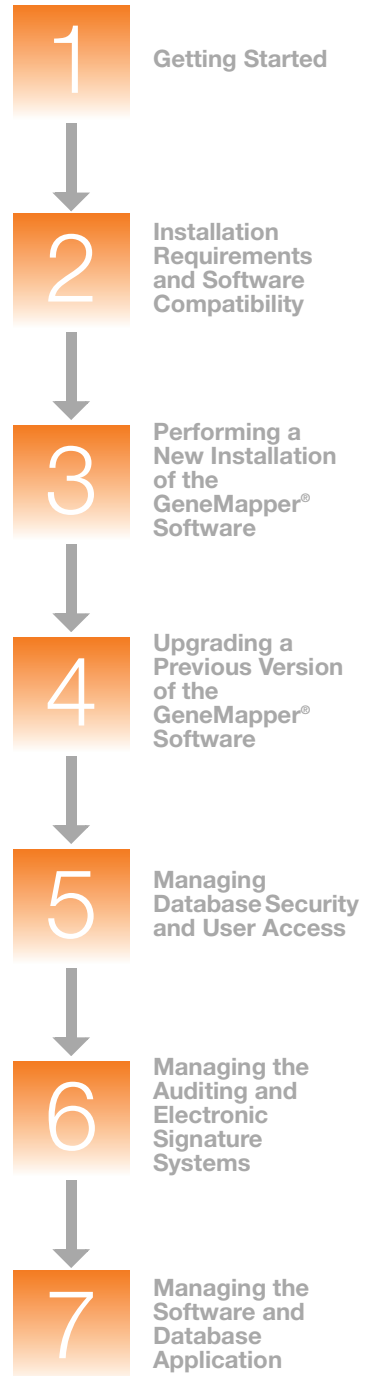


Installation and Administration Guide



Installation and Administration Guide

Getting Started **1**

Installation Requirements and Software Compatibility **2**

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

Upgrading a Previous Version of the GeneMapper® Software **4**

Managing Database Security and User Access **5**

Managing the Auditing and Electronic Signature Systems **6**

Managing the Software and Database Application **7**

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GeneMapper Software has not undergone specific developmental validation for human identification applications. Human identification laboratories analyzing single-source or parentage samples which choose to use GeneMapper Software for data analysis should perform their own developmental validation studies.

The AFLP process is covered by patents owned by Keygene N.V.

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How to Use This Guide

Purpose of This Guide This guide describes the procedures for installing, securing, and maintaining the GeneMapper® Software Version 4.1.

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 xi](#).

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 Applied Biosystems 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


The following related documents are shipped with the software:

- ***GeneMapper® Software Version 4.1 Getting Started Guides*** for microsatellite analysis (PN 4403672), loss of heterozygosity (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 Applied Biosystems 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 Version 4.1 Online Help*** – Describes the GeneMapper Software and provides procedures for common tasks. Access online help by pressing **F1**, selecting **Help** ▶ **Contents and Index**, or clicking  in the toolbar of the GeneMapper window.
- ***GeneMapper® Software Version 4.1 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 Version 4.1 Reference and Troubleshooting Guide*** (PN 4403673) – Provides reference information such as theory of operation and includes troubleshooting information.

Portable document format (PDF) versions of this guide and the other documents are available on the GeneMapper Software Version 4.1 Documentation CD.

Note: For additional documentation, see “[How to Obtain Support](#)” on [page xii](#).”

Obtaining Information from the Online Help

The GeneMapper Software features an online help system that describes how to use each feature of the user interface. Access online help by clicking  in the toolbar of the GeneMapper window, selecting **Help ▶ Contents and Index**, or pressing **F1**.

Using the online help, you can:

- Search for a specific topic
- View Adobe® Acrobat® versions of all documents of the GeneMapper Software Version 4.1 documentation set.

Send Us Your Comments

Applied Biosystems welcomes your comments and suggestions for improving its user documents. You can e-mail your comments to:

techpubs@appliedbiosystems.com

How to Obtain Support

For the latest services and support information for all locations, go to <http://www.appliedbiosystems.com>, then click the link for **Support**.

At the Support page, you can:

- Search through frequently asked questions (FAQs)
- Submit a question directly to Technical Support
- Order Applied Biosystems user documents, MSDSs, certificates of analysis, and other related documents
- Download PDF documents
- Obtain information about customer training
- Download software updates and patches

In addition, the Support page provides access to worldwide telephone and fax numbers to contact Applied Biosystems Technical Support and Sales facilities.

Safety Information


This section covers:


- Safety Conventions Used in This Document xiv
- General Instrument Safety xv
- Workstation Safety xvi


Safety Conventions Used in This Document

Safety Alert Words Four safety alert words appear in Applied Biosystems 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 Applied Biosystems 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

Chapter 1
Getting Started

Chapter 2
Installation
Requirements and
Software Compatibility

Chapter 3
Performing a
New Installation of the
GeneMapper® Software

Chapter 4
Upgrading a
Previous Version of the
GeneMapper® Software

Chapter 5
Managing
Database Security
and User Access

Chapter 6
Managing the
Auditing and Electronic
Signature Systems

Chapter 7
Maintaining the
Software and
Database Application

This chapter covers:

- Start Here: Getting the Most Out of This Guide 2
- New Features in the GeneMapper® Software Version 4.1 4
- For Applied Biosystems 3500 Series Genetic Analyzers. 5
- Oracle® Database License Agreement 6
- GeneMapper® Software Workflow 7

Start Here: Getting the Most Out of This Guide

The *GeneMapper® Software Version 4.1 Installation and Administration Guide* describes how to install the GeneMapper® Software Version 4.1 and manage the software, database, and auditing functions.

Installation To get the most out of this guide, Applied Biosystems recommends that you:

1. Read through this chapter to familiarize yourself with the:
 - New features in the GeneMapper® Software Version 4.1
 - 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. Be sure to follow the appropriate procedures for your particular instrument/software setup:
 - For a new installation (no previous versions of the GeneMapper Software are on your computer), see [Chapter 3](#).
 - For an upgrade installation, see [Chapter 4](#).
4. Log in to and configure the GeneMapper Software:
 - For a new installation, see [Chapter 3](#).
 - For an upgrade installation, see [Chapter 4](#).

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 190](#).
2. If you continue to have problems, complete the Troubleshooting Checklist on [page 198](#), then contact Technical Support ([page xii](#)).

New Features in the GeneMapper® Software Version 4.1

In addition to a number of user interface and feature improvements, the GeneMapper Software v4.1 includes the following new features:

- **Oracle® database** – GeneMapper Software v4.1 uses an Oracle® 11g 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. GeneMapper Software v4.1 also includes enhancements to SQL*Plus® requests.
- **Autosave** – In the option menu, you can now customize the project Autosaving frequency.
- **6th dye** – GeneMapper Software v4.1 allows the analysis of 6th dye data generated from the Applied Biosystems 3500 and 3500xL instrument systems.
- **Data normalization** – GeneMapper Software v4.1 enables size standard normalization of data generated from the Applied Biosystems 3500 and 3500xL instrument systems.
- **Sizing quality** – In the analysis method, you can now define a linearity range. This feature is especially useful for large fragment analysis (>1000 bp).
- **Size standard** – The new GeneScan™ 600 LIZ® Size Standard and GeneScan™ 1200 LIZ® Size Standard are now installed with GeneMapper Software v4.1.
- **SNPlex** – The default 3130xI analysis settings, “SNPlex_Rules_3130” analysis method, and the “SNPlex_48plex_3130” kit are now installed with GeneMapper Software v4.1

The GeneMapper Software v4.1 provides:

- Continued support of security and audit features to assist with 21CFR11 (phase 1) requirements.
- Coinstallation and autoanalysis with Data Collection Software v3.1 on the Microsoft® Windows® XP or Windows Vista® operating systems.

- Coinstallation and autoanalysis with 3500, 3500xL Data Collection Software v1.0 on the Windows Vista operating system.

GeneMapper Software v4.1 also maintains GeneMapper Software v4.0 features such as client-server functionality, universal markers, and marker-specific analysis.

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
- Setting up remote autoanalysis

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

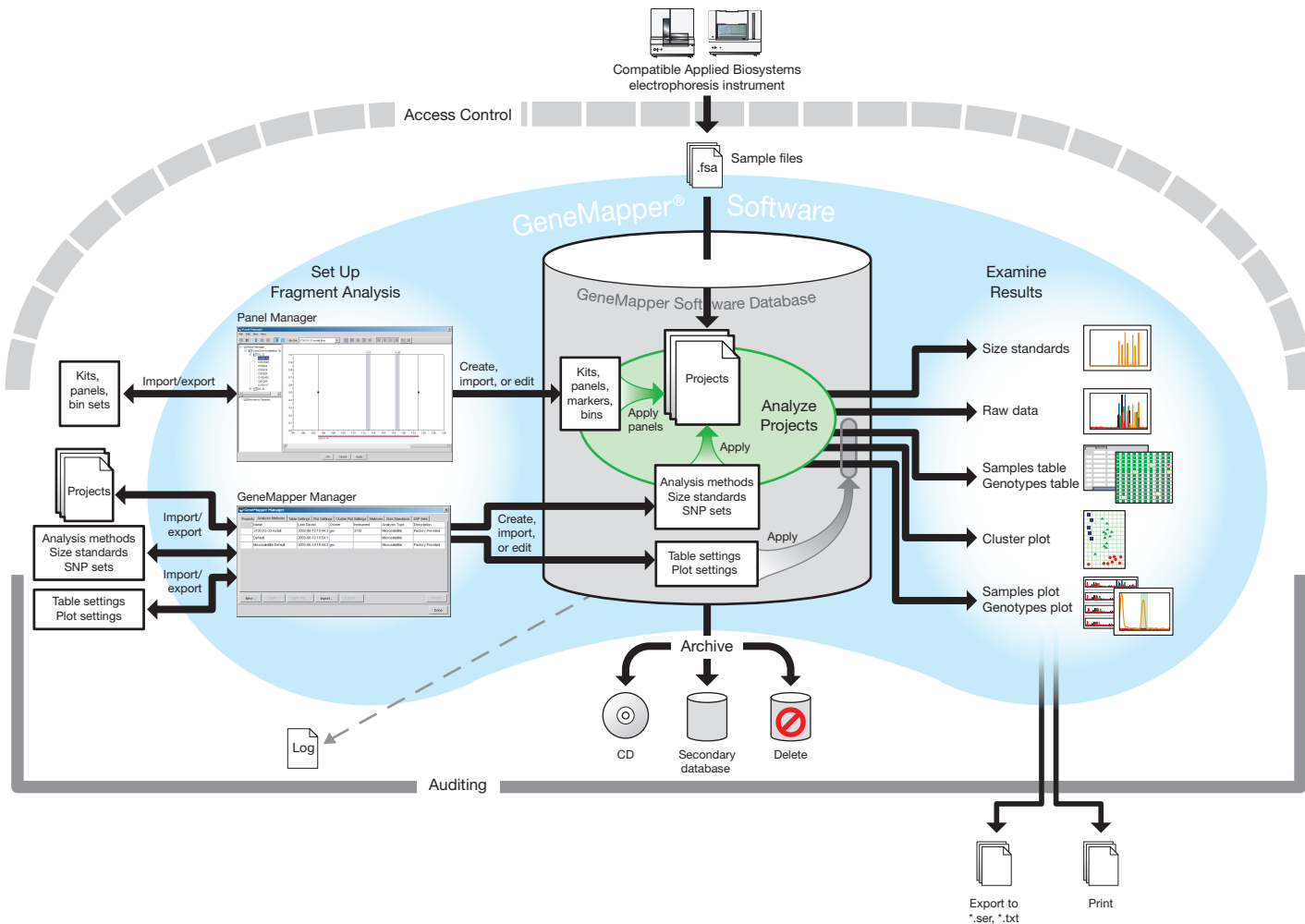
Oracle® Database License Agreement

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 Applied Biosystems 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 Applied Biosystems agreement with the Oracle corporation.

GeneMapper® Software Workflow

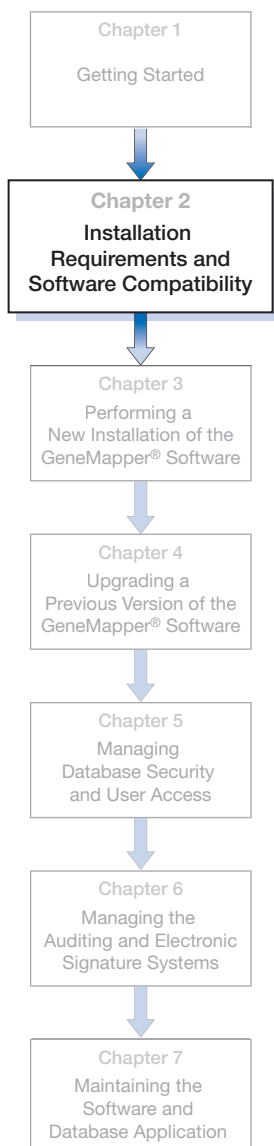




Chapter 1 Getting Started
GeneMapper® Software Workflow

2

Installation Requirements and Software Compatibility



This chapter covers:

■ Overview	10
■ Computer Requirements	11
■ Instrument, Software, and Data Compatibility	14
■ User Account Requirements	16
■ GeneMapper® Software Installation DVDs	18

Overview

This chapter specifies the requirements for installing the GeneMapper® Software Version 4.1.

Figure 2-1 shows an overview of the installation process. For more information about any part of the workflow, see the specified chapter.

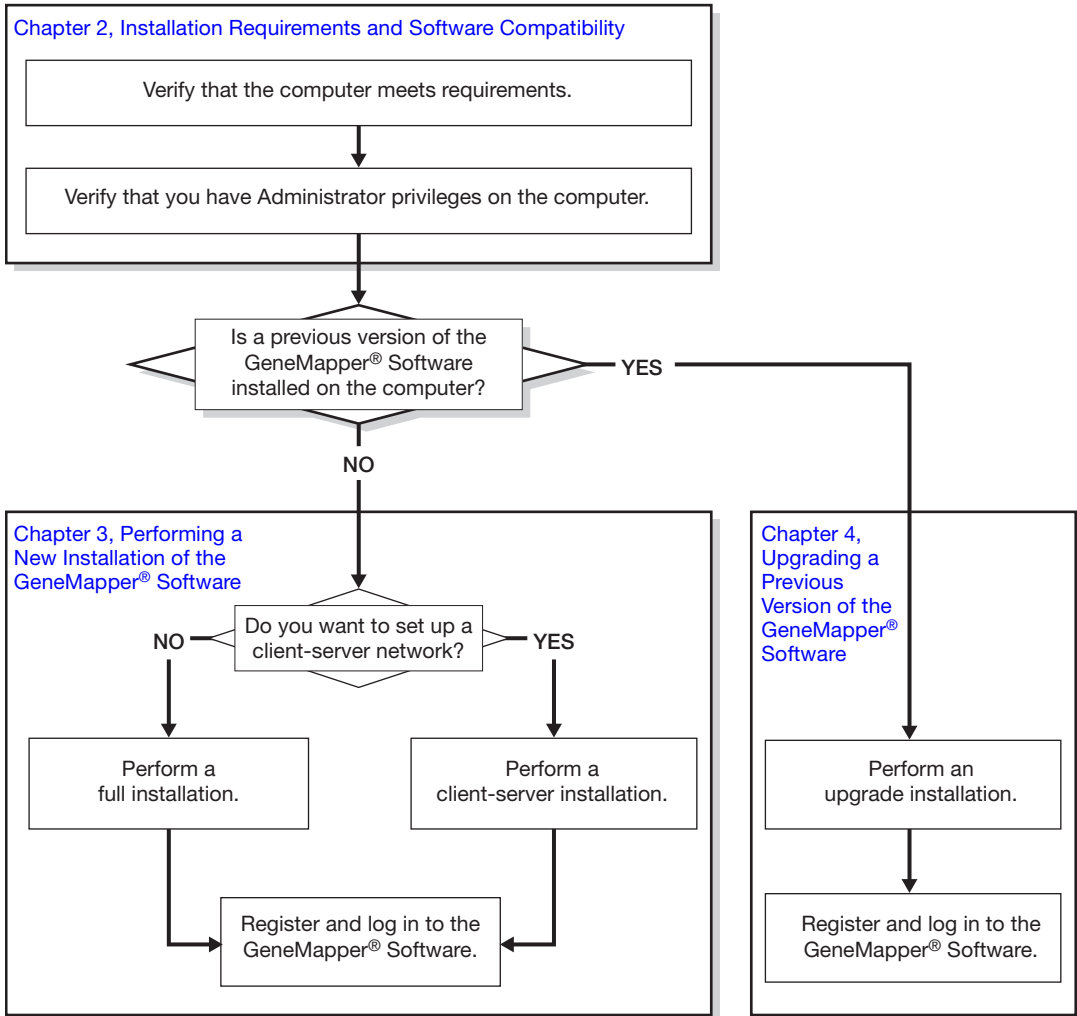


Figure 2-1 Installation workflow overview

Computer Requirements

Computer Configuration Table 2-1 shows the computer specifications that Applied Biosystems recommends for use with the GeneMapper Software Version 4.1.

Even though you can install the GeneMapper Software on a computer containing the minimum supported RAM, Applied Biosystems highly recommends using 2 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.

Note: GeneMapper Software v4.1 has not been tested on a computer with server-type hardware or server operating systems

Table 2-1 GeneMapper® Software computer requirements

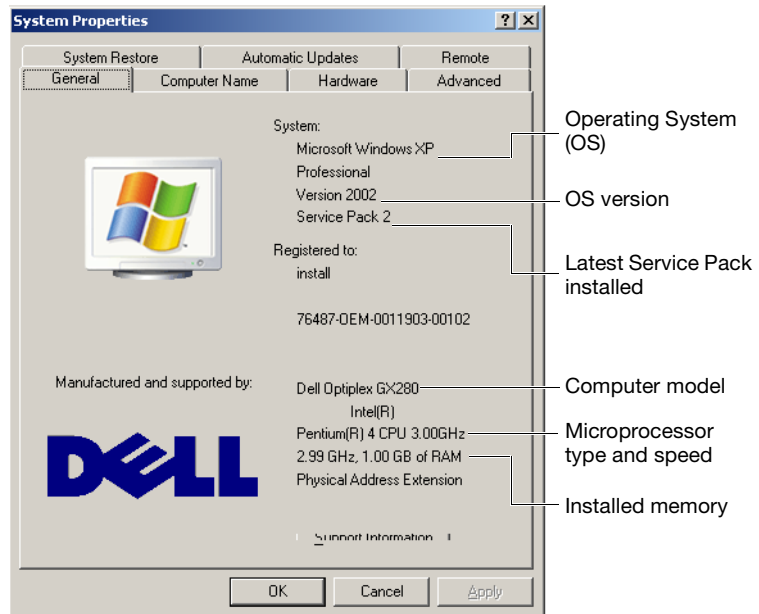
Component	Recommended Configuration	Minimum Configuration [‡]	
		Full or Server Installation	Client Installation
Computer	<ul style="list-style-type: none"> Dell® OptiPlex™ 755 PLUS Minitower, Intel® Core™2 Duo Processor, E8400/3.0 GHz 2 GB of RAM, Non-ECC, 667 MHz DDR2 2 × 1 GB 320 GB SATA hard drive, 3.0 Gb/s and 8 MB Data Burst Cache 16X DVD +/- RW IDE Combo Drive 	<ul style="list-style-type: none"> Dell® OptiPlex™ 755 STANDARD Minitower, Intel® Core™2 Duo Processor, E4500/2.2 GHz 1 GB of RAM 160 GB SATA hard drive, 3.0 Gb/s and 8 MB Data Burst Cache 16X DVD +/- RW IDE Combo Drive 	<ul style="list-style-type: none"> Dell® 270 Workstation, Intel® Pentium® 4 Processor, 2.8 GHz 512 MB of RAM 1 × 80 GB EIDE hard drive 16X/48X IDE DVD/CD-ROM Drive 10/100 NIC network card with RWU (internal)
Monitor	<ul style="list-style-type: none"> 1280 × 1024 or higher pixel resolution 17-inch color monitor 		
Operating System	<p>One of the following operating systems:</p> <ul style="list-style-type: none"> Microsoft® Windows® XP Professional operating system, Service Pack 2 or 3 Microsoft® Windows Vista® Business edition operating system, 32-bit, 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 client-server environment.

Verifying that Your Computer Meets the Minimum Requirements

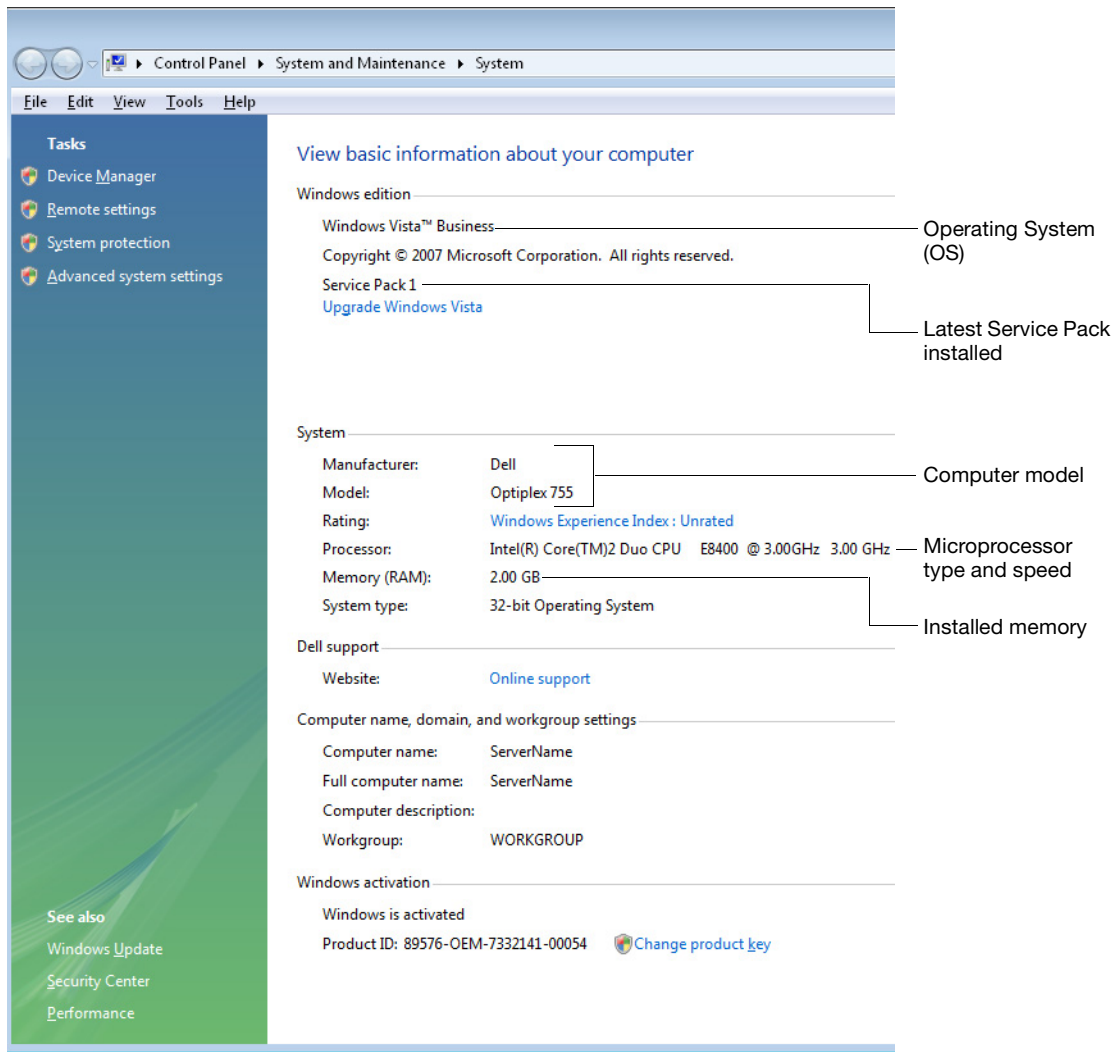
For the Windows® XP operating system

1. In the desktop, right-click **My Computer**, then select **Properties**.
2. In the General tab of the System Properties dialog box, verify that your computer meets the minimum requirements for the operating system, processor, and memory as shown in “Computer Requirements” on page 11.



For the Windows Vista® operating system

1. In the desktop, right-click **Computer** (Windows Vista), 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 11.



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 15.

