

Waters[®] Empower 3

Empower™ 3 software (build 3471) contains changes, new features, and enhancements. These release notes contain the following information and instructions:

- Operating system requirements
- Processor and memory requirements
- Issues fixed in previous versions of Empower software
- Issues fixed in Empower 3 software
- Known issues in Empower 3 software
- GxP compliance requirements
- Post-installation considerations
- Empower 3 performance considerations
- Empower calculation considerations
- Using Empower 3 online Help
- Test configurations

Use these release notes in conjunction with release notes that were issued for all previous Empower service packs and feature releases. Unless superseded, all previous release note and product support information apply to this software release.

See also: The following guides for detailed instructions on installing, configuring, upgrading, and administering Empower 3 software:

- *Empower 3 System Administrator's Guide*
- *Empower 3 Installation and Configuration Guide*
- *Waters Ethernet Instrument Getting Started Guide*

For information about new features, see *What's New in Empower 3* on the Empower 3 documentation media.



Operating system requirements

Empower 3 software is supported on the following operating systems:

- Personal workstation - Windows® 7 Professional or Enterprise, 64-bit
- Client or LAC/E³² - Windows 7 Professional or Enterprise, 64-bit; Windows XP Professional SP3, 32-bit
- Windows database server - Windows Server 2008 R2 Enterprise, 64-bit
- Citrix® server - Windows Server 2008 R2 Enterprise, 64-bit, XenApp™ Server 6.0 with client online plug-in 12

Unsupported operating systems

During installation, the Empower 3 software installer gathers information about your system and compares your system configuration to the minimum required specifications.

- If the installer detects the Windows NT, Windows 2000, Windows XP 64-bit, or Windows 2000 Server operating system, it exits without installing the Empower 3 software.
- If the installer detects the Windows Vista 32-bit, Windows Vista 64-bit, Windows 7 32-bit, Windows XP 32-bit (Empower 3 Personal software only), or Windows Server 2003 operating system, it displays an error message and prompts you to indicate whether to continue the installation. This information is documented in the Empower 3 installation log.

Although the Empower 3 software can be successfully installed on these operating systems, Waters does not support such installations. Installation is allowed on these operating systems for testing and development purposes only.

If you install Empower 3 software on a Windows 7 32-bit operating system, you must click "Install" when the Windows Security Device Installation dialog box prompts you to install the BusLAC/E drivers. If you select "Don't Install", the Empower 3 installation fails and the installer attempts to roll back changes. The roll-back process might not successfully remove the Empower Instruments folder.

Tip: To prevent the security dialog box from appearing during future installations, select "Always trust software from Waters Corporation".

Empower 3 software does not support file server clustering or Waters Service clustering.

Processor and memory requirements

The following table illustrates the minimum and recommended minimum hardware requirements for Empower 3 software installation:

Configuration		Minimum	Recommended minimum
Personal/ Workstation	Processor	Core™ 2 Duo E6400, 2.13 GHz	Core 2 Duo E8400, 3.0 GHz
	Memory	2 GB	4 GB
	Hard drive (Empower 3 application)	1 GB	- -
	Hard drive (Project directory)	1 GB	- -
	Hard drive (Oracle application)	8 GB	- -
Enterprise Server	Processor	Intel® Xeon® 2 GHz (single or dual)	Intel Xeon 2.7 GHz (single or dual)
	Memory	4 GB	6 GB
	Hard drive (Empower 3 application)	1 GB	- -
	Hard drive (Empower 3 database)	3 GB	- -
	Hard drive (Project directory)	1 GB	- -
	Hard drive (Oracle application)	5 GB	- -
Workgroup Server	Processor	Intel Xeon 2 GHz (single or dual)	Intel Xeon 2.7 GHz (single or dual)
	Memory	2 GB	4 GB
	Hard drive (Empower 3 application)	1 GB	- -

Workgroup Server (<i>continued</i>)	Hard drive (Empower 3 database)	3 GB	- -
	Hard drive (Project directory)	1 GB	- -
	Hard drive (Oracle application)	5 GB	
Client or LAC/E ³²	Processor	Core 2 Duo E6400 2.13 GHz	Core 2 Duo E8400 3.0 GHz
	Memory	2 GB	2 GB
	Hard drive (Empower 3 application)	1 GB	- -
	Hard drive (Oracle application)	5 GB	- -

The Empower 3 installer checks the processor requirement, but does not display a warning message or terminate the installation if it finds an incompatible processor. Processor information is recorded in the Empower 3 installation log.

If your system does not meet the minimum memory requirements, the installer displays an error message, and the installation is terminated. The installation log is updated with the insufficient memory information. The memory sizes recorded in the installation log may be rounded up from those reported as the computer properties.

If your system does not meet the hard drive space requirements, the installer displays an error message, and returns you to the Custom installation page, where you can delete files to create free disk space or select a different target drive. The installer checks the drive hosting the Empower Projects directory for the suggested 1 GB of free space. If the drive does not have the suggested free disk space, the installer displays a warning message, but allows the installation to continue. The installer checks each of the free space requirements against the target hard drive. If multiple Empower 3 components will be installed on the same hard drive, the installer checks the hard drive to ensure there is adequate free space for the sum of those components.

Waters NuGenesis SDMS and Empower 3 compatibility

Empower 3 Enterprise software is supported with SDMS 7.1 SR7, which is slated for release in late 2010.

The core SDMS and Vision Publisher (VP) 7.1 software are not compatible with 64-bit Windows operating systems or on Windows Server 2008 R2 operating systems. Because Empower 3 Personal software is supported on Windows 7 64-bit only, it is not supported with SDMS/VP.

SDMS File Capture is compatible with 32-bit operating systems. For Empower 3 Enterprise or Workgroup software, File Capture is supported running the Empower Remote Data Adapter on Windows 7 Professional or Enterprise, 64-bit. The SDMS Archive Agent must be run on either Windows XP SP3 32-bit or Windows 2003 Server R2 SP2 32-bit operating systems.

See "Installing NuGenesis SDMS data adapters" below for instructions on setting up Empower 3 file capture with SDMS.

SDMS Print Capture is compatible with 32-bit operating systems, but is not compatible with 64-bit operating systems. You must use a Windows XP 32-bit client to use Print Capture from Empower 3 software. Hence, SDMS Print Capture from Empower 3 Personal is not supported.

Vision Publisher client and VP options such as Form Designer are compatible with 32-bit operating systems, but are not compatible with 64-bit operating systems. You must use a Windows XP 32-bit client to access Empower 3 data through Vision Publisher's External Systems screen.

Empower 3 support is structurally validated with SDMS/VP 7.1 SR7 only. Prior versions of SDMS have not been tested with Empower 3 software.

Operating System	Empower 3 Enterprise	Waters NuGenesis SDMS 7.1 Service Release 7					
		NuGenesis VISION client	Vision Publisher client	UNIFY print capture driver	Archive Agent	Empower Remote data adapter	Empower Restore data adapter
Windows 2003 Server R2 SP2 32-bit	No	Yes	Yes	Yes	Yes	(Yes)	(Yes)
Windows XP Professional SP3 32-bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Windows 7 (Professional or Enterprise) 64-bit	Yes	No	No	No	No	Yes	No

Note: Entries in parenthesis indicate that while the respective component is compatible with the operating system, it is not compatible with Empower 3 software.

Issues fixed in previous versions of Empower software

The following table contains a list of the problems fixed in previous versions of Empower software. The PCS (Product Change System) numbers identify software issues that Waters personnel monitor within a system change request tracking tool.

