

# PeakNet<sub>®</sub> IA Software User's Guide

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i Contents

# Introduction

# Using the Online Help System and the Manual

The online Help system and this user manual differ only slightly in content, but are intended for different situations.

- Refer to the online Help system to look up terms or to find information on how to use the software in a specific situation on the *current screen*. The easiest and quickest way to receive help is by pressing the *>F1 Key*. For further information, see Activating Online Help.
- Look up information in the user manual to become familiar with the fundamental features and operation of the data system. We recommend that you read the topics of the first two sections and look up unfamiliar terms in the glossary.

# **Overview: Online Help**

The PeakNet IA online Help features various windows and levels. These correspond, in general, to the sections of the user manual (the table of contents, main section, appendix, and index). In addition, the online Help provides many context-sensitive tips that can be opened only from a program window.

The overview displayed via the **Contents** button corresponds to the table of contents in the user manual:

- Double-click a book symbol to view further levels ("branches").
- Double-click a question mark symbol to open the corresponding topic.
- Click the Index tab to search online Help for an index term.
- Click the Find tab to search online Help for any non-indexed string.

The selected topic appears in a separate Help window. This window has a white background if the topic deals with questions regarding theory, installation, or operation. The background color is yellow if practical tips are displayed (**How to ...**). Both windows can be displayed simultaneously.



Online Help is automatically displayed in the language of the current language setting (see Windows Control Panel/International Settings). The English version is loaded by default.

# **Activating Online Help**

There are several ways to access online Help.

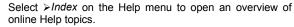
F1 Key



Press the F1 key to open a Help topic containing contextsensitive Help information.

Select **How to** ... from the menu of the right mouse button (context menu) to view information about operations that are currently possible (practical tips). Select **What's this?** to view a description of the corresponding control or the currently displayed window (theoretical information).

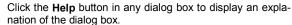
Help menu



The **Using Help** menu item shows how to use online Help.



Click this button to change the mouse cursor to a question mark, and then click any screen element to display a description of the element.





When viewing a topic in the online Help, you can *>jump to another Help topic* by clicking the underlined term or phrase, or by clicking a shortcut symbol.

Topics underlined with a dotted line can be viewed simultaneously with the current window.

# **Overview: User Manual**

The PeakNet IA user manual contains sections on **Theory**, **Installation**, **Operation**, **How to ...:**, and a **Glossary**. Use **Contents** and **Index** to search for specific terms and to get an overview of topics described in the manual.

# "Theory, Installation, Operation"

This section describes the structure and the functions of the Dionex Data System, as well as basic chromatographic facts and methods. When appropriate, the user is referred to related topics. These references are indicated as follows:

>	Jump term	Refers to technical terms in the glossary section. This type of reference corresponds to the green link terms in the online Help system.

Shortcut symbol Refers to topics in the Theory, Installation, Operation, or How to .... sections.

# "How to ...:"

This section contains answers to frequently asked questions, such as:

"How do I perform a query?"

"How do I open the Wellness control panel?"

# **Appendix: Glossary**

The glossary contains an alphabetical list of chromatographic and programrelated terms. Refer to the glossary to view definitions of technical terms, commands, and parameters.

# Index

Refer to the index to locate information about a specific term. Page numbers preceded by the letter **A** refer to the glossary section; for example:

# Command

reconnect	A-93
wait	A-147
wash	A-147

<sup>&</sup>quot;How do I add a timebase?"

# Theory, Installation, Operation

# Hardware and Software Chromatography Components

# **Chromatography Instruments**

PeakNet IA is especially designed to control and monitor the Dionex DX-80 Ion Analyzer. A system may include (at most) one anion DX-80 and one cation DX-80. If desired, a Dionex AS40 Automated Sampler may be connected.

If you have any questions about product support, please contact your Dionex Sales Representative.

# **Device Communication**

To control the chromatography system and to record chromatograms, the Dionex Data System constantly communicates with peripherals.

The data system sends control commands to the instruments. Depending on the type of the exchanged data, various transmission methods are used.

For further information, see the topic below:



# **Device Communication: LAN**

The LAN (local area network) consists of at least one DX-80 Ion Analyzer and a PC; the PC contains a motherboard with a built-in LAN card.

# **Timebases**

If you intend to operate a single chromatographic system with the Dionex Data System, you will work with a single **timebase**. All instruments are time-dependent on each other and are synchronized during operation (i.e., they have a common clock).

If you control several systems, the individual systems work independently (asynchronously) from each other: the Dionex Data System must manage a separate timebase for each system (i.e., the systems behave as if they were controlled by separate PCs).

# PC

These are the guidelines for personal computer (PC) specifications for the Dionex Data System.

- IBM-compatible computer, Intel Celeron 400 MHz minimum
- 32-bit **Operating System** (Microsoft Windows 98, Windows NT 4.0, or Windows 2000)
- 64 MB RAM minimum
- · Hard disk drive with minimum of 2 Gbyte free space
- 10BASE-T compatible PCI LAN card
- CD-ROM drive
- Windows-compatible monitor; resolution of 1024 x 768 pixels (minimum)
- Mouse supported by Windows

# **Operating System**

The Dionex Data System supports the following operating systems:

- Windows 98
- Windows NT 4.0
- Windows 2000

Because these are 32-bit > Multi-Tasking operating systems, several programs can be executed simultaneously. This is especially important for instrument control, data acquisition, and printer support.



There are differences between the operation of the Dionex Data System under Windows 98 and Windows NT/Windows 2000. For details, see the following topic in the chapter Installation: The Dionex Data System under Windows 98 and Windows NT/2000.

# **Network**

The network capability of the Dionex Data System allows operation of the data system within local and global networks, also referred to as LAN (local area network) or WAN (wide area network).

The Dionex Data System can not only be operated locally in a single-user installation, but also within a network. This includes data transfer and remote operation via ISDN. Dionex Data System stations can be linked around the world (wide area network).

To enjoy the advantages of network operation (including centralized data storage, backup, and administration, shared access to methods and world-wide availability), safe and fast data exchange is essential.

Even state-of-the-art networks sometimes have difficulty coping with the enormous amount of data. Therefore, client/server systems offer decisive advantages by specifically selecting transferred data.

# **Client/Server System**

From a decentralized PC (client), sub-programs are started on a central computer (>Server or Chromatography Server) via >RPC commands (Remote

Procedure Calls). The server executes the actual "work" (searching for data in a database, running an application, etc.). The client merely receives the search results or the current status of the application. Basically, this means that the client provides the user interface, while the actual operation is performed on the server via "remote control." The Dionex Data System also uses this division of labor.

The user starts the Dionex Data System on a local PC, the *➤Client*. The user can then perform all server-independent tasks, including reprocessing of raw data and creating sequences.

If a Chromatography > Server is activated via the > Server Monitor Program, it is possible to control and monitor the chromatography instruments connected to the server. Theoretically, each client connected with a running server via a > Control Panel can perform this control. In practice, the first client using this possibility also has control rights. From this point, all other Dionex Data System users can only monitor the system status.

Via device drivers, the server converts the control commands entered on the first client PC for the analytical instruments. Inversely, the server receives information from the system and forwards it to the appropriate locations. Thus, status information appears on all client PCs connected with this chromatography system. Raw data is automatically stored in the directory of a >Datasource and the underlying database.

Depending on whether the client and the server are located on the same PC or on different PCs on a network, a distinction is made between local client/server installation and network installation. For more details, see the topics below:

Local Client/Server Installation

Network Installation

# ■ Local Client/Server Installation

The *➤ Client* and the (Chromatography) *➤ Server* are located on the same PC. They must be started separately.

The controlled instruments in the chromatography system are connected to the PC via the LAN (local area network). Each chromatography server can operate a maximum of two *>Timebases* (chromatography systems).

Data are saved on the local PC. During the initial Dionex Data System installation, a local datasource is installed on each local computer.

If the PC is part of a local network (LAN = Local Area Network or WAN = Wide Area Network), data can also be saved externally. In the same way, external data can be used for data editing.

If the local PC is connected to a network, all network installation options are available.

# Network Installation

The *>Client*, the Chromatography *>Server* and the *>Datasource* can be installed on different computers. They are connected via the network and the corresponding network server (generally a Windows NT/2000 server). Each chromatography server can operate up to two systems (*>Timebases*), one anion system and one cation system.

The client, server, and datasource are independent units within the network.

A client, a server, and a local datasource are set up on each PC during the Dionex Data System installation. Independently of this, each PC can act as "client only" or "server only." Theoretically, each client can access each datasource and each server. However, in practice, this may not be desirable for safety reasons. Therefore, there are various ways in which to restrict user access.

• The ➤ Server Configuration program allows you to define the extent of network operation for each ➤ Server and for each timebase. A server can be made available for the entire network, or the server can be partly or completely locked. If the server is partly locked, monitoring the server is possible, but control of the connected instruments is disabled. In this case, control is reserved for the local client. This distinction also applies to the timebases. If three timebases (TIME1/2/3) are installed on a server, TIME1 could be completely shared, TIME2 could be excluded from network operation, and TIME3 could be shared for monitoring only.

Datasources and/or their subdirectories can also be protected from undesired access. Depending on the location of the corresponding database (on the local hard disk or a network PC), the respective user or the network administrator decides (by "sharing" a directory) which data can be accessed and by whom. In addition, datasources shared in Windows can be locked in the Dionex Data System.

Important data are often stored on central data server PCs. If, during data acquisition, the network connection is interrupted or the data server PC crashes, data acquisition should, of course, be continued. All data relevant for the Dionex Data System server are stored locally on the server's hard disk to ensure that data acquisition is not interrupted in case of a network failure.

In addition to allowing data exchange within a local area on a Windows, Novell, DEC, or UNIX network (LAN), data transfer across huge distances (WAN) via ISDN is possible. The basic requirement for any type of network operation is the availability of the corresponding network drivers for Windows 98 or Windows NT/2000.



There are differences between the operation of the Dionex Data System under Windows 98 and Windows NT/2000. See the following topic in the chapter Installation: Dionex Data System under Windows 98 and Windows NT/2000.

# **Overview: Chromatography Data System**

The data system is the control center of the chromatography system. The data system tasks are to:

- Monitor the state of the connected chromatography instruments.
- Log all user entries and modifications to the system.
- · Save and archive all data.
- Graphically represent data and allow the user to check the system status and system results.
- Allow the user to thoroughly check and evaluate data.

# Components

- The basis for precise control is a real-time capable Operating System.
- Installation and configuration is the task of the Server Configuration Program.
- Communication with different instruments and device types is enabled by the chromatography BIOS and the **Device Drivers**.
- Each operation (execution of a command, display of an error message, etc.) is recorded in the Audit Trail.
- Depending on the required scope of performance, various Dionex Data System **Options** are available.

# **Dionex Data System User Interface**

• The Dionex Data System follows Windows conventions regarding the menu structure, screen elements, and operation (see **Start Screen**.

# Operation

- Before the Program Start, the correct hardware configuration must be ensured, as well as the connections between the PC and the system and between the PC and a datasource.
- In Network Operation, the client PC can control systems and datasources that are not directly connected to the PC.
- Operation of the data system is facilitated by various assistants, called > Wizards.

# Dionex Data System Options

The Dionex Data System's scope of performance can be adjusted to the requirements of a specific application. In addition to the basic software package, various options can be purchased.

The purchased scope of performance is coded in a copy protection chip or determined by the *>License Server* (see Software Protection). The Dionex Data System can be started with the full range of features only if a protection device is detected (i.e., a *>Dongle* on the parallel PC interface) or if a license, provided by the license server, is detected.

The following options are available for the Dionex Data System:

Basis: The basis license (without additional features) includes signal acquisition

with one timebase.

**Control:** Control allows controlling chromatography systems. The software module

must be purchased once to control any number of timebases.

**RPC:** With the RPC option, the Dionex Data System can be controlled network-

wide. For each installed Chromatography ➤ Server, one RPC option is re-

quired.

Timebase: Additional license for extending the Dionex Data System by one time-

base. A maximum of 6 timebases per PC can be installed.

Client: Additional single-user license for data reprocessing on a network PC, in-

cluding control of any number of systems in the network.

Data: Additional single-user license for data reprocessing on a network PC

without control.

# ■ Device Drivers

The Dionex Data System is capable of operating analytical instruments via a uniform, device-independent control language. The Dionex Data System uses the driver concept, which means that the appropriate >Device Driver must be loaded for each controlled device. This is done automatically when the data system is started.

The device driver determines the instrument's scope of function. The driver is responsible for all device-specific tasks, such as sending commands in the command language of the device or deciphering the data sent by the device. Thus, the control program of the data system does not have to deal with specifics, but prompts the driver to execute certain instrument functions.

All drivers are stored in the BIN directory. The version number assigned to a driver can be viewed in the Explorer via the **Properties** context menu.

# Audit Trail

The Dionex Data System device drivers send the parameters specified in the control file to the corresponding devices. In addition, they constantly monitor the device parameters and compare the nominal values with the actual values. Deviations from the nominal values are either corrected or indicated by an error message.

Each command, each correction, and each error message is not only recorded and stored by the Dionex Data System with split-second accuracy, but is displayed in the Audit Trail window of the **Source Control Panel**.

For further information on storing protocol data, refer to the following topic in the chapter **Data:** Protocol **Data (Audit Trail)**.

# Installation: Software

# **Tips for Software Installation**

For information about installation of the Dionex Data System, refer to **Initial Installation and Update**.

The software installation procedure is also documented in the *PeakNet IA System Installation Instructions* (Document No. 031717).

After installation, refer to Program Start.

# **Initial Installation and Update**

🔛 Tip:

For additional information, also refer to Dionex Data System Under Windows 98 and Windows NT/Windows 2000.

# **Dionex Data System Setup**

Initial installation of the Dionex Data System is started by opening the Setup program, SETUP.EXE. If CD Autostart is active on your PC, the installation is started automatically when a CD is inserted into the drive.



The >Server, the >Client, and the server monitor must not be active during the Setup procedure. Make sure that there are no minimized program buttons on the Windows taskbar and that there is no server monitor icon.

Follow the installation steps to correctly install the Dionex Data System. Please take note of the directory name in which the Dionex Data System is installed.

At the end of the installation process, a program group <NAME of DIRECTORY> is generated; the program group includes five links to start the different program parts and to uninstall the Dionex Data System.

The programs on which the links are based are located in the BIN directory in the directory structure created by the Dionex Data System.

The DATA directory contains various subdirectories (PANELS, REPORTS, PROGRAMS, PCNAME\_1) that serve to save default templates. A default > Datasource is also created. The underlying database is located directly in the DATA directory under the name CM LOCAL.mdb.

Datasources are visible only in the Dionex Data System > Browser (see the **Data** section). The environment created by the Setup program has the following structure:

The local datasource has the name <PCNAME\_local>. It contains the **PCNAME\_1** subdirectory, in which the >Sequence "manual" is located. The sequence, which consists of a single default sample, enables manual data acquisition. To access default templates directly in the Dionex Data System, subdirectories of the DATA directory are mapped (PANELS, REPORT...).

Modifications to the described directory structure are realized by creating new:

- Datasources and sequences (in the Browser)
- Timebases (in the Server Configuration Program).



If the Dionex Data System is not started correctly, there may be a version conflict between the system files in the Windows system directory. In this case, install MDAC\_TYP.EXE once again. The Installation Qualification Manager provides an overview on the version numbers used.

# **Dionex Data System Update**

Updating the Dionex Data System is started by the SETUP.EXE file.

■ Note:

When updating the Dionex Data System version, uninstalling a previous Dionex Data System version is not required and not recommended, as this would delete all Dionex Data System entries in the Registry (e.g., key code and data-sources). Before updating the version, close the server, the client, the Server Monitor Program, and all other applications.

If the Setup program detects "old" PAN- (control panel) or RDF- (report definition) files in the PANELS or REPORT directories, the user is prompted whether to overwrite existing destination files. Therefore, it is highly recommended that you save any personal PAN-Files and RDF-Files to prevent them from being overwritten.

Mote:

Before performing an update, copy all PAN-Files and RDF-Files you created to a separate directory, to prevent the files from being inadvertently overwriten.

# The Dionex Data System Under Windows 98 and Windows NT/2000

The Dionex Data System supports the Windows 98 and Windows NT/Windows 2000 operating systems. Although Windows NT/Windows 2000 and Windows 98 have similar user interfaces, their cores differ considerably. Windows NT resembles "large" operating systems such as UNIX or VMS, while Windows 98 still contains traces of DOS. The main focus of Windows NT/Windows 2000 is stability, safety, and security. These properties are responsible for the higher storage capacity demands of Windows NT and Windows 2000.

When operating the Dionex Data System under Windows NT or Windows 2000, please note the following considerations:

# Setup

Performance of the Dionex Data System Setup on a Windows NT computer requires PC administrator privileges. Otherwise, it is not possible to create data-sources or to install various system programs. The Dionex Data System cannot operate correctly without these settings.

Under Windows NT/Windows 2000, SETUP creates the user group **Chromeleon Operators**. The user currently logged onto the system is immediately included in this group. All users wishing to work with the Dionex Data System must also be members of this group. Under Windows NT, adding new users and assigning them to various groups is via the **User Manager**. The **User Manager** is accessed by clicking **Start menu** → **Programs** → **Administrative Tools**. Registered users can be added to a group.

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# **Datasources**

When generating a new datasource or connecting to an existing datasource, activate the **Common Datasource** check box for system-wide access sharing. The datasource is recognized in the entire system as a system datasource. Creating system datasources also requires administrator rights on the local PC.

All datasources that are accessed by the Dionex Data System server to process sequences must be system datasources.

#### Server Access to the Network

Users logging onto a PC have a personal Windows NT user account defining the currently granted rights. Under Windows NT, the server is installed as a system-inherent service. As long as the server only works on the local data-source, this will have no negative effects. In contrast, the server will continue operation even if a user logs off the system.

Problems occur when the server is to perform operations via the network. If the server should process sequences located on a network datasource, a special procedure may be necessary under Windows NT. The server must be assigned a user account for its network access. This is only possible if the user has administrator rights.

# Proceed as follows:

- Click the **Services** icon on the Control Panel.
- Select the Chromeleon Server item from the list and click the "Start..." button.
- Caution: do not modify the Chromeleon Driver entry!
- In the Services dialog box, activate This Account. Enter a user name and
  password with access to the corresponding network directory. Use the button on the right of the edit field to choose a user name from the list.

**Note**: The selected user must be a member of the **CHROMELEON** 

# Operators group.

If users must change their passwords at regular intervals, it is recommended that you establish a separate account for the server; this eliminates the need to change the passwords for the Dionex Data System server service at regular intervals.

After completion and restarting the system, the Dionex Data System server is automatically logged on under the new user account.

# **Software Protection**

Each Dionex Data System station (regardless of whether it is a server and/or a client) is protected by a copy protection chip (>Dongle). A dongle stores the licensed serial number for one Dionex Data System station.

For large installations, a Dionex Data System license server manages the availability of licenses.

Each user of a dongle-protected station must enter a 12-digit *≻Key Code* during Dionex Data System installation. The key code includes all functions and options available to the user. A key code matches exactly one serial number.



It is not possible to operate several Dionex Data System stations with the same key code or to expand the scope of functions on a different station. Unless the entered key code matches the dongle, the Dionex Data System can be operated only in the one-hour demo mode.

If the Dionex Data System functions are upgraded by acquiring the corresponding license, the user receives a new key code. The extended scope of functions becomes available when the new code is entered.

See also: How to ...: Actions in the Server Configuration / Selecting the Copy Protection Location and Entering the Key Code.

# **Server Configuration Program**

#### **Function**

The *Server Configuration* program serves to install *Timebases* on a *Server*. It is required if you use the Dionex Data System to control a chromatography system and wish to change the current instrument configuration.

For users who perform data evaluation only, it is not absolutely necessary to be familiar with the Server Configuration program.

# **Starting the Server Configuration Program**

To start the Server Configuration program and modify the server configuration, select Server Configuration from the Start/Programs menu on the Windows taskbar (i.e., select Start/Programs/PeakNet 6/Server Configuration).



Modifications of the installation are only possible if the server to be configured is started (see the following topic in the chapter **Installation**: **Topical Program Start**) and if no sequences or samples are currently processed on this server.

When opening the Server Configuration program for the first time or when changing an existing server configuration, there are also changes in the directory structure.

# **Description**

The user interface of the Server Configuration program contains two partial windows. The left-hand window lists the names of all currently active (started) chromatography servers. The right-hand window logs the configuration process (Audit Trail).

A running server is shown in the shape of a PC icon; an inactive server is crossed out red. An active server (for example, one busy processing samples) is indicated by a red prohibited sign (red circle with white line).

Click the + character next to any server name to see its timebases and hardware components (**Timebase**, **Hardware**). In the same way, the chromatography instruments assigned to a timebase (**Devices**) can be displayed. Information on the type and number of all installed components, as well as their configuration, is stored in the file CMSERVER.CFG.

# Installation/Configuration Procedure

Access to a server (and the ability to change its configuration) is only possible after the server has been started, and if sequence and sample processing are not in progress.

The Server Configuration program allows adding and removing timebases, hardware, and instrument components. The configuration of each component can be changed here. The changes are saved in the *Server Configuration*.

- Select Connect Remote Computer on the Server menu to establish a
  connection to a specific server. Enter the computer name of the server and
  the protocol to use. As soon as there is a connection to the server, its name
  and symbol appear in the left window of the Server Configuration program.
- Select Add Timebase / Add Device on the Edit menu to add new components to the system.
- Select a component in the file structure and double-click to change its configuration. Or, choose the **Properties** menu item via the right mouse button.
   In both cases, a dialog box containing several tab dialog boxes is opened; these contain all configuration options.

When opening the Server Configuration program for the first time or changing an existing server configuration, the directory structure also changes.

- The Dionex Data System creates a local datasource under <PCNAME local>.
- For each timebase on the current server, the datasource receives a separate subdirectory for storing the corresponding raw data.
- Below each timebase, a sequence directory with a corresponding sequence is created. The sequence contains a sample for manual data acquisition.

For detailed information on operating the Server Configuration program, refer to How to ...: Actions in the Server Configuration Program / Changing the Server Configuration.

