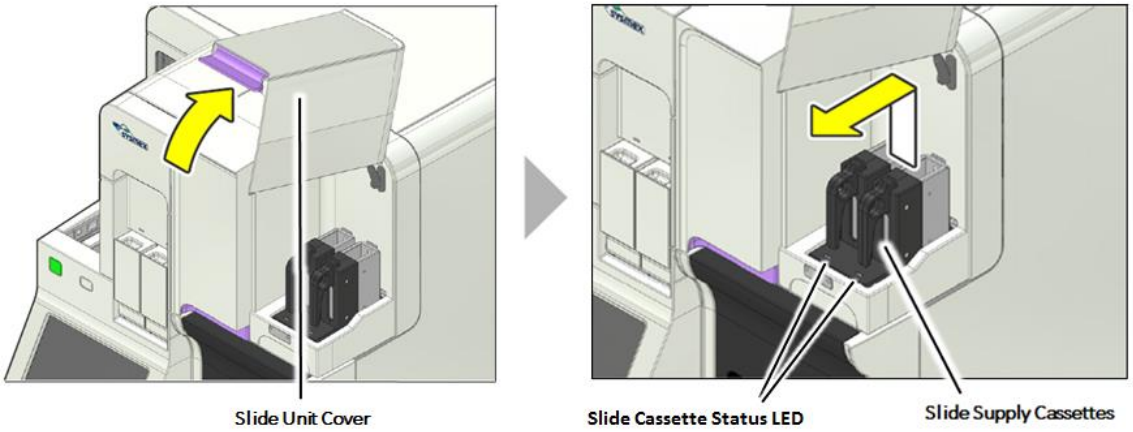
8. Perform Start-up procedure as per Shutdown 1.

As Required Maintenance

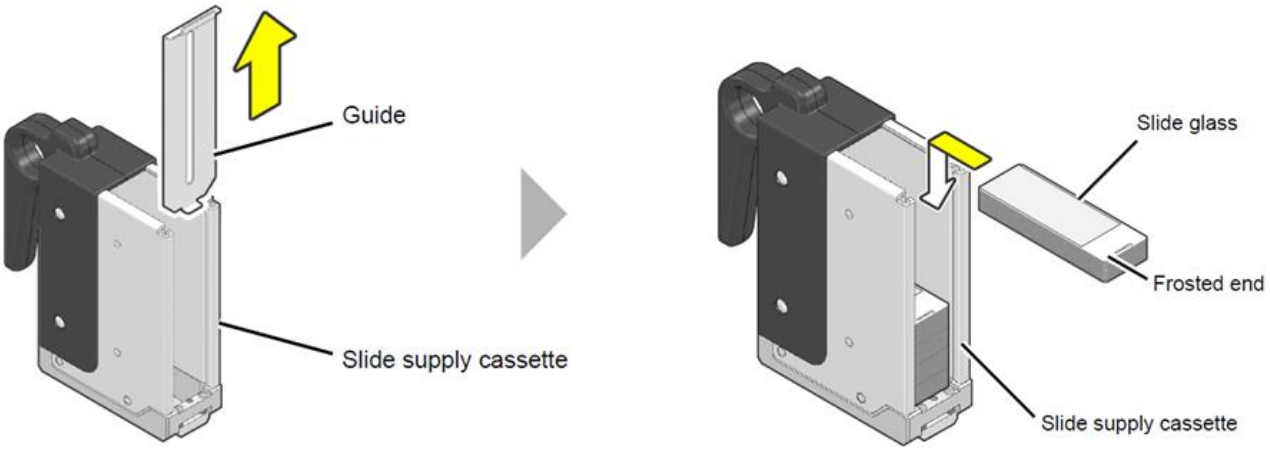
Loading Glass Slides

To load the glass slides:

1. Open the slide unit cover and remove the slide supply cassettes. Before removing, make sure that the slide cassette status LED is either Green or red.



2. Remove the slide supply cassette guide and load in the new slides. Load the glass slides so that the frosted end faces upwards and is positioned toward the 'guide end' of the cassette, opposite end to the handle.

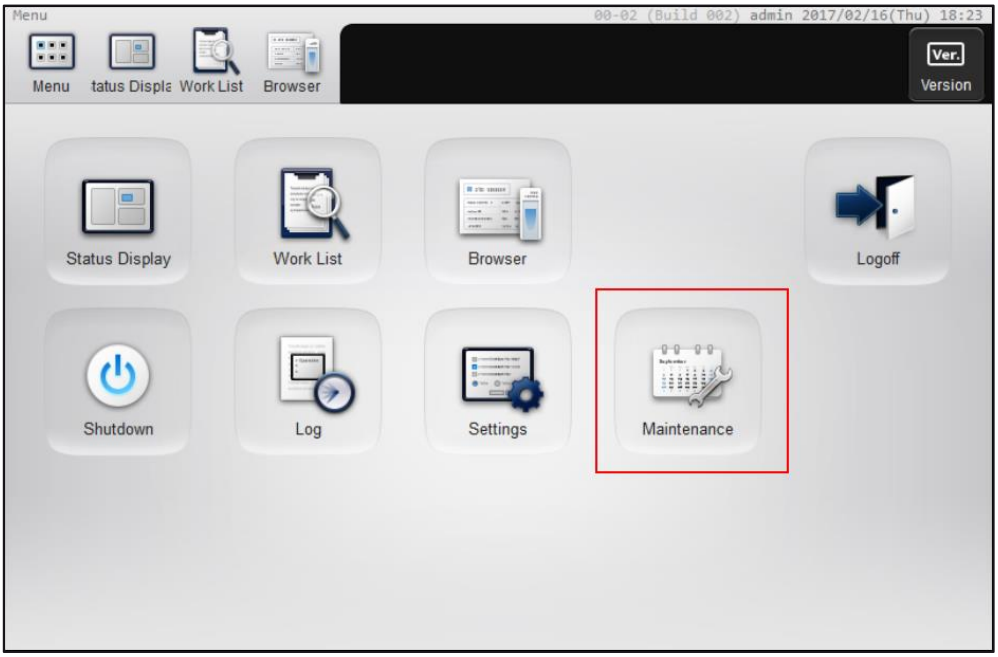


3. Replace the slide supply cassette guide, load the slide cassettes back into the slide supply unit and close the slide unit cover.

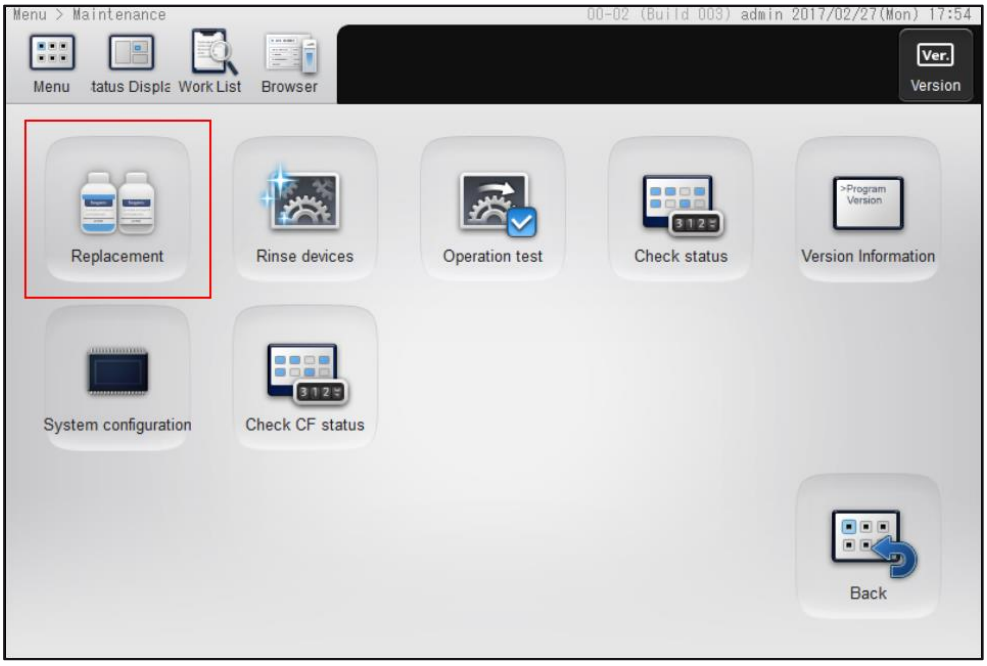
Replace Spreader Glass

To replace the spreader glass:

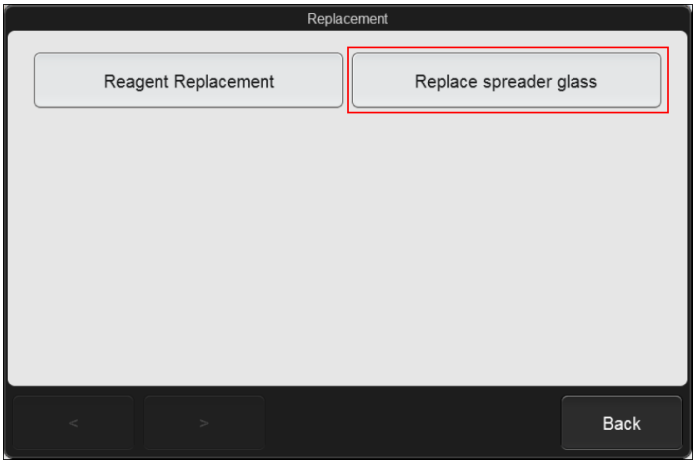
1. From the [Menu] select [Maintenance].



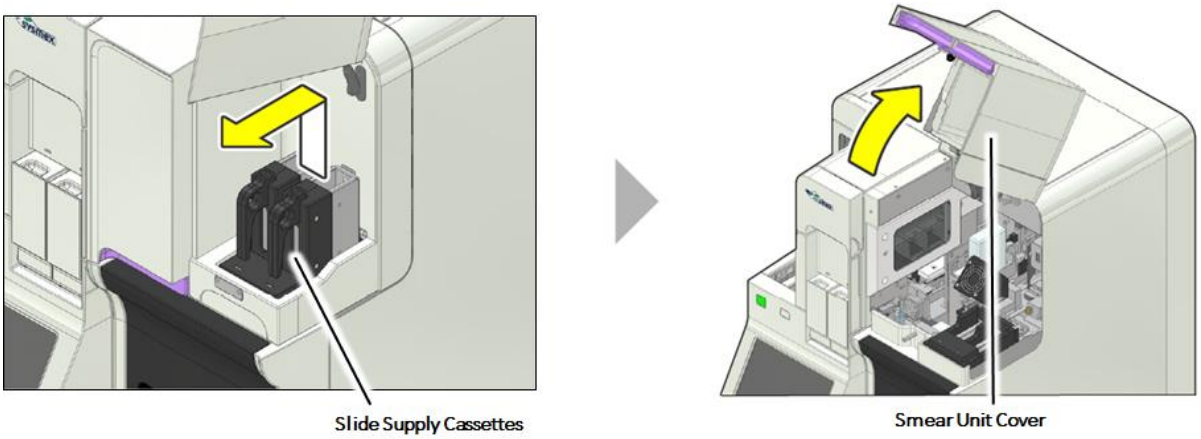
2. From the [Maintenance] menu select [Replacement].



3. The [Replacement] dialog box will appear. Make sure the smear unit cover is closed and select [Replace spreader glass]. The smear unit will now move towards the front to an accessible position.

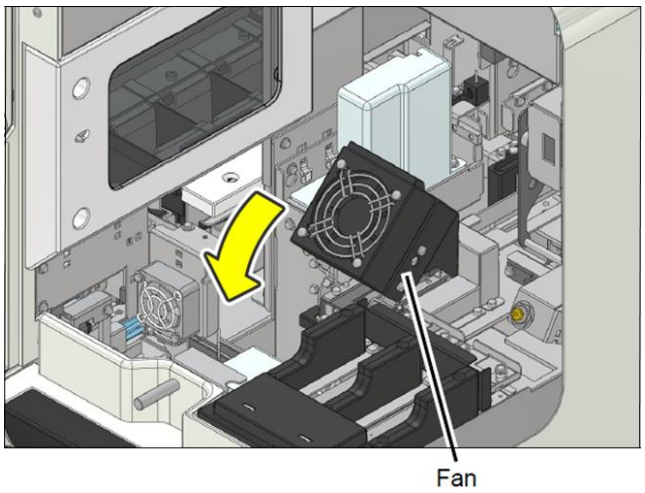


4. Open the slide unit cover and remove the slide supply cassettes. This will enable you to open the smear unit cover.

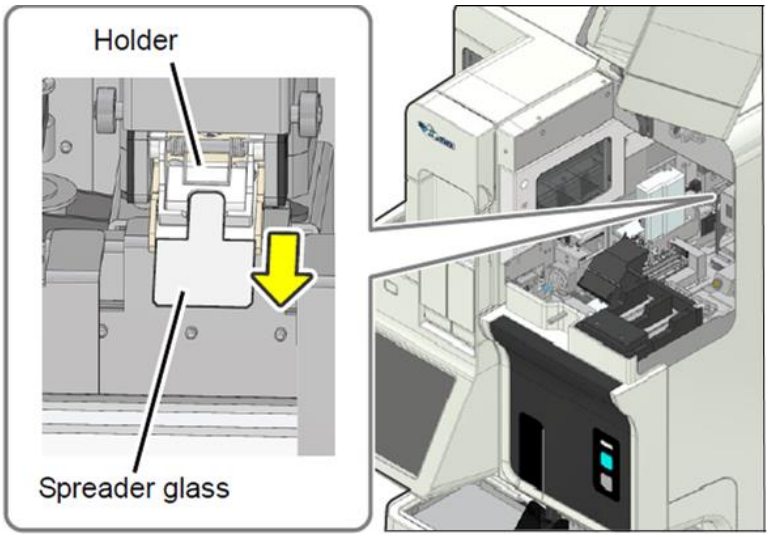


IMPORTANT: Be sure to open the all covers until they are locked in place.

