Agilent Feature Extraction Software (v10.5)

Installation Guide

Use this guide to install and start the Agilent Feature Extraction Software.

What's new in v10.5

Feature Extraction (FE) version 10.5 includes the following new features and changed functions:

- Improved gridding for new Agilent microarrays with 30-micron feature size.
- eArray integration for automatic download of missing and updated templates, protocols, and QC metric sets from the eArray server.
- Tiff images in the project no longer require grid templates and/or protocols to be attached to the extraction sets to start the extraction run.
- QC metric set is associated with FE protocol and is no longer assigned to all extraction sets in the project.

Agilent Technologies

- QC metric set can no longer be specified in the Project Properties.
- New protocol step "Optimize Grid Fit" adjusts the grid to improve overall image registration.
- Improved memory usage for faster extraction and image loading of Agilent microarrays with 65-micron feature size.
- New image viewing option "View Pixels Used" for visualizing pixels used to calculate feature signal. Image viewing preferences for pixels used can also be changed.
- Improved QC Report includes sample name field and streamlined QC metrics relevant to the CGH application.
- Improved XML output file for FENoWindows contains segregated extraction run messages, STATS table, output file paths, and sample names for the extraction set.
- FENoWindows can get barcode from the tiff image file.
- QC Reports and XML outputs support the new field "Sample name (red/green)". The red and green sample names for the microarray can be entered by the user in the new Sample Management utility (available in February 2009).

Where to find more information

Quick Start Guide   Find the first steps to learn how to use the Agilent Feature Extraction Software after installation.

User Guide   Find detailed instructions for using the Feature Extraction Software, as well as definitions and explanations for the fields on the screens.

    Chapter 1– Working with Feature Extraction

    Chapter 2– Extracting Microarrays Automatically

    Chapter 3– Creating Grid Files and Templates

    Chapter 4– Changing Protocol Settings

    Chapter 5– Changing Image Displays

Reference Guide   Find detailed information on protocols, results and Feature Extraction algorithms.

    Chapter 1 – Default Protocol Settings

    Chapter 2 – QC Report Results

    Chapter 3 – Text File Parameters and Results

    Chapter 4 – MAGE-ML/GEML Results

    Chapter 5 – How Algorithms Calculate Results

    Chapter 6 – Command Line Feature Extraction

QC Chart Tool Instructions   Learn how to set up your own QC metrics and do run charting. This is a user-contributed document.

System requirements

Check that you have the following capabilities and virtual memory settings prior to installing and using Agilent Feature Extraction software (v10.5):

Software

- Windows Server 2003 SP1
- XP Professional 32 SP2
- XP Professional 64 SP2 (PDF QC report and PDF QC Chart are not supported)
- Vista 32 Business Edition
- Vista 64 Business Edition (PDF QC report and PDF QC Chart are not supported)
- Internet Explorer 6 or later
- Adobe Acrobat Reader 5 or later

Hardware

- Pentium IV 3 GHz or higher (Dual Core system recommended)
- 2 GB RAM (3-4 GB with 64-bit OS recommended for 2- and 3-micron scans)
- 40 GB available disk space
- PC must be able to load SQLExpress SQL Server 2005.

Virtual Memory

- Check that the virtual memory page file allows for at least 4GB of virtual memory.
- For the Windows XP operating system, use these instructions to access the Virtual Memory setting:

Using the Windows XP Classic view

1 Open the **Control Panel**.

2 Double-click **System**, and click the **Advanced** tab.

3 Click **Settings** (Performance) **> Advanced > Change** (Virtual Memory).

4 Under paging file size for selected drive, make sure the initial size and the Maximum size are both 4096 MB or greater.

Using the Windows XP Category view

1 Open the **Control Panel**.

2 Click **Performance and Maintenance**.

3 Click **System**, and click the **Advanced** tab.

4 Click **Settings** (Performance) > **Advanced** > **Change** (Virtual Memory).

5 Under paging file size for selected drive, make sure the initial size and the Maximum size are both 4096 MB or greater.

NOTE   True 32-bit systems cannot set virtual memory as high as 4096 MB, but Windows XP can increase the address space for larger applications, as long as the hardware supports it.

Step 1. Set up to install the example images (optional)

You must install the example images to do the exercises in the *Agilent Feature Extraction Quick Start Guide*. The images use a separate installer than that for the software.

- To install the example images automatically when Feature Extraction software installs, place the example image installer in the same directory as the v10.5 installer directory. (If you are installing from a CD, the example image installer is already on the CD.)

- If the image installer is not located in the same directory as the v10.5 installer, you must go to the image installer directory and install the images from there. You can do this either before or after software installation.

Step 2. Determine the type of FE installation you need

There are two types of Feature Extraction installation. Depending on what version is currently installed on the computer, you can install FE 10.5 as a new installation or as an upgrade installation.

New installation

You must install Feature Extraction as a new installation if *any* of the following is true.

- Feature Extraction is not installed on the computer.
- Feature Extraction v9.5.x or earlier is currently installed on the computer.

FE v10.5 uses a different database schema than the one provided in FE v9.5x or earlier. For this reason, if the computer is installed with FE v9.5.x or earlier, you must install FE v10.5 as a new installation.

The database server included in FE installation is used by both the FE software and the QC Chart Tool (if installed). Any data stored on the current database server for FE v9.5 or earlier will be lost when you install FE v10.5. Therefore, before the new installation:

- Export any *user-created* FE protocols and QC metric sets from Feature Extraction.

  You can import or add the exported protocols and QC metric sets back to the new database after the new FE is installed.

- Backup QC Chart Tool database (if installed).

Go to if you need to install FE v10.5 as a new installation.

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Update installation

If FE v10.1 or v10.2 is currently installed on the computer, you can install Feature Extraction as an update installation. You can also install the software as a new installation.

FE v10.5 uses the same database schema as the one provided in FE v10.1 and v10.2. For this reason, you do not need to export user-created protocols and QC metric sets from FE nor backup QC Chart Tool database before you update to v10.5.

Go to "Step 5. Install FE as a update installation" on page 18.

NOTE   If you plan to use a MySQL database instead of the SQLExpress database that Agilent provides:
- You must install the MySQL database prior to installing the Feature Extraction software. See "To install and configure a MySQL database" on page 26 and MySQL documentation for installation instructions.
- The QC Chart database will not be available with the Feature Extraction installation, if you chose to use MySQL database.

