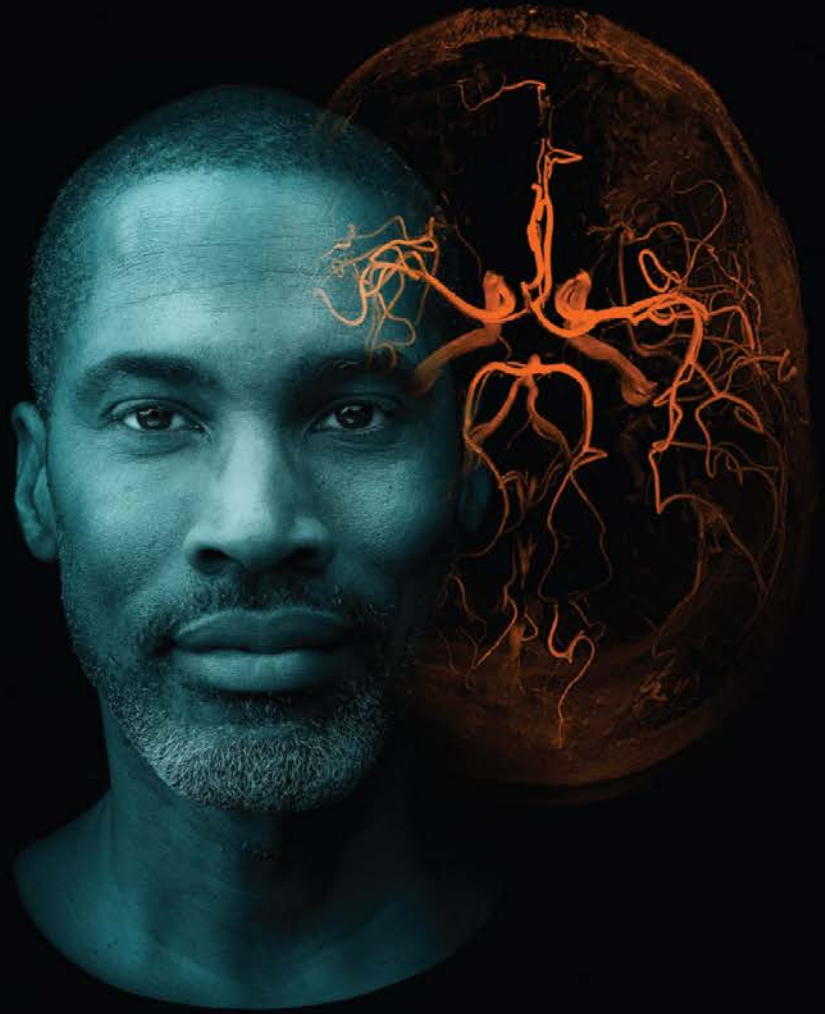


Dimension® Systems

# Routine Operations

Virtual Training Workbook





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# Siemens Healthineers

## Dimension Systems Routine Operations

### Virtual Training Workbook



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# 1 Welcome

## **Welcome to Training**

Siemens Healthineers would like to welcome you to the Virtual Training on the Dimension Systems.

This course is designed to enhance the skills needed to operate and properly maintain the Dimension Systems.

Our staff welcomes the opportunity to present this training program to you.

## Safety Information

While you are participating in this virtual training, please follow safety practices as outlined by your facility which may include the following:

- In the event of a **fire alarm**, **Stop work immediately and leave the building** through the nearest exit.
- Eating and drinking are **not allowed** in the instrument area of the classroom.
- You must wear laboratory coats and gloves which are provided. Do not wear these garments outside the laboratory
- Use **safety glasses** when operating the instrument or preparing samples.
- Dispose of waste materials appropriately:
  - **Biohazard Waste:** Wastebaskets with **red** plastic liners
  - **Paper Waste:** Wastebaskets with **clear** plastic liners
  - Use sharps containers for the disposal of glass or sharp objects.
- Wash your hands before leaving the classroom and after removing your gloves.

## Course Objectives

Upon completion of this course, you will be able to:

- Identify system hardware components and software functions.
- Perform daily maintenance.
- Process QC.
- Process samples.
- Review test report messages.
- Perform calibrations and review results
- Demonstrate replacement of consumables.
- Perform weekly and monthly maintenance.



