General Information

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Safety information

See the operator’s guides of the instruments or devices associated with this software product for information on how to safely operate and maintain them.
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1 Introduction to Driver Pack 4

Driver Pack 4 contains the instrument drivers and firmware required to control Waters® instruments. It also contains the Console, Columns Calculator, and Connections INSIGHT applications.

This document explains the installation process for Driver Pack 4, which varies according to the laboratory environment:

- Installation on standalone workstations
- Installation in Empower® client/server environments

The installation process is simplified for both scenarios and greatly improved for Empower client/server environments. The previous requirement that the same driver pack be installed on all computers on an Empower client/server network no longer applies, reducing the need for requalification.

The following sections provide overviews of the two installation processes.

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Introduction to Driver Pack 4

Installation on standalone workstations

Standalone workstations run data systems such as Empower Personal software or MassLynx® software and are connected directly to the instruments they control.

The installation process for standalone workstations consists of installing Driver Pack 4 on the workstation, and then loading the firmware installed by Driver Pack 4 on the instruments connected to the workstation.

**Note:** Instruments connected to a standalone workstation running Driver Pack 4 must be running the Driver Pack 4 firmware or compatible firmware. See Appendix B for firmware compatibility information.

Installation in Empower client/server environments

Empower client/server environments comprise many computers connected through a network. The computers relevant to the Driver Pack 4 installation process are the Empower LAC/E®32 modules, Citrix® servers, and Empower clients.

When Driver Pack 4 is installed on a LAC/E32 module, the Driver Pack 4 firmware must be installed on the instruments connected to that module. Driver Pack 4 must also be installed on any Empower clients or Citrix servers connected to the LAC/E32 module. Unlike previous driver packs, however, Driver Pack 4 is not required on all LAC/E32 modules in an Empower client/server network.

You can now run multiple driver-pack versions on the same network. This feature makes possible the addition of new systems to the network without upgrading and requalifying the existing LAC/E32 modules. Driver Pack 1.40, the June 2010 Supplemental 2 Driver Pack, and June 2011 Driver Pack support this feature.

**Requirement:** Instruments must run firmware included in the driver pack installed on the LAC/E32 module that they are connected to or other compatible firmware. See “Compatibility Information for Empower Enterprise Networks” on page 57 for firmware compatibility information.
2 Installation Process

The Driver Pack 4 DVD includes instrument drivers and their associated firmware files, as well as a deployment manager and firmware autoloader. The Driver Pack 4 Deployment Manager installs instrument drivers and firmware files on a computer. The Autoloader updates firmware on the instruments connected to the computer.

Notes:

• Installing Driver Pack 4 does not affect existing instrument methods. Methods you developed and used with previous instrument driver and firmware versions work equally well with Driver Pack 4. Nor are other instrument settings and parameters entered in the console software affected.

• Upgrades to Driver Pack 4 can only be done from Driver Pack version 1.40, June 2010 Driver Pack, and June 2011 Driver Pack. You cannot use Driver Pack 4 to upgrade driver packs prior to version 1.40.

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Where to install in Empower environments

Where you install Driver Pack 4 depends on the configuration of computers and instruments in your laboratory. Empower environments comprise three configurations:

- Standalone, Empower Personal workstations.
- One or more LAC/E32 modules connected to Empower clients in an Empower Enterprise system.
- One or more LAC/E32 modules connected to Citrix thin clients via a Citrix server in an Empower Enterprise system.

Requirements:

- You can install Driver Pack 4 on standalone workstations as desired.
- You can install Driver Pack 4 on LAC/E32 modules as desired.

Exception: Do not install Driver Pack 4 on Empower database servers or Citrix thin clients.

Note: The latency limit for running Driver Pack 4 instrument drivers on wide-area networks is 300 milliseconds.
Preparing to install

Before you install Driver Pack 4, prepare your system:

• Always use the Deployment Manager included with Driver Pack 4. Do not use earlier versions.
• Exit all applications, and restart the computer.
• For installation on any computer, you must be logged in as a local administrator to install Driver Pack 4.
• Install data system software first, including service packs or SCNs.
• If you must install third-party instrument drivers, do so before you install Driver Pack 4.
• If you must install Head Space Control, Empower WFC III ICS, or Agilent ICF, use the Empower DVD packaged with Driver Pack 4. See “Empower DVD” on page 53.
• If you must install Head Space Control, Empower WFC III ICS, or Agilent ICF, use the Empower DVD packaged with Driver Pack 4. See “Empower DVD” on page 53.
• If upgrading from a previous driver pack, and Connections INSIGHT is installed, uninstall Connections INSIGHT before installing Driver Pack 4.
• If your system configuration requires Waters instrument drivers released prior to Driver Pack 4, install them before you install Driver Pack 4.
• You need not uninstall previous versions of the driver pack when you install Driver Pack 4.
• Run Empower Verify Files prior to installing Driver Pack 4, to ensure your systems are in a good state before the installation. See “Verifying Installation” on page 29.
• Power-on all the instruments in your system.

Note: If your network includes a Citrix server, put the server in Install mode by opening a command prompt and typing “Change user /install”. The screen response states “User session is ready to install applications”.

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2 Installation Process

Deployment Manager

You perform these tasks using the deployment manager:

• Install the driver pack on a computer.
• Upgrade an existing driver-pack installation.
• Remove the driver pack from a computer.
• Repair driver-pack installations.

These restrictions apply to use of the Deployment Manager:

• You cannot change the installation directory for the instrument drivers that the Deployment Manager installs. The installation directory cannot be changed for Empower clients or MassLynx workstations.
• You can install mass-spectrometer instrument drivers on Empower clients. You cannot, however, install drivers for mass spectrometers on LAC/E32 modules or MassLynx workstations.

To launch the Deployment Manager:

1. Run Setup.exe from the Driver Pack 4 DVD.
   
   Result: The Welcome page of the Deployment Manager appears.

2. Click Next, to open the Deployment Manager’s main menu.
Installation

You can install this driver-pack release according to one of these methods:

- Install from the Driver Pack 4 DVD.
- Download and install from the Waters Web site. To do so, visit http://www.waters.com, and click Services & Support > Software Downloads. Then search for the driver-pack name. A support plan is required.

After you launch the Deployment Manager, select Install/Upgrade, confirm that you read the recommendations in the release notes and accepted the license agreement. Then select one of two installation options.

**Installation options:**

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<th>Installation option</th>
<th>Description</th>
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<td>Typical (recommended)</td>
<td>Install the contents of the Driver Pack 4 DVD in their entirety.</td>
</tr>
<tr>
<td>Custom (advanced)</td>
<td>Select which instrument drivers to install or upgrade.</td>
</tr>
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Typical installation

Select a typical installation for most system configurations. A typical installation ensures that all software files in your system are updated properly.

