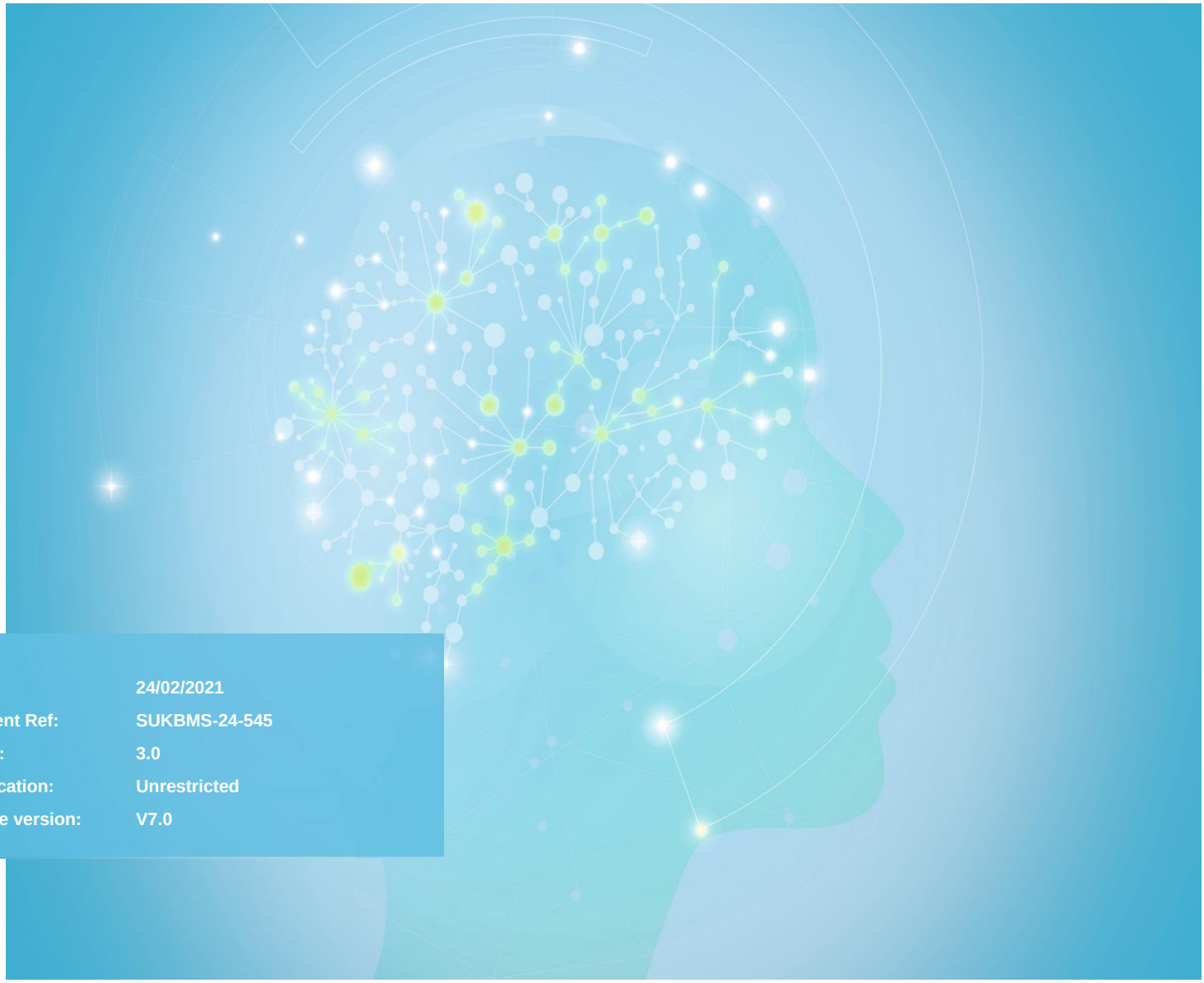
Routine Use Training Workbook

DC-1



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Disclaimer

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Revision History

Revised section	Alteration	Name	Date
New Document		J Hammersley	December 2020
Smear Checker	New section added	J Hammersley	February 2021

Reference Documents

Document title	Version	Date
CellaVision Review Software – Instructions for use 7.0	PM-10892-01	27 May 2019
CellaVision DC-1 – Instructions for Use Software 7.0	PM-10895-01	27 May 2019

DC-1 Overview

The DC- 1 is an automated cell locating device intended for blood cell morphology. The peripheral blood application is intended for differential count of white blood cells (WBC), characterisation of red blood cell (RBC) morphology and platelet estimation. It locates and presents images of blood cells with a suggested classification on peripheral blood smears. The operator identifies and confirms the classification or reclassifies each cell according to type.

Through the CellaVision software there is the ability for collaboration and remote viewing by users from other locations. Databases on the analyser allow permanent electronic images of the slides to be stored.

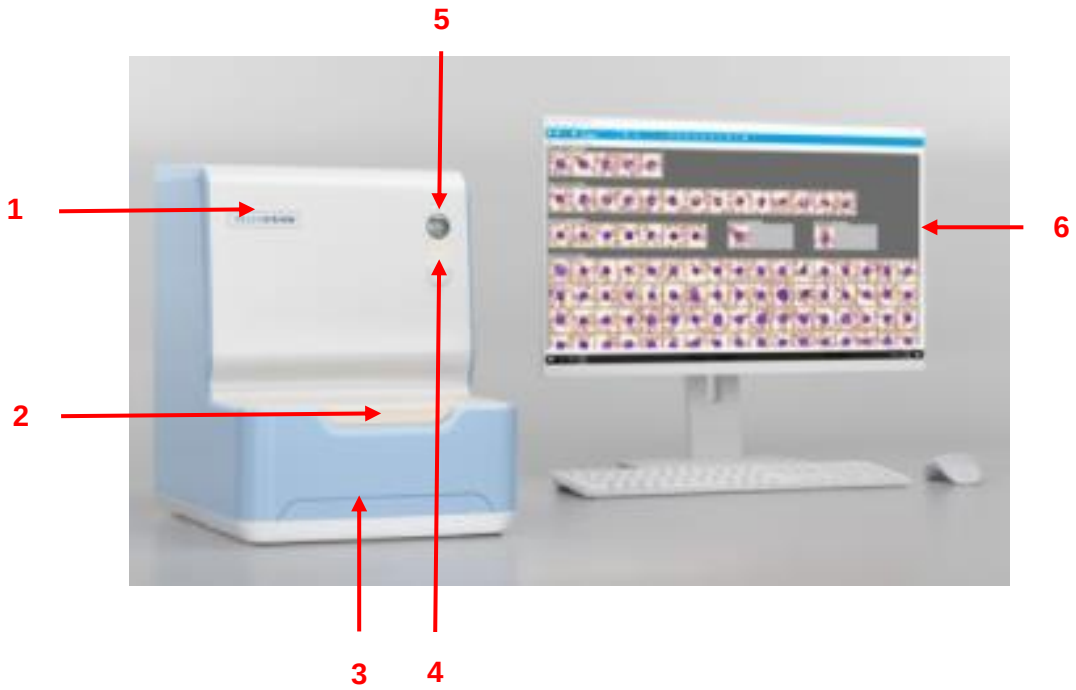
Facts and Figures	
Throughput	10 slides/hr (RBC/PLT/100-WBC)*
Slide Loading Capacity	1
Magnification	100x
Technologies	Motorised microscope High-quality progressive-scan CCD colour camera
Slides	75.0 – 76.0mm x 25.0 – 26.0mm x 0.9 – 1.2mm Ground edge slides with frosted end Clipped, rounded or square corners
Modes	Peripheral blood mode
Quality Control	Cell location for peripheral blood
Databases	Processing database Export database Scan database
Optional Applications	CellaVision Remote Review Software CellaVision Proficiency software

* Processing time per slide will vary depending on smear quality, WBC count and non-WBC count.

Analyser Components

Analyser Components

Outside the Analyser



1. **Main Unit Hood** – Where slide processing takes place. Hatch lifts to give access to internal components of DC-1 such as immersion oil unit, digital camera, and motorised microscope.

2. **Input Hatch** – Slides requiring analysis are placed in the input hatch with barcode facing upwards and to the right. The barcode can then be entered and immersion oil manually applied.

3. **Drip Tray** – Collects excess immersion oil and acts as a non-reflective surface for the light system.

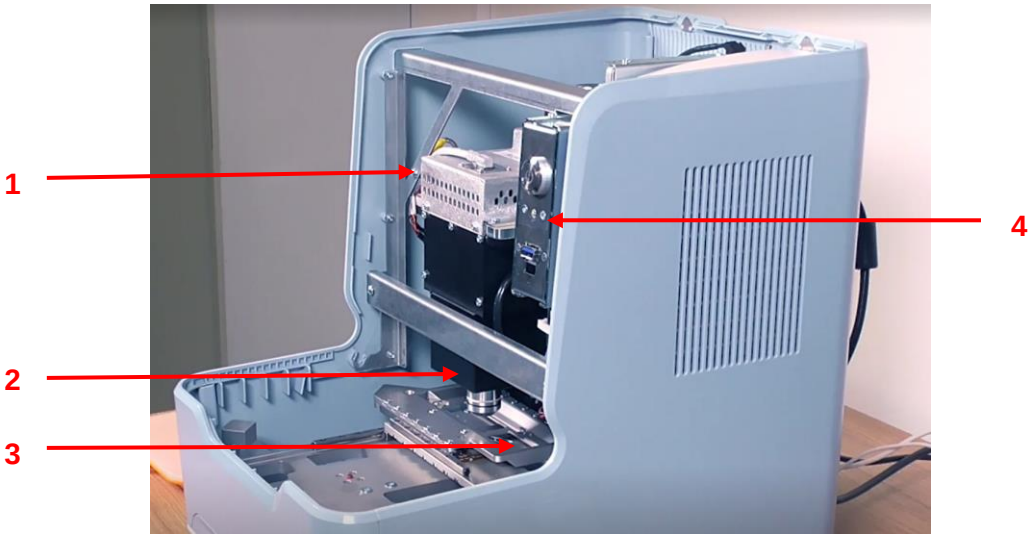
4. **Status LED** – Indicates status of analyser:

[Yellow]	Starting up/processing
[Flashing **Green**]	Startup complete/analysis complete
[Green]	Analyser idle/ready to use
[Flashing **Red**]	Mechanical error
[Grey]	Mains power OFF

5. **Stand-by Switch** – Used to power analyser ON or OFF

6. **Information Processing Unit (IPU)** – User interface containing CellaVision software including all settings for analyser. CellaVision software is used for processing of all slides.