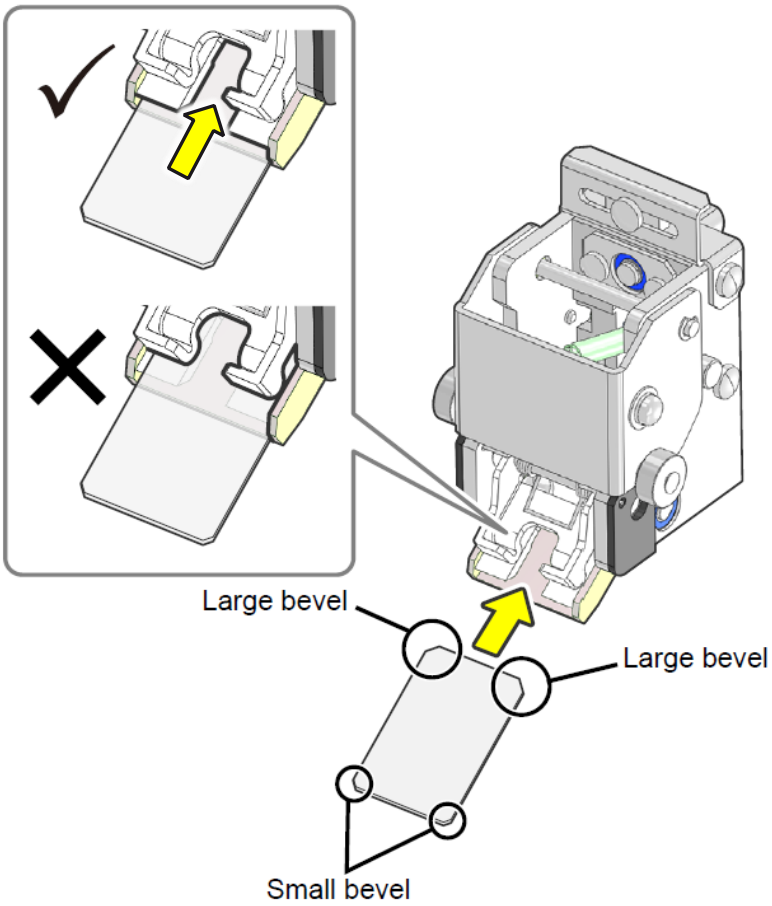
5. Rotate the drying fan forward to gain access to the spreader glass.



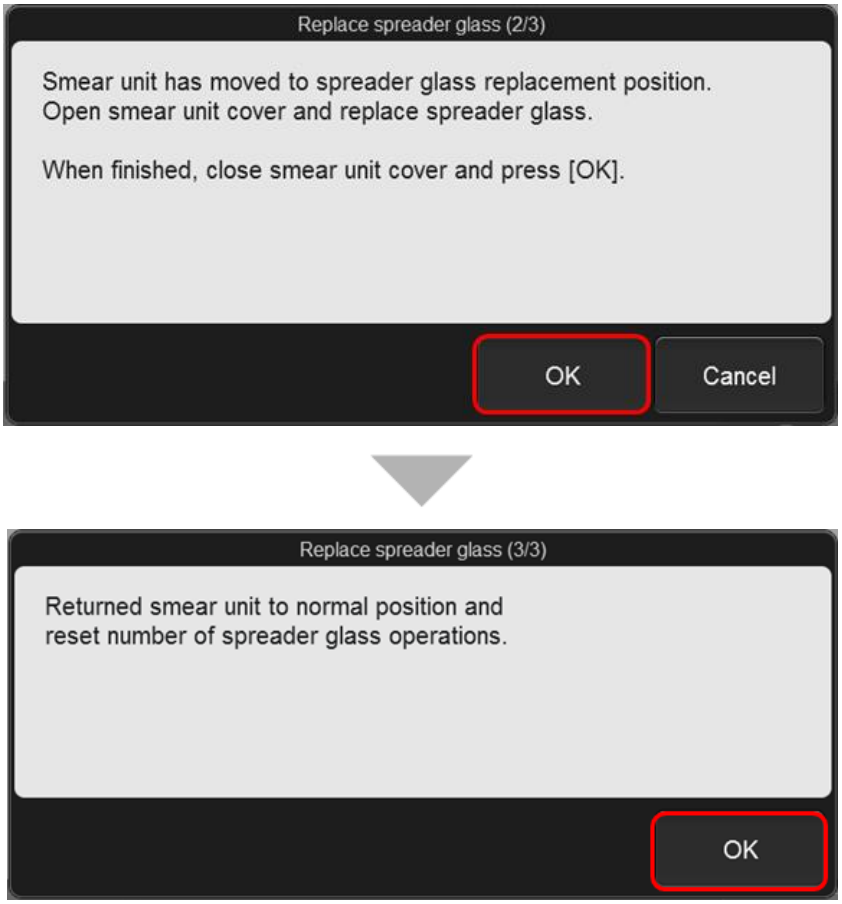
6. Remove the spreader glass from the holder by gently pulling it forward.



7. Set the new spreader glass in the holder. Set the spreader glass so that the edge with the small beveled edges faces forward. Insert the spreader glass all the way into the spreader glass holder until it stops.



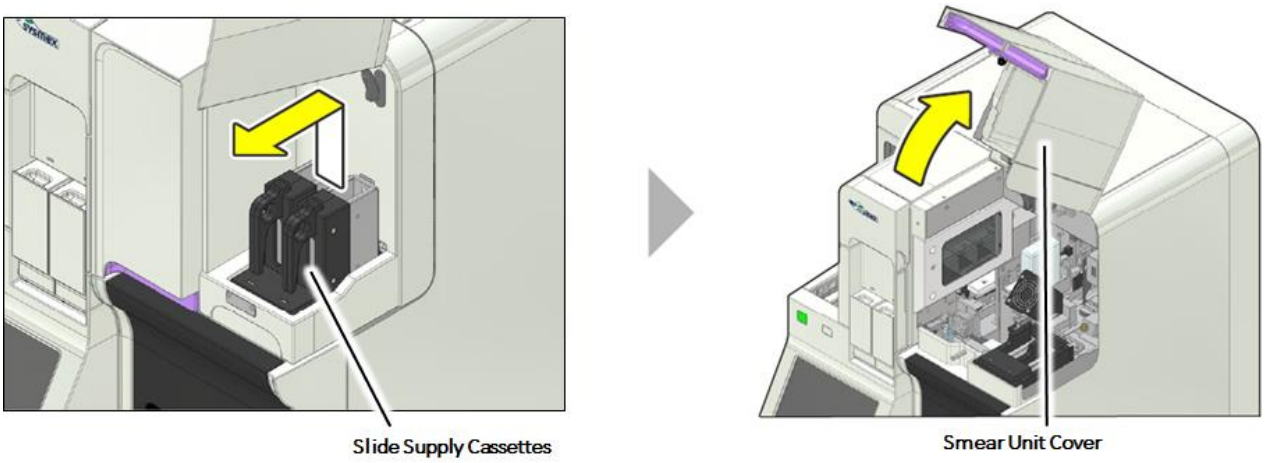
8. Once the spreader glass has been replaced, restore all affected components back to their original position. On the IPU, select [OK] on the spreader glass operation count followed by [OK]. This will reset the counter.



Replacing Ink Ribbon

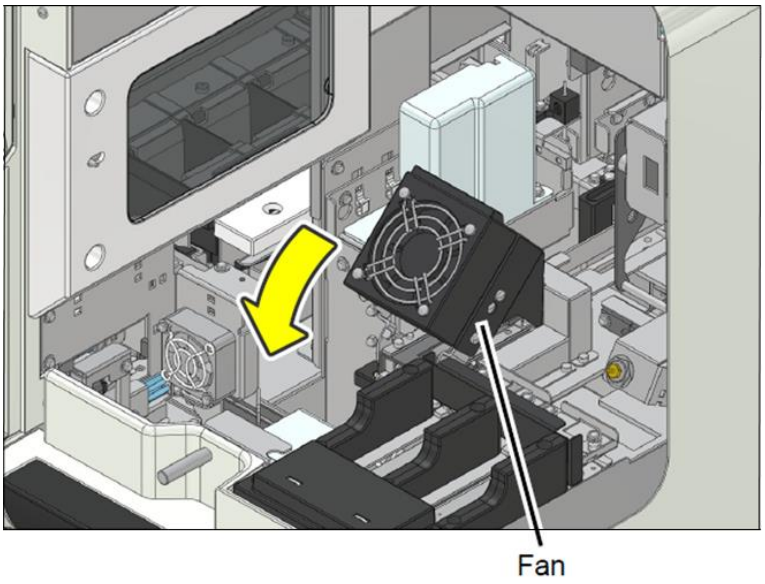
To replace the ink ribbon:

1. Open the slide unit cover and remove the slide supply cassettes. This will enable you to open the smear unit cover.

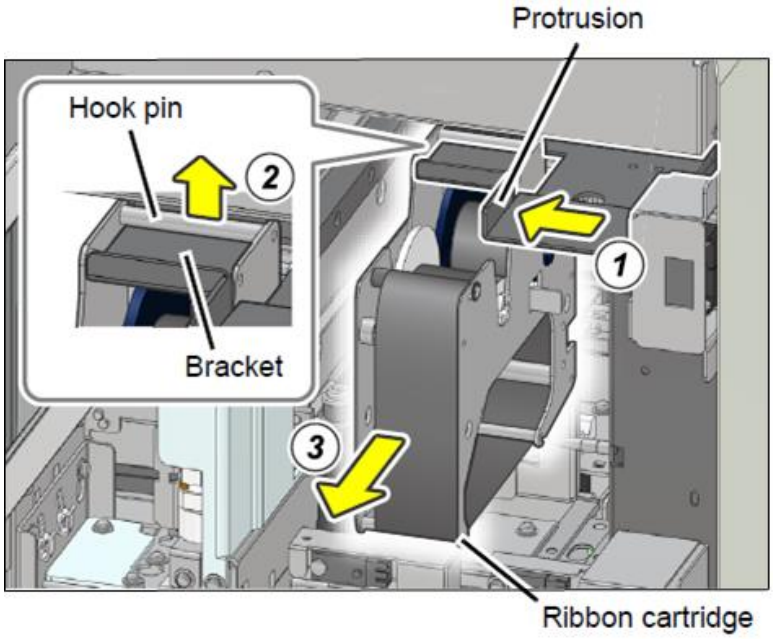


IMPORTANT: Be sure to open the all covers until they are locked in place.

2. Rotate the drying fan forward to gain access to the ink ribbon.

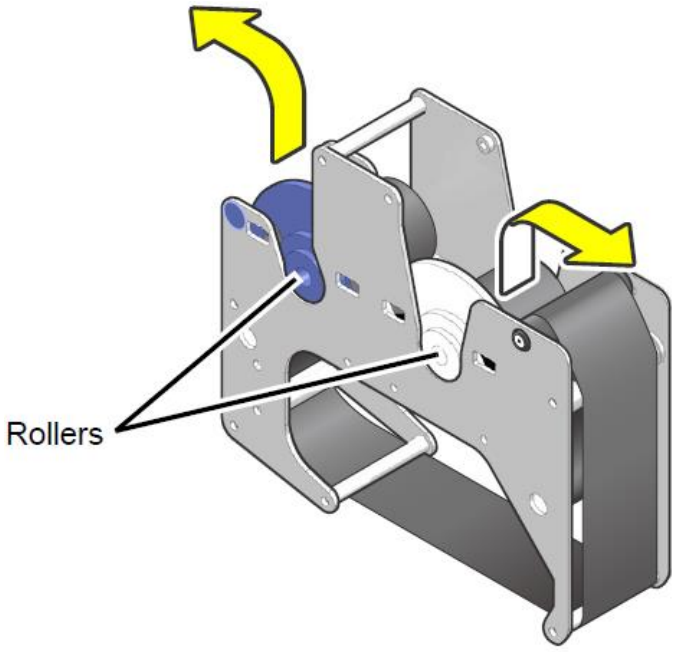


3. Remove the ink ribbon cartridge from the bracket as shown in the diagram below:

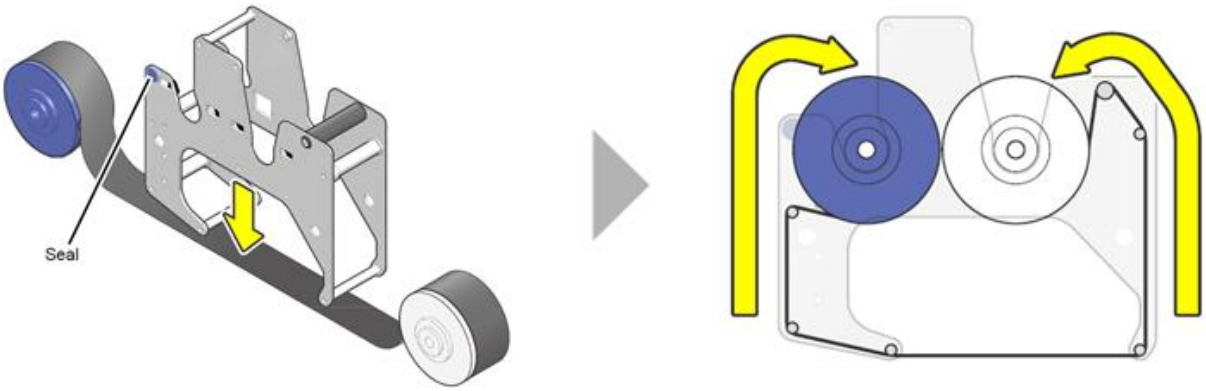


(1) Pull the protrusion slide the bracket to the left to move the ribbon to the removal position.
(2) Lift the ribbon and remove the hook pin from the bracket.
(3) Remove the ribbon cartridge.

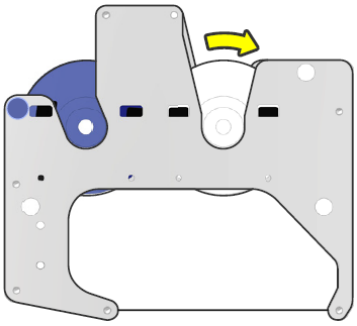
4. Remove the ink ribbon by lifting both rollers out from the ribbon cartridge.



5. Replace the ink ribbon making sure the ink side of the ribbon faces down. Place the blue roller on the side with the seal with the white roller on the opposite side.

