1. **PRINCIPLE:**

The Sysmex UF1000i is an automated urine particle analyzer intended for in vitro diagnostic use in urinalysis. The instrument is designed to replace manual microscopic testing of normal and abnormal urine specimens and to flag samples containing certain abnormal formed elements. The UF-1000i is intended to screen patients for urine abnormalities that indicate the need for further assessment.

The analyzer automatically mixes, aspirates and analyzes formed elements in urine using flow cytometry measurement of forward scattered light (FSC), side scattered light (SSC) and fluorescence (FI). The instrument displays and enumerates RBCs, WBCs, Squamous Epithelial Cells (EC), Hyaline Casts (Cast) and Bacteria (Bact). It will also provide flagging information for other pathological elements such as Crystals ( X’TAL), Yeast-like Cells (YLC), Pathological Casts (Path. Cast), Small Round Cells (SRC), Spermatozoa (Sperm) and Mucus.

1. **SPECIMEN REQUIREMENTS**

* Manual Mode: 1 ml. minimum volume
* Auto Mode: 4 ml. minimum volume
* Perform manual microscopic for volumes less than 1ml.

Fresh uncentrifuged urine received less than 2 hours after collection in plastic conical tube or up to 12 hours in a UA preservative tube. If specimens cannot be analyzed readily, they may be refrigerated to prevent bacterial growth and chemical composition changes. Formed elements may disintegrate at varying rates depending on pH, osmolality and storage conditions.

**CAUTION: Do not analyze the following specimen types as results may be affected**:

* Very turbid and bloody samples
* Samples with large amounts of mucus
* Urine with large visible particles/debris
* Urine with fluorescent colors; ie. Bright orange urine seen in patients receiving phenazopyridine (Pyridium) to alleviate UTI symptoms.

1. **REQUIRED MATERIALS/REAGENTS**

UFII SHEATH REAGENT

UFII PACK-SED REAGENT

UFII SEARCH-SED REAGENT

UFII PACK-BAC REAGENT

UFII SEARCH-BAC REAGENT

UFII LOW CONTROL

UFII HIGH CONTROL

SAMPLE RACKS

URINE TEST TUBES (12-15 mm diameter and 95-120 mm height)

1. **OPERATING PROCEDURE**
2. Start-up Procedure- Daily in A.M.
3. Check UF analyzer by visual inspection:
4. Fill printer with paper.
5. Check trap chamber for fluid accumulation. Empty chamber if needed (See Section XIV: Trap Chamber Removal and Cleaning).
6. Check expiration dates of installed reagents. Any expired reagents should be replaced (See Section XI: Reagent Replacement- Good for 60 days).
7. Remove controls from the refrigerator to warm for 20 mins.
8. Perform **Daily Maintenance** (Bleach is never used for UF Maintenance)
9. Take analyzer out of Sleep mode if not in Ready state (press large green button on front of main unit).
10. With instrument in Ready (LED’s green), Double-click on Shutdown icon on the Main screen. The Shutdown dialog box will appear. Select “YES” to Main Unit power off.
11. Press the “Start” Button ( large green button on front of Main Unit) on the analyzer to begin the Shutdown sequence. You’ll see the Progress bar count up to 100%. Process takes about 10 mins.
12. When the Shutdown is complete the “Connection with Analyzer has disconnected” box will appear. Click “OK”.
13. Press small green power button on front right side of the Main Unit. The instrument will perform a series of self checks ending in a background count.
14. If background is high and out of range (counts in red), perform “Autorinse”.

If background is still out alert a supervisor or call Service (TAC) for further assistance.

If background is acceptable (counts in black) proceed to QC analysis.

1. Record and complete logsheet for UF maintenance.
2. **QC ANALYSIS:**

Two Levels: UF II Control L, UF II Control H

* Controls should be run at the beginning of each shift and after sample filter or SRV cleaning.
* Run controls in the manual mode only.
* Record date opened and date control will expire on control bottle. Stable for 30 days once opened. Store at 2-10 degrees C in original box to protect from direct sunlight.

