

## TRAINING UPDATE

**Lab Location:** GEC, SGMC & WAH  
**Department:** Core Lab

**Date Distributed:** 8/28/2017  
**Due Date:** 9/18/2017  
**Implementation:** 8/30/2017

### DESCRIPTION OF PROCEDURE

<b>Name of procedure:</b>
<b>Data Innovations Instrument Manager      SGAH.L49 v6</b>
<b>Description of change(s):</b>
<p>Addendum 3 [Sysmex (Hematology) Instrument Specific Actions] was revised to add more information, specifically steps 11-19</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"><li>• <i>To make the review easier, the attached SOP has addendum 3 shown first, followed by the rest of the SOP</i></li><li>• <i>The quiz covers use of DI when operating the Sysmex. You may wish to print that section of the SOP or keep it displayed on the computer so you can refer to it.</i></li></ul> <p><b>This revised SOP will be implemented on August 30, 2017</b></p>

**Document your compliance with this training update by taking the quiz in the MTS system.**

Addendum 3

Sysmex (Hematology) Instrument Specific Actions

1. Hematology SM Workspace Overview

Cell Counter and Images Tabs

Test Name	Result (1)	Units (1)	Error Code(s) (1)	Error Name(s) (1)	Test Comm...	Result (2)	Units (2)	Error Code(s) (2)	Error Name	
PLT_Abn_Distrib...	1		A,HOLD	Abnormal,Vorte...						
Thrombocytopena	1		A	Abnormal		4		A,Rerun	Abnormal,P	
<b>CBC</b>										
WBC	5.3	10 <sup>3</sup> /uL	HOLD	Other Tests Held		5.4	10 <sup>3</sup> /uL	Rerun,HOLD	Previously r	
RBC	4.13	10 <sup>6</sup> /uL	Check for clot...	Other Tests Held,		4.08	10 <sup>6</sup> /uL	Check for clot,R...	Previously r	
HGB	11.4	g/dL	HOLD	Other Tests Held		11.4	g/dL	Rerun,HOLD	Previously r	
HCT	34.3	%	HOLD	Other Tests Held		33.8	%	Rerun,HOLD	L,Previously	
MCV	83.1	fL	HOLD	Other Tests Held		82.8	fL	Rerun,HOLD	Previously r	
MCH	27.6	pg	HOLD	Other Tests Held		27.9	pg	Rerun,HOLD	Previously r	
MCHC	33.2	g/dL	HOLD	Other Tests Held		33.7	g/dL	Rerun,HOLD	Previously r	
RDW-CV	14.2	%	HOLD	Other Tests Held		14.2	%	Rerun,HOLD	Previously r	
<b>Platelet</b>										
MPV	---	fL	A,HOLD,HOLD	Abnormal/Invali...		UTC	fL	A,HOLD,HOLD	Abnormal, M	
PLT	46	10 <sup>3</sup> /uL	W,HOLD,HOL...	Low Reliability...	BACK-	13	10 <sup>3</sup> /uL	Check for clot,c...	L,Check for	
IPF	HIDE		HOLD	Other Tests Held		29	%	HOLD,	H,Other Te	
<b>ADIFF</b>										
DTYPE	ADIFF		HOLD,HOLD	Other Tests Hel...		ADIFF		HOLD,HOLD	Other Tests	
NEUT%	59.8	%	HOLD	Other Tests Held		60.1	%	Rerun,HOLD	Previously r	
LYMPH%	26.5	%	HOLD	Other Tests Held		24.9	%	Rerun,HOLD	Previously r	
MONO%	10.8	%	HOLD,	Other Tests Held...		11.4	%	Rerun,HOLD,	H,Previous	
EO%	1.9	%	HOLD	Other Tests Held		2.2	%	Rerun,HOLD	Previously r	
BASO%	0.6	%	HOLD	Other Tests Held		0.6	%	Rerun,HOLD	Previously r	
IG%	0.4	%	HOLD	Other Tests Held		0.8	%	Rerun,HOLD,	H,Previous	
NRBC%	0.0	/100...	HOLD	Other Tests Held		0.0	/100...	Rerun,HOLD	Previously r	
NEUT#	3.16	10 <sup>3</sup> /uL	HOLD	Other Tests Held		3.07	10 <sup>3</sup> /uL	Rerun,HOLD	Previously r	

Hematology SM Workspace with expanded Cell Counter Tab

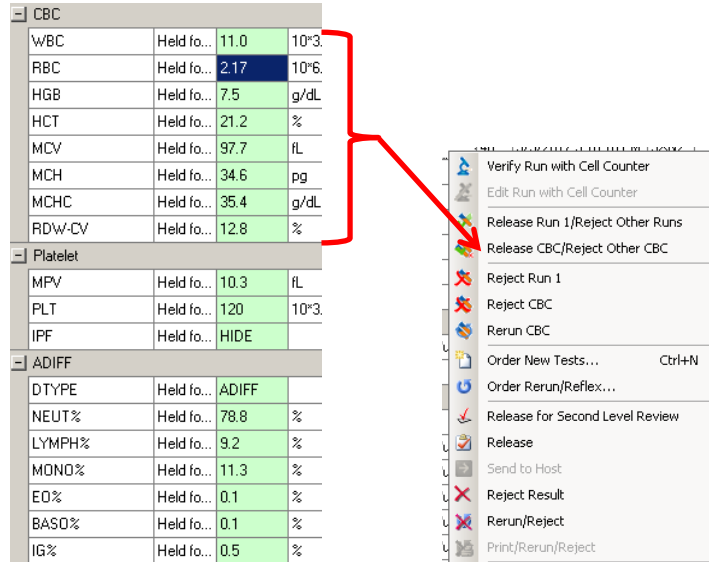
Hematology SM Workspace with expanded Images Tab

## 2. Hematology RunWorksheets Test Grouping

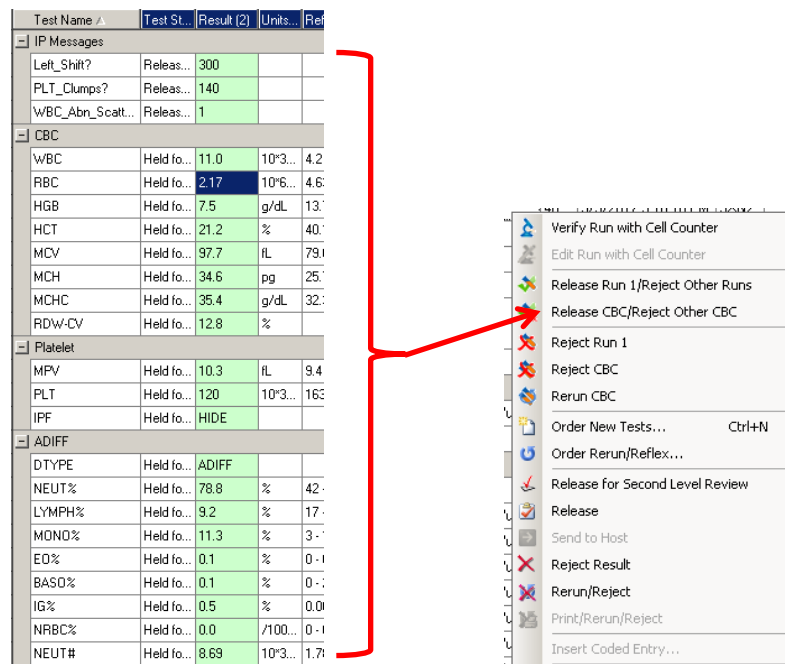
The Hematology RunWorksheet is divided into six test groups. The groups are IP Messages, CBC, Platelet, ADIFF, MDIFF and Images. See the description of each group below.

Run Worksheet					
Test Name ▲	Result (1)	Units (1)	Error Code(s) (1)	Error Name(s) (1)	
[-] IP Messages					
Left_Shift?	130		A,HOLD	Abnormal,DIFF	IP Messages Grouping displays the Instrument's abnormal and suspect flags
PLT_Abn_Distrib...	1		A,HOLD	Abnormal,Vorte...	
Thrombocytopenia	1		A	Abnormal	
[-] CBC					
WBC	4.5	10 <sup>3</sup> /uL	HOLD	Other Tests Held	CBC grouping displays the Hemogram without the platelet
RBC	2.47	10 <sup>6</sup> /uL	Check for clot,...	L,Other Tests ...	
HGB	8.6	g/dL	HOLD,	L,Other Tests ...	
HCT	25.9	%	HOLD,	L,Other Tests ...	
MCV	104.9	fL	HOLD,	H,Other Tests ...	
MCH	34.8	pg	HOLD,	H,Other Tests ...	
MCHC	33.2	g/dL	HOLD	Other Tests Held	
RDW-CV	25.7	%	SCAN,HOLD	Other Tests Held,	
[-] Platelet					
MPV	UTC	fL	A,HOLD,HOLD	Abnormal,Invali...	Platelet grouping displays the platelet. Note: MPV has been moved to this group
PLT	28	10 <sup>3</sup> /uL	W,HOLD,HOL...	Low Reliability,...	
IPF	HIDE		HOLD	Other Tests Held	
[-] ADIFF					
DTYPE	ADIFF		HOLD,HOLD	Other Tests Hel...	ADIFF grouping displays the automated Diff count
NEUT%	74.0	%	W,HOLD	Low Reliability,...	
LYMPH%	11.8	%	HOLD	L,Other Tests ...	
MONO%	8.5	%	HOLD	Other Tests Held	
EO%	5.1	%	W,HOLD	Low Reliability,...	
BASO%	0.2	%	HOLD	Other Tests Held	
IG%	0.4	%	W,HOLD,HOLD	Low Reliability,...	
NRBC%	0.0	/100...	HOLD	Other Tests Held	
NEUT#	3.31	10 <sup>3</sup> /uL	W,HOLD	Low Reliability,...	
LYMPH#	0.53	10 <sup>3</sup> /uL	HOLD	L,Other Tests ...	
MONO#	0.38	10 <sup>3</sup> /uL	HOLD	Other Tests Held	
EO#	0.23	10 <sup>3</sup> /uL	W,HOLD	Low Reliability,...	
BASO#	0.01	10 <sup>3</sup> /uL	HOLD	Other Tests Held	
NRBC#	0.00	10 <sup>3</sup> /uL	HOLD	Other Tests Held	
[-] MDIFF					
DTYPE1					MDIFF grouping displays the manual diff count
[-] Images					
DIST_PLT	PNG&R...				Images grouping displays the images generated by the instrument
DIST_RBC	PNG&R...				

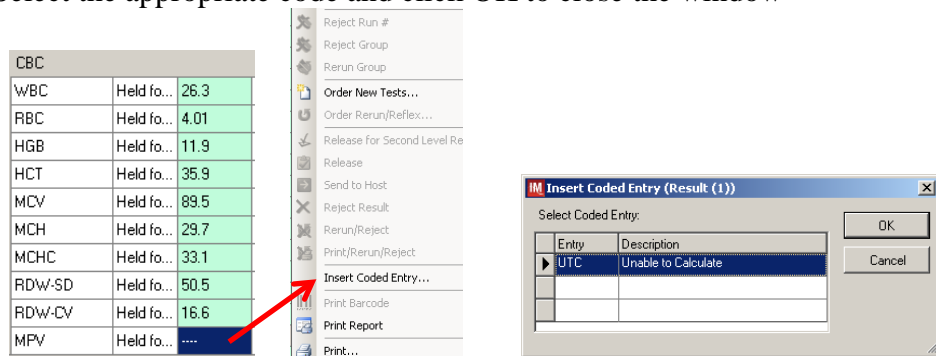
3. Release or reject by Group
  - a. Right click on the test to be released/rejected
  - b. If “Release CBC/Reject Other Runs” is selected, DI will release the CBC and reject other CBC from a different run



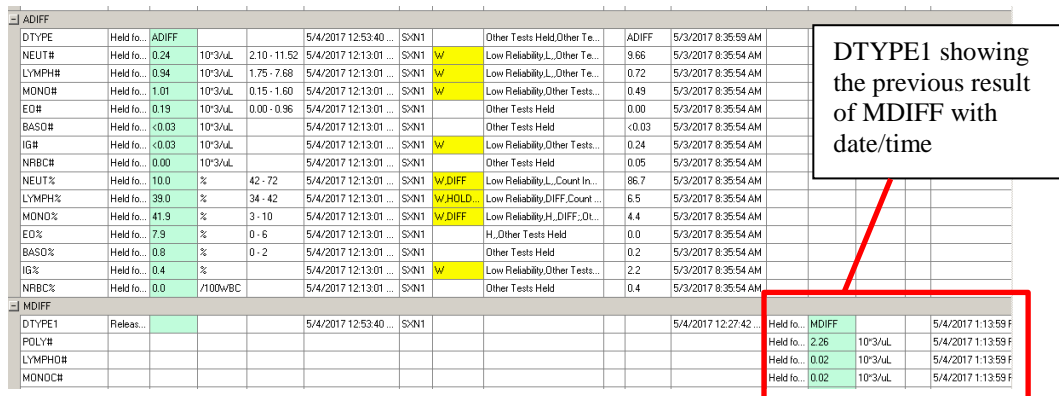
4. Release or reject by Run #
  - a. Right click on the specific Result # column to be released/rejected
  - b. If “Release Run 1/Reject Other Runs” is selected, DI will release that specific run# and reject other runs



5. To Insert Coded Entry within the Hematology Run Worksheet
  - a. Right click on the result field to be edited
  - b. Select "Insert Coded Entry"
  - c. Select the appropriate code and click OK to close the window

