P/ACE™ MDQ
Basic Training Workbook

32 Karat™ 8.0

A33116AB
November 2009
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Welcome

Welcome to the Basic level of the Beckman Coulter training program for P/ACE™ MDQ with 32 Karat™ Software. During this training, our engineer will guide you through the basic operation of the system, review safety and maintenance guidelines, and review optional accessories that provide optimum performance for your system.

The purpose of basic training is to introduce you to the system and ensure that you are able to perform basic functions. However, the training is not intended to include creating custom applications. For advanced training options, please contact your sales office.

The following prerequisites have been defined to ensure a successful basic training:

1. The operator must be available without interruption for the entire training session.
2. No more than two operators will be trained as part of the installation.

The system operation requires a basic knowledge of Windows XP. The operator must be familiar with the following terms and skills:

- Creating, opening, saving, editing, moving, and copying files
Training Overview

The training is organized in thirteen sections. Your instructor will guide you through each section. At the end of most sections, a skill check is provided to help you evaluate your progress.

System Overview
- Overview
- Hardware Terminology
- Software Terminology

Safety
- Safety Features
- Safety Notices
- Chemical and Biological Safety
- Electrical Safety
- Electrostatic Discharge

Software Setup and Initialization
- Accessing 32 Karat Software
- Configuring 32 Karat Software
- Starting the Instrument
- Skill Check

Reviewing Detectors
- UV Detectors
- PDA Detectors
- LIF Detectors

Using Direct Control
- Accessing Direct Control
- Using Direct Control Screens
- Skill Check

Working with Methods
- Using the Method Wizard
- Creating a Method
- Saving a Method
- Editing a Method
- Printing a Method
- Other Method Functions
- Skill Check
Running a Sample
- Running a Single Sample
- Stopping or Aborting a Method
- Displaying Data
- Skill Check

Analyzing and Integrating Data
- Opening Data Files
- Optimizing Integration
- Defining and Naming Peaks
- Identifying Peaks Based on Migration Time
- Identifying Peaks Based on Mobility
- Skill Check

Using Sequence Tables
- Using the Sequence Wizard
- Viewing a Sequence
- Editing a Sequence
- Saving a Sequence
- Running a Sequence
- Skill Check

Creating Calibrations
- Editing the Peak ID table
- Creating a Calibration Sequence with the Sequence Wizard
- Running a Calibration Sequence
- Reviewing Calibration Curves
- Final Skill Check

Preparing Custom Reports
- Accessing and Editing a Custom Method Report
- Creating a Custom Method Report
- Skill Check

Summary
- Advancing your skill
- Record of Operator Training
1.1 Overview

This section describes the hardware components of P/ACE MDQ system. You will learn the operation considerations for each module and terms commonly used for the software and hardware.

Figure 1.1 P/ACE MDQ System
System Overview

Overview

Hardware Terminology

System

- Power Switch
- Front Panel LEDs and Indicator lights
- Communications cables
- Remote hook-ups
- Other detectors
- Spare parts and consumables list
Trays

- Tray Cover and Capillary Cartridge Cover
- Tray Racks
- Sample Tray and Sample Cooling
- Tray Name and Format

1. Buffer Tray
2. 48 Vial Sample Tray
3. 96 Position Sample Tray
4. Large Volume Buffer Reservoir
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Coolant tubing with capillary inside</td>
</tr>
<tr>
<td>2.</td>
<td>Inlet Side</td>
</tr>
<tr>
<td>3.</td>
<td>Capillary</td>
</tr>
<tr>
<td>4.</td>
<td>Outlet Side</td>
</tr>
<tr>
<td>5.</td>
<td>Detector Window and Aperture</td>
</tr>
<tr>
<td>6.</td>
<td>Aperture for UV and PDA cartridge</td>
</tr>
<tr>
<td>7.</td>
<td>Aperture and Stabilizer Plug for LIF cartridge</td>
</tr>
</tbody>
</table>
Detectors (UV, PDA or LIF)

Lamp
- Hours
- Change procedure
- Diagnostics

Software Terminology

Window

1. Title Bar
2. Menu Bar
3. Toolbar
4. Status Line
Main Menu
- New Instrument
- System Configuration
- Interface Configuration
- Online/Offline System Administration

Summary
This section introduced you to an overview of P/ACE MDQ system. Now you are ready to learn the details required for successful operation. Refer to "Safety" on page 2-7 before proceeding.
2.1 Overview

This section provides safety instructions for P/ACE MDQ hardware and accessories. You will review:

- Safety Feature
- Safety Notices
- Chemical and biological safety
- Electrical safety
- Moving parts
- Instrument safety features
- Release Notes

2.2 Safety Information for P/ACE MDQ and 32 Karat Software

All safety instructions should be read and understood before installation, operation, maintenance or repairs are attempted.

See the MDQ User's Guide for Safety Information regarding this system.

Safety Features

Review the location and action of the following safety features:

- ON/OFF switch
- Fuse replacement and voltage selection

Safety Notices

Review meaning and placement:

- International safety symbols
- High voltage symbol
Safety Information for P/ACE MDQ and 32 Karat Software

Chemical and Biological Safety
Normal operation of the system involves the use of many solvents and reagents, which may be toxic, flammable or biologically harmful.

- Observe all cautionary information printed on the original solution containers prior to use.
- Operate the system in an appropriate enclosure and take all necessary precautions when using pathologic, toxic, or radioactive materials to prevent the generation of aerosols.
- Observe the appropriate cautionary procedures as defined by your safety officer when using flammable solvents in or near the powered-up instrument.
- Wear appropriate lab attire (safety glasses, gloves, lab coat, and breathing apparatus) when working with hazardous materials.
- Remember that solvents may be flowing under high pressure.

Electrical Safety
- Always disconnect power to the system before performing maintenance operations.
- Refer servicing that requires removal of covers to qualified personnel.

Electrostatic Discharge
- Ground yourself before working with system.
- Carpeting in a building can influence static charge. Use caution when working in this environment.
  - Contact Beckman Coulter Field Service if you have questions.

Release Notes
The Release Notes contain important information that became available after the 32 Karat Software manuals were printed:

- Read and review the information contained in this file
- Print the file and place in binder, if necessary

Summary
This completes the safety portion of the basic training. For more detailed information regarding safety, refer to the P/ACE MDQ Installation and Maintenance Guide.

WARNING Do not use the product in any manner other than specified. The safety and performance of the equipment will be impaired.
Software Setup and Initialization

3.1 Overview

This section considers the start-up process for the 32 Karat Software. We will discuss:

- Accessing 32 Karat Software
- The Enterprise Screen (Main Menu)
- Configuring 32 Karat Software
- Screen Layout
- Skill Check

3.2 Accessing 32 Karat Software

Figure 3.1 Accessing 32 Karat Software through Startup Menu
Software Setup and Initialization

Accessing 32 Karat Software

Figure 3.2 Accessing 32 Karat Software through Windows
3.3 Instrument Configuration

- Creating an Instrument
- Online Instruments (for control of system)
- Offline Instruments (for multitasking)
- System Administration
- System Administration Wizard
- Users

Figure 3.3 32 Karat Software Enterprise Screen (Main Menu)

- Naming the Instrument
- When and how to auto-configure
- Selecting system options
- SS420A/D Board or SS420x A/D Device
3.4 Module Configuration: Selecting Options

- Naming the Detectors

![Image of P/ACE MDQ System Configuration dialog](image1)

*Figure 3.4 P/ACE MDQ System Configuration dialog*

![Image of Instrument Configuration dialog](image2)

*Figure 3.5 Instrument Configuration dialog*

- GPIB Communication
- Inlet/Outlet Trays
- Sample Trays
- LIF Calibration Wizard
- Filters
- Units
- Temperature Control

Figure 3.6 Configuration Options dialog
- PDA
- System Suitability
- Qualitative Analysis
- Caesar Integration
3.5 Starting the Newly Configured Instrument

Instrument Wizard

![Figure 3.7 Instrument Wizard dialog](image)

Instrument Window Screen Layout

![Figure 3.8 Instrument Window](image)

- Instrument Window
3.6 Skill Check

Upon completion of this section, you should be able to do the following:

1. Start the computer.
2. Log on to the Windows operating system.
3. Start 32 Karat Software.
5. Auto Configure the instrument.
6. Open the Instrument Window.

3.7 Summary

This completes the software setup portion of the training. The software should now be started and configured.

The next section covers the various types of detectors. You will review the information that pertains to the configuration of your instrument. Only one detector type will be covered.
Software Setup and Initialization

Summary
4.1 Overview

Depending on the configuration of your system, the function of the detector(s) varies. This section focuses on the important setup and functions of each detector. Some of these relate to report options you will learn in Section 12. In this section we will discuss:

- UV Initial Conditions Tab
- UV Data Display
- PDA Initial Conditions Tab
- The PDA Setup Window
- PDA Data Display
- LIF Initial Conditions Tab
- LIF Data Display
- LIF Calibration Wizard

4.2 UV Detector

UV Initial Conditions

![UV Initial Conditions Tab](Image)