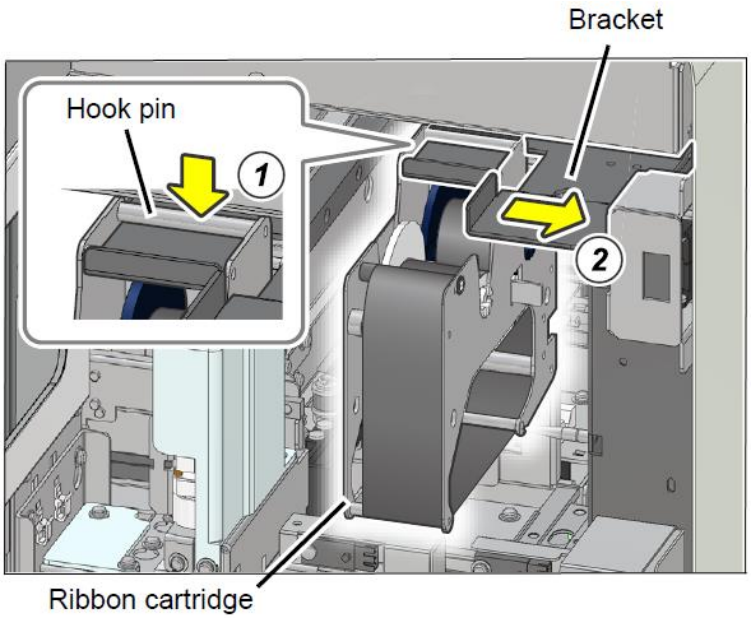


6. Before loading, wind the white roller in the direction shown to remove in slack in the ribbon.



7. Install the ink ribbon cartridge as shown in the diagram below:

(1) Attach the ribbon to the hook pin on the bracket.
(2) Slide the bracket back to the right to load the ink ribbon cartridge.

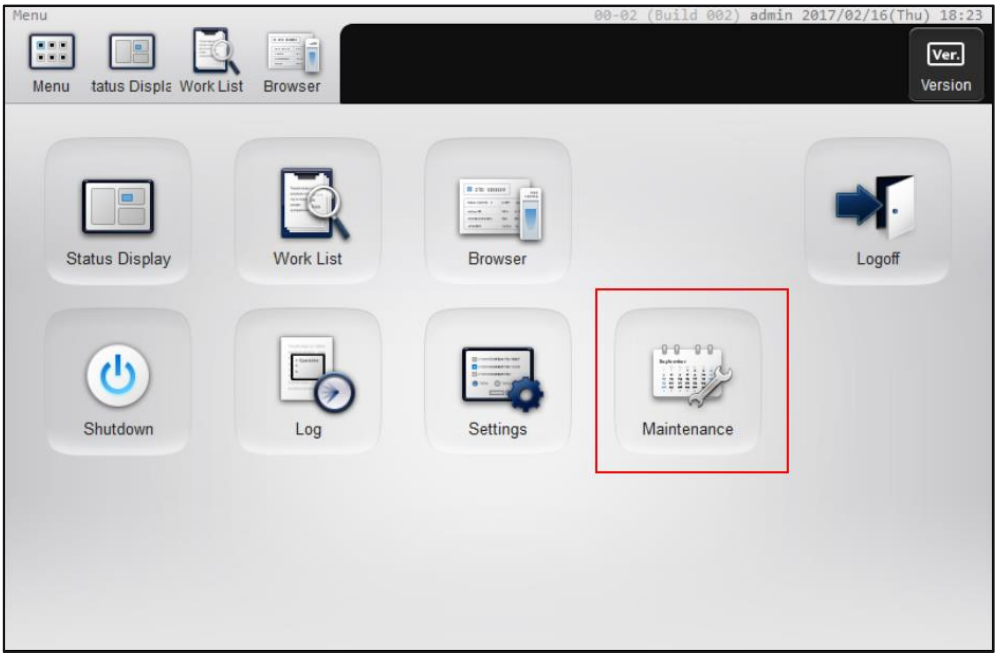


8. Once the ink ribbon has been replaced, restore all affected components back to their original position.

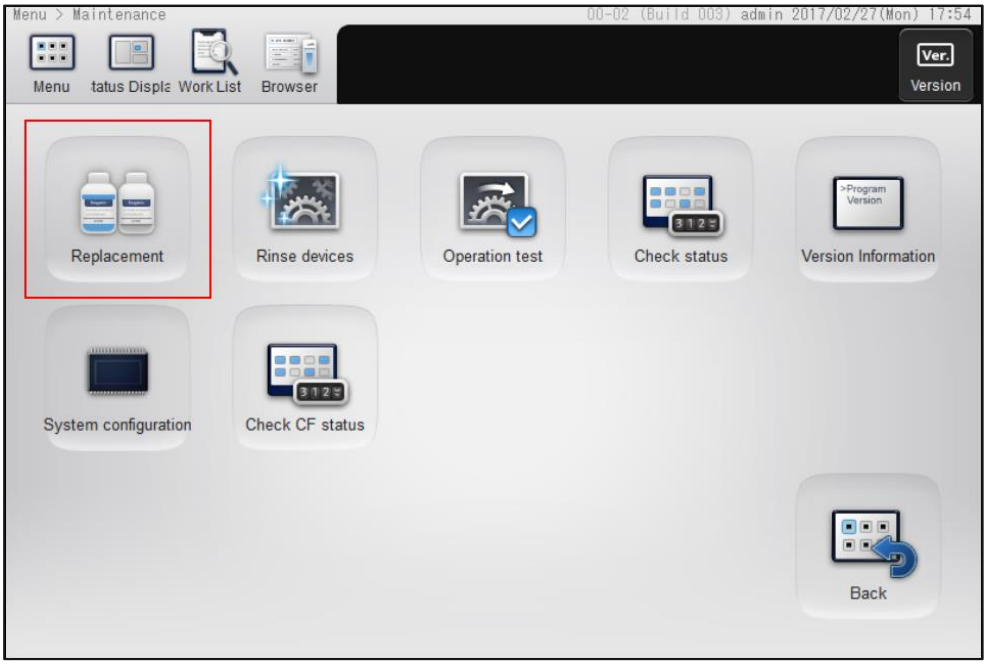
Replacing Reagents – CellPack DCL, Stains & Buffer Solution

To replace the CellPack, Stains and Buffer reagents on the SP-50:

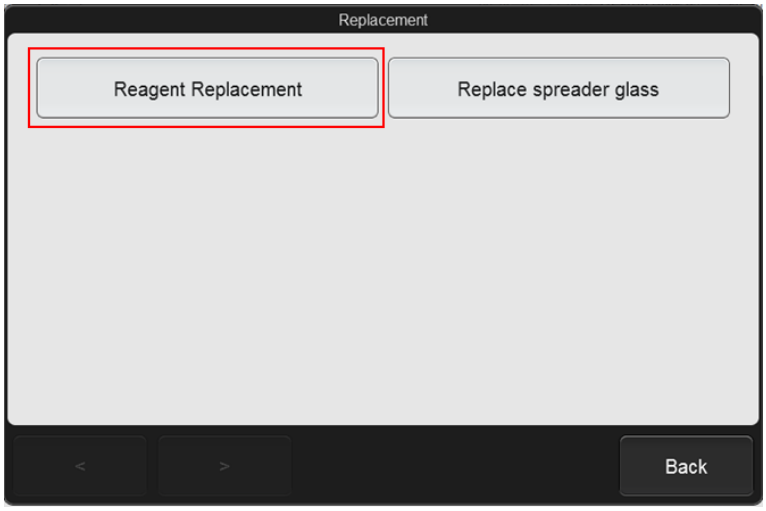
1. From the [Menu] select [Maintenance].



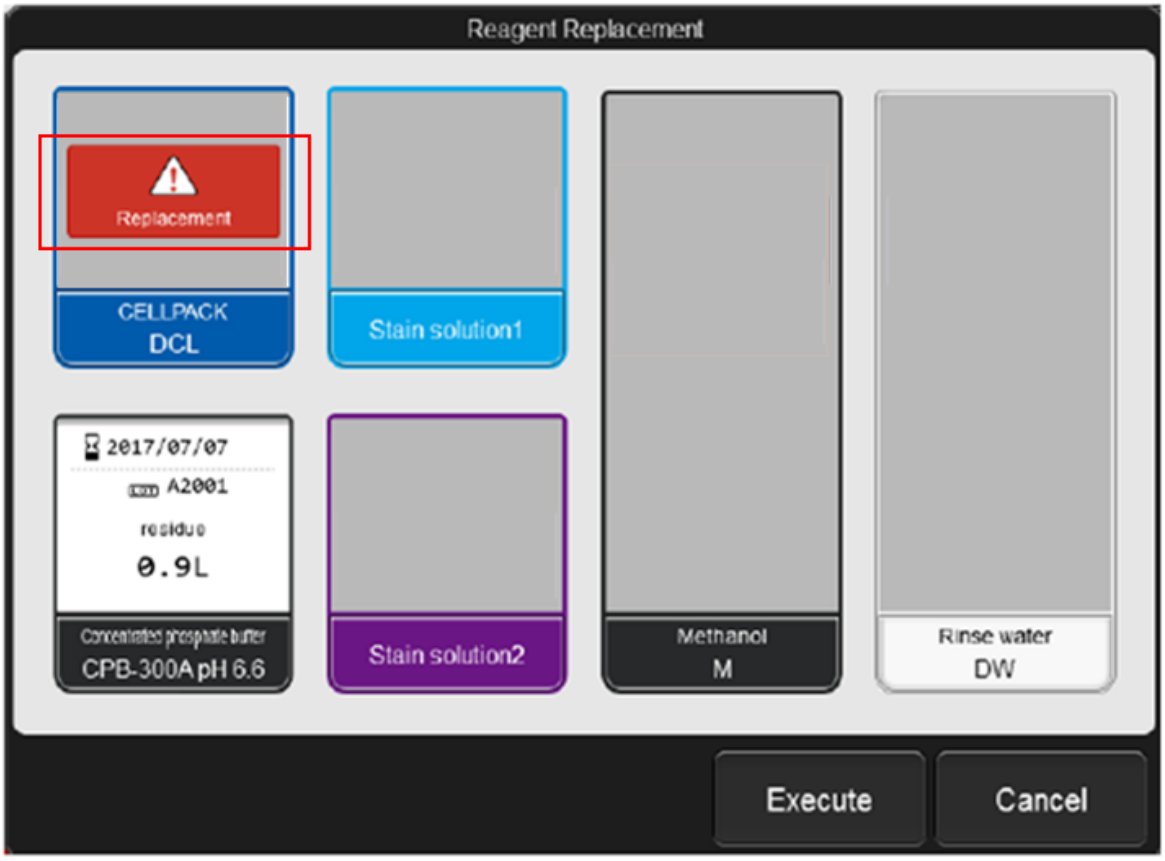
2. From the [Maintenance] menu select [Replacement].



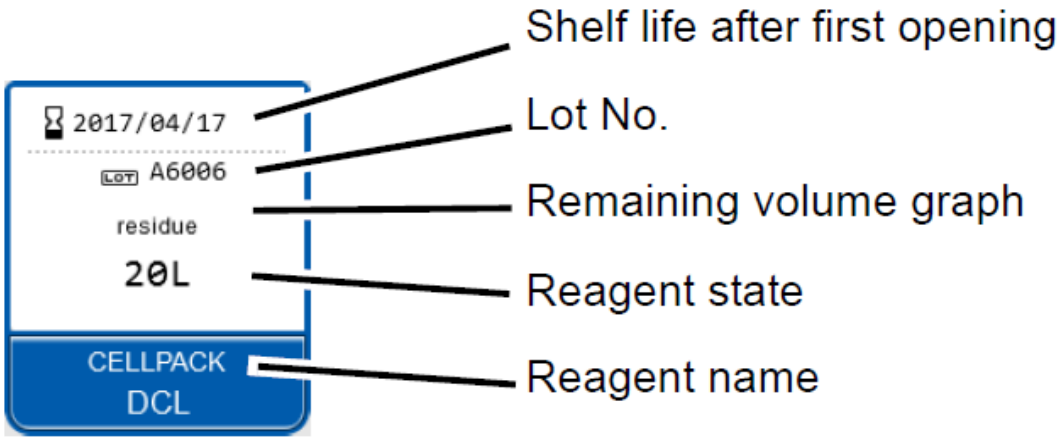
3. The [Replacement] dialog box will appear. Select [Reagent Replacement].



4. The [Reagent Replacement] dialog box will appear. A red warning triangle will be displayed indicating which reagent requires replacing.



