
Software Update Notification

Zetasizer Software v 7.01

Product	Part No. - Issue
Software suite	PSS0012-32

Product	Part No. - Issue
Zetasizer series	PSW0085/7.01
Firmware	PFW0044/1.34.002

Manuals	Part No. - Issue
Zetasizer Nano series	MAN0485/1.0
MPT-2	MAN0318/4.0
Zetasizer APS	MAN0425/1.0
Zetasizer μ V	MAN0428/1.0

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1. Overview

This document details the release of software PSS0012-32. This is the Zetasizer software version 7.01.

It covers the additions and improvements as well as issues fixed in this release of the software.

2. Computer

2.1. Operating system support

Version 7.01 is compatible with Windows 7 32 and 64 bit as well as Windows XP Professional SP3

Note: Windows XP 'Home' and Windows Vista versions are not supported

2.2. Minimum computer requirements

Intel Dual Core or hyper threaded processor, 2GB RAM, 150MB free hard disk space, 1024 x 768 screen resolution running in 16 bit colour mode, CD-ROM drive, 1 free USB port, Windows XP Pro SP3 or later operating system.

The software and system can be used with a laptop computer with a free USB port.

2.3. Recommended computer requirements

Intel Core 2 Duo, 2GB RAM, 160GByte hard disk drive, 1024 x 768 screen resolution running in 32 bit colour mode, CD-ROM drive, 1 free USB port, Windows 7 operating system.

3. 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.

Installation of the software must be performed with the instrument switched off or not connected.

3.1. Windows 7

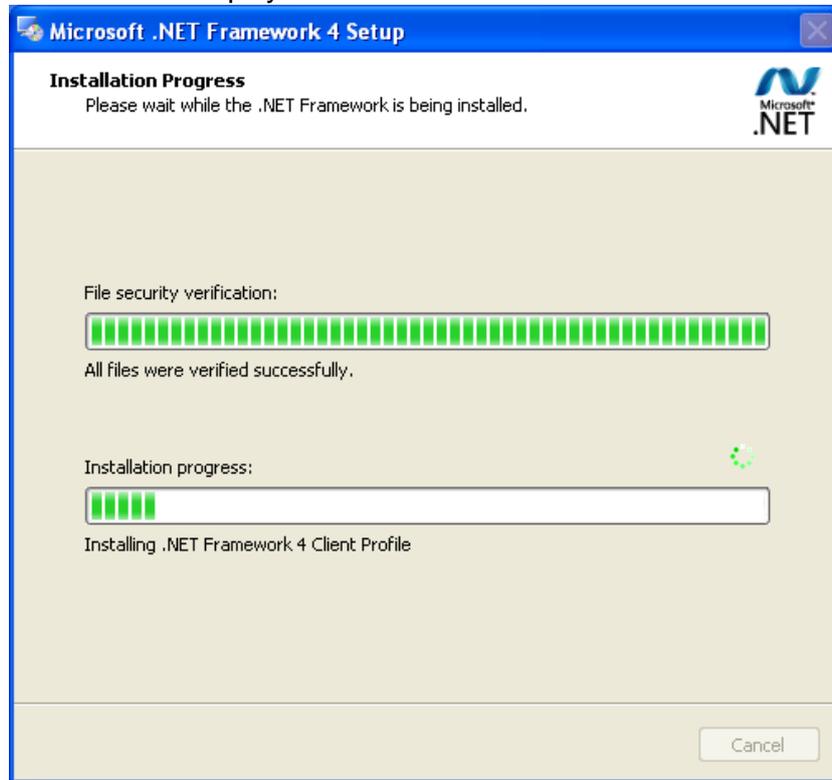
The software suite comes on an auto-loading CD-ROM. Inserting the CD into a system configured to Auto-run a CD will run the installation program automatically. If your system does not support this feature run the setup program from the root directory of your CD drive.

Note: For Zetasizer Series software, Windows 7 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.

Note: You must either switch-off the Zetasizer or unplug the USB cable from the PC or Zetasizer before installing the software.