Figure 4.1 UV Initial Conditions tab
Reviewing Detectors

UV Detector

**Electropherogram Channel**
- Wavelength
- Data Rate

**Filter Settings**
- Peak width

**Relays**
- On/Off

**Absorbance signal**
- Direct
- Indirect

**UV Data Display**

![Instrument Window with UV data displayed](image)

*Figure 4.2  Instrument Window with UV data displayed*
4.3 PDA Detector

PDA Initial Conditions

Figure 4.3 PDA Initial Conditions tab

Electropherogram scan data
- Data rate
- Scan range

Electropherogram channel data
- Data rate
- Channel Definition
- Peak detect

Filter Settings
- Peak width
Reviewing Detectors

PDA Setup

Fraction Collector / Relays
- On
- Off

Reference Channel
- Wavelength
- Bandwidth

Absorbance signal
- Direct
- Indirect

4.4 PDA Setup

Figure 4.4 PDA Options with Library tab selected
- Library Search Parameters
Purity Calculations

Spectral Filtering
### PDA Options with Multi-Electropherogram tab selected

<table>
<thead>
<tr>
<th></th>
<th>Enabled</th>
<th>Wavelength</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✔️</td>
<td>200</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>✔️</td>
<td>210</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Enabled
- Wavelength
- Bandwidth
<table>
<thead>
<tr>
<th>Ratio plot</th>
<th>Wavelength</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel 1:</td>
<td>254 nm</td>
<td>6 nm</td>
</tr>
<tr>
<td>Channel 2:</td>
<td>280 nm</td>
<td>8 nm</td>
</tr>
<tr>
<td>Threshold:</td>
<td>0 mAU</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.8 PDA Options with Ratio tab selected

- Wavelength
- Bandwidth
4.5 PDA Data Display

Figure 4.9 Instrument Window with PDA data file open; View menu open and PDA View selected

- Photo Diode Array data features
- PDA View
View Options

Figure 4.10  Photo Diode Array data
4.6 LIF Detector

LIF Initial Conditions

![Image of LIF Initial Conditions tab]

**Figure 4.11 LIF Initial Conditions tab**

**Electropherogram Channels**
- Dynamic range
- Filter Settings
- Peak width
- Signal

**Laser/Filter Descriptions**
- Excitation wavelength
- Emission wavelength
4.7 Data Rate

Relays

- On/Off

LIF Data Display

Figure 4.12 Instrument Window with LIF data file open; right mouse click menu open
LIF Calibration Wizard

Accessing LIF Calibration Wizard

Figure 4.13 Instrument Configuration dialog

Figure 4.14 LIF Detector Calibration Wizard - Step 1
4.8 Summary

This completes the detector portion of the 32 Karat Software Basic Instrument Training. You are ready to use the Direct Control feature.
Reviewing Detectors

Summary
5.1 Overview

This section covers the start up process and parameter control for P/ACE MDQ system. You will establish initial running conditions for each component.

We will discuss:

- Accessing Direct Control
- Direct Control screens
- Controlling module parameters
- Skill Check

Accessing Direct Control

![Instrument Window with Control | Direct Control selected](image-url)
5.2 Using Direct Control

![Direct Control Screen](image)

**Figure 5.2 Direct Control Screen**

**Cartridge Coolant Temperature**
- Set Temperature

**Sample Storage Temperature**
- Set Temperature

**Capillary Information**
- Capillary Description
- Capillary Lot Number
Rinse

Figure 5.3 Rinse dialog

Inject

Figure 5.4 Inject dialog
Separate

![Separate dialog](image)

**Figure 5.5** Separate dialog

**Detector Settings**

**Common Parameters**
- Data Filters
- Peak Width
- Relays
- Detection Signal
- Data Acquisition

**UV Detector Parameters**
- Wavelength selection
- Data Rate
- Filter Positions

**PDA Detector Parameters**
- Channel data
- Scan Data
- Reference Channel
- Shutter

**LIF Detector Parameters**
- Electropherogram Channels 1 and 2
- Dynamic Range
- Data Rate
- Laser / Filter Description

**Lamp Status**
- On/Off

**Laser Status**
- On/Off

**Tray Position**
- Graphical display

**Voltage Settings**
- Voltage
- Duration
- Ramp Time
- Voltage Max
- Current Max
- Tray Positions
- External Adapter
- Polarity
- Pressure

**Current Settings**
- Current
- Duration
Using Direct Control

- Ramp Time
- Voltage Max
- Current Max
- Tray Positions
- External Adapter
- Polarity
- Pressure

**Power Settings**
- Power
- Duration
- Ramp Time
- Voltage Max
- Current Max
- Tray Positions
- External Adapter
- Polarity
- Pressure

**Pressure**
- Pressure / Vacuum
- Duration
- Tray Positions
- Direction
- Pressure Type

**Time Remaining**
- Graphical display
Status

Figure 5.6 Instrument Window with Control | Instrument Status | View selected
### Using Direct Control

#### Skill Check

Upon completion of this section, you should be able to do the following:

- Access Direct Control.
- Program and run a rinse.
- Program and run an injection.
- Program and run a separation.

