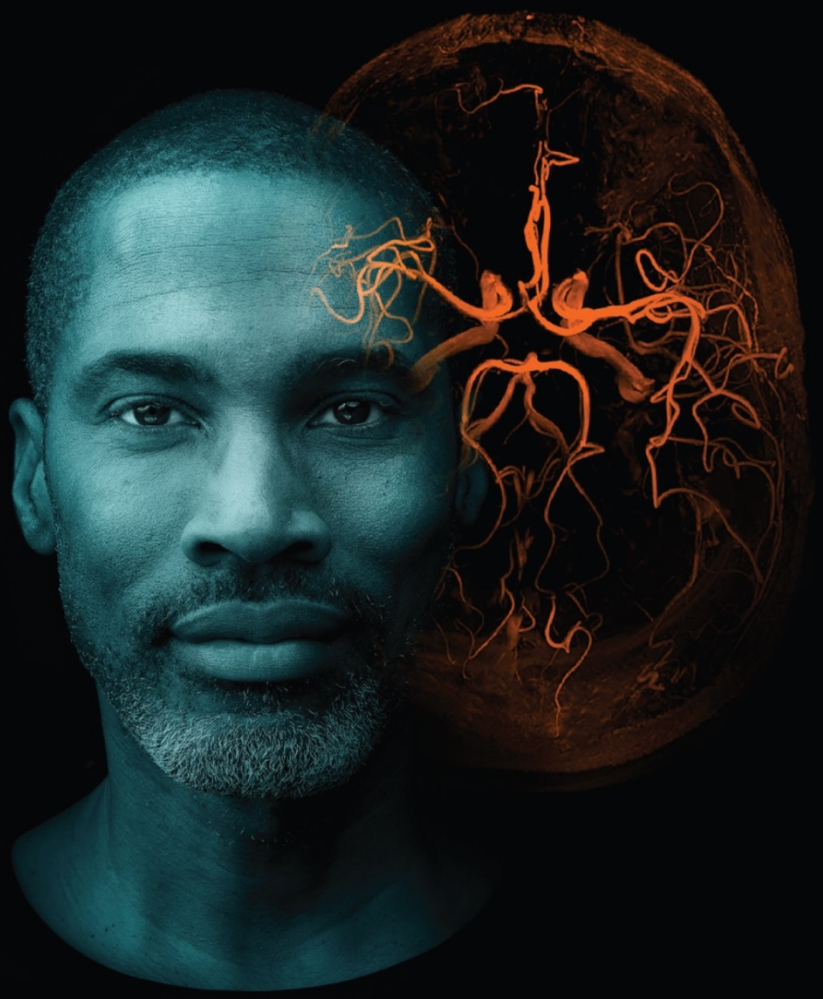
ADVIA® Chemistry XPT System

Operator Training

Workbook



SIEMENS Healthineers

Siemens Healthineers

ADVIA® Chemistry XPT System

Operator Training Workbook

Table of Contents

1 Welcome

Welcome to Training

The Siemens Healthineers Training would like to welcome you to training on the **ADVIA Chemistry XPT System**.

This course is designed to teach you the skills needed to operate and maintain the **ADVIA Chemistry XPT System**. Our staff welcomes the opportunity to present this training program to you.

Course Objectives

After participating in the classroom lectures and exercises, you will be able to:

- Identify the major components and functions of the ADVIA Chemistry XPT System.
- Describe the tools on the Command Bar and Status Bar.
- Navigate the ADVIA Chemistry XPT System software.
- Perform Daily System Operations.
- Perform a sample run.
- Order and run STAT samples.
- Create and modify work orders manually.
- Process QC samples.
- Monitor QC results in Real Time Monitoring.
- Review QC results.
- Perform Daily Maintenance.
- Differentiate types of data seen on the sample tray, real time monitoring and test results overview screens.
- Perform a sample search.
- Review and edit results.
- Access results from the Dashboard.
- Print a patient report.
- Recognize system solutions and reagents.
- Identify available reagent wedge sizes and adapters.
- Describe the Reagents workspace.
- Review calibration results.
- Print a calibration report.
- View Event Log for messages relating to calibrations.
- Perform and interpret ISE calibrations.
- Perform and interpret colorimetric calibrations.
- Identify the components of the ISE module.
- Identify the maintenance for the ISE module.
- Describe the ISE Operations tab features.
- Perform Weekly Maintenance.
- Perform Monthly Maintenance.
- Describe As Needed Maintenance.

- Access troubleshooting procedures from the Operator Event log.
- Troubleshoot a failed ISE calibration.
- Troubleshoot a failed colorimetric calibration.

Agenda

Day 1

- Welcome
- System Overview
- Daily Setup – System Operations
- Reagent Management
- Quality Control Processing
- Sample Processing
- Result Management
- Daily Maintenance

Day 2

- Morning Review and Day 2 Exercise
- Calibration
  - ISE
  - Photometric
- ISE Maintenance
- Troubleshooting
- Weekly Maintenance

Day 3

- Morning Review and Day 3 Exercise
- Monthly Maintenance
- Periodic and As Needed Maintenance
- Course Assessment

ADVIA Chemistry XPT System

Course Validation Checklist

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

Competency	Task	Completed
System Overview	Identify the major components and functions of the ADVIA Chemistry XPT System	
	Describe the ADVIA Chemistry XPT System software tools	
	Navigate the ADVIA Chemistry XPT System software	
Daily System Operation	Perform daily system operations	
Reagent Management	Recognize system solutions and reagents	
	Identify available reagent wedge sizes and adapters	
	Identify and load working solutions on the system	
	Describe the Reagents workspace	
Sample Processing	Perform a sample run	
	Order and run STAT samples	
	Create and modify work orders manually	
Daily Maintenance	Perform daily maintenance	
Quality Control	Process QC results	
	Monitor QC results in Real Time Monitoring	
	Review QC results	

Competency	Task	Completed
Result Management	Differentiate types of data seen in the Samples and Test Results workspaces	
	Perform a sample search	
	Review and edit results	
	Access results from the Dashboard	
	Print a chartable report	
Calibration	Perform and interpret an ISE Calibration	
	Perform and interpret photometric calibrations	
	Review calibration results	
	View Event Log for messages relating to calibrations	
	Print calibration reports	
ISE	Identify the components of the ISE module	
	Describe the ISE Operations tab feature	
	Identify the maintenance for the ISE module	
Weekly/Monthly Maintenance	Perform weekly maintenance	
	Perform monthly maintenance	
As Needed Maintenance	Describe As Needed maintenance	
Troubleshooting	Access troubleshooting procedures from the Operator Event Log	
	Locate a test result reaction curve and describe its role in troubleshooting	
	Troubleshoot a failed calibration	

Instructor: _____

Student: _____

Date: _____

What was most helpful to you during this program?

_____

_____

_____

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

_____

_____

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Training Center Safety Information

While you are at the Training Center, please follow these safety practices:

- Please wear your name badge at all times.
- In the event of a **fire alarm**, **Stop work immediately and leave the building** through the nearest exit. Instructors will discuss the evacuation route.
- Note the location of the **fire extinguisher**.
- Use the eyewash located near the sink if you should happen to get anything in your eye(s).Report **any injury** to the instructor.
- Carefully read the **warnings**, **cautions**, and **notes** in the guides and manuals.
- 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 classroom.
- 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.
- Dispose of probes or glass in the designated sharps containers.
- Wash your hands before leaving the classroom and after removing your gloves.

2 System Overview

System Overview

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*
- *ADVIA Chemistry XPT Hardware Overview PEP*
- *ADVIA Chemistry XPT Software Overview PEP*

Objectives

Upon completion of this exercise you will be able to:

- Identify the major components and functions of the ADVIA Chemistry XPT System.
- Describe the ADVIA Chemistry XPT System software tools.
- Navigate the ADVIA Chemistry XPT System software.