Basic Operation 22

# **Basic Operation**

# Operation via the Keyboard

All menu items can be reached via the keyboard. Open the desired pull-down menu by simultaneously pressing the **Alt** key and the underlined letter (= hot-key). Enter another hotkey to select a menu item. You can also move to the desired menu item via the arrow keys. Then, confirm your choice by pressing the **Enter** key.

**Example:** To execute the Align Left function on the Edit menu, subse-

quently press the keys **E**, **A**, and **L** while you press and hold the **Alt** key. Alternatively, enter **Alt+E** and select a menu item

via the arrow keys  $\Psi$  and  $\rightarrow$ .

In addition, important commands have "shortcuts." Shortcuts are displayed on the right-hand side of menu items and functions. Entering the key combination directly executes the corresponding function.

**Example:** Press the **Control** and **C** keys (Ctrl+C) to copy a selected

item.

For a list of available shortcuts, see:

How to ...: Device Control / Using Keyboard Shortcuts.

# **Operation via the Mouse**

The Dionex Data System features the typical Windows properties and capabilities of a two-button mouse.

Use the **left mouse button** to point and select menus, menu items, and icon buttons; to operate display and control elements; and to modify windows (increase or reduce the size of a window, zoom, modify display and control elements, etc.). Double-click the left-hand mouse button to execute the selected function.

Press the **left mouse button and the SHIFT key** to simultaneously select several cells in a table. Select the first cell with the left mouse button, press the SHIFT key, and select a new cell. All cells between the two will be selected.

Use the **left mouse button and the CTRL key** to select cells in a table that are not adjacent. Select the first cell with the left mouse button, press the CTRL key, and select a new cell. Keep the CTRL key depressed and repeat until all required cells are selected.

Click an object with the left mouse button and drag it to the desired position (**Drag and Drop**). Thus, you can move selected text items or entire samples. Perform this operation while pressing the CTRL key to copy the corresponding object.

The **right mouse button** is reserved for opening context-sensitive menus. These menus contain functions that are required or allowed in the current situation.

For further information, please refer to your Windows manual.

# **Undo / Redo Commands**

The Dionex Data System "remembers" the user's last modification. The operation can be undone by selecting the **Undo** command on the **Edit** menu. Select **Redo** to repeat the last operation.

# **Program Start**

The Dionex Data System is operated exclusively via a PC equipped with Windows 98 or Windows NT/Windows 2000. As of Windows NT 4.0, both operating systems feature the same (Windows 95) user interface. A correctly installed Dionex Data System is started as follows:

#### Start

- Click the Start button on the taskbar to open the Start menu. Move the mouse cursor to the **Programs** menu item and wait until the submenus are displayed.
- Move the mouse cursor to PeakNet. A submenu with several choices is displayed.

## Client

Select PeakNet to start the data system and the data evaluation.



Users wishing to control a chromatography system via the Dionex Data System must start the Dionex Data System server.

# Server (Server Monitor)

Select Server Monitor to start the >Sever Monitor Program. On the Windows taskbar, the Dionex Data System icon will appear next to the Windows system clock.



The Dionex Data System creates a link in the Autostart group during installation, so that the program is started as soon as the computer is started. You will see the corresponding icon.

- Move the mouse cursor over the icon. You will see a quick message,
   PeakNet Server is not running.
- Press the right mouse button and choose the Start Server command (or double-click the icon and then click Start). The icon will show various color steps according to its status. The gray coloring indicates that the server is running (and the following message is displayed: PeakNet Server is run-

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**ning idle**). From this point, you will have direct access (via control panels) to the devices installed below a timebase. Provided the instruments are correctly installed, they can be operated online.

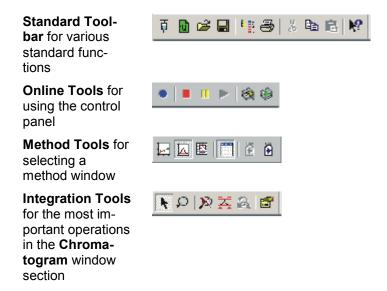


Any problems that occur when controlling single instruments may be caused by an incorrect server configuration. Start the Server Configuration Program to check the configuration.

# The Client User Interface

The Dionex Data System user interface employs standard Windows elements, including the menu bar, >Toolbar and >Status Bar.

The toolbar display (see below) is enabled and disabled via the **View** menu.



Move the mouse cursor over a button to view a description of the button.

The space between the taskbar and the status bar is called the workspace. The workspace displays four different **Mindow Types**.

# Window Types

In the Dionex Data System, there are four different window types with different appearances and functions. For descriptions, see the topics below:

- Control Panel
- **I** Browser
- Method Window
- **I** Table Editor

# **Control Panel**

A control panel (also referred to as an online window) controls and monitors the chromatography instruments of a > Timebase.

For details, see the following topics:

- Function
- Audit Trail

# ■ Function

Control panels are used to control and monitor individual >Timebases. The timebase to be controlled is specified when creating the control panel. As soon as the control panel is opened, the software automatically attempts to establish a connection with the specified timebase. If this is not possible (e.g., because the corresponding timebase was renamed or because the corresponding Chromatography > Server is not in operation), a message appears on-screen. In this case, the assignment must be changed manually. Proceed as follows:

- Open the preferred control panel via File/Open.
- Select Connect to Timebase from the Control menu and specify the name
  of the timebase to be connected with the control panel or select the name
  from the available list.

The new assignment is valid until the window is closed. Store the window if you want to have the current assignment available next time you open the window.

The currently selected timebase is displayed in the status bar.

# Audit Trail

The Audit Trail in a Control Panel logs all commands performed during sample processing and saves information regarding the entire system. This includes graphical and text information. The Dionex Data System classifies commands, status information, and error messages as indicated below:

System Message

Warning

Error

Abort Error

Next command

(Symbol appears only during the batch and only if there is a connection to a data-source containing the > Sequence to process.)

Executed instruction. The color indicates the filter level. The message is displayed from this level on:

Green: Normal

Yellow: Advanced

Red: Expert

This color code is not valid for manual commands.

Protocol; comments on program steps or descriptions of chromatographic conditions

Message on the screen that must be confirmed by the user

Fulfilled > Trigger condition

Triggered command

Manually executed command

LOG command (performed manually / by the device driver)

After starting data acquisition, the Audit Trail window shows the start time and any subsequently performed commands (**Acquisition on**, **Inject**, etc.).

Even commands and status messages that are not automatically recorded (e.g., the current system pressure) can be periodically retrieved and displayed, using the **Log** command.

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Of course, each event included in the Audit Trail window is stored. This allows you to determine later how a sample was processed and which events occurred during sample processing. For more information, see the following topic in the chapter **Data:** Protocol **Data (Audit Trail)**.

For documentation purposes, single events can be included in a report. For details, see **How to ...: Actions in the Window Section "Report"** Audit Trail.

# **Browser**

The *Browser* displays the directories in which chromatographic data are located. The Browser allows opening, moving, and deleting chromatographic data, as well as searching for specific data in various databases. When a file is selected, it can be opened and its contents can be viewed in a separate window.

▲ Caution: The Browser functions and structure are similar to those of the Windows Explorer. However, do not confuse the Browser and Windows Explorer. Do not use the Windows Explorer for operations within Dionex Data System datasources.

For more details, see the topics below:

- Common Features with the Windows Explorer
- Differences from the Windows Explorer
- Function

# ■ Common Features with the Windows Explorer

The Dionex Data System Browser window has two separate sections. As in the Windows Explorer, the directory structure of all selectable directories is displayed on the left. Detailed information on files and >Sequences is shown on the right. Operation is also identical to the Explorer:

- Click the + and symbols next to each directory name to expand or collapse the subdirectory structure.
- Select a directory to view its contents in the right-hand window section. Files and single samples are displayed.

Double-click a file or sample in the right-hand window section to open the appropriate editor for a file or the corresponding chromatogram for a sam-

For convenient identification, each file type, sample, or sequence has a typespecific icon. The Dionex Data System automatically recognizes the sample type (calibration sample, integration sample, PGM-File) or the stored data format and displays the data in the corresponding chromatographic environment.

Select a subdirectory, a sequence, or a file to drag it with the mouse to a different directory.



#### Caution:

For safety reasons, the corresponding data are always copied. To move files, copy them and then delete the original files. Directly moving files is not allowed.

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### Differences from the Windows Explorer

#### Structure

Only chromatographic data that are part of a > Datasource are presented in the Dionex Data System Browser.

A datasource always represents the top level of the Browser hierarchy. The datasource can be created exclusively with the Browser and cannot be compared to the "normal" subdirectory in the Windows Explorer. A small icon indicates the type of data on which it is based.

Below the datasource level is the familiar Explorer directory structure (yellow file folder). The directory structure helps to manage different > Sequences in a datasource. A sequence is represented by a blue file folder. It is not possible to create a subdirectory below the sequence level.

#### Operation

Select a datasource, any subdirectory, or a sequence to view its contents in the right-hand window section of the Browser.

In the case of the datasource or subdirectory, you see the usual list of all directories and files. If you select a sequence, the right-hand window half is divided into two horizontal sections. These include the header (with general

properties of the selected sequence) and a list of all analysis and standard samples and their sample data (Sequence Editor).

#### Caution:

The sample data can be edited directly here. Additional samples can be included in the sequence, existing sample data can be modified, or old samples can be removed. For a detailed description of the sequence editor, refer to the Sequences section.

Press the right mouse button and choose the **Query** command to search for specific sequences, data, or samples (also simultaneously in several datasources). This is a true > Query that can also search for specific properties.

Moving, deleting, or copying directories, data, and files is very similar to the corresponding operations in the Windows Explorer (see > Common Features with the Windows Explorer).



#### Caution:

Moving, deleting, or opening chromatographic files must be performed exclusively in the Browser, as processes below the surface are performed apart from the visible result.

### ■ Function

- Use the Browser to set up > Datasources and to create subdirectories, to move files via Drag & Drop, or to delete files.
- Select a > Sequence in the left window (blue folder) to display a list of its contents on the right.
- Double-click a sample name to view the corresponding chromatogram.
- Select a file and press the right mouse button for further functions.
- Select several files (as in the Windows Explorer) and press the right mouse button to perform a function for several files simultaneously.
- Select a file, press the right mouse button, and start a > Query for several sequences and/or datasources. The result of the query (different files or samples with at least one common feature) is displayed in the right-hand window section of the Browser.

### **Method Window**

Offline windows represent chromatographic results; they show chromatograms and lists of results.

#### General

Method windows can be opened via any of the following:

- The View menu
- Toolbar icons
- Double-clicking a file

The appearance of method windows can vary considerably. A window can have various window sections, whose borders can be moved. If the window section is too small to show all information, the hidden area can be viewed via the scroll arrows or bars.

The contents of the window section depend on the type of data represented. A table editor can also be integrated as a window section in a method window. Window sections with a graphical representation show the coordinates of the mouse cursor in the status bar.

### **Table Editor**

The table editor is used for representation and entry of various parameters and variables. This includes creating sequences in the sequence table and the representation of all result variables.

- Appearance and use of all tables correspond to the Windows conventions.
   Editing is by cell, column, or line.
- Selected columns can be moved, hidden, or made visible at the current cursor position. The column width is adjusted by moving the left or right delimiter or by applying the function **Optimum column width**.
- (Unknown samples only) Adding lines to the table.
- (Unknown samples only) Removing selected lines from the table.
- The described functions can be accessed via the right mouse button.

 The font size can be changed. For example, to display more information on the screen, select a smaller font.

- Press the F1 key to view online Help about a specific column.
- Press the F8 key to open an Edit dialog box for a specific field. This prevents the input of incorrect or invalid values and names.
- Press the F9 key to fill an entire column with the value of the current field.
   Logical rows of numbers can also be extended with this method. If the input is 2, 4, and 6 in the first three fields, the row is continued with 8, 10, 12, etc.

### **User Profiles (Workspaces)**

It is possible to save any combination of windows in a workspace. This facilitates opening single files or windows, and allows the user to work with the preferred work environment on the screen.

Information about which windows should be used is stored in a WSP-File. If you want to start working with a specific workspace, open the corresponding WSP-File or generate a new WSP-File by storing the current screen contents.

- Select the Open Workspace command from the Workspace menu to open an existing workspace.
- Select the **Save Workspace** command to save the current workspace.
- Select the Save Workspace as command to save the current workspace with a new name.

The appearance of each individual window is stored in the **Meport Definition**.

There is no limit to the number of **Mindows** that can be saved with each workspace.

Notes:

When the Dionex Data System is started, the most recently used workspace is loaded. Increasing the number of displayed windows and data in a workspace will increase the loading time.

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### **Report Definition**

The PReport Definition (RDF-File) contains current settings, such as the names and scaling of axes, the representation of chromatograms, display of additional information or auxiliary lines, settings for various font types and sizes, and the arrangement of columns in a table. The report definition also determines how the current screen contents (Hardcopy) or online batch results are printed (see Frinting).

In contrast to the workspace, a report definition can be used for individual windows. The report definition is required whenever a window is not opened via the workspace. The most recent report definition will be opened. If no RDF-Files have been saved, the default report definition supplied with the Dionex Data System (DEFAULT.RDF) is used. It is located in the REPORT directory.

- Select Save Report Definition from the context or View menu to save the current settings.
- Select Load Report Definition from the context or View menu to open a
  previously saved report definition.

### Create/Open Files, Windows, and Templates

There are several ways to open or create files, windows, and templates. Frequently, other information is required for this.

For example, each time it is opened, the control panel searches "its" > Time-base (i.e., the correct link between the client PC and a certain chromatography system) and each method window searches data from a specific > Datasource.



If a problem arises in this context, it may be because a correctly installed timebase or datasource is later renamed by a user.

Similar problems may occur if a database is located on a network PC to which no link can be currently established, or for which the user has no share authorization.

In this case, refer to **How to ...:** Actions in the Browser / Setting Up a Datasource / Connecting a Database.

#### **Automatically Loading the Most Recent User Profile**

The Dionex Data System automatically loads the most recently used workspace. If this is not possible, the Browser is started.

### **Opening Existing File Types or Windows**

Select the **Open** command on the **File** menu, select the datasource and the directory containing the file to open, and select the file type to represent.

Alternatively, open a file by selecting it in the *▶Browser* (File menu) and double-clicking it.

### **Open Most Recent Files and Templates**

On the **File** and **Workspace** menus, the lower section lists the most recently used templates and files. Click a template or file to open it. This is the fastest, easiest way to continue an interrupted task.

#### New

Select the **New** command from the **File** menu to display a list of possible file types and chromatographic operations.

- Select Sequence (using Wizard) to start the Sequence Wizard for creating a ➤ Sequence. The samples to be analyzed are entered in the sequence.
- Select Query (using Wizard) to start the Query Wizard and perform a
   Query Wizard.

### **Printing**

The Dionex Data System features numerous options for presenting results. You can print the screen contents, or print using defined templates.

#### **Printing the Screen Contents**

To print the contents of the currently active window, select the corresponding **Print** ... command. Via **Print Sequence**, you can print in the Browser the current sample list with either the corresponding PGM-File or QNT-File.

#### **Printing with Report Templates**

If one or more samples or sequences are selected in the Browser, **Batch Report** starts the printed output. The user specifies the report template (>Report Definition) to be used, as well as which pages are printed for which sample type from the selected report template.

### Printing in an Online Batch

If several samples are processed in an automatic sample batch (>Batch Processing), it is possible to define whether to output results after completing the process and how the results are output.

Printing can be started after processing a single sample or a complete sequence.



The report template used for printing is stored with other settings (e.g., screen settings) in the Report Definition (RDF-File).

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# **Control**

### **Control Concept**

Controlling a system makes high demands on the adaptability of the chromatography data system, as operation of individual components must be easy and thus **device-independent**. That is, input and representation of a specific control command is always performed in the same way.

The Dionex Data System enables this by the chromatography BIOS and **Device Drivers**.

For details about control of the chromatography system, see the topic below:

Control (Direct)

## **Control (Direct)**

Direct control means the immediate and interactive operation of individual instruments and device functions via a **Control Panel**. Please note the following requirements:

- The data system must be extended by one of the Dionex Data System Options.
- Correct installation and configuration of the controlled instrument(s) and device driver(s) via the Server Configuration Program.
- Establishment of an intact connection between the PC and the chromatography server.
- Establishment of an intact connection between the chromatography server and the chromatography system via the **LAN**.

For an overview of the executable system and instrument commands, refer to the following topic:

System Commands

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### System Commands

System control comprises all commands relating to the entire chromatographic process or the entire system. The commands are available via **Command** on the **Control** menu. Some commands are available on the toolbar, also.

Abort Sample Stops data acquisition and sample; continues the *▶Batch* with the next

sample.

Abort Batch: Stops data acquisition and batch processing.

*Stop Flow*: Stops the pump flow, interrupts data acquisition, stops batch process-

ng.

► Hold: Interrupts data acquisition, holds batch processing.

➤ Continue: Continues all functions in hold mode.➤ Acquisition On/Off: Starts and terminates data acquisition.

### DX-80 Ion Analyzer Commands

The following commands are available for direct control of the DX-80 Ion Analyzer operating functions:

Pump Turns the pump on and off.

Load/Inject Switches the injection valve between the load and inject positions.

Offset PeakNet IA subtracts the value in the Offset field from the total sig-

nal value sent by the DX-80. To display the total conductivity, enter

zero.

### General Commands

The following general commands are available.

Branch Starts another program and terminates the currently active program.

>Log: Logs device variable values in the Audit Trail ( Protocol Data).

Message Displays a message to the user; suspends the program until the mes-

sage is clicked.

*>Protocol*: Logs any message in the *>Audit Trail*.

*▶Wait*: Interrupts the program until a certain condition is fulfilled.

Delays execution of the next program command for the specified

time period.

*▶Trigger*: Stops data acquisition and sample processing.

EndTrigger: Continues all processes in hold mode. End: Starts and stops data acquisition.

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### ■ PGM-File

The program file, or PGM-File, is a list of time-precise control commands. The aim is the automatic and repeated execution of specific routine tasks (for example, automated sample processing or conditioning of a column by rinsing with solvent). Monitoring of certain parameters or limits can also be performed via a PGM-File.

The user cannot edit the PGM-File.

# **Data**

**Data: Overview** 

#### **Input Data**

Various types of input data are required for sample analysis, as well as for documentation and archiving purposes. The user must determine or enter the data before starting the analysis. These include the chromatographic conditions (connected devices, etc.), as well as the run time. A distinction is made among the following types of data:

- Data that describes a sample (➤ Sample Data).
- Data that describes a sequence (➤ Sequence Data (usually entered automatically).
- Data that describes the chromatographic treatment of a sample (➤ Chromatographic Methods).

The user input data serves as the basis for the analytical process.

### **Output Data**

The data recorded during analysis are referred to as output data. Output data includes the following:

- Data provided by the analysis process itself (analysis and ➤Raw Data).
- Protocol data on the analysis (➤ Audit Trail).

Because of the variety of data types, systematic data organization and **Data Storage** are very important.

### **Datasource**

The term > Datasource is used for the top level of the directory structure displayed in the > Browser. The Browser is also the tool for handling datasources. Each datasource is based on a separate database. When setting up a datasource, the user must enter a path to an existing database or create a new database.

Select the Datasources command from the File menu to set up a data-source. For detailed information on the required steps, see How to ...:
 Actions in the Browser / Setting Up a Datasource.

The Browser indicates only the name of the *datasource*, not the name of the underlying *database*. The type and number of the datasources visible to the user determine the data that can be accessed. This simplified representation offers the following advantages:

- Data are always accessed in the same way. The user does not have to worry about the data's actual storage location in the network. It is not necessary to enter the path because the location is specified when the datasource is created.
- Each user can take advantage of a database without having to deal with special database programs.

#### **Database Formats of a Datasource**

The Dionex Data System supports several database formats. In addition to the most frequently used Access database format (mdb-container), the data system's >ODBC Capability supports SQL ("Structured Query Language") or database formats such as ORACLE and SQL servers.

When installing the Dionex Data System, a default datasource is created automatically on each client PC. Its name is derived from the computer name (assigned during the installation under Windows installation) and the addition **Local**. This guarantees that each user has a separate datasource in which "personal" results and data are stored. For single systems, this is the only possibility for data storage. Raw data of each manually performed analysis is stored here. Therefore, do not delete the datasource <PCNAME\_LOCAL>!

#### **Directory Structure of a Datasource**

Each datasource can be equipped with any number of hierarchically organized subdirectories via the command File / New Directory.

Caution:

Do not use special characters (e.g., the umlaut) for new directory names or sequences, as this may cause problems on

Novell networks.

Caution:

Actions performed in the Browser, such as creating datasources or directories, require complex operations below the user interface and cannot be compared to or performed by the Windows Explorer. The representation of directories and data also differs considerably from the Explorer.

Subdirectories, sequences, and chromatographic methods can be moved via Drag & Drop within a datasource, but also between datasources of different types. This is a copy process that can also change the underlying database. If you want to actually move a sample, delete the original sample in the Browser after the copy process.

Caution:

Drag & Drop operations can be executed exclusively via the >Browser. Actions outside of the Dionex Data System (e.g., in the Windows Explorer) will result in loss of data.

### Locking Datasources, Directories, and Sequences

To protect data and results, the Dionex Data System allows the user to lock datasources, directories, or sequences. If the Locked status is enabled, it is not possible to modify the corresponding object. This also applies to all objects below the locked object. If, for example, a datasource is locked, all directories and sequences in the datasource are also locked. Locked items can be recognized in the Browser by the red lock on the icon ( $\mathbb{E}/\mathbb{E}/\mathbb{E}$ ).

To lock an object:

- · Select the object in the Browser.
- Select the Properties command via the context menu and activate the Locked check box in the edit box.

Repeat these steps to undo the operation.

### **Data Storage**

In order to ensure fast and efficient access to specific data, intelligent storage and organization of the complete data are very important. The Dionex Data System solves this problem by storing data and files in different locations. Databases and sequence directories are available for this purpose. Both are part of the Datasource.

#### Storage in a Database

Data that can be compared across sequences are stored and managed in a relational, >ODBC-capable database. This applies to the entire >Sample and >Sequence Data. The advantage of this type of data management is not only easy integration into applications such as Excel, Access, or dBASE, but efficient searching and sorting capabilities.

A > Query allows you to find all samples processed on a certain day, created by a certain user, and/or with a certain name.

### Storage with the Sequence

All data describing the chromatographic treatment of a sample or data recorded during the analysis are stored in a > Sequence. This includes all protocol data and raw data (see Raw Data Storage).

