USER GUIDE

applied biosystems®
by life technologies™

GeneMapper® Software 5

Installation and Administration

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life technologies™

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Contents

Preface 7

How to Use This Guide 7
How to Obtain More Information 9
How to Obtain Support 10

Safety Information 11

Safety Conventions Used in This Document 12
General Instrument Safety 13
Workstation Safety 14

Chapter 1 **Getting Started** 15

Start Here: Getting the Most Out of This Guide 16
For Applied Biosystems 3500 Series Genetic Analyzers 17
Oracle® Database License Agreement 18
GeneMapper® Software Workflow 19

Chapter 2 **Installation Requirements and Software Compatibility** 21

Overview 22
Computer Requirements 23
Instrument, Software, and Data Compatibility 26
User Account Requirements 27
GeneMapper® Software Installation DVDs 28

Chapter 3 **Performing a New Installation of the GeneMapper® Software** 29

Overview 30
Exporting GeneMapper® Software from a Windows XP Computer 30
Importing GeneMapper® Software to a Windows 7 Computer . . . 30
Determining Your Installation Options 32

Section 3.1: Full Installation Procedures 35
Instrument Configuration Procedures 36
Stand-alone Configuration Procedures 43

Section 3.2: Client Installation Procedures 48
Client Configuration Procedures 48

Section 3.3: Software Login Procedures 53
Registering the Software After a New Installation 54
Logging In to the Software for the First Time After a New Installation 55
Logging In to the Database Dashboard for the First Time 57
What Next? 58
Logging In to and Out of the Software 59

Chapter 4 **Managing Database Security and User Access** 63

About GeneMapper® Software Security 64
Configuring the Password Policies 66
Managing User and Security Groups 70
    Setting Up User and Security Groups 75
Managing Applications 78
Managing Profiles 78
Managing User Accounts 88
Viewing the Security Report 94
Exporting and Importing the Security Settings 96

Chapter 5 **Managing the Auditing and Electronic Signature Systems** **97**

About the Data Tracking Systems 98

Section 5.1: Setting Up the Auditing System 99
About the Auditing System 100
Audit Maps, Objects, and Attributes 102
Configuring the Audit Map 107
Managing Audit Records 114
Viewing the Audit History 114
Backing Up, Removing, and Restoring Audit Data 118

Section 5.2: Setting Up the Electronic Signature System 121
About the Electronic Signature System 122
About Electronic Signatures 124
Configuring the Electronic Signature Settings 125
Configuring the GeneMapper® Software Action Map 126
Viewing the Electronic Signature History 128

Chapter 6 **Maintaining the Software and Database Application** **131**

Maintenance Overview 132

Section 6.1: Managing Study, Project, and Sample Data 133
Exporting Data Objects 135
Exporting GeneMapper Data Objects 137
Exporting and Importing Projects 137
Exporting and Importing Studies 140
Exporting and Importing Reference Data 142
Exporting Kits, Panels, and Bin Sets 143
Exporting All Other Reference Data 144

Section 6.2: Managing the Database 145
Using the Oracle® Database 146
About the Dashboard Software 149

Reviewing the Database Statistics 151
Allocating Disk Space 154
Viewing Project Information 156
Backing Up the Database 158
Generating a Database Report 160

Appendix A **Troubleshooting the Installation** **161**

Troubleshooting Tasks 162
Uninstalling the Software 164
Troubleshooting Checklist 170

Appendix B **Operating the Software from a Command Line** **173**

Operating the Software from a Command Line 174
Example Commands 179
Example #1: Basic Sample File Analysis 179
Example #2: SNPlex® System Analysis 180
Example #3: Sample File Analysis with Named Ladders . . . 181
Example #4: Export of Project Data 182
Command Line Arguments 183

Appendix C **Migrating Data Using the GeneMapper® Database Utility Wizard** **189**

Appendix D **Migrating Data Manually** **193**

Glossary **197**

Index **207**

Preface

How to Use This Guide

Purpose of This Guide

This guide describes the procedures for installing, securing, and maintaining the GeneMapper® Software 5.

Note: For instructions on analyzing sample data using the GeneMapper® Software, see the appropriate applications getting started guide for your fragment analysis chemistry as explained on page 9.

Audience

This guide is written for laboratory personnel responsible for installing and maintaining the GeneMapper® Software.

Assumptions

This guide assumes that you have a working knowledge of the Microsoft® Windows® operating system.

Text Conventions

This guide uses the following conventions:

- **Bold** indicates user action. For example:

  Type **0**, then press **Enter** for each of the remaining fields.
- *Italic* text indicates new or important words and is also used for emphasis. For example:

  Before analyzing, *always* prepare fresh matrix.
- A right arrow bracket (▸) separates successive commands you select from a drop-down or shortcut menu. For example:

  Select **File ▸ Open ▸ Spot Set**.

  Right-click the sample row, then select **View Filter ▸ View All Runs**.

User Attention Words

Two user attention words appear in Life Technologies user documentation. Each word implies a particular level of observation or action as described below:

Note: Provides information that may be of interest or help but is not critical to the use of the product.

IMPORTANT! Provides information that is necessary for proper instrument operation, accurate chemistry kit use, or safe use of a chemical.

Examples of the user attention words appear below:

Note: The size of the column affects the run time.

Note: The Calibrate function is also available in the Control Console.

IMPORTANT! To verify your client connection to the database, you need a valid Oracle® user ID and password.

IMPORTANT! You must create a separate Sample Entry Spreadsheet for each 96-well plate.

How to Obtain More Information

Related Documentation

Portable document format (PDF) versions of this guide and the documents listed below are available on the GeneMapper® Software Documentation CD.

- ***GeneMapper® Software Getting Started Guides*** for microsatellite analysis (PN 4403672), loss of hetereozygosity (LOH) analysis (PN 4403621), AFLP® system analysis (PN 4403620), SNaPshot® kit analysis (PN 4403618), and SNPlex® system analysis (PN 4403617) – Five guides that explain how to analyze the application-specific example data provided with the GeneMapper Software. The guides provide brief, step-by-step procedures for the analysis of microsatellite, LOH, AFLP® system, SNaPshot® kit, and SNPlex® system data generated by compatible Life Technologies electrophoresis instruments and Data Collection Software. The guides are designed to help you quickly learn to use basic functions of the GeneMapper Software.
- ***GeneMapper® Software Quick Reference Guide*** (PN 4403615) – Provides workflows for specific analysis types and lists instruments, software, and analysis applications compatible with the GeneMapper Software.
- ***GeneMapper® Software Reference and Troubleshooting Guide*** (PN 4403673) – Provides reference information such as theory of operation and includes troubleshooting information.

Note: For additional documentation, see "How to Obtain Support" on page 10.

Obtaining Information from the Online Help

The GeneMapper® Software online help system describes the GeneMapper Software and provides procedures for common tasks. Access online help by clicking in the toolbar of the GeneMapper window, selecting **Help ▸ Contents and Index**, or pressing **F1**.

How to Obtain Support

For the latest services and support information for all locations, go to **www.lifetechnologies.com/support**.

At the Support page, you can:

- Access to worldwide telephone and fax numbers to contact Life Technologies Technical Support and Sales facilities
- Search through frequently asked questions (FAQs)
- Submit a question directly to Technical Support
- Order Life Technologies user documents, SDSs, certificates of analysis, and other related documents
- Download PDF documents
- Obtain information about customer training
- Download software updates and patches

Safety Information

This section covers:

- Safety Conventions Used in This Document 12
- General Instrument Safety 13
- Workstation Safety 14

Safety Conventions Used in This Document

Safety Alert Words

Four safety alert words appear in Life Technologies user documentation at points in the document where you need to be aware of relevant hazards. Each alert word–**IMPORTANT, CAUTION, WARNING, DANGER**–implies a particular level of observation or action, as defined below:

Definitions

CAUTION – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

DANGER – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

Examples

The following examples show the use of safety alert words:

CAUTION **MUSCULOSKELETAL AND REPETITIVE MOTION HAZARD**. These hazards are caused by potential risk factors that include but are not limited to repetitive motion, awkward posture, forceful exertion, holding static unhealthy positions, contact pressure, and other workstation environmental factors.

WARNING Do not attempt to lift or move the computer or the monitor without the assistance of others. Depending on the weight of the computer and/or the monitor, moving them may require two or more people.

General Instrument Safety

WARNING **PHYSICAL INJURY HAZARD.** Use this product only as specified in this document. Using this instrument in a manner not specified by Life Technologies may result in personal injury or damage to the instrument.

Moving and Lifting Stand-Alone Computers and Monitors

WARNING Do not attempt to lift or move the computer or the monitor without the assistance of others. Depending on the weight of the computer and/or the monitor, moving them may require two or more people.

Things to consider before lifting the computer and/or the monitor:

- Make sure that you have a secure, comfortable grip on the computer or the monitor when lifting.
- Make sure that the path from where the object is to where it is being moved is clear of obstructions.
- Do not lift an object and twist your torso at the same time.
- Keep your spine in a good neutral position while lifting with your legs.
- Participants should coordinate lift and move intentions with each other before lifting and carrying.
- Instead of lifting the object from the packing box, carefully tilt the box on its side and hold it stationary while someone slides the contents out of the box.

Workstation Safety

Correct ergonomic configuration of your workstation can reduce or prevent effects such as fatigue, pain, and strain. Minimize or eliminate these effects by configuring your workstation to promote neutral or relaxed working positions.

CAUTION **MUSCULOSKELETAL AND REPETITIVE MOTION HAZARD**. These hazards are caused by potential risk factors that include but are not limited to repetitive motion, awkward posture, forceful exertion, holding static unhealthy positions, contact pressure, and other workstation environmental factors.

To minimize musculoskeletal and repetitive motion risks:

- Use equipment that comfortably supports you in neutral working positions and allows adequate accessibility to the keyboard, monitor, and mouse.
- Position the keyboard, mouse, and monitor to promote relaxed body and head postures.

1 Getting Started

This chapter covers:

- Start Here: Getting the Most Out of This Guide 16
- For Applied Biosystems 3500 Series Genetic Analyzers. . . 17
- Oracle® Database License Agreement 18
- GeneMapper® Software Workflow 19

Start Here: Getting the Most Out of This Guide

The *GeneMapper® Software 5 Installation and Administration Guide* describes how to install the GeneMapper® Software 5 and manage the software, database, and auditing functions.

Note: GeneMapper® Software 5 does not support autoanalysis on any instrument platform.

Installation

To get the most out of this guide:

1. Read through this chapter to familiarize yourself with the Oracle® database licensing agreement.
2. Review the general installation requirements in Chapter 2:
   - Installation overview workflow
   - Computer requirements and compatible operating systems
   - Supported instruments and software applications
   - User account requirements
3. Install the GeneMapper® Software as described in Chapter 3.
4. Log in to and configure the GeneMapper® Software as described in Chapter 3.

Administration

Review the procedures for setting up and maintaining the:

- GeneMapper® Software security settings
- Password policies
- Profiles and user accounts
- Data tracking system
- Audit map and audit history
- Electronic Signature settings

Maintenance

Review the procedures for using the Database Dashboard to:

- Review database statistics
- Export and import projects and supporting data
- Maintain the GeneMapper® Software by backing up data and allocating disk space

Troubleshooting

If you have trouble with the installation, see Appendix A. Be sure to perform the troubleshooting procedures in the order given:

1. Read through the troubleshooting procedures starting on page 162.
2. If you continue to have problems, complete the Troubleshooting Checklist on page 170, then contact Technical Support (page 10).

For Applied Biosystems 3500 Series Genetic Analyzers

If you are installing the GeneMapper® Software on an Applied Biosystems 3500 series genetic analyzer, refer to the user guide for instructions for:

- Starting the Data Collection services on the local computer
- Installing the GeneMapper® Software on the same computer as the Data Collection Software

Document	Part number
Applied Biosystems 3500/3500xL Genetic Analyzer User Guide	4401661
Applied Biosystems 3500 Dx/3500xL Dx Genetic Analyzer User Guide	4401688

Oracle® Database License Agreement

About the Database

The GeneMapper® Software uses an Oracle® database to store all project-related data. In addition to serving as a common data repository, the database provides user authentication, robust and scalable data management, and flexible archive capabilities through the utilities provided with the GeneMapper® Software.

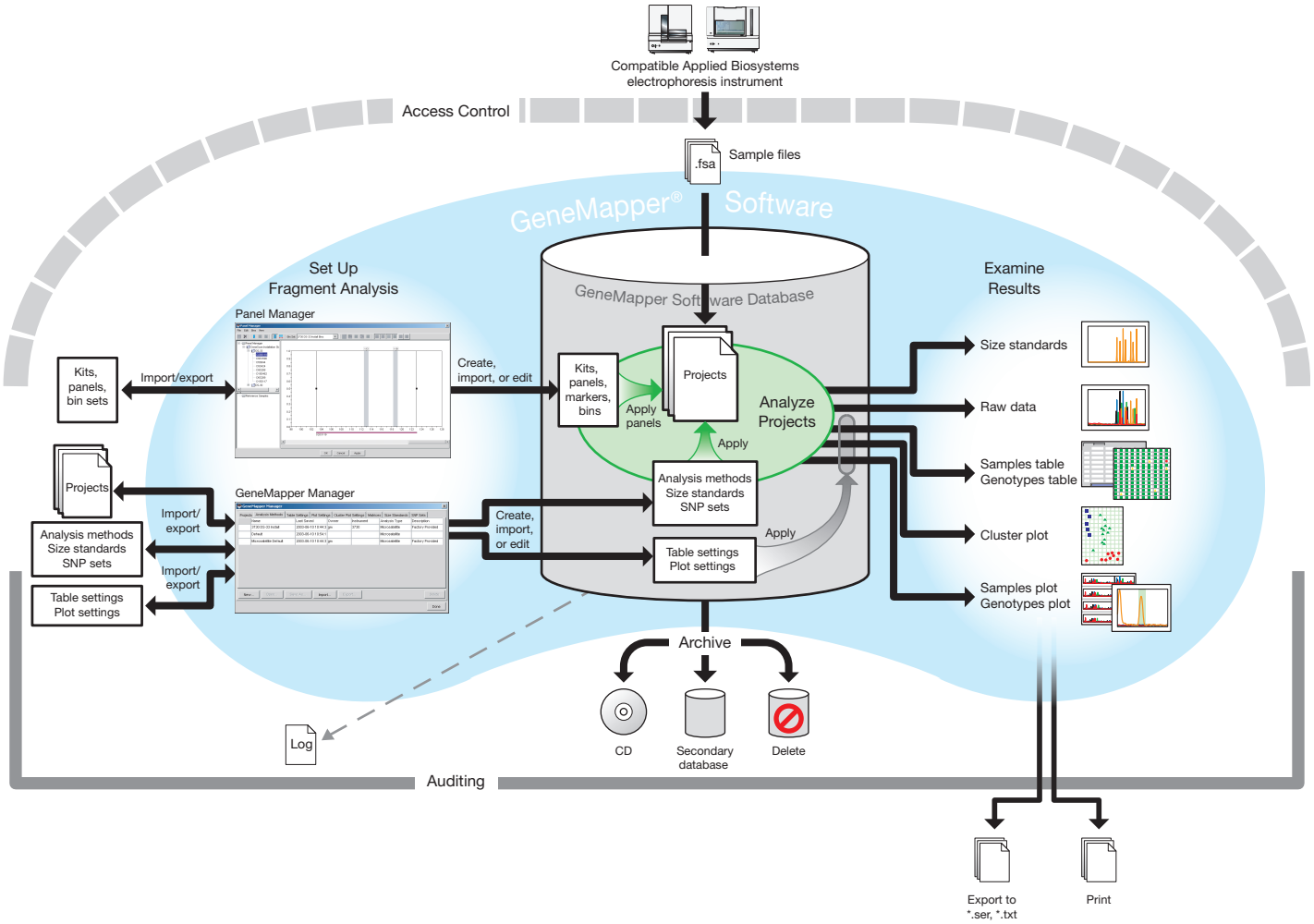
Database Access

Life Technologies does not support access to the Oracle® database through any means other than the GeneMapper® Software.

User Access

The version of the Oracle® database included with the GeneMapper® Software is an embedded-license database. This license allows access to the database for up to five named users at any one time. If you want to accommodate more than five named users, you can purchase either additional GeneMapper® Software licenses or additional Oracle®-named user privileges and thereby honor Life Technologies agreement with the Oracle® Corporation.

GeneMapper® Software Workflow



2 Installation Requirements and Software Compatibility

This chapter covers:

- Overview 22
- Computer Requirements. 23
- Instrument, Software, and Data Compatibility. 26
- User Account Requirements. 27
- GeneMapper® Software Installation DVDs 28

Overview

This chapter specifies the requirements for installing the GeneMapper® Software 5.

Step	See page
Verify that the computer meets requirements ↓	23
Verify that you have Administrator privileges on the computer ↓	27
Is a current version of GeneMapper® Software installed? ↓ No → Yes Export data from the current database ↓	30
Perform a full installation or Perform a client installation	35 or 48
↓ Import data into the new database ↓	30
Register and log in to the GeneMapper® Software	54 and 55

Computer Requirements

Computer Configuration

Table 2-1 shows the computer specifications that Life Technologies recommends for use with the GeneMapper® Software 5.

Even though you can install the GeneMapper® Software on a computer containing the minimum supported RAM, Life Technologies highly recommends using 4 GB of RAM (or higher) for better performance.

Note: The following specifications are for the 3130 and 3730 series instrument computer. The 310 instrument computer has less RAM and HD capacity than the 3130 and 3730 series computer, so performance may vary.

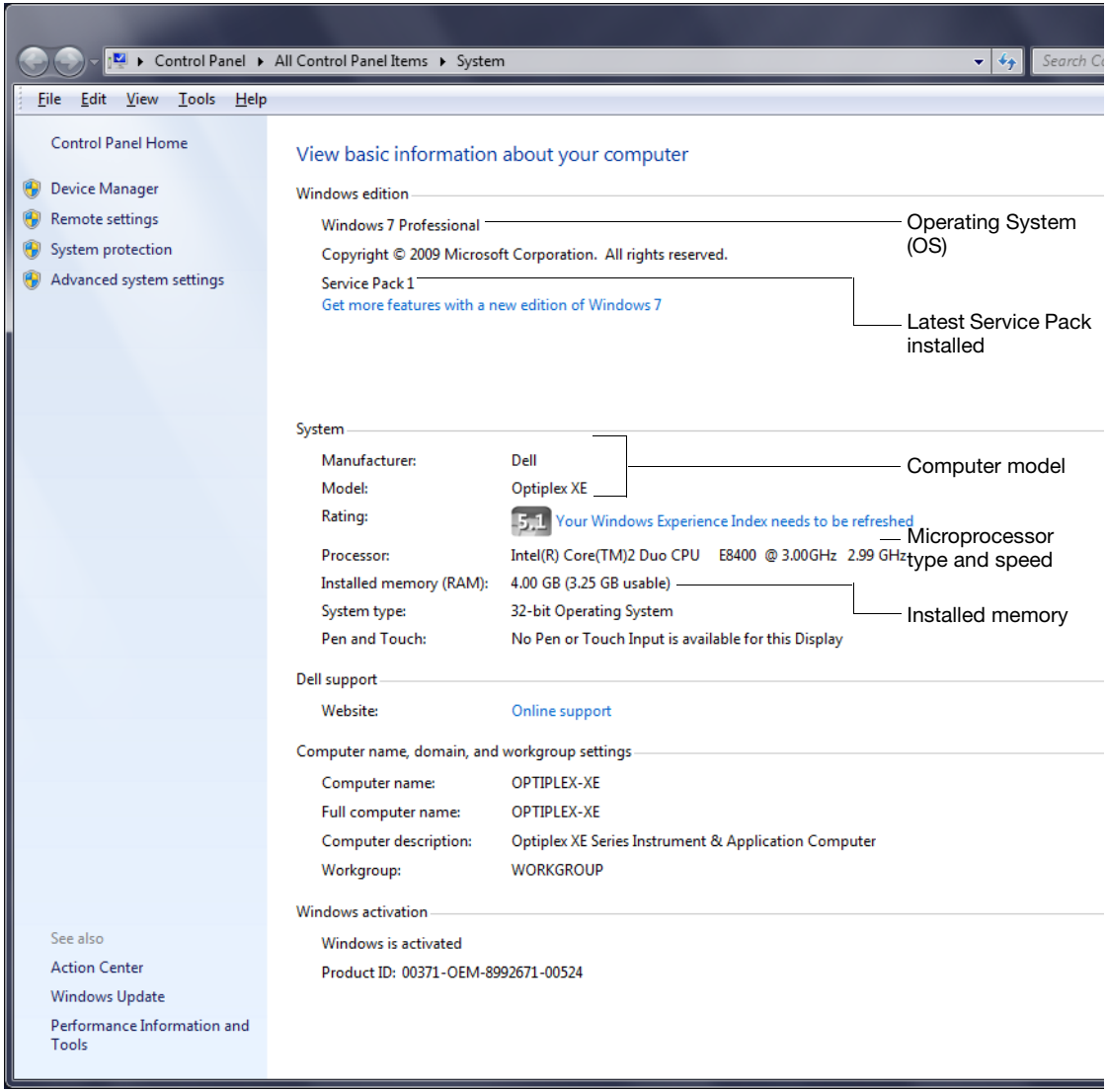
Table 2-1 GeneMapper® Software computer requirements

Component	Recommended Configuration	Minimum Configuration‡	
		Full Installation	Client Installation
Computer	• Dell® OptiPlex® CE, Intel® Core™2 Duo Processor, E8400/3.0 GHz • 4 MB of RAM, Non-ECC, 667 MHz DDR2 2 × 1 GB • 320 GB SATA hard drive, 3.0 Gb/s and 8 MB Data Burst Cache • 16X DVD +/- RW IDE Combo Drive • Free disk space: 500MB on the boot drive, 7 GB on the drive on which the GeneMapper® Software is installed	• Intel® Core™2 Duo Processor, E8400/3.0 GHz • 4 GB of RAM • 10/100 NIC network card with RWU (internal) • Free disk space: 500MB on the boot drive, 7 GB on the drive on which the GeneMapper® Software is installed	• Intel® Pentium® 4 Processor, 2 GHz • 2 GB of RAM • 10/100 NIC network card with RWU (internal) • Free disk space: 1 GB
Monitor	• 1280 × 1024 or higher pixel resolution • 17-inch color monitor		
Operating System	• Microsoft® Windows® 7 Professional operating system, Service Pack 1		

‡ The memory and hard disk space requirements need to be considerably higher than the minimum configuration if the product is deployed in a multi-user environment.

Verifying that Your Computer Meets the Minimum Requirements

1. In the desktop, right-click **Computer**, then select **Properties**.
2. Verify that your computer meets the minimum requirements for the operating system, processor, and memory as shown in "Computer Requirements" on page 23.


Control Panel ▸ All Control Panel Items ▸ System
File Edit View Tools Help
Control Panel Home
Device Manager
Remote settings
System protection
Advanced system settings
View basic information about your computer
Windows edition
Windows 7 Professional
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1
Get more features with a new edition of Windows 7
Operating System (OS)
Latest Service Pack installed
System
Manufacturer: Dell
Model: Optiplex XE
Rating: 5.1 Your Windows Experience Index needs to be refreshed
Processor: Intel(R) Core(TM)2 Duo CPU E8400 @ 3.00GHz 2.99 GHz
Installed memory (RAM): 4.00 GB (3.25 GB usable)
System type: 32-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer model
Microprocessor type and speed
Installed memory
Dell support
Website: Online support
Computer name, domain, and workgroup settings
Computer name: OPTIPLEX-XE
Full computer name: OPTIPLEX-XE
Computer description: Optiplex XE Series Instrument & Application Computer
Workgroup: WORKGROUP
Windows activation
Windows is activated
Product ID: 00371-OEM-8992671-00524
See also
Action Center
Windows Update
Performance Information and Tools

Instrument, Software, and Data Compatibility

Compatibility Matrix

Table 2-2 shows the version(s) of the Data Collection Software, Windows operating system, and sample data files that are supported by the GeneMapper® Software for specified instruments.

Note: The columns in Table 2-2 are described on page 27.

Table 2-2 Compatibility matrix

Genetic Analysis Instrument	Compatible Data Collection Software and Operating System	Sample Data Compatibility
 **Applied Biosystems 3500/3500xL Genetic Analyzer**	• Data Collection v2.0 • Windows 7 Professional, 32-bit, SP1	• Sample files • Co-installation
 **Applied Biosystems 3730/3730*xl* DNA Analyzer**	• Data Collection v4.0 • Windows 7 Professional, 32-bit, SP1	• Sample files • Co-installation
 **Applied Biosystems 3130/3130*xl* Genetic Analyzer**		
 **Applied Biosystems 3100 Genetic Analyzer**		
 **Applied Biosystems 310 Genetic Analyzer**		

Compatible Data Collection Software and Operating System Column

This column displays the version(s) of the Data Collection Software, Windows operating system, and any associated service pack(s) supported by the GeneMapper® Software for the specified instrument.

Sample Data Compatibility Column

This column indicates the methods by which the GeneMapper® Software can process sample data produced by the associated combination of instrument, Data Collection Software, and Windows operating system.

- **Sample Files** – The software can import sample files created by the specified combination of the Data Collection Software and Windows operating system.
- **Co-installation** – The software can be installed on the same computer that contains the specified combination of the Data Collection Software and Windows operating system.

PDF File Reader

To open the user documentation included on the *GeneMapper® Software Documentation* CD, use the Adobe® Acrobat® Reader® software available from **www.adobe.com.**

User Account Requirements

Log On Requirements

To install the GeneMapper® Software, you must:

- Have administrator privileges (complete and unrestricted access) on the local computer.

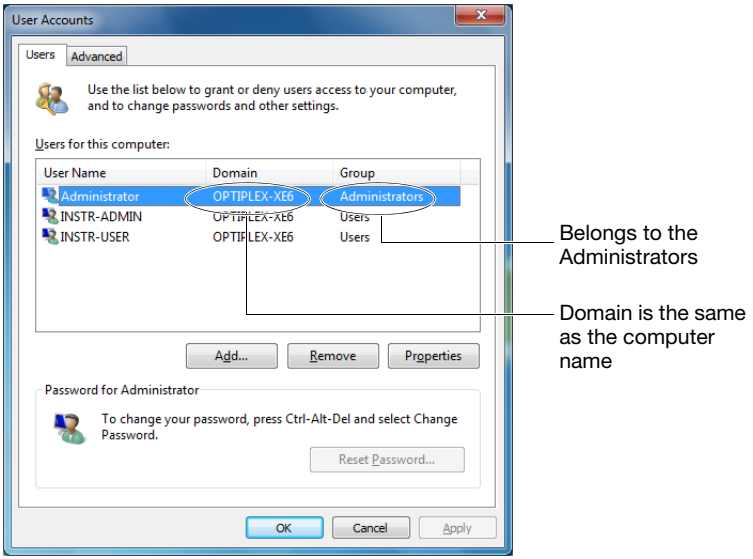
Note: This level of access is required only to install the GeneMapper® Software. After it is installed, you can run the GeneMapper® Software without administrator privileges.

Verifying that Your User Account Meets the Requirements

1. In the desktop, select **Start ▸ Control Panel**.
2. In the Control Panel window, double-click **User Accounts**.

3. In the Users tab of the User Accounts dialog box, verify that the user account you are using belongs to the Administrators group. If you are performing a full installation, verify that the domain is the same name as the computer name.

   Example:



4. Click **OK**.

GeneMapper® Software Installation DVDs

Before installing/upgrading the GeneMapper® Software, verify that you have the appropriate installation DVD(s).

Table 2-3 GeneMapper® Software installation DVDs

If you are performing a …	Use the DVD …
A full installation	*GeneMapper® Software Full Installation*
A client installation	*GeneMapper® Software Installer for Client*

3 Performing a New Installation of the GeneMapper® Software

This chapter covers:

- Overview 30
- Exporting GeneMapper® Software from a Windows XP Computer 30
- Importing GeneMapper® Software to a Windows 7 Computer 30
- Determining Your Installation Options 32

Section 3.1: Full Installation Procedures 35

- Instrument Configuration Procedures 36
- Stand-alone Configuration Procedures. 43

Section 3.2: Client Installation Procedures 48

- Client Configuration Procedures 48

Section 3.3: Software Login Procedures. 53

- Registering the Software After a New Installation 54
- Logging In to the Software for the First Time After a New Installation 55
- Logging In to the Database Dashboard for the First Time. . 57
- What Next?. 58
- Logging In to and Out of the Software 59

Overview

This chapter describes how to perform a new installation of the GeneMapper® Software on a Windows 7 computer. To perform a new installation, you cannot have a previous version of the GeneMapper® Software on your computer.

