ZS XPLORER SOFTWARE: v3.0.0 (PSS0048-15)
SOFTWARE UPDATE NOTIFICATION

Introduction

This document details the release of Zetasizer XPLORER software version 3.0.0 (PSS0048-15) for the Zetasizer Advance range of instruments. Here forward referred to as ZS XPLORER.

This release supports the Zetasizer Advance range of instruments only (including Pro (ZSU5800) and Ultra (ZSU5700) models).

ZS XPLORER is not compatible with the Zetasizer Nano series of instruments (Nano S90, Nano ZS90, Nano S, Nano ZS, Nano ZSE, Nano ZSP, Zetasizer μV and Zetasizer APS) nor can it read the *.dts file format from the Classic Zetasizer series software 8.01 or earlier. However, it is possible to have both the ZS XPLORER software and the Zetasizer software 7.02 or above installed on the same computer.

For the latest version of this document please check our website at https://www.malvernpanalytical.com/en/support/product-support/software/zetasizer-ultra-pro-zs-xplorer-software-update-v3.00

Installation

It is assumed that you have authority to install or update software within your company's SOPs. If you do not have this authority, please consult with your I.T. support department before proceeding.

It is assumed that you have Administrator rights for the computer. This is required by the installation process. For ZS XPLORER software, Windows 10 and later will not allow an installation if the user does not have administrator access. This is in line with Microsoft's Logo policy and is standard practice.

IMPORTANT:

Only Windows 10 64-bit Operating System is supported

Microsoft user accounts are not supported

Before installation of the software, the instrument should be switched off and disconnected.

Regulated Environment customers upgrading to ZS Xplorer V2.3.1 or later, will need to also upgrade to OmniTrail and OmniAccess V1.4.

In some cases, the installer will require the user to restart the PC, in this case it is required that the Administrator logs in to the PC for the first time, following the restart. Failure to do so may cause the software to crash. In this case reinstalling the software on the Administrator account will fix the issue.

Recommended System Requirements

The recommended computer system requirements for running this software are highlighted in table 1 below.

Table 1 Recommended system requirements for ZS Xplorer software.

Feature	Specification
Processor Type	8th Gen+ Intel Core i7 Processor (or better)
Memory	16 GB RAM
Solid State Drive	512GB or greater
Display Resolution	1920 x 1080 full HD screen resolution
Connectivity	2 free USB2.0 or higher ports
Operating System *	Windows 10 64 bit. * The ZS XPLORER software is not compatible with 32-bit Operating Systems

Supported operating systems

ZS XPLORER is compatible with Windows 10 (tested on Windows 10 1909 version or later). Only 64-bit Professional versions are supported.

Supported Languages

- English (US)
- Chinese (simplified)
- Japanese

Installation Instructions

Installation process

The software suite is available as a web download. The downloaded extractor contains the ZS XPLORER Setup and License Manager Setup files. License Manager is a prerequisite of ZS XPLORER, even if you are not using OMNITRUST regulated environment software suite.

When the extractor is run (see Figure 1) it will extract the required installers to a folder named 'MPInstallers' in the location the extractor is run, and the folder and a readme with important information will be opened (see Figure 2).