Step 3. Install FE as a new installation

You must have administrative privileges to install Feature Extraction Software.

1 Back up your QC Chart Tool database using the **Backup Restore Utility** if you have QC Chart Tool installed and you want to save your data. For detailed instructions, see "To back up QC Chart Tool Database" of the *QC Chart Tool User Guide* (G4460-90022) included in FE installation CD. You can also download the *QC Chart Tool User Guide* from the Agilent Web site at www.agilent.com/chem/feqcmetrics.

2 Export any user-created FE protocols and QC metric sets from the previous Feature Extraction version. For detailed instructions, see "Import or export a protocol to or from the database" on page 91 of the Feature Extraction User Guide.

3 Remove the previous version of Feature Extraction before you install the new version. See "To remove Feature Extraction" on page 31 for detailed instructions.

4 Start Feature Extraction new installation:
- If you are installing from an original CD, insert the CD into the CD drive. If the installation program does not start automatically, double-click **Setup.exe** on the installation CD.

- If you are installing from a file downloaded from the Agilent Web site, double-click **FeatureExtraction10_5_1Setup.exe** in the folder that you saved the file.

5 On the **Welcome** page of the Feature Extraction – InstallShield Wizard, click **Next**.

6 Accept the terms of the license agreement, then click **Next.**

In the InstallShield Wizard, the next page prompts you to decide whether to use the provided MSSQL database or a third-party database (only MySQL is supported).

Step 4. Select a database to install

- If you plan to use Agilent's SQLExpress database, continue with "To use the Microsoft SQL database" on page 9.

- If you plan to use MySQL instead, continue with "To use a MySQL database" on page 13.
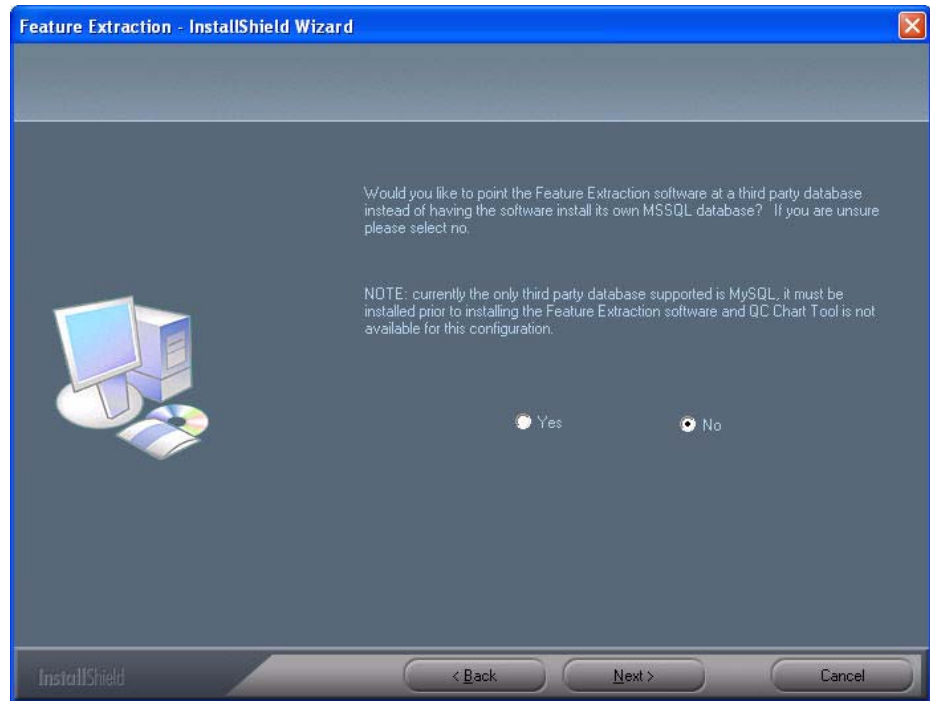
To use the Microsoft SQL database

Would you like to point the Feature Extraction software at a third party database instead of having the software install its own MSSQL database? If you are unsure please select no.

NOTE: currently the only third party database supported is MySQL, it must be installed prior to installing the Feature Extraction software and QC Chart Tool is not available for this configuration.

○ Yes   ● No

Figure 1   Specifying MSSQL database

1 To use the MSSQL database, select **No** (the default).

2 Click **Next**.

The **Select Features** page appears with components to be installed. It also shows the amount of space required and available on the destination drive for the installation. For a successful installation, check that you have enough disk space required for the installation.
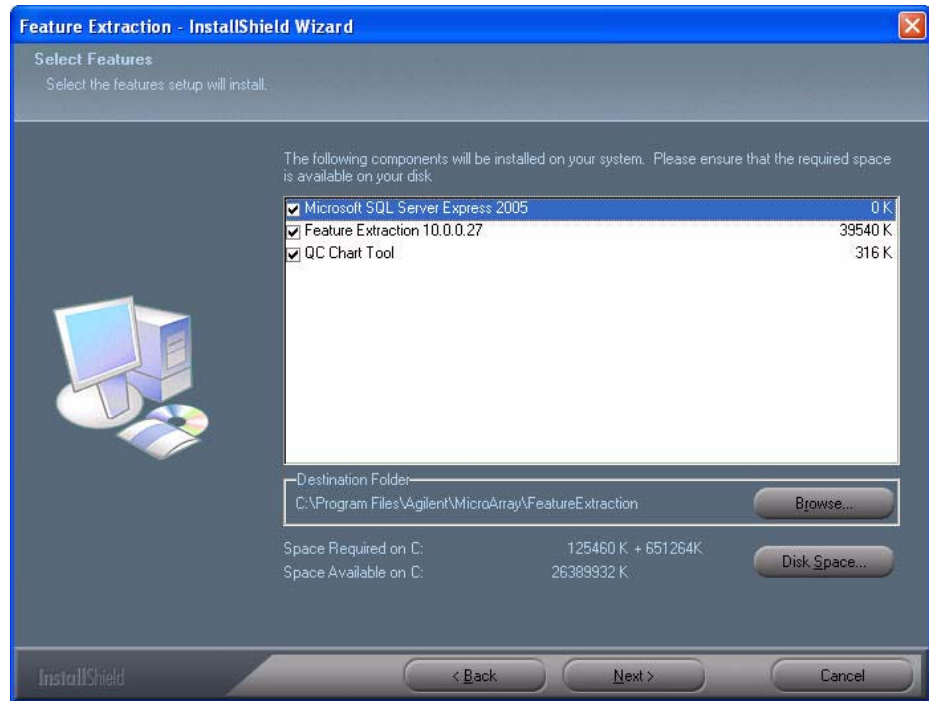
Figure 2   Select Features page