Hardware Overview Notes

ADVIA Chemistry XPT

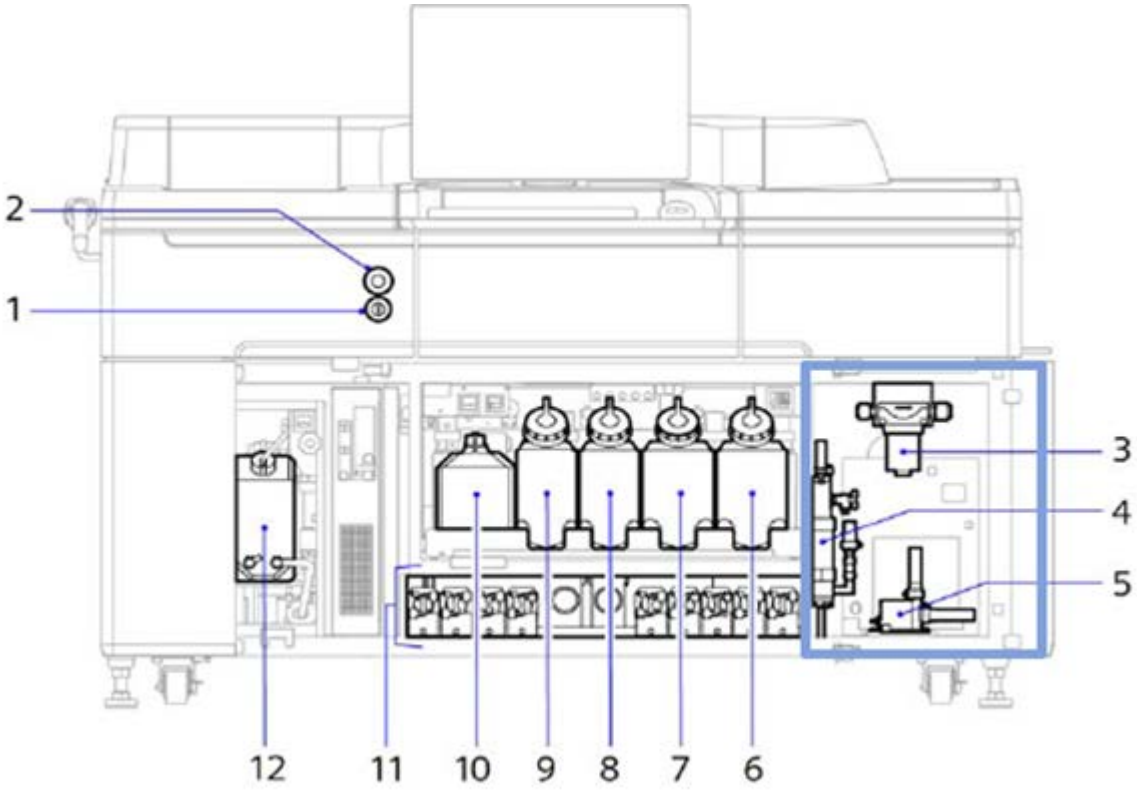
- Consists of 59 Tests including 3 ISE's.
- Performs 1800 photometric + 600 ISEs per hour.
- Drift monitored before and after each ISE sample.
- Ancillary fluids can be loaded on the fly.
- Status light indicates system alerts.

Hardware Overview Exercise

Identify the Major Components and Functions of the ADVIA Chemistry XPT System

Label the **Front View** of the ADVIA Chemistry XPT System.

Note: Hardware items 3, 4 and 5 are located behind the far left panel and will not be accessed during this exercise.



1		7	
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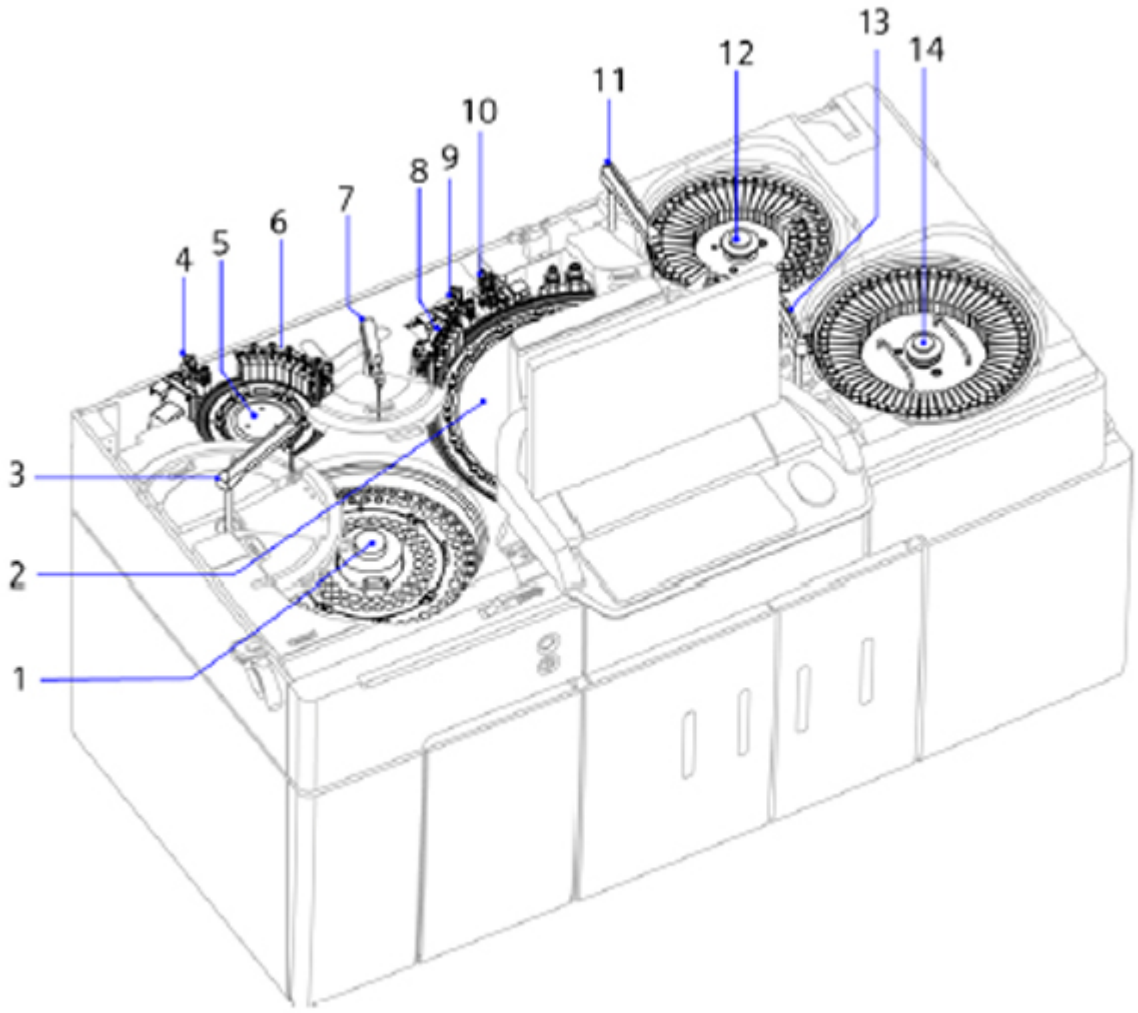
3		9	
4		10	
5		11	
6		12	

Label the Top View of the ADVIA Chemistry XPT System



1		8	
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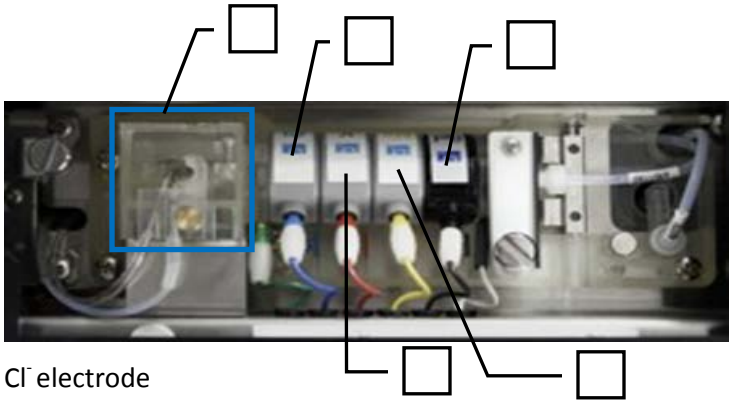
7		14	

Identify the Components of the ISE Module

The ISE module performs an indirect simultaneous measurement of Na^+, K^+ and Cl^- utilizing just 22ul of sample. The module can process up to 600 assays per hour.

Label the ISE Module using the descriptions below.



a. Cl^- electrode

b. K^+ electrode

c. Na^+ electrode

d. Reference electrode

e. Dilution Bowl

Starting Up the System

1. Turn on the main power switch at the back of the analyzer (if needed).

   Note: Turning on the main power switch is an infrequent task and is only used if applicable. Power to the workstation computer will resume automatically.

