

Waters Driver Pack 2018 Release 1

Installation and Configuration Guide

General information

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We seriously consider every customer comment we receive. You can reach us at tech_comm@waters.com.

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1 System requirements

Waters Driver Pack 2018 Release 1 (DP 2018 R1) includes instrument drivers and their associated firmware files, as well as the Deployment Manager and firmware Autoloader. The Deployment Manager installs instrument drivers and deploys firmware files on a computer. The Autoloader updates firmware on the instruments connected to the computer.

This section describes what environments DP 2018 R1 supports and how to identify and resolve any compatibility issues before installing DP 2018 R1 on computers and servers.

DP 2018 R1 supersedes Waters Driver Pack 2017 Release 2 (DP 2017 R2), Waters Driver Pack 2017 Release 1 (DP 2017 R1), Waters Driver Pack 2016 Release 2 (DP 2016 R2), Waters Driver Pack 2016 Release 1 (DP 2016 R1), and Waters Driver Pack 4 Supplemental Release 1.

Requirement: Review the [Identifying and resolving compatibility issues](#) section before proceeding with installation.

See also: For a list of all drivers provided in DP 2018 R1, see [Instrument drivers](#).

1.1 System and software requirements

You can install DP 2018 R1 on the following configurations:

- Empower workstations
- MassLynx computers
- Empower LAC/Es
- Empower clients/Citrix servers

Restriction: Do not install DP 2018 R1 on Empower database servers or with Windows 8.1 or Windows Server 2003.

You can run DP 2018 R1 on the following operating systems:

- Windows 7, 64-bit
- Windows 10, 64-bit, Enterprise and Professional editions
- Windows Server 2008 R2 Standard edition
- Windows Server 2012 R2 Standard edition

Requirements:

- When installing on a Windows 7, Windows Server 2008 R2, or Windows Server 2012 R2 operating system, the Windows Update KB2999226 must be installed or the DP 2018 R1 installation cannot proceed.

Note: When obtaining Windows Update KB2999226, ensure that you download the x86 or x64 version, depending on your operating system. Typically, it is the x64 version.

- For all operating systems, you must enable the .Net Framework 3.5 feature or the DP 2018 R1 installation cannot proceed.

1.2 Supported chromatography data software

DP 2018 R1 supports and has been tested with the following software:

- Empower 3 software - base to latest version according to the Waters website.
- MassLynx software with compatible SCNs (see [Supported mass spectrometers](#)).
- Stand-alone console.
- AB Sciex Analyst, version 1.6.3.

Note: Third-party chromatography data software is tested and supported by the manufacturer.

1.3 MassLynx supported mass spectrometers

The following mass spectrometers are compatible with this release. If a mass spectrometer is compatible, it will function as expected after DP 2018 R1 and the most current SCNs are installed.

Mass spectrometers supported	Systems	Operating system
QDa	<ul style="list-style-type: none"> • Alliance HPLC • ACQUITY UPLC • ACQUITY UPLC H-Class • ACQUITY UPLC H-Class Bio • ACQUITY UPLC I-Class • ACQUITY Arc 	Windows 7 64-bit
SQD2	<ul style="list-style-type: none"> • ACQUITY UPLC • ACQUITY UPLC H-Class • ACQUITY UPLC H-Class Bio • ACQUITY UPLC I-Class 	Windows 7 64-bit

Mass spectrometers supported	Systems	Operating system
SQ	<ul style="list-style-type: none"> • ACQUITY UPLC • ACQUITY UPLC H-Class • ACQUITY UPLC H-Class Bio • ACQUITY UPLC I-Class 	Windows 7 64-bit
TQ	<ul style="list-style-type: none"> • ACQUITY UPLC • ACQUITY UPLC H-Class • ACQUITY UPLC H-Class Bio • ACQUITY UPLC I-Class 	Windows 7 64-bit

1.4 Empower client/server environment requirements

If you are installing the driver pack in an Empower client/server environment, follow these requirements:

- You can configure a maximum of four systems on each LAC/E module.
- You can configure a maximum of two 3D data generating optical detectors and a single QDa detector on each LAC/E module. The optical detectors are the PDA, eλ PDA, 2998, FLR, and the 2475.

Restriction: During the installation of an SQ, TQ, SQD2, or 3100 on a client, the WatersService is disabled in order to allow these instruments to work properly. The SQ, TQ, SQD2, and 3100 cannot be installed on a LAC/E.

See also: For detailed information, see the appropriate version of the Empower software installation guide; for example, the *Empower 3 Installation, Configuration, and Upgrade Guide*.

1.5 Systems and modules not supported in Driver Pack 2018 Release 1

The following systems and modules are not supported by DP 2018 R1:

- Windows XP is not supported.
- Windows 8.1 is not supported.
- Windows Server 2003 is not supported.
- Empower version 2.x feature releases, service releases, and hot fixes are not supported.
- The 2420 ELS detector will not operate after a DP 2018 R1 installation.