3 Click **Next** to proceed.

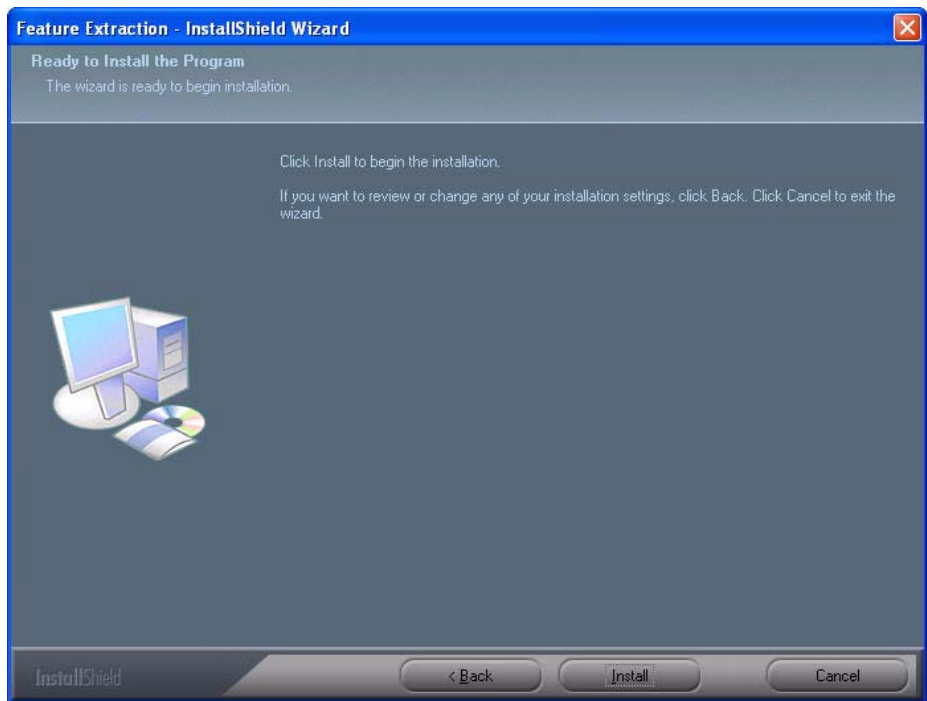**4** Click **Install** to start installing the components displayed in Figure 2.

Figure 3 Ready to Install the Program page

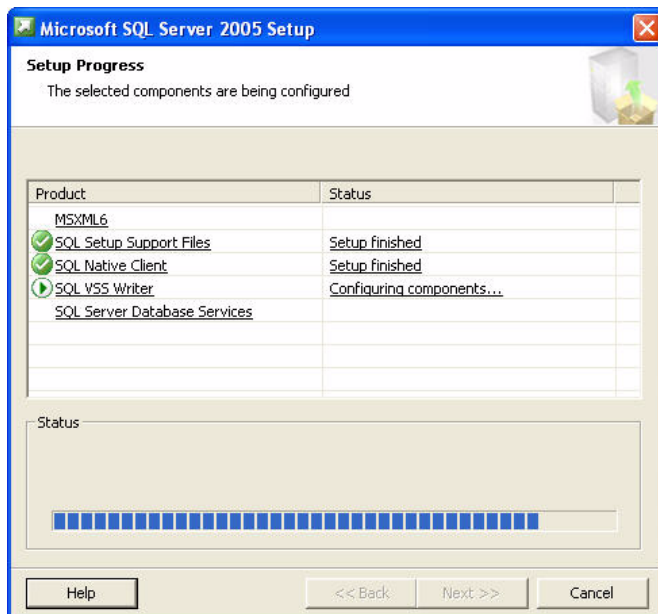After a short while, the InstallShield Wizard displays the Setup Progress page shown below.

Figure 4   MSSQL Setup Progress page

5 When the InstallShield Wizard is finished installing the database, click **Next**.

6 When installation is complete, click **Finish** to restart your computer.

7 Configure the QC Chart Tool database.

For detailed instructions, see "To configure the QC Chart Tool Database" in the *QC Chart Tool Installation and Configuration Guide* (G4460-90021) included on the FE installation CD. You can also download the *QC Chart Tool Installation and Configuration Guide* from the Agilent Web site at www.agilent.com/chem/feqcmetrics.

8 If you have a backup of the QC Chart Tool database, you can restore the saved database to the new database server that was included with Feature Extraction.

For detailed instructions, see "To restore the QC Chart Tool Database" in the *QC Chart Tool User Guide* (G4460-90022) included on the FE installation CD. You can also download the *QC Chart Tool Installation and Configuration Guide* from the Agilent Web site at www.agilent.com/chem/feqcmetrics.

9 If you have exported user-created FE protocols and QC metric sets from Feature Extraction, you can import them back.

For detailed instructions, see "Import or export a protocol to or from the database" on page 91 and "To import or export a QC Metric Set to or from the database" on page 93of the Feature Extraction User Guide.

10 If you start Feature Extraction after restarting your computer, you will get an error message saying that a license does not exist. You must set up a valid license to run Feature Extraction. See "Step 6. Set up a valid license" on page 21.

To use a MySQL database

If you plan to use a MySQL database instead of the MSSQL database that Agilent provides:

- You must install the MySQL database before you install the Feature Extraction software. See "To install and configure a MySQL database" on page 26 and MySQL documentation for installation instructions.
- The QC Chart database will not be available to your Feature Extraction installation, if you choose to use MySQL database.