Exporting GeneMapper® Software from a Windows XP Computer

To export GeneMapper® Software data from a Windows XP computer:

If the GeneMapper® Software Configuration is	Follow the procedure in
• Stand-alone (not co-installed with Data Collection software) • Co-installed on a 3500 Series computer	Appendix C, Migrating Data Using the GeneMapper® Database Utility Wizard
• Co-installed on a 3730 Series, 3130 Series, 3100, or 310 computer	Appendix D, Migrating Data Manually

Importing GeneMapper® Software to a Windows 7 Computer

To import GeneMapper® Software data to a Windows 7 computer:

If the GeneMapper® Software Configuration is	Follow the procedure in
• Stand-alone (not co-installed with Data Collection software) • Co-installed on a 3500 Series computer	Appendix C, Migrating Data Using the GeneMapper® Database Utility Wizard

If the GeneMapper® Software Configuration is	Follow the procedure in
• Co-installed on a 3730 Series, 3130 Series, 3100, or 310 computer	Appendix D, Migrating Data Manually

Determining Your Installation Options

Your installation options depend on the type of computer on which you are installing the software:

- Instrument computer (connected to the instrument)
- Stand-alone computer (not connected to the instrument)

Table 3-1 GeneMapper® Software installation options

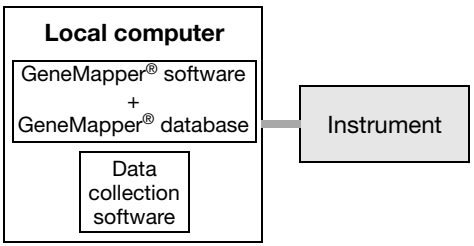
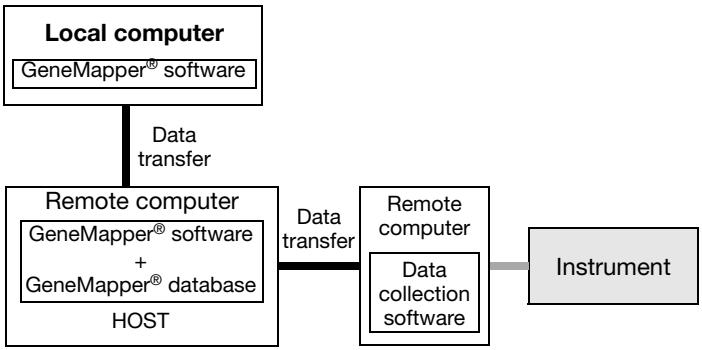
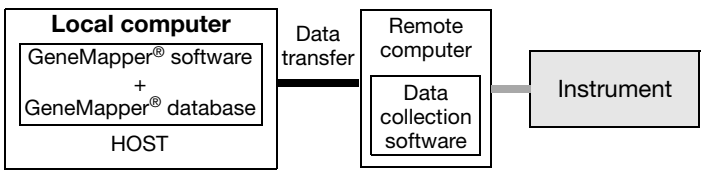
Computer	Description	See page
Instrument: Full Installation only (software and database)	 The Data Collection Software and the GeneMapper® Software are installed on the same computer. In this configuration, you can use the GeneMapper® Software to: • Add sample files and studies to a project from a local Data Collection Software database. • Perform manual analysis of the project or study.	36

Table 3-1 GeneMapper® Software installation options

Computer	Description	See page
Stand-alone: Client Installation (software only)	 The Data Collection Software and the GeneMapper® Software are installed on separate computers. In a stand-alone configuration, you can use the GeneMapper® Software to: • Add sample files and studies to a project from a remote Data Collection Software database. • Perform manual analysis of the project or study.	43
Stand-alone: Full Installation (software and database)	 The Client GeneMapper® Software can be installed on multiple client computers. The Full GeneMapper® Software is installed on one computer separate from the client computers. The Data Collection Software is installed on a computer separate from the client computers. In a client configuration, you can set up the Client GeneMapper® Software to: • Obtain sample files from the remote Data Collection Software database. • Store sample files, panel and bin definitions, analysis methods, size standards, table and plot settings, and projects on the GeneMapper® Software instrument computer.	48

Section 3.1 Full Installation Procedures

This section covers:

- Instrument Configuration Procedures 36
- Stand-alone Configuration Procedures. 43

Note: To perform a client installation, go to Section 3.2, "Client Installation Procedures," on page 48.

IMPORTANT! Be sure you use the *GeneMapper® Software Full Installation* DVD when performing the installation procedures described in this section.

Instrument Configuration Procedures

Install the instrument configuration if the Data Collection Software is installed on the local computer.

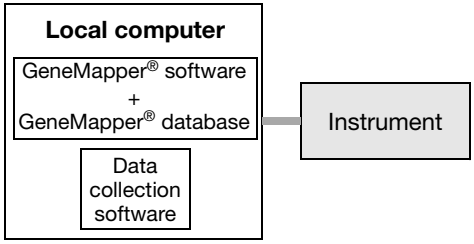


Figure 3-1 Example of an instrument configuration

If you do not have the Data Collection Software on the computer, do one of the following:

- Install the Data Collection Software before proceeding
- Install the stand-alone configuration (see page 43)

Installation Tasks for an Instrument Configuration

Installing the GeneMapper® Software in an instrument configuration requires that you:

Task	See page
1. Export from the database on the Windows XP computer:	
– 3500 Series computer	189
– 3730 Series, 3130 Series, 3100, or 310 computer	193
2. Start the Data Collection services on the computer.	37
3. Install the GeneMapper® Software on the computer.	39

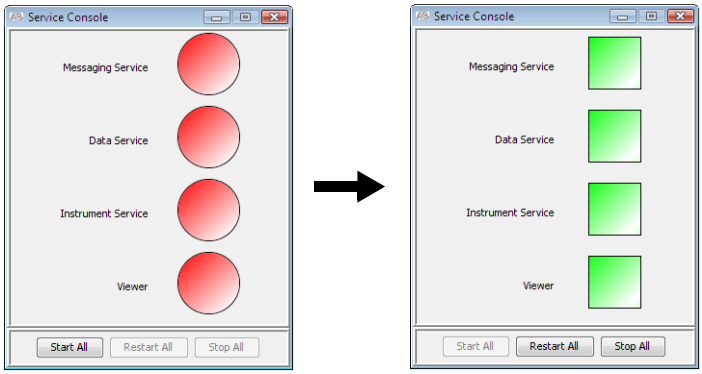
Starting the Data Collection Services on the Local Computer

Before you install the GeneMapper® Software, start the Data Collection services on the local computer.

Note: For information on starting the Data Collection services for the 3500 series genetic analyzers, refer to the instrument user guide.

1. Select **Start** ▸ **All Programs** ▸ **Applied Biosystems** ▸ **Data Collection** ▸ **Run** <***Data Collection version***>, where <*Data Collection version*> is one of the following:
   - 3730/3730*xl* Data Collection v3.1
   - 3130/3130*xl* Data Collection v3.1

   After the Service Console opens, wait until all four symbols change to green squares.



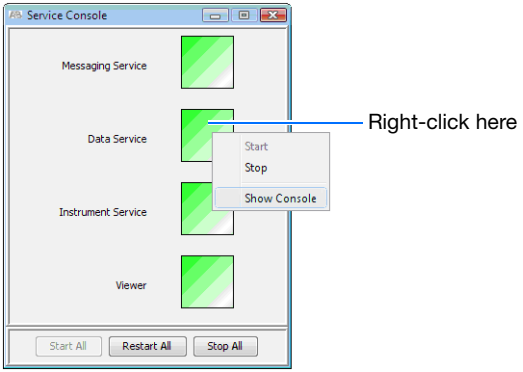
Note: If the services do not start automatically, click **Start All**.

2. If the Data Collection Software requires a password, a login dialog box opens. Type the Login Name and Password, then click **OK**.

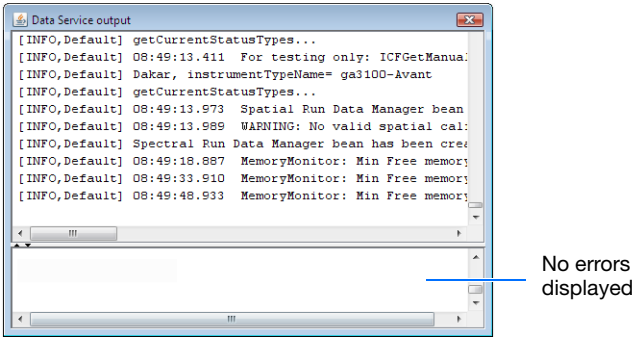
Note: If you do not know the Login Name or Password, contact the administrator.

3. Verify that Data Service started without errors:

   a. In the Service Console, right-click the square next to Data Service and select **Show Console** to display the Data Service output window.



   b. Verify that no errors are displayed in the lower pane of the window, then close the Data Service output window.



Installing the Instrument Configuration of the GeneMapper® Software

To install the GeneMapper® Software on the same computer as the Data Collection Software:

1. Insert the *GeneMapper® Software Full Installation* DVD into the DVD drive to start the installer.

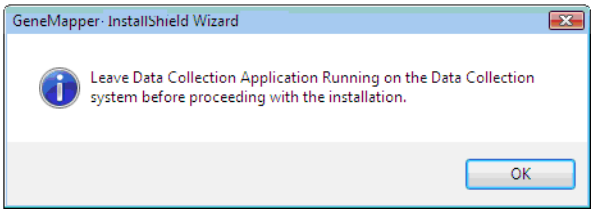
   If the installer does not start automatically:

   a. Right-click **Computer** and select **Explore**.

   b. Expand the DVD drive, then select the **GeneMapper 5** folder to display the contents.

   c. Double-click  **GeneMapper5** to start the installer.

2. Be sure that the Data Collection services are running (see page 37). Close all other applications and windows, then click **OK** to close the following message:



3. In the Welcome window, click **Next**.

4. Review the installation requirements status, then click **Next**.

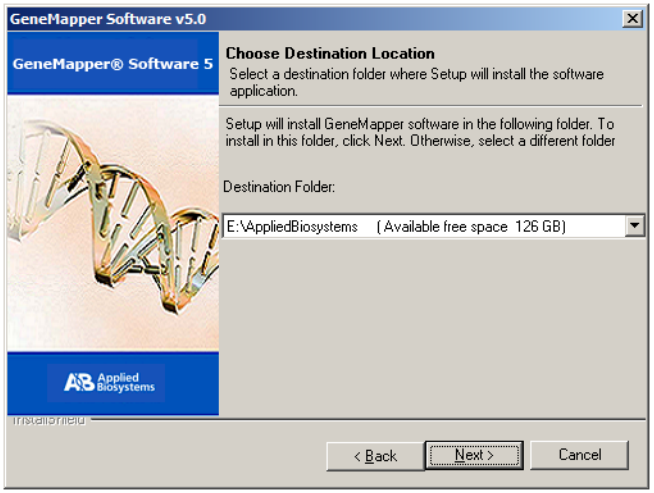
5. Read the release notes, then click **Next**.

6. If you want to install the GeneMapper® Software to a drive different from the default drive, select the destination folder:

Note: We recommend installing the GeneMapper® Software on the E drive when co-installing the GeneMapper® Software on the same computer as the Data Collection Software.

   a. Confirm that the boot drive has at least 200 MB of available free space.

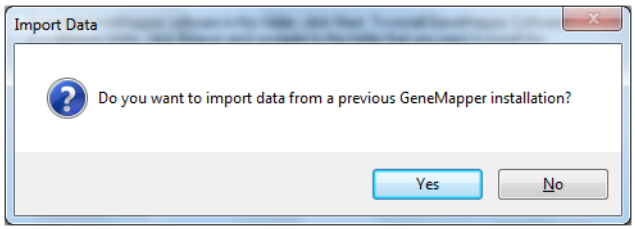
   b. Select a destination folder with at least 7 GB of free space, then click **Next**.



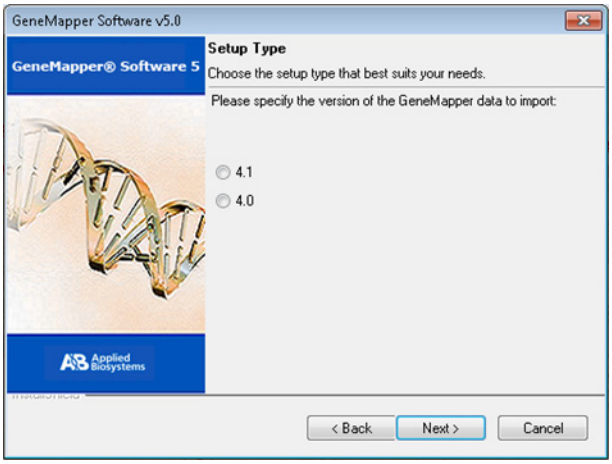
Note: On 3500 Series computers, the installation prompts you to import the database that you exported from the Windows XP computer. On 3730 Series, 3130 Series, 3100, or 310 computers, the installation does not prompt you to import; you must manually import the database contents from the Windows XP computer (see 193).

7. **On 3500 Series computers only:** To import data you exported from the GeneMapper Windows XP computer:

   a. Click **Yes** in the Import Data dialog box.



b. Select the version you are importing in the Setup Type window, then click **Next**.



8. View the amount of disk space that is preallocated for the GeneMapper® Software database, then click **Next**.

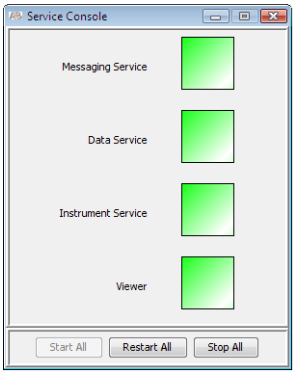
Note: The amount of disk space that is preallocated varies according to your computer configuration.

9. Review the settings, then click **Next** to start the installation.

IMPORTANT! During installation, DOS commands are executed and the DOS window may open. Do not delete, close, or click the DOS window. If you do click it, press the **Esc** key.

10. After the installer completes the installation, it displays an InstallShield Wizard Complete window. Be sure to stop the Data Collection services before restarting your computer:

    a. In the Service Console, click **Stop All**.



    b. Remove the installation DVD from the drive.

    c. In the InstallShield Wizard Complete window, select **Yes, I want to restart my computer now**, then click **Finish**.

11. Go to Section 3.3, “Software Login Procedures,” on page 53.

Stand-alone Configuration Procedures

Install the stand-alone configuration on a computer that does not contain the Data Collection Software.

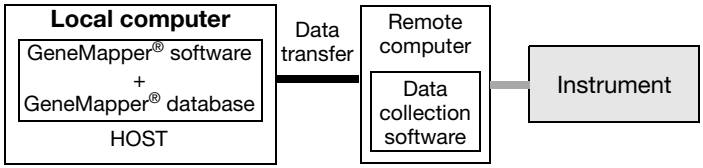


Figure 3-2 Example of a stand-alone configuration

Installation Tasks for a Stand-alone Configuration

Installing the GeneMapper® Software as a stand-alone configuration requires that you:

Task	See page
Export the database using the GeneMapper® Database Utility Wizard	189
Install the GeneMapper® Software on the local computer.	43

Installing the Stand-alone Configuration of the GeneMapper® Software

To install the GeneMapper® Software on a computer separate from the Data Collection computer:

1. Insert the *GeneMapper® Software Full Installation* DVD into the DVD drive to start the installer.

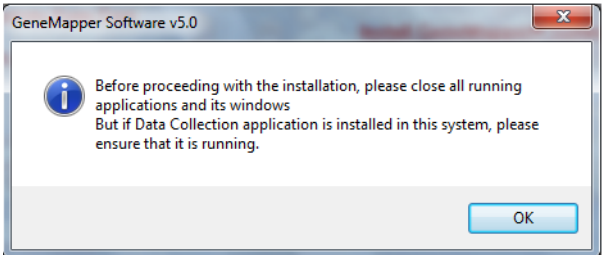
   If the installer does not start automatically:

   a. Right-click **Computer** and select **Explore**.

   b. Expand the DVD drive, then select the **GeneMapper5** folder to display the contents.

   c. Double-click **GeneMapper5** to start the installer.

2. Close all other applications and windows, then click **OK** to close the following message.



3. Review the installation requirements status, then click **Next**.

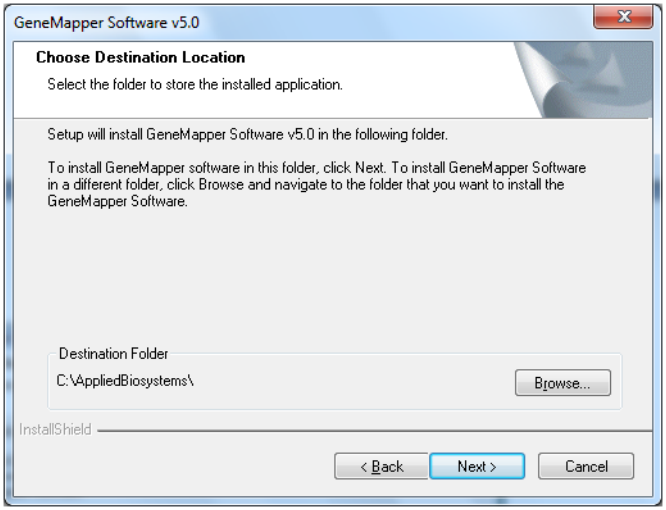
4. Select **Stand-alone** for type of installation, then click **Next**.

5. Read the release notes, then click **Next**.

6. If you want to install the GeneMapper® Software to a drive different from the default drive, select the destination folder:

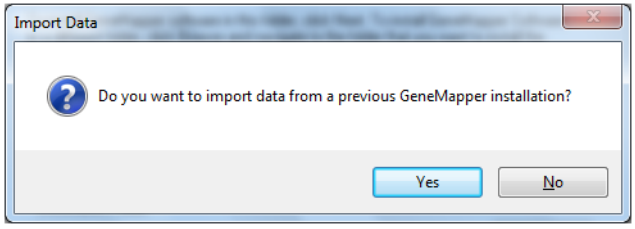
   a. Confirm that the boot drive has at least 200 MB of available free space.

b. Select a destination folder with at least 7 GB of free space, then click **Next**.

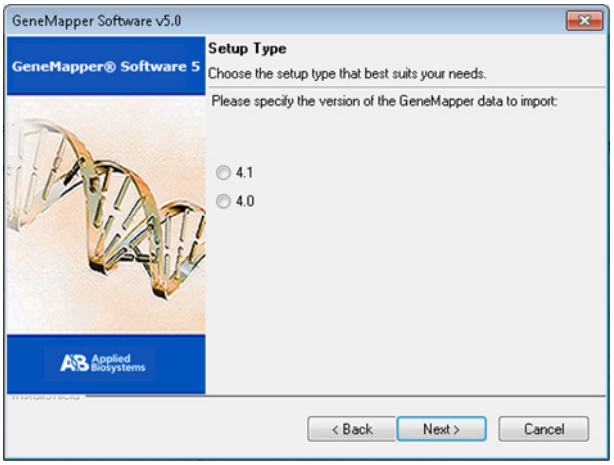


7. To import data you exported from the GeneMapper Windows 7 computer:

   a. Click **Yes** in the Import Data dialog box.

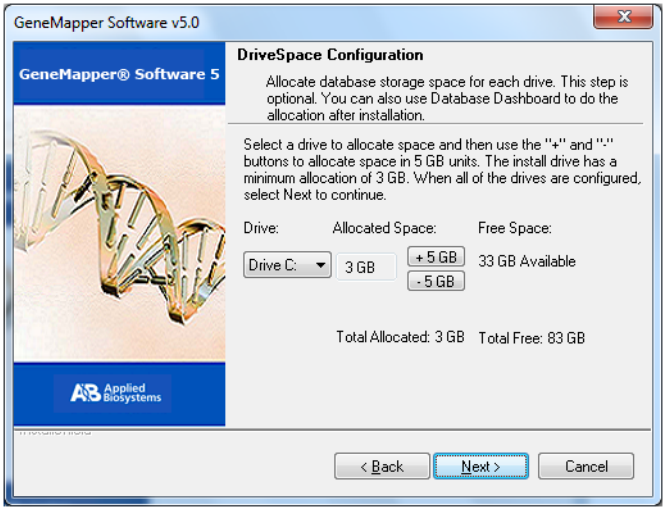


   b. Select the version you are importing in the Setup Type window, then click **Next**.



8. (Optional) Allocate space for the GeneMapper® Software database, then click **Next**.

IMPORTANT! The minimum allocation for the install drive is 3 GB. If you want to increase the drive space allocation, increase it in increments of 5 GB.



Note: You can allocate more drive space later using the Database Dashboard. See "Allocating Additional Disk Space" on page 155.

9. Read the current settings, then click **Next** to start the installation.

IMPORTANT! During installation, DOS commands are executed and the DOS window may open. Do not delete, close, or click the DOS window. If you do click it, press the **Esc** key.

10. In the InstallShield Wizard Complete window, select **Yes, I want to restart my computer now**, remove the installation DVD from the drive, then click **Finish**.

11. Go to Section 3.3, “Software Login Procedures,” on page 53

Section 3.2 Client Installation Procedures

Client Configuration Procedures

Install the client configuration on computers that share one central GeneMapper® Software database. You can install the GeneMapper® Software clients as a stand-alone configuration.

Stand-alone Client Configuration

In *stand-alone configuration*, the GeneMapper® Software client *does not* interact with the Data Collection Software.

You can use the stand-alone client to:

- Add sample files from a remote Data Collection Software database to a project, then perform manual analysis of the project.
- Add sample files from the GeneMapper® Software to a project, then perform manual analysis of the project.

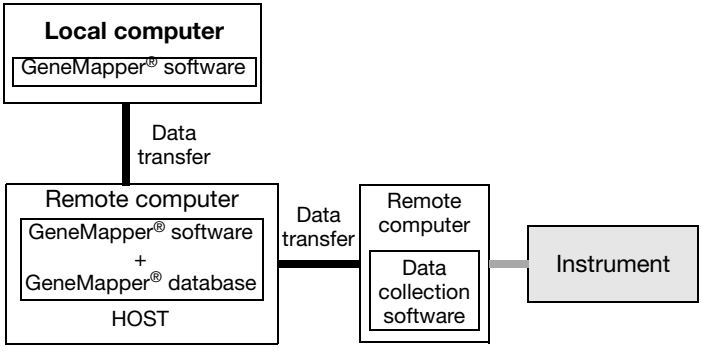


Figure 3-3 Example of stand-alone client configuration

Installation Tasks for a Stand-alone Client Configuration

To install the GeneMapper® Software as a *stand-alone client configuration*, perform the following tasks:

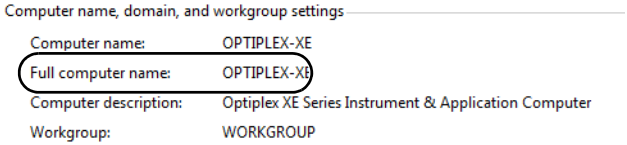
Task	See page
1. Obtain the name of the GeneMapper® Software instrument computer.	49
2. Install the GeneMapper® Software client on the local computer.	50

Obtaining the GeneMapper® Software Instrument Computer Name

When installing the GeneMapper® Software clients, you need the name of the GeneMapper® Software instrument computer.

1. Right-click **Computer** in the desktop and select **Properties**.
2. Locate the full computer name. You will need to enter the name when you install the GeneMapper® Software.

   Note: The full computer name is the host name.



3. Close the dialog box.

Installing the Client Configuration of the GeneMapper® Software

1. Insert the *GeneMapper® Software 5 Installer for Client* DVD into the DVD drive to start the installer.

   If the installer does not start automatically, then:

   a. Right-click **Computer** and select **Explore**.

   b. Expand the DVD drive.

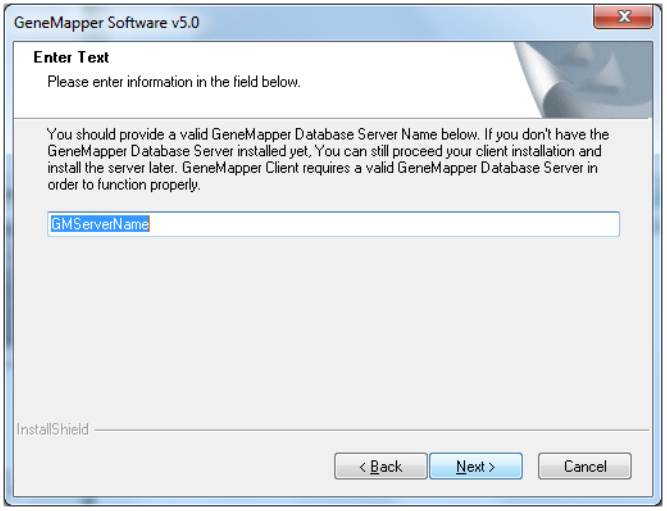
   c. Select the **GeneMapper 5** folder to display the contents.

   d. Double-click **GeneMapper5** to start the installer.

2. In the Welcome window, click **Next**.

3. Review the installation requirements status, then click **Next**.

4. Type the instrument computer name (host name or full computer name) for the GeneMapper® Software database computer (see page 49), then click **Next**.

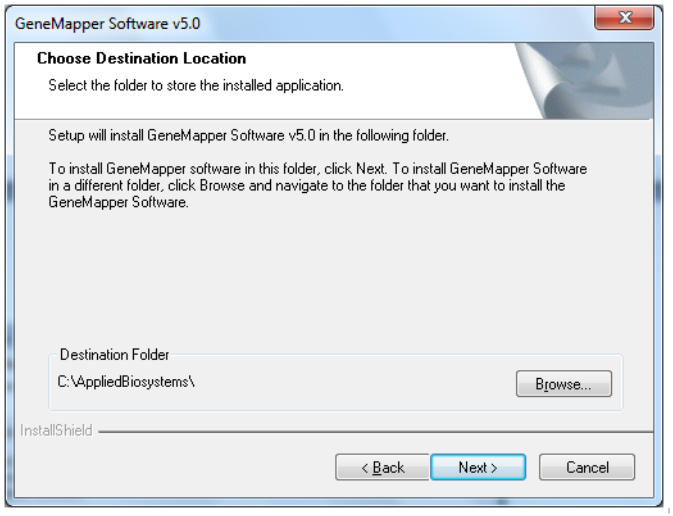


5. After the installer establishes a connection with the GeneMapper® Software instrument computer, click **OK** to continue.

6. Select **Stand-alone** for the type of installation:

7. Read the release notes, then click **Next**.

8. If you want to install the GeneMapper® Software to a drive different from the default drive, select the destination folder:
   a. Confirm that the boot drive has at least 200 MB of available free space.
   b. Select a destination folder with at least 7 GB of free space, then click **Next**.



9. Read the current settings, then click **Next** to start the installation.

IMPORTANT! During installation, DOS commands are executed and the DOS window may open. Do not delete, close, or click the DOS window. If you do click it, press the **Esc** key.

10. In the InstallShield Wizard Complete window, click **Finish**.

11. Go to Section 3.3, “Software Login Procedures,” on page 53.

Note: To import data from a previous version of the software after you log in, see Appendix D, Migrating Data Manually,

Section 3.3 Software Login Procedures

This section covers:

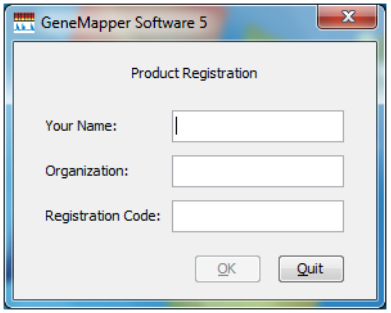
- Registering the Software After a New Installation 54
- Logging In to the Software for the First Time After a New Installation 55
- Logging In to the Database Dashboard for the First Time . . 57
- What Next? 58
- Logging In to and Out of the Software 59

Registering the Software After a New Installation

Register the software the first time that you start the software.

Note: If you cannot to register the software as described, see Appendix A on page 161.

1. In the desktop, double-click GeneMapper5 or select **Start ▸ All Programs ▸ Life Technologies ▸ GeneMapper ▸ GeneMapper5**.
2. Complete the Registration dialog box:



Note: The registration code is on the registration card packaged with the software. Keep your registration code where you can retrieve it easily. If you need to reinstall the software, you will be prompted for the registration code.

3. Click **OK**.

Logging In to the Software for the First Time After a New Installation

1. Complete the Login to GeneMapper dialog box:
   a. Use the default user name **gm**.
   b. Type the password **password**.
   c. Click **OK**.

2. Click **OK** when the software prompts you to change the password.

3. Change the password:
   a. Type a new password.
   b. Retype the new password to confirm.
   c. Click **OK**.

Note: Type a password that is 6 to 10 alphanumeric characters.

IMPORTANT! Keep the new password for the default user gm where you can retrieve it easily. If you forget or lose your password for the default user gm, it is not possible for Life Technologies to retrieve it.

4. Read the license agreement, then click **Yes** if you agree with the terms.

5. Review the license agreement and product warranty. You can:
   - Click **Decline** to quit the application.
   - Click **Service** to bypass the agreement and proceed to the Project window.

     IMPORTANT! You can click **Service** (and bypass the agreement) up to three times before you are locked out of the software. After you make this selection one or two times, the license agreement and product warranty are displayed the next time that you log in to the software.

   - Click **Print** to print the agreement.
   - Click **Accept** to accept the terms of the agreement and open a new, untitled Project window.

6. If necessary, see the "Creating a User Account" on page 89 for instructions on adding users.

Logging In to the Database Dashboard for the First Time

Use the following procedure to log in to the Database Dashboard for the first time after performing a new full installation of the GeneMapper® Software.

To log in to the Database Dashboard for the first time:

1. Select **Start** ▸ **All Programs** ▸ **Life Technologies** ▸ **Database Dashboard** ▸ **Dashboard**.
2. Complete the Login to Dashboard dialog box:
   a. Type the password **password**.
   b. Click **OK**.
3. Click **OK** when the software prompts you to change the password.
4. Change the password:
   a. Type a new password.
   b. Retype the new password to confirm.
   c. Click **OK**.

Note: Type a password that is 6 to 10 alphanumeric characters.

IMPORTANT! Keep the new password for the Database Dashboard where you can retrieve it easily. If you forget or lose your password for the Database Dashboard, it is not possible for Life Technologies to retrieve it.

5. See "About the Dashboard Software" on page 149 and the GeneMapper® Software Online Help for more information about using the Database Dashboard to maintain the GeneMapper® Software database.

What Next?

For user instructions, refer to the:

- *GeneMapper® Software Getting Started Guides*
- *GeneMapper® Software Online Help*

  To access the online help from the GeneMapper® Software, do one of the following:

  – Click  in the toolbar
  – Select **Help ▸ Contents and Index**
  – Press **F1**

Logging In to and Out of the Software

Logging In

1. In the desktop, double-click GeneMapper5 or select **Start ▸ All Programs ▸ Life Technologies ▸ GeneMapper ▸ GeneMapper5**.

2. Select your user name from the User Name drop-down list. If your name is not listed, type it in.

If you do not have a user name, request a user name and/or password from the administrator. If you are the administrator, use:

- User Name: **Administrator**
- Password: **Administrator**

If your password is pre-expired, the software prompts you to create a password after you click **OK**.

3. Type your password.

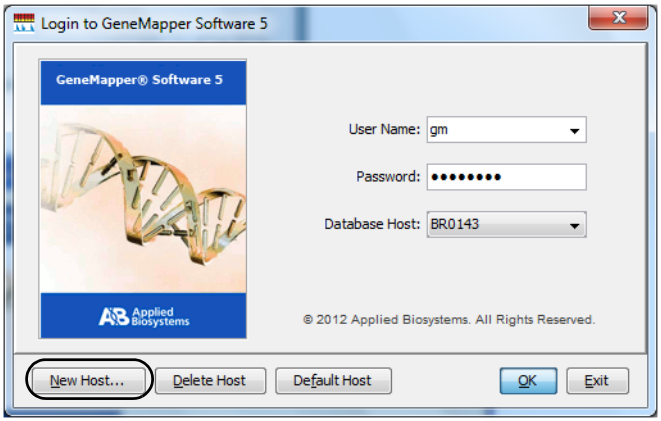
IMPORTANT! Life Technologies recommends changing the password for the Administrator user account after installing the software.

4. Click **OK**.

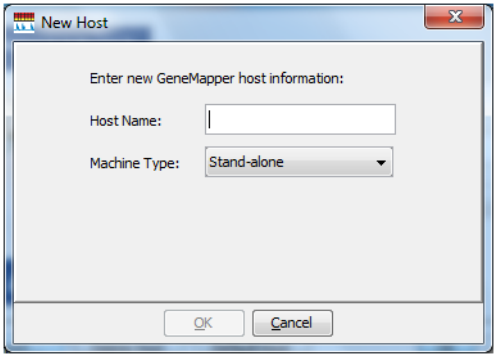
Note: If you unsuccessfully attempt to log in to the software more times than allowed by your password policy, your account becomes suspended. To activate a suspended user account, either wait the time specified by the policy associated with the account, or ask your administrator to reactivate the account (see "Activating, Deactivating, and Suspending User Accounts" on page 93 for more information).