See also: [Checking for ELS detector driver compatibility](#)

2 Identifying and resolving compatibility issues

2.1 Compatible instrument control software

The following Agilent ICSs are compatible with DP 2018 R1:

- Agilent Instrument Control Framework (ICF) Support version 2.1 Hotfix 1
- Agilent Instrument Control Framework (ICF) Support version 2.2
- Agilent Instrument Control Framework (ICF) Support version 3.0
- Agilent 6850 GC Instrument Control Software (ICS) version 1.3
- Agilent 7890 GC Instrument Control Software (ICS) version 2.5
- Waters Headspace Control Option, version 3.0
- Waters A6850 Software, version 1.40
- Waters A7890 Software, version 2.6

2.2 Upgrading Waters HPLC and ACQUITY Arc detectors

The DP 2018 R1 supports the Alliance HPLC detectors as well as the newer ACQUITY Arc detectors using the same updated ICS.

2.2.1 Empower Enterprise installations

2.2.1.1 Checking for ELS detector driver compatibility

In earlier driver packs, a single ICS (the ELS detector ICS driver version 1.40) controls the ELS detector, 2424 detector, and 2420 detector. In DP 2018 R1, the ELS detector and 2424 detector are controlled using two separate instrument drivers. DP 2018 R1 does not contain a driver for the 2420 detector.

Restriction: DP 2018 R1 is incompatible with the ELS detector instrument driver version 1.40.

2.2.1.1.1 2420 ELS

Prior to DP 2016 R1, the 2420 ELSD shared an ICS with the 2424 and ACQUITY ELS detectors. There are now separate ICS versions for the 2424 HPLC (version 1.69) and the ACQUITY ELS (version 1.69).

Restriction: If you install DP 2018 R1, you disable control of the 2420 ELSD.

2.2.1.1.2 2424 ELS compatibility

If the version of the ICS supporting the 2424 HPLC is prior to 1.65, you must install DP 2018 R1 on the client and the LAC/E module. Prior to version 1.65, the 2420 ELSD shared an ICS with the 2424 and ACQUITY ELS detectors. There are now separate ICS versions for the 2424 HPLC (version 1.69) and the ACQUITY ELS (version 1.69).

Restriction: The 2424 ELS firmware is not available on the driver pack media. Contact Waters Technical Service or your local Field Service Support personnel to have the latest version installed.

2.2.1.2 2414 RI

If you want to run the 2414 HPLC detectors with the ICS, you must install version 1.65 on the client and the LAC/E module and update the firmware, unless the detector is running in 410 emulation mode.

2.2.1.3 2489 UV/Vis and 2998 PDA

If the version of the ICS supporting the 2489 and 2998 HPLC detectors is prior to 1.65, you must install DP 2018 R1 on the client and the LAC/E module, and update the firmware.

2.2.1.4 2475 FLR

If the version of the ICS supporting the 2475 HPLC detectors is prior to 1.65, then DP 2018 R1 must be installed on the client and the LAC/E module, and the firmware must be updated.

2.3 Checking computer compatibility

Review each computer on which you plan to install DP 2018 R1 for the following conditions that can cause compatibility issues.

Resolution: If any of these conditions exist, uninstall all drivers, and then follow the instructions in [Resolving incompatibility issues](#).

Condition	Recommendation
Incorrect installation order of drivers	Waters recommends that you install DP 2018 R1 on computers with drivers that were installed in order by release date, from oldest to newest. See the Waters drivers for computers topic.
Custom installation	Waters recommends installing DP 2018 R1 on computers with driver packs that were installed using the Typical installation option
Not loading latest firmware on instruments	Ensure that instruments are running the latest versions of firmware

2.4 Waters drivers for computers

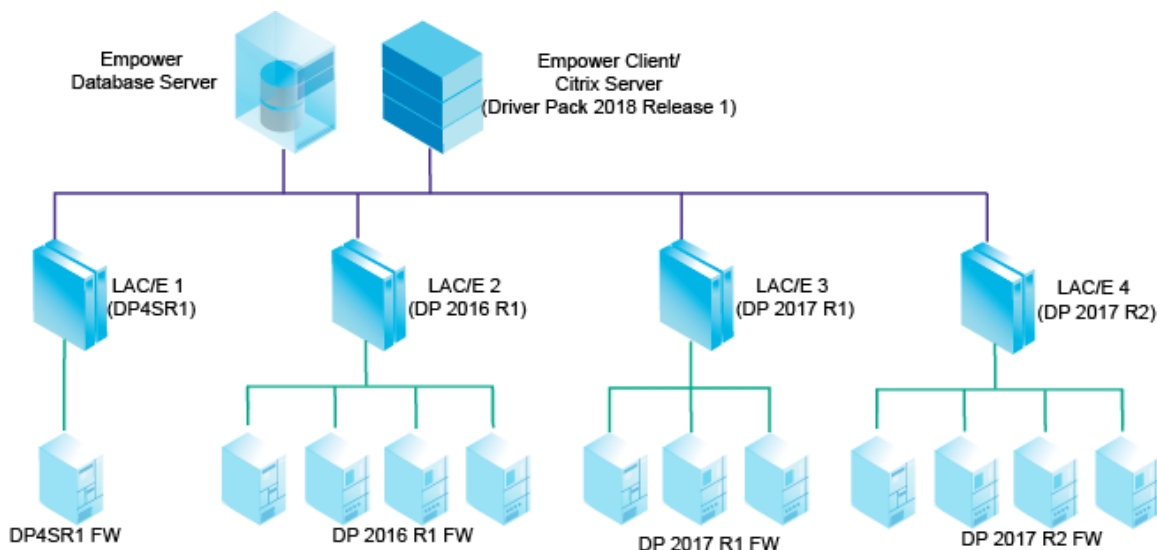
The following table lists the drivers you can install on supported computers, if DP 2018 R1 is installed.