1. Allow controls to warm to room temperature for 20 -30 mins. before use.
2. With instrument in “Ready” (LEDs green), click the” Manual” icon from the main menu or F2 on the keyboard. Click on the QC icon on the right side of the window.
3. Choose the correct QC file from list displayed and click OK. Close “QC Measurement Help” dialog box. Verify correct lot # and control level is displayed.
4. Mix the UF II control bottle by shaking until there is no sediment at the bottom, shake vigorously at least 20 times to mix. Never sample directly from the control bottle.
5. Within 10 secs. of mixing, dispense 1 ml. of control into a plastic tube. Immediately (within 10 secs.), hold the tube with the dispensed control up to the aspiration pipette with the tip near the bottom of the tube, and press the green manual Start button on the front of the unit. Hold tube in place until beeping stops and aspiration is complete.
6. Discard test tube after measurement; any remaining control in tube should be discarded.
7. QC results will display in a dialog box for your review. Any out of range results will be highlighted in red. Press the scattergram key to check for the presence of a single peak in the RBC forward scatter screen (RBC-S-FSC). Press “Accept” tab to plot results regardless of whether they are in range or not. Repeat control if results are unacceptable(repeat from step 2).Assure all values are in range and repeat from step 2 for second control.
8. Review QC in Levy Jennings graphs or Radar charts (see directions below).
9. The instrument is ready to analyze patient samples once QC is acceptable.
10. Do not run instrument if QC is out of range; troubleshoot or alert supervisor for assistance.
11. Record and complete logsheet for UF QC.

****

1. **Reviewing QC**

**Viewing Radar Charts**

1. Select “QC Files” on the toolbar on the IPU or press F5 on the keyboard.
2. Select the appropriate file number (1-24). Do not open the file.
3. Once the file is highlighted, the Radar Chart will display on the right side of the screen.
4. The most recent control data is displayed in blue on the radar chart. Date and time of analysis are displayed immediately to the left of the radar chart in the Analysis Date column.
5. Parameters that exceed the acceptable limit will have a red “X” displayed on the chart. The parameter name will be backlit in red and the word “ERROR” will be displayed to the left of the file number.

**Viewing L-J Charts**

1. Select “QC Files” from the Main Menu or F5.
2. Double-click to select the appropriate file number (1-24).
3. The L-J Chart will display when the file is selected.
4. Parameters that exceed the acceptable limit will have a red “X” displayed as the plotted point. The parameter name and result value will be backlit in red.
5. To view the remaining parameters, use the scroll bar on the right side of the screen or the down arrow key on the keyboard.
6. **SAMPLE PROCESSING: AUTO MODE**

* 4 ml. Minimum volume required; 1200ul. aspirated volume
* Samples <4 ml. Proceed to manual mode processing.

1. Place instrument in “Ready” (green light lit on front of machine and in lower left corner of IPU screen). If sleep mode is displayed in lower left corner of computer screen, Press large green button on front of instrument to return to ready state.
2. Check specimens for proper volume before placing on instrument.
3. Place patient samples into grey racks with bar codes centered and facing forward. Load racks onto the right side of instrument. The notch on the rack should be on the right. Up to 5 racks can be set on the sampler at a time.

NOTE: The plastic conical urine tubes need an empty space between them to accommodate their flared tops otherwise a rack error may occur.

1. Click “Sampler” on IPU screen or Press F3 on keyboard.
2. Click “Sampler Start” or Press Enter on keyboard. Completed results can be viewed in Explorer or Browser screens. A printed copy will automatically be generated for any sample requiring review.

**If sampler needs to be stopped once run is started:**

1. Click “Sampler” button in tool bar on menu screen, OR
2. Press F3 on keyboard, OR
3. Double click “Sampler Sample No.” icon on menu screen.

The Sampler analysis stop dialog box will display. Click “Abort” to stop run or “Cancel” to continue run.

NOTE: If the run is interrupted during analysis, move partially sampled rack back to the right side of the instrument without changing the order of the specimens, and restart rack from the beginning. The analyzer will skip over the samples which it already processed and begin sampling where it stopped. Finished racks should be moved to the left side.

Alternatively, you can run a completely empty rack through the analyzer which will reset the instrument. This will allow you to continue running samples in any order you wish.

1. **SAMPLE PROCESSING: MANUAL MODE**

* 1 ml. Minimum volume required; 800ul.aspirated volume.
* Used for QC analysis and patient samples QNS for auto mode.
* Perform manual microscopic for samples < 1ml.