PCS Number	Empower 2 version	Description
44653	SPF HF1 44596	When selecting an object in the Project window, you no longer receive a message about a required resource or Empower 3 no longer closes unexpectedly. To fix this problem, memory leaks for Graphics Device Interface (GDI) objects were resolved and stay below the maximum limit of 10,000.
44654	SPF HF1 44559 44586	When you delete one or more rows in the Peaks table in the Review Window using either the Pro or QuickStart interface, the software no longer closes unexpectedly.
44698	SPG 44571	When switching injections and updating the 2D and 3D Channel tables in the Review window and QuickStart, the software no longer closes unexpectedly.
44699	SPG 44209	When you manually identify peaks (Named Group or Timed Group) in the Review window and in QuickStart, the software no longer closes unexpectedly.
44700	SPG 43590	When you log into Empower 3 software as a non-Administrator and open the View Sample History dialog box, QuickStart and the Run Samples window no longer close unexpectedly.
44701	SPG 44233	While exporting data that contains fields with no values, the software no longer closes unexpectedly.
44703	SPG 44311	In MVM validation reports containing a Validation Test Data table, the linearity test's Response Factor (RF) and the Relative Response Factor (RRF) were interchanged.
44705	SPG 41951	The Review window and QuickStart no longer close unexpectedly when the title of the project path contains more than 100 characters.
44706	SPG 43340	The first application windows to open were allocated excessive amounts of memory by the Windows operating system. Empower 3 applications were modified to override the Windows defaults and allocate memory equitably.
44707	SPG 44610	When using an LDAP user account, you can now enter your LDAP password to confirm manual integration of a peak.
44917	SPG 43252	When you export data containing fields that are too long to fit on one line, the software no longer closes unexpectedly.
45240	SPG 45032	When an Administrator presses the [Esc] key in the Your Password has Expired dialog box, a logged-in user's role is no longer changed to Administrator.
45241	SPG 38016 42546	The Open Access user interface now opens correctly the first time and does not close immediately upon opening.
45755	SPG HF1 45545	In the QuickStart and Review windows, you can no longer create results against a modified calibration curve without first saving the calibration curve.

45756	SPG HF1 45324	In the QuickStart and Review windows, the following menu options have now been re-enabled, as they were in releases prior to Empower 2 Service Pack G: <ul style="list-style-type: none"> • Edit > Manual Coefficients (GPC Calibration Curve) • Edit > Clear Calibration • Navigate > Previous Purity Pass (Result window) • Navigate > Next Purity Pass (Result window) • Navigate > Previous Library Match (Result window) • Navigate > Next Library Match (Result window)
46096	SPG HF2 46265	An Oracle parameter has been implemented to improve database responses to Toolkit or client queries. This change is intended to improve performance in wide-area network (WAN) applications, but some improvement in local-area network environments may also be noticed. This feature does not have a significant effect when a large number of different queries are executed (such as opening a project or bringing a large number of results into Review), or with tasks involving intensive non-database activity.

Issues fixed in Empower 3 software

The following table contains a list of the problems fixed in Empower 3 software. The PCS (Product Change System) numbers identify software issues that Waters personnel monitor within a system change request tracking tool.

PCS Number	Description
36203	Although chromatographic system comments were available in Empower build 1154, they were not available in Empower 2 build 2154. The system creation process recorded the system comment only as the reason for creating the system and not as an entry into the audit trail. The Empower 3 system creation process includes two comment fields: <ul style="list-style-type: none"> • System Comment – Allows you to enter free text to describe the system • Comment – Provides information for the system audit trail
38260, 41333	In a Full Audit Trail project, the software now prompts you for a comment (and password, if the "Confirm Identity" policy is enabled) each time you attempt to delete an object using the Delete key.
38488	The "Export to text" function in Configuration Manager now displays the correct information and list of projects for the selected user.
40277	The software now produces a signal-to-noise value when the USP option is selected in a processing method's suitability parameters.
40630	The System Monitor now displays the correct number of installed user licenses.

41383	When the ACQUITY SM-FTN Instrument Control Software (ICS) version 1.5 or greater is installed, Empower 3 software no longer allows a user to enter an incorrect injection volume when the sample manager is in Full Loop mode.
41661	When two GPC results are reported together and the first selected result is associated with a GPC calibration curve with points, and the second selected result is associated with a GPC calibration curve without points, the GPC Calibration Table report group now reports the correct results for GPC calibration curves that do not have points.
41807	<p>The ApexTrack Peak Width value now determines more accurate inflection points, thus producing more accurate plate count and resolution values.</p> <p>For all ApexTrack peaks with an Integration Type of BB, the software attempts to recalculate the inflection points using a peak width that is optimized for the integrated peak rather than determining the inflection points using the Peak Width parameter within the processing method (as in past revisions of Empower). If successful, the recalculated inflection points are used to calculate the Inflection Width, the optimized peak width value is provided in the peak's Optimized Peak Width field which is new in Empower 3 and the peak gets an S53 processing code indicating the peak's inflection points were determined using the optimized peak width.</p> <p>When compared to previous versions of Empower, Inflection Width and the 5 fields that are calculated using Inflection Width-- Width @ Tangent, USP Resolution, USP Plate Count, Width @ Tangent (USP Plate Count), and Relative Resolution (when the Pharmacopoeia type in the processing method is set to USP)-- could be different due to recalculating the inflection points using the optimized peak width. These values have improved accuracy when the Peak Width parameter used in the processing method is inappropriate for the peak(s).</p> <p>In Review and QuickStart, the Empower 3 software no longer displays a message box with the warning "Warning: This ApexTrack result was obtained using a Peak Width value that differs significantly from the Auto-Peak Width value calculated for the channel."</p>
42091	The "ORA-01461: can bind a LONG value only for insert into a LONG column" error message no longer occurs during processing, and results are produced as expected.
42324	The message "One or more Accuracy channels were processed multiple times in the result set" is now classified as a warning instead of an error.

42393, 44910	Projects with names that differ only in letter case can no longer be moved to another parent project that contains a project with the same name. For instance, the project "Quality_lab_2009" can no longer be moved to a parent project that contains a project named "Quality_LAB_2009" by changing the "Quality_lab_2009" project's parent (in project properties). In previous versions of the software, both projects in this example could subsequently be moved to the same level by modifying project properties. Deleting one of the projects deleted the other project.
42485	Extracted PDA chromatograms no longer display incorrect run times when higher sampling rates are used.
42959, 43417	In previous versions of Empower software, enabling the Require User Comments system policy resulted in a Comments dialog box and a Revision History dialog box. However, after restoring FAT projects from Empower to Empower 2, the Revision History dialog box did not appear when a method was copied from a restored project into a new project. Empower 3 software allows both method comments and audit trail comments for methods.
42989	A Procsrvr MFC application error no longer occurs when attempting to print or report an instrument method containing a deactivated (Off) SAT/IN2.
43070	If you used the QuickStart Make Single Injection function in a GPC-enabled project that used an inject function of "Inject Broad Samples," the sample type for the first sample injected was defined as a "Broad Unknown."; however, subsequent injections of the same sample type were incorrectly defined as an "Unknown.". Subsequent injections of the same sample type are now correct.
43426	In the Processing Method Editor's Suitability tab, the Noise Value for s/n field is no longer cleared when US or Japanese pharmacopoeia are selected. The s/n fields are now calculated for any of the pharmacopoeia selections when the Noise Value for s/n field is not blank.
43592	A new processing system policy "Enable Empower (1154) ApexTrack Manual Integration" controls whether to perform ApexTrack manual integration using the Empower ApexTrack manual integration code or the Empower 2 ApexTrack manual integration code. By default, this system policy is disabled. If you enable it, ApexTrack manual integration works as it does in Empower (completely manually). If you disable it, ApexTrack manual integration works as it does in Empower 2 (semi-automatically). See also: "Manually altering integration" and "Setting up data processing techniques" in the Empower 3 online information system.
44144	In some cases, database backups failed with error message "Backup Database terminated with errors." These backups now function properly.