Connecting to a New Host

1. Click **New Host** on the Login to GeneMapper dialog box.



2. Complete the fields in the New Host dialog box to connect to a GeneMapper® Software database on another computer:



a. In the Host Name field, type the instrument computer name or IP address of the database host.

   The window displays the new database host and its user names list. If the GeneMapper® Software cannot connect to the database host you entered, the error message "You have entered an invalid host" is displayed. Click **OK** to exit, then retype the database host information.

b. Select the appropriate machine type.

c. Click **OK**.

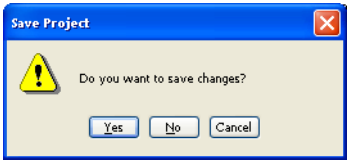
IMPORTANT! If, at any time, the network connection is interrupted or lost, the GeneMapper® Software becomes unusable. To restore the connection, exit the software, then restart it using a user account that belongs to the Administrator user group.

Logging Out

You can close the GeneMapper® Software in one of three ways:

- Select **File ▸ Logout**
- Select **File ▸ Exit**
- Click (the Close button).

When you log out of the GeneMapper® Software with a GeneMapper project that has unsaved changes, the software prompts you to save or discard the changes you made since the last time you updated the project.



If you close the GeneMapper® Software using the File ▸ Logout command, the login window reopens after you select either "Yes" or "No." GeneMapper® Software closes completely if you use either the File ▸ Exit command or the Close button.

4 Managing Database Security and User Access

This chapter covers:

- About GeneMapper® Software Security 64
- Configuring the Password Policies 66
- Managing User and Security Groups 70
- Managing Applications 78
- Managing Profiles 78
- Managing User Accounts 88
- Viewing the Security Report 94
- Exporting and Importing the Security Settings 96

About GeneMapper® Software Security

Security System Components

The GeneMapper® Software uses two applications to secure and monitor the data it stores:

- Security Manager
- Audit Map Configuration Software

This chapter describes how to use the Security Manager utility to control user access to the GeneMapper® Software. For more information on monitoring use and modification of data stored by the GeneMapper® Software, see Chapter 5, "Managing the Auditing and Electronic Signature Systems."

About the Access Control Administration Software

The Access Control Administration Software restricts user access to the functions of the GeneMapper® Software and to the data it stores. Using the Security Manager, you can create or remove user accounts, control user access to functions of the GeneMapper® Software, and define general policies for password use.

IMPORTANT! Use of the Access Control Administration Software is not optional.

Note: The Access Control Administration Software is an integral part of the GeneMapper® Software that cannot be deactivated or uninstalled.

Starting the Access Control Administration Software

IMPORTANT! Only users that belong to the Administrator user group (see page 83) can use the Access Control Administration Software.

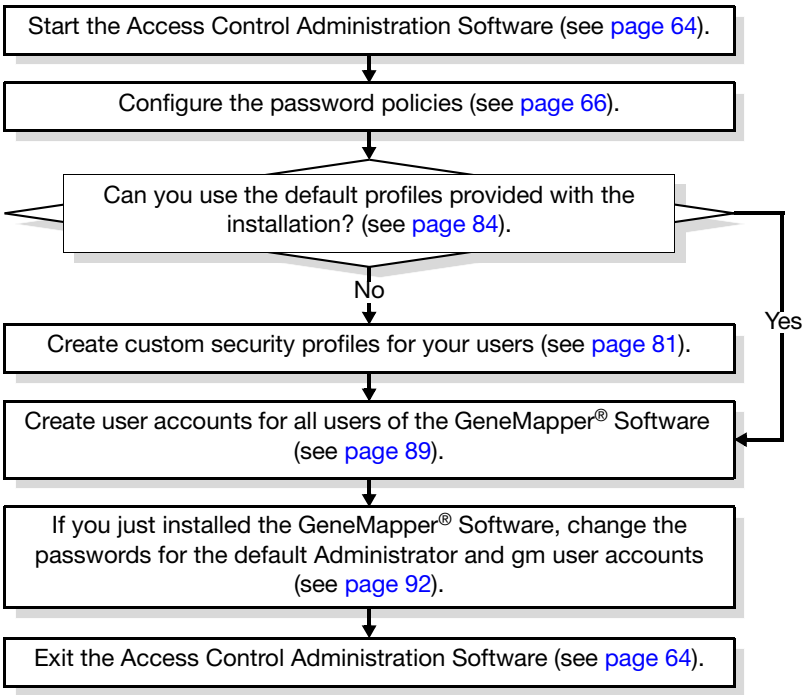
IMPORTANT! After the installation of the software, the first person to log in must do so using the default user account (user name: **gm**; password: **password**), then configure user names for his or her department.

1. Start and log in to the GeneMapper® Software (see "Logging In to and Out of the Software" on page 59).
2. In the GeneMapper window, select **Tools ▸ Security Manager**.

3. In the AdminToolAcc dialog box, type a user name and password for a user account with administrative privileges, then click **OK**.

Setting Up the Security System

The following tasks must be performed to set up the Security System Software for the GeneMapper® Software.



Maintaining the Security System

Perform the tasks in the following table to maintain the security system for the GeneMapper® Software.

Frequency	Tasks
As needed	• Create, modify, or retire user accounts as needed (see page 89). • Create, modify, or retire security profiles as needed (see page 81).

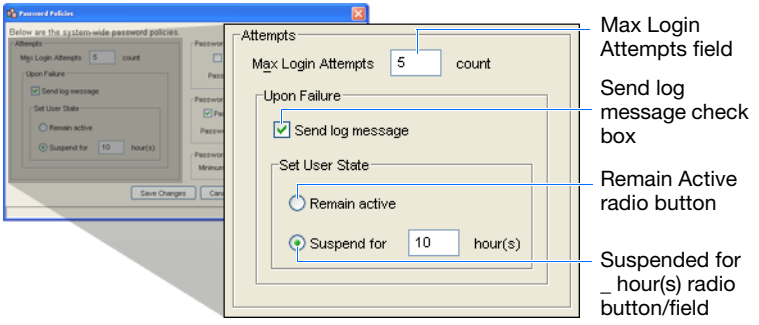
Configuring the Password Policies

About Password Policies

The password policies system of the Access Control Administration Software is a set of rules that control various aspects of password use and how the software responds to failed login attempts. The Access Control Administration Software applies the password policies settings uniformly to all user accounts, including those with administrative privileges. Configuring the password policies system is not optional. We recommend that you configure the password policies immediately after you install the GeneMapper® Software, and review the policies every six months as part of routine maintenance.

Setting the Password Policies

1. Start the Access Control Administration Software (see page 64).
2. Select **Settings** ▸ **Password Policies**.
3. In the Password Policies dialog box, configure the Attempts settings to determine how the software handles failed login attempts (when a user attempts to log in using the wrong password):



- **Max Login Attempts** – Type the number of failed login attempts that the software should allow before suspending the user account.

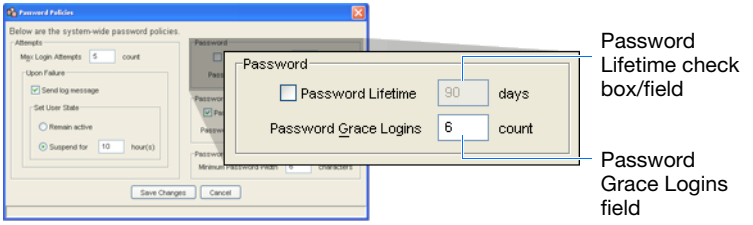
- **Send log message** – Select this if you want the software to record the failed login attempts to the security log.

  Note: The security log for the GeneMapper® Software is an ASCII text file located in `<drive>:\AppliedBiosystems\ GeneMapper\GeneMapper_Log.txt`. For more information on interpreting the notations in the security log, see "Viewing the Security Report" on page 94.

- **Set User State** – Select an option to determine the way that the software responds to users who exceed the number of failed login attempts (defined by the Max Login Attempts field):
  - **Remain Active** – If selected, the user account remains active when a user exceeds the maximum login attempts.
  - **Suspended for _ hour(s)** – If selected, the software suspends the user account for the specified number of hours when a user exceeds the maximum login attempts.

  Note: If a user exceeds the maximum number of login attempts, you can reactivate the user account before the specified time period elapses as explained in "Activating, Deactivating, and Suspending User Accounts" on page 93. Otherwise, the user must wait for the specified number of hours to elapse before he or she can attempt another login.

4. Configure the Password settings to determine the length of time that passwords are valid on the system:

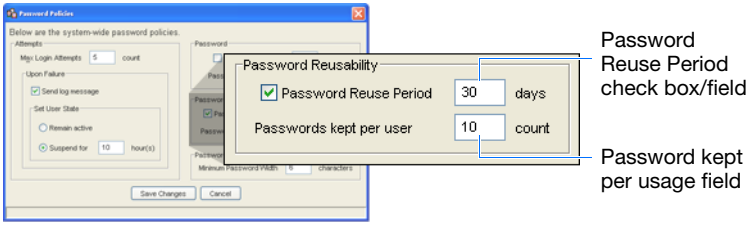


- **Password Lifetime** – Select this if you want the software to retire the password of each user account after the specified number of days elapses.

  Note: When the software retires a password, it automatically prompts the user to create a new password the next time he or she uses the GeneMapper® Software.

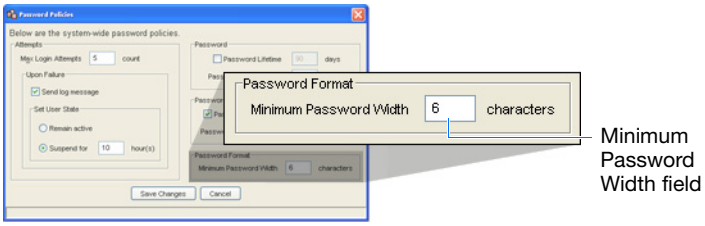
- **Password Grace Logins** – Type the number of times that a user can delay changing his or her password after the software prompts the user to change it. Once the user exceeds the number of specified logins, the software requires the user to change his or her password.

5. Configure the Password Reusability settings to determine how long users can use the same password:



- **Password Reuse Period** – Select this if you want the software to allow a user to reuse a former password after the specified number of days has elapsed since its last use.
- **Password kept per usage** – Type the number of former passwords per user that the Access Control Administration Software should store.

6. In the Minimum Password Width field of the Password Format settings, type the number of characters that the software should enforce as the lower limit for all user passwords.



For example, if you type “6” in the Minimum Password Width field (as shown in the figure above), all users must choose passwords at least 6 characters in length.

Note: By default, all passwords must be at least 6 characters.

7. Click **Save Changes**.

Managing User and Security Groups

Overview

The GeneMapper® Software employs a system of user and security groups to manage data access privileges in a multi-user environment. By combining the groups you can create multiple public and private data pools for the users of the GeneMapper® Software. In addition to the control provided by the user and security groups, the GeneMapper application provides a locking mechanism to prevent users from unknowingly overwriting each other's changes.

IMPORTANT! Use of the user and security groups is applicable only to multi-user environments (such as the client installation and situations in which multiple users operate the GeneMapper® Software on a single computer). Individual users who do not plan to share the application, do not need to alter the user and security group settings.

About User Groups

As the name implies, user groups associate user accounts for the sole purpose of bestowing them with data access privileges. Each user group can be individually configured to provide users with Read or Update access to the data object controlled by the associated security groups. When rights conflict, the most permissive right prevails. A user account can belong to multiple user groups, and a user group can be associated with multiple security groups.

Note: If a user belongs to multiple user groups, the user's access privileges are a combination of all the rights granted by the associated groups.

The GeneMapper® Software installs two default user groups:

- **Administrators** – The default user group created for users responsible for maintaining and administrating the software. The Administrator user group has Read/Update privileges (uneditable) to all data objects.
- **All Users** – All users are automatically members of the All Users group. By default, the All Users user group has Read/Update privileges to all data objects belonging to the default GeneMapper security group.

About Security Groups

Top-level GeneMapper® Software data (such as individual analysis methods, projects, and panels) are assigned to a single security group. When a security group is associated with a user group, the GeneMapper® Software defines the access rights of that user group to the data of the security group. Security groups provide the basis for ownership of the objects used by the GeneMapper® Software. For example, if a user creates a new project and associates it with a particular security group, only users who belong to a user group that has Read or Update permissions for the same security group can view the project. Security groups restrict access to: projects, table settings, plot settings, cluster plot settings, report settings, reference data, chemistry kits, and panels.

IMPORTANT! Security groups *do not* restrict access to sample data. After samples are added to a project, the GeneMapper® Software stores the pertinent data from the sample files to the database, where any user can access it for use in additional projects.

The GeneMapper® Software installs two default security groups:

- **Admin Security Group** – Contains all data objects for the:
  - Access Control Administration Software (user accounts, user profiles, user and security groups, and applications)
  - Electronic Signature Software (electronic signature settings and records)
  - Audit Manager Software (audit map settings and records)
- **GeneMapper** – By default, the GeneMapper security group contains all data objects used by the GeneMapper® Software (until the addition of other security groups).

User and Security Groups From the User's Perspective

After you configure the GeneMapper® Software with user and security groups and associate user accounts to the user and security groups, the software modifies the content of specific dialog boxes and windows accordingly. When a user creates, opens, or attempts to modify a controlled data object, the software includes in the appropriate element of the user interface, a drop-down list that prompts the user to assign a Security Group to the data object.

Examples

This section illustrates the function of user and security groups through a series of example scenarios. Figure 4-1 on page 74 displays a diagram of the user and security group configuration for each example.

Example 1: Simple Public and Private Data Configuration

This configuration supports two users who do not co-author projects, but share data resources, such as analysis methods, size standard definitions, panels and bin sets, or SNP sets.

In Example 1:

- Both users can read and update data belonging to the Public security group (shared data such as analysis methods, size standard definitions, panels and bin sets).
- Each user can read and update data belonging to his or her personal security group (projects)
- The users cannot read each other's private data.

Example 2: Public and Private Data Configuration with Viewer

This configuration provides the same support explained in Example 1, except that it features the Private Viewer user group that allows Users 1 and 2 to view each other's private data.

In Example 2:

- Both users can read and update public data belonging to the Public security group (multi-author projects and other shared data such as analysis methods, size standard definitions, panels and bin sets).
- Each user can read and update private data belonging to his or her personal security group (single-author projects).
- Because both users belong to the Private Viewer user group, they can read each other's private data.

Note: The Private Viewer user group prevents the users from updating each other's projects, but it allows them to use and create copies of the viewable projects.

Example 3: Workgroup Configuration

This configuration contains two duplicate workgroups in the configuration shown in Example 2. Also included in Example 3 are user and security groups for a principal investigator (PI) who is responsible for managing and reviewing the data generated by the work groups.

In Example 3:

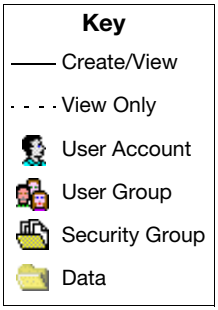
- The users of the workgroups can read and update public data belonging to the Workgroup security group for their workgroup.

  For example, Users 1 and 2 can read and update data objects belonging to the Workgroup 1 security group (multi-author projects and other shared data, such as analysis methods, size standard definitions, panels and bin sets).
- All users can read and update the private data belonging to their personal security group (single-author projects).
- Because the members of each workgroup belong to a Workgroup user group, they can view each other's private data.

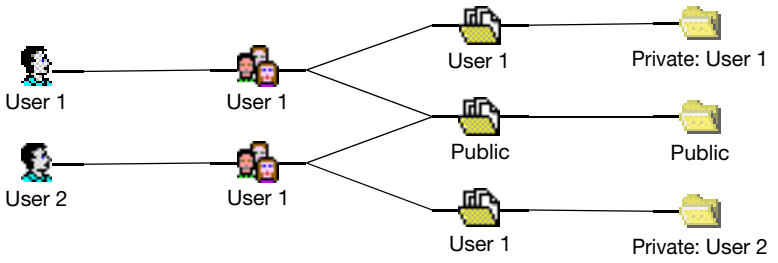
  Note: The Workgroup user group prevents the users from altering each other's private data, but the users can use and create copies of the viewable data objects.

- The user assigned to the principal investigator user group can read and update the private data of all other users.

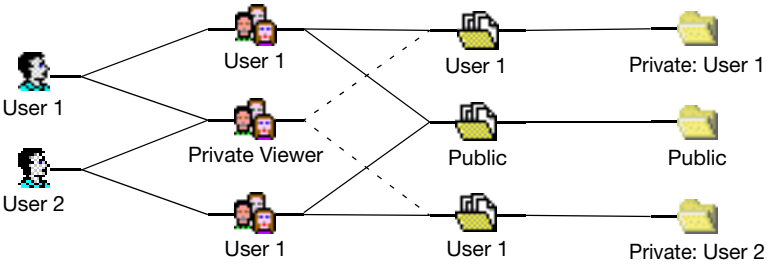
Note: One possible application of the Example 3 configuration is version control of reference data (such as analysis methods, panels, and bin sets). The principal investigator could assume the responsibility of maintaining the reference data used by the members of the workgroups. By storing all reference data in the security group for the principal investigator, the other members could use the reference data to analyze their respective projects, but control of the data objects would belong only to the principal investigator.



Example 1: Public and Private Data Setup



Example 2: Public and Private Data Configuration with Viewer



Example 3: Workgroup Configuration

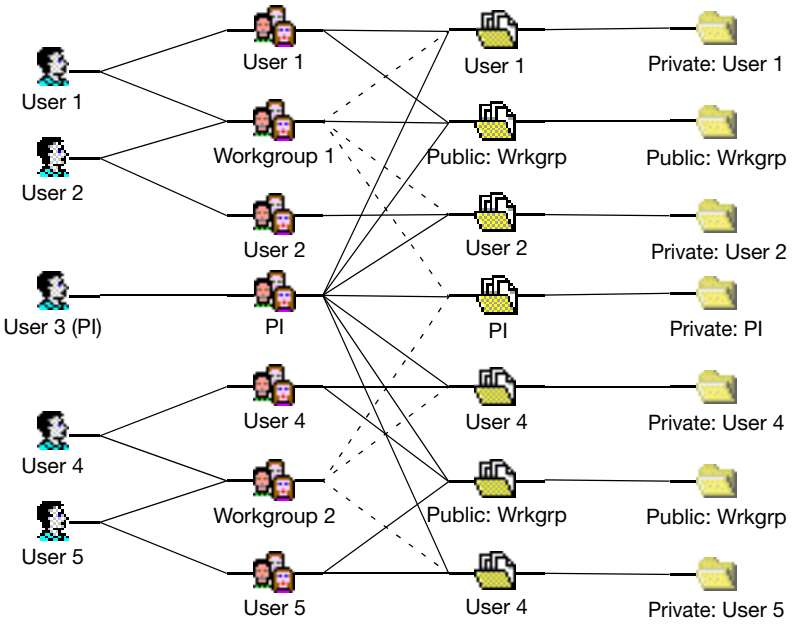


Figure 4-1 Examples of user and security group configurations

Setting Up User and Security Groups

Overview

Setting up user and security groups for the GeneMapper® Software requires that you:

- Carefully read "Managing User and Security Groups" on page 70 and determine the appropriate user and security group structure for your users.
- Create security groups as explained below.
- Create user groups as explained in "Creating a User Group" on page 77 (associate the security groups and user accounts during or after the creation of each).
- If necessary, create security profiles as explained in "Creating a Profile" on page 81.
- Create user accounts for your users as explained in "Creating a User Account" on page 89.
- Test the access control system you created by creating, modifying, deleting, and viewing data objects using the appropriate user accounts.
- Modify the system as necessary.

Creating Security Groups

1. Start the Access Control Administration Software (see page 64).
2. In the Access Control Administration window, click (**File** ▸ **New Security Group**).
3. In the Create Security Group dialog box, click **Next**.
4. In the Create Security Group screen, type a name and description for the new group, then click **Next**.

   Note: The name cannot begin with a number (1, 2, 3, …) or contain symbols (&, $, #, …).

   IMPORTANT! Do not modify the Control Security Group setting. The Control Security Group drop-down list assigns the security group data object you are editing to an existing security group. If you assign it to an unassociated security group, the group you are editing becomes unavailable.

5. In the Associate User Groups settings:
   a. Select **Associate** for each user group that you want to associate with the new security group.
   b. For each associated user group, select **Read** or **Update** to determine the data access privileges to provide users of the group.
   c. When finished, click **Next**.
6. Click **Finish** to complete the setup.
7. Click (**File** ▸ **Save**).

To edit an existing Security Group:

1. Expand **Security Groups** in the Navigation Pane of the Access Control Administration window, then select a security group.
2. Modify the settings for the selected security group displayed in the Security Group Properties pane.
3. When you finish, click (**File** ▸ **Save**).

Creating a User Group

1. In the Access Control Administration window, click (**File ▸ New User Group**).
2. In the Create User Group dialog box, click **Next**.
3. In the Configure the New User Group screen, type a name and description for the new group. The name cannot begin with a number (1, 2, 3, …) or contain symbols (&, $, #, …).
4. Select the default rights for the software to apply when associated with a security group:
   - **Read** – Select to allow the user to read the data objects of the security groups that you will associate with the user group.
   - **Update** – Select to allow the user to modify the data objects of the security groups that you will associate with the user group.

   IMPORTANT! Do not modify the Control Security Group setting. The Control Security Group drop-down list assigns the security group data object you are editing to an existing security group. If you assign it to an unassociated security group, the group you are editing becomes unavailable.
5. Click **Next**.
6. Select **Associate** for each user account that you want to associate with the new user group, then click **Next**.
7. In the Associate Security Groups settings:
   a. Select **Associate** for each security group that you want to associate with the new user group.
   b. For each associated security group, select **Read** or **Update** to determine the data access rights to provide users of the new users group for the associated security group data objects.
   c. When finished, click **Next**.
8. Click **Finish** to complete the profile setup.
9. Click (**File ▸ Save**).

Editing an Existing User Group

1. In the Navigation Pane of the Access Control Administration window, expand **User Groups**, then select a user group.
2. Modify the settings for the selected user group displayed in the User Group Properties pane.
3. When you finish, click (**File ▸ Save**).

Managing Applications

About Applications

The applications settings are for use by Life Technologies support personnel and should not be modified.

Managing Profiles

About Profiles

A profile is a set of rules that limit user access to:

- Aspects of the GeneMapper® Software
- Data contained by the GeneMapper® Software
- Security and audit management software of the GeneMapper® Software

You can limit the access of individual users by assigning each user account a profile that provides the user with access to appropriate functions. By default, the Access Control Administration Software installs three generic security profiles (Technician, Scientist, and Administrator) that correspond to the typical professional roles in a laboratory environment. We recommend that you use the default profiles until you are familiar with the software, then you can either create custom profiles for your workplace or modify the settings of the default profiles as necessary.

Profile Elements and Inheritance

Each profile consists of a set of switches called *Installed Elements* that grant a user permission to perform an action on a specific aspect of the GeneMapper® Software or one of the software utilities that install with the software. Each Installed Element has two settings that exist in the on (☑), off (☐), or inherited (☑/☐) states:

- **Execute** – If selected, the software allows users of the associated profile to perform the action defined by the Installed Element.
- **OIR** (Override Inherited Rights) – If selected, the Installed Element overrides the setting it inherits from its aggregate element.

The Installed Elements exist in a relational hierarchy where the settings of the aggregate elements (denoted by the and icons) determine the default settings of the elements in the group they define. In this way, the subordinate Installed Elements are said to *inherit* the setting of the element to which they belong. Note that you can override the inherited setting of any Installed Element by selecting OIR (☑), then selecting or deselecting the Execute check box. Figure 4-2 on page 80 illustrates the concept of the inheritance hierarchy using the Installed Elements of the GeneMapper applications group.

Example of Installed Element Inheritance

Figure 4-2 illustrates an example of inherited rights in the installed elements for the GeneMapper® Software.

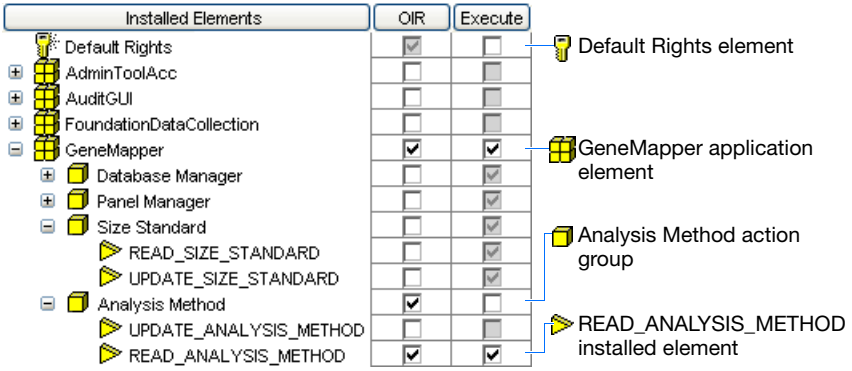


Figure 4-2 Hierarchy of Installed Elements

- **Default Rights element** – Because Execute is not selected (☐), the software assigns the value as the default (☐) for all Installed Elements of the profile.
- **GeneMapper application element** – Because OIR is selected (☑), the Execute value (☑) overrides the inherited value (☐). Also, the software assigns the override Execute value (☑) to all Installed Elements that belong to the GeneMapper application element.
- **Analysis Method action group** – Because OIR is selected (☑), the Execute value (☐) overrides the inherited value (☑). Also, because Execute is not selected (☐), the software assigns the override Execute value (☐) to all Installed Elements of the action group.
- **READ_ANALYSIS_METHOD installed element** – Because OIR is selected (☑), the software overrides the inherited Execute value (☐) and applies the selected Execute value (☑) for the individual Installed Element.

Creating a Profile

1. Start the Access Control Administration Software (see page 64).
2. Click (**File** ▸ **New Profile**).
3. In the Create Profile dialog box, click **Next**.
4. In the Configure the New Profile screen, enter:
   - A name for the new profile (≤30 characters).
   - A brief description of the new profile (≤1024 characters).
5. Select **Control Security Group** ▸ ***<security group>***.

   IMPORTANT! Do not modify the Control Security Group setting. The Control Security Group drop-down list assigns the security group data object you are editing to an existing security group. If you assign it to an unassociated security group, the group you are editing becomes unavailable.

6. Configure the Installed Elements as desired to provide users of the profile with the appropriate level of access to the GeneMapper® Software and other applications.

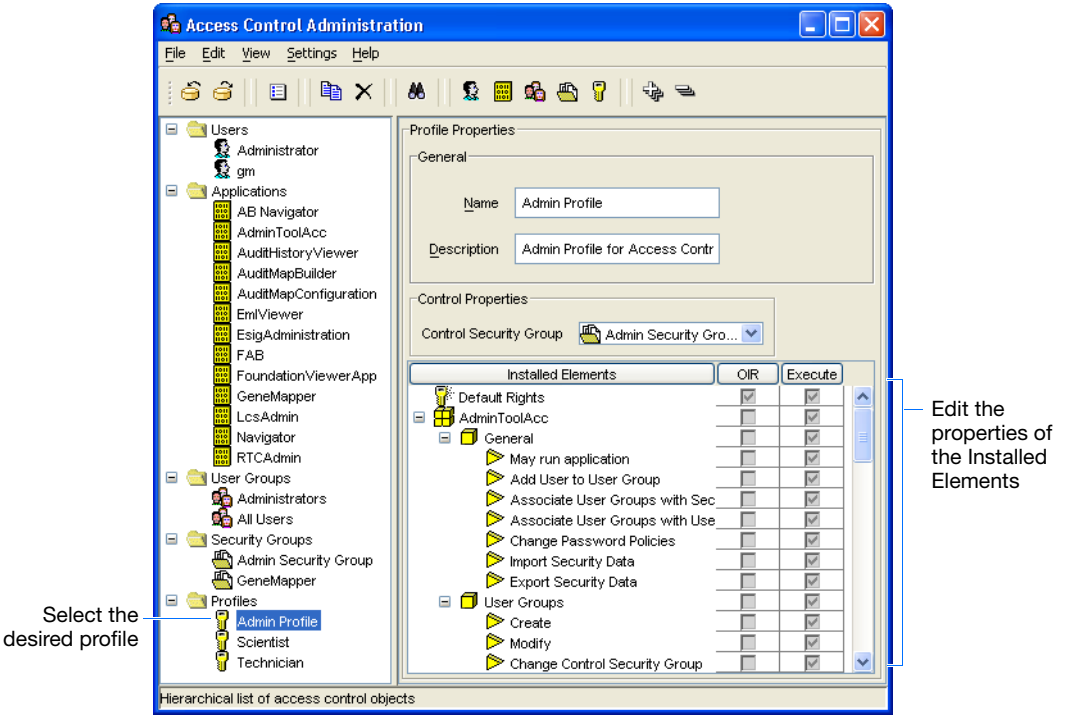
   Note: See Table 4-1 on page 84 for a description of the functions displayed in the Installed Elements table.

   a. Select (☑) or deselect (☐) **Default Rights** to determine the default value for all Installed Elements in the profile.
   b. For each Installed Element, select (☑) or deselect (☐) **OIR** and/or **Execute**.
   c. When you finish assigning rights to the profile, click **Next**.
7. Click **Finish** to complete the profile setup.
8. Click (**File** ▸ **Save**).

Editing a Profile

IMPORTANT! We strongly recommend against modifying the Admin(istrator) Profile.

1. Start the Access Control Administration Software (see page 64).
2. In the Navigation Pane of the Access Control Administration window, expand **Profiles**, then select the desired profile.
3. In the Profile Properties pane, modify the Installed Elements settings for the selected profile.



4. When you finish, click (**File ▸ Save**).

About Default Profiles and Privileges

By default, the Access Control Administration Software installs the following security profiles:

- **Administrator** – Designed for laboratory personnel responsible for installing and maintaining the GeneMapper® Software, and for managing user profiles and user accounts.
- **Scientist** – Designed for laboratory personnel responsible for analyzing sample data using the GeneMapper® Software.
- **Technician** – Designed for laboratory personnel responsible for operating the genetic analysis instrument, and for uploading sample data to the GeneMapper® Software database.

Note: If the GeneMapper® Software is installed on a computer that contains other Life Technologies products, the Installed Elements table may contain elements other than those listed in Table 4-1. Most Life Technologies products employ the Access Control Administration Software and install their elements to the same location.