Inside the Analyser



1. **Imaging Module** – Contains a high-quality progressive-scan CCD colour camera and is also responsible for all motor movement.

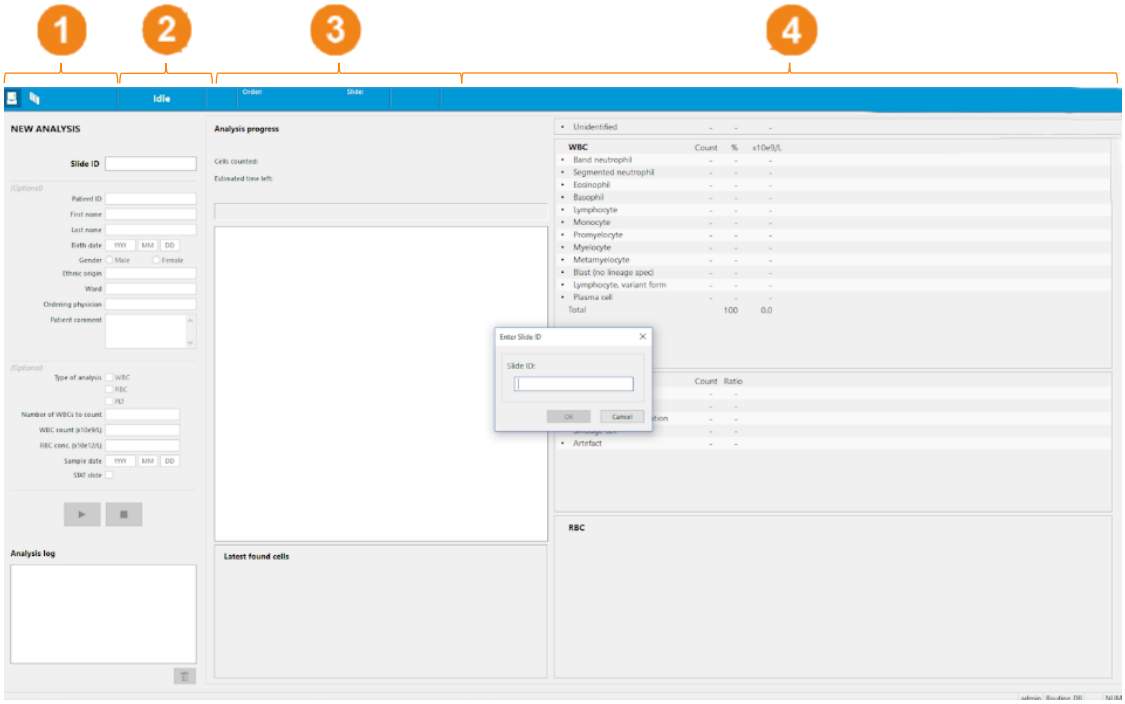
2. **Microscope Module –** The microscope module sits directly below the imaging module and contains upright light microscope with a 100x objective that moves up or down to focus images.

3. **Loading Tray** – Acts as the stage and is responsible for XY movement of the slide under the microscope.

4. **System Computer** – Full embedded PC responsible for running CellaVision software.

5. **LED Module (Not shown)** – Sits directly under the light microscope at the bottom of the analyser and is responsible for illumination of the slide.

IPU Layout



1. **Standard Icons** – used to access ‘System View’, ‘Database View’, ‘Verification View’ and ‘Report View’.

System Control View

Database View

2. **Analyser Status** – Displays analyser status as: Idle, Analyzing, Stopped, Paused or Error.

3. **Status Icons** – Displays the status of the hood and hatch and order number (if an order is open)

Hood is open

Hatch is open

Hatch and hood are open

Close order. Used to close an open order.

Order data. Used to access order data for open slide.

4. **Changeable Tool Bar** - Icons present change depending on which screen is being viewed.

Quick Guides

Maintenance

Weekly Maintenance

Shutdown Procedure

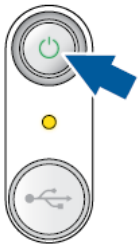
Shutdown of the DC-1 analyser is recommended as part of the weekly maintenance. To shut down the analyser:

1. Ensure all processing of slides has finished and there are no slides in the input hatch.
2. From the 'File' menu select [Exit]. **IMPORTANT:** Always exit the CellaVision Software before restarting or shutting down the computer system.
3. Click the 'Windows' icon  and select [Shutdown] to turn OFF the IPU. ***NOTE:*** *The user can select [Restart] if the IPU is to be turned on again straight away but not if analyser is being shut down*.
4. Press power button on the front of the analyser to power the analyser 'OFF'.

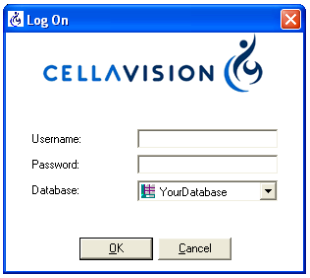
Start-up Procedure

To start up the analyser:

1. Make sure that the hood and input hatch are closed.
2. Press 'standby' button on the front of the DC-1 to power the analyser 'ON'. The status light will flash 'yellow'. On startup, the analyser will perform several self-tests to ensure both software and hardware are working correctly. If an error does occur a message will be displayed on the IPU once started to inform the operator.

   IMPORTANT: Do NOT open the input hatch during startup. When the status light is steady lit green the input hatch can be opened.
3. Turn IPU 'ON' from the PC desktop unit.
4. The user will automatically be logged in to windows and then the CellaVision software log in dialog box will appear. To start slide validation, log in to the CellaVision software by entering the username and password and selecting the appropriate database.



Clean the DC-1

It is recommended that this procedure is carried out following analyser shutdown. To clean slide scanning unit:

1. Perform analyser shutdown.
2. Wipe the hood with a moist cloth.
3. Wipe any excess oil from the loading tray.
4. Perform analyser start-up procedure.

Remove Unsigned slides

Deleting unsigned slides on a regular basis helps to maintain database size. Only users with administrator level can delete unsigned slides. This can be done manually as described below or by setting up an autodelete of unsigned slides (Please see IFU).

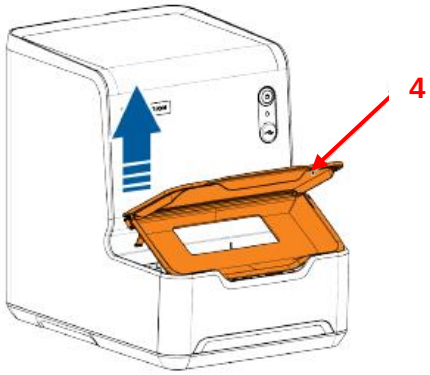
1. Click [Database View] 
2. Select the orders you want to delete in the 'Processed Orders' list. ***TIP:*** consecutive and non-consecutive orders can be selected by holding down shift or Ctrl, respectively. Database view can also be filtered for unsigned slides by selecting [View unsigned] from the drop-down menu.
3. Click [Delete] and press [Yes].

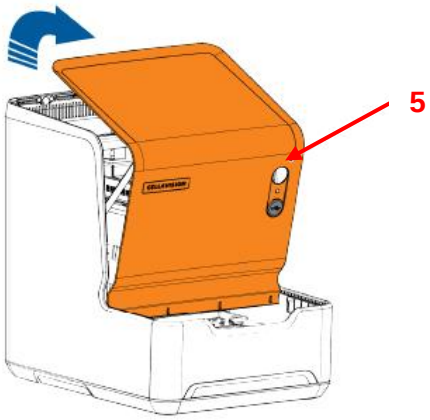
As Required Maintenance

Removing/Replacing the Analyser Input Tray and Hood

The procedure should be carried out whenever access to the inside of the analyser is required, for example cleaning the objectives. To remove the input tray and hood:

1. Ensure status of analyser is idle and that there are no slides in the input tray.
2. Remove the USB port cover.
3. Select [Maintenance] from the menu and click [open hood position].
4. Open the input hatch and remove the hatch by pulling it up from the lid.

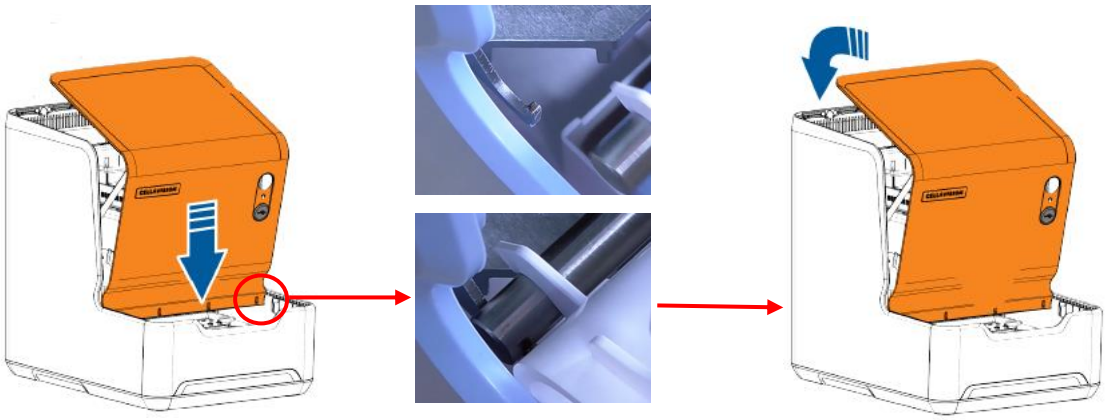




5. Open the hood by placing a hand on the top of the cover and pulling it up and forward.
6. Perform the procedure required.

To replace input tray and hood:

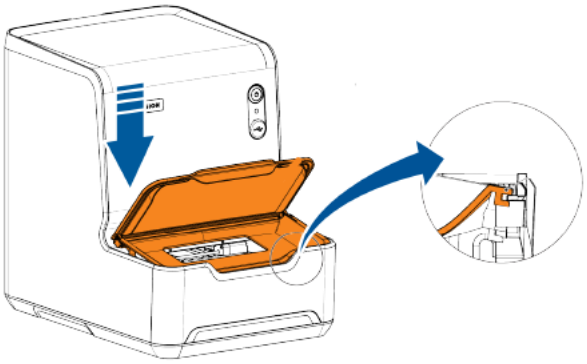
1. Put the hood back at an angle and gently pushing down so that the metal bar sits in the hooks before pushing the hood backwards



2. Replace the USB cover

3. Open the input hatch lid and angle the hatch so that the front edge goes in first with the hooks on the front bottom of the hatch on the edge located inside the analyser casing.