44193	<p>Empower 3 software now calculates USP signal-to-noise (S/N) according to the latest USP definition (USP32-NF27 Supplement 2). The USP signal-to-noise is calculated as follows:</p> $S/N = 2h/h_n$ <p>where:</p> <p>h = the height of the peak corresponding to the component concerned</p> <p>h_n = the difference between the largest and smallest noise values observed over a distance equal to at least five times the width at the half-height of the peak and, if possible, situated equally around the peak of interest.</p>
44217	Using an individual report method to print data for sample sets containing replicate injections no longer produces several copies of each result.
44226	Removal of the Method Validation Administrator user type no longer causes upgrades to fail.
44287, 44310	In Empower 2 FR5 systems with an e2695 or e2795 connected via Ethernet, interactive flow changes no longer cause the Run Samples window to become unresponsive.
44301	The Save Preferences function did not save the control panel configurations in the QuickStart and RunSamples windows. The software now saves the position and visibility states of control panels on a per user, per application, and per system basis. These are saved automatically, upon exit from the window, with no need to select the Save Preferences menu item.
44666	In Review, when a 3D channel is derived from a 2D channel, the 3D channel's data rate is now calculated correctly.
44716	LDAP user account names are no longer required to have at least four characters.
44829	When you import AIA data, Empower 3 software now issues an error and terminates the import process if the data array type is incompatible with the AIA chromatography template specification.
45207	When reporting a result set, the sample set method table now reports the version of the sample set method that was used to process the data.
45404	When working with Empower System Policies, Other Policies, Force Different Reasons, a combination of the length of the string and number of strings selected as valid reasons for the Force Different Reasons no longer causes the Configuration Manager application to exit and produce a Microsoft Visual C++ Runtime Library error.
45502	When running two 2414 systems connected via Ethernet to the same Empower acquisition computer, the injection sequence from one system no longer causes a negative spike on the second system.

45609	The MVM AQT report contained no reference to the processing node. The validation results processing node now appears in the validation report header.
45611	For Enterprise configurations with many licenses, the Waters Licensing Wizard now prints all pages of the list of licenses.
45687	For 15xx pumps, the Run Samples interactive mode now displays the correct flow rate for Pump C.
45689	Empower 3 software now includes an updated driver for the Configuration 13 LAC/E ³² .
45901	You can no longer alter locked channels using the Alter Sample function.
46014	Empower 3 reports signed off in QuickStart and sent to SDMS now print to SDMS Unify.
46148	Users with the View Multiple Projects Only privilege can no longer delete channels in the Channel view or studies in the Validation Study view.
46294	In the Review and QuickStart windows, you can now scroll through the injections displayed in the tree pane using the keyboard up arrow and down arrow keys. You must first click in the tree to set the focus.
46376	When an LDAP group includes a group that is a parent group, Empower can now successfully retrieve the LDAP tree info.

Known issues in Empower 3 software

The following table contains a list of the known issues and workarounds in Empower 3 software. The PCS (Product Change System) numbers identify software issues that Waters personnel monitor within a system change request tracking tool.

Empower 3 software and Instrument Control Software (ICS) Installation

PCS Number	Description
46051	If you use Empower 3 software on a Windows 7 64-bit system, you cannot install the NuGenesis Unify driver. Contact your Waters informatics Sales or Support Representative for assistance.
46088	If you attempt to install the 8-port serial hub (ESP-8) device driver on a computer on which the 8-port serial card driver is already installed, the installation might fail. Resolution: Remove the secondary IP address of 64.1.1.1 for the network interface card (NIC), and then reinstall the 8-port serial hub (ESP-8) driver. See the <i>Waters Ethernet Instrument Getting Started Guide</i> for more information.

46775	<p>When you log in to an Empower 3 Workgroup or Enterprise system for the first time after performing a system object import, the Message Center displays the following message:</p> <p>Oracle Error ORA-00904: "INVALIDPASSATTEMPT" invalid identifier.</p> <p>Although the message is accurate, it appears only during the initial logon.</p>
46794	<p>Do not uninstall the Agilent LC Control software from a computer that also hosts Empower 3 software unless you also uninstall Empower 3. If you remove the Agilent LC Control software from an Empower 3 system, the removal causes the Empower 3 Verify Files to fail.</p> <p>Workaround: Remove the Agilent LC Control license without removing the software for the instrument.</p> <p>Note: To access the Agilent LC Control instrument Help, press F1 while editing an instrument method containing an Agilent LC instrument.</p>
47126	<p>The Verify Files document does not include the "Installation Information" and "The following product updates have been applied to this installation" sections if Empower 3 software is installed after installing the Bing Toolbar or Windows Live ID on the computer.</p> <p>Prevention: When updating Java, ensure the Install Bing Toolbar option is unselected. Do not download and install the Bing Toolbar or Windows Live ID applications onto any computer on which Empower 3 software is installed.</p> <p>Resolution: Open the Windows Control Panel, select Uninstall a Program, and then uninstall the Windows Live ID program. This corrects the problem immediately; you do not need to restart the computer.</p>
47128	<p>During uninstallation of Empower 3 software, the Waters DHCP server message "Could not delete service" sometimes appears. If this message appears, click OK. The uninstallation continues and completes successfully.</p>
47154	<p>The domain name reported in the Empower 3 installation log is that of the user who performed the installation, which is not necessarily the same as the domain in which the computer resides.</p>
47204	<p>When installing Empower 3 client LAC/E³² software on a computer that previously contained Empower 3 Personal software, you must first remove the TNS_Admin environment variable.</p>
47212, 47213	<p>When executing a push install of Instrument Control Software (ICS) for mass spectrometers, ensure that no other users are logged on to the target (client) system. If the local admin user is logged on to the target system during the installation, ICS installation sometimes fails.</p>

47223	If you attempt to log in to the Waters Licensing Wizard using a disabled or removed account, the software displays an error message indicating that the failed login attempt was due to your lack of Administrator privileges. The message should indicate that the login was not permitted because your user account was disabled or removed.
47278	After importing system objects from a previous version of Empower software into Empower 3 software, the Waters Licensing Wizard sometimes generates an empty activation file. Resolution: Start Empower 3. When the Login window appears, click Cancel, and then proceed with the normal license activation process.
47374	The Configure BusLAC/E button is removed from the General tab of the Node Properties dialog box in Configuration Manager. The BusLAC/E is installed and configured properly during the Empower 3 software installation as long as the BusLAC/E is present before starting the Empower 3 installation. To configure the BusLAC/E in the manner previously employed by the Configure BusLAC/E button, access the acquisition node directly, right-click the Computer icon on the desktop and select System Properties, and then click the Hardware tab. Recommendation: Install the BusLAC/E board in the computer before you install Empower 3.
47400	When you run a system object export from an Empower 3 client, a blank dialog box sometimes appears after you double-click watexp.exe. Workaround: Click OK in the dialog box. The system object export wizard then starts normally.
47401	When you run a system object export from a client, you need only the System account password.

Communications

PCS Number	Description
45834	When connecting an Empower node to an SQ or a TQ mass detector for the first time, the message "An unnamed file contains an invalid path" appears. Click OK to close the message. Empower establishes communication with the instrument and the message no longer appears.