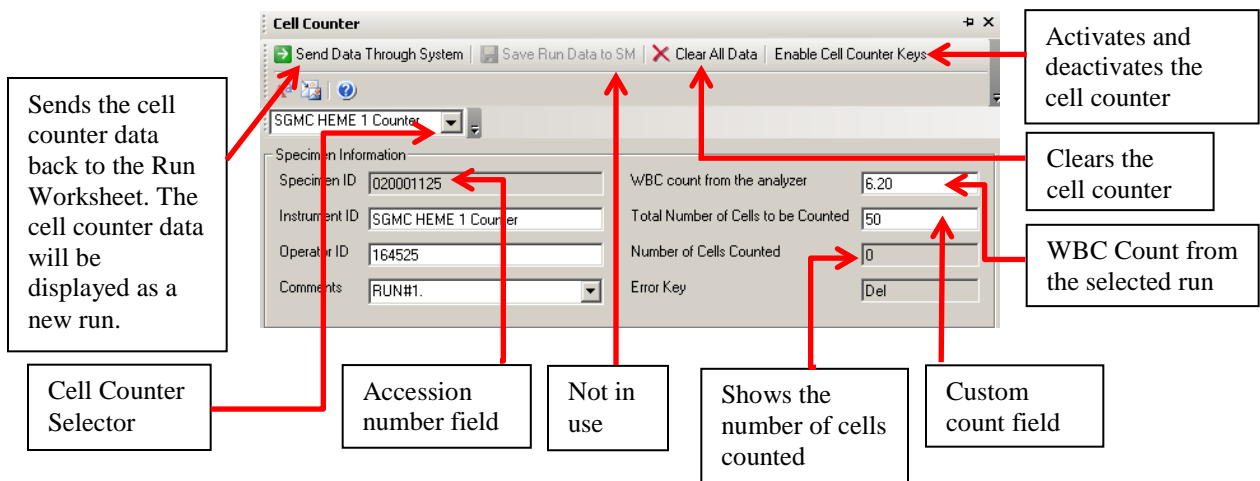


6. To see the previous MDIFF performed  
 Go to the DTYPE1 result field and scroll to the right until the most recent previously result of MDIFF is displayed. If there is one, check the date and time of resulting



7. Overview of the the Cell Counter

- a. Cell Counter Functions and Fields

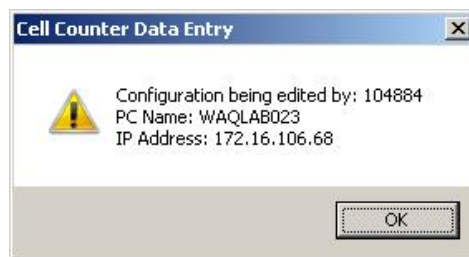


b. Cell Counter Grouping

The screenshot shows the 'Cell Counter' software interface. It features a menu bar with options like 'Send Data Through System', 'Save Run Data to SM', and 'Clear All Data'. Below the menu is a toolbar with 'Enable Cell Counter Keys', a printer icon, and a 'Clear All Data' button. The main window displays a table with columns for 'Test Code', 'Result', '%', 'Absolute', 'Units', 'Test Comment(s)', and 'Shortc...'. The table is organized into several sections: 'DIFF TYPE' (with sub-sections for DTYPE1, MDIFF, MORPH COMMENT, RCOM, PCOM, WCOM, Platelet, PLTEST), 'DIFF' (listing various cell types like POLY, LYMPHO, MONOC, EDSD, BASOP, BAND, META, MYELO, PRDM, ALYM, PLASM, ELAST, NRBC), 'RBC MORPHOLOGY' (listing various RBC types like ACANTO, ANISO, BSTITL, BURRC, CRENA, ELLIPT, HEINZB, HUBOD, HYPOC, MACROC, MICROC, OVALO, POKLO, POLYCR, PROULX, SCHIST, SICKLO, SPHERO, STOMA, TARGET, TEARDR), 'WBC MORPHOLOGY' (listing various WBC types like AUERR, DOHLE, HYSEG, SMUDGE, TEOGRN, VACUOL), and 'PLT MORPHOLOGY' (listing CLMP and GPLT). Red lines connect callout boxes to specific fields in the interface.

- Displays the default MDIFF result for DTYPE1
- The section used to enter the results for RCOM, PCOM and WCOM. To result any of these fields, select "BELOW" from the drop down menu and enter the comment under the Test Comment(s) field preceded with ";
- When this PLT Estimate field is not empty, DI will add "RCM" as a comment on the RunWorksheet.
- This is where the WBC Differential cells are counted. The manual cell count can be entered by first activating the cell counter and entering the count by using the assigned shortcut keys. Another way of entering the manual count is by deactivating the cell counter and using the number keypad to enter the count.
- This is where the RBC morphology cells are entered. To enter morphology, deactivate the cell counter and select the result field of the cell type observed. A drop down list will display the different results for the selected morphology.
- This is where the WBC morphology cells are entered. To enter morphology, deactivate the cell counter and select the result field of the cell type observed. A drop down list will display the different results for the selected
- This is where the PLT observations are entered

- c. Each site, with the exception of GEC, has two cell counters. Each cell counter can only handle one active user. If another user tries to access the same cell counter that is already in use, DI will display an error that says "configuration is being edited by user: 123456"



Location	Cell Counter Assignment
GEC	GEC Heme Counter
SGMC Microscope #1	SGMH Heme 1 Counter
SGMC Microscope #2	SGMH Heme 2 Counter
WAH Microscope #1	WAH Heme 1 Counter
WAH Microscope #2	WAH Heme 2 Counter

## 8. Using the Cell Counter

### a. To Enter the Accession number for the Cell Counter

There are two ways of entering the accession number for use by the Cell Counter. Once the accession number has been entered, the WBC Count\_from\_the\_Analyzer field will be populated with the WBC count from the selected run

#### i. By using the “Verify Run with Cell Counter”

- Right click on the specific result column that you would like to be verified by the cell counter
- Select the “Verify Run with Cell Counter”

Test Name	Test St.	Result (2)	Units	Reference	Result Date	Time	Test	Error Code
IP Messages								
Let_Shift?	Releas...	300			7/13/2017 6:57...		SKN1	A,HOLD
PLT_Clumps?	Releas...	140			7/13/2017 6:57...		SKN1	A,HOLD
WBC_Abrn_Scatt...	Releas...	1			7/13/2017 6:57...		SKN1	A,HOLD
CBC								
WBC	Held fo...	11.0	10 <sup>3</sup> ...	4.2 - 9.1	7/13/2017		SKN1	HOLD
RBC	Held fo...	2.17						
HGB	Held fo...	7.5						
HCT	Held fo...	21.2						
MCV	Held fo...	97.7						
MCH	Held fo...	34.6						
MCHC	Held fo...	35.4						
RDW-CV	Held fo...	12.8						
Platelet								
MPV	Held fo...	10.3						

**Note:** When the verify Run with Cell Counter is grayed out, do the following:

- go to the cell counter tab and select a cell counter that is not in use (see section 7c)
- go back to the run worksheet

#### ii. By manually typing the specimen ID within the Cell Counter

- Select the appropriate cell counter for your location
- Enter the accession number within the Specimen ID field and press the TAB key

**Cell Counter**

Send Data Through System | Save Run Data to SM | Clear All Data | Enable Cell Counter Keys

GEC HEME Counter

Specimen Information

Specimen ID: 11234 | WBC count from the analyzer: [ ]

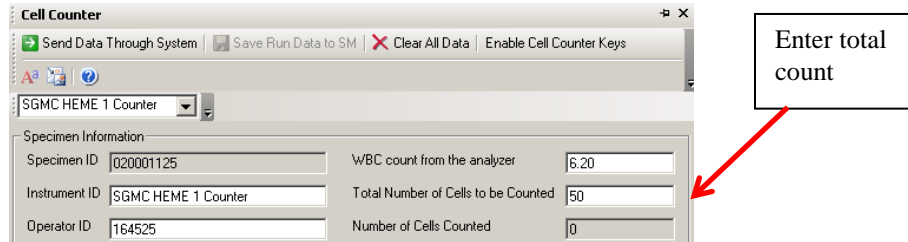
Instrument ID: GEC HEME Counter | Total Number of Cells to be Counted: 100

Operator ID: 164525 | Number of Cells Counted: 0

b. Setting the Total Number of Cells to be Counted field

To change the Total Number of Cells to be Counted:

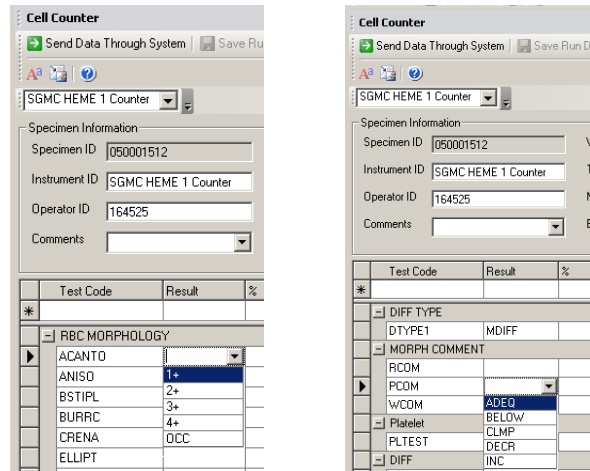
- Disable the Enable Cell Counter Keys button.
- Enter the desired total count on the “Total Number of Cells to be Counted” field. The default count is 100



c. To Insert Coded Entry within the Cell Counter

- Toggle the “Enable Cell Counter” button to disable it
- Click on the result field to show the drop-down menu arrow
- Click on the drop-down menu arrow
- Select the appropriate code

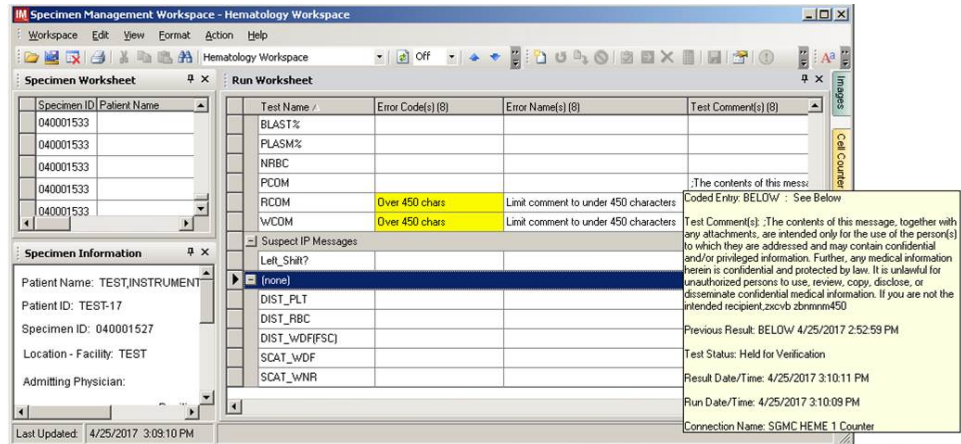
Note: The coded entry only works for Morph Comment, Platelet, RBC Morphology, WBC Morphology and PLT Morphology groups





d. Resulting WCOM (Path Review)

- To enter the narrative from the Path Review, click on the WCOM result field and select “BELOW” from the drop down list. Under the WCOM Test Comment field, enter the path review narrative.
- There is a limit of 450 characters for WCOM. This limit also applies to RCOM and PCOM fields. DI will display an error message of “Over 450 characters” when the comment entered on this field is over the limit



9. Error and IP (Interpretive Program) Messages

Error Code	Error Name	Description
A	Abnormal	Abnormal result due to analysis or hardware error
W	Low Reliability	This error code is equivalent to asterisk (*) on Sysmex printout

IP Message	Work Instruction
Atypical_Lympho?	DIFF- Perform diff
Blasts/Abn_Lympho?	DIFF- Perform diff
Dimorphic_Population	Scan smear for abnormal RBC morph
Fragments?	Scan smear for abnormal RBC morph
IG_Present	DIFF- Perform diff
Left_Shift?	DIFF- Perform diff
NRBC_Present	SCAN. Remove if not seen on smear
PLT_Abn_Distribution	Vortex and Rerun
PLT_Abn_Scattergram	Vortex and Rerun
PLT_Clumps(S)	If not clotted, Vortex. Rerun in PLT-F mode. If unresolved, SCAN
PLT_Clumps?	If not clotted, Vortex. Rerun in PLT-F mode. If unresolved, SCAN
RBC_Abn_Distribution	Scan smear for abnormal RBC morph
RBC_Agglutination?	Warm at 37, rerun. If unresolved, perform plasma replacement
RET_Abn_Scattergram	Perform 1:5 dilution
Sample_Mixing_Failure?	Vortex and Rerun
Turbidity/HGB_Interference?	If gross hemolysis, cancel with HMT. If lipemic, do saline replacement
WBC_Abn_Scattergram	SCAN for abnormal cells and NRBC

Form revised 3/31/00

Test Name	Test St...	Result (2)	Units...	Error Code(s) (2)	Error Name(s) (2)
<b>IP Messages</b>					
Left_Shift?	Releas...	300		A,HOLD	Abnormal,DIFF
PLT_Clumps?	Releas...	140		A,HOLD	Abnormal,If not clotted, ...
WBC_Abn_Scatt...	Releas...	1		A,HOLD	Abnormal,SCAN for abn...
<b>CBC</b>					
WBC	Held fo...	11.0	10 <sup>3</sup> ...	HOLD	H,Other Tests Held
RBC	Held fo...	2.17	10 <sup>6</sup> ...	HOLD,HOLD,H...	L,Other Tests Held
HGB	Held fo...	7.5	g/dL	HOLD	L,Other Tests Held
HCT	Held fo...	21.2	%	HOLD	L,Other Tests Held
MCV	Held fo...	97.7	fL	HOLD	H,Other Tests Held
MCH	Held fo...	34.6	pg	HOLD	H,Other Tests Held
MCHC	Held fo...	35.4	g/dL	HOLD	Other Tests Held
RDW-CV	Held fo...	12.8	%	HOLD	Other Tests Held
<b>Platelet</b>					
MPV	Held fo...	10.3	fL	W,HOLD	Low Reliability,Other Te...
PLT	Held fo...	120	10 <sup>3</sup> ...	W,Check for Cl...	Low Reliability,Vortex, ...
IPF	Held fo...	HIDE		HOLD	Other Tests Held

Examples of IP Messages and Abnormal error codes

Examples of "W" (Low reliability) error codes. "W" is equivalent to asterisk (\*) on Svsmex

### 10. Release/Hold Conditions

Condition	CBC	PLT	DIFF	RET	Release/Hold
1	Normal	Normal	Normal	Normal	Release CBC, PLT, DIFF & RET
2	Normal	Normal	Normal	Abnormal	Release CBC, PLT, DIFF. Hold RET
3	Normal	Normal	Abnormal	Normal	Release CBC, PLT & RET. Hold DIFF
4	Normal	Normal	Abnormal	Abnormal	Release CBC & PLT. Hold DIFF & RET
5	Normal	Abnormal	Normal	Normal	Release CBC & RET. Hold PLT & DIFF
6	Normal	Abnormal	Normal	Abnormal	Release CBC. Hold PLT, DIFF & RET
7	Normal	Abnormal	Abnormal	Normal	Release CBC & RET. Hold PLT & DIFF
8	Normal	Abnormal	Abnormal	Abnormal	Release CBC. Hold PLT, DIFF & RET
9	Abnormal	Normal	Normal	Normal	Release RET. Hold CBC, PLT, DIFF
10	Abnormal	Normal	Normal	Abnormal	Hold CBC,PLT,DIFF & RET
11	Abnormal	Normal	Abnormal	Normal	Release RET. Hold CBC, PLT, DIFF
12	Abnormal	Normal	Abnormal	Abnormal	Hold CBC,PLT,DIFF & RET
13	Abnormal	Abnormal	Normal	Normal	Release RET. Hold CBC, PLT, DIFF
14	Abnormal	Abnormal	Normal	Abnormal	Hold CBC,PLT,DIFF & RET
15	Abnormal	Abnormal	Abnormal	Normal	Release RET. Hold CBC, PLT, DIFF
16	Abnormal	Abnormal	Abnormal	Abnormal	Hold CBC,PLT,DIFF & RET

Form revised 3/31/00

### 11. Coded Entry

The following are added to all the components of the CBC and Platelets:

- HIS: Result consistent with patient history
- PTR: Patient transfused
- SREV: Smear reviewed
- UTC: Unable to calculate
- CLMP: Clumped \*\*Added to platelet group only
- OCC-CLMP: Occasional Clumping \*\*Added to Platelet group only
- 1+, 2+, 3+, 4+, OCC: Possible results for GPLT (Giant Platelets)
- INC, DEC, ADEQ, BELOW: Possible results for PCOM

### 12. Clumped platelets

Action: Depending upon quantity of clumping noted

- a. If platelets clumping is more than occasional, then report PLT as CLMP and result MPV as UTC.
- b. If platelets clumping is occasional, then add comment of OCC-CLMP in the Test comment field associated with PLT.