NOTE The QC Chart Tool only works with the Microsoft SQLServer Express 2005 that is included in the Feature Extraction installation.
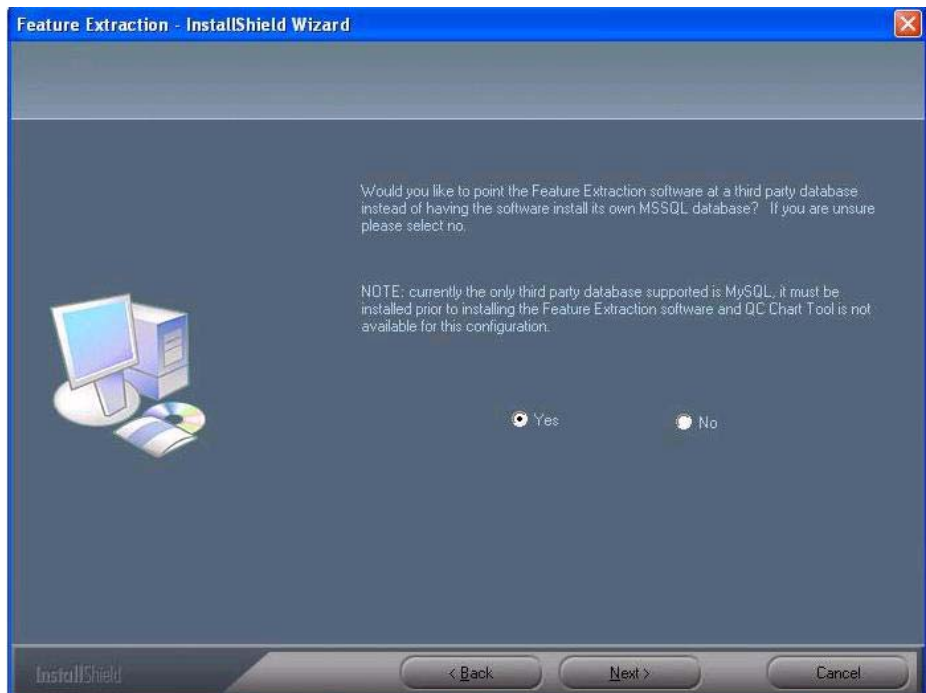
The following steps continue from Figure 1 on page 9.

Figure 5   Specifying the use of a third-party database

1 Select **Yes** to install third-party database instead of the MSSQL database included in Feature Extraction software.

2 Click **Next**.

3 Enter the appropriate configuration information.

  a Accept the default MySQL server host name, **LocalHost**, in the **Server Host** text box. This default causes the software to look on the local machine for the database connection.

  b Accept the default port displayed in the **Port** text box, unless you are certain that you need to use a different port and you know the port number.

  c Make sure the **Username** text box says **root**.

  d Type the password for the user **root** in the **Password** text box. The **Password** text box displays dummy characters for security reasons.
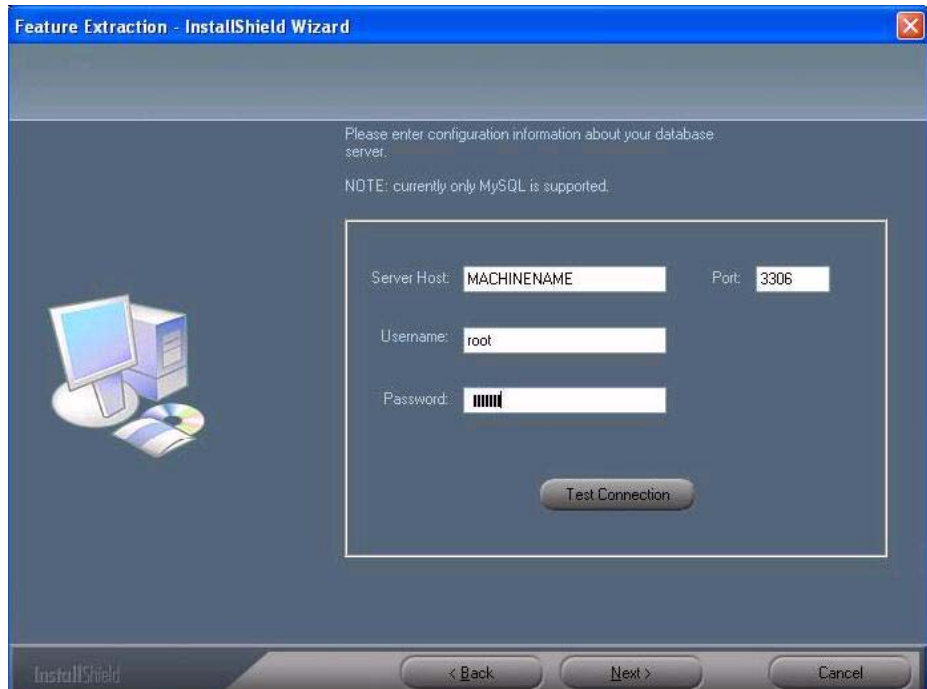
Figure 6   Configuration page for using a MySQL database

4 Click **Test Connection** to make sure the Feature Extraction host machine can communicate with the MySQL server host machine.

If the connection fails, make sure you have entered the MySQL server information correctly in the page shown in Figure 6. Also, make sure you installed the MySQL software according to the steps listed in "To install and configure a MySQL database" on page 26.