3.2. .Net Framework 4

The Microsoft .Net Framework 4 must be installed for the Zetasizer software to run. This is installed during the Zetasizer software installation progress. Completion of this stage of the installation can take a few minutes, and in the case of Windows 7 64 bit can take over 10 minutes. Whilst the .Net Framework is being installed the following window will be displayed:



3.3. Connecting the Zetasizer to the PC

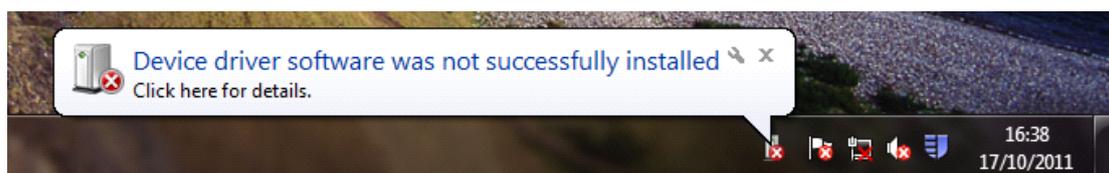
With the software installed the instrument should be connected via the USB port, and the system switched on.



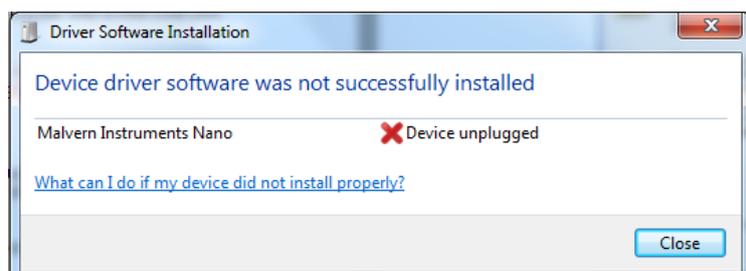
If you are connecting to a Zetasizer APS or Zetasizer μ V, the name used to identify the hardware will be displayed as “Malvern Zetasizer” rather than “Malvern Instruments Nano”.

This should be left with the default selection of ‘Install the software automatically’ and the ‘Next’ button should be selected so that file transfer begins. Once file transfer has completed the ‘Finish’ button should be selected to complete the installation.

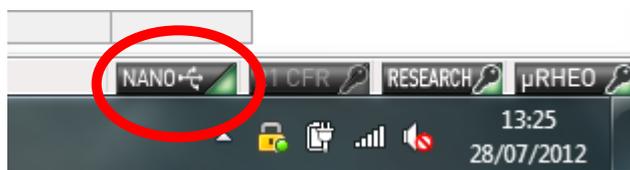
Windows will indicate that the new hardware is installed and ready to use. In Windows 7, when the Zetasizer Nano is installed, it is possible that the message ‘Device driver software was not successfully installed’ in the message in the bottom-right hand corner of the screen, as in the image below.



Alternatively, the following message may appear.



These messages can be safely ignored as long as, when the Zetasizer software is started, the 'Nano' icon is enabled as in the image below.



3.4. Zetasizer APS and Zetasizer µV users

The New Hardware Wizard will appear a second time as these instruments require two drivers to be installed. Use the steps described above to install the second driver.

3.5. Running the software

When the software is started the first time, the following dialog box will appear. Click on the appropriate system to select it. This dialog will not appear the next time the software is started.



The instrument type can be changed at any point by selecting the menu item; 'Tools', 'Options', 'Instrument type'. Once the instrument type has been changed the software must be restarted for the change to take effect.

4. Uninstall procedure

The software can be uninstalled using the standard Add/Remove feature in the Windows 'Control panel'.

5. Additions

5.1. Functionality of the Zetasizer Nano ZSP

This version of the software introduces functionality for the Zetasizer Nano ZSP.

5.2. Protein mobility measurement type

This version of the software introduces a new measurement type for the measurement of protein electrophoretic mobility. This measurement type is called 'Protein Mobility' and must be unlocked by entering a feature key using the 'options' setting under the 'tools' menu. This can be provided by a Malvern representative. It is possible to install a trial version of the key to allow access to this measurement type for a 30 day trial.

5.2.1. Measurement type

The new measurement type can be selected under the 'measurement type' option in the SOP editor. Selecting this option brings up the SOP settings for this measurement type. Selecting protein mobility fills the options with the default values. Re-selecting this measurement type when it is already selected will restore all of the default values in the SOP editor.