Table 2-2 Compatibility matrix







Genetic Analysis Instrument	Compatible Data Collection Software and Operating System	Sample Data Compatibility
 Applied Biosystems 3500/3500xL Genetic Analyzer	<ul style="list-style-type: none"> • Data Collection v1.0 • Windows Vista® Business edition, 32-bit, SP1 	<ul style="list-style-type: none"> • Sample files • Co-installation • Automation
 Applied Biosystems 3730/3730xL DNA Analyzer	<ul style="list-style-type: none"> • Data Collection v1.0 • Windows® 2000, SP 2 	<ul style="list-style-type: none"> • Sample files
	<ul style="list-style-type: none"> • Data Collection v2.0 • Windows® 2000, SP 3 and 4 	
	<ul style="list-style-type: none"> • Data Collection v3.0 • Windows® XP Professional, SP 1 and 2 	<ul style="list-style-type: none"> • Sample files • Co-installation • Automation
 Applied Biosystems 3130/3130xL Genetic Analyzer	<ul style="list-style-type: none"> • Data Collection v3.0 • Windows® XP Professional, SP 1 and 2 	<ul style="list-style-type: none"> • Sample files
	<ul style="list-style-type: none"> • Data Collection v3.1 • Windows® XP Professional, SP 2 and 3 • Windows Vista® Business edition, 32-bit, SP1 	<ul style="list-style-type: none"> • Sample files • Co-installation • Automation

Table 2-2 Compatibility matrix (*continued*)

Genetic Analysis Instrument	Compatible Data Collection Software and Operating System	Sample Data Compatibility
 ABI PRISM® 3100 Genetic Analyzer	<ul style="list-style-type: none"> • Data Collection v1.0/1.0.1/1.1 • Windows® NT, SP 5 	<ul style="list-style-type: none"> • Sample files
	<ul style="list-style-type: none"> • Data Collection v2.0 • Windows® 2000, SP 3 and 4 	
 ABI PRISM® 3100-Avant Genetic Analyzer	<ul style="list-style-type: none"> • Data Collection v1.0 • Windows® NT, SP 5 	
	<ul style="list-style-type: none"> • Data Collection v2.0 • Windows® 2000, SP 3 and 4 	
 ABI PRISM® 310 Genetic Analyzer	<ul style="list-style-type: none"> • Data Collection v1.0/1.0.1/1.1/3.0 • Windows® NT 4.0, SP 3, 4, 5, and 6a 	<ul style="list-style-type: none"> • Sample files
	<ul style="list-style-type: none"> • Data Collection v3.0 • Windows® 2000, SP 3 and 4 	
	<ul style="list-style-type: none"> • Data Collection v3.1 • Windows® XP Professional, SP 2 and 3 	<ul style="list-style-type: none"> • Sample files • Co-installation
	<ul style="list-style-type: none"> • Data Collection v3.1 Vista Patch • Windows Vista® Business edition, 32-bit, SP1 	

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.
- **Automation** – The software can automatically retrieve and analyze data generated by the specified combination of the Data Collection Software and Windows operating system.

GeneMapper[®] Software

You can install GeneMapper Software as:

- A new installation
- An upgrade from a previous version (version 4.0 only)

Note: The GeneMapper Software cannot be upgraded directly from v3.7 or earlier to v4.1; you must first back up your data, uninstall the earlier version of GeneMapper Software, then install the full version of v4.1

You cannot co-install the GeneMapper Software Version 4.1 on a computer running a previous version of the GeneMapper Software.

PDF File Reader

To open the user documentation included on the *GeneMapper[®] Software Version 4.1 Documentation* CD, use the Adobe[®] Acrobat[®] Reader[®] software available from:

- www.adobe.com
- www.appliedbiosystems.com/support/software

User Account Requirements

Log On Requirements

To install the GeneMapper Software, you must:

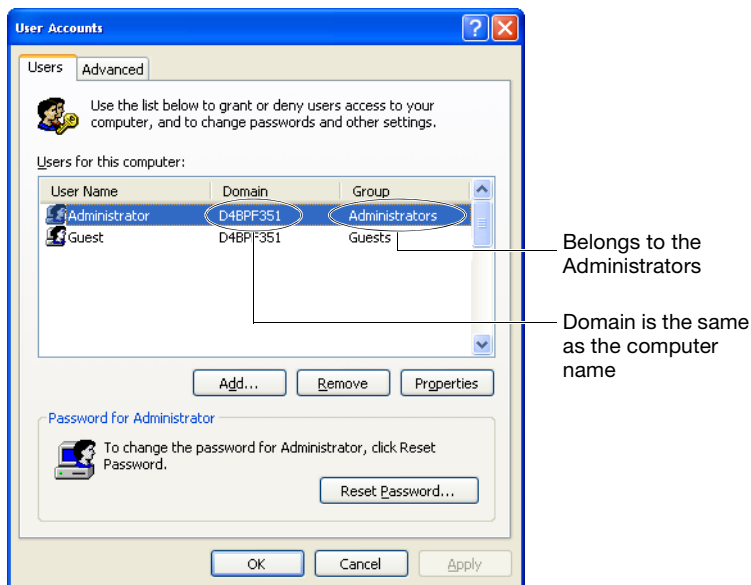
- Have administrator privileges (complete and unrestricted access) on the local computer.

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 or server installation, verify that the domain is the same name as the computer name.

Example:



4. Click **OK**.

GeneMapper® Software Installation DVDs

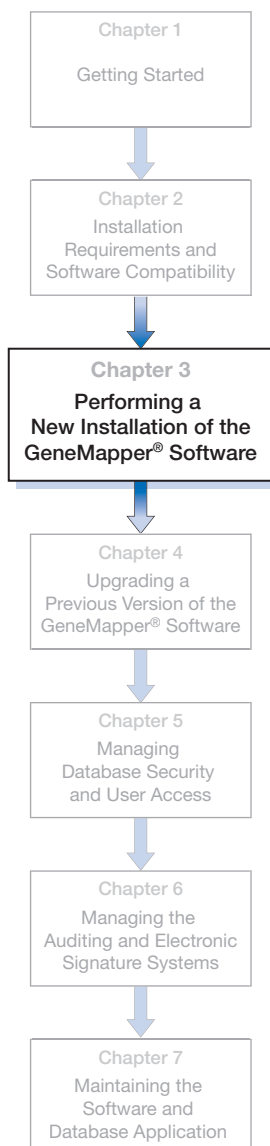
Before installing/upgrading the GeneMapper Software, verify that you have the appropriate installation DVD(s).

Table 2-3 GeneMapper® Software installation DVDs

If you are performing a ...	Use the DVD ...
A full installation	<i>GeneMapper® Software v4.1 Full Installation</i>
A server installation	<i>GeneMapper® Software v4.1 Installer for Server</i>
A client installation	<i>GeneMapper® Software v4.1 Installer for Client</i>
An upgrade	<i>GeneMapper® Software v4.1 Upgrade Software v4.0 to v4.1</i>

3

Performing a New Installation of the GeneMapper® Software



This chapter covers:

■ Overview	20
■ Selecting a Configuration for a New Installation.....	21
Section 3.1: Full Installation Procedures	25
■ Full Installation Workflow	25
■ Instrument Configuration Procedures	27
■ Remote Autoanalysis Configuration Procedures	33
■ Stand-alone Configuration Procedures.....	40
Section 3.2: Client-Server Installation Procedures	45
■ Client-Server Installation Workflow	45
■ Server Configuration Procedures	47
■ Client Configuration Procedures	51
Section 3.3: Software Login Procedures.....	59
■ Registering the Software After a New Installation	60
■ Logging In to the Software for the First Time After a New Installation.....	61
■ Logging In to the Database Dashboard for the First Time..	63
■ What Next?.....	64
■ Logging In to and Out of the Software	65

Overview

This chapter describes how to perform a new installation of the GeneMapper® Software Version 4.1. To perform a new installation, you cannot have a previous version of the GeneMapper Software on your computer.

Note: If you have a previous version of the GeneMapper Software on your computer, go to [Chapter 4](#), “Upgrading a Previous Version of the GeneMapper® Software.”

Selecting a Configuration for a New Installation

When you perform a new installation of the GeneMapper Software, you can select one of the following configurations:

- Instrument
- Remote autoanalysis
- Stand-alone
- Client-server

In [Table 3-1](#), find the configuration that best suits your needs, then go to the referenced page for the appropriate installation procedures.

Table 3-1 GeneMapper® Software configurations

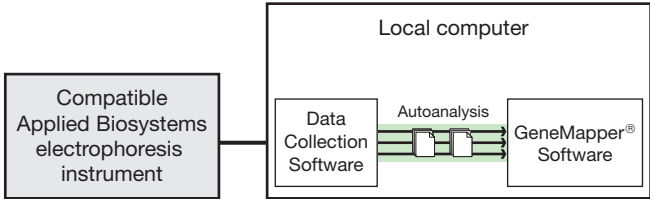
Configuration	Description	See page
Instrument	 <p>The Data Collection Software and the GeneMapper Software are installed on the same computer.</p> <p>In an instrument configuration, you can set up both software products so that the GeneMapper Software:</p> <ul style="list-style-type: none"> • Obtains sample files from the local Data Collection Software database. • Performs analysis of the generated sample files automatically (autoanalysis). 	27

Table 3-1 GeneMapper® Software configurations (*continued*)

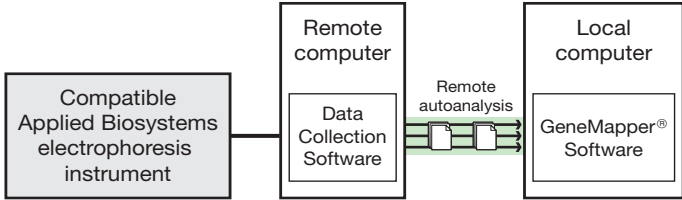
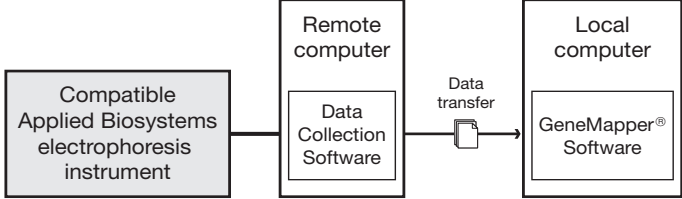
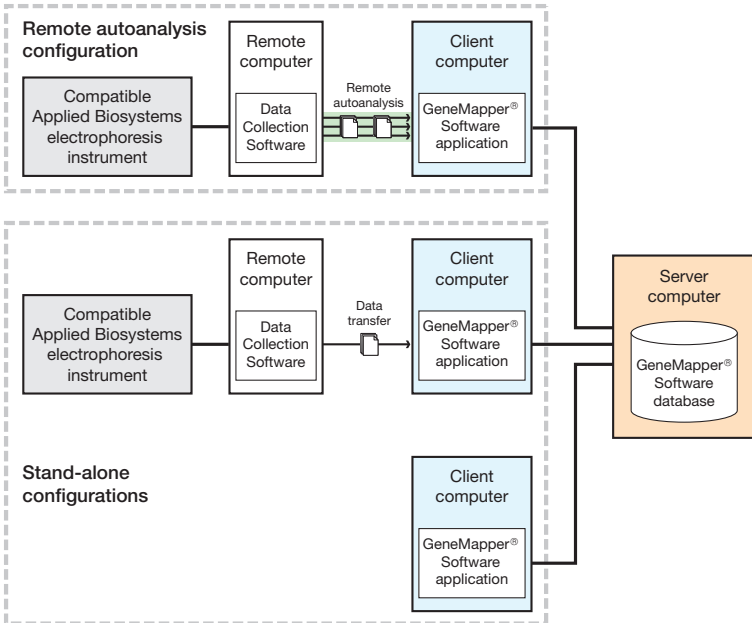
Configuration	Description	See page
Remote autoanalysis	 <p>The diagram shows a flow from a 'Compatible Applied Biosystems electrophoresis instrument' to a 'Remote computer' containing 'Data Collection Software'. From the remote computer, three arrows labeled 'Remote autoanalysis' point to a 'Local computer' containing 'GeneMapper® Software'.</p> <p>The Data Collection Software and the GeneMapper Software are installed on separate computers.</p> <p>In a remote autoanalysis configuration, you can set up both software products so that the GeneMapper Software:</p> <ul style="list-style-type: none"> • Connects to a remote computer running the Data Collection Software. • Obtains sample files from the remote Data Collection Software database. • Performs analysis of the generated sample files automatically (remote autoanalysis). 	33
Stand-alone	 <p>The diagram shows a flow from a 'Compatible Applied Biosystems electrophoresis instrument' to a 'Remote computer' containing 'Data Collection Software'. An arrow labeled 'Data transfer' with a file icon points from the remote computer to a 'Local computer' containing 'GeneMapper® Software'.</p> <p>The Data Collection Software and the GeneMapper Software are installed on separate computers.</p> <p>In a stand-alone configuration, you can use the GeneMapper Software to:</p> <ul style="list-style-type: none"> • Add sample files and studies to a project from a remote Data Collection Software database. • Perform manual analysis of the project or study. <p>Note: In stand-alone configuration, the GeneMapper Software <i>does not</i> interact with the Data Collection Software for autoanalysis or remote autoanalysis.</p>	40

Table 3-1 GeneMapper® Software configurations (continued)

Configuration	Description	See page
Client-server	 <p>The diagram illustrates three configurations for GeneMapper software:</p> <ul style="list-style-type: none"> Remote autoanalysis configuration: A Compatible Applied Biosystems electrophoresis instrument is connected to a Remote computer containing Data Collection Software. This Remote computer is connected to a Client computer containing the GeneMapper® Software application. A bidirectional arrow labeled 'Remote autoanalysis' connects the Remote computer and the Client computer. Data transfer configuration: A Compatible Applied Biosystems electrophoresis instrument is connected to a Remote computer containing Data Collection Software. This Remote computer is connected to a Client computer containing the GeneMapper® Software application. A single-headed arrow labeled 'Data transfer' points from the Remote computer to the Client computer. Stand-alone configurations: A Client computer containing the GeneMapper® Software application is shown separately, connected to a Server computer containing the GeneMapper® Software database. <p>The Server computer and its database are connected to both Client computers in the other configurations.</p> <p>The GeneMapper Software application is installed on multiple client computers. The GeneMapper Software database is installed on a server computer separate from the client computers. The Data Collection Software is installed on a computer separate from the clients and server.</p> <p>In a client-server configuration, you can set up a GeneMapper Software client to:</p> <ul style="list-style-type: none"> • Connect to a remote computer running the Data Collection Software. • Obtain sample files from the remote Data Collection Software database. • Perform analysis of the generated sample files automatically (remote autoanalysis). • Store sample files, panel and bin definitions, analysis methods, size standards, table and plot settings, and projects on the GeneMapper Software server computer. <p>IMPORTANT! The GeneMapper Software server configuration and the Data Collection Software cannot be installed on the same computer.</p>	45

Section 3.1 Full Installation Procedures

This section covers:

■ Full Installation Workflow	25
■ Instrument Configuration Procedures	27
■ Remote Autoanalysis Configuration Procedures	33
■ Stand-alone Configuration Procedures	40

Note: To perform a client-server installation, go to [Section 3.2, “Client-Server Installation Procedures,”](#) on page 45.

IMPORTANT! Be sure you use the *GeneMapper® Software v4.1 Full Installation* DVD when performing the installation procedures described in this section.

Full Installation Workflow

[Figure 3-1 on page 26](#) shows the workflow for performing a full installation of the GeneMapper Software.

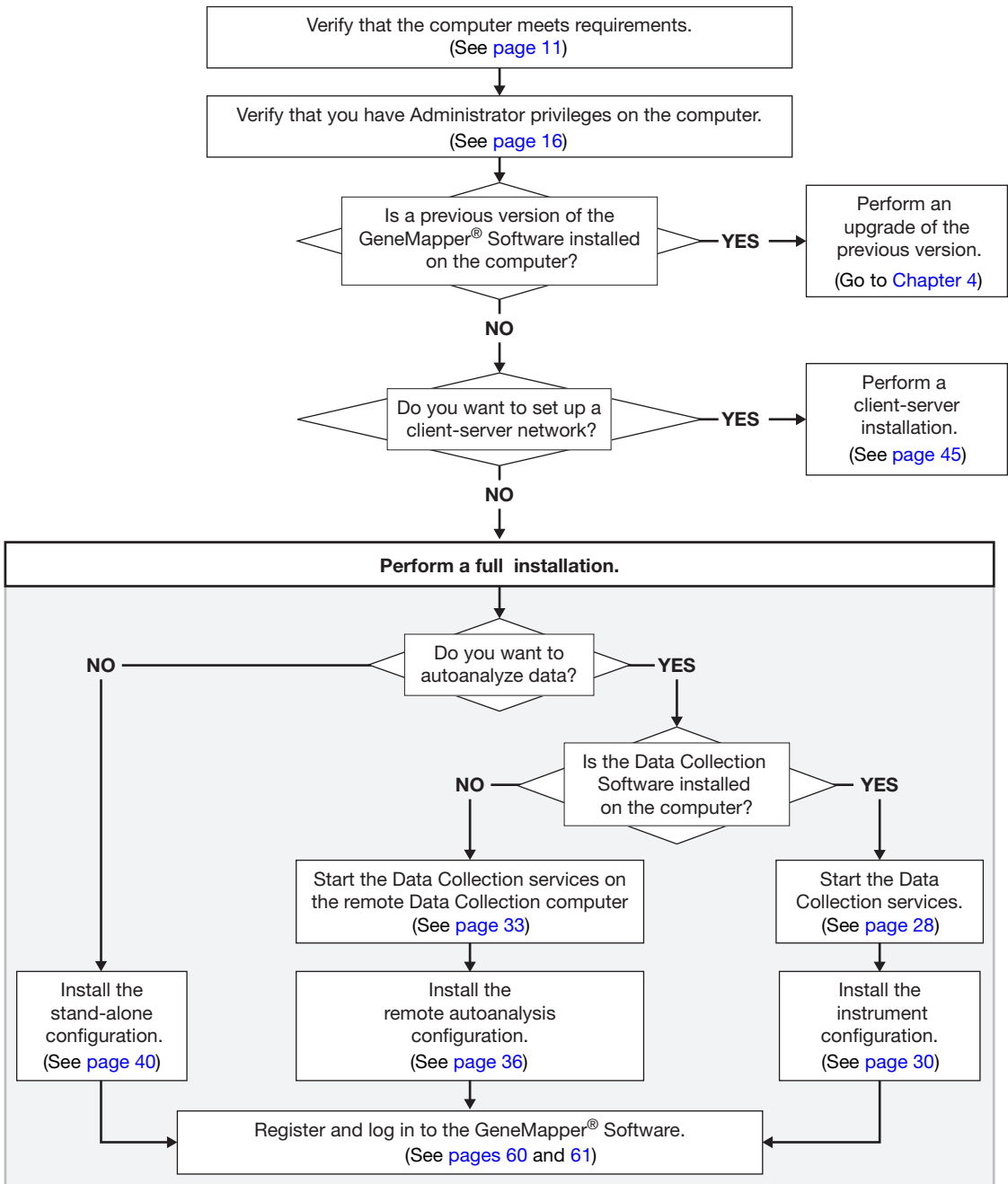


Figure 3-1 Full installation workflow

Instrument Configuration Procedures

Install the instrument configuration if:

- The Data Collection Software is installed on the local computer.
- You want to perform analysis of the generated sample files automatically (autoanalysis).

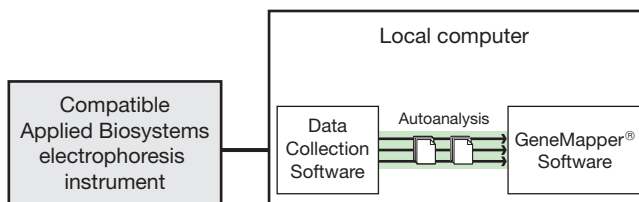


Figure 3-2 Example of an instrument configuration

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 remote autoanalysis configuration (see [page 33](#))
- Install the stand-alone configuration (see [page 40](#))

Installation Tasks for an Instrument Configuration

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

Task	See page
1. Start the Data Collection services on the computer.	28
2. Install the GeneMapper Software on the computer.	30

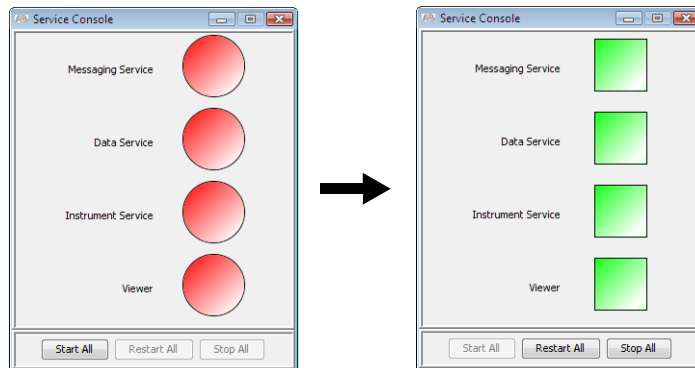
Starting the Data Collection Services on the Local Computer

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:
 - 3730/3730xl Data Collection v3.1
 - 3130/3130xl Data Collection v3.1

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

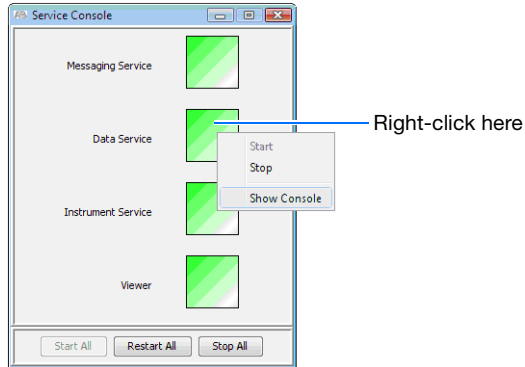


Note: If the services do not start automatically, click **Start All**.

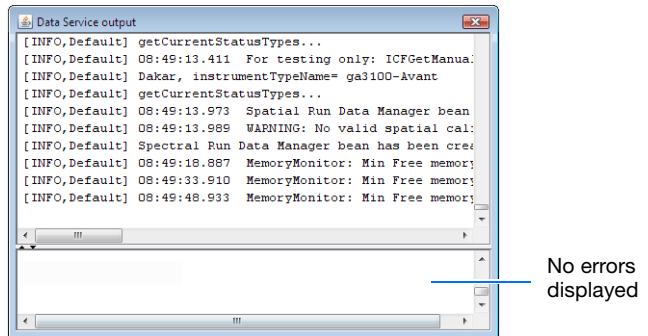
2. If the Data Collection Software requires a password, a login dialog box opens. Type the Login Name and Password, then click **OK**.

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

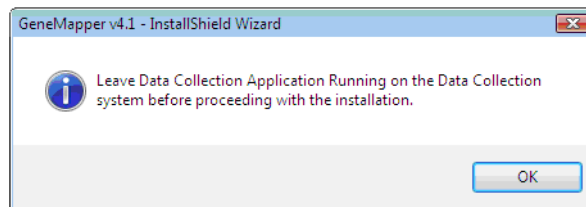
To install the GeneMapper Software Version 4.1 on the same computer as the Data Collection Software:

Note: For information on installing the GeneMapper Software on the same computer as the Data Collection Software for the 3500 series genetic analyzers, refer to the instrument user guide.

1. Insert the *GeneMapper® Software v4.1 Full Installation DVD* into the DVD drive to start the installer.

If the installer does not start automatically:

- a. Right-click **My Computer** (Windows® XP) or **Computer** (Windows Vista®) and select **Explore**.
 - b. Expand the DVD drive, then select the **GeneMapper 4.1** folder to display the contents.
 - c. Double-click  **GeneMapper4.1** to start the installer.
2. Be sure that the Data Collection services are running (see [page 28](#)). Close all other applications and windows, then click **OK** to close the following message:

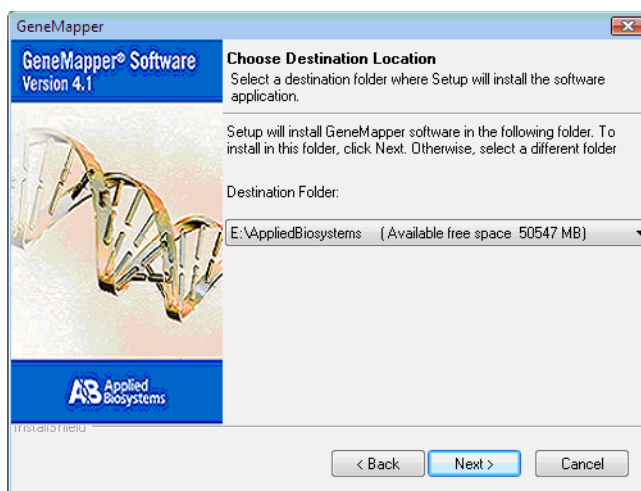


3. In the Welcome window, click **Next**.
4. Review the installation requirements status, then click **Next**.
5. Read the release notes, then click **Next**.

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

Note: Applied Biosystems recommends 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**.



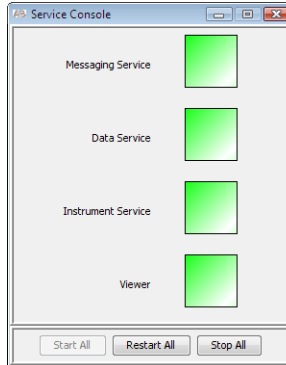
7. View the amount of disk space that is preallocated for the GeneMapper Software database, then click **Next**.

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

8. 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.

9. 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**.
10. Go to [Section 3.3, “Software Login Procedures,”](#) on page 59.

Remote Autoanalysis Configuration Procedures

Install the remote autoanalysis configuration if:

- You plan to connect to a separate computer running the Data Collection Software.
- You want to autoanalyze data.