### 13. MPV

If on the first run MPV is resulted as “---” DI will display an error code to rerun. If the rerun is still “---” DI will automatically replace “---” with code UTC

Test Name	Result (1)	Units (1)	Error Code(s) (1)	Error Name(s) (1)	Test Comment(s) (1)	Result (2)	Units (2)	Error Code(s) (2)	Error Name(s) (2)
- IP Messages									
PLT_Abn_Distrib...	1		A,HOLD	Abnormal,Vortex and R...					
Thrombocytopenia	1		A	Abnormal		1		A,Rerun	A
- CBC									
WBC	5.3	10 <sup>3</sup> /uL	HOLD	Other Tests Held		5.1	10 <sup>3</sup> /uL	Rerun,HOLD	P
RBC	4.13	10 <sup>6</sup> /uL	Check for clot,H...	Other Tests Held,		4.08	10 <sup>6</sup> /uL	Check for clot,Rer...	P
HGB	11.4	g/dL	HOLD	Other Tests Held		11.4	g/dL	Rerun,HOLD	P
HCT	34.3	%	HOLD	Other Tests Held		33.8	%	Rerun,HOLD,	L
MCV	83.1	fL	HOLD	Other Tests Held		82.8	fL	Rerun,HOLD	P
MCH	27.6	pg	HOLD	Other Tests Held		27.9	pg	Rerun,HOLD	P
MCHC	33.2	g/dL	HOLD	Other Tests Held		33.7	g/dL	Rerun,HOLD	P
RDW-CV	14.2	%	HOLD	Other Tests Held		14.2	%	Rerun,HOLD	P
- Platelet									
MPV	---	fL	A,HOLD,HOLD	Abnormal,Invalid result, ...		UTC		A,HOLD,HOLD	A
PLT	16	10 <sup>3</sup> /uL	W,HOLD,HOLD...	Low Reliability,Vortex a...	CBACK-	13	10 <sup>3</sup> /uL	Check for clot,L...	L
PLT	HIDE		HOLD	Other Tests Held		29	%	HOLD	H

### 14. SCAN indicated in DI

Action:

Review slide for abnormal cells. If no abnormal cells are seen, then enter SREV [Smear Reviewed] under the Test Comment field for the test that is associated with the SCAN comment.

15. Resulting CBC with automated diff with Morphology

- a. Change DTYP1 result to ADIFF
- b. Enter morphology results via the Cell Counter
- c. Click on “Send data through system”
- d. Release the MDIFF group on the run that you want to release
- e. Release the ADIFF group on the run that you want to release

16. Platelet Estimates

- a. Use Cell Counter to result platelet estimate.
- b. Click on “Send data through system”
- c. Platelet estimate results will display in a new run along with the MPV results.
- d. Release the platelet group with the platelet estimate (it will automatically reject the other platelet groups)

Note: if MPV result is “---” then result MPV in Cell Counter as UTC

Run Worksheet						
Test Name	Result (9)	Units (9)	Reference ...	Test ...	Error Code(s) (9)	Test Comment...
- IP Messages						
WBC_Abn_Scattergram						
- CBC						
WBC						
RBC						
HGB						
HCT						
MCV						
MCH						
MCHC						
RDW-CV						
MPV						
PLT						
- Platelet						
MPV	8.7			SXN1		
PLT						
IPF	HIDE			SXN1		
PLT Estimate	400	10 <sup>3</sup> /uL	140 - 400	SXN1		RCM

17. How to select results to release

a. If you want to release by Group

Left click on one of the results in the group. Then right click and select **release by group**. *Example:*

We want to release the “CBC” group. We select the WBC result field and then right click to select “release by group”

The screenshot shows a table with columns: Test Name, Test St., Result (2), and Units. The table is grouped into sections: IP Messages, CBC, Platelet, and ADIFF. A red arrow points to the WBC result field (11.0) in the CBC group.

Test Name	Test St.	Result (2)	Units...
- IP Messages			
Left_Shift?	Releas...	300	
PLT_Clumps?	Releas...	140	
WBC_Abn_Scatt...	Releas...	1	
- CBC			
WBC	Held fo...	11.0	10 <sup>3</sup> ...
RBC	Held fo...	2.17	10 <sup>6</sup> ...
HGB	Held fo...	7.5	g/dL
HCT	Held fo...	21.2	%
MCV	Held fo...	97.7	fL
MCH	Held fo...	34.6	pg
MCHC	Held fo...	35.4	g/dL
RDW-CV	Held fo...	12.8	%
- Platelet			
MPV	Held fo...	10.3	fL
PLT	Held fo...	120	10 <sup>3</sup> ...
IPF	Held fo...	HIDE	
- ADIFF			
DTYPE	Held fo...	ADIFF	
NEUT%	Held fo...	78.8	%

b. If you want to release an individual test result

Left click on the result **on the RUN** that you want to release. Then right click and select **Release**.

18. Order of result release is **VERY IMPORTANT**

**Never release the ADIFF or MDIFF first**

Depending on the actual test results for a particular specimen, release in this order:

CBC group, followed by Platelet group, then ADIFF or MDIFF

CBC group, followed by Platelet group, then Morphology, and ADIFF last

CBC group, followed by Platelet Estimate, then MDIFF

### 19. Color Coding Standard (Standard coding across all instruments connected via DI)

Description	Criteria	Format Type	Field to Format	Value	Workspaces to Format
Critical	'cH' or 'cL'	Cell	Error Code(s)	N/A	All
Delta	'DELTA'	Cell	Error Code(s)	N/A	All
Stat Priority	'S'	Cell	Priority	N/A	All
Rejected	'Rejected'	Cell	Result	N/A	All
Cancelled	'Cancelled'	Cell	Result	N/A	All
Outpatient	'S'	Row		N/A	SGAH CHEM HOLD
No Sample	'E172'	Cell	Error Code(s)	N/A	All
Above Assay RNG	'E521'	Cell	Error Code(s)	N/A	All
CRIT	'CRIT'	Cell	Error Name(s)	N/A	All
QC	'BRQC'	Row		N/A	All
Stago QC OUT	'AC'	Row		N/A	Connection Testing,GEC CHEM & COAG HOLD,GEC COAG HOLD,SGAH
Stago Numeric Errors Codes	'2' or '5' or 'DELTA'	Cell	Error Code(s)	N/A	Connection Testing,GEC CHEM & COAG HOLD,GEC COAG HOLD,SGAH
Stago Alpha Errors Codes	'AA' or 'AH' or 'AI' or 'A'	Cell	Error Code(s)	N/A	Connection Testing,GEC CHEM & COAG HOLD,GEC COAG HOLD,SGAH
Stago QNS	'6' or 'AE' or 'AF' or 'A'	Cell	Error Code(s)	N/A	Connection Testing,GEC CHEM & COAG HOLD,GEC COAG HOLD,SGAH
Stago Assay RNG	'3' or '4' or '8'	Cell	Error Code(s)	N/A	Connection Testing,GEC CHEM & COAG HOLD,GEC COAG HOLD,SGAH
UA Hold	'Correlation' or 'Refra'	Cell	Error Code(s)	N/A	SGAH Second Level Review HOLD,SGAH URINALYSIS HOLD,WAH
USPG	'Refractometer'	Cell	Result	N/A	SGAH Second Level Review HOLD,SGAH URINALYSIS HOLD,WAH
Result Run Workspace	"	Cell	Result	N/A	All
Urine QC Expired/Out	'Fail' or 'QC Time Out'	Row		N/A	SGAH Second Level Review HOLD,SGAH URINALYSIS HOLD,WAH
For Path Review	'Review' or 'TEA' or 'A'	Cell	Error Code(s)	N/A	GEC HEME HOLD,Hematology Workspace,SGAH HEME HOLD,WAH
Hemo HOLD	'DIFF' or 'MORPH' or 'A'	Cell	Error Code(s)	N/A	GEC HEME HOLD,Hematology Workspace,SGAH HEME HOLD,WAH

Non-Technical SOP

<b>Title</b>	<b>Data Innovations Instrument Manager</b>	
<b>Prepared by</b>	Robert SanLuis	Date: 7/11/2012
<b>Owner</b>	Robert SanLuis	Date: 3/12/2013

<b>Laboratory Approval</b>		
<b>Print Name and Title</b>	<b>Signature</b>	<b>Date</b>
<i>Refer to the electronic signature page for approval and approval dates.</i>		
Local Issue Date:		Local Effective Date:

<b>Review:</b>		
<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Form revised 3/31/00

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### **1. PURPOSE**

To describe the processes associated with the use of Instrument Manager (IM) to manage specimens and result release to into the Sunquest (SQ) Laboratory system.

### **2. SCOPE**

Instrument Manager functions to provide connectivity between instrumentation and the laboratory information system (LIS). IM provides the ability to review multiple instruments and work areas at one time. IM utilizes rules-based decision processing via graphical interface to release results without technical intervention which provides technical staff additional time to attend to the true exceptions.

### **3. RESPONSIBILITY**

Knowledge of IM is the responsibility of all laboratory technical staff.

### **4. DEFINITIONS**

Instrument Manager (IM) – computer application to manage laboratory processes, instrument interfaces, and deploy rules-based decision processing via graphical interface.




## 5. PROCEDURE

### A. Log on to Instrument Manager



If the program is not open double click on the icon on the desktop.  
(Note: A popup window may state unknown publisher. Click Run.)

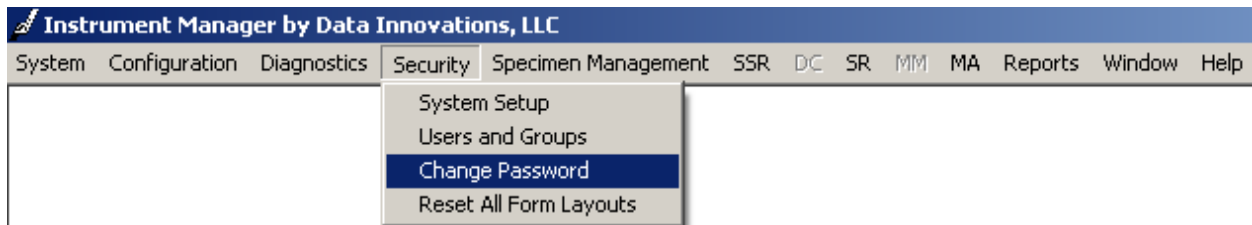


First time users will enter their Quest employee ID number then click . You will then be asked to establish a password. It is recommended to keep SunQuest and Instrument Manager passwords in sync.

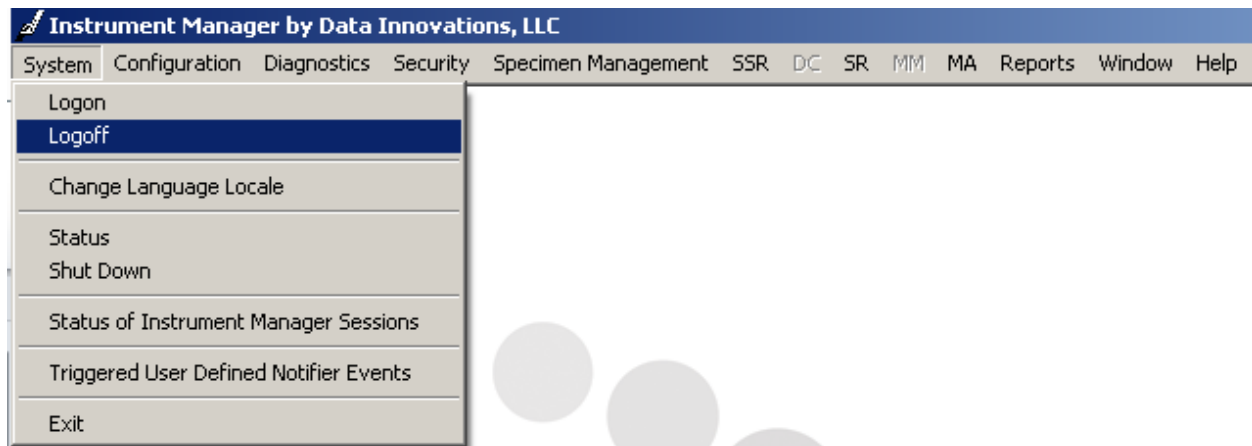
Once your password is established you will Logon with the above established user name and password to gain access to the system.

### B. Security

You are responsible for results release under your code. See below to change your password on demand.