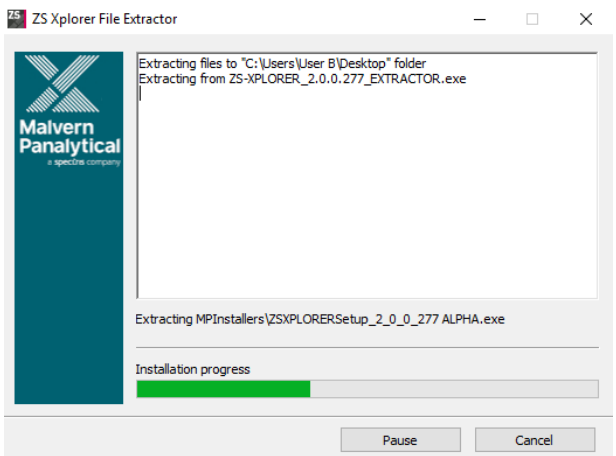

Figure 1 ZS Xplorer Self-Extracting Installation files

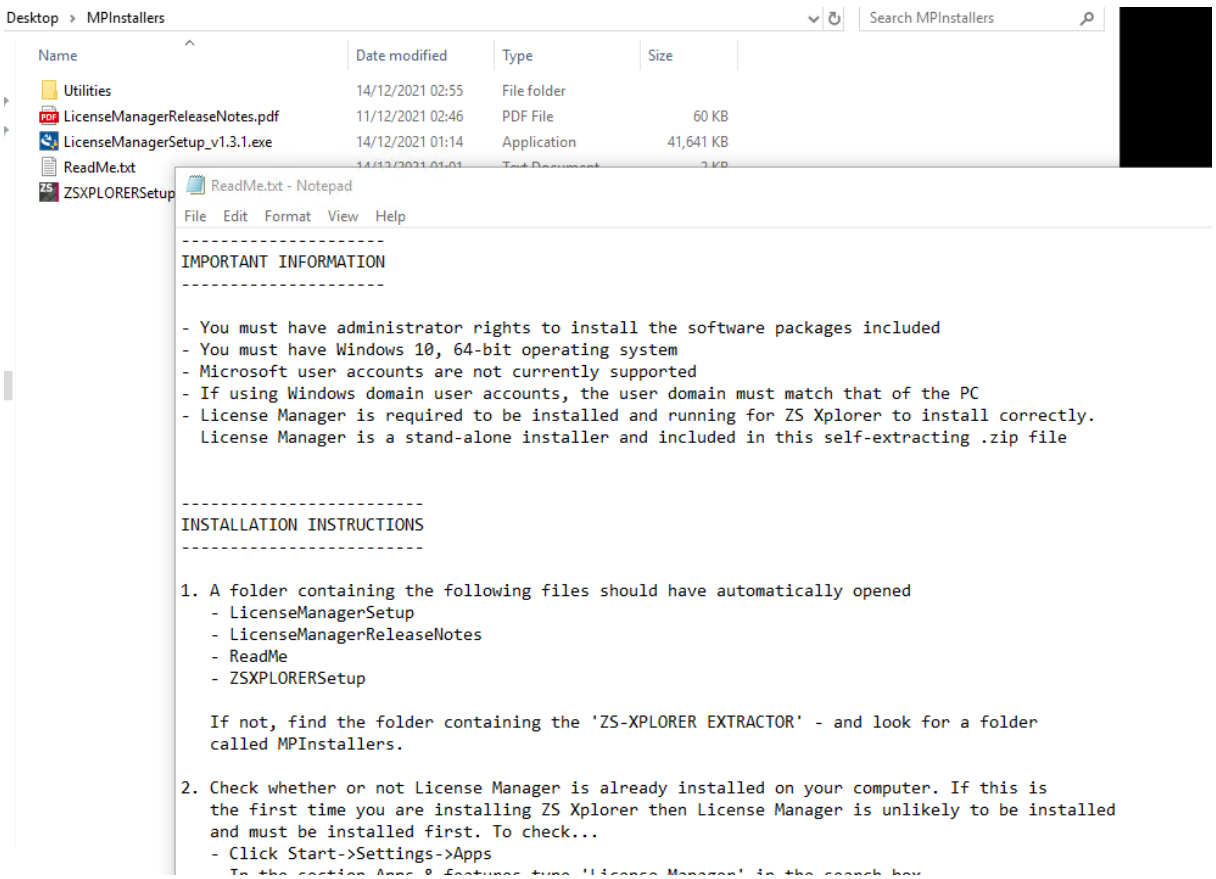

Figure 2 Extracted installation files and ReadMe file.

License manager Installation

The Malvern Panalytical license manager component is a requirement for the ZS XPLORER software to run correctly and must be installed prior to the installation of ZS XPLORER. Please note that users upgrading from 2.00 or later are not required to re-install License Manager. Those upgrading from ZS Xplorer vers.1.50 or earlier must install License manager.

ZS XPLORER Installation

During the installation process, you will be prompted with the following message (Figure).

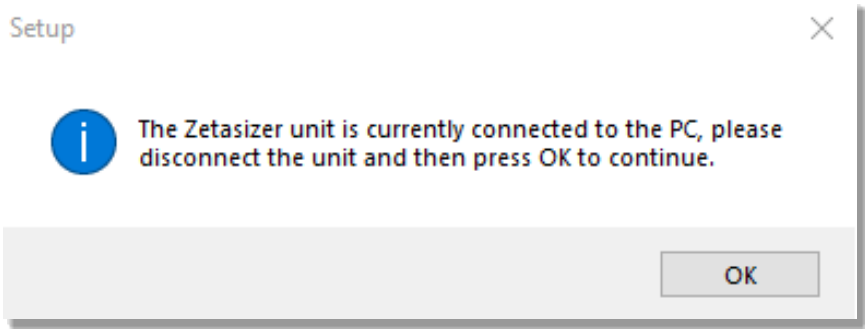

Figure 3 "Disconnect Zetasizer Unit" message

Note:
You must unplug the USB cable from the computer or Zetasizer and then press OK. If you press the OK button without performing these previous steps, then the installation will not continue.

Microsoft .Net Framework, .NET 5 SDK and Microsoft C++ Redistributable

The Microsoft .Net Framework 4 (version 4.6.2 or greater) the .NET 5 SDK and the Microsoft Visual C++ Redistributable must be installed for the ZS XPLORER software to run. This is installed during the ZS XPLORER software installation progress and under certain circumstances can involve the computer needing to restart. Completion of this stage of the installation can take a few minutes and can take over 10 minutes. Whilst these components are being installed a window such as below will be displayed, figure 4.

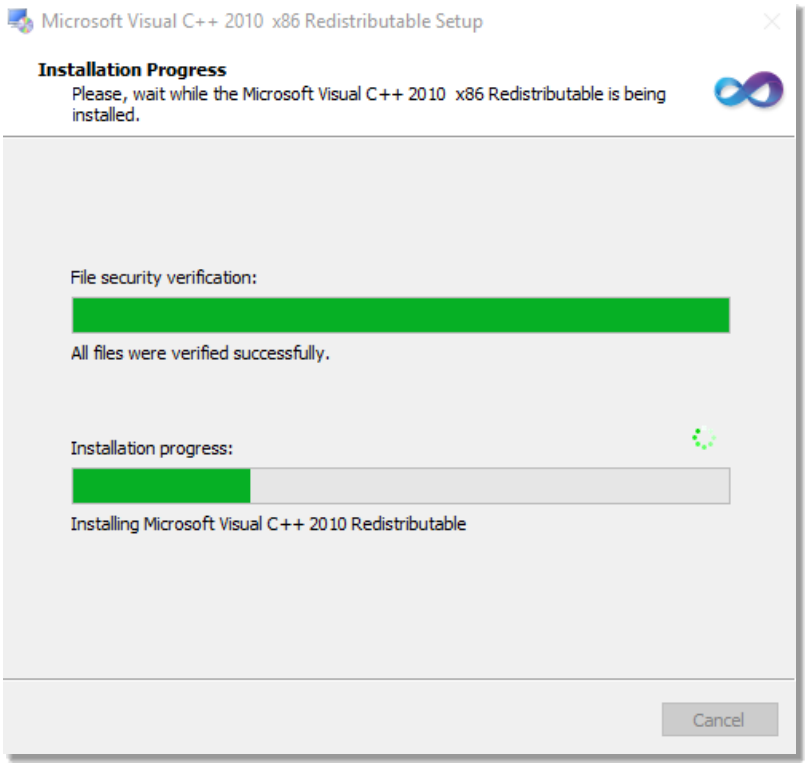

Figure 4 Microsoft Visual C++ Redistributable Installation Window

USB Driver Installation

During the installation of the USB drivers you may be prompted several times with a message as shown in *Figure 5*.

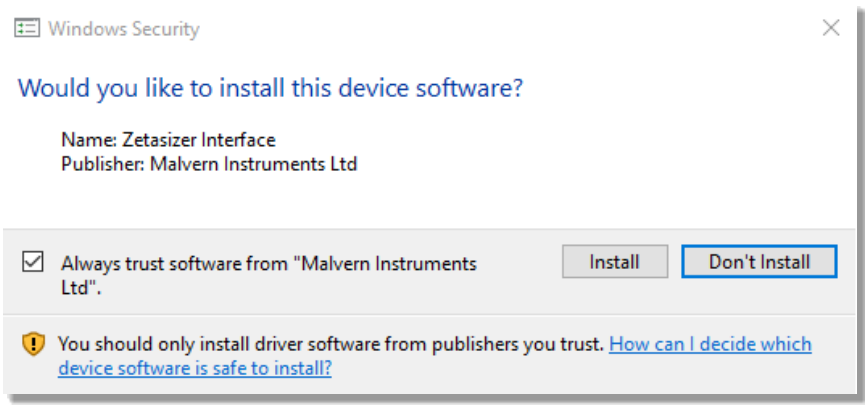

Figure 5 Install USB window

This warning can safely be ignored as the software installation has been fully tested on Windows 10. Press **Install** to continue installation of the USB drivers.