Table 4-1 User groups and privileges

Installed Elements (Application/Action Group/Action)	Technician	Scientist	Admin Profile	Service	Grants the user permission(s) to…
Default Rights	✓	✓	✓	✓	All or none of the installed elements (determines the default value for all installed elements)
Admin Tool Acc(ess)			✓	✓	All aspects of the Access Control Administration Software
General			✓	✓	Use the general functions of the Access Control Administration Software, which include: • Starting the Access Control Administration Software (see page 64) • Editing user accounts (see page 91) • Editing user groups • Changing the password policies (see page 66) • Exporting/importing security settings (see page 94)
May Run Application			✓	✓	
Add User to User Group			✓	✓	
Associate User Groups with Security Groups			✓	✓	
Associate User Groups with Users			✓	✓	
Change Password Policies			✓	✓	
Import Security Data			✓	✓	
Export Security Data			✓	✓	
User Groups			✓	✓	Create, delete, or modify user groups ( ).
Create			✓	✓	
Modify			✓	✓	
Change Control Security Group			✓	✓	
Delete			✓	✓	

Table 4-1 User groups and privileges (Continued)

Installed Elements (Application/Action Group/Action)	Technician	Scientist	Admin Profile	Service	Grants the user permission(s) to…
Profiles			✓	✓	Create, delete, or modify user profiles ().
Create			✓	✓	
Modify			✓	✓	**Note:** See page 78 for more information on user profiles.
Change Control Security Group			✓	✓	
Delete			✓	✓	
Applications			✓	✓	Create, delete, or modify applications ().
Create			✓	✓	
Modify			✓	✓	**Note:** See page 70 for more information on applications.
Delete			✓	✓	
Users			✓	✓	Create, delete, or modify user accounts ().
Create			✓	✓	
Modify			✓	✓	**Note:** See page 88 for more information on user accounts.
Change Control Security Group			✓	✓	
Delete			✓	✓	
Security Groups	—	—	✓	✓	Create, delete, or modify security groups ().
Create	—	—	✓	✓	
Modify	—	—	✓	✓	
Change Control Security Group	—	—	✓	✓	

Table 4-1 User groups and privileges (Continued)

Installed Elements (Application/Action Group/Action)	Technician	Scientist	Admin Profile	Service	Grants the user permission(s) to…
Audit GUI			✓	✓	All aspects of the Audit Map Configuration Software and the Audit History Viewer Software.
Audit History Viewer			✓	✓	Use the Audit History Viewer Software.
May Run Application			✓	✓	**Note:** See page 114 for more information on the Audit History Viewer Software and the audit history.
Map Configuration Tool			✓	✓	Use the Audit Map Configuration Software including enabling, disabling, and modifying audit maps. **Note:** See page 107 for more information on the Audit Map Configuration Software and the auditing system for the GeneMapper® Software.
Enable and Disable Maps			✓	✓	
May Run Application			✓	✓	
Change Auditing State			✓	✓	
Foundation Data Collection		✓	✓	✓	All aspects of the Data Collection Software
GeneMapper			✓	✓	All aspects of the GeneMapper® Software
Database Manager			✓	✓	Use the functions of the Database Manager including: • Viewing (reading) database statistics (see page 151) and project information (see page 156) • Modifying (updating) the disk space allocated for the GeneMapper® Software database (see page 154)
READ_DATABASE_INFO(rmation)			✓	✓	
UPDATE_DATABASE_CONGIF(uration)			✓	✓	

Table 4-1 User groups and privileges (Continued)

Installed Elements (Application/Action Group/Action)	Technician	Scientist	Admin Profile	Service	Grants the user permission(s) to…
Panel Manager			✓	✓	Use the functions of the Panel Manager including: • Viewing (reading) panels, bin sets, and bin definitions • Creating/modifying (updating) panels, bin sets, and bins **Note:** For more information on panels, bin sets, bins, or the GeneMapper Manager, see the Online Help.‡
READ_PANEL			✓	✓	
UPDATE_PANEL			✓	✓	
Size Standard			✓	✓	Use the GeneMapper Manager to view (read) and create or modify (update) the size standard definitions stored by the GeneMapper® Software. **Note:** For more information on size standard definitions or the GeneMapper Manager, see the online help.‡
READ_SIZE_STANDARD			✓	✓	
UPDATE_SIZE_STANDARD			✓	✓	
Analysis Method			✓	✓	Use the GeneMapper Manager to view (read) and create or modify (update) the analysis methods stored by the GeneMapper® Software. **Note:** For more information on analysis methods or the GeneMapper Manager, see the online help.‡
READ_ANALYSIS_METHOD			✓	✓	
UPDATE_ANALYSIS_METHOD			✓	✓	
Study			✓	✓	Use the GeneMapper Manager to view (read) and create or modify (update) the studies stored by the GeneMapper® Software. **Note:** For more information on analysis methods or the GeneMapper Manager, see the online help.‡
READ_STUDY			✓	✓	
UPDATE_STUDY			✓	✓	

‡ You can access the Online Help at any time by clicking in the toolbar of the GeneMapper window, selecting **Help** ▸ **Contents and Index**, or pressing **F1**. See "Related Documentation" on page 9 for more information.

Managing User Accounts

About User Accounts

The GeneMapper® Software user account system is similar to that used by the Windows operating system, in which each user is assigned a user account with a personalized password. The account provides the user with specific privileges to operate the GeneMapper® Software and its utilities based on the profile assigned to it. See "Managing Profiles" on page 78 for more information on user profiles.

User accounts not only provide direct control of user access to the GeneMapper® Software, they also serve as the basis for auditing user activity. When a user performs an audited activity, the auditing software creates an audit record that includes the name of the user account used to perform the action. In this way, the auditing software uses user accounts to identify the users responsible for performing audited activities. For more information about auditing or audit records, see Chapter 5, "Managing the Auditing and Electronic Signature Systems."

Default User Names and Passwords

Table 4-2 lists the default user accounts that install automatically with the GeneMapper® Software. Both default accounts belong to the Administrator profile and should be used to install and configure the GeneMapper® Software, not to analyze sample data.

IMPORTANT! To ensure the security of your data, we strongly recommend that you reassign the passwords for both default user accounts after installing the GeneMapper® Software.

IMPORTANT! Do not misplace the password for the Administrator account. If the administrator password is lost, the access control system must be reset, resulting in the loss of all users and profiles

Table 4-2 Default user accounts and passwords

User Name	Password	Description
Administrator	Administrator	A user account for the person responsible for configuring and managing the security and auditing systems of the GeneMapper® Software§
gm	password‡	A user account for logging into the GeneMapper® Software for the first time after installation.

‡ The password for the "gm" user account is changed during the installation of the GeneMapper® Software.
§ The "Administrator" user account cannot be deleted.

Creating a User Account

1. Start the Access Control Administration Software (see page 64).
2. Click (**File ▸ New User**).
3. In the Create User dialog box, click **Next**.
4. In the Configure the New User screen, type a name and description for the new user.

IMPORTANT! The user name cannot begin with a number (1, 2, 3, …) or contain symbols (&, $, #, …).

IMPORTANT! You cannot create a user account with the same name as a user account that has been deleted.

5. Configure the user details for the new user:
   - **Full Name** – Type the first and last name of the new user separated by a space character.
   - **Show EULA** – (Optional) If selected, the software displays the End User License Agreement (EULA) when the user logs in.
   - **Status** – Select the appropriate status for the user account.

Status	Definition
Active	The user can log in to and use the software.
Inactive	The user cannot log in to the software.
Suspended	The user cannot log in to the software. **Note:** Depending on the Password Policy settings (see page 78), the software assigns the Suspended status to user accounts that have been subject to multiple unsuccessful login attempts.

6. Select the control properties for the new user:
   - **Profile** – Select the appropriate profile from the drop-down list.
   - **Default Security Group** – Select the appropriate security group from the drop-down list.
   - **Control Security Group** – Select the appropriate security group from the drop-down list.

   CAUTION Do not modify the Control Security Group setting. The Control Security Group drop-down list assigns the security group data object you are editing to an existing security group. If you assign it to an unassociated security group, the group you are editing will be unavailable.

7. Set the password for the new user:
   a. Click **Set Password**.
   b. In the Change Password dialog box, type a temporary password in the **Type** and **Retype** fields.
   c. Click **OK**.

   Note: Because the password is configured to Pre-Expire by default, the password set in this step is temporary. When the user logs in for the first time, the software prompts for a new password.

8. When finished assigning rights to the user, click **Next**.
9. Select the appropriate check boxes in the Associate column to associate the user account with the appropriate user groups, then click **Next**.
10. Click **Finish** to complete the user setup.
11. Select **File** ▸ **Save** (or click in the toolbar).

Editing a User Account

1. Start the Access Control Administration Software (see page 64).
2. In the Navigation Pane of the Access Control Administration window, expand **Users**, then select a user account.
3. Modify the settings for the selected user account displayed in the User Properties pane.
4. When you finish, click (**File ▸ Save**).

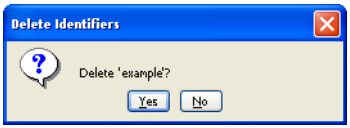
Deleting a User Account

The Access Control Administration Software allows you to delete any user account except for the default Administrator account (see page 88). After you delete a user account, you cannot retrieve or restore it, nor can you create another user account of the same name. We recommend using the delete function sparingly, and only when you are certain to have no further need of a user account.

Note: Instead of deleting a user account, consider deactivating or suspending the user account as explained in "Activating, Deactivating, and Suspending User Accounts" on page 93.

To delete a user account:

1. Start the Access Control Administration Software (see page 64).
2. In the Navigation Pane of the Access Control Administration window, expand **Users**, then select the user account to delete.
3. Click (**Edit ▸ Delete**).
4. In the Delete Identifiers dialog box, click **Yes** to confirm the action.



5. Click (**File ▸ Save**).

IMPORTANT! After the user account has been deleted, you cannot create another user account of the same name.

Changing the Password of an Existing User Account

In the event that a user forgets his or her password or you identify a security risk, you can log in to the Access Control Administration Software using an administrative user account to change the password for a user account.

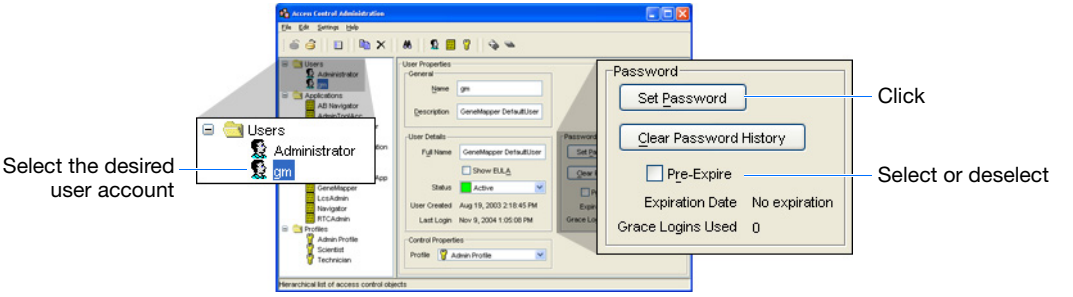
IMPORTANT! To ensure the security of your data, We strongly recommend that you reassign the passwords for both default user accounts (gm and Administrator) after installing the GeneMapper® Software.

To change the password of an existing user account:

1. Start the Access Control Administration Software (see page 64).
2. In the Navigation Pane of the Access Control Administration window, expand **Users**, then select the user account ( ) of interest.
3. In the User Properties pane, set the new password for the user:
   a. Click **Set Password**.
   b. In the Change Password dialog box, type a password in the **Type** and **Retype** fields.
   c. Click **OK**.
4. Select ( ) or deselect ( ) **Pre-Expire**.

   – When the user logs in for the first time, the software prompts the user to enter a password of their choice.

   – The user must use the password assigned in step 3.



5. When finished, select **File** ▸ **Save** (or click in the toolbar).

Activating, Deactivating, and Suspending User Accounts

The Access Control Administration Software allows you to change the status (Active, Suspended, or Inactive) of individual user accounts. This function is useful when:

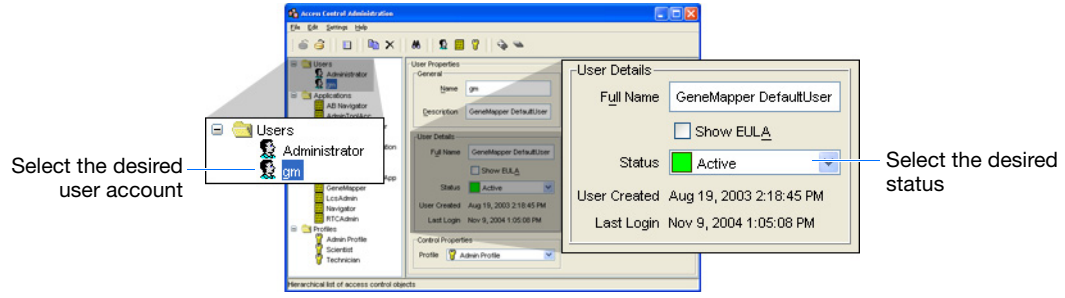
- You want to deactivate a user account without deleting it
- A user exceeds the maximum number of failed login attempts and you want to activate the user account manually

Note: The software can suspend a user account if the user repeatedly enters an incorrect password (see page 66).

To reactivate, deactivate, or suspend the user account:

1. Start the Access Control Administration Software (see page 64).
2. In the Navigation Pane of the Access Control Administration window, expand **Users**, then select the user account ( ).
3. In the Status menu of the User Properties pane, select the appropriate account status for the user account.

Status	Definition
Active	The user can log in to and use the software.
Inactive	The user cannot log in to the software.
Suspended	The user cannot log in to the software. **Note:** Depending on the Password Policy settings (see page 78), the software assigns the Suspended status to user accounts that have been subject to multiple unsuccessful login attempts.



4. When finished, select **File** ▸ **Save** (or click in the toolbar).

Viewing the Security Report

About the Security Report

The Access Control Administration Software can print a summary of one or more components of the security system (user accounts, applications, and profiles).

Note: The security report does not summarize login attempts or other user activity. To monitor and record user activity, you must configure the software for auditing (see Chapter 5, "Managing the Auditing and Electronic Signature Systems," for more information).

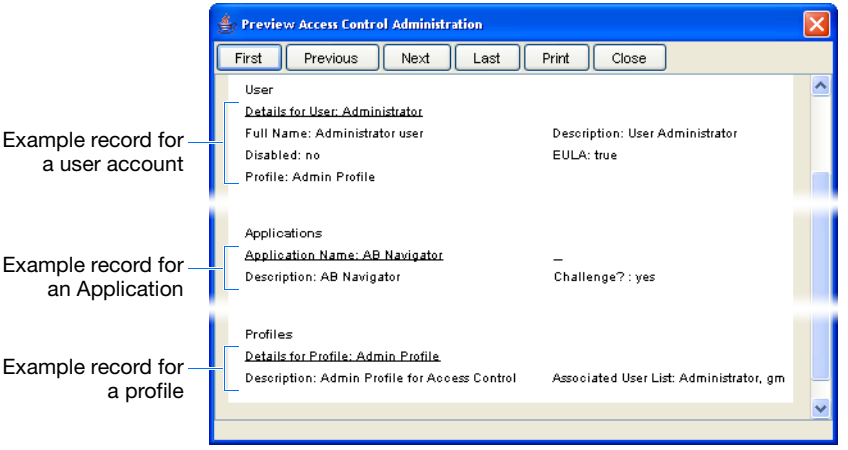


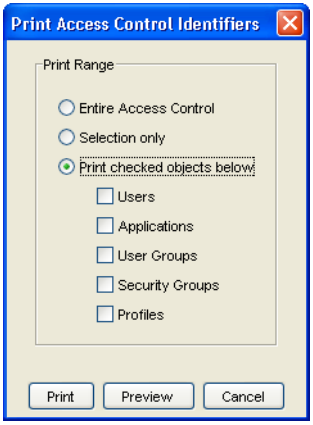
Figure 4-3 Security report example records

Printing the Security Log

Note: The security log is regenerated daily.

1. Start the Access Control Administration Software (see page 64).
2. If you want to print a report for a specific user account or profile, select a user account or profile in the Navigation Pane of the Access Control Administration window.
3. Click (**File ▸ Report**).

4. In the Print Access Control Identifiers dialog box, select an option to determine the content of the report:



   - **Entire Access Control** – Select to print a summary of all user accounts, applications, and profiles.
   - **Selection only** – Select to print a report of the selected user account, application, or profile selected in the left pane of the Access Control Administration Software window.
   - **Print checked objects below** – Select to print a report of all elements of a specific type (user accounts, applications, or profiles), then select one or more of the following:
     - **Users** – Select to print a report of all user accounts.
     - **Applications** – Select to print a report of all applications.
     - **Profiles** – Select to print a report of all profiles.

5. Click **Preview** to view a preview of the report.

6. Review the report preview. If the preview contains all of the information of interest, click **Print**. Otherwise, click **Close** and go to step 4 to modify the report settings as desired.

7. Click **Close** to close the report preview.

8. Click **Cancel** to close the Print Access Control Identifiers dialog box.

Exporting and Importing the Security Settings

Transferring Security Settings Between Computers

The Access Control Administration Software allows you to export a summary of all security settings for backup or transfer to another computer. The exported Access Control file is small (≤100KB) and contains the password policies for the software and all user accounts, applications, and profiles.

Note: The security settings for the Access Control Administration Software are not stored as part of the GeneMapper® Software project data and must be backed up separately as an exported file.

Exporting the Security Settings

1. Start the Access Control Administration Software (see page 64).
2. In the Access Control Administration window, select **File ▸ Export Database.**
3. In the Save dialog box, type a file name for the exported file, select **Access Control files (.acc)**, then click **Save** to export the security settings as an **.acc** file.
4. In the Export Users dialog box, click **OK**.

Importing the Security Settings

IMPORTANT! Importing security settings from an .acc file automatically replaces all existing settings.

1. Start the Access Control Administration Software (see page 64).
2. In the Access Control Administration window, select **File ▸ Import Database.**
3. In the Save dialog box, navigate to the appropriate location, select the desired **.acc** file, then click **Open**.
4. In the Import Users dialog box, click **OK**.

5 Managing the Auditing and Electronic Signature Systems

This chapter covers:

- About the Data Tracking Systems 98

Section 5.1: Setting Up the Auditing System 99

- About the Auditing System 100
- Audit Maps, Objects, and Attributes 102
- Configuring the Audit Map 107
- Managing Audit Records 114

Section 5.2: Setting Up the Electronic Signature System . . 121

- About the Electronic Signature System 122
- About Electronic Signatures. 124
- Configuring the Electronic Signature Settings. 125
- Configuring the GeneMapper® Software Action Map. . . . 126
- Viewing the Electronic Signature History 128

About the Data Tracking Systems

About the Data Tracking Systems

The GeneMapper® Software installs two software utilities that you can use to monitor user activity and modify data stored by the software:

- Audit Mapping Software
- Electronic Signature Software

Use of the data tracking system does not interfere with the operation of the software and is optional. By default, both utilities install automatically with the client installation of the GeneMapper® Software and must be activated as described in this chapter before they monitor data activity.

Table 5-1 summarizes the functions of the utilities.

Table 5-1 Elements of the data tracking systems

Utility	Description/Function	See Page
Audit Mapping Software	Creates an audit trail for data objects (such as projects and analysis methods) used by the GeneMapper® Software that have been configured for auditing. Each audit trail lists the changes (creation, modification, and deletion) made to the associated data object. Depending on the configuration of the utility, the software can track changes with or without (silent auditing) the users knowledge.	99
Electronic Signature Software	Restricts the creation, deletion, and modification of data stored by the GeneMapper® Software. Similar to the auditing system, the Electronic Signature (e-Signature) System creates a history of user activity based on actions performed on the data objects stored by the GeneMapper® Software. However, unlike the auditing system, the e-Signature system requires the user to authenticate or “sign” for actions by entering a user name (optional) and password.	121

Section 5.1 Setting Up the Auditing System

This section covers:

- About the Auditing System 100
- Audit Maps, Objects, and Attributes 102
- Configuring the Audit Map 107
- Managing Audit Records 114

About the Auditing System

Components of the Auditing System

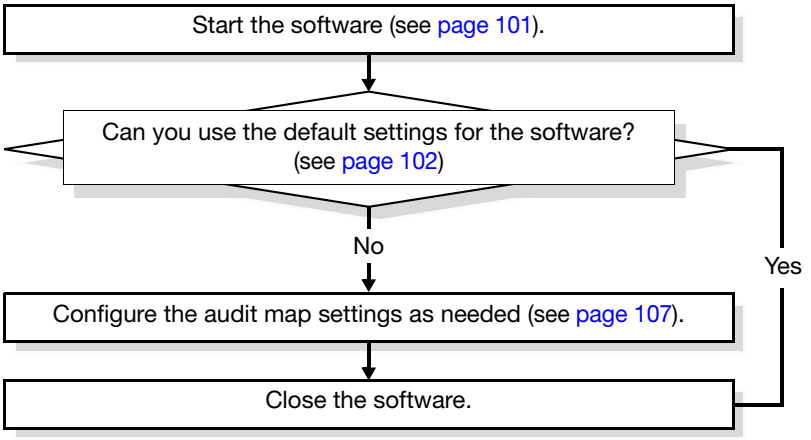
The GeneMapper® Software uses two applications, the Security Manager Software and the Audit Map Configuration Software, to secure and monitor the data it contains. This chapter describes how to use the Audit Map Configuration Software to control and monitor use and modification of the data stored by the GeneMapper® Software. For information about securing the GeneMapper® Software, see Chapter 4, "Managing Database Security and User Access."

About the Audit Map Configuration Software

The Audit Map Configuration Software monitors and records the modification of data stored by the GeneMapper® Software. Using the Audit Map Configuration Software, you can determine what data elements the software monitors and how it monitors them. Use of the Audit Map Configuration Software is optional and is inactive by default.

Setting Up the Auditing System

The following tasks must be performed to set up the auditing system for the GeneMapper® Software.



Maintaining the Auditing System

Perform the tasks in the following table to maintain the auditing system for the GeneMapper® Software.

Frequency	Tasks
As needed	• Review the audit report for the GeneMapper® Software (see page 114). • Backup/restore audit records (page 118).
Semi-annually	Review the audit map for the GeneMapper® Software and modify it as necessary to meet the regulation requirements of your laboratory (see page 107).

Starting the Audit Map Configuration Software

1. Start and log in to the GeneMapper® Software (see "Logging In to and Out of the Software" on page 59).
2. In the GeneMapper window, select **Tools ▸ Audit Manager ▸ Setting**.
3. In the AuditMapConfiguration dialog box, type a user name and password for a user account with administrative privileges, then click **OK**.

IMPORTANT! Only users that belong to the Administrator user group (see page 83) can use the Audit Map Configuration Software.

Audit Maps, Objects, and Attributes

About the GeneMapper® Software Audit Maps

The Audit Map Configuration Software monitors GeneMapper® Software activity based on the configuration of the "audit map" for the application. An audit map is a collection of rules that define which data elements of an application the Audit Map Configuration Software monitors, and how it monitors them. The audit map consists of two elements: audit map objects and object attributes. In terms of the GeneMapper® Software, audit map *objects* represent the types of data used by the software (such as bins, projects, and samples), and *object attributes* describe the ways that users can modify them. For example, the audit map object "Analysis Method" shown in Figure 5-1 has the attributes "created, deleted, and modified" because users can create, delete, or modify analysis methods using the GeneMapper® Software.

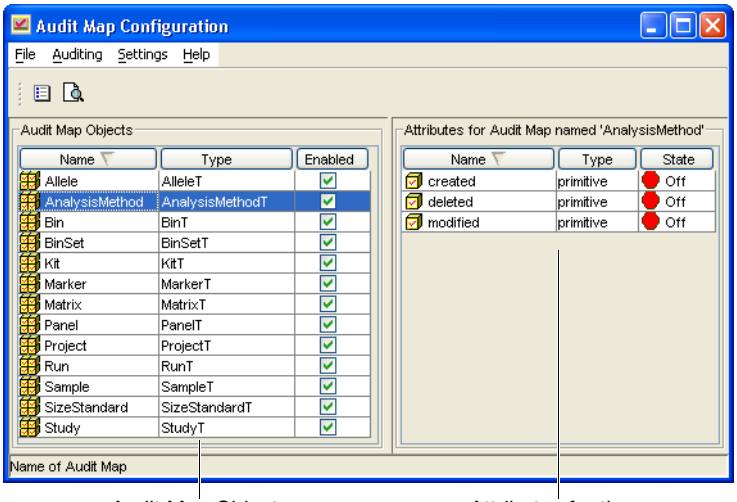


Figure 5-1 Audit map objects and attributes

Note: Because most Life Technologies products use the Audit Map Configuration Software to monitor data activity, the auditing software may display additional audit map objects if the GeneMapper® Software is installed on a computer that contains other software.

About Audit State Inheritance

The audit map, each audit map object, and each object attribute have an audit state that determines which elements of the GeneMapper® Software the Audit Map Configuration Software monitors, and how it monitors them. By configuring the audit states of the components of the audit map, you can customize the system to meet the regulatory requirements of your laboratory workplace. Figure 5-2 displays the locations of the audit state controls in the software.

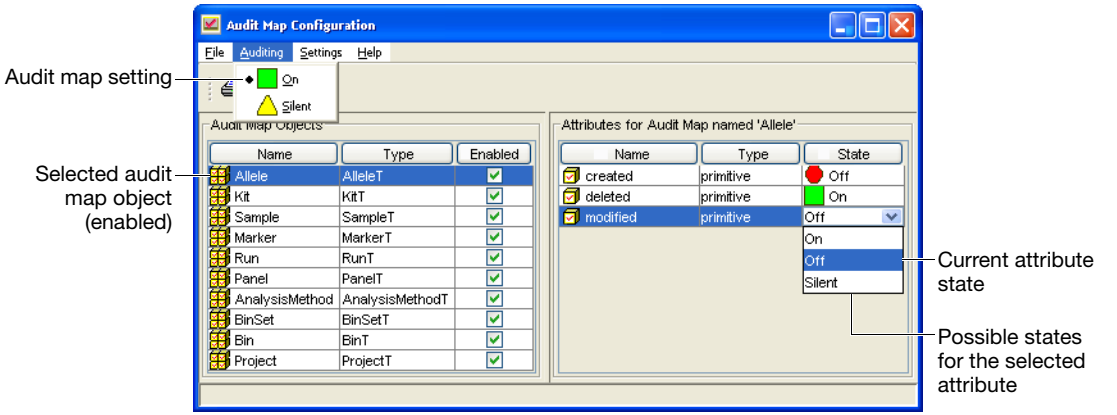


Figure 5-2 States of the audit map, audit objects, and attributes

The audit states of the audit map, the audit map objects, and the object attributes are linked in a hierarchical relationship, where the states of the audit map and objects override those of the object attributes. Understanding this relationship is crucial to successfully configuring the audit map. Table 5-2 shows the result of all possible combinations of the audit states for the audit map objects and object attributes.

Table 5-2 Audit state inheritance matrix

State of the Audit Object (Enabled)	Audit State of the Attribute		
	ON	Silent	OFF
(Yes)	ON	Silent	OFF
(No)	OFF	OFF	OFF

Auditing from the Users Perspective

When a user changes an audited object attribute, the software displays the Reason(s) For Change dialog box (see Figure 5-3). To proceed with the action, the user must type a description of the reason for the change and click OK. If the user clicks OK, the software changes to the attribute and saves the information as an audit record. The user cannot cancel the audited action.

Note: If the audit map is configured for silent auditing (Silent), the software does not display the Reasons for Change dialog box and just records the action to the audit history.

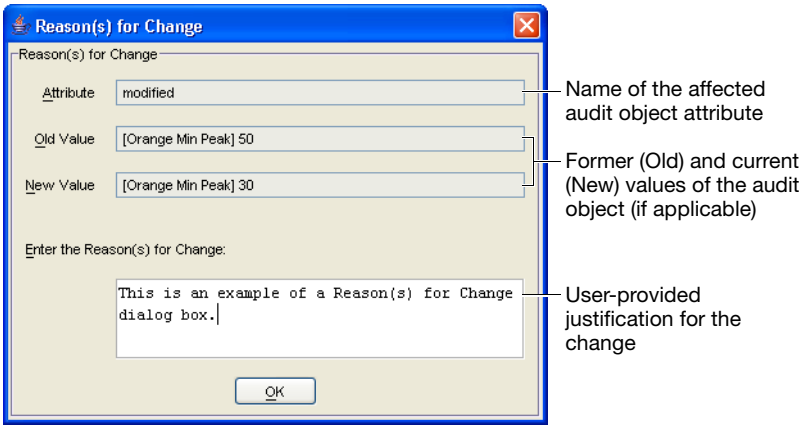


Figure 5-3 Reason(s) For Change dialog box

Note: Figure 5-3 shows the Reason(s) for Change dialog box that the software displayed when a user changed the Orange Peak Amplitude Threshold setting of the "Temp" analysis method from 50 to 30 RFU.

Example

Figure 5-4 displays the settings for the Allele audit object of the GeneMapper® Software. In the example configuration, the Audit Map Configuration Software:

- Displays the Reason(s) for Change dialog box when a user deletes an allele call
- Passively creates a record when a user changes an allele call

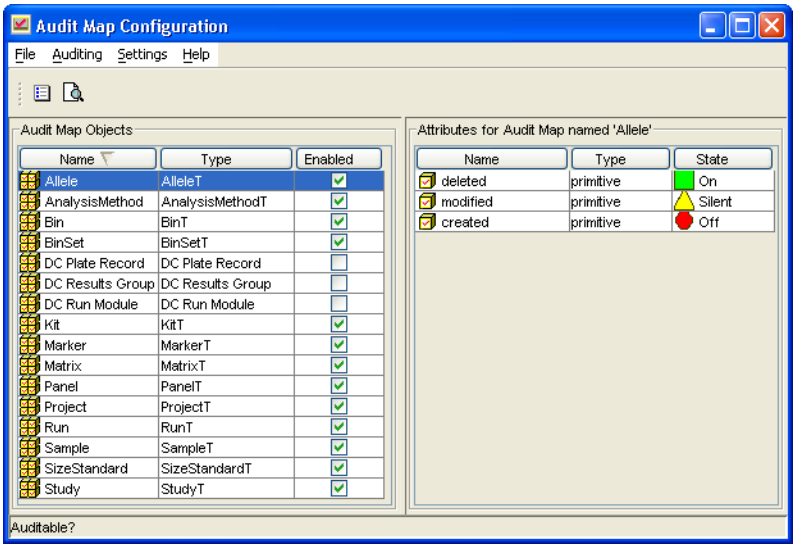


Figure 5-4 Auditing Settings for the Allele audit object

Note: If you have installed the GeneMapper® Software on a computer that contains other Applied Biosystems software, the audit map may display additional auditable objects and attributes. Because most Applied Biosystems products use the Audit Map Configuration Software for auditing purposes, the audit map may display more objects and attributes than displayed in Figure 5-4.