Recommendations:

- Ensure that drivers were installed in the following order, using the **Typical** option in the Deployment Manager.
- Waters recommends employing dedicated workstations and LAC/Es when using third-party instrument drivers.
- Waters recommends installing all the drivers in the Driver Pack.

Driver or driver pack	Waters release date
Waters 2432 Conductivity Detector Instrument Driver version 1.65	April 2016

The following illustration depicts a sample configuration with four Empower LAC/E modules, each of which has a different Driver Pack installed on it, with multiple Alliance and ACQUITY systems.



ACQUITY instruments must have the firmware versions deployed with the driver pack installed on the Empower LAC/E.

Note: If you have an Alliance system with a 2414, 2424, 2475, 2489, or 2998 detector prior to version 1.65, you must upgrade the LAC/E to DP 2018 R1 after upgrading the Empower client/Citrix server.

2.5 Resolving incompatibility issues

To reinstall driver packs:

Recommendation: Waters recommends using the **Typical** installation option in the Deployment Manager.

1. Ensure that all driver packs and instrument drivers were uninstalled from the computer.
See also: For detailed instructions, see [Removing instrument drivers and utilities](#).
2. Install the necessary driver packs and drivers in the order they were released, from oldest to newest.

See also: [Waters drivers for Empower LAC/E modules](#).

3. Install DP 2018 R1.

Note: If the installation is for an Empower workstation, a MassLynx computer, or an Empower LAC/E module, click **Load Firmware** to prompt the Autoloader to load the firmware deployed by DP 2018 R1 on the instruments connected to the computer.

See also: For detailed installation instructions, see [Installing the instrument-control software and firmware](#) or [Silent and push installations](#).

3 General Installation Process

3.1 Driver pack installation

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

- Install from the Waters Driver Pack 2018 Release 1 DVD.
- Download and install from the Waters website. To do so, visit <http://www.waters.com> and click **Services & Support > Drivers/Updates**. Search for Waters Driver Pack 2018 Release 1.

Always use the Deployment Manager provided with this driver pack. Do not use an earlier version of the Deployment Manager. You cannot change the installation directory in which the Deployment Manager installs the instrument drivers.

Note: Ensure that the drivers installed previously on the computer or LAC/E module are compatible with this driver pack. See [Identifying and resolving compatibility issues](#).

3.2 Installing the instrument-control software and firmware

To install the instrument-control software and firmware:

1. Exit all applications and restart the computer.
2. Log on as a user with local administrator privileges.
3. If you are installing the software on a Citrix server, put the server in Install mode by opening a command prompt and typing `Change user/install`.

Result: The screen response states `User session is ready to install applications`.


4. Run `Setup.exe`.
5. On the Deployment Manager Welcome page, click **Next**.
6. Click **Install/Upgrade**.
7. Select **I have read the product release notes**, and then click **Next**.
8. Select **I agree to the License terms and conditions**, and then click **Next**.
9. Select **Typical (recommended)** or **Custom**.
10. If you are installing the software on an Empower computer, do as follows:

- a. Indicate whether to install mass spectrometers.
- b. Select the mass spectrometer driver to control.

Tip: You can install multiple mass spectrometers, but control only one. Select **None** if you intend only to view mass-spectrometer data.

11. Indicate whether to install Connections INSIGHT.
12. Review the list of instrument drivers and utilities for accuracy, and then click **Next** to start the installation.

Tips:

- Though installation times vary depending on the speed of the computer, they are approximately 20 minutes.
- If you click , the Deployment Manager completes the current module's installation, and then stops.

13. Click **Finish**.

Result: The Autoloader is launched. It lists the modules that require firmware updates.

Tip: To locate the firmware file for a specific module, point to the module's name.

14. Click **Load Firmware** to install the latest firmware.



Notice: To avoid interrupting the firmware installation, do not cycle power to any system module until firmware for all modules is installed.

Tip: You can run the Autoloader separately from the Deployment Manager; for example, when you must install new firmware for one module. Run `Autoloader.exe` from one of the following locations:

- In an Empower-controlled system, `C:\Empower\Instruments\Firmware`.
- In a MassLynx-controlled system, `C:\Program Files (x86)\Waters Instruments\Firmware`.

15. After all firmware is loaded, cycle power to all modules, as prompted by the Autoloader, and then click **Close**.
16. If you are installing the software on a Citrix server, you must return the server to Execute mode by opening a command prompt and typing `Change user/execute`.
17. Restart the computer.

3.3 Removing instrument drivers and utilities

When necessary, use the Deployment Manager to remove driver pack instrument drivers and utilities.