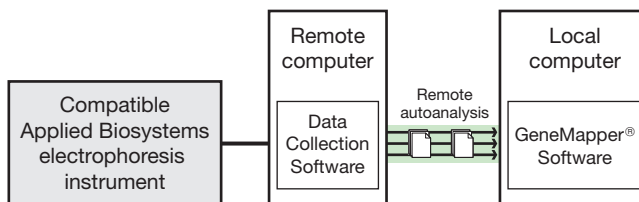


Figure 3-3 Example of a remote autoanalysis configuration

Installation Tasks for a Remote Autoanalysis Configuration

Installing the GeneMapper Software as a remote autoanalysis configuration requires that you:

Task	See page
1. Start the Data Collection services on the remote Data Collection computer.	33
2. Install the GeneMapper Software on the local computer.	36

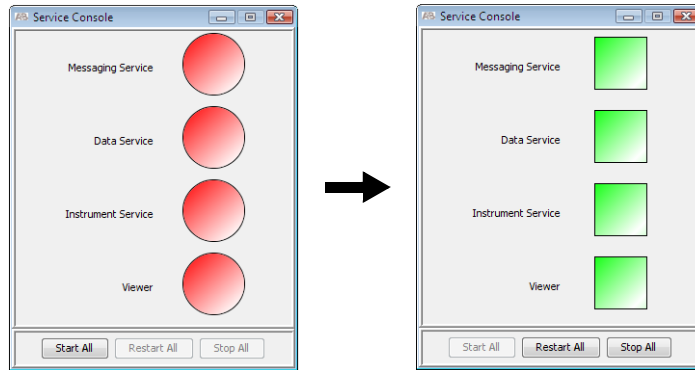
Starting the Data Collection Services on the Remote Computer

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

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

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

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

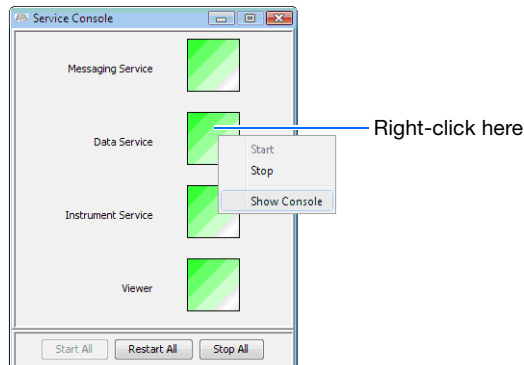


Note: If the services do not start automatically, click **Start All**.

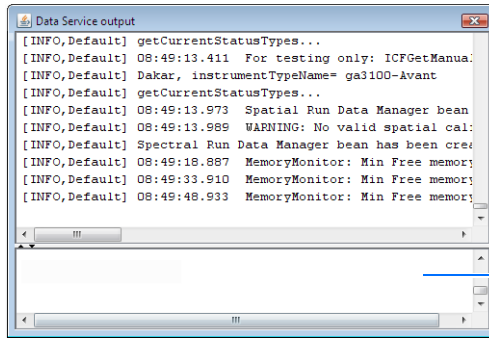
2. If the Data Collection Software requires a password, a login dialog box opens. Type the Login Name and Password, then click **OK**.

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.

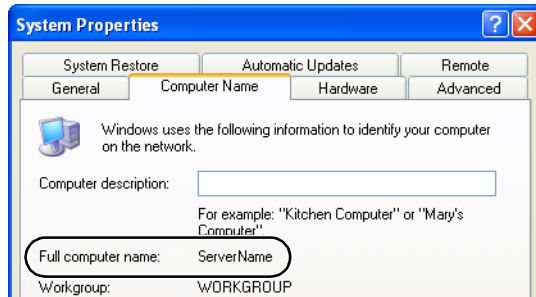


No errors displayed

- 4. Obtain the host name:
 - a. Right-click **My Computer** (Windows XP) or **Computer** (Windows Vista) in the desktop and select **Properties**.
 - b. Locate the full computer name. You will need to enter the name when you install the GeneMapper Software.

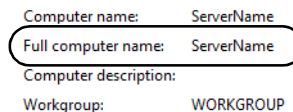
Note: The full computer name is the host name.

- **Windows XP** – Select the **Computer Name** tab to view the full computer name.



- **Windows Vista**

Computer name, domain, and workgroup settings




- c. Close the dialog box.

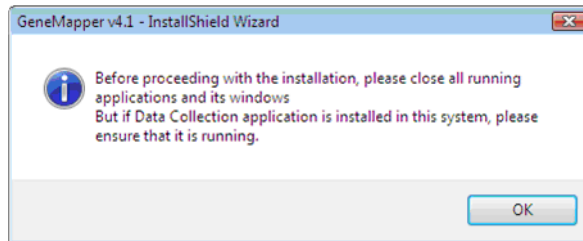
Installing the Remote Autoanalysis Configuration of the GeneMapper® Software

To install the GeneMapper Software Version 4.1 on a computer separate from the Data Collection computer:

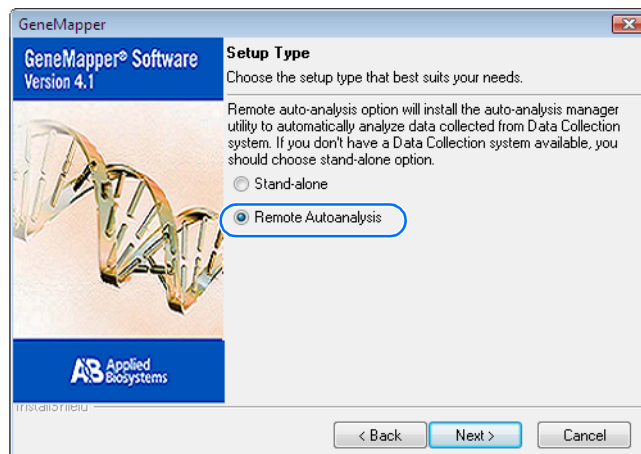
1. Insert the *GeneMapper® Software v4.1 Full Installation* DVD into the DVD drive to start the installer.

If the installer does not start automatically:

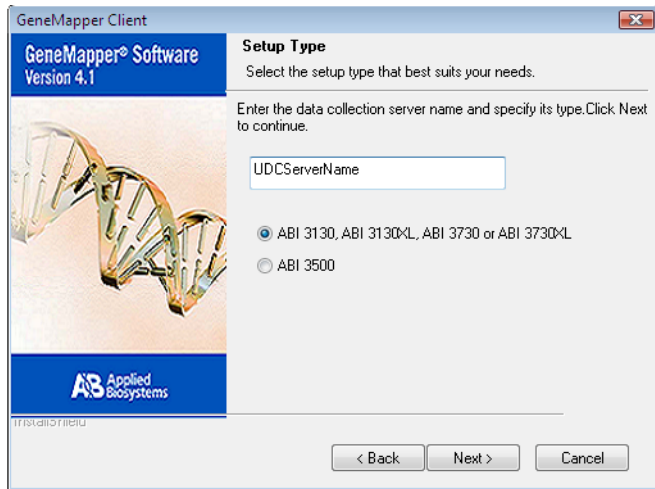
- a. Right-click **My Computer** (Windows XP) or **Computer** (Windows Vista) and select **Explore**.
 - b. Expand the DVD drive, then select the **GeneMapper 4.1** folder to display the contents.
 - c. Double-click  **GeneMapper4.1** to start the installer.
2. Close all other applications and windows, then click **OK** to close the following message.



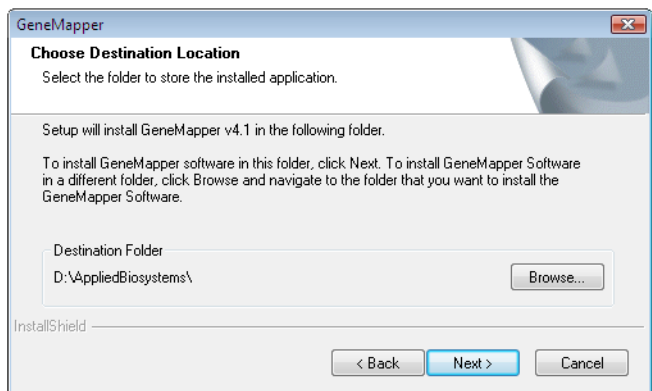
3. In the Welcome window, click **Next**.
4. Review the installation requirements status, then click **Next**.
5. Select **Remote Autoanalysis** for type of installation, then click **Next**.



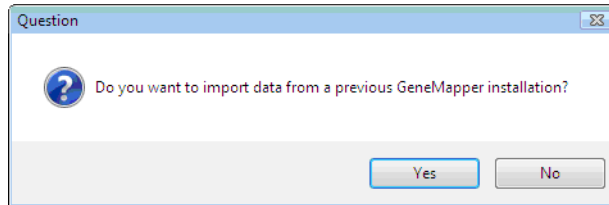
6. Type the server name (host name or full computer name) for the Data Collection computer (see [step 4 on page 35](#)), select the instrument type, then click **Next**.



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. Verify 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**.

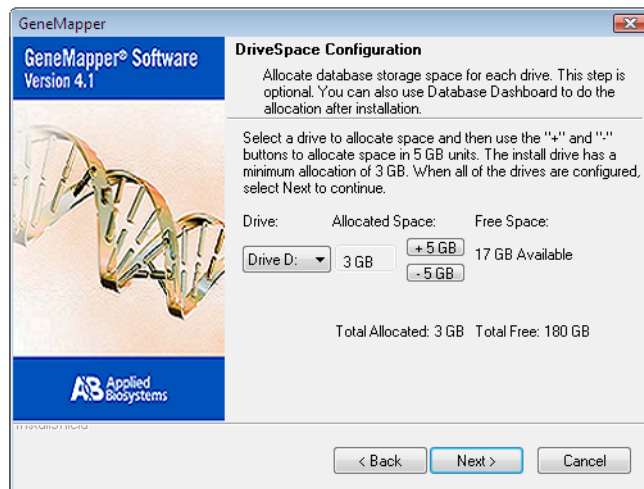


9. If you do not want to import data from a previous GeneMapper installation, click **No**.



10. (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 184.

11. 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.

12. 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**.
13. Go to [Section 3.3, “Software Login Procedures,”](#) on page 59.

Stand-alone Configuration Procedures

Install the stand-alone configuration if you *do not* plan to connect to a computer with Data Collection Software for autoanalysis or remote autoanalysis.

IMPORTANT! It is not possible to convert from the stand-alone configuration to the remote autoanalysis configuration.

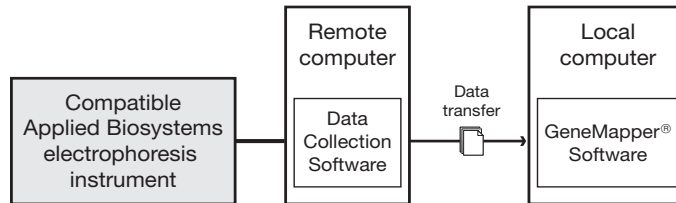


Figure 3-4 Example of a stand-alone configuration

Installation Tasks for a Stand-alone Configuration

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


Task	See page
Install the GeneMapper Software on the local computer.	40

Installing the Stand-alone Configuration of the GeneMapper® Software

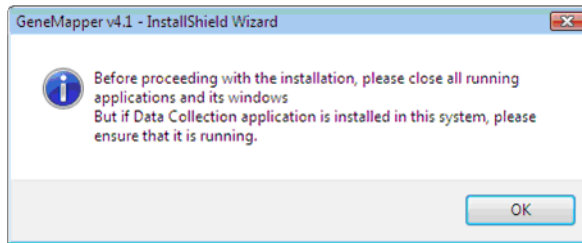
To install the GeneMapper Software Version 4.1 on a computer separate from the Data Collection computer *without* autoanalysis or remote autoanalysis:

1. Insert the *GeneMapper® Software Version 4.1 Full Installation* DVD into the DVD drive to start the installer.

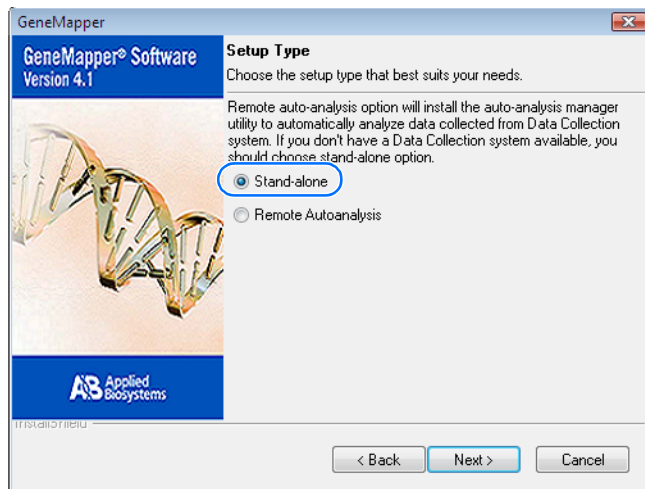
If the installer does not start automatically:

- a. Right-click **My Computer** (Windows XP) or **Computer** (Windows Vista) and select **Explore**.
- b. Expand the DVD drive, then select the **GeneMapper 4.1** folder to display the contents.
- c. Double-click  **GeneMapper4.1** to start the installer.

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

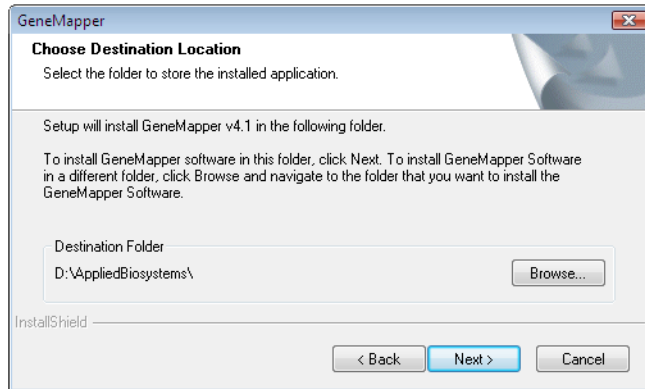


3. Review the installation requirements status, then click **Next**.
4. Select **Stand-alone** for type of installation, then click **Next**.

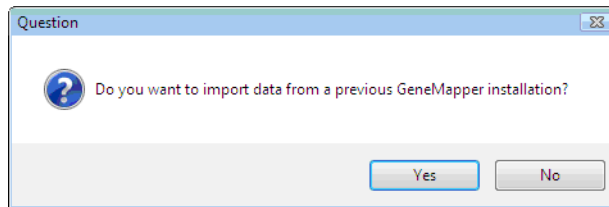


5. Read the release notes, then click **Next**.
6. If you want to install the GeneMapper Software to a drive different from the default drive, select the destination folder:
 - a. Confirm that the boot drive has at least 200 MB of available free space.

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

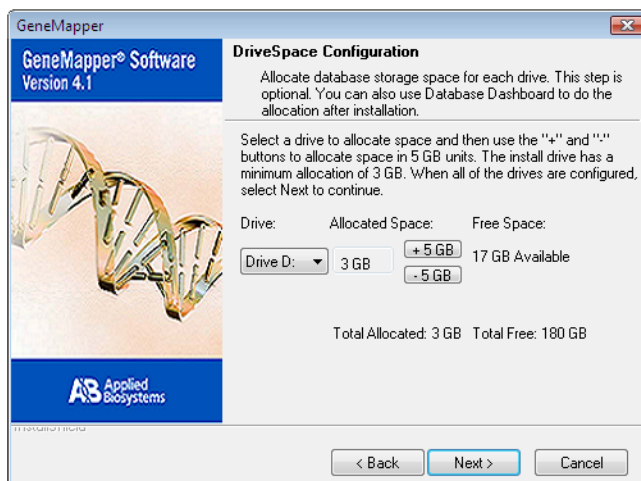


7. If you do not want to import data from a previous GeneMapper installation, click **No**.



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 184.](#)

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 59](#)

Section 3.2 Client-Server Installation Procedures

This section covers:

■ Client-Server Installation Workflow	45
■ Server Configuration Procedures	47
■ Client Configuration Procedures	51

IMPORTANT! Be sure you use the appropriate installation DVD when performing the procedures described in this section:

- For a *server* installation, use the *GeneMapper® Software v4.1 Installer for Server DVD*
 - For a *client* installation, use the *GeneMapper® Software v4.1 Installer for Client DVD*
-

Client-Server Installation Workflow

[Figure 3-5 on page 46](#) shows the workflow for performing a client-server installation of the GeneMapper Software.

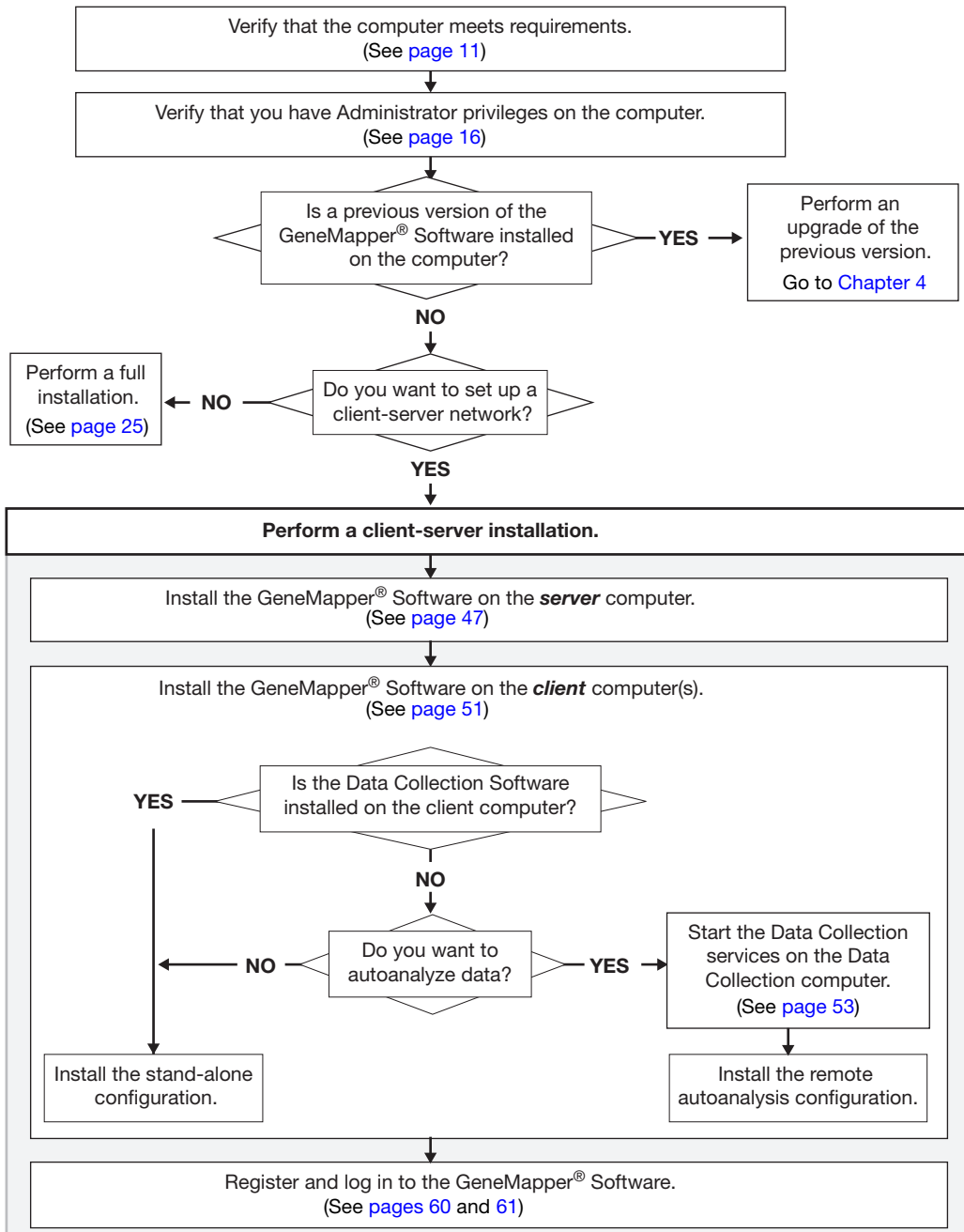


Figure 3-5 Client-server installation workflow

Server Configuration Procedures

Install the server configuration on a separate computer that serves multiple client computers.

IMPORTANT! The GeneMapper Software server configuration and the Data Collection Software cannot be installed on the same computer.

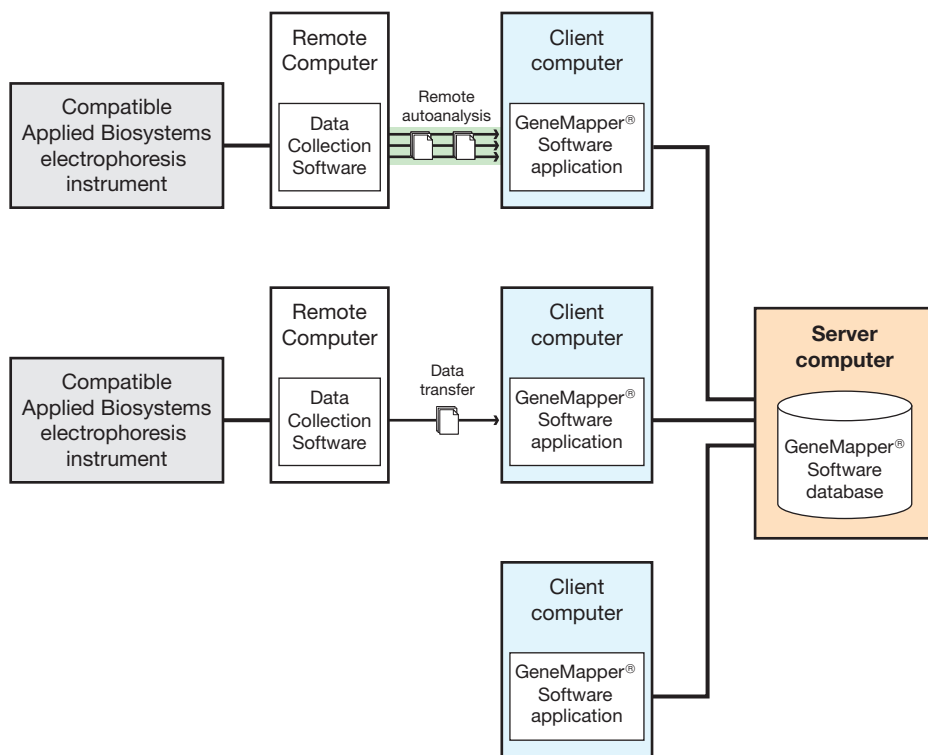


Figure 3-6 Example of a server configuration

Installation Tasks for a Server Configuration

Installing the GeneMapper Software as a server configuration requires that you:


Task	See page
Install the GeneMapper Software database on the server computer.	48

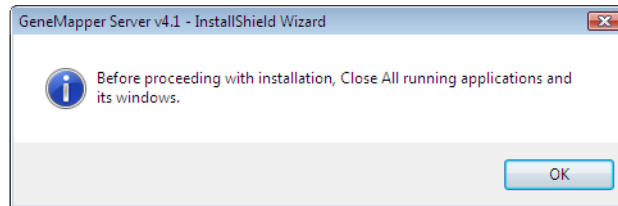
Installing the Server Configuration of the GeneMapper® Software

To install the GeneMapper Software Version 4.1 as a database server:

1. Save and close all applications and windows.
2. Insert the *GeneMapper® Software Version 4.1 Installer for Server* DVD into the DVD drive to start the installer.

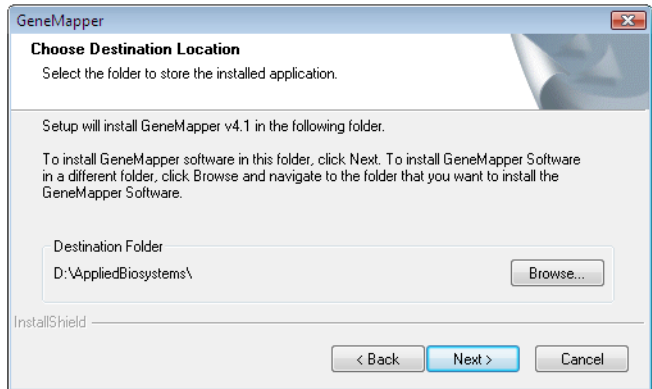
If the installer does not start automatically, then:

- a. Right-click **My Computer** (Windows XP) or **Computer** (Windows Vista) and select **Explore**.
 - b. Expand the DVD drive, then select the **GeneMapper 4.1** folder to display the contents.
 - c. Double-click  **GeneMapper4.1** to start the installer.
3. Close all other applications and windows, then click **OK** to close the following message.

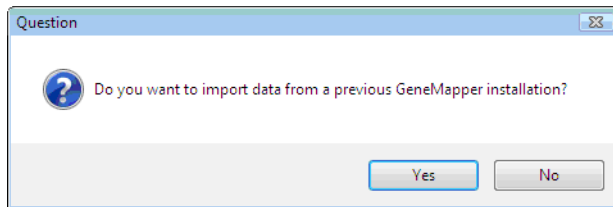


4. In the Welcome window, click **Next**.
5. Review the installation requirements status, then click **Next**.
6. Read the release notes, then click **Next**.
7. If you want to install the GeneMapper Software to a different drive than the default one, select the destination folder:
 - a. Confirm that 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**.



8. If you do not want to import data from a previous GeneMapper installation, click **No**.



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

Note: 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 184.

10. 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.

11. 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**.
12. Install the GeneMapper Software application on the client computers (see [page 51](#)).

Client Configuration Procedures

Install the client configuration on computers that share one central GeneMapper Software database. You can install the GeneMapper Software clients as:

- Stand-alone
- Remote autoanalysis

Stand-alone Client Configuration

In *stand-alone configuration*, the GeneMapper Software client *does not* interact with the Data Collection Software for autoanalysis or remote autoanalysis.

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.