To perform a typical installation of Driver Pack 4:

1. Follow all of the guidelines and steps in “Preparing to install” on page 13.
2. Run Setup.exe on the Driver Pack 4 DVD.
3. On the Welcome page of the Deployment Manager, click Next, and then select Install/Upgrade.
4. Confirm that you read the release notes, and then click Next.
5. Accept the Waters Software License Agreement, and then click Next.
6. Select Typical.
   
   Result: An Options dialog box appears. The options available depend on whether yours is an Empower installation or a non-Empower installation.

7. For Empower installations:
   a. By default, instrument drivers for the Waters SQ Detector and Waters TQ Detector are installed. If you do not want to install the drivers, clear the Install Mass Spectrometers check box. This option applies to Empower clients only, not to LAC/E32 modules.
   b. If you want to install drivers for the mass spectrometers, select which mass spectrometer you want to control. Select None if you intend only to view mass-spectrometer data.
   c. By default, Connections INSIGHT is installed. If you do not want to install Connections INSIGHT, clear the Connections INSIGHT check box.
   d. Click OK.
For non-Empower installations:

a. By default, Connections INSIGHT is installed. If you do not want to install Connections INSIGHT, clear the Connections INSIGHT check box.

b. Click OK.

**Result:** A list of the instrument drivers and utilities that will be installed on the computer appears along with a list of the firmware files that will be deployed to the computer.

8. Review the list of instrument drivers and utilities for accuracy, and then click Next, to start the installation and deployment operation.

**Tip:** To change settings before installing, click Back.

**Note:** Although installation times vary, usually all instrument drivers are installed in approximately 20 minutes.

9. After installation is complete, click Finish.

**Result:** The Autoloader launches automatically and selects the instruments that require firmware updates.

**Tips:**

- To locate the firmware file for a particular instrument, move the pointer over the instrument’s name.
- If the firmware file for a particular instrument was not deployed, the Autoloader displays the message, “Firmware not available”. To obtain the necessary firmware file, install the corresponding instrument driver.
- Allow all of the instruments in your system to initialize before you start the Autoloader. If you start the Autoloader too soon after you power-on or cycle power to an instrument, the Autoloader sometimes displays the message “Determining instrument status” or “Communications failure” for the instrument.

**Requirement:** Instruments connected to a workstation or LAC/E32 module running Driver Pack 4 must use the firmware included with Driver Pack 4. Driver Pack 4 cannot control instruments running earlier firmware.
2 Installation Process

10. Click Load Firmware, to load the latest firmware on each of the instruments.

**Tip:** If the Autoloader application fails to begin to load the firmware, or if it fails to complete the process successfully, re-run Autoloader.exe from one of the following locations:

- For Empower systems: `C:\Empower\Instruments\Firmware`
- For MassLynx or third-party data systems: “`C:\Program Files\Waters Instruments\Firmware`” on 32-bit machines, or “`C:\Program Files (x86)\Waters Instruments\Firmware`” on 64-bit machines

**Important:** To avoid corrupting the firmware, do not cycle power to any instrument in the stack until all firmware is loaded.

11. When the Autoloader indicates firmware is loaded for all instruments that require updates, cycle power to the instruments, as prompted in the Autoloader, and then click Close.

12. Restart the computer when prompted.
Installation

**Custom installation**

Select a custom installation *only* if your system configuration is incompatible with a typical installation.

When you select a custom installation, all instrument drivers are selected by default. Clear the selections of instrument drivers that you do not want to install.

**To perform a custom installation of Driver Pack 4:**

1. Follow all of the guidelines and steps in “Preparing to install” on page 13.
2. Run Setup.exe on the Driver Pack 4 DVD.
3. On the Welcome page of the Deployment Manager, click Next, and then select Install/Upgrade.
4. Confirm that you read the release notes, and then click Next.
5. Accept the Waters Software License Agreement, and then click Next.
6. Select Custom.

**Important:** If you are upgrading from an earlier driver pack, in the list that appears of installable instrument drivers and utilities (all of which are selected by default), install all available instrument drivers. Failure to do so can result in a system containing incompatible driver versions.

7. Clear the selection of any instrument drivers and utilities that you do not need to install.

**Tip:** When you clear the selection of an instrument driver in the Install section of the list, in the Deploy section of the list, the selections of its corresponding firmware file (or files) are also cleared. If you are not installing the driver pack for use with Empower or MassLynx software, you can change the default installation location in the Install Path section of this page.

8. Click Next.
9. For Empower installations, if both the Waters SQ Detector and Waters TQ Detector instrument drivers were selected for installation, the Mass Spectrometer Selection dialog box appears.
   a. Select the mass spectrometer that you want to control. Select None if you intend only to view mass-spectrometer data.
   b. Click OK.
   **Result:** A list of the instrument drivers and utilities to be installed appears, along with a list of the firmware files to be deployed.

10. Review the list of instrument drivers and utilities for accuracy, and then click Next, to start the installation.
   **Tip:**
   - You can change settings before installing by clicking Back.
   - Although installation times vary, usually all instrument drivers are installed within approximately 20 minutes.

11. After installation is complete, click Finish.
   **Result:** The Autoloader launches automatically and selects the instruments that require firmware updates.
   **Tip:**
   - To locate the firmware file for a particular instrument on the computer, move the pointer over the instrument’s name.
   - If the firmware file for a particular instrument has not been deployed to the computer, the Autoloader displays “Firmware not available”. To obtain the necessary firmware file, install the corresponding instrument driver.

**Requirement:** Instruments connected to a workstation or LAC/E module running Driver Pack 4 must run the firmware included with Driver Pack 4. Driver Pack 4 cannot control instruments running earlier firmware.
12. Click Load Firmware to update the firmware on the selected
   instruments.
   
   **Tip:** If the Autoloader application does not begin to load the firmware, or
   if it fails to complete the process successfully, re-run Autoloader.exe
   from one of the following locations:
   
   • For Empower systems: C:\Empower\Instruments\Firmware
   • For MassLynx or third-party data systems: C:\Program
     Files (86)\Waters Instruments\Firmware
   
   **Caution:** To avoid corrupting the firmware, do not cycle power to any
   instrument in the stack until all firmware is loaded.

13. When the Autoloader indicates firmware is loaded for all instruments
    that require updates, cycle power to the instruments, as prompted in the
    Autoloader, then click Close.

14. Restart the computer when prompted.
New firmware installation

Occasionally Waters issues firmware updates. To install them without reinstalling all of the Driver Pack 4 instrument drivers, follow the steps below.

To install new firmware from Driver Pack 4:

1. Follow all of the guidelines and steps in “Preparing to install” on page 13.
2. Run Setup.exe on the Driver Pack 4 DVD.
3. On the Deployment Manager welcome page, click Next, and then select Install/Upgrade.
4. Confirm that you read the release notes, and then click Next.
5. Accept the Waters Software License Agreement, and then click Next.
6. Select Typical.
   Result: A list of the new firmware files that will be deployed to the computer is displayed.
7. Review the list for accuracy, and then click Next, to start the deployment. To change settings before deploying, click Back.
   Note: Deployment of firmware files requires only a few minutes.
8. After installation is complete, click Finish.
   Result: The Autoloader launches automatically and selects the instruments that require firmware updates.