1. Verify instrument is in the “Ready” state (LED light on front of instrument is green).
2. Click the “Manual” icon on IPU screen or Press F2 on keyboard.
3. Enter sample order number using handheld bar code reader or manually enter using keyboard. Press “OK” to exit out of the manual sample window. After the first sample is scanned, the ID number will increase sequentially unless a new number is added via scanning or keyboard entry.
4. Place well mixed sample under aspiration probe making sure pipette is well below the meniscus of the sample.
5. Press “Start” button (large green button) on front of main unit.
6. Hold tube in place until all beeps have stopped (6 slow beeps, 2 quick beeps). The “Ready” LED will flash green/orange when the analysis is in progress.
7. When LED light returns to green Ready state, another specimen may be processed. Repeat from Step 2.
8. Completed samples can be viewed in Explorer and/or Browser screens. A printed copy of any sample requiring review will be automatically generated.

**WHAT TO DO IF UF ALARMS/ TROUBLESHOOTING**

The UF alarms (Beeping) when an error occurs and the Help dialog box

appears on the IPU screen.

1. Press “Reset Alarm” button on screen to stop alarm beeping. Wait for instrument to finish analyzing last sample.
2. Read the error message in the pop up box under the “Error List”. You may see more than one error listed. Click on the error.
3. The Action necessary to remove the error is displayed underneath the Error list. Follow the instructions and Press “OK”. Pressing “OK” runs the error correcting process.

Once the error is corrected you can press the “Cancel” button to exit out of the Help dialog box.

1. See Section in procedure for “As Needed Maintenance” (Short Sample and High WBCs) if appropriate or refer to UF-1000i Instructions for Use Guide-Troubleshooting Section.
2. Instrument problems must be logged in the problem log and a supervisor notified if the issue cannot be resolved.
3. **SAMPLE EXPLORER/ STORED DATA**

**FINDING A SAMPLE**

1. Click on the “Sample Explorer” icon or Press F7 on the keyboard.
2. Verify “Last 20” is deselected on the menu bar to access all stored data.
3. From Menu bar, click “Edit”, then “Find” in dropdown, or press Ctrol+F on keyboard.
4. Enter order number (number must match exactly) in the Find dialog box. If entering the order number manually, 28 must be included at the end of the number( no hyphen)

Ex.510400051 should be entered as 51040005128. Press “Next”. If a “not found” pop up box appears try pressing the “Prev” key. The located sample will be backlit in blue.

1. Select “Close” to exit the Find dialog box.

**EDITING A SAMPLE NUMBER AND TRANSMITTING TO LIS**

**When sample barcodes are not read by the instrument they will appear as “ERR0000000” on your Explorer list.**

1. Click on the “Sample Explorer” icon or Press F7 on the keyboard.
2. Verify “Last 20” is deselected on the menu bar to access all stored data.
3. Click to highlight the sample to be edited.
4. Click on the “Validate” icon or press F11 to unvalidate the sample (V will be removed from the far left column of Sample Explorer screen).
5. On the Menu Bar, click “Edit”, then “Modify” or press F10. The Modify dialog box displays with the selected sample number.
6. Enter new edited order number using the bar code scanner or keyboard.
7. Click “OK”.
8. Click “Validate” to revalidate sample.
9. On Menu Bar, Click ”Report”, then “Host” or press F12 then 1.

**REPRINTING REPORTS OR RETRANSMITTING DATA TO HOST(LIS)**

Note: Data that is not validated will not be reprinted or retransmitted.

1. Click “Explorer” or press F7. Verify the “Last 20” icon is de-selected to access all stored sample data.
2. Click on the sample you wish to reprint.

To select multiple samples (not necessarily in order), press and hold “CTRL” on the keyboard and click each sample.

To highlight a block of samples, click on first sample to output. Then press and hold “Shift” on keyboard and click last sample to output.

1. To reprint to graphic printer, click “Report”, then “Report GP” or Press F12 then 3.
2. To retransmit to Host (LIS), Click “Report” and “Host” or press F12 then 1.
3. **REVIEW CRITERIA AND ACTIONS**

Only samples with review flags off the UF will generate a printed report. These printouts will have REVIEW or ERROR in the top left corner of the page. This will occur if one or more parameters exceeds the review judgment threshold, data reliability is low, or there is an analysis error. These will require a scan or manual microscopic.