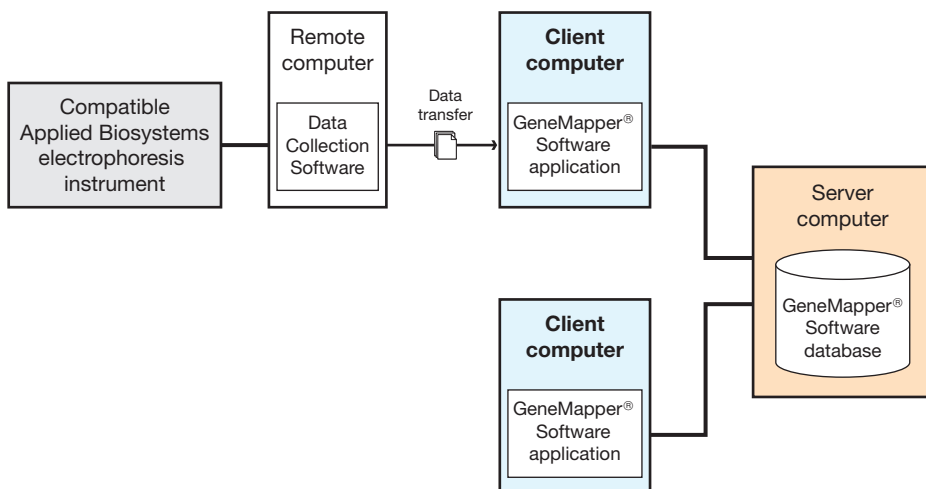


Figure 3-7 Examples of stand-alone client configurations

Remote Autoanalysis Client Configuration

In *remote autoanalysis configuration*, the GeneMapper Software client can connect to and obtain sample files from a remote computer with Data Collection Software, then perform analysis of the generated sample files automatically (remote autoanalysis).

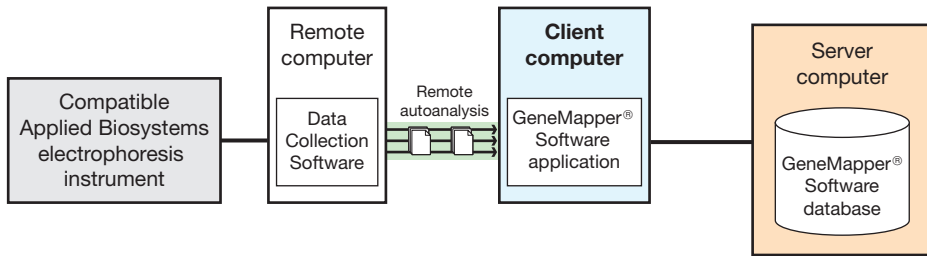


Figure 3-8 Example of a remote autoanalysis client configuration

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 server computer.	52
2. Install the GeneMapper Software client on the local computer.	56

Installation Tasks for a Remote Autoanalysis Client Configuration

To install the GeneMapper Software as a *remote autoanalysis client configuration*, perform the following tasks:

Task	See page
1. Obtain the name of the GeneMapper Software server computer.	52
2. Start the Data Collection services on the remote Data Collection computer.	40
3. Obtain the name of the remote Data Collection computer.	55
4. Install the GeneMapper Software client on the local computer.	56

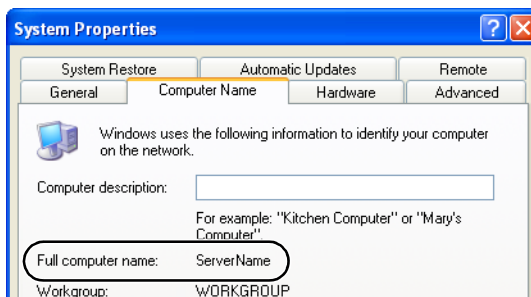
Obtaining the GeneMapper® Software Server Name

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

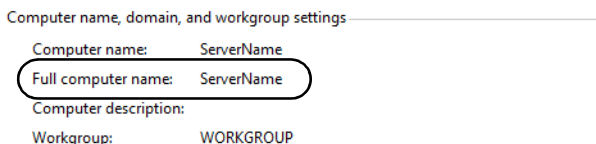
1. Right-click **My Computer** (Windows XP) or **Computer** (Windows Vista) in the desktop and select **Properties**.
2. Locate the full computer name. You will need to enter the name when you install the GeneMapper Software.

Note: The full computer name is the host name.

- **Windows XP** – Select the **Computer Name** tab to view the full computer name.



- **Windows Vista**



3. Close the dialog box.

Starting the Data Collection Services on the Remote Computer (For Remote Autoanalysis Only)

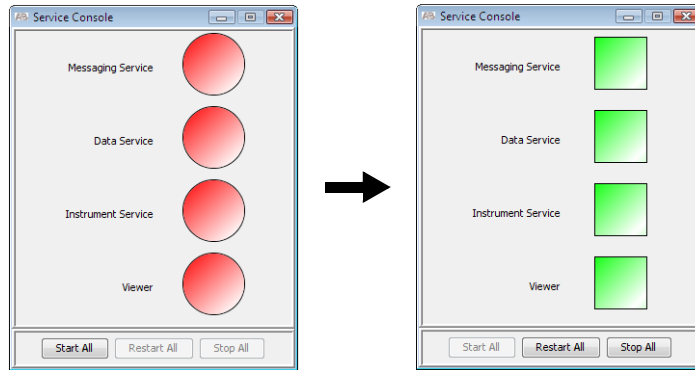
Before you install the remote autoanalysis configuration of the GeneMapper Software, start the Data Collection services on the remote Data Collection computer.

Note: If you are installing a stand-alone configuration, go to [page 56](#).

Note: For information on setting up remote autoanalysis for the 3500 series genetic analyzers, refer to the instrument user guide.

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

The software displays the Service Console. Wait until all four symbols change to green squares.

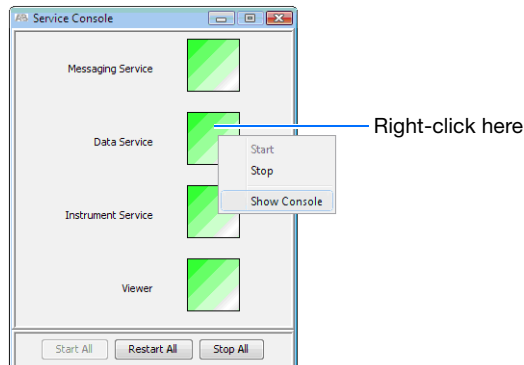


Note: If the services do not start automatically, click **Start All**.

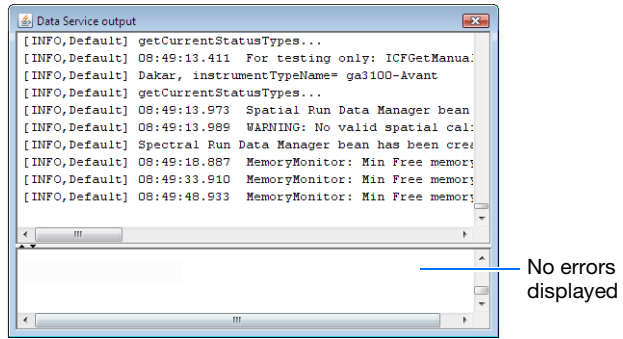
2. If the Data Collection Software requires a password, a login dialog box appears. Type the Login Name and Password, then click **OK**.

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.



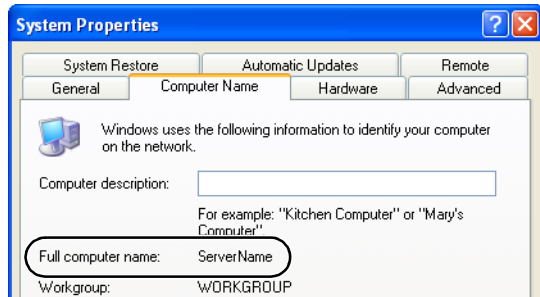
- b. Verify that no errors are displayed in the lower pane of the window, then close the Data Service output window.



- 4. Obtain the name of the Data Collection computer:
 - a. Right-click **My Computer** (Windows XP) or **Computer** (Windows Vista) in the desktop and select **Properties**.
 - b. Locate the full computer name. You will need to enter the name when you install the GeneMapper Software.

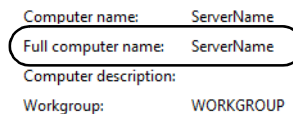
Note: The full computer name is the host name.

- **Windows XP** – Select the **Computer Name** tab to view the full computer name.



- **Windows Vista**

Computer name, domain, and workgroup settings




- c. Close the dialog box.

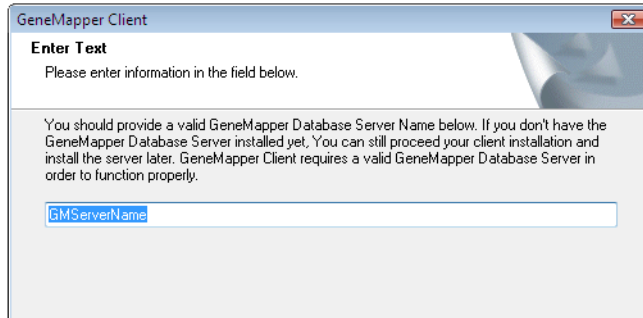
Installing the Client Configuration of the GeneMapper® Software

To install the GeneMapper Software Version 4.1 as a software application-only client:

1. Insert the *GeneMapper® Software Version 4.1 Installer for Client* DVD into the DVD drive to start the installer.

If the installer does not start automatically, then:

- a. Right-click **My Computer** (Windows XP) or **Computer** (Windows Vista) and select **Explore**.
 - b. Expand the DVD drive.
 - c. Select the **GeneMapper 4.1** folder to display the contents.
 - d. Double-click  **GeneMapper4.1** to start the installer.
2. In the Welcome window, click **Next**.
 3. Review the installation requirements status, then click **Next**.
 4. Type the server name (host name or full computer name) for the GeneMapper Software database computer (see [page 52](#)), then click **Next**.

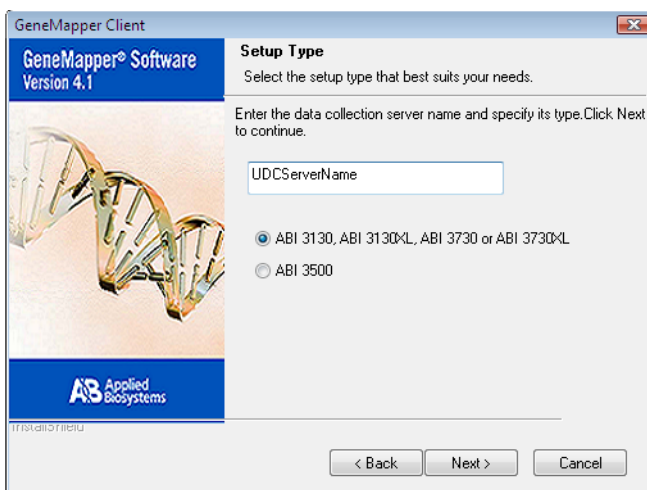


5. After the installer establishes a connection with the GeneMapper Software server computer, click **OK** to continue.
6. Select the type of installation:
 - **Stand-alone** – Select this if you do not want the GeneMapper client to interact with the Data Collection Software for autoanalysis or remote autoanalysis

- **Remote Autoanalysis** – Select this if you want to connect to and obtain sample files from a remote Data Collection computer and perform remote autoanalysis of data.

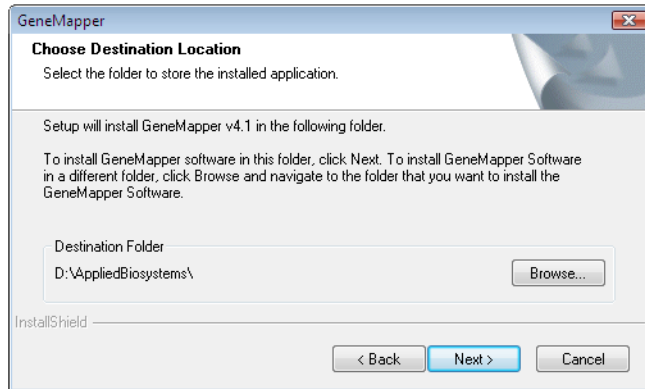
IMPORTANT! If you select Remote Autoanalysis, be sure that the Data Collection services are running on the remote Data Collection computer (see [page 53](#)).

7. If you are installing a *remote autoanalysis* configuration, type the server name (host name or full computer name) for the Data Collection computer (see [step 4 on page 35](#)), select the type of instrument, then click **Next**.



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

9. 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**.



10. 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.

11. In the InstallShield Wizard Complete window, click **Finish**.
12. Go to [Section 3.3, “Software Login Procedures,”](#) on page 59.

Section 3.3 Software Login Procedures


This section covers:

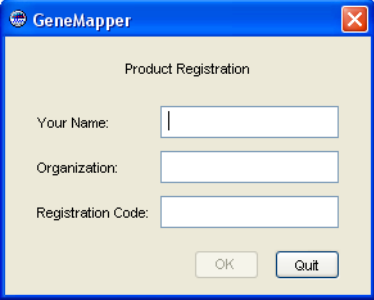
- Registering the Software After a New Installation 60
- Logging In to the Software for the First Time
After a New Installation 61
- Logging In to the Database Dashboard for the First Time . . 63
- What Next? 64
- Logging In to and Out of the Software 65

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 189](#).

1. In the desktop, double-click  GeneMapper v4.1 or select **Start ▶ All Programs ▶ Applied Biosystems ▶ GeneMapper ▶ GeneMapper v4.1**.
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

Use the following procedure to log in to the GeneMapper Software for the first time after performing a new installation of the software or upgrading the software from version 3.7 or older.

To log in for the first time after installing GeneMapper® Software Version 4.1 as 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 Applied Biosystems 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 121](#) 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 or server installation of the GeneMapper Software.

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

1. Select **Start ▶ All Programs ▶ Applied Biosystems ▶ 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 Applied Biosystems to retrieve it.

5. See [“About the Dashboard Software” on page 178](#) and the GeneMapper Software Online Help for more information about using the Database Dashboard to maintain the GeneMapper Software database.


What Next?

For a New Installation


If you installed the GeneMapper Software Version 4.1 as a new installation, you can use the software. For user instructions, refer to the:

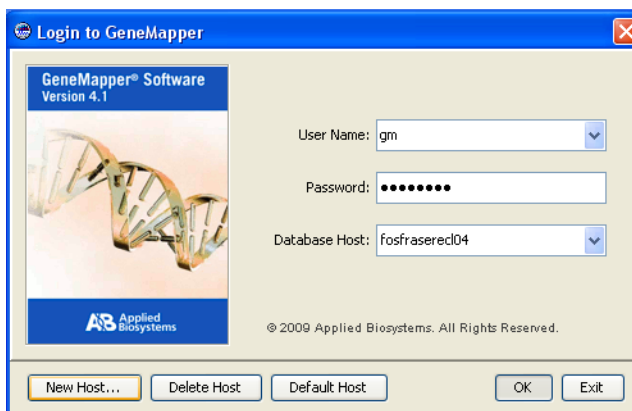
- *GeneMapper® Software Getting Started Guides*
- *GeneMapper® Software Version 4.1 Online Help*

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  GeneMapper v4.1 or select **Start ▶ All Programs ▶ Applied Biosystems ▶ GeneMapper ▶ GeneMapper v4.1**.
 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! Applied Biosystems recommends changing the password for the Administrator user account after installing the software.

4. Click OK.

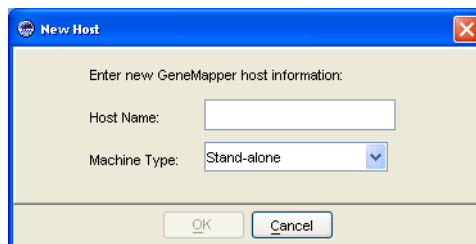
Note: If you unsuccessfully attempt to log in to the software more times than allowed by your password policy, your account becomes suspended. To activate a suspended user account, either wait the time specified by the policy associated with the account, or ask your administrator to reactivate the account (see [“Activating, Deactivating, and Suspending User Accounts”](#) on page 125 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 server 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.

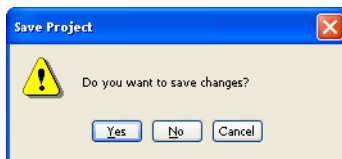
- b. Select the appropriate machine type.
- c. Click **OK**.

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).

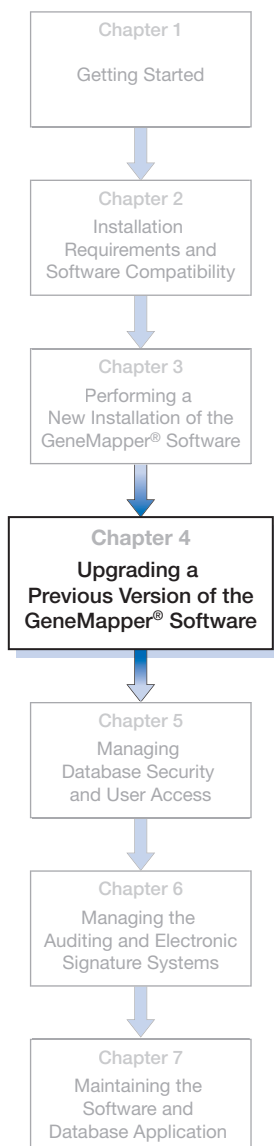
When you log out of the GeneMapper Software with a GeneMapper project that has unsaved changes, the software prompts you to save or discard the changes you made since the last time you updated the project.



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

Upgrading a Previous Version of the GeneMapper® Software



This chapter covers:

■ Overview	70
■ Upgrade Workflow	70
■ Upgrading from GeneMapper® Software Version 3.7 or earlier	72
■ Backing Up Your Data (Version 4.0 Only)	73
■ Determining the Appropriate Upgrade Procedure for Your Configuration	74
■ Instrument Configuration Upgrade	77
■ Remote Autoanalysis Configuration Upgrade	80
■ Stand-alone Configuration Upgrade	83
■ Client-Server Configuration Upgrade	84
■ Upgrading the GeneMapper® Software	85
■ Registering the Software After Upgrading	88
■ Logging In to the Software for the First Time After Upgrading	89
■ What Next After Upgrading?	90
■ Logging In to and Out of the Software	91

Overview

This chapter describes how to upgrade a previous version of the GeneMapper® Software to Version 4.1.

Note: If you do not have a previous version of the GeneMapper Software on your computer, go to [Chapter 3, “Performing a New Installation of the GeneMapper® Software.”](#)

Note: Be sure you use the *GeneMapper® Software v4.1 Upgrade Software v4.0 to v4.1* DVD when performing the installation procedures described in this chapter.

IMPORTANT! The GeneMapper Software cannot be upgraded directly from v3.7 or earlier to v4.1; you must first back up your data, uninstall the earlier version of GeneMapper Software, then install the full version of v4.1.

Upgrade Workflow

[Figure 4-1 on page 71](#) shows the workflow for upgrading a previous version of the GeneMapper Software to version 4.1.

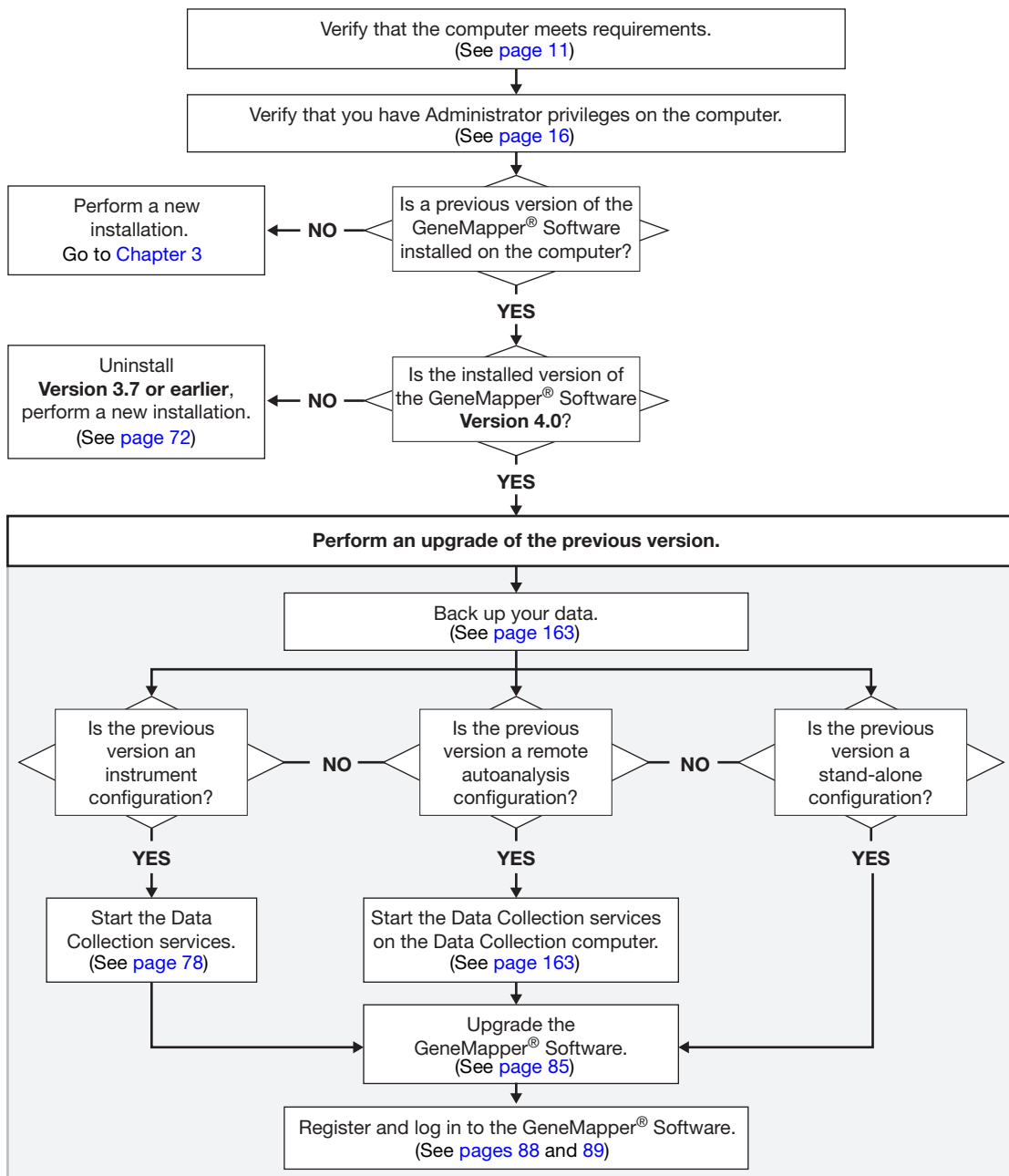


Figure 4-1 Upgrade installation workflow

Upgrading from GeneMapper® Software Version 3.7 or earlier

IMPORTANT! Be sure to back up your data before you upgrade to GeneMapper Software Version 4.1.

The GeneMapper Software cannot be upgraded directly from v3.7 or earlier to v4.1; you must:

1. Back up your data.
2. Uninstall the earlier version of GeneMapper Software.
3. Install the full version of v4.1.

Backing Up Your Data (Version 3.7 or Earlier)

The following steps provide only a brief outline for backing up your data. For details on how to perform each step, see [Section 7.1, “Managing Study, Project, and Sample Data,”](#) on page 163.

1. If necessary, restore any data that you have archived.

IMPORTANT! You cannot restore archived data from an earlier version of the GeneMapper software after you upgrade to GeneMapper Software Version 4.1.

2. Export reference data (such as panels, bin sets, analysis methods, and size standards).
3. Export projects.

Uninstalling the Earlier Version of GeneMapper® Software

See [“Uninstalling the Software”](#) on page 192 for instructions.

Installing GeneMapper® Software Version 4.1

See [Chapter 3, “Performing a New Installation of the GeneMapper® Software,”](#) for instructions.

Backing Up Your Data (Version 4.0 Only)

IMPORTANT! Be sure to back up your data before you upgrade to GeneMapper Software Version 4.1.

Use the GeneMapper® Database Utility Wizard to back up your data before upgrading to GeneMapper® Software v4.1. See [Appendix C on page 217](#) for more information.

Determining the Appropriate Upgrade Procedure for Your Configuration

When you upgrade to the GeneMapper Software Version 4.1, the installer automatically selects your existing configuration. For example, if you installed GeneMapper Software Version 4.0 as an instrument configuration, GeneMapper Software Version 4.1 will also be installed as an instrument configuration.

IMPORTANT! You cannot change configurations during an upgrade installation.

Find your existing configuration in [Table 4-1](#), then go to the referenced page for the appropriate upgrade procedure.