5. The [Reagent Replacement] dialog box displays the reagent information and remaining volume.

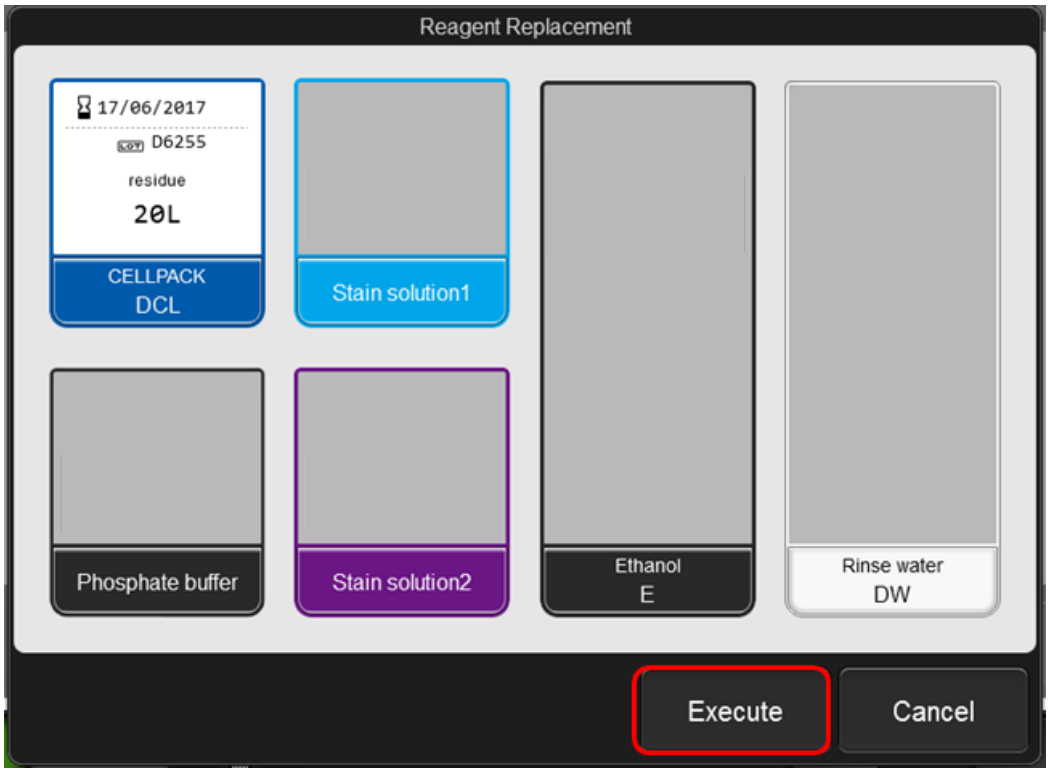


Reagent Information	
Shelf life after first opening	Displays the shelf life of the reagent after it has been opened. This is not displayed if the reagent has not been registered. When the shelf life after first opening has expired, it is displayed in white letter on a red background
Lot Nº	Displays the lot number of the reagent
Remaining volume graph	The remaining CELLPACK DCL and concentrated phosphate buffer reagent appears as a graph.
Reagent state	For CELLPACK DCL and concentrated phosphate buffer, the reagent level is shown. When the reagent runs low, the background becomes yellow. During CELLPACK DCL replacement, progress is indicated as "0 to 100 %"
Reagent name	Displays the reagent name

6. Input the new reagent information by scanning the barcode on the outer box/container of the new reagent. You can also enter the reagent code manually by selecting the reagent required and entering the information using the onboard keypad. If changing manually, make sure the [Replace the reagent] box is ticked.

7. When the correct reagent information has been entered the red warning triangle will be replaced by a green tick.

8. Remove the old container and replace it with the new reagent. Select [Execute] to prime the new reagent. Once complete the [Reagent Replacement] dialog box closes.



Replacing Methanol

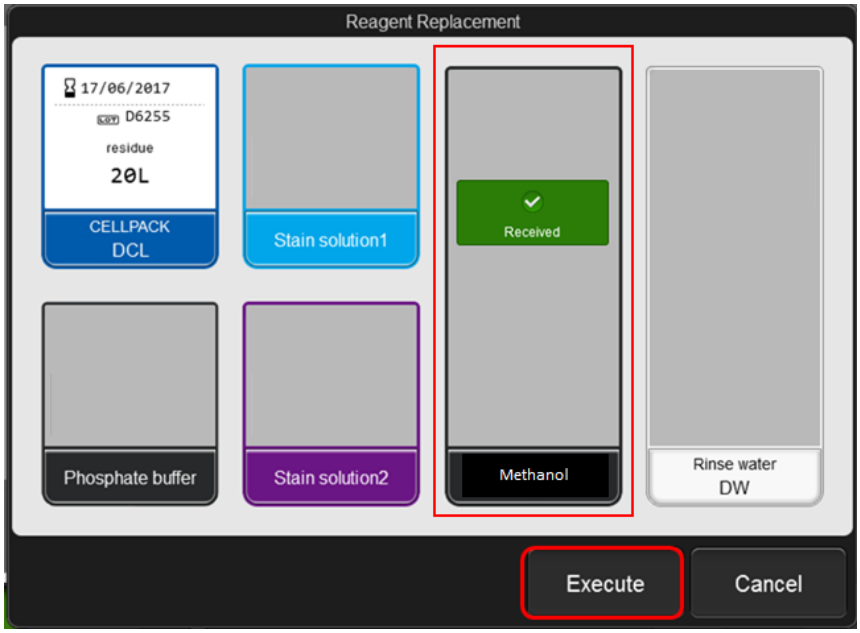
To replace the methanol on the SP-50:

1. Remove the cap from the container and discard any residual reagent. When removing the float switch take care not to touch the end or place it on a dirty surface.

2. Fill the container with Methanol to the desired level and replace the cap and float switch.

3. Display the [Reagent Replacement] dialog box.

4. Select [Methanol] followed by [Execute]. Reagent replenishment will now start, once complete the [Reagent Replacement dialog box will update.



5. When finished, select [Cancel] to close dialog box.

Quick Guide: Running Samples

Sample Preparation

There are 2 methods of preparing a slide on the SP-50, sampler preparation and manual preparation.

Sampler Preparation

Sample tubes with the cap closed are placed in a sample rack and loaded on the instrument. All steps from sample mixing to smear preparation are performed automatically. You can place up to 50 samples in the sampler at a time.

Manual Preparation

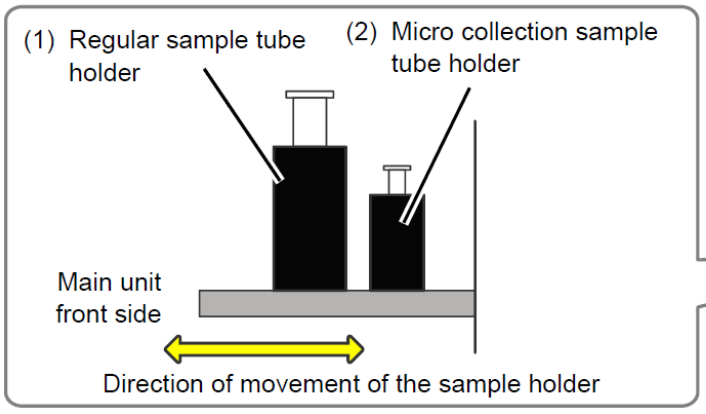
Use this method for urgent samples or samples that have volume that is not sufficient for the system / rack mode. Samples **must be mixed manually** by inversion before analysis.

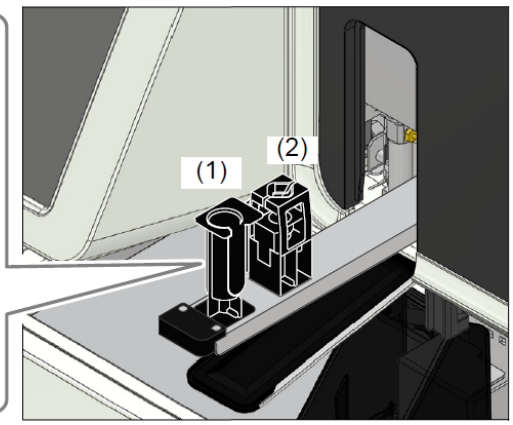
Mode	Sampler	Manual	Description
 [Smear & Stain] Mode	✓	✓	Use this mode when you want to print sample information and perform sample smear & stain.
 [Smear] Mode	✓	✓	Use this mode when you want to print sample information and perform sample smear only.
 [Staining] Mode	X	✓	Use this mode when you want to stain a smear sample that has been manually prepared.
 [Print] Mode	X	✓	Use this mode when you only ant to print sample information onto a glass slide.

Sample Volumes

Sample aspiration volumes and sample volumes required for smear preparation are indicated below:

Slide Preparation Method	Sample Tube	Cap	Sample Position	Tube	[Cap Open]	Aspiration Volume	Required Volume
Sampler	Regular	✓	Sample rack		N/A	70 µl	500 µl
	RBT	✓	RBT Rack				250 µl
Manual	Regular	✓	Regular Holder	Tube	OFF	70 µl	500 µl
	Regular (1 slides)	X			ON	38 µl	300 µl
	Regular (2 slides)	X				70 µl	
	RBT	✓			OFF	70 µl	250 µl
	Micro (1 slide)	X	Micro Holder	Tube	N/A	38 µl	110 µl
	Micro (2 slides)	X				70 µl	140 µl

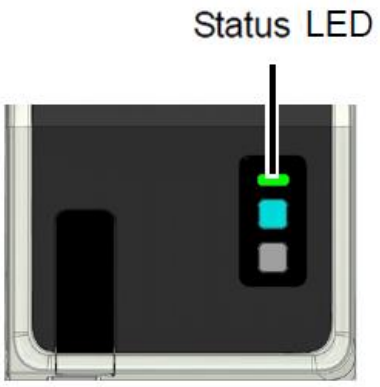




Sampler Mode

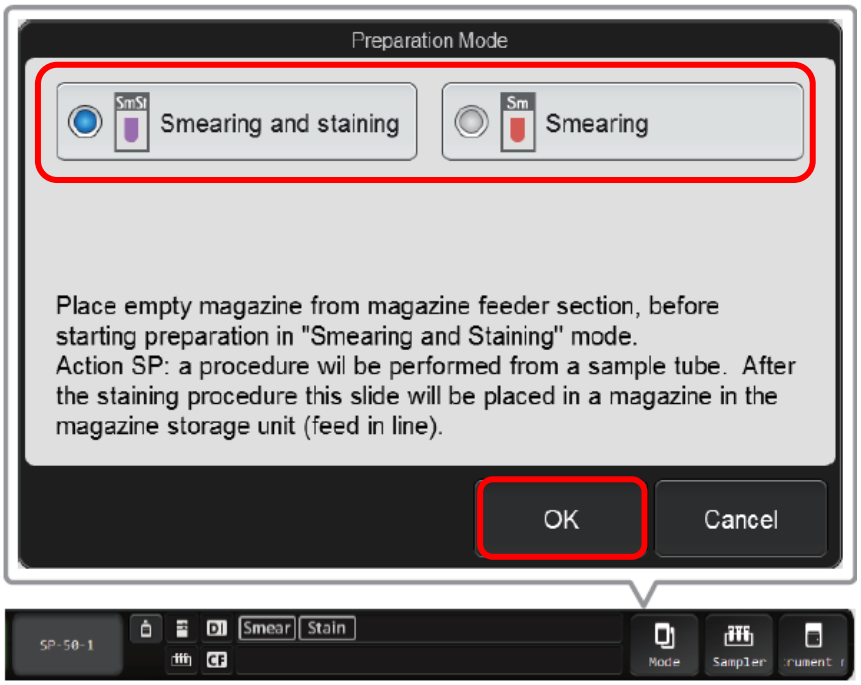
To run samples in sampler mode:

1. Make sure the SP-50 is in the ready state. The sample holder should be retracted into the main unit and the status indicator LED should be green.

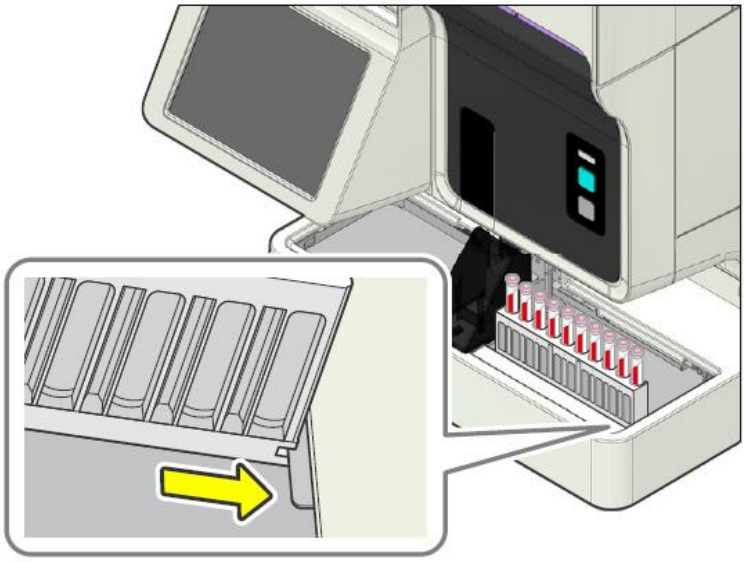


2. If required, change the slide preparation mode to the desired setting. Select [Mode] from the status area to open the [Preparation Mode] dialog box.

3. Select either [Smearing & Staining] or [Smearing] and touch [OK].



4. For standalone analysers; place the rack containing the sample tubes on the right-hand side of the sampler unit. Slide the groove on the sample rack onto the protrusion, the rack will be automatically fed into the analyser(s) for processing. A maximum of 5 sample racks can be loaded at any one time. For tracked analysers, in System mode, racks will automatically be fed into the SP-50.

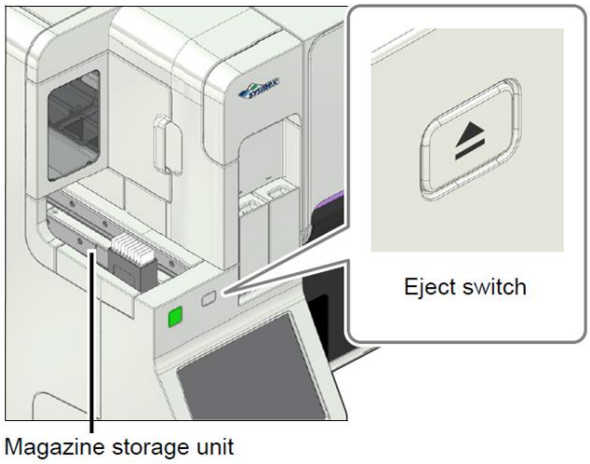


5. Once analysis is complete, remove the sample rack from the left-hand side of the sampler unit.

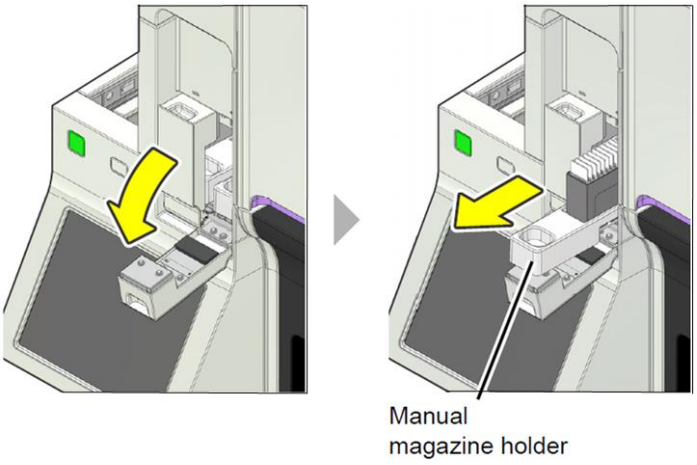
6. [Staining & Smearing] mode: The prepared smears will be stored in the slide magazine. When preparation of all smears is complete, the magazine containing the samples will be ejected to the storage location for removal.