The following indicators may appear after the data:

\* Data is suspect and needs confirmation

+ Review judgment limit exceeded

\_ \_ \_ No data due to analysis error or abnormal sample

+++ Data exceeds display range

**Review Comments**:

|  |  |
| --- | --- |
| RBC/X’TAL Abn Cls | Overlap of RBCs and Crystals in the scattergram |
| RBC/BACT Abn Cls | Overlap of RBCs and bacteria in the scattergram |
| RBC/YLC Abn Cls | Overlap of RBCs and yeast like cells in the scattergram |
| DEBRIS HIGH | High particle counts in the bacteria channel |
| CARRYOVER | The previous sample had a high bacteria count |

Measured parameters= RBC, WBC, EC, CAST, BACT

Flagging parameters= X’TAL, YLC, SRC, PATH CAST, MUCUS,SPERM

If both measured parameters and flagging parameters flag: perform manual micro.

|  |  |
| --- | --- |
| Rbc flag \* | Spin and perform manual microscopic |
| Wbc flag \* | Spin and perform manual microscopic |
| EC (epithelial cells)flag \* | Spin and perform manual microscopic |
| CAST(hyaline casts) flag \* | Spin and perform manual microscopic |
| BACT (bacteria)flag \* | Spin and perform manual microscopic |
| Rbc Abnormal Cluster  flags | Spin and perform manual microscopic |
| Abn DC Sensitivity  Flags | Spin and perform manual microscopic |
| Vote Outs | Spin and perform manual micro. |

Measured parameters (RBC,WBC, EC,BACT) do not flag and only flagging

parameters flag:

|  |  |
| --- | --- |
| X’Tal(crystals) flag + | Spin and scan sediment for flagging parameter, include any other important findings. |
| YLC(yeast like cells)+ | Spin and scan sediment for flagging parameter, include any other important findings. |
| SRC(small round cells)+  - Transitional+Renal Epis,  Trichomonas | Spin and scan sediment for flagging parameter, include any other important findings. |
| Path Cast(pathological casts)+  -Any cast other than hyaline | Spin and scan sediment for flagging parameter, include any other important findings. |
| Mucus flag+ | Spin and scan sediment for flagging parameter, include any other important findings. |
| Sperm flag+ | Spin and scan sediment for flagging parameter, include any other important findings |

1. **REAGENT REPLACEMENT:**

The UF 1000i uses 5 Reagents. Open stability is 60 days for all reagents. All reagents are stored at room temp. and are to be used within the manufacturer’s expiration date printed on each container. Store away from direct sunlight and dust.

UF II SEARCH-BAC (USB)

UF II SEARCH-SED (USS)

UF II PACK-BAC (UPB)

UF II PACK-SED (UPS)

UF II SHEATH (UTS)- **Do Not Mix**; avoid creating bubbles in this reagent

before use. Allow to sit for 24 hours before using if

shaken, mixed or dropped.

Do not use if turbid or discolored.

1. If the reagent runs low during analysis, the instrument stops automatically after completing the last analysis and starts alarming. Press “Reset Alarm” button to stop the alarm.
2. Read error message displayed. If the Help dialog box does not appear, press the “Help” icon. A message indicating which reagent needs to be replaced will appear.
3. Click OK, Reagent Replacement Screen will display; select the appropriate tab for the reagent to be replaced.
4. Highlight the old lot number and scan barcode of the lot number on the new container using the handheld bar code reader. The expiration date will be entered automatically. You can also input the lot number and expiration dates manually using the keyboard.
5. Place new reagent onto instrument being careful not to place tubing onto any dirty work surface. Initial and write opened and expiration dates on new reagent container.
6. Foil pouches should be disposed of in hazardous waste containers. Close instrument front cover before priming if either foil pouch is replaced otherwise alarm will sound.
7. Once reagent is changed, Click “Run” to initiate prime.
8. For multiple reagents, repeat above steps.
9. Perform an Auto-rinse after any reagent change and check background.
10. When background passes, the instrument is ready to resume specimen processing.

Reagent replacement is automatically documented on the Reagent Log. From the IPU main menu screen, click “Controller”, then “Reagent Log”. Comments can be entered for any reagent by double clicking on the line entry and entering the desired comment.