Table 4-1 GeneMapper® Software configurations for upgrading

Existing configuration	Description	See page
Instrument	<div> <pre> graph LR subgraph Local_computer [Local computer] DCS[Data Collection Software] GMS[GeneMapper Software] end Instrument[Compatible Applied Biosystems electrophoresis instrument] --- DCS DCS -- Autoanalysis --> GMS </pre> </div> <p>The Data Collection Software and the GeneMapper Software are installed on the same computer.</p> <p>In the instrument configuration, the GeneMapper Software can:</p> <ul style="list-style-type: none"> • Obtain sample files from the local Data Collection Software database. • Perform analysis of the generated sample files automatically (autoanalysis). 	77

Table 4-1 GeneMapper® Software configurations for upgrading (*continued*)

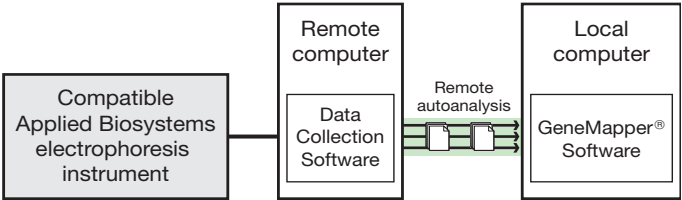
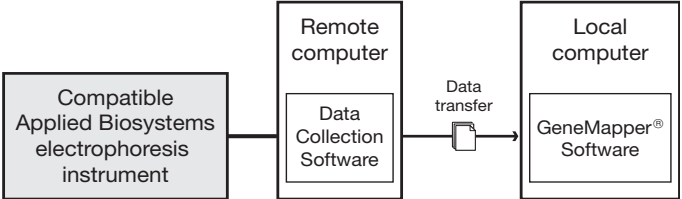
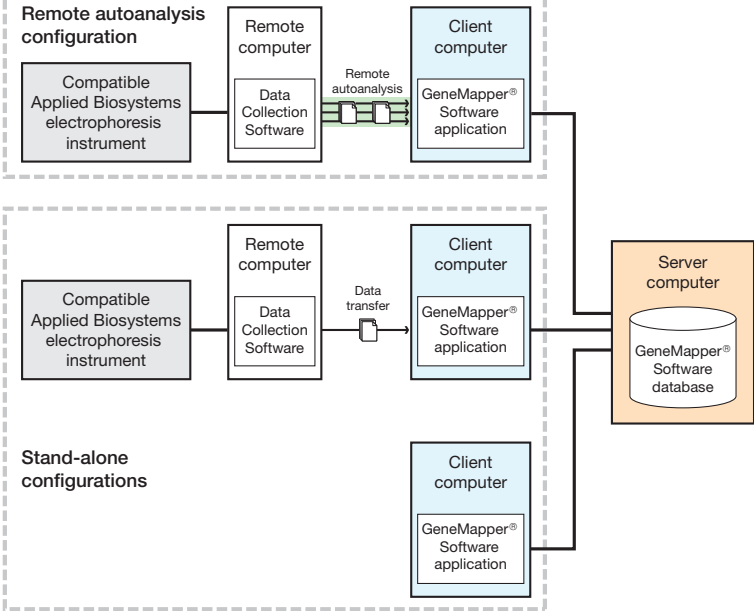
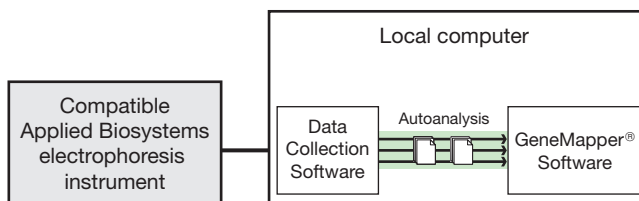
Existing configuration	Description	See page
<p>Remote autoanalysis</p>	 <p>The Data Collection Software and the GeneMapper Software are installed on separate computers.</p> <p>In the remote autoanalysis configuration, the GeneMapper Software can:</p> <ul style="list-style-type: none"> • Connect to a remote computer with Data Collection Software. • Obtain sample files from the remote Data Collection Software database. • Perform analysis of the generated sample files automatically (remote autoanalysis). 	<p>80</p>
<p>Stand-alone</p>	 <p>The Data Collection Software and the GeneMapper Software are installed on separate computers.</p> <p>In the stand-alone configuration, you can use the GeneMapper Software to:</p> <ul style="list-style-type: none"> • Add sample files from a remote Data Collection Software database to a project • Perform manual analysis of the project. <p>Note: In stand-alone configuration, the GeneMapper Software does <i>not</i> interact with the Data Collection Software for autoanalysis or remote autoanalysis.</p>	<p>83</p>

Table 4-1 GeneMapper® Software configurations for upgrading (*continued*)

Existing configuration	Description	See page
Client-server	 <p>The GeneMapper Software application is installed on multiple client computers. The GeneMapper Software database is installed on a server computer separate from the client computers. The Data Collection Software is installed on a computer separate from the clients and server.</p> <p>In a client-server configuration, you can set up a GeneMapper Software client to:</p> <ul style="list-style-type: none"> • Connect to a remote computer running the Data Collection Software. • Obtain sample files from the remote Data Collection Software database. • Perform analysis of the generated sample files automatically (remote autoanalysis). • Store sample files, panel and bin definitions, analysis methods, size standards, table and plot settings, and projects on the GeneMapper Software server computer. <p>IMPORTANT! The GeneMapper Software server configuration and the Data Collection Software cannot be installed on the same computer.</p>	84

Instrument Configuration Upgrade



Data Collection Software and GeneMapper® Software Versions

You can upgrade an instrument configuration only if you are:

- Running Data Collection Software v3.1
- Upgrading from the GeneMapper® Software Version 4.0

Note: If you have another version of the Data Collection Software or an earlier version of the GeneMapper Software, install GeneMapper Software Version 4.1 as a new installation. See [“Uninstalling the Software” on page 192](#), then [“Instrument Configuration Procedures” on page 27](#).

Note: After upgrading to version 4.1, you must recreate any results groups and plates that were created using the GeneMapper Software Version 4.0.

Installation Tasks for Upgrading an Instrument Configuration

Upgrading an instrument configuration of the GeneMapper Software requires that you:

Task	See page
1. Back up your data.	72
2. Start the Data Collection services on the local computer.	78
3. Upgrade the GeneMapper Software on the local computer.	85

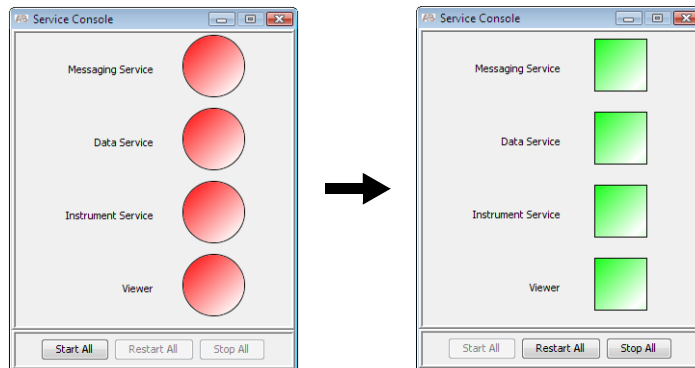
Starting the Data Collection Services on the Local Computer (For Instrument Configuration Upgrades Only)

Before you upgrade an *instrument configuration* of 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:
 - 3730/3730xl Data Collection v3.1
 - 3130/3130xl Data Collection v3.1

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

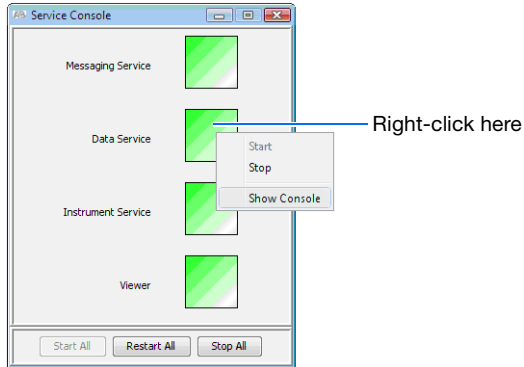


Note: If the services do not start automatically, click **Start All**.

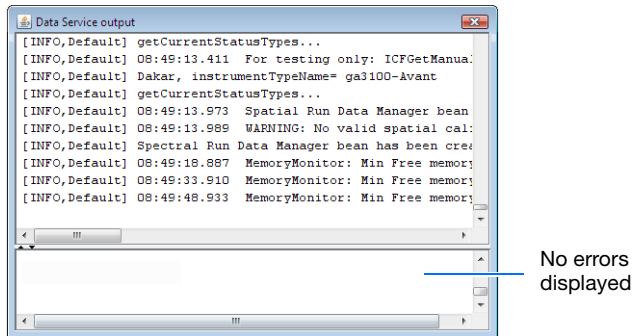
2. If the Data Collection Software requires a password, a login dialog box opens. Type the Login Name and Password, then click **OK**.

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.

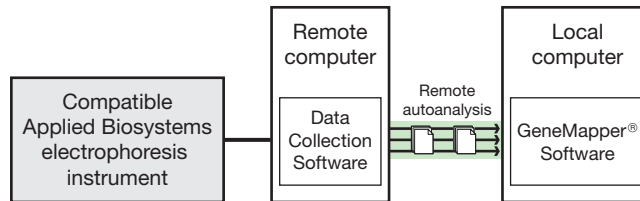


- b. Verify that no errors are displayed in the lower pane of the window, then close the Data Service output window.



4. Go to [“Upgrading the GeneMapper® Software”](#) on page 85.

Remote Autoanalysis Configuration Upgrade



GeneMapper® Software Versions

You can upgrade a remote autoanalysis configuration only if you are upgrading from the GeneMapper® Software Version 4.0.

Note: If you have an earlier version of the GeneMapper Software, you need to install GeneMapper Software Version 4.1 as a new installation. See [“Uninstalling the Software” on page 192](#), then [“Remote Autoanalysis Configuration Procedures” on page 33](#).

Note: After upgrading to version 4.1, you must recreate any results groups and plates that were created in the GeneMapper Software Version 4.0.

Installation Tasks for Upgrading a Remote Autoanalysis Configuration

Upgrading a remote autoanalysis configuration of the GeneMapper Software requires that you:

Task	See page
1. Back up your data.	72
2. Start the Data Collection services on the remote Data Collection computer.	81
3. Upgrade the GeneMapper Software on the local computer.	85

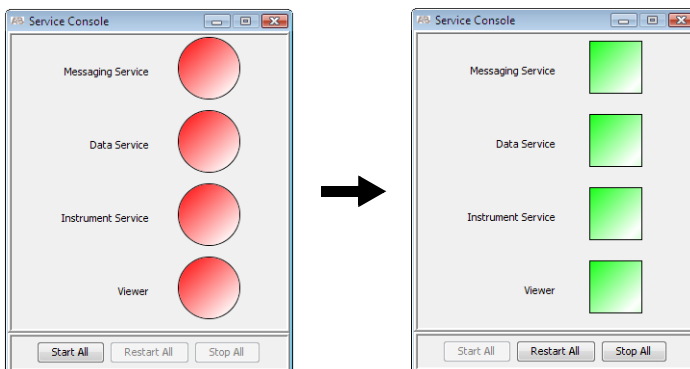
Starting the Data Collection Services on the Remote Computer (For Remote Autoanalysis Upgrades Only)

Before you upgrade the *remote autoanalysis configuration* of the GeneMapper Software, start the Data Collection services on the remote Data Collection computer.

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

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

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

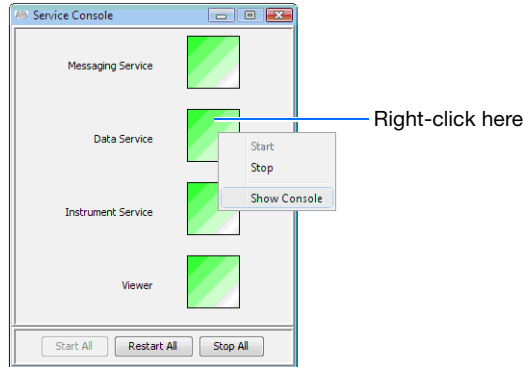


Note: If the services do not start automatically, click **Start All**.

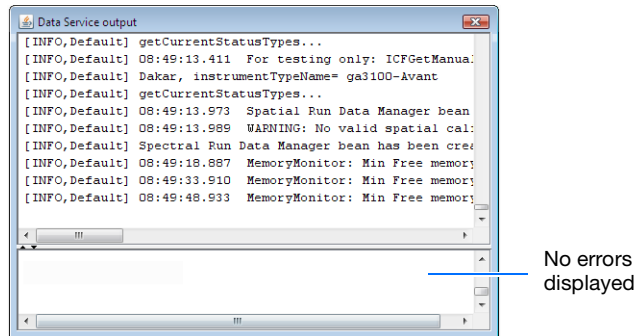
2. If the Data Collection Software requires a password, a login dialog box opens. Type the Login Name and Password, then click **OK**.

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.

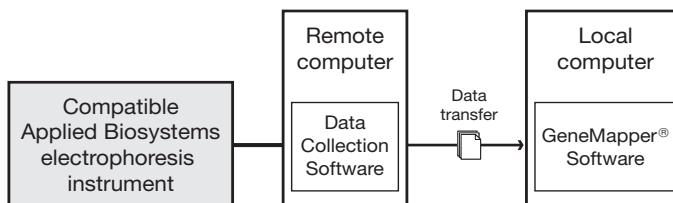


- b. Verify that no errors are displayed in the lower pane of the window, then close the Data Service output window.



4. Go to [“Upgrading the GeneMapper® Software”](#) on page 85

Stand-alone Configuration Upgrade



Note: In stand-alone configuration, the GeneMapper Software does *not* interact with the Data Collection Software for autoanalysis or remote autoanalysis.

GeneMapper® Software Versions

You can upgrade a stand-alone configuration only if you are upgrading from the GeneMapper® Software Version 4.0.

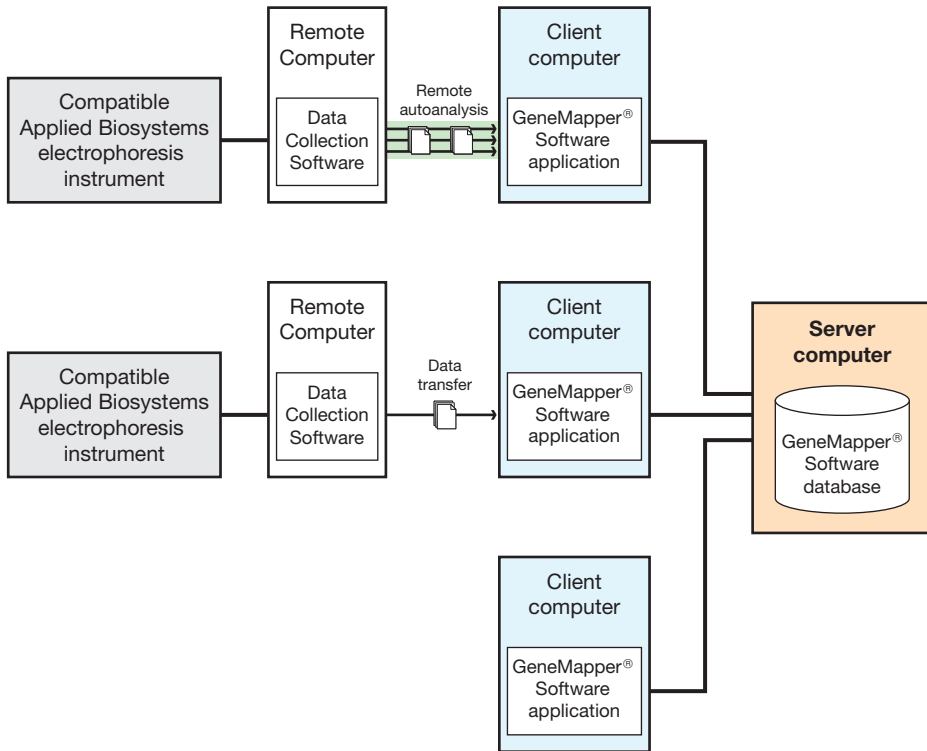
Note: If you have an earlier version of the GeneMapper Software, you need to install GeneMapper Software Version 4.1 as a new installation. See “[Uninstalling the Software](#)” on page 192, then “[Stand-alone Configuration Procedures](#)” on page 40.

Installation Tasks for Upgrading a Stand-alone Configuration

Upgrading a stand-alone configuration of the GeneMapper Software, requires that you:

Task	See page
1. Back up your data.	72
2. Upgrade the GeneMapper Software on the local computer.	85

Client-Server Configuration Upgrade



GeneMapper® Software Versions

You can upgrade a client-server configuration only if you are upgrading from the GeneMapper® Software Version 4.0.

Installation Tasks for Upgrading a Client-Server Configuration

Upgrading a client-server configuration of the GeneMapper Software, requires that you:

Task	See page
1. Back up your data.	72
2. Upgrade the GeneMapper Software on the server computer.	85
3. Upgrade the GeneMapper Software on the client computer(s).	85

Upgrading the GeneMapper® Software

Before You Upgrade the GeneMapper® Software

Make sure you complete the appropriate pre-installation tasks before you upgrade the GeneMapper Software.

Table 4-2 Pre-installation tasks

If you are upgrading ...	Before you upgrade the GeneMapper Software
An instrument configuration	<ol style="list-style-type: none"> 1. Back up your data. 2. Make sure the Data Collection services are running on the <i>local</i> computer.
A remote autoanalysis configuration	<ol style="list-style-type: none"> 1. Back up your data. 2. Make sure the Data Collection services are running on the <i>remote</i> computer
A stand-alone configuration	Back up your data.
A client-server configuration	Back up your data.

Note: If you are not able to complete the upgrade as it is described, see [Appendix A on page 189](#).


Upgrading the GeneMapper® Software to Version 4.1

IMPORTANT! Be sure to back up your data before you upgrade to GeneMapper Software Version 4.1.

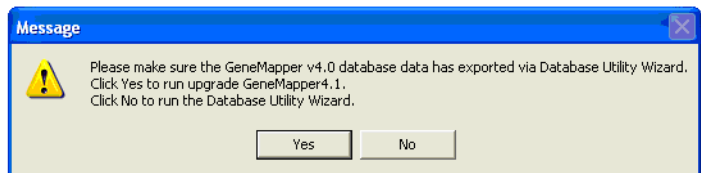
IMPORTANT! If you are upgrading a *client-server* configuration, upgrade the server computer first, then upgrade the client computers.

1. Insert the *GeneMapper® Software v4.1 Upgrade Software v4.0 to v4.1* DVD into the DVD drive to start the installer.

If the installer does not start automatically:

- a. Right-click **My Computer** (Windows® XP) or **Computer** (Windows Vista®) and select **Explore**.
- b. Expand the DVD drive, then double-click  **GeneMapper4.1** to start the installer.

- c. In the splash screen, click **GeneMapper v4.1** *<type of upgrade>*, where *<type of upgrade>* is one of the following:
 - Full Upgrade
 - Server Upgrade
 - Client Upgrade
- d. For the full or server upgrade, make sure the database has been saved using the GeneMapper Database Utility Wizard. Click **No** to start the utility wizard.



2. Close all other applications and windows, then click **OK** to close the “Close All” message box.

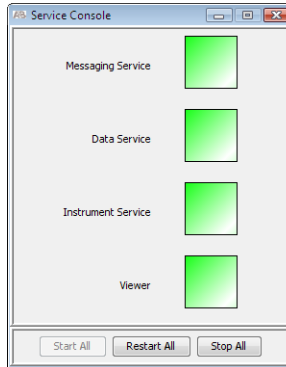
IMPORTANT! If you are upgrading an *instrument configuration*, leave the Data Collection Software running on the local computer.

3. Carefully read the message in the “Caution: Before you proceed with the upgrade” window, then:
 - If you have not already backed up your data, click **Exit**, then return to [page 72](#) for backup procedures.
 - If you have already backed up your data, click **Accept** to open the InstallShield Wizard Welcome window.
4. Click **Next**, then follow the instructions in the wizard.

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

5. When the InstallShield Wizard Complete window appears, finish the installation:

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. Remove the upgrade DVD from the drive.
- b. In the InstallShield Wizard Complete window, select **Yes, I want to restart my computer now**.
- c. Click **Finish**.

Proceed to [“Registering the Software After Upgrading”](#) on page 88.

Registering the Software After Upgrading

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

Note: If you are not able to register the software as described, see [Appendix A on page 189](#).

1. In the desktop, double-click  GeneMapper v4.1 or select **Start ▶ All Programs ▶ Applied Biosystems ▶ GeneMapper ▶ GeneMapper v4.1**.
2. Complete the Registration dialog box:



The screenshot shows a Windows-style dialog box titled "GeneMapper". Inside the dialog, the text "Product Registration" is centered. Below this, there are three text input fields labeled "Your Name:", "Organization:", and "Registration Code:". At the bottom of the dialog, there are two buttons: "OK" and "Quit".

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 Upgrading

Use the following procedure to log in to the GeneMapper Software for the first time after upgrading the software from versions 4.0.

Note: If you upgraded from GeneMapper Software Version 3.7 or older, follow the log in procedure for a new installation (see [page 60](#)).

To log in for the first time after upgrading from GeneMapper® Software Version 4.0 to GeneMapper® Software Version 4.1:

1. Complete the Login to GeneMapper dialog box:
 - a. Type your existing user name and password (the user name and password from your previous version of the GeneMapper Software).
 - b. Click **OK**.
2. Read the license agreement, then click **Yes** if you are in agreement with the terms.
3. Review the license agreement and product warranty. You may:
 - Click **Decline** to quit the application.
 - Click **Service** to bypass the agreement and proceed to the Project window.

Note: 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.
4. If necessary, see “[Creating a User Account](#)” on [page 121](#) for instructions on adding users.

What Next After Upgrading?

For an Upgrade Installation

If you have upgraded to GeneMapper Software Version 4.1 from a previous version of the software, you can migrate your existing projects using the steps listed below.


Note: These steps provide a brief outline only for migrating existing projects. For details on how to perform each step, see the *GeneMapper® Software Version 4.1 Online Help*.

1. Import the reference data and projects into the GeneMapper Software Version 4.1 database.
2. Associate sample files with the migrated projects. This allows you to view raw and EPT data, and to analyze projects.

Note: If you export/import only the reference data and projects, but do not associate sample files, you can view results and make or edit allele calls, but you cannot reanalyze the projects.

3. Reanalyze the migrated projects. To reanalyze the migrated projects, make sure that sample files were generated on any of the following instruments:
 - Applied Biosystems 3130 Genetic Analyzer
 - Applied Biosystems 3130*xl* Genetic Analyzer
 - Applied Biosystems 3730 DNA Analyzer
 - Applied Biosystems 3730*xl* DNA Analyzer
 - ABI PRISM® 3100 Genetic Analyzer
 - ABI PRISM® 3100-*Avant* Genetic Analyzer
 - ABI PRISM® 310 Genetic Analyzer

Logging In to and Out of the Software

1. In the desktop, double-click  GeneMapper v4.1 or select **Start ▶ All Programs ▶ Applied Biosystems ▶ GeneMapper ▶ GeneMapper v4.1**.
2. Select your user name from the User Name drop-down list or, 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 when you click **OK**.

3. Type your password.

IMPORTANT! Applied Biosystems recommends changing the password for the Administrator user account after installing the software.

4. Click OK.

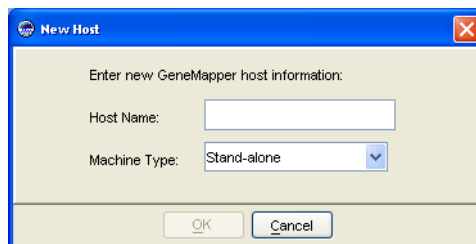
Note: If you unsuccessfully attempt to log in to the software more times than allowed by your password policy, your account becomes suspended. To activate a suspended user account, you can either wait out the time specified by the policy associated with the account, or ask your administrator to reactivate the account (see “[Activating, Deactivating, and Suspending User Accounts](#)” on page 125).

**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 server 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.

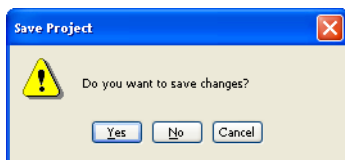
- b. Select the appropriate machine type.
- c. Click **OK**.

IMPORTANT! If, at any time, the network connection is interrupted or lost, the GeneMapper Software becomes unusable. To restore the connection, exit, then restart the software 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).

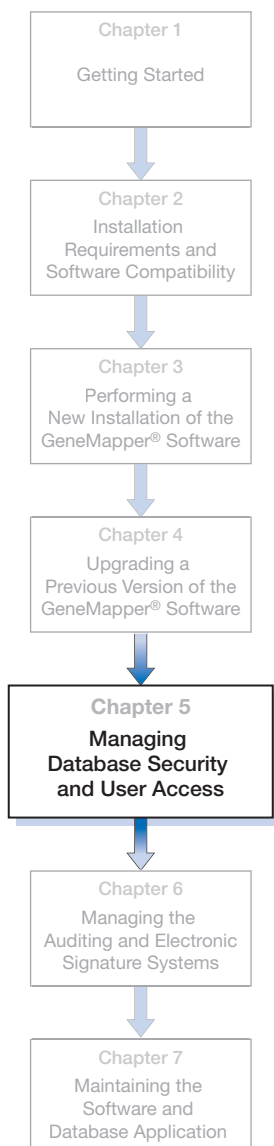
When you log out of the GeneMapper Software with a GeneMapper project that has unsaved changes, the software prompts you to save or discard the changes you made since the last time you updated the project.



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

5

Managing Database Security and User Access



This chapter covers:

- About GeneMapper® Software Security 96
- Configuring the Password Policies 98
- Managing User and Security Groups 102
- Managing Applications 110
- Managing Profiles 110
- Managing User Accounts 120
- Viewing the Security Report 126
- Exporting and Importing the Security Settings 128

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 6, “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

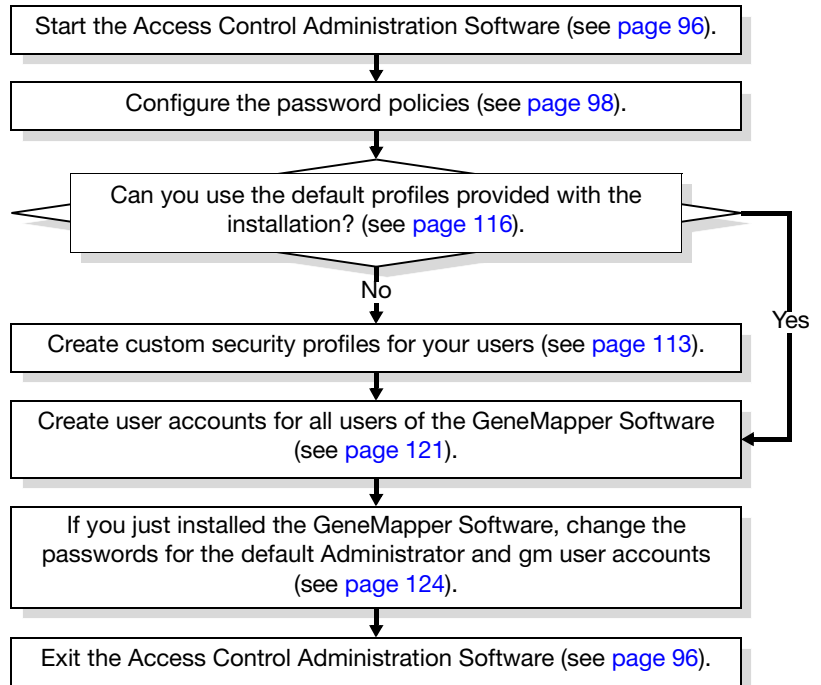
IMPORTANT! Only users that belong to the Administrator user group (see [page 115](#)) can use the Access Control Administration Software.