IMPORTANT! When a user makes a change to an audited object, the auditing software writes the name of the user account that was used to make the change to the audit record. The software does not require the user to authenticate himself or herself to make the change.

IMPORTANT! The audit information is saved when the user saves modified documents back to the database (for example, **File ▸ Save**). If the user closes a document or object without saving it, the software discards the audit information.

Configuring the Audit Map

Guidelines for Configuring the Audit Map

Observe the following guidelines when modifying the audit map:

- All changes made to the audit map are applied immediately. The software does not have a "save" function.
- When the audit map is changed, the software must be closed before the changes take effect.

Configuring the Audit Map

1. Start the Audit Map Configuration Software (see page 101).
2. In the Audit Map Configuration window, select **Auditing** ▸ ***<audit state>***.

   The Auditing setting of the Audit Map Configuration Software determines how the software audits changes to the audit map. The Auditing setting exists in two states:

   - **On** – Configures the software to display the Reason(s) for Change dialog box whenever a user modifies the audit map.
   - **Silent** – Configures the software to audit all changes the audit map passively (the software records each change but does not prompt the user to enter a reason for the change).

3. For each audit map object displayed in the Audit Map Objects (left) pane:

   a. Decide whether to track modifications to the audit map object (see Table 5-3 on page 110 for descriptions of all objects).

   b. Select (☑) or deselect (☐) the Enabled check box.

   The state of an audit map object determines whether the software creates audit records for the data type that the object represents. Audit map objects can exist in two states:

   - ☑ (*enabled*) – Configures the software to audit all object attributes according to their individual audit states.
   - ☐ (*disabled*) – Configures the software to ignore changes made to the audit map object.

   c. Repeat steps 3a and 3b for the remaining audit map objects.

4. For each audit map object that you enabled, perform the following actions for each attribute in the right pane:
   a. Select the audit map object.
   b. Decide how you want the software to audit the associated data type.
   c. Click the cell in the State column for each attribute, then select a state for the attribute.

      The state of an audit map object determines whether the software creates audit records for the data type that the object represents. Audit map object attributes can exist in three states:

      - **On** – The software actively creates an audit trail for the attribute. When an attribute is set to "On" and a user performs the action associated with the attribute, the software displays the Reasons For Change dialog box (see page 105). When the user clicks OK, the software creates an audit record for the change that includes the description of the reason for the change entered by the user.
      - **Silent** – The software passively creates an audit trail for the attribute. When an attribute is set to "Silent" and a user performs the action associated with the attribute, the software automatically creates an audit record, but does not prompt the user to enter an explanation for the change.
      - **Off** – The software ignores changes made to the attribute. When an attribute is set to "Off" and a user performs the action associated with the attribute, the software does not create an audit record.

   d. Repeat steps a and b for each audit map object you enabled in step 3 on page 115.
5. When you finish configuring the audit map, select **File ▸ Exit** to close the software.

About the Audit Map, Audited Objects, and Attributes

Table 5-3 shows the components of the audit map for the GeneMapper® Software that installs with the Audit Map Configuration Software.

Note: If the GeneMapper® Software is installed to a computer that contains other Applied Biosystems products, the Audit Map Objects table may contain elements other than those listed in Table 5-3. Most Applied Biosystems products employ the Audit Map Configuration Software and install their audit map objects to the same location.

Table 5-3 Elements of the audit map for the GeneMapper® Software

Object	Attribute(s)	Default State	Definition
Allele	created	Off	Represents allele calls made by the software. When configured for auditing, the software creates a record of the associated modification(s) made from the Cluster Plot Manager, the Samples Plot, or the Genotypes Plot.
	deleted	Off	
	modified	Off	
Analysis Method	created	Off	Represents the analysis methods used to analyze project data. When configured for auditing, the software creates a record of the associated modification(s) made from the Analysis Method Editor.
	deleted	Off	
	modified	Off	
Bin	created	Off	Represents the individual bins of the bin sets used to analyze project data. When configured for auditing, the software creates a record of the associated modification(s) made from the Panel Manager or the Samples or Genotypes Plots.
	deleted	Off	
	modified	Off	
BinSet	created	Off	Represents the bin sets used to analyze project data. When configured for auditing, the software creates a record of the creation and/or deletion of bin sets using the Panel Manager.
	deleted	Off	
Kit	BINSET	On	Represents the kits used to analyze project data. When configured for auditing, the software creates a record of the associated modification(s) made from the Panel Manager. **Note:** When the BINSET or PANEL attributes are activated, the software creates audit records for edits made to bin sets or panels that are associated with kits.
	created	Off	
	deleted	Off	
	modified	Off	
	PANEL	On	

Table 5-3 Elements of the audit map for the GeneMapper® Software (Continued)

Object	Attribute(s)	Default State	Definition
Marker	BIN	On	Represents the markers of the bin sets used to analyze project data. When configured for auditing, the software creates a record of the associated modification(s) made from the Panel Manager or the Samples or Genotypes Plots. **Note:** When the BIN attribute is activated, the software creates audit records for edits made to bins that are associated with markers.
	created	Off	
	deleted	Off	
	modified	Off	
Matrix	created	Off	Represents the matrices used to analyze project data. When configured for auditing, the software creates a record of the associated modification(s) made using the GeneMapper Manager.
	deleted	Off	
	modified	Off	
Panel	created	Off	Represents the panels used to analyze project data. When configured for auditing, the software creates a record of the associated modification(s) made from the Panel Manager or the Samples or Genotypes Plots. **Note:** When the MARKER attribute is activated, the software creates audit records for edits made to markers that are associated with panels.
	deleted	Off	
	MARKER	On	
	modified	Off	
Project	analyzed	Off	Represents the project data object that associates analysis parameters, settings, and sample data for projects. When configured for auditing, the software creates a record of the associated modification(s) made from the GeneMapper window. **Note:** When the RUN attribute is activated, the software creates audit records for edits made to the run folders within projects.
	created	Off	
	deleted	Off	
	modified	Off	
	RUN	On	

Table 5-3 Elements of the audit map for the GeneMapper® Software (Continued)

Object	Attribute(s)	Default State	Definition
Run	created	Off	Represents the run folders of the project data object that contain samples for an analysis. When configured for auditing, the software creates a record of the associated modification(s) made from the GeneMapper window. **Note:** When the SAMPLE attribute is activated, the software creates audit records for edits made to the samples within run folders.
	deleted	Off	
	SAMPLE	On	
Sample	ALLELE	On	Represents the sample data added to projects. When configured for auditing, the software creates a record of the associated modification(s) made from the Samples or Genotypes tabs of the GeneMapper window. **Note:** When the ALLELE attribute is activated, the software creates audit records for edits made to the alleles of individual samples. **Note:** When the OverrideGQ attribute is activated, the software creates an audit record when users override the GQ PQV made by the software. **Note:** When the OverrideSQ attribute is activated, the software creates an audit record when users override the SQ PQV made by the software.
	created	Off	
	deleted	Off	
	modified	Off	
	OverrideGQ	Off	
	OverrideSQ	Off	
Size Standard	created	Off	Represents the size standard definitions used to analyze project data. When configured for auditing, the software creates a record of the associated modification(s) that are made using the GeneMapper Manager.
	deleted	Off	
	modified	Off	

Table 5-3 Elements of the audit map for the GeneMapper® Software (Continued)

Object	Attribute(s)	Default State	Definition
Study	analyzed	Off	Represents the study data object that associates projects for the analysis of SNPlex® System data. When configured for auditing, the software creates a record of the associated modification(s) made from the Study Manager. **Note:** When the PROJECT attribute is activated, the software creates audit records for edits made to the projects that are attached to studies.
	created	Off	
	deleted	Off	
	OverrideStatus	Off	
	PROJECT	On	
	ProjectAdded	Off	
	ProjectRemoved	Off	
	RunAnalyzed	Off	

Managing Audit Records

Overview

You can view, back up, remove, and restore the audit history records generated by the GeneMapper® Software.

- Viewing the Audit History . . . . . (see below)
- Backing Up, Removing, and Restoring Audit Data. 118

Viewing the Audit History

About the Audit Map Viewer Software

The Audit Map Viewer Software is the GeneMapper® Software utility that allows users belonging to the Administrator user group to view historic audit data. The software provides read-only access to audit records and data filters so that audit records can be viewed in different formats.

Note: Only users of the Administrator user group (see page 83) can use the Audit Map Viewer software.

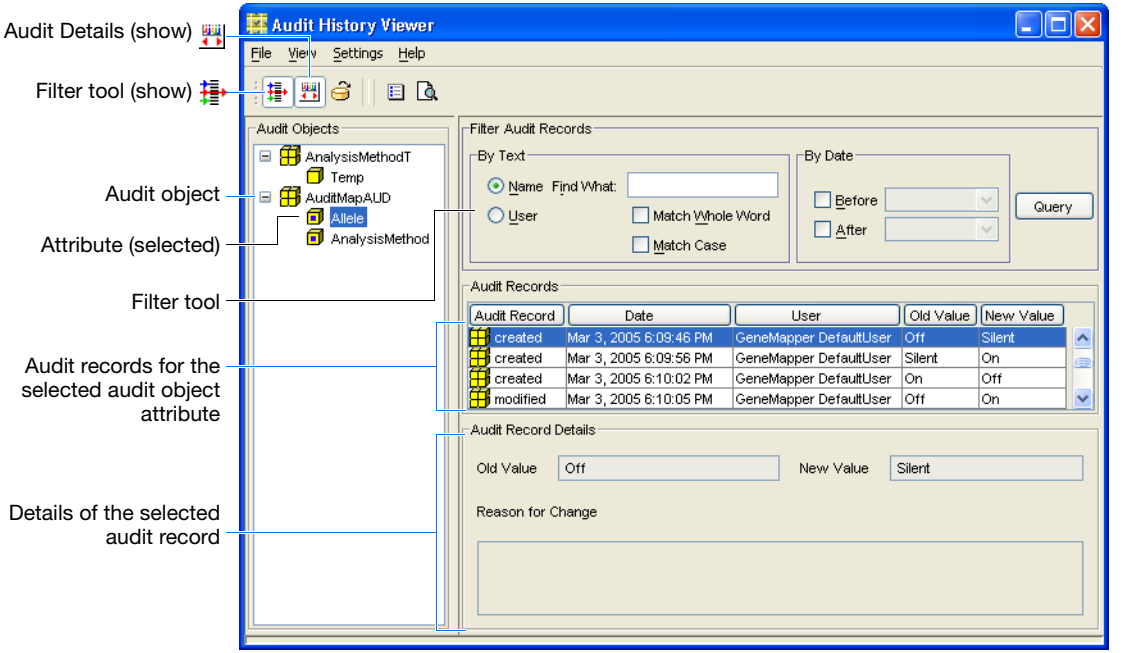


Figure 5-5 Components of the Audit History Viewer window

Starting the Audit History Viewer

IMPORTANT! Only users that belong to the Administrator user group (see page 83) can use the Audit History Viewer Software.

1. Start and log in to the GeneMapper® Software (see "Logging In to and Out of the Software" on page 59).
2. In the GeneMapper window, select **Tools ▸ Audit Manager ▸ Report**.
3. In the AuditHistoryViewer dialog box, type a user name and password for a user account with administrative privileges, then click **OK**.

Viewing Audit History Records

1. Start the Audit History Viewer Software (see above).
2. In the Audit Objects pane, select the audit object of interest, or click ⊞ to the left of an object to display its attributes.
3. Select the audit object attribute for which you want to display audit records.

The following options are available:

- View the audit record details
- Filter or Sort the audit records
- Print the audit records (by selecting **File ▸ Print Preview**).

Viewing Audit Record Details

If you configured an audit object attribute for active auditing (see step 4c on page 108), then you can view the details of the associated audit records.

To view the details of the audit history records:

1. Click (**View ▸ Details Panel**) to show the Audit Record Details panel.
2. Select individual records from the Audit Records list.

Sorting the Record Data by Column

You can sort the audit history records in the Audit Records list by clicking one of the column headers. When the software sorts data by a column, a triangle (▲) appears inside the header to indicate the direction of the sort.

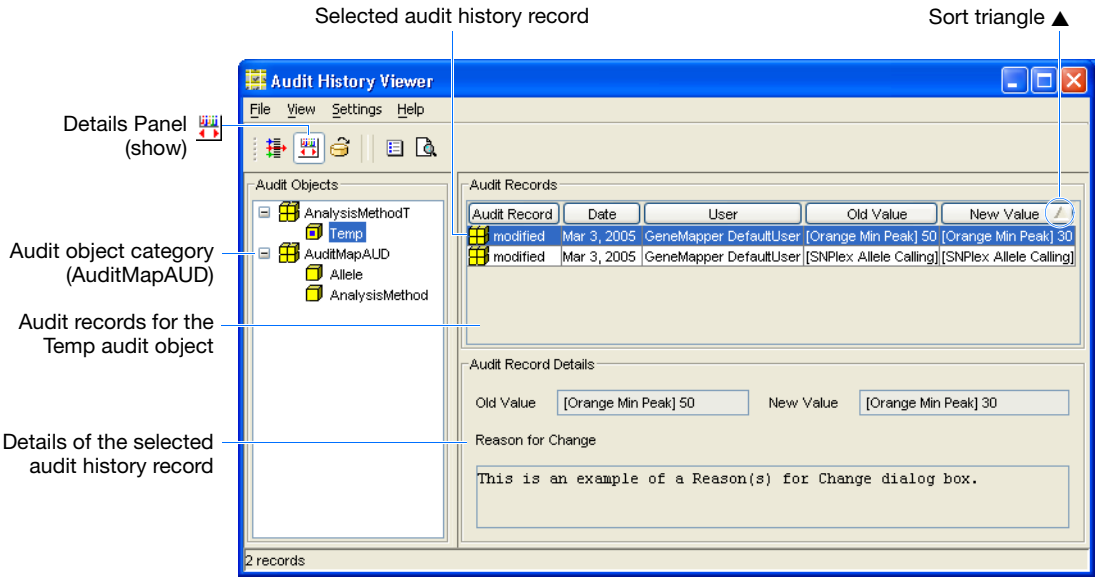


Figure 5-6 Details of the Audit Record created for the change shown in Figure 5-3 on page 105

Filtering the Record Data

The Audit History Viewer software includes a Filter tool to help you organize the large sets of audit history records generated through routine use of the GeneMapper® Software. The tool allows the software to display a subset of the total number of records based on a set of predefined criteria.

To filter the audit history records:

1. Make sure that the Audit Records list contains the record data that you want to filter.
2. Click (**View ▸ Filter Records**) to display the Filter Audit Records pane.
3. Type search criteria in the applicable fields:

   To display records containing a specific word or phrase:

   a. In the Find What field, type the word or phrase.

   b. Select the **Name** or **User** option button to specify the column in which you expect the word or phrase to occur.

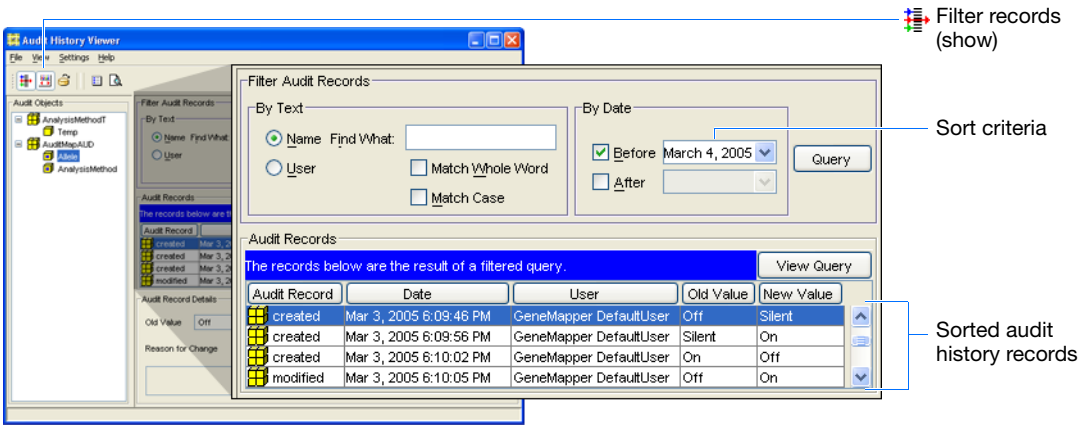
   c. Select the appropriate options for the text search:

   - **Match Whole Word** – The software retrieves only records that contain words that match the specified text exactly.
   - **Match Case** – The software retrieves only records that match the case (upper or lower) of the specified text.

   To display records created within a specific period of time:

   a. To display records that were created before a specific date, select **Before**, then click the adjacent field and select a date.

   b. To display records that were created after a specific date, select **After**, then click the adjacent field and select a date.
4. Click **Query**.



Backing Up, Removing, and Restoring Audit Data

Overview

The GeneMapper® Software allows you to backup, remove, and restore audit records from the GeneMapper database application. Depending on the configuration of the electronic signature system and the frequency of software use, the system can generate a significant number of audit records in a very short period. Over time, the amount audit data may begin to hinder the database and will need to be removed to optimize performance.

Scheduling Backups and Data Removal

Depending on your circumstances you may need to devise a schedule for backing up and removing audit data. As part of regular maintenance of the GeneMapper® Software, routinely review the amount of space occupied by audit records using the Database Dashboard utility (see "Reviewing the Database Statistics" on page 151). As the Audit Data tablespace approaches the maximum limit defined in the software, you must either:

- Increase the size of the Audit Data tablespace as explained in "Allocating Disk Space" on page 154, or
- Back up and remove the audit records as explained below.

Backing Up and Removing Audit Records

IMPORTANT! The GeneMapper® Software automatically backs up the audit data with the main database application (see "Backing Up the Database" on page 158). Therefore, the primary use of the Backup Audit Records function described here is for transferring audit data to a flat file for archival.

1. Start and log in to the GeneMapper® Software (see "Logging In to and Out of the Software" on page 59).
2. In the GeneMapper window, select **Tools ▸ Audit Manager ▸ Backup Audit Records**.
3. In the Backup Audit Records dialog box:
   a. Navigate to the desired location.
   b. Type a name for the exported file.
   c. Click **Backup**.

4. In the GeneMapper window, select **Tools** ▸ **Audit Manager** ▸ **Delete All Audit Records**.
5. In the Delete All Audit Records dialog box, click **Yes**.

The exported GeneMapper audit file (*.aud) can now be compressed and transferred to a storage medium for archival. If you ever need to view the archived records, restore the records as explained below and view them using the Audit History Viewer Software (see "Viewing the Audit History" on page 114).

Restoring Audit Records

1. Start and log in to the GeneMapper® Software (see "Logging In to and Out of the Software" on page 59 for more information).
2. In the GeneMapper window, select **Tools** ▸ **Audit Manager** ▸ **Backup Audit Records**.
3. In the Backup Audit Records dialog box, navigate to and select the desired GeneMapper audit file (*.aud).
4. Click **Restore**.

Section 5.2 Setting Up the Electronic Signature System

This section covers:

- About the Electronic Signature System 122
- About Electronic Signatures. 124
- Configuring the Electronic Signature Settings. 125
- Configuring the GeneMapper® Software Action Map. . . . 126
- Viewing the Electronic Signature History 128

About the Electronic Signature System

About the Electronic Signature Software

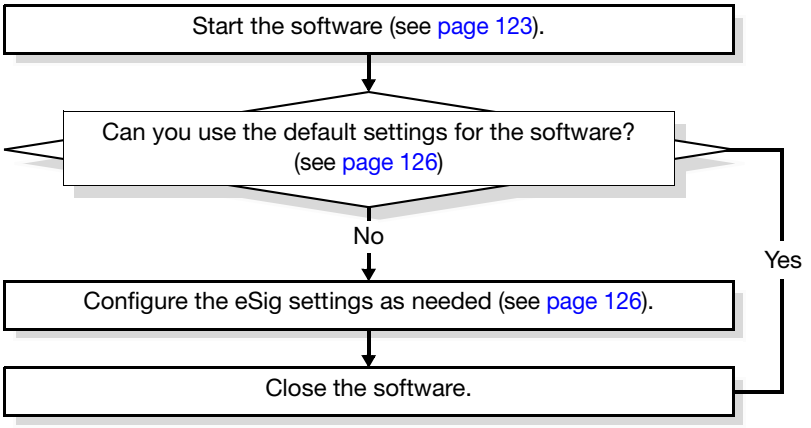
The Electronic Signature (eSig) Software is the GeneMapper® Software utility that allows users belonging to the Administrator group to setup, monitor, and maintain the electronic signature system.

Guidelines for Using the Electronic Signature Software

- Only users of the Administrator user group (see page 83) can use the software.
- Unlike the audit trail utilities, you must save changes made to the electronic signature system before the database can implement them.

Setting Up the Electronic Signature System

The following tasks must be performed to set up the electronic signature system for the GeneMapper® Software.



Maintaining the Electronic Signature System

Perform the tasks in the following table to maintain the electronic signature system for the GeneMapper® Software.

Frequency	Tasks
As needed	Review the electronic signature history for the GeneMapper® Software (see page 128).
Semi-annually	Review the electronic signature system settings and modify them as necessary to meet the regulation requirements of your laboratory (see page 125).

Starting the Electronic Signature Administration Software

1. Start and log in to the GeneMapper® Software (see "Logging In to and Out of the Software" on page 59).
2. In the GeneMapper window, select **Tools** ▸ **Esig Administrator**.
3. In the ESigAdministration dialog box, type a user name and password for a user account with administrative privileges, then click **OK**.

IMPORTANT! Only users that belong to the Administrator user group (see page 83) can use the Electronic Signature Administration Software.

About Electronic Signatures

Electronic Signatures from the User's Perspective

The GeneMapper® Software has an Electronic Signature (eSig) system that can be used to regulate the creation, deletion, and modification of data stored by the database. When a user performs an action (such as the detection of data) that has been configured for an electronic signature, the GeneMapper® Software displays the Electronic Signature Verification dialog box (see Figure 5-7). The user must then authenticate or "sign" for the action by typing the user name (optional) and password of his or her account.

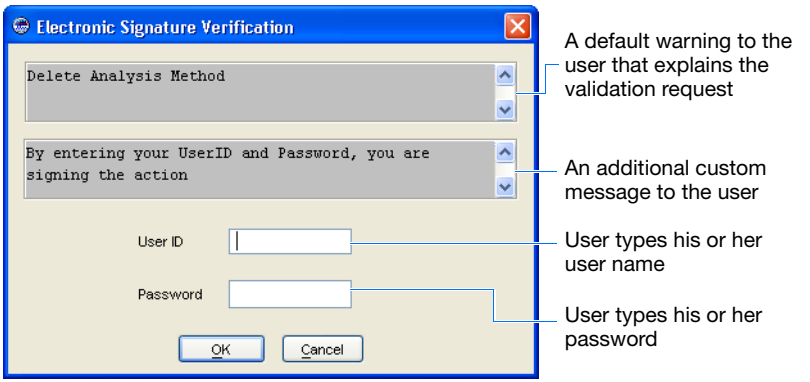


Figure 5-7 Electronic Signature Verification dialog box

If a user enters the correct password, the GeneMapper® Software performs the requested action and records the electronic signature transaction. If the password fails, the software either locks out the user or returns the user to the screen from which the user attempted the action, depending on the password policies.

Note: The Electronic Signature Software tracks the number of failed login attempts.

Configuring the Electronic Signature Settings

About the Configuration Tab Settings

The Electronic Signature Software allows you to activate (and deactivate) the electronic signature system using the Configuration tab of the software. The setting is system-wide and can be customized.

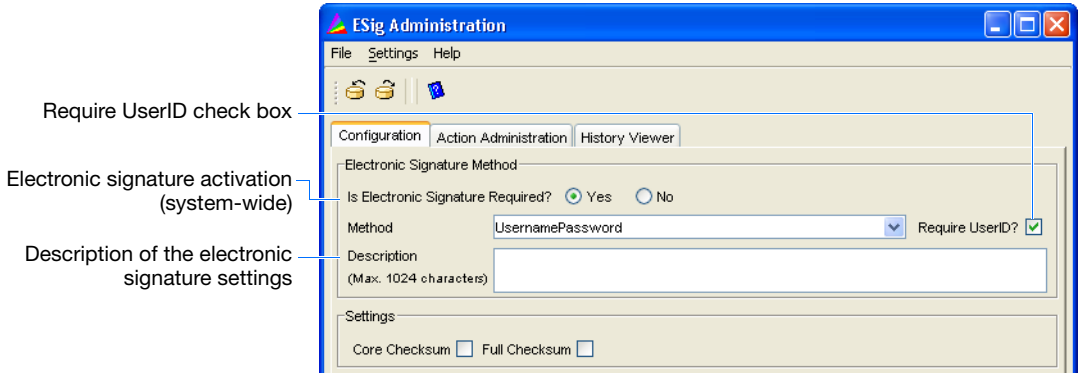
Enabling Electronic Signatures

1. Start the Electronic Signature Software (see page 123).
2. In the Electronic Signature window, select the **Configuration** tab.
3. In the Configuration tab, select **Yes** to activate the Electronic Signature System.
4. Select **Method ▸ UsernamePassword**.
5. (Optional) If you want the software to require the user to enter his or her user name as part of the electronic signature verification, select **Require UserID?**

   IMPORTANT! Users belonging to the Administrator user group can reconfigure the requirement for entering a user name in the Electronic Signature Verification dialog box.

6. (Optional) In the Description field, type a brief description of the electronic signature settings.

   Note: The software does not use the Checksum settings.



7. Click (**File ▸ Save**) to save the settings.

Configuring the GeneMapper® Software Action Map

About the Action Administration Tab Settings

The Action Administration tab of the Electronic Signature Software allows you to configure the electronic signature requirements for the controlled actions (creating, deleting, and editing) of the GeneMapper® Software applications.

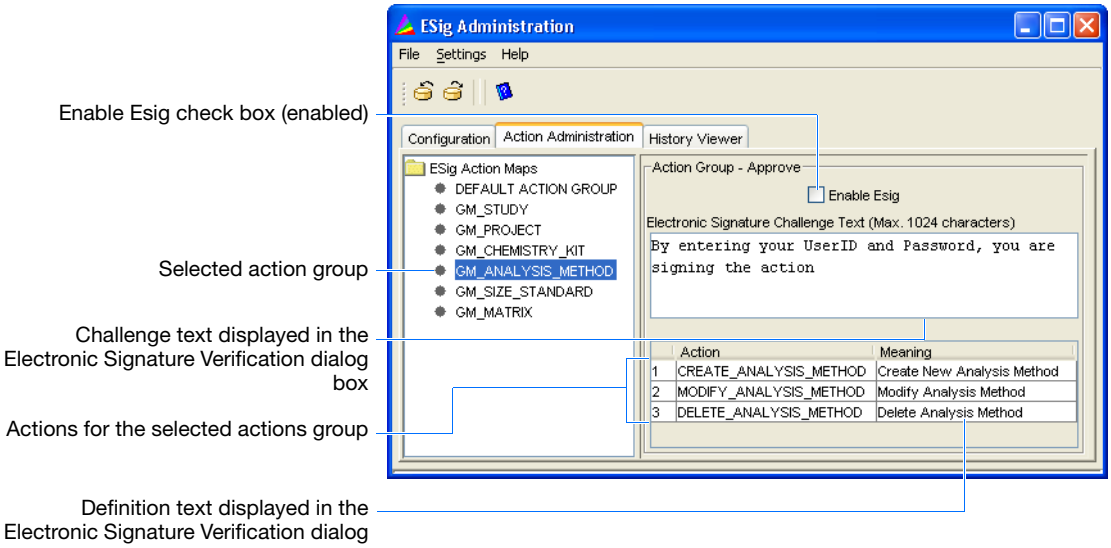
About the GeneMapper® Software Action Maps

Electronic signatures for the GeneMapper® Software are configured through a set of GM_ action maps that represent the data objects of the GeneMapper® Software. For each action map, you can enable or disable the electronic signature requirement for the corresponding data object and customize the challenge text that appears in the Electronic Signature Verification dialog box (see Figure 5-7 on page 124).

Configuring the Action Maps

IMPORTANT! You must enable the electronic signature system as explained on page 125 and save it before changes to the ESig Action map can take effect.

1. If necessary, start the Electronic Signature Software (see page 125).
2. In the ESig Administration window, select the **Action Administration** tab.



3. For each GM_ action group in the left pane of the Action Administration tab:
   a. Select a GM_ action group.
   b. Carefully review the information displayed in the Action Groups - Approve group box for the associated action map.
   c. If you want to require electronic signatures for the actions displayed in the Actions List, select the **Enable ESig** check box.
   d. In the Electronic Signature Challenge Text field, type a short message to your users. The software displays the text you enter here when the software prompts the user for an electronic signature
   e. Repeat steps 3a through 3d for each action map in the ESig Action Maps pane.
4. Click (**File ▸ Save**) to save the electronic signature settings.

Viewing the Electronic Signature History

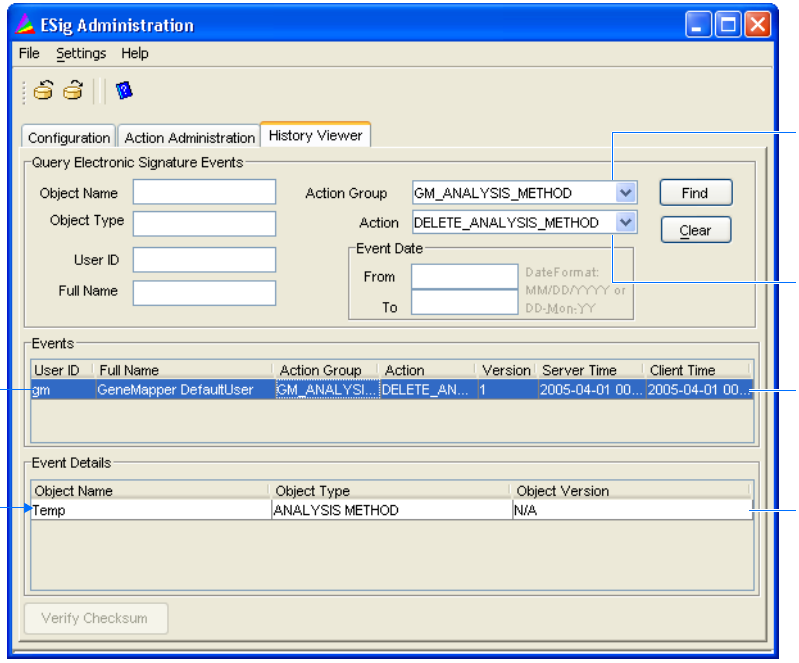
About the History Viewer Tab Settings

The History Viewer tab of the Electronic Signature Software allows you to query, retrieve, and view the event history for the controlled actions (creating, deleting, and editing) of the GeneMapper® Software.