1. **WEEKLY MAINTENANCE: DO NOT USE BLEACH FOR ANY UF CLEANING.**

**(Performed by Night Shift)**

1. Perform Shutdown by double clicking on the Shutdown icon. Select “Yes” in the shutdown dialog box to turn main unit power OFF.
2. Press the large green Start button on the front of the instrument. The Shutdown sequence will begin and continue until the progress bar reaches 100%.
3. Power off the analyzer (black switch on the lower right side of instrument).
4. Power off the IPU by clicking “File” in the upper left corner of the IPU screen, and then “Exit”. Click “Yes” to exit program.
5. Click “Start” at the bottom of Windows desktop and then select “Shutdown. Press “Enter” or click “OK”.
6. Wait at least one minute and press top black button on the right side of the IPU screen to power back on.
7. IPU log on is: admin. It is not necessary to enter a password. Click OK.
8. Turn on analyzer black power switch (lower right side). Wait one min.
9. Press small green button on front right side of the UF.
10. Assure system checks and background are acceptable.
11. Record cleaning on maintenance log.
12. **MONTHLY MAINTENANCE: performed by supervisor or lead tech**

Clean the sample rotor valve (SRV) either monthly or every 9000 cycles. If 9000 or more samples have been analyzed since the previous cleaning, the message “Clean the SRV” will be displayed.



1. Turn OFF the power to the main unit (black switch on lower right side of UF), and wait one minute for pressure to drop. Open front cover of the instrument. Remove controls from refrigerator to warm to room temperature.
2. Turn the fixing screw counterclockwise, and remove it from the SRV mounting shaft. Remove the front fixed plate by pulling gently toward you



1. Remove the SRV. The valves are held together by suction and are difficult to separate. Pull the valves gently and carefully twist them off. Be careful not to lose the white washer between the valves.
2. Wash the surfaces of the front and rear fixed valves, the SRV, the shaft and the washer with gauze soaked in distilled water.
3. Reassemble the valve in reverse order from which it was removed. Turn the fixing screws clockwise to tighten them against the shaft being careful NOT to over tighten.

Note: Do not reverse the front-rear orientation of the SRV. Make sure the metal knob is between the valve switching plates on the right. The metal knob should be touching the top valve switching plate.

1. If dirty, remove, clean and dry the SRV tray. Remove rubber tray by pushing it to the left; it is not screwed down. Place tray back into position when finished cleaning.
2. Close the front cover, and power on the analyzer (black switch on lower right side of UF). Press small green startup button on front of UF to start system checks. Verify background is acceptable.
3. Run QC to make sure SRV is working properly.
4. Verify QC is within acceptable limits.
5. Reset the SRV counter.

* Double click the “Controller” icon from the IPU main menu.
* Click “Maintenance” then “Counter”. The counter dialog box will appear.
* Press the “Reset” button next to SRV to reset the count back to zero.
* Press “OK” to close the Counter Reset box and then “OK” to save the changes.

1. Record cleaning on the maintenance log.
2. **Removal and Cleaning of Vacuum Trap Chamber**

If the trap chamber collects fluid on a daily basis, contact customer

service.

1. If fluid is present, turn Main Unit off (black switch on bottom right side of UF). Wait one minute for the internal pressure to drop.
2. Open front cover of the analyzer. The trap chamber is located on the upper right side(see illustration below). Turn lower portion of the trap chamber counterclockwise to remove.
3. Discard fluid. Rinse off ball and chamber with distilled water and dry completely.
4. Replace ball (pointed side up) inside chamber.
5. Replace chamber and turn clockwise to create a finger tight seal.
6. Power on UF. Record in Maintenance log.

NOTE: Pressure and vacuum problems can arise if the chamber is not properly seated or the tubing is not properly connected.

1. **AS NEEDED MAINTENANCE**

When analyzing samples with high wbc counts, or if a sample is not aspirated even though there is sufficient sample in the tube, there is a possibility that the sample filter may be clogged and the analyzer results may be incorrect. Error messages display to alert the user to clean or replace the sample filter.

**When “Check Sample Filter” (Short Sample) error message displays:**

1. Wait for instrument to finish analyzing the last sample. “Sampler Stop” pop up box will appear. Move racks according to on screen instructions. Press “OK”.
2. Visually examine the sample tube that caused the error to determine if volume is inadequate. Remove sample from further analysis.
3. The “Check Sample Filter” pop up box will appear. Select “Error Recovery” in the dialogue box and click OK. Exit out of the error list box by pressing the “Cancel” button
4. On the main menu double click the AutoRinse icon. After AutoRinse is performed and background is within limits, continue with specimen processing. If background fails clean sample filter (see instructions below).