Connecting the Zetasizer to the computer

When the software has been installed and the instrument has been connected via the USB port, and switched on, the ZS XPLORER software may need to upgrade the firmware on the Zetasizer, in which case the status icon on the lower right of the software screen will indicate such (see *Figure 6*).

Figure 6 instrument firmware updating status icon

Users should not disconnect or power off their PC or instrument during normal firmware updating. In some rare occasions the firmware may fail to update correctly, in such circumstances a notification will be displayed indicating the issue – please restart the instrument and software to reset and repeat the firmware upgrade process.

With the correct firmware version installed the Zetasizer will connect to the instrument. A successful connection is indicated with an icon in the corner of the software (see *Figure 7*) showing green and with a tick.

Figure 7 Instrument connected icon

Uninstall Procedure

The software can be uninstalled using the standard Apps & Features panel in Windows Settings.

Running the installer with the ZS XPLORER software running

If the installer is run whilst the software is running, the window in *Figure 8* will display.

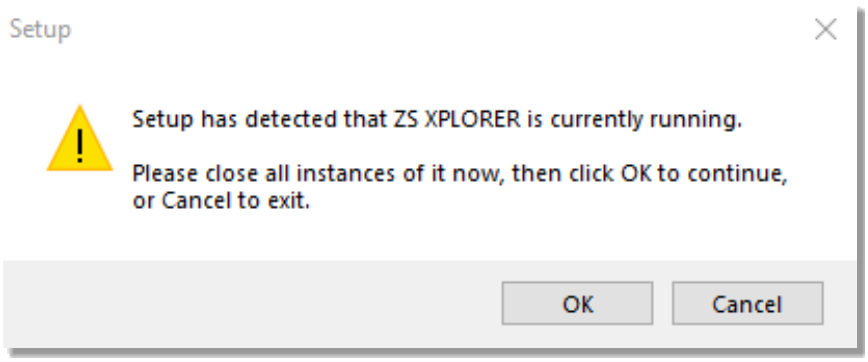

Figure 8 Running installer with software open

Connecting the MPT-3 Titrator to the PC

Ensure the computer is turned on and connected to a Zetasizer Advance system.

Connect the MPT-3 Autotitrator to the computer using the USB cable provided, ensuring that it is turned on. Click on the settings button in the top left corner of the ZS XPLORER software. See *Figure 9*.

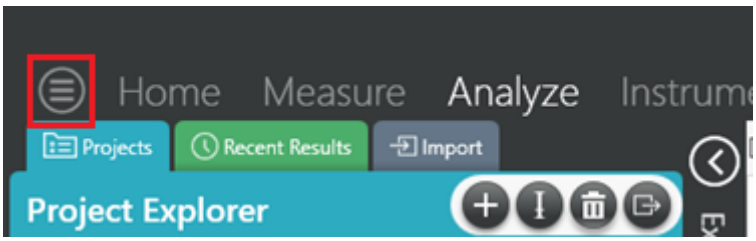

Figure 9 Software options

Click Options and navigate to the Titrator tab as seen in *Figure 10*.

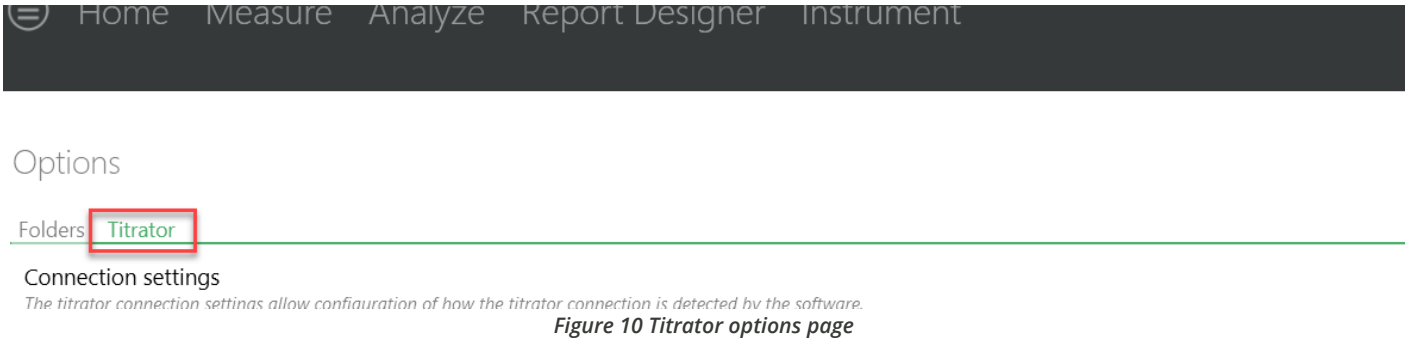

Figure 10 Titrator options page

On the COM Port drop down menu, select USB Serial Port (COMXX) as shown in figure 11. (Note that the COM port number and description may vary). If the titrator has been detected on this port, then a green tick will be visible See *Figure 11*.

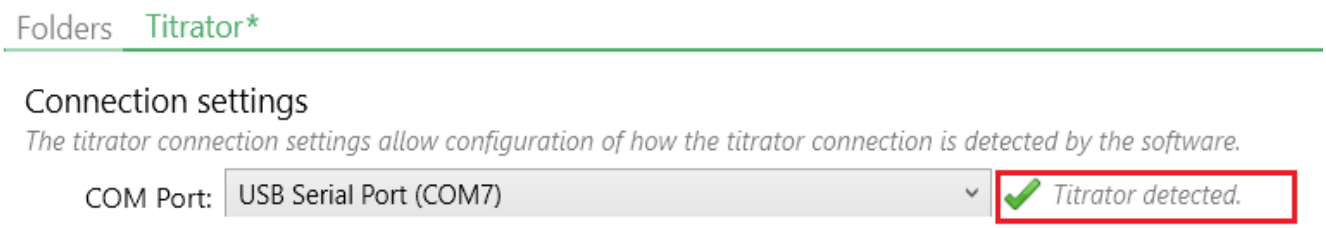

Figure 11 Titrator successfully detected

If the titrator is not detected on the selected COM port, then a red exclamation icon will be displayed with a message. See *Figure 12*.