Note: The Electronic Signature Software does not record printing or exporting in the event history.

Viewing Histories

1. If necessary, start the Electronic Signature Software (see page 125).
2. In the Electronic Signature window, select the **History Viewer** tab.



GM_ANALYSIS_METHOD Action Group

DELETE_ANALYSIS_METHOD Action

Deleted analysis method electronic signature event

Details of the electronic signature event

3. In the Query Electronic Signature Events group box, enter parameters to refine the query of electronic signature records:

   Note: Enter parameters only in those fields that are relevant to your search. The software can perform a query regardless of whether the remaining fields and menus contain values.

   - **Object Name** – Enter the name of an object. For example, entering "Study 123" in the Object Name field retrieves all events for study "Study 123."
   - **Object Type** – Enter the type of object (study, project, or analysis method). For example, entering "study" in the Object Type field retrieves events for all studies.
   - **User ID** – Enter the name of a user account to query the electronic signature events created by a specific user.
   - **Full Name** – Enter the full name of a user to query the electronic signature events created by a specific user.
   - **Action Group** – Select an action group to view all events for the group. For example, selecting Action Group ▸ GM_ANALYSIS_METHOD retrieves all events created when a user created, deleted, or modified an analysis method.
   - **Action** – After selecting an action group, select an action to further refine the search by isolating it to a specific action of the group. For example, after selecting Action Group ▸ GM_ANALYSIS_METHOD, selecting Action ▸ DELETE_ANALYSIS_METHOD retrieves all events created when a user deletes an analysis method.
   - **Event Date/Time** – Enter a date or dates to display records created in a specific time period.

     From – Restricts the search to events created after the date.

     To – Restricts the search to events created before the date.

4. Click **Find**.

5. (Optional) In the Events list, select an event to view the details for the electronic signature.

6. If you want to run another query, click **Clear**, then repeat steps 3 through 5.

6 Maintaining the Software and Database Application

This chapter covers:

- Maintenance Overview 132

Section 6.1: Managing Study, Project, and Sample Data . . 133

- Exporting Data Objects 135
- Exporting GeneMapper Data Objects 137
- Exporting and Importing Reference Data 142

Section 6.2: Managing the Database. 145

- Using the Oracle® Database 146
- About the Dashboard Software 149
- Reviewing the Database Statistics 151
- Allocating Disk Space 154
- Viewing Project Information 156
- Backing Up the Database 158
- Generating a Database Report 160

Maintenance Overview

Overview

The GeneMapper® Software requires regular maintenance to ensure:

- Optimal performance of the software and database application
- Protection against data loss (due to hardware or software failure)
- Security of the stored data (projects, analysis methods, etc.)
- Compliance with changes in regulatory requirements

This chapter explains how to maintain the GeneMapper® Software and the associated database application. The procedures for maintaining the security, auditing, and electronic signature systems are referred to in Table 6-1, but are explained in Chapters 4 and 5 respectively.

Recommended Maintenance Schedule

IMPORTANT! The maintenance schedule shown in Table 6-1 contains general recommendations and may require adjustment based on system throughput.

Table 6-1 Database maintenance activities

Frequency	Tasks
Weekly	• Exit the GeneMapper® Software and cycle the computer power (see page 61). • (Optional) Back up the GeneMapper database application (see page 158). • Review the statistics for the database (see page 151), and if necessary: – Export unused projects and data (see page 138). – Allocate additional disk space (see page 154).
Monthly	• Defragment the computer hard drive. • If using the auditing system, review the audit report (see page 114). • If using the electronic signature system, review the history (see page 128).
Semi-annually (6 months)	• If using the auditing system, review the audit map and modify the settings as necessary (see page 107). • If using the electronic signature system, review the electronic signature settings and modify them as necessary (see page 125).
As Needed	Export projects (see page 138), studies (see page 140), and audit records (see page 118).

Section 6.1 Managing Study, Project, and Sample Data

This section covers:

- Exporting Data Objects 135
- Exporting GeneMapper Data Objects 137
- Exporting and Importing Reference Data 142

Exports Not Covered in this Section

This section does not explain how to export elements of the GeneMapper® Software user interface. The software can export most of the tables and plots displayed during an analysis of a project or study for:

- Transfer to a third-party application for secondary analysis (such as a spreadsheet or a database), or
- Inclusion in a report, paper, or slide show presentation

Table 6-2 lists the elements of the user interface that can be exported by the GeneMapper® Software. See the *GeneMapper® Software Online Help* or the individual *GeneMapper® Software Getting Started Guides* for information on exporting the individual tables and plots.

Table 6-2 Exportable elements of the GeneMapper® Software user interface

Interface Element	Can be exported as…
Cluster Plot	A *.jpg graphic generated from the plot(s) of the Cluster Plot Manager
Genotypes Plot	A screen capture of the Genotypes Plot dialog box
Genotypes table of the Cluster Plot	A tab/comma-delimited text file (*.txt) containing all columns of the Genotypes table in the Cluster Plot Manager.
Genotypes table of the Samples Plot	A tab/comma-delimited text file (*.txt) containing all columns of the Genotypes table in the Samples Plot
Project	A tab/comma-delimited text file (*.txt) containing columns of the Samples/Genotypes tables for an individual project
Samples Plot	A screen capture of the Samples Plot dialog box
Sizing table of the Samples Plot	A tab/comma-delimited text file (*.txt) containing all columns of the Sizing table in the Samples Plot
SNP table of the Cluster Plot	A tab/comma-delimited text file (*.txt) containing all columns of the Genotypes table in the Cluster Plot Manager.
Study (table and genotypes data)	A tab/comma-delimited text file (*.txt) containing specific columns of the Samples/Genotypes tables of the projects that belong to the study

Exporting Data Objects

Overview

The GeneMapper® Software can export most of the data objects stored by the GeneMapper database application. Exported data objects can be used to:

- Transfer the data object(s) to other computers running additional copies of the GeneMapper® Software
- Store or archive the associated data object(s)

Table 6-2 lists the exportable data objects of the GeneMapper® Software.

Table 6-3 Exportable data objects of the GeneMapper® Software

Data Object(s)	Export Format/Description	See Page
• Analysis Method • Cluster Plot Setting • Plot Setting • Size Standard Definition • SNP Set • Report Setting • Table Setting	An *.xml file containing the metadata equivalents of the settings displayed in the associated editor dialog box when accessed from the GeneMapper Manager. For example, an exported analysis method file contains the metadata equivalent of all settings found in the Analysis Method Editor dialog box.	144
Audit Records	An *.aud file containing the metadata equivalents of the audit records generated by the GeneMapper® Software	118
Bin Set	An *.xml file containing the metadata equivalents of the base pair ranges of all bins in the bin set	143
Panel	An *.xml file containing the metadata equivalents of the kit, panel, and marker definitions	143
Projects	A *.ser file containing all of the analyzed data for a project‡	137
Security Settings	An *.acc file containing the metadata equivalents of the security settings of the Access Control Administration Software (user accounts, profiles, user and security groups).	96
Study	A *.ser file containing all of the analyzed data for a study and associated projects‡	140

‡ Exported projects and studies contain the associated supporting data used to perform the analysis (such as the analysis method, size standard definition, and SNP set). Therefore, you do not need to export the supporting files separately and imported again to reanalyze the project or study.

Export Formats

The GeneMapper® Software supports the following export formats:

- **Access Control File (*.acc)** – An encoded flat file that contains the security settings of the Access Control Administration Software.
- **Audit File (*.aud)** – An encoded flat file that contains exported audit records created by the GeneMapper® Software Audit Management System.
- **Extensible Markup Language File (*.xml)** – An ASCII text file that contains the essence of a data object used by the GeneMapper® Software (such as analysis methods, panels and bin sets, or size standard definition). The data stored by the file is encoded in an extensible markup language (XML) standard used by the GeneMapper® Software.
- **Java Serialized File (*.ser)** – An encoded flat file that contains the essence of a data object used by the GeneMapper® Software. Only projects and studies can be saved as Java serialized files usually for the purpose of storage, backup, or transfer of the associated data.
- **Joint Photographic Experts Group File (*.jpg or *.jpeg)** – A compressed color image format recognized as an internet and multimedia standard. Jpeg graphics can be imported by most major word processing applications or referenced by an HTML document for web publishing.
- **Tab/Comma-Delimited Text Files (*.txt)** – An ASCII text file that contains tabular data in which each row is exported as a single line of text and the cells are separated by the tab (ASCII#009) or the comma (ASCII#044) characters.

Exporting GeneMapper Data Objects

Overview

The GeneMapper® Software can export most types of data objects (such as projects, studies, and analysis methods) stored by the GeneMapper database application.

The exported files can be used to:

- Back up the related data objects by transferring the files to an offline storage device (such as an external hard drive, DVD ROM, or other storage media)
- Transfer studies or projects to other computers running additional copies of the GeneMapper® Software
- Update the reference data (such as analysis methods, bin sets, and panels) on other computers running additional copies of the GeneMapper® Software

Exporting and Importing Projects

Overview

The GeneMapper® Software allows you to export projects from the GeneMapper database application as *.ser files. The exported files contain the analyzed sample data and analysis parameters of each project. Depending on the configuration of the export settings, the files can also contain the reference data (analysis methods, size standard definitions, etc.) used to perform the analysis.

Note: Exported projects do not contain the raw data of the sample files associated with the project. If the sample files for a project are lost, the project cannot be used to regenerate them.

Exporting Projects

1. In the GeneMapper window, click (**Tools** ▸ **GeneMapper Manager**).
2. In the GeneMapper Manager, select the **Projects** tab.
3. Using the Shift and Ctrl keys, select the project(s) that you want to export, then click **Export**.
4. In the Export Project dialog box:
   a. Navigate to the location where you want to save the exported project(s).
   b. Configure the options for the export:
      - **Autoname** – Configures the software to name the exported file(s) automatically using the project(s) name.
      - **Overwrite existing files** – Configures the software to overwrite existing files of the same name.
      - **Export reference data** – Configures the software to include the supporting data objects (such as panels, bin sets, size standards, and SNP sets) in the exported file.
   c. If you did not select Autoname, type a name for the exported project file in the File name field.
5. Click **Save**.

Note: If you did not select Autoname, the software prompts you to name each project as it is exported. Note that at any time, you can select Autoname to have the software automatically name the files.

Importing Projects

Before importing projects, make sure that the projects were exported with the associated reference data. If not, before importing the projects, import the associated reference data including:

- Panels and bin sets (see page 143)
- Supporting data such as analysis methods, table settings, plot settings, cluster plot settings, matrices, size standard definitions, SNP sets, or report settings (see page 144)

To import one or more projects:

1. In the GeneMapper window, click (**Tools ▸ GeneMapper Manager**).
2. In the GeneMapper Manager, select the **Projects** tab.
3. In the Import Project dialog box:
   a. Navigate to the location containing the exported project(s).
   b. While pressing Ctrl, select the project(s) that you want to import.
   c. Configure the Reference Data options to determine what the software does when it attempts to import reference data (analysis methods, size standard definitions, etc.) with the same name as an existing data object:
      - **Skip** – Configures the software to proceed without importing the reference data.
      - **Overwrite** – Configures the software to overwrite existing reference data.
4. Click **Import**.

Exporting and Importing Studies

Overview

The GeneMapper® Software allows you to export studies from the GeneMapper database application for transfer to offline storage, such as a hard drive, a CD ROM, or other storage media.

Note: Sample files used by the projects are not exported with the study.

Exporting a Study

1. In the GeneMapper window, select **Tools ▸ Study Manager**.
2. In the Study Manager, open the study you want to export:
   a. Click (**File ▸ Open**).
   b. In the Open Study dialog box, select a study, then click **OK**.
3. In the Study Manager, select **File ▸ Export**.
4. In the Export Study dialog box, navigate to the location where you want to save the exported study.
5. If necessary, select **Export reference data** to include the supporting data objects (such as panels, bin sets, size standards, and SNP sets) for the associated projects in the exported file.
6. Type a name for the exported study file.
7. Click **Export**.

Importing a Study

Before importing a study, make sure that the study was exported with the reference data for the associated projects. If not, before importing the study, import the associated reference data including:

- Panels and bin sets (see page 143)
- Supporting data such as analysis methods, table settings, plot settings, cluster plot settings, matrices, size standard definitions, SNP sets, or report settings (see page 144)

To import one or more studies:

1. In the GeneMapper window, select **Tools ▸ Study Manager**.
2. In the Study Manager, select **File ▸ Import**.
3. In the Import Study dialog box, navigate to the location containing the exported study.
4. Configure the Reference Data options to determine what the software should do when it attempts to import reference data (analysis methods, size standard definitions, etc.) with the same name as an existing data object:
   - **Skip** – Configures the software to proceed without importing the reference data.
   - **Overwrite** – Configures the software to overwrite existing reference data.
5. Click **Import**.

Exporting and Importing Reference Data

Overview

The GeneMapper® Software allows you to export and import reference data independently of studies and projects. Reference data refers to the data objects that are used to analyze projects, but are not altered by the process (such as analysis methods, size standard definitions, and panels).

Table 6-4 Exportable reference data

Reference Data	Exported from the…	See Page
• Kits • Panels • Bin sets	Panel Manager	143
• Analysis methods • Cluster plot settings • Matrices • Plot settings • Report settings • Size standard definitions • SNP sets • Table settings	GeneMapper Manager	144

Exporting Kits, Panels, and Bin Sets

Export All Kits

From the Panel Manager, you can export the panels and bin sets for all of the kits in your current GeneMapper® Software database.

Note: This procedure allows you to export all panels and bin sets at once. If you want to export only specific panels and bin sets, see "Exporting Panels" on page 143 and "Exporting Bin Sets" on page 144.

To export all kits (all panels and bin sets at once):

1. In the GeneMapper window, select **Tools ▸ Panel Manager**.
2. In the Panel Manager, select **File ▸ Export All Kits** to open the Export All Kits dialog box.
3. Select a folder where you want to save the exported kits (panels and bin sets), then click **Export All Kits**.

   The software exports the panel and bin set *.txt files for all of the kits to the selected folder.

Note: The names of the exported panels and bin sets correspond to the names used in the GeneMapper® Software.

Exporting Panels

From the Panel Manager, you can export specific panels from the GeneMapper® Software database as tab-delimited *.txt files.

Note: This procedure allows you to export specific panels. If you want to export all panels at once, see "Export All Kits" on page 143.

To export specific panels:

1. In the GeneMapper window, select **Tools ▸ Panel Manager**.
2. In the navigation pane of the Panel Manager, select a kit folder.
3. Select **File ▸ Export Panels** to open the Export Panels dialog box.
4. Select the folder where you want to save the exported panel(s), type a file name, then click **Export**.

Exporting Bin Sets

From the Panel Manager, you can export specific bin sets from the GeneMapper® Software database as tab-delimited *.txt files.

Note: This procedure allows you to export specific bin sets. If you want to export all bin sets at once, see "Export All Kits" on page 143.

To export specific bin sets:

1. In the GeneMapper window, select **Tools ▸ Panel Manager**.
2. In the navigation pane of the Panel Manager, select a kit folder.
3. Select **File ▸ Export Bin Sets** to open the Export Bin Set dialog box.
4. Select the folder where you want to save the exported bin set(s), type a file name, and click **Export**.

Exporting All Other Reference Data

Exporting Reference Data Using the GeneMapper Manager

1. In the GeneMapper window, select **Tools ▸ GeneMapper Manager**.
2. In the GeneMapper Manager, select the appropriate tab (Analysis Methods, Table Settings, Plot Settings, Cluster Plot Settings, Matrices, Size Standards, SNP Sets, or Report Settings).
3. Using the Shift or Ctrl keys, select one or more analysis methods to export, then click **Export**.
4. In the Export Analysis Method dialog box, navigate to the location where you want to save the exported data object
5. Type a file name for the exported file.
6. Click **Export**.

Note: The only file type available for exported analysis methods files is *.xml.

Section 6.2 Managing the Database

This section covers:

- Using the Oracle® Database 146
- About the Dashboard Software 149
- Reviewing the Database Statistics 151
- Allocating Disk Space 154
- Viewing Project Information 156
- Backing Up the Database 158
- Generating a Database Report 160

Using the Oracle® Database

About the Oracle® 11*g* Database

The GeneMapper® Software employs a relational Oracle® 11*g* Database for all of its data management needs. The database serves as a common repository for the analyzed fragment analysis data (projects and studies), and the supporting data objects (such as analysis methods, size standard definitions, and SNP sets).

IMPORTANT! Do not install third-party database applications to the computer running the GeneMapper® Software. If co-installed with the GeneMapper® Software, third-party database applications can produce unexpected results including loss of data and corruption of the GeneMapper database application. Consult a certified Oracle® database administrator before making any changes to the configuration of the Oracle® 11*g* database or before using any of the Oracle® utilities.

Database Access

Life Technologies does not support access to the Oracle® database through any means other than the GeneMapper® Software and associated tools (such as the Database Dashboard, the Security Manager Software, and Audit Map Configuration Software).

SQL Support

Life Technologies does not support the use of SQL (using SQLMGR or SQL*Plus) to query or modify the tables of the GeneMapper database application.

API Support

The GeneMapper® Software does not feature an application programming interface (API) for linking the GeneMapper database application with a LIMS. However, the software can export data from the database application in a variety of formats, many of which can be imported by major third-party data storage and analysis applications.

Note: The GeneMapper® Software features a command line interface that can be useful when integrating the software into an existing LIMS. The interface allows you to automate most of the software operations via a scripting language or batch file so that most maintenance and data-entry tasks can be minimized or eliminated altogether. See Appendix B, "Operating the Software from a Command Line," for more information.

Database License

Use of the Oracle® 11*g* Database bundled with the GeneMapper® Software is limited by the terms of an embedded license agreement that prohibits the installation and use of additional third-party database applications. The license included with the purchase of the GeneMapper® Software allows access to the database for up to five named users at any given time. If you want to accommodate more than five named users, you can purchase either additional GeneMapper® Software licenses, or additional Oracle®-named user privileges and thereby, honor Life Technologies' agreement with the Oracle® Corporation.

IMPORTANT! Life Technologies strongly advises against using the database for any purpose other than as a data repository for the GeneMapper® Software.

Oracle® 11*g* Database Tools

IMPORTANT! The operation and maintenance of the GeneMapper® Software does not require the use of the Oracle® tools.

The Oracle® Corporation provides utilities for accessing and maintaining their database products. Life Technologies does not support the use of the Oracle® utilities and recommends against their use by anyone other than a certified Oracle® database administrator.

Oracle® Documentation

Additional documentation for the Oracle® 11*g* Database is available from the Oracle® web site:

www.oracle.com

About the Dashboard Software

Overview

The Database Dashboard utility that installs with the full version of the GeneMapper® Software provides tools for maintaining the Oracle® 11*g* Database and for evaluating the performance of the GeneMapper database application. This section explains how to use the Database Dashboard to maintain the GeneMapper database application that resides in the Oracle® 11*g* Database.

About the Utility

The Database Dashboard provides multiple views for evaluating the characteristics and performance of the Oracle® 11*g* Database, and several features for maintaining and optimizing the system.

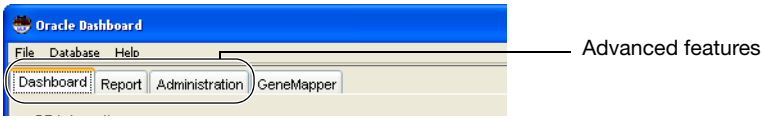
The interface includes the following tabs:

- **Dashboard Tab** – Provides real-time information about database performance, space utilization, and operating systems space usage. The traffic light displays the current state of the database.
- **Report Tab** – Provides a comprehensive view for troubleshooting the Oracle® 11*g* Database or the GeneMapper database application. The top of the report provides a list of potential problems that the software has identified.
- **Administration Tab**–Provides a limited set of database administration functions.
- **GeneMapper Tab** –Provides statistical summaries and tools for the GeneMapper database application.

Note: If the GeneMapper® Software is installed to a computer containing additional Life Technologies software products, the Database Dashboard utility may contain additional tabs for the administration of the related applications.

Features Not Covered in This Manual

The Database Dashboard provides several advanced features not discussed in this manual that can be used by a certified Oracle® Database Administrator to optimize the performance of the Oracle® 11*g* Database. Life Technologies strongly recommends against using the features of the Dashboard, Report, and Administration tabs unless you have been trained to administer Oracle® databases. Many of the features require advanced knowledge of Oracle® systems to ensure the integrity of the database.



About the Administrator Role

When operating the GeneMapper® Software in a multi-user environment, Life Technologies recommends designating a single user as an administrator for the workgroup. The administrator need not have prior knowledge of the Oracle® 11*g* and should be responsible for performing the basic database administration tasks described in this section. By designating an administrator in a multi-user environment, you can avoid most problems caused by usage conflicts.

Note: Ideally, Life Technologies recommends that the maintenance of the Oracle® 11*g* Database be performed by a certified Oracle® Database Administrator, preferably one with prior knowledge of the application.

Starting the Software

IMPORTANT! Only users that belong to the Administrator user group (see page 83) can use the software.

1. In the desktop, select **Start** ▸ **All Programs** ▸ **Life Technologies** ▸ **Database Dashboard** ▸ **Dashboard**.
2. In the Enter Database Details dialog box:
   a. In the DB Name field, type **IFA**.
   b. In the Machine Name field, type the name of the computer that contains the instance of the Oracle® database.
   c. In the Port Number field, type **1521**.
   d. In the SYSTEM Password field, type **manager**.
   e. Click **OK**.

Reviewing the Database Statistics

Overview

As part of regular maintenance, you should compute the statistics of the GeneMapper database application regularly to ensure optimal performance of the GeneMapper® Software. The statistics can warn you of potential problems and help you troubleshoot existing ones.

About the Database Statistics

The Database Dashboard displays the statistics for the GeneMapper database application in the Database Statistics table of the GeneMapper Statistics tab. The values displayed in the table are calculated from the space that is allocated for the Oracle® database itself and the and that which is used by the GeneMapper database, including tables, indexes, and other information.

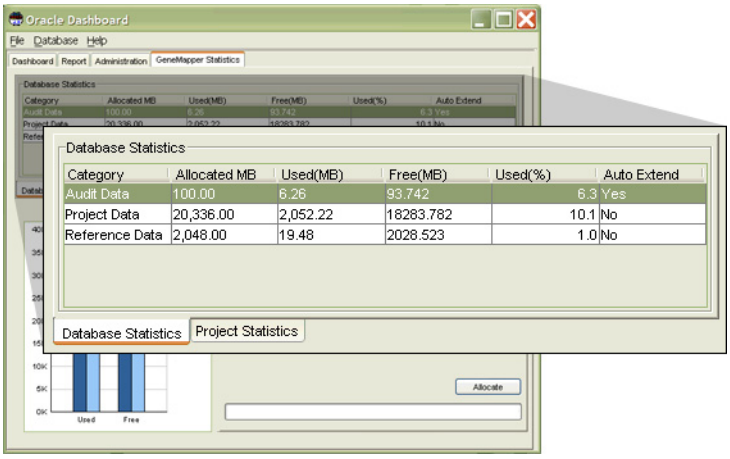


Figure 6-1 Database Statistics table of the Dashboard Software

Columns of the Database Statistics Tab

Note: Values displayed by the Database Statistics tab are approximate.

- **Category** – Lists the names of the tables used by the GeneMapper database application to store data.

Table	Stores
Audit Data	If auditing is turned on, audit records generated from changes made to the software
Project Data	Studies and projects, including samples and result data
Reference Data	Supporting data such as analysis methods, bin sets, kits, markers, matrices, panels, size standard definitions, SNP sets, and all other settings

- **Allocated MB** – Displays the amount of disk space allocated for the table space.
- **Used (MB)** – Displays the amount of disk spaced used by the table space.
- **Free (MB)** – Displays the amount of disk space available to be allocated to the total table space.
- **Used (%)** – Displays the used value divided by the Allocated Size value.
- **Auto Extend** – Indicates whether the Oracle® database can automatically increase the Allocated Size of the associated table.

Auto Extend Value	Effect
YES	The Oracle® database can automatically increase the allocated size of the associated table when the Used (MB) approaches Allocated Size limit.
NO	the allocated size is not increased automatically.

Determining Whether Database Maintenance is Necessary

When reviewing the database statistics, use the following procedure to determine if maintenance is required to optimize performance of the GeneMapper® Software.

To determine whether the database requires maintenance:

1. Start the Database Dashboard (see page 150).
2. In the Database Dashboard window, select the **GeneMapper** tab.
3. In the GeneMapper Statistics tab, select the **Database Statistics** tab.
4. Review the content of the statistics table and determine whether database maintenance is required using the following table.

Used (%) Value	Auto Extend Value	Required Action
> 80%	YES	Allocate more space for data as explained in "Allocating Disk Space" on page 154, if: • The Used (MB) is approaching Maximum Allocated (MB), or • The available Disk Space on allocated drives is low
	NO	Allocate more space for data as explained in "Allocating Disk Space" on page 154. If Available Space on the computer is insufficient for disk allocation, export data and delete it from the GeneMapper database application.
< 80%	n/a	No maintenance required

Allocating Disk Space

Overview

The GeneMapper® Software allows you to allocate additional space on the computer hard drive for use by the GeneMapper database application. When the Used (%) value of any database table approaches 80%, you must allocate additional disk space for the GeneMapper database application.

Alternative to Allocating Additional Disk Space

Instead of increasing the disk space occupied by the Oracle® database, you can export and remove existing data objects to provide more room for new analyses. The type of data objects that you export and remove depends on which table space is approaching its limit. Table 6-5 lists the data objects that you can export and remove to reduce the size of the corresponding tables of the GeneMapper database application.

Note: See "Reviewing the Database Statistics" on page 151 to view the table size statistics.

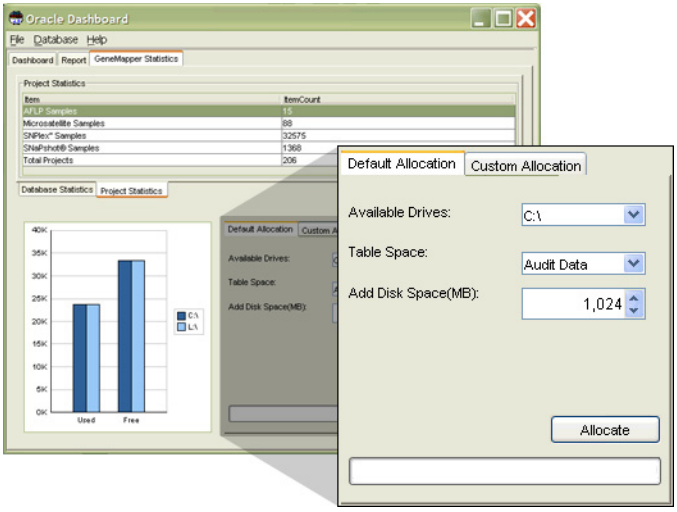
Table 6-5 Table spaces and related exportable data objects

Table Approaching Limit	Export and Remove	See Page
Audit Data	Audit records	118
Project Data	Projects and studies	137 / 140
Reference Data	• Analysis methods • Bin sets • Cluster plot settings • Kits • Markers • Matrices • Panels • Plot settings • Size standard definitions • SNP sets • Report settings • Table settings	143 / 144

Allocating Additional Disk Space

Note: The Project Data tablespace consists of three subdivisions that can be allocated separately to maximize application performance. For more information on refining the Project Data tablespace allocation, see the Database Dashboard Online Help.

1. Start the Database Dashboard (see "Starting the Software" on page 150 for more information).
2. In the Database Dashboard window, select the **GeneMapper** tab.
3. In the GeneMapper Statistics tab, select the **Database Statistics** tab.
4. In the bottom portion of the Database Dashboard, select the **Default Allocation** tab.
5. In the Default Allocation tab, select **Available Drives** ▸ ***<select a drive>***.



6. Select **Table Space** ▸ ***<select a database table>***.

   Note: See "Columns of the Database Statistics Tab" on page 152 for more information on the tables used by the GeneMapper database application.

7. In the Add disk space (MB) field, increase the additional disk space in MB to allocate for the selected table.

8. Click **Allocate**.
9. In the Alert dialog box, click **Yes**.

IMPORTANT! Allocating disk space cannot be undone.

10. Wait until the progress bar indicates that the allocation is complete, then select **Database ▸ Refresh** (or press Alt-R) to refresh the screen and verify that the software has increased the Allocated Size and Maximum Allocation values in the data table.

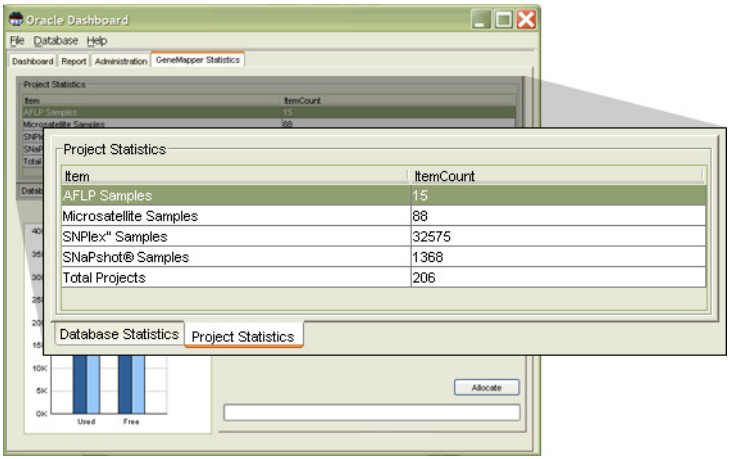
Viewing Project Information

Viewing the Statistics

The GeneMapper® Software can summarize the statistics for the projects that are stored by the GeneMapper database application. The Database Dashboard that performs the computations automatically.

To view project information:

1. Start the Database Dashboard (see page 150).
2. In the Database Dashboard window, select the **GeneMapper** tab.
3. In the GeneMapper Statistics tab, select the **Project Statistics** tab to display table space values and table values for each data type.


Oracle Dashboard
File Database Help
Dashboard Report Administration GeneMapper Statistics
Project Statistics
Item ItemCount
AFLP Samples 15
Microsatellite Samples 88
SNPlex™ Samples 32575
SNaPshot® Samples 1368
Total Projects 206
Database Statistics
Project Statistics
Allocate
Used
Free

Backing Up the Database

Note: This section presents general recommendations only. The backup and restore strategy appropriate for your site depends on your circumstances and your organization's data-protection policies. An experienced Oracle® database administrator knows the appropriate commands to enter to back up or restore the Oracle® database.