**When “Check Sample Filter” (WBC High) error displays**:

1. Wait for instrument to finish analyzing last sample. “Sampler Stop” pop up box will appear. Move racks according to on screen instructions. Press “OK”. Remove the sample tube that caused the error from further analysis. Spin and perform manual microscopic.
2. The “Check Sample Filter” pop up box will appear. Select “Error Recovery”. Exit out of the error box by pressing the “Cancel” button.
3. On the main menu double click the AutoRinse icon. After AutoRinse is performed and background is within limits continue with specimen processing. If background fails clean sample filter.
4. **Replace or Clean Sample Filter.**
5. Remove controls from refrigerator to warm for 20 mins. Press black power switch off (lower right side of main unit). Open front cover of the instrument
6. Remove the sample filter unit from the metal clip holding it in place. Remove the filter fixture (large center section) from the upper and lower supporting braces (small threaded pieces with tubing) by turning counterclockwise to loosen.
7. Remove the filter(white disk) from inside the filter fixture. Clean dirty filter by placing into clean urine container filled with distilled water. Remove filter from container, dry off and check the holes in the filter to confirm there are no clogs.
8. Reassemble filter components in reverse order of disassembly. Screw the thin top threaded fixture back onto the center housing, and then reattach the bottom tubing until finger tight. Replace filter into metal clip. Close cover.
9. Power on instrument by pressing black switch on right side, then small green button on front of main unit.
10. When system checks and background pass, perform QC analysis to verify accuracy of aspiration, absence of leaks and system performance.
11. If there is a problem, clean or replace filter again. If there are no problems and QC passes, continue with sample analysis.
12. **TURNING OFF POWER**
13. Main Unit – always turn off first before the IPU

Press black power switch off on lower right side of instrument.

1. IPU

* Power off the IPU by clicking “File” in the upper left corner of the IPU screen, and then “Exit”. Click “Yes” to exit program.
* Click “Start” at the bottom of Windows desktop and then select “Shutdown. Press “Enter” or click “OK”.

1. **TURNING ON POWER**
2. IPU ( Information Processing Unit)- always turn on IPU before Main Unit.

* Turn on power switch on the right side of the computer screen (top black button).
* The IPU logon box displays, enter “admin” for User name. It is not necessary to enter a password. Click “OK”.

Note: IPU must display main screen before powering on the main unit.

1. Main Unit

* Turn main power on by pressing black switch on lower right side of instrument.
* Press small green start-up button on front of main unit. The UF 1000i will perform a series of self checks to test the system ending in a background count.
* If any check fails, an error message displays, see UF 1000i Instructions for Use Manual, Troubleshooting Chapter for help or alert supervisor.

1. **LIMITATIONS OF PROCEDURE**

UF 1000i Manufacturer Stated Linearity

Range of Element Concentrations

|  |  |  |
| --- | --- | --- |
| RBC | 1.0-5000.0/ul | 0.2-900/hpf |
| WBC | 1.0-5000.0 ul | 0.2-900/hpf |
| EC | 1.0-200.0/ul | 2.9-580/Lpf |
| CAST | 1.0-30.0/ul | 2.9-87/Lpf |
| BACT | 5.0-10000/ul | 0.9-1800/hpf |

Sample types described in the CAUTION note in Specimen Requirements should not be analyzed. This is due to the possibility of interference with counting and/or particle classification

1. **REFERENCE RANGES**

WBC 0-5/ hpf

RBC 0-5/ hpf

Hyaline Casts 0-3/ Lpf

Epi Cells none-few/ Lpf

Bacteria none-few/ hpf

**PROCEDURAL NOTES: Bleach is not to be used at any time on the UF Analyzer.**

1. **REFERENCES**
2. Sysmex UF1000i- Instructions for Use; Sysmex Corp.; Feb. 2012.
3. Sysmex UF1000i Automated Urine Analyzer Quick Guide; Sysmex America, Inc;

Aug. 2012.

1. Sysmex UF 1000i Automated Urine Particle Analyzer Training Manual; Sysmex

America Inc; Nov. 2011.

1. Sysmex UF 1000i CLSI Procedure; Sysmex America Inc; Set. 2012.4.
2. **HISTORY**

H-1 This procedure was written by Mary Stegina on 2/10/2014