4. If the dialog box is open, close it and restart the CellaVision software.



Cleaning the Objectives

This procedure only needs to be performed if there are issues with the image capturing of the system.

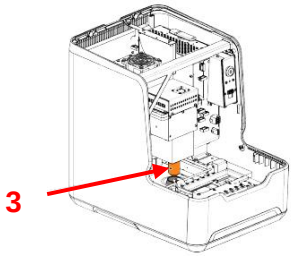
1. Ensure status of the analyser is idle and that there are no slides in the input tray.

2. Remove input hatch and hood.

3. Clean the objective using new lens tissue.

4. Discard the lens tissue after use.

5. Replace the hood and input hatch.



6. Before processing any slides run a couple of already processed slides to remove any air bubbles that may have been introduced to the objective during cleaning. Air bubbles will have a negative effect on the image quality and can cause misleading results or errors in slide processing. **IMPORTANT:** Delete test slide results once functioning of analyser is confirmed to avoid confusion.

7. Perform cell location.

Checking Database Size

If the local database size exceeds 20 000Mb steps should be taken to reduce database size such as compressing the database, removing unsigned slides, archiving or deleting signed slides. To check database size:

1. Select the [Help] menu.
2. Select [System information]
3. Followed by [Database size].

Compressing the Database

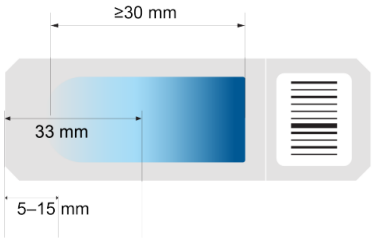
Compressing the database helps to maintain database size by freeing up hard disk space from files that have been removed from the database. This should be performed if the local database size is greater than 20,000MB. **IMPORTANT:** While database is being compressed no clients can be used or connected to the database. Any users logged on will receive an error message. It may take some time to compress a database, so this procedure should be carried out at an appropriate time. To compress the database:

1. Make sure that no users are logged onto the database you want to compress.
2. Start the CellaVision Software and log on to an alternative database as a user with administration access.
3. Select [Tools] menu followed by [Settings]
4. Select the [Database Tab].
5. Select the database needing to be compressed from the ‘Database List’.
6. Select [Compress].
7. Check the value for ‘Available on harddisk’ this should be at least the same as the ‘original size’. If the value for ‘Available on harddisk’ is less than the original size then more space must be freed up before compressing the database.
8. Click [Compress Database]

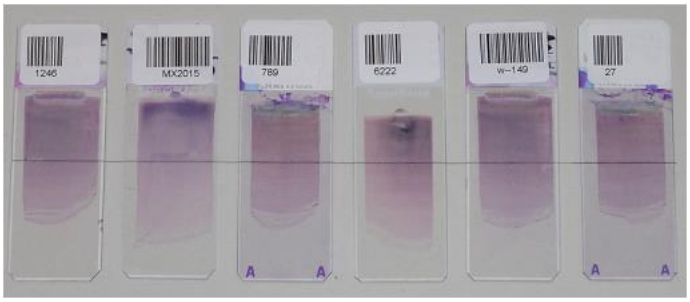
Preparing Slides

The quality of the slide, whether patient slides or cell location slides, placed on the DC-1 is critical as analysis is started 33mm from the end of the slide. Slides that are too think/thin, long/short or of poor stain quality will affect the ability of the analyser to locate the correct start point for analysis or its ability to locate and capture cell images. The slide must fulfill the following criteria:

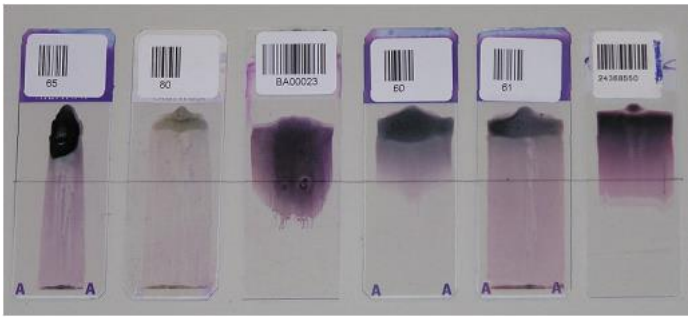
- The blood smear must be at least 30mm in length.
- Blood smear must terminate 5 – 15mm from the edge of the slide
- The blood smear must start near the labelled or frosted end of the slide and there must be a gradual transition in thickness without grainy streaks, troughs, ridges, holes, or bubbles.



Examples of Acceptable Blood Smears



Examples of Unacceptable Blood Smears



Quality control

Cell Location Test

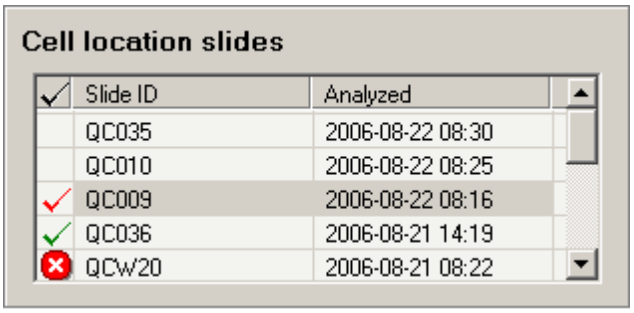
The cell location test validates the slide preparation process and it also verifies the analyser's ability to locate cells. When you run a cell location test, the analyser will try to locate a monolayer on a peripheral blood slide and try to locate 200 WBCs in that monolayer. It will then show the user overview images with the located cells marked. You can verify that the analyser has located all nucleated cells by examining the overview images and counting any cells that have not been located by the analyser. The analyser will then calculate the percentage of the nucleated cells that have been located.

Cell location should be performed once a day or following cleaning of the objectives or a change in staining solution/staining protocol. To perform the cell location:

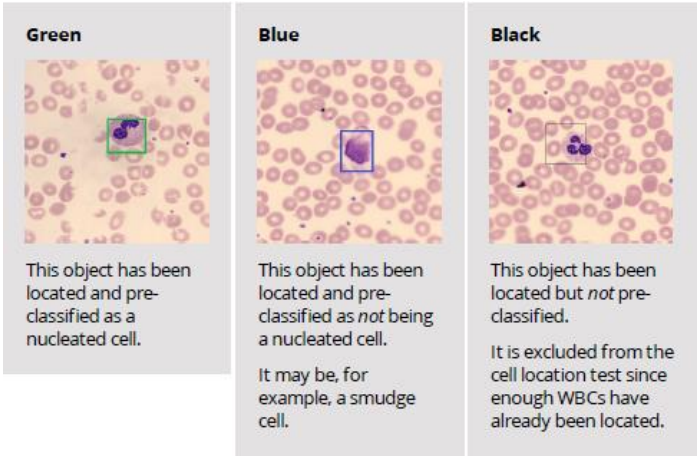
1. Select a normal blood sample in which the WBC count falls within normal ranges (a WBC above 7 x 10^9/ L is recommended) and make a peripheral blood film according to laboratory standard operating procedures. **IMPORTANT:** Label slide with barcode with the prefix 'QC', e.g. QC[DATE], QC03082020

2. Place cell location slide onto DC-1 following steps detailed in 'Processing Slides'.

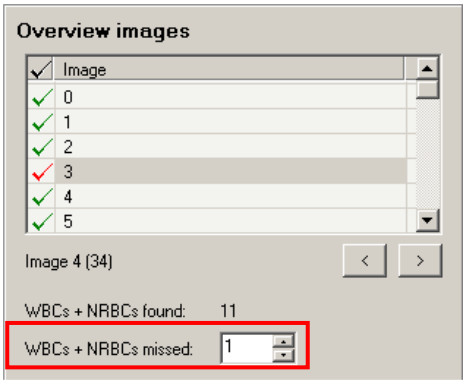
3. Once analysis is complete select [Cell location tool] from drop down windows 'Tool' bar. Select the appropriate QC slide from the list

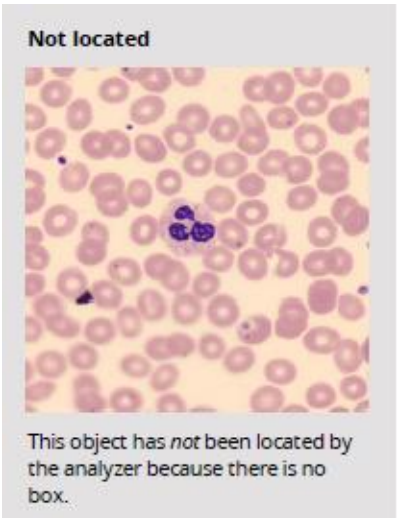


4. Go through all overview images to ensure no nucleated cells have been missed. **NOTE:** a sample with WBC count of 7 to 11 x 10^9/L will produce between 20 to 80 overview images. If fewer overview images are obtained this indicates poor slide preparation. Green boxes mark nucleated cells; blue boxes mark artefacts and **black** boxes indicated cells located but not required. Double-click will enlarge the area of interest.

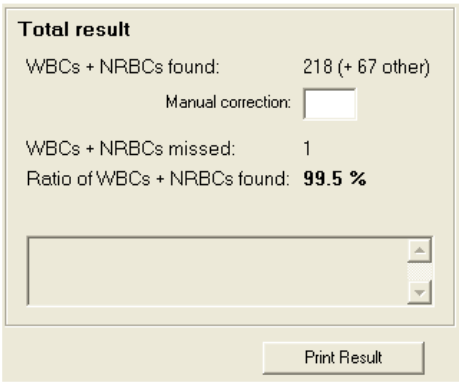


5. Nucleated cells not surrounded by a box indicate nucleated cells that have been missed. Enter these into the WBC+NRBC missed box.

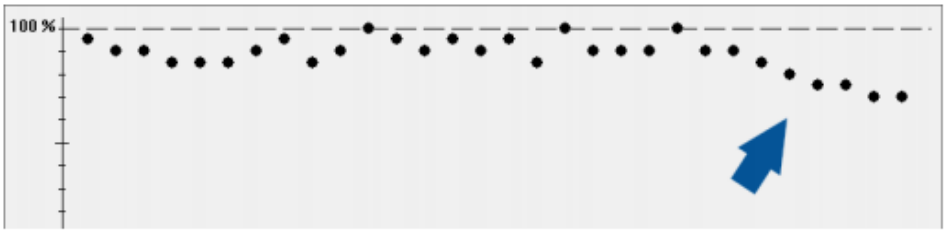




6. When ALL overview images have been examined the total result box will appear. The result is automatically calculated and should be compared to the laboratories own established limits. **NOTE:** If the system cannot locate 200 nucleated cells or the non-nucleated cell count exceeds 3% the results will be discarded, and an error message will appear in total results panel.



7. Click [Show History] to check the 'Cell Location History' chart. This displays the percentage of identified cells for the last 30 cell locations performed. Shifts or trends may indicate that further review/troubleshooting is required. **NOTE:** cell location results with images are only stored for 5 days. The 3 most recent cell location tests with images are always stored even if over 5 days old.



CellaVision Smear Checker

The CellaVision Smear Checker is a tool that allows the user to objectively assess the quality of the peripheral blood smear and staining protocol used. It assesses 3 core criteria;

- Monolayer quality
- Stain intensity
- Stain colour

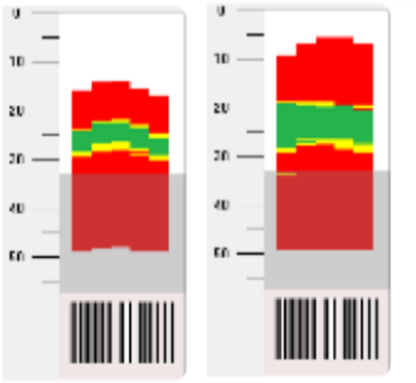
It is recommended that the CellaVision Smear Checker is used as part of troubleshooting on the DC-1 or if any changes are made to either the staining or smear protocol for peripheral blood smears. It can also be used on a daily basis following maintenance of smear and staining equipment to provide a daily quality control. Failure of any part of the Smear Checker results indicates that the problem causing analysis failure on the DC-1 is more likely to be due to poor smear preparation, than an issue with the DC-1 analyser. Smear Checker results must be improved first before further troubleshooting on the DC-1 is performed.

To use the CellaVision Smear Checker:

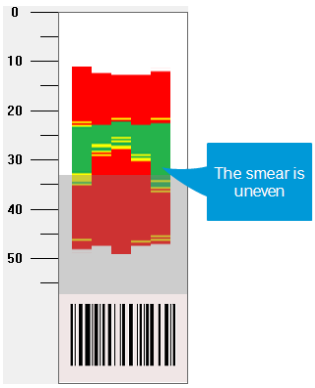
1. Close the routine processing CellaVision software
2. Open CellaVision Smear Checker software
3. Place cell location slide onto DC-1 following steps detailed in ‘Processing Slides’.
4. On completion the CellaVision Smear Checker results can be seen on the screen or selected from the drop-down menu.

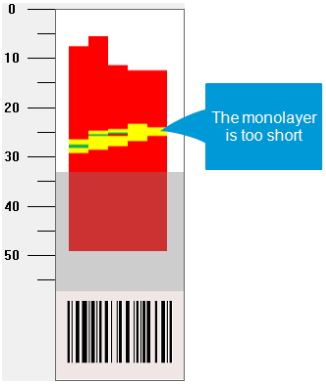
5. Examine the quality of the monolayer. The monolayer must;

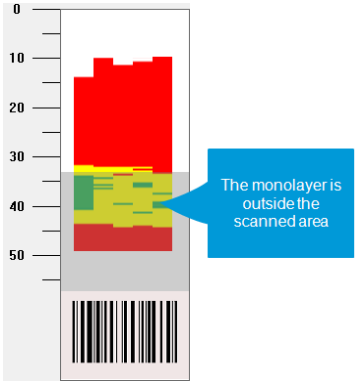
- Start somewhere in the gray area, that is more than 33 mm form the end of the slide.
- Be more than 30mm in length.
- Terminate 5 to 15mm from the non labelled end of the slide.
- Have a large area of good monolayer (GREEN) with border of acceptable monolayer (YELLOW) that goes across the slide evenly

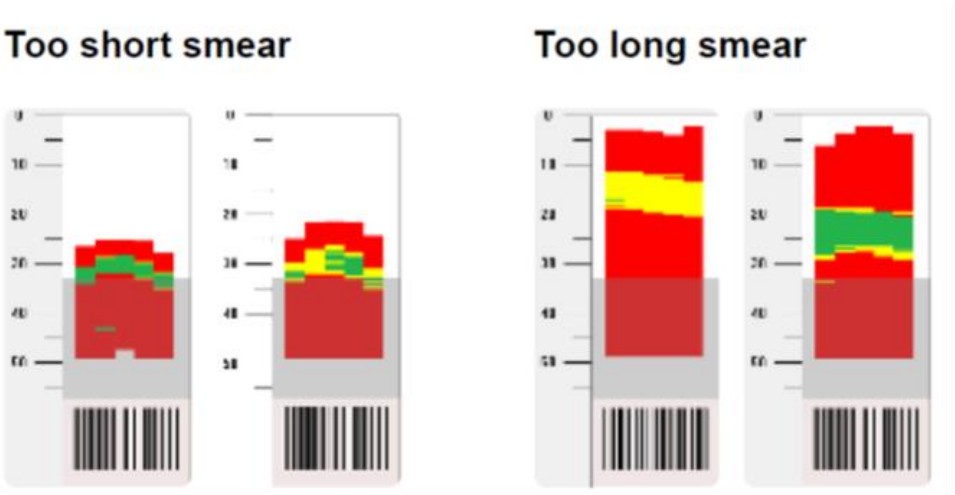


Examples of bad smears



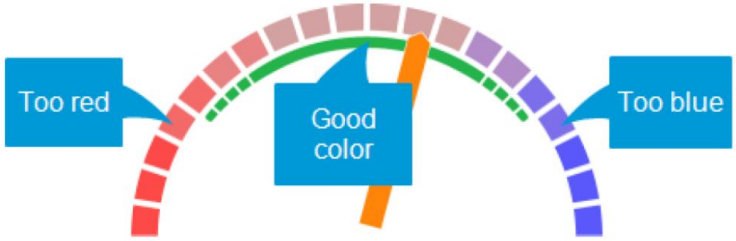






6. Examine the stain intensity gauge. It should sit within the green area, if the stain is too dark it moves to the left, if it's too light it moves right.

7. Examine smear colour gauge. It should sit within the green area, if the stain is too red it moves to the left, if it's too blue it moves to the right.

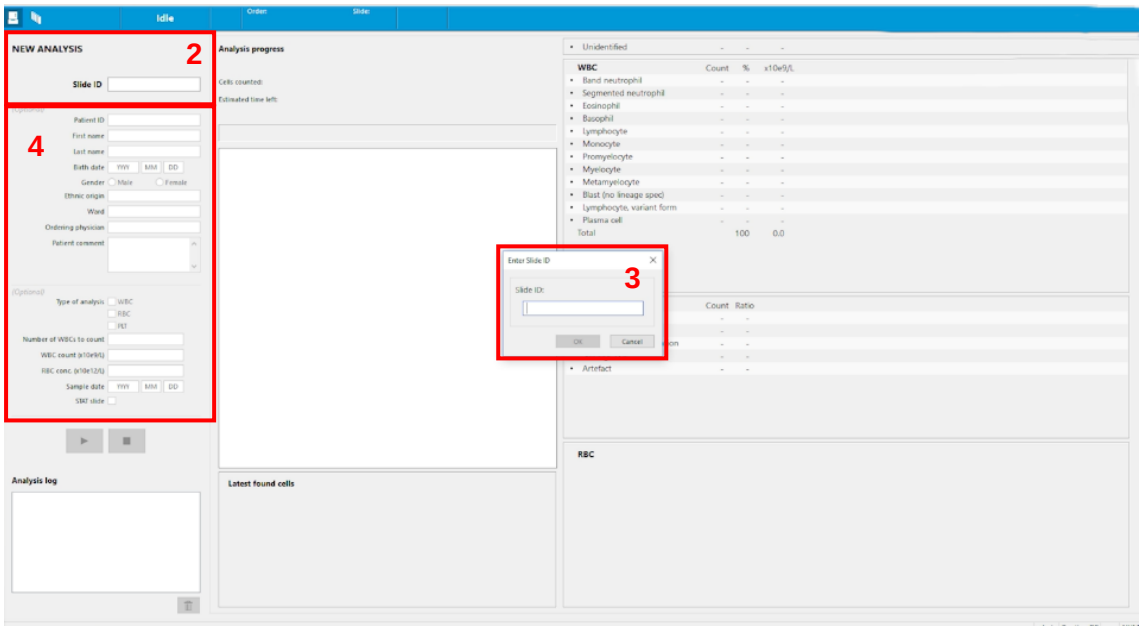


8. Once Smear Checker results have been analysed, steps should be taken to correct any failures as a result of the smear preparation process, if required.

Processing Slides

1. Open the input hatch and place the slide with the smear facing upwards and frosted end of the slide to the right.

2. Select [System control view,] and click [Slide ID] text box.



3. Enter the slide ID requiring analysis and Click [OK]. This can be done manually or by using the handheld barcode scanner.

4. **NOTE**: If analyser is not connected to EPU or LIS or the order has not been received from LIS, then additional information can be entered and type of analysis to be performed can be selected.