### Summary

This completes the Direct Control portion of 32 Karat Software Basic Instrument Training. When the system finishes equilibrating, you will prepare a method to run.
6.1 Overview

In this section we will explain procedures for building and editing a method. A method automates all of the hardware functions as well as data collection.

Later we will talk about editing, analysis parameters, and report generation. In this section, we will discuss:

- Method Wizard
- Creating a Method
- Saving a Method
- Editing a Method
- Printing a Method
- Other Method Properties
- Skill Check

Using the Method Wizard

![Method Window dialog]

Figure 6.1 Method Window dialog

- Creating a new method
- Modifying the current method
- Modifying a method on disk
Creating a Method

Figure 6.2 Instrument Window with File | Method | New selected

Figure 6.3 Instrument Window with Method | Instrument Setup selected
Instrument Setup

Figure 6.4 Instrument Setup Window with Time Program tab
Initial Conditions Tabs

- Auxiliary data channels
- Mobility Channels
- Temperature
- Peak detect parameters
- Trigger settings
- Tray type selection
- Analog output scaling
Time Programming

Time Programming tab

- Time
- Event
- Value
- Duration
- Inlet Vial/Outlet Vial
- Summary
- Comments
Figure 6.6 Time Program tab with available Event list displayed

Events
- Rinse
- Inject
- Separate

UV Detector
- Associated Event dialog boxes

PDA Detector
- Associated Event dialog boxes

LIF Detector
- Associated Event dialog boxes

External Detector
- Selecting an External Detector Adapter
Saving a Method

Figure 6.7 Instrument Window with File | Method | Save selected

- Save Method As
- Save As Default

Figure 6.8 Save icon with Method selected

- Naming and saving a new method
- Saving an existing method
Working with Methods

Overview

Editing a Method
- Method Wizard
- Open method

Figure 6.9 Open Method File dialog
- Make changes
- Save Method or Save Method As
Printing a Method

Figure 6.10 Instrument Window with File | Method | Print selected

Other Method Functions Properties

Figure 6.11 Description tab

- Method Description
Working with Methods

Overview

Figure 6.12 Options tab

- Analysis
- Data Compression

Figure 6.13 Calibration tab

- Automatically Average Replicates
- Response Factor Definition
- Peak Identification Options
Figure 6.14 Audit Trail tab

Audit Trail
6.2 Skill Check

Upon completion of this section, you should be able to do the following:

1. Create a new method for a constant voltage separation in a 60 cm, 75 µm I.D. capillary.
2. Prepare the following 2 mL vials for inlet and outlet vial positions and for rinses:

<table>
<thead>
<tr>
<th>Vial</th>
<th>Contents</th>
<th>Volume</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rinse</td>
<td>Run Buffer A</td>
<td>2 mL</td>
<td>BI:B1</td>
</tr>
<tr>
<td>Injection</td>
<td>Run Buffer A</td>
<td>1 mL</td>
<td>BO:B1</td>
</tr>
<tr>
<td>Separation</td>
<td>Run Buffer A</td>
<td>2 mL</td>
<td>BI:A1</td>
</tr>
<tr>
<td>Separation</td>
<td>Run Buffer A</td>
<td>2 mL</td>
<td>BO:A1</td>
</tr>
<tr>
<td>Waste</td>
<td>N/A</td>
<td>0</td>
<td>BO:A3</td>
</tr>
</tbody>
</table>

S = Sample; B = Buffer
I = Inlet; O = Outlet
A1 through F6 indicate Vial Positions

3. For UV and PDA detectors, fill one 2 mL vial with Beckman Coulter Test Mix B and place in the SI:A1 position. If you are using an LIF detector, fill the 2 mL vial with Beckman Coulter LIF Detector Test Mix. (Prepare LIF Detector Test Mix according to the Test Mix directions.)

4. Set the initial temperature to 23°C.

5. Program an un-timed pre-rinse (with a duration of at least two minutes at 20-30 psi) of Run Buffer A (BI:B1) to the waste vial (BO:A3).

6. Program a 10 second forward pressure injection of Beckman Coulter Test Mix (SI:A1) at 0.5 psi to the injection buffer vial (BO:B1).