Tips:

• To locate the firmware file for a particular instrument, move the pointer over the instrument’s name.
• If the firmware file for a particular instrument was not deployed to the computer, the Autoloader displays “Firmware not available”. To obtain the necessary firmware file, install the corresponding instrument driver.

Requirement: Instruments connected to a workstation or LAC/E module running Driver Pack 4 must use the firmware included with Driver Pack 4. Driver Pack 4 cannot control instruments running earlier firmware.
9. Click Load Firmware, to update the firmware on the selected instruments.

**Tip:** If the Autoloader application does not begin to load the firmware, or if it fails to complete the process successfully, re-run Autoloader.exe from one of the following locations:

- For Empower systems: C:\Empower\Instruments\Firmware
- For MassLynx or third-party data systems: C:\Program Files (86)\Waters Instruments\Firmware

**Caution:** To avoid corrupting the firmware, do not cycle power to any instrument in the stack until all firmware is loaded.

10. When the Autoloader indicates firmware is loaded for all instruments that require updates, click Close, and then restart the computer when prompted.

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**Post-installation task**

If your network includes a Citrix server, you must return the server to Execute mode. To do so, open a command prompt and type “Change user /execute”.

---

*Post-installation task*
Anti-virus considerations

If you are using real-time virus scanning, exclude the data system and instruments folders and sub-folders as shown below. Some real-time virus scanners can mistake normal data acquisition and instrument control for virus activity and thus interfere with proper operations. Full-system scans and live updates can be network-intensive, disk-intensive, and CPU-intensive, and they can also interfere with normal data acquisition. Schedule scans and updates for idle times when data acquisition does not occur.

Exclude these folders:

- For Empower 2 and Empower 3 installations, the Empower installation folder, usually “C:\Empower”, and its sub-folders.
- For MassLynx installations,
  - “C:\Program Files\Waters Instruments”, and its sub-folders (“C:\Program Files (x86)\Waters Instruments” on 64-bit machines).
  - the MassLynx installation folder, usually “C:\MassLynx”, and its sub-folders.
- For standalone console software and other third-party installations, “C:\Program Files\Waters Instruments”, and its sub-folders (“C:\Program Files (x86)\Waters Instruments” on 64-bit machines).

Certain anti-virus program features like “intrusion prevention” and “tamper protection” can also interfere with normal operation. Disable them as well.
Removing instrument drivers and utilities

Use the Deployment Manager to remove Driver Pack 4 instrument drivers and utilities from your computer.

To perform a typical removal of instrument drivers and utilities:
1. Run Setup.exe on the Driver Pack 4 DVD.
2. On the Welcome page of the Deployment Manager, click Next, and then select Remove.
3. Select Typical.
   Result: The Removal Options dialog box appears.
4. If desired, clear the Remove Connections INSIGHT check box, to prevent Connections INSIGHT from being removed.
5. Click OK.
   Result: A list of the instrument drivers and utilities to be removed from the computer appears.
6. Review the list for accuracy, and then click Next, to start the removal.
   Tip:
   • To change settings before removing, click Back.
   • Though removal times vary depending on the speed of the computer, they are usually approximately 20 minutes.
7. After removal is complete, click Finish.
8. When prompted, restart the computer.
To perform a custom removal of instrument drivers and utilities:

1. Run Setup.exe on the Driver Pack 4 DVD.
2. On the Welcome page of the Deployment Manager, click Next, and then select Remove.
3. Select Custom.
   **Result:** A list of removable instrument drivers and utilities appears. By default, no instrument drivers or utilities are selected.
4. Select the items in the list that you want to remove, and then click Next.
   **Result:** A list of removable instrument drivers and utilities appears.
5. Review the list of removable items for accuracy, and then click Next, to start the removal.
   **Tip:**
   - To change settings before removing, click Back.
   - Though removal times vary depending on the speed of the computer, they are usually approximately 20 minutes.
6. After removal is complete, click Finish.
7. When prompted, restart the computer.
Guidelines for instrument drivers and firmware: compatibility considerations

In an Empower client/server network, install Driver Pack 4 on all the Empower clients. You can maintain older instrument drivers on the LAC/E32 modules. Instrument drivers on a given LAC/E32 module, and firmware loaded on instruments connected to that module, must be from the same driver pack.

When you install Driver Pack 4 on your Empower clients, do not install Driver Pack 4 on your LAC/E32 modules as well, unless you plan to upgrade the firmware on instruments connected to those modules. For example, if you install the June 2011 Driver Pack on a LAC/E32 module, the instruments connected to that module must run firmware that accompanies the June 2011 Driver Pack.

You must perform upgrades on LAC/E32 modules and connected instruments at the same time, to ensure that instrument drivers and instrument firmware originate with the same driver pack. For example, if you install Driver Pack 4 on another LAC/E32 module, you must install Driver Pack 4 firmware for the instruments connected to that module.

See also:

- “Installation in Empower client/server environments” on page 10.
- “Instruments, instrument drivers and firmware in Empower client/server networks” on page 58 for a table of compatible firmware versions and instrument driver versions.
Co-installation guidelines

Co-installation occurs when you install Driver Pack 4 in a network that currently runs earlier driver packs such as Driver Pack version 1.40, June 2010 Driver Pack, and June 2011 Driver Pack.

**Note:** You need not uninstall existing instrument drivers before you install Driver Pack 4 on LAC/E32 modules, Empower clients, and Citrix servers.

Follow these guidelines when you run Driver Pack 4 with earlier driver packs in an Empower client/server network:

- When you run multiple driver-pack versions in the same Empower client/server network, you must run Driver Pack 4 instrument drivers on all the Empower clients.
- When you run Driver Pack 4 firmware on an instrument, you can run instrument drivers from the June 2011 Driver Pack on the LAC/E32 module. You cannot, however, run Driver Pack 4 firmware with the June 2010 Driver Pack, or Driver Pack version 1.40 instrument drivers.

Follow these guidelines for Empower Enterprise networks that contain one or more Citrix servers:

- Each Citrix server in a network environment supports only one driver-pack version. You can install other driver-pack versions, or third-party drivers on the LAC/E32 modules connected to a Citrix server.
- For Empower client/server networks that use both Empower clients and Citrix servers, upgrade all the clients and Citrix servers to Driver Pack 4.
- To ensure software compatibility throughout your network, upgrade all Citrix servers to Driver Pack 4. LAC/E32 modules can remain at their current driver-pack versions, provided that correct, matching firmware is installed in the systems that they control.
Verifying Installation

You must ensure that no copying errors occurred when you installed Driver Pack 4. To do so, you verify the installation using one of these utilities:

- Empower Verify Files, which confirms proper installation of Driver Pack 4 instrument drivers for systems controlled by Empower software.
- Verify Instrument Driver Files, which confirms proper installation of Driver Pack 4 instrument drivers for systems controlled by MassLynx or third-party software.