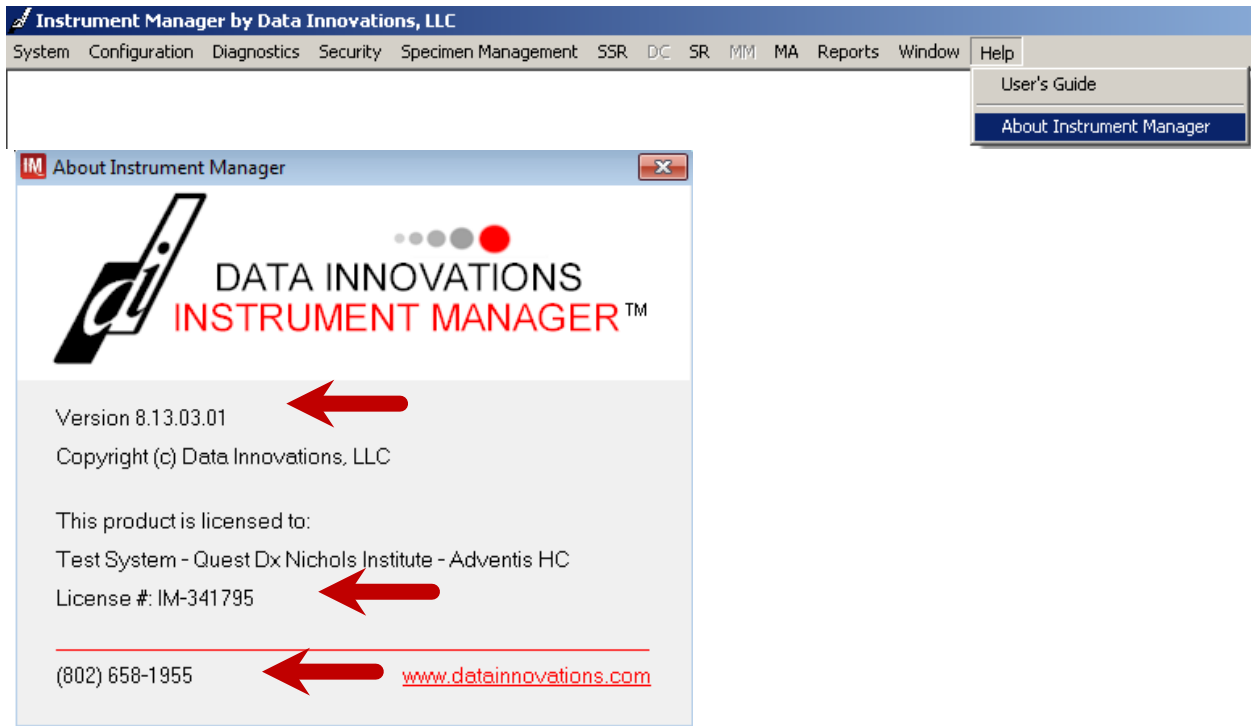
To maintain system security logoff under system as demonstrated.



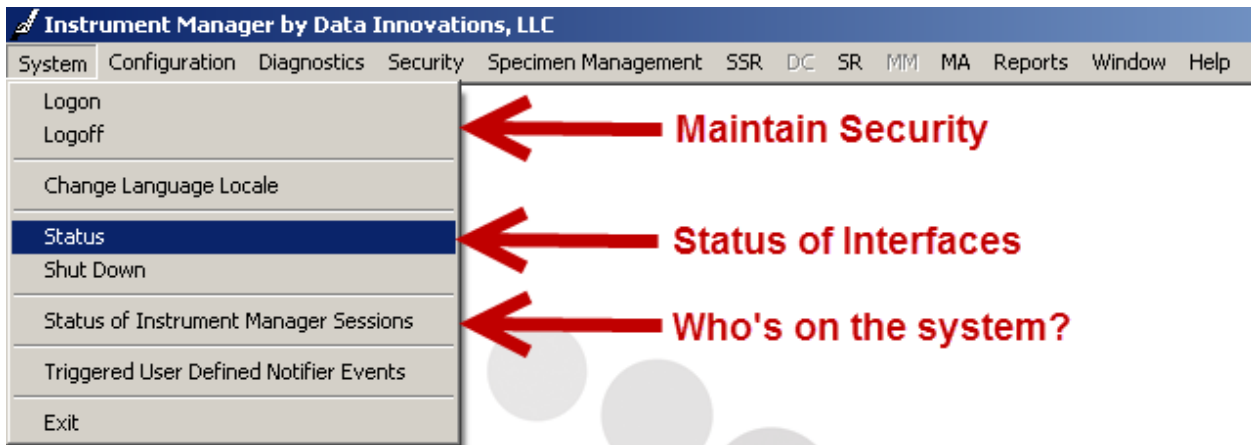
**Note:** Auto-logout: will automatically logoff users from Instrument Manager after a defined period of inactivity. The timer is currently set to 60 minutes

### C. Help

The About Instrument Manager under the help menu will provide required information when calling customer support.



### D. System menu



#### System Status

The status of interfaces should be on all the time for the following:

- Qmgr
- PurgeSpecimen Routing
- ArchiveCENTAURS
- CENTAURW
- EZLINKG

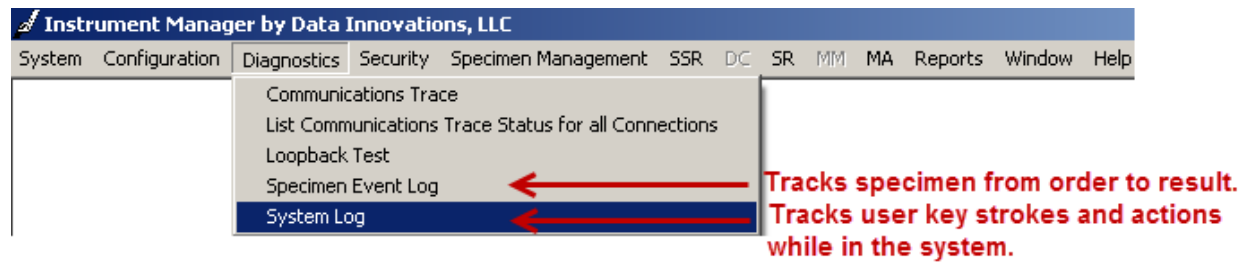
EZLINKS  
 EZLINKW  
 STAGO-GS1  
 STAGO-SS1  
 STAGO-SS2  
 STAGO-WS1  
 STAGO-WS2  
 IRIS1S  
 IRIS1W  
 SUNQUEST ORDERS  
 SUNQUEST RESULTS  
 GEC HEME Counter  
 SGAH HEME Counter 1  
 SGAH HEME Counter 2  
 WAH HEME Counter 1  
 WAH HEME Counter 2  
 SYSMEX-GEC  
 SYSMEX-SG  
 SYSMEX-WAH

Note the below screen shot demonstrates EZLINKG at Germantown is not working. It is trying to connect unsuccessfully. You can attempt to repair the connection - click on the connection then select **STOP**/once stopped then **START** selected connection.

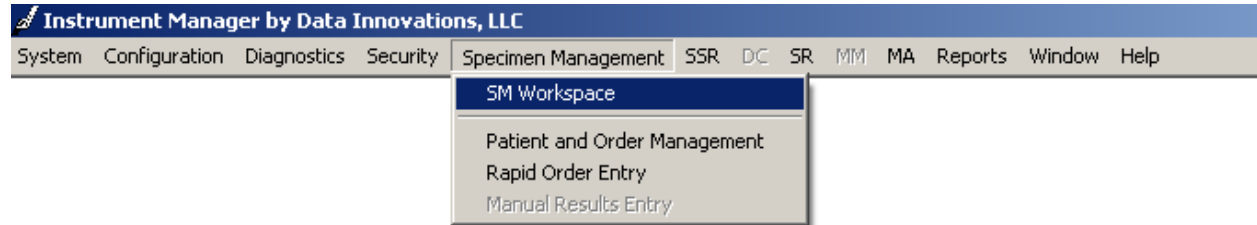
Connection	Status	In Service	In	InQ	SendQ	Sent	Errors
<b>System</b>							
Purge	On						0
Qmg...	On (2/2)				0	327	0
Specimen Routing	On						0
<b>User Defined</b>							
CENTAURS	On	Yes	0	0	0	0	0
CENTAURW	On	Yes	0	0	0	0	0
<b>EZLINKG</b>	<b>Connecting</b>	Yes	0	0	1606	0	0
EZLINKS	On	Yes	87	0	0	62	1
EZLINKW	On	Yes	6	0	0	51	1
SG Chemistry	Off	Yes	0	0	7	0	0
SUNQUEST ORD...	On	Yes	144	0	0	0	0
SUNQUEST RES...	On	Yes	0	0	0	38	0
TEST printer	Off	Yes	0	0	0	0	0
WAHLIS	Off	Yes	0	0	0	0	0

### E. Diagnostics menu

Troubleshooting – staff will use this infrequently with IT support direction. Arrows below denote key logs utilized to capture all actions within the system.



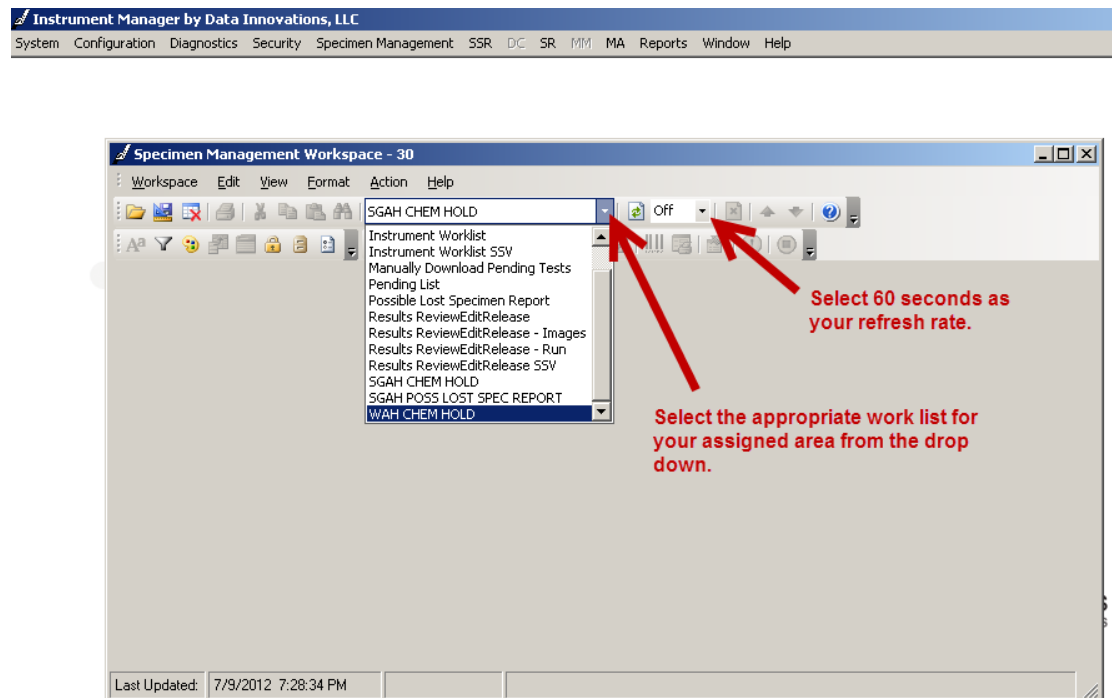
## F. Specimen Management Menu



SM Workspace is the default window for technical staff. This is where specimen results are reviewed, rejected, and/or released.

- Click on SM Workspace – Your default screen will appear. The first time you log in it is blank because you have not selected a default worklist.
- Select your default site specific (SGAH, WAH or GEC) worklist (CHEM HOLD , COAG HOLD, or CHEM & COAG HOLD)
- Set a 60 second screen refresh rate.

See Example Below:





Below you will find key areas of interest denoted with description.

The screenshot shows the 'Instrument Manager by Data Innovations, LLC' interface. The main window is titled 'Specimen Management Workspace - SGAH CHEM HOLD (Modified)'. It features a menu bar (System, Configuration, Diagnostics, Security, Specimen Management, SSR, DC, SR, MM, MA, Reports, Window, Help) and a toolbar. The interface is divided into several panes:

- Specimen Worksheet #3:** A table listing specimen details. Red callout #6 points to a row with Specimen ID 010000647.
- Patient Information #4:** A panel showing patient details for TESTSG, MARIE (TEST-200), including birth date, sex, and collection date.
- Test Worksheet #5:** A table of test results. Red callouts #7, #8, #10, and #11 highlight specific test rows and error codes.

ITEM	DESCRIPTION	FUNCTION																				
#1	Work List	<table border="1"> <thead> <tr> <th>Site</th> <th>Chemistry</th> <th>Coagulation</th> <th>Combined</th> <th>Quality Control</th> </tr> </thead> <tbody> <tr> <td>GEC</td> <td>GEC CHEM HOLD</td> <td>GEC COAG HOLD</td> <td>GEC CHEM &amp; COAG HOLD</td> <td>GEC QC LIST</td> </tr> <tr> <td>SGMC</td> <td>SGAH CHEM HOLD</td> <td>SGAH COAG HOLD</td> <td>SGAH CHEM &amp; COAG HOLD</td> <td>SGAH QC LIST</td> </tr> <tr> <td>WAH</td> <td>WAH CHEM HOLD</td> <td>WAH COAG HOLD</td> <td>WAH CHEM &amp; COAG HOLD</td> <td>WAH QC LIST</td> </tr> </tbody> </table>	Site	Chemistry	Coagulation	Combined	Quality Control	GEC	GEC CHEM HOLD	GEC COAG HOLD	GEC CHEM & COAG HOLD	GEC QC LIST	SGMC	SGAH CHEM HOLD	SGAH COAG HOLD	SGAH CHEM & COAG HOLD	SGAH QC LIST	WAH	WAH CHEM HOLD	WAH COAG HOLD	WAH CHEM & COAG HOLD	WAH QC LIST
		Site	Chemistry	Coagulation	Combined	Quality Control																
		GEC	GEC CHEM HOLD	GEC COAG HOLD	GEC CHEM & COAG HOLD	GEC QC LIST																
		SGMC	SGAH CHEM HOLD	SGAH COAG HOLD	SGAH CHEM & COAG HOLD	SGAH QC LIST																
		WAH	WAH CHEM HOLD	WAH COAG HOLD	WAH CHEM & COAG HOLD	WAH QC LIST																
		<table border="1"> <thead> <tr> <th>Site</th> <th>Urinalysis</th> <th>Combined</th> <th>Quality Control</th> </tr> </thead> <tbody> <tr> <td>SGMC</td> <td>SGAH URINALYSIS HOLD</td> <td>N/A</td> <td>SGAH QC LIST</td> </tr> <tr> <td>WAH</td> <td>WAH URINALYSIS HOLD</td> <td>N/A</td> <td>WAH QC LIST</td> </tr> </tbody> </table>	Site	Urinalysis	Combined	Quality Control	SGMC	SGAH URINALYSIS HOLD	N/A	SGAH QC LIST	WAH	WAH URINALYSIS HOLD	N/A	WAH QC LIST								
		Site	Urinalysis	Combined	Quality Control																	
		SGMC	SGAH URINALYSIS HOLD	N/A	SGAH QC LIST																	
		WAH	WAH URINALYSIS HOLD	N/A	WAH QC LIST																	
		<table border="1"> <thead> <tr> <th>Site</th> <th>Hematology</th> <th>Combined</th> <th>Quality Control</th> </tr> </thead> <tbody> <tr> <td>GEC</td> <td>GEC HEME HOLD</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>SGMC</td> <td>SG HEME HOLD</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>WAH</td> <td>WAH HEME HOLD</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table>	Site	Hematology	Combined	Quality Control	GEC	GEC HEME HOLD	N/A	N/A	SGMC	SG HEME HOLD	N/A	N/A	WAH	WAH HEME HOLD	N/A	N/A				
Site	Hematology	Combined	Quality Control																			
GEC	GEC HEME HOLD	N/A	N/A																			
SGMC	SG HEME HOLD	N/A	N/A																			
WAH	WAH HEME HOLD	N/A	N/A																			