2. Slide the computer power switch to the left and press the power button, if applicable.

3. Wait for the Windows reboot to complete and the system workspace to display on the monitor.

4. Sign into the system

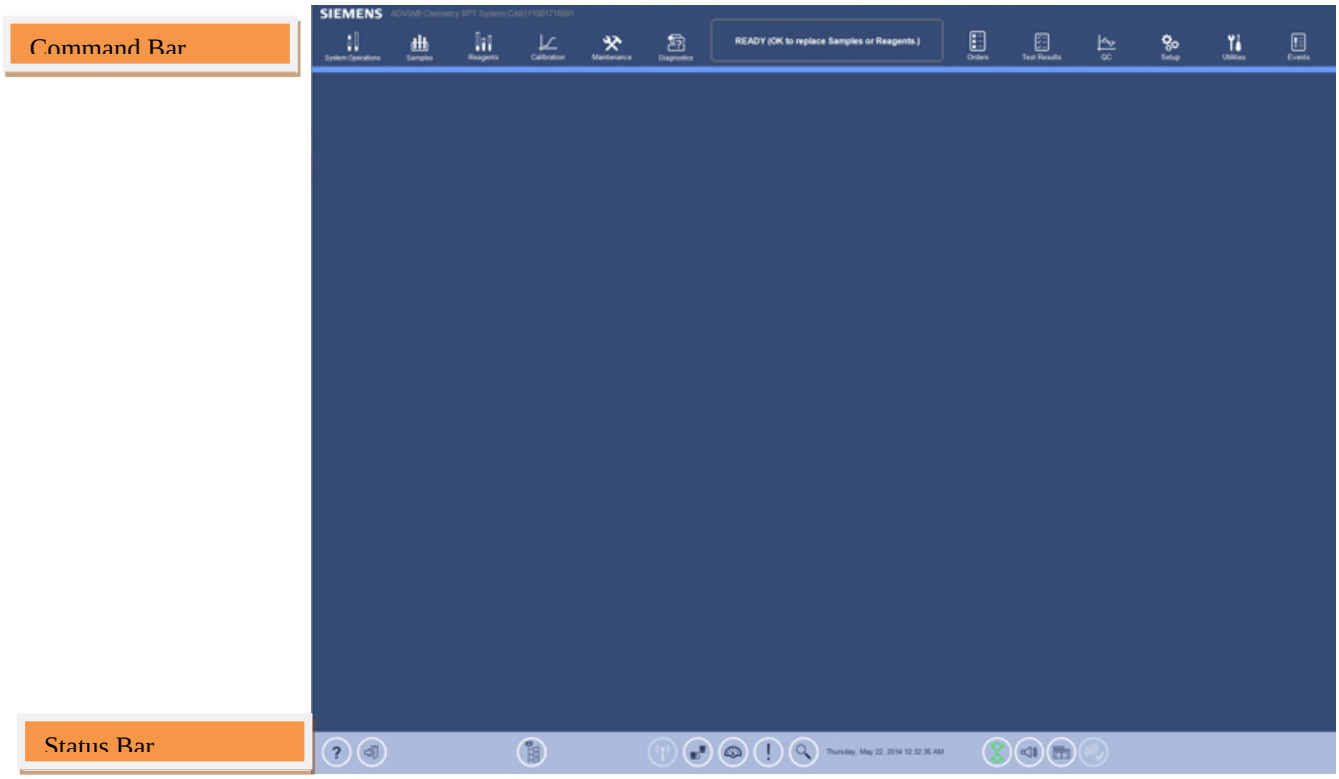
5. Turn on the power switch.

   Note: The power switch has two settings: ON with auto startup and ON.

   Position the gray line perpendicular for **ON with auto startup** (as displayed). Position the gray line to the right for **ON**.

Software Overview Notes

- Features next generation user-interface software.
- The **Command bar** contains buttons for main system functions.
- The **Status bar** displays the Operational state of the system.
- Provides access to the Online Operator's Guide.
- Provides Event codes and procedures for identifying and solving system events.
- The **Dashboard** posts a quick view of the status of samples and tests.
- The system tracks the status of supplies, samples, QC exceptions, reagents, maintenance and events.



Software Overview Exercise

Describe the ADVIA Chemistry XPT System Software Tools

Command Bar

Label and define **2** functions under each Command Bar button.

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Status Bar

Label and define each Status Bar icon.

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Navigate the ADVIA Chemistry XPT System software

Sign into the software at the **User** level using the following:

- Operator ID: XXXX
- Password: XXXXXXXXXX

1. Select the **Samples** Command Bar button to display Real Time Monitoring in the workspace. Select a sample ID and display.

    f. Name 2 of the identifying columns displayed on the right screen panel.

    g. How can the operator ensure the Real Time Monitoring window is displaying the most current data?

2. Select the **Samples > Cal/QC Sample Settings** tab which defaults to the **CTT** Tray.

    Under the Container column at position 2, verify ACSC/Adapter is selected.

    a. Select the drop down arrow under Lot at position 2. Select a calibrator ***other than*** the Chemistry Calibrator. …

    b. What change takes place in **Assay Selection** column when a different calibrator is selected?

    Which materials are always located in positions 11-16 on the CTT?

3. Select the **Samples > Sample** Trays tab.

    Using the Legend key, which color is attributed to a sample in process?

4. Select the **Reagents** Command Bar button. The default view is **Inventory**.

    a. Select the Summary button. What information is posted in the Summary list?

    b. Other than an empty wedge, name a situation where an assay would display a *Zero Assays* count in the Summary window?

5. Select the **Calibration** Command Bar button. From the **Calibration Results** tab, select an assay and select the View button.

a. What information is posted in the Order section of the Calibration Results View window?

b. Which two other tabs under the Calibration Command bar button are associated with calibration results?

6. Select **Maintenance** from the Command Bar.

7. Select the Startup Wash.

8. Select the Procedure detail button.

   a. Read the procedure for the Startup Wash.

   b. Load the required reagent on the system.

9. Select the **Orders** Command Bar button.

   Enter a sample number in the Sample ID field, which button needs to be selected to search sample orders in the database?

10. Select **QC** from the Command Bar.

    Note: The ADVIA Advanced QC application is a very powerful QC analysis tool with a variety of options to assist the operator in managing quality control. The default view is QC>QC Statistics >Review.

    How can the system operator quickly find information to assist with navigation and details about the different QC windows?

11. Select **Events** from the Command Bar.

    Note: The Events button assists the operator in managing system troubleshooting events. The button may flash yellow or red based on event severity until all the events have been acknowledged by the operator.

12. Selecting an event in the **Operator Event Log** window will display additional details in the details window at the bottom of the screen.

3 Daily System Operations

Daily System Operations

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*
- *ADVIA Chemistry XPT PEP Daily System Operations module*

Objective

Upon completion of this exercise you will be able to perform Daily System Operations.

Perform Daily System Operations Notes

Daily System Operations includes:

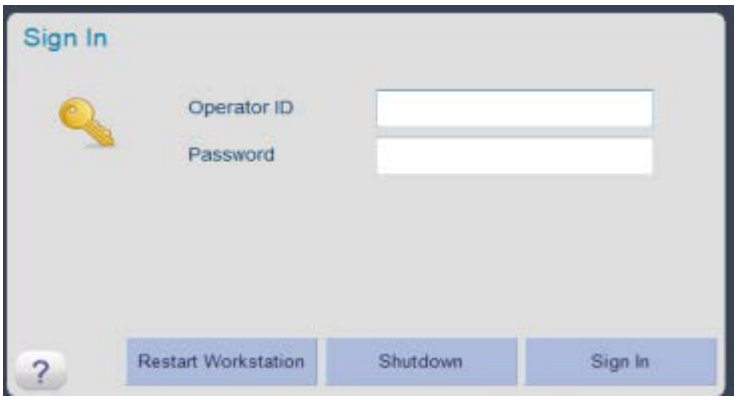
- Signing into the workstation.
- Checking the Event Log.
- Checking system components and conditions.
- Checking the status of assay reagents, ancillary reagents, calibrations and quality control.
- Performing required maintenance.
- Processing Quality control materials.

Daily System Operation Exercise

Signing into the workstation

1. Select **Sign In** icon from the Status bar.
2. The **Sign out** Pop up window displays.

3. Select **Yes** to sign out.
4. The **Sign in** Pop up window displays.



5. Enter the appropriate Operator ID and Password.
6. Select the **Sign In** button.
7. The User Operator ID displays next to the Sign In icon.