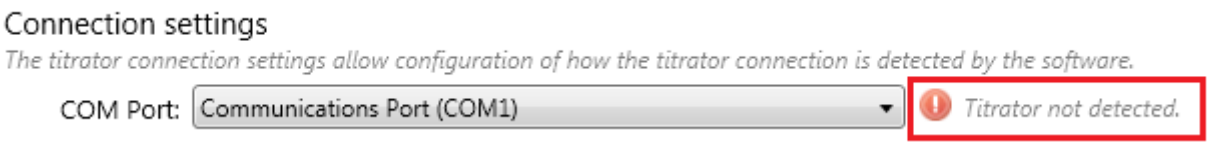

Figure 12 Unable to detect titrator

Once the titrator has been detected, click to save the settings.

Once the settings are saved an icon and a saved message will appear next to the saved COM port as shown in *Figure 13*.

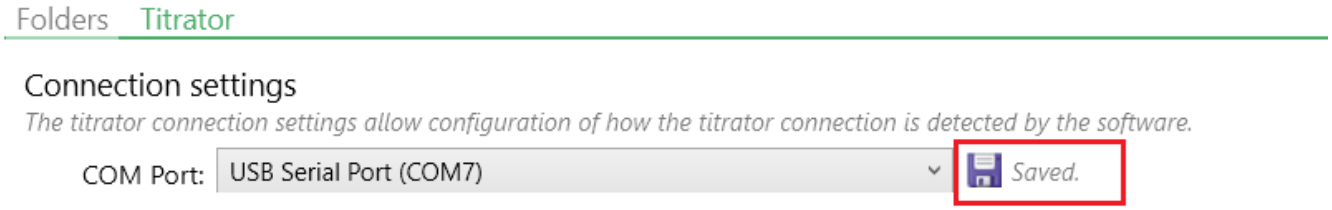

Figure 13 COM port saved

The titrator icon at the bottom right of the screen should turn green indicating that the titrator is successfully connected as shown in *Figure 14.*

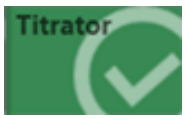

Figure 14 Titrator successfully connected

ZS Xplorer – Backup & Restore

What to backup

By installation default, this version of ZS Xplorer application uses C:\ProgramData\Malvern Instruments\ZS XPLORER and its subfolders for configuration and user created output files. For ease, we would suggest this is the simplest folder to backup and restore.

To create a backup, we recommend that you consult your IT department to select the best method to achieve this. For pharmaceutical regulated environments, you should also consult your validation department - as they may have specific compliance requirements, and/or recommendations. Backup frequency and type e.g., full, incremental, or differential, along with consistency checking, should be considered when choosing the most appropriate backup methodology.

Table 2 provides information on the location and details of the important files and folders used by ZS Xplorer as well as our recommendations on backing up of data.

It is at the discretion of individual organization to define a backup process that is appropriate to their needs and the criticality of their data.

All file types used by ZS Xplorer can be copied to a secure location, we recommend that this be done at times when the system is not in use. Backups should be full backups (not differential) and a history of backups is retained to avoid overwriting a good backup with a corrupt version.

How to restore

In this section we cover the two most likely reasons why you want to restore backup files. The first being accidental deletion of files, or to replacing corrupted files for a working installation of the ZS Xplorer application.
The second reason might be because the primary drive, on which the ZS Xplorer application was install upon, has been replaced or a fresh operating system has been installed, both of which requires the reinstallation of the ZS Xplorer application software.
It is important to note that when reinstalling the ZS Xplorer application, the version being installed must be same or later, as some files may not be backwards compatible with earlier versions of the application software.

Scenario 1 - restoring files to an existing installation:

1. Make sure the ZS Xplorer application is NOT running.
2. Restore/copy the required files from your backup to the destination folder, replacing the deleted or corrupted file/s.
3. Start ZS Xplorer and verify the recovered file/s are working as expected.

Scenario 2 – restoring files for a fresh reinstallation of ZS Xplorer.

1. If your backup contains the complete ZS Xplorer folder, subfolder, and files, simply restore/copy this folder to C:\ProgramData\Malvern Instruments\. This folder will need to be manually created.
2. Install your existing version of ZS Xplorer or later.
3. Start the application as normal and verify everything works as expected and that the software connects to the Zetasizer instrument.

Table 2 - ZS Xplorer file structure

File Name	File Extension	Location	Backup?
Cells	.data	*%ProgramData%\Malvern Instruments\ZS XPLORER\Cells*	Not required – auto-regenerated if deleted
Materials & Dispersants	.data	Shared: *%ProgramData%\Malvern Instruments/ZS XPLORER\Materials* Individual: *%userprofile%Documents\Malvern Instruments\ZS XPLORER\Materials*	Defaults are auto-regenerated, however can be user configured – backup recommended
Measurement data (export location)	.zmes	*Location set via option in ZS Xplorer*	This is a temporary export location only – so user discretion on importance of any files here
Methods	.zskd	Shared: *%ProgramData%\Malvern Instruments\ZS XPLORER\Methods* Individual: *%userprofile%\Malvern Instruments\ZS XPLORER\Methods* Also, any other folders the user selects.	Recommended if custom methods used
Reports	.zrep	Shared: *%ProgramData%\Malvern Instruments\ZSXPLORER\CustomReports* Individual: *%userprofile%\Malvern Instruments\ZS XPLORER\Reports* For reports with custom headers or logos, there is an additional folder: *%ProgramData%\Malvern Instruments\Malvern.Reporting*	Default reports auto-regenerated on deletion – recommended if custom reports used
pH probe calibration	.cal	*%ProgramData%\Malvern Instruments\ZS XPLORER\Titrator*	Not necessary as can be re-calibrated

Scattering standard	.data	*%ProgramData%\Malvern Instruments\ZS XPLORER\ScatteringStandards*	Recommended
Working file	.db	Shared: *%ProgramData%\MalvernInstruments\ZS XPLORER\Working File* Individual: *%userprofile%\Malvern Instruments\ZS XPLORER\Working File*	This is the main working database file that holds measurement records – highly recommended
Program data folder	various	*%ProgramData%\Malvern Instruments\ZS XPLORER*	This is the main programme data and can be restored by re-installation of the software
Titrator configuration	.xml	*%ProgramData%\Malvern Instruments\ZS XPLORER\Titrator*	Not required as can be readily set-up in ZS Xplorer
Storage configuration	.xml	*%ProgramData%\Malvern Instruments\ZS XPLORER\WorkingFileSettings*	Not absolutely required as can be set-up in ZS Xplorer

New Features

Studies

Added a new feature called studies. Studies allow the measurement and comparison of "trends". A trend measurement differs from normal size and zeta measurements as the parameters of interest from the analysis are a result of a series of measurements. Trends can be seen as the change in a sample due to change in a variable. In this first release Studies supports the analysis of concentration trends – that is the measurement of a sample at various concentrations to elucidate the physical parameters of molecular weight, B_{22} and/or k_D. See the Zetasizer Advanced Manual or Help Files for full details on using Studies.