### **File History**

 Select a datasource in the Browser and activate the Enable Modification History option for the context command Properties.

When the **File History Mode** is activated, the Dionex Data System prompts the user for a comment on the modification or operation prior to saving any modified object. This allows you to document all performed modifications, together with the user name and the object name. In combination with the **Copy**, **Create**, and **Save as** commands, the comment is entered automatically.

Objects can be samples, sequences, or datasources, control *▶Panel*, *▶RDF*, *▶PGM*, and/or *▶QNT* files and modified chromatograms.

 Select a datasource or a single directory and select the Show History context command to see all objects that were modified and for which a comment was entered.

Depending on the filter you use, the Dionex Data System will show a list of all objects that were modified within a certain period and/or by a certain operator.

 Select an object from the list and click the **Details** button to view information about an object.

### **Data Export**

The Dionex Data System offers various data export options that enable communication with other programs:

- 1. You can export report pages from the ➤Browser with the Batch Report command on the File menu. Clicking the Export check box opens the Batch Setup dialog box, where you can export report pages in five different formats:
  - a) ANDI/Chromatography AIA (\*.cdf)
  - b) ASCII text format (\*.txt)
  - c) Excel file format (\*.xls)
  - d) Windows metafile format (\*.wmf)
  - e) Adobe Acrobat file format (\*.pdf)
  - f) Dionex Data System archive format (\*.cmb)
- 2. In addition, raw data can be exported in the AIA format from the Browser via the Export/Backup command under ANDI/Chromatography (AIA). (Also see Raw Data Export).

If you wish to send Dionex Data System data to another laboratory (e.g., by e-mail), we recommend that you perform a **Backup** first and transmit the compressed data in the Dionex Data System archive format.

### **Backup**

To avoid unforeseen data losses, such as may occur due to a defective hard disk, Dionex strongly recommends a regular backup on a different storage medium. For this purpose, **Creating Backup Files** is available in the *Browser*.

Backup data are compressed and stored in a different location. Because GLP does not allow modification of backup data, this data cannot be accessed directly. It must be "unpacked" using the Restoring Backup Files function. The backup logs each single file that is copied and issues warnings if errors occur. In the backup process, the complete directory structure is maintained.

### **Raw Data**

All analog or digital values measured by a detector and stored digitally on the PC are referred to as raw data. Raw data exists only for those signals that were selected by the user before the analysis.

### Raw Data Storage

Raw data storage refers to saving the signals received from a detector in digital form. Other important data are also stored: analysis time, signal unit, number of data points, etc.

#### **Storage Procedure**

With conventional data systems, an analog value is digitized at a fixed time interval (e.g., a digital value of defined accuracy is stored every second). The number of stored values per second is normally referred to as the ➤ Sampling Rate. The DX-80 Ion Analyzer sampling rate is 10 Hz.

The higher the sampling rate, the more data points are stored, and the more exactly the original signal can be restored from the stored data. However, a higher sampling rate requires more memory.

#### **Storage Location**

Raw data are stored in the directory of the current sequence. In addition, a protocol data directory is created. The directories are not visible in the Browser, because all raw data are managed automatically by the Dionex Data System. At no time can the user directly access the raw data.

The only way to view raw data is via the Windows Explorer, provided that the datasources are not locked. However, as the datasource names are not displayed in the Browser, you must follow the path to the corresponding sequence directory.

A separate raw data file is created for each sample in a sequence for which raw data were recorded.



Do not modify these directories. Operations outside of the Dionex Data System will result in a loss of data. Therefore, we recommend that you protect your datasources to prevent them from being accessed via the Windows Explorer. In the file or context menus of the Browser, activate the **Protect Data Set Directory** option on the **Properties** tab of the corresponding datasource.

# Raw Data Compression

Storing raw data automatically compresses the data. For the signal value, this is achieved by storing the difference from the next data point, instead of storing each data point. The actual value is stored only periodically. This increases the compression by 50%.



The compression procedure is not destructive; complete data are stored and can be restored at any time.

## Restoring a Chromatogram from Raw Data

When restoring a chromatogram from the raw data, equidistant data points are joined with straight lines. Thus, a diagram "resembling" the recorded analog signal is created.

# **Raw Data Export**

The Dionex Data System supports the export of raw data by conversion into the  $\gt AIA$  and ASCII formats. In addition, raw data can be exported as a Dionex Data System backup file (\*.cmb). Use the **Export / Backup** command on the File menu to export as an AIA or backup file.

Format	Description
AIA Cat. 2	Samples and peak variables are stored in the AIA format.
AIA Cat. 1+2	In addition to samples and peak variables, the raw data of a chromatogram (all stored data points) are stored in the AIA format.
Dionex data system backup (*.cmb):	All data from a sequence are stored in the .cmb format.
ASCII	Raw data are exported in the ASCII format. Use the <b>Batch Report</b> command on the File or context menu. Click <b>Export</b> in the dialog box and then select the <b>ASCII</b> export format. All raw data for the actual sequence are stored in the ASCII format.

It is also possible to export data sheets of a report in different formats (see **Data Export**).

### **Raw Data Import**

It is possible to import the following raw data formats:

- ➤ AIA data (\*.txt)
- Dionex data system archive (\*.cmb)

From the File menu, select the **Import / Restore** command and then the corresponding command. Use **\*Restore** to import Dionex Data System backup data.

### Raw Data Storage in Power-Off Case

The raw data of a sample interrupted by a power failure are not lost, as raw data are automatically saved ("autosaved") continuously during sample processing. The autosave ensures that raw data are stored on the hard disk in short intervals. The user can reduce the time interval to approximately 30 seconds. In the case of a power failure, the maximum data loss would thus be 30 seconds.

If a power failure interrupts the automatic sample batch, the >Power-Failure Protection and the >Power-Off Handling ensure that processing resumes at the same point when the system is restarted.

## **Protocol Data (Audit Trail)**

In addition to raw data, the Dionex Data System also records the data of the Audit Trail (protocol data storage). The following information is included:

- · Commands from a control file
- Manually-executed commands
- Commands activated by a trigger condition
- Error messages
- · Start of sample processing
- · New start of the Dionex Data System after booting the computer

Each item is stored with the current time. Furthermore, the current program time is added to information whenever data are recorded or a sample batch is processed.

Storage is continuous over an entire workday, as well as for the duration of processing of a single file. Therefore, the following distinction is made:

- Daily Protocol
- Sample Protocol

Audit Trails can be displayed from the Browser (as daily or sample protocols) or as Audit Trail control in the control panel. To select the extent and type of the display, a display filter (**Normal**, **Advanced**, **Expert**, and **Error** or **Warning**) can be chosen from the context menu (right mouse click).

### Daily Protocol

The daily protocol stores all GLP-relevant data related to the status of a specific timebase. This information is displayed in the **Audit Trail Control** of the control panel.

When starting the Dionex Data System >Server, the 'AUDIT' directory is created in the server datasource below the timebase. The server saves the daily protocol in this directory. The daily protocol is given the current date as the file name (e.g., '20000926.slg' for the daily protocol of Sept. 26, 2000). A new file will be created for each day.

On the right section of the Browser window, the daily protocols are displayed, together with their names and the time of their last change. A double-click opens the file and displays its contents in a separate window. The display corresponds to the Audit Trail control of the control panels and can also be printed.

In the Browser, you can copy and delete daily Audit Trails.



The daily protocol is not overwritten by the protocol of the following day. Because the Dionex Data System generates a new file for each daily protocol, old protocols that are no longer required should be deleted from time to time.

### Sample Protocol

The sample protocol contains all Audit Trail data for the corresponding sample. The sample protocol is part of each default report.

 Display a report in any method window and select the Audit Trail worksheet to view the Audit Trail data of the current sample.

The sample protocol can be activated via the Browser. Open the context menu of the sample in the Browser. You can open a box via **Open** and view the sample protocol via **Audit Trail**.

# **Samples and Sequences**

### **Sample Preparation**

Sample preparation is a major part of a chromatographic analysis. It can include simple procedures such as weighing, solving, and diluting a sample, as well as more complicated physical (filtration, centrifugation, etc.) and chemical separation procedures (liquid-liquid-extraction or fixed phase extraction). As a general rule, careful sample preparation contributes substantially to the quality and reproducibility of a chromatographic separation.

Furthermore, the *Dilution Factor*) allows the user to define dilution steps, and can thus be used to consider the sample preparation when evaluating the data.

### Sample Processing

Sample processing includes three major steps:

- Sample definition (single samples and sample series)
- Analytical procedure (manual or automatic control)
- Evaluation (methods and reports)

The performance of each step depends primarily on the methods used and the instruments available. The working environment could range from a fully automatic sample laboratory with large quantities of samples to single-user applications in a research lab. Easy and quick analysis procedures may be the focus in the first case, while special methods and parameters for peak recognition may have priority in the latter case. Thus, functions crucial to one group of users may be irrelevant to others.

Please take these facts into account when information is presented from different viewpoints in Help topics.

# Sample Registration

In the Dionex Data System, the term **sample** has a more specific meaning than in colloquial use.

#### Each injection is defined as an individual "sample."

Multiple injections from the same sample vial under similar conditions are considered several samples.

Defining a sample means the process of determining how much of a substance is injected from which vial and under which conditions, and which evaluation parameters are used. A distinction is made between a single sample and a sample series.

#### Single Sample

A sample can be analyzed individually by entering all required information and user commands via the keyboard or the mouse.

The user selects the **Inject** command, enters the volume to inject, and performs the injection via a hand-operated valve. If an autosampler is available, the user determines the sample location with the **Inject** command. Then, *Data Acquisition* is started (via the **Acquisition On** command). When the end of the sample is reached, the user terminates data acquisition (**Acquisition Off** command) and specifies where to save the acquired data.

The recorded data are temporarily saved to the **manual** sequence of the default datasource of the system. In network operation, this datasource is designated with the computer name of the user in the network.

As soon as the user terminates data acquisition, the user is prompted to select the final storage location for the temporarily saved data.

#### Sample Series

If several samples are to be processed successively, they are included in a sample list (sequence table), together with the instrument control and evaluation information.

Then, the samples are processed by starting automatic *➤Batch Processing*, the **online batch**.

For details how to create a sample list, see **Sample List**.

### Sample List (Sequence Table)

The sample list (sequence) is part of the **MBrowser**. It appears on the lower right window section as soon as a sequence is selected, and it is "read" line by line. One line corresponds to one sample.

A sample is characterized by various column entries. The entries are managed in a database and are referred to as >Sample Data. To display a short explanation of each column, press the F1 key.

The list of samples to be processed with the characteristic sample data must be created by the user prior to each analysis. There are various options:

- Select a cell with the mouse, and then change the cell input via the keyboard.
- Select a cell with the mouse, and then press F8 to open an edit dialog box that facilitates data input.
- Open a similar, existing sequence table and modify the input.
- Automatically generate a sequence table via the Message Sequence Wizard.

After entering all relevant information, select the **Save as** command on the **File** menu to save the sample list with a name.

The number of samples per sequence is not limited, but should exceed 100 only in exceptional cases. The fewer samples that are added to a sequence, and thus the more sequences that are created, the faster single samples can be accessed and the easier it is for the user to keep track of the processed samples. Criteria for combining several samples in one sequence could, for example, be the same analysis conditions, the same origin, or the samples of the same day.

For detailed information on how to create a sample list, see:

How to ...: Actions in the Browser / Creating a Sample List

# **Sequence Wizard**

The Sequence > Wizard helps you quickly create a basic sample list consisting of analysis and standard samples. To open the **Sequence Wizard**, select the **File > New** command in the Browser. Creating a > Sequence is performed in these easy steps:

- Step 1: Selecting the ion mode, injection method, and sample type (➤ Step 1)
- Step 2: Selecting a timebase (➤ Step 2)
- Step 3: Specifying unknown samples, if required (➤ Step 3)
- Step 4: Saving the sequence (➤ Step 4)

Each step is performed on a separate screen. Click one of the two arrow buttons (<Back, Next>) to browse through the screens.

Click the <Finish> button in the final step to save the sequence and close the wizard.

Caution:

Do not use special characters (e.g., the umlaut) for new directory names or sequences, as this may cause problems on Novell networks.

### **Calibration Wizard**

The Calibration ➤ Wizard helps you quickly create a new calibration ➤ Sequence and calibrate the retention time.

If the system shipped to you does not include a preconfigured computer, the Calibration Wizard automatically appears when PeakNet IA is loaded for the first time. You must calibrate the DX-80 before beginning operation.

The Calibration Wizard guides you through the following steps:

- Selecting the ion mode, the number of calibration levels, and the injection method (➤Step 1).
- Creating a new calibration sequence or copying an existing calibration sequence (> Step 2).
- Selecting a timebase for the new calibration sequence ((> Step 3).
- Saving the new calibration sequence ➤ Step 4.

Each step is performed on a separate page of the Calibration Wizard. Clicking **Next** on any page takes you to the following page. Click **Finish** on the final step to save the sequence and close the wizard.

# **Automatic Batch Operation (Online Batch)**

Independent processing of one or several sequences is known as >Online Batch.

When the actual sample preparation is completed, the chromatographic conditions of processing, the samples to be processed, and the order of processing must be communicated to the data system. This is performed in the sequence table. The result is stored as a >Sequence.

To start online batch processing, the following steps are required:

#### Starting the Automatic Batch

After data input is completed, the analytical process can be started in an online batch.

- Open a control panel and choose the Edit command from the Batch menu.
- Enter the names of the sequences containing the samples to be analyzed.

- Perform a ➤ Ready Check.
- Start the analysis process by clicking the **Start** button.

### **Processing the Automatic Batch**

As soon as the online batch is started, all samples of the sequence with the status **single** are analyzed successively. If a sequence contains a sufficient number of samples, sample processing "around the clock" is possible.

Instead of including all samples in one sequence, they can be distributed in several sequences. Accordingly, more sequences (a maximum of 16) are then entered in the batch dialog box.

This list can be considered a batch; it is also referred to as online sample batch or online batch. The order of the sequences determines the order of processing: when starting the batch process, samples 1 to n of the first sequence are analyzed, then samples 1 to n of the second sequence, and so on.

### Saving the Results

The results of the online batch are saved with the individual samples.

### Sample Evaluation

In spite of largely automated work processes and intelligent pre-settings, it is the responsibility of each user to determine the framework conditions of sample evaluation.

#### **Result Output**

The result of sample processing can be represented in graphics and tables, either on the screen or as printed output. The Dionex Data System provides method windows for generating this output.

For a list and detailed description of available method windows, see **Data Reprocessing** 

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# **Validation**

### **Validation**

Analytical data from various workstations or laboratories can be compared only if it is possible to determine the quality of the results that were produced.

#### Validation (Definition)

The process of ensuring that a system and its analysis procedures supply reproducible and reliable results is referred to as validation. This includes procedures guaranteeing the optimum technical condition of instruments (hardware and firmware) and of computers (hardware and software), especially regarding planning, implementing, and documenting a method. Validation is thus an integral part of  $\triangleright$  Good Laboratory Practice (GLP).

### When is validation necessary?

Instruments should be validated prior to bringing them into service and thereafter at regular intervals. This especially applies after exchanging worn parts, performing repairs, or replacing an instrument. The system must be validated after installing a software update, also.

Quantification methods should be validated before they are used in daily laboratory procedure. As the quantification method changes when modifying single parameters, validation is also necessary in the daily routine.

#### How is validation performed?

At startup, many instruments perform an automatic self-test to ensure optimum operation. It is important to check precision, detection limits, the dynamic work range, and the robustness of a procedure and the involved components. Important issues in this context are validation sample averaging, normal distribution, statistical, and systematic errors, blank reading, selectivity, etc.

The Dionex Data System offers numerous options for meeting GLP and validation requirements. See the topics below for details:

■ Installation Qualification Manager

■ Log File CMSetup.log

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### Installation Qualification Manager

The CMIQ.EXE program, located in the Dionex Data System IQ directory, is referred to as the Installation Qualification Manager. Following each Dionex Data System update, this program automatically checks the current installation. This check can be started manually, as well.

#### **Activating CMIQ.EXE Automatically**

After copying all files and completing the Setup, the program is automatically activated. CMIQ.EXE generates an ASCII report in a file named CHKSETUP.log. The file can be read using Windows Notepad or a word processor. The file contains information on:

- The system (time, computer name, user name, operating system, processor).
- The Dionex Data System (version, Setup date, Setup operator, key code, serial number, number of installed timebases, status of installed software modules).
- All copied files (file name and path, file version, date of last modification date, file size in bytes, product version, 32-bit check sum).

The data are compared to the data in a write-protected list (IQDATA.dat) supplied with the Setup. If the lists are identical, successful Dionex Data System installation is confirmed. As soon as there are differences, the Dionex Data System issues a warning or error.

If a warning is displayed, the functionality of the Dionex Data System should not be affected. You can start the Dionex Data System as usual.

If any problems occur, please contact Dionex Service. The same applies if the Dionex Data System reports an error.

### **Activating CMIQ.EXE Manually**

Especially after installing or updating other software packages, specific system files (DLL) used by several programs may be overwritten. If this occurs, it may impair the functionality of the Dionex Data System.

In this case, it can be useful to open the program outside the Setup routine via the **Installation Qualification** command on the **Qualification** menu.

Mote:

For a correct system check of all files, you must close all ap-

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plications (not just Dionex Data System modules). Do not forget to close the Dionex Data System > Server and the > Monitor Program.

There are three options:

**Check Installation:** Checks the files of the current Dionex Data System version and the

required Windows system files. The type and scope are freely se-

lectable.

Normal: Checks the Setup.

**Extended**: Compares the installation with the stored status

(see Save System Status, below). The scope of

the report is freely selectable.

Full: Checks and reports all files.

**Short**: Checks all files. The report includes only errors and

warnings.

**System Information:** Generates the system information of your Dionex Data System.

Save System Status: Saves the current system status.

Use this option to save the names and the versions of all files contained in the Windows System directory and in the BIN directory of

an operable Dionex Data System version.

If you performed this option once, the saved system status can be used as the basis for the file check (see **Check Installation / Ex-**

tended, above) instead of the IQDATA list.

### **■ Log File CMSETUP.LOG**

Complete information about the system and the operations performed by the Setup is logged in the **CmSetup.log** file. The file is first saved to the Windows installation root directory; it is moved to the Dionex Data System main directory after successful completion of the Setup.

This file includes the following information: who performed the installation, when the installation was performed, which files were copied, and which files were replaced by other files with the same names. The latter is especially important, as it indicates which default reports or control panels were replaced.

System Wellness 58

# **System Wellness**

### **System Wellness Overview**

### What is System Wellness?

System Wellness monitors the overall "health" of the chromatographic system. It provides built-in diagnostic and calibration features that help prevent unscheduled system shutdowns and ensure reliable operation. Calibration and diagnostic commands are available from the Wellness control panel.

#### **System Wellness Features**

- The System Wellness control panel, which allows easy access to diagnostic and calibration commands and data
- Download of current, previous, or factory calibration data
- Pressure transducer calibration
- Conductivity cell calibration
- Pump and cell diagnostics

For instructions on setting up and using System Wellness features, see **How to...:** System Wellness

# **Data Reprocessing**

# **Definition: Data Reprocessing**

Data reprocessing is the presentation of raw data under various aspects.

Each operation is displayed in a separate window. Each **partial method** is intended for one specific task and has its own window arrangement and menu structure. The Dionex Data System currently features the following partial method, which is described in a separate topic:

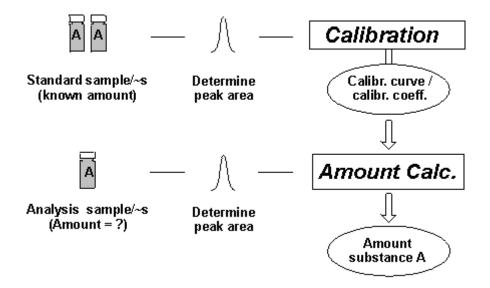
Integration

# Integration

# **Overview: Integration**

The chromatographic process of converting peak areas below peaks in amount or concentration values is referred to as integration. The integration is performed on the basis of the calibration. It supplies a calibration curve and a calibration coefficient.

Inserting the calibration coefficients in the formula for amount calculation supplies the amount concentration in a single peak area. The data system automatically performs this process for all peaks it "finds."



The number of peaks that are detected, and whether any of the peaks can be identified, depends on whether an anion or cation analysis is running.

The results of the two processes, area calculation and peak identification, are represented graphically (chromatogram) and as a table (Report) in the window of the partial method **Integration**.

For more information, see the topics below:

- Operation
- Integration Report
- Peak Summary Report
- Chromatogram Comparison

### Operation

### **Opening**

Opening a sample automatically opens the integration method window and displays the sample chromatogram. There are three options:

- Double-click a sample of a specific sequence in the Browser, or
- Select a sample in the Browser and double-click, or
- Select File > Open, and then select Sample in the Object of type list box.

### **Modifying the Appearance**

Each displayed chromatogram can be changed by enabling and/or disabling the display of various elements and by modifying them.

- Double-click a peak to see the Peak Properties.
- Draw a frame around the section of the chromatogram that you want to enlarge.
- Select the **Decoration** ... command on the context menu (right mouse button) to modify the window background, the different axes, the layout of individual peaks and the color, shape, and size of their captions.

#### **Opening Additional Window Sections**

Use the following commands to display further window sections:

• Select the **Split Zoom** command from the View menu to split the window. By drawing a frame, you can zoom a section of the window. The upper half of the window shows the entire chromatogram and the frame, the lower half displays the zoomed section. Use the mouse to move and position the frame in the upper window section. This mode is recognized by the shape of the mouse cursor (�). Of course, a new frame can be drawn at any time.

• Select the **Report** command from the **View** menu to display the integration report (see Integration/Integration Report).

• Compare two chromatograms by enabling the display of an additional chromatogram (see **Integration/Chromatogram Comparison**).

### Integration Report

The integration report is opened via the **Report** command on the **View** menu. It is displayed as a table in the window of the partial method Integration.

#### **Contents**

- The table contains numeric data relating to retention time, peak area and height, amount, peak type, and other peak variables.
- If the chromatogram is modified, this is reflected immediately by the changed report data.
- Via the Windows Clipboard, data from the report can be directly integrated into other Windows applications.
- The chromatogram and the integration report can be printed at any time via the **Print** command.