Check the Event Log

1. Select **Events** from the Command Bar.

   How are events listed, by default, in this workspace?

2. The Operator notices that the Events button is flashing red.

   a. How can the operator display Events with a severity of Error?

   b. How can the operator acknowledge an event?

Check System Components and Conditions

1. Select **Instrument Status** from the Status Bar to verify system operating conditions.

   List two items being monitored on this screen.

2. Visually inspect the levels of controls and calibrators on the CTT (if applicable), wash solutions on the RTT's and CTT and lamp coolant.

Check Assay Reagent

3. Navigate to **Reagents** on the Command Bar to display the combined RTT1 and RTT 2 **Inventory** tab.

4. Load the required reagents on the ADVIA Chemistry XPT System, if needed.

5. Once reagents are loaded, complete the required barcode scan.

   a. What status does the analyzer need to be in to load reagents on the Reagent Trays?

   b. How are barcode errors displayed to the operator on the Reagent Barcode Scan Confirmation window?

Check Ancillary Reagents

Which ancillary Reagent(s) are never replenish, only replaced?

Review Calibration and Quality Control Status

1. Select Reagents > Inventory to review Calibration and Quality Control Status.

   Which flag displays in the Calibration Interval column if a calibration is required?

2. Once the QC is defined, the status column will display the results of the most recent QC check. Results include **OK, Warning or Error**.

Perform Required Maintenance

The **Maintenance Schedule** details several tasks to be performed daily. Once each task is completed select the Completed details button to log the task as complete.

Visually inspect each of the following components: Probes, Mixers, DWUD, WUD, Probe Wash Cups, all system covers and system pumps.

How will an overdue maintenance task be displayed in the Maintenance workspace?

4 Reagent Management

Reagent Management

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*
- *ADVIA Chemistry XPT Reagent Management PEP module*

Objectives

Upon completion of this exercise you will be able to:

- Recognize system solutions and reagents.
- Identify available reagent wedge sizes and adapters.
- Identify and load working solutions on the system.
- Describe the Reagents workspace.

Assay and System Reagent Notes

- Working solutions used on the system: 20% Probe Wash 0, 5% Probe Wash 3 and 5% Lamp Coolant.
- **Neat (undiluted)** solution of Probe Wash 0, 5% Probe Wash 3, and deionized water are loaded on the CTT.
- **20%** Probe Wash 0, 5% Probe Wash 3, and deionized water are loaded on RRT1 and RTT2 trays.
- The 5% Lamp Coolant solution is added to the Lamp Coolant tower as needed.
- Assay reagents are loaded on the reagent trays.
- Cuvette Detergent, Cuvette Conditioner, 0.9% Isotonic Saline, Incubation Bath Oil, ISE Buffer 2 and the ISE Baseline solution are loaded on the Ancillary reagent tray.
- All solutions on the Ancillary Reagent tray can be topped off *except for* the ISE Buffer2 and the ISE Baseline solution.
- Necessary action is warranted if any of the columns on the Reagent Inventory window are backlit red or yellow.

Reagent Management Exercise

Recognize System Solutions and Reagents

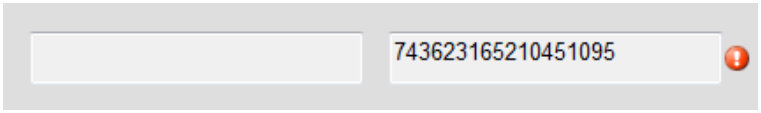
1. Check and fill, if needed, Ancillary Reagent bottles located on the Ancillary Reagent shelf.
   a. List the system reagents found on the Ancillary reagent shelf.

   b. Which Ancillary Reagent is found on the left fluids door?

2. How does the ADVIA Chemistry XPT System recognize assay reagents loaded on the Reagent Turntable Trays (RTT 1&2)?

3. When does the ADVIA Chemistry XPT System perform a reagent barcode scan?

   Note: Invalid barcodes will display the following in the **Reagent Barcode Scan Confirmation** window:



4. Select **Instrument Status** from the Status Bar to display the Ancillary Reagent **Status.**
5. Would the system process samples if an ancillary reagent has a *NG* flag?

6. Replenish or replace any Ancillary Reagents listed as *NG* (not in range).
   a. What status does the analyzer need to be in to replenish Ancillary Reagents?

   b. Which Ancillary Reagent(s) are never replenished, only replaced

Identify Available Reagent Wedge Sizes and Adapters

1. List the three available wedge sizes on the system.

2. Which adapter/s would you use to load a 20mL reagent wedge on the reagent trays?

Identify and Load Working Solutions Used on the System

1. Remove the Reagent Turntable Tray (RTT 1& 2) covers to answer the following questions.

   a. Where on Reagent Tray 1 is the 20% Probe Wash 0 solution loaded?

   b. Where on Reagent Tray 2 is the 5% Probe Wash 3 solution loaded?

2. The cooling solution for the lamp is concentrated upon receipt. Using the Online Operator Guide to answer the following question:

   What concentration should the lamp solution be prior to refilling?

Describe the Reagents Workspace

Select **Reagents** from the Command Bar. Refer to the following columns to answer the questions below: **Usage, Calibration Status, and Calibration Interval.**

1. How are multiple packs of the same reagents differentiated in the Inventory tab?

2. How does the system notify the operator when a calibration is required?

3. How can the operator get a summary of all available reagents on RTT1 and RTT2?

5 Quality Control Processing

Quality Control Processing

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*

Objectives

Upon completion of this exercise you will be able to:

- Process QC samples.
- Monitor QC results in Real Time Monitoring.
- Review QC Results.

Quality Control Processing Notes

- Quality Control should be processed at least once a day.
- At minimum, 2 levels of controls should be processed daily.
- QC should be processed prior to running patient samples.
- QC should be processed after calibration.
- QC should be processed after Maintenance.
- Quality Control locations are defined at the **Samples > Cal/QC Sample Setting.**
- Out of range QC will be flagged with “High” or “Low” in the Real Time Monitoring screen.
- QC statistics may be monitored using the ADVIA Advanced QC package.

Process QC Samples

1. Assess the QC inventory at **Samples > CTT Inventory.**
2. Load required QC.
3. Select **System Operations > Start/Restart.**
4. Select **Analyze** under **QC** and select the Assay Selection button.
5. Select **Yes** if the Selected Assays box appears.
6. Ensure all QC profiles are selected, select **OK, OK** and **Yes**.

Monitor QC Results in the Real Time Monitor

Open **Real Time Monitoring** to find the control samples that were run.

Are your controls in range? If not, which flag(s) is posted?

Review QC Results

ADVIA Chemistry XPT System includes a Quality Control program. This program allows the user to review and manage all quality control, if required.

1. Select **QC** from the Command Bar.
2. Select 

3. Select 

.

   QC severities are designated by color. List the meaning for each color:

   Yellow -

   Blue -

   Red -

6 Sample Processing

Sample Processing

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*
- *ADVIA Chemistry XPT Sample Processing Module*

Objectives

Upon completion of this exercise you will be able to:

- Perform a sample run.
- Order and run STAT samples.
- Create and modify work orders manually.

Sample Processing Notes

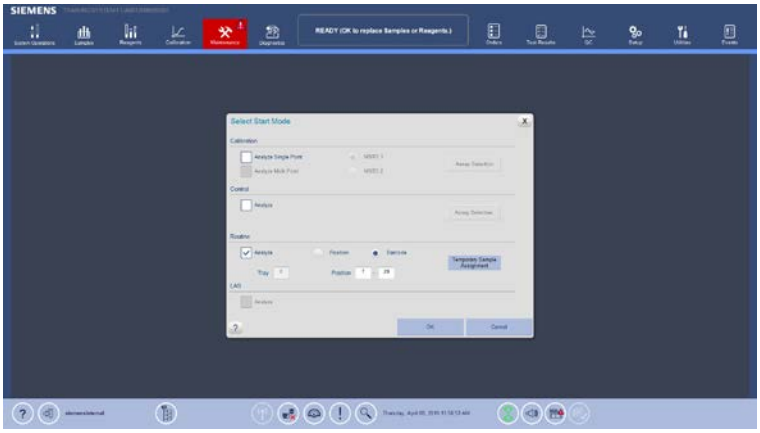
- System performs 1:5 dilution of samples for photometric assays.
- System performs 1:40 dilution of samples for ISE assays.
- System accepts 5mL, 7mL, 10mL tubes, ADVIA Chemistry sample cup (ACSC), Small sample container (SSC) using adaptors.
- Sample work-orders may be manually entered in the system by selecting **System Orders > Create Patient Orders**.
- After entering a work-order for a sample, select serum or urine. Hit Enter to activate the test table, and select the appropriate assay.
- The Search button  could be selected after entering the Sample ID, in order to search for that order in the database.
- Mandatory fields on the Create Patient Orders screen are backlit yellow.