5. Place 2 drops of immersion oil on to the slide at the red marker without touching the slide.

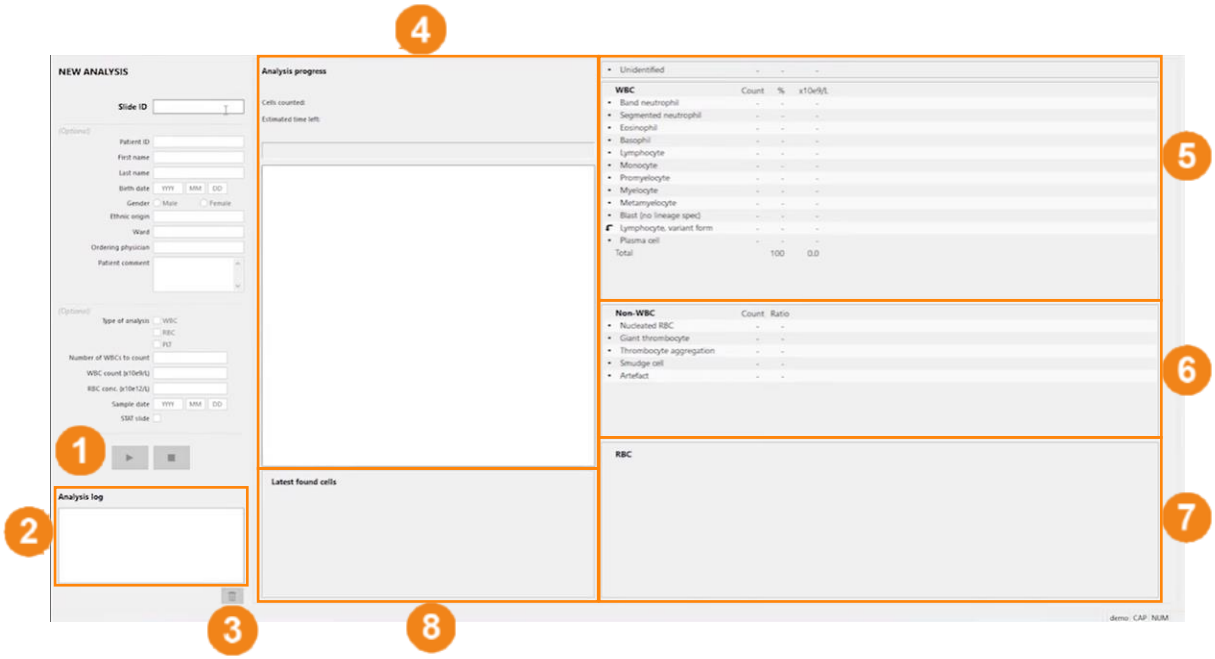
6. Close the input hatch.

7. Click the [Start Button,] in the 'system control view'. The status LED light on the analyser will turn YELLOW. As soon as analysis is completed the status LED will flash GREEN. If a mechanical error occurs the status LED will go RED.

8. On completion of analysis open the input hatch and remove the slide.

System Control View

The ‘System Control View’ allows the user to view the status of slides, including analysis progress, latest cells found, number of WBC’s, non- WBC’s and RBC’s being processed.



1. **Slide Processing**

Start or resume slide processing

Used to stop slide processing

2. **Slide ID and Status** – Displays slide barcode ID and status icon

Processing

Slide has been processed with no warnings or errors.

Slide processing has been stopped by the user.

Warning. A problem has occurred during slide processing. Images and preliminary results have been saved to the database for slide processing. **NOTE:** most common causes of a warning are no order for slide received from LIMS or not enough WBCs found to fulfil the required WBC differential settings, i.e. low WBC count.

3. **Clear Log** – Used to clear ‘System Control View’ log manually. The log is automatically cleared when the CellaVision software is exited.

4. **Analysis Progress** – Displays the number of cells found, estimated time till completion and steps of analysis

5. **WBC** – Displays the number of WBCs found in the 12 different WBC classifications analysed: Unidentified cells, Band Neutrophils, Segmented Neutrophils, Eosinophils, Basophils, Lymphocytes, Monocytes, Promyelocytes, Myelocytes, Metamyelocytes, Blast Cells, Lymphocytes variant forms, Plasma Cells.

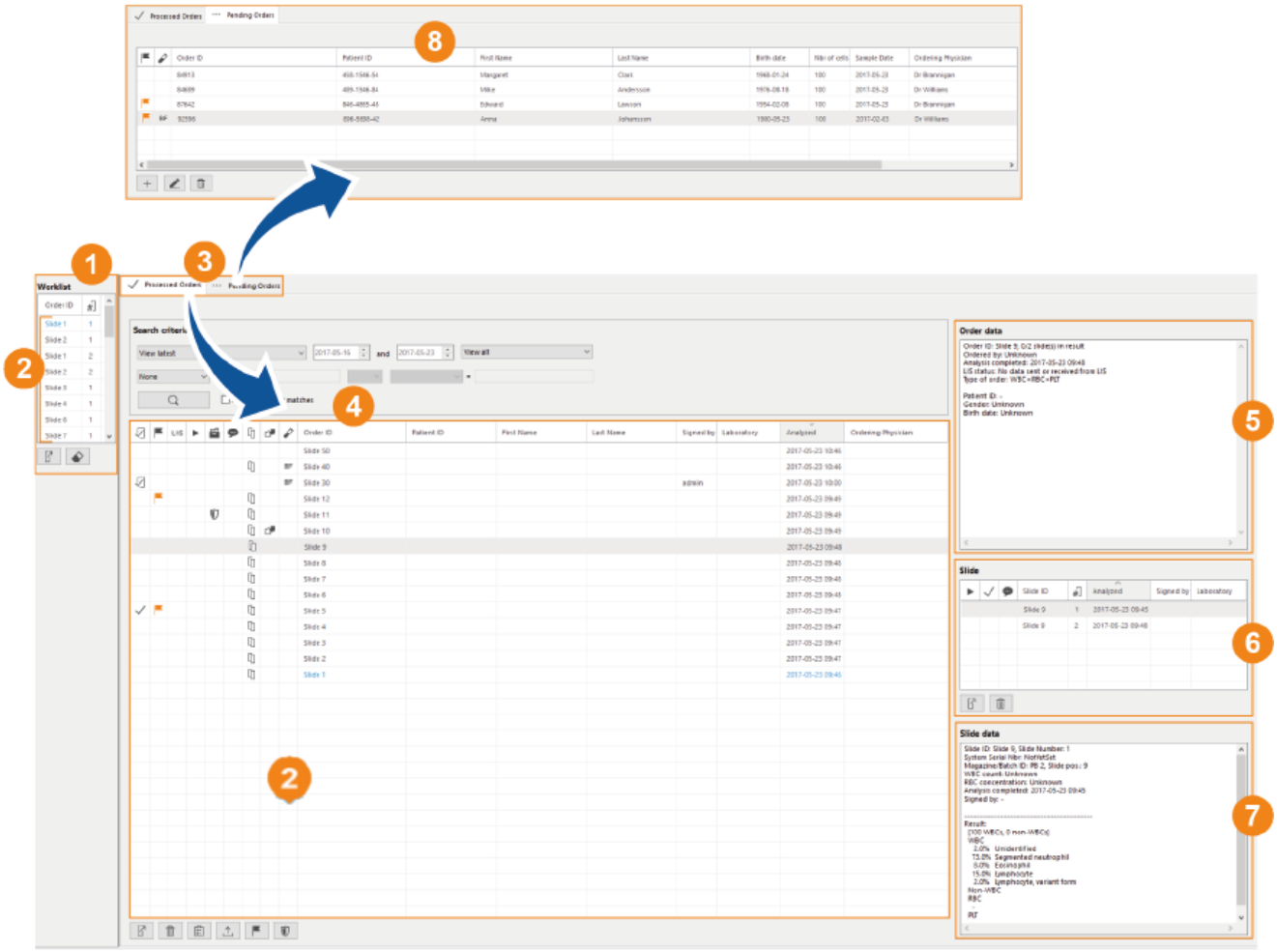
6. **Non-WBCs** – Displays the number of non-WBCs found in the 5 classification analysed: Nucleated RBC, Giant thrombocytes, Thrombocyte aggregation, Smudge Cells, Artefact

7. **RBC pre-classification** – Displays the analysis results for 6 RBC characteristics pre-classified by the DC-1: Polychromasia, Hypochromia, Anisocytosis, Microcytosis, Macrocytosis and Poikilocytosis.

8. **Last found cell** – Displays images of the last 3 cells found as they are located.

Database View

The database view gives the overall status of processed and pending orders.



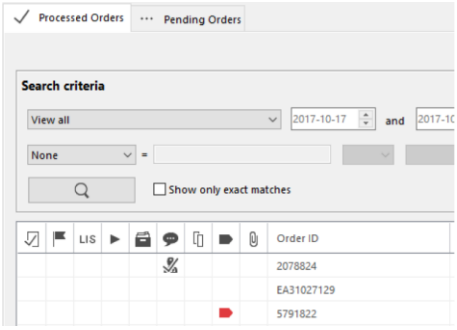
1. **Worklist**: Samples can be added to the worklist manually or automatically through the settings. When you sign a slide in an order it is removed from the worklist and the next order/slide is automatically opened.

	Slide number
	Open slide in verification view. Slide can also be opened in verification by ‘double click’.
	Remove slide from your worklist. **NOTE:** All orders are automatically removed from worklist when CellaVision software is exited.
	Add slide to worklist

2. **Slides Added in the Worklist:** Displays list of slides added to the work list. Orders that are locked by you are shown in blue, while orange text indicates that the order is locked by another user.

3. **Processed/Pending Orders Tab**:

   - Processed Orders Tab: displays all orders where processing on the DC-1 has been completed.
   - Pending Orders Tab: displays orders that have been added manually and are waiting to be analysed



4. **Processed Orders List**: Processed orders list displays both signed and unsigned orders. The display can be sorted by clicking the column headers or filtered by using the search function. Orders that are locked by you are shown in blue, while orange text indicates that the order is locked by another user. To open an order, in the Processed Orders list, double-click the order.

Order Status

- Order is signed
- At least one slide in the order is signed
- Order is cancelled

STAT

Emergency samples can be marked as STAT. This can also be sent via the LIMS or by marking them as STAT in the database view.

- Order is marked as STAT

LIS Status

LIS

- Data was received from LIS
- Result is currently sent to LIS
- Result could not be sent
- Result has been sent

Process Status

- At least one slide in the order failed to be processed
- At least one slide in the order was stopped by the user
- All slides have been processed, but at least one slide in the order was processed with a warning

Archive Status

Order is protected and cannot be deleted

Order is archived

All images are deleted, except region of interest. This is only applicable for Scan databases

Comments

The order contains at least one comment

At least one slide in the order is marked for pathology review

Pathology review is completed

Multi-slide Status

An order can contain more than one slide from the same sample.

The order contains more than one slide

The order contains a cell counter confirmed result

The slide is signed without performing a complete verification

Category

Orders can be categorised using designated colour codes.

Select relevant order(s), right-click the selected order(s), select categorise and then appropriate category.

This order is categorised as **RED**

This order is categorised as **GRAY**

This order is categorised as **GREEN**

This order is categorised as **PINK**

This order is categorised as **YELLOW**

This order is categorised as **BLUE**

5. **Order Data Box:** Shows extended data for the chosen order.

6. **Slide Box:** List all slides for the chosen order if more than one slide has been processed on the same sample number.