7. Program a 30.0 kV constant voltage separation using a 0.17 minute ramp time and a duration of 6.0 minutes. Select the At Time check box and enter 0.00 minutes.

8. If you are using a UV detector, set the wavelength to 214 nm. If you are using a PDA, set the wavelength to 214 nm with a 10 nm bandwidth. If you are using an LIF detector make sure that the appropriate filters are in place.

9. Save the method you have created as TestMixB.met.

Summary

This completes the methods development portion of the 32 Karat Software Basic Instrument Training. We are ready to run an actual separation.
7.1 Overview

We will now use the method you prepared in the previous lesson to generate an electropherogram of Beckman Coulter Test Mix. We will discuss:

- Running a Single Sample
- Stopping / Aborting Method
- Data Display
- Skill Check

7.2 Running a Single Sample

![Figure 7.1 Single Run Acquisition dialog](image)

- Sample ID
- Method
- Data path
- Data file
Running A Sample

Stopping / Aborting Method

- Description

![Sample Description dialog]

Figure 7.2 Sample Description dialog

- Start

7.3 Stopping / Aborting Method

- Stop Run
- Abort Run
7.4 Displaying Data

Figure 7.3 Instrument Window with TestMixB.dat open
Running A Sample
Displaying Data

Figure 7.4 Instrument Window with data file open and right mouse click menu open

Add Trace

Figure 7.5 New Trace Properties dialog
Running A Sample
Displaying Data

- New Trace
- Annotation
- Appearance

Add Multiple Traces

Figure 7.6 Open Data File dialog
Axis Setup

Figure 7.7 Axis Properties Setup dialog

- Axis Setup
- Graph Title
- Autoscale
- Range
- Margins
- General Options
- Orientation
Annotations

Figure 7.8 Trace Annotation Properties dialog

- Traces
- Available Annotations list box
- Other options

Appearance

Figure 7.9 Appearance Properties dialog
Running A Sample
Displaying Data

- Scheme
- Line Style
- Item
- Font

Full Unzoom

Operations

Figure 7.10 Operations Sub-menu
Utilities

Figure 7.11 Utilities Sub-menu

Properties

Figure 7.12 Data Graph Properties dialog
7.5 Skill Check

Upon completion of this section, you should be able to do the following:

1. Run the method TestMixB.met.
2. Zoom the display scale.
3. Auto zero from the status window.
4. Change the selections in the status window.
5. Save the data as TestMixB.dat.

Summary

Congratulations! You have just generated your first electropherogram with your new P/ACE MDQ system. Next we will learn how to analyze the data.
8.1 Overview

Now that we have collected some actual run data, we will use the integration features of 32 Karat Software to begin analysis of the sample.

We will discuss:

- Opening data files
- Graphical integration events programming
- Defining and Naming Peaks
- Identifying Peaks based on Migration Time
- Identifying Peaks based on Mobility
- Annotation of the on-screen Display
- Skill Check

8.2 Opening Data Files

![Image of Instrument Window with data file open and Analysis menu selected](image)

Figure 8.1 Instrument Window with data file open and Analysis menu selected
Analyzing and Integrating Data

Opening Data Files

Figure 8.2 Analyze icon

Graphical Programming

Define Peaks
Analyzed electropherogram

Figure 8.4 Instrument Window with an analyzed data file open
8.3 Optimizing Integration

The Integration Tool bar is located at the bottom of the Instrument window or, from the right mouse button-click menu and select Graphical Programming.

![Integration Events Toolbar](image1)

**Figure 8.5 Integration Events Toolbar**

![Instrument Window with right mouse click menu open and Graphical Programming selected](image2)

**Figure 8.6 Instrument Window with right mouse click menu open and Graphical Programming selected**

- Set Width
- Set Threshold
- Integration Off
- Manual Integration Fixes vs. Integration Events Table
- Valley to Valley
- Horizontal Baseline
- Backward Horizontal Baseline
- Tangent Skim
- Front Tangent Skim
- Minimum Area
- Negative Peak
- Disable Peak End Detection
- Reassign Peak
- Manual Baseline
- Manual Peak
- Split Peak
- Force Peak Start
- Force Peak Stop
- Move Baseline Start
- Move Baseline Stop
- Percentile Point
- Left Slope Sensitivity
- Right Slope Sensitivity
- Define Single Peak
- Define Peaks
- Define Groups
Suggest Sampling Frequency

8.4 Defining and Naming Peaks

- Suggest Sampling Frequency

**Figure 8.7** Instrument Window with Define Peaks selected

- Define Peaks

**Figure 8.8** Define Peaks icon

- Select Start of Named Peak Range
- Select End of Named Peak Range
Analyzing and Integrating Data