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 65](#)).
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	<ul style="list-style-type: none"> • Create, modify, or retire user accounts as needed (see page 121). • Create, modify, or retire security profiles as needed (see page 113).

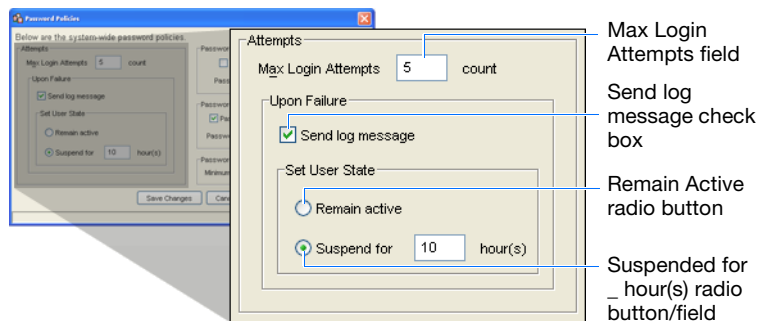
Configuring the Password Policies

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. Applied Biosystems recommends 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 96](#)).
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.

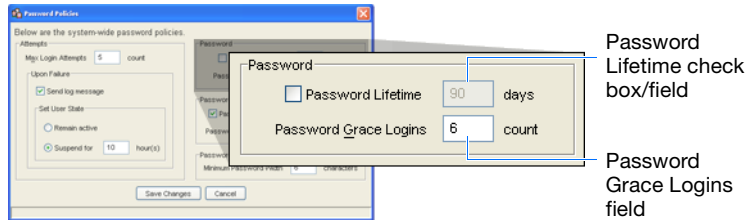
- **Send log message** – Select this if you want the software to record the failed login attempts to the security log.

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 126](#).

- **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 125](#). 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:

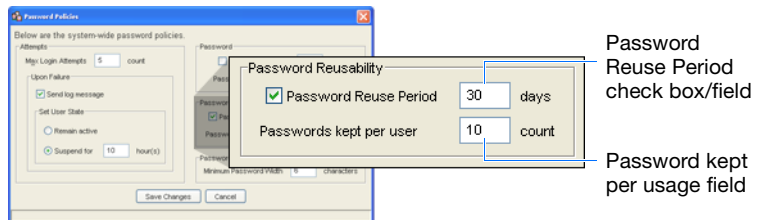


- **Password Lifetime** – Select this if you want the software to retire the password of each user account after the specified number of days elapses.

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.

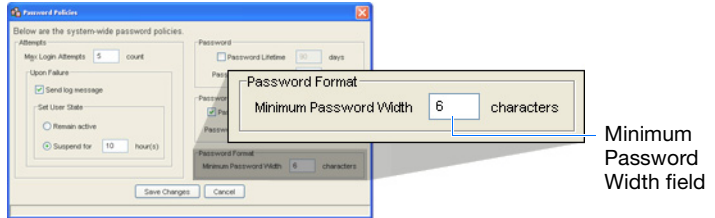
- **Password Grace Logins** – Type the number of times that a user can delay changing his or her password after the software prompts the user to change it. Once the user exceeds the number of specified logins, the software requires the user to change his or her password.

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-server 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 5-1 on page 106](#) 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.

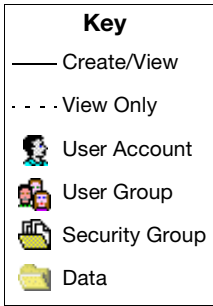
In Example 3:

- 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.

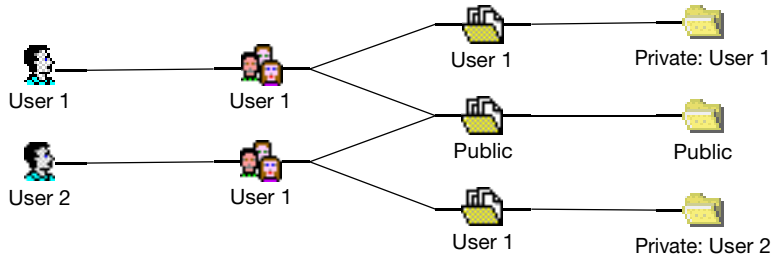
Note: The Workgroup user group prevents the users from altering each other's private data, but the users can use and create copies of the viewable data objects.

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

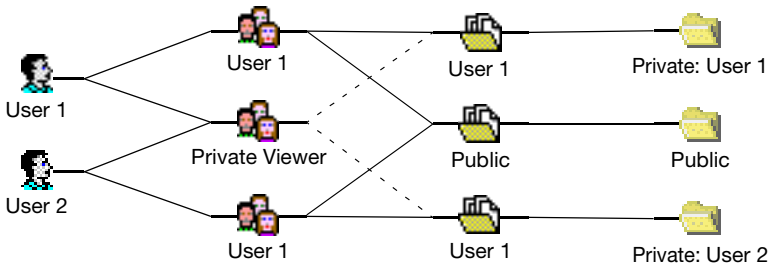
Note: One possible application of the Example 3 configuration is version control of reference data (such as analysis methods, panels, and bin sets). The principal investigator could assume the responsibility of maintaining the reference data used by the members of the workgroups. By storing all reference 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

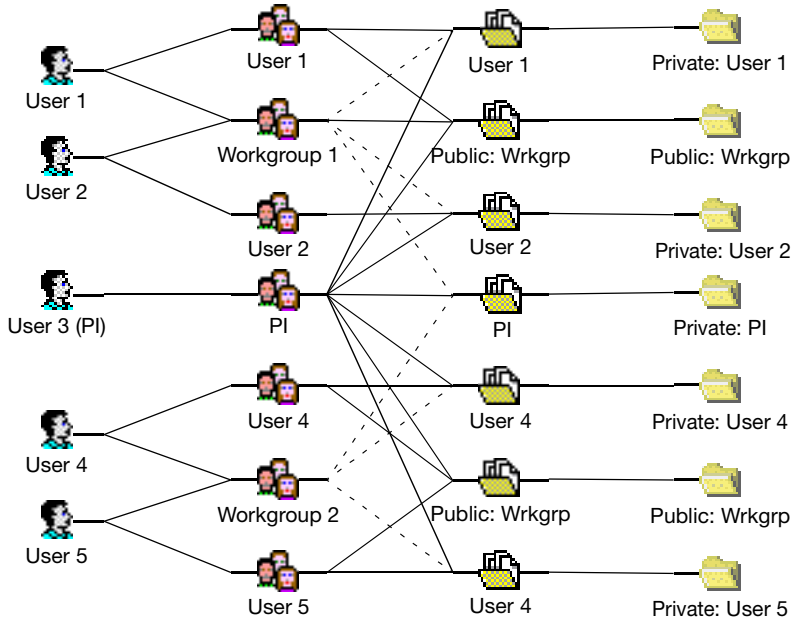



Figure 5-1 Examples of user and security group configurations

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 102](#) 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 109](#) (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 113](#).
- Create user accounts for your users as explained in [“Creating a User Account” on page 121](#).
- 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 96](#)).
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 Applied Biosystems 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. Applied Biosystems recommends 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 5-2 on page 112](#) illustrates the concept of the inheritance hierarchy using the Installed Elements of the GeneMapper applications group.

Example of Installed Element Inheritance


Figure 5-2 illustrates an example of inherited rights in the installed elements for the GeneMapper Software.

Installed Elements	OIR	Execute	
Default Rights	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Default Rights element
AdminToolAcc	<input type="checkbox"/>	<input type="checkbox"/>	
AuditGUI	<input type="checkbox"/>	<input type="checkbox"/>	
FoundationDataCollection	<input type="checkbox"/>	<input type="checkbox"/>	
GeneMapper	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	GeneMapper application element
Database Manager	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Panel Manager	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Size Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Analysis Method action group
READ_SIZE_STANDARD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
UPDATE_SIZE_STANDARD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Analysis Method	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Analysis Method action group
UPDATE_ANALYSIS_METHOD	<input type="checkbox"/>	<input type="checkbox"/>	
READ_ANALYSIS_METHOD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	READ_ANALYSIS_METHOD installed element

Figure 5-2 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 96](#)).
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.

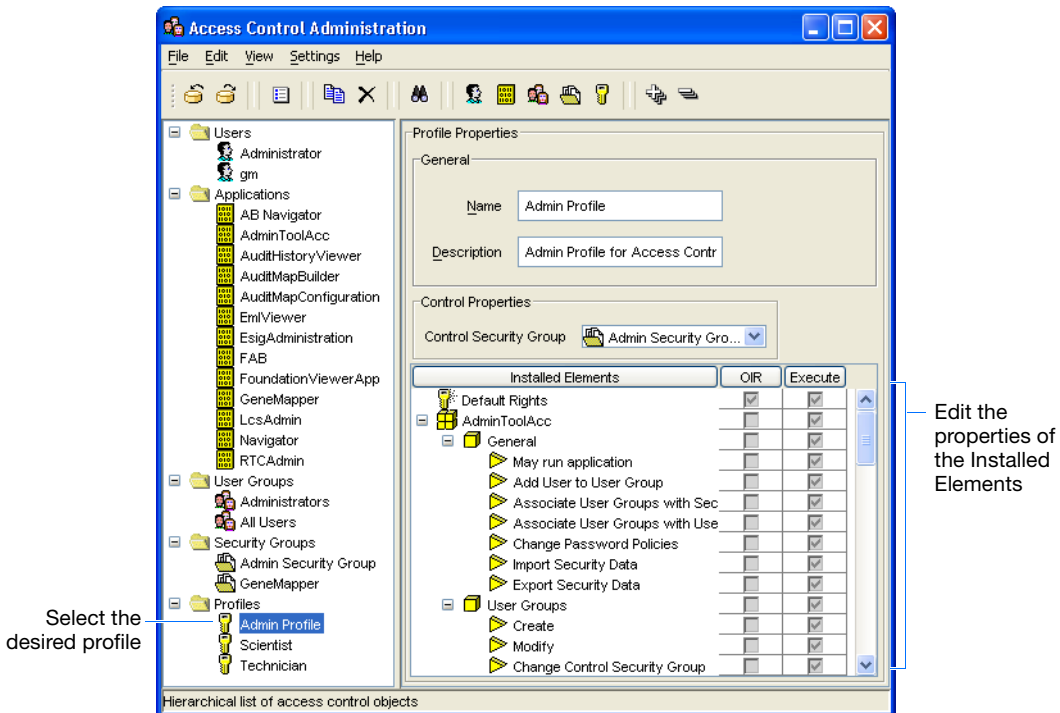
Note: See [Table 5-1 on page 116](#) for a description of the functions displayed in the Installed Elements table.

- 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! Applied Biosystems strongly recommends against modifying the Admin(istrator) Profile.

1. Start the Access Control Administration Software (see [page 96](#)).
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 Applied Biosystems products, the Installed Elements table may contain elements other than those listed in [Table 5-1](#). Most Applied Biosystems products employ the Access Control Administration Software and install their elements to the same location.

Table 5-1 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: <ul style="list-style-type: none"> Starting the Access Control Administration Software (see page 96) Editing user accounts (see page 123) Editing user groups Changing the password policies (see page 98) Exporting/importing security settings (see page 126)
 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			✓	✓	
 Modify			✓	✓	
 Change Control Security Group			✓	✓	
 Delete			✓	✓	

Table 5-1 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			✓	✓	 <p>Note: See page 110 for more information on user profiles.</p>
 Modify			✓	✓	
 Change Control Security Group			✓	✓	
 Delete			✓	✓	
 Applications			✓	✓	Create, delete, or modify applications ().
 Create			✓	✓	 <p>Note: See page 102 for more information on applications.</p>
 Modify			✓	✓	
 Delete			✓	✓	
 Users			✓	✓	Create, delete, or modify user accounts ().
 Create			✓	✓	 <p>Note: See page 120 for more information on user accounts.</p>
 Modify			✓	✓	
 Change Control Security Group			✓	✓	
 Delete			✓	✓	
 Security Groups	—	—	✓	✓	Create, delete, or modify security groups ().
 Create	—	—	✓	✓	
 Modify	—	—	✓	✓	
 Change Control Security Group	—	—	✓	✓	

Table 5-1 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 145 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.
 Enable and Disable Maps			✓	✓	Note: See page 138 for more information on the Audit Map Configuration Software and the auditing system for the GeneMapper Software.
 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:
 READ_DATABASE_INFO(rmation)			✓	✓	• Viewing (reading) database statistics (see page 180) and project information (see page 185)
 UPDATE_DATABASE_CONGIF(uration)			✓	✓	• Modifying (updating) the disk space allocated for the GeneMapper Software database (see page 183)

Table 5-1 User groups and privileges (continued)

Installed Elements (Application/Action Group/Action)	Technician	Scientist	Admin Profile		Grants the user permission(s) to...
			Admin Profile	Service	
Panel Manager			✓	✓	Use the functions of the Panel Manager including: <ul style="list-style-type: none"> 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 xi](#) 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 110](#) 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 6, “Managing the Auditing and Electronic Signature Systems.”](#)

Default User Names and Passwords

[Table 5-2](#) 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, Applied Biosystems strongly recommends 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 5-2 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 96](#)).
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 110), 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 the user to enter a password of their choice.

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 96](#)).
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**).

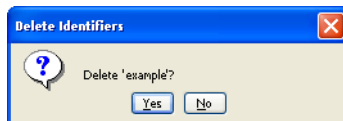
Deleting a User Account

The Access Control Administration Software allows you to delete any user account except for the default Administrator account (see [page 120](#)). After you delete a user account, you cannot retrieve or restore it, nor can you create another user account of the same name. Applied Biosystems recommends 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 125](#).

To delete a user account:

1. Start the Access Control Administration Software (see [page 96](#)).
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.

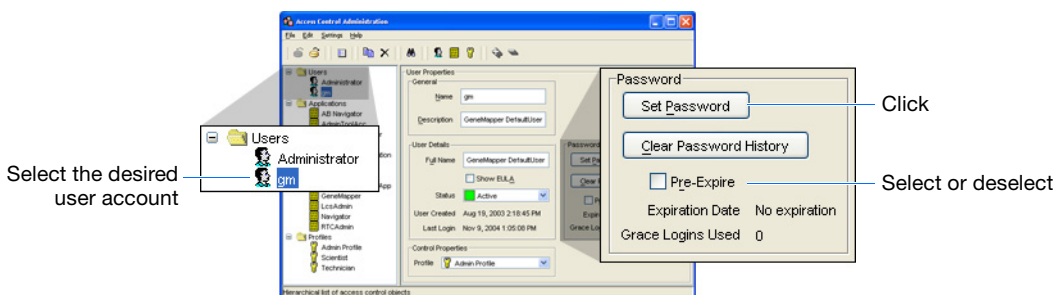
Changing the Password of an Existing User Account

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, Applied Biosystems strongly recommends 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 96](#)).
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:

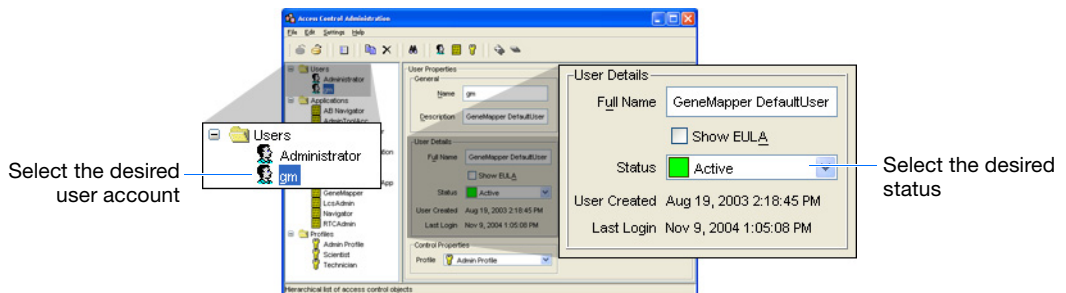
- You want to deactivate a user account without deleting it
- A user exceeds the maximum number of failed login attempts and you want to activate the user account manually

Note: The software can suspend a user account if the user repeatedly enters an incorrect password (see [page 98](#)).

To reactivate, deactivate, or suspend the user account:

1. Start the Access Control Administration Software (see [page 96](#)).
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 110), 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 6, “Managing the Auditing and Electronic Signature Systems,”](#) for more information).

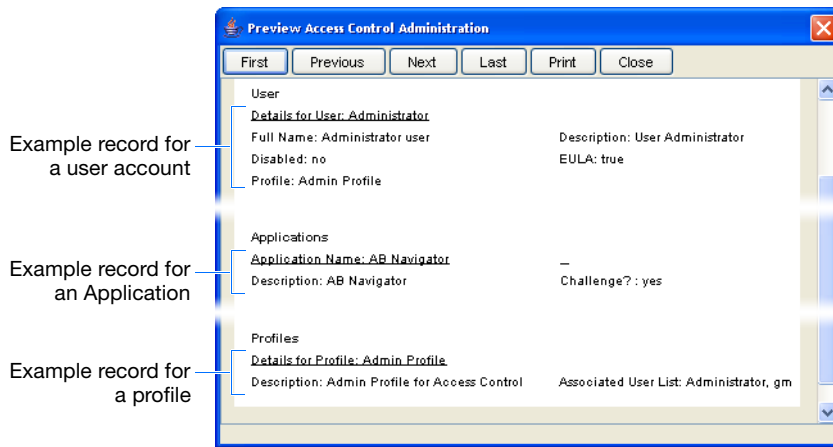



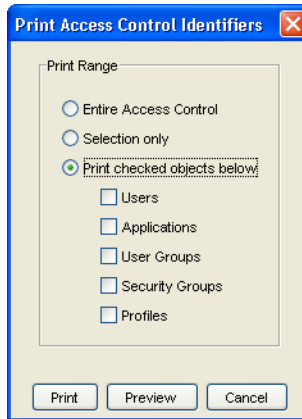
Figure 5-3 Security report example records

Printing the Security Log

Note: The security log is regenerated daily.

1. Start the Access Control Administration Software (see [page 96](#)).
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 ($\leq 100\text{KB}$) 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 96](#)).
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**.

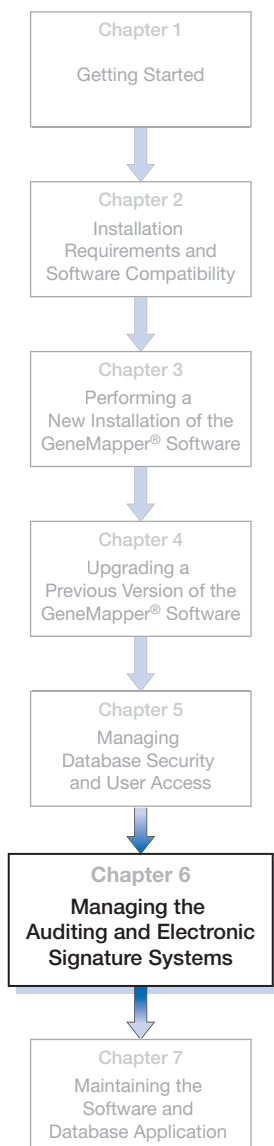
Importing the Security Settings

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

1. Start the Access Control Administration Software (see [page 96](#)).
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**.

6

Managing the Auditing and Electronic Signature Systems



This chapter covers:

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About the Data Tracking Systems

About the Data Tracking Systems

The GeneMapper® Software Version 4.1 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 6-1](#) summarizes the functions of the utilities.

Table 6-1 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.	131
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.	151

Section 6.1 Setting Up the Auditing System

This section covers:

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- Audit Maps, Objects, and Attributes 134
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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 5, “Managing Database Security and User Access.”](#)

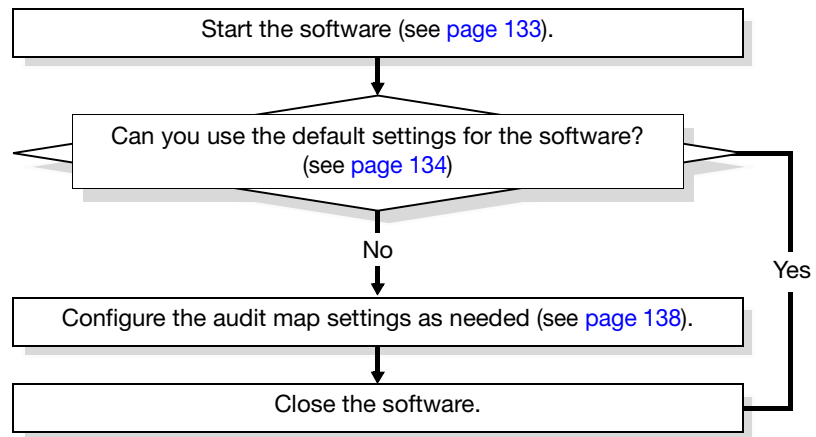
About the Audit Map Configuration Software

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.

Note: The Audit Map Configuration Software is an integral part of the GeneMapper Software that cannot be deactivated or uninstalled.

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	<ul style="list-style-type: none">Review the audit report for the GeneMapper Software (see page 145).Backup/restore audit records (page 149).
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 138).

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 65](#)).
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 115](#)) 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 6-1](#) has the attributes “created, deleted, and modified” because users can create, delete, or modify analysis methods using the GeneMapper Software.

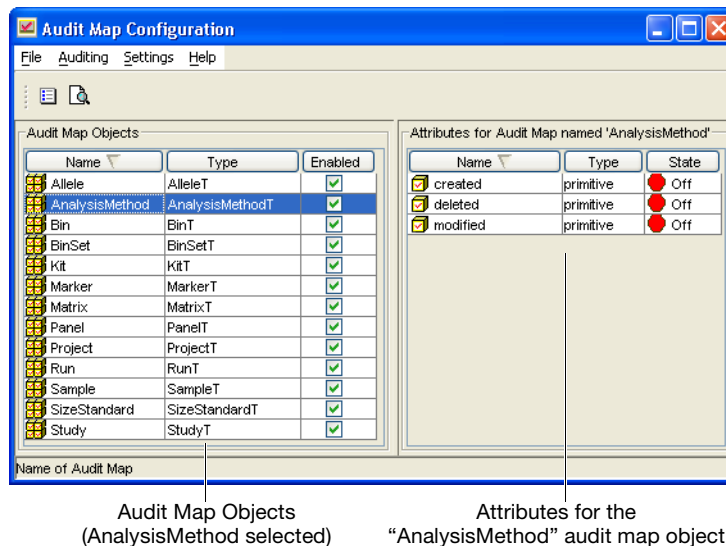


Figure 6-1 Audit map objects and attributes

Note: Because most Applied Biosystems 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 6-2 displays the locations of the audit state controls in the software.

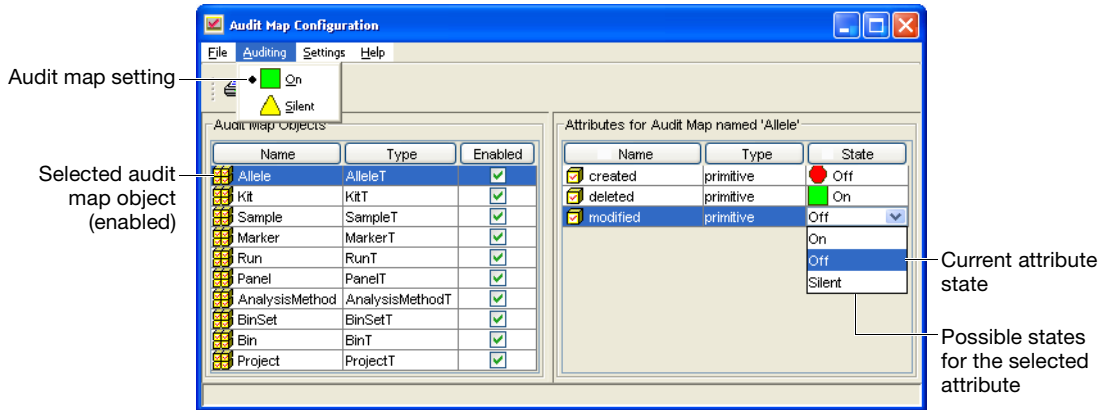


Figure 6-2 States of the audit map, audit objects, and attributes

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 6-2 shows the result of all possible combinations of the audit states for the audit map objects and object attributes.

Table 6-2 Audit state inheritance matrix

State of the Audit Object (Enabled)	Audit State of the Attribute		
	ON	Silent	OFF
<input checked="" type="checkbox"/> (Yes)	ON	Silent	OFF
<input type="checkbox"/> (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 6-3](#)). 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.