When to Back Up the Oracle® 11*g* Database

We recommend that you back up the Oracle® 11*g* Database bundled with the GeneMapper® Software onto an external storage medium (such as 4-mm tape) at least once weekly, or more frequently depending on software use.

Note: The security settings for the Security Manager Software are not stored as part of the GeneMapper® Software project data and must be backed up separately as an exported file. See "Exporting and Importing the Security Settings" on page 96 for more information.

Performing a Logical Backup

IMPORTANT! The GeneMapper database application can become very large, and the amount of disk space required for export can also be sizeable. Plan on maintaining 60 to 70% of the size of the database for the export file.

To back up the database:

1. Start the Database Dashboard (see page 150).
2. In the Database Dashboard window, select the **Administration** tab.
3. In the navigation column of the Administration tab, select **Administration** ▸ **Export Database**.
4. In the Full Database Backup settings, click **Browse**, navigate to the desired location, type a name for the exported file, then click **Open**.
5. Click **Export** and wait for the software to complete the operation.

The software displays the progress of the export operation in the Log Viewer field.

Restoring the Database

After exporting the database tables, you can import the resulting *.dmp file using the Import utility of the Database Dashboard.

To restore the database from an exported file:

1. Start the Database Dashboard (see page 150).
2. In the Database Dashboard window, select the **Administration** tab.
3. In the navigation column of the Administration tab, select **Administration ▸ Import Database**.
4. In the Full Database Restore settings, click **Browse**, navigate to the desired location, select the file, then click **Open**.
5. Click **Import**.

Wait for the Database Dashboard to complete the operation. The software displays the progress of the export operation in the Log Viewer field.

Generating a Database Report

About the Report Tab

The Report tab displays a comprehensive report that characterizes nearly all aspects of the Oracle® database and the resident applications. Advanced users with prior knowledge of Oracle® databases can use the information displayed by the report to assess and optimize database and application performance. In the event of a malfunction, the report can provide database error information which can be used to troubleshoot the problem.

Distributing the Report

1. In the Database Dashboard window, select the **Report** tab.
2. In the Report tab, to:

   Print the report, click **Print**.

   Save the report as an HTML or tab-delimited text file:

   a. Click **Save**.

   b. In the Save dialog box, navigate to the desired destination directory.

   c. Type a name for the exported file,

   d. Select the desired file format (HTML or tab-delimited text),

   e. Click **Save**.

   Email the report:

   a. Click **E-mail.**

   b. Type the address of a valid email account, then click **OK**.

A Troubleshooting the Installation

This appendix covers:

- Troubleshooting Tasks 162
- Uninstalling the Software 164
- Troubleshooting Checklist 170

Troubleshooting Tasks

IMPORTANT! If you have trouble installing the GeneMapper® Software on your computer, perform the following tasks in the order given below.

Task	See page
1. Collect the installation log file.	162
2. Check the Oracle® database installation.	162
3. If necessary, uninstall the software.	164

Collect the Installation Log File

1. Go to ***x*:\AppliedBiosystems\GeneMapper,** where *x* is the drive on which the GeneMapper® Software is installed.
2. Copy and save the **GMInstall.log** file.

   You may need to send the GMInstall.log file to Life Technologies Technical Support if the troubleshooting procedures in this appendix do not solve the installation problem.

Check the Oracle® Database Installation

Check to see if the Oracle® database instance was installed correctly.

1. Select **Start ▸ All Programs ▸ Accessories ▸ Command Prompt**.
2. Type **sqlplus**, then press **Enter**.
3. Type the user name **system**, then press **Enter**.
4. Type the password **manager**, then press **Enter**.
   - If a "Connected to:" message is displayed, the Oracle® database was installed correctly. Proceed to "Uninstalling the Software" on page 164.
   - If the Oracle® database was not installed correctly, complete Table A-1, "Troubleshooting checklist," on page 170, then contact Technical Support.

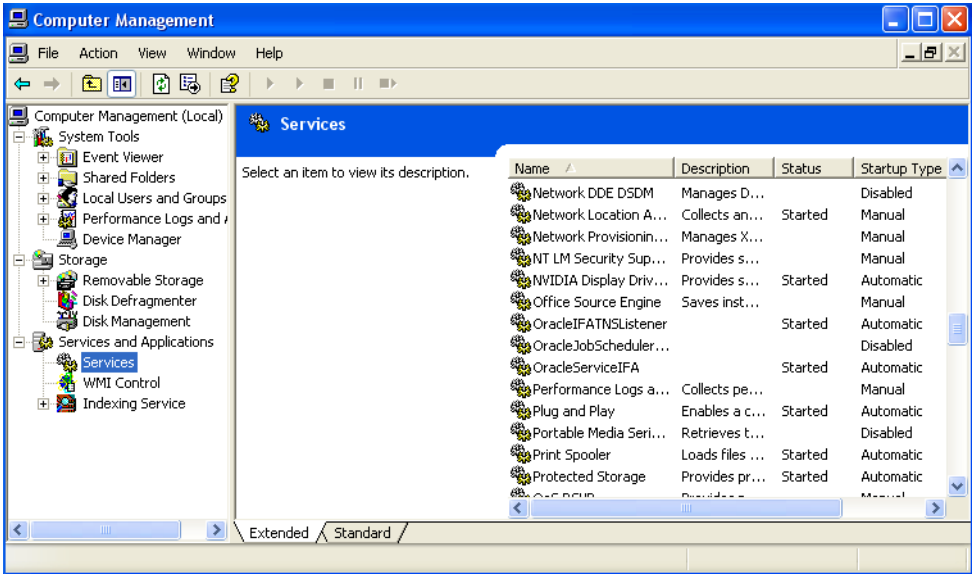
Check the Oracle® Services

After installation, if you have trouble connecting to the default database, perform the following tasks:

- Check the Oracle® Services
- Check to see if the Oracle® services are running.

IMPORTANT! Make sure that the GeneMapper® Software is closed.

1. Right-click **Computer** and select **Manage**.
2. Expand **Services and Applications** and select **Services**.



3. Scroll to **OracleServicesIFA** and **OracleIFAListener** and check if they have started.
4. If they are not listed as “Started” under the Status column, right-click the service name and select **Start**.
5. After the services have started, restart the GeneMapper® Software.

Uninstalling the Software

Uninstall Tasks

To uninstall the GeneMapper® Software, perform the following tasks:

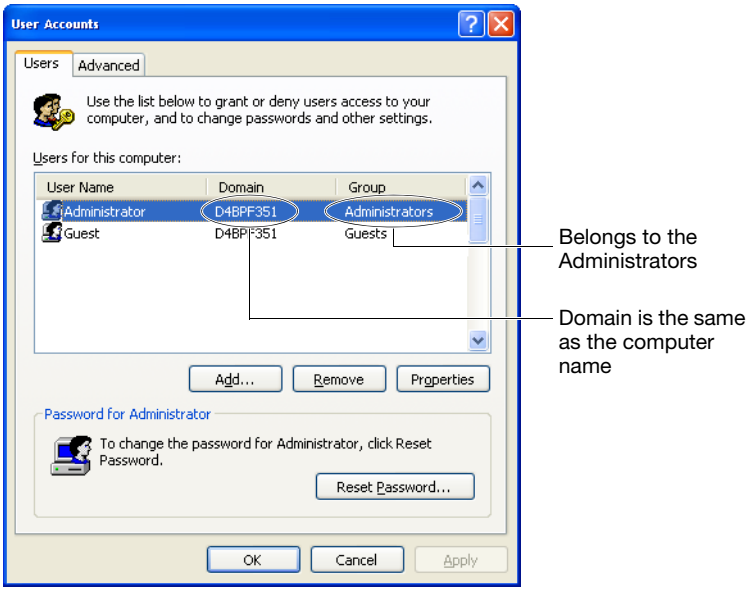
Task	See page
1. Verify that you are logged in as a user with administrator privileges.	165
2. If you are uninstalling an co-installation configuration of the GeneMapper® Software, start the Data Collection Software.	166
3. Uninstall the software.	168

Verifying that You Are a User with Administrator Privileges

Note: Administrator privileges means you have complete and unrestricted access to the local computer.

1. In the desktop, select **Start ▸ Control Panel**.
2. In the Control Panel window, double-click **User Accounts**.
3. In the Users tab of the User Accounts dialog box, verify that the user account you are using belongs to the Administrators group and to the domain with the same name as the computer name.

   Example:



4. Click **OK**.

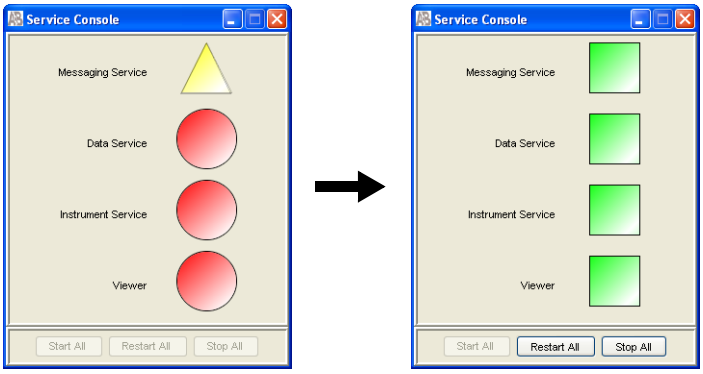
Starting the Data Collection Services

Before you uninstall co-installation configuration of the GeneMapper® Software, start the Data Collection services.

To start the Data Collection services:

1. Select **Start** ▸ **All Programs** ▸ **Applied Biosystems** ▸ **Data Collection** ▸ **Run** ***<Data Collection version>***, where *<Data Collection version>* is one of the following:
   - 3730/3730*xl* Data Collection v3.1
   - 3130/3130*xl* Data Collection v3.1

   After the Service Console opens, wait until all four symbols change to green squares.

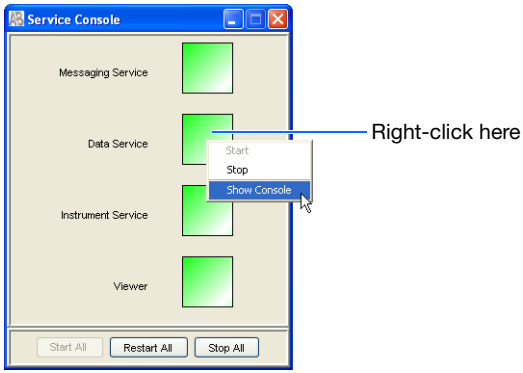


Note: If the services do not start automatically, click **Start All**.

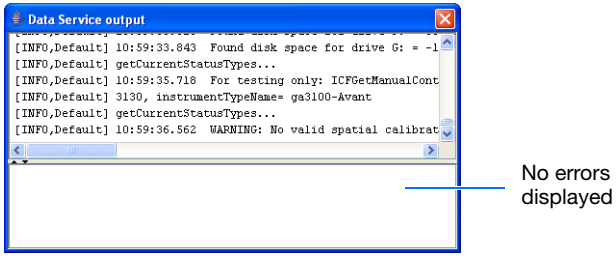
2. If the Data Collection Software requires a password, a login dialog box displays. Type the Login Name and Password, then click **OK**.

Note: If you do not know the Login Name or Password, contact the administrator.

3. Confirm that Data Service started without errors:
   a. In the Service Console, right-click the square next to Data Service and select **Show Console** to display the Data Service output window.



b. Confirm that no errors are displayed in the lower pane of the window, then close the Data Service output window.



Uninstall the Software

This procedure removes the GeneMapper® Software and the Oracle® Database Standard Edition.

To uninstall the GeneMapper® Software:

1. Ensure that the Data Collection software is open (see page 166).
2. Close all other applications (including the GeneMapper® Software) and windows before proceeding with the uninstall.

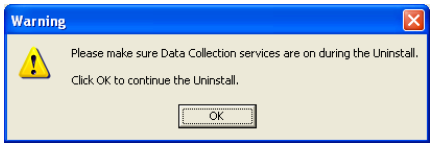
   Note: If you do not close the GeneMapper® Software before proceeding with the uninstall, the uninstall will fail. The next time you attempt to uninstall the GeneMapper® Software, the operating system performs a disk check. If inconsistencies are found during the disk check, you may be required to correct issues involving some GeneMapper® Software files.

3. Select **Start** ▸ **Control Panel**.
4. Double-click **Add or Remove Programs**.

   Note: If you receive the message stating that you need administrator rights or privileges, log off of the computer, then log on again as a user with administrator privileges.

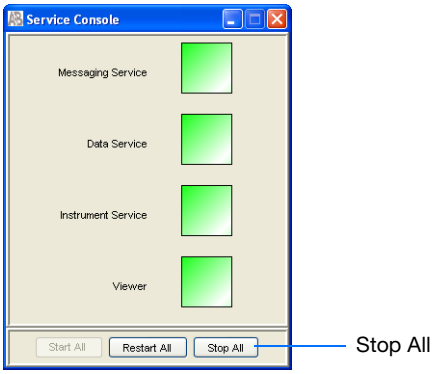
5. Select the GeneMapper® Software.
6. Click **Change/Remove**. The InstallShield Wizard starts up.
7. In the Welcome window, select **Remove**, then click **Next**.
8. At the prompt, click **OK** to confirm the uninstall.

9. If you are uninstalling an instrument configuration, the message below appears. Be sure Data Collection services is open, then click **OK** to start the uninstall.



10. When the Maintenance Complete window appears, finish the uninstallation process:

IMPORTANT! If you are upgrading an *instrument configuration*, stop the Data Collection services before restarting your computer by clicking **Stop All** in the Service Console for the Data Collection Software:



a. Select **Yes, I want to restart my computer now**.

b. Click **Finish**.

Troubleshooting Checklist

IMPORTANT! Complete the Troubleshooting Checklist before contacting Life Technologies Technical Support for assistance.

Table A-1 Troubleshooting checklist

Check	Information for Technical Support
	Summarize the problem:
	Have you been able to repeat the problem? If yes, list the steps that you perform: 1. 2. 3. 4. 5. 6. 7.
	Life Technologies personnel that you have contacted: ❑ Field Applications Specialist ❑ Field Service Engineer ❑ Technical Support ❑ Sales Representative ❑ Order Administration ❑ Other
	Computer specifications: • Operating system: • Version: • Processor • Memory • Hard disk space: • Hard disk configuration:

Table A-1 Troubleshooting checklist (Continued)

Check	Information for Technical Support
	Software installed: ❏ Data Collection Software version: ❏ Status of Data Collection services: ❏ GeneMapper® Software version: ❏ Other Life Technologies software:
	Computer login information: • User privileges: • Local or networked domain:
	Software configuration installed: ❏ Instrument ❏ Stand-alone ❏ Client
	Instrument and instrument computer information: • Model: • Data Collection Software version: • Status of Data Collection services: • Other Life Technologies software: • Capillary length: • Capillary lot number: • Run module: • Dye set:
	Chemistry kit or reagent, with version number:
	Be prepared to send to Technical Support: • Installation log file (page 162) • Exported panels • Exported bins • Exported size standard definition • Exported analysis method • Sample (.fsa) files • GeneMapper_log.txt • PanelImportLog.txt • Printed results

Appendix A

B

Operating the Software from a Command Line

This appendix covers:

- Operating the Software from a Command Line 174
- Example Commands 179
- Command Line Arguments 183

Operating the Software from a Command Line

Overview

This appendix explains how to analyze, import, and export data from the command line interface of the GeneMapper® Software.

IMPORTANT! Life Technologies supports the use of the command line interface only as it is explained in this manual.

Note: If you are unfamiliar with Microsoft DOS, Life Technologies recommends running the application from the user interface.

About the Interface

The primary advantage of the GeneMapper® Software command line interface is that it can automate most software operations without using the graphic user interface. If incorporated as part of a batch file or a scripted sequence, the commands can eliminate most of the repetitive, data-entry tasks associated with project analysis. Use of the command line interface is intended for advanced users (such as systems administrators, bioinformaticians, and network administrators) who choose to operate the application using a scripting language.

Command Syntax

Commands are issued to the GeneMapper® Software command line interface via the MS DOS shell of the Windows operating system. The basic formula for all commands is as follows:

```
<GeneMapper.exe> -commandline <arguments>
```

where:

- `<GeneMapper.exe>` is the path and filename of the executable file for the GeneMapper® Software.
- `-commandline` is the argument that placed the software into command line mode.
- `<arguments>` is the series of arguments that specify the operation(s) to be performed.

Creating a Batch File to Run the GeneMapper® Software

This section explains how to use the command line interface of the GeneMapper® Software by creating a common batch file for the Windows® operating system. The use of batch files is a convenient method to author and submit command line commands to the GeneMapper® Software; however, use of the command line interface is not limited to the method demonstrated here.

To create the batch file:

1. In the desktop, open the Windows Notepad accessory (**Start ▸ All Programs ▸ Accessories ▸ Notepad**).
2. In the Notepad window, type **@ECHO OFF** to instruct the operating system to hide the batch file commands as they are executed.

   Note: If you want the operating system to display each command in the MD DOS prompt as it is executed, replace @ECHO OFF with @ECHO ON. The @ECHO ON command can be useful when troubleshooting batch file errors. If the software encounters an error when executing the commands in the batch file, you can review the contents of the batch file to identify the offending command.

3. Press **Enter** to create a new line.
4. In the Notepad window, type the following:

```
@echo off

"GeneMapper" -commandline -option h -username "user" -password
"password" -project "project"
```

where:

- *GeneMapper* is the directory path for the GeneMapper® Software executable (enclosed in double quotes).
- *user* is the name of a user account with privileges sufficient to perform the desired functions (enclosed in double quotes).
- *password* is the password of the user account (enclosed in double quotes).
- *project* is the name of the project to create or analyze (enclosed in double quotes).

For example:

```
@echo off

"D:\AppliedBiosystems\GeneMapper\app\GeneMapper.exe" -commandline -
option h -username "gm" -password "password" -project "snpProject"
```

5. Following the `-project` argument, type any additional arguments to instruct the GeneMapper® Software to perform the desired functions. See "Command Line Arguments" on page 183 for a complete list of all arguments.

   IMPORTANT! Follow the guidelines below when entering commands:

   - Add arguments to the command in any order.
   - Type all arguments on the same line of text (the command cannot contain hard or soft returns)
   - Enclose the user-defined component of arguments in double quotes (for example: `-project "my project"`)
   - Separate all arguments using a space (ASCII character 32).

6. (Optional) After typing the last argument in the command, repeat steps 3 through 5 to enter additional commands.

   Note: The operating system executes the commands in the order that they appear in the batch file (from top to bottom).

7. (Optional) After typing the last command:
   a. Press **Enter** to create a new line.
   b. Type **ECHO Batch file operation complete**.
   c. Press **Enter** to create a new line.

Example batch file:

```
@ECHO off

"D:\AppliedBiosystems\GeneMapper\app\GeneMapper.exe" -commandline -
option h -username "gm" -password "password" -project "snpProject" -
analysismethod "snpAM" -sizestandard "snpSS" -panel "snpPanel"
-snpset "snpSet1" -folder "D:\populationStudy\asian D:\
populationStudy\caucasian" -ladder "D:\populationStudy\asian
ladder1.fsa ladder2.fsa" -ladder "D:\populationStudy\caucasian
ladder.fsa" -exportall "D:\populationStudy\genemapper_export.txt"

ECHO Batch file operation complete.
```

Note: See "Example #2: SNPlex® System Analysis" on page 180 for an explanation of the example batch file.

8. When finished, carefully review the text of the batch file for any errors or typos.
9. When satisfied with the content of the file, save the text as a batch file:
   a. Select **File** ▸ **Save**.
   b. In the File name field, type a name for the batch file that terminates in the **.bat** file extension.
      For example: *mybatchfile.bat* or *GManalysis.bat*
   c. Click **Save**.
10. Select **File** ▸ **Exit** to close the batch file.

To run the batch file, double-click the file icon and wait for the computer to run the scripted command. While the GeneMapper® Software executes the command(s) in the batch file, the operating system displays a command prompt window. When the operating system has finished processing the batch file, the command prompt window displays Press any key to continue.

CAUTION Do not close the command prompt window before it displays "Press any key to continue." Doing so prematurely terminates the command(s) executed by the batch file and could result in loss of data.

Note: Depending on the speed of your computer and the number of commands included in your batch file, the operating system may take several minutes to a number of hours to process the batch file.

Example Commands

Example Commands in This Section

- Example #1: Basic Sample File Analysis . . . . . (see below)
- Example #2: SNPlex® System Analysis 180
- Example #3: Sample File Analysis with Named Ladders . . 181
- Example #4: Export of Project Data 182

Example #1: Basic Sample File Analysis

Purpose

This command was written to analyze sample files that have been configured with the appropriate analysis method, size standard, panel, SNP set, and ladder using the Data Collection Software (the default options can also be used to perform the analysis).

Description

The command logs into the GeneMapper® Software using the default user account and password (*gm* and *password*) and analyzes the sample files located in the *d:\mouseStudy\mouseTrait* directory. After the analysis, the command instructs the software to save the project as *Mouse Project*.

Example File

```
@echo off

"D:\AppliedBiosystems\GeneMapper\app\GeneMapper.exe" -commandline -
option h -username "gm" -password "password" -project
"Mouse Project" -folder "d:\mouseStudy\mouseTrait"

ECHO Batch file operation complete.
```

Example #2: SNPlex® System Analysis

Purpose This command was written to perform a SNPlex® System analysis.

Description This command logs into the GeneMapper® Software using the default user account and password (*gm* and *password*) and analyzes the sample files located in the *d:\populationStudy\asian* and *d:\populationStudy\caucasian* directories using the *snpAM* analysis method, the *snpSS* size standard, the *snpPanel* panel, and the *snpSet1* SNP set. The command also instructs the software to use the *ladder1.fsa* and *ladder2.fsa* sample files located in the *d:\populationStudy\asian* directory, and the *ladder.fsa* sample file located in the *d:\populationStudy\caucasian* directory as allelic ladders for the analysis. Following the analysis, the command instructs the software to save the project as *SNP Project*, and then to export the Samples and Genotypes tables to the *d:\populationStudy* folder as the *genemapper_export.txt* file.

Example File

```
@echo off

"D:\AppliedBiosystems\GeneMapper\app\GeneMapper.exe" -commandline -
option h -username "gm" -password "password" -project "SNP Project"
-analysismethod "snpAM" -sizestandard "snpSS" -panel "snpPanel"
-snpset "snpSet1" -folder "d:\populationStudy\asian d:\
populationStudy\caucasian" -ladder "d:\populationStudy\
asian ladder1.fsa ladder2.fsa" -ladder "d:\populationStudy\
caucasian ladder.fsa" -exportall "d:\populationStudy\
genemapper_export.txt"

ECHO Batch file operation complete.
```

Example #3: Sample File Analysis with Named Ladders

Purpose

This command was written to analyze sample files that have been configured with the appropriate analysis method, size standard, panel, SNP set, and ladder using the Data Collection Software (the default options can also be used to perform the analysis).

Description

The command logs into the GeneMapper® Software using the default user account and password (*gm* and *password*) and analyzes the sample files located in the *e:\dog project\dog trait*. The command also instructs the software to use the *dog ladder1.fsa* and *dog ladder2.fsa* sample files located in the *e:\dog project\dog trait* directory as the allelic ladders for the analysis. After the analysis, the command instructs the software to save the project as *Dog Project* before closing the application.

Example File

```
@echo off

"D:\AppliedBiosystems\GeneMapper\app\GeneMapper.exe" -commandline -
option h -username "gm" -password "password" -project "Dog Project"
-folder "e:\dog project\dog trait" -ladder "e:\dog project\dog
trait" "dog ladder1.fsa" "dog ladder2.fsa"

ECHO Batch file operation complete.
```

Example #4: Export of Project Data

Purpose This command was written to export the sizing data and analyzed electropherogram data for the sample files of an existing project.

Description The command logs into the GeneMapper® Software using the default user account and password (*gm* and *password*) and exports the sizing data and analyzed electropherogram data of the *California Orange* project as the *g:\orange project\size map.txt* and *g:\orange project\analyzed eps.txt* files.

Example File

```
@echo off

"D:\AppliedBiosystems\GeneMapper\app\GeneMapper.exe" -commandline -
option h -username "gm" -password "password" -project
"California Orange" -exportsizemap "g:\orange project\size map.txt"
-exportanalyzedeps "g:\orange project\analyzed eps.txt"

ECHO Batch file operation complete.
```

Command Line Arguments

Conventions

This section uses the following text conventions:

- *"italic text"* – Italic text appearing between double quotation marks ("") must be substituted with custom values when entered as part of a command.

  IMPORTANT! Always enclose italic text in double quotes ("*This is an example*"). The quotations allow the software to accommodate spaces in the user-defined text.

- **bold text** – Bold text must be typed exactly as it appears.
- Greyed text – Grey table cells indicate the required elements of all commands issued via the command line interface.

Commands

Table B-1 contains a summary of all parameters for the command line interface.

Table B-1 Summary of arguments for the GeneMapper® Software command line interface

Argument	Action/Definition	Usage
`-analysismethod`	Specifies the name of the analysis method to use in the analysis of the specified project.	**`-analysismethod "`***`method`***"** where *`method`* is the name of the analysis method.
`-commandline`	Configures the GeneMapper® Software to operate in command line mode.	**`-commandline`**
`-deleteproject`	Deletes the specified project(s).	**`-deleteproject "`***`project1`***`" "`***`project2`***`"** … where *`project1`* and *`project2`* are the names of the projects to be deleted.
`-deletesnpset`	Deletes the specified SNP sets.	**`-deletesnpset "`***`snpset1`***`" "`***`snpset2`***`"** … where *`snpset1`* and *`snpset2`* are the names of the SNP sets to be deleted.
`-exportall`	Exports the combined contents of the Samples and Genotypes tables of the specified project as a tab-delimited text file of the specified name.	**`-exportall "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-exportanalyzedeps`	Exports the analyzed electropherogram data for the samples of the specified project as a tab-delimited text file of the specified name.	**`-exportanalyzedeps "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-exportbinoffsettable`	Exports the bin offsets for the specified project as a tab-delimited text file of the specified name.	**`-exportbinoffsettable "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-exportclustergenotypetable`	Exports the Genotypes table of the Cluster Plot Manager for the specified project as a tab-delimited text file of the specified name.	**`-exportclustergenotypetable "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.

Table B-1 Summary of arguments for the GeneMapper® Software command line interface (Continued)

Argument	Action/Definition	Usage
`-exportgenotypetable`	Exports the Genotypes table for the specified project as a tab-delimited text file of the specified name.	**`-exportgenotypetable "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-exportplotsampletable`	Exports the Samples table of the Samples plot for the specified project as a tab-delimited text file of the specified name.	**`-exportplotsampletable "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-exportsampletable`	Exports the Samples table for the specified project as a tab-delimited text file of the specified name.	**`-exportsampletable "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-exportsizemap`	Exports the sizing data for the specified project as a tab-delimited text file of the specified name.	**`-exportsizemap "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-exportsnptable`	Exports the specified SNP table for the specified project as a tab-delimited text file of the specified name.	**`-exportsnptable "`***`filename`***"** where *`filename`* is the long path (file name appended to the export directory path) of the exported file.
`-folder`	Specifies the names of the affected run folders in the project: • If analyzing by run, the argument specifies the run folder of interest • If analyzing by project, the argument specifies the run folders of interest in the specified project.	**`-folder "`***`folder1`***`" "`***`folder2`***`"`** … where *`folder1`* is always required. The following folders are needed only if analyzing by project (not used when analyzing by run).

Table B-1 Summary of arguments for the GeneMapper® Software command line interface (Continued)

Argument	Action/Definition	Usage
-help	Prints a summary of the commands for the command-line interface.	**-help**
-importanalysismethod	Imports the specified file as an analysis method.	**-importanalysismethod "***filename***"** where *filename* is the long path (file name appended to the import directory path) of the imported file.
	IMPORTANT! The specified file must be formatted as an XML file that uses GeneMapper-specific syntax and contains the necessary analysis method data in the format identical to that of an exported analysis method.	
-importproject	Imports the project or projects stored by the specified file.	**-importproject "***filename***"** where *filename* is the long path (file name appended to the import directory path) of the imported file.
	IMPORTANT! The specified file must be an exported project file (*.) created by the export function of the GeneMapper Manager.	
-importsizestandard	Imports the specified file as a size standard.	**-importsizestandard "***filename***"** where *filename* is the long path (file name appended to the import directory path) of the imported file.
	IMPORTANT! The specified file must be formatted as an XML file that uses GeneMapper-specific syntax and contains the necessary size standard data in the format identical to that of an exported size standard.	
-importsnpset	Imports the specified file as a SNP set.	**-importsnpset "***filename***"** where *filename* is the long path (file name appended to the import directory path) of the imported file.
	IMPORTANT! The specified file must be formatted as an XML file that uses GeneMapper-specific syntax and contains the necessary SNP set data in the format identical to that of an exported SNP set.	

Table B-1 Summary of arguments for the GeneMapper® Software command line interface (Continued)

Argument	Action/Definition	Usage
`-ladder`	Instructs the software to use the specified samples as allelic ladders in the analysis of the specified project.	**`-ladder "`***`folder`***" "`***`ladder1`***" "`***`ladder2`***" …** where: • *`folder`* is the name of the project folder that contains the negative control samples. • *`ladder1`* and *`ladder2`* … are the names of the allelic ladder sample files separated by a space.
`-negcontrol`	Instructs the software to use the specified samples as negative controls in the analysis of the specified project.	**`-negcontrol "`***`folder`***" "`***`ctrl1`***" "`***`ctrl2`***" …** where: • *`folder`* is the name of the project folder that contains the negative control samples. • *`ctrl1`* and *`ctrl2`* … are the names of the negative control sample files separated by a space.
`-option`	Specifies the options for the exported data.	**`-option "`***`option`***";"***`option`***";…;"***`option`***"** where *`option`* is any of the following option letters: • **`b`** – Attaches bin names to the exported Genotype table • **`h`** – Hides the user interface • **`p`** *`"port"`* – Specifies the monitoring TCP/IP port number (default is 8393)
`-panel`	Specifies the name of the panel to use in the analysis of the specified project.	**`-panel "`***`panel`***"** where *`panel`* is the name of the panel.
`-password`	Specifies the password for the user account defined by the `-username` argument.	**`-password "`***`password`***"** where *`password`* is the password for the user account.