Sample Processing Exercise

Perform a Sample Run

Setup a sample run on the system utilizing the provided materials.

1. Load all the samples onto the STT.
2. Select **System Operations > Start/Restart**.



3. Select **Analyze** under **Routine**.
4. Ensure that the radio button **Barcode** is selected if running barcoded samples.
5. Ensure that the radio button **Position** is selected if running non-barcoded samples. Ensure that Tray and cup positions are defined.
6. Select **OK**.
7. Verify and select **Yes** at the Confirmation Pop up window.
8. When processing barcoded samples from the STT, the Sample Confirmation window appears once sample aspiration begins.
9. Select **Timer Off** button to make edits to this window if needed.
10. Select **OK**.
11. Select **Samples > Sample Trays** to ensure that all samples have been aspirated.

    Which status(s) can the analyzer be in to start a sample run?

Order and Run STAT Samples

A nurse has contacted the laboratory regarding 2 samples that were incorrectly ordered. Theses samples are in ACSC containers within 10mL tubes. Each sample should have been ordered STAT.

1. Load the samples onto the STT, noting the sample position.
2. Select **System Operations > Start/Restart**.
3. Select **Analyze** under **Routine**.
4. Select the **Temporary Sample Assignment** button.
5. Check the **STAT** box at each sample position.
6. Select the container type **ACSC/16x100** from the drop down menu.
7. Select the **OK** window button. *Note: the word **Assigned** is posted under the Temporary Assignment button*.
8. Select the **OK** window button on the Select Start window.
9. Verify and select **Yes** at the Confirmation Pop up window.
10. When processing barcoded samples from the STT, the Sample Confirmation window appears once sample aspiration begins.
11. Select **Timer Off** button to make edits to this window if needed.
12. Select **OK**.
13. Navigate to **Samples > Sample Tray** to view run details.

    What is ETA as it applies to the sample?

Create and Modify Work Orders Manually

Using the provided materials and instructions below, create the following workorders for non- barcoded samples:

Sample ID	Tray-Cup	Last, First Name	Tests	Sample Type
M4239	5-1	Doe, John	GLUH_3	Plasma
X4578	5-2	Doe, Jane	ALT	Serum
H5126	5-3	Doe, Jim	NA,K,CL	Urine

1. Select **Orders** from the Command Bar.

2. Enter the sample ID and select the search button  .

3. Input the additional patient information and select the required tests.

4. Select **Save**.

   a. Which button is selected to search for samples in the database?

   b. How are mandatory fields indicated?

   c. If the operator wants a sample collection date and a sample comment (e.g. Hemolysis). Where is this information entered?

5. Access the **View Pending Orders** tab to see the created orders.

6. Select John Doe's sample from the list and add TP and Creatinine.

   Can multiple work orders be selected and edited at the same time?

7. Load the samples on the system and start the run.

   Note: Designate Tray and Positions in the Routine Analyze section of the select start mode screen.

7 Result Management

Result Management

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*
- *ADVIA Chemistry XPT Results Management PEP module*

Objectives

Upon completion of this exercise you will be able to:

- Differentiate types of data seen in the Samples and Test Results workspaces.
- Perform a sample search.
- Review and edit results.
- Perform a manual sample rerun.
- Access results from the Dashboard.
- Print a Patient report.

Result Management Notes

- Samples and QC results are displayed under:
  - **Samples > Real Time Monitoring**
  - **Test Results > Overview**

Real Time Monitoring Screen

- The Auto Update checkbox should be checked to ensure that sample results are populated timely in the Real Time Monitoring screen.
- To view data associated with a sample in the Real Time Monitoring screen, select the sample. All associated data will be displayed on the right side of the screen.
- The operator may customize the view on this screen by selecting the filters on that screen such as Patient, Control, ISE calibration, etc…

Overview Screen

- The Overview screen defaults to Today's Samples.
- The Overview screen allows the operator to customize multiple displays of results by selecting the various Header columns (e.g. Disposition, Reference range, Multiple results).
- The Filter button allows the operator to display results by Test Status, Tests, Priority, etc…Additionally; the operator may create Customizable filters.
- The Overview screen allows the operator to order manual repeats of patient samples.
- The Overview screen allows the operator to transmit patient and QC results to the LIS.
- The Overview screen allows the operator to view Reaction Curves for samples.

Result Management Exercise

Differentiate Types of Data Seen in the Samples and Test Results Tools

Match the software location to the description of the window.

1. **Samples > Sample Tray**
2. **Samples > Real Time Monitoring**
3. **Test Results > Overview**

_____The operator can review results in real time as they become available.

_____The operator can edit patient information and results from this window.

_____The operator can view sample position of the last sample aspirated.

Select the Tests Results **Button from The Command Bar**

1. Select the predefined filter **"Today's Tests with Results"**.

2. Locate the symbols in the Test States column.

   a. How can the operator find more information about the symbol meanings?

   b. Match the symbols to their meanings.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

a. Transmitted

b. Incomplete

c. Error

d. Transmit Failed

e. Repeat

f. Hold

g. Complete

h. In process

i. Transmitting

j. Historical

Test Results Workspace

Note: All underlined values on the Test Results > Overview window are selectable fields. The underlined values in the header allow the operator to customize the

layout of the Overview window. The underlined values within the window workspace (i.e. tests, SID numbers) navigate the operator to the detail level windows for each specific item.

1. Navigate to **Test Results > Overview**.
2. Select the 2nd underlined Header column.

   Name two options for displaying sample data on the Overview screen?

3. Select a sample ID that is in process.

   What is the ETA for this sample?

4. Scroll through the **Test Results > Overview** screen and stop at a result that has a yellow arrow in the reference range column.
5. Select the yellow arrow.

   a. What information, specific to the test is found in the Reference Range pop up box?

   b. Other than the Reference Range column, list 2 other options for displaying sample results using the Test State Columns.

6. Select a sample **ID** and the **Start Watching** details button.

   a. Where is the watched sample displayed in the software?

   b. Describe a situation where this feature would be beneficial to your workflow.

7. Samples can be manually moved to a Historical database if needed.

a. Select any sample and select Move to Historical detail button.

b. Use the **Historical Samples** predefined filter to find the result that was moved.

Perform a Sample Search

Sample searches can be performed using the Status bar search icon.

1. Select the **Quick Search** icon from the Status bar.
2. Select **SID** from the Type drop down list.
3. Enter the sample ID in the Value box.
4. Select **Active** in the Database drop down list.

   What workspace does the sample search open?

Review and Edit Results

Reviewing and editing results includes manually rerunning, diluting, dispositioning and adding results and comments, if applicable. All of these tasks can be completed in the **Test Result** workspace.

Manual Rerun

1. Navigate to Test **Results > Overview**.
2. Select a sample to rerun.

   a. Which detail button is selected to rerun a test?

   b. Which detail button would you select if you wanted to repeat more than one test for that sample?

3. Ensure that the sample is in the Sample Tray.

   What action does the operator need to take in order to process this sample?

Disposition

Accept is available on the **Test Result > Overview** window.

Where can the operator **Omit** or **Hold** test results?

Add Results and Result Comments

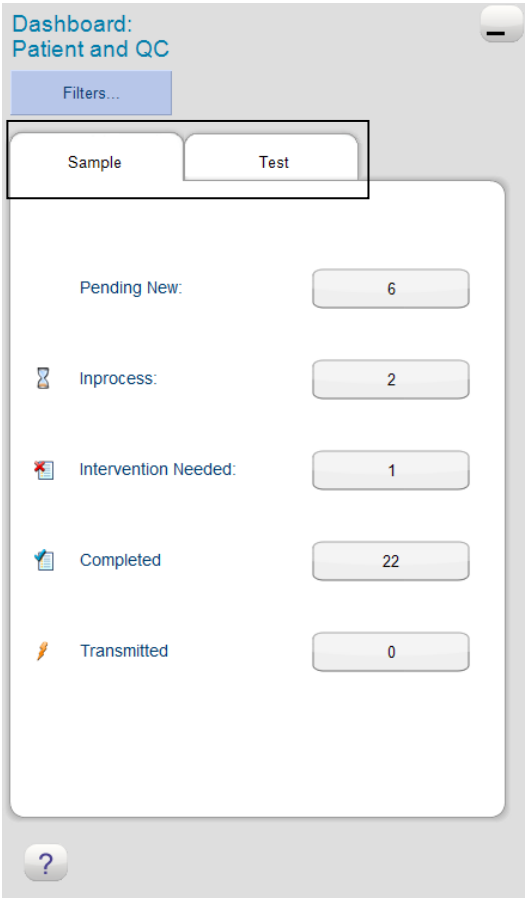
1. Select a Sample.
2. Select **Edit/View…detail** button
3. Select **Add Result**…
4. Input a reasonable result in the Result field.
5. Input "**Manually Resulted"** in the Comment field.
6. Select **OK**.
7. Select **Save**.
8. Review the change on the **Test Result > Overview** workspace.