NOTE:

In this first iteration Studies are not supported for OmniTrust users in a regulated environment and will not be visible to such users whilst in regulated environment mode.

Concentration trend measurements are not supported for users of Zetasizer Lab system models – support will be available in next release of ZS Xplorer for Zetasizer Lab users.

Studies are split into several views that aid the set-up, measurement and analysis of trends. Users can navigate between views using the navigation buttons, figure 15.

Figure 15 study window navigation buttons

Study builder

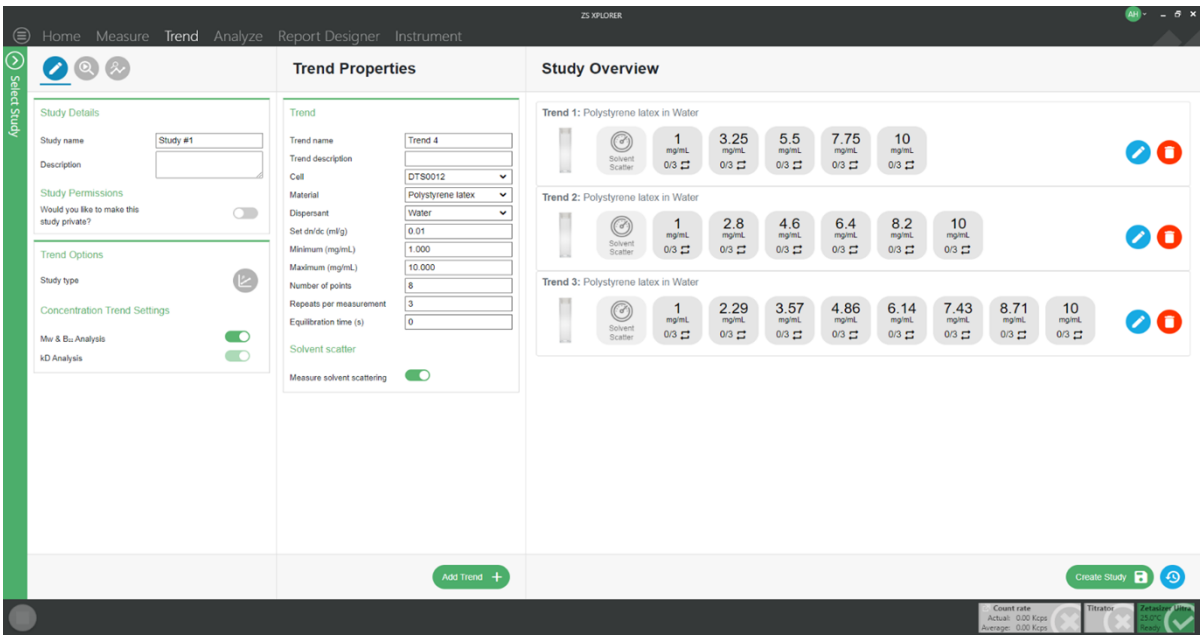

Figure 16- study builder with example concentration trends

The study builder allows users to create new studies and select the parameters of interest in the available concentration trend type, figure 16. Studies can be set as “private” or “public”, private studies can only be viewed by the creator (assuming user accounts used on host PC). Up to five trends can be added per study.

Measurement and Live Analysis

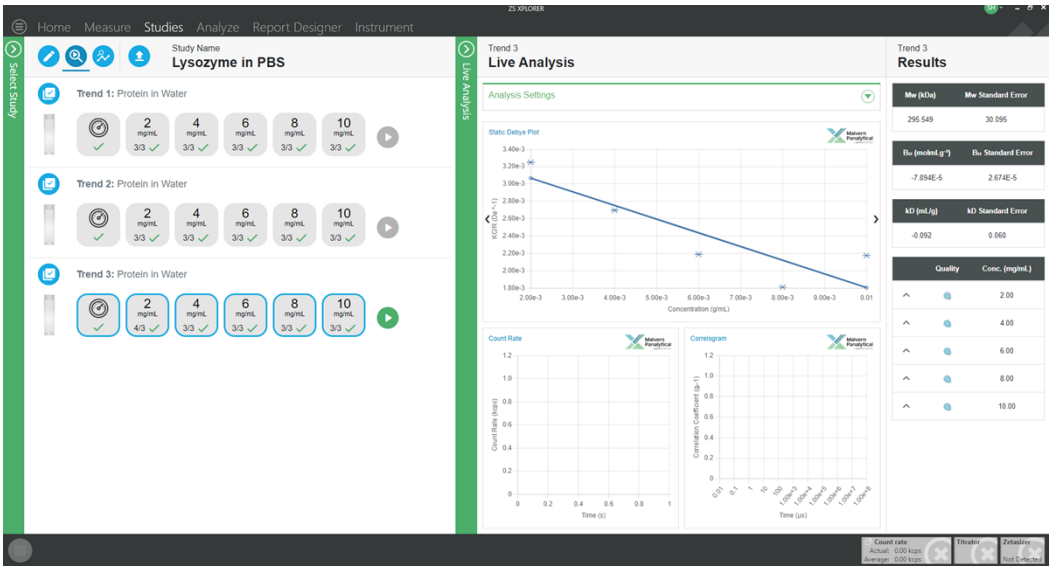

Figure 17 Measurement/Live analysis view

The measurement window (figure 17) allows users to run a trend, in the case of concentration trends a whole trend or just an individual point in the trend can be scheduled to run. The trend overview lets you see the status of each point as well as the analysis results during analysis. Note that the analysis table, static and dynamic Debye plots are only available after three points (the minimum required) have been completed.