Table B-1 Summary of arguments for the GeneMapper® Software command line interface (Continued)

Argument	Action/Definition	Usage
`-poscontrol`	Instructs the software to use the specified samples as positive controls in the analysis of the specified project.	**`-poscontrol "`***`folder`***`" "`***`ctrl1`***`" "`***`ctrl2`***`" …`** where: • *`folder`* is the name of the project folder that contains the positive control samples. • *`ctrl1`* and *`ctrl2`* … are the names of the positive control sample files separated by a space.
`-project`	Specifies the name of the project to create or analyze.	**`-project "`***`project`***`"** where *`project`* is the name of project.
`-sizestandard`	Specifies the name of the size standard to use in the analysis of the specified project.	**`-sizestandard "`***`standard`***`"** where *`standard`* is the name of the size standard.
`-snpset`	Specifies the name of the SNP set to use in the analysis of the specified project.	**`-snpset "`***`snpset`***`"** where *`snpset`* is the name of the SNP set.
`-username`	Specifies the user account with which to perform the actions of command.	**`-username "`***`user`***`"** where *`user`* is the name of a user account. **IMPORTANT!** The user account that you use must have privileges sufficient to perform the desired function(s).

C Migrating Data Using the GeneMapper® Database Utility Wizard

When to use

Use the utility wizard to export the database from the GeneMapper® Software installed on a Windows XP computer.

Use this procedure to export the database from a Windows XP computer with the following GeneMapper® Software configuration:

- Stand-alone (not co-installed with Data Collection software)
- Co-installed on a 3500 Series computer (the 3500 Series Data Collection software does not store data in a database)

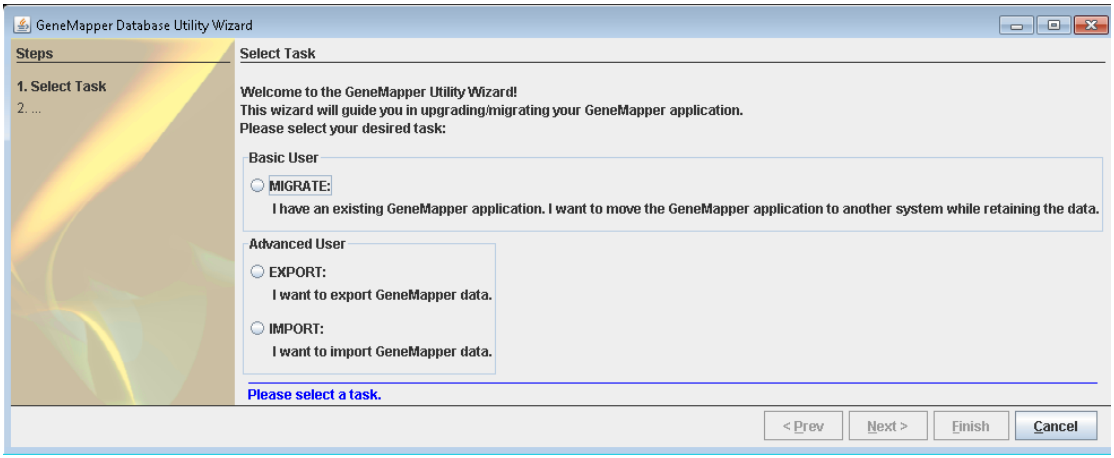
IMPORTANT! This procedure exports the entire database. For computers with a GeneMapper® Software co-installation that share the database with the Data Collection software (3730 Series, 3130 Series, 3100, or 310 computers), follow the procedure in Appendix D, Migrating Data Manually.

The GeneMapper® Database Utility Wizard is included on the GeneMapper® Software v5 Full Installation DVD.

Procedure

1. Insert the Full Installation DVD.
2. In the launcher window, click **Software Extras**, then click **GeneMapper Database Utility Wizard**.
3. In the GeneMapper Database Utility Wizard window, select **MIGRATE**.

   Note: The MIGRATE option only exports the database to a .dmp file; it does not actually migrate the GeneMapper® Software. When you perform a full installation of the software (described on page 35), the software prompts you to import the .dmp file.



4. Click **Next** and follow the instructions in the wizard.

   Note: Exporting or importing the database may take a while to complete. You can check the progress by opening the minimized command prompt window.

5. Click **Finish**.

6. Perform a full installation (page 35). The full installation prompts you to import the .dmp file.

Other functions

The wizard also includes the following functions. These functions are for use to export and import on the same computer.

Note: Do not use the IMPORT function to import the .dmp file into the GeneMapper® Software on the Windows 7 computer. When you perform a full installation of the software (described on page 35), the software prompts you to import the .dmp file.

- **EXPORT** makes a copy of the database and saves it to the folder that you specify.

  Note: Exporting a database may require more disk space than is available. You may need to export the database temporarily to a different hard drive.

- **IMPORT** restores the exported database to the upgraded software. This is done automatically by the upgrade installer during installation. However, you can use this option to manually import the GeneMapper database.

Log File

The wizard log file is written to: `<C>:\AppliedBiosystems\logs\GeneMapper41_DB_Utility\wizard.log`

Appendix C

D Migrating Data Manually

When to use

Use this procedure to:

- Export GeneMapper® Software components from the database on a Windows XP computer co-installed with 3730 Series, 3130 Series, 3100, or 310 Data Collection Software. In these co-installation configurations, the GeneMapper® Software and the Data Collection Software share the database.
- Import GeneMapper® Software components into the database on a Windows 7 computer co-installed with 3730 Series, 3130 Series, 3100, or 310 Data Collection Software.

Note: For computers with a GeneMapper® Software co-installation on a stand-alone or a 3500 Series computer, follow the procedure in Appendix C, Migrating Data Using the GeneMapper® Database Utility Wizard.

Export procedure

1. Export projects elements:
   a. In the GeneMapper main window, select **Tools ▸ GeneMapper Manager**.
   b. Select a tab:
      - Projects
      - Analysis Methods
      - Table Settings
      - Plot Settings
      - Cluster Plot Settings
      - Matrices
      - Size Standards
      - SNP Sets
      - Report Settings
   c. Select the object(s) you want to export. Press and hold **Shift** or **Ctrl** to select multiple objects.

d. Click **Export**.

e. Repeat for all remaining tabs.

2. Export projects elements:

a. In the GeneMapper main window, select **Tools ▸ GeneMapper Manager**.

b. Select a tab:

- Projects
- Analysis Methods
- Table Settings
- Plot Settings
- Cluster Plot Settings
- Matrices
- Size Standards
- SNP Sets
- Report Settings

c. Select the object(s) you want to export. Press and hold **Shift** or **Ctrl** to select multiple objects.

d. Click **Export**.

e. Repeat for all remaining tabs.

3. Export studies:

a. In the GeneMapper main window, select **Tools ▸ Study Manager**.

b. Select **File ▸ Manage Study**.

c. Select the studies, then click **Export**.

4. Export security settings:

a. In the GeneMapper main window, select **Tools ▸ Security Manager**.

b. In the Access Control Administration window, select **File ▸ Export Database.**

c. In the Save dialog box, type a file name for the exported file, select **Access Control files (.acc)**, then click **Save** to export the security settings as an **.acc** file.

d. In the Export Users dialog box, click **OK**.

5. Export audit records:
   a. In the GeneMapper main window, select **Tools ▸ Audit Manager ▸ Backup Audit Records**.
   b. In the Save dialog box, type a file name for the exported file, then click **OK**.
6. Copy all exported data to the computer on which you installed the new version of software.

Import procedure

Import the data in the following order:

1. Security settings
2. Audit records
3. Analysis methods, Table Settings, Plot Settings, Cluster Plot Settings, SNP Sets, Report Settings, Matrix, Kits, Panels, Bin Sets
4. Projects
5. Studies

Appendix D

Glossary

ABB (Automatic Bin Builder)	The first step in accurate allele assignment. After sample files are collected, bins are created by the ABB based on the chosen panel information and successive allele calls from sample file collection. As each sample file in the collection is processed, the bin definitions are refined to reflect the actual data.
access control list	(*See* security group)
Admin profile	A pre-configured profile that cannot be removed and that has execute access to all functions. Initially associated with the "admin" user. (A user must always have an assigned profile.)
admin security group	A pre-configured security group that cannot be removed. This security group has been granted all rights to all data, to provide a way for at least one user to have "admin" access to all data.
admin user group	A pre-configured user group that cannot be removed and that is always associated with the Admin security group.
administrator user	A pre-configured user that cannot be removed and that is always associated with the Admin user group.
ADO	Allele Display Overflow PQV
AE	Allele Edit PQV
AFLP	Amplified Fragment Length Polymorphism. A DNA fingerprinting technique that allows the comparison of the DNA from different organisms. DNA fragments of varying lengths are created by cleaving an organism's DNA with restriction enzymes; a specific subset of these fragments are amplified and analyzed for comparison purposes.

algorithm A set of ordered steps for solving a problem, such as a mathematical formula or the instructions in a program. The terms algorithm and logic are synonymous, where both refer to a sequence of steps to solve a problem. However, an algorithm is an expression that solves a complex problem rather than the overall input-process-output logic of typical business programs.

all user group A user group that contains all users. A user cannot be disassociated from the user group.

allele One of two or more alternate forms of a marker or gene.

Reference alleles are all alleles or bins created in a bin set in the GeneMapper Software. They are denoted by a red cross hatch + in the Panel Manager.

Project alleles are all alleles detected in sample data in a project in the GeneMapper Software. They are denoted by a blue asterisk in the Panel Manager.

allele call Identification of the specific allelic form of a marker.

allele-calling Identification of alleles based on bin definitions; genotyping; GeneMapper® Software analysis

allelic ladder A sample of DNA containing most possible alleles for a specific marker or set of markers. Used to create a sample file that the GeneMapper Software can use to genotype or make allele calls on sample data.

Within the GeneMapper Software, you select a Sample Type of Allelic Ladder for the sample file generated using an allelic ladder.

AN Allele Number PQV

analysis method A collection of user-defined parameters that determine the bin set and analysis algorithms.

analysis parameters A collection of user-defined settings (including analysis method, size standard, and panel) that determine the sizing and genotyping algorithms used by the GeneMapper Software to analyze all sample files in a project. Also called project settings.

association	Two identifiers combined are said to be associated. A user can be associated with a user group. A user group associated with a security group yields a set of data rights.
audit event	A single permanent change to one or more attributes of an object. Includes creating a new instance of an object or deleting an exiting one.
audit map	An object associated with an object type; used to tell the audit component how to audit an object type.
audit object	A collection of data defined by an application. Also referred to as an object.
audit record	The description of a single audit event.
autopanelizer	A feature that uses reference data generated by the Primer Focus kit to quickly define new SNP markers and bin sets.
BD	Broad Peak PQV
bin	Within the GeneMapper Software, a fragment size (bp) or basepair range and dye color that define an allele within a marker. You create a bin for each possible allele associated with a marker.
BIN	Out of Bin Allele PQV
bin set	Within the GeneMapper Software, a collection of bins (allele definitions), typically specific to a set of experimental conditions, usually an instrument. Bin sets are available inside a kit.
cache	An “in memory” representation of the access control data. The Admin Tool modifies the data in the cache. When the Admin Tool or Admin API issues the “save” command, the data in the cache are written to the data store.
CC	Control Concordance PQV
challenge	A term from user authentication indicating that the user is asked to provide identification (typically by entering a password).

chromosome	A long stretch of coiled strands of DNA and proteins containing many genes. Human DNA is contained within 23 pairs of chromosomes.
control	See "positive control" on page 203. See "negative control" on page 202.
control security group	The security group assigned to an Access Control administrative identifier (user, user group, security group, profile). This security group is used to determine access by a user to the administrative data in the Administrative GUI and API.
data access control	The part of access control that administers access to user data.
data group	(*See* security group)
data rights	Properties that define the type of access a user has to a piece of data.
database	One form of offline storage.
diploid	Having two sets of chromosomes and, therefore, having two alleles per marker or gene. Human cells (other than egg and sperm cells) are diploid.
DP	Double Peak PQV
dye set	A set of four to five different colored dyes. A specific dye set is used to label DNA fragments or markers in matrix standards, installation standards, and chemistry kits.
electropherogram	A graphical representation of the intensity (y-axis) of bands produced in a single gel lane or capillary as a function of time (x-axis).
electrophoresis	A technique used to separate molecules by using an electric field to pass those molecules through a porous matrix.
gene	The basic unit of heredity that carries the genetic information for a given RNA molecule or protein.

genome	All the DNA contained in an organism or cell, including both the chromosomes in the nucleus and the DNA in the mitochondria.
genotype	The set of allele calls for specific markers or genes within an organism. (noun) To determine the allele calls for specific markers or genes within an organism. (verb)
GQ	Genotype Quality PQV
haploid	Having one set of chromosomes and, therefore, having one allele per marker or gene. Human egg and sperm cells are haploid.
heterozygous	Having two different alleles for a specific marker or gene.
homozygous	Having two identical alleles for a specific marker or gene.
installation standard	A collection of known genetic markers, labeled with dyes from a specific dye set, used to test the function of a genetic analyzer.
kit	Within the GeneMapper Software, a group of panels.
LMS	Linkage Mapping Set; Life Technologies chemistry using dinucleotide repeat microsatellite markers
locus	The chromosomal location of a genetic marker or gene.
LPH	Low Peak Height PQV
marker	A known segment of DNA that has two or more allelic forms. A marker exists at a known chromosomal loci and can be a gene or a non-gene. See also microsatellite and SNP. Within the GeneMapper Software: A microsatellite marker is defined by a name, fragment size range (bp), dye color, and repeat length. A SNaPshot® kit analysis marker is defined by a name and fragment size range (bp).

matrix standard	A collection of known DNA fragments, labeled with four to five different colored dyes from a specific dye set. The matrix standard is run on a genetic analyzer and used for spectral calibration of sample fragments that are run on the same instrument and labeled with the same dye set.
microsatellite	Microsatellite markers, also known as short tandem repeats (STRs), are polymorphic DNA loci consisting of a repeated nucleotide sequence. The repeat sequence can be from 2 to 7 base pairs long. The number of repeat units varies within a population, thereby creating multiple alleles for a microsatellite locus.
MNF	Matrix Not Found
NB	Narrow Bin PQV
negative control	A blank sample that contains no DNA, but all other reagents used in the experiment. It can indicate if any contamination came from sample preparation. In the Sample tab of GeneMapper Software, you select a Sample Type of Negative Control for the sample file generated from the negative control. Additionally, in the Panel Manager you define the negative control when creating markers.
OBA	One Basepair Allele PQV
OS	Offscale PQV
OVL	Overlap PQV
panel	A group of markers. Within the GeneMapper Software, you associate a panel with a bin set to provide bin definitions for the markers.
phenotype	The physical manifestation of a genotype.
PHR	Peak Height Ratio PQV
polymorphism	Differences between organisms' or individuals' DNA. Variations of allele calls.

positive control — A sample that contains DNA with known alleles for specific markers. Its purpose is to verify that the PCR amplification, electrophoresis, and GeneMapper® Software analysis worked correctly.

In the Sample tab of GeneMapper Software, you select a Sample Type of Positive Control for the sample file generated from the positive control. Additionally, in the Panel Manager you define the positive control when creating markers.

PQV — Process Component-Based Quality Values reported by data analysis and are an aid to finding and fixing problems in sample preparation and analysis.

primer — A single-stranded piece of DNA or RNA that anneals to a complementary section of DNA and serves as a starting point for chain extension by DNA polymerase.

Primer Focus® kit — An Life Technologies kit containing reagents used to create and amplify all four possible alleles of any SNP marker. The kit allows you to take advantage of the Auto Panel feature in the GeneMapper Software to automatically create bins for each allele in a SNaPshot kit analysis.

probe — A DNA or RNA fragment that has been labeled in some way (for example, fluorescent or radioactive), then used in a molecular hybridization assay to identify DNA or RNA sequences that are the same or closely related to it in sequence.

profile — An identifier that gives an administrator the ability to grant or revoke access to functions.

project — Within the GeneMapper Software, a collection of sample files and the analysis parameters for genotyping them.

project settings — See “analysis parameters” on page 198.

project settings — Parameters set by the user to prepare a project for analysis.

reference samples — All or a subset of the actual samples. The reference samples typically contain all of the alleles present in the sample set and are used to create a bin for each allele within the GeneMapper® Software.

rights	Properties that define whether a user has access to data or a function.
security group	An identifier that can be associated with a user group to confer a set of data rights.
security ID	The universal identifier of the security group and the preferred name of the column in an application table that holds the security group ID.
SFN	Sample File Normalization
SFNF	Sample File Not Found
SHP	Sharp Peak PQV
silent auditing	Automatic audit record creation (without prompting of the user).
size match editor	A window in GeneMapper® Software that allows users to examine size-standard electropherograms, edit the identification of size-standard peaks, and view the size-calling curve.
size standard	A collection of DNA fragments of known lengths within a range (for example, 50 to 400 bp) all tagged with the same dye. The size standard is co-injected into the genetic analyzer capillary with the sample, then used to size the sample data. All Life Technologies size standards are labeled with a red or orange dye.
SNaPshot® kit	An Life Technologies kit containing reagents used to PCR amplify any SNP markers, using single-base-extension technology. Sample files can then be sized and genotyped by using a SNaPshot analysis in the GeneMapper Software.
SNaPshot® System Multiplex Analysis	Primer extension-based chemistry for SNP validation
SNF	Size Standard Not Found
SNP	Single Nucleotide Polymorphism. A marker consisting of a single base pair that varies, thereby creating up to four alleles of the marker. In this document, SNP refers to SNaPshot® system markers and SNPlex® systems

SNPlex® System	High-throughput assay for genotyping.
SP	Split Peak PQV
SPA	Single Peak Artifact PQV
SPU	Spectral Pull-Up PQV
SQ	Sizing Quality

Index

A

ABB (automatic bin builder), definition 197
Access Control Administration Software 64
access control list, definition 197
action maps 126
activating
  auditing system 107
  electronic signature system 125
  user accounts 93
admin profile, definition 197
admin security group, definition 197
admin user group, definition 197
admin user, definition 197
Administrator
  default user account 84
  default user profile 83
administrator privileges 27
  verifying 27, 165
administrator, role 150
ADO PQV column 197
Adobe Acrobat Reader 27
AE PQV column 197
algorithm, definition 198
all user group, definition 198
Allele audit map object 110
ALLELE audit map object attribute 112
allele-calling, definition 198
allelic ladders, specifying in a command line analysis 187
allocating, disk space 154
AN PQV column 198
Analysis Method audit map object 110
analysis methods
  definition 198
  import via a command line 186
  specifying in a command line 184
analysis methods, backing up 144
analysismethod argument 184
API support 147
applications, managing 78
Applied Biosystems 3500 series genetic analyzers 17
arguments (command line interface)
  about 183
  analysismethod 184
  commandline 184
  deleteproject 184
  deletesnpset 184
  exportall 184
  exportanalyzedeps 184
  exportbinoffsettable 184
  exportclustergenotypetable 184
  exportgenotypetable 185
  exportplotsampletable 185
  exportsampletable 185
  exportsizemap 185
  exportsnptable 185
  folder 185
  help 186
  importanalysismethod 186
  importsizestandard 186
  importsnpset 186
  ladder 187
  negcontrol 187
  option 187
  panel 187
  password 187
  poscontrol 188
  project 188
  sizestandard 188

snpset 188
username 188
association, definition 199
assumptions for using this guide 7
Audit Data table 152
audit event, definition 199
audit map
configuring 107
Audit Map Configuration Software
about 100
global auditing setting 107
starting 101
audit map definition 199
audit map object attributes
about 109
states 108
audit map objects
about 109
states 107
Audit Map Viewer Software
about 114
starting 115
audit maps 102, 109
about 102
configuring 107
viewing the history 114
audit object attributes 102
audit object, definition 199
audit records
archiving 118
backing up 118
filtering 116
removing 118
viewing 115
audit records, definition 199
audit state inheritance 103
auditing 63, 97
auditing setting (global) 107
auditing system
about 100
maintaining 101
setup 100
Auto Extend 152
autoanalysis not supported 16
automatic notification 66
automating software operations 174
autopanelizer, definition 199

B

backing up
analysis methods 144
audit records 118
bin sets 144
cluster plot settings 144
database 158
kits 143
matrices 144
panels 143
plot settings 144
projects 138
report settings 144
size standards 144
SNP sets 144
studies 140
table settings 144
batch file, creating for command line operation 175
BD PQV column 199
Bin audit map object 110
BIN audit map object attribute 111
bin offsets, export via a command line 184
BIN PQV column 199
bin sets, backing up 144
BinSet audit map object 110
BINSET audit map object attribute 110
bold text, when to use 7

C

cache, definition 199
CAUTION, description 12
CC PQV column 199
challenge, definition 199
changing, user password 92
checklist, troubleshooting 170

Checksum settings 125
client configuration
  installing client 50
client configuration (stand-alone)
  description 48
  installation tasks 48
Cluster Plot Genotypes table, export via a command line 184
cluster plot settings, backing up 144
command line interface
  about 174
  arguments 183
  example commands 179
  hiding the user interface 187
  specifying allelic ladders 187
  specifying analysis methods 184
  specifying negative controls 187
  specifying panels 187
  specifying port setting 187
  specifying positive controls 188
  specifying size standards 188
  specifying SNP sets 188
  specifying the project 188
commandline argument 184
compatibility matrix 26
computer requirements
  full installation 23
  verifying minimum 24
Configuration tab settings 125
configurations, new installation
  instrument 36
  stand-alone 33, 43
configuring
  action maps 126
  audit map 107
  automatic notification 66
  electronic signature system 125
connecting to a new host 60
control security group, definition 200
controlling access to the software 63, 97
conventions
  bold text 7
  for describing menu commands 7
  IMPORTANTS! 8
  italic text 7
  Notes 8
  safety 12
  user attention words 8
creating
  security profiles 81
  user accounts 89
  user profiles 81

D

DANGER, description 12
data
  archiving 133, 145
  export via a command line 184
data access control, definition 200
Data Collection services
  starting on local computer 37
Data Collection Software
  installing with locally 36
  starting 37, 166
  stopping 42, 169
data compatibility 26
data group, definition 200
data rights, definition 200
Data Service output window 38
Data Service, checking if started without errors 38, 166
database
  API support 147
  backing up 158
  SQL support 146
  statistics, viewing 151
Database Dashboard software
  about 149
  logging into for the first time 57
database utilities
  Audit Configuration Tool 100
  Audit Map Viewer Software 114
  Electronic Signature Software 122
database, definition 200
deactivating
  auditing system 107
  electronic signature system 125

user accounts 93
default user name 55
deleteproject argument 184
deletesnpset argument 184
deleting, user accounts 91
destination folder, selecting 40, 44, 51
disk space, allocating 154
documentation, related 9
domain name, verifying 28, 165
DOS window, during installation 41, 47, 51
DP PQV column 200

E

editing
security profiles 82
user account 92
user accounts 91
user profiles 82
Electronic Signature Challenge Text 127
electronic signature records
about 124
viewing 128
electronic signature system
about 122
configuring 125
maintaining 123
Electronic Signature Verification dialog box 124
electropherogram data, export via a command line 184
enabling
auditing 107
electronic signatures 125
ergonomics, safety 14
eSig software. *See* electronic signature system
exportall argument 184
exportanalyzedeps argument 184
exportbinoffsettable argument 184
exportclustergenotypetable argument 184
exportgenotypetable argument 185
exporting
analysis methods 144
bin sets 144
cluster plot settings 144
database 158
Database Utility Wizard 189
kits 143
matrices 144
panels 143
plot settings 144
projects 138
reference data 142
report settings 144
security settings 96
size standards 144
SNP sets 144
studies 140
table settings 144
exportplotsampletable argument 185
exportsampletable argument 185
exportsizemap argument 185
exportsnptable argument 185

F

filtering
audit records 116
record data 116
folder argument 185
full installation
computer requirements 23

G

GeneMapper® Database Utility Wizard 189
GeneMapper® Software
logging out 61
registering after new installation 54
uninstalling 168
Genotypes table (Cluster Plot), export via a command line 184
Genotypes table, export via a command line 184
gm, default user name 55
GQ PQV column 201

guidelines
Audit Map Configuration Software 107
Electronic Signature Software 122

H

hazard symbols. *See* safety symbols, on instruments
help argument 186
help, online, accessing 10
history
auditing (viewing) 114
electronic signature (viewing) 128
History Viewer tab settings 128
how to use this guide 7, 12

I

importanalysismethod argument 186
importing
analysis methods (via a command line) 186
projects 139
security settings 96
size standard definition (via a command line) 186
SNP sets (via a command line) 186
studies 141
importsizestandard argument 186
importsnpset argument 186
inheritance, audit state 103
installation DVDs 28
installation process workflow 22
installation tasks
client configuration (stand-alone) 48
instrument configuration 36
stand-alone configuration 43
installation, troubleshooting 162
installed elements 83
installer, starting 39, 43, 50
installing software
instrument configuration 39
instrument compatibility 26
instrument configuration
description 36
installation tasks (new installation) 36
installing (new installation) 39
italic text, when to use 7

K

Kit audit map object 110
kits, backing up 143

L

ladder argument 187
license agreement, Oracle® database 18
Life Technologies
contacting 10
Technical Support 10
LIMS, linking the software using the command line interface 174
LMS, definition 201
log file, collecting 162
log on requirements 27
logging out of the GeneMapper® Software 59
LPH PQV column 201

M

maintaining
auditing system 100, 101
database 153
electronic signature system 123
security system 65
software and database 132
maintenance schedule 132
managing
software and database 132
user accounts 88
user profiles 78
Marker audit map object 111
MARKER audit map object attribute 111
matrices, backing up 144

Matrix audit map object 111
menu commands, conventions for describing 7
migrating data 193
migration utility. *See* GeneMapper® Database Utility Wizard 189
minimum requirements for computer 24
MNF PQV column 202
monitor requirements 23
moving and lifting, safety 13
MSDSs, obtaining 10

N

NB PQV column 202
negative controls, specifying in a command line analysis 187
negcontrol argument 187
new host, connecting to 60
new installation
  instrument configuration 39
  registering the software 54

O

OBA PQV column 202
OIR (Override Inherited Rights) 79
online help, accessing 10
operating system
  requirements 23
Operator default user account 84
option argument 187
Oracle® database
  checking installation of 162
  maintenance 132
  tools, use of 147
  viewing statistics 151
Oracle® database license agreement 18
OS PQV column 202
OverrideGQ audit map object attribute 112
OverrideSQ audit map object attribute 112
OverrideStatus audit map object attribute 113
OVL PQV column 202

P

panel argument 187
Panel audit map object 111
PANEL audit map object attribute 110
panels
  backing up 143
  specifying in a command line analysis 187
password argument 187
password policies
  about 66
  Max Login Attempts 66
  Minimum Password Width 69
  Password Grace Logins 68
  Password kept per usage 68
  Password Lifetime 68
  Password Reuse Period 68
  Send log message 67
  Set User State 67
passwords
  changing 55, 57, 92
  default user accounts 88
PHR PQV column 202
plot settings, backing up 144
poscontrol argument 188
positive controls, specifying in a command line analysis 188
Primer Focus® kit, definition 203
primer, definition 203
procedural workflow, GeneMapper® Software 19
profile, definition 203
project argument 188
Project audit map object 111
PROJECT audit map object attribute 113
Project Data table 152
project settings, definition 203
ProjectAdded audit map object attribute 113

ProjectRemoved audit map object attribute 113
projects
backing up 138
deletion via a command line 184
importing 139
specifying in a command line analysis 188

R

Reason(s) For Change dialog box 105
recommended maintenance schedule 132
Reference Data table 152
reference data, exporting 142
registering the GeneMapper® Software
new installation 54
registration code 54
removing
audit records 118
the GeneMapper Software 168
repetitive motion, safety 14
report settings, backing up 144
Require UserID? setting 125
requirements
log on 27
user accounts 27
verifying minimum computer 24
verifying user account 27
restoring
audit records 118
projects 139
security settings 96
studies 141
rights, definition 204
Run audit map object 112
RUN audit map object attribute 111
run folder, specifying in a command line analysis 185
RunAnalyzed audit map object attribute 113

S

safety
before operating the instrument 13
conventions 12
ergonomic 14
moving/lifting 13
repetitive motion 14
workstation 14
Sample audit map object 112
SAMPLE audit map object attribute 112
sample data file compatibility 26
Samples table, export via a command line 184
Scientist default user account 84
Scientist default user profile 83
scripting software operations 174
security group, definition 204
security ID, definition 204
security log 94
security profiles
creating 81
editing 82
security settings
exporting 96
importing 96
security system
about 64
maintenance 65
reporting 94
setup 65
Service Console 37, 166
setting
action maps 126
audit map object attribute states 108
audit map object states 107
electronic signature settings 125
global auditing setting 107
password policies 66
setting up
auditing system 100
electronic signature system 125
security system 65
Show EULA option 89

SHP PQV column 204
signatures (electronic) enabling 125
silent auditing, definition 204
size match editor, definition 204
Size Standard audit map object 112
size standard definition, import via a command line 186
size standards
  backing up 144
  specifying in a command line analysis 188
sizestandard argument 188
Sizing table (Samples Plot), export via a command line 185
SNaPshot® analysis, definition 204
SNF PQV column 204
SNP sets
  deletion via a command line 184
  import via a command line 186
  specifying in a command line analysis 188
SNP sets, backing up 144
SNPlex® system analysis, definition 205
snpset argument 188
software
  Access Control Administration 64
  Audit Map Configuration Software 100
  Audit Map Viewer Software 114
  controlling access to 64
  maintenance 132
SP PQV column 205
SPA PQV column 205
SPU PQV column 205
SQ PQV column 205
SQL support 146
stand-alone configuration
  description 33
  installation tasks (new installation) 43
  installing (new installation) 43
starting
  Access Control Administration Software 64
  Audit Map Configuration Software 101
  Audit Map Viewer Software 115
  Esig Administration Software 123
studies
  backing up 140
  importing 141
Study audit map object 113
suspending, user accounts 93

T

table settings, backing up 144
Technical Support
  contacting 10
  information needed before contacting 170
Technician default user profile 83
training, information on 10
troubleshooting checklist 170
troubleshooting tasks 162

U

uninstalling the GeneMapper Software 168
user accounts 88
  activating 93
  Administrator 84
  changing password 92
  creating 89
  deactivating 93
  deleting 91
  editing 91, 92
  Operator 84
  requirements 27
  Scientist 84
  status 89
  suspending 93
User Accounts dialog box 27, 165
user attention words, defined 8
user guide
  attention words 8
  audience 7
  how to use 7, 12
  purpose of 7
  text conventions 7

user name, default 55
user privileges 84
user profiles
about 78
creating 81
default privileges 83
editing 82
username argument 188

V

verifying
administrator privileges 27, 165
computer minimum requirements 24
domain name 28, 165
user account 27
viewing
audit history 114
audit record details 116
audit records 115, 118
database statistics 151
electronic signature records 128
security log 94

W

WARNING, description 12
workflow
GeneMapper® Software 19
installation process overview 22
workstation safety 14

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