

SOFTWARE UPDATE NOTIFICATION

MORPHOLOGI SOFTWARE v8.20: PSS0025-29

**PARTICLE SIZE****PARTICLE SHAPE****CHEMICAL IDENTIFICATION**

Introduction

This document details the release of software PSS0025-29: the Morphologi Software Suite including version 8.20 software for the Morphologi G3 instrument family. It covers software issues fixed and new features. This information is required to perform a risk analysis to determine if the software should be installed. In this risk analysis the benefits of the new features provided and resolved software issues must be weighed against the risk of new issues that may be introduced to vital areas of the software or possible changes to the results of future analysis. Installation instructions are provided.

In addition, Appendix A provides good practice guidance to help users get the best performance from the instrument based on our experience using it.

Note: If you are upgrading from a version of software than precedes version 8.13, additional information about the intermediary versions can be found in the relevant Software Update Notifications which can also be found on this installation CD.

Installation

It is assumed that you have authority to install or update software within your facility. It is also assumed that you have Administrator rights for the system upon which the software is installed, as this is a requirement of the installation process. If you do not have this authority please consult with your I.T. support department before proceeding.

Recommended System Requirements

The minimum requirements for running this software are highlighted in table 1 below. Although the software can run using Windows 7™ (64-bit), it has been fully tested under Windows 7™ (32-bit). Windows 7 (32-bit) is therefore the preferred operating system.

Note: The Morphologi G3-ID family is only compatible with Windows 7 (32-bit) and English language.

Note: Power saving and USB selective suspend should be disabled, see Appendices B and C to ensure that the software can operate correctly during long measurements

Note: Some 3rd party software or OS patches may prevent the Morphologi software from running correctly. It is not possible to test for compatibility with all windows programs.

Supported Languages

The Morphologi software suite is available as an English language application.

Table 1: Recommended system requirements for the Morphologi software.

Feature	Specification
Processor Type	Intel Core i7 4770 Processor
Memory	4GB
Hard Disk Storage	1Tb HDD
Additional Storage Media	DVD +/-R/RW drive
Display	1 x 22" Widescreen Flat Panel Monitor for software 1 x 22" Widescreen Flat Panel Monitor for live video feed
Connectivity	1 high speed USB port (not USB 3.0/Superspeed) 1 Firewire (IEEE1394) port <i>Note: PCs using a Morphologi G3-ID instrument will require an extra USB port (not USB 3.0/Superspeed), and an extra RS232 port.</i>
Operating System	Morphologi G3: Windows 7 (32 bit and 64 bit) Morphologi G3-ID: Windows 7 32 bit, English language

Installation Instructions

The software is supplied on a CD-ROM that will automatically start the installation process when inserted into the drive. If your system does not support this feature run the \Morphologi\setup.exe program from the root directory of your CD drive.

The software may also be installed from the web. To use this option, Run the web installer Malvern Morphologi v8.20 PSS0025-29 EN.exe.

In both cases the installer will prompt for the user to select Morphologi G3-ID mode or standard G3.

Upgrading an Existing Installation

Always uninstall any existing version of the Morphologi software before installing any other.

Note: Upgrading an existing installation to this version of the Morphologi software may require the camera driver to be upgraded for older Morphologi G3 systems. To upgrade the camera driver once the Morphologi software has been upgraded, ensure that the camera is attached to the PC then open the windows device manager and uninstall the Baumer camera driver. Then, scan for hardware changes and direct windows to the drivers\camera folder inside the Morphologi installation folder when prompted for a driver. For details see Malvern technical note "Updating the camera driver on a Morphologi instrument" (MRK1516) available from Malvern helpdesk or your local Malvern representative.

Note: Upgrading an existing installation to use a 64-bit operating system may require a firmware upgrade for the camera on the instrument. Please contact your local Malvern representative for more information.

Note: Please read *MRK1059- xx CFR Part 11 compliance guide* and *MRK1058 - xx CFR Part 11 – User guide* (where –xx refers to the latest versions of these documents).

Uninstall Procedure

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

Note: uninstalling previous versions of the software will remove all the standard Malvern reports, even if they have been edited. Best practice is to avoid overwriting standard Malvern reports but instead create new reports.

Backward Compatibility

This version is back compatible with all prior versions of the Morphologi software.

Morphologi G3, G3SE, G3-ID and G3SE-ID instruments are fully supported. This release supports the use of the Sample Entrainment Spool disperser which is included with the Morphologi G3SE and G3SE-ID instruments, and as such is not backward compatible with the Sample Cartridge disperser supplied with Morphologi G3S and G3S-ID instruments. To upgrade to the latest hardware specification please contact your local Malvern representative.