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Viewing the installation log

The installation log records information about Driver Pack 4 installations. Open the log file to review your installation choices, the installation environment, and installation status. For partial or unsuccessful installations, review the installation log for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value is 0, the installation was successful. If the value is anything other than 0, record the value, and contact Waters Technical Support.

To view the installation log:

1. Navigate to C:\Windows\WatersICS.log in Windows® Explorer.
2. Open WatersICS.log in Notepad.
3. Review the contents of the file.
4. In Notepad, click File > Exit to close the log file.
Running the Empower Verify Files utility

Run the Empower Verify Files utility to verify Driver Pack 4 installation for these system configurations:

- Standalone workstation
- Client/server
- Citrix server

The utility ensures the integrity of the installed Driver Pack 4 files. Run the utility to ensure that Driver Pack 4 files did not change since their installation.

After the Driver Pack 4 installation, run Empower Verify Files as part of your installation qualification.

To run the Empower Verify Files utility:

1. Click Start > All Programs > Empower > Verify Files.
   
   **Result:** The utility compares the checksum for installed Driver Pack 4 instrument drivers with a previously stored checksum. Then it creates a verification report named “Checksum_XX-XX-XXXX_XX.XX.XX.txt”.

2. Review the contents of the file, and print or save a copy of the results.

3. Click File > Exit.

To view the file verification results:

1. Click Start > All Programs > Empower > View Verify Files.

   **Result:** The latest verification report opens in the report viewer.

2. Review the contents of the verification report.

The Driver Pack 4 installation passes the verification check if all files have a status of “OK”, and the installation qualification summary on the final page states “No installation changes were detected.” If the verification report indicates any files marked as “changed”, contact Waters Technical Support.
Running the Verify Instrument Driver Files utility

Run the Verify Instrument Driver Files utility to verify Driver Pack 4 installation for systems controlled by MassLynx software or third-party software.

For non-Empower systems, the utility ensures the integrity of the installed Driver Pack 4 files. Run the utility to ensure that Driver Pack 4 files did not change since their installation.

After the Driver Pack 4 installation, run Verify Instrument Driver Files as part of your installation qualification.

To run the utility:

1. Click Start > All Programs > Waters Instruments > Verify Instrument Driver Files.

   **Result:** The utility compares the checksum for installed Driver Pack 4 instrument drivers with a previously stored checksum. It then creates a verification report named “IQReport.html”.

2. Review the contents of the file, and print or save a copy of the results.

3. Click File > Exit.

To view the file verification results:

1. Click Start > All Programs > Waters Instruments > View Verify Instrument Driver Files.

   **Result:** The latest verification file opens in the report viewer.

2. Review the contents of the verification report.

Driver Pack 4 installation passes the verification check if the status of all files is “OK”, and the installation qualification summary on the final page states “No installation changes were detected.” If the verification report indicates any files marked as “changed”, contact Waters Technical Support.
Requalifying a system, if necessary

Driver Pack 4 includes instrument driver software and firmware used on your laboratory instruments, servers, and workstations. As with any change in a regulated environment, follow your organization’s standard operating procedures for managing software changes.

This update has been designed not to alter the physical specifications of the instrument(s) or system(s) and Waters believe that methods run and data generated on instruments before and after the update will be identical.

However, after a risk based review of the changes detailed in the release notes, users in a regulated environment may need to consider and document what, if any, requalification of the instrument modules, the chromatographic system and/or the Chromatographic Data System (CDS) are required by their own change control SOPs.

Use the appropriate qualification methods outlined below to verify installation and correct operation:

• To confirm that the driver pack installation has not negatively affected any critical system functions, and that the new files have loaded properly, you may consider performing a Software Installation Qualification (IQ). To confirm the firmware installed on the modules are correctly installed, compare the checksum value in the product release notes to the checksum value displayed in the console.

• To confirm an instrument’s operation with the newly loaded driver software and firmware, you may consider performing an Operational Qualification (OQ) for the updated instrument or system.

• To confirm performance, control, and communications of the instruments in your system, you should consider conducting a Performance Qualification (PQ) (user or vendor PQ) or System Suitability test.

Where multiple identical systems are involved, a risk-based approach to qualification activities may be an important consideration.
3 Verifying Installation

Re-qualifying the instrument driver software, firmware, and hardware when upgrading is covered under the Total Assurance Plan with System Qualification Option in the following cases:

- During yearly requalification under the plan.
- If loading this release is required for operation of a new module or system, where qualification of the new module or system is covered under the plan.

Re-qualification of the CDS software and computers after a driver upgrade may or may not be included in Assurance Plans from the CDS vendor.

Review your Total Assurance Plan to determine which services are covered, and which are not covered. For situations not covered under the plan, Waters can still perform the qualification, but additional charges apply.
Advanced Installations

Follow the procedures in this chapter when performing silent and push installations and removals. Only components installed by the Deployment Manager can be silent or push installed.

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Silent installations and removals

The Driver Pack 4 Deployment Manager supports silent installations and removals. Silent, or unattended, operations do not require user interaction. During a silent installation or removal, no interactive user interface is displayed. Instead, information required for the operation is stored in a response file and an instrument-driver list file. You can call both files from a command prompt or from the commands in a batch file.

To launch a silent installation or removal, run Setup.exe from a command prompt or batch file, and include the path to the response file immediately afterward.

See: “Push installations and removals” for more information about response files and instrument-driver list files.

Silent installations or removals occur in these cases:

- Silent installation for an Empower client or LAC/E32 module
- Silent removal for an Empower client or LAC/E32 module
- Silent installation for a Citrix server
- Silent removal for a Citrix server
Silent installation or removal for an Empower client or LAC/E\textsuperscript{32} module

To perform a silent installation for an Empower client or LAC/E\textsuperscript{32} module:

1. Modify the instrument-driver list file to include the instrument drivers that you want to install.
   
   Tip: Instrument drivers are installed in the order in which each instrument appears in the Deployment Manager installation or removal list, not in its order in the response file.

2. Modify the response file, and set all the appropriate properties.
   
   Tip: Ensure the ACTION property in the response file is set to InstallALL, UpgradeALL, or InstallAndUpgradeALL.

3. Run Setup.exe from a command prompt or from a batch file.
   
   Requirement: The command must include the name of the response file and the path to Setup.exe.

   Result: The instrument drivers are installed on the Empower client or LAC/E\textsuperscript{32} module.

4. When the restart message appears, after installation, click Yes.
   
   Result: The computer is rebooted.