Analysis

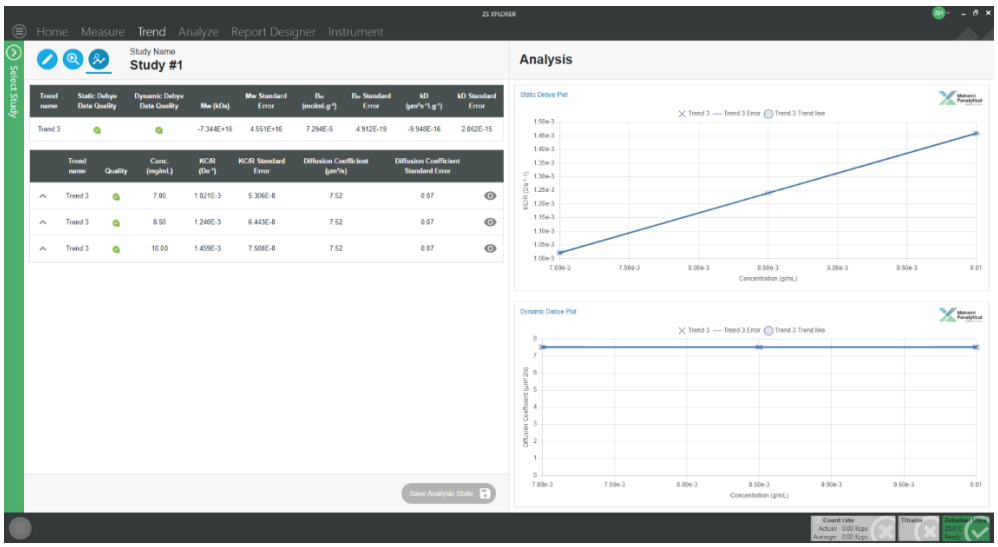

Figure 18 Analysis view

The analysis view (figure 18) allows users to review the results from a trend measurement as well toggle which points are included in the analysis (minimum of three points required) and save the state of the analysis.

Improved robustness of analysis for poor scattering samples

Previous versions of ZS Xplorer would sometimes throw an event error and fail to measure a sample with a Z Ave = 0 error. This was typically due to low scattering sample, such as a pure buffer/solvent. We have improved the analysis and such measurements should now complete but may report the result as having a Z-ave equal to zero or very poor data quality. Users should ensure that data is of sufficient quality to use.

Shared data storage

New installations of ZS Xplorer will now default to the shared data location option as default. Upgrading a previously installed version of ZS Xplorer will honor the previous user setting, figure 19.

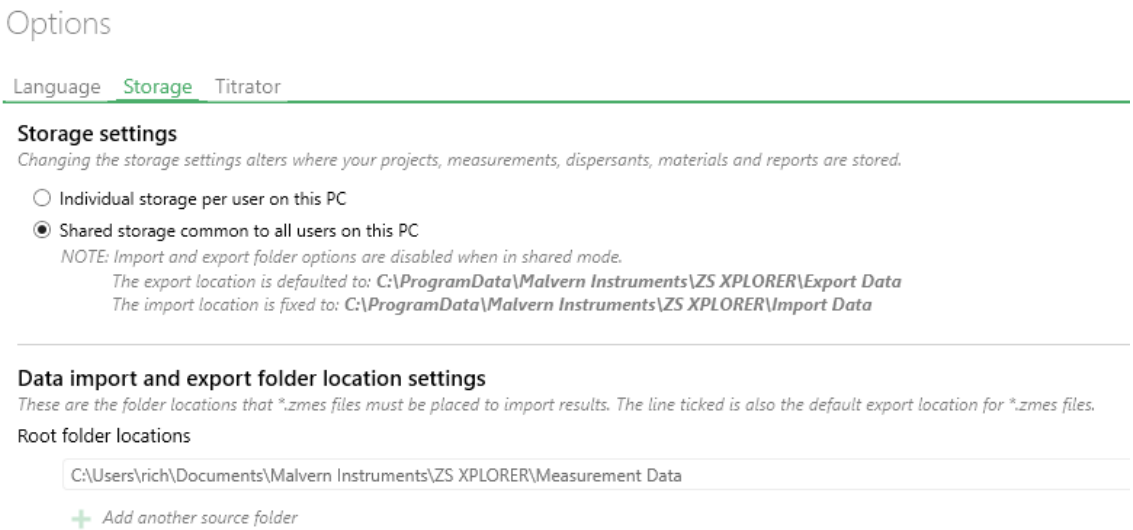

Figure 19 shared storage settings are now default for new/clean installations

Zeta, MADLS and Particle Concentration Auto Averaging

The three above measurement types now support auto-averaging of results when a measurement step has more than one replicate measurement set. Auto-averaging can be set in the properties window of the measurement type as shown in figure 20.

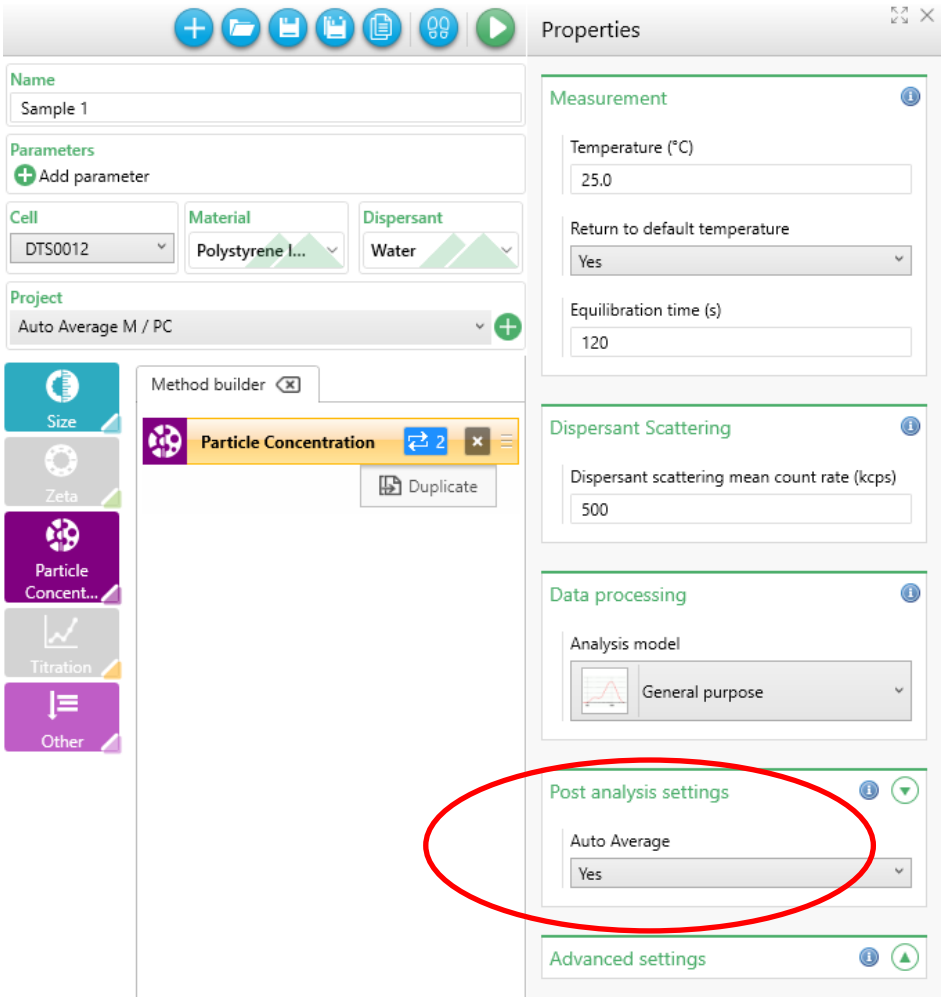

Figure 20 setting a measurement to produce an auto-average when replicates are greater than one.