Defining and Naming Peaks

Figure 8.9 Define Peaks dialog

- Define peaks in range
- Retention time window
- Units
- Quantitate on Area or Height

Identifying Peaks based on Migration Time

Figure 8.10 Method Properties dialog

- Defining Peaks
- Viewing Peak ID Table
Figure 8.11 Peak ID Table

- Enter peak names in Peak ID Table
Figure 8.12 Instrument Window with the right mouse click menu and Annotations highlighted
Analyzing and Integrating Data

Defining and Naming Peaks

Figure 8.13 Trace Annotation Properties dialog

- Annotation of on-screen display

Figure 8.14 Data Display with Annotations for Time-Based Peak Identification
Identifying Peaks based on Mobility

Figure 8.15 Method Properties dialog

- Defining Peaks

Figure 8.16 Peak ID Table with Mobility Marker selected
Analyzing and Integrating Data
Defining and Naming Peaks

Figure 8.17 Trace Annotations Properties dialog

Figure 8.18 Data Display with Annotations for Mobility - Based Peak identification
8.5 Skill Check

Upon completion of this section, you should be able to do the following:

1. Open the Test Mix B.dat data file.
2. After data collection, add a Peak ID Table to identify the two peaks.
3. Analyze the data.
4. Set the peak width and threshold to obtain acceptable integration of both peaks.
5. Build a table to name the peaks. (The elution order is Benzoic acid and then Phenyl acetic acid.)
6. Make sure Time based is selected in the Options tab of the Method Properties dialog.
7. Set the parameters in the Peak ID table to identify peaks based on migration time.
8. Analyze the data and apply annotations to show names, migration times and corrected areas on the on-screen electropherogram display.
9. Change the selection in the Options tab to Mobility based.
10. Change the parameters in the Peak ID table to identify peaks based on mobility.
11. Reanalyze the data.
12. Apply the appropriate annotations to the data display.

Summary

This completes the Analysis and Integration portion of the Basic Instrument Training. Be sure to come back and explore all the various integration and peak identification options to find the ones that best suit your own work.

Next we will automate groups of consecutive runs using Sequence Tables.
Analyzing and Integrating Data

Skill Check
Using Sequence Tables

9.1 Overview
In this section we will further automate the system by defining a sequence of methods and samples to run unattended. This is accomplished using a Sequence Table. We will discuss:

- Sequence Wizard
- Editing Sequence Tables
- Saving Sequence Tables
- Running Sequence Tables

9.2 Using the Sequence Wizard

Figure 9.1 Instrument Window with File | Sequence | New selected
Using Sequence Tables

Using the Sequence Wizard

Figure 9.2 Sequence Wizard - Methods dialog
- Method Information
- Data File Type
- Amount values

Figure 9.3 Sequence Wizard - Unknowns dialog
- Information about unknown and data file
Figure 9.4  Sequence Wizard - Vials dialog
- Information about vials

Figure 9.5  Sequence Wizard - Calibration dialog
- Calibration Information
Using Sequence Tables
Using the Sequence Wizard

Figure 9.6 Sequence Wizard - Reports dialog

- Reports Information
- Summary
- System Suitability
- QC Check Standard
9.3 Viewing a Sequence

Figure 9.7 Instrument Window with File | Sequence | Open selected

<table>
<thead>
<tr>
<th>Figure 9.8 Sequence Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
</tr>
<tr>
<td>Run Type</td>
</tr>
</tbody>
</table>

Figure 9.7 Instrument Window with File | Sequence | Open selected

Figure 9.8 Sequence Table

- Status
- Run Type
<table>
<thead>
<tr>
<th>Clear All Calibration</th>
<th>Begin Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear Calibration at Level</td>
<td>Summary Run</td>
</tr>
<tr>
<td>Print Calibration Report</td>
<td>End Summary</td>
</tr>
<tr>
<td>Average Replicates</td>
<td>Vial Summary</td>
</tr>
<tr>
<td>Clear Replicates</td>
<td>QC Check Standard</td>
</tr>
<tr>
<td>Begin Loop</td>
<td>Unspiked</td>
</tr>
<tr>
<td>End Loop</td>
<td>Spiked</td>
</tr>
<tr>
<td>Shutdown</td>
<td>Spike 1 of 2</td>
</tr>
<tr>
<td>Print Additional Reports</td>
<td>Spike 2 of 2</td>
</tr>
<tr>
<td>Begin System Suitability</td>
<td>Duplicate</td>
</tr>
<tr>
<td>System Suitability Standard</td>
<td>Begin Calibration</td>
</tr>
<tr>
<td>End System Suitability</td>
<td>End Calibration</td>
</tr>
</tbody>
</table>