To perform a silent removal for an Empower client or LAC/E\textsuperscript{32} module:

1. Modify the instrument drivers list file to include the instrument drivers that you want to remove.

2. Modify the response file, and select all the appropriate properties.
   
   Tip: Ensure the ACTION property in the response file is set to RemoveAll.

3. Run Setup.exe from a command prompt or batch file.

   Requirement: The command must include the name of the response file and the path to Setup.exe.

   Result: The instrument drivers are removed from the Empower client or LAC/E\textsuperscript{32} module.

4. When the restart message appears, after removal, click Yes.

   Result: The computer is rebooted.
Silent installation or removal for a Citrix server

**Requirement:** Put the Citrix server in Install mode for both installation and removal of instrument drivers.

**To perform a silent installation for a Citrix server:**

1. Modify the instrument-driver list file to include the instrument drivers that you want to install.
   
   **Tip:** Instrument drivers are installed in the order in which each instrument appears in the Deployment Manager installation or removal list, not in its order in the response file.

2. Put the Citrix server in Install mode by opening a command prompt and typing “Change user /install”.

3. Modify the response file, and set all the appropriate properties.
   
   **Tip:** Ensure the ACTION property in the response file is set to InstallALL, UpgradeALL, or InstallAndUpgradeALL.

4. Run Setup.exe from a command prompt or batch file.

   **Requirement:** The command must include the name of the response file and the path to Setup.exe.

   **Result:** The instrument drivers are installed on the Citrix server.

5. When the restart message appears, after installation, click Yes.

   **Result:** The computer is rebooted.
To perform a silent removal for a Citrix server:

1. Modify the instrument-driver list file to include the instrument drivers that you want to remove.
2. Put the Citrix server in Install mode by opening a command prompt and typing “Change user /install”.
3. Modify the response file, and set all the appropriate properties.  
   Tip: Ensure the ACTION property in the response file is set to RemoveAll.
4. Run Setup.exe from a command prompt or batch file.  
   Requirement: The command must include the name of the response file and the path to Setup.exe.  
   Result: The instrument drivers are removed from the Citrix server.
5. When the restart message appears, after removal, click Yes.  
   Result: The computer is rebooted.
Push installations and removals

Driver Pack 4 supports push installations and removals using PsExec. For push installations, you deploy instrument drivers to multiple Empower clients, LAC/E modules, or Citrix servers from a single location. For push removals, you uninstall drivers from one location. After they are initiated from a command prompt or batch file, push operations do not require user interaction.

Information required for a push installation or removal is stored in a response file, an instrument-driver list file, and a node list file. You can open these files by means of the command that launches the push operation.

Notes:

- Push operations occur in Empower Enterprise networks, for ACQUITY UPLC instruments. They are not supported for mass spectrometers.
- Use the latest version of each instrument driver, available on the Driver Pack 4 DVD, for push installations.

A push installation or removal occurs in these cases:

- Push installation for Empower clients or LAC/E32 modules
- Push removal for Empower clients or LAC/E32 modules
- Push installation for Citrix servers from a host
- Push removal for Citrix servers from a host
Requirements

Driver Pack 4 software supports push installations and removals for instrument drivers using PsExec, a Microsoft command-line tool. PsExec is part of the toolkit, PsTools. To download the toolkit, go to http://technet.microsoft.com/. At this site, enter “psexec 1.98” in the search box, and click Search. Click the PsExec link, and then download PsTools. Follow the instructions for installing and using PsExec v1.98.

After you install PsExec, perform the following tasks:

• Create the response file.
• Create a text file (for example, Node_List.txt) that lists the machines where you want to install or remove instrument drivers.
• Create a text file (for example, ICS_List.txt) that contains the list of instrument drivers you want to install or remove.
• Obtain local administrator privileges for each machine in the node list.
• Run the PsExec command, with correct syntax, from a command prompt or from a batch file.

Modifying the response file

To perform a push installation of Driver Pack 4 instrument drivers, you must first create a response file. The response file must be in the correct XML format. A sample response file is available in the Push Install directory of your Driver Pack 4 DVD.

The parameter settings in the response file specify how to install Driver Pack 4 instrument drivers. Response file settings apply to all of the instrument drivers in the instrument-driver list file and to all of the machines in the node list file.

Note: You can rename the response file, but the file extension must remain “.rsp”.


When you run PsExec from a command prompt or batch file, include the path to the response file immediately afterward.
Creating the instrument-driver list file

Create an instrument-driver text file that lists the names of all the instrument drivers that you want to install or remove. Store the file on the computer from which the push installation or removal is executed. Use a separate line in this file for each instrument driver. A sample text file is available in \Push Install\ICS_List_En.txt on the Driver Pack 4 DVD.

**Requirement:** To install or remove instrument drivers for Waters 2465 and 2475 instruments using the PsExec utility on Windows 7 systems, first disable the User Account Control. Click Start > Help and Support, and then search the Help for “Turn off User Access Control”.

Creating the node list file

On the computer from which you intend to execute the push installation, create a text file that lists the names or IP addresses of all the Empower clients, LAC/E\textsuperscript{32} modules, or Citrix servers on which you want to install instrument drivers or remove them from. Use a separate line in this file for each computer. A sample text file is available on the Empower 3 media, in \Push Install\Node_List.txt on the Driver Pack 4 DVD.
Push installation or removal for Empower clients or LAC/E$^{32}$ modules

To perform a push installation for Empower clients or LAC/E$^{32}$ modules:

1. Modify the instrument-driver list file to include the instrument drivers that you want to install.
   
   **Tip:** Instrument drivers are installed in the order in which each instrument appears in the Deployment Manager installation or removal list, not in its order in the instrument-driver list file.

2. Modify the node list file to include the names of all the Empower clients or LAC/E$^{32}$ modules on which you want to install the instrument drivers.

3. Modify the response file, and select all the appropriate properties.
   
   **Tip:** Ensure that the ACTION property in the response file is set to InstallALL, UpgradeALL, or InstallAndUpgradeALL.

4. Run PsExec from a command prompt or batch file.

   **Requirement:** Ensure that the command specifies the location of the PsExec executable file, the instrument-driver list file, and the node list file.

   **Result:** The instrument drivers are installed on the Empower clients or the LAC/E$^{32}$ modules.

To perform a push removal for Empower clients or LAC/E$^{32}$ modules:

1. Modify the instrument-driver list file to include the instrument drivers that you want to remove.

2. Modify the response file to specify that the ACTION property is set to RemoveAll.

3. Modify the node list file to include the names of all the Empower clients or LAC/E$^{32}$ modules from which you want to remove the instrument drivers.

4. Run PsExec from a command prompt or batch file.

   **Requirement:** Ensure that the command specifies the location of the PsExec executable file, the instrument-driver list file, and the node list file.
Result: The instrument drivers are removed from the Empower clients or the LAC/E\textsuperscript{32} modules.

**Push installation or removal for Citrix servers from a host**

You can install or remove instrument drivers for Citrix servers from a separate host, and store the response file and other files needed for the operation on the host. To do so, you must create an instrument-driver list file that lists the instrument drivers that you want to install. You must also create a node list file that contains the names of the Citrix servers on which you want to install the instrument drivers.

**Requirement:** Citrix servers must be in Install mode for both of the procedures below.

**To perform a push installation for Citrix servers from a host:**

1. Modify the instrument-driver list file to include the instrument drivers that you want to install.
   
   **Tip:** Instrument drivers are installed in the order in which each instrument is listed in the Deployment Manager installation or removal list, not in its order in the instrument-driver list file.

2. Modify the response file, and select all of the appropriate properties.
   
   **Tip:** Ensure the ACTION property in the response file is set to InstallALL, UpgradeALL, or InstallAndUpgradeALL.

3. Modify the node list file to include the name of all the Citrix servers on which you want to install the instrument drivers.

4. Run PsExec from a command prompt or batch file.
   
   **Requirement:** Ensure the command specifies the location of the PsExec executable file, the instrument-driver list file, and the node list file.

**Result:** The instrument drivers are installed on the Citrix servers.
To perform a push removal for Citrix servers from a host:

1. Modify the instrument-driver list file to include the instrument drivers that you want to remove.
2. Modify the response file to specify that the ACTION property is set to RemoveAll.
3. Modify the node list file to include all the names of the Citrix servers from which you want to remove the instrument drivers.
4. Run PsExec from a command prompt or batch file.
   
   **Requirement:** Ensure the command specifies the location of the PsExec executable file, the instrument-driver file, and the node list file.

   **Result:** The instrument drivers are removed from the Citrix servers.
Create a custom installation package

Create your own installation package to deploy Driver Pack 4 from a shared location in your network. You can select which instrument drivers and firmware files to place in the package.

**Important:** Create a new directory for Driver Pack 4. Do not copy Driver Pack 4 folders and files into a directory that contains older instrument drivers.

**To create an installation package for Driver Pack 4:**

1. Create a directory for Driver Pack 4 folders and files in the desired network location.

2. Create folders in the new directory to store Driver Pack 4 instrument drivers files:
   
   - Place instrument drivers and files in separate sub-folders, using a file structure that mimics the file structure of the Driver Pack 4 DVD.
   
   - Do not use special characters, such as trademark symbols, in folder names.

3. Copy selected instrument drivers and files from the Driver Pack 4 DVD to the new directory.

   **Tip:** Copy only the instrument drivers and files that you need for your system.

**See also:** For information about how to accomplish a push installation from a custom installation package, see "Push installations and removals" on page 39.
4 Advanced Installations
Operational problems can arise. It is important to be able to identify the causes of problems and correct them.

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**Recovering from installation failure**

If an installation error occurs, the installation log file “C:\Windows\WatersICS.log” may contain further information about the error. Check the log to determine if the error is something you can correct yourself, such as insufficient user account privileges.

If the installation fails, and the log provides no helpful information, the best course of action is to uninstall all previous versions of the software and retry the installation.

**To uninstall previous versions of the software:**

1. Exit all applications, and restart the computer.
2. Run Setup.exe, on the DVD.
3. Select “Remove”, to remove the previously installed instruments, and then click Next.
4. Select all of the instruments and devices that you want to remove, and then click Next.
5. Click Finish.
6. Restart the computer.
7. Repeat the installation procedure.
Troubleshooting

**Requirement:** In a co-installation environment, load the oldest instrument drivers first, and load Driver Pack 4 last.

**Repair utility**

The Deployment Manager includes the Repair utility. The utility corrects known installation and compatibility problems involving installation artifacts caused by nonstandard installers or older Waters instrument-control software.

If you installed instrument drivers from an earlier driver-pack release, use the Driver Pack 4 Repair utility in the Deployment Manager to reconcile any incompatibility that you might have introduced.

**Important:** To avoid introducing incompatible versions of drivers, install older drivers before newer drivers. If you encounter a compatibility problem, use the repair utility in the Driver Pack 4 Deployment Manager.

If any Driver Pack 4 instrument driver is installed, the Repair utility is enabled. If no Driver Pack 4 instrument driver is installed, you can run the utility from the Deployment Manager.

Always restart your computer after using the Repair utility.

**To run the Repair utility:**

1. Exit all applications.
2. Run Setup.exe on the DVD.
3. Click Next.
4. Click Repair, and then click Repair again.
5. Restart the computer.
Service Profile and installation problems

The ACQUITY Service Profile utility records system information, including configuration data, serial numbers, software versions, errors, network setup, Windows updates, other applications installed, counters, and diagnostic results.

To save a service profile log:

1. Go to ACQUITY Console > Troubleshoot > Save service profile.
2. Enter required information to create a problem description.txt file when the log is saved.
3. Click the Settings tab.
4. Select the options that specify the information that you want to collect.
5. Click Save.
   **Result:** The console saves the Waters Service Profile.zip file.
6. Send the ZIP file to your Waters service technician.
5 Troubleshooting
Console

The ACQUITY® About Console dialog box displays the currently installed software and firmware versions. If Driver Pack 4 is running in an Empower Citrix or client/server environment, and the LAC/E\textsuperscript{32} module runs a different driver-pack version, the About Console dialog box displays the software versions on the LAC/E\textsuperscript{32} module. Version data are also captured in the ACQUITY Service Profile utility, and they are available in the instruments log folder for viewing.

Repair utility

The Driver Pack 4 Deployment Manager incorporates a Repair utility to address co-installation and other compatibility problems. See “Repair utility” on page 48 for more information.
Columns Calculator

When you change from HPLC to UPLC, you must use different columns for your separations. UPLC columns operate with different pressures and flow rates than their HPLC counterparts. Other parameters can differ, as well. Use the Columns Calculator to calculate new parameter settings for your instrument methods when you switch from HPLC to UPLC columns.

To use the ACQUITY UPLC Columns Calculator, specify parameter settings for the column that you would use for your analytical method in an HPLC system. The calculator advises you regarding what column to use for the same method in a UPLC system.

An updated, improved version of the columns calculator is released with Driver Pack 4. It is also available as a standalone application. The new calculator includes various new features.

Connections INSIGHT

Connections INSIGHT remote services offer real-time diagnostics to ensure, via the Internet, maximum instrument availability.

Service profile

The service profile includes information from the Driver Pack 4 installation log. This information is useful for troubleshooting systems.

See: “Service Profile and installation problems” on page 49.
Empower DVD

Driver Pack 4 updates a significant percentage of Waters drivers for a number of high-volume, core UPLC products. The Empower® Instrument Driver Pack includes the new Driver Pack 4 drivers and several others, including those from third parties.

**Recommendation:** If yours is an Empower Enterprise network, install instrument drivers and firmware from the updated Empower Instrument Driver Pack DVD. The software you install depends on the instruments and detectors included in your network.