Custom percentiles

Users can now add custom percentiles to parameter tables (figure 21) and statistic tables in ZS Xplorer. Values between the 5th and 95th percentile in intensity, volume and number distribution weightings are supported by default. Percentiles above or below these values can be set with a configuration change (see your local Malvern Panalytical representative for advice) but are strongly advised against use due to poor statistical confidence in these edge percentiles.

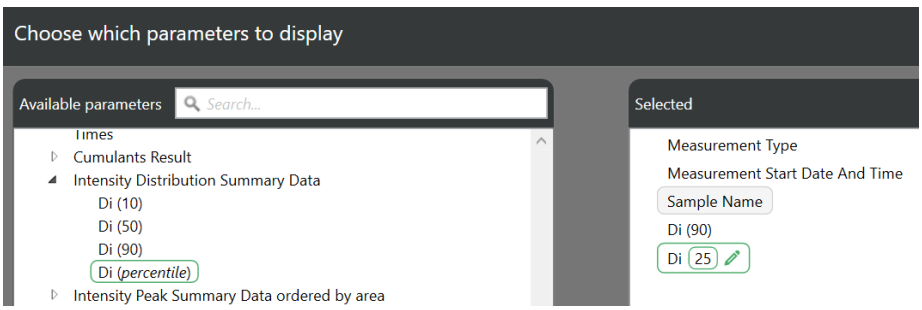

Figure 21 adding custom percentiles

GAMP 5 Software categorization

In its standard mode of operation, the Zetasizer Xplorer software provides users with a series of standard interfaces and functions that enable the software to be configured to meet specific user business requirements. These interfaces include the ability to define Standard Operating Procedures (SOPs) for sample measurement and create report definitions using pre-defined functions. If users apply these functions, then the software can be considered to be a Category 4 product.

Security Advisories

The following section and table 3 details any security updates that have been addressed in this release, including fixes for identified vulnerabilities.

Note:
We always recommend updating to the latest software version which will provide you with new features, bugfixes and most importantly, security updates.

Note:
Other products may also be affected by any issue described here. We recommend you regularly check the Software Updates Notifications (SUNs) for all your Malvern Panalytical products, and register on our website to receive updates.

Table 3 Security updates

Reference	Description	Recommendation
HEN-1042	Version 2.00 and earlier of the ZS XPLORER software contains a vulnerability which could allow an attacker to craft malicious measurement (.zmes) and schedule (.zskd) files. Loading one of these malicious files could result in arbitrary code execution. Version 2.10 introduces a fix to completely mitigate this vulnerability.	Upgrade to version 2.10 or later of the software. Never open files from an untrusted source, even if they appear to be non-executable.
HEN-572	Version 1.50 and earlier of the ZS XPLORER software contains a vulnerability in the reports feature which could allow an attacker to craft a malicious report file. Loading a malicious report file could result in arbitrary code execution. Version 2.00 introduces a fix to completely mitigate this vulnerability.	Upgrade to version 2.00 or greater of the software. Never open files from an untrusted source, even if they appear to be non-executable.

Changes and fixed issues

The main changes and issues fixed in this release of the software are listed in table 4.

Table 4 changes and fixed issues in version 3.0.0 ZS Xplorer software

Issue key	Summary	Issue Type
HEN-1683	Auto refresh measurement data on analyze page when new results are available	Story
HEN-1473	Data quality enhancements	Story
HEN-1281	Add cell images to trend method builder	Story
HEN-1163	Add trend selector onto analyse page	Story
HEN-1167	Create general notification stream	Story
HEN-1283	Update Trend Service to Share Study information with ZS	Story
HEN-1279	Add multiple samples in builder	Story
HEN-1298	Pass parameters from trend measurement to size created in ZSX	Story
HEN-1254	Create Study builder Material/Dispersant component	Story
HEN-1253	Trend Service - Create basic study builder	Story
HEN-1252	Retrieve Cell, Material, Dispersants from ZSX	Story
HEN-1256	Trend Service - Get rules for user guidance	Story
HEN-1660	Trend overview - Live analysis	Story
HEN-1659	Trend overview page - top level results	Story
HEN-1654	UI design for trend sample addition panel	Story
HEN-1666	Create soft navigation panel buttons for Analysis page	Story
HEN-1665	Create soft navigation panel buttons for trend overview page	Story
HEN-1714	Integrate the trend service installer into the ZS Xplorer installer	Story
HEN-1712	Hook up new Trend Overview Tables to the Selected sample in Measurements grid	Story
HEN-1527	Study Builder - Persistent Values	Story
HEN-1526	Study Builder Sample name Increment	Story
HEN-1645	Add data quality to sample table on analysis page and icon from the chart	Story
HEN-1644	Create soft navigation panel buttons for Create/edit page	Story
HEN-1639	Create design for soft navigation panel	Story
HEN-1641	Create soft navigation outer component	Story

HEN-1640	Allow user to save analysis state	Story
HEN-1498	Study builder Updates	Story
HEN-1497	Study builder - Cell selector	Story
HEN-1495	CT Import Scattering Standard Values for Calculations	Story
HEN-1501	Study size considerations	Story
HEN-1499	Run measurements Updates	Story
HEN-1463	Individual Measurement Replicates	Story
HEN-1462	Live Analysis View	Story
HEN-1636	Output selection implementation	Story
HEN-1757	Edit sample workflow changes	Story
HEN-1449	Trends service installer	Story
HEN-1534	Trend output selection	Story
HEN-865	Trend Configuration - Select dispersant delta	Story
HEN-864	Trend Configuration - Select cell type	Story
HEN-862	Allow user guidance based on trend type	Story
HEN-867	Limit cell type selection based on method parameters	Story
HEN-866	Trend Configuration - Select Material delta	Story
HEN-839	Design of Navigation of the trend service from analysis page	Story
HEN-838	Create trend analysis workspace	Story
HEN-1544	Count Rate Meter Issue - kcps should be all lower case	Bug
HEN-1494	Add Sample Concentration (mg/mL) to Record List	Story
HEN-1286	Rename Unfiltered Size Analysis Result	Story
HEN-1694	Dynamic parameters - add ranges and validation for input values	Story
HEN-1559	Auto-average for Zeta potential measurements	Story
HEN-1558	Add automation for creating averages for replicate MADLS/P. Conc Measurements	Story
HEN-1382	Parameter list does not show long names after restart	Bug
HEN-1585	Dynamic Parameters basic implementation	Story
HEN-606	Parameter table is unable to copy Unicode characters	Bug
HEN-758	Extended Percentile parameters range	Story
HEN-1903	Change default installer behaviour to shared/public .db & folder locations	Story

Known Issues

The following software bugs have been discovered within the software and will be investigated as part of a future release. Please follow the suggested work-around where they are provided.