   What information is available when the operator selects the following icons:

Access Results from the Dashboard

The Dashboard is updated with samples and tests in real time until the sample or test is deleted or moved to the Historical database.

1. Select the **Dashboard** icon from the Status bar.



The operator can select buttons under Sample or Test status tabs.

2. Select the **Test** tab and select the **Pending New** button

   What window opens in the software to display the Pending New tests?

3. Select the Sample status tab and select completed

   Does the system allow the operator to select additional status buttons to display or only one status at a time?

4. Minimize the Dashboard.

Print a Patient Report

1. Select the first sample in the **Test Results > Overview** list.
2. Select the **Print…** window button. Select the Report Type drop down list.

   List the types of patient reports available in the ADVIA Chemistry XPT system.

8 Daily Maintenance

Daily Maintenance

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System Quick Reference Guide*
- *ADVIA Chemistry XPT System PEP Connect*
- *ADVIA Chemistry XPT Daily and Weekly Maintenance module*

Objectives

Upon completion of this exercise you will be able to:

- Perform Daily Maintenance.
- Log Daily Maintenance performed.

Daily Maintenance Notes

- The maintenance log can be accessed through **Maintenance** on the Command Bar.
- A paper copy of the maintenance logs may be printed from the Online Help Guide under Maintenance. Select **the Printable Maintenance log**.
- The Shutdown Wash may be performed at a time which is most convenient for the lab.
- The Start-up Wash may be performed manually or can be automated.
- *Note: Nozzle and Line washes can be combined with the Startup Wash or Shutdown Wash. These washes normally occur in the Wash Station settings of the wash workspace.*

Daily Maintenance Tasks include:

- Performing startup wash.
- Inspecting probes, mixer rods, wash cups, WUD, DWUD and probe wash cups and splash covers.
- Checking pumps for leaks.
- Performing ISE Calibration.
- Performing shutdown wash.
- Logging Maintenance performed.

Daily Maintenance Exercise

Perform the Daily Maintenance

1. Access the Maintenance schedule. How can the operator distinguish between instrument driven maintenance tasks and tasks the operator is responsible for performing?

2. Can the maintenance schedule be customized?

3. Locate the **Database backup** task in the list and note its current daily schedule.

   a. Edit it to run daily at your laboratory's preferred time.

   b. Reconfigure it to its original default time of 12:30AM.

Setup the Start-up Wash. Select the Start-up Wash activity from the Maintenance Schedule screen and read the procedure.

1. Which ancillary reagent is needed for the Start-up wash?

2. Which 3 components of the system are rinsed during the Startup Wash?

3. How long does it take for the system to complete the Startup Wash?

Inspect probes, Mixer Rods, Wash Cups, WUD, DWUD and Splash Covers

These tasks are generally performed as part of Daily System Operations.

1. Inspect each component.

    a. What should the operator look for when inspecting the probes?

    b. What supplies can be used to wipe down the probes?

    c. What could be the impact on the system from using a dirty probe or a dirty wash cup?

2. Inspect the splash covers. If splattering is extensive, what action should the operator take?

Check pumps for leaks

List the two types of pumps and the location of each type on the system.

Perform ISE calibration

ISE Calibrations are performed in the Maintenance workspace.

1. Select Maintenance > ISE Operations > Calibration
2. Select Serum
3. Select Perform

    Where are ISE calibration results reviewed?

Setup the Shutdown Wash

Review the procedures for Startup and Shutdown Wash in the Online Help Guide.

1. Perform the Shutdown Wash procedure.

    a. What are the differences between the Startup and Shutdown Wash procedures?

    b. Which solutions are used for the Shutdown Wash?

2. Select **ON** for the Wash Station radio button. The Wash station option is only active with the Startup and Shutdown washes.

    a. Which system components are being cleaned when performing the Wash Station procedure?

    b. How long does the Wash station procedure take to complete?

Log Maintenance activities

1. In The Maintenance Schedule tab, select **maintenance** activities you have completed, then select the **Completed** button.

    How would you be able to track if a particular maintenance was performed?

2. View the **Maintenance log**. When was the last successful database backup performed?

3. Select the Online Operator's Guide and print a Printable Maintenance log.

9 Morning Review 1 and Day 2 Exercise

Morning Review

- Hardware Overview
- Software Overview
- Daily System Operations
- Quality Control Processing
- Sample Processing

Day 2 Morning Exercise

Reference: *Online Operator's Guide*

1. Sign out and Sign back into the software.
2. Perform Daily System Operations.
3. Log Maintenance performed on the Log screen.
4. Process QC for Calcium and Total Protein.
5. Process 5 barcoded patient samples.

10 Calibration

Calibration

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*

Objectives

Upon completion of this exercise you will be able to:

- Perform and interpret an ISE calibration.
- Perform and interpret photometric calibrations.
- Review calibration results.
- View Event Log for messages relating to calibrations.
- Print calibration reports.

Calibration Notes

ISE

- ISE calibration results are displayed under:
  - **Samples > Real Time Monitoring,**
  - **Calibration > Calibration Results, and**
  - **Calibration > ISE**
- The ADVIA Chemistry XPT system measures Na^+, K, Cl^- in serum and urine samples.
- ISE assays may be calibrated from the ISE Operations screen or from the Start/ Restart screen.
- A maximum of 8 calibrator replicates are aspirated during calibration.
- A minimum of 3 replicates are aspirated for the low standard and a minimum of 3 replicates are aspirated for the high standard.
- Accuracy and precision are performed on calibrator replicates.
- Other checks performed in the Calibration Summary report include; slope, dilution factor, reference electrode, etc…

ISE Calibration Limits

	Na^+	**K^+**	**Cl^-**
Serum Low standard	-50 to -10	-50 to -10	-5 to 35
Serum High standard	-4 to 44	75 to 130	-37 to -12
Urine Low standard	-296 to -230	198 to 264	61 to 89
Urine High standard	50 to 102	757 to 872	-86 to -57
Slope	38 to 65	38 to 65	-38 to -65
Dilution Factor	25 to 60	25 to 60	25 to 60

Calibration Notes (continued)

Photometric

- Photometric calibration results are displayed under;
  - **Samples > Real Time Monitoring,**
  - **Calibration > Calibration Results, and**
  - **Calibration >Chemistry**
- A full calibration requires that the blank and calibrator/s are selected for calibration.
- Single point calibrators are loaded on the CTT.
- Multipoint calibrators are loaded on the STT.
- Multipoint and Single point calibration may be programmed simultaneously by selecting the Analyze checkbox for both.
- The ADVIA Chemistry XPT system evaluates the following criteria before accepting a single point calibration; precision, accuracy, and trend for the Calibrator and Blank samples.
- The ADVIA Chemistry XPT system evaluates six criteria before accepting a multipoint calibration.

Calibration Exercise

Perform and Interpret an ISE Calibration

1. ISE Standards for calibration have designated positions on the CTT.
2. Place fresh serum standards into the CTT in the assigned positions.
3. Select **Maintenance > ISE Operations**
4. Select **Calibration** from the ISE Operations list.
5. Select **Perform**.
6. Navigate to the Sample Tray to ensure calibrators are pro
7. Navigate to **Real Time Monitoring** to observe the progress of the calibration.
   a. How many replicates were aspirated from serum high standard?

   b. What is the maximum number of replicates the system will aspirate per standard?

New electrodes require a Serial Number, Installation Date and Expiration Date.

1. Select **Setup >Test Definition > ISE > Electrolyte > Electrolyte Settings**.
2. Select the **Electrode…** window button on the system to ensure the serial numbers of the installed electrodes are correct.

