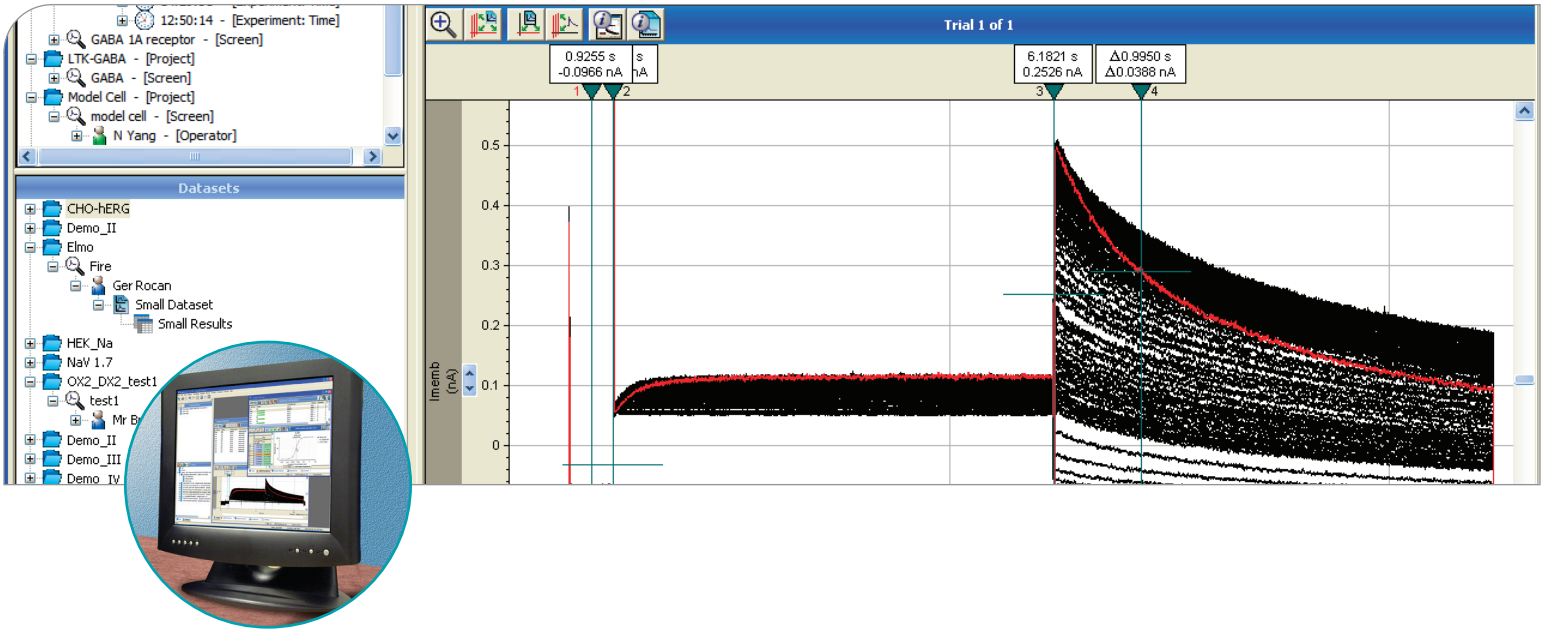
Molecular Devices

DataXpress 2 Software

ELECTROPHYSIOLOGY DATA MANAGEMENT AND ANALYSIS SYSTEM



- → SEARCHABLE SQL DATABASE WITH OVER ONE HUNDRED ATTRIBUTES
- → POWERFUL TRIAL EDITING CAPABILITY
- → EXTENSIVE ANALYSIS AND GRAPHING FUNCTIONS
- → CONVENIENT GRAPHICAL MACRO EDITOR
- → AUTOMATICALLY IMPORT DATA FROM PATCHXPRESS 7000A SYSTEMS

DataXpress® 2 Software from Molecular Devices is a data management and analysis system for electrophysiology data. By incorporating an SQL database with over 100 attributes, users can quickly query and sort information about their assays. The software's trial editing, analysis and graphing capabilities provide users with a comprehensive set of tools to analyze and interpret their data. DataXpress 2 Software seamlessly integrates with the PatchXpress® 7000A Automated Parallel Patch Clamp System from Molecular Devices and incorporates a powerful graphical macro editor for automated data analysis that reduces the time required to analyze electrophysiology data.