Form revised 3/31/00

ITEM	DESCRIPTION	FUNCTION
#2	Screen Refresh Rate	The Refresh Rate is how frequently the computer looks for new data. Selections are OFF, 30s, 60s, 120s, and 300s. The Refresh Rate should generally be set to 60s. If you have a particularly complex result to review you can toggle the setting to OFF. If the setting is OFF the screen will not refresh automatically which could affect turnaround time negatively.
#3	Specimen Worksheet	List of specimens to review before result release.
#4	Patient Information	This panel displays patient demographic information on the selected patient.
#5	Test Worksheet	Displays the results of the selected patient.
#6	Selected Patient	The arrow designates the patient being evaluated and acted on.
#7	Selected Test Result	The arrow indicates the current test being evaluated. The test is CL run on VS2 with result of 105.0 and held of the critical high Potassium.
#8	Critical	The critical result is flagged with cH and CBACK-; appends for documentation of the call.
#9	Save Changes	Save changes after entering test comments so they will not be lost. If the screen refreshes you will be asked 'do you want to save changes'. Responding <i>yes</i> to the save request will save your work but not release it.
#10	Error Code	The Error Code or flag is what holds a sample for review. The name of the error is listed in the adjacent cell. Additional information may also be provided to assist in evaluating the specimen results.
#11	Previous Results	If available, previous results will be listed. Please note that delta flags are triggered at certain intervals thus the difference may exceed the delta range but the time for the flag to trigger has elapsed.
#12	Reject Result	The Red  rejects results you do not want to release. You can select individual results to reject or groups of results by depressing the Shift or Ctrl key in combination with the mouse. Always evaluate and reject before you release.
#13	Release Results	The clipboard with the check mark  allows you to release results to Sunquest. SQ requires results to be delivered in neat packets. Therefore, you must evaluate results and reject everything except that which you want sent to the patients chart. Do not send duplicate results - SQ gets confused.
#14	Filter	The filter will allow you to add or remove a filter from the current Work List (#1 Above) you are viewing. For example, the default Work List only shows "Tests Held" for review. If you click on the filter you can remove a filter and see both held for review and complete.
#15	Send to Host	Selected results may be resent to the host Sunquest. This is most effective if you have a single result that did not cross for some reason; such as, using a comment without appropriate format or mistype of a canned comment.

## G. Result Evaluation Process


### Example 1

1. Review results for errors, deltas, criticals, and HIL flags.
2. Only issues noted is a critical K of 6.5. Result called and read back (CBACK-;) by Rob at 16:40.

The screenshot displays the Quest Diagnostics Instrument Manager interface. The 'Specimen Worksheet' shows three specimens for patient TESTSG, MARIE, all with a status of 'Tests Held'. The 'Test Worksheet' shows results for various tests. The Potassium (K) test result is 6.5, which is outside the reference range of 3.5 - 5.1. A comment indicates 'CBACK-; Rob at 16:40' and an error code 'cH' is present. Other tests like Chloride, Total CO2, Sodium, H, I, L, and AGAP are all marked as 'HOLD' with 'Other Tests Held' error codes.

Tes...	Test S...	Test Code	Test Name	Result	Reference ...	Result Date/Time	Re...	Test Comment(s)	Error Code(s)	Error Name(s)	Previous...	Previous...	Previous
VS2	Held f...	CL	Chloride	105.0	98 - 107	7/8/2012 4:34:37 PM	<input type="checkbox"/>		HOLD	Other Tests Held	108.0	101.0	
VS2	Held f...	ECO2	Total CO2	33.0	21 - 32	7/8/2012 4:37:19 PM	<input type="checkbox"/>		HOLD	Other Tests Held	27.0	18.0	20.0
VS2	Held f...	K	Potassium	6.5	3.5 - 5.1	7/8/2012 4:34:37 PM	<input type="checkbox"/>	CBACK-; Rob at 16:40	cH	cH	4.3	4.3	3.9
VS2	Held f...	NA	Sodium	150.0	136 - 145	7/8/2012 4:34:37 PM	<input type="checkbox"/>		HOLD	Other Tests Held	145.0	135.0	
VS2	Held f...	H	H	1		7/8/2012 4:35:45 PM	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
VS2	Held f...	I	I	2		7/8/2012 4:35:45 PM	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
VS2	Held f...	L	L	1		7/8/2012 4:35:45 PM	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
VS2	Held f...	AGAP	AGAP	19		7/8/2012 4:26:08 PM	<input type="checkbox"/>		HOLD	Other Tests Held	16	20	22

### Example 2

1. Review results for errors, deltas, criticals, and HIL flags.
2. Error noted (E172) no sample detected.
3. Since only LA is ordered check the sample and order rerun.
4. Reject  the bad results.

The screenshot displays the Quest Diagnostics Instrument Manager interface. The 'Specimen Worksheet' shows one specimen for patient TESTSG, MARIE with a status of 'Tests Held'. The 'Test Worksheet' shows results for Lactic Acid (LA), L, I, and H. All tests are marked as 'HOLD' with error code 'E172' and the message 'No Sample'. The Lactic Acid result is 0.4.

Tes...	Test S...	Test Code	Test Name	Result	Reference ...	Result Date/Time	Re...	Test Comment(s)	Error Code(s)	Error Name(s)	Previous...	Previous...	Previous
VS1	Held f...	LA	Lactic Acid	0.4		7/8/2012 3:02:24 PM	<input type="checkbox"/>		E172	No Sample	0.4		
VS1	Held f...	L	L			7/8/2012 3:02:24 PM	<input type="checkbox"/>		E172	No Sample	1	1	1
VS1	Held f...	I	I			7/8/2012 3:02:24 PM	<input type="checkbox"/>		E172	No Sample	1	1	1
VS1	Held f...	H	H			7/8/2012 3:02:24 PM	<input type="checkbox"/>		E172	No Sample	1	1	1

**Example 3**

On evaluation of the below results the entire result set was rejected.

**Note:** Rejecting a result in IM does **NOT** cancel the test in SQ. Test cancellation is a separate process in SQ requiring specific documentation per applicable procedure.

**Specimen Worksheet**

Specimen ID	Specimen ...	Patient Name	Priority	Total ...	Collection Date/Time	Specimen Dilution	Posi
010000649	Complete	BBBSUNQUEST,VISTA WOM...	R	17	7/8/2012 6:00:00 PM	1	

**Patient Information**

Patient Name: BBBSUNQUEST,VISTA WOMAN  
 Patient ID: 31000161  
 Date of Birth: 6/18/1982  
 Sex: F  
 Location - Facility: SLAB

**Test Worksheet**

**This is an example of a rejected result. The status in IM is complete but note no results were released to SQ. Complete here indicates resolved in IM.**

Tes...	Test S...	Test Code	Test Name	Result	Reference ...	Result Date/Time	Re...	Test Comment(s)	Error Code(s)	Error Name(s)	Previous...	Previous...	Prev...
VS2	Reject...	TP	Total Prot...	5.5	6.4 - 8.2	7/8/2012 9:06:03 PM	<input type="checkbox"/>		HOLD	Other Tests Held	7.2	8.5	7.4
VS2	Reject...	TP	Total Prot...	5.3	6.4 - 8.2	7/8/2012 9:16:08 PM	<input type="checkbox"/>		HOLD	Other Tests Held	7.2	8.5	7.4
VS2	Reject...	TBIL	Bilirubin, ...	0.40	0 - 1	7/8/2012 9:05:56 PM	<input type="checkbox"/>		HOLD	Other Tests Held	0.70	0.30	0.30
VS2	Reject...	TBIL	Bilirubin, ...	0.40	0 - 1	7/8/2012 9:16:22 PM	<input type="checkbox"/>		HOLD	Other Tests Held	0.70	0.30	0.30
VS2	Reject...	NA	Sodium			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample	130.0	140.0	142.0
VS2	Reject...	NA	Sodium			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample	130.0	140.0	142.0
VS2	Reject...	NA	Sodium	102.0	136 - 145	7/8/2012 8:57:46 PM	<input checked="" type="checkbox"/>	CBACK-;	cL,DELTA,I...	cL,DELTA,Possible IV Contami...	130.0	140.0	142.0
VS2	Reject...	L	L	1		7/8/2012 8:58:12 PM	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
VS2	Reject...	K	Potassium			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample	HLK	HLK	HLK
VS2	Reject...	K	Potassium			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample	HLK	HLK	HLK
VS2	Reject...	K	Potassium	HLK	3.5 - 5.1	7/8/2012 8:57:46 PM	<input checked="" type="checkbox"/>		HEMOLYZED	HEMOLYZED	HLK	HLK	HLK
VS2	Reject...	I	I	1		7/8/2012 8:58:12 PM	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
VS2	Reject...	H	H	4		7/8/2012 8:58:12 PM	<input type="checkbox"/>		HEMOLYZED	HEMOLYZED	4	4	4
VS2	Reject...	GLUC	Glucose	56	74 - 106	7/8/2012 9:01:30 PM	<input type="checkbox"/>		HOLD	Other Tests Held	86	205	50
VS2	Reject...	GLUC	Glucose			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample	86	205	50
VS2	Reject...	ECO2	Total CO2			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample	16.0	20.0	23.0
VS2	Reject...	ECO2	Total CO2	11.0	21 - 32	7/8/2012 9:01:19 PM	<input type="checkbox"/>		HOLD	Other Tests Held	16.0	20.0	23.0
VS2	Reject...	CREA	Creatinine			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample	2.0	1.1	1.3
VS2	Reject...	CREA	Creatinine	0.9	0.6 - 1.3	7/8/2012 9:01:04 PM	<input type="checkbox"/>		HOLD	Other Tests Held	2.0	1.1	1.3
VS2	Reject...	CL	Chloride			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample		102.0	108.0
VS2	Reject...	CL	Chloride			7/8/2012 9:05:13 PM	<input type="checkbox"/>		E172	No Sample		102.0	108.0
VS2	Reject...	CL	Chloride	102.0	98 - 107	7/8/2012 8:57:46 PM	<input checked="" type="checkbox"/>	CBACK-;	cL,DELTA,I...	cL,DELTA,Possible IV Contami...	102.0	108.0	108.0

**Note:** For a calculation to work all components of the calculation must be present. Review results for 'Unable to Calculate' errors. To get the calculation to fire rerun all components required for the calculation.



**Example 4**

Comment format is critical to properly file the result in SQ.

English Text Codes are acceptable and the preferred method for result comments.

**Note-1:** The format is slightly different in that the (-) is appended by SQ. Review the format utilized in the screen captures below.

**Note-2:** Free text comment must be preceded by (;). Remember the (-) is already appended.

English Text: HIR and REP

The screenshot displays three windows from the Quest Diagnostics software. The 'Specimen Worksheet' window shows a table with columns for Specimen ID, Specimen, Patient Name, Priority, Total, and Collection Date/Time. The 'Patient Information' window shows details for Patient Name: BBBSUNQUEST,VISTA BABY, Patient ID: 31000160, Date of Birth: 6/3/2012, and Sex: F. The 'Test Worksheet' window is the largest and contains a table with columns: Tes..., Test S..., Test Code, Test Name, Result, Reference..., Result Date/Time, Re..., Test Comment(s), Error Code(s), and Error Name(s). The table lists various tests such as Bilirubin, Sodium, Potassium, Calcium, Glucose, and Creatinine, with their respective results and comments like 'HIR' and 'REP'.

English Text-English Text: CBACK-; SUZIE RN AT 2020-REP

The screenshot shows a 'Test Worksheet' window with a table of test results. The table has columns for Test S..., Test Code, Test Name, Result, Reference..., Result Date/Time, Re..., Test Comment(s), Error Code(s), Error Name(s), and three columns for Previous... values. The table contains several rows, including tests for Total Protein, Glucose, and Creatinine. Two rows are circled in red: one with 'Relea... TP' and another with 'Relea... GLUC'. The 'Relea... GLUC' row has a comment 'CBACK-; SUZIE RN AT 2020-REP' and an error code 'cL,DELTA'. Other rows have comments like 'Repeat Rejected' and error codes like 'HOLD' and 'Other Tests Held'.

The below typo will cause the result to **NOT** file in SQ. You would need to correct the comment in OEM.


Test Worksheet														
Tes...	Test S...	Test Code	Test Name	Result	Reference ...	Result Date/Time	Re...	Test Comment(s)	Error Code(s)	Error Name(s)	Previous...	Previous...	Previous	
*							<input type="checkbox"/>							
▶	VS2	Reject...	TP	Total Prot...	3.2	6.4 - 8.2	7/6/2012 10:48:10 ...	<input type="checkbox"/>		HOLD	Other Tests Held	3.2	3.2	6.9
	VS2	Reject...	TP	Total Prot...	3.2	6.4 - 8.2	7/6/2012 10:50:56 ...	<input type="checkbox"/>		HOLD	Other Tests Held	3.2	3.2	6.9
	VS2	Reject...	L	L	1		7/6/2012 10:33:07 ...	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
	VS2	Reject...	I	I	1		7/6/2012 10:33:07 ...	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	3
	VS2	Reject...	H	H	1		7/6/2012 10:33:07 ...	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
	VS2	Relea...	GLUC	Glucose	26	74 - 106	7/6/2012 10:36:32 ...	<input type="checkbox"/>	C SUSANRRNBACK;	cL	cL	25	11	333
	VS2	Reject...	GLUC	Glucose	26	74 - 106	7/6/2012 10:43:01 ...	<input type="checkbox"/>	CBACK;	cL	cL	26	25	11

The below comments are entered correctly.