5.2.2. Workspace

A 'Protein Mobility' workspace has been added. Since the protein mobility measurement type is a combination of size and zeta potential measurements, data for both of these measurement types is displayed in this workspace.

5.2.3. Expert advice

A protein mobility expert advice section has been added to provide expert advice specific to this measurement type.

5.3. Microrheology measurement type

This version of the software introduces a new measurement type for the measurement of rheological parameters using a DLS type measurement. This measurement type is called 'Microrheology' and must be unlocked by entering a feature key using the 'options' setting under the 'tools' menu. This can be provided by a Malvern representative. It is possible to install a trial version of the key to allow access to this measurement type for a 30 day trial.

5.3.1. Measurement type

The new measurement type can be selected under the 'measurement type' option in the SOP editor. Selecting this option brings up the SOP settings for this measurement type. Selecting microrheology fills the options with the default values. Re-selecting this measurement type when it is already selected will restore all of the default values in the SOP editor.

5.3.2. Workspace

A 'Microrheology' workspace has been added. Since the microrheology measurement type is a combination of microrheology, size and zeta potential measurements, data for all of these measurement types is displayed in this workspace.

5.3.3. Expert advice

A microrheology expert advice section has been added to provide expert advice specific to this measurement type.

5.3.4. Microrheology utilities

A 'microrheology utilities' tool has been added to the software. This can be found by right clicking on a microrheology measurement and selecting 'microrheology utilities'. These tools allow analysis of Mean Square Displacement, the Viscoelastic Modulus and the Complex viscosity. In all three tabs, data within the relevant limits can be fitted to an appropriate power law and saved and exported for analysis in other software packages.

5.4. Calculators

The protein utilities have been renamed as 'Calculators' and have been significantly extended with additional tools. The newly added calculators are:

Protein charge & $f(ka)$ – calculates $f(ka)$ for the Henry equation and subsequently protein charge based on measured electrophoretic mobility.

Virial diameter (thermodynamic diameter) – Calculates virial or thermodynamic diameter based on molecular weight and second virial coefficient.

DLS Debye plot – plots diffusion coefficient as a function of concentration to calculate 'true' hydrodynamic radius and the DLS interaction parameter (A_2).

Interparticle distance – calculates the distance between molecules/particles and the screening distance to assess whether there is overlap and likely interaction between individual particles.

Mixture viscosity – calculates the viscosity of a mixture of liquids based on a simple volume proportion relationship.

Oligomer ratio – calculates the likely ratio of monomer and dimer based on the known size of each and a measured hydrodynamic radius.

These calculators are locked behind the same feature key as the protein mobility measurement type.

5.5. Plate Navigator 'Colour by Quality'

The plate navigator for the Zetasizer APS can now be coloured according to measurement quality. The quality tests are the same as those used on the 'protein purity' report page. If the data is assessed as good, samples are coloured green. If the distribution analysis is good but the cumulants analysis is poor, samples are coloured orange and if the tests indicate poor result quality, samples are coloured red.

5.6. Multi-parameter aggregation point analysis

The analysis to calculate the aggregation point has been updated to be more reliable. The new analysis monitors sample count rate and the distribution

peak size. This option is selected by default but the old analysis can be selected as part of the 'advanced' size settings in the SOP editor.

6. Improvements

6.1. Molecular weight measurement

The molecular weight measurement type has been updated to allow measurement of sample scattering intensity across a range of attenuators. Correction across attenuator settings is performed by measuring toluene count rate at each attenuator used in the measurement process. The lowest attenuator setting used in the measurement is attenuator 7 due to the very low scattering of this sample at lower attenuator values.

6.2. Melting point renamed to 'Aggregation Point'

The 'melting point' analysis, measurement type and reports have all been renamed to aggregation point. This more accurately represents the protein behavior that is being monitored by the Zetasizer.

6.3. Workspaces updated

A number of report pages and workspaces have been updated and new workspaces have been added including for microrheology and protein mobility.

6.3.1. Updating to latest workspaces

New workspaces can be imported by selecting the 'import workspace' option in the workspace selection menu.