To remove instrument drivers and utilities:

1. Restart the computer.
2. Navigate to the driver pack installation files, and run `Setup.exe`.
3. On the Welcome page of the Deployment Manager, click **Next**, and then select **Remove**.
4. To remove all drivers, select **Typical**, or to select specific drivers, select **Custom**.
5. If you selected **Typical**, you can prevent Connections INSIGHT from being removed by clearing the **Remove Connections INSIGHT** check box in the Removal Options dialog box.
6. If you selected **Custom**, review the list of modules, and select the modules that you want to remove.
7. Click **OK**.

Result: A list of the instrument drivers and utilities to be removed from the computer appears.

8. Review the list for accuracy, and then click **Next**, to start the removal.

Tips:

- To change settings before removal, click **Back**.
 - Though removal times vary depending on the speed of the computer, they are usually approximately 20 minutes.
9. After removal is complete, click **Finish**.
 10. When prompted, restart the computer.

4 Silent and Push Installations

4.1 Silent and push installations

You can install or remove the driver pack using a silent or push installation. Both silent and push installations and removals are unattended, meaning that these operations do not require user interaction.

During a silent installation or removal, you deploy instrument drivers on a single Empower client, LAC/E module, or Citrix server. You store information required for the operation in a response file and an instrument-driver list file. You then call both files from a command prompt or from the commands in a batch file.

During a push installation or removal, you deploy instrument drivers to multiple Empower clients, LAC/E modules, or Citrix servers from a host computer. You control push installations and removals using PsExec, a Microsoft command-line tool. When you run PsExec, the response file is called as a command line argument, after the `setup.exe` file.

4.1.1 Preparing for a silent installation or removal

Before performing a silent installation or removal, you must first set up an instrument-driver list file and a response file. You can perform a silent installation or removal on an Empower client, a LAC/E module, or a Citrix server.

4.1.1.1 Creating the instrument-driver list file

1. Create a `.TXT` file on the computer from which the installation or removal will be executed.

Tip: You can edit the sample text file in the `\Push Install\[language]\` directory of the downloaded driver pack. For example, `\Push Install\en\ICS_List_EN.txt` is the English language sample file.

2. List the names of all the instrument drivers to install or remove.

Requirement: You must use a separate line for each item.

See also: [Instrument drivers](#).

Note: Instrument drivers are installed in the order in which each instrument appears in the Deployment Manager dialog box, not in the order in the instrument-driver list file.

4.1.1.2 Creating the response file

Specify the parameter settings in the response file to direct how instrument drivers are installed. For example, you specify the destination paths, language to install, and whether to restart the system. Response file settings apply to all of the instrument drivers in the instrument-driver list file.

The response file must be in XML format, using the correct XML syntax. You can rename the response file, but the file extension must remain `.RSP`.

Tip: A sample response file is available in the `\Push Install\[language]` directory of the downloaded driver pack. For example, `\Push Install\en\ICS_Response_EN_InstallAndUpgradeAll.rsp` is the English language sample file.

See also: For detailed information about the response file, see the appropriate chromatography data software's installation guide; for example, the *Empower 3 Installation, Configuration, and Upgrade Guide*.

4.1.2 Performing a silent installation or removal

1. Ensure that the instrument-driver list file includes the instrument drivers that you want to install or remove.

See also: [Creating the instrument-driver list file.](#)

2. If you are installing or removing the driver pack on a Citrix server, put the Citrix server in Install mode by opening a command prompt and typing `Change user /install`.
3. In the response file, do one of the following:
 - To install drivers, ensure that the **ACTION** property is set to **InstallAll**, **UpgradeAll**, or **InstallAndUpgradeAll**.
 - To remove drivers, ensure that the **ACTION** property in the response file is set to **RemoveAll**.

See also: [Creating the response file.](#)

4. 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`; for example, `C:\<Waters Driver Pack>\Setup.exe /responseFile C:\<Waters Driver Pack>\Push Install\ICS_Response_EN_InstallAll.rsp`.

Result: The instrument drivers are installed on or removed from the Empower client, LAC/E module, or Citrix server, and then the computer restarts.

4.1.3 Preparing for a push installation or removal

Before performing a push installation or removal, download PsExec, a Microsoft command-line tool, to a host computer. As with a silent installation, you create a instrument-driver list and a response file. Additionally, for a push operation, you must create a node list file, which lists the addresses of all Empower clients, LAC/E modules, and Citrix servers to which you will install drivers or from which you will remove drivers.

You launch the push operations using PsExec. Use a command prompt or batch file to run the response file, instrument-driver list file, and node list file.

4.1.3.1 Downloading PsExec

You perform 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:

1. Go to <http://technet.microsoft.com/>.
2. In the search box, type `psexec`, and click **Search**.
3. Click the **PsExec** link, and then download PsTools.
4. Follow the instructions for installing and using PsExec.

4.1.3.2 Creating the node list file

To create a node list file:

1. Create a `.TXT` file on the computer from which the installation or removal is executed.
2. List the names or IP addresses of all the Empower clients, LAC/E modules, or Citrix servers on which to install instrument drivers or from which to remove them.

Requirement: Use a separate line for each item.