7. [Smearing] mode: The smears will be loaded into the manual magazine holder for removal.

Staining & Smearing Mode



Smearing Mode



Operation of the SP-50 on the XN Track

Placing into ‘Offline’ or Isolation

The SP-50 should be placed offline when performing any maintenance, running the analyser in ‘Sampler’ mode or troubleshooting on the analyser as this will prevent further racks being sent to the analyser.

To isolate or place the SP-50 offline:

1. Select the [Mode Switch] on the front of the CV-unit of the SP-50

2. The LED indicator light will change from **Green** to **Orange**.
3. Carry out the sample preparation, maintenance or troubleshooting required.
4. Once complete select the [Mode Switch] again to put the analyser back into ‘System’ Mode.

Running Samples in ‘Offline’ or Sampler Mode

To run samples in ‘Sampler’ Mode:

1. Isolate the SP-50 from the track (please see above).
2. Place racks on the right hand side of the sampler unit and run like normal.
3. Once complete the rack will be available on the left hand side of the sampler unit.

Manual Mode

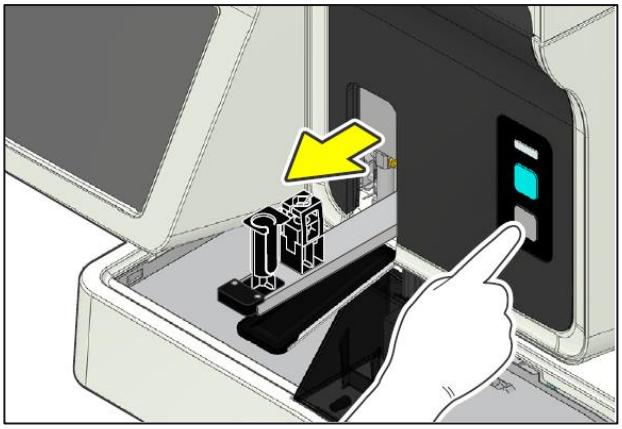
Manual mode can be used for the following situations:

- When you want to interrupt sampler preparation for an urgent sample.
- When you want to prepare a smear using a micro collection sample tube.
- When you only want to stain an already-prepared smear.
- When you only want to print sample information on the slide glass.

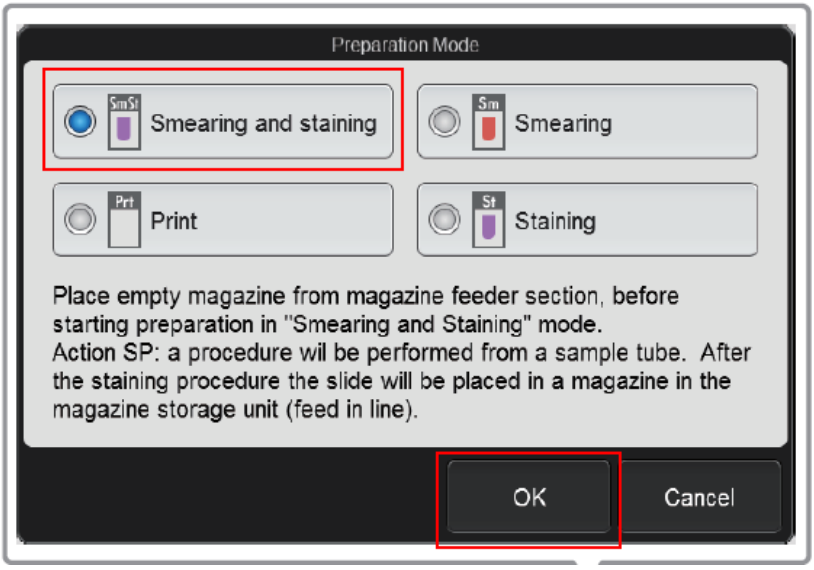
Manual – Smearing & Staining

To perform manual a smear & stain:

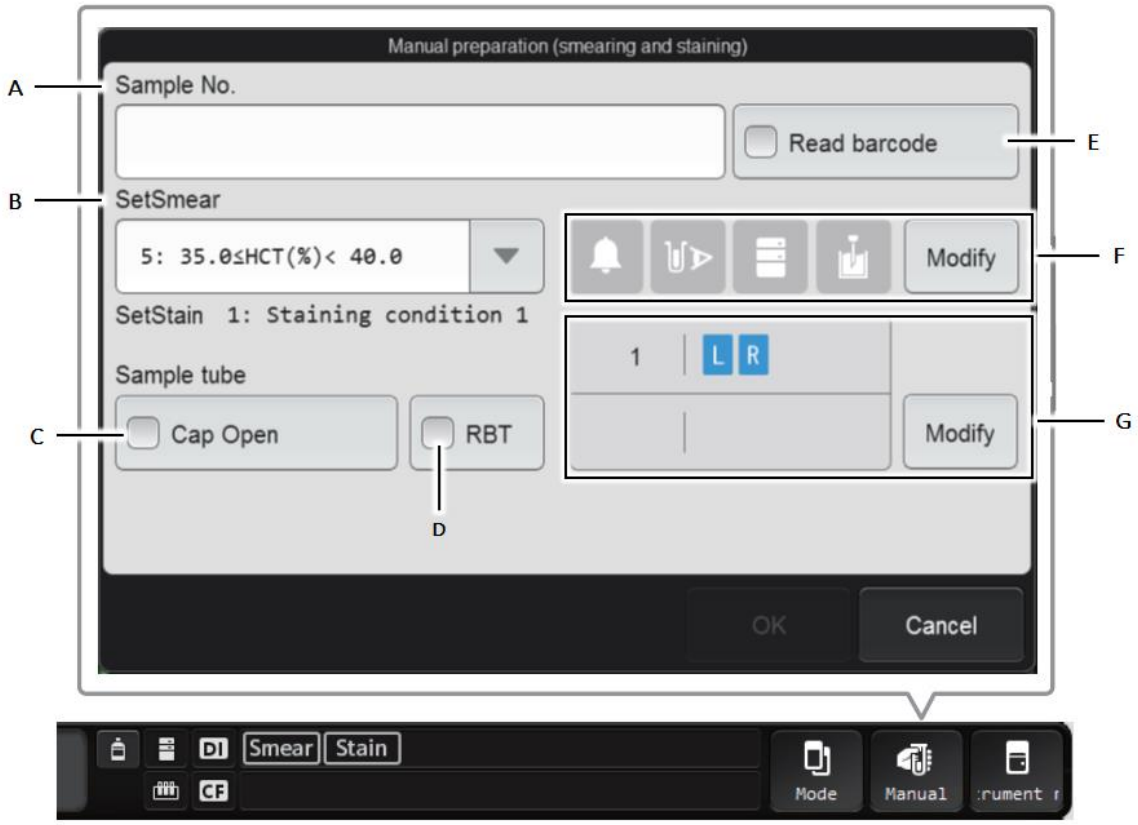
1. Make sure the SP-50 is in the manual mode by pressing the mode switch on the front of the main unit.



2. From the IPU, select [Mode] from the status area. The [Preparation Mode] dialog box will open. Select [Smearing and staining] followed by [OK].



3. Select [Manual] from the status area, the [Manual Preparation] dialog box will open. Configure the menu for your sample type.



A) Sample Nº - Sample number, if required, can be manually entered here. Sample numbers can be entered either via a hand-held barcode reader or inputted using the onboard keyboard.

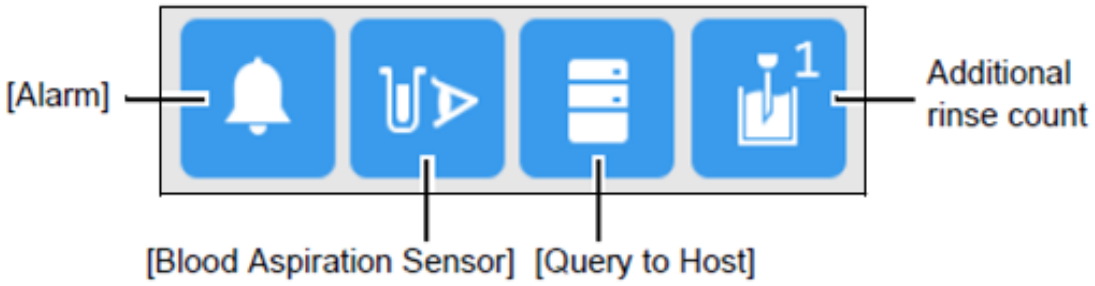
B) Set smear – Can be used, if required, to run samples using alternative smearing conditions.

C) Cap open – Select this box to aspirate samples with the cap open loaded into the regular sample tube holder.

D) RBT – Select this box if using a Raised Bottom Tube (RBT)

E) Read barcode – Select this box if you wish the analyser to read the sample barcode. This function can only be performed for samples loaded into the regular sample tube holder.

F) Preparation action display area: This area shows the settings for slide preparation actions by the icons below. When the icon is blue, the setting is ON.



[Alarm] – If selected, an alarm will sound at the end of smear preparation.

[Blood Aspiration Sensor] – Select to enable/disable blood aspiration sensor. Disable sensor for small volume samples.

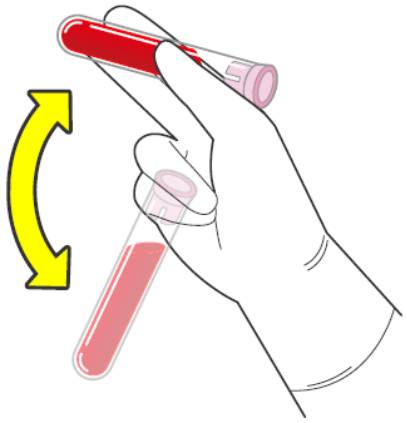
[Query to Host] – Select to query the host for the order.

[Additional Rinse Count] – This option allows the user to perform additional rinses for the piercer and spreader glass if required.

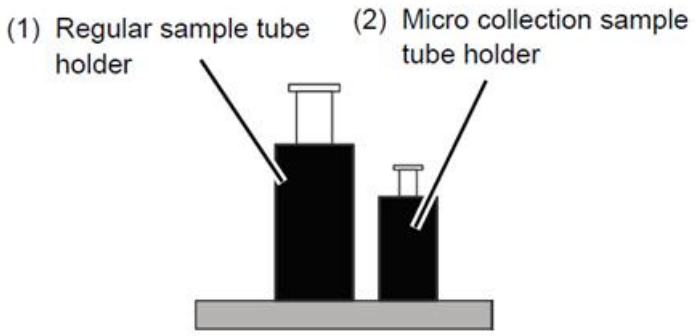
G) Preparation order display area: Displays information of the order. When the icon is blue, the setting is ON. This are allows the user to select:

- Which slide supply cassette is used
- To send, if connected, to the DI-60
- Number of slides to produce

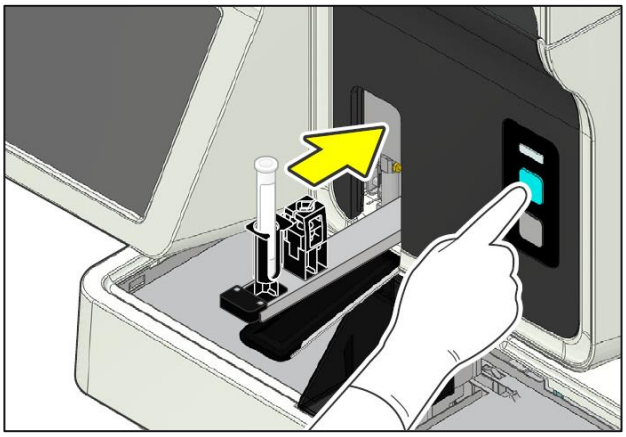
4. Once the above settings have been confirmed, mix the sample as shown:



5. Place the sample tube in to the correct position in the sample holder.

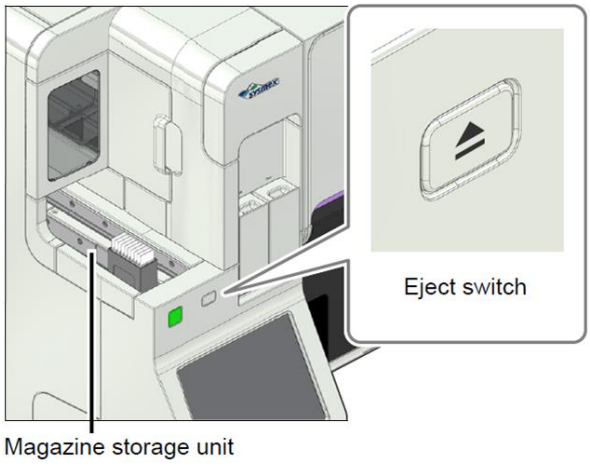


6. Press the start switch on the front of the main unit. The sample holder will retract and smear preparation starts. When the sample aspiration is completed the sample holder is ejected out automatically.



7. Once complete, remove sample and close the sample tube holder by pressing the mode switch on the front of the main unit.

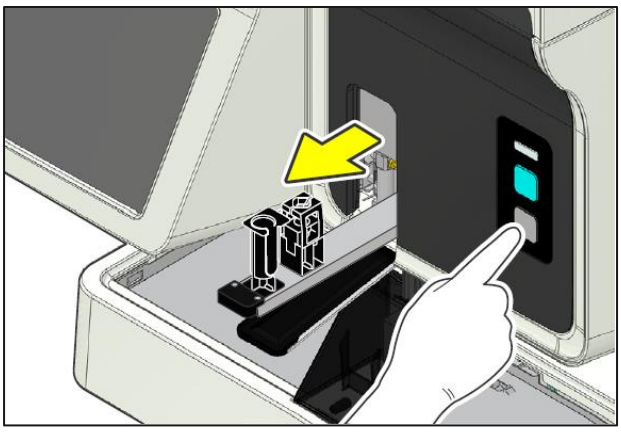
8. The prepared smears, once complete will be stored in the magazine. The magazine is automatically ejected to the storage location. Magazines can be manually ejected using the 'Eject' switch.