45991	<p>When your Empower system is configured with gas chromatography instruments, the OK status displayed in the Instrument tab of the Node Properties dialog box in Configuration Manager might incorrectly display "No" when the instrument status is actually OK. The incorrect status does not prevent data acquisition.</p> <p>Workaround: If the Instrument tab of the Node Properties dialog box reports "No" in the OK field for any GC instrument, but acquisition is possible, it is acceptable to continue using the system. Restarting the computer corrects the instrument status.</p>
46487	<p>Occasionally, it may take several attempts for Empower 3 software to establish communication with the WFCIII and achieve successful status in Configuration Manager.</p> <p>To establish communication, close the Empower 3 software, restart the computer, and then restart the WFC III.</p>
47100	<p>Empower 3 software is unable to establish communications with an MS detector after Instrument Control Software (ICS) for unused MS detectors is removed. The instrument's OK status displayed in node properties is "No", the Run Samples control panel is blank, and the Tune page cannot be opened or is unresponsive.</p> <p>This defect applies to all mass spectrometers supported by Empower 3 software (EMD1000, ZQ2000, ZQ4000, EMD3100, SQD, and TQD).</p> <p>Workaround: Uninstall the ICS for all installed mass detectors, restart the computer, re-install the ICS, and then restart both the mass detector and the computer again.</p>
47107	<p>If there is no network adapter (network interface card, or NIC) present in an Empower 3 Personal computer, or if the network adapter is powered off or becomes powered off as a result of a power saving mode change, a "Database connection terminated ORA-12571" message appears.</p> <p>Resolution:</p> <p>Power on the network adapter, or install the Microsoft Loopback Adapter as follows:</p> <ol style="list-style-type: none"> 1. Click Start. 2. In the Search box, type cmd. 3. In the results list, right-click cmd and select Run as Administrator. 4. At the command prompt, enter hdwwiz.exe. 5. When the Add Hardware Wizard appears, click Next. 6. Select Install the hardware that I manually select from a list (Advanced). 7. Click Next. 8. In the Common hardware types list, select Network adapters.

	<p>9. In the Manufacturer list, select Microsoft.</p> <p>10. In the Network Adapter list, select Microsoft Loopback Adapter.</p> <p>11. Click Next.</p> <p>12. When the installation is complete, click Finish.</p> <p>Confirm the successful installation of the loopback driver by right-clicking Computer (on the Windows desktop), and then selecting Properties. Click Device Manager, expand the Network Adapters node, and confirm that Microsoft Loopback Adapter appears in the list.</p>
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System administration

PCS Number	Description
45754	<p>If you import system objects from a version of Empower 2 software prior to Service Pack G, and LDAP authentication is enabled, you must update the LDAP information in Empower 3 software, or you will be unable to create users or alter the LDAP account information for an existing user.</p> <p>To update LDAP information:</p> <ol style="list-style-type: none"> 1. In System Policies, access the User Account Policies tab. 2. Under LDAP Domain Manager, click the top blank line in the box, and then click Edit. 3. On the Authentication Policies page, enter a domain name. 4. Enter the domain component information (for example, DC=DomainName,DC=com). 5. In the Search Criteria box, remove the domain component information (for example, DC=DomainName,DC=com) beside each line in the box.
46041, 46053, 47080, 47081	<p>Depending on the user account's administrative privileges, Empower 3 software sometimes exhibits one or more of the following behaviors when configured for use with a mass detector:</p> <ul style="list-style-type: none"> • The message "Cannot save Tune method, user does not have the "Save Tune method" privilege" appears when you access Run Samples. • The message "You must select (or enter) the name of existing Calibration Reference." appears when you access the calibration dialog box from the Tune page. • A Microsoft.NET Framework message appears when you click the W3100 control panel in Run Samples windows. • The Microsoft.NET Framework message "Unhandled exception has occurred in your application" appears. If you click Continue, the application ignores the error and attempts to continue. If you click Quit, the application closes immediately. • The Reference files dropdown list is blank. • The message "Acquity console client has stopped working - - -" appears.

	<p>To ensure proper operation of Empower 3 software with mass detectors, observe the following login guidelines:</p> <p>TQD and SQD – You can log in to the domain using an account that does not have Administrator privileges, but the account must have local Administrator privileges. You can the log in to Empower 3 software using an account that does not have Administrator privileges.</p> <p>3100, ZQ, and EMD – You can log in to both the domain and the Empower 3 software using an account that does not have Administrator privileges.</p>
46310	<p>On an Empower 3 Personal installation, do not change the default database password. Changing the password can cause a failure when you try to restore the database.</p> <p>Recommendation: In a Workgroup or Enterprise configuration, change this password for security purposes.</p>
46502	<p>When configured in LDAP authentication mode using Windows 2003 Active Directory and a user account configured so that the user is not allowed to log into a particular Empower workstation, Windows does not pass the "User not authorized to logon from this workstation" error to Empower 3 software. As a result, the user is allowed to log in to Empower 3 software. This Empower problem results from the Microsoft defect.</p>
46603	<p>When logging in to Empower 3 Client/Server or Workgroup software on supported Asian language Windows versions (Simplified Chinese, Japanese, and Korean), an Oracle error (-1) occurs if the database alias has the same name as the local computer. This problem is caused by an Oracle defect.</p> <p>Workaround: Ensure that the database alias name is different than the local computer name.</p>
46720	<p>When you run Net Configuration Assistant on a Windows 7 system, the screens might not display correctly. For example, the title of the screen might not pertain to the body text.</p> <p>Workaround: Close the Net Configuration Assistant and run it again.</p>
47380	<p>You cannot start the Empower 3 database from Oracle Enterprise Manager (OEM). Instead, use Services in the Windows Administrative tools to start and stop the Oracle service. See the <i>Empower System Administrator's Guide</i> for more information.</p>
47404	<p>In Empower 2, the "System" user was included by default in the administrators user group. In Empower 3, no default users are included in the administrators user group. You must manually add the "System" user to this group, unless you are importing system objects from Empower 2..</p>

Backing up and restoring projects

PCS Number	Description
45970	<p>When the SDMS option "Archive When Project Deleted" is enabled, projects deleted using the Configuration Manager do not appear in the table view, but remain in the tree view.</p> <p>This behavior occurs because the table view does not show projects that are awaiting deletion. Because projects are not fully deleted from Empower until the SDMS archiving completes, they remain in the tree view.</p> <p>After the archive operation is complete, refresh the project tree by collapsing and uncollapsing it, or by restarting Configuration Manager. The list of projects is then correct.</p>
46377	<p>After configuring a valid NuGenesis server URL in the NuGenesis SDMS Archive Properties dialog box, the message "Invalid URL" sometimes appears when you select or deselect the Archive when Project Deleted option.</p> <p>Resolution: Click Connect to reconnect the URL.</p>
46545, 46774	<p>When using the Backup and Restore Wizard to restore a large batch of projects, the window response is sometimes delayed. If you click your mouse during the restore process (for example, if you click outside of the project window), Microsoft Windows displays the following message:</p> <p>"CONFIGMGR MFC Application is not responding"</p> <p>Workaround: When this message appears, do nothing, or click "Wait for the system to respond." The message closes and the restoration continues.</p>
46641	<p>The Backup Project wizard might fail when the project you select for backup has sub-projects, and you press F1 to access Help at the following prompt:</p> <p>"At least one of the selected projects contains one or more sub-projects. Do you want to backup the contained sub-projects also?"</p> <p>Resolution: If the Backup Project Wizard has exited or is unresponsive, restart the backup operation.</p>
47065	<p>To minimize user interaction when restoring batches of projects, Empower 3 software sets the time zone for restored projects without time zones to the time zone of the node (client, etc.) from which the project restore operation was initiated. Previous versions of Empower software prompted the user to select the time zone for the first project restored as part of a project update during a batch restore.</p>

47193	<p>Project restoration from a Citrix client is delayed and the project hierarchy is sometimes not restored. When clicking through the Restore wizard, there may be significant delays, and the status sometimes indicates that the window is not responding. This behavior occurs when the projects to be restored are local on the Citrix client.</p> <p>Workaround: When restoring from a Citrix client drive, do one of the following:</p> <ul style="list-style-type: none"> • Ensure the Citrix client is part of a domain that has a trust relationship with the Citrix server and is logged into that domain. If the client and the server reside in separate domains with no trust relationship, the project restoration might fail. • Copy data to be restored to a network share in the same domain as the Citrix server.
47382	<p>Sub-projects do not appear in the list of projects being restored when the following circumstances exist:</p> <ul style="list-style-type: none"> • The projects being restored are located directly within a drive's root directory. • Only the first project's directory (listed alphabetically) contains sub-projects. • No other project hierarchies are located in the root directory. <p>Workaround: In the root directory, create an empty folder with a name that is alphabetically before the top-level project folder.</p>

Data acquisition

PCS Number	Description
34576	<p>If you run a sample set containing a method in which the "lamp on" option is disabled, the sample set completes with an instrument failure and the "Lamp off during acquisition" message appears.</p> <p>This occurs when you:</p> <ul style="list-style-type: none"> • Deselect the "lamp on" option in a shutdown method. This error occurs even though the shut-down method does not collect samples. • Program a "lamp off" event before the run time is complete. In this case, you can correct the problem by altering the method so that the "lamp off" event occurs after the run time expires.