### **■** Peak Summary Report

Commonly used >Reports, such as integration reports and calibration reports, contain data for just one sample. In the case of a chromatogram comparison, only the data of the currently selected chromatogram is displayed.

It is possible to compare peak data from different samples via the **Peak Summary** partial report.

### **Sample Selection**

- If one sample is selected and opened from the Browser, the Peak Summary is based on the corresponding > Sequence.
- If several samples are selected in the Browser, only these selected samples are part of the Peak Summary.

 If a >Query is started in the Browser, the search result forms the basis for the Summary. In this way, it is possible to compare peaks from different sequences.

#### **Peak Selection**

- Normally, no peak is selected in the chromatogram of the sample. The Peak Summary Report therefore contains no entries. All fields are marked n.a. (not available) or Div/0 (Division/0). Only when a peak is selected manually within a chromatogram does the Peak Summary Table contain entries. As soon as this is performed, this peak is searched in all previously selected samples. The search result is displayed in the Summary Report.
- If the currently selected peak is an identified peak (i.e., a peak labeled with
  its name in the peak table), all involved samples are searched for this peak
  name. The corresponding values of all found peaks are displayed in the
  Summary.
- If the currently selected peak is a non-identified peak (i.e., a peak not labeled with its name in the peak table), a "fixed time window" (± 5% of the detected retention time) is calculated for this peak. All peaks within this time window will be included in the summary. If two or more peaks are detected in the time window, the peak that is nearest to the specified retention time will be selected. If the peak is an identified peak, this will be indicated by Ambiguous? in the Summary header.

#### **Creating a Summary**

- Double-click one of the samples to open the Integration window.
- Display the Report and select the default Peak Summary worksheet, which
  contains a selection of the most important default peak variables. A separate line in the report is reserved for each sample that is part of the Summary.

As in all reports, the currently selected sample in the chromatogram window is highlighted in the Summary Table.

### Chromatogram Comparison

When comparing two or more samples or chromatograms, a comparison of their numerical results would be the most exact method. However, overlaying

the chromatograms is often sufficient. This is performed via the chromatogram comparison.

#### What can be compared?

Multiple injections can be overlaid. The number of simultaneously displayed chromatograms in the Dionex Data System is theoretically unlimited. However, when numerous chromatograms are displayed, the presentation becomes confusing. Therefore, the Dionex Data System prompts the user to confirm whether to display more than 20 chromatograms. This prevents the display of chromatograms due to an operator error and a resulting decrease in system performance.

#### How are chromatograms compared and displayed?

Chromatograms can be displayed in the integration window and compared. One chromatogram represents the currently active chromatogram. It is selected with the mouse. It can be recognized by the additional information displayed (decoration, etc.). The names of all represented chromatograms are listed above the window. The currently active chromatogram is marked by a different color. Clicking the name of any chromatogram selects it as the active chromatogram.

The presentation of the window and the active chromatogram is controlled via the **Decoration** command on the context menu.

### How do I select the chromatograms to be compared?

There are various ways to select chromatograms:

- Select one or several samples in the Browser, and drag them into an open integration window.
- Select the Add Overlay ... command from the File menu to display a specific channel of any sample in an opened integration window.
- Select the **Compare** command to compare a specific channel in several selected samples.
- Perform a query to specifically compare samples with certain properties.
- Click the **Next Chromatogram** icon ( ) while holding down the CTRL key to also display the chromatogram of the next sample.
- Click the **Previous Chromatogram** icon ( ) while pressing the CTRL key to also display the chromatogram of the previous sample.

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For details on selecting chromatograms to compare, see **How to ...:**Actions in the Window Section "Chromatogram" / Performing a Chromatogram Comparison.

#### Placing chromatograms in relation to each other

In general, the appearance of a chromatogram is affected considerably by such factors as solvent, column quality, etc. As these conditions cannot be modified later, other possibilities must be found to perform as exact a comparison as possible. This is achieved by adapting the position and the size of a chromatogram to match another. There are several ways to achieve this:

- Chromatograms can be assigned an offset in the x- and y-direction.
- Chromatograms can be time-normalized (i.e., they can be overlaid at a specific retention time).
- Peak height can be normalized (i.e., the height of a specific peak can be adjusted).
- Chromatograms can be stretched and compressed.
- Chromatograms can be subtracted from each other.

For the active chromatogram, **Decoration** is chosen via the context menu. Enter the settings in the **Comparison** tab dialog box.

For further details, see **How to ...:** Actions in the Window Section "Chromatogram" / Performing a Chromatogram Comparison.

Printer Layout 66

# **Printer Layout**

#### Printing

#### From the Printer Layout

The Printer Layout allows you to print the report template at any time.

- Select Print from the File menu to start printing.
- Click Preview in the Print dialog box to preview the layout of the printed output.

The printed output uses the data of the current sample with the layout of the currently opened sheet.

#### From the Browser

The Browser allows printing single samples and entire sample series.

- Use the mouse to select the samples to print. If you want to print all samples of one or several sequences, just select the corresponding sequence(s).
- Perform a > Query to use samples from several sequences.
- Select Batch Report ... from the context menu and select the Report Definition to be used for the printed output. Also specify the printer.

In addition to the results, it is possible to print sample data (the information in the sample list).

• Open a sample list and choose **Print Table** ... from the context menu.

# How to ...:

# Actions in the Server Configuration Program

The following topics contain useful information about the installation of the Dionex Data System software.

- Changing the Server Configuration
- Selecting the Copy Protection Location and Entering the Key Code
- Updating Moduleware

Before connecting new chromatography components to the data system, read the following topic:

#### Adding Timebases / Instruments

If a device is connected to the Dionex Data System via the LAN (local area network), certain built-in diagnostic and calibration functions are provided. These functions, known as System Wellness, are enabled and disabled from the Server Configuration program. See the following topic for details:

Enabling/Disabling System Wellness Functions

#### Changing the Server Configuration

#### Starting the Server Configuration Program

To start the Server Configuration program, select *>Server Configuration* from the Start/Programs menu on the taskbar (i.e., select Start/ Programs/ Peak-Net 6/ Server Configuration).

Caution:

Modifications to the server configuration are only possible if the corresponding > Server was started before. Normally, this is done automatically when starting the computer on which the server is installed.

#### **Configuring the Server**

Select the name of the server on which you want to extend or change the configuration, and double-click. Then, enter the  $\nearrow$ Key Code and the type of **Software Protection**.

#### **Adding Components**

Select the name of the server of which you want to extend the configuration. Click the + character in front of the server name to view its current configuration.

Select the following commands via the Edit menu or the right mouse button:

- Add Timebase to install a ➤ Timebase on the server. Enter the name of the timebase in the Edit box.
- Add Device to add more chromatography instruments to a timebase. Select the instrument from the list. Only one instrument can be added at a time.



When the timebase is created, a corresponding folder is also created in the Browser. This folder has the same name as the timebase and contains a default Sequence table and a folder for Protocol Data files for the timebase.

#### **Configuring Components**

Click the component to configure and select the item **Properties** from the right mouse button menu. Each configurable component has one or more tab dialog boxes for alternative settings. Refer to context-sensitive online Help for information on possible settings.

#### **Deleting Components**

Click the component to delete and select the item **Delete** from the right mouse button menu.



When deleting a timebase, all instruments installed below this timebase are also deleted. The same applies to deleting single hardware components or the complete hardware. If you select a server and choose **Delete**, the components and the installation file CMSERVER.CFG are deleted.

#### **Copying or Moving Components**

Each selected component can be copied to the Clipboard via the **Copy** command, and then inserted in a different place via **Paste**. It is also possible to **Cut** single components. Alternatively, both actions can be performed via **Drag & Drop.** 

#### Saving the Server Configuration

Each modification to the Server Configuration (adding, moving, deleting, or configuring single components) can be saved. There are two possibilities:

- Save Installation (Name) saves the current server configuration as a new configuration directly on the server.
- Save as saves the current server configuration with a freely selectable name (and the extension .CFG) in any directory. The file CMSERVER.CFG is not overwritten and is still valid. Configuration files saved with this method are "personal" server configuration files. These enable the user to quickly change from one installation environment to another by simply loading the file.

#### Loading the Personal Server Configuration to a Server ("Import")

To use a personal server configuration as the valid server configuration CMSERVER.CFG, perform the following steps:

- Start the Server Configuration program.
- Activate the server for which the personal server configuration is to be valid.
- Select the Import... command from the File menu and specify the name and the directory of the personal server configuration. The configuration is loaded to the server.
- Select Save to save the personal server configuration under the name CMSERVER.CFG. The previous file with this name is overwritten with the contents of the personal configuration. All changes are indicated in the file tree of the Server Configuration program, or when opening the corresponding tab dialog boxes.

#### **Check Configuration**

After installing and configuring new components, the current server configuration should be checked.

Select the **Check Configuration** command from the **Server** menu to start the check.

The Dionex Data System shows the result in a separate dialog box. If no errors or conflicts occur, the current server configuration can be saved.

If the system issues one or several warnings, the user must decide whether to change the current configuration.

If the system issues an error message, the cause must be found and remedied before optimal operation be ensured.

#### **Installation Configuration Report**

The configuration report contains information about the server itself (e.g., name, key code, copy protection) as well as the name of the connected time-base(s). In addition, the report lists the settings of the instruments assigned to the timebase.

- Select the Create Report command from the Server menu to generate a report.
- Click the Save button to store the report in the CMINST.LOG file. The old file is then renamed CMINST.OLD. Caution: The report is always saved to the BIN directory of the server!
- Click the **Print** button to copy the report to Windows Notepad and to print it from there. After creating the report, it is also on the Windows Clipboard and can be inserted in other applications.

# ■ Selecting the Copy Protection Location and Entering the Key Code

You may enter the software protection location and the >Key Code for either a server PC or a client PC:

- In the case of the client PC, select Preferences on the File menu of the Dionex Data System client. The License tab of the Preferences dialog box allows you to select the copy protection location and to enter the key code as described below.
- In the case of a server PC, open the **Server Configuration** program by clicking **Server Configuration**. Double-click the appropriate server name to access the **General** tab. The options described below are possible only if the corresponding *▶Chromatography Server* was previously started. Generally, this is performed automatically when starting the computer on which the server was installed. If this is not the case, start the Dionex Data System via the *▶Monitor Program*.

#### **Selecting the Software Protection Location**

Specify whether your system is protected by a >Dongle or a >License Server.

- Select **Dongle** if your system is protected by a dongle on the parallel PC interface.
- Select License Server if your license was generated by a license server.
   (This disables the edit field for the key code.) Clicking the Browse button
   "..." to the right of the License Server opens a dialog box where you specify the computer on which the license server of your Dionex Data System is running.

#### **Entering the Key Code**

The key code is also entered via the **Properties** or **License** dialog box. Enter the 12-digit key code in the corresponding field.

#### Updating Moduleware

Follow the steps below to install a new version of > Moduleware in the DX-80 lon Analyzer.

- 1 Insert the CD containing the new Moduleware version into the CD drive.
- 2 Start the ➤ Server Configuration program by selecting Server Configuration from the Start/Programs menu on the taskbar (i.e., select Start/ Programs/ PeakNet 6/ Server Configuration).
- 3 Select Dionex UDP Interface under Sharable Devices and select Properties from the Edit or context menu.
- 4 Select the **Update Moduleware** tab. The names of the currently connected modules, their serial numbers, and current Moduleware versions are displayed.
- 5 Click the Select button.
- 6 Select the file containing the new Moduleware version and click **OK**. The selected file appears in the **Moduleware File** box.
- 7 From the list of modules, select the DX-80 Ion Analyzer to be updated and click the **Update** button. Repeat this step to update any additional modules.
- Important: Make certain the Moduleware matches the module type before updating. Downloading the wrong type of Moduleware can corrupt the module's memory.
- 8 The new Moduleware version is downloaded to the selected DX-80. To display the new version number in the list, click the **Rescan** button.

#### Adding Timebases / Instruments

The Dionex Data System can control two DX-80 Ion Analyzers via a LAN. Each instrument, as well as the PC on which the Dionex Data System is installed, must be equipped with a 10BASE-T compatible PCI LAN card (the DX-80 motherboard contains a built-in LAN card), connected with 10BASE-T LAN cables, and have the appropriate device driver installed.

After PeakNet IA is installed, start the *Server Configuration* program and assign each DX-80 to a timebase. Refer to *Installing the PeakNet IA System* (Document No. 031717) for details.

#### ■ Enabling and Disabling System Wellness Functions

The Properties dialog box for the DX-80 Ion Analyzer includes two tab pages, Calibration and Diagnostics, that allow you to enable or disable individual calibration and/or diagnostic functions. By default, all DX-80 calibration and diagnostic functions are enabled.

Follow the steps below to disable calibration and/or diagnostic functions for the DX-80 or to enable functions that are currently disabled.

- 1. Start the Server Configuration program.
- 2. Under the *➤Timebase*, select the DX-80 for which you want to disable or enable the calibration and/or diagnostic functions.
- Select Properties from the Edit or context menu and select the Calibration or Diagnostics tab.
- 4. Enable or disable individual calibration or diagnostics functions by clicking the **Activate** box next to each function in the list. To enable or disable all calibration or diagnostics functions, right-click and select the **Activate All** or **Deactivate All** command from the context menu.

# **Actions in the Control Panel**

See the following topics for details on how to load a **Control Panel** and how to modify the timebase assignment:

■ Loading a Control Panel

Connecting a Control Panel with a Timebase

See the following topic for details on how data acquisition can be simulated in a control panel:

■ Using/Recording Demo Data

#### ■ Loading a Control Panel

Before processing a new unknown sample or beginning operation, the DX-80 lon Analyzer control panel (>Panels) must be loaded, either manually or automatically:

#### Manually

The DX-80 control panel is named **DIONEX\_DX80\_SYSTEM.PAN**. Search for the file directly in the *>Browser*, in the **Panels** directory of the local *>Data-source*. Select the control panel and double-click the name to open it.

Each window must be connected with a >Timebase. When opening the window, the Dionex Data System automatically establishes a connection to the most recently used timebase. This is usually the timebase that was assigned during installation. Naturally, each window can be connected with any other timebase (see How to ...: Connecting a Control Panel with a Timebase).

#### **Automatically**

When starting the Dionex Data System, the most recent > Workspace is loaded. If this view contains a control panel, it will also be loaded.

If it is not possible to load a workspace (for example, because no such view was arranged by the user), the control panel must be opened manually.

#### Connecting a Control Panel with a Timebase

When loading the DX-80 Ion Analyzer control panel (= >Panel), it is automatically connected with the previously stored >Timebase. This timebase assignment can be modified at any time.

Open the DX-80 Ion Analyzer control panel (DIONEX\_DX80.PAN) and select the Connect to Timebase command from the Control menu.

On the left, the input dialog box displays the name of the current timebase, the computer name of the corresponding > Server, and the communications protocol. On the right is the icon for the local computer (**My Computer**). If the computer is connected to a network, an icon for the network neighborhood is displayed, also.

- Open the directory tree by clicking the + character.
- If the server is started, all timebases of the local server are listed below My Computer. If the server is not active, or if no server is installed, the message The server is not running is displayed.
- Below Network Neighborhood is a list of all PCs currently connected to
  the network. Open the directory tree below a computer name to see
  whether a Dionex Data System server is installed on this computer. If the
  server is active, the names of the corresponding timebases are visible;
  otherwise, the message The server is not running is displayed.
- Select the name of a timebase and complete the input by clicking OK.

The Dionex Data System now connects the DX-80 control panel with the corresponding timebase. If the action is successfully completed, the connected instrument(s) can be controlled via the controls in various colors.

#### **Problems with Establishing a Connection**

Whether a non-local server is visible or can be accessed depends on which network protocol is selected. The system requires several seconds to determine whether the selected protocol can be used. If no connection is established to a specific timebase, there are several possible reasons:

- First, check whether the corresponding server is running.
- If the corresponding server is running, try another network protocol. The Dionex Data System can communicate via various network protocols (e.g., IPX, TCP/IP, or NetBEUI).



#### Caution:

Communication between two stations is possible only if the same network protocol is installed and selected. Generally, it is sufficient to install the corresponding Microsoft (IPX/SPXcompatible protocol, NetBEUI, TCP/IP) or Novell (Novell IPX ODI Protocol) network protocol via Settings/Control Panel/Network/Configuration. The protocol that is actually used depends on the current network installation. Please contact your network administrator. If a connection is to be established to a Windows NT/Windows 2000 computer, this is usually possible via the **Named Pipes** protocol.

- Sometimes, the required timebase exists (Server is running) but is not displayed. Or, this can also occur when linking two computers via an ISDN connection. The cause is usually a slightly incorrect network installation. In this case, open the Connect to Timebase dialog box again.
- If the IPX/SPX compatible protocol is used, select the Activate NetBIOS IPX/SPX option under Settings/Control Panel/Network/ Configuration/Properties/NetBIOS.

If it is still not possible to establish a connection, contact Dionex for assistance.

#### **Problems with Controlling Instruments**

In addition to the control mode, the Dionex Data System offers the Monitor Only mode. If a user establishes a connection to a timebase via a network, the user receives the monitor only status on this timebase.

The monitor only status is also assigned when a user attempts to access a local timebase that is currently in use by an external user.

Deactivate the Monitor Only command on the Control menu to enable complete control of the timebase.

#### ■ Using/Recording Demo Data

#### **Simulating Data Acquisition**

Demo Mode lets you simulate data acquisition by loading a pre-recorded demo file and then displaying the data from the demo file in the *Panel's* signal window. The demo file is "read back" as though the data were being acquired in real time.

- 1. To select Demo Mode, start the ➤ Server Configuration program and select the DX-80 Ion Analyzer under the timebase.
- 2. Select **Properties** from the **Edit** or context menu.
- 3. Activate the Demo Mode for the DX-80 on the **General** tab page.
- 4. Select the demo file from the list.
- Open the DX-80 control panel (DIONEX\_DX80.PAN), connect to the timebase, and then turn on data acquisition. The Data Acquisition dialog box appears.
- The demo file begins running, and will run continuously until data acquisition is turned off.

#### **Recording Demo Data**

- To create a demo file for the DX-80, open the Properties dialog box in the Server Configuration program and select Write under Demo Mode on the General tab page.
- Enter a name for the demo file. Select the Device ID under Communication.
- 3. To write the demo file, open the DX-80 control panel (**DIONEX\_DX80.PAN**) and turn on data acquisition. The data acquired from the DX-80 is recorded in the demo file.
- 4. To stop recording data, turn off data acquisition. The demo file is then complete.

# **Actions in the Browser**

Use the **Browser** to manage, copy, move, and delete chromatographic data and files.

#### 🛕 Warning:

The Browser functions are similar to those of the Windows Explorer. However, do not confuse the Browser and Windows Explorer. Renaming or moving files in the Windows Explorer makes them invisible to the Dionex Data System. Thus, the files could be unintentionally deleted.

In addition, the Browser allows creating a sample list, setting up datasources, searching, and selecting data in a database. For further details, see the topics below:

- Creating a Sample List (Sequence Table)
- Setting Up a Datasource
- In Handling Files, Datasources and the Network
- Performing a Query
- System Wellness

# Creating a Sample List (Sequence Table)

There are two ways to create a **Sample List**: manually or automatically.

#### Manually

- Select a sequence in the left window section of the **Browser**.
- Enter the name and the properties of the standard and unknown samples, line by line, in the lower partial window on the right.

#### Proceed as follows:

- Click the cell in the table and enter the new value or the name via the keyboard.
- Enter a name for each sample to analyze in the column > Name.
- Input in the remaining columns (>Dilution Factor and Comment) is optional.

- If you are not sure which values or names to enter, select the cell and
  press the F8 key. This opens an edit dialog box, in which all valid values
  and options are listed. Select the desired value. The cell input is then
  automatically updated.
- Press the F1 key to view further information about individual columns.
- Press the F9 key to fill all subsequent cells of a column with the same input.
- Save the sequence with a new name (Save as).
- Check the sequence properties by clicking **Alt** + **Enter**.



It is possible to edit an existing sequence. However, the currently running sample cannot be edited (the corresponding line in the sample list is indicated by a different color).

#### **Automatically**

- Select the New command on the File menu and select Sequence (using Wizard).
- Click **OK** to start the **Mizard**.
- Follow the instructions in the Wizard to create a basic sequence.
- Press the F1 key for more help.

# How to ...: Setting Up a Datasource

All steps connected with the **Datasource** setup are initiated using the **Datasources** command on the **File** menu.

 Open the >Browser and select the Datasources command on the File menu.

The datasource manager lists all >Datasources that can be accessed by the >Client.



As a minimum, the default datasource (<PC-NAME\_LOCAL>) created during the Dionex Data System installation should be visible here. If a local station is not integrated on a network, the name entered in the operating system under **Control Panel / Network / Identification** is used instead of the computer name. If no identification was entered, the datasource is named **DEFAULT\_LOCAL**.

For information about the possible actions at this point, see the following topics:

- Connecting a Database ("Connect")
- Disconnecting a Database ("Disconnect")
- Creating a New Database ("New")
- Opening the ODBC Manager ("ODBC Mgr.")

#### Connecting a Database

In order to access data in an existing *>Database*, there must be a connection between the *>Client* and the database.

- Open the ➤ Browser and select the Datasources command.
- Select the Connect button in the datasource manager to establish a connection to a datasource.
- Select the type of the underlying datasource.

It is possible to connect to Dionex Data System databases ("Native Dionex Data System Datasource"), default Microsoft Access databases ("mdb containers"), and to SQL and Oracle databases ("SQL servers").

Different input is required, depending on the datasource type:

- For Access datasources, the mdb container must be specified.
- For SQL datasources, the dialog box for the ODBC driver will be opened.



If you want to include databases in the  $\gt SQL$  or  $\gt ORACLE$  formats, refer to the corresponding topic.

#### ■ Disconnecting a Database

The >Datasource can be disconnected at any time, if necessary. Once this is done, the client is denied access to the disconnected datasource.

- Open the ➤ Browser and select the Datasources command.
- Select the datasource in the datasource manager and click the **Disconnect** button.

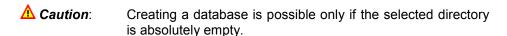


The connection to a datasource can also be terminated via the **Dismount Datasource** command on the context menu. For details about the Mount/Dismount Datasource commands, see **How to ...:** Datasources on Removable Media.