Workspaces are stored in the following directory:

C:\Users\[username]\Documents\Malvern Instruments\Zetasizer\Export Data

To simply update all workspaces in the Zetasizer software, navigate to the folder:

C:\Users\[username]\Documents\Malvern Instruments\Zetasizer

and delete all "EN-US File" file types.

6.4. Copy data

The ability to copy tabulated data from some graph types has been added to make it easier to export data such as the correlation function. Selecting 'copy data' from the 'edit' menu when looking at specific reports will copy that data to the clipboard allowing it to be pasted into other software packages such as Microsoft Excel. This functionality has been added to the intensity PSD, the volume PSD and the correlation function.

6.5. Updated help files

The help files have been updated to provide information on the new software features.

6.6. New icons for instrument connection etc.

A new set of icons in the bottom right hand corner of the software display has been implemented. These display:

- Instrument connection status
- Type of instrument connected
- Microheology features activated
- Protein specific features activated
- Research features activated
- 21CFR11 compliance (ER/ES features) activated

6.7. Concentration utilities

The concentration utilities in the calculators section have been updated to more accurately represent the capabilities of the instruments. The Zetasizer Nano ZSP has also been included in this tool.

6.8. Debye plot updates

6.8.1. Debye plot renamed

The Debye plot in the calculators has been renamed to 'SLS Debye Plot'.

6.8.2. Debye chart properties

The SLS Debye Plot tool has been updated to allow customization of the graph display. These options can be selected by choosing the 'chart properties' from the drop-down menu in the top right hand corner of the dialogue.

6.8.3. Debye plot calculations

An error box has been added to the A_2 calculation to display the error in the calculated value.

6.9. Records view / Percent polydispersity

The records view has been updated to enable the display of 'percent polydispersity' as a parameter. It is now possible to display percent polydispersity of peaks 1-3 by selecting these parameters in the 'configure workspace' dialogue.

6.10. Count rate meter

The count rate meter for the Zetasizer APS and the μV has been updated to clarify the attenuation, transmission and power of the attenuator and laser.

7. Bug fixes

Numerous bug fixes have been implemented to improve software stability and quality. These include but are not limited to those in the table below:

The advice button in the count rate meter was not working
Surface zeta potential expert advice has been updated
The viscosity displayed on the Intensity PSD (M) report was incorrect
Instrument crashing when advanced graph formatting features are opened
The report designer was not saving report names correctly
The CONTIN analysis model in the research features was broken
The expert advice page was causing the molecular weight measurement to crash
A spelling mistake was present in the Size SOP settings
Occasionally, when the measurement window was closed, the software would not allow other actions
More than one instance of the software could be opened causing problems
When running a zeta potential temperature trend measurement, dielectric constant was not calculated properly
Size measurements were sometimes performed in the wrong cell position when using cell ZEN0118
The plate navigator displayed some units incorrectly
The surface zeta potential graph was incorrectly labelled
Repeat size measurements were not performed when added as part of a molecular weight measurement
Dual angle measurements using the folded capillary cell were performed at an incorrect measurement position
Default values in the external detectors dialogue were incorrect

8. Known Issues

8.1. Workspaces

A selection of new workspaces have been created for the new measurement types. A number of reports from other workspaces have also been updated.

However, due to the way the software is updated, these may not appear if a current Zetasizer user is having their software upgraded.

New workspaces can be imported by selecting the 'import workspace' option in the workspace selection menu.

Workspaces are stored in the following directory:

C:\Users\[username]\Documents\Malvern Instruments\Zetasizer\Export Data

To simply update all workspaces in the Zetasizer software, navigate to the folder:

C:\Users\[username]\Documents\Malvern Instruments\Zetasizer

and delete all “EN-US File” file types.

8.2. Zetasizer APS and Zetasizer μ V drivers

The current drivers for the Zetasizer APS and Zetasizer μ V are incompatible with some of the earliest instruments. This is expected to affect only Zetasizer μ V. This issue manifests as an inability to connect to the instrument. These issues will be handled on a case by case basis and if identified, should be referred to Product Management via the Helpdesk.