45349	<p>When using Empower 3 Personal software with an instrument system connected via Ethernet, do not open multiple copies of RunSamples to acquire data in different projects using the same chromatographic system. If you do, the instrument becomes unresponsive, sounds a continuous alarm, and displays the following message:</p> <p>"Please cycle power. Unable to continue due to error in Vrtx Task capRunner3: Assertion failed:(runnerLock.Lock()==ok)file evntrun.cxx, Line"</p> <p>In the Empower Message Center, the following error appears:</p> <p>"Lost communication, instrument error."</p>
46239	<p>Empower 3 software can acquire data from only one Quaternary Gradient Module (QGM) system at any given time. If you attempt to acquire data using two QGM systems, the first system might not complete the acquisition.</p>
46746	<p>When the % Monitor collect between windows parameter is set to 100%, the collection peaks appear as square waves in the Run Samples real-time plot. Because the WFCIII displays data in 1-second intervals, fractions of seconds are displayed as collection peaks. This is the expected behavior.</p>
46871	<p>The Waters Fraction Collector III (WFCIII) skips the first collection vessel if both the Skip per Inj and Monitor collect between windows options are enabled in the instrument method. This is the expected behavior.</p>
46926	<p>When you change an instrument method that is actively being used for acquisition, your changes do not take effect until the next sample set is run or until you stop and then resume the current sample set. For the changes to take effect during the current acquisition, you must make them using the Alter Running Sample function.</p>
46962	<p>When specifying special vials 1 through 4 in the Run Samples window Single tab or the QuickStart single injection window, use the following format:</p> <p><i>V:position</i></p> <p>Where <i>position</i> is the sequential location of the vial in the sample tray. For example:</p> <p>V:1</p> <p>V:2</p> <p>V:3</p> <p>V:4</p> <p>If you use the wrong syntax, the message "The position must begin with the plate number followed by a colon" appears when you attempt to inject.</p>

47018	Empower 3 software displays the total time remaining for queued sample sets in days, hours, minutes, and seconds. Previous versions of Empower software displayed the time in hours only.
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Method development

PCS Number	Description
35915	You can use the "&" character to create comments; however, when you print the comment to a report, that character is not displayed.
46219	<p>In an environment that contains multiple Quaternary Gradient Modules (QGM) that share instrument methods, when editing a QGM instrument method, the instrument method editor sometimes displays a generic method editor with incorrect flow rate ranges and flow scale parameters. When printed, the instrument method reflects the system for which it was created, regardless of the system on which it was run. These behaviors occur when the instrument method was created on a mismatched QGM system.</p> <p>To optimize the use of QGM instrument methods across Empower systems, ensure the system properties include the same instrument types, listed in the same order, and that the QGM models are identical.</p>
46220	When you create or save an instrument method that includes a Quaternary Gradient Module (QGM), and then attempt to close the instrument method without making changes, the software prompts you to save changes.
46691	When using the Method Properties dialog box to compare methods from a system with a Sample Manager – Flow Through Needle (SM-FTN), Quaternary Solvent Manager (QSM) and Photodiode Array Detector (PDA), configured in that order, the software fails if you choose the second method version before the first one in the Method Properties dialog box, and then click Differences.
46713	If you use the Method Differences function to compare an instrument method that includes a Quaternary Solvent Manager (QSM) with a method that does not include a QSM, the project.exe application fails.

Data processing

PCS Number	Description
45275, 45276, 46551	<p>Empower 3 software is built using a different compiler than previous versions of Empower and Millennium software. The compiler used to build Empower 3 software allows separate settings for improved floating point precision and for faster speed of execution. Earlier compilers allowed only a single compiler setting for either improved floating point precision or faster speed of execution.</p> <p>Empower 3 software is optimized for both improved floating precision and faster speed of execution. Because previous versions of Empower and Millennium software were optimized only for speed of execution, results produced by Empower 3 software might not match results produced using previous versions of Empower and Millennium software.</p> <p>For more information, see "Empower calculation considerations".</p>
46168	<p>To ensure that you have adequate computer resources to view a large number of large data files (for example, 3D files with long sample run times with data collected at the maximum data rate) in Review or QuickStart, do one or more of the following:</p> <ul style="list-style-type: none"> • Increase virtual memory to 10 times the size of the RAM. • Access the Method Set Options dialog box in Review by selecting Options > Method Set Options. Clear the "Automatically apply method set" check box, exit Review or QuickStart, and then open Review or QuickStart to view the data. • In Windows 7 systems, select a basic operating system theme.
46583	<p>Empower 3 software allows only one sample set or result set in Review and QuickStart at one time. Previous versions of Empower software allowed multiple sample or result sets in Review and QuickStart.</p> <p>If you attempt to bring two sample or result sets into Review or QuickStart, the software rejects the second set. If you have a sample or result set in Review, and you attempt to bring in an additional sample or result set, the software rejects it. If you attempt to bring a sample or result set into QuickStart when a data set of the same type is already loaded, you can choose to replace the existing data with the data from the selected set or to keep the data already loaded.</p> <p>Workaround: Create a process-only sample set from the sample sets you want to bring into Review.</p>
46715	<p>Previous versions of Empower software allowed you to drag and drop invalid file types (.AR0, .AR1, .AR2, .AR3, and .AR4) into the Project window. Invalid file types are not allowed in the Empower 3 Project window.</p>

46730	<p>In Empower 3 MVM Linearity results, small negative (10^{-16}) skew values do not match corresponding skews calculated in JMP® 6.0. However, larger, positive skew values in Empower 3 software match corresponding skews calculated in JMP 6.0.</p> <p>This behavior occurs only for skews. All other statistical calculations (mean, standard deviation, etc.) for the same linearity results match JMP 6.0 calculations.</p>
46836	<p>In Empower 3 MVM Linearity of the method results, the Intercept value in the Regression Coefficient Table does not match the JMP, Excel, or Table Curve intercept value. Because the MVM result's curve intercept value is so close to zero, Empower 3 software calculates it differently than other software.</p>
46857	<p>On Empower 3 Windows XP clients, background processing may not work as expected if you use the TNS_ADMIN environment variable to define the net service name.</p> <p>Workaround: Specify the computer name instead of an IP address when defining the TNS_ADMIN variable.</p>
46914	<p>When performing a Linearity test in Empower 3 MVM software, the value in the Variance Cochran Test Ref field sometimes does not match the accepted documentation¹ to the fourth significant figure. At other times, the value matches appropriately.</p> <p>Because the accepted documentation pre-dates chromatography data systems, the values calculated by Empower 3 software are likely to be more accurate than the numbers in the accepted Cochran table. Discrepancies are random and could be caused by rounding error.</p> <p>¹ Statistical Principals in Experimental Design, Third Edition, by B.J. Winer, Donald R. Brown, Kenneth M. Michels.</p>
47007	<p>During processing, when the available tablespace for a project falls below 10 MB, the software should halt processing and display the "Available table space below minimum level to continue processing. Processing aborted" message in the Message Center. Instead, processing continues until the available tablespace for the project falls below 0.5 MB, at which point the "Oracle error ORA 01536;Space quota exceeded for table space USER_DATA" message appears.</p>
47072, 46997	<p>In the Method Validation Regression Coefficient Table, Empower 3 software recalculates the t-Ratio, p-Value, and lower and upper confidence values for both the intercept and the slope using the reported slope and intercept values (calculated using the curve fitting routine).</p> <p>Empower 2 software did not recalculate these values and reported the values calculated using the statistical routine.</p>