The updated Empower Instrument Driver Pack DVD contains these software packages, which are installed or uninstalled via the Deployment Manager:

• Head Space Control v2.0
• Empower WFC III ICS v1.10
• Agilent ICF A.01.05 Update

To avoid known issues in the installation and uninstallation of the software above, follow the procedures below exactly.

**Prerequisite:** If you plan to install the Agilent ICF A.01.05 Update, you must first install Agilent ICF version 2.1 via the Deployment Manager before continuing.
Installing software from the Empower DVD

The following procedures prescribe installing software using the Empower Instrument Driver Pack DVD. Follow these procedures, if necessary, in the sequence in which they appear.

To install Head Space Control:

1. Run the repair utility from the Deployment Manager.
2. Install Head Space Control version 2.0 from the “[LANGUAGE]\ Head Space Control v2.0” folder on the DVD.
3. Run the repair utility via the Deployment Manager.

To install the Empower WFC III instrument driver:

1. Run the repair utility from the Deployment Manager (if not already done for step 3 above).
2. Install WFC III instrument driver version 1.10 from the “[LANGUAGE]\Empower WFC III ICS v1.10” folder on the DVD.
3. Run the repair utility from the Deployment Manager.

**Important:** Next, run the Deployment Manager, and install whichever components you require.

To install Agilent ICF:

1. Run the repair utility from the Deployment Manager (if not already done for step 6 above).
2. Install Agilent ICF A.01.05 update from the “[LANGUAGE]\Agilent ICF A.01.05 Update” folder on the DVD.

**See:** “Agilent Instrument Control Framework (ICF) Update A.01.05”, Rev A.

3. Run the repair utility from the Deployment Manager.
Uninstalling software from the Empower DVD

Before you begin uninstalling software, run the Deployment Manager, and uninstall any unneeded components that are supported in the Deployment Manager.

The following procedures prescribe uninstalling software using the Empower Instrument Driver Pack DVD. Follow these procedures, if necessary, in the sequence in which they appear.

To uninstall Head Space Control:

1. Run the repair utility from the Deployment Manager.
2. Uninstall Head Space Control version 2.0 from the “[LANGUAGE]\Head Space Control v2.0” folder on the DVD.
3. Run the repair utility from the Deployment Manager.

To uninstall Empower WFC III instrument driver:

1. Run the repair utility from the Deployment Manager (if not already done for step 3 above).
2. Uninstall WFC III instrument driver version 1.10 from the “[LANGUAGE]\Empower WFC III ICS v1.10” folder on the DVD.
3. Run the repair utility from the Deployment Manager.

To uninstall Agilent ICF:

1. Run the repair utility from the Deployment Manager (if not already done for step 6 above).
2. Uninstall Agilent ICF A.01.05 update from the “[LANGUAGE]\Agilent ICF A.01.05 Update” folder on the DVD.
3. Run the repair utility from the Deployment Manager.
For any instrument drivers not supported by the Deployment Manager, perform these tasks:

- Install these drivers before you install instrument drivers via the Deployment Manager.
- Run the Deployment Manager's Repair utility before and after you install these drivers.
- Uninstall these drivers after you uninstall instrument drivers via the Deployment Manager.
- Run the Deployment Manager's Repair utility before and after you uninstall these drivers.
- Uninstall older versions of these drivers before you upgrade them to a newer version.
For Empower client/server networks, install Driver Pack 4 on the LAC/E$^{32}$ modules that you want to upgrade. Other LAC/E$^{32}$ modules, configured for existing ACQUITY UPLC systems, can remain at their current driver-pack and firmware versions. The information in this appendix helps you manage multiple driver-pack and firmware versions in the same Empower client/server network.

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**Requirement:** When you mix driver-pack versions in your network, the driver pack installed on the Empower clients or Citrix server must be Driver Pack 4. Note, however, that some Driver Pack 4 features are not available when you mix driver-pack versions in a network environment.
For each ACQUITY UPLC instrument or detector, the table below lists instrument driver and firmware versions in each driver pack. Wherever possible, ensure the instrument driver and firmware for a given instrument originate with the same driver pack. Even if you run multiple driver-pack versions in your Empower network, ensure instrument firmware for each system is consistent with the instrument drivers on the system’s LAC/E32 module.

Refer to the table below to determine, for each instrument, which firmware version, or versions, are compatible with specific driver versions. Read each row from, left to right, to track compatible firmware and driver versions for each instrument.

**Compatible versions for drivers and firmware installed in Empower Enterprise networks:**

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<td>TQ</td>
<td>Driver 1.40 FW n/a</td>
<td>Driver 1.40 FW n/a</td>
<td>Driver 1.40 FW n/a</td>
<td>Driver 1.41 FW n/a</td>
</tr>
<tr>
<td>QSM</td>
<td>Driver n/a</td>
<td>Driver 1.47 FW 1.46</td>
<td>Driver 1.50 FW 1.50</td>
<td>Driver 1.60 FW 1.60</td>
</tr>
<tr>
<td>SM-FTN</td>
<td>Driver 1.49 FW 1.47</td>
<td>Driver 1.50 FW 1.55</td>
<td>Driver 1.60 FW 1.60</td>
<td></td>
</tr>
<tr>
<td>2998</td>
<td>Driver 1.30 FW 1.40</td>
<td>Driver 1.30 FW 1.40</td>
<td>Driver 1.30 FW 1.41</td>
<td></td>
</tr>
<tr>
<td>2489</td>
<td>Driver 1.31 FW 1.40</td>
<td>Driver 1.31 FW 1.40</td>
<td>Driver 1.31 FW 1.41</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Instrument driver and firmware compatibility is tested for specific instruments, but may not be tested for the system configuration present in your network.
Compatibility of instrument drivers and firmware

Compatibility problems can arise when you add instruments to existing systems. The following problems occur when you add a newer instrument to an older system:

- If the system’s driver-pack version precedes the new instrument’s firmware version by only one release, add the new instrument.
- If the system’s driver pack is too old to be compatible with the new instrument’s firmware, upgrade the driver pack.

When you add an older instrument to a newer system, you must upgrade its firmware to match the system’s driver pack.

Co-installation guidelines

These guidelines address compatibility questions that arise when you co-install Driver Pack 4 with other driver packs in a client/server environment:

- any earlier driver pack on the LAC/E32 module.
- When you install any earlier driver pack on the Empower client, you cannot run Driver Pack 4 on the LAC/E32 module.