5 Click **Next**.

The **Select Features** page appears with components to be installed. It also shows the amount of space required and available on the destination drive for the installation.
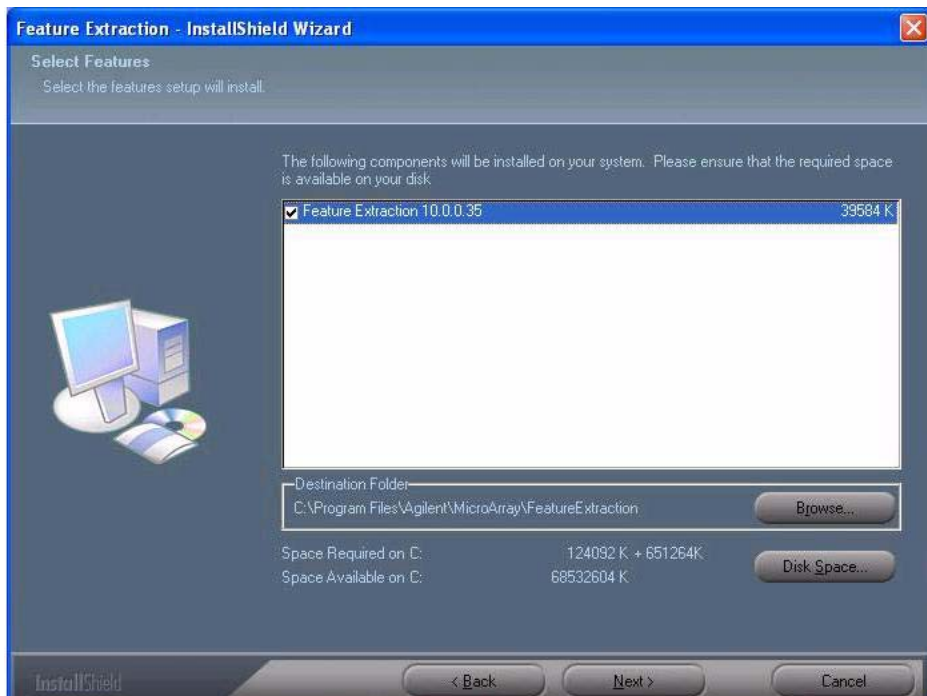
Figure 7   Select Features page
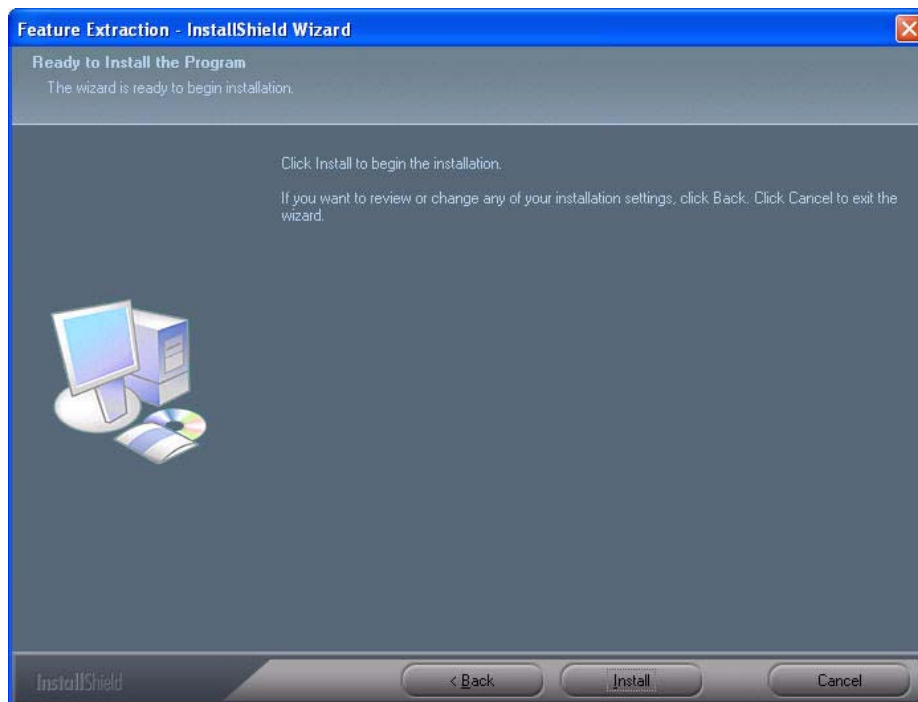
6 Click **Next** to proceed.

Figure 8   Ready to Install the Program page

7 Click **Install** to start installing Feature Extraction software.

8 When the InstallShield wizard is finished installing the database, click **Next**.

9 When installation is complete, click **Finish** to restart your computer.

10 If you have exported user-created FE protocols and QC metric sets from Feature Extraction, you can import them back.

For detailed instructions, see "Import or export a protocol to or from the database" on page 91 and "To import or export a QC Metric Set to or from the database" on page 93of the *Feature Extraction User Guide*.

11 If you start Feature Extraction after restarting your computer, you will get an error message saying that a license does not exist. You must set up a valid license to run Feature Extraction. See "Step 6. Set up a valid license" on page 21.

Step 5. Install FE as a update installation

You can update to Feature Extraction v10.5 from v10.1.1.1 or v10.2.1.3 without having to remove the previous version. Before starting the update installation, verify that your current FE license is good toward the new version. Current license information can be found under FE menu **Help > About**. To learn more about FE licenses, see "Types of licenses" on page 21.

NOTE   If you have Feature Extraction v9.5.3.1 or earlier, you must remove the previous version first before you install v10.5, see "Step 3. Install FE as a new installation" on page 7.

1 Start the update installation:
   - If you are installing from an original CD, the installation program starts automatically. If it does not, double-click **Setup.exe** on the CD drive.
   - If you are installing from a file downloaded from the Agilent Web site, double-click **FeatureExtraction10_5_1Setup.exe** in the folder that you saved the file.
2 On the **Welcome** to Feature Extraction Upgrade – InstallShield Wizard, click **Next**.

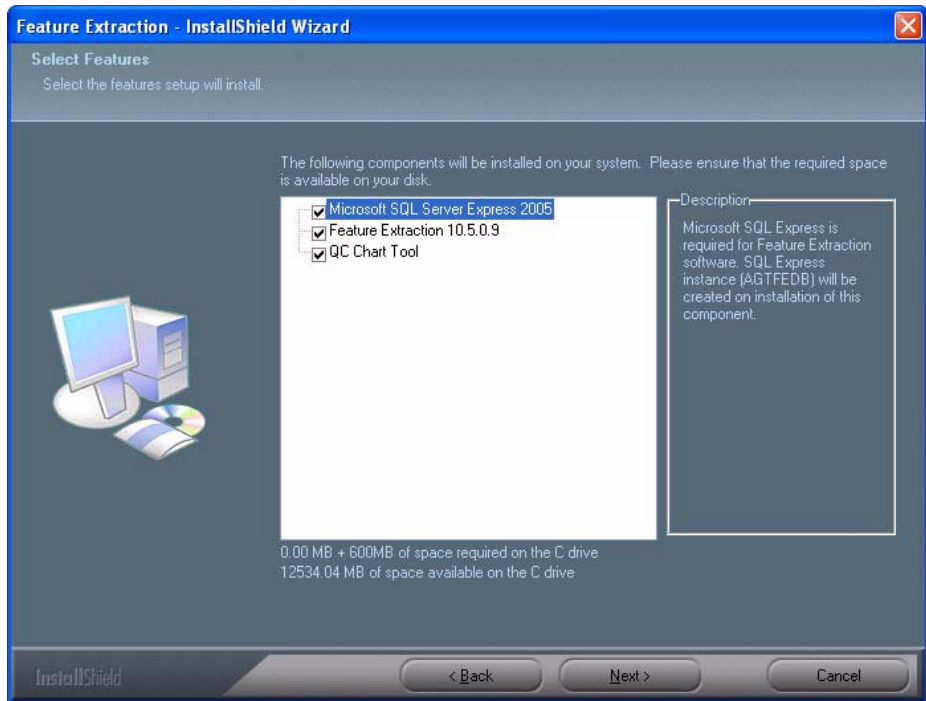   The **Select Features** page appears with components to be installed.