47224	When creating a new processing method, the Spectra to Average field in the MS processing method's MS Library Search tab defaults to 5. In earlier versions of Empower software, the Spectra to Average field defaults to 1. The Empower 3 online Help for the MS Library Search Tab incorrectly lists the default as 1.
46343, 47261	In the process-only sample set editor, if you split replicate injections into separate sample lines, the component editor shows the components for the first injection of the replicates, even when you select a subsequent replicate. Workaround: View component information in the Alter Sample Editor.
47375	When you attempt to display many large 3D and 2D channels in Review, "Data Missing" appears in the 3D and 2D plots, an MEM processing code is added to the Result Codes in the Chromatogram Result table in the Result Window, and the following messages appear in Message Center: <ul style="list-style-type: none"> • Chrom map view of file failed. • Not enough storage is available to process this command. The "Data Missing" error is incorrect; no loss of data occurs. Workarounds: <ul style="list-style-type: none"> • Bring smaller groups of data into Review. • Bring a sample set or injections instead of channels, and a result set instead of results into Review.
47379	In the multi project mode, the Project windows fails when you select Remove All Projects from the Global Projects branch or when you click the Deactivate All button in the Project Available tree view (View->Toolbar->Project Available) and then try to reactivate a project. Workaround: Remove and activate projects individually in the Projects Available tree view.
47406	In Empower 3 simplified Chinese software, the translation of the Lower Error Limit (LCL) Method Validation field name is incorrect and is not consistent with the translation of the Upper Error Limit (UCL) field name.

Configuration Manager

PCS Number	Description
46297	To import the sample plate file for the Waters 2707 autosampler ("W2707_Plate_Type.txt"), your Empower 3 software must be the same language version as the system from which the sample plate file was exported. If you attempt to import a sample plate file from a different language version, the system issues the following message: 'unexpected file found'

46589	<p>If you attempt to clear an offline system audit trail while a view filter that displays no entries is applied, Empower 3 software displays a message indicating that there are no records to clear. This message appears even if the database contains entries eligible to be cleared.</p> <p>To clear an offline system audit trail, select a view filter that displays at least one entry, then clear the audit trail. All entries are then cleared, regardless of which entries appear in the current view. To ensure regulatory compliance, Empower 3 software clears all records; you cannot selectively clear individual entries.</p>
46945	<p>By design, the Configuration Manager displays eCord column pressure in psi regardless of the type of units selected and displayed in the ACQUITY UPLC console. Although the Configuration Manager uses a different unit of measurement than the ACQUITY UPLC console, the data that the Configuration Manager displays is correct and equivalent to the measurements presented in the ACQUITY UPLC console.</p>
47196	<p>The eCord Summary information in Configuration Manager may not update properly if more than one sample set runs to completion while the acquisition server is buffering data. The eCord summary information will be displayed properly when a new sample set or a single injection is run when the acquisition server is no longer buffering.</p>
47329	<p>When Configuration Manager is simultaneously open on two nodes (either a client and a server or two clients), the list of projects shown in editors such as the New Project Wizard can be inaccurate when projects have been created or deleted using a node other than the node on which the list of projects is viewed.</p> <p>Workaround: To ensure the latest project information is displayed, shut down and restart Configuration Manager.</p>

Reporting

PCS Number	Description
45475	<p>In Empower 64-bit installations (Windows 7), reports sometimes do not display or print properly when the font setting in the Windows Control Panel is 150%. Reports sometimes appear truncated because they do not use the full length and width available for the paper.</p> <p>This behavior does not occur on Empower 3 software installed on 32-bit versions of Windows XP, or if you use a Windows XP computer to remotely access a Windows 7 64-bit computer.</p> <p>Workaround: In Windows Control Panel, access the font size setting by selecting Appearance and personalization > Display, and then selecting a size setting other than 150%.</p>
47318	<p>Adobe Acrobat must be installed on your computer to view signed off reports in Report Viewer.</p> <p>Refer to the Adobe web site if you do not have Acrobat installed on your system.</p>

Custom fields

PCS Number	Description
46853	<p>Some Empower 2 and Empower 3 Korean default projects have an improper translation of the sample weight field name. The correct translation is sample weight; the incorrect translation is sample mass. Any projects cloned from these affected projects also have the improper translations.</p> <p>Empower 3 projects with the incorrect translation include:</p> <p>Custom_fields Defaults_FAT GPCVLS_Default GPC_Default LIMS_ASCII_Andi LIMS_LabSystems PDA_Default SysSuit_Default ZQ_Default</p> <p>Workaround: Before copying data from one of the affected projects, correct the sample weight custom field name in the source project so that it matches the translation in the destination project.</p>
47264	<p>An Improper Argument error sometimes appears when you access the custom field editor in the following manner:</p> <ol style="list-style-type: none"> 1. In the Project window, access the Custom Fields tab. 2. Double click a custom field. The Project Properties dialog box opens in Configuration Manager. 3. Close the Project Properties dialog box. 4. In the Configuration Manager project list, right-click a different project and select Properties. 5. In the Project Properties window, click the Custom Fields tab. <p>If the custom field that was opened in the first project does not exist in the subsequently opened project, the Improper Argument error appears.</p> <p>Workaround: Start the custom field editor from Configuration Manager rather than from the Project window.</p>
47402	<p>In the Japanese version of Empower 3 software, the translation of the "Injection" field does not match the translation in Empower 2. After upgrading your Empower 2 data to Empower 3, if you have custom fields that are defined using this field, you might need to update those custom fields to use the Empower 3 translation of the "Injection" field.</p>

47407	PDA field names were changed in Empower 2, Feature Release 4 software. If you have custom formulas that reference PDA field names, you must manually update them for custom formula calculations to generate results correctly.
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Toolkit

PCS Number	Description
45955	The Intervals class, which was used only with the Pattern Matching option, is obsolete. If your Empower Toolkit applications use the Intervals class, you must rename the class and recompile the application.
47408	To view the Toolkit Professional Help file (miltk.chm), copy the file from the Toolkit media to your computer, navigate to the file in My Computer, and then double click it.

Qualification

PCS Number	Description
47052	The Automated Qualification Tool (AQT) for SAT/IN is not compatible with Empower 3 software.

Online Help

PCS Number	Description
44321	<p>The Empower 3 online Help contains inconsistent units for the peak fields "Slope" and "Offset".</p> <p>"Slope" refers to the slope of the baseline drawn beneath a peak, or peak cluster, based on how it is currently integrated. Slope units are the y-axis units divided by minutes. In some cases, the online Help lists Slope units as microvolts/second, $\mu\text{V}/\text{second}$, or plot units/minutes.</p> <p>"Offset" refers to the y-intercept of the baseline of a peak or peak cluster extrapolated to time zero. Offset units are the same as the y-axis units. In some cases, the online Help lists Offset units as microvolts, μV, or plot units.</p>

GxP compliance requirements

When you install Empower Software for the first time, or when you uninstall software, Waters recommends that you perform software qualification to meet GxP compliance requirements. Any time you install or uninstall software in a GxP environment, Waters recommends that you follow your company's management-approved software change management standard operating procedures.