4.1.4 Performing a push installation or removal

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

To perform a push installation or removal:

1. If necessary, download PsExec.

See also: [Downloading PsExec.](#)

2. Ensure that the instrument-driver list file includes the instrument drivers that you want to install or remove.

See also: [Creating the instrument-driver list file.](#)

3. Ensure that the node list file includes the names of all the Empower clients, LAC/E modules, and Citrix servers on which you want to install or remove the instrument drivers.

See also: [Creating the node list file.](#)

4. In the response file, do one of the following:
 - To install drivers, ensure that the ACTION property is set to InstallALL, UpgradeALL, or InstallAndUpgradeALL.
 - To remove drivers, ensure that the ACTION property is set to RemoveAll.

See also: [Creating the response file.](#)

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

Requirement: The command must include the location of the PsExec executable file, the response file, the instrument-driver list file, and the node list file.

Result: The instrument drivers are installed on or removed from the Empower clients, LAC/E modules, or Citrix servers.

4.2 Creating an installation package

By creating your own installation package to deploy the driver pack from a shared location in your network, you can select which instrument drivers and firmware files to place in the package.

To create an installation package:

1. In the desired network location, create a directory for this driver pack's folders and files.

Recommendation: Ensure that you always use the Deployment Manager that comes with the latest driver pack. The Deployment Manager software is updated regularly, and is not necessarily compatible with other Waters driver packs.

2. Copy the driver folders and files that you need for your system, the source folder, and `Setup.exe` to the new directory.

Requirement: You must copy the source folder, which contains the `DM.exe` file and the `Setup.exe` file.

Restriction: If you rename folders, do not use special characters, such as trademark symbols.

5 Verifying installation and troubleshooting

After performing the installation, verify that the files were successfully installed. If installation fails, you can take the following actions:

- Run the Repair utility, which corrects known installation and compatibility problems involving installation artifacts caused by nonstandard installers or older Waters instrument-control software.
- Remove all previous versions of the software and retry the installation.
- Save a service profile log with information about your system, and then contact Waters Technical Support for assistance.

See also: [Using the Repair utility](#) and [Saving a service profile log](#).

5.1 Verifying installation

Verify the installation using the Verify Files utility, in Empower software, or Verify Instrument Driver Files utility, in MassLynx.

See also: For detailed procedures on using these utilities, see the appropriate chromatography data software's installation guide; for example, the *Empower 3 Installation, Configuration, and Upgrade Guide*.

5.2 Using the Repair utility

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

To use the Repair utility:

1. Navigate to the driver pack installation files, and run `Setup.exe`.
2. On the Deployment Manager Welcome page, click **Next**.
3. Click **Repair**.

5.3 Saving a service profile log

The 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.

Note: The exact information saved to the service profile log depends on your user access. An Administrator can save all information to the log.

To save a service profile log:

1. In the Console, select **Troubleshoot** > **Save service profile**.
2. Enter a description of the issue you are experiencing or a question for Waters Technical Support.
3. Click **Settings**.
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. The default location is the computer desktop.

6. Send the `.ZIP` file to Waters Technical Service.

Alternative: You can also save a service profile log by navigating to one of the following paths and double-clicking `serviceprofile.exe`.

- For Empower software: `C:\Empower\Instruments\Bin`
- For MassLynx software: `C:\Program Files (x86)\Waters Instruments\Bin`

A Instrument drivers

The following ICS and firmware drivers are included in DP 2018 R1.

A.1 Solvent managers

Table A-1: Solvent Managers

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC Binary Solvent Manager (BSM), ACQUITY UPLC I-Class BSM, ACQUITY UPLC I-Class BSM PLUS	186015001, 186015000, 186015082	ACQUITY UPLC and ACQUITY UPLC I-Class Series	Binary Solvent Manager	1.71	Binary Solvent Manager [V1.71]	0x1B6B9613
ACQUITY UPC ² Binary Solvent Manager (ccBSM)	186015036	ACQUITY UPC ²	ACQUITY UPC ² Binary Solvent Manager	1.50	ACQUITY UPC2 Binary Solvent Manager	0x1090528B
ACQUITY UPC ² Convergence Manager (ccM)	186015037	ACQUITY UPC ²	ACQUITY Convergence Manager	1.50	ACQUITY Convergence Manager	0x72815285

Table A–1: Solvent Managers (continued)

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC Quaternary Solvent Manager (QSM), bioQSM, QSM PLUS, bioQSM PLUS, QSM-XR PLUS, and bioQSM-XR PLUS	186015018 (QSM), 186015041 (bioQSM), 186015080 (QSM PLUS), 186015081 (bioQSM PLUS), 186015083 (QSM-XR PLUS), 186015084 (bioQSM-XR PLUS)	ACQUITY UPLC H-Class Series and ACQUITY UPLC H-Class Bio Series	Quaternary Solvent Manager	1.71	Quaternary Solvent Manager [V1.71]	0x94AE01D3
ACQUITY Arc Quaternary Solvent Manager-R (QSM-R)	186017000	ACQUITY Arc	Quaternary Solvent Manager-R	1.70	Quaternary Solvent Manager-R [V1.70]	0x8D12B154
ACQUITY UPLC Isocratic Solvent Manager (ISM) and ACQUITY APC Isocratic Solvent Manager (p-ISM)	186015019, 186015050	All ACQUITY UPLC and ACQUITY Advanced Polymer Chromatography	Isocratic Solvent Manager	1.70	Isocratic Solvent Manager [V1.65]	0xB12ADF87