Figure 9   Select Features page

3 Click **Next** to proceed.

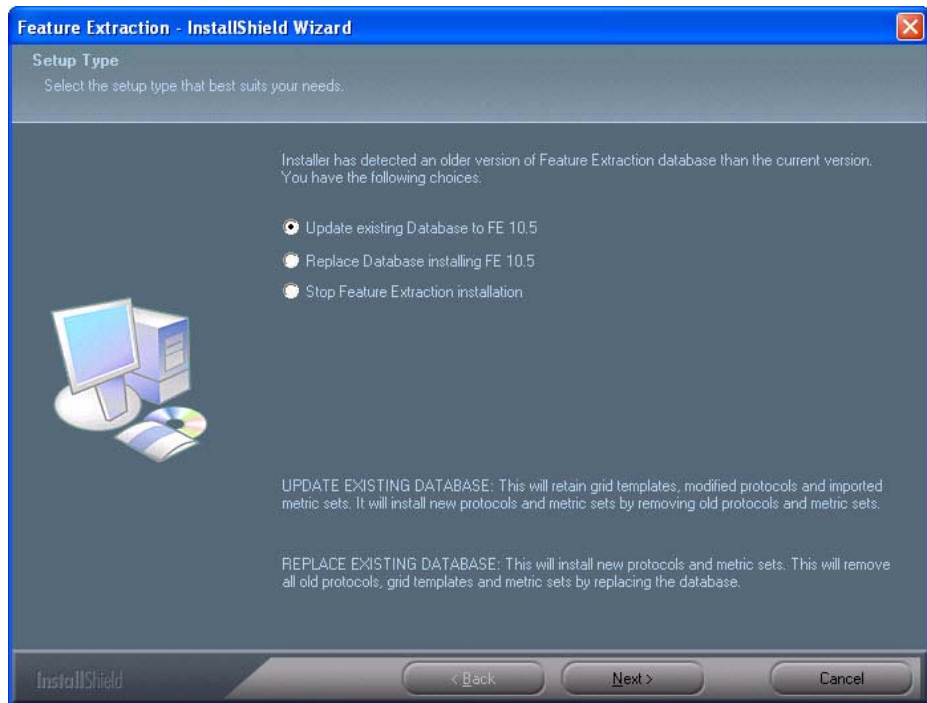| CAUTION	Make sure you have enough disk space. Otherwise Feature Extraction can fail to install and your database can be corrupted.

Figure 10   Setup Type page

4 Select the appropriate FE database set up type, and click **Next** to start installing the components displayed in Figure 9.

5 When update installation is complete, click **Finish** to restart your computer (default option).

If your current license is good for the new version, you will see FE _Project1 in the Project Explorer pane when you open FE after restarting the computer.

If your current license is not valid, you will get an error message saying that a license does not exist. You must set up a valid license to run Feature Extraction. See "Step 6. Set up a valid license" on page 21.

NOTE   If you are installing MySQL database as an upgrade installation, you will be asked if you want to replace your existing database. Click No to install MySQL as an update installation. Click Yes to install as a new installation, which will wipe out your existing database.

Step 6. Set up a valid license

Types of licenses

Agilent supplies two kinds of licenses: demo and perpetual.

Demo

If you want to try the FE before purchasing, you can download a 30-day demo license from the Agilent Web site at www.agilent.com/chem/fe.

The demo license expires 30 days from the date you download it. If you install the demo license on the same day that you downloaded it, Feature Extraction will work for the next 30 days. However, if you waited until day 20 to install the downloaded demo license, the software will only work for the remaining 10 days.

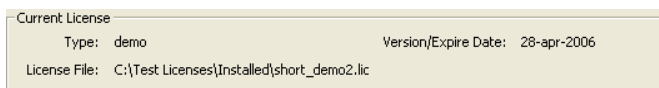- To view when your demo license expires, select **Help > About**.

Figure 11   Current License Information - Demo

Perpetual

When you purchase Feature Extraction software, Agilent provides you with a perpetual license.

- • Perpetual license never expires.
- • Perpetual license is good for the current software version released at time of purchase.
- • Perpetual license is good toward new software versions released within the license term (1-year, 2-year, and 3-year licenses are available).
- To view the date that your perpetual license is still good toward new software versions, select **Help > About**.
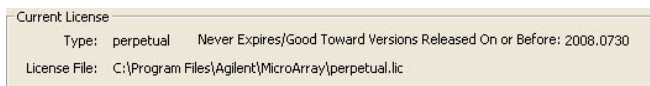

Figure 12   Current License Information - Perpetual

The date "2008.0730" shown in Figure 12 indicates that the license is good towards new software versions released on or before July 30, 2008.

Instructions to set up a valid license depend on several situations:

• If you want to try the software first before you purchase
• If you have purchased a new version or an upgrade
• If your license is about to expire or has expired, or is invalid

<table>
<tr><td>**CAUTION**</td><td>Because the Feature Extraction license uses the Ethernet MAC address as host ID, the license will become invalid if you remove or change Ethernet cards.</td></tr>
</table>

If you want to try the software first before you purchase

Follow the instructions to demo the software before purchase.

1 Go to www.agilent.com/chem/fe and click **Download Trial License** located on the lower left side of the Web site.

2 Download the 30-day trial license and the Feature Extraction software, according the Web site.

   You must register at the Agilent site to do this.