Process Status

- At least one slide in the order failed to be processed
- At least one slide in the order was stopped by the user
- All slides have been processed, but at least one slide in the order was processed with a warning

Slide Status

- The slide is signed
- The slide is cancelled
- Slide number

Comments

- The order contains at least one comment
- At least one slide in the order is marked for pathology review
- Pathology review is completed

Buttons

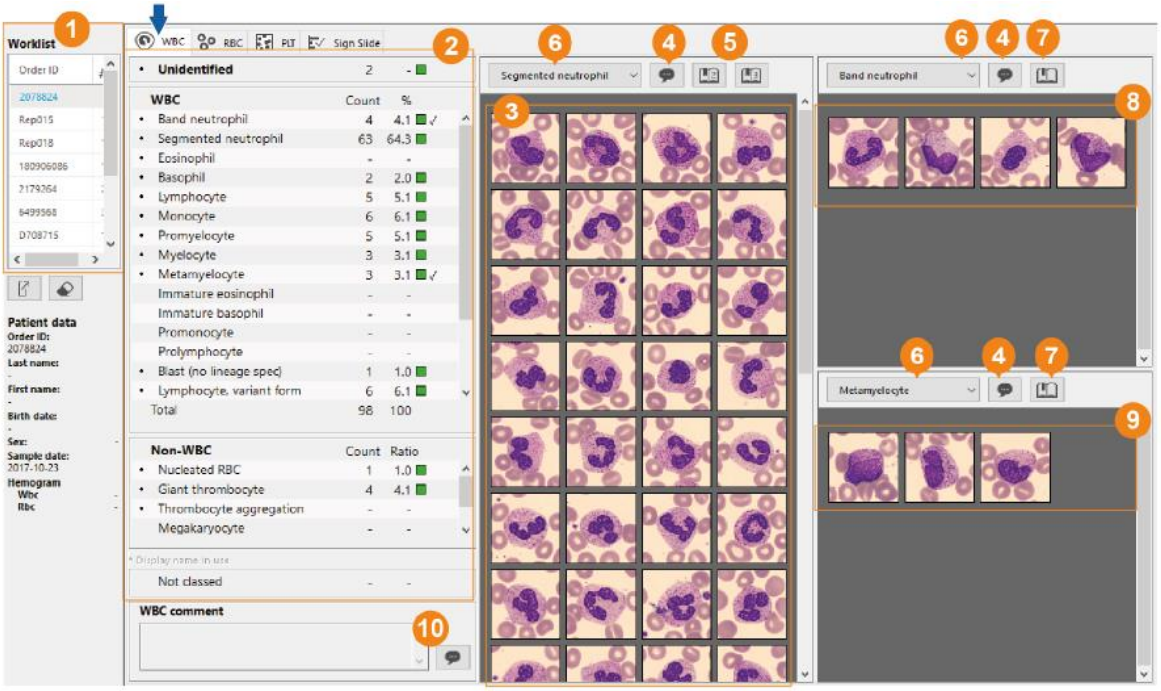
- Delete the slide from the Processed Orders list
- Open the slide in Verification View

7. **Slide Data:** shows information about the results for a chosen slide in the ‘Slide box’, such as percentages of WBC’s and non-WBCs found.

8. **Pending Orders List:** Shows orders that have been manually added and are awaiting analysis.

WBC Verification View

To open ‘Verification’ double-click appropriate slide number on system control panel or select [Verification view] icon in system control screen toolbar menu. Click on [WBC] tab to view WBC verification view.



1. **Worklist:** Samples can be added to the worklist manually or automatically through the settings. When you sign a slide in an order it is removed from the worklist and the next order/slide is automatically opened.

	Slide number
	Open slide in verification view. Slide can also be opened in verification by ‘double click’.
	Remove slide from your worklist. **NOTE:** All orders are automatically removed from worklist when CellaVision software is exited.
	Add slide to worklist

2. **WBC and non-WBC Panel:** Displays the cells identified as a count or percentage. All cell images within each classification must be viewed to sign a slide:

	Cell classification is pre-classified by the analyser
	Cell classification contains cell images.
	Cell classification contains cells that have been reclassified.
	All cells within the cell classification have been viewed.
	Cells within classification have been automatically forwarded to another cell classification
*	Indicates a custom display name. To see the original cell class name, point to the display name.

3. **Gallery 1:** The galleries show the WBCs per class. You can choose to view one, two or three galleries at the same time or display all classifications on the screen at the same time using [Full Screen View]. The galleries can also show reference cells. Cell classification to be displayed can be selected from the drop-down menu.

One Gallery
Two Gallery
Three Gallery
Full Screen View

4. **Add Comments to this Cell Class:** Allows the user to add comments to the cell classification. These comments may or may not be sent to host depending on set up. Cell classification with comments attached are marked with 💬.

5. **Show Reference Cells in Gallery 2 or Gallery 3:** Allows the reference cells for the classification displayed in gallery 1 to be displayed in gallery 2 or 3:

6. **Select Cell Class:** Allows the user to select the classification images or reference cells to be displayed in the selected gallery. Individual cell images can be magnified by [double-click] or all cells images within the gallery can be magnified by using the appropriate icon.

Zoom In
Zoom Out

7. **Show Reference Cells:** Allows the reference cell images for the category selected within the gallery to be displayed.

8. **Gallery 2:** Displays images taken for the category selected from the drop-down menu.

9. **Gallery 3:** Displays images taken for the category selected from the drop-down menu.

10. **Add Comments to the WBC Results:** Allows the user to add comments to WBCs as a whole group rather than WBC classification. These comments may or may not be sent to host depending on set up.

Reclassification of WBC

The DC-1 locates and pre-classifies WBCs and non-WBCs only. Each image taken must be reviewed and reclassified if necessary, to complete the differential. Once all cells within a classification have be reviewed the classification will be marked with a ✓. Reclassification of WBC can be achieved by several methods:

- Dragging and dropping cells from one gallery to another. TIP**:** Press [CTRL] to select more than one random cell or press [SHIFT] to select a block of cells for reclassification.
- Right click on the cell to open drop down menu. Select new classification. TIP: right click menu also gives you DC-1s 1st, 2nd, and 3rd suggestions of classification.

Reclassified cells will always appear at the beginning of a gallery and any classification containing a reclassified cell will be indicated by a ■ and once slide is signed you cannot reclassify WBCs on a signed slide.

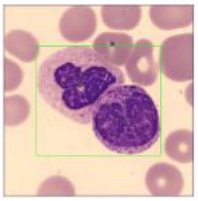
IMPORTANT: To sign a slide 2 criteria must be met:

- All cell images displayed in the WBC and non-WBC panel must be reviewed.
- All images in the [Unidentified] classification must be re classified.

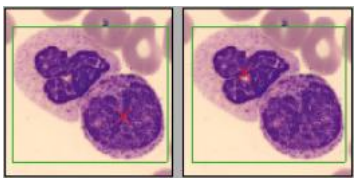
Marking/Splitting Cells

If one or more cells are displayed in an image, it can be difficult to identify which one of the cells the analyser has identified. This can be achieved by using the cell marker. The cell marker places a green box around the cell identified.

Occasionally the analyser will fail to identify two cells as individual cells due to them being too close together, placing the green box over both cells and as a result classifying them as one cell. These cells must be split and reclassified separately. To split cells:

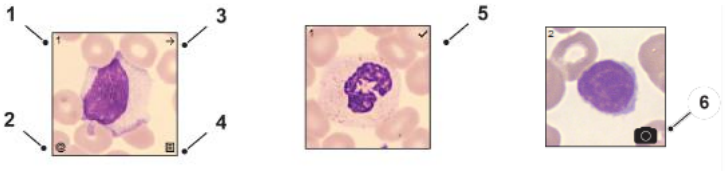


1. [Right-click] on the appropriate image and select [Split cells].
2. [Click] on the nucleus of each cell in the image. This marks the cell with a X. The green box remains over all the cells.
3. Click [OK] and the CellaVision software will produce the appropriate number of copies based on the number of cells marked.
4. Each cell marked with the X must then be re-classified.



WBC Attributes

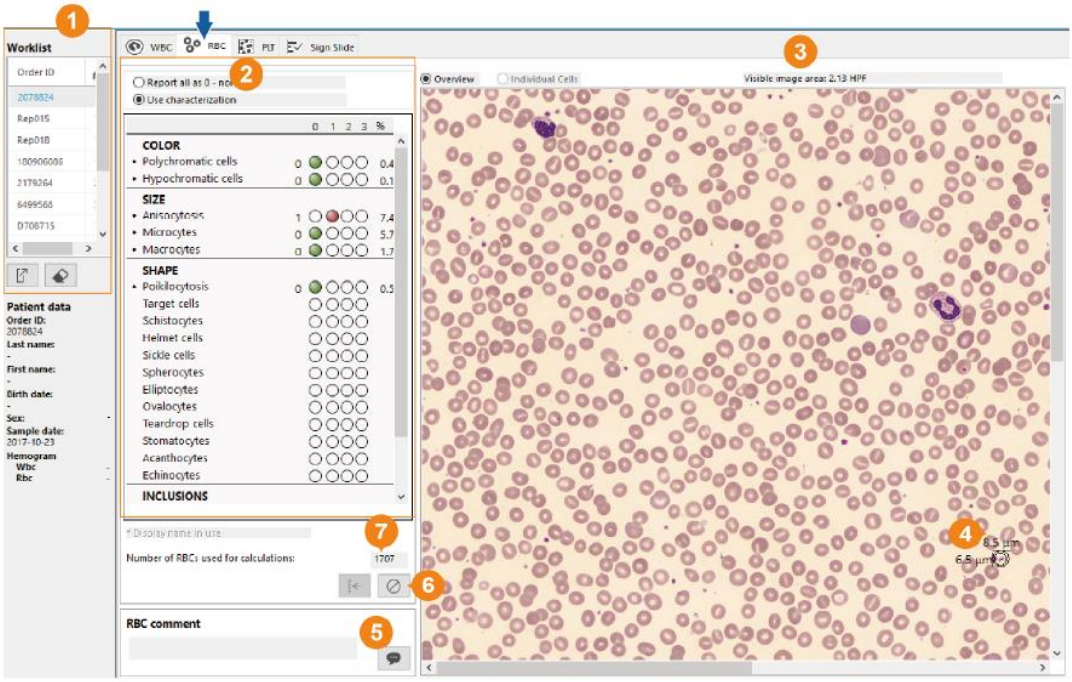
WBC attributes/information can be displayed using the WBC attributes icon, .