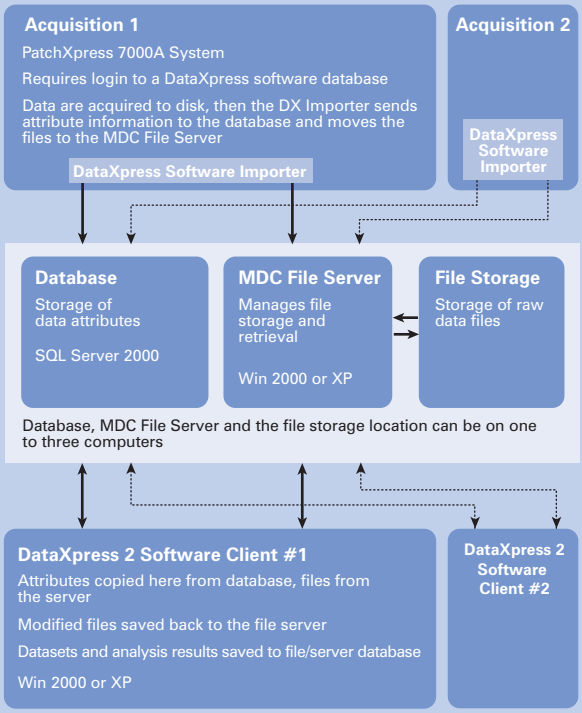
The power of the DataXpress 2 Software lies in its ability to manage not only raw data, but also meta-data, such as information about compound addition, cells and solutions, operator, cell health parameters and many more categorizing properties. The graphical macro editor allows users to create standardized analysis procedures that automatically calculate, for example, compound response, IC_{50} or EC_{50} values, current-voltage relations or voltage-dependent channel gating.

POWERFUL DATABASE TO MANAGE ELECTROPHYSIOLOGY DATA

DataXpress 2 Software stores information using a variant of the MDCStore™ Database, a database structure used in several Molecular Devices applications. This structure uses an ODBC-compliant database and the MDC File Server software to efficiently manage information. (See Figure 1.) Data files are parsed for their attributes, which are stored in the database. Raw data files are stored elsewhere on the network via the MDC File Server. The SQL database serves as a hub from which data from multiple acquisition systems can flow while multiple users are analyzing data. With over 100 attributes that can be queried, users can rapidly search and sort the database for information about their assays. User permission levels and data sharing capability ensure that users see only raw data and analysis results that they have permission to view and analyze. The use of an ODBC interface for the connection between the DataXpress Software clients and server provides improved database connection reliability.

Integrated Database and Analysis

DataXpress 2 Software Architecture (Figure 1)



Relationship between the DataXpress 2 Software database, acquisition programs and clients.

Trials and Analysis Functions (Figure 2)

Trial Editing Functions

- Adjust baseline as specified by cursor position or manually
- Arithmetic operations between trials (*e.g.*, add, subtract, multiply, etc.)
- Average traces within a trial
- Filter (*e.g.*, highpass, lowpass, bandpass, electrical interference and notch filtering)
- Force values to eliminate transients or artifacts
- Subtract a control trial from other trials
- Subtract the average of the last "N" traces within a trial
- Time-shift sweeps by specified interval or to align peaks
- Remove traces

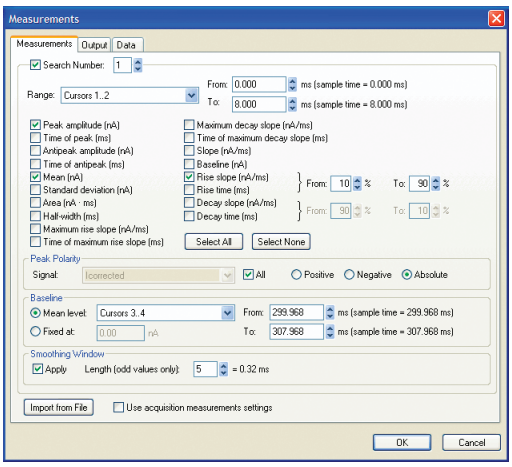
Analysis Functions

- Retrieve attributes from the database and write them to the Results sheets
- Add graph and edit graph, with the capability to customize graph appearance
- Measurements (*e.g.*, peak amplitude, time of peak, anti-peak, time of anti-peak, mean, standard deviation, area, half-width, maximum rise slope, time of maximum rise slope, maximum decay slope, time of maximum decay slope, slope, baseline, rise slope, rise time, decay slope, and decay time)
- Current/Voltage and Trace vs. Trace analysis to generate I-V plots
- Curve fit trials
- Histogram analysis of trials
- Arithmetic operations between results columns
- Average rows on the Results sheets
- Effective concentration with user-defined percentage of effect
- Curve fit results columns
- Histogram analysis of results columns
- Automatic Rundown Correction by curve fitting with graphic preview and manual override
- Compound response analysis averages the last "N" measurements before change of compound
- Normalize the compound response to negative and positive controls
- Combine results obtained in several Cell Procedures by copying to Dataset Results
- Copy results and graphs to clipboard
- Export results in Excel or CSV format