- Level
- Concentration Override
- Repetitions
- Sample ID
- Method
- Filename
- Sample Amount
- ISTD Amount
- Multiplier
- Action
- Description
9.4 Editing a Sequence

Figure 9.9 Instrument Window with Sequence | Edit selected

Figure 9.10 Edit Sequence icon
9.5 Saving a Sequence

Figure 9.11 Saving Sequence dialog

- Save Sequence
- Save Sequence As
9.6 Running a Sequence

Figure 9.12 Instrument Window with Control | Sequence Run selected

Figure 9.13 Sequence Run icon
Using Sequence Tables

Running a Sequence

Figure 9.14 Run Sequence dialog

Figure 9.15 Instrument Window with Sequence | Process selected

- Process
Figure 9.16 Process Sequence dialog

- Sequence Information
- Run Range
- Mode
- Review
- Printing
9.7 **Skill Check**

Upon completion of this section, you should be able to do the following:

1. Run the same method (TestMixB.met) three times.
2. Specify sample vial SI:A1 as the sample for line 1, vial SI:F10 as the sample for line 2 and vial SI:C8 as the sample for line 3.
3. Specify sequential file names for the data.
4. Do NOT run the sequence table at this time.

**Summary**

This completes the Sequence portion of the 32 Karat Software Basic Instrument Training. We can now automate running and processing the data of multiple samples.

In the next section we will take a look at the steps necessary to automatically generate and apply calibration data.
10.1 Overview

The Peak ID and Sequence Tables have entry columns that we have not yet discussed. These parameters are used for generating and updating the calibration data for a given method. To generate a calibration curve we will:

- Edit a Peak ID Table for calibration
- Create a Calibration Sequence Table
- Run a Single Level Calibration Sequence
- Review Calibration Curves
- Final Skill Check

10.2 Editing the Peak ID Table

![Image](image.png)

*Figure 10.1 Instrument Window with Method | Peaks | Groups selected*
Creating Calibrations

Editing the Peak ID Table

Figure 10.2  Peak ID Table set for Calibration

- Properties - Select parameters

Parameter Options

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>10 Levels</td>
</tr>
<tr>
<td>Ref ID #</td>
<td>STD ID #</td>
</tr>
<tr>
<td>ISTD ID #</td>
<td>STD Mult.</td>
</tr>
<tr>
<td>Units</td>
<td>Low Conc</td>
</tr>
<tr>
<td>Analysis Channel</td>
<td>High Conc</td>
</tr>
<tr>
<td>Quantitate</td>
<td>Check Std 1 Conc</td>
</tr>
<tr>
<td>Fit Type</td>
<td>Check Std 1%RD</td>
</tr>
<tr>
<td>Zero</td>
<td>Spike 1 Amount</td>
</tr>
<tr>
<td>Calib Flag</td>
<td>Spike 2 Amount</td>
</tr>
<tr>
<td>Calib Weight</td>
<td>Dup %RD Limit</td>
</tr>
<tr>
<td>% Calib Margin</td>
<td>RF %RSD Limit</td>
</tr>
<tr>
<td>Scale</td>
<td></td>
</tr>
</tbody>
</table>
10.3 Creating a Calibration Sequence with the Sequence Wizard

![Figure 10.3 Instrument Window with File | Sequence | New selected](image)

![Figure 10.4 Sequence Wizard - Calibration dialog](image)

- Calibration ID
- Calibration Path
Creating Calibrations

Creating a Calibration Sequence with the Sequence Wizard

- Calibration file
- Number of levels
- Number of Repetitions per level

Figure 10.5 Completed Sequence
10.4 Running a Calibration Sequence

Figure 10.6 Instrument Window with Control | Sequence Run selected

Figure 10.7 Run Sequence icon

Figure 10.8 Run Sequence dialog
10.5 Reviewing Calibration Curves

Figure 10.9 Instrument Window with Method | Review Calibration selected

Figure 10.10 Review Peak Calibration icon
Figure 10.11 Review Peak Calibration Window

- Selecting a curve to review
- Deleting data points
- Equation and goodness of fit
10.6 Final Skill Check

Upon completion of this section, you should be able to do the following:

1. Edit the peak ID table in your method to specify three calibration levels. (Five level calibration is shown in this section.)
2. Modify the sequence table you created in the previous section to specify the run types as calibration (enter the level number in the Level column to change run type from Unknown to Calibration).
3. Dilute the test mix to create three levels of concentrations for calibration.
4. Specify sequential file names for the calibration standards.
5. Use Direct Control to bring the trays to the load position. Verify that the Test Mix vials are in the appropriate positions.
6. Run the Sequence table.
7. When the run is complete, review your calibration data.