To ensure the firmware that you run on your instruments is compatible with the instrument drivers installed on your workstation or LAC/E32 module, do as follows:

- When you install Driver Pack 4 on a workstation or LAC/E32 module, install Driver Pack 4 firmware on the instruments.
- When you install the June 2010 Driver Pack, or Driver Pack version 1.40 on a workstation or LAC/E32 module, do not run Driver Pack 4 firmware on the instruments.
Limitations for instruments connected to one LAC/E\textsuperscript{32} module

These limitations apply to the maximum number of instruments supported by one LAC/E\textsuperscript{32} module:

- One LAC/E\textsuperscript{32} module supports a maximum of four ACQUITY or third-party systems.
- Among the instruments in four ACQUITY or third-party systems, one LAC/E\textsuperscript{32} module supports a maximum of eight detectors.
- Among eight detectors connected to a single LAC/E\textsuperscript{32} module, the LAC/E\textsuperscript{32} module supports a maximum of two PDA detectors. A LAC/E\textsuperscript{32} module with two PDA detectors attached supports two systems, not four.

Thus you can run a maximum of eight detectors and four systems on one LAC/E\textsuperscript{32} module.
B Compatibility Information for Empower Enterprise Networks
The table below lists terms and definitions from the guide.

**Terms and definitions:**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition server</td>
<td>LAC/E(^{32}) module</td>
</tr>
<tr>
<td>Autoloader</td>
<td>Utility for loading or updating firmware onto instruments.</td>
</tr>
<tr>
<td>BSM</td>
<td>Binary solvent manager</td>
</tr>
<tr>
<td>Classic</td>
<td>Original ACQUITY UPLC instruments, such as the BSM, SM, TUV, and PDA.</td>
</tr>
<tr>
<td>CM</td>
<td>Column manager</td>
</tr>
<tr>
<td>CM-A</td>
<td>Column manager - active</td>
</tr>
<tr>
<td>Citrix server</td>
<td>Server in an Empower Enterprise network environment that runs Citrix software.</td>
</tr>
<tr>
<td>Citrix thin client</td>
<td>Computer connected to a Citrix server in an Empower Enterprise environment.</td>
</tr>
<tr>
<td>Columns calculator</td>
<td>To specify flow rates and other parameters related to column selection, use the calculator when you convert between HPLC inlet methods and UPLC inlet methods to achieve equivalent separation.</td>
</tr>
<tr>
<td>Waters Instrument Console</td>
<td>Software that interfaces with Waters instruments.</td>
</tr>
<tr>
<td>Control panel</td>
<td>Displays the status of an instrument within the data system, such as current flow rate and temperature.</td>
</tr>
<tr>
<td>Custom installation</td>
<td>Deployment Manager option, where you select which instrument drivers and corresponding firmware to install.</td>
</tr>
</tbody>
</table>
C  Glossary

Terms and definitions:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Deployment Manager</td>
<td>The Deployment Manager, or installer, manages the driver-pack installation process. It allows for the installation, removal, and repair of instrument drivers.</td>
</tr>
<tr>
<td>Driver pack</td>
<td>A driver pack combines drivers for ACQUITY and other Waters-related devices on a DVD or in a download file. It is a collection of control software, firmware, the Deployment Manager, and other applications.</td>
</tr>
<tr>
<td>ELSD</td>
<td>Evaporative light scattering detector</td>
</tr>
<tr>
<td>Empower client</td>
<td>Client connected to an Empower Enterprise environment. Runs the Empower data system, contains instrument drivers and other driver-pack files. Empower clients do not connect directly to instrument systems but control them through a LAC/E\textsuperscript{32} module or an Empower acquisition client.</td>
</tr>
<tr>
<td>Empower software</td>
<td>Data-system software for Waters systems.</td>
</tr>
<tr>
<td>Firmware</td>
<td>Software that runs on an instrument or device, to control its actions. Communicates with instrument drivers installed on the PC.</td>
</tr>
<tr>
<td>FLR detector</td>
<td>Fluorescence detector</td>
</tr>
<tr>
<td>Instrument control software (ICS)</td>
<td>Now called instrument drivers. Instrument drivers contain all software required to configure, control, and monitor a particular instrument.</td>
</tr>
<tr>
<td>ICS Companion</td>
<td>ICS Companion is a program that runs as a background process when you launch the Deployment Manager. It reconciles .NET and other dynamically linked files (DLLs) used to control instruments.</td>
</tr>
</tbody>
</table>
Terms and definitions:

<table>
<thead>
<tr>
<th>Term</th>
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</tr>
</thead>
<tbody>
<tr>
<td>LAC/E\textsuperscript{32} module</td>
<td>Acquisition server in Empower systems. LAC/E stands for Laboratory Acquisition and Control Environment.</td>
</tr>
<tr>
<td>MassLynx software</td>
<td>Data system used primarily with mass spectrometers.</td>
</tr>
<tr>
<td>nanoACQUITY</td>
<td>Nano-scale flow rate version of the ACQUITY UPLC system.</td>
</tr>
<tr>
<td>Nano switching utility</td>
<td>Allows switching between ACQUITY UPLC and nanoACQUITY systems from a single workstation.</td>
</tr>
<tr>
<td>PDA detector</td>
<td>Photodiode array detector</td>
</tr>
<tr>
<td>PsExec</td>
<td>Command-line tool by Microsoft\textsuperscript{®} that lets you execute the Deployment Manager, in order to push instrument drivers on remote systems.</td>
</tr>
<tr>
<td>QSM</td>
<td>Quaternary solvent manager</td>
</tr>
<tr>
<td>Repair utility</td>
<td>Use the Repair utility to correct installation problems. Launch the utility if a problem arises after you install the driver pack, after you install older drivers, or after you load a MassLynx SCN.</td>
</tr>
<tr>
<td>SCN</td>
<td>Software change notice. MassLynx release adapted for use with a specific mass spectrometer or system.</td>
</tr>
<tr>
<td>SM-FL</td>
<td>Sample manager, with a fixed loop.</td>
</tr>
<tr>
<td>SM-FTN</td>
<td>Sample manager, with a flow-through needle.</td>
</tr>
<tr>
<td>Supplemental driver pack</td>
<td>Waters releases fixes and updates for instrument drivers and firmware in a supplemental driver pack.</td>
</tr>
<tr>
<td>Third-party data systems</td>
<td>Non-Waters data systems compatible with Driver Pack 4.</td>
</tr>
<tr>
<td>TUV detector</td>
<td>Tunable ultraviolet detector</td>
</tr>
<tr>
<td>UPLC</td>
<td>Ultra-high Performance Liquid Chromatography, or Ultra Performance LC\textsuperscript{®}.</td>
</tr>
<tr>
<td>Verify Files</td>
<td>Verify installation of driver pack for Empower.</td>
</tr>
<tr>
<td>Verify Instrument Driver Files</td>
<td>Verify installation of driver pack for MassLynx and third-party data systems.</td>
</tr>
</tbody>
</table>
**Terms and definitions:**

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Workstation</td>
<td>Standalone workstation, with Empower Personal, MassLynx, or third-party data system installed.</td>
</tr>
<tr>
<td>WPC</td>
<td>Waters Pump Control. Software component necessary for MassLynx control of multiple pumps.</td>
</tr>
</tbody>
</table>