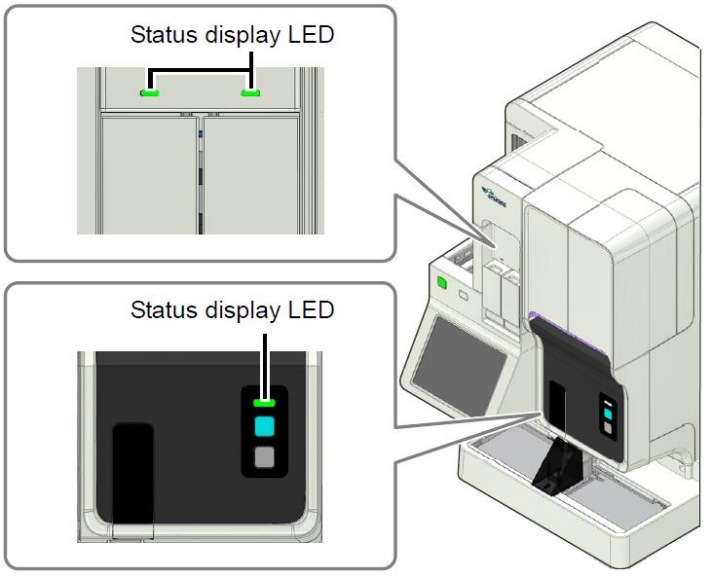
Manual – Stain Only

To perform a stain only:

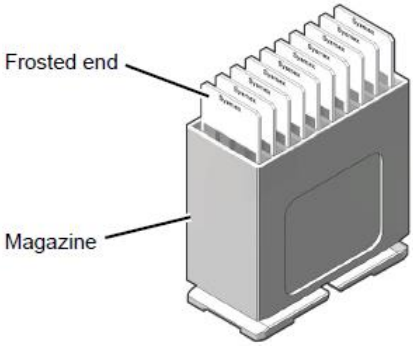
1. Make sure the SP-50 is in manual mode by pressing the mode switch to eject the sample tube holder.



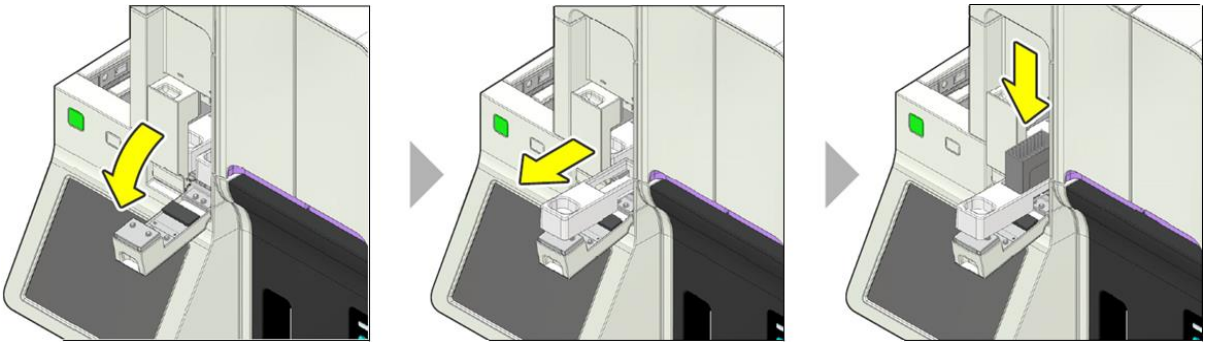
2. Check the instrument and magazine holder status LED's are green.



3. Load the prepared slides into an empty storage magazine. Load the slides so that they face the same direction with the frosted end of the slide facing towards the front.

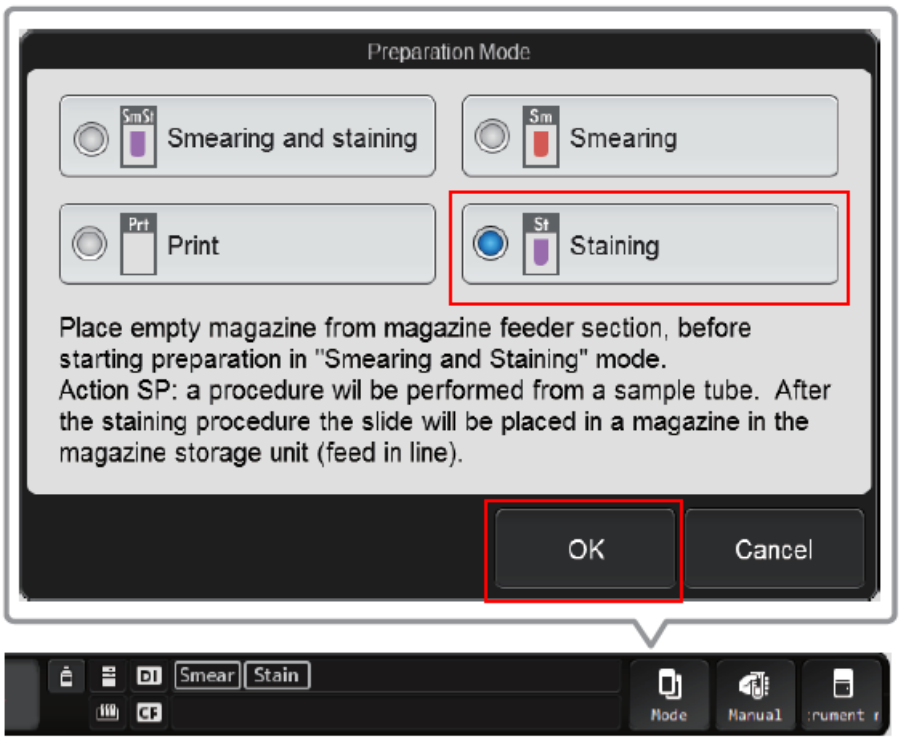


4. Open the manual magazine holder cover, pullout the holder and load the magazine. You can load either sections or both if required. The left hand-side magazine will be processed first.



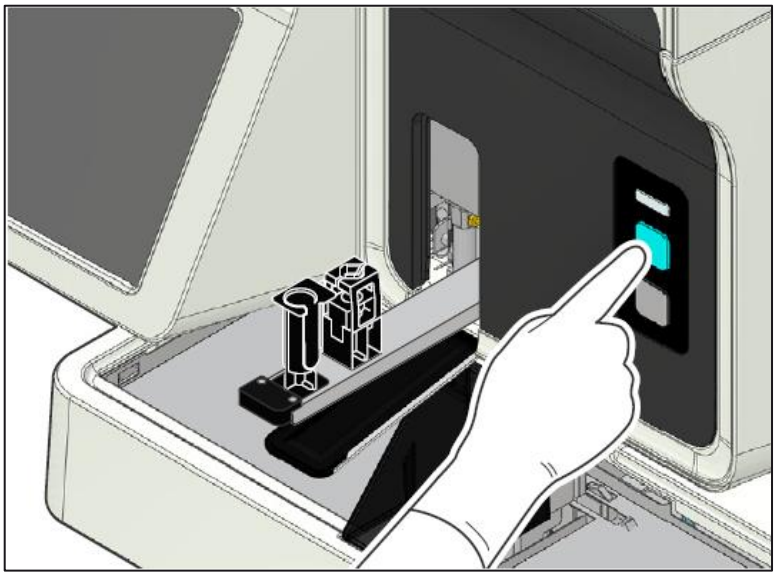
5. Push the magazine hold back into the analyser and close the magazine holder cover.

6. Select [Mode] from the status area. The [Preparation Mode] dialog box will open. Select [Staining] followed by [OK].



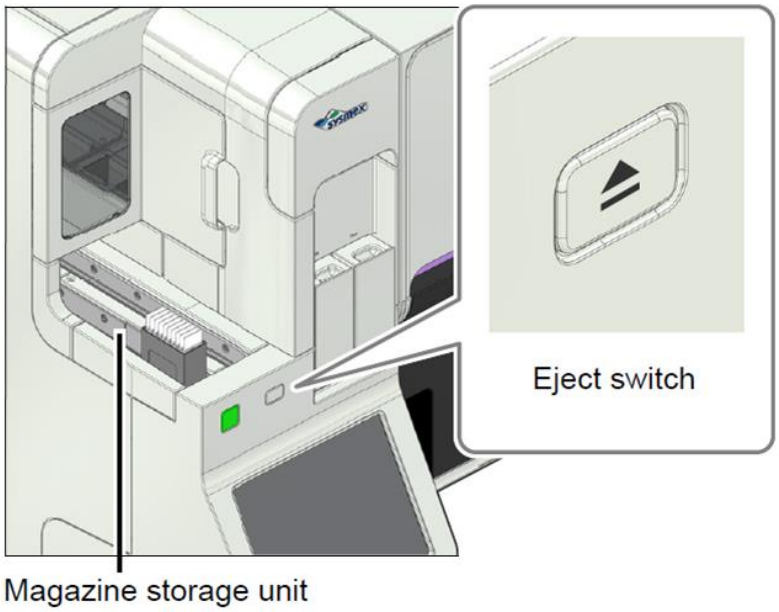
7. From the status area, select the [Manual] option if you wish to alter the staining protocol. E.g. for bone marrow staining.

8. Press the start switch on the front of the main unit.



9. Once complete, close the sample tube holder by pressing the mode switch on the front of the main unit.

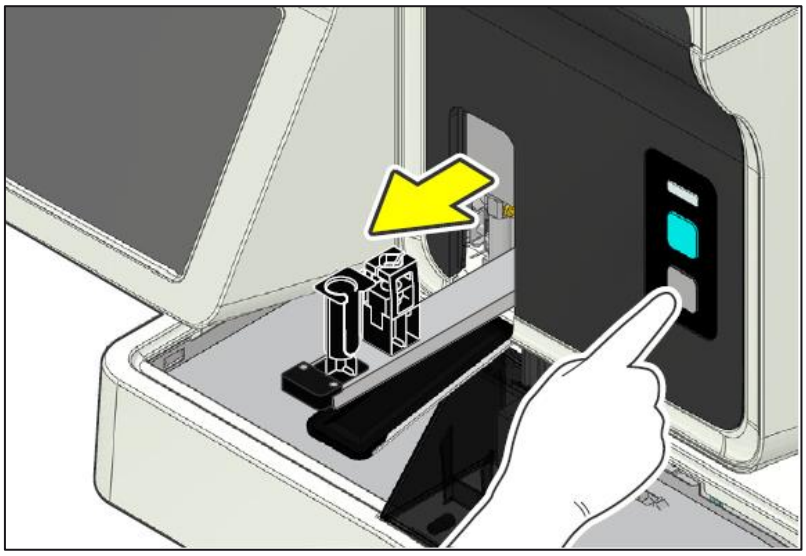
10. The prepared smears, once complete will be stored in the magazine. The magazine is automatically ejected to the storage location. Magazines can be manually ejected using the 'Eject' switch.



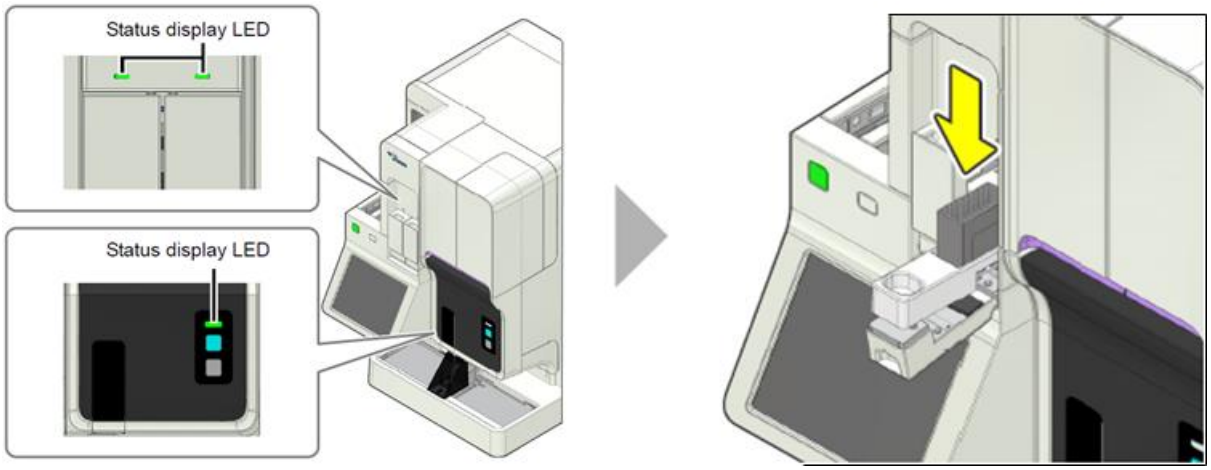
Manual – Smear Only

To perform a smear only:

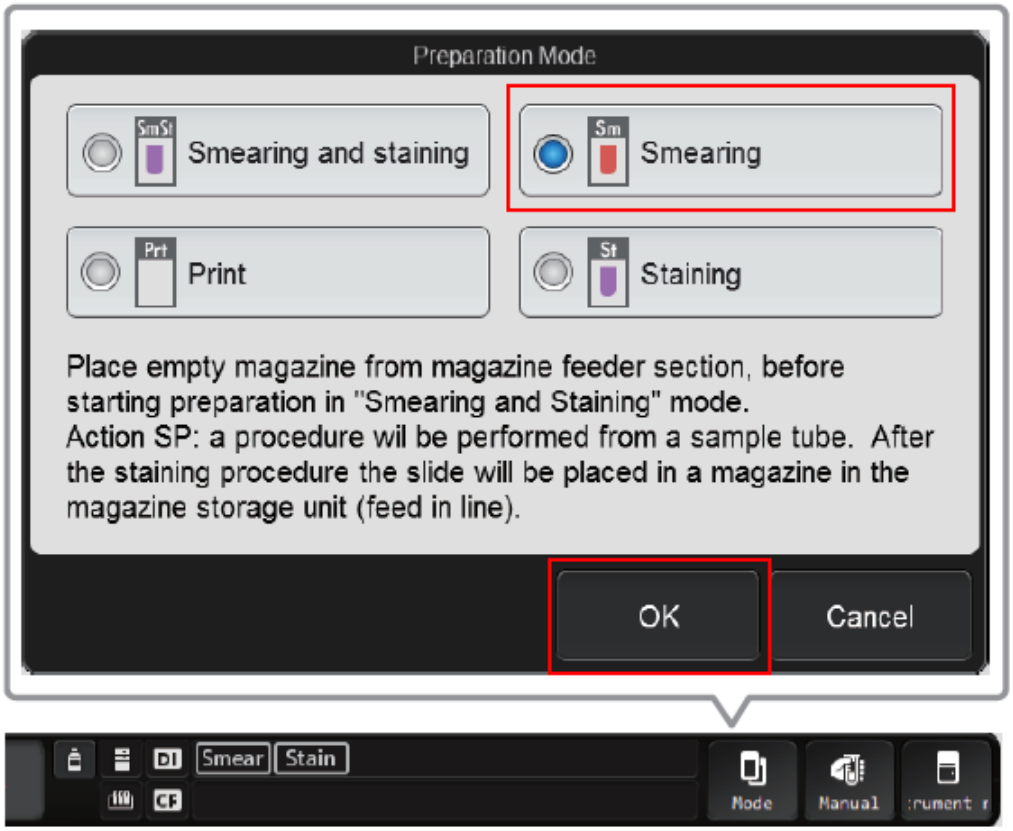
1. Make sure the SP-50 is in manual mode by pressing the mode switch to eject the sample tube holder.