1	1	These numbers are sequential within a classification and are the same number for any user viewing the cells within the same order.
2		Image selected for email.
3		Image forwarded to another class.
4		Cell comment exists. Cell comments cannot be sent to host.
5		Re-classified cell.
6		The image has been manually captured on the CellaVision Image Capture System (always shown).

RBC Verification View

The RBC overview corresponds to 8 microscope high power fields (x100 objective). The DC-1 will pre-characterise 6 RBC morphologies: polychromatic cells, hypochromic cells, anisocytosis, microcytosis, macrocytosis and poikilocytosis. To complete RBC morphology the RBC overview needs to be reviewed and reported as normal, appropriate comments added or RBC analysis excluded.



1. **Worklist:** Samples can be added to the worklist manually or automatically through the settings. When you sign a slide in an order it is removed from the worklist and the next order/slide is automatically opened.

	Slide number
	Open slide in verification view. Slide can also be opened in verification by ‘double click’.
	Remove slide from your worklist. **NOTE:** All orders are automatically removed from worklist when CellaVision software is exited.
	Add slide to worklist

2. **RBC Panel**: Red cell morphology within the RBC overview is automatically graded into predefined categories. Red cell morphologies with customised display names will be indicated by a *.

Grade	Indication	Meaning
Normal (0)	● ○ ○ ○	Indicates a normal level
Slight (1)	○ ● ○ ○	Indicates that the morphology is present at a low level
Moderate (2)	○ ● ● ○	Indicates that the morphology is present at a moderate level
Marked (3)	○ ● ● ●	Indicates that the morphology is present at a high level

3. **RBC Overview (HPF):**

	Zoom in	Used to magnify image
	Zoom out	Used to zoom out
	Zoom mode.	Image can be magnified by clicking on the RBC overview and moving the mouse up or zoomed out by clicking on the RBC overview and moving the mouse down
	Full RBC Image	Returns RBC overview to its original magnification
	Scroll Mode.	Image can be moved by user clicking on RBC overview and moving mouse in desired direction
	RBC Grid 	Allows the user to systematically review the RBC overview at 1 HPF. Arrow keys on keyboard are used to navigate grid icon. - Green indicates section viewed - Blue indicates section being viewed - Red indicates section not viewed
	Colour/brightness	Allows user to adjust colour and brightness.
	Switch colour/brightness settings	Allows user to switch between colour and brightness settings

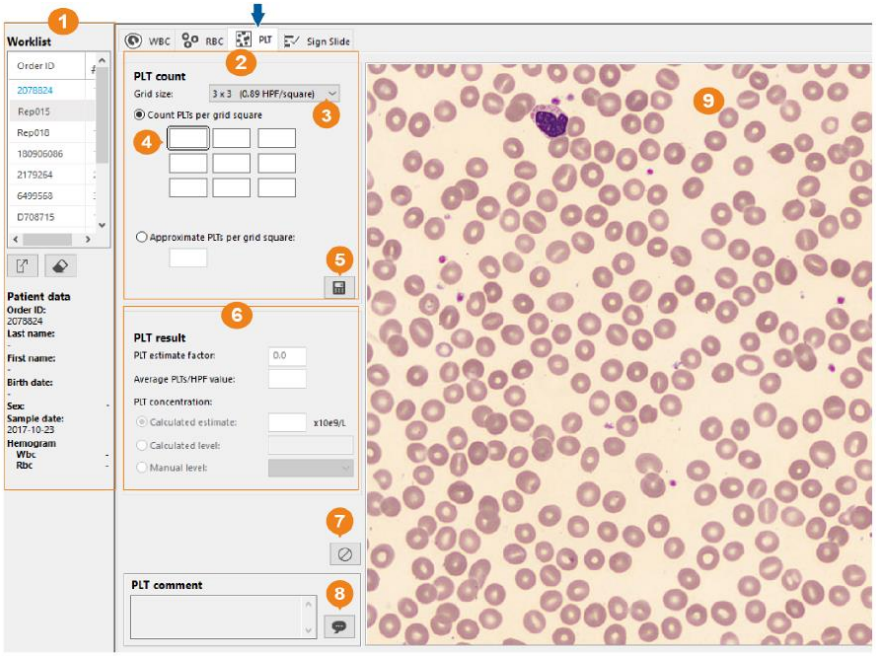
4. **Ruler**: The ruler helps you to identify macrocytes or microcytes in the RBC overview image. The ruler can be moved by dragging it anywhere on the screen and will zoom in/out in proportion.

5. **Add Comments to the RBC Result:** Allows the user to add comments to the RBC overview. These comments may or may not be sent to host depending on set up. Orders with comments attached are marked with 💬.

6. **Exclude RBC Analysis:** ⊘ Used to exclude RBC analysis from report if not required.
7. **Number of RBCs:** Number of RBCs used for % calculations of characteristics seen.

PLT Verification View

Platelet verification view is an overview of the RBC monolayer and is used to perform a platelet count or estimated platelet concentration, depending on software configuration.



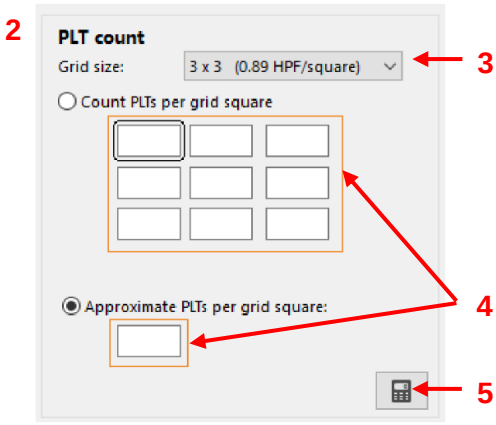
1. **Worklist:** Samples can be added to the worklist manually or automatically through the settings. When you sign a slide in an order it is removed from the worklist and the next order/slide is automatically opened.

	Slide number
	Open slide in verification view. Slide can also be opened in verification by 'double click'.
	Remove slide from your worklist. **NOTE:** All orders are automatically removed from worklist when CellaVision software is exited.
	Add slide to worklist

2. **PLT Count Panel:** Used to count platelets. The overview image is divided into 4, 9, or 16 grid squares as defined by the grid size.

3. **Grid Size:** The grid size options are 2×2, 3×3, and 4×4. These can be selected from the drop-down menu.

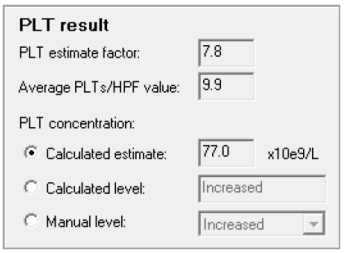
4. **Count Platelets:** Platelets can either be counted per grid square by entering the number counted in the corresponding grid square or by estimating approximate PLTs per grid square.



5. **Calculate PLT Result:** Once PLTs have been calculated or estimated, select [Calculate PLT Result] icon to calculate the PLT result.

6. **PLT Result Panel:** Used to define how platelets are reported after platelets have been counted per grid square in the PLT Count Panel. PLT counts can be reported as significantly decreased, decreased, normal or increased based on:

   - Platelets per HPF
   - Manual estimate



7. **Exclude PLT Analysis:** ⊘ Used to exclude PLT analysis from report if not required.

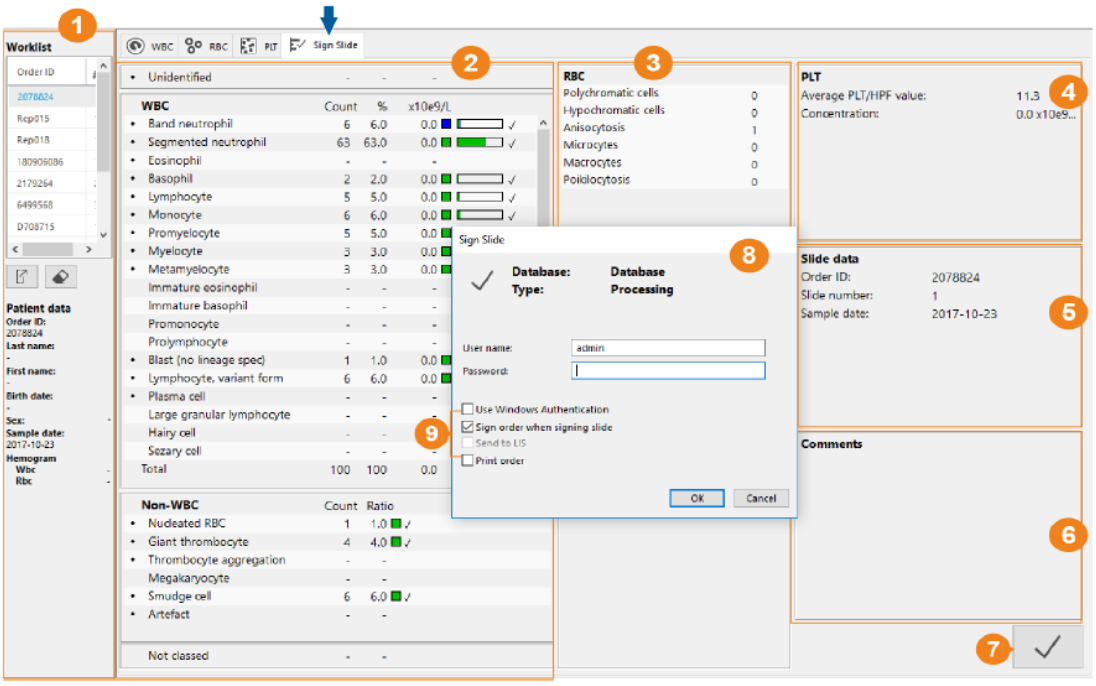
8. **Add Comments to the PLT Results:** Allows the user to add comments to the PLT results. These comments may or may not be sent to host depending on set up. Orders with comments attached are marked with 💬.

9. **Overview Image:**

	Colour/brightness	Allows user to adjust colour and brightness.
	Switch colour/brightness settings	Allows user to switch between colour and brightness settings
	Help Lines	Applies gridlines to the PLT image to aid with counting platelets.

Peripheral Blood Slide Signing

Sign slide shows a summary of WBC, RBC and PLT analysis and allows the completion of slide analysis. **IMPORTANT:** For a slide to be signed and completed, all images taken, from all verification views, must be viewed and all WBC classified as unclassified must have been classified. If these steps have not been completed the CellaVision software will inform the user what has been missed.