Summary

You now know the basics of generating, analyzing and reporting electrophoretic data. Next we will set up customized reports and sequence reports.
Preparing Custom Reports

11.1 Overview

This section considers the creation of custom reports. We will discuss:

- Accessing a Custom Report
- Editing a Custom Report
- Creating a Report
- Skill Check

11.2 Accessing and Editing a Custom Method Report

![Instrument Window with Method | Custom Report selected](image)

Figure 11.1 Instrument Window with Method | Custom Report selected
Preparing Custom Reports

Accessing and Editing a Custom Method Report

Figure 11.2 Instrument Window with File | Report Template selected

Figure 11.3 Report Template Open dialog
Figure 11.4 Method Report Template with right-click menu displayed
11.3 Creating a Custom Method Report

![Figure 11.5 Instrument Window - Custom Report, right-click menu displayed](image)

*Figure 11.5 Instrument Window - Custom Report, right-click menu displayed*
Preparing Custom Reports

Creating a Custom Method Report

Instrument Window - Custom Report, right-click menu, Insert Field selected

- Inserting a Field
Preparing Custom Reports

Creating a Custom Method Report

Figure 11.6 Instrument Window - Custom Report; right-click menu, Insert Graph selected

- Inserting a Graph
Preparing Custom Reports
Creating a Custom Method Report

Figure 11.7 Instrument Window - Custom Report; right-click menu, Insert Report Selected

- Inserting a report
- Format columns
Preparing Custom Reports

Creating a Custom Method Report

Run Report dialog

Figure 11.8 Formatted Custom Report
11.4 **Skill Check**

Upon completion of this section, you should be able to do the following:

1. Start and configure 32 Karat Software.
2. Establish initial conditions to run the method used to generate your first electropherogram.
3. Run a sample of test mix.
4. Analyze the data and generate a custom report that includes:
   - A header and footer
   - Information fields
   - An electropherogram with identified peaks (data graph)
   - A run report
5. Save the report as a template and print the final report.

**Summary**

Congratulations! You have successfully completed 32 Karat Software Basic Instrument Training. We suggest that you repeat these exercises on your own before beginning work with your own methods and samples.
Preparing Custom Reports

Skill Check
12.1 Advancing Your Skill

We sincerely hope that you are pleased with your new P/ACE MDQ system.

32 Karat Software has many additional features and functions that are beyond the scope of this introduction. These include:

- System Administration
- System Suitability
- Data Export
- User-defined data manipulation

To help you benefit from these advanced features, we have provided you with Online Help. This Help is also available as an on-line manual which can be found on the 32 Karat Software Manual CD-Rom.

Please take some time to familiarize yourself with these references. If you would like to enroll in one of our advanced seminars or purchase additional in-lab training, please contact your local service representative.
12.2 Record of Operator Training

Training Summary

The following pages list the contents of 32 Karat Software Basic Training Workbook. Items initialed by the instructor are relevant to the system trained and were covered. Items marked with an “x” are not relevant to the system trained and were not covered.

Instructor Name__________________________________________

Operator Name____________________________________________

Operator Name____________________________________________
Checklist:

- System Overview
- Hardware Terminology
- Safety Features
- Safety Notices
- Chemical/Biological Safety
- Electrical Safety
- Electrostatic Discharge
- Windows Explorer
- Accessing 32 Karat Software
- Configuring 32 Karat Software
- Starting Newly Configured Instrument
- Accessing Direct Control
- Using Direct Control
- Using the Method Wizard
- Creating a Method
- Saving a Method
- Editing a Method
- Printing a Method
- Other Method Functions
- Running a Single Sample
- Stopping / Aborting Methods
- Displaying Data
- Opening Data Files
- Optimizing Integration
- Defining and Naming Peaks
- Identifying Peaks using Migration
- Identifying Peaks using Mobility
- UV, PDA or LIF Initial Conditions
- PDA Setup
- UV, PDA or LIF Data Display
- LIF Calibration Wizard
- Using the Sequence Wizard
- Viewing a Sequence
- Editing Sequences
- Saving Sequences
- Running Sequences
- Accessing Custom Reports
- Creating Custom Reports
- Editing Peak ID Table for Calibration
- Creating Calibration Sequences with Sequence Wizard
- Running Calibration Sequences
- Reviewing Calibration Curves
- Saving a Method
- Editing Peak ID Table for Calibration
Signatures:

Operator ____________________________ Date __________

Operator ____________________________ Date __________

The person(s) listed above have received basic instruction from the representative signed below.

Instructor ____________________________ Date __________