Test Worksheet														
Tes...	Test S...	Test Code	Test Name	Result	Reference ...	Result Date/Time	Re...	Test Comment(s)	Error Code(s)	Error Name(s)	Previous...	Previous...	Prev	
*							<input type="checkbox"/>							
▶	VS3	Relea...	TBILN	Bilirubin, ...	0.30	0 - 1	7/4/2012 6:12:07 PM	<input type="checkbox"/>		HOLD	Other Tests Held	0.40	0.50	0.20
	VS3	Relea...	NA	Sodium	140.0	136 - 145	7/4/2012 6:04:15 PM	<input type="checkbox"/>		HOLD	Other Tests Held	146.0	149.0	151.0
	VS3	Relea...	L	L	1		7/4/2012 6:05:52 PM	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
	VS3	Relea...	K	Potassium	HLK	3.5 - 5.1	7/4/2012 6:04:15 PM	<input type="checkbox"/>	NOTIFIED RN XY AT 1745	HEMOLYZED	HEMOLYZED	4.6	4.6	3.9
	VS3	Relea...	IBIL	Calc Indir...	0.3		7/4/2012 6:08:12 PM	<input type="checkbox"/>		HOLD	Other Tests Held	0.3		
	VS3	Relea...	I	I	1		7/4/2012 6:05:52 PM	<input type="checkbox"/>		HOLD	Other Tests Held	1	1	1
	VS3	Relea...	H	H	4		7/4/2012 6:05:52 PM	<input type="checkbox"/>		HEMOLYZED	HEMOLYZED	1	1	1
	VS3	Relea...	GLUC	Glucose	114	74 - 106	7/4/2012 6:07:19 PM	<input type="checkbox"/>	REP	DELTA	DELTA	19	71	77
	VS3	Relea...	ECO2	Total CO2	23.0	21 - 32	7/4/2012 6:07:12 PM	<input type="checkbox"/>		HOLD	Other Tests Held	15.0	24.0	22.0
	VS3	Relea...	DBILN	Bilirubin, ...	0.05	0 - 0.3	7/4/2012 6:09:57 PM	<input type="checkbox"/>	HIR-REP	DELTA	DELTA	0.09	< 0.05	< 0.05
	VS3	Relea...	CREA	Creatinine	0.7	0.6 - 1.3	7/4/2012 6:06:43 PM	<input type="checkbox"/>		HOLD	Other Tests Held	>60	>60	1.3
	VS3	Relea...	CL	Chloride	104.0	98 - 107	7/4/2012 6:04:15 PM	<input type="checkbox"/>		HOLD	Other Tests Held	109.0	110.0	108.0
	VS3	Relea...	CA	Calcium	8.2	8.5 - 10.1	7/4/2012 6:06:36 PM	<input type="checkbox"/>		HOLD	Other Tests Held	9.0	9.4	9.2

**Example 5**

Review results for QC failures

1. Error noted (AC) means **“QC Out of Range or Not Done - Check Instrument Status”**
2. Reject  the bad results (FIBR and PTT). Release the DDIMER, INR, AND PTA only
3. Check the instrument for QC issues and troubleshoot. Rerun samples with bad results once QC for FIBR and PTT are in range.

Specimen ID	Specimen ...	Requested Date/Time /	Patient Name	Prio...	Specimen Dil...	Collection Date/Time	Ri
030021474	Tests Held	3/7/2015 9:12:44 PM	CHEN	S		3/7/2015 9:10:00 PM	
020050292	Tests Held	3/7/2015 9:13:36 PM	CHEN	R		3/7/2015 9:11:00 PM	
020049213	Tests Held	3/7/2015 9:14:34 PM	CHEN	R		3/7/2015 9:13:00 PM	

Test St.	Test Name	Result	Reference ...	Result Date/Time /	Rer...	Test Comment(s)	Error Code(s)	Error Name(s)	Previous R...	Per
SS1	Held f... DDIME	DDIMER	1.83	0 - 0.50	3/7/2015 10:35:4...		HOLD	Other Tests Held	0.35	<0.;
SS1	Held f... FIBR	Fibrinogen	638	200 - 400	3/7/2015 10:35:4...		AC	QC Out of Range or Not ...	<60	60
SS1	Held f... INR	INR	0.8		3/7/2015 10:35:4...		HOLD	Other Tests Held	<0.7	3.8
SS1	Held f... PTA	Prothrombin Time	11.5	12.5 - 14.8	3/7/2015 10:35:4...		HOLD	Other Tests Held	<10	38.0
SS1	Held f... PTT	PTT	28	23 - 37	3/7/2015 10:35:4...		AC	QC Out of Range or Not ...	<20	104

**Example 6**

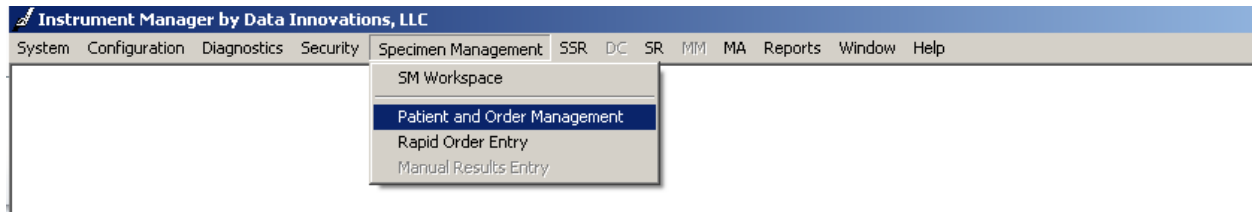
Review of results with “Previously Resulted from a Different Instrument” error

1. DI will display an error and HOLD the results whenever a specimen or two specimens with the same accession numbers are run on two different instruments from the same class (for example, Vista 1 and Vista 2, Xpand 1 and Xpand 2, Stago 1 and Stago 2, Sysmex 1 and Sysmex 2)
2. Check SQ to see if the test has already been resulted. If resulted, then reject the rerun. If the first result has not been resulted, then select which run to release and reject the other run. Do not release both results from Instrument 1 and Instrument 2 to SQ as the first result will be overwritten by the second result

Test St.	Test Name	Result	Units	Referenc...	Result Date/Time /	Test Comment(s)	Error Code(s)	Error Name(s)	Previ.
SS1	Held f... INR	INR	3.8	INR	2/28/2017 2:42:4...	RVT	DELTA	DELTA	1.0
SS1	Held f... PTA	Prothrom...	36.8	sec. 12.5 - 14.8	2/28/2017 2:42:4...		HOLD	Other Tests Held	13.2
SS1	Held f... PTA	Prothrom...	36.8	sec. 12.5 - 14.8	2/28/2017 3:03:4...		Rerun	Range High,Rerun Test	13.2
SS1	Held f... INR	INR	3.8	INR	2/28/2017 3:03:4...	RVT	DELTA,Rer...	DELTA,Rerun Test	1.0
SS2	Held f... PTA	Prothrom...	39.1	sec. 12.5 - 14.8	2/28/2017 3:12:5...		Rerun	Range High,Previously resulted from a different instrument	13.2
SS2	Held f... INR	INR	4.2	INR	2/28/2017 3:12:3...	CBACK: ~RVT	CH DELTA	Critical High,DELTA,Previously resulted from a different instrument	1.0

Form revised 3/31/00

## H. Patient and Order Management



Select Patient and Order Management to look up previous results, order tests, and print results (downtime use only).

**Note:** Patient reports should only be printed from SQ for distribution to providers. The print feature is utilized to create preliminary reports for downtime purposes only or for internal use only.

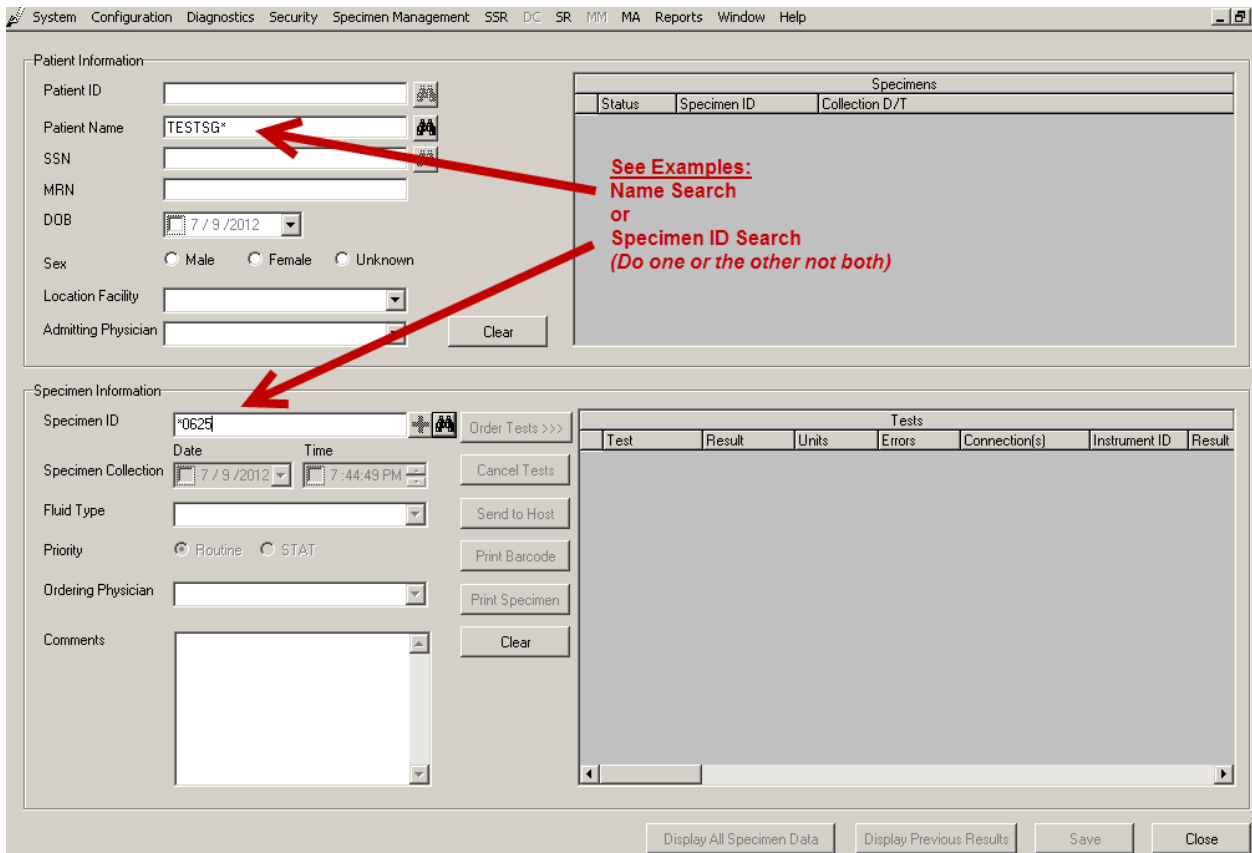
You can perform exact match searches or wild card searches.

### Wild Card Searches

**Patient name field** type the search criteria, part of last name, followed by a wild card (\*).

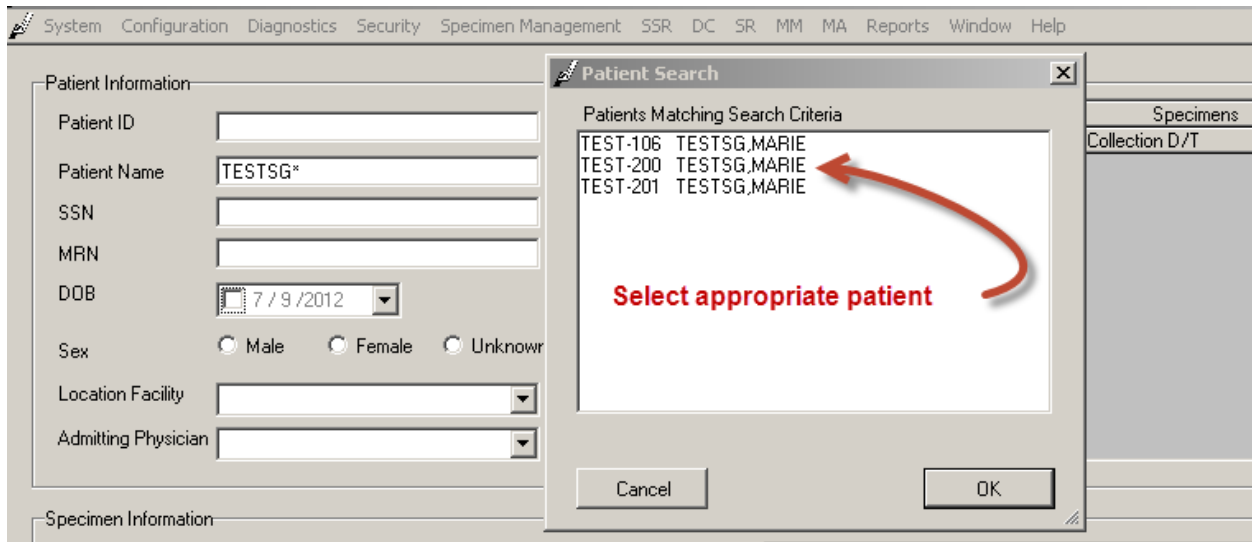
**Specimen ID field** type the wild card (\*) followed by part of the specimen ID number.

### Example Wild Card Searches



Form revised 3/31/00

## Result of Patient Name search



### I. Out Patient Call Back List

Flag an Out-Patient for “Call Back” by removing the “CBACK-;” for the test comment field in IM.

When the result is released the Call Back List is automatically updated.

### Example: Call Back

Specimen ID	Specimen Completion Status	Patient Name	Priority	Total Number of Tests ...	Specimen Dilu...
040003389	Tests Held	BBBSUNQUEST, VISTA BABY	R	13	1
040003334	Tests Held	BBBSUNQUEST, VISTA WOM...	R	18	1
040003307	Tests Held	BBBSUNQUEST, VISTA CHILD	R	3	1
040003338	Tests Held	BBBSUNQUEST, VISTA CHILD	R	3	1
1	Tests Held		R	5	1

Tes...	Test S...	Test Code	Test Name	Result	Reference ...	Result Date/Time	Re...	Test Comment(s)	Error Code(s)	Error Name(s)	Previous...	Previous...
VS1	Held f...	TP	Total Prot...	3.2	6.4 - 8.2	7/9/2012 10:12:25 ...			HOLD	Other Tests Held		7.8
VS1	Held f...	L	L	1		7/9/2012 9:51:00 PM			HOLD	Other Tests Held	1	1
VS1	Held f...	I	I	1		7/9/2012 9:51:00 PM			HOLD	Other Tests Held	1	1
VS1	Held f...	H	H	1		7/9/2012 9:51:00 PM			HOLD	Other Tests Held	1	2
VS1	Held f...	GLUC	Glucose	32	74 - 106	7/9/2012 9:52:30 PM			cL	cL	36	958

**Remove CBACK-;**  
**For an Out Patient Location removing CBACK-;**  
**automatically sends the result to the call back list.**

## J. Tests Requiring Special Handling/Programming

Due to multiple fluid types on the same accession number special consideration must be given to CRCL and GTT testing. These tests should be manually programmed on the instrument utilizing the following format:

*Program the accession number + TEST*

CRCL - Example

F3200 UCRR

F3200 CREA

GTT

F3201 GT0

F3201 GT1

F3201 GT2

F3201 GT3

Results will need to be entered manually in MEM.