To verify that the installation of Empower 3 software does not affect any data, reprocess a data set before and after you install the software, and then verify that the results are equivalent.

Waters recommends that you run either the Verify Files utility or the ConnectionsAQT for Empower IQ. After you run one of these utilities, review the resulting checksum.txt file for an entry that states "No installation changes were detected."

In a GxP-compliant environment, Waters recommends enabling the Disallow Use of Annotation Tools system policy. Enabling this policy prevents all users from using the Annotation tool in Report Publisher and in Review. You access the system policy options by selecting View > System Policies > Other tab in Configuration Manager.

Post-installation considerations

Activating licenses and options

Empower 3 installations require using the Waters Software License Management System to register, activate, deactivate, and view Waters software licenses and options. Key disks are unavailable for Empower 3 software.

For detailed instructions on using the Waters Licensing Wizard, see the *Empower 3 Installation and Configuration Guide*, Revision A, on the Empower 3 Documentation media.

Option changes

The following options, which were available in previous versions of Empower software, are not available in Empower 3 software:

- Webservice
- Pattern Matching
- Data converter options, including Waters Data Converter, AccessChrom, ChemStation, and MassLynx Data Converter. As a result, the Import MassLynx Data and Waters Data Converter selections have been removed from Empower 3 menus. These options will be replaced by the Waters Data Converter 2 (WDC 2) software.

In addition, the GPC, GPCV, and GPCVLS options have been replaced by the GPC/SEC option. No GPC, GPCV, or GPCVLS functionality was changed as a result of this change. These options continue to be enabled on a per-project basis within the project properties.

Configuring projects

In Empower software, chromatographic data and metadata are organized into projects. When Empower 3 software is first installed, no projects are configured. You use Configuration Manager to create new projects or restore projects from previous versions of Empower software. The Empower 3 Default Projects media, provided in the Empower 3 software kit, includes example projects you can restore to your Empower 3 system.

For information regarding creating and restoring projects, see the "Creating Projects" and "Restoring Projects" topics in the Empower 3 online information system.

Installing Waters NuGenesis SDMS data adapters

The Empower Remote Data Adapter and Empower Restore must be installed on a computer running the Empower 3 Enterprise client. Data capture from Empower 3 Personal software into SDMS is not supported.

As of this release, the Empower Remote Data Adapter software is supported on English and Japanese language versions of Microsoft Windows. NuGenesis VISION and UNIFY are supported on English, Japanese, Chinese, and Korean language versions of Windows 2003 and Windows XP.

In general, the steps to install NuGenesis SDMS data adapters are:

1. Install SDMS 7.1 remote data adapters.

Note: When installing remote data adapters, select Waters Corp. Empower-2 (Remote). This data adapter has been structurally validated with Empower 3 Enterprise software.

2. Install the NuGenesis Transfer application.

3. Install SDMS Data Adapters.

Note: When installing SDMS Data Adapters, select Data Restore, then select Waters Corp. Empower-2 0 Restore.

4. Install service release 6 (or later).

After you install the NuGenesis SDMS Data Adapters, you may see an error when you run the Installation Qualification. If this error message appears, click "This program is installed correctly".

To run the Data Adapters, you must disable your Windows firewall or configure it to allow the following programs:

C:\Program Files (x86)\NuGenesis 7.1\EVS\ng70DMEVSEmp2SVR.exe

C:\Program Files (x86)\NuGenesis 7.1\EVS\ng70EVSEmp2Svr.exe

C:\Program Files (x86)\NuGenesis 7.1\PM\NG71atbld.exe

In the "Allowed programs and features" list, select the Domain, Home/Work (Private), and Public check boxes for each of the programs listed above.

For more detailed instructions, refer to the SDMS 7.1 Service Release 7 Release Notes.

Empower 3 performance considerations

Empower 3 performance testing has shown differences in two key areas as compared to Empower 2. This is reported in the Waters tracking system as PCS 47381.

General performance in a 64-bit environment

Empower 3 is a 32-bit application that can be run in a 32-bit Windows XP or a 64-bit Windows 7 environment. The computer industry reports that launching an application in a Windows 7, 64-bit environment can take up to seven seconds longer than launching the same application in a Windows 32-bit environment. In our evaluation labs, launching Empower 3 applications in a Windows 7, 64-bit environment sometimes took a few seconds longer than launching Empower 2 applications or Empower 3 applications in a Windows XP, 32-bit environment. Additionally, the Windows 7 64-bit operating system reportedly reduces overall performance for 32-bit applications by 2% compared to its 32-bit predecessor, Windows Vista.

Recommendation: Set the computer power options to High Performance. For Windows 7, open Control Panel, select Power Options, and then select High Performance.

References:

Windows 7 Performance Tests: Odd One Out: Application Launch Times

http://www.pcworld.com/article/172509-2/windows_7_performance_tests.html

Optimization of 64-bit programs

http://www.start64.com/index.php?option=com_content&task=view&id=2889%Itemid=126

32-bit vs. 64-bit: More Bit, More Performance?

<http://blog.tune-up.com/windows-insights/32-bit-vs-64-bit-more-bit-more-performance/>

Project restoration

Restoring pre-Empower 3 projects

Restoring a project backed up in a previous version of Empower software to Empower 3 software can take 2- to 5- times longer than restoring the same project (or equivalent) to Empower 2 software. During the restoration of a pre-Empower 3 project, Empower 3 updates the project, to ensure database compatibility. Restoring a project created in Empower build 1154 or Millennium³² requires more extensive project updates and therefore takes longer than restoring a project created in Empower 2. Restoration times for groups of larger projects tend to fall on the low end of the 2x – 5x time range, whereas restoring batches of multiple small projects tend to fall on the high end of the range. The reason for these tendencies is that Empower 3 must perform certain restoration operations for each project in the batch, regardless of the amount of data the project contains.

Restoring Empower 3 projects

Restoring projects that were backed up in Empower 3 takes approximately 25% more time in a Windows XP 32-bit environment and approximately 50% more time in a Windows 7 64-bit environment compared to restoring a project that was backed up in Empower 2 and restored into Empower 2.

General project restoration information

The challenge caused by the increased time required to restore projects into Empower 3 software is offset by the capability to perform unattended batch project restoration. In previous versions of the software, the batch-restoration process produced error and informational messages that required user intervention. In Empower 3 software, however, these messages are logged silently and require no user intervention.

Empower calculation considerations

When you use Empower 3 software, you may see differences in some numeric calculations due to the software compiler used with Empower 3.

Differences observed when comparing results obtained in Empower 3 with those obtained in Empower 2 are reported in the Waters PCS system as 45275, 45276, 45585, 46551, and 47072.

Software Compilers

Empower build 1154 software and Empower 2 build 2154 software were compiled using an option for better speed during processing. The compiler used did not have a separate option to compile based on precision.

Empower 3 software is compiled using an updated compiler within Microsoft's current development tool suite. The same compiler options as used previously are not available. This compiler has an option that increases precision and provides the best compromise between floating point precision and execution speed.

Numeric Differences

When Empower results are compared for accuracy to those produced by another software package such as Excel or JMP, Waters' testing approach requires numbers to match to 7 significant digits for iterative calculations and to 9 significant digits for non-iterative calculations. Waters' testing approach used to compare numbers between different versions of Empower software typically requires all floating point digits to match. Although the Empower 3 compiler change results in several Empower 3 values not matching their Empower 2 counterparts, these values exceed the requirements of matching third-party software and remain within the variation that is expected when using a different compiler.

The numeric changes that were observed are primarily for values determined using iterative calculations such as calibration curve coefficients or calculations that depend on calibration curve coefficients such as MVM Linearity results.