#### Creating a New Database

The Dionex Data System enables setting up a > Datasource with a new database. The new database is always in the Microsoft Access database format (mdb container).

- Open the >Browser and select the Datasources command from the File menu.
- Select New to create a new database.
- Enter the name of the new datasource; this name will be displayed in the Browser.
- Enter the path of an empty subdirectory in which to store the database for the new datasource. Use the **Browse** button to search for an empty directory.



If Common Data Source is activated, the Dionex Data System ➤ Server
can access this datasource. Processing sequences is possible only on datasources with this setting.



The local datasource is always selected as **Common Data Source**. If a datasource is not defined as **Common Data Source** under Windows NT/Windows 2000, the datasource must be set up for each potential user.

Upon completing the procedure (**OK**), the Dionex Data System generates a database named **cm\_local.mdb** in the selected directory. Databases with different formats cannot be generated in the Dionex Data System; they must be created with the appropriate database software.

#### Opening the ODBC Manager

⚠ Caution: Modifications to the ODBC configuration should be performed only by experienced users. Otherwise, loss of data may result and re-installation of the Dionex Data System may be necessary.

Normally, no modifications are required here. If a modification is required (for example, to repair a damaged database in a Microsoft Access datasource), proceed as follows.

• Click the **ODBC Manager** button in the *>Datasource* Manager to open the Windows *>ODBC* dialog box of the control panel.

# Handling Files, Datasources, and the Network

To handle, store, and save data in the best possible way, the Dionex Data System offers several options:

- Locking Datasources on Removable Media
- Locking Datasources, Directories, and Sequences
- Opening Protocol Data (Audit Trails)
- Creating Backup Files
- Restoring Backup Files

#### Locking Datasources on Removable Media

➤ Datasources can be installed on removable media (a floppy disk, Zip disk, CD-ROM, etc.), in addition to the hard disk of either the local PC or network PC.

• Select the **Mount Datasource** command on the **File** menu and select a drive, or search for the datasource via the **Browse** command.

The Dionex Data System will automatically show the Windows drive letters of all currently available removable media.

- If the Dionex Data System finds an existing datasource on the selected media, this datasource is automatically "connected" and is displayed in the Browser.
- If the Dionex Data System does not find a datasource on the selected media, the user can install a new datasource on this drive. The datasource will be given the name of the drive.



Datasources in the Microsoft Access database format can be copied to the removable medium. Simply copy the DATA directory of the local datasource of the corresponding subdirectory of a network datasource to the removable medium.



If a connection is established to a datasource on a removable medium via the **Mount Datasource** command, do not remove the medium until the connection is correctly terminated via the **Dismount Datasource** context command. **Otherwise, the operating system will crash!** 

#### ■ Locking Datasources, Directories, and Sequences

To protect data and results, the Dionex Data System allows you to lock > Data-sources, directories, or sequences. When the "Locked" status is enabled, it is not possible to modify the corresponding object. This also applies to all objects below the locked object. If, for example, a datasource is locked, all directories and sequences contained in the datasource are also locked. Locked items can be recognized in the > Browser by their icon (a red lock).

Proceed as follows to lock an object:

- Select the object in the Browser.
- Select the Properties command via the context menu and select the Locked check box in the edit box.

Proceed as follows to unlock an object:

- Select the object in the Browser.
- Select the **Properties** command via the context menu and clear the **Locked** check box in the edit box.

#### ■ Opening Protocol Data (Audit Trails)

From the Browser, protocol data (either **Protocol Data (Audit Trails)** for a single day (**Daily Protocols**) or for a single sample (**Sample Protocols**)) can be activated.

In the server datasource, daily protocols are located in the **AUDIT** directory under the corresponding *>Timebase*. Daily protocols can be opened by double-clicking.

To view a sample protocol, the corresponding sample must be selected. Select **Open** via the context menu (right mouse click) and open the sample protocol via **Audit Trail**. Alternatively, you can view sample protocols in the **Report**. To open the sample, double-click and select the **Audit Trail** tab.

#### Creating Backup Files

The Dionex Data System includes a program that allows you to create backup files.

Before starting the >Backup, the objects to archive must be selected in the >Browser. All selection options of the Browser are supported. Select the Export/Backup command on the File menu to open the Backup dialog box. Backup copies of the following objects can be created:

When selecting... ... a backup copy is created of:

a directory All subdirectories and the included files, sequences, etc. All samples, as well as files included in the sequence (QNT-File a sequence

and PGM-File).

individual samples The sequence information (name, directory, title, etc.), the se-

lected samples, and the ➤PGM and ➤QNT files used by the se-

lected samples.

other files The corresponding files.

When using the >Query function in the Browser, these are the selection options:

When selecting... ... a backup copy is created of:

individual samples The sequence information (name, directory, title, etc.), the se-

lected samples, and the PGM-File and QNT-File used by these

sequences All samples contained in the guery of the corresponding sequence.

The following linked objects are also copied when creating the backup:

Object Link

sequence Preferred *≻RDF* file

peak table Calibration list for the calibration mode "fixed".

Preferred RDF file Query

QNT-File samples

PGM-File

Select Backup to open the Backup dialog box. For a description of the individual fields, see *▶Backup*.

Before starting the backup, the required storage space is determined. In the case of hard disks and network drives, the Dionex Data System checks whether there is sufficient storage capacity. If there is not enough space, an error message appears to allow the user to cancel the backup procedure.

If using removable media, the expected number of media is displayed. The user is prompted to keep the media ready. If using data compression, the number of actually required media may differ from the displayed number.

After that, the selected objects are stored. A dialog box appears to allow the user to monitor the procedure. A progress bar indicates the current status. The bar corresponds to the percentage of stored data already copied to the medium.

If the destination is a removable medium, the user is prompted to change the medium, as necessary.

The backup is indicated in the >File History. The backup can be interrupted at any time by clicking the **Cancel** button. In this case, the backup contains all objects stored up to this point.

If the original objects should be deleted after the backup, a dialog box appears asking the user to confirm the action. If the history mode is active, a dialog box for entering a history comment will be opened.

Backup files have the extension **.cmb**. For information about how to open and restore backup files, see the topic below:

#### Restoring Backup Files

■ Note:

The easiest way to open archive files is to double-click the files in the Windows Explorer. Archive files have the extension .cmb.

After opening the dialog box, select the backup file to be restored. The Dionex Data System recognizes whether the file is stored on a removable medium, a hard disk, or a network.

If the backup file is stored on removable media, insert the first medium (which includes a list of the contents). The Dionex Data System displays the contents list of the backup file. For a description of the individual fields, see  $\triangleright Restore$ .

Following this dialog box, the selected objects are restored, together with the raw data files of the Audit Trails and the history. A new dialog box, similar to the Backup dialog box, appears. If the backup is located on several removable media, the user is prompted to insert the next medium, as necessary.

If the directory of an object to restore does not exist, it will be created. The corresponding sequence and datasource must exist. Missing directories will be created, as necessary.

If the destination object already exists, the user is prompted whether to overwrite it. The following options are available: **Yes**, **Yes to all**, **No**, **No to all**, and **Cancel**. Each restored object will receive a corresponding history entry.

The restoration can be interrupted at any time by clicking the **Cancel** button.

# Performing a Query

The term > Query refers to the search for data on the basis of specific search criteria. In the Dionex Data System, you can search for samples and the corresponding sequences with user-selected parameters. You can either use very detailed criteria to search for one specific sample, or more general criteria to search for a specific series of samples with the same properties.

Follow these steps to start a query:

- Change to the ➤ Browser and select the Query command via the right mouse button or select New / Query (using the Wizard) on the File menu. In either case, a ➤ Wizard opens to make it easier to enter the required conditions.
- On the first Wizard page, define the >Data Source in which to perform the
  query. In addition, specify whether to find certain >Sequence properties
  (Sequences), sample properties (Samples), and/or other conditions (Results).
- Define the individual conditions on the following Wizard pages. All pages that refer to the properties selected on the first page will open.

Clicking **Finish** opens another dialog box, which offers another four tabs:

- Select General to specify the datasource where the search will be performed.
- Select Native SQL to enter the SQL statement directly in the SQL syntax of the corresponding >ODBC driver (contains translated Dionex Data System statements).
- Select SQL to define the search statement in an entry dialog box.
- Select Result Restrictions to limit the resulting sample list via further result gueries.

For details, refer to the following topics:

- Entering the Sample Query Using a Wizard
- Selecting Search Criteria
- Examples (Wizard)
- Specifying the Sample Query Using the Dialog Box
- Editing SQL Statements
- Examples (Dialog Box)
- Saving a Query

#### ■ Entering the Sample Query Using the Wizard

On the first Wizard page, specify whether the >Query will be performed in the currently open >Data Source (Selected Datasource) or in a different one. Click the corresponding option to open the combo box and select the desired data source from the list.

In addition, you can define the criteria types for the query:

- ▶Sequences
- Samples
- Results (variables from the different report categories)

On the following Wizard pages, use **Data Field** to choose the variable whose property you want to find. Enter an operator and define the value (also see **Selecting Search Criteria**).

The combo box to the right of the respective line allows you to enter a logic connective with another search property. Only after you enter **AND** or **OR** can you enter a second search property.

Click Finish to complete the Wizard and to open the New Query Properties dialog box, where you can further specify your query (also see Specifying the Sample Query Using the Dialog Box).

#### ■ Selecting Search Criteria

The >Query allows you to search for samples and sequences, using a variety of properties. Enter the search criteria (see below) on either the Query Wizard: Sequences page or Samples page. To further restrict the query, double-click the SQL dialog box and enter the appropriate criteria in the Field of the Edit Conditions sheet.

#### Search Criteria

Sample Name

Sample Number

Sample Type

Sample Status

**Sample Comment** 

**Sample Inject Position** 

Sample Inject Volume

Sample Replicate ID

Sample Inject Time

**Sample Dilution Factor** 

Sample Weight

Sample Amount

Sample Raw ID

Sample User ID

**Sample Program Name** 

**Sample Method Name** 

Sequence Name

**Sequence Description** 

Sequence Preferred Channel

**Sequence Preferred Report** 

**Sequence Directory** 

Sequence Timebase

**Sequence Creation Date** 

**Sequence Creation Operator** 

**Sequence Last Update** 

**Sequence Last Update Operator** 

The search criteria can be divided into four different groups (1 - 4); see the table below for available groups:

- Text variables (e.g., Sample or Sequence Name, ...) (1),
- Numerical variables (e.g., Sample Number, ...) (2),
- Variables with specific values (Sample Type or Sample Status) (3), and
- Time variables (Sample Inject Time, Sequence Creation Date, ...) (4).

These search parameters must be further specified. Depending on the type, the search criterion can be linked with a value via various operators. The following operators are available:

Operator:	Searches all samples	Group no.
=	That are equal to the specified character string.	1, 2, 3, 4
<>	That are not equal to the specified character string.	1, 2, 3, 4
>	That are larger than the specified character string.	1, 2, 4
<	That are smaller than the specified character string.	1, 2, 4
>=	That are larger than or equal to the specified character string	1, 2, 4
<=	That are smaller than or equal to the specified character string	1, 2, 4
contains:	That contain the specified character string.	1
does not contain:	That do not contain the specified character string.	1
starts with:	That start with the specified character string.	1
does not start with:	That do not start with the specified character string.	1
ends with:	That end with the specified character string.	1
does not end with:	That do not end with the specified character string.	1
is like:	That fulfill the specified wildcard condition.	1
is not like:	That do not fulfill the specified wildcard condition.	1
is between:	That are between two values.	1, 2, 4
is not between:	That are not between two values.	1, 2, 4
during the previous:	That were created during a selectable time before the query.	4
is null	In which the variable does not exist.	1, 2, 3, 4
is not null	In which the variable exists.	1, 2, 3, 4

If the operators >, <, >=, or <= are used for text variables, the alphabetical order is considered (e.g., A<B).



All SQL time queries containing a relative reference (operator **during the previous** in the **Edit Condition** window) are recalculated for each query.

Wildcards ("placeholders") represent character strings. The following wildcards are valid for text variables with the operator "is (not) like":

Wildcard	Significance
%	Any character string with 0 or more characters.
_(underscore)	Any single character.
[]	A single character within a specified range (e.g., [a-f]).
[^]	Any character with the exception of the specified range.

As soon as the search conditions have been completed, you click the **Apply** button to start the query.

Further conditions can be entered on the **Result Restrictions** page of the Wizard or in the **Properties** dialog box via the **Edit Conditions** page of the **Result Restrictions**.

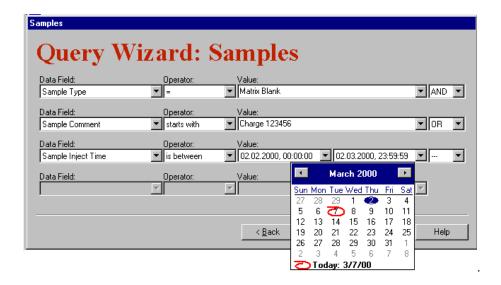


Depending on the number of samples resulting from the SQL query, the execution of the result restriction may take some time. After about 3 seconds, a window will indicate the status of the result restriction (in % of the samples to test). The user can cancel the query. Only the samples of the SQL query that have "successfully passed" the result restrictions so far will be listed as query results.

#### ■ Examples (Wizard)

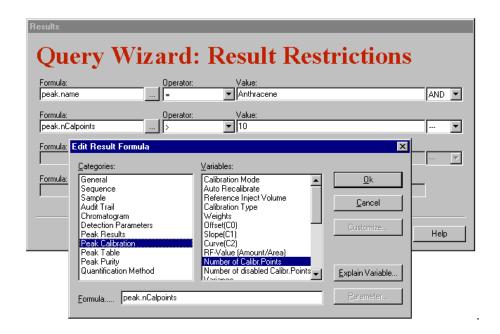
The following SQL query searches for all samples:

- with the sample type Matrix Blank and
- whose comment starts with Charge 123456 or
- an injection date between 2/2/2000 and 3/2/2000:



Use the following settings to restrict the query to samples

- containing an Anthracen peak or
- containing more than 10 calibration points:



For further examples on restricting the query, see **Examples** (Dialog Box).

#### ■ Specifying the Sample Query Using the Dialog Box

You can edit the properties of a > Query that has already been performed in the dialog box named **Properties of Query "xyz"**. To access this dialog box, click the query and select **Properties** on the context menu or **File** menu.

The dialog box contains the following four tabs:

- General tab: In addition to entering a query title, it is possible to specify the
  datasource where the query is performed. If this field remains empty (default), the datasource used is the one where the query is saved. The Preferred RDF-File setting is used for opening a sample or for starting a batch
  report.
- SQL tab: This tab allows you to edit the SQL condition(s) the samples must fulfill. You can open an Edit Condition dialog box via the Edit/Insert button, by double-clicking the left mouse button, or via the context menu. This box allows you to add (Restrict/Expand Condition) or change SQL conditions (Change Condition).

- Via Field, you can select a search criterion. To restrict the criterion, SQL operators are available (see How to ...: Selecting Search Criteria). The corresponding comparison value can be defined in the Value edit field. When editing a search criterion, all sequence and sample variables can be used.
- Native SQL tab: This tab dialog box translates the SQL statement into the SQL syntax of the corresponding ODBC driver. As the default, this sheet is "read only" and informs you about the SQL statement sent to the ODBC driver. Select the Always use native SQL option if you want to edit the SQL statement manually.

▲ Caution: If SQL conditions were edited, this "translated" SQL statement will be used to perform the query.

- **Result Restrictions** tab: The list of samples found via the SQL query can be further limited by result restrictions. Open the **Edit Conditions** dialog box by double-clicking the left mouse button or via the context menu, and then edit the result conditions. Specifying result restrictions generally limits the query to samples that contain raw data.
- As soon as the search conditions have been completed, you can start the search by clicking the Apply button.

#### ■ Editing SQL Statements

The **Native SQL** tab dialog box shows the SQL statement the Dionex Data System created from the database query specified via the **SQL** tab dialog box.

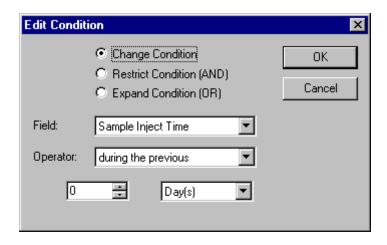
Users who are knowledgeable about the SQL database language can specify further conditions for their  $\triangleright Query$ . Be sure to select the **Always use native SQL** option if you want to edit the SQL statement manually.

⚠ Caution:

If you edit the SQL statement via the **Native SQL** tab, this "translated" SQL statement will be executed whenever the query is performed, as long as this box is checked.

### **Examples (Dialog Box)**

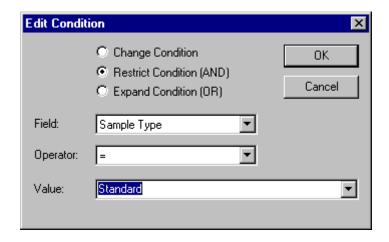
The following SQL query searches for all samples of the current day:



The SQL sheet will show the following:

Samples.smp\_inject\_time >= CURRENT\_INTERVAL '0' DAY.

To restrict the search to the current day's standard samples instead of all sample types, the SQL query must also include the following input:

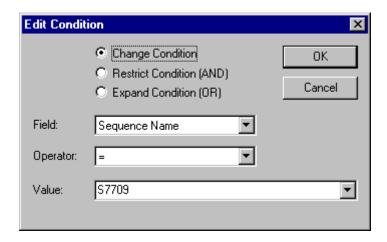


The SQL sheet now shows the following:

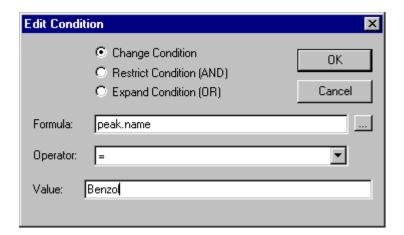
Samples.smp\_type = 'S'

AND Samples.smp\_inject\_time >= CURRENT\_INTERVAL '0' DAY

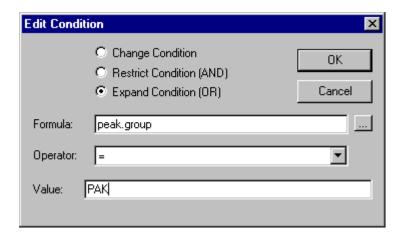
To search for all samples in a sequence named **S7709**, in which the peak **Benzol** (benzene) or a peak of the **PAK** (PAH) peak group was identified, first enter the following:



In addition, specify the following conditions in the **Result Restrictions** box:



Finally, enter the condition or PAK (PAH) in the Result Restrictions box:



The **SQL** sheet will now show:

Sequences.seq\_name = 'S7709'

and the **Result Restrictions** sheet will indicate:

peak.name = 'Benzol'
OR peak.group = 'PAK'.

For examples on entering the query using the Wizard, see **Examples** (Wizard).

#### ■ Saving a Query

Queries can be saved as a file in the datasource. For this purpose, open the  $\succ$  Query Wizard via the **File** menu or via the right mouse button. After entering the conditions, click the **OK** button to save these conditions as a query object under any file name.

In the Browser, the *>Query* is indicated by the following symbol:



If the cursor is positioned on a query, the Dionex Data System acts as when displaying a sequence: If the query is located in the left window section of the *Browser*, the sample query is immediately executed. The result will be displayed in the right window section. If the query is located in the right window

section of the Browser, pressing **Return** or double-clicking the file with the left mouse button will execute the guery.

A previously saved query can be edited via the **Properties** command on the **File** menu (or via the context menu).

# System Wellness

System Wellness provides built-in diagnostic and calibration features that help prevent unscheduled system shutdowns and ensure reliable operation of the DX-80 Ion Analyzer. For an introduction to System Wellness features, see System Wellness Overview.

System Wellness tasks are performed from the Browser. See the following topics for details:

- Opening a Wellness Control Panel
- Viewing and Restoring Calibration Data
- Performing Device Calibrations

Also see the following topic:

Enabling/Disabling System Wellness Functions

#### Opening a Wellness Control Panel

- 1. In the *▶Browser* under the local *▶datasource*, open the **Panels** folder and then open the **Wellness** sub-folder.
- 2. Double-click **DIONEX\_DX80\_WELLNESS.PAN**, the Wellness control panel for the DX-80 Ion Analyzer.
- 3. The control panel opens. The Dionex Data System then attempts to connect to the timebase assigned to the panel.
- 4. If an error message appears stating that the timebase was not found, close the message and then select **Connect to Timebase** from the **Control** menu. Select the timebase to be connected to the panel.
- 5. After communication is established with the timebase, the calibration and diagnostic controls on the panel are enabled.

## ■ Viewing and Restoring Calibration Data

Calibration data for the DX-80 Ion Analyzer is displayed on the Wellness control panel (see **How to...:** Depening a Wellness Control Panel).

The Dionex Data System stores three sets of calibration data for the DX-80 Ion Analyzer:

- **Current** is the data most recently sent (uploaded) from the DX-80. It is the data currently stored in the DX-80 memory.
- Previous is the data from the previous time calibration data was uploaded from the DX-80.
- Factory is the data obtained (uploaded) from the DX-80 when it was initially configured in the System Configuration program (see How to...: 
  Enabling and Disabling System Wellness Functions).

The Wellness control panel displays the current data and the date the current calibration function was performed. If the factory value is the current data, the date field displays "---."

• To view previous or factory data, or to download calibration data from the Dionex Data System to the DX-80, click the **Details** button.

A Calibration Details dialog box appears that displays the three sets of calibration data values and their corresponding dates. The dates indicate when the values were uploaded from the DX-80 to the Dionex Data System.

 To download calibration data to the DX-80, select Current, Previous, or Factory from the list to the right of the Download button. Then, select Download.

## Performing Device Calibrations

The Wellness control panel displays calibration data and provides command buttons for calibrating the DX-80 lon Analyzer. After a calibration is performed, the DX-80 uploads the new calibration data to the Dionex Data System.

Mote:

You may need to complete preliminary setup steps before the calibration procedure begins. Before selecting a calibration command from the control panel, see the topics below for details about the particular calibration task you plan to perform.