3 Install the software according the instructions in this guide.

   When you open the Feature Extraction main window after restarting the computer, you see the following error message.
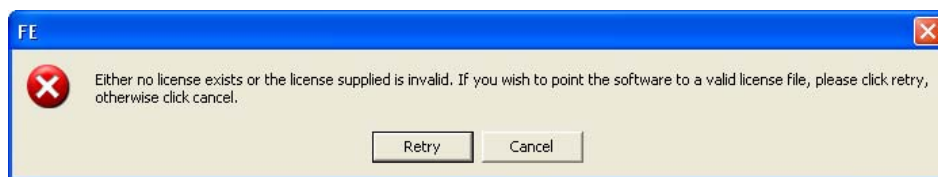

Figure 13   No License Exists message

4 Temporarily ignore this message and go to the folder where you saved the 30-day trial license file.

5 Unzip the 30-day trial license file

6 Save the unzipped license file to the following directory (on the drive where you installed the software):

   Program Files\Agilent\Microarray

   Or, you can place the license anywhere you want.

7 Return to the FE main window, and click **Retry**.
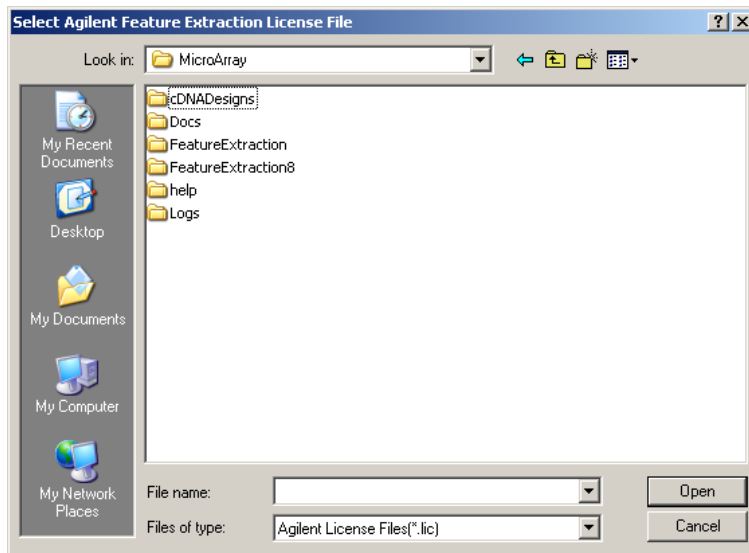
Figure 14 appears.

Figure 14   Select Agilent Feature Extraction License File Browser

8 Find the directory that contains the unzipped license file.

9 Select the license file (.lic), and click **Open**.

You are now ready to work with a project.

If you bought a new version of the software (with or without an Agilent scanner)

When you purchase Agilent Feature Extraction software, you receive a Software Entitlement Certificate (SEC). To redeem your purchased license, you must go to the Agilent Software License Redemption Web site and use the information on the certificate.

These instructions assume that you have already installed the software.

1 Start the Feature Extraction program. If Figure 13 appears, click **Cancel**.

2 Select **Help > Agilent License**. This will launch the Internet browser to the Agilent Software License Redemption Web site.

Have the following items available:

- **Software Entitlement Certificate (SEC)** - This PDF contains the Order Number and Certificate Number that you need to provide in order to redeem your purchased license.

- **Host ID** - This can be found under the menu **Help > About**. You need to provide the host ID to redeem your purchased license.

3 Follow the instructions on the Agilent Software License Redemption Web site to redeem your license.

After redeeming the license on line, you will receive an email with the license attached.

4 Save the license file to the following directory (on the drive where you installed the software):

Program Files\Agilent\Microarray

Or, you can place the license file anywhere you want.

5 If the Feature Extraction program is already running, open a project. Otherwise, double-click the Feature Extraction icon to open a project.

Figure 13, "No License Exists message," on page 22 appears:

6 Click **Retry**.

Figure 14, "Select Agilent Feature Extraction License File Browser," on page 23 appears.

7 Find the directory that contains the license file.

8 Select the license file (.lic), and click **Open**.

Feature Extraction opens automatically with FE_Project1.

If your license has expired or is invalid for the software version

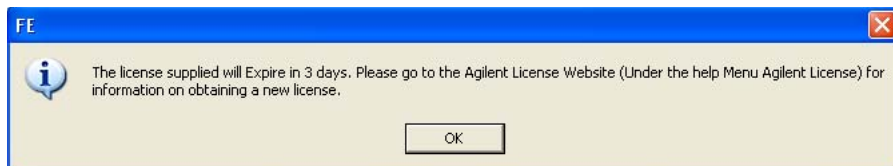The software warns you 20 days before your license file expires. The following message appears.

Figure 15 License Will Expire

Without a valid license you can still open an image, import templates and protocols, set up preferences and change protocols. You cannot open a project or open Grid Mode for manual gridding.

If you try to open a project in Feature Extraction and your license has expired or is not valid for the software version, an error message appears saying that your license has expired or is invalid.

You can acquire a valid FE v10.5 license by contacting Agilent.

1 Call your local sales representative or go online to www.agilent.com/chem/wheretobuy to purchase a new license.

After your purchase, you receive a Software Entitlement Certificate.

2 Start the Feature Extraction program and select **Help > Agilent License**.

Have the following items available:

- **Software Entitlement Certificate (SEC)** - This PDF contains the Order Number and Certificate Number that you need to provide in order to redeem your purchased license.
- **Host ID** - This can be found under the menu **Help > About**. You need to provide the host ID to redeem your purchased license.

3 Follow the instructions on the Agilent Software License Redemption Web site to redeem your purchased license.

After redeeming the license on line, you will receive an email with the license attached.

4 Save the license file to the same path as your previous license.

You are now ready to work with a project.

To install and configure a MySQL database

Feature Extraction v10.5 uses ODBC to interact with the database, so users installing MySQL need to install the MySQL Server (http://dev.mysql.com/downloads/mysql/5.0.html) and the Connector/ODBC - MySQL ODBC driver (http://dev.mysql.com/downloads/connector/odbc/3.51.html).

FE 10.5 has been tested against MySQL 5.0.51 on Windows XP, and MySQL 5.0.45 on Windows Vista. The ODBC-tested ODBC driver is Connector/ODBC 3.51.

You must install the MySQL database software before installing FE. If you wish to switch to MySQL after installing FE, then you must remove FE, install MySQL, and reinstall Feature Extraction.