COMPREHENSIVE ELECTROPHYSIOLOGY ANALYSIS TOOLS

To analyze electrophysiology data, DataXpress 2 Software features a comprehensive set of analysis tools. (See Figure 2.) Using the now-integrated trial editing functions, users can adjust the baseline, perform arithmetic operations on trials, average, filter, time shift and apply other signal conditioning functions to their datasets. Up to 18 different measurement types (*e.g.*, peak amplitude, time of peak, mean current, and 15 other types; see Figure 3) from up to eight different time regions within trials can be applied to recordings. DataXpress 2 Software provides an extensive selection of 16 different types of analyses, such as current/voltage, curve fitting, tools for IC_{50} and EC_{50} analysis and effective concentration percentage. Information is conveniently displayed in a spreadsheet format for easy management and can be exported in Microsoft Excel format or as comma separated value (CSV) files for further analysis. To facilitate interpretation, data can be visualized and graphically presented automatically as multiple plots, histogram plots, scatter plots or line graphs. Both graphs and numerical results can be copied to the clipboard to include them in a presentation, in a lab notebook or in other documentation.

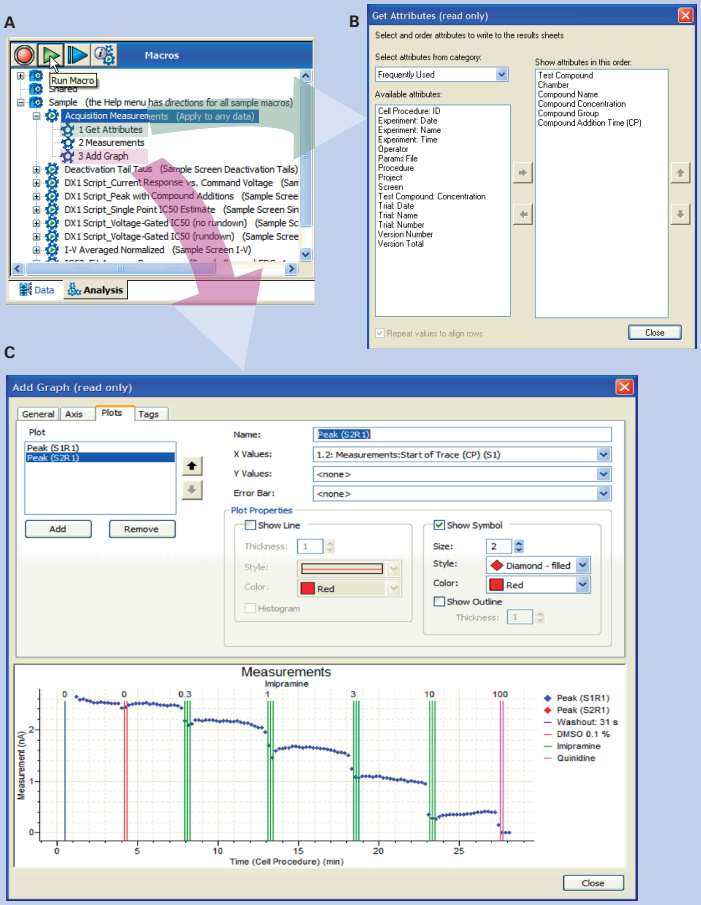
Measurements Dialog (Figure 3)



The DataXpress 2 Software Measurements dialog.