#### **Calibration Procedures**

- Pressure Transducer Offset
- Conductivity Cell

# ■ Calibrating the Pressure Transducer Offset

When to Calibrate: As required

- 1. Turn off the pump flow.
- 2. Open the waste valve on the front of the pump head.
- 3. Open the System Wellness control panel for the DX-80 Ion Analyzer (see How to...: Opening a Wellness Control Panel).
- 4. Click the calibrate offset command button under pressure transducer. The pump calibrates the offset and uploads the new value to the Dionex Data System. The Dionex Data System stores this new offset as the current value.
- 5. Close the waste valve.
- Connect a pressure gauge between the pump outlet and the pressure transducer. Turn on the pump and let the system stabilize. Note the average pressure reading on the gauge, and then enter this reading on the line labeled **Measured**.
- 7. Click the calibrate slope command button under pressure transducer. The pump calibrates the slope and uploads the new value to the Dionex Data System. The Dionex Data System stores this new slope as the current value.
- 8. Turn off the pump.
- 9. Disconnect the pressure gauge. Reconnect the pressure transducer to the pump.

#### Calibrating the Conductivity Cell

When to Calibrate: After installing a new cell

Every 6 months

Items Needed: 1.0 mM KCl solution: Prepare by dissolving 0.07456 g of reagent-

grade KCl in one liter of 18-megohm deionized water.

Backpressure tubing to provide at least 7 MPa (1000 psi). Use 0.076 mm (0.003 in) ID yellow PEEK tubing (P/N 049715).

1. Open the System Wellness control panel for the DX-80 Ion Analyzer (see How to...: Depening a Wellness Control Panel).

- 2. Remove the two screws securing the cell to the DX-80 component mounting panel. Let the cell hang by the tubing.
- 3. Allow the conductivity to stabilize for 5-10 minutes.
- 4. Click the calibrate offset command button under conductivity cell.
- 5. Reconnect the cell to the DX-80 component mounting panel.
- Disconnect the pump outlet line from the injection valve; connect the line directly to the cell inlet.
- 7. Verify that there is a minimum of 7 MPa (1000 psi) of backpressure.
- 8. Pump 1.0 mM KCl through the cell.
- 9. Allow the conductivity to stabilize for 5-10 minutes.
- 10.Click the calibrate slope command button under conductivity cell. The cell is calibrated and a new cell calibration constant is uploaded to the Dionex Data System. The Dionex Data System stores this value as the current cell calibration constant.

After calibration, the conductivity reading should be 147.00  $\pm~2~\mu S/cm$  and the cell calibration constant should be between 130 and 190. If this is not the case, refer to the troubleshooting section of the DX-80 operator's manual.

- 11. Flush the KCl solution from the system by pumping deionized water through the cell. When the conductivity drops to near zero, stop the pump flow.
- 12. Reconnect the pump to the injection valve and reconnect the line from the suppressor to the cell inlet.

# Actions in the Window Section "Chromatogram"

This window shows the integrated chromatogram of a sample. Normally, the software automatically determines and integrates peak areas. However, the user may manually modify the peak delimiters and baseline, assign peaks manually, and display other chromatograms for comparison. For details, refer to the following topics:

- Manual Re-Integration
- Manual Peak Assignment
- Performing a Chromatogram Comparison

For details on how to display a >Report, refer to the following topic under **How to ...:** 

Actions in the Window Section "Report"

# Manual Re-Integration

**Manual Re-Integration** includes all actions performed directly in the chromatogram via mouse-click by means of the **Automatic Tool** on the Integration > Toolbar. This includes the actions described in the topics below:

- Moving Peak Delimiters
- Modifying the Baseline
- Inserting a Peak

#### **Prerequisite**

An integrated chromatogram can be recognized by the red baseline below the peaks and by the peak delimiters on the left and right of the baseline (=integration limit).



These elements must be displayed in the chromatogram (see: Context menu (right mouse button) / Decoration / Peak Decoration).

Before performing any manual re-integration, it is helpful to zoom the area in which you want to perform a modification. Select the **Automatic Tool** on the

Integration toolbar to mark each place in the chromatogram that you plan to modify manually. The shape of the mouse cursor indicates which action is currently possible.

All modifications to the chromatogram can be undone, provided that they have not been stored. On the **Edit** menu, select the **Delete Manipulations** command.

#### Moving Peak Delimiters

When the **Automatic Tool** is selected, the mouse cursor changes its appearance near the blue peak delimiters. The cursor shape becomes peak start ( $\leftarrow$ ) or peak end ( $\uparrow \uparrow \uparrow$ ).

Press the left mouse button and move the mouse cursor to the new peak start or peak end.

It is not possible to "run over" a peak delimiter; the peak delimiter would be moved in the same direction. After positioning, the Dionex Data System draws a new baseline. The modified peak properties (area, width, amount, etc.) are immediately updated and displayed in the integration report.

Peak delimiters of negative peaks can also be moved. In this case, the presentation of the mouse cursor is mirrored.

#### ■ Modifying the Baseline

Two peaks that are not completely separated in a chromatogram can be integrated individually by dropping a perpendicular line from the minimum between the two peaks to the baseline. The intersection with the baseline is referred to as the "baseline node."

When the **Automatic Tool** is selected, each baseline node can be moved along the perpendicular line and positioned at any point; the node is then referred to as a "freely floating baseline node." Freely floating baseline nodes can be generated at the end point of a baseline, if desired.

If the mouse cursor approaches either a baseline node or a freely floating baseline node, the cursor automatically clicks into place and the shape  $(\uparrow, \uparrow)$  indicates which action is currently being performed.

The system automatically makes a distinction between moving a peak delimiter horizontally and a baseline node vertically, depending on the direction in which the mouse cursor is drawn.

Between two baseline nodes, the entire baseline can be moved vertically. The shape of the mouse cursor  $(\mbox{$\not;$})$  indicates whether the action is possible.

#### **Inserting Peaks**

In each free position in the chromatogram, as well as on the ascending and descending flanks of a peak, a new peak (i.e., a baseline and two peak delimiters) can be inserted. Places where this is possible are indicated by a small peak (A) on the right side of the mouse cursor.

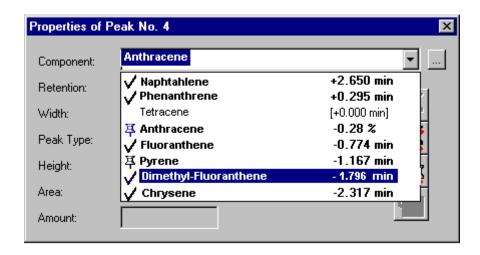
When you select the **Automatic Tool**, the mouse cursor indicates the places where a peak can or cannot be inserted. Other actions (edit modes) are not possible at this point.

# Manual Peak Assignment

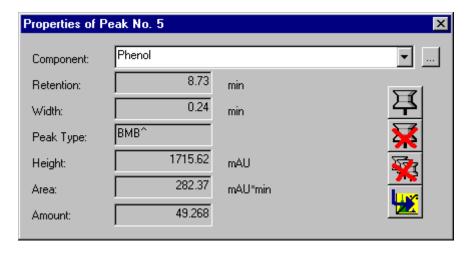
#### (Dialog box "Properties of Peak No. x")

If you have inserted a new peak, wish to name existing or unidentified peaks, or wish to rename incorrectly identified peaks, you can do this in the chromatogram in a report.

- Click the peak and then select the Peak Properties command on the context menu to open the Properties of Peak No. x dialog box, or simply double-click the peak.
- Enter the corresponding name under Component or select one of the names listed in the combo box. Pressing <Return> or the lowest symbol bottom inserts the peak into the peak table of the QNT method, using the retention time of the current chromatogram and the settings of the previous peak



It is also possible to rename an identified peak by manually assigning it a different name. Enter the new name, or select one of the names listed in the combo box, and then confirm your entry by pressing the first symbol button. Via the additional symbol buttons, you can cancel this action or delete all manual peak assignments (see quick info for the buttons). Manual peak assignments of identified peaks are not transferred to the QNT method; they apply only to the currently open chromatogram.



You do not have to close the dialog box to continue working in the chromatogram. The dialog box remains open until it is closed or until the chromatogram is closed.

# Performing a Chromatogram Comparison

Comparison is always between one or several channels of one or several samples. The channels must be selected and placed in relation to each other (i.e., they must be overlaid).

#### Selecting channels

- Display the chromatogram of a sample in an integration window by opening the sample (e.g., double-click its name in the ➤ Browser).
- Select one or several samples of one sequence in the Browser and drag the sample(s) into an open integration window while pressing the left mouse button. The action is indicated by a + sign on the mouse cursor. After releasing the mouse button, the chromatogram of the sample(s) is displayed. The same channel is used as for the reference sample.

or:

 Select a sample in the Browser, press the right mouse button and select Compare. The submenu of this command includes a total list of all recorded channel types. After selecting a channel, the chromatograms of all samples that have raw data for this channel are compared.

or:

- Select a sample in the Browser, press the right mouse button and select All
  Channels to compare all channels of a sample in a separate window. If you
  press the F4 key or the Shift+F4 key combination, the channels of all samples in a sequence can be displayed successively.
- If several samples are selected, all channels of the first selected sample are displayed. If you press the F4 key or the Shift+F4 key combination, you can browse through the selected samples.

or:

• Click the **Next/Previous Chromatogram** icons ( ) while holding down the Ctrl key to insert the chromatogram of the next or previous sample.

or:

Perform a ➤ Query over several sequences or datasources. Press the right
mouse button and select the Compare command. The submenu of this
command contains a complete list of all recorded channel types. After you
select a channel, the chromatograms of all samples that have raw data for
this channel are compared.

#### Relating channels to each other

For a sensible comparison of different chromatograms, a common reference point is generally chosen. The chromatograms are normalized. As the default, the retention time is used for the normalization; thus, all chromatograms are arranged so that their start points match (t = 0).

Alternatively, chromatograms can use a common peak as their reference point.

- Select the **Decoration** command on the context menu and open the **Comparison** tab dialog box.
- Select the reference peak from the At Peak list box.
- Select the Off option to overlay the peak selected below At Peak in all chromatograms.
- Select the Shift option if this is to be performed independently from the length of the chromatogram.
- Select the Stretch option if the chromatograms are to be stretched or compressed in x-direction, so that there is a time scaling in all chromatograms.
   The stretch 0 to 1 min (or n min) has the same length for all chromatograms.
- Activate the Normalize Signal check box if the peak height should match.
  Depending on how much the reference peak must be stretched or compressed, all other peaks in the chromatogram are also stretched or compressed. This enables an estimation of the amount for the same peaks from different chromatograms.

If you want to offset the chromatograms in x- and/or y-direction, this is performed via the signal or time offset.

- Activate the **Time** check box to move the current chromatogram in the x-direction.
- Activate the Signal check box to move the current chromatogram in the ydirection.

The offset is specified as a percentage of the signal or time axis. A signal offset of 5% shifts each following chromatogram upward by 5%. Accordingly, a time offset causes a percentage alteration in the x-direction. This results in a "pseudo 3D" presentation.

# **Actions in the Window Section "Report"**

The Dionex Data System offers numerous options for working with *▶ Reports*.

For details, refer to the topics below:

- Displaying a Report
- Peak Summary
- Audit Trail

### ■ Displaying a Report

Each of the method windows (integration or calibration plot) can include a numerical > Report.

• Select the **Report** command from the **View** menu.

If you have not generated a report before, a default report will be opened. The default report contains several worksheets (or report types): **Integration**, **Calibration**, **Peak Analysis**, **Summary**, and **Audit Trail**.

 Use the tab in the lower left corner of the report to change from one worksheet (or report type) to another.

Each worksheet includes a number of default variables that are an integral part of the corresponding report type. For example, in an integration report, these include the **Ret. Time**, **Area**, and **Amount** columns. A calibration report contains columns named **Offset (c0)**, **Slope (c1)**, **Curve (c2)**, etc.

Without requiring additional input, these predefined report sheets are available for various purposes.

# Peak Summary

To generate a **Peak Summary**, use the worksheet by this name in the window section **Report**.

The required steps are described under **How to ...:** Displaying a Report.

In contrast to a "normal" > Report, which lists the data of various peaks in one sample, the Peak Summary represents data of a specific peak from several samples (generally a sequence). A line therefore contains not only the informa-

tion on one peak, but information on *one specific peak* in a sample. The user decides which peak to represent by selecting the peak in the chromatogram.

The default Summary report contains several columns. In addition to the sample name and the retention time, it also includes columns for **Area**, **Height**, **Amount**, **Types**, and **Plates**. As soon as a user selects a peak in the chromatogram, the values of this peak are included in the Summary report. If the selected peak is not contained in a sample, this line remains empty (n.a. = not available).

Below the sample list are lines for the **Average** and **Relative Standard Deviation**. The average value of a column is calculated and displayed. The relative standard deviation from this value is indicated in percent.

The user can modify the default Summary report at any time. However, this is not advisable; if you need another report, create an additional Peak Summary report sheet with new column assignments.



Instead of a single sequence, a Summary report sheet can also be created on the basis of various samples and sequences. In this case, a  $\triangleright Query$  must be started in the Browser.

#### ■ Audit Trail

The **Audit Trail** can be included in a **Proposition** Report Template via a worksheet. The sheet always shows the Audit Trail for the currently selected sample (= **Sample Protocol**).

- The Day Time column indicates the time of a command or message.
- The **Ret.Time** column indicates the corresponding retention time.
- The Command/Message column shows the command itself, a message text, or an event.

The contents of the worksheet can be included in other documents via Copy & Paste. It is also possible to print the entire Audit Trail via the method Printer Layout.

# Actions in the Window Section "Calibration Plot"

The **Calibration Plot** window section includes two sub-windows. The **Calibration Curve** section displays the calibration curve calculated from the calibration points. The **Calibration Function Data** section lists the most important calibration data of the current peak.

In addition, the following options are available:

- From the menu of the right mouse button, select **Next Peak / Prev.Peak** to view the calibration curve of the next/previous peak.
- Select **Decoration** to change the caption, color, and axes.

#### Printing with a Report Template

If you want to print one or several samples, you will be prompted for the name of a *➤ Report Template* or a worksheet.

The results of a sample are then printed in the defined form. However, report templates or worksheets only refer to the presentation of results.

The **Print Setup** and **Page Setup** settings are stored separately for each worksheet in a report template (**Integration**, **Calibration**, **Peak Analysis**, etc.). Select the desired settings for each worksheet separately.

• Select the **Print Setup** command on the **File** menu to determine the printer, the paper size, and the format (portrait or landscape).

Note:

The **Print Setup** settings selected here apply only to the report definition file of the current sequence. They do not affect the default settings for Windows. Similarly, changing the default printer, paper size, and format in Windows will not affect the settings selected here.

- Select the Page Setup command on the File menu to determine the appearance of the headers and footers, the size of the margins, the alignment, etc. You can also set a grid, determine whether column headers are displayed, and specify whether the printout is in black and white or in color.
- Select the **Batch Setup** command on the **File** menu to determine how to print or to export. Specify which worksheets of a report template are printed,

and for which type of samples this is performed. Also, define the export format and specify where to store the data to export.

# **Device Control**

# Controlling the DX-80 Ion Analyzer

The following operating functions can be controlled from the DX-80 control panel:

Pump Turns the pump on and off. During a running batch, *≻Batch Process*-

ing is stopped

**Connect/Disconnect** Connects and disconnects the DX-80 from the > Timebase.

Autozero Resets the signal to zero.

# **■** Monitoring the DX-80 Ion Analyzer

The following operating functions can be monitored (but not controlled) from the DX-80 control panel:

Function	Meaning	
System Status	Checking: Indicates that the signal is being checked to ensure that Ready conditions are met before the sample is loaded.	
	Ready: Indicates that the system passed the check and is ready to load the sample.	
	Running: Indicates that data acquisition is in progress.	
AS40	Indicates whether the AS40 Automated Sampler (if installed) is idle or loading.	
Valve	Indicates whether the injection valve is in the load or inject position.	
Manual Over- ride	Manually toggles the injection valve between the load and inject positions.	
Signal	The offset or total signal value.	
Autozero	Resets the signal to zero.	
Show Plot	Displays the signal window.	
Pump	The pressure reading.	
<b>Program Time</b>	The elapsed time and the total run time.	
Audit Trail	The <i>&gt;Audit Trail</i> .	

# Using Keyboard Shortcuts

Many operations, especially in online control, can be performed via shortcuts.

	Action	Where	Reaction
General	Esc or		aborts Drag/Move
	right mouse but- ton		
	F1		opens the context-sensitive Help
	F2		activates the Edit mode
	Alt+Enter	≻Browser + ≻Panels	opens the respective Properties
	Ctrl + Tab		toggle between open windows
	Ctrl	signal window in the <i>≻Report</i>	for zooming (changes the cursors to the zoom cursor)
Edit	Ctrl. + X		Cut
	Ctrl. + C		Сору
	Ctrl. + V		Paste
	F9		Fills the column / selected cell(s)
			with the first value of the selection
Control	Ctrl. + F		Flow Command
	Ctrl. + I		Inject
	Ctrl. + Break		Pump Stop
	Pause		Hold Mode
	Ctrl. + A		Data Acquisition On
	Ctrl. + B		Edit Batch
Signal window	Double-click	- Overview window	Unzoom
C.g	2000.0 0	- Time axis	Auto Plot Speed
		- Signal axis	Autoscale
		- Plot range	Signals
		(- otherwise:)	Axis/Decoration
	Shift	- when Zooming	Retains scale ratio between sig-
	Office	- when 200ming	nal and value axis (i.e., the shape of chromatograms is maintained)
Command But- ton	Click	pressed button	Indicates running program. Stops program upon confirmation.
Edit Field	Tab/Enter		Sends the new value
	Esc		Aborts entry

# Glossary

# **Acquisition On/Off**

The **Acquisition on** command activates data recording ( $\nearrow Raw\ Data$ ) from all selected  $\nearrow Signals$  of a timebase. Each signal is stored in a separate file. The type of data from each signal is determined via signal parameters.

Raw data acquisition may be interrupted via the  $\succ$ *Hold* and  $\succ$ *Stop* commands. The  $\succ$ *Continue* command is used to resume acquisition. To terminate raw data acquisition, select the **Acquisition off** command.

Motes:

To reduce the raw data storage requirements, **Acq. on** should be activated after the **Inject** command, but at least 30 seconds before the elution of the first peak.

The command can be selected from the Menu command, or automatically via the >PGM File.

# **AIA (Analytical Instrument Association)**

AlA is the abbreviation for **Analytical Instrument Association**, an association comprised of companies that manufacture and sell chemical analysis instruments and software. The AlA is dedicated to developing guidelines for a standardized chromatography file format; a standardized format facilitates data exchange between laboratory systems produced by different manufacturers. Standardization efforts also involve operation, documentation, maintenance, and GLP (Good Laboratory Practice) requirements.

The generally valid AIA export format for chromatography data is known as **ANDI** (**AN**alytical **D**ata **I**nterchange/Chromatography). Since 1992, there have been five data format categories (Category 1 through 5). However, only Categories 1 and 2 are widely accepted.

Data formats of *Category 1* comply with standard raw data, unit, and scaling guidelines, and include information about where the original data and corresponding methods are stored. This allows exact restoration of a chromatogram from raw data.

Data formats of *Category 2* also transmit all calculated results (e.g., on the basis of a chromatogram), in addition to amount values and names for substance identification. The data can thus be managed in a database or a LIMS system.

#### Using the AIA format (ANDI) in the Dionex Data System

The ANDI format can be used to export data from the Dionex Data System. Select the **Export/Backup** command on the **File** menu of the Browser and

open the corresponding dialog box via the ANDI/Chromatography (AIA) option.

It is also possible to export and print data simultaneously. Select the **Batch Report** command on the **File** menu of the Browser. The **Export** option opens the **Batch Setup** dialog box. The AIA format is defined on the **AIA format** (\*.cdf) tab.

You can also import AIA files into the Dionex Data System. Select the **Import/Restore** command on the **File** menu and select **ANDI/Chromatography AIA**. A dialog box opens, in which you may select the file you want to import.

# **AIA Peak Type**

See > Detection Code at Peak Start / End.

#### **Audit Trail**

An Audit Trail is a daily and sample protocol that is kept independently by the system. The Audit Trail contains all operations relevant to GLP (Good Laboratory Practice), such as current and future commands, events, and error messages.

For additional information, refer to the topics:

Audit Trail

■ Protocol Data

#### **Auto Autoscale**

Use the **Auto Autoscale** option to automate the performance of the *≻Autoscale* function.

During data acquisition, this option adjusts the scaling of the signal window to exactly the size of the current chromatogram when the signal window border is exceeded in the x or y direction.

# **Autosampler**

Autosamplers allow automation of routine analyses. A number of samples can be prepared and then processed (injected) in automatic > Batch Processing.

A distinction is made between the following two states:

#### Loading the Sample

The fluidic input and output are directly connected. The solvent flow delivered by the pump is via the sampler to the column. In a second cycle, the volume to be injected is drawn from a sample vial into the sample loop, using a syringe.

#### Injecting the Sample

To inject the sample, the needle is lowered into the autosampler inject port. A valve directs solvent flow from the pump to the column, via the sample loop and the needle seat or inject port. Sample residue in the syringe is discarded to waste.

#### **Autoscale**

The **Autoscale** option adjusts the scaling of the signal window exactly to the displayed window section (e.g., the height of a peak).

The difference between the maximum and minimum values of the largest peak fills 80% of the signal axis in the online mode.

Select the >Auto Autoscale option to perform Autoscale automatically.

#### **Autozero**

The **Autozero** command resets signals to zero. The subsequently measured data is interpreted and displayed in relation to the new zero point.

Motes:

The >Acquisition On command automatically performs the Autozero function.

# **Backup**

The **Backup** command allows storing data for data security. The procedure is described in the section **How to ...:** Actions in the Browser Creating **Backup Files**.

The Dionex Data System stores data in databases and other files organized in a hierarchical directory structure. There are many links among the included objects.

For problem-oriented data archiving, it is necessary to know how individual objects are linked with each other. Because conventional backup and archiving programs do not offer this support, the Dionex Data System has its own backup program. This integrated backup program offers the following functions:

- Archiving of all objects displayed in the Browser (samples, sequences, files, entire directory trees, etc.), together with all linked files (➤Raw Data, Audit Trail ( Protocol Data), history, preferred RDF file, etc.)
- Selective restoration of objects stored via backup
- Compression of the stored data
- Division of the backup files onto several media (e.g., diskettes or ZIP drives)
- Optional deletion of original files after the successful backup
- Generation of corresponding entries in the file history

Backup files are located outside the datasources. Therefore, backup files cannot be stored within the directory structure of the datasources and they have no file history.