Table 5 Known issues in ZS Xplorer version 3.0.0

Reference	Severity	Issue	Workaround
NA	Normal	Regulated Environment customers upgrading to ZS Xplorer v3.0.0 may need to also upgrade to OmniTrail and OmniAccess V1.4 if previous version earlier than v2.3.0	Check or Install Omnitrail V1.4 and OmniAccess V1.4 when using ZS Xplorer v3.0.0 in a regulated environment.
HEN-945	Normal	Edited records display the original record created date – this is a display issue and underlying data is correct	Changing projects or re-starting the software will cause the display to be refreshed and display correctly
HEN-386	Normal	Run button disabled when connecting an instrument during measurement creation	Disconnect and reconnect the instrument or add another measurement step
HEN-377	Normal	Software locks-up if you cancel a measurement during the enable for size step	None- force close the application
HEN-1747	Major	Measurements in a study can be left with status of running if a crash occurs	Re-run any measurements still marked as "in progress" and immediately abort them to force the state to refresh
HEN-1894	Normal	Edit study button may not reactivate at the end of a measurement	Navigate to an intermediate page to refresh the status
HEN-2003	Normal	Unable to enter min. & max. concentrations for concentration trend when installed on Windows OS with culture settings that use commas as decimal separators, i.e. French language	Leave min & max values blank – defaults will be used when adding the trend. Edit the actual concentrations prior to running the trend measurement
HEN-1996	Normal	Occasional error thrown when navigating from edit to analysis in Studies	Click the reload dialog that is shown when this occurs
HEN-1990	Normal	If using count rate meter to obtain scattering standard value for concentration trends and different cell type used than that in study may fail to refresh optimal central position for cell type	Use the same cell type for solvent scatter determination as used by the rest of the concentration trend measurement

HEN-1922	Normal	User is able to edit study whilst measurement in progress – this is a bug in an underlying component	Do not edit studies whilst measurements in progress
HEN-1904	Normal	Excluding/Including outliers can re-set graph to show any previously excluded trends	No work around. Re-edit graph as appropriate after removing outliers
HEN-1899	Normal	Studies not in order	No workaround
HEN-1876	Normal	Some parameters display too many decimal places	No workaround
HEN-1615	Normal	ZS Xplorer hamburger menu can become obscured when in trends tab	No workaround

Error Reporting

Should persistent problems occur contact the local Malvern Panalytical Helpdesk. To speed up response time include all the following.

A full-screen screen shot of any error message and everything behind it.

Full description of what was happening at time of issue and ideally leading up to it.

Instrument serial number (e.g. MAL1060289), instrument serial number can be found inside the sample cell basin and on the instrument back panel.

The software version, which can be found as described in a section below.

The log information described below.

And, if relevant and possible, export the relevant measurement data as described in the last section below.

Extracting log information

If an error occurs, further information about the error can be found from the Windows Event Viewer.

Click the Windows Start Button.

Type Event Viewer and press enter.

Navigate to Applications and Service Logs/Zetasizer All Events.

The window will display the most recent errors that have occurred with the ZS XPLORER software.

Error information can be selected and then exported with the Save selected Events button allowing this information to be passed to the Malvern Panalytical team for troubleshooting.

The contents of the measurement log window are logged to file at *Documents\Malvern Instruments\ZS XPLORER\logs*

Software version

The Software Version is vital to determining the cause of problems. To retrieve the version number:

Click on Application Menu button (*Figure 19*)

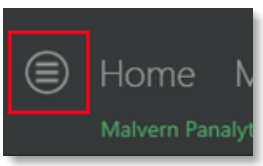

Figure 19 Application Menu button

Click on the About button

Read version number (Figure 20)

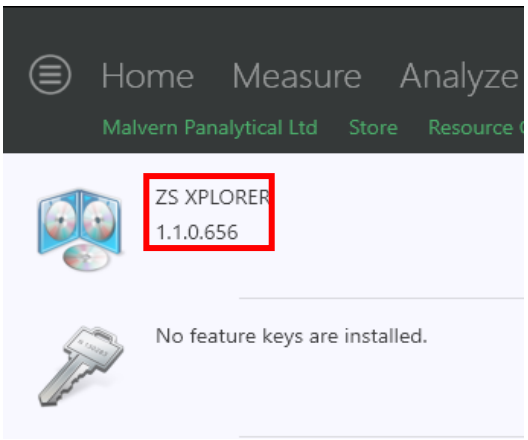

Figure 20 Software Version Number

Extracting measurement data to send

In situations where the errors appear to be related to a specific record or records, the affected records can be exported from the software by selecting them and pressing the export icon, *see Figure 21*, and send the *.zmes file to the Malvern Panalytical team for investigation.

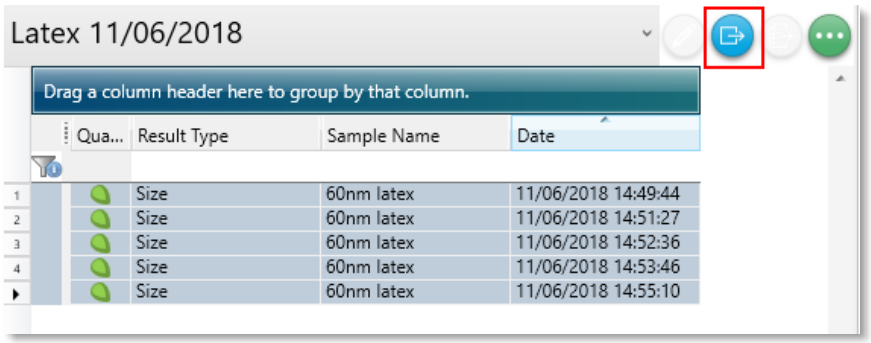

Figure 21 Exporting selected record

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