## K. Start Holding All Results

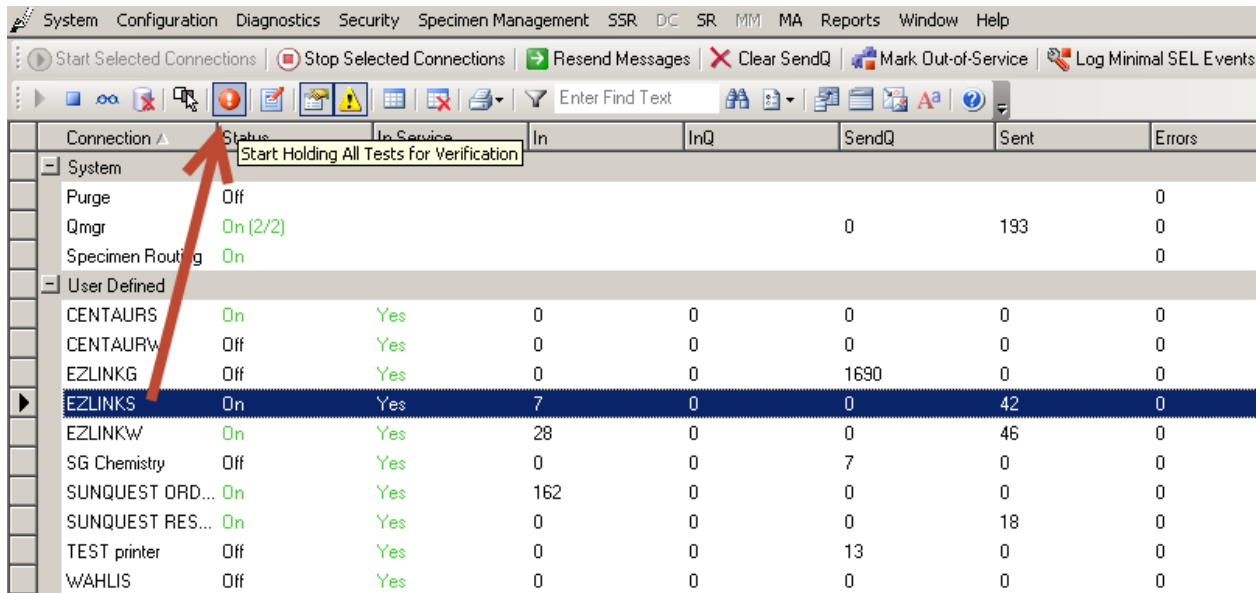
If there is a suspected problem with Auto-verification there is a command to Immediately Stop Auto-Verifying Results. If the need arises to STOP Auto-Verification do so, then immediately:

- Notify Lab Management (Supervisor/Director/Admin On-Call).
- Notify other system laboratories.
- Complete a QV Form.
- Begin releasing results manually.

Go to the System-Status screen.

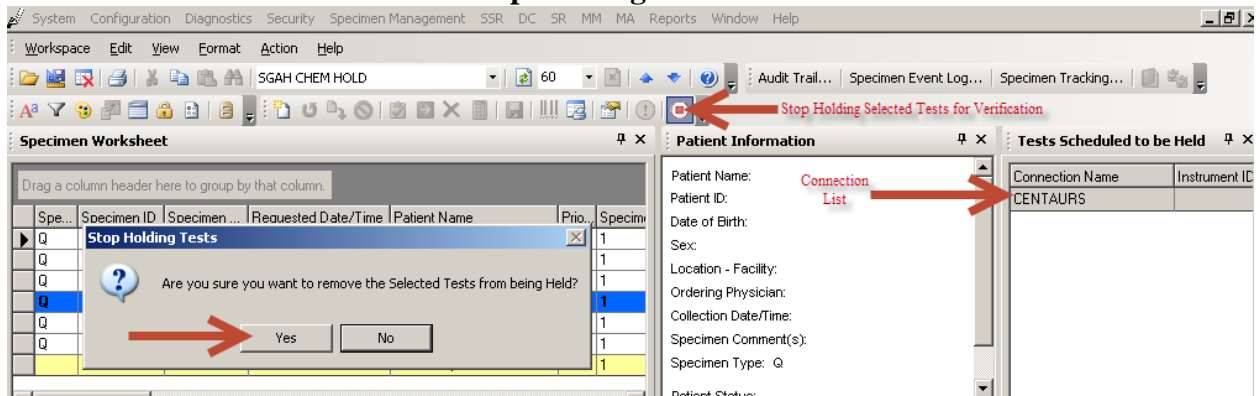
Select the appropriate interface (example. ELINKS or EZLINKW)

Select  Start Holding All Test For Verification



To turn the Auto – Verification back on, from the SM Workspace page

- Select **Stop Holding Selected Tests for Verification**
- Select the appropriate connection name
- Then select **Stop Holding Selected Tests for Verification**



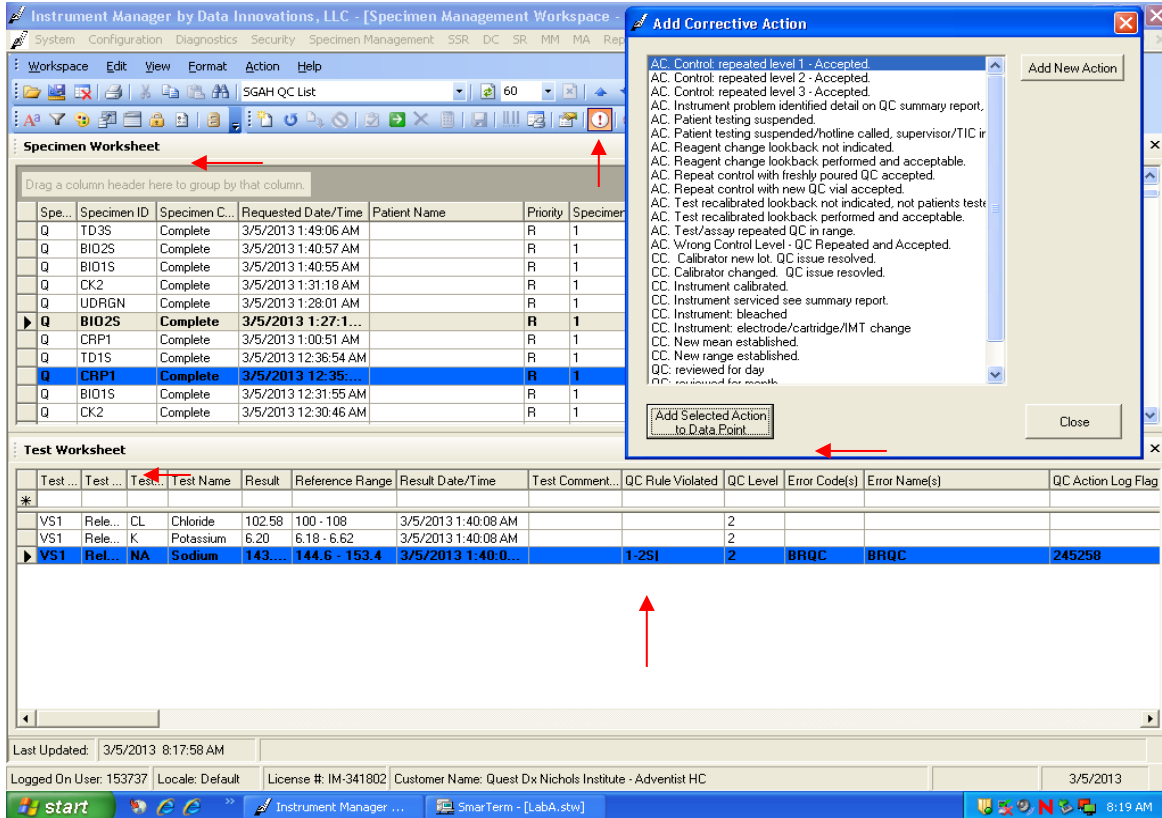
## L. Quality Control:

The Data Innovation software evaluates each QC result against acceptable ranges and highlights the ones that violate the QC rules, in blue color. The DI software will use the 1 – 2s, 2 – 2s and 1 – 3s Statistical Process Control (SPC) rules to describe the extent of the failure. Before releasing the QC result which has violated the QC rule, a corrective action must be added to the failed QC. To add a corrective action to QC results,

- under **Specimen Worksheet** click on blue highlighted QC
- under **Test Worksheet** select the blue highlighted assay which has violated the QC rule
- **QC Action Log** icon gets activated



- select the appropriate action that has been (*Not Will Be*) taken to trouble shoot the failed QC
- click on **Add Selected Action to Data Point**

Release the QC result, the selected action will now migrate to Bio-Rad Unity Real Time.



When QC results fail, **stop the Auto-Verification immediately**. Once the QC is repeated and falls within acceptable ranges turn the Auto-Verification back on. Utilizing the process below, click on the designated icon, then select the connection name and designated test to stop holding:

To turn the Auto – Verification back on, from the SM Workspace page

- Select  **Stop Holding Selected Tests for Verification**
- Select the appropriate connection name
- Then select  **Stop Holding Selected Tests for Verification**

## 6. RELATED DOCUMENTS

- OEM - On Line Entry Method, LIS procedure
- MEM - Manual Result Entry, LIS procedure
- Critical Values - Accepting Results in LIS, LIS procedure
- Correcting Results, LIS procedure
- Delta Check, QA procedure



## 7. REFERENCES

User Documentation, *Instrument Manager v8.12*, Data Innovations, INC.

## 8. REVISION HISTORY

Version	Date	Reason for Revision	Revised By	Approved By
000	3/12/2013	Update owner Section 5: Added process to reinstate Auto-verification to item K. Added QC section (item L)	A. Chini	R. SanLuis
001	3/18/2015	Section 5: Add auto-log off, update screen shots, add Coag and GEC instruments, update work lists, remove outdated calculation example, add Coag example Section 6: add Delta Check Footer: version # leading zero's dropped due to new EDCS in use as of 10/7/13	D. Concepcion L. Barrett	R. SanLuis
2	6/8/2016	Section 5: Add Iris (Urinalysis) processing through DI	D. Concepcion M. Sabonis	R. SanLuis
3	8/1/2016	Header: Add other sites Section 5: Add second level review for crystals	D. Concepcion	R. SanLuis
4	5/18/2017	Section 5: Add Hematology Interfaces & work lists, Update Iris QC, add example 6 (previously resulted from different instrument error) Section 6: Remove SOP numbers Section 9: Add addenda; Move Iris actions from section 5, add Coag and Sysmex (Hematology) processing through DI	D. Concepcion M. Sabonis L. Barrett	R. SanLuis
5	9/17/2017	Addendum 3: add steps 11-19	D. Concepcion	R. SanLuis

## 9. ADDENDA AND APPENDICES

1. Stago (Coagulation) Instrument Specific Actions
2. Iris (Urinalysis) Instrument Specific Actions
3. Sysmex (Hematology) Instrument Specific Actions

## Addendum 1

### Stago (Coagulation) Instrument Specific Actions

The DI Stago driver is set to collate all the coagulation tests on the same accession number until all the results have been completed within a set amount of time. For example, if the first test has been completed and the second test is still pending and the collation time has been exceeded, DI will release the first test as long as it does not have an error. This setting is at the Driver level.

Diagnostica Stago STA-R Evolution, STA Compact, STA Satellite Configuration

Standard Configuration | **Driver Configuration** | Comment Configuration

Rerun/Reflex/Repeat Support  
 Yes  No

Instrument Model  
 STA-R Evolution  STA Compact/Satellite

Hold Results Until Complete  
20 Send Results Automatically After Timeout (min)

Logical ASTM Records Per Frame  
 Single  Multiple

Date Of Birth Format MM/DD/YYYY

Separate Outbound Messages  
 Yes  No

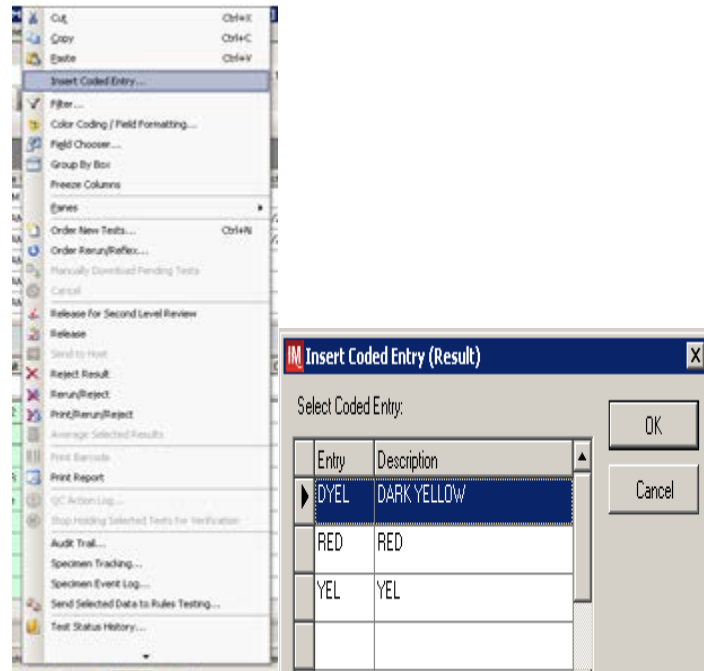
## Addendum 2

### Iris (Urinalysis) Instrument Specific Actions

#### A. General Information

##### 1. Color

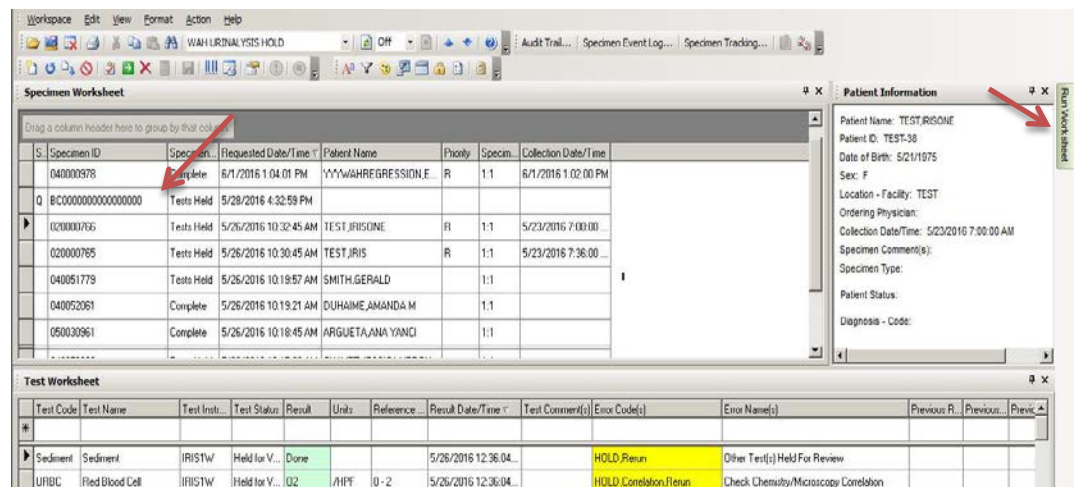
With the cursor in the result cell, right click → Insert Coded Entry → Click on desired result → Ok. Result in Cell will update.