A.2 Sample managers

Table A–2: Sample Managers

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC Sample Manager (SM)	186015005, 186015006	ACQUITY UPLC	Sample Manager	1.70	Sample Manager [V1.65]	0x42C0E8CB
ACQUITY UPLC Sample Manager – Flow Through Needle (SM-FTN, bioSM-FTN, SM-FTN PLUS, and bioSM-FTN PLUS)	186015017, 186015040, 186015046, 186015085 (H-Class PLUS), 186015086 (H-Class Bio PLUS), 186015088 (I-Class PLUS)	ACQUITY UPLC H-Class Series, H-Class Bio Series, and I-Class Series	Sample Manager-FTN	1.71	Sample Manager-FTN [V1.71]	0x285858D7
ACQUITY UPLC Sample Manager – Fixed Loop Series (SM-FL and SM-FL PLUS) and ACQUITY UPC ² Sample Manager – Fixed Loop (ccSM-FL)	186015060, 186015035, 186015087 (SM-FL PLUS)	ACQUITY UPLC I-Class Series and ACQUITY UPC ²	Sample Manager	1.70	Sample Manager-FL [V1.70]	0x30B5761D
ACQUITY Sample Manager	361000600	ACQUITY UPLC I-Class and ACQUITY UPC ²	Sample Manager	1.70	Sample Manager [V1.65]	0x42C0E8CB

Table A–2: Sample Managers (continued)

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY Arc Sample Manager Flow Through Needle-R, with and without heating/cooling, (SM FTN-R)	186017001, 186017007	ACQUITY	Sample Manager FTN-R	1.70	Sample Manager FTN-R [V1.71]	0xA7F6FD36
ACQUITY APC Sample Manager-Flow Through Needle (SM-pFTN)	186015051	ACQUITY Advanced Polymer Chromatography	Sample Manager-FTN	1.71	Sample Manager APC [V1.60]	0x31502C7A
ACQUITY UPLC Sample Organizer (SO) and ACQUITY UPLC Sample Organizer, for rotary tray-style sample managers	186015020, 186015021, 186015014	All ACQUITY UPLC, H-Class, H-Class Bio, I-Class, and Arc	N/A	Controlled by the Sample Manager	Sample Organizer [V1.60]	0x96FA9AB0

A.3 Column modules

Table A–3: Column Heaters

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC Column Heater	N/A	ACQUITY UPLC	N/A	Controlled by the Sample Manager	Controlled by the Sample Manager	N/A

Table A–3: Column Heaters (continued)

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC Column Heater/Cooler (CHC)	186015008	ACQUITY UPLC	Column Manager	1.69	Column Manager [V1.40.74]	0x8E9D1DC0
ACQUITY UPLC Column Heater, Active (CH-A)	186015042	ACQUITY UPLC H-Class and H-Class Bio ACQUITY UPLC I-Class	N/A	Controlled by the Sample Manager	Controlled by the Sample Manager	N/A
ACQUITY UPLC High-Temperature Column Heater (HTCH)	186015010	ACQUITY UPLC	N/A	Controlled by the Sample Manager	Controlled by the Sample Manager	N/A

Table A–4: Column Managers

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC Column Manager	186015007, 186015009	ACQUITY UPLC	Column Manager	1.69	Column Manager [V1.40.74]	0x8E9D1DC0
ACQUITY UPLC Column Manager, Active (CM-A)	186015043	ACQUITY UPLC H-Class and H-Class Bio ACQUITY UPLC I-Class ACQUITY UPC ²	Column Manager	1.69	Column Manager (Active) [V1.69]	0x17AC4A76

Table A–4: Column Managers (continued)

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC Column Manager Auxiliary (CM-AUX)	186015049	ACQUITY UPLC H-Class and H-Class Bio	Column Manager	1.69	Column Manager (Active) [V1.69] ^a	0x17AC4A76
ACQUITY Single-Zone Column Manager (CM-S)	186015054	ACQUITY Advanced Polymer Chromatography	Column Manager	1.69	Column Manager (Active-S) [V1.62]	0xC1CCF89D

a. Controlled by the Column Manager, Active (CM-A)

Table A–5: 30-cm Column Heaters and Managers

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC 30-cm Column Heater (30-cm CH)	186017008	ACQUITY Arc	N/A	Controlled by the Sample Manager	Controlled by the Sample Manager	N/A
ACQUITY UPLC 30-cm Column Heater/ Cooler (30-cm CHC)	186015011, 186017009	All ACQUITY UPLC and ACQUITY Arc	N/A	Controlled by the Sample Manager	Controlled by the Sample Manager	N/A
ACQUITY UPLC 30-cm Column Heater with Active Solvent Preheating (CH-30A)	186015045	ACQUITY UPLC I-Class, H-Class, H-Class Bio, and Arc	N/A	Controlled by the Sample Manager	Controlled by the Sample Manager	N/A

Table A–5: 30-cm Column Heaters and Managers (continued)