New Features

This software has been developed to provide users with:

- The option to select the Thin-path wet cell for SOP measurement and in the manual microscope interface.
- A Manually Targeted Raman feature where users are able to return to selected particle(s), and collect a number of spectra from each particle by repositioning the laser, trying different acquisition settings, removing background contribution. The best spectrum is then selected to be saved and associated with the particle image.
- The ability to perform a 'grab and analyze' morphological measurement and then a Manually Targeted Raman measurement which is particularly useful for method development.
- A direct export link to KnowItAll® from Bio-Rad a spectral search software and database containing over 13000 Raman spectra to aid identification of unknown particles.
- The export of Chemical correlations scores along with exported particle details

Fixed issues

The issues fixed in this version of the software are detailed below.

Reference(s)	Issue	Comment
46601	Multiple power cycles occasionally resulted in the BFDf sledge becoming misaligned.	The BFDf calibration is now performed on instrument start up.
47506	A full SOP chemical measurement only gave a single result.	2 separate results are now recorded the morphological and the chemical one.
58157	Occasional timeout of the camera and/or stage control hardware components during measurements where z-stack is selected in the SOP	Timeout on the Z stacking thread increased in line with the rest of the measurement.

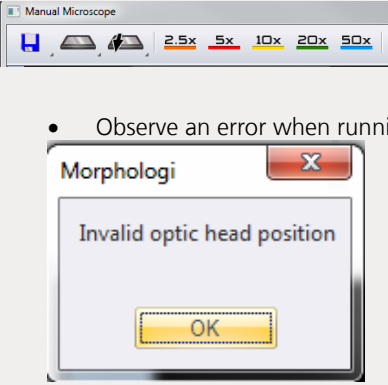
Known Issues

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 one is available.

Issue	Work around	Comment
<p>If an SOP is extracted from a measurement, and the "Grab New Image." button is pressed on the threshold page, the manual microscope is opened but no connection occurs to the instrument.</p> <p>Since the SOP has been extracted it should not be possible to change the Threshold so the "Grab New Image" should not be available.</p>	To change the threshold save the extracted SOP first and then open for editing from the main software window.	Issue has been logged as bug #31151
<p>Stop on particle limit does not work with multiple optics. The measurement does not stop on particle limit, whether the limit is reached on the first or subsequent optics scans.</p>	We do not recommend applying particle count limit when using multiple optics, as this can cause sample biasing.	Issue has been logged as bug #30871
<p>If a measurement is stopped and a new measurement is started from the open live measurement manager display window, the 2nd measurement will not complete if it is set up to use a different slot in the slide holder.</p>	Close the live measurement manager display window and start a new measurement.	Issue has been logged as bug #30307
<p>If the user runs an SOP requiring multiple slides but does not select them all at the beginning of the measurement but instead selects them one by one via the live measurement manager display, the measurement only succeeds in measuring the first slide.</p>	Select all the intended slides at the beginning of the measurement.	Issue has been logged as bug #31966
<p>It is not possible to abort a measurement during the plate level operation</p>	Wait till the plate level operation is complete. Note: if the coverslip option is selected in the SOP the plate level operation takes several minutes.	Issue has been logged as bug #46662
<p>The Bright Field (BF) or Dark Field (DF) setting is not automatically controlled during SOP threshold image acquisition</p>	Ensure that instrument is in the right BF/DF condition prior to editing the SOP.	Issue has been logged as bug #29158
<p>1-Click measurements with merged slide results will not do a Chemical ID measurement.</p>	We do not recommend merging slides on ID measurements. Instead, it is better to measure separately then combine the measurements afterwards.	Issue has been logged as bug #28786
<p>If a wet cell is fitted in the instrument, and a SDU dispersion is attempted, the software will not recognize that an unsuitable plate type is fitted, and will continue with the dispersion process. This may damage the wet cell windows.</p>	Users are advised to ensure that a wet cell is not fitted before carrying out a dry powder dispersion.	Issue has been logged as bug #31285