Perform and Interpret Photometric Calibrations

Perform a Single Point Calibration

1. Prepare the calibrator material according **to** the Instructions for Use (IFU).
2. Verify the system is in a ready state.
3. Load the calibrators.

   Where are the assigned positions for calibrators and BLK samples located in the software?

4. Select **System Operations > Start/Restart**.
5. Select **Analyze Single Point > Assay Selection > Yes > Clear.**
6. Select _____.
7. Select **OK > OK > Yes**.

   Navigate to **Sample Trays.** How many pink dots should the operator see for a single point calibration?

   Where can the operator find the **status of a finished** calibration?

Perform a Multipoint Calibration

1. Prepare the calibrator material according the Instructions for Use (IFU).
2. Verify the system is in a ready state.
3. Load the calibrators.

   Where are multipoint calibrators loaded on the system?

4. Select **System Operations > Start/Restart.**
5. Select **Analyze Multi Point**.
6. Select either **MSTD1** or **MSTD2**
7. Select **Assay Selection**.
8. Select _____.
9. Select **OK > OK > Yes**.

   Navigate to **Sample Trays.** How many pink dots should the operator see for a multipoint calibration?

Review Calibration Results

During Daily System Operations calibration results are reviewed and managed; however, additional information may be required if a calibration or quality control fails.

ISE calibration results

1. Select **Samples > Real Time Monitoring**.
   a. How many replicates of the high standard were aspirated?

   b. How many replicates of the low standard were aspirated?

2. Select **Calibration > Calibration Results**.
3. Select each ISE assay you calibrated.

   What is the status of your calibration?

4. Select **Calibration > ISE.**

   Compared to the Calibration Results screen, how are your calibration results displayed on this screen?

Photometric calibration results

1. Select **Samples > Real Time Monitoring**.
2. Apply the Calibrator filter to your screen. Select the two checkboxes associated with your photometric assay calibration (e.g. Calibrator---, and ---Select an Assay) to view the raw data.

   What is the status of your calibration?

3. Select **Calibration > Calibration Results.**

   What is/are the reagent lot number/s associated with your calibration?

4. Select the **Calibration > Chemistry**.
5. Select the **photometric assay calibrated**.
6. Select the **Details** button.

   What information is available in the Calibration Detail window?

View Event Log for Information Relating to Calibrations

1. Select **Events** from the Command bar.
2. Access the **Operator Event Log** tab.
3. Select **Filter** and check **Subsystem: Calibration**.
   a. What type of calibration events are listed in the Operator Event Log?

   b. How will the operator be notified if an event is listed in the log?

Print Calibration Reports

1. Select **Calibration.**
2. Select the **Calibration Results** tab.
3. Select **TP** and the **Print** details button.
4. Select **Preview…** to view the calibration report.

11 ISE Maintenance

ISE Maintenance

Ressources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*

Objectives

Upon completion of this exercise you will be able to:

- Identify the components of the ISE module.
- Describe the ISE Operations tab features.
- Identify the maintenance for the ISE module.

ISE Maintenance Notes

- The ISE module is cleaned automatically during the Shutdown wash.
- ISE Maintenance is performed through the ISE Operation screen.
- Sodium and Potassium electrodes need to be conditioned overnight prior to use.
- The ISE Buffer2 and the Baseline Solution may be replaced **only** when the system is in the Ready state.
- The operator must select the Solution Change button on the ISE Operation screen when replacing the Baseline Solution. This will reset the assay count to 2500 for the Remaining Baseline Solution.
- It is recommended to bufferprime and calibrate the ISE's after performing maintenance to ensure proper electrode positioning.

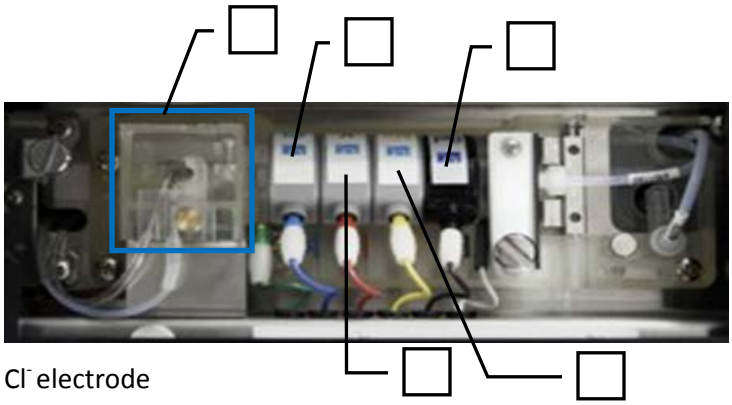
ISE Maintenance Exercise

Identify the Components of the ISE Module

The ISE module performs an indirect simultaneous measurement of Na^+, K^+ and Cl^- utilizing just 22ul of sample and 800ul of ISE Buffer2.

The module can process up to 600 assays per hour.

Label the ISE Module using the descriptions below.



a. Cl^- electrode

b. K^+ electrode

c. Na^+ electrode

d. Reference electrode

e. Dilution Bowl

Describe the ISE Operations Tab Features

ISE Operations List

Select **Maintenance > ISE Operations**. The ISE Operations list is located along the left side of the ISE Operations window and includes most of the tasks available to ensure optimal performance of the ISE system.

1. Select each task to review the different settings.

2. Perform a 10x Bufferprime.

a. How would the system indicate to the operator that a Bufferprime is running?

b. Which settings would be used to troubleshoot the ISE system?

Change ISE Baseline Solution

1. This solution provides a baseline reference between each sample measurement for measurement stability over time and temperature fluctuation. Check the **Remaining Assay** status bar at the top left of the screen.

2. Replace the ISE Baseline Solution bag if the assay count is below 200.

3. Select 

.

4. Select **Yes** to reset the count to 2500.

5. Prime the Baseline solution 10x.

ISE Periodic Wash

Review the **Maintenance > ISE Operations** window and window buttons prior to answering the following ISE Periodic Wash questions.

1. What is the current status of the ISE Periodic Wash? How can the status be changed?

2. If the ISE Periodic Wash is in the ON position, what process will occur?

Identify the Maintenance for the ISE Module

Perform a Line Wash

1. Follow the Washing ISE Lines procedure in Online Help to install the dummy electrode and perform a line wash.

   a. What fluid fills the dummy electrode?

   b. What secondary task is required as part of the Line Wash procedure?

2. Bufferprime 10x.

3. Calibrate serum ISE's.

4. Siemens has recommendations regarding the frequency of washing electrode lines. Match the two columns below based on types of samples.

1. <100 dialysis samples/month	a. Once a week
2. ≥100 dialysis samples/month	b. Once a month
3. 500+ dialysis samples/month	c. Every three days

Describe the procedure for conditioning new electrodes

The electrode expected use is 30,000 samples or 3 months, whichever occurs first. New electrodes require conditioning prior to use. Review the **As-Needed Maintenance** procedure for conditioning electrodes in the Online Help.

1. How long should a new NA or K electrode be "conditioned" prior to use?

2. What is the dilution and volume of the pooled serum that is placed in the flow path of the electrode?

12 Troubleshooting

Troubleshooting

Resources

- *ADVIA Chemistry XPT System Operator's Guide*
- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*

Objectives

Upon completion of this exercise you will be able to:

- Access troubleshooting procedures from the Operator Event log.
- Troubleshoot a failed colorimetric calibration.
- Troubleshoot a failed ISE calibration.

System Troubleshooting Notes

- If a calibration slope value results in a **normal** upper (h) or lower (l) limit flag consider this a warning that maintenance is required or electrodes need replaced soon.

- If a calibration slope value results in an **abnormal** upper (H) or lower (L) limit flag:

Troubleshooting Exercise

The instruments have been set to duplicate some issues that you may encounter at your facility. Please do not try to identify issues prior to processing. Refer to the Operator Event tab, online Operator guide and class notes to troubleshoot.

Make note of issues, accompanying messages, resolution on the Troubleshooting log sheets following this exercise.

Proceed with the exercise in the exact sequence listed below! **HAVE FUN**!

1. Bufferprime ISE 10x.
2. Calibrate Serum ISE.
3. Verify that all reagents are on board for calibration.
4. Load reagents if needed.
5. Perform a barcode scan.
6. Calibrate C02_c, TP, Calcium, Magnesium, ALT or ALP.
7. Review calibration data for all assays.
8. Process QC for all assays including ISE.
9. Review QC data for all assays.
10. Enter workorders for 3 barcoded pooled samples for ISE's and C02_c.
11. Process the 3 barcoded samples.
12. Review sample results.

Access Troubleshooting Procedures from the Event Log

1. Select Events > Operator Event Log.
2. Select 

3. Select **Reagent Management** from the Subsystem list.
4. Select **OK**.
5. Select an Event from the list and select **Troubleshooting Help** to view the corrective action.

   How does the operator acknowledge an event?

Troubleshoot a Failed ISE Calibration

1. Perform ISE maintenance
2. Replace the affected ISE electrode(s)- if necesary
3. Contact Siemens Customer Care Center

   According to the Online Help topic **Replacing ISE Electrodes**; when does the Reference electrode need to be replaced?

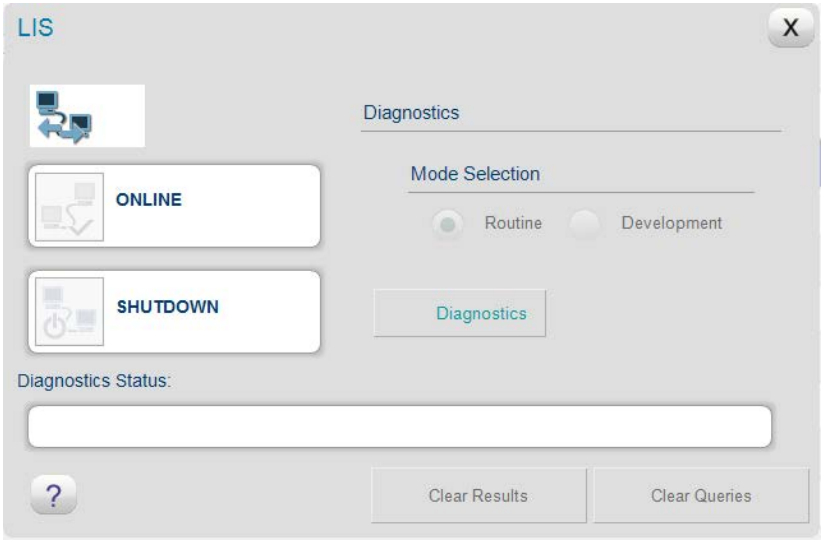
Troubleshoot a Failed Colorimetric Calibration

1. Select **Calibration** from the Command Bar.
2. Select the **Chemistry** tab.
3. Select an assay _____.
4. Select the **Details…** button.

   What calibration information tools are available to assist the operator in troubleshooting a failed calibration?

Troubleshoot LIS Connections

Select the **LIS Status Bar** icon.



1. Select _____ to open a connection to the LIS.
2. Select _____ to perform **Routine** modifications to the LIS settings.
3. What state must the LIS connection be in to test the connection using the Diagnostics button?

Troubleshooting Log

Issues	Error Messages	Resolution

13 Weekly and Monthly Maintenance

Weekly and Monthly Maintenance

Resources

- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System Quick Reference Guide*
- *ADVIA Chemistry XPT System PEP Connect*
- *ADVIA Chemistry XPT Daily & Weekly Maintenance PEP module*

Objectives

Upon completion of this exercise you will be able to:

- Perform Weekly Maintenance.
- Perform Monthly Maintenance.

Weekly and Monthly Maintenance Notes

- All maintenance procedures may be located in the ADVIA Chemistry XPT System Online Help.
- Weekly Maintenance should be performed in the following sequence:
  - Weekly Wash
  - Lamp Energy check
  - Cuvette Blank Measurement
- The Weekly Wash uses 5% Probe Wash 3 detergent.

  Note: Laboratories running the system more than 8 hours per day or running large numbers of dialysis or urine samples are advised to perform the weekly wash daily in place of the daily shutdown wash procedure.

Weekly Maintenance Exercise

Perform Weekly Maintenance

Review the Weekly Maintenance procedures in Online Help.

Label the order in which to perform the following three weekly maintenance items:

_____ Lamp Energy Check

_____ Weekly Wash

_____ Cuvette Blank Measurement

Perform the Weekly Wash

Review the Performing Weekly Wash procedure in Online Help.

1. The weekly wash is the same as the daily shutdown wash, except that a _____ solution of reagent probe wash 3 is substituted for _____ Probe Wash 0.

2. What wash setting is required to perform the WUD/DWUD wash?

Perform the Lamp Energy Check

1. Select **Maintenance > Lamp Energy.**

2. Ensure that the bottle at position 60 of the RTT1 contains DI water.

3. Select **Start Lamp Energy** window button.

4. Select **OK**.

5. Select **OK** at the **Would you like to execute measure lamp energy?** prompt.

    a. When should the Register Data window button on the Lamp Energy tab be selected?

    b. What are the 3 criteria for a successful Lamp Energy check?

Perform Cell Blank Measurement

1. Select **Maintenance > Cuvette Blank > Start Cuvette Blank.**
2. Select **Yes** to confirm.
3. Highlight the final result and select **View**.
4. Select the **Abnormal List** window button.
5. Evaluate and **Accept CB Results**.

   What criteria determine the replacement of cuvette segments?

Clean the System Covers, Panels and Doors

What solutions can be used to complete this procedure?

Clean the Mixer Rods and Wash Cups (if needed)

1. Access the mixers and visually inspect each mixing rod and wash cup.
2. Clean dirty mixing rods as follows:
   a. Set system to STANDBY
   b. Wipe each rod with a lint-free cloth moistened with de-ionized water.
   c. Ensure no threads or fibers are left on the mixing rods.
3. Pour de-ionized water in the mixer wash cup.
4. Clean the wash cup with a lint-free cloth or foam tipped applicator.

Perform Monthly Maintenance

Refer to the Monthly Maintenance procedures in Online Help.

Clean Turntable Interiors

1. Shutdown the system.
2. Remove the CTT, STT, RTT1 and RTT2 tray holders.
3. Wipe the housing with a lint-free cloth.
4. Reinstall all tray holders.
5. Restart the system.

Why do the turntable interiors require cleaning?

Clean and Replenish the Saline Dilution and Cuvette Wash Bottles

When cleaning and replenishing ancillary fluid bottles, how many cycles should the Prime 2 be set to run?

Clean the WUD and DWUD

This procedure will not be performed. Review the process in Online Help.

What is the purpose of the monthly cleaning of the WUD and DWUD?

Clean the Chiller Filter

Review the process in Online Help.

1. Where is the chiller filter located?

2. What is used to clean the filter?

Clean the Large Water Pump (LWP) Line Filter

Clean the LWP line filter.

What value should the water pressure be set to upon completion of this procedure?

14 Morning Review 2 and Day 3 Exercise

Morning Review

- Daily Maintenance
- Result Management
- Reagent Management
- Calibration ISE
- Calibration Photometric

Day 3 Morning Exercise

Reference

- *Online Operator's Guide*

1. Sign out and Sign back into the software.
2. Perform Daily System Maintenance (**Do not execute Wash cycles**).
3. Log Maintenance performed on the Log screen.
4. Calibrate serum ISE through the ISE Operations screen.
5. Calibrate C02_c, Creatinine, Calcium, TP and DIG.
6. Review calibration results.
7. Process QC for all calibrated assays.
8. Review QC results.
9. Process 5 barcoded patient samples.
10. Review patient results.

15 Periodic and As – Needed Maintenance

Periodic and As Needed Maintenance

Resources

- *ADVIA Chemistry XPT System Online Help*
- *ADVIA Chemistry XPT System PEP Connect*

Objective

Upon completion of this exercise you will be able to describe the Periodic and As Needed maintenance tasks.

Periodic and As-Needed Maintenance Notes

- All maintenance procedures can be located in the ADVIA Chemistry XPT System Online Help.
- As Needed maintenance topics can be located in the *ADVIA Chemistry XPT Online Help* and include a variety of tasks such as:
    - backing up the system
    - replacing an ISE electrode
    - filling the RRV bath oil
    - replacing probes

Periodic and As Needed maintenance Exercise

Describe Periodic and As Needed Maintenance

Periodic Maintenance

1. List the time intervals for periodic maintenance on the ADVIA Chemistry XPT System.

2. Which maintenance items are required every 3 months?

As-Needed Maintenance

Replace the DPP

1. List the features of the DPP probe.

2. Which two wires must be removed prior to probe replacement?

Replace the RPP

1. What is the purpose of the rod and lever mechanism on the RPP probes?

2. What task does the operator need to perform following probe replacement?