NOTE   Agilent does not support use of FE with a remote database. Install MySQL on the same computer as Feature Extraction.

System requirements

Read the system requirements for MySQL software in the MySQL documentation, and make sure you have the required capabilities and virtual memory settings prior to installing MySQL software for use with Agilent Feature Extraction software (v10.5).

Make sure that you install the appropriate release of MySQL database software according to the following table.

Windows operating system version	MySQL release	MySQL installation file name
Windows 2000 32 SP4	5.0.51	mysql-essential-5.0.51a-win32.msi
Windows 2003 32 SP1	5.0.51	mysql-essential-5.0.51a-win32.msi
XP Professional 32 SP2 or later	5.0.51	mysql-essential-5.0.51a-win32.msi
XP Professional 64 SP2 or later	5.0.51	mysql-essential-5.0.51a-winx64.msi
Vista 32 Professional SP1 or later	5.0.45	mysql-essential-5[1].0.45-win32.msi
Vista 64 Professional SP1 or later	5.0.45	mysql-essential-5[1].0.45-winx64.msi

NOTE   On Vista systems, you must use MySQL release 5.0.45, not 5.0.51.

1 Log onto the computer on which you will install both Feature Extraction and MySQL, using a user name (such as Administrator) with administrative privileges.

2 Start the MySQL installer (for example, **mysql-essential-5.0.51-win32.msi**).

The system launches the MySQL Setup Wizard.

3 Click **Next**.

4 In the Setup Type page, accept the default option, **Typical**, and click **Next**.

5 The Setup Wizard displays the Ready to Install the Program page. Click **Install**.

6 Click **Next** until the Setup Wizard displays the Wizard Completed page.

Figure 16 The MySQL Wizard Completed page, prior to configuration

7 Make sure the **Configure the MySQL Server Now** check box is marked. Click **Finish**.

The system displays the MySQL Server Instance configuration wizard.

8 Click **Next**.

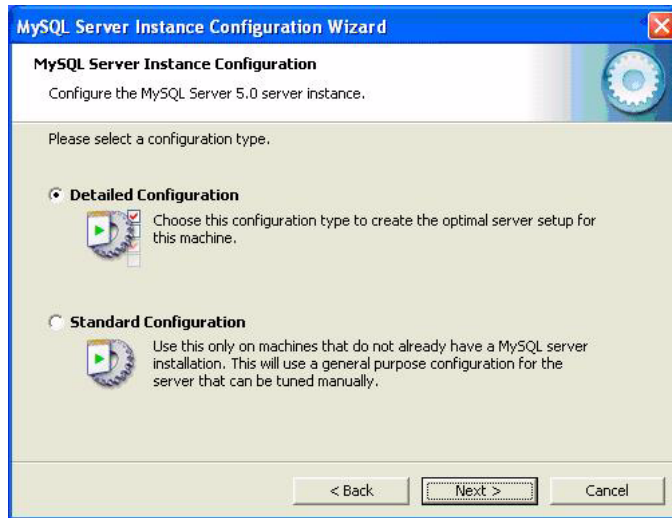The configuration wizard prompts you to select a configuration type.

Figure 17   Selecting a configuration type

9 Select **Detailed Configuration**, and click **Next**.

10 Select **Server Machine** as the server type, and click **Next**.

11 Accept the default "database usage" option, **Multifunctional Database**, and click **Next**.

12 Accept the default number of concurrent database connections, **Decision Support (DSS/OLAP)**. This option allows up to 20 concurrent database connections. Click **Next**.

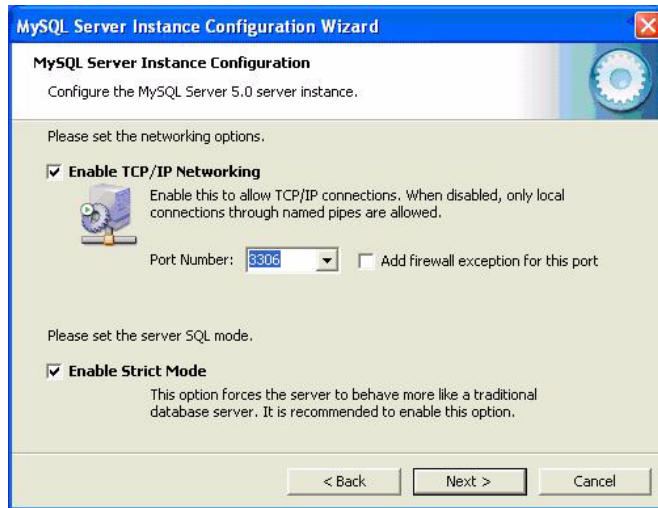13 The configuration wizard displays the networking options page. Accept the default values, and click **Next**.

Figure 18   Networking options page

14 Accept the default option, **Standard Character Set**, and click **Next**

15 The configuration wizard displays the Windows options page. Mark the **Include Bin Directory in Windows PATH** check box; both check boxes on the page should be marked. Click **Next**.

Figure 19   Configuring the Windows options

If you do not select the **Include Bin Directory in Windows PATH** option, you will be unable to back up your Feature Extraction data using the Backup Restore Utility.

16 On the security options page:

   a Type the password for the user **root**.

   b Mark the **Enable root access from remote machines** check box. (Even though the MySQL database is on the same machine as the Feature Extraction software, the connection appears to be remote. MySQL cannot distinguish between this type of ODBC connection and a remote connection.)

   c Click **Next**.

Figure 20   The security options page

If you do not select the **Enable root access from remote machines** option, you will be unable to successfully complete Feature Extraction installation.

17 The configuration wizard displays the Processing Configuration page.

18 Click **Finish**.

To remove Feature Extraction

If you need to remove a previous version of Feature Extraction before you install v10.5, you can do so using the Add or Remove Programs from the Windows Control Panel.

1 Click Windows **Start** button and select **Control Panel**.

2 Double-click **Add or Remove Programs**.

3 Select **Feature Extraction** from the **Currently installed programs** list, and click **Remove**.

4 When the remove is complete, restart the computer.

After you restart the computer, see step 4 to start Feature Extraction new installation.

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In this guide

This guide contains the system requirements and brief instructions to show you how to:

- Install the software
- Install the example images
- Set up a valid license

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