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When reanalyzing a record with a large amount of spectra, the software can crash if the reanalyzed record is viewed immediately after it is created.	None. However, the measurement data is saved correctly. If users experience poor software performance following a reanalysis, we would recommend restarting the software.	Issue has been logged as bug #31286
When the file permissions for the Morphologi documents library are set up to deny deletion of files or folders, it is not possible to create new files.	None	Issue has been logged as bug #31287
Slow stage on start-up after unexpected power down of the instrument	Wait for the stage to initialize. This may take 10 minutes or more depending on the stage position when it was powered down.	Issue has been logged as bug #25263
Some Morphologi G2 instruments can lose the position of the optical turret when switching optics.	Restart the measurement. Note that this does not affect Morphologi G3 or Morphologi G3-ID instruments.	-
Stopping a merge measurement while measuring with the first optic only aborts the measurement with the current optic. The system then goes on to measure with the next optic.	Stop the measurement for each optic in the merge measurement process.	Issue has been logged as SCR5901
In manual microscope, aborting Raman acquisition can lead to a software crash if abort is clicked during spectrometer bench set up. Bench set up happens after the acquisition settings have been changed.	<ol style="list-style-type: none"> 1) For short acquisition times avoid aborting, allow acquisition finish 2) for long acquisition times do not press abort until laser spot is seen on the sample 	Issue has been logged as bug #31442
Reanalysis of records whilst acquiring a Raman spectrum in manual microscope may cause a software crash	Do not reanalyze records whilst capturing a Raman spectrum.	Issue has been logged as bug #31397
Stopping or aborting automated Raman measurement during spectrometer bench set up can lead to a software crash	Do not stop or abort an automated Raman analysis until the laser spot is seen on sample particles.	Issue has been logged as bug #23756
The manual targeting dialog can generate a high memory load on some PCs and may result in a crash.	Do not leaving the manual targeting dialog open when not in use	Issue has been logged as bug #52004
When re-running measurement without closing the Live Display, fixed focus, single slide measurements using a different slide index from the first measurement results in an unspecified error.	Always close the live display between sop runs.	Issue has been logged as bug #52546
If plate tilt compensation is disabled and the selected magnification is greater than 5x, the recorded focus in SOPs is not be portable between instruments	Use plate tilt compensation for magnifications greater than 5x.	Issue has been logged as bug #53225

<p>Turret error in the manual microscope or when running an SOP,</p> <p>The user may:</p> <ul style="list-style-type: none"> Experience difficulty when swapping objectives using the manual microscope where no objectives are highlighted and the instrument will not move the turret.  <ul style="list-style-type: none"> Observe an error when running an SOP 	<p>Ensure instrument is switched on BEFORE starting the software</p>	<p>Issue has been logged as bug #33408</p>
<p>If the computer goes into standby mode after a period of inactivity the measurement can hang. Since measurements of large areas can take some time this is a likely event.</p>	<p>Disable the power saving options of the computer using the instructions in Appendix B: Disabling power saving.</p> <p>USB suspend must also be disabled on the PC. See Appendix C: Disabling USB selective suspend.</p>	<p>-</p>
<p>Installation of software for remote PC support and desktop sharing can interfere with the live display on the second monitor and cause the software to crash during measurement.</p>	<p>None.</p>	<p>-</p>
<p>Backup of data to external devices like external hard drives or network servers during measurement can slow down the measurement or cause the software to crash.</p>	<p>Automatic backups should be scheduled at times when the instrument is not in use.</p>	<p>-</p>
<p>If .Net 4.5 is not present before installation of Morphologi, the Morphologi installer may display a warning about files being in use by a running application.</p>	<p>Install .Net 4.5 before installing Morphologi. Alternatively, press the Ignore button – the installer will then ask you to reboot when it has finished.</p>	<p>-</p>

Error Reporting

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

- A **fullscreen** 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 - found under the triangular cover right side of instrument (e.g. MAL1060289)
- Software version - go to Help>About Morphologi (e.g. 8.13; all digits are important)
- System information – double click on the G3 or G3ID logo at bottom right corner of the Software. Take a screen shot of system information and include on error report.

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- Additional system setting export – go to tools>maintenance. Enter the password (maintenanceon). Select Export and save the text file to include on error report

Appendix A: Good Practice Guidance.