##### 2. View Sample Reruns and Release Results

With the Iris you may have to rerun a sample. Reruns will be indicated in the Error Codes column. The “Urinalysis Hold” SM workspace is designed to display a tab on the right side of the workspace called “Run Worksheet”. This is where the original and the rerun results will display.

- a. To display both results, click on specimen ID and then use mouse to hover over or click on the green “Run Worksheet” tab

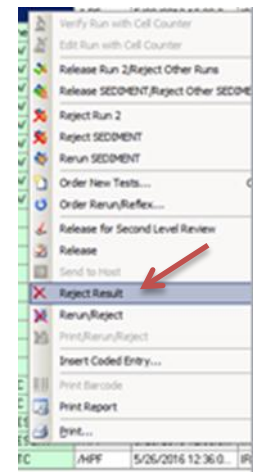


**Addendum 2 (continued)**

b. Both runs display.

Test Name	Result (1)	Units (1)	Result Date/Time (1)	Test Instrument	Result (2)	Units (2)	Result Date/Time (2)	Test Instrument
<b>CHEMISTRY</b>								
Dipstick Lot	:9EB6A18		5/26/2016 12:01:3...	IRIS1W	:9EB6A18		5/26/2016 12:36:0...	IRIS1W
Urobilinogen	<2.0	mg/dL	5/26/2016 12:01:3...	IRIS1W	<2.0	mg/dL	5/26/2016 12:36:0...	IRIS1W
Specific Gravity	1.012		5/26/2016 12:01:3...	IRIS1W	1.012		5/26/2016 12:36:0...	IRIS1W
pH	5.5		5/26/2016 12:01:3...	IRIS1W	5.5		5/26/2016 12:36:0...	IRIS1W
Clarity	CLER		5/26/2016 12:01:3...	IRIS1W	CLER		5/26/2016 12:36:0...	IRIS1W
Chemistry	Done		5/26/2016 12:01:3...	IRIS1W	Done		5/26/2016 12:36:0...	IRIS1W
Nitrite	NEG		5/26/2016 12:01:3...	IRIS1W	NEG		5/26/2016 12:36:0...	IRIS1W
Leukocytes	NEG	Leu/uL	5/26/2016 12:01:3...	IRIS1W	NEG	Leu/uL	5/26/2016 12:36:0...	IRIS1W
Bilirubin	NEG	mg/dL	5/26/2016 12:01:3...	IRIS1W	NEG	mg/dL	5/26/2016 12:36:0...	IRIS1W
Glucose	NEG	mg/dL	5/26/2016 12:01:3...	IRIS1W	NEG	mg/dL	5/26/2016 12:36:0...	IRIS1W
Ketone	NEG	mg/dL	5/26/2016 12:01:3...	IRIS1W	NEG	mg/dL	5/26/2016 12:36:0...	IRIS1W
Blood	NEG	mg/dL	5/26/2016 12:01:3...	IRIS1W	NEG	mg/dL	5/26/2016 12:36:0...	IRIS1W
Protein	TR	mg/dL	5/26/2016 12:01:3...	IRIS1W	TR	mg/dL	5/26/2016 12:36:0...	IRIS1W
Color	YEL		5/26/2016 12:01:3...	IRIS1W	YEL		5/26/2016 12:36:0...	IRIS1W
<b>(none)</b>								
Fat	PRESENT	/HPF	5/26/2016 12:01:3...	IRIS1W				
Oval Fat Body	PRESENT	/HPF	5/26/2016 12:01:3...	IRIS1W				
Trichomonas	PRESENT	/HPF	5/26/2016 12:01:3...	IRIS1W	PRESENT	/HPF	5/26/2016 12:36:0...	IRIS1W
<b>SEDIMENT</b>								
Fat					PRESENT	/HPF	5/26/2016 12:36:0...	IRIS1W
Oval Fat Body					PRESENT	/HPF	5/26/2016 12:36:0...	IRIS1W
Mucous	1+	/LPF	5/26/2016 12:01:3...	IRIS1W	1+	/LPF	5/26/2016 12:36:0...	IRIS1W
Bacteria	1+		5/26/2016 12:01:3...	IRIS1W	1+		5/26/2016 12:36:0...	IRIS1W
Squamous Epithel...	2+	/LPF	5/26/2016 12:01:3...	IRIS1W	2+	/LPF	5/26/2016 12:36:0...	IRIS1W

c. To release a run, place your cursor in one of the result cells for the run you want to release and right click. Select appropriate option.




d. To close the Run Worksheet for the specimen that you are viewing, click on a cell in either the specimen or test worksheet.

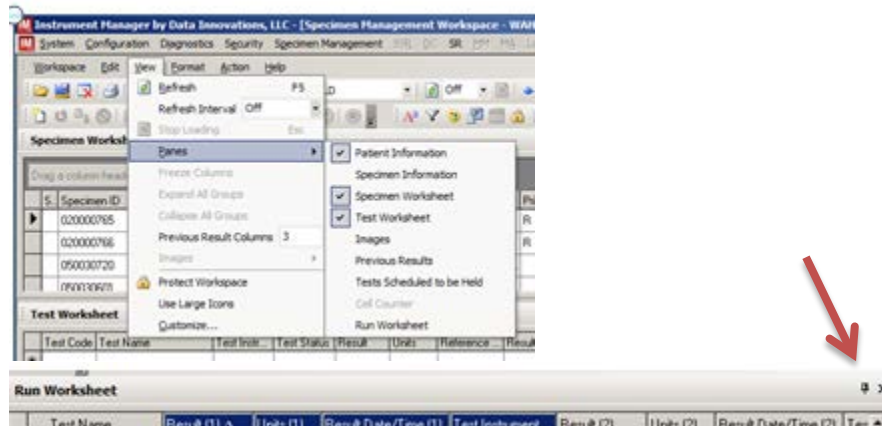
**\*\* DO NOT CLICK ON THE X in the Run Worksheet as this will cause the Run Worksheet tab to be removed from viewing.**



**Note:** To re-display the RUN WORKSHEET (green tab) -  
 From the main banner select **View**→**Panes**→**Run Worksheet**.

## Addendum 2 (continued)

When the run Worksheet displays, click on  the **push pin** icon to minimize it.



### B. Iris (Urinalysis) Manual Refractometer testing

1. If the specific gravity is  $>1.035$ , then the result is suppressed and an error message will alert tech to perform a manual refractometer to determine specific gravity.

USFG	Specific Gravity	IRIS1S	Held for V...		1.005 - 1.030	5/29/2016 4:25:37 ...	<b>HOLD, Confirm with Refractometer</b>	Confirm with Refractometer
------	------------------	--------	---------------	--	---------------	-----------------------	---	----------------------------

2. If manual refractometer result is  $>1.035$ , then enter result into DI as  $>1.035$

### C. Iris (Urinalysis) Pyridium (Orange colored urines)

1. If urine is orange, you will see error code "HOLD, Color"
2. Verify that urine is truly orange, if urine is orange then
  - a. Report out Color, Appearance and Microscopic (if applicable).
  - b. Remove and replace the rest of the Chemistry results with COLINT. With cursor in result cell, right click → Insert Coded Entry → click on COLINT → OK. Result in result cell updates.

**Addendum 2 (continued)**

**D. Abnormal Crystals for Second Level Review**

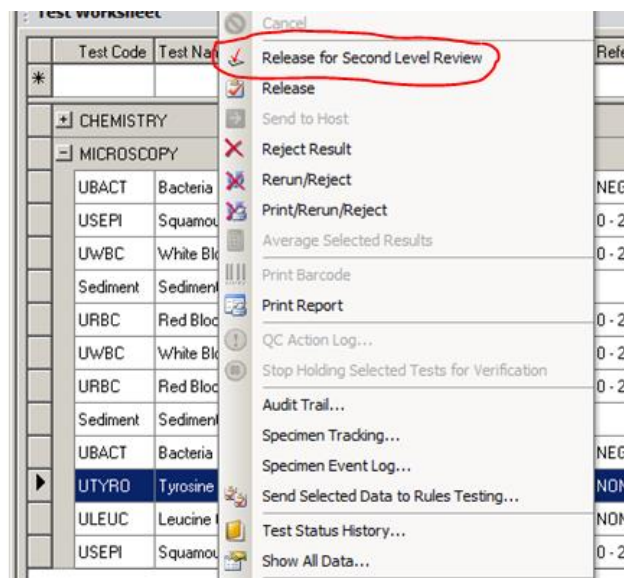
1. If an abnormal crystal is present in the urine, you will see error code of “Abnormal Crystal”

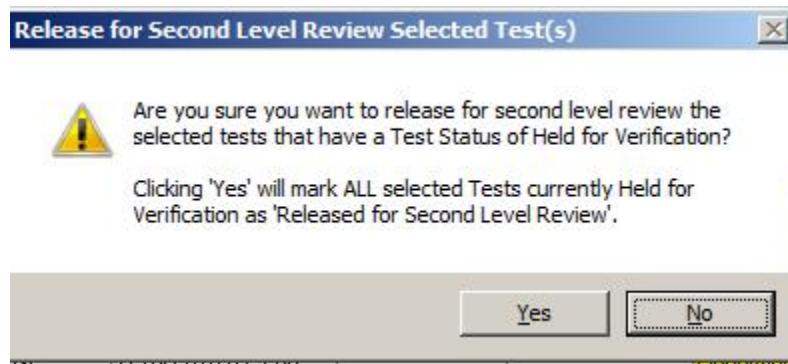
S	Specimen ID	Specimen	Requested Date/Time	Patient Name	Priority	Specim.	Collection Date/Time	Last Run ID
	010000117	Tests Held	5/29/2016 4:46:06 PM	TEST_INSTRUMENT	R	1:1	5/29/2016 4:44:00 ...	2
	010000123	Tests Held	5/29/2016 10:20:38 PM	TEST_INSTRUMENT	R	1:1	5/29/2016 10:19:0...	3
	010000125	Tests Held	5/29/2016 10:48:06 PM	TEST_INSTRUMENT	R	1:1	5/29/2016 10:46:0...	3

Test Code	Test Name	Test I...	Test Status	Result	Units	Reference	Result Date/Time	Test Comment(s)	Error Code(s)	Error Name(s)
* CHEMISTRY										
* MICROSCOPY										
ULEUC	Leucine Crystal	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:21:32 ...		Abnormal Crystal.R...	Review Crystal
USEPI	Squamous Epithelial	IRIS1S	Held for V...	1+	/LPF	0 - 2	7/13/2016 5:21:32 ...		Rerun	Rerun
UTYRO	Tyrosine Crystal	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:21:32 ...		Abnormal Crystal.R...	Review Crystal
UCYFT	Cystine Crystal	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:21:32 ...		Abnormal Crystal.R...	Review Crystal

2. Verify the abnormal crystal with a second technologist
3. If both are in agreement, then follow the steps below to release the result for Second Level Review, then to LIS
  - a. First Tech – Within the DI Urinalysis workspace, select the abnormal crystal and release it for Second Level Review. Click YES on the Release for Second Level Review window. The result will go to the Second Tech for review





- b. Second Tech – Go to the Second Level Review HOLD, then release the abnormal crystal. The result will then go to LIS

**Specimen Worksheet**

S.	Specimen ID	Specimen	Requested Date/Time	Patient Name	Priority	Specim...	Collection Date/Time	Last Run ID
	060026845	Tests Held	7/12/2016 12:44:55 PM	BARRY, WILLIAM N		1:1		1
	010000126	Tests Held	5/29/2016 10:55:40 PM	TEST JNSTRUMENT	R	1:1	5/29/2016 10:54:0...	2
	010000125	Tests Held	5/29/2016 10:48:06 PM	TEST JNSTRUMENT	R	1:1	5/29/2016 10:46:0...	3
	010000124	Tests Held	5/29/2016 10:28:06 PM	TEST JNSTRUMENT	R	1:1	5/29/2016 10:26:0...	3
	010000123	Tests Held	5/29/2016 10:20:38 PM	TEST JNSTRUMENT	R	1:1	5/29/2016 10:19:0...	3
	060011993	Tests Held	5/20/2016 10:32:41 AM	TEST JIRIS3	R	1:1	5/20/2016 10:31:0...	2

**Test Worksheet**

#	Test Code	Test Name	Test I...	Test Status	Result	Units	Reference ...	Result Date/Time	Test Comment(s)	Error Code(s)	Error Name(s)
	UTYRD	Tyrosine Cty...	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:18:03 ...		Abnormal C...	Review Crystal
	UTYRD	Tyrosine Cty...	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:21:32 ...		Abnormal C...	Review Crystal,
	ULEUC	Leucine Cty...	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:21:32 ...		Abnormal C...	Review Crystal,
	UCYFT	Cystine Crystal	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:18:03 ...		Abnormal C...	Review Crystal
	UCYFT	Cystine Crystal	IRIS1S	Held for V...	FEW	/HPF	NONE	7/13/2016 5:21:32 ...		Abnormal C...	Review Crystal,