Use the **Restore** command (see **How to ...:** Actions in the Browser / **Restoring Backup Files**) to restore backup files that were created via the **Backup** function.

#### **Baseline**

The line drawn from peak start to peak end for calculating the peak area is called the **Baseline**.



In colloquial language, the chromatogram section between two peaks is also referred to as the baseline.

# **Batch Processing**

Repeating a processing step several times is referred to as batch processing (also called batch or online batch). In chromatography, this means automatically processing or analyzing several samples in a defined order.

For details, see:

Samples and Sequences / Online Batch.

#### **Browser**

The Dionex Data System Browser enables you to set up, delete, and move > Datasources, subordinate directories, and files.

The Browser displays samples, methods, and programs, as well as additional details about a > Sequence. The functions and the structure are similar to the Windows Explorer. Open the individual files by double-clicking.



Caution:

The Browser functions and structure are similar to those of the Windows Explorer. However, do not confuse the Browser and Windows Explorer. Do not use the Windows Explorer for operations within Dionex Data System datasources.

For further details, refer to:



# **Chromatogram Overlay**

Select Chromatogram Overlay to display an earlier chromatogram in an online signal window of a control panel. The Add Overlay command on the File menu can be used to overlay the current chromatogram with an earlier one.

The comparison chromatogram can be taken from an already processed sample of the current sequence, or from any other sequence.

Also refer to: Chromatogram Comparison.

# **Chromatographic Methods**

All instructions and parameters regarding sample analysis and processing are referred to as chromatographic methods. Depending on the included information, the following distinction is made:

Chromatographic method Program files (PGM-Files)		d	Description	
			Commands and instructions enabling automation of the analysis.	
Quantification Files)	methods	(QNT-	All parameters required for qualitative peak identification and for quantitative area determination.	

The data are stored in the >Sequence Directory or are copied there by the data system.

# **Chromatography Server**

See *>Server*.

#### Client

Workstations that can start the Dionex Data System are called clients. The client provides a user interface that allows access to chromatography data and databases, as well as appropriate representation of their contents.

To control or monitor a chromatography system from a client PC, the client must be connected to the chromatography > Server Normally, this connection is established when opening a > Control Panel. As soon as there is a connection, the user has access to the timebase(s) installed on the server.

To manage database access, the Dionex Data System uses the capability of modern **Operating Systems** to share resources. Thus, a client can access all files or databases for which sharing was issued on a different workstation.

It is only possible to monitor and control a system via the client. To do this, the client must establish a connection to a (chromatography) > Server.

In combination with a **Network**, this allows operation of a system, as well as online representation of the system status and the current chromatogram course, from any client. Synchronous control of a system via several clients is not possible.

#### Comment

In addition to the sample name, further comments can be entered here.

Press the F8 key or double-click to access the enlarged edit field.

#### Connect

Execute the **Connect to Timebase** command to connect a user PC (*>Client*) with a timebase (*>Chromatography Server*). In a network installation, a connection can thus be established between the current client and any server within the network.

Select the **Connect Device** command to connect a device with the server to enable remote control. The command verifies that the specified device is actually connected and then activates the instrument. For all installed instruments, the **Connect** command is automatically executed when the program is started.

# **Contents (Button)**

The **Contents** tab dialog box in the online Help shows the contents list. Click a **book** icon to see further topics of a chapter. Click a **document** icon to open a specific Help topic.

#### Continue

The **Continue** command cancels the >Hold and >Stop Flow commands. If a sample batch was interrupted, it will resume. If pump flow was interrupted, it will resume.

#### Control Panel

See *>Panel*.

#### **Data Collection Rate**

The data collection rate (or sampling rate) is the rate at which the data system collects digital data points from the detector, expressed as points per second or hertz (Hz).

#### **Datasource and Database**

The term datasource is used for a database that is registered on a Dionex Data System server. Setting up (registering) a datasource is performed in the *>Browser*. The user specifies the format and the location of the database. For details, see **How to ...:** Actions in the Browser / Setting up a Datasource.

During the initial Dionex Data System installation, a local default datasource is created on each Client PC. In network operation, the datasource name is composed of the computer name and the addendum LOCAL (<PC-NAME\_LOCAL>). In a local station not included on a network, the name stated in the operating system below Control Panel / Network / Identification is used. If no identification is entered, the datasource is named DE-FAULT\_LOCAL.

Normally, Dionex Data System data is stored in an Access database (i. e., in an MDB (**Microsoft Data Base**) container). The default datasource is also based on an Access database. The *>ODBC Capability* of the data system also allows using various other formats (dBASE, SQL, Oracle, etc.). Independently of the chosen format, data of single samples (*>Sample Data*) are saved, as well as data of sequences (*>Sequence Data*).

Databases can be saved on a local hard disk or any other mass storage device.

The **Directory** command allows the creation of individual subdirectories below a datasource. The directories are used for saving *≻Sequences* and corresponding data and programs.

#### **Network Database**

If the datasource is located on a centralized network PC, the database is accessible by all clients that are granted the appropriate access rights by the system administrator. If the datasource is stored on a local hard disk, it is up to the corresponding client to decide whether the database can be accessed via the Windows **File Sharing**. The Dionex Data System also offers the option of locking datasources, directories, or sequences.

For further details on datasources, see the chapter **Data**: **Datasource**.

#### Non-Availability of the Network Database

In many companies and organizations, the database server is shut down during the daily backup. As with a network breakdown, the database will not be available during this time. In this case, it is known, however, when the database will not be available. The Dionex Data System should be disconnected before the backup to ensure data integrity. When the database is available again, the Dionex Data System automatically connects to the database and writes back any data that were acquired during the breakdown.

# **DELTA (Signal Property)**

The Dionex Data System is capable of recording and evaluating signals or output variables supplied by a detector. Instead of the actual value, the changes of a variable in a specific period of time can be calculated. This is possible via the DELTA signal property. For more information, see > Trigger Condition.

#### **Demo Mode**

Demo Mode lets you simulate data acquisition by loading a pre-recorded demo file and then displaying the data from the demo file in the *Panel's* signal window. The demo file is "read back" as though the data were being acquired in real time.

For information on how to simulate data acquisition, see **How to ...:** Actions in the Control Panel / Using/Recording Demo Data.

# **Detection Code at Peak Start / End (AIA Peak Type)**

This peak result variable indicates how the peak start is classified. In principle, this corresponds to the peak type classification used in the Dionex Data System. The classification described below complies with the  $\geq AIA$  convention.

The following AIA peak types are evaluated:

AIA Peak Type	Description	Dionex Data System Peak Type
B (baseline peak)	The peak starts on the base-line.	BM, bM
VD (vertical drop)	The peak starts with a perpendicular line dropped to the baseline.	MB, M
PT (pretangent skim)	The peak is interpreted as a rider.	Ru or Rd

## **Device Driver**

Each controllable instrument has its own device driver. The driver is activated when the Dionex Data System is started. The device driver translates the user's PC instructions (via "mouse click") into device-specific digital commands that are converted into "real control commands" after the data are transferred to the instrument. Similarly, the signals of all instruments (readings, status information, etc.) are converted so that they can be read by the Dionex Data System and can be displayed on the screen.

Device drivers are also capable of monitoring regularly inquired or automatically given device parameters in a target/actual value comparison. Unexpected events can be corrected or displayed (in an error message). If the functionality of the driver can be modified via parameters, this is performed in the **Server Configuration Program**.

The names of the device drivers are derived from the corresponding instrument. The extension **CDD** means "Chromatographic Device Driver." The device driver for the DX-80 Ion Analyzer is **DX\_DX80.CDD**.

During the Dionex Data System installation, all device drivers are saved in the BIN directory and receive a version ID that can be viewed via the **Properties** command on the context menu (e.g., in the Explorer).

## **Dilution Factor**

The >Sample Variable Dilution Factor is a correction factor for the amount calculation formulas.

As the injection volume, it can be used in multiple-point calibrations to define the dilution of subsequent calibration samples. For integration samples, it serves to account for any dilution that was made before injection.

The calculated result is corrected by the appropriate dilution factor for all peaks of a sample.



The effect is reciprocal to the injection volume (i.e., if the dilution factor of a sample is larger than that of the previous sample, the sample contains less of the component than the previous one).

#### Disconnect

Select the Disconnect command to separate a user PC (client) from a timebase. The specified instrument is no longer monitored by the data system, nor can it be operated via the data system.



Select the **Connect** command to undo the operation.

# Dongle

A dongle is an adapter that is placed on the parallel PC interface. The free end of the adapter is designed as a parallel interface connector and thus provides the parallel interface functions. The dongle stores the serial number of a Dionex Data System station. Each station has its own serial number.

The Dionex Data System be operated correctly only if the serial number of the dongle and the *≻Key Code* stored in the Dionex Data System match.

If there is no dongle or license server (or if the key code is incorrect), the Dionex Data System can be operated only in demo mode.

For further details, refer to the chapters Installation 5 Software Protection and How to ...: Actions in the Server Configuration Program / Selecting the Copy Protection Location and Entering the Key Code.

# Drag & Drop

The Drag & Drop function is a way to copy, move, and print any element, instead of selecting the corresponding menu commands.

The **Drag & Drop** function is available in both the online and offline modules. and is most useful when editing lists. Press the mouse button and keep it pressed to move the selected element to its new position. To move an object, use the left mouse button. To copy an object, use the right mouse button.

# F1 Key

Press the F1 key to open context-sensitive online Help; this is the displayed help text that refers to the current cursor position.

# **File History**

The File History mode allows complete documentation of any changes and operations performed in specific objects and files. Objects include samples, >Sequences or datasources, >Control Panels, report templates, RDF-, >PGM-Files, and/or >QNT-Files, and, of course, modified chromatograms.

The File History mode can be activated (or deactivated) individually for each datasource (see **Properties of a datasource / Enable Modification History**). When this mode is activated, each user is prompted to enter a comment before saving the changed object.

To view the changes documented so far, select a datasource, a directory, or a single object, and then select the **Show History** command.

# Find (Button)

The **Find** tab in the online Help window allows you to find specific words, terms, or text included anywhere in the online Help.

#### **Full Size**

The **Full Size** function undoes all previous **Zoom** operations. To undo only the last operation, use the **Unzoom** function.

In the signal window, double-click in the >Overview Window to implement the Full Size function.

# **GLP ("Good Laboratory Practice")**

Good Laboratory Practice means the adherence to regulations pertaining to the organization and conditions of planning, performing, and monitoring laboratory work. GLP contributes to enhancing the quality of test data.

A special focus is the complete and clear listing of the complete data in an analysis process. Also, regular checks of the instruments and the software are required.

# Help

See ➤ Online Help.

#### Hold

The Hold command stops *>Data Acquisition* and automatic *>Batch Process-ing*.

In the Hold mode, no more data is acquired, the pump continues delivery, and processing of the batch samples is stopped before the next sample.

All processes can be completely aborted via the  $\gt Stop$  (Flow) command, or can be continued with the  $\gt Continue$  command.

# Index (Button)

The **Index** tab dialog box contains an alphabetical list of online Help topics. Enter the initial letter of the topic and select **Display** to view Help information on this topic.

# **Industry Minute**

An industry minute (also referred to as *decimal minute*) has 100 units, instead of 60 seconds.

"2.500" (industry minutes) therefore means "2 minutes, 30 seconds" and "2.100" means "2 minutes, 6 seconds", etc.

# **Injection Time**

The column **Inj. Time/Date** shows the day, month, year, hour, minute, and second when the sample was injected (please also see > *Time*). This column cannot be edited. The Dionex Data System enters the injection time of the sample in the corresponding column of the sample list.

The kind of entry (empty or time value) indicates whether and when the sample was processed.



The time difference between successive samples is generally the analysis time plus the time required for injecting the following sample. As the injection time is generally minimal, the time value provides a reliable indication as to whether the sample batch was processed without incident.

#### **Isocratic**

A solvent flow of constant composition is called isocratic. This may be either a pure solvent or a solvent mixture of constant composition. The DX-80 Ion Analyzer delivers only pure solvent.

# **Jump to Another Help Topic**

As soon as the mouse cursor is positioned on a link term, it changes into a pointing hand. All link terms are displayed in green.

Terms underlined by a dotted line (e.g., >Dongle) are links to additional information in a pop-up. Terms underlined by a single line are links to a new Help topic.

# **Key Code**

The range of functions available for an individual Dionex Data System station is determined during installation by a key code. Each Dionex Data System station is fitted with a *> Dongle*; the station can be operated only if the serial number coded in the dongle matches the 12-digit key code.

Each user who expands the Dionex Data System scope of functions by acquiring the corresponding licenses receives a new key code. The extended scope of functions becomes available as soon as the new code is entered.

Enter the key code via the **About** box on the Help menu or via the *>Server Configuration* program. Valid characters are numbers and letters. The input is not case-sensitive.

For further details, refer to the sections Installation Software Protection and How to ...: Actions in the Server Configuration Program / Selecting the Copy Protection Location and Entering the Key Code.

#### License Server

If a site includes a large number of computers, the Dionex Data System licenses can be managed by the optional Dionex Data System License Server. With this type of installation, it would not make sense to equip all client PCs with >Dongles and to enter the corresponding >Key Codes.

If no dongle or License Server is specified, the Dionex Data System can be operated in the demo mode only.

For further information, refer to the following:

Installation Software Protection and

How to ...: Actions in the Server Configuration Program / Selecting the Copy Protection Location and Entering the Key Code.

#### LOG

The **LOG** command allows the user to document the values of variables in the Audit Trail at any time. This option is especially useful for logging information that is not periodically retrieved.

The function is available by selecting **Command** on the **Control** menu.

#### **Moduleware**

The instrument control firmware installed in each DX-80 Ion Analyzer. The DX-80 Moduleware sends status information and data to the Dionex Data System and receives control parameters from the Dionex Data System.

# "Monitor Only" Mode

If a connection is established to the local server via a control panel, you can control the instruments connected to a timebase via the controls on the control panel (control mode). The purpose of monitor only mode is to prevent multiple users from simultaneously controlling a timebase.

For example, assume that user A has control of the local timebase. If user B accesses the same timebase, this user is automatically assigned **monitor only** status. This means that user B can view all current values and states in the control panel, but cannot change any of them.

#### **Changing from Monitor Mode to Control Mode**

To change between the two modes, activate or deactivate the **Monitor Only** command on the **Control** menu.

# Multi-Tasking

Multitasking refers to the simultaneous operation of several programs on a PC. Allocation of processing time under Windows 98 and Windows NT/2000 is

monitored and controlled externally (pre-emptive). This guarantees that each application (process) is automatically continued after a specific time. A single process cannot claim all processing time at the expense of other processes.



Pressing the key combination Alt-Ctrl-Del interrupts multitasking in Windows 98 and stops all running processes. It also interrupts the Dionex Data System device control. Do not press the key combination Alt-Ctrl-Del in Windows 98 during a running batch or during data acquisition. This will cause data overrun and communication problems with the controlled instruments. This does not apply to the Windows NT operating system.

# (Signal) Noise

The **Signal Noise** parameter indicates the signal noise within a chromatogram, as calculated by the Dionex Data System. The value serves as the basis for the *Signal-to-Noise Ratio* determined from the raw data at the start of data acquisition.

#### **Determining the Signal Noise (according to the default)**

All data points recorded during the first 10 seconds of a chromatogram form the basis for determining the noise value. The Dionex Data System calculates a regression line using the method of least squares, and then determines the maximum distance of a data point above *and* below the line. (When calculating the regression line, all data points are weighted with their corresponding step unless the step is equidistant.) Adding both values supplies the first noise value.

The same procedure is used for the last 10 seconds of a chromatogram and supplies a further noise value.

# **ODBC (Open DataBase Connectivity)**

ODBC is the name of a standard database interface that allows access to various databases (e.g., SQL server, dBASE, or ORACLE) via an ODBC driver.

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# **Online Help**

The Dionex Data System **Online Help** offers help information for any situation on the screen.

- Press the Help button on the toolbar to view help information for a specific item on the screen.
- Press the F1 key to see context-sensitive help information for a specific situation. A description of the selected menu bar, (tab) dialog box, or activated control will appear.
- Select Index on the Help menu to view the table of contents for online Help.
   Select Using Help to see more details about using online Help.

# **Operational Qualification (OQ)**

According to the definition formulated together with EUROACHEM, Operational Qualification is "the process of demonstrating that an instrument will function according to its operational specification in the selected environment" [P. Bedson and M. Sargent, Accred. Qual. Assur. (1996) 1, 265-274]

The purpose of OQ is to prove and document that your analytical system functions according to its operating specifications, while taking into account your specific environmental conditions. Normally, OQ is performed following the installation of a new device or following a repair or system service.

The **Qualification** menu of the Dionex Data System Browser includes the **Instruments OQ** and  $\triangleright OQ$ -Setup commands. Select **Instruments OQ** to perform the operational qualification. Select **OQ Setup** to generate the templates required for performing the operational qualification. Normally, this is only necessary after a new installation or when the configuration has been modified.

The individual report pages of the **Instrument OQ** correspond to the *Performance Qualification* pages for instruments. However, the limits valid for OQ are stricter than those used for PQ.

#### OQ

See ➤ Operational Qualification (OQ).

# **Original Size**

See *>Full Size*.

# **Overlay**

See *➤ Chromatogram Overlay*.

#### **Overview Window**

When zooming, an overview window is displayed in the upper right corner of the signal window. The overview window shows the entire chromatogram and indicates the currently enlarged section.

#### **Panel**

In online control, the control and display elements combined in one window are referred to as a Control Panel. The control and display elements allow controlling and/or monitoring a *Timebase*. The DX-80 Ion Analyzer timebase is Dionex DX80.PAN.

Also see:

How to ...: Actions in the Control Panel.

# **Peak Summary**

A Peak Summary lists peak and sample variables of any required samples in a table. Generally, it includes samples of one sequence. A Summary can also be created on the basis of a  $\triangleright$  Query.

For details, see:

Peak Summary Report

## **Performance Qualification (PQ)**

As defined in cooperation with EURACHEM, Performance Qualification is "the process of demonstrating that an instrument consistently performs according to a specification appropriate for its routine use" [P. Bedson and M. Sargent, Accred. Qual. Assur. (1996) 1, 265-274].

The task of PQ is to prove and to document that your system functions as required by your special (routine) operation. The frequency and the scope of the Performance Qualification depend on the special requirements in your laboratory. This can be specified in internal instructions or in an SOP. The parameters should be similar to those of routine operation. In addition to the Performance Qualification, the >Operational Qualification is an important factor for validating instruments and software.

The **Qualification** menu of the Dionex Data System Browser includes the **Instruments PQ** and **PQ-Setup** commands. Select **Instruments PQ** to perform the performance qualification. Select **PQ Setup** to generate the templates required for performing the performance qualification. This is usually necessary only after a new installation or when the configuration was modified.

The Dionex Data System CD supplies a datasource with a master template in the directory named PQ\Templates\PQ. This template is designed for the Performance Qualification in a standard HPLC configuration. In addition to various sequences, the template contains a PQ report template with the following sheets:

#### SPECIFICATION:

The **SPECIFICATION** sheet lets you enter the system specifications (instruments, fluidics, and limits).

#### INJ\_FLO\_PREC\_AN and INJ\_FLO\_PREC\_CAT:

The INJ\_FLO\_PREC\_AN and INJ\_FLO\_PREC\_CAT sheets let you check the reproducibility of the injector and the retention time for an anion system and cation system, respectively. If the result is within the specified limits, the 'Result' column indicates **OK**.

#### INJ\_CARRY\_OVER\_AN and INJ\_CARRY\_OVER\_CAT:

The INJ\_CARRY\_OVER\_AN and INJ\_CARRY\_OVER\_CAT sheets supply a measure for the carryover in the anion system and cation system, respectively. If the result is within the specified limits, the 'Result' column indicates **OK**.

#### **DET LINEARITY AN and DET LINEARITY CAT:**

The DET\_LINEARITY\_AN and DET\_LINEARITY\_CAT sheets supply a measure for the linearity of detector response and peak height for the anion system and cation system, respectively.

#### **DET\_NOISE\_DRIFT\_AN** and **DET\_NOISE\_DRIFT\_CAT**:

The DET\_NOISE\_DRIFT\_AN and DET\_NOISE\_DRIFT\_CAT sheets supply a measure for baseline noise and drift for the anion system and cation system, respectively.

Audit Trail: The Audit Trail sheet shows the protocol data (Audit Trail) for the analyzed sample.

Several additional **Data** sheets are available for calculating further values.



#### Caution:

Do not edit report sheets, even if editing is possible! The Dionex Data System automatically reads the corresponding values. Within the report, individual data sheets are very often accessed via references. If you insert or delete lines and columns, these references will be lost. Thus, the calculations will be wrong!

The report must be printed as a Batch Report from the Browser to ensure that, in the report, the data are read in and processed correctly. Select the sequence for which the report will be printed. Make sure that no sample is selected. Select Batch Report on the File menu and start printing by clicking OK.

#### PGM-File

See *▶Program File*.

#### **Power-Failure Protection**

The Dionex Data System recognizes during the load sequence of the data system whether online >Batch Processing was interrupted by a power failure, etc.

This is possible because the date and the time are entered in the sequence editor whenever processing of a new sample is started. The Dionex Data System checks whether all "started" samples (labeled with date and time) were completed (i.e., whether they reached the status F, for finished). If this is not the case, the *Power-Off Handling* offers various options to continue processing.

## **Power-Off Handling**

The *Power-Failure Protection* ensures that online batch processing continues, even after a power failure. This protection is determined via the **Power-off handling**. The following options are available:

- Continue with the interrupted sample
- Continue with the next sample
- Reprocess the entire online batch
- Abort the entire online batch
- · User-defined selection of the four options

#### PQ

See > Performance Qualification (PQ).

#### **Pressure Limits**

The Dionex Data System is capable of monitoring the pressure value provided by the pump. When a pressure limit is exceeded, the DX-80 Ion Analyzer > Moduleware reports this to the Dionex Data System. The Data System then stops the flow, displays an error message, and stops the sample batch, as necessary.



Exceeding the upper pressure limit can be due to a blocked column or a defective injection valve.