## Training Agenda

Morning		Afternoon
<p><b>Welcome</b></p> <p>System Overview Daily Maintenance QC Processing Sample Processing Test Report Messages</p>	<p><b>Lunch</b></p>	<p>Calibration Replacing Consumables Weekly Maintenance Monthly Maintenance</p>

## Dimension® Systems Routine Virtual Training Course Validation Checklist

The participant places a checkmark beside the competency when it is completed. When all competencies are checked, the instructor and participant sign and date below as record of completion.

Topics	Competencies	Completed
<b>System Overview</b>	Identify major hardware components	
	Identify the main software functions and navigation	
<b>Daily Maintenance</b>	Review a system check	
	Perform daily maintenance	
	Document daily maintenance	
<b>QC Processing</b>	Identify the adapter needed for each tube type	
	Process daily QC	
	Navigate software to view processing time	
<b>Test Report Messages</b>	Identify and interpret test report messages	
<b>Calibration</b>	Use package inserts to scan in calibrator values	
	Perform calibrations	
	Review calibration results	
<b>Replacing Consumables</b>	Change cuvette diaphragm	
	Change cuvette film	
	Change HM and IMT Consumables	
<b>Weekly/Monthly Maintenance</b>	Perform and document weekly and monthly maintenance	

**Instructor:** \_\_\_\_\_

**Participant:** \_\_\_\_\_

**Date:** \_\_\_\_\_

What was most helpful to you during this program?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

How can we improve this program to make it more meaningful to you?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 2 System Overview

## System Overview

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*

### Objectives

Upon completion of this exercise, you will be able to:

- Identify the hardware components.
- Identify and navigate software functions.

## Exercise

### Hardware Overview

Component	Notes
IMT: Integrated Multisensor Technology	
Sample area	
HM: Heterogeneous Module	
LOCI	
Reagent area	
Electrical Cabinet	
Pump Panel	
Cuvette Waste	
RMS: Reagent Management System	

---

## Software Overview

Log in to simulator using labmanager, discuss the function of the following software keys

<b>General Navigation</b>	<b>Notes</b>
Function Keys	
Backing up one screen	
Operating Menu	
<b>Help Options</b>	<b>Notes</b>
Help	
Control Help	
Alt Help	
Shift Help	
<b>Additional Keys</b>	<b>Notes</b>
Alert Keys	
Test Keys With Shift With Control With Alt	
<b>Action Keys</b> Stop Pause Reset Run	
<b>Status Fields</b>	
Segment status boxes	
Instrument status boxes	





## 3 Daily Maintenance

## Daily Maintenance

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*

### Objectives

Upon completion of this exercise, you will be able to:

- Review a system check.
- Perform daily maintenance.
- Document daily maintenance.

## Exercise

1. Sign into the software using the following Operator ID and password.
  - Operator ID: **labmanager**:
    - **LAB SPECIFIC** in the Operator ID field
  - Password: Specific to your lab
  
2. Review the System Check printout.

How do you know if your System Check passes?
  
3. Perform the daily maintenance tasks.
  - a. What did you clean the sample area with?  
  

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  - b. What waste is emptied as part of daily maintenance?  
  

---
  
4. Document the daily maintenance.

## Notes

The top of the System Check printout will list the status as “PASS,” when the System Check passes, and “FAIL,” when the System Check fails. Any component that failed will be back lit on the printout.

Clean the sample area and bulk loader (RMS only), with a cloth dampened with deionized water.

If any additional maintenance is due, the software will prompt you with additional function keys listed in the Daily Maintenance Routines screen. F2: Check Counts, F3: Chk HM Counts, and F4: Chk RMS Cnts (RMS only) will display the corresponding System Counters screen.

Documenting “cuvette waste emptied,” in the instrument software is necessary for date and time stamping the daily maintenance electronically each day.

# 4 QC Processing

## QC Processing

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*

### Objectives

Upon completion of this exercise, you will be able to:

- Identify the adapter needed for each tube type.
- Process daily barcoded QC.
- Process manually ordered QC.
- Review QC results printout.

## Exercise

1. Process daily barcoded QC.
2. Manually program and process QC in sample cups.
3. Navigate software to view processing time.
4. Review the QC results printout.

## Review

What does a yellow QC alert indicate?

---

## Notes

A segment not completely seated on the sample wheel could result in the error message “sample carousel mis-positioned.”

When manually processing QC, ensure the priority and fluid are correct. Priority and fluid type will store QC results in different QC files.

Sample cups must be placed in a segment position with a teal or beige adapter.