<p>Size range</p> <p>Consider particle size range of interest.</p> <p>Is analysis Morphological only or is Chemical Identification required?</p> <p>Table provides guidance.</p>	<table border="1"> <thead> <tr> <th data-bbox="411 237 638 367">Magnification</th> <th data-bbox="638 237 753 367">2.5x</th> <th data-bbox="753 237 868 367">5x</th> <th data-bbox="868 237 983 367">10x</th> <th data-bbox="983 237 1098 367">20x</th> <th data-bbox="1098 237 1204 367">50x</th> </tr> </thead> <tbody> <tr> <td data-bbox="411 367 638 518">Morphological size range (µm)</td> <td data-bbox="638 367 753 518">1000-13</td> <td data-bbox="753 367 868 518">420-6.5</td> <td data-bbox="868 367 983 518">210-3.5</td> <td data-bbox="983 367 1098 518">100-1.8</td> <td data-bbox="1098 367 1204 518">40-0.5</td> </tr> <tr> <td data-bbox="411 518 638 655">Potential range for chemical ID (µm)</td> <td data-bbox="638 518 753 655">1000-100</td> <td data-bbox="753 518 868 655">420-25</td> <td data-bbox="868 518 983 655">210-20</td> <td data-bbox="983 518 1098 655">100-20</td> <td data-bbox="1098 518 1204 655">40-1</td> </tr> </tbody> </table>	Magnification	2.5x	5x	10x	20x	50x	Morphological size range (µm)	1000-13	420-6.5	210-3.5	100-1.8	40-0.5	Potential range for chemical ID (µm)	1000-100	420-25	210-20	100-20	40-1
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Potential range for chemical ID (µm)	1000-100	420-25	210-20	100-20	40-1														
<p>Multiple measurement for ID analyses</p>	<p>If performing an ID analysis, in the SOP do not select any of the following:</p> <ul style="list-style-type: none"> • multiple slides • multiple objectives • multiple scan areas 																		
<p>Maximum number of particles to target for an ID analysis</p>	<p>The maximum number of particles analyzed using an ID measurement during instrument development was 10,000 with a 1 second acquisition time. Analysis time was >1.5 days.</p> <p>If targeting a larger number of particles and/or using a longer acquisition time it is recommended to perform separate morphological scans followed by Raman analysis on each independently and then combine the data later. Note when combining data sets, any particle tags will be lost.</p>																		
<p>Chemical classes in full Morphologi and Chemical 1-click SOPs</p>	<p>If running a chemical measurement, either as part of a 1-click SOP or from a base morphological measurement, you must ensure any classes in the SOP or result do not contain both chemical correlation parameters and have the 'exclude unclassified' particles option selected.</p> <p>This is because at the end of the morphological analysis no particles are classed (as no chemical data yet exists) thus all particles will be excluded and therefore will not be available for chemical measurement.</p>																		

File Management and memory load management

Insufficient memory may lead to aborted measurement.

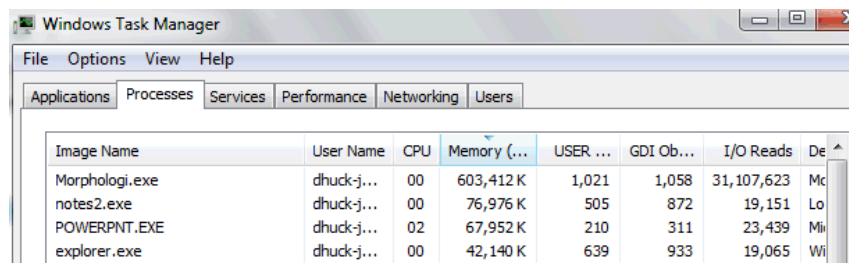
If the memory load goes above 1,200,000 K during a measurement it can fail.

Minimize RAM usage by closing any measurement files not in use and minimizing number of records in each measurement file.

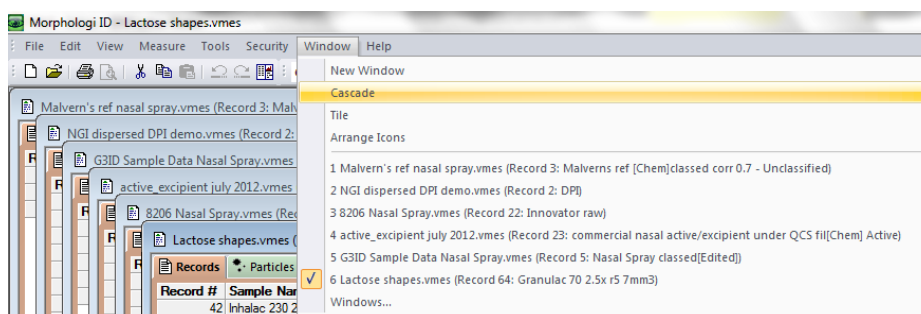
The amount of PC RAM available for an analysis is reduced and may not be sufficient to run the measurement if:

- several measurement files are open,
- measurement files contain a large number of records and/or large numbers of particles,
- if they contain large amounts of Raman data

To check the memory load go to the Windows task Manager. If the Morphologi.exe process load is more than 400,000 K BEFORE you start the measurement it is recommended that you close open measurement files and/or open a new measurement file if the number of records in the open measurement is high(>10).



To check the number of measurement files open go to View>Cascade



If several measurement files can be seen, close all those that are not in use.