If the pressure is below the lower limit, it is probably due to a leak in the flow system.

## **Program File (PGM-File)**

The program file (PGM-File) can be considered a "schedule" for the execution of different control commands. The file contains all commands to be executed before, during, and after the sample analysis. This enables complete automa-

tion of the analysis, including routine procedures before and after the analysis (e.g., column conditioning). It is also possible to monitor parameters or limits via the PGM-File. The PGM-File cannot be edited.

#### **Protocol Command**

The Protocol command enables the user to log specific events in the Audit Trail. The command syntax is as follows:

0.000 Protocol "Text"

The **Protocol** text is included in the Audit Trail and is thus directly linked with the corresponding sample. The **Protocol** text can thus be used for commenting individual samples.

### **Quantification Method (QNT-Method)**

A **Quantification Method** (also known as "working instructions") includes all parameters that are used for evaluation of a chromatogram. Thus, the QNT-Method serves as the basis of calculation for evaluating a sample. QNT-Methods cannot be edited.

### Query

The Dionex Data System allows the user to efficiently search directories, sequences, samples, or comment lines for specific names or character strings:

- In the >Browser, choose the Query command via the right mouse button or select New / Query (using Wizard) on the File menu. A wizard opens to facilitate entering the desired conditions.
- On the first page, define whether the query is performed in the currently open >Datasource or in a different one. In addition, define whether to find certain sequence properties and/or sample properties, and/or other result properties.
- After clicking **Finish**, you can enter additional conditions to limit the query.

Based on the entered information, the Dionex Data System generates an SQL statement that can start a query within all >ODBC-capable databases.

For more details, see **How to ...:** Actions in the Browser / Performing a Query.

The result of a query can be saved as a new sequence via the **Save as** command. QNT-Files and PGM-Files are copied, raw data is copied optionally. File names occurring more than once receive a consecutive number. The following symbol indicates the query sequence:

### **QNT-Method**

See: ➤ Quantification Method (QNT-Method).

### **Raw Data**

Raw data refers to all analog and digital data points that are stored digitally on a PC. Therefore, raw data exists only for signals that were selected by the user prior to data acquisition.

For further details, see the following topics in the **Data** chapter:

- Raw Data Storage
- Raw Data Compression

## **Ready Check**

The >Ready Check allows the user to verify that the connected instruments are ready to operate (i.e., to process a sample batch). The following items are checked:

- Are all instruments switched on?
- · Are all instruments connected correctly?
- · Are all required files available?
- Is there sufficient storage capacity?

You can perform a ready check via the Ready Check button in the Batch dialog box. Also, a ready check is automatically performed for each online command. If there is a problem, an error message or warning will be displayed.

#### Reconnect

Use the **Reconnect** command to check the connection between the PC and the timebase, or between the instrument and the data system. If there is no connection, the *>Connect* command will be issued automatically.

### Replot from Beginning

Enable the **Replot from beginning** option to automatically replot when the signal leaves the right-hand border of the signal window. The current chromatogram is then replotted from the beginning. The time axis is scaled by one unit, so as to fit the chromatogram into the window.

For example, if the first time axis is 2 minutes, after 2 minutes the window is enlarged by 2 minutes to show 4 minutes; after 4 minutes, the window is enlarged by another 2 minutes to show 6 minutes; and so on.

### **Report Definition**

Report Definition Files (**RDF-Files**) have two functions: They serve to display and reprocess your results on the screen (**Report**) and to prepare the printout (**Printer Layout**).

All settings regarding user-specific representation of chromatographic data in different windows are stored in the Report Template (= **Report Definition**). In conjunction with the *>Workspace*, this enables the user to arrange the screen according to personal preference.

If no workspace is loaded, each new window is opened on the basis of the most recently used RDF-File. If no Report Definitions were stored, the default RDF-File included in the Dionex Data System (**DEFAULT-RDF**) is used. It is located in the **Report** directory.

Each RDF-File contains specific information on window sections and views, window presentations, and captions, color, size of individual elements, and the presentation of reports. This requires the user to make decisions about the following features:

- Are the window contents (e.g., the chromatogram) shown in the zoomed view or full-scale view?
- Which type of axis scaling is used?
- Which additional objects (grid, comparison chromatogram, units, etc.) are displayed?

- Which colors are used for comparison chromatograms, captions, etc.?
- Are other window sections displayed (Calibration Curve, Report, etc.)?
- Which worksheet makes up the report and how is the report formatted?
- Which columns does the worksheet include?

## Restore (File)

The **Restore** command allows you to restore files previously stored via the >Backup function. The procedure is described in the section **How to ...:**Actions in the Browser / Restoring Backup Files.

To implement the **Restore** command, select **Import/Restore** on the Browser **File** menu.

Note:

The easiest way to open these archive files, which have the extension \*.cmb, is to double-click them in the Windows Explorer.

## **Right Mouse Button**

The most common commands and functions are available via the right mouse button. The choice is context-sensitive (i.e., the commands most likely to be used in the current situation are available).

### **RPC (Remote Procedure Calls)**

The RPC technology introduced with Windows 95/NT makes it possible to run a program on a different computer.

Unlike true full-control programs, such as PC-DUO or PC-ANYWHERE, the amount of transferred data is considerably lower with this type of control. Processes started from a remote computer run almost without any time delay and it is not possible to determine whether the process is performed on the local or on a remote PC.

RPC requires a functioning network connection between the involved computers. The computers may be part of the same network or may be linked via a modem connection. Communication also functions between different networks (such as Novell or Windows), provided the networks communicate via a common protocol.

The Dionex Data System generally communicates via the network protocols IPX/SPX, TCP/IP, or NetBEUI. Under Windows NT/2000, the protocol **Named Pipes** is also valid.

### Sample Data

Data that contribute to characterize a single sample are stored in a database by the Dionex Data System. These data include not only the entered data (name, etc.), but all results calculated from the >Raw Data and the chromatographic conditions under which the sample was analyzed (column, solvent, etc.).

## Sample Name

The >Sample Variable Sample identifies a sample and is used to label graphics and result reports.

When creating a sample list with the **Sequence Wizard**, automatic sample name generation is possible.

## Sample Number (Nr.)

The >Sample Variable Nr. indicates the sample number for a particular sample row and is used to label graphics and result reports.

## **Sample-Oriented Operation**

Due to the object-oriented concept of the Dionex Data System, emphasis is on samples and >Sequences, not on methods or activities.

The user selects the sample or sequence to process and automatically receives the corresponding view (e.g., integration samples are displayed in the integration window and sequences are displayed in the sample editor). For each sample or sequence, only the selectable or expected views, methods, or functions are available to the user. This saves time and reduces the number of simultaneously active windows.

This context-sensitive procedure is also valid for options selectable with the right mouse button. The selection depends on the position and the time of the mouse click.

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### Sample Type

The >Sample Variable Type specifies which type of sample is used.

**Unknown** indicates an unknown analysis sample. This sample type is indicated by the symbol: 2.

**Standard** indicates a standard sample with a known concentration. This sample type is indicated by the symbol: .

## Sample Variables (Overview)

The variables in the **Sample List (Sequence Table)** columns are referred to as sample variables. They characterize a sample and are stored in a database as part of the *Sample Data*. The following sample variables are available:

#### Columns that can be edited

- **≻**Comment
- ➤ Sample Name (Name)
- **▶**Dilution Factor

#### Columns that cannot be edited

Compound names

Nr. (Sample Number)

Sample Type (Type)

## **Sampling Rate**

The number of stored signal values per second is referred to as sampling rate (or data collection rate). The maximum of stored values corresponds to the number of values generated per second.

## **Sensitivity (Signal Parameter)**

The **Sensitivity** parameter adjusts the data system to the sensitivity of the detector.

### Sequence, Sequence Table, Sample List

A sequence combines samples that belong together due to their origin or processing. The names of all samples that belong to one sequence are entered in the sample list (also called sequence table). A sequence is thus a container for various samples.

To create a sequence, use the 🔼 Sequence Wizard.



#### Caution:

Do not use special characters (e.g., the umlaut) for new directory names or sequences, as this may cause problems on Novell networks.

The sequence table also defines how to process a sample. Sequences are usually started from a control > Panel. However, they can be started directly in the >Browser as well, provided the sequence has already been assigned to the appropriate > Timebase. Either press **Start** on the > Batch menu or the corresponding button of the online *▶Toolbar*.

All data collected in connection with creating and processing a sequence, including raw data and protocol data recorded during the analysis, are saved in the sequence directory of a datasource or in the underlying database. Of course, this includes the raw and protocol data recorded during the analysis.

Similar to datasources, sequences can be "locked." When a sequence is locked, data and results can be read, but they cannot be modified or extended. For details on locking datasources, directories, and sequences, see Data: Datasource.

### Sequence Data

Data that serve to characterize a > Sequence, instead of a single sample (see ➤ Sample Data), are referred to as sequence data.

This includes, for example, the date of the last change or the corresponding timebase. As with the sample data, this information is stored in a database.

## (Chromatography) Server

PCs connected to the components of an IC or HPLC system via a serial interface can be used as chromatography servers.

A chromatography server is automatically installed on the PC during the Dionex Data System installation. The chromatography server controls the data exchange between the system and the PC. Upon starting, each server is capable of serving up to 6 controlled or 16 non-controlled systems (timebases). The server receives the commands entered by a >Client PC in a >Panel and executes them at the specified time (by transmitting them to the corresponding device driver of the system). In the opposite direction, the server also assumes this buffer function. Thus, the raw data of each system are stored at the location specified by the client and all system-relevant data are forwarded to the client.

Starting (loading) the server can be performed manually or automatically. Use the >Server Monitor Program to select the required options. For optimum functionality, the server must be configured. This is performed with the Dionex Data System **Server Configuration** program from any client PC.

If the server and the client software of the data system are located on the same PC, the installation is local; if not, it is a network installation (see: **Metwork**).

■ Notes:

In the case of manual data acquisition, the >Raw Data from the system are always stored in the server directory PCNAME\_LOCAL. In the case of a >Batch, each user can choose where to store the data. To minimize the risk of losing data, raw data should always be stored temporarily on the server. In the course of archiving, it can be transferred to a different computer.

### **Server Configuration**

The Server Configuration includes information on which device is assigned to which timebase, to which server a timebase is connected, and the configuration of individual devices. The server configuration is defined in the **Server Configuration** program.

The information is saved in an installation file (\*.CFG file). The current configuration is always saved in the file CMSERVER.CFG on the chromatography server.

If a user creates several installation files with the **Server Configuration Program**, these files can be transferred to any server (via the **Import** function) and used there.

Executing the **Save** command saves this configuration as the new CSERVER.CFG file on the server.

For more information, see: How to ..: Actions in the Server Configuration Program / Changing the Server Configuration.

## **Server Monitor Program**

The program required for starting and monitoring the chromatography server is called the Server Monitor. During installation, it can be included in the Autostart group of the operating system.

When starting the Server Monitor, an additional icon appears on the Windows status bar indicating the current status of the server.

- Move the mouse cursor over the icon to view the server status via a quick info field.
- Open the corresponding context menu via the right mouse button to start or to stop the server (Start/Stop Server) or to exit the monitor program (Quit Monitor).
- Double-click the icon for further options (e.g., to automatically start the server when booting the computer).

The icon's color also indicates the server status:

lcon	Color	Message
<b>%</b>	Crossed out red	PeakNet Server is not running.
	Yellow	PeakNet Server is starting / is closing.
	Green	PeakNet Server is active.
	Tur- quoise	PeakNet Server is reconfiguring.
	Gray	PeakNet Server is running idle.
	Yellow/ red	PeakNet Server needs attention.  The server waits for the response to a message. For example, after a power failure, the user must decide how the program should continue the interrupted sample processing.

Glossary A-33

## **Signal**

The data (either analog or digital) transferred directly from an instrument to the data system are referred to as *physical* signals.

The measuring data of the different signals is stored in uniform raw data files.

## **Signal Noise**

See *➤Noise*.

### Signal-to-Noise Ratio

The signal-to-noise ratio serves to characterize electronic components. The lower the noise, the smaller the possible signal variations that can be recorded. As a general rule, the average of a signal should be at least twice the standard deviation of the signal value.

#### Status Bar

In the status bar on the lower window margin, messages regarding the current system status are shown on the left and the current timebase and the currently executed command are shown on the right.

The display of the status bar can be enabled and disabled via the View menu.

## **Stop Flow**

The **Stop Flow** command switches off the pump flow and interrupts data acquisition. A running batch is stopped, as in the hold mode. The **Stop Flow** command is executed via the **Control/Stop Flow** menu command.

Use the *➤ Continue* command to undo this command.

## Suppressor

A suppressor is a patented electrolytic device from Dionex which reduces background signals and enhances analyte signals in conductivity detection. Conductivity detection requires eluents that contain strong electrolytes. These electrolytes can interfere with detection of the ionic analytes of interest. The suppressor uses ion exchange to neutralize (suppress) the electrolytes in the

eluent, thus reducing the background conductivity. In addition, the ion exchange mechanism replaces a less conductive counterion with one that is highly conductive (hydrogen in anion exchange and hydroxide in cation exchange). Since both the analyte and the counterion produce the detector response, the analyte signals are increased.

The anion version of the DX-80 Ion Analyzer contains an AMMS III. The cation version of the DX-80 contains a CMMS III. For more information, refer to the suppressor manual.

## **System Check**

PeakNet IA monitors the status of certain system parameters. If a parameter does not meet specification, the software displays an error message. All error messages are logged in the >Audit Trail.

Parameter Specification		Comments
Total Back- ground	< 35 µS (anion mode)	The total background is checked (for up to 10 minutes) before each sample injection. While the system is equilibrating, the <b>Ready</b> LED on
	< 3 μS (cation mode)	the DX-80 front panel flashes. When the back-ground meets the specification for 30 consecutive seconds, the <b>Ready</b> LED remains on continuously. If the background fails to meet the specification within 10 minutes, the <b>Ready</b> LED flashes. The default severity for the error message is abort.
Drift	-100 μS < x < 100 μS	The first and last points during data acquisition are used to calculate the difference.
Noise	< 10 nS	The final minute of data during data acquisition is used to calculate the difference.

## **Template**

Templates facilitate entering data. The Dionex Data System offers various predefined templates; the report template is DEFAULT.RDF.

### **Time**

The Dionex Data System stores time stamps as universal time (Greenwich time). However, the date notation is displayed according to the local settings chosen in the Windows Control Panel.

#### **Timebase**

All components combined in a chromatography system to enable the chromatographic separation, as long as the components are related in a time context with each other, are assigned to the same timebase.

A timebase consists of one DX-80 Ion Analyzer, with or without an AS40 Automated Sampler. Only a further system that is completely independent represents a new timebase. Administration of different timebases may be on one or several *>Chromatography Servers*.

The name for a timebase is assigned in the **Server Configuration** program.

#### **Toolbars**

Frequently used commands and features are available as icons. Related functions are combined on toolbars located directly below the menu bar. When starting the Dionex Data System, the standard toolbar is displayed. Select the **Toolbars** command from the **View** menu to enable or disable the display of individual toolbars. The following toolbars are available:

· Standard (standard functions)



Online (commands for the ➤ Control Panel)



Method (for changing to other method sections or samples)



Integration (commands for processing chromatograms)



• >Status Bar (enables/disables the Status Bar)

Move the mouse pointer over an icon to view its name in the quick info display.

## **Trigger Commands**

A trigger refers to the automatic execution of a command as soon as a condition becomes true. For example, a trigger command (**Sound**) can be used to

generate acoustic signals. When specific conditions are fulfilled, the acoustic signal is issued.

A **Trigger** command can be included in a programmable button, but not in the online control. The following syntax is valid:

```
Time Trigger TRIGGERNAME Condition, True, Delay, Limit, Hysteresis
Reaction 1
Reaction 2
Reaction ...
Time EndTrigger
```

The activation time and the trigger name are selected by the user. If the condition specified via Condition=... and True becomes true, all commands between Trigger and EndTrigger are executed. Execution is delayed by the Delay parameter and can be limited to a specific number of executions via Limit.

As several triggers can be simultaneously active, all trigger commands must have unique names. Terminating an active trigger condition is by entering the trigger command again with an added zero and closing it without a reaction.

```
Time Trigger TRIGGERNAME 0
EndTrigger
```

This applies to each single trigger. It is not possible to simultaneously close all triggers.

The times at which a trigger is actuated are entered in the Audit Trail and can be displayed on the screen or included in the printed output.

For details, refer to the following topics:

```
    ➤ Trigger Name
    ➤ Trigger Delay
    ➤ Trigger Hysteresis
    ➤ Trigger Condition
    ➤ Trigger Limit
```



A pure basis license does not include the advanced feature **Trigger** (also see **Dionex Data Systems**.

### Trigger Name

The name of a > Trigger serves to identify it. Therefore, the trigger name must be unique; for example, the trigger cannot have the same name as a device or

another command. This allows simultaneous activation of several trigger commands with different names.

Please note that the trigger command and the trigger name are separated. For example:

```
2.500 Trigger TRIGGERNAME ....
```

To quickly locate the trigger in an Audit Trail or a Report, it is recommended that you enter the trigger name in capital letters.

### ■ Trigger Condition

A > Trigger condition is entered as follows:

Condition=	<parameter></parameter>	<operator></operator>	<value></value>

The expressions **Parameter**, **Operator**, and **Value** have the following significance:

Expression	Description
<parameter></parameter>	All installed channels, but also parameters such as Pressure (system pressure) and System Status can be used.
	Instead of the actual value, the first derivative of the signal can be evaluated. This is achieved by adding the signal property > DELTA.
<operator></operator>	<, >, =, <=, >= and <>
<value></value>	Fixed point number. The dimension of the <value> corresponds to the signal dimension. Parameters that are combined with DELTA have the dimension [signal dimension / sec].</value>

If several parameters are to be linked, this can be realized via mathematical (+, -, \*, /, \*\*) or logical (AND, OR, NOT, XOR) operators. Round brackets show combinations and hierarchy.

Logical links of entire conditions are also possible. Adding **Condition =** is optional.



A trigger is executed whenever the condition changes from **false** to **true** (**flank triggering**). If a condition is **true** at the beginning, the trigger cannot be changed from **false** to **true**. This applies as long as the condition is set to **false** again (e.g., manually or via another trigger). We therefore recommend determining specific start conditions at the beginning of a trigger command.

### ■ Trigger Validity (True)

The parameter **True** indicates for how long the condition must be fulfilled before the *Trigger* command is executed.

The parameter True is used as a criterion for the truth of signals (e.g., to differentiate between **true** signals and spikes). If the parameter TRUE is used in combination with the parameter DELAY, the command is only executed <TRUE> + <DELAY> seconds after the condition is fulfilled.

### ■ Trigger Delay

The parameter **Delay** refers to the delay in seconds. This is the interval between the fulfillment of a  $\succ$  *Trigger* condition and triggering a reaction.

If the parameter DELAY is used in combination with the parameter TRUE, the command is only executed <TRUE> + <DELAY> seconds after the condition is true.

### **■** Trigger Limit

Normally, a >Trigger command is repeated any number of times (each time the corresponding trigger condition is fulfilled). This only changes if the trigger is terminated.

The parameter **Limit** enables you to define the maximum number of times the trigger is executed. As soon as this number is reached, the trigger automatically ends.

#### ■ Trigger Hysteresis

To prevent multiple trigger execution with very noisy signals, each >Trigger receives the **Hysteresis** parameter in addition to the **True** parameter.

In contrast to the **True** parameter, hysteresis is signal-dependent, not time-dependent. The parameter can vary between 0 and 100%. The default value is 5%.

#### ■ Trigger Reaction

As a response to a > Trigger condition becoming true, virtually any instruction can be performed. Even trigger commands can be triggered!

#### TTL

TTL (Transistor-Transistor Logic) inputs and outputs are electronic switching devices for controlling instruments.

#### Unzoom

The command undoes the last zoom operation.

In the signal window, the **Unzoom** command can be implemented by double-clicking in the *>Overview Window*.

#### Wait

The **Wait** command interrupts program execution until the specified remote input signal arrives. During this time, program time and data acquisition are stopped and the pump is kept in the **Hold** mode.

#### Wizard

Various input procedures, such as creating a  $\triangleright$  Sequence or defining  $\triangleright$  Query conditions, are facilitated by the use of **Wizards**. The system prompts the user to define conditions and to enter the required information. The Wizard then adds default elements to complete a basic structure.

## Workspace

The area between the menu bar or >Toolbar and the >Status Bar is called the Workspace. The workspace displays the currently open windows of the various "window types."

The workspace allows you to open a specific set of windows. This is usually the most recently used workspace, but you may save or open any view with a separate name. The Dionex Data System stores this information in WSP-Files.

To save settings of an individual window without changing the workspace, you can use a *>Report Definition (RDF-File)*. The RDF-File is used whenever a sample or a window is opened individually, not in connection with a workspace.

Combining RDF-Files and a workspace allows the user to have a personal representation of the screen. For a detailed description, refer to the **Suser Profiles** chapter.

## **Year 2000 Conformity**

According to the document PD2000-1:1998, published by the British Standards Institution (BSI), "year 2000 conformity shall mean that neither performance nor functionality is affected by dates prior to, during and after the year 2000."

In particular, this means that the following rules are adhered to:

- 1. General Integrity: No value for current date will cause any interruption in operation.
- 2. Data Integrity: Date-based functionality must behave consistently for dates prior to, during, and after the year 2000.
- 3. Explicit/Implicit Indication of the Century: In all interfaces and data storage, the century in any date must be specified either explicitly or by unambiguous algorithms or inferencing rules.
- 4. Leap Year: The year 2000 must be recognized as a leap year. (According to the Gregorian calendar, the year 1900 was not a leap year.)

The Dionex Data System and all Dionex instruments are in compliance with the BSI rules. Contact Dionex if a Year 2000 Certificate is required for any Dionex product.

## Zoom

Press the left mouse button and draw a frame around a section of a signal window that you wish to zoom. Select *>Unzoom* to undo the last zoom operation. Select **Full size** to return to the original display (100% representation).



In the online signal window, an >Overview Window is displayed in the upper right corner in addition to the enlarged section.

While drawing a zoom frame, the operation can be canceled by pressing the ESC key or the right mouse button. Use this function to prevent redrawing the window when the wrong frame was selected. Index

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