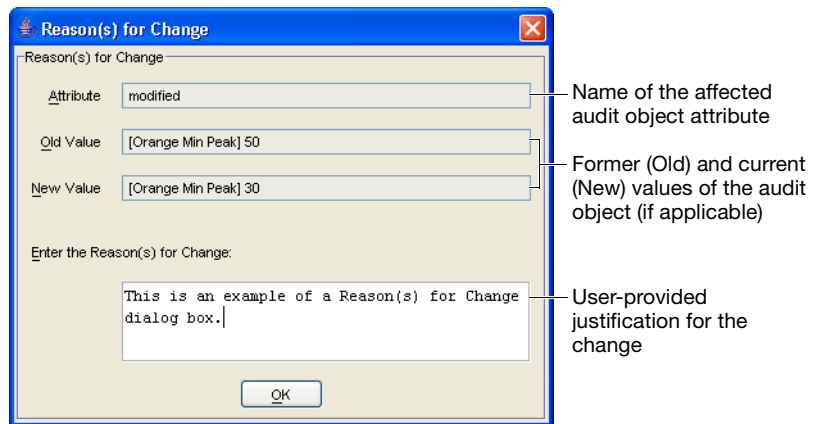


Figure 6-3 Reason(s) For Change dialog box

Note: [Figure 6-3](#) 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 6-4](#) 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

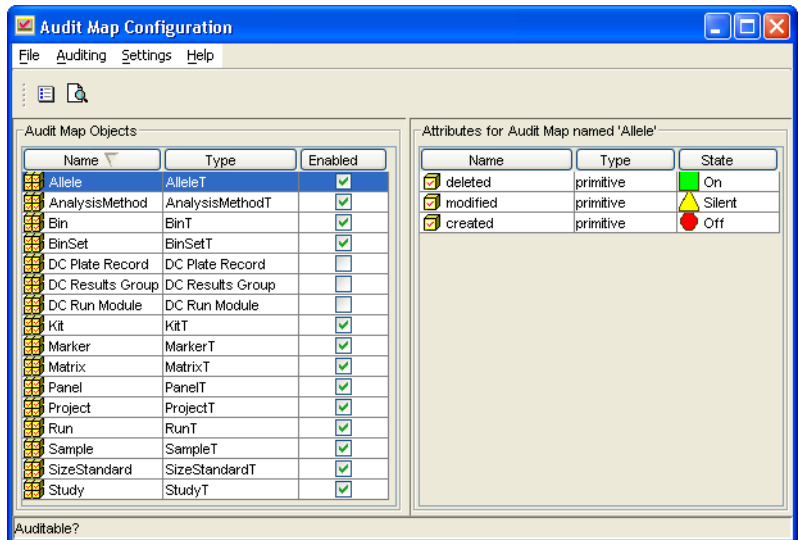


Figure 6-4 Auditing Settings for the Allele audit object

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 6-4](#).

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 133](#)).
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 6-3 on page 141](#) 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 136](#)). 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 146](#).
5. When you finish configuring the audit map, select **File ▶ Exit** to close the software.

About the Audit Map, Audited Objects, and Attributes

[Table 6-3](#) 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 6-3](#). Most Applied Biosystems products employ the Audit Map Configuration Software and install their audit map objects to the same location.

Table 6-3 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.
	 deleted	 Off	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.
	 modified	 Off	
 Analysis Method	 created	 Off	Represents the analysis methods used to analyze project data.
	 deleted	 Off	When configured for auditing, the software creates a record of the associated modification(s) made from the Analysis Method Editor.
	 modified	 Off	
 Bin	 created	 Off	Represents the individual bins of the bin sets used to analyze project data.
	 deleted	 Off	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.
	 modified	 Off	
 BinSet	 created	 Off	Represents the bin sets used to analyze project data.
	 deleted	 Off	When configured for auditing, the software creates a record of the creation and/or deletion of bin sets using the Panel Manager.
 Kit	 BINSET	 On	Represents the kits used to analyze project data.
	 created	 Off	When configured for auditing, the software creates a record of the associated modification(s) made from the Panel Manager.
	 deleted	 Off	
	 modified	 Off	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.
	 PANEL	 On	

Table 6-3 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.
	 created	 Off	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.
	 deleted	 Off	
	 modified	 Off	
 Matrix	 created	 Off	Represents the matrices used to analyze project data.
	 deleted	 Off	When configured for auditing, the software creates a record of the associated modification(s) made using the GeneMapper Manager.
	 modified	 Off	
 Panel	 created	 Off	Represents the panels used to analyze project data.
	 deleted	 Off	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.
	 MARKER	 On	
	 modified	 Off	Note: When the MARKER attribute is activated, the software creates audit records for edits made to markers that are associated with panels.
 Project	 analyzed	 Off	Represents the project data object that associates analysis parameters, settings, and sample data for projects.
	 created	 Off	When configured for auditing, the software creates a record of the associated modification(s) made from the GeneMapper window.
	 deleted	 Off	
	 modified	 Off	Note: When the RUN attribute is activated, the software creates audit records for edits made to the run folders within projects.
	 RUN	 On	

Table 6-3 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 6-3 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.
	 created	 Off	
	 deleted	 Off	When configured for auditing, the software creates a record of the associated modification(s) made from the Study Manager.
	 OverrideStatus	 Off	
	 PROJECT	 On	
	 ProjectAdded	 Off	Note: When the PROJECT attribute is activated, the software creates audit records for edits made to the projects that are attached to studies.
	 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](#) 149

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 115](#)) can use the Audit Map Viewer software.

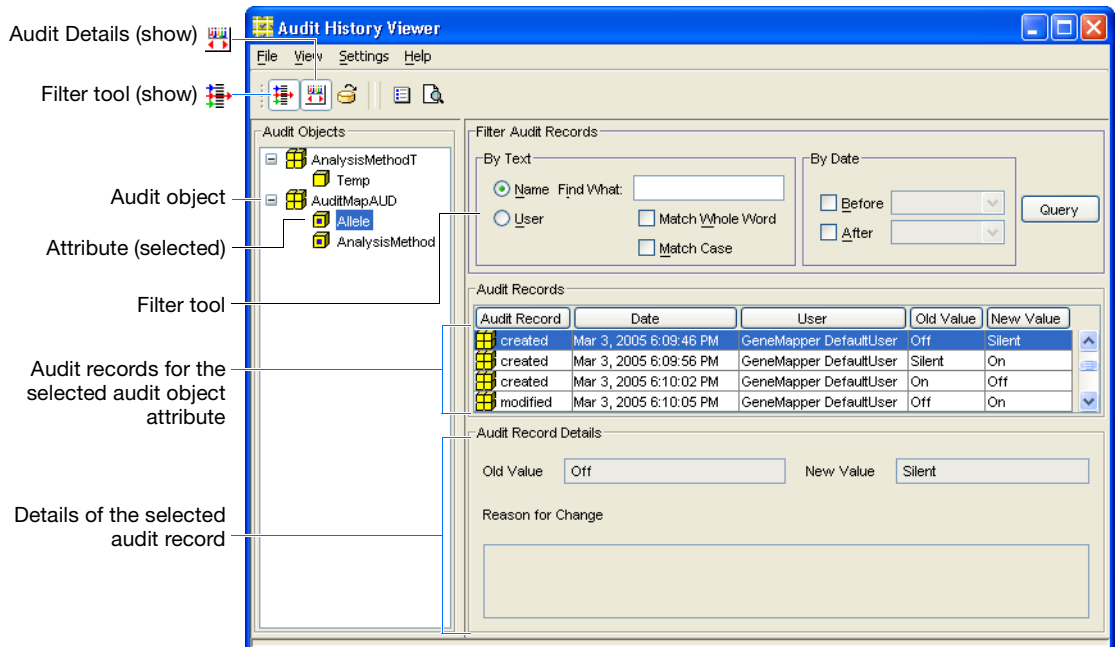


Figure 6-5 Components of the Audit History Viewer window

Starting the Audit History Viewer

IMPORTANT! Only users that belong to the Administrator user group (see [page 115](#)) 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 65](#)).
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 139](#)), 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.

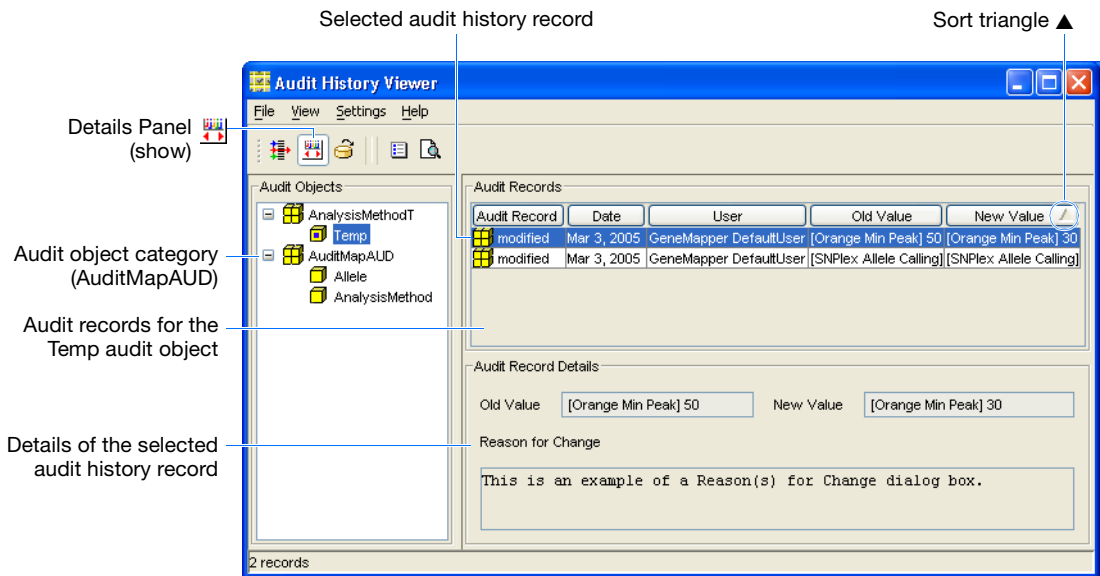



Figure 6-6 Details of the Audit Record created for the change shown in [Figure 6-3](#) on [page 136](#)

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:

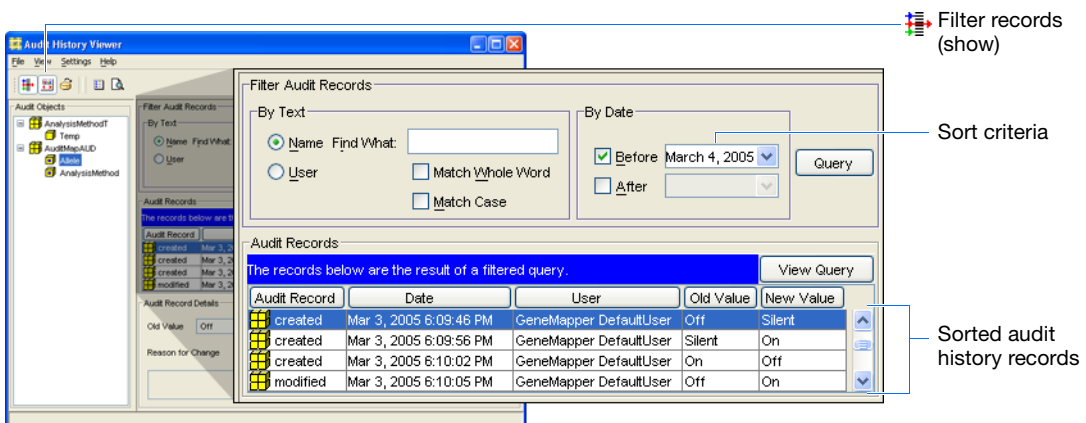
To display records containing a specific word or phrase:

- 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**.



Filter records (show)

Sort criteria

Sorted audit history records

Audit Record	Date	User	Old Value	New Value
created	Mar 3, 2005 6:09:46 PM	GeneMapper DefaultUser	Off	Silent
created	Mar 3, 2005 6:09:56 PM	GeneMapper DefaultUser	Silent	On
created	Mar 3, 2005 6:10:02 PM	GeneMapper DefaultUser	On	Off
modified	Mar 3, 2005 6:10:05 PM	GeneMapper DefaultUser	Off	On

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 180](#)). 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 183](#), 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 186](#)). 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 65](#)).
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 145).

Restoring Audit Records

1. Start and log in to the GeneMapper Software (see “[Logging In to and Out of the Software](#)” on page 65 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 6.2 Setting Up the Electronic Signature System

This section covers:

- About the Electronic Signature System 152
- About Electronic Signatures. 154
- Configuring the Electronic Signature Settings. 155
- Configuring the GeneMapper[®] Software Action Map. 156
- Viewing the Electronic Signature History 158

About the Electronic Signature System

About the Electronic Signature Software

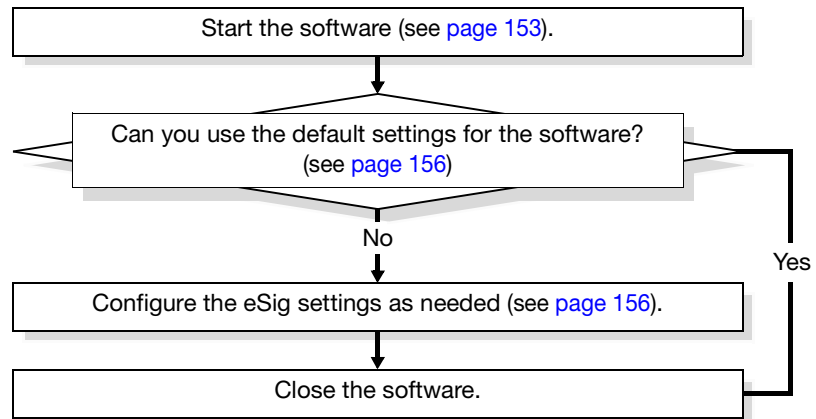
The Electronic Signature (eSig) Software is the GeneMapper Software utility that allows users belonging to the Administrator group to setup, monitor, and maintain the electronic signature system.

Guidelines for Using the Electronic Signature Software

- Only users of the Administrator user group (see [page 115](#)) 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 158).
Semi-annually	Review the electronic signature system settings and modify them as necessary to meet the regulation requirements of your laboratory (see page 155).

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 65](#)).
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 115](#)) can use the Electronic Signature Administration Software.

About Electronic Signatures

Electronic Signatures from the User's Perspective

Version 4.1 of 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 6-7](#)). The user must then authenticate or “sign” for the action by typing the user name (optional) and password of his or her account.

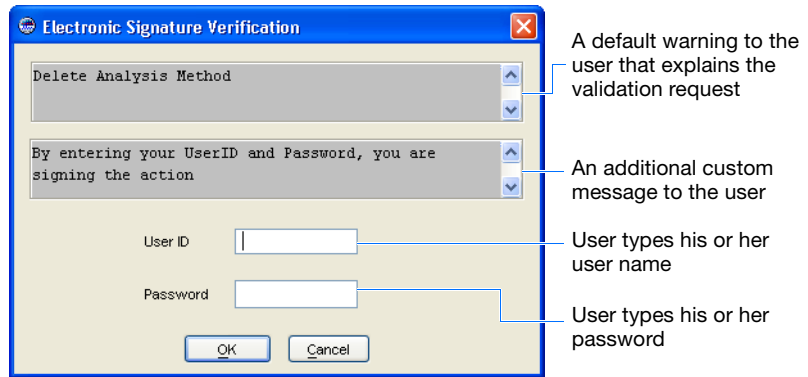


Figure 6-7 Electronic Signature Verification dialog box

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.

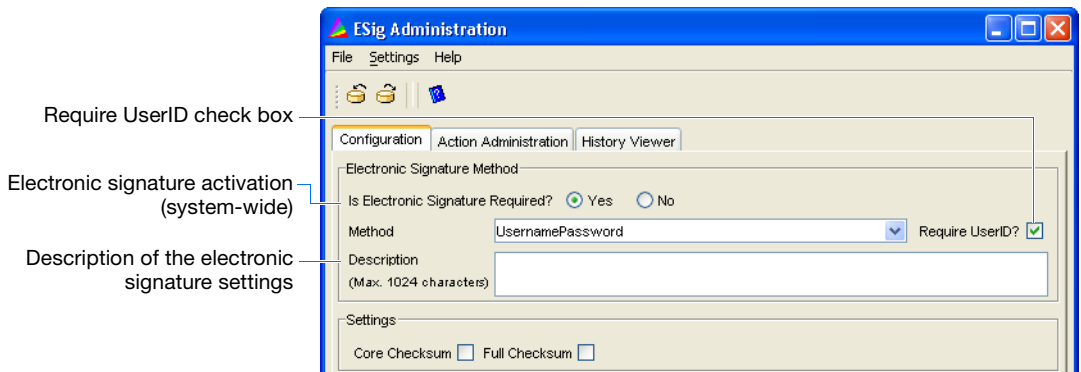
Enabling Electronic Signatures

1. Start the Electronic Signature Software (see [page 153](#)).
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.

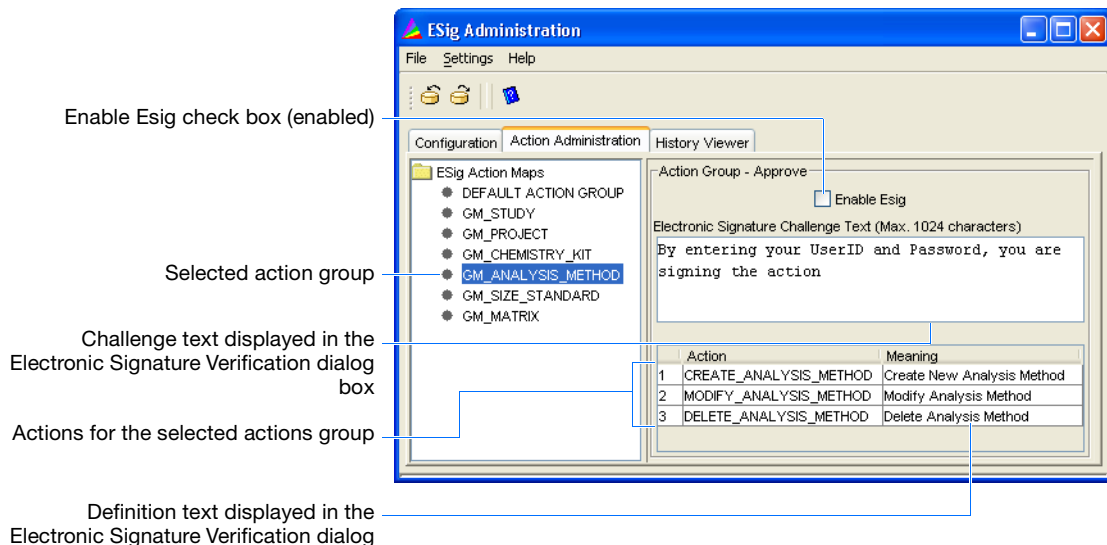
About the GeneMapper® Software Action Maps


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 6-7 on page 154](#)).

Configuring the Action Maps

IMPORTANT! You must enable the electronic signature system as explained on [page 155](#) and save it before changes to the ESig Action map can take effect.

1. If necessary, start the Electronic Signature Software (see [page 155](#)).
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 155](#)).
2. In the Electronic Signature window, select the **History Viewer** tab.

The screenshot shows the ESign Administration window with the History Viewer tab selected. The window has a menu bar (File, Settings, Help) and a toolbar. The main area is divided into several sections:

- Query Electronic Signature Events:** Contains input fields for Object Name, Object Type, User ID, and Full Name. It also has dropdown menus for Action Group (set to GM_ANALYSIS_METHOD) and Action (set to DELETE_ANALYSIS_METHOD). There are buttons for Find and Clear. Event Date fields (From and To) and a DateFormat dropdown are also present.
- Events:** A table displaying the results of the query. The first row is highlighted and contains: User ID: gm, Full Name: GeneMapper DefaultUser, Action Group: GM_ANALYSIS_METHOD, Action: DELETE_ANALYSIS_METHOD, Version: 1, Server Time: 2005-04-01 00:00:00, Client Time: 2005-04-01 00:00:00.
- Event Details:** A table showing details for the selected event. The first row is: Object Name: Temp, Object Type: ANALYSIS METHOD, Object Version: N/A.
- Verify Checksum:** A button at the bottom left.

Annotations on the right side of the screenshot point to specific elements:

- GM_ANALYSIS_METHOD Action Group (points to the Action Group dropdown)
- DELETE_ANALYSIS_METHOD Action (points to the Action dropdown)
- Deleted analysis method electronic signature event (points to the first row in the Events table)
- Details of the electronic signature event (points to the first row in the Event Details table)

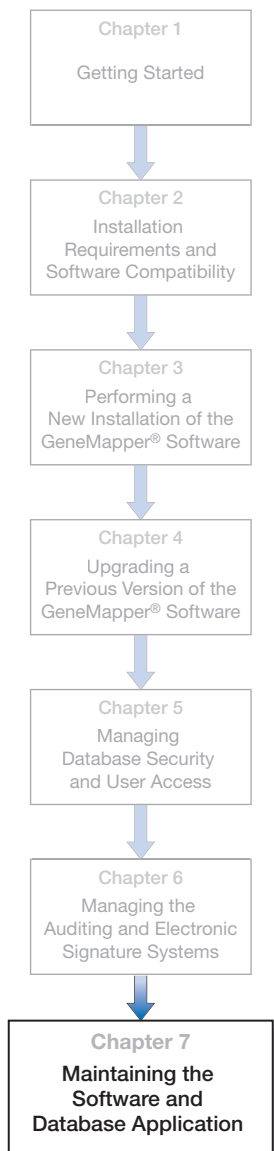
3. In the Query Electronic Signature Events group box, enter parameters to refine the query of electronic signature records:

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.

7

Maintaining the Software and Database Application



This chapter covers:

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Section 7.1: Managing Study, Project, and Sample Data ..	163
■ Exporting Data Objects	165
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■ Exporting and Importing Reference Data	172
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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 7-1](#), but are explained in Chapters 5 and 6 respectively.

Recommended Maintenance Schedule

IMPORTANT! The maintenance schedule shown in [Table 7-1](#) contains general recommendations and may require adjustment based on system throughput.

Table 7-1 Database maintenance activities

Frequency	Tasks
Weekly	<ul style="list-style-type: none"> • Exit the GeneMapper Software and cycle the computer power (see page 67). • (Optional) Back up the GeneMapper database application (see page 186). • Review the statistics for the database (see page 180), and if necessary: <ul style="list-style-type: none"> – Export unused projects and data (see page 168). – Allocate additional disk space (see page 183).
Monthly	<ul style="list-style-type: none"> • Defragment the computer hard drive. • If using the auditing system, review the audit report (see page 145). • If using the electronic signature system, review the history (see page 158).
Semi-annually (6 months)	<ul style="list-style-type: none"> • Visit the Applied Biosystems website and check for software upgrades • If using the auditing system, review the audit map and modify the settings as necessary (see page 138). • If using the electronic signature system, review the electronic signature settings and modify them as necessary (see page 155).
As Needed	Export projects (see page 168), studies (see page 170), and audit records (see page 149).

Section 7.1 Managing Study, Project, and Sample Data

This section covers:

- Exporting Data Objects 165
- Exporting GeneMapper Data Objects 167
- Exporting and Importing Reference Data 172

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 7-2 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 7-2 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 7-2 lists the exportable data objects of the GeneMapper Software.

Table 7-3 Exportable data objects of the GeneMapper® Software

Data Object(s)	Export Format/Description	See Page
<ul style="list-style-type: none"> • 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.	174
Audit Records	An *.aud file containing the metadata equivalents of the audit records generated by the GeneMapper Software	149
Bin Set	An *.xml file containing the metadata equivalents of the base pair ranges of all bins in the bin set	173
Panel	An *.xml file containing the metadata equivalents of the kit, panel, and marker definitions	173
Projects	A *.ser file containing all of the analyzed data for a project [‡]	167
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).	128
Study	A *.ser file containing all of the analyzed data for a study and associated projects [‡]	170

[‡] 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 173](#))
- Supporting data such as analysis methods, table settings, plot settings, cluster plot settings, matrices, size standard definitions, SNP sets, or report settings (see [page 174](#))

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 173](#))
- Supporting data such as analysis methods, table settings, plot settings, cluster plot settings, matrices, size standard definitions, SNP sets, or report settings (see [page 174](#))

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 7-4 Exportable reference data

Reference Data	Exported from the...	See Page
<ul style="list-style-type: none"> • Kits • Panels • Bin sets 	Panel Manager	173
<ul style="list-style-type: none"> • Analysis methods • Cluster plot settings • Matrices • Plot settings 	<ul style="list-style-type: none"> • Report settings • Size standard definitions • SNP sets • Table settings 	GeneMapper Manager 174

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 173](#) and [“Exporting Bin Sets” on page 174](#).

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 173](#).

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 173](#).

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 7.2 Managing the Database

This section covers:

- Using the Oracle® Database 176
- About the Dashboard Software 178
- Reviewing the Database Statistics 180
- Allocating Disk Space 183
- Viewing Project Information 185
- Backing Up the Database 186
- Generating a Database Report 188

Using the Oracle® Database

About the Oracle® 11g Database

The GeneMapper Software employs a relational Oracle® 11g 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 11g database or before using any of the Oracle utilities.

Database Access

Applied Biosystems 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

Applied Biosystems 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 11g 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 version 4.1 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 Applied Biosystems' agreement with the Oracle corporation.

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

**Oracle® 11g
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. Applied Biosystems 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 11g 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 and the server version of the GeneMapper Software provides tools for maintaining the Oracle 11g 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 11g Database.

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

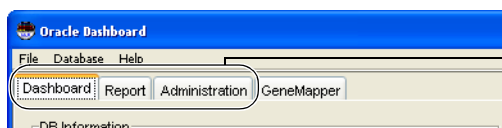
The interface includes the following tabs:

- **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 11g 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 Applied Biosystems 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 11g Database. Applied Biosystems 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.



Advanced features

About the Administrator Role

When operating the GeneMapper Software in a multi-user environment, Applied Biosystems recommends designating a single user as an administrator for the workgroup. The administrator need not have prior knowledge of the Oracle 11g 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, Applied Biosystems recommends that the maintenance of the Oracle 11g 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 115](#)) can use the software.

1. In the desktop, select **Start ▶ All Programs ▶ Applied Biosystems ▶ 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.