1. **Worklist:** Samples can be added to the worklist manually or automatically through the settings. When you sign a slide in an order it is removed from the worklist and the next order/slide is automatically opened.

Slide number

Open slide in verification view. Slide can also be opened in verification by ‘double click’.

Remove slide from your worklist. **NOTE:** All orders are automatically removed from worklist when CellaVision software is exited.

Add slide to worklist

2. **WBC and Non-WBC Panels:** Displays the WBC cells identified as a count or percentage as determined in the WBC verification view. Non-WBC cells identified are displayed as a percentage or ratio as determined in the WBC verification view:

Cell classification is pre-classified by the analyser

Cell classification contains cell images.

Cell classification contains cells that have been reclassified.

All cells within the cell classification have been viewed.

Cells within classification have been automatically forwarded to another cell classification

3. **RBC Overview:** Displays the grading of the 6 pre-characterised RBC morphologies determined in the RBC verification view.
4. **PLT Overview:** Displays the platelet results determined in the PLT verification view.
5. **Slide Data:** shows information about the results for a chosen slide in the 'Slide box', such as percentages of WBC's and non-WBCs found.
6. **Comments:** Displays WBC, RBC and PLT comments (if applicable).
7. **Sign Slide:** Select ✓ to sign slide and open sign slide dialog box.
8. **Sign Slide Dialog:** Allows user to enter username and password.
9. **Signing Options:** Select appropriate options, e.g. send to LIS, print order etc. Click [OK].

Use Windows Authentication:	When ticked allows user to use their windows authentication username and password.
Sign order when signing slide	When ticked slide and order are signed. Once the order is signed the result can no longer be changed.
Send to LIS	When ticked results will be sent to LIS
Print Order	When ticked results will be printed

Merging Orders

When multiple slides have been processed on the same order they are automatically included in the reported results. Analysis results can be merged based on one or multiple slides or slides can be excluded from the results. When results are merged any manually altered results will be changed in the report view to new automatically calculated results which are based on the average WBC differential, highest RBC grading and average PLT count per HPF, average PLT concentration or the highest PLT concentration. To merge slides in a multiple slide order:

1. Open order requiring merging of orders.
2. Click [Report View] icon 
3. On the 'Slide Merge' tab, select or clear the check box next to the 'Slide ID'. If slide is unchecked a comment is required to explain the reason for exclusion.

Pathology Review

Pathology review allows the user to mark any slide, signed or unsigned, for a senior member of staff/clinician to find and review. In ‘Database View’, orders marked for pathology review are indicated by the ’Pathology review‘ icon. Comments from ‘Pathology Review’ are not sent to LIS.

Marking a Slide for Pathology Review

1. Locate and [Open] the required order.
2. Select the [Pathology Review] button .
3. Type comment in the ‘Pathology Review’ lower dialog text box.
4. Click [OK].
5. Select [Close Order] button to close the order. **NOTE:** The individual performing the ‘Pathology Review’ will not be able to open the order it if it is not closed by the user requesting the ‘Pathology Review’.
6. The order will now appear in the ‘Database view’ marked with in the comments column,

To Review an Order Marked for Pathology Review

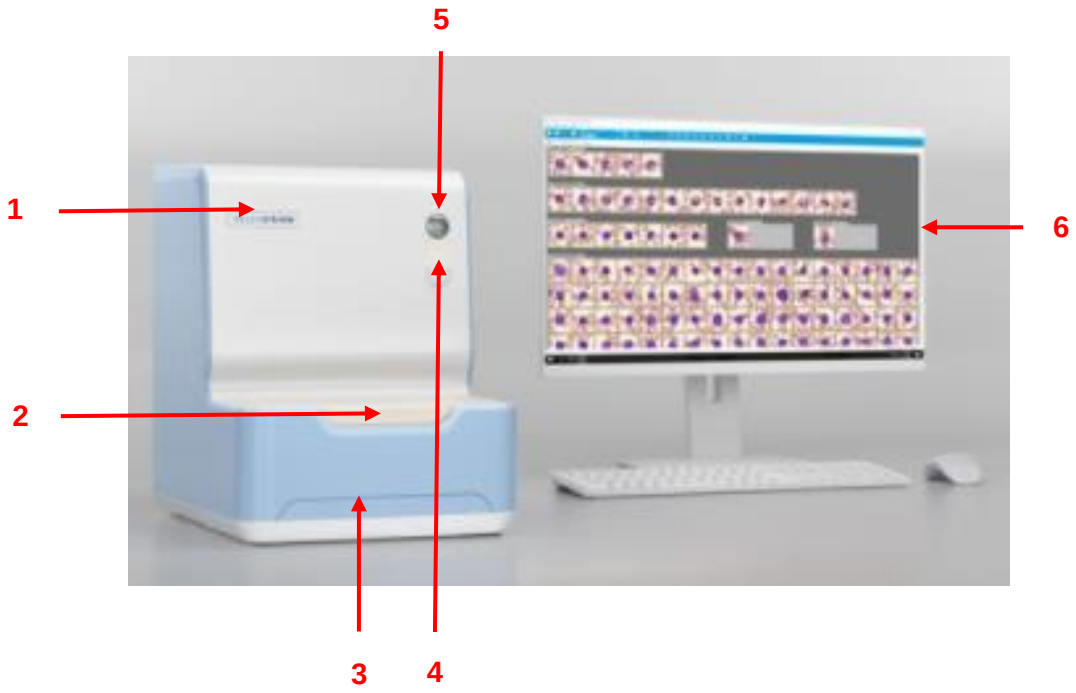
1. Locate slides marked for pathology review by clicking the title cell of the ‘Comments’ column in the ‘Database view’. This will order the list so that slides marked for ‘Pathology Review’ are at the top.
2. Open order marked for pathology review . A dialog box will open with all previously added comments.
3. Review the order as described previously.
4. Click the [Pathology Review] button to open the ‘Pathology Review’ dialog box. All previously added ‘Pathology Review’ comments can be read in the upper text box.
5. Type any new ‘Pathology Review’ comments in the lower text box.
6. Select [Pathology Review Completed] check box and click [OK].

7. Select [Close Order] button  to close the order. **NOTE:** The order will not be able to be opened by any other user if the order is not closed by the user completing the ‘Pathology Review’.

8. The order will now appear in the ‘Database view’ marked with  in the comments column,  . **NOTE:** Orders can be reopened for ‘Pathology review’ by unchecking the [Pathology Review Completed] check box.

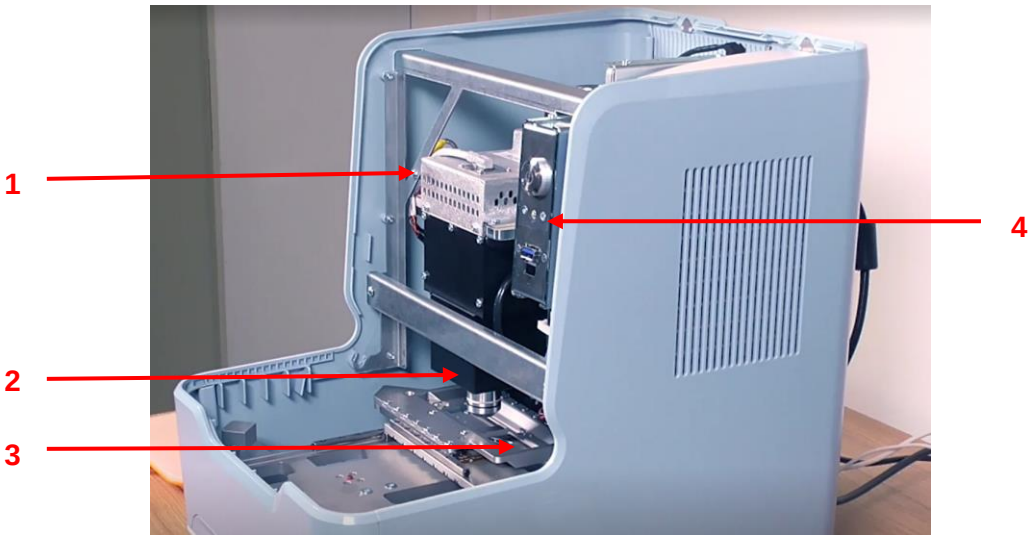
Tasks

Task 1: DC-1 External Components



Drip Tray	Information Processing Unit (IPU)	Stand-by Switch
Status LED	Main Unit Hood	Input Hatch

Task 2: DC-1 Internal Components



Loading Tray

Imaging Modules

System Computer

Microscope Module

Task 3: Routine Use

As a group or individually, using the information in this workbook perform the following tasks

1. What weekly maintenance is required?
    - _____
    - _____
    - _____

2. Cell location: Select a slide suitable for peripheral blood cell location
    a. Label slide appropriately
    b. Perform cell location
        - What do blue squares mean?
        - What do black squares mean?
        - Do results of cell location fall within acceptable limits?

3. Peripheral blood film analysis: Select a variety slides for analysis
    a. Ensure slides are label appropriately
    b. Perform peripheral blood film analysis
        - Where you look to see if analysis is complete?

        i. Create a work list of the slides you have analysed.

        - What icons are displayed (if any) for the slides that you have run? What do they indicate?

c. Mark one slide for;

i. Pathology review (if available)

ii. As STAT

iii. Protect from auto delete or archive

4. WBC Verification view: Select one of the slides you have processed from the database view.

a. Change screen layout

i. All classifications

ii. 2 classifications

- LHS lymphocyte/RHS monocytes
- Change RHS Gallery to lymphocyte reference cells.

iii. 3 classifications

- How do you know when all cells within an individual cell classification have been view?

b. With the screen on 1 classification, reclassify and confirm cell types

i. Using drag drop

ii. Using right click menu

- How do you know when cells have been reclassified?

c. Add comments

i. General WBC comment

ii. Classification comments

iii. Individual cell comments

- When a comment has been added to a cell class what icon do you see appear and where?
- Which level of comments are not included in the report?

5. RBC verification view
    a. Zoom in/out of RBC overview
    b. Use RBC characterisation
    c. Name the 6 preclassified RBC features
    d. Add RBC comments
6. PLT verification view (if available):
    a. Excluded PLT analysis
7. **Sign slide:** Sign slides using username: admin and password admin. Select to, sign order when signing slide but not send order to LIS.
    - What 3 criteria must be met to sign a slide?
    - Return to database view what differences do you notice?
    - Reopen slide. Can you make changes?

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