Based on these results, Amounts (X Values) calculated using calibration curves in Empower 3 and displayed with the default precision of 6 are not expected to differ from Amounts (X Values) calculated in Empower 2.

Out of thousands of automated testing benchmarks, only the following result determinations were found to be different in Empower 3 as compared to Empower 2:

Result	Difference in precision compared to Empower 2¹	Difference in significant digits compared to Empower 2²	# of occurrences out of # of tests
Area	0	16	2 out of 1389
Start Height	0	>17	1 out of 77
End Height	0	>17	1 out of 77
Coefficient A for a weighted cubic curve	9	12	1 out of 64
Slice Observed [n] (dl/g)	6	11	4 out of 1127
Results in MVM Linearity Regression Coefficient table			
F Ratio Reference	12	14	2 out of 26
Quadratic Effect F-Ratio Reference	12	14	1 out of 1
Calculated Y Value CI	10	15	3 out of 28
Calculated Y Value UCL	9	15	1 out of 28
Residual	9	11,12,13, and 14	9 out of 28
Residual Mean	9	13	3 out of 6
Residual % Bias	12	12	1 out of 6
Residual SD	11	15	1 out of 14
F-Ratio	9	15	1 out of 26
Slope SD	12	15	2 out of 10
Slope CI	10	15	3 out of 10
Intercept	10	13 and 14	2 out of 10
Intercept SD	11	15	2 out of 9
Intercept CI	9	15	3 out of 10
Intercept % Bias	12	12	1 out of 10

¹ The position to the right of the decimal place where the difference in the Empower 3 value occurred as compared to the Empower 2 value. Zero means that the difference occurred immediately before the decimal.

² The position, as a significant digit, where the difference in the Empower 3 value occurred as compared to the Empower 2 value.

Using Empower 3 online Help

The Empower 3 Online Information System is designed to answer your questions while you work with Waters Corporation products and the Empower product suite.

When you press F1 in an Empower 3 software window or click the Help button in a dialog box, you have access to reference information for that application. To access additional information for Empower tasks, from the Empower Help menu, click Empower Help Topics. When you want to quickly find information, you can conduct a search for specific word(s). When searching for a phrase, enclose the phrase within double quotation marks, for example, "interpreting processing codes".

For more information about using the Empower 3 online information system, see the "Welcome to our Online Information System" topic.

Other useful topics for getting started with Empower include: "Managing Projects", "Creating User Accounts", "Acquiring and analyzing chromatographic data" and "Using a quickstart guided tour to learn about Empower."

Test configurations

The following test configurations were used during the development and evaluation of Empower 3 software.

Windows XP (Client or LAC/E³²)

Operating system: Windows XP Professional SP3 (32-bit)

Windows hotfixes: KB953297, KB953595, KB958484, KB963707, KB927978, KB936181, KB954430, KB973688, KB933579, KB892130, KB933566, KB938127, KB942615, KB950759, KB953838, KB969897, KB980182, KB923789, KB929399, Windows Imaging Component, KB936782, KB905474, KB939683, KB941569, KB951698, KB951376-v2, KB950760, KB951978, KB951748, KB950762, KB952954, KB946648, KB952287, KB953839, KB951072-v2, KB950974, KB951066, KB955839, KB956572, KB955069, KB956802, KB954600, KB954550-v5, KB957097, KB958644, KB958687, KB938464-v2, KB959426, KB959772, KB960225, KB960803, KB954459, KB923561, KB961373, KB961501, KB967715, KB954154, KB968537, KB952069, KB952004, KB969898, KB956803, KB970238, KB971468, KB971657, KB971961, KB972270, KB973354, KB973507, KB973540, KB973687, KB973815, KB973869, KB973904, KB974112, KB974318, KB974392, KB974571, KB975025, KB975467, KB975560, KB975561, KB975713, KB977165-v2, KB977914, KB978037, KB978251, KB978262, KB978706, KB979306, KB969947, KB968816, KB968389, KB961118, KB960859, KB958869, KB956844, KB956744, KB954155, KB955759, KB969059

Windows 7

Operating system: Windows 7 Professional (64-bit)

Windows hotfixes: KB971033, KB2032276, KB2079403, KB2160329, KB2183461, KB2272691, KB2286198, KB2347290, KB958488, KB971468, KB972270, KB973525, KB974332, KB974431, KB974571, KB975364, KB975467, KB975496, KB975560, KB976098, KB976264, KB976325, KB976662, KB977074, KB977863, KB978207, KB978251, KB978262,

KB978506, KB978542, KB978601, KB978637, KB978886, KB979099, KB979306, KB979309, KB979482, KB979683, KB979900, KB979916, KB980182, KB980195, KB980218, KB980232, KB980302, KB980408, KB980436, KB980846, KB981078, KB981332, KB981793, KB981852, KB982110, KB982214, KB982664, KB982665, KB982799, KB983590

Operating system: Windows 7 Enterprise (64-bit)

Windows hotfixes: KB971033, KB2032276, KB2079403, KB2158563, KB2207566, KB2272691, KB2281679, KB2286198, KB2296011, KB2345886, KB2347290, KB2360131, KB2362765, KB2378111, KB2387149, KB2416471, KB958488, KB971468, KB972270, KB974332, KB974431, KB974571, KB975467, KB975496, KB975560, KB976098, KB976264, KB976422, KB976662, KB977074, KB977863, KB978207, KB978251, KB978262, KB978506, KB978542, KB978601, KB978637, KB978886, KB979099, KB979306, KB979309, KB979482, KB979538, KB979683, KB979687, KB979688, KB979900, KB979916, KB980182, KB980195, KB980218, KB980232, KB980302, KB980408, KB980846, KB981078, KB981332, KB981852, KB981957, KB982110, KB982132, KB982214, KB982665, KB982799, KB983590

Windows Database Server 2008

Operating system: Windows Server 2008 Enterprise (English), R2 (64-bit)

Windows hotfixes: KB982519, KB982381, KB981793, KB980218, KB980195, KB979916, KB979559, KB987482, KB981332, KB980408, KB980232, KB980182, KB979683, KB979309, KB978601, KB978542, KB979306, KB978262, KB978251, KB978207, KB976662, KB975560, KB975467, KB974571, KB974431, KB971468, KB981390, KB977239, KB977238, KB977236, KB981392, KB981391, KB987632, KB978637, KB978506, KB977074, KB976264, KB979099, KB976098, KB975364, KB974332, KB973525, KB972270, KB982519, KB980846, KB979900, KB958488, KB981111

Oracle version: 11.2.0.1.0

Citrix Servers

XenApp 6.0

Operating system: Windows Server 2008 Enterprise (English), R2 (64-bit)

Windows hotfixes: KB980408, KB978542, KB981390, KB977239, KB977238, KB981111, KB977236, KB981392, KB981391, KB980302, KB980232, KB980182, KB979683, KB979309, KB979306, KB978637, KB978601, KB978262, KB977074, KB976662, KB976264, KB975560, KB971468, KB979099, KB981332, KB976325, KB976098, KB975467, KB975364, KB974571, KB974431, KB974332, KB973525, KB972270, KB983590, KB982799, KB982664, KB982214, KB981852, KB980436, KB978886, KB2286198, KB2183461, KB2160329, KB2079403, KB2032276, KB982666, KB982519, KB982381, KB981793, KB980846, KB980218, KB980195, KB979916, KB979900, KB979734, KB979559, KB979482, KB958488, KB981111, KB982632, KB982132, KB982132, KB982110, KB981957, KB979688, KB979687, KB979538, KB2416471, KB2398632, KB2387149, KB2362765, KB2360131, KB2347290, KB2345886, KB2296011, KB2272691, KB2207566, KB2158563