2. Check the status indicator LED of the instrument and magazine holders are green. Load an empty magazine into the manual magazine holder.



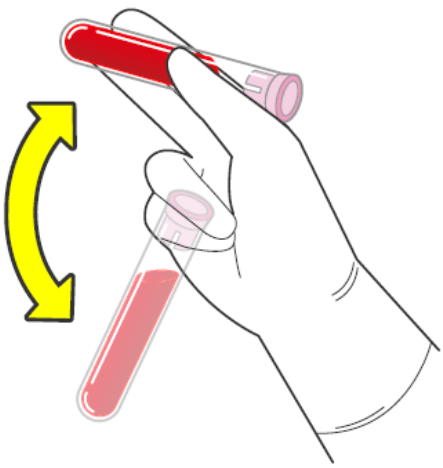
3. Select [Mode] from the status area. The [Preparation Mode] dialog box will open. Select [Smearing] followed by [OK].



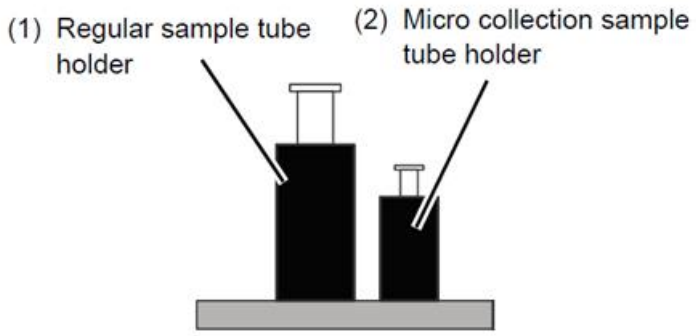
4. Select [Manual] from the status area, the [Manual Preparation] dialog box will open. Configure the menu for your sample type.

Note: Details for this can be found in the ► [Manual – Smearing & Staining] section.

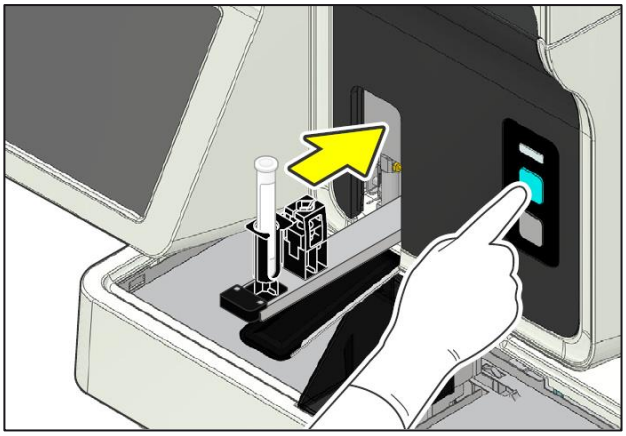
5. Once the above settings have been confirmed, mix the sample as shown:



Place the sample tube in to the correct position in the sample holder.

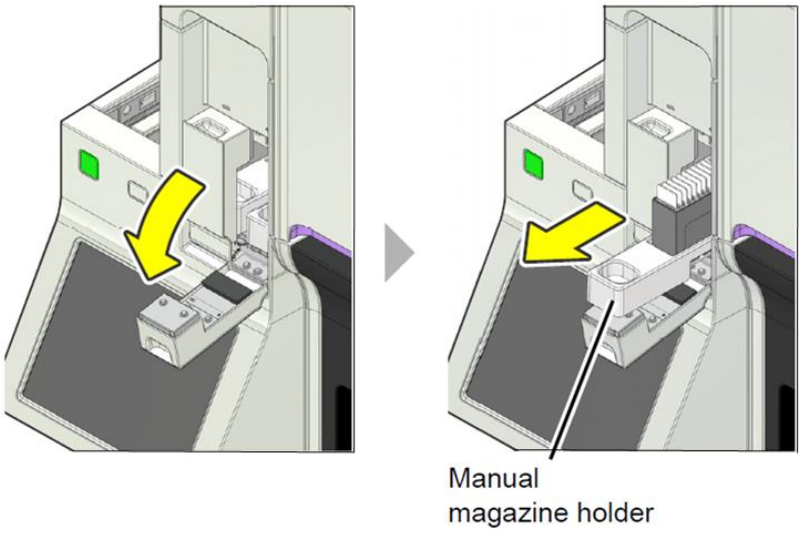


Press the start switch on the front of the main unit. The sample holder will retract and smear preparation starts. When the sample aspiration is completed the sample holder is ejected out automatically.



Once complete, remove sample and close the sample tube holder by pressing the mode switch on the front of the main unit.

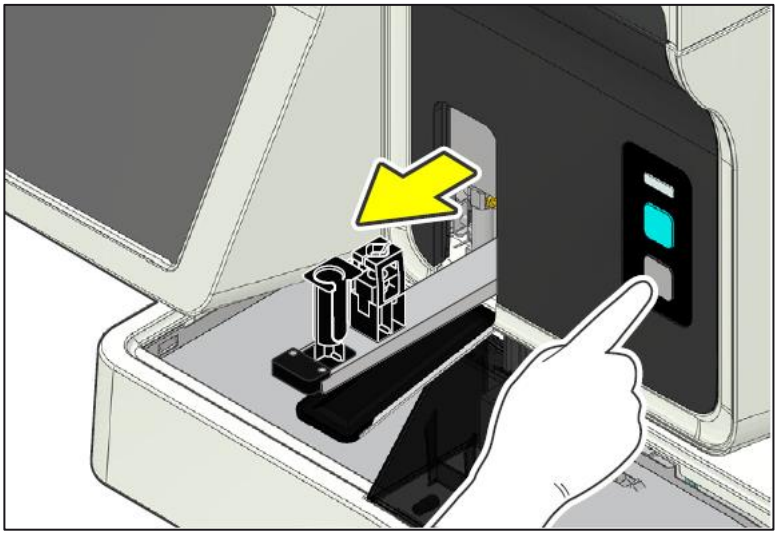
The prepared smears, once complete will be fed out into the manual magazine holder.



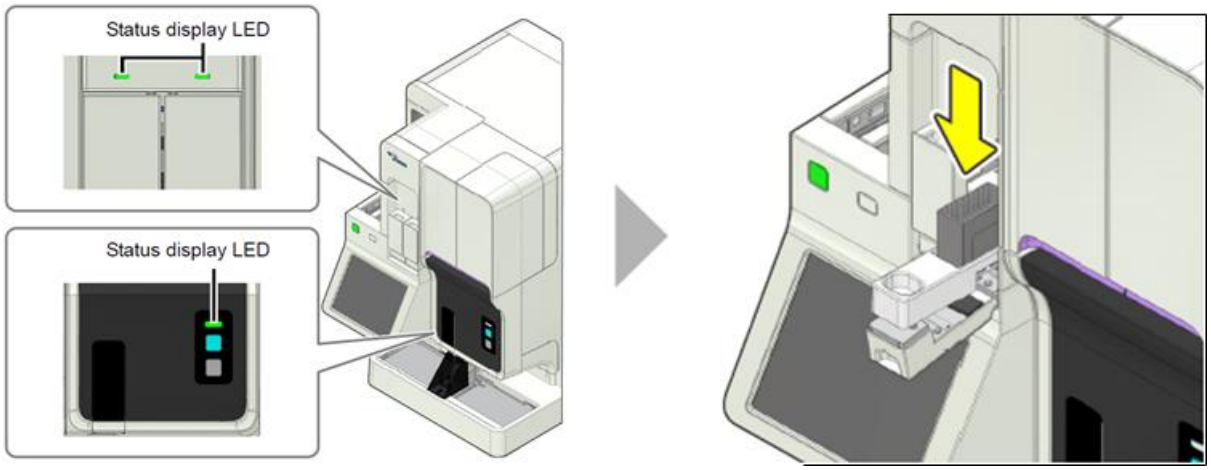
Manual – Print Only

To perform a print only:

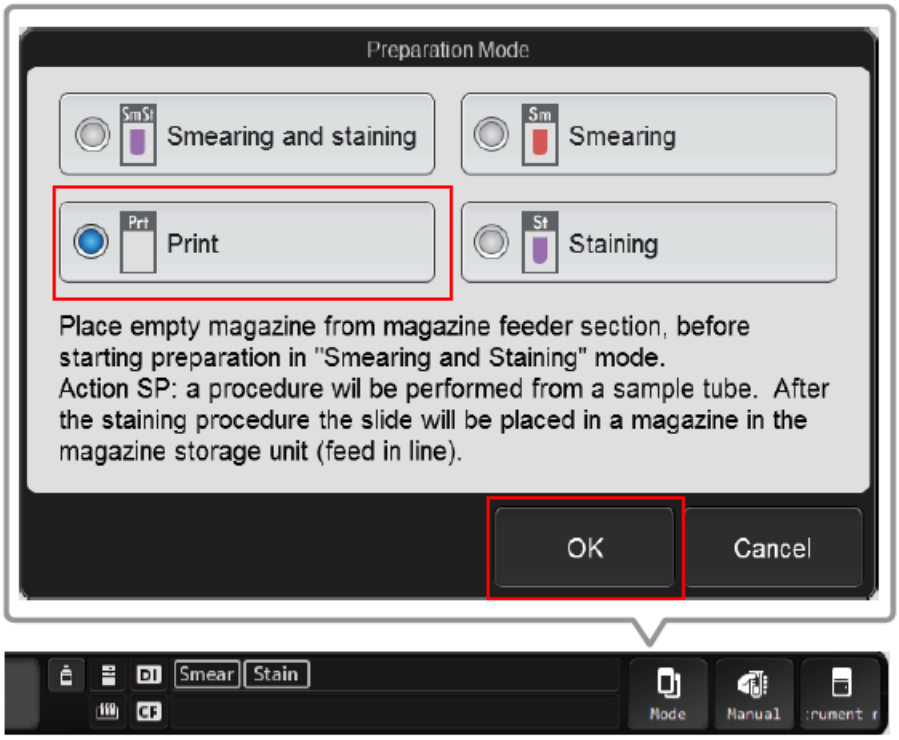
1. Make sure the SP-50 is in manual mode by pressing the mode switch to eject the sample tube holder.



2. Check the status indicator LED of the instrument and magazine holders are green. Load an empty magazine into the manual magazine holder.



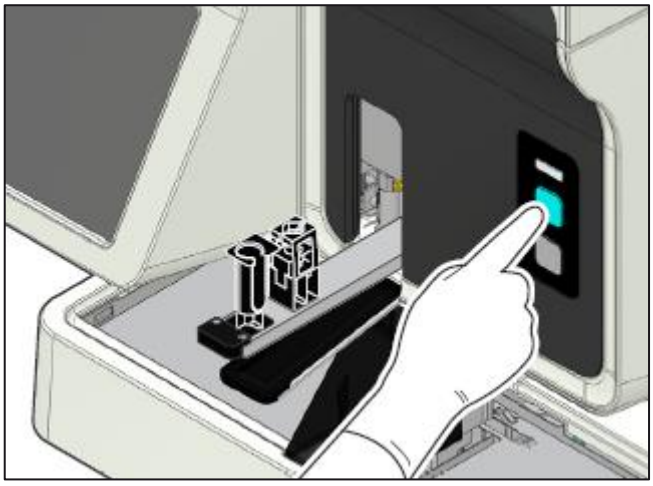
3. Select [Mode] from the status area. The [Preparation Mode] dialog box will open. Select [Print] followed by [OK].



4. Select [Manual] from the status area, the [Manual Preparation] dialog box will open. Configure the menu for your sample type.

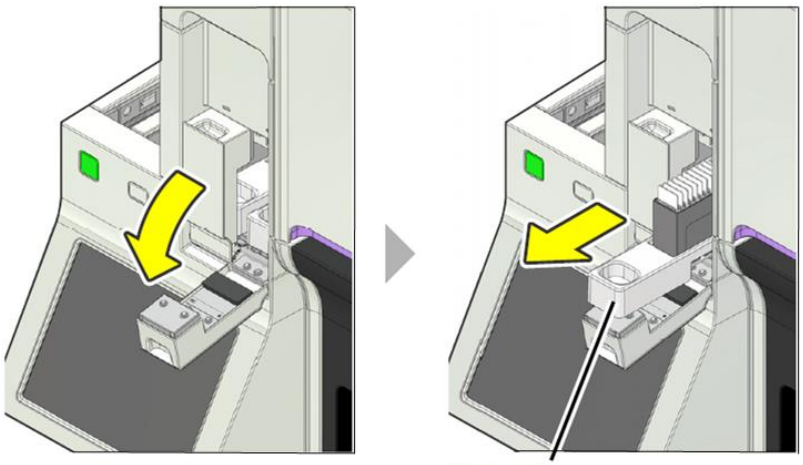
Note: Details for this can be found in the ► [Manual – Smearing & Staining] section.