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY UPLC 30-cm Single-Zone Column Manager (CM-30S)	186015056	ACQUITY Advanced Polymer Chromatography	Column Manager	1.69	Column Manager (30S) [V1.62]	0xBED9D41A

A.4 Detectors

Table A–6: Detectors

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY TUV	186015028	All ACQUITY UPLC	TUV Detector	1.70	TUV Detector (1) [V1.70]	0xB9E50966
ACQUITY TUV, thermally enhanced	186015031	All ACQUITY UPLC	TUV Detector	1.70	TUV Detector (2) [V1.70]	0xD4B0C7BC
ACQUITY PDA	186015026	All ACQUITY UPLC	PDA Detector	1.70	PDA Detector (1) [V1.65]	0xF7835E17
ACQUITY PDA, thermally enhanced	186015032	All ACQUITY UPLC	PDA Detector	1.70	PDA Detector (2) [V1.65]	0xDC2F6074

Table A–6: Detectors (continued)

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY PDA e λ	186015030	All ACQUITY UPLC	PDA Detector	1.70	PDA Detector (1) [V1.65]	0xF7835E17
ACQUITY PDA e λ, thermally enhanced	186015033	All ACQUITY UPLC	PDA Detector	1.70	PDA Detector (2) [V1.65]	0xDC2F6074
ACQUITY FLR	186015029	All ACQUITY UPLC	FLR Detector	1.69	FLR Detector [V1.69]	0xD99F06EF
ACQUITY RI	186015070	All ACQUITY UPLC	RI Detector	1.40	RI Detector [1.40]	0xAA39BF4C
ACQUITY ELS	186015027	All ACQUITY UPLC	ELS Detector	1.69	ELS Detector [1.40] ^a	0x216F9370
2489 UV-Vis	186002487, 186248900, 186017002	Alliance HPLC and ACQUITY Arc	2489 UV/Vis Detector	1.69	2489 Detector [V1.69]	0xBAB5BE45
2998 PDA	186002998, 186299800, 186017003	Alliance HPLC and ACQUITY Arc	2998 PDA Detector	1.70	2998 Detector [V1.65]	0xEDD8EBF3
2475 FLR	186002475, 186247500, 186017006	Alliance HPLC and ACQUITY Arc	2475 FLR Detector	1.70	2475 Detector [V2.20]	0xDBCEAB47
2414 RI	186241400, 186241401, 186017004	Alliance HPLC and ACQUITY Arc	2414 RI Detector	1.65	2414 Detector [V2.10]	0x5038C65E

Table A–6: Detectors (continued)

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
2424 ELS	186002424, 186242400, 186017005	Alliance HPLC and ACQUITY Arc	2424 ELS Detector	1.69	N/A ^b	0x123F2F1E

- a. Contact Waters Technical Service for the latest ELS firmware, version 1.65.
- b. Contact Waters Technical Service for the latest 2424 ELS firmware, version 1.65.

Table A–7: Empower only Mass Detectors and Spectrometers

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
ACQUITY QDa	186008511, 186006511	Alliance HPLC, All ACQUITY UPLC, and ACQUITY Arc	QDa Detector	1.69	N/A	N/A
ACQUITY TQ	176001263	All ACQUITY UPLC	Waters TQ Detector	1.44	N/A	N/A
ACQUITY SQ	176000872	All ACQUITY UPLC	Waters SQ Detector	1.44	N/A	N/A
ACQUITY SQD2	186005832	All ACQUITY UPLC	Waters SQ Detector 2	1.51	N/A	N/A

A.5 Fraction Collector

Table A–8: Fraction Collector

Module name	Part number	Systems	ICS name in Deployment Manager	ICS version	Firmware name in Deployment Manager	Checksum
Waters Fraction Manager – Analytical	186006857	HPLC and UPLC	Fraction Manager – Analytical	1.66	Fraction Manager – Analytical [V1.60].sft	0x31d1e50e

A.6 Accessories

Module name	Systems	ICS name in Deployment Manager	ICS version	Checksum
Local Console Controller	All ACQUITY UPLC	Local Console Controller	1.60	N/A
Connections INSIGHT	All Waters instrument drivers fully support Connections INSIGHT	Connections INSIGHT	3.2.82.0	N/A
Columns Calculator	HPLC and UPLC	Columns Calculator	2.00	N/A
nanoACQUITY Switch Utility ^a	ACQUITY M-Class	N/A	N/A	N/A
Waters Pump Control Software	Waters ACQUITY solvent managers, Waters 25X5 Quaternary Gradient modules	Waters Pump Control Software	3.10	N/A
e-SAT/IN	All ACQUITY UPLC	Waters Empower e-SAT/IN Software	1.3	N/A

Module name	Systems	ICS name in Deployment Manager	ICS version	Checksum
Deployment Manager	N/A	N/A	3.1.240.5	N/A

a. For more information, refer to the *ACQUITY UPLC M-Class Driver Pack Installation and Configuration Guide*.

B Compliance recommendations

Any time you install, change, or uninstall software or system modules in a regulated environment, Waters recommends that you follow your organization's approved standard operating procedures.

A risk-based review may assist you in a regulated environment to evaluate changes detailed in the release notes. Using company SOPs, determine if any documentation updates and requalification of the system modules, chromatographic system, or chromatographic data system (CDS) are required.