Look at number of records and number of particles in results including any filtered particles that may not be included in the particle number count in the workspace.

In the example shown there were over 60 results and some contain more than 150000 particle images before considering filtered/excluded particles.

54	Spherolac 100 2.5x r5	29 January 2009 17:08:24	False	13471
55	Granulac 70 5x r1	29 January 2009 19:11:4	False	158346
56	Granulac 70 2.5x r1	30 January 2009 11:14:49	False	50660
57	Granulac 70 5x r2	30 January 2009 13:58:34	False	154010
58	Granulac 70 2.5x r2	30 January 2009 14:52:40	False	56442
59	Granulac 70 5x r3 7mm.3	30 January 2009 17:01:12	False	123322

If the memory load rises above 1,200,000Kb during a measurement the software can cease to operate leading to a failed measurement.

Avoid viewing previous results whilst measurement is running.

Viewing results may increase memory load on PC and affect the measurement, see above. As such it is especially important to avoid viewing results if several hours through a long ID measurement to avoid loss of data.

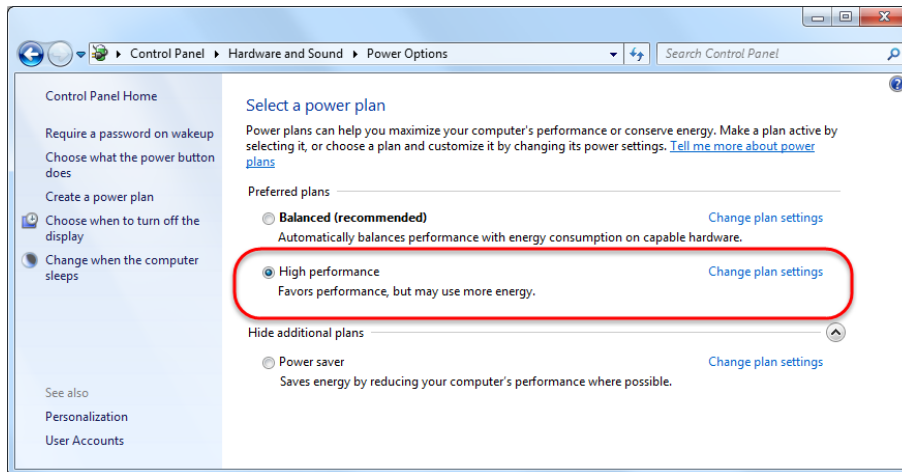
Additionally, editing results during a measurement is not recommended, including applying filters/classes and saving as new record. If editing the results is required it is recommend to copy the data to another PC.

	<p>In particular do not do the following:</p> <ul style="list-style-type: none"> • Switch between measurement files – the active file at the end of the measurement run must always be the one open when the measurement was started to ensure the result data is saved into the correct measurement • Create a mean spectrum • Edit chemical correlation based classes or filters
Save data locally and back up to network, storage drive or shared PC.	Morphologi data set can be very large. Many network drives may not support such files. Direct saving to a network may affect the system performance, resulting reduced analysis speed and cause the system to be affected by other network traffic. It is recommended to back up data to a network, shared access drive or PC when the instrument is not in use, e.g. overnight. Software can be installed on alternative PCs for data review.
Avoid virus scans, windows updates etc. occurring during a measurement.	If any other PC activity causes the Software to crash or causes the PC to shut down measurements in progress will be lost.
USB Ports	<p>Use USB SS(USB 3.0) ports for Keyboard and mouse only and not for any system connection.</p> <p>Morphologi G3 instruments must be connected to a different bank of USB ports to the mouse and keyboard.</p> <p>For Morphologi G3-ID instruments the Raman bench connection must be in a different bank of USB ports to any other connection.</p>

Appendix B: Disabling power saving

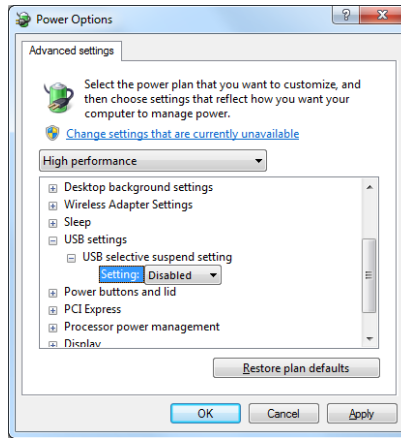
To disable the power saving options of the computer use the Power Options available in Control Panel.

Modify the default settings to those highlighted below for your OS.



Appendix C: Disabling USB selective suspend

From the power options dialog shown in Appendix B, select Change plan settings and set USB selective suspend setting to Disabled.



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