5. Press the start switch on the front of the main unit.



6. Once complete, close the sample tube holder by pressing the mode switch on the front of the main unit.

7. The printed slides, once complete will be stored in the manual magazine holder.

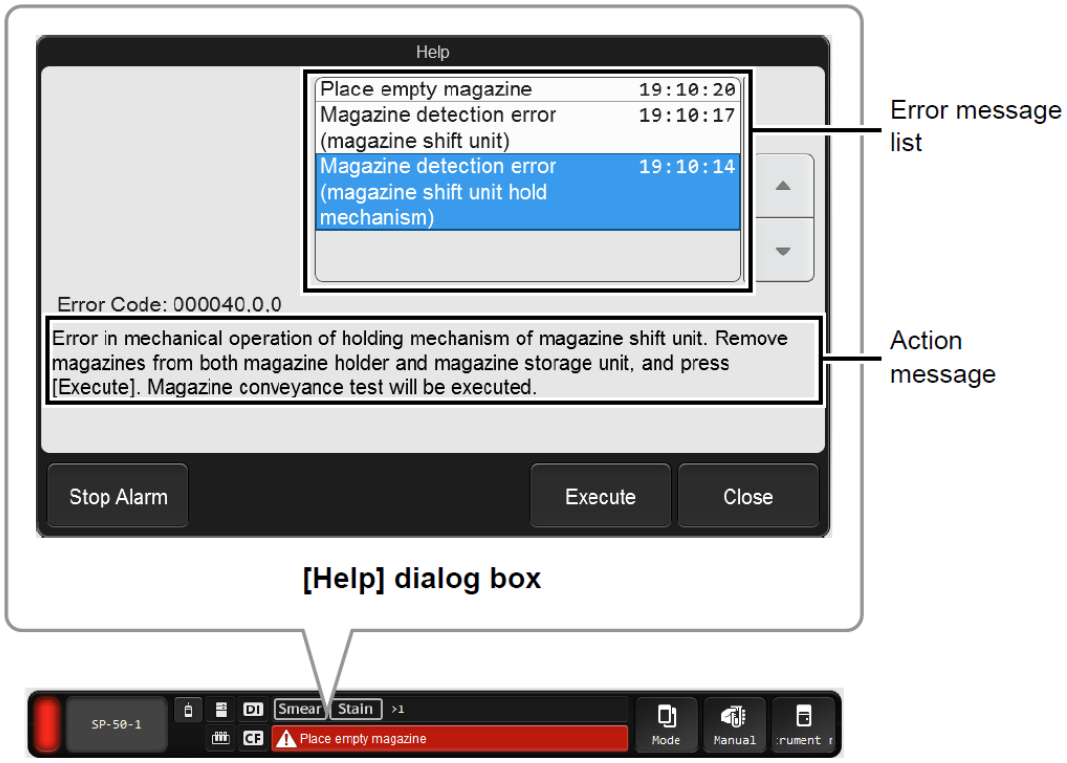


Manual
magazine holder

Responding to Alarms

When an error occurs an audible alarm will be heard and the [Help] dialog box will be displayed on the IPU. If connected, DI-60 and CF-70 errors will also be displayed here.

If an error occurs while another dialog box is displayed, the error message will appear on the status area at the bottom of the screen. Close the displayed dialog box and touch the error message on the status area to display the [Help] dialog box.



Message Type	Description
Error message list	Displays the current errors. Errors that have the highest priority are displayed at the top.
Action message	Displays troubleshooting action for the selected error.

In the [Help] dialog box screen you can perform the following functions:

- Stop the alarm.
- Access the IFU (Instructions For Use).
- Execute and/or accept the error. [Execute] will execute the action required, [Accept] will clear the error.

Audit Logs

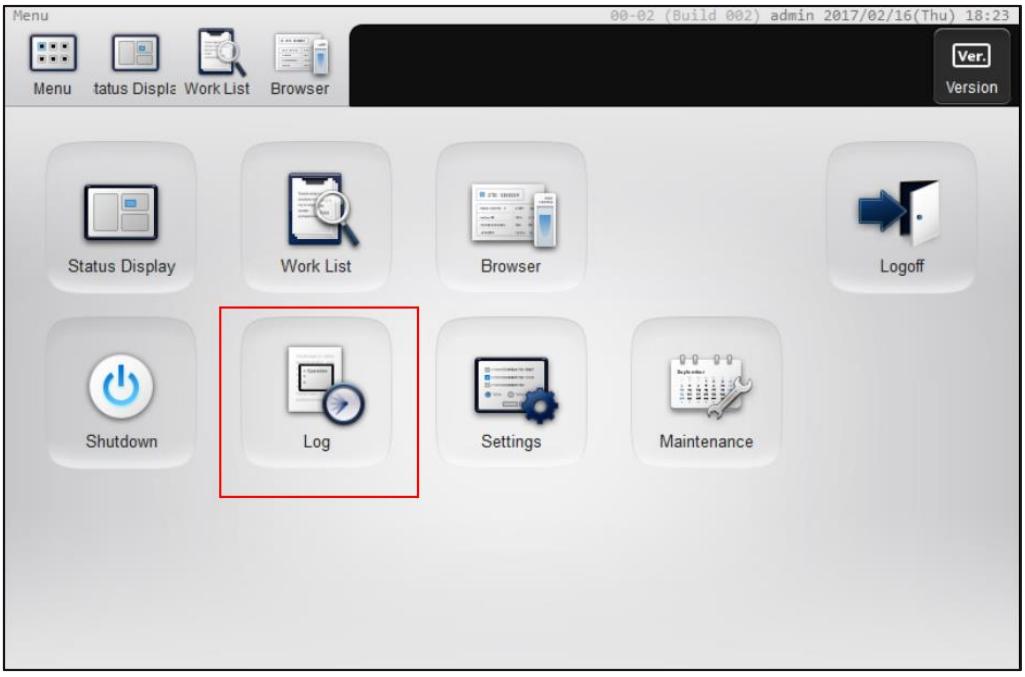
The SP-50 has the following audit logs which can be viewed:

Logs	Description
Audit log	Displays a log of operations.
Error log	Displays a log of errors that have occurred and information at the time of occurrence and clearance.
Maintenance log	Displays a log of maintenance tasks executed and information at the time of execution.
Reagent replacement log	Displays a log of reagent replacement and any information that was entered at the time of replacement.

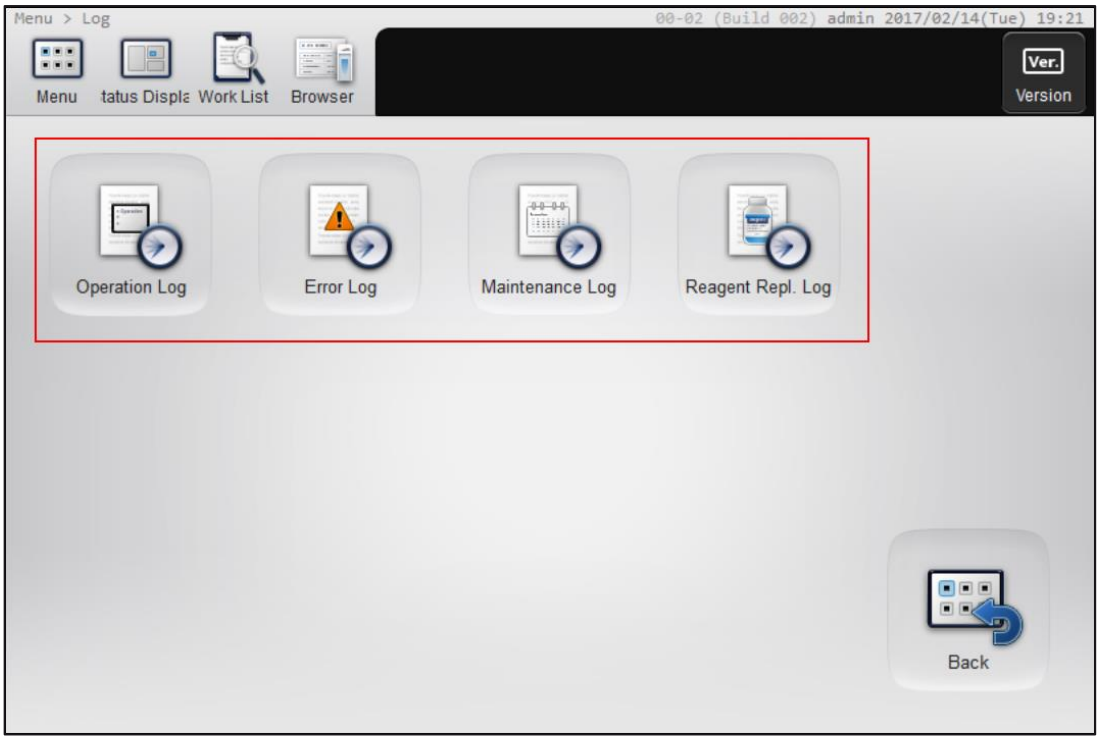
A maximum of 5,000 entries are saved in each log. When the maximum number of entries is reached in a log, each new entry automatically deletes the oldest entry.

To check a log:

1. From the [Menu] screen select [Log].

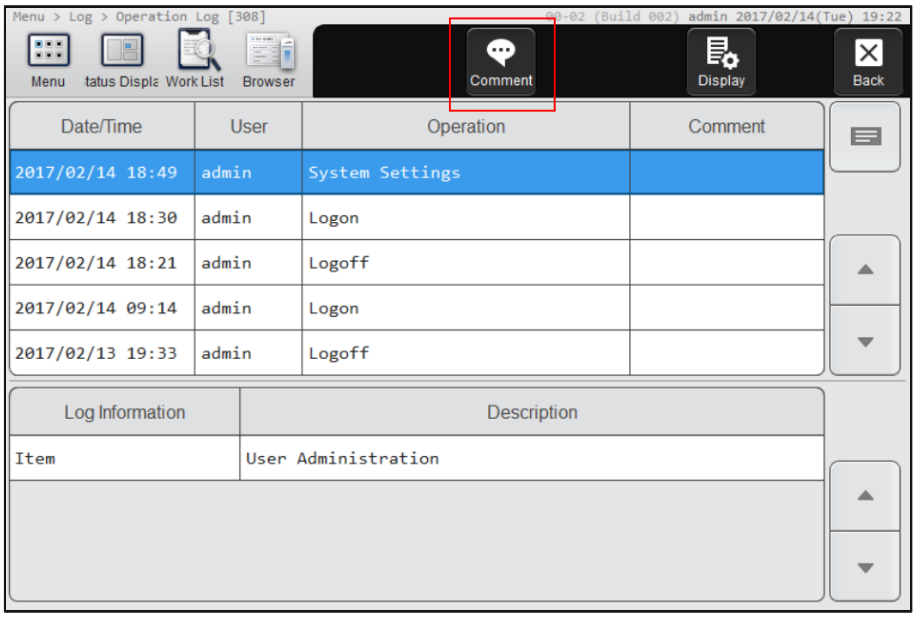


2. The [Log] menu screen will open. Select the desired log you wish to view.



To add a comment to a log:

1. Once in the desired log, select [Comment] from the top toolbar.



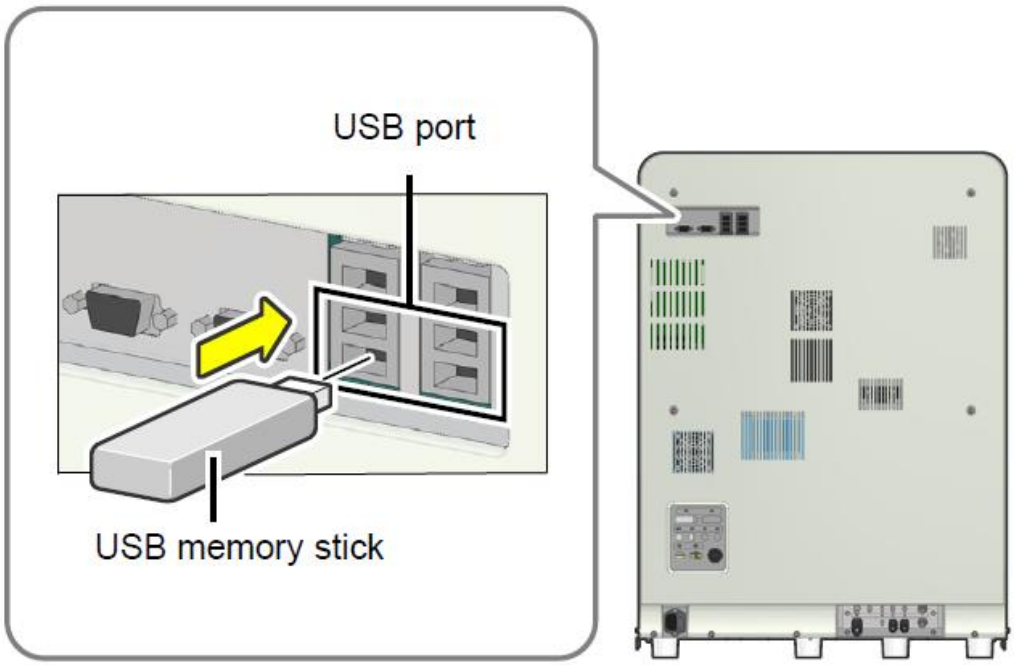
2. Enter a comment up to a maximum of 100 characters.

3. Select [OK]. The comment is now added.

To save a log in CSV format:

1. From the [Menu] screen select [Log].
2. Select the desired log you wish to save.
3. Insert the USB stick into a free USB port on the back of the instrument.

NOTE: A USB memory stick with a password lock function cannot be used.



4. Select [File] from the top toolbar and select [Output in CSV Format]. The save starts and the [Waiting for completion] dialog box appears. When the dialog box closes, the save is complete. When performing a save, the file location/folder/name is automatically created on the memory stick.
5. Remove the USB stick.

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