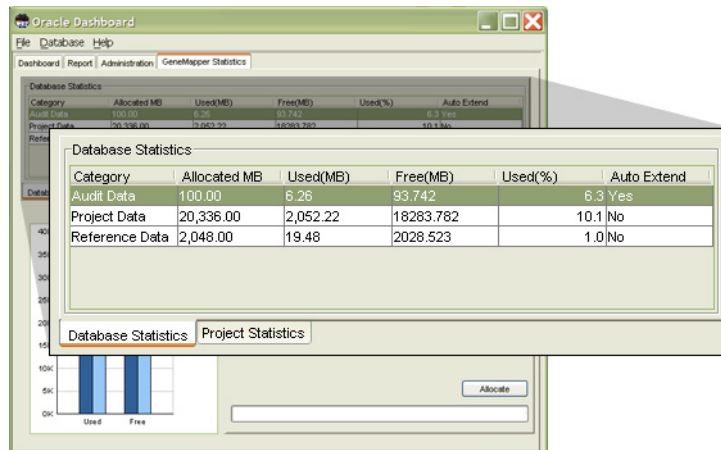


Figure 7-1 Database Statistics table of the Dashboard Software

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 179](#)).
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 183 , if: <ul style="list-style-type: none"> • 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 183 . 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 7-5](#) 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 180](#) to view the table size statistics.

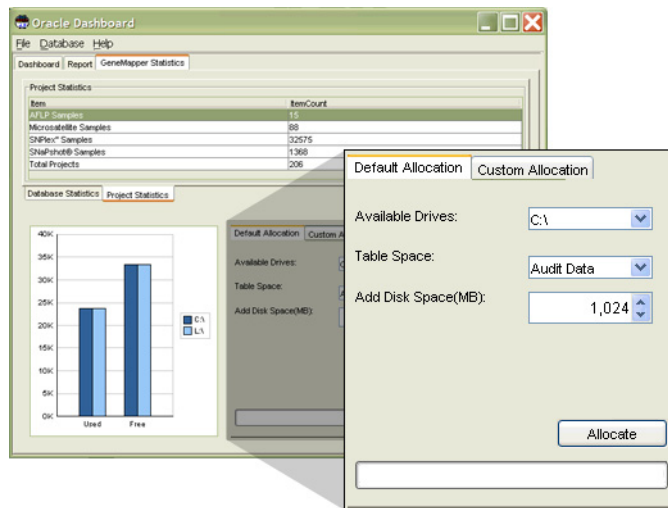
Table 7-5 Table spaces and related exportable data objects

Table Approaching Limit	Export and Remove	See Page
Audit Data	Audit records	149
Project Data	Projects and studies	167 / 170
Reference Data	<ul style="list-style-type: none"> • Analysis methods • Bin sets • Cluster plot settings • Kits • Markers • Matrices • Panels • Plot settings • Size standard definitions • SNP sets • Report settings • Table settings 	173 / 174

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 179 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 181 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**.

- In the Alert dialog box, click **Yes**.

IMPORTANT! Allocating disk space cannot be undone.

- 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.

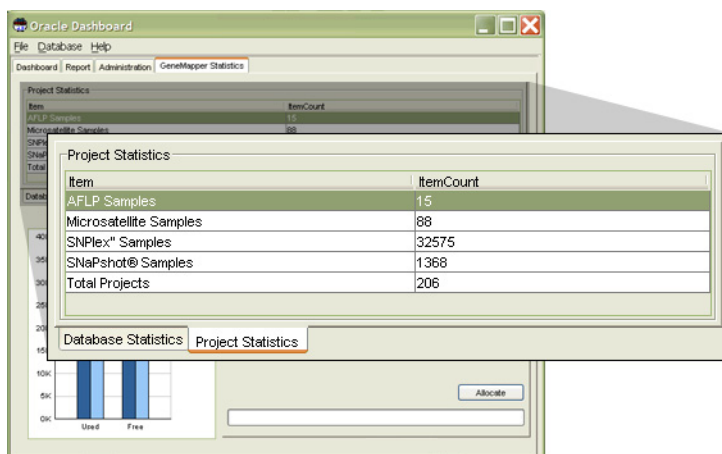
Viewing Project Information

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:

- Start the Database Dashboard (see [page 179](#)).
- In the Database Dashboard window, select the **GeneMapper** tab.
- In the GeneMapper Statistics tab, select the **Project Statistics** tab to display table space values and table values for each data type.



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® 11g Database

Applied Biosystems recommends that you back up the Oracle 11g 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 128](#) 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 179](#)).
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 179](#)).
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 190
- Uninstalling the Software..... 192
- Troubleshooting Checklist 198

Troubleshooting Tasks

IMPORTANT! If you have trouble installing the GeneMapper® Software Version 4.1 on your computer, perform the following tasks in the order given below.

Task	See page
1. Collect the installation log file.	190
2. Check the Oracle® database installation.	190
3. If necessary, uninstall the software.	192

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 Applied Biosystems 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 192](#).
 - If the Oracle database was not installed correctly, complete [Table A-1, “Troubleshooting checklist,” on page 198](#), then contact Technical Support.

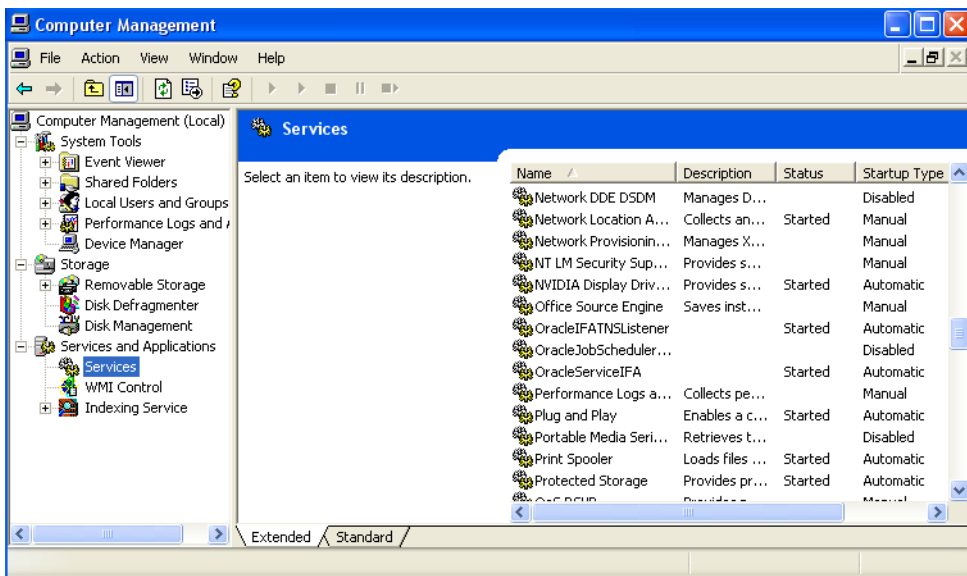
Check the Oracle® Services

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 **My Computer** (Windows® XP) or **Computer** (Windows Vista®) and select **Manage**.
2. Expand **Services and Applications** and select **Services**.



3. Scroll to **OracleServiceIFA** 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:

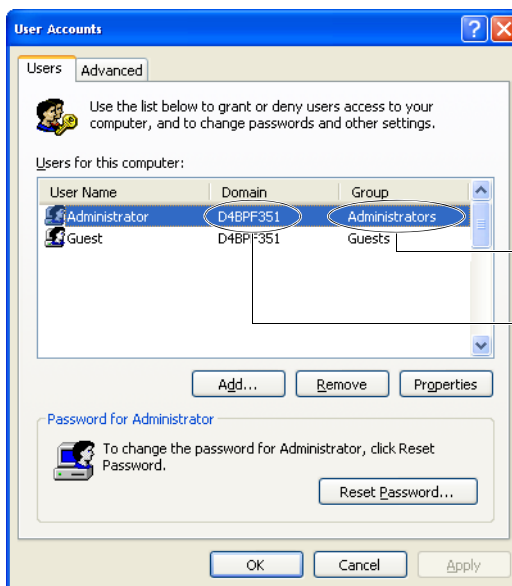
Task	See page
1. Verify that you are logged in as a user with administrator privileges.	193
2. If you are uninstalling an instrument or remote autoanalysis configuration of the GeneMapper Software, start the Data Collection Software. <ul style="list-style-type: none">• Instrument configuration – Start the Data Collection Software on the local computer.• Remote autoanalysis configuration – Start the Data Collection Software on the remote Data Collection computer.	194
3. Uninstall the software.	196

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

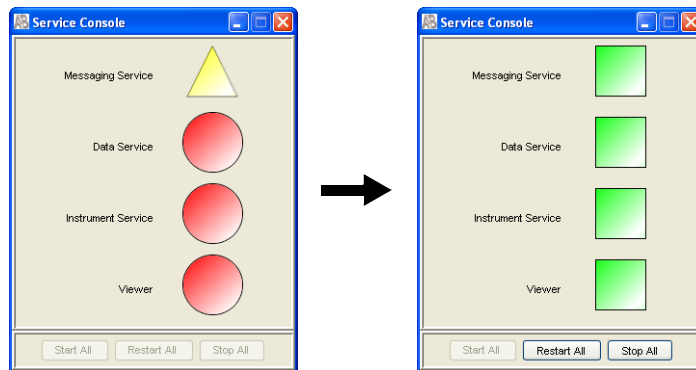
Before you uninstall an instrument or remote autoanalysis configuration of the GeneMapper Software, start the Data Collection services.

- If you are uninstalling an *instrument configuration* of the GeneMapper Software, start the Data Collection services on the local computer.
- If you are uninstalling a *remote autoanalysis configuration*, start the Data Collection services on the remote Data Collection computer.

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:
 - 3730/3730xl Data Collection v3.1
 - 3130/3130xl Data Collection v3.1

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

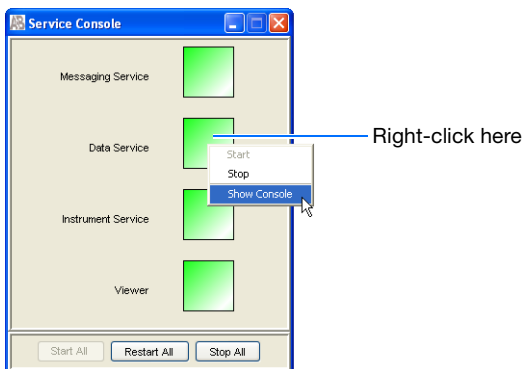


Note: If the services do not start automatically, click **Start All**.

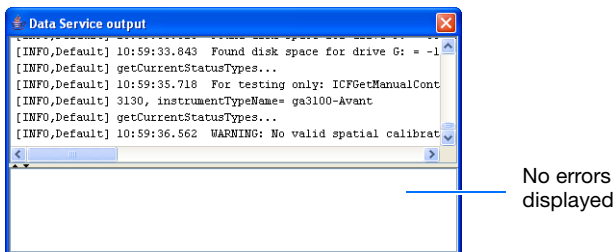
2. If the Data Collection Software requires a password, a login dialog box displays. Type the Login Name and Password, then click **OK**.

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.

Note: If you installed the GeneMapper Software server, then installed the client on the same computer, uninstall each one separately.

To uninstall the GeneMapper Software:

1. If you are uninstalling an instrument configuration or a remote autoanalysis configuration, be sure that the Data Collection software is open (see [page 194](#)).
2. Close all other applications (including the GeneMapper Software) and windows before proceeding with the uninstall.

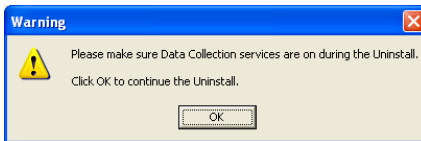
Note: If you do not close the GeneMapper Software before proceeding with the uninstall, the uninstall will fail. The next time you attempt to uninstall the GeneMapper Software, the operating system performs a disk check. If inconsistencies are found during the disk check, you may be required to correct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

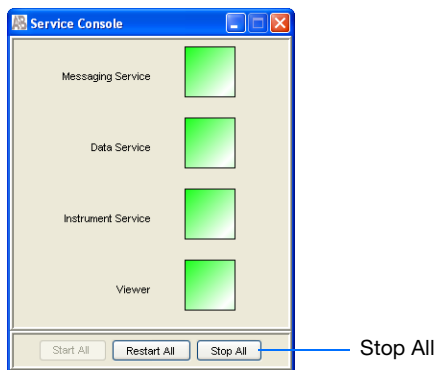
9. If you are uninstalling an instrument configuration, the message below appears. Be sure Data Collection services is open, then click **OK** to start the uninstall.



Note: If you are uninstalling a remote autoanalysis configuration, you will not receive the message above; however, be sure the Data Collection services are open on the remote Data Collection computer.

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 Applied Biosystems 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.
	Applied Biosystems personnel that you have contacted: <input type="checkbox"/> Field Applications Specialist <input type="checkbox"/> Field Service Engineer <input type="checkbox"/> Technical Support <input type="checkbox"/> Sales Representative <input type="checkbox"/> Order Administration <input type="checkbox"/> 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: <ul style="list-style-type: none"> <input type="checkbox"/> Data Collection Software version: <input type="checkbox"/> Status of Data Collection services: <input type="checkbox"/> GeneMapper Software version: <input type="checkbox"/> Other Applied Biosystems software:
	Computer login information: <ul style="list-style-type: none"> • User privileges: • Local or networked domain:
	Software configuration installed: <ul style="list-style-type: none"> <input type="checkbox"/> Instrument <input type="checkbox"/> Remote autoanalysis <input type="checkbox"/> Stand-alone <input type="checkbox"/> Client-server
	Instrument and instrument computer information: <ul style="list-style-type: none"> • Model: • Data Collection Software version: • Status of Data Collection services: • Other Applied Biosystems software: • Capillary length: • Capillary lot number: • Run module: • Dye set:
	Chemistry kit or reagent, with version number:
	Be prepared to send to Technical Support: <ul style="list-style-type: none"> • Installation log file (page 190) • Exported panels • Exported bins • Exported size standard definition • Exported analysis method • Sample (.fsa) files • GeneMapper_log.txt • PanellImportLog.txt • Printed results



Appendix A Troubleshooting the Installation

Troubleshooting Checklist

B

Operating the Software from a Command Line

This appendix covers:

- Operating the Software from a Command Line 202
- Example Commands 207
- Command Line Arguments 211

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! Applied Biosystems supports the use of the command line interface only as it is explained in this manual.

Note: If you are unfamiliar with Microsoft DOS, Applied Biosystems 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 211](#) 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 208](#) 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 208
- Example #3: Sample File Analysis with Named Ladders 209
- Example #4: Export of Project Data 210

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 " <i>method</i> " where <i>method</i> 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 " <i>project1</i> " " <i>project2</i> " ... where <i>project1</i> and <i>project2</i> are the names of the projects to be deleted.
-deletesnpset	Deletes the specified SNP sets.	-deletesnpset " <i>snpset1</i> " " <i>snpset2</i> " ... where <i>snpset1</i> and <i>snpset2</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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 " <i>filename</i> " where <i>filename</i> 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: <ul style="list-style-type: none"> • 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 " <i>folder1</i> " " <i>folder2</i> " ... where <i>folder1</i> 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. 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.	-importanalysismethod "filename" where <i>filename</i> is the long path (file name appended to the import directory path) of the imported file.
-importproject	Imports the project or projects stored by the specified file. IMPORTANT! The specified file must be an exported project file (*.*) created by the export function of the GeneMapper Manager.	-importproject "filename" where <i>filename</i> is the long path (file name appended to the import directory path) of the imported file.
-importsizestandard	Imports the specified file as a size standard. 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.	-importsizestandard "filename" where <i>filename</i> is the long path (file name appended to the import directory path) of the imported file.
-importsnpset	Imports the specified file as a SNP set. 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.	-importsnpset "filename" where <i>filename</i> is the long path (file name appended to the import directory path) of the imported file.

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.	<p>-ladder "<i>folder</i>" "<i>ladder1</i>" "<i>ladder2</i>" ... where:</p> <ul style="list-style-type: none"> <i>folder</i> is the name of the project folder that contains the negative control samples. <i>ladder1</i> and <i>ladder2</i> ... 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.	<p>-negcontrol "<i>folder</i>" "<i>ctrl1</i>" "<i>ctrl2</i>" ... where:</p> <ul style="list-style-type: none"> <i>folder</i> is the name of the project folder that contains the negative control samples. <i>ctrl1</i> and <i>ctrl2</i> ... are the names of the negative control sample files separated by a space.
-option	Specifies the options for the exported data.	<p>-option "<i>option</i>"; "<i>option</i>"; ...; "<i>option</i>" where <i>option</i> is any of the following option letters:</p> <ul style="list-style-type: none"> b – Attaches bin names to the exported Genotype table h – Hides the user interface p "<i>port</i>" – 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.	<p>-panel "<i>panel</i>" where <i>panel</i> is the name of the panel.</p>
-password	Specifies the password for the user account defined by the -username argument.	<p>-password "<i>password</i>" where <i>password</i> is the password for the user account.</p>

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.	<p>-poscontrol "folder" "ctrl1" "ctrl2" ... where:</p> <ul style="list-style-type: none"> • <i>folder</i> is the name of the project folder that contains the positive control samples. • <i>ctrl1</i> and <i>ctrl2</i> ... are the names of the positive control sample files separated by a space.
-project	Specifies the name of the project to create or analyze.	<p>-project "project" where <i>project</i> is the name of project.</p>
-sizestandard	Specifies the name of the size standard to use in the analysis of the specified project.	<p>-sizestandard "standard" where <i>standard</i> is the name of the size standard.</p>
-snpset	Specifies the name of the SNP set to use in the analysis of the specified project.	<p>-snpset "snpset" where <i>snpset</i> is the name of the SNP set.</p>
-username	<p>Specifies the user account with which to perform the actions of command.</p> <p>IMPORTANT! The user account that you use must have privileges sufficient to perform the desired function(s).</p>	<p>-username "user" where <i>user</i> is the name of a user account.</p>

C

Migrating Data Using the GeneMapper® Database Utility Wizard

The GeneMapper® Database Utility Wizard is included on the:

- *GeneMapper® Software v4.1 Full Installation DVD*
- *GeneMapper® Software v4.1 Installer for Server DVD*
- *GeneMapper® Software v4.1 Upgrade Software v4.0 to v4.1 DVD*

Use the utility wizard to export/import your data when upgrading to GeneMapper® Software v4.1.

1. Insert the full installation, server, or upgrade DVD into the DVD drive.
2. In the launcher window, start the GeneMapper Database Utility Wizard:
 - For the *full* or *server installation* DVD – Click **Software Extras**, then click **GeneMapper Database Utility Wizard**.
 - For the *upgrade* DVD – Select **GeneMapper v4.1 Full Upgrade** or **GeneMapper v4.1 Server Upgrade**, then click **GeneMapper Database Utility Wizard**.
3. In the GeneMapper Database Utility Wizard window, select the task you want to perform:
 - **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.

Other tasks you can perform with the utility wizard are:

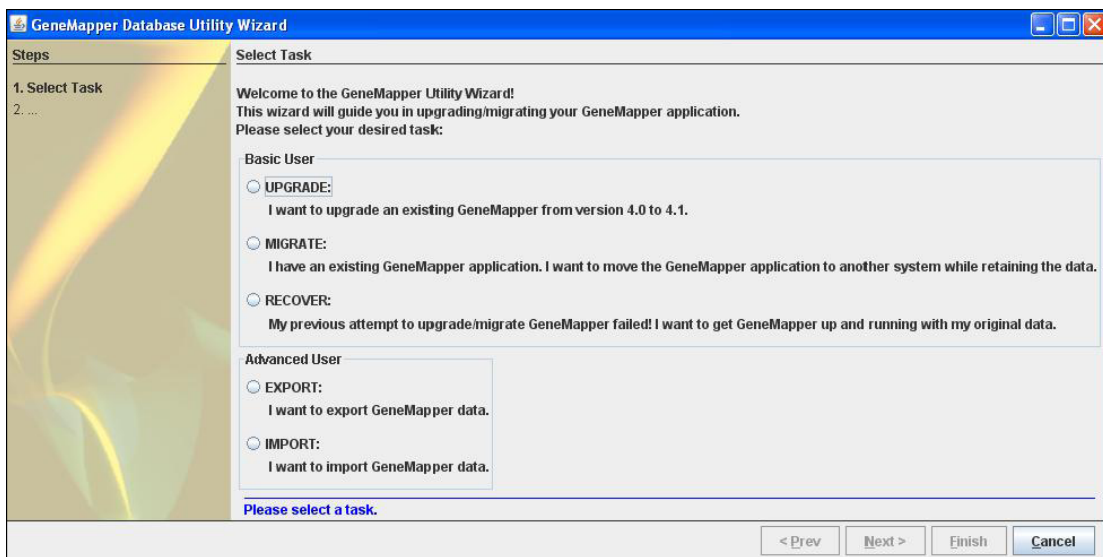
- **UPGRADE** gives a detailed description of the steps required to perform the upgrade and exports the database from the currently-installed GeneMapper Software version.

Note: The UPGRADE option only exports the database; it does not actually upgrade the GeneMapper Software.

- **MIGRATE** provides a workflow detailing how to migrate the GeneMapper Software and database from one computer to another and exports the database from the currently-installed GeneMapper Software version.

Note: The MIGRATE option only exports the database; it does not actually migrate the GeneMapper Software.

- **RECOVER** describes the workflow needed to restore the database after a failed attempt to upgrade or migrate data. This option will import the database into the version of the GeneMapper Software that was installed prior to the upgrade/migration attempt.



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**.

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



D

Software Warranty Information

This appendix covers:

- Computer Configuration 222
- Limited Product Warranty 222

Computer Configuration

Applied Biosystems supplies or recommends certain configurations of computer hardware, software, and peripherals for use with its instrumentation. Applied Biosystems reserves the right to decline support for or impose extra charges for supporting nonstandard computer configurations or components that have not been supplied or recommended by Applied Biosystems. Applied Biosystems also reserves the right to require that computer hardware and software be restored to the standard configuration prior to providing service or technical support. For systems that have built-in computers or processing units, installing unauthorized hardware or software may void the Warranty or Service Plan.

Limited Product Warranty

Limited Warranty

Applied Biosystems warrants that for a period of ninety (90) days from the date the warranty period begins, its GeneMapper® Software will perform substantially in accordance with the functions and features described in its accompanying documentation when properly installed on the instrument system for which it is designated, and that for a period of ninety (90) days from the date the warranty period begins, the tapes, diskettes, or other media bearing the software product will be free of defects in materials and workmanship under normal use. If buyer believes that it has discovered a failure of the software to satisfy the foregoing warranty, and if buyer notifies Applied Biosystems of such failure in writing during the ninety (90) day warranty period, and if Applied Biosystems is able to reliably reproduce such failure, then Applied Biosystems, at its sole option, will either (i) provide any software corrections or “bug-fixes” of the identified failure, if and when they become commercially available, to buyer free of charge, or (ii) notify buyer that Applied Biosystems will accept a return of the software from the buyer and, upon such return and removal of the software from buyer's systems, terminate the license to use the software and refund the buyer's purchase price for the software. If there is a defect in the media covered by the above warranty and the media is returned to Applied Biosystems within the ninety (90) day warranty period, Applied Biosystems will replace the



defective media. Applied Biosystems does not warrant that the software will meet buyer's requirements or conform exactly to its documentation, or that operation of the software will be uninterrupted or error free.

Warranty Period Effective Date

Any applicable warranty period under these sections begins on the earlier of the date of installation or ninety (90) days from the date of shipment for software installed by Applied Biosystems personnel. For all software installed by the buyer or anyone other than Applied Biosystems, the applicable warranty period begins the date the software is delivered to the buyer.

Warranty Claims

Warranty claims must be made within the applicable warranty period.

Warranty Exceptions

The above warranties do not apply to defects resulting from misuse, neglect, or accident, including without limitation: operation outside of the environmental or use specifications, or not in conformance with the instructions for the instrument system, software, or accessories; improper or inadequate maintenance by the user; installation of software or interfacing, or use in combination with software or products, not supplied or authorized by Applied Biosystems; and modification or repair of the product not authorized by Applied Biosystems.

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Some countries or jurisdictions limit the scope of or preclude limitations or exclusion of warranties, of liability, such as liability for gross negligence or willful misconduct, or of remedies or damages, as or to the extent set forth above. In such countries and jurisdictions, the limitation or exclusion of warranties, liability, remedies or damages set forth above shall apply to the fullest extent permitted by law, and shall not apply to the extent prohibited by law.

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	(<i>See</i> 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	<p>One of two or more alternate forms of a marker or gene.</p> <p>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.</p> <p>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.</p>
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	<p>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.</p> <p>Within the GeneMapper Software, you select a Sample Type of Allelic Ladder for the sample file generated using an allelic ladder.</p>
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 231. See “negative control” on page 230.
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	(<i>See</i> 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; Applied Biosystems 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	<p>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.</p> <p>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.</p>
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	<p>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.</p> <p>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.</p>
PQV	<p>Process Component-Based Quality Values reported by data analysis and are an aid to finding and fixing problems in sample preparation and analysis.</p>
primer	<p>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.</p>
Primer Focus[®] kit	<p>An Applied Biosystems 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.</p>
probe	<p>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.</p>
profile	<p>An identifier that gives an administrator the ability to grant or revoke access to functions.</p>
project	<p>Within the GeneMapper Software, a collection of sample files and the analysis parameters for genotyping them.</p>
project settings	<p>See “analysis parameters” on page 226.</p>
project settings	<p>Parameters set by the user to prepare a project for analysis.</p>
reference samples	<p>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.</p>

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 Applied Biosystems size standards are labeled with a red or orange dye.
SNaPshot® kit	An Applied Biosystems 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

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