# 5 Sample Processing

## Sample Processing

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*

### Objectives

Upon completion of this exercise, you will be able to:

- Use segment status screen to delete segments.
- Evaluate sample heights and use correct tube adapters.
- Process samples.
- Navigate software to view completion time.
- Identify STAT and Sample Alerts.
- Review test result printouts.



## Exercise

1. Delete all segments.
2. Evaluate the sample heights and choose the correct tube size adapter.
3. Process the barcoded samples provided (sufficient and insufficient). Use the tube fill guide when necessary to determine adequate sample volume.
4. Pause the sampler and process the non-barcoded tubes and cup samples.
5. Locate a sample and view its completion time.
6. Use the Quick Search icon to locate a patient's results.



7. Review time to completion for STAT samples.
8. Review the sample printouts.

**Primary Tube**

<b>Patient Name</b>	<b>Sample #</b>	<b>Tests</b>		<b>Mode</b>	<b>Priority</b>	<b>Fluid</b>
Patient 1	1111	GLUC		Primary Tube	Routine	Serum
Patient 2	2222	GLUC		Primary Tube	Routine	Plasma
Patient 3	3333	BUN		Primary Tube	Routine	<b>Urine</b>

**Sample Cups**

<b>Patient Name</b>	<b>Sample #</b>	<b>Tests</b>	<b>Mode</b>	<b>Priority</b>	<b>Fluid</b>
Patient 4	4444	LYTES	Sample Cup	Routine	Plasma
Patient 5	5555	GLUC	Sample Cup	STAT	Plasma
Patient 6	6666	BUN	Sample Cup	Routine	<b>Urine</b>

## Review

When can segments be loaded onto the instrument?

---

## Notes

When the sampler is paused, wait until the timer completes its countdown and the sampler status displays as "Samplers Off." After loading new samples or segments, the operator must press Pause, followed by Run.

Insufficient barcoded samples should be placed in an SSC. Insufficient non-barcoded samples can be placed in an SSC or sample cup.

A sample cup can hold up to 1.5mL of sample, while an SSC can only hold up to 1mL. The dead volume of a sample cup is 30uL, while the dead volume in a Siemens SSC is 30  $\mu$ L only when placed in the same size sample tube that was used to perform the sample probe maximum depth alignment.

Selecting F5: Process Control from the Operating Menu will display the estimated completion time of all instrument action currently in progress.

The STAT alert will turn yellow to alert the operator that a STAT is complete. The STAT alert will turn red when a STAT sample is complete, but there is no result, as well as when a STAT sample is not run.

# 6 Test Report Messages

## Test Report Messages

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*

### Objectives

Upon completion of this exercise, you will be able to:

- Identify and interpret Test Report Messages.

# Test Report Messages

## Exercise

The newly trained operator requests your assistance with interpreting the following test report messages.

### 1. Reference Range Indicators

```

+++++
                Dimension Training
                    18:45 Oct 24 20XX
+++++

TEST REPORT

Patient:      MRS. LABORATORY
Sample No.:   567
Location:     OP
Sample:       Plasma
Priority:      Routine
Entered:      15:56 Jan 30 20XX

Position:     3
Segment:      F

TEST      RESULT  REF. INTERVAL  UNITS
PHOS      7.4 HI    2.5-4.9      mg/dL
    
```

Explain the reference range indicator "HI."

## 2. Reference Range Indicators

```
+++++
Dimension Training
17:07 Jan 30 20XX
+++++

TEST REPORT

Patient: JOHN DOE
Sample No.: 789
Location:
Sample: Plasma
Priority: Routine
Entered: 16:58 Jan 30 20XX

Position: 5
Segment: F

TEST      RESULT  REF. INTERVAL  UNITS
PHOS      2.1 lp   2.5-4.9        mg/dL
```

What does the message “lp” indicate?

### 3. Diluted

```

+++++
                Dimension Training
                16:37 Jan 30 20XX
+++++

TEST REPORT

Patient:      STEVE PITA
Sample No.:   145
Location:     ER
Sample:       Plasma
Priority:      STAT
Entered:      16:29 Jan 30 20XX

Position:     2
Segment:      F

TEST      RESULT REF. INTERVAL UNITS
GLUC        531 HI   diluted          mg/dL
    
```

What is the explanation of the “diluted” message?



#### 4. Above Assay Range

```
+++++
Dimension Training
18:45 Oct 24 20XX
+++++

TEST REPORT

Patient: Betty Boop
Sample No.: 567
Location: ER
Sample: Plasma
Priority: Routine
Entered: 16:43 Jan 30 20XX

Position: 4
Segment: F

TEST      RESULT  REF. INTERVAL  UNITS
AMY       724 HI  above asy rng  mg/dL
```

What is the explanation of the “above assay range” message?