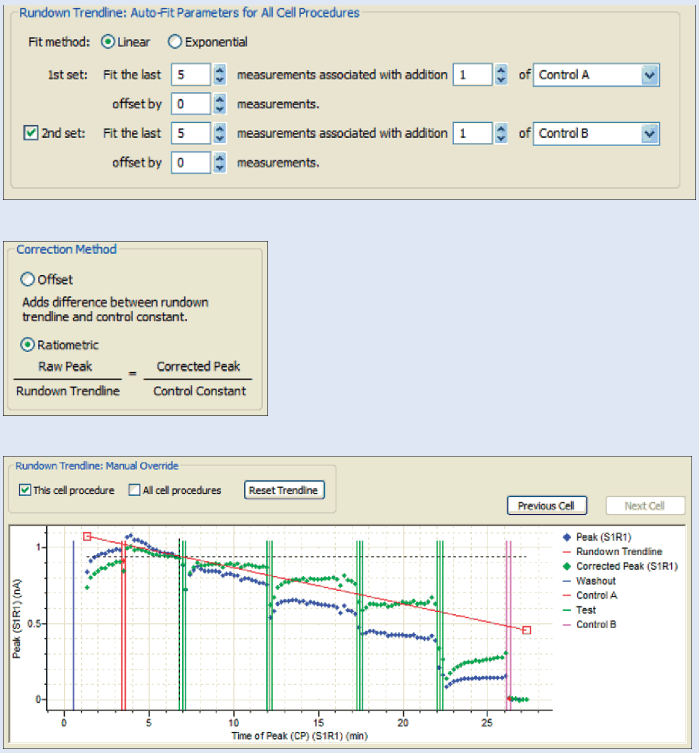
Graphical Macro Editor

Graphical Macro Editing (Figure 4)



A: The Macros window displays macro steps in tree format.
B & C: Double-clicking on a macro step displays the step information.

Automatic Rundown Correction (Figure 5)



Automatic Rundown Correction by curve fitting with graphic preview and manual override.

AUTOMATED DATA ANALYSIS USING GRAPHICAL MACRO EDITOR

Trial Editing and Analysis commands are recordable using the graphical macro editor of DataXpress 2 Software. Macros are created as a sequence of dialog-configured commands, making them straightforward to create and edit. A window displays the macro steps in a tree format so it is always easy to see the details of your analysis. (See Figure 4.) Multi-step Undo and Redo functionality allows a user to experiment with analysis steps and see the results before saving the macros. The ability to run a macro while recording another allows the creation of complex macros from a library of commonly used sub-macros. Once saved, macros can be replayed and applied to new datasets to efficiently automate data analysis. Macros can be stored and managed on a user basis and shared with other DataXpress software users. A comprehensive set of sample macros, together with step-by-step tutorials on their use, is provided to help users get started with setting up customized analysis procedures.

SUMMARY

DataXpress 2 Software is a data management and analysis system for highly flexible and efficient handling of electrophysiology data. Assay attributes are stored in a SQL server database, allowing users to quickly browse, query and sort their experiments. The software has powerful trial editing, analysis and graphing features that facilitate the interpretation of raw data and the compilation of results. Using a graphical macro editor, users can create standardized analysis procedures for automated analysis of

electrophysiology data and then, using the configurable results export functionality, export the data into corporate compound databases. DataXpress 2 Software significantly reduces both the time and the effort required to analyze electrophysiology data.

SYSTEM REQUIREMENTS

DataXpress 2 Software (Server)

PatchXpress 7000A Systems ship with a database server computer pre-configured with DataXpress 2 Software. Users who are planning to install the DataXpress 2 Software on a different computer should contact Molecular Devices Tech Support. The requirements listed below may differ, depending on user-specific implementations.

Processor:	1 GHz
Memory:	512 MB
Hard Disk size:	> 150 GB; a mirrored RAID array (RAID 1) or data file storage on a file server network share is recommended
Network:	Fast Ethernet (100 Mbps)
USB port:	1 available
Operating system:	Microsoft Windows 2000 or XP Professional. Microsoft SQL Server 2000 Personal Edition or higher (MSDE/ SQL Server 2005 Express Edition is not recommended.)
	DataXpress 2 Software does not support operating system emulators (*e.g.*, VMWare, etc.).

DataXpress 2 Software (Client)

Processor:	1 GHz
Memory:	512 MB
Hard Disk size:	5 GB free
Network:	Fast Ethernet (100 Mbps)
Operating system:	Microsoft Windows 2000 or XP Professional
	DataXpress 2 Software does not support operating system emulators (*e.g.*, VMWare, etc.).

ORDERING INFORMATION

DataXpress 2 Software upgrade (from DataXpress software version 1.0)

Part Number: DataXpress 2 Upgrade

- DataXpress 2 Software (on CD-ROM)
- DataXpress 2 user guide
- License for 2 concurrent seats
- USB software protection key

Additional DataXpress 2 Software seat

Part Number: 1-6195-0001

- License for an additional concurrent seat
- USB software protection key programming or exchange

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Printed in U.S.A. 6/10 #0120-1412B