8.3. PCs with single core CPUs may lock up when connected to an APS or μ V

Some PCs, running the Zetasizer software, may lock-up or freeze when connected to an APS or μ V. The APS and μ V both require a PC with at least two cores or alternatively, a CPU that is Hyper-threading (HT) enabled. Therefore, it is advisable to run the software on a PC that meets the recommended specification detailed earlier in this document if the PC is to be connected to either a Zetasizer APS or Zetasizer μ V. The Zetasizer Nano is not affected by this issue.

8.4. USB detection

USB detection occurs automatically on new computers. On older computers the instrument is not always detected automatically and the instrument icon in the bottom right-hand corner of the status bar will remain greyed-out. This is fixed by closing the application, restarting the computer and restarting the software.

8.5. Missing parameters in user reports

The parameter dictionary has been updated for this version of the software and some of the parameters have changed. For reports that the user may have created containing the affected parameters, the parameters will become undefined. This can be seen when a report is opened and the parameter displays the text ‘No parameter has been selected’ or if the nothing is shown next to the text label (i.e. the value appears blank). To fix this problem for each parameter carry out the following steps:-

- 1) Double-click on the affected parameter to bring up its property dialogue.
- 2) Click the ‘Select’ button to display the ‘Select a parameter’ dialogue.
- 3) Select the relevant parameter.

N.B. Remember to correct the affected parameters on both the screen and page layout views

8.6. Results

The analysis algorithms for the calculation of size, zeta potential and molecular weight, including data filtering, are being continually improved. The effect of this is that if data taken from a previous version of software is edited, the result may change, even if only the sample name is edited. This is because the algorithms themselves are not stored with the record. This does not apply to parameters stored with the record such as the viscosity, and refractive index etc. as the same parameters are always used in the recalculation of the edited result.

This does not of course change the result of the stored record, as after editing a new record is created. To tell if a record is the original or has been edited, the parameter

'Is edited' can be added to a report or the record view. This can be found in the measurement audit information section of the parameters list. It will display 'False' if the record has not been edited.

8.7. SOP sample settings can be lost on software upgrade

The SOP sample settings will be copied to a backup location during the installation process. To maintain these settings with the new installation, the following process should be followed:

Once the files have been backed up and the new software installed, to incorporate these settings, the relevant files need to be manually copied by the user to the correct location to replace the installed files.

To do this the following steps need to be followed:

1. Ensure that you are logged onto the computer as an administrative user
2. Run the Zetasizer software once then close it down so there are no copies of it running.
3. Use Windows Explorer to copy the files:

SampleProperties.cfg
CompoundProperties.cfg
IonicSpecies.cfg

to the relevant location. The locations of the files depend on the operating system:

Windows XP

Copy from C:\Documents and Settings\All Users\Application Data\Malvern Instruments\Zetasizer<date/time of install> to overwrite files in C:\Documents and Settings\All Users\Application Data\Malvern Instruments\Zetasizer

Windows 7

Copy from C:\ProgramData\Malvern Instruments\Zetasizer<date/time of install> to overwrite files in C:\ProgramData\Malvern Instruments\Zetasizer

N.B. The Application Data folder is a hidden folder. To view it on Windows XP you need to access the Control Panel then select Folder options->View and then enable the option to Show hidden files and folders.

N.B. The ProgramData folder is a hidden folder. To view it on Windows 7 you need to access the Control Panel then select Appearance and Personalization->Folder Options->Show Hidden files and folders and then enable the option to Show hidden files, folders and drives.

N.B. If the installation process is terminated prematurely, the backup from the last installation is maintained in the following directory:

Windows XP - C:\Documents and Settings\All Users\Application Data\Malvern Instruments\Zetasizer_BACKUP

Windows 7 - C:\ProgramData\Malvern Instruments\Zetasizer_BACKUP

8.8. PC entering sleep mode can disconnect the Zetasizer

If the PC should enter sleep mode while the Zetasizer is connected and running, the connection will be lost and the measurement fail. It is recommended to disable the sleep function while the Zetasizer is being used.

9. Customer deliverables

9.1. Application software suite

The software is contained on one CD-ROM. The disk is labelled PSS0012/32

9.1.1. Disk contents

- Operating software
- Zetasizer User manual
- MPT-2 manual
- USB drivers
- Software Update Notification (SUN) with changes from previous software version
- Adobe Acrobat Reader