**5. Abnormal Assay**

```

+++++
                Dimension Training
                16:35 Jan 30 20XX
+++++

TEST REPORT

Patient:      Buggs Bunny
Sample No.:   134
Location:     OP
Sample:       Plasma
Priority:      Routine
Entered:      16:31 Jan 30 20XX

Position:     1
Segment:      F

TEST      RESULT  REF. INTERVAL  UNITS
BUN       17      abnl assay     mg/dL
    
```

Is the result reportable?

## 6. Abnormal Reaction

+++++			
Dimension Training			
11:25 Jan 30 20XX			
+++++			
TEST REPORT			
Patient:	ANDREW TECK		
Sample No.:	456		
Location:	OP		
Sample:	Plasma		
Priority:	Routine		
Entered:	11:15 Jan 30 20XX		
Position:	1		
Segment:	A		
<u>TEST</u>	<u>RESULT</u>	<u>REF. INTERVAL</u>	<u>UNITS</u>
TGL	42 LO	abnl reaction	mg/dL

This is a Non-HM method. What is the explanation of the “abnormal reaction” message?

Is the result reportable?

# 7 Calibration

## Calibration

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*

### Objectives

Upon completion of this exercise, you will be able to:

- Use calibrator Instructions for use (IFU) to scan in calibrator values.
- Perform calibrations.
- Review calibration results.

---

## Exercise

1. Define the current Chem Cal 1 calibrator product.  
(IFU is found in the calibrator box)
2. Perform group calibrations for Chem Cal I.
3. Review calibration results for the group calibration.

## Review

What are three ways you can tell if a calibration auto accepted?

- 
- 
- 

## Notes

Verified methods verify enzymatic activity.

**Do not press calculate for Amylase, GGT, or AST**

If using the group calibration function, you do not have to select each individual test that needs to be calibrated.

With auto acceptance on, results that pass will display as green while results that fail will display as red.

# 8 Replacing Consumables

## Replacing Consumables

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*


### Objectives

Upon completion of this exercise, you will be able to:

- Change cuvette diaphragm
- Change cuvette film
- Change HM consumables
- Change IMT consumables



## Exercise

1. Observe the System Counters screen of the Simulator.
2. Change the cuvette diaphragm.
3. Locate the cuvette film cartridge low icon  on the Simulator screen.
4. Change cuvette film.
5. Check the HM System Counter screen on the Simulator.

Physically locate and check all HM consumables. Replace/update as needed.

- a. What percentage remains for Reagent Probe Cleaner?

\_\_\_\_\_

- b. What is the maximum fill volume of the vessel waste container?

\_\_\_\_\_

6. Physically locate and check all IMT consumables. Replace/update as needed.  
What is the lot # of Standard A on the IMT consumables screen?

---

## Review

How often are the Cuvette Film Cartridge and Diaphragm replaced?

\_\_\_\_\_

## Notes

Control + Help will display a list of information for all operating condition icons.

When changing the cuvette diaphragm, ensure that the number 002 can be read on the front of the diaphragm after installation.

DO NOT interrupt the film load program, only when the program comes to completion are cuvettes made and the count is reset automatically.

After selecting an IMT consumable to replace, selecting F8: Store Changes will prompt the instrument to prime the IMT system and calibrate if required.

# 9 Weekly and Monthly Maintenance

## Weekly and Monthly Maintenance

### Resources

- *Dimension® EXL™ Systems Resource Guide*
- *Dimension® EXL™ 200 / Dimension® EXL™ with LM Operator's Guide*

### Objectives

Upon completion of this exercise, you will be able to:

- Perform Weekly Maintenance.
- Perform Monthly maintenance.
- Document Maintenance tasks.

## Exercise

1. Complete Weekly Maintenance.
2. Perform HM Monthly Maintenance.
3. Locate and/or replace instrument air filters.
4. Perform reagent drain cleaning monthly maintenance.
5. Perform IMT and clot check monthly maintenance.
6. Document all maintenance tasks.

## Review

What must be done after replacing the IMT sensor?

---

## Notes

When reinstalling a reusable air filter, insert the new filter with the air flow arrows pointing in toward the instrument.

The thermal chamber filter is the only disposable air filter.

The reagent probe drains must be cleaned with undiluted bleach or sample probe cleaner.

Coordinate the cleaning of the IMT system with the routine scheduled replacement of the IMT sensor.