B.1 Instrument update classification (minor update)

Waters considers this update to be a minor change from previous versions. This update is designed to not alter the physical specifications of instruments or systems. Waters expects that methods run and data generated on instruments before and after the update will be consistent. As with any change, you should evaluate the impact of this update to your instruments or systems.

B.2 Software requalification options

Consider using the requalification options outlined below to verify software installation and correct operation:

- To confirm that the new files loaded properly, consider performing a software installation qualification.
- To confirm the operation of the newly loaded software, consider performing an operational qualification (user or vendor) for the updated software installation.
- To determine if additional testing is required, consider evaluating the changes in the software release, to assess the risk associated with the installation. Depending on the risk, it may be appropriate to perform existing, updated, or new software tests. These tests may be known as performance qualification tests, user acceptance tests, verification tests, or validation tests.

To assist you, if required, Waters provides various levels of Qualification (or Compliance) Services and validation consultancy through our Professional Services organization.

When multiple, identical systems are involved, consider a risk-based approach to qualification activities.

B.3 Instrument requalification options after software or firmware change

Consider using the requalification options outlined below to verify hardware installation and correct instrument operation:

- To confirm that the firmware files on the system modules were installed correctly, compare the checksum values in the product release notes to the checksum values displayed in the console.
- To confirm instrument system operation with any newly loaded software, driver, or firmware, consider performing an operational qualification for the updated instrument system.
- To confirm performance, control, and communications of the instrument system, consider conducting a performance qualification (user or vendor) or system suitability test.

B.4 Requalification with Waters' Total Assurance Plans

The Waters' Total Assurance Plan (TAP) with System Qualification Option covers upgrades and requalification of the instrument driver, software, firmware, or hardware in these cases:

- During yearly requalification, as provided in the plan.
- If installing this release is required for operation of a new module or system, where qualification of the new module or system is covered by the plan.

Requalification of the CDS software and computers after a driver upgrade may or may not be included in your TAP.

Review your TAP to determine which services are covered and which are not covered. For situations not covered by the plan, Waters can perform the qualification, but additional charges will apply.

C Anti-virus considerations

Some real-time virus scanners 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.

Certain anti-virus program features like "intrusion prevention" and "tamper protection" can also interfere with normal operation. Disable them as well.

C.1 Empower installations

For Empower software installations, exclude the Empower installation folder (usually `C:\Empower`) and its sub-folders.

C.2 MassLynx installations

For MassLynx installations, exclude these folders:

- For 64-bit computers: `C:\Program Files (x86)\Waters Instruments`, and its sub-folders.
- The MassLynx installation folder, usually `C:\Masslynx`, and its sub-folders.

D Glossary

Acquisition server

LAC/E module.

Autoloader

Utility for loading or updating firmware onto instruments.

BSM

Binary solvent manager.

Citrix server

Server in an Empower Enterprise network environment that runs Citrix software.

Deployment Manager

The Deployment Manager, or installer, manages the driver-pack installation process. It allows for the installation, removal, and repair of instrument drivers.

Driver pack

A driver pack combines drivers for ACQUITY and other Waters-related devices on a DVD or in a downloadable file. It is a collection of control software, firmware, the Deployment Manager, and other applications.

ECD

Electrochemical detector.

ELS detector

Evaporative light scattering detector.

Empower client

Client connected to an Empower Enterprise environment that runs the Empower data system and contains instrument drivers and other driver-pack files. Empower clients do not connect directly to instrument systems, but control them through an LAC/E module or an Empower acquisition client.

Empower software

Data-system software for Waters systems.

Firmware

Software that runs on an instrument or device to control its actions. Communicates with instrument drivers installed on the PC.

FLR detector

Fluorescence detector.

ICS Companion

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.

Instrument control software (ICS)

Now called instrument drivers. Instrument drivers contain all software required to configure, control, and monitor a particular instrument.

LAC/E module

Acquisition server in Empower systems. LAC/E stands for Laboratory Acquisition and Control Environment.

MassLynx software

Data system used primarily with mass spectrometers.

nanoACQUITY

Nano-scale flow rate version of the ACQUITY UPLC system.

PDA detector

Photodiode array detector.

PsExec

Command-line tool by Microsoft from which you execute the Deployment Manager to push instrument drivers on remote systems.

QDa

A mass detector specifically designed for liquid chromatography.

Repair utility

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.

SCN

Software change note. MassLynx software release adapted for use with a specific mass spectrometer or system.

Supplemental driver pack

Waters releases fixes and updates for instrument drivers and firmware in a supplemental driver pack.

TUV detector

Tunable ultraviolet detector.

UPLC

Ultra-high Performance Liquid Chromatography or Ultra Performance LC.

UV/Vis detector

Ultraviolet/Visible detector.

Verify Files

Verify installation of driver pack for Empower software.

Verify Instrument Driver Files

Verify installation of driver pack for MassLynx software and third-party data systems.

Workstation

Stand-alone workstation with Empower Personal, MassLynx software, or third-party data system installed.

WPC

Waters pump control. Software component necessary for MassLynx software control of multiple pumps.