Technology that counts



NC-View™ Software User Guide

P/N 991-2022 Revision 1.3 January 2020





ChemoMetec A/S

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Caution!

This software must be operated as described in this user guide and documents referred to herein. Please read the entire guide and referred documents before attempting to use the software.

Contacting Support

Technical information that is not covered in this document or referred documents, is available from our support:

- Email questions to support@chemometec.com
- Speak to a Technical Support Specialist, by calling (+45) 48 13 10 20

Please create support files in NC-View[™] via Help -> Create support files, before contacting ChemoMetec for support.

Sales and Ordering Information

To order NucleoCounter[®] NC-202[™], NC-View[™] software, and consumables, call (+45) 48 13 10 20 or send an e-mail to <u>sales@chemometec.com</u>.

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Quick Guide



Repeat steps 4, 5 and 6 to perform the same protocol on a new sample.

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Getting Started

Introduction

The NC-View[™] software is required for control and data acquisition with the NucleoCounter[®] NC-202[™] instrument. NC-View[™] is available for Windows 10 only – refer to the <u>Installation Guide</u> section for more information.

This manual is integrated into NC-View[™]. Pressing 'F1' while in NC-View[™] will open the manual to the relevant section.

Get Started in 8 quick steps

- 1. Log into your dedicated computer (see <u>requirements</u>) with your Windows administrator credentials
- 2. Unpack the NucleoCounter[®] NC-202[™] instrument and locate the software installation package on the USB key provided.
- 3. Launch the Install NC-View[™] X.X.X.X.exe (the Xs indicate the version number e.g. 1.0.60.0.exe) using administrator permissions. **WARNING**: Do <u>NOT</u> open the .bin file
- 4. Follow the on-screen instructions to install the camera and other device drivers. To complete installation, restart the computer
- 5. Next, open the NC-View[™] 🥯 software in the Windows start menu
- 6. Insert the USB data cable included in a USB 3 port on the computer
- Unpack the NucleoCounter[®] NC-202[™] instrument and connect it to the computer. Using the enclosed mini screwdriver, fasten the USB data cable with the screw lock mechanism to secure the connection
- 8. Insert the power cable into the outlet at the back of the NucleoCounter[®] NC-202[™] and then connect it to a 3-prong outlet (i.e. including a grounding wire). The NucleoCounter[®] NC-202[™] is ready to use when the RUN-indicator turns green (this may take a minute)

For more details see the Installation Guide section below.

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Startup

On the computer, open NC-View^M using the *NC-View^M* icon \bigcirc in the Windows start menu. The instrument will initialize, and the motor can be heard aligning during this process. When the LED indicator on the instrument turns green and the *Run* icon \bigcirc becomes enabled, the instrument is ready to use. If the NucleoCounter[®] NC-202^M fails to connect, ensure that the instrument is connected to the computer using the supplied USB cable and ensure power supply is connected to the main power outlet.

Validation with IQ/OQ Protocols

For the initial NucleoCounter[®] NC-202[™] installation or when the instrument has been moved to a new location, performing a system validation is recommended via the *Installation Qualification* (IQ) and *Operation Qualification* (OQ) protocols.

Installation Qualification (IQ) and Operation Qualification (OQ)

- 1. Start NC-View[™] up via the *NC-View[™]* icon [●] in the Windows start menu
- 2. Click the *Select Protocol* icon 📕 to launch the <u>Protocol Browser</u>
- 3. In the Protocol Browser select the NC-202 IQ/OQ protocol
- 4. Press the *Run* icon **and** select *IQ* or *OQ* protocols, respectively
- 5. Follow the instructions on-screen to perform the IQ and OQ test
- 6. After run has completed, a message will confirm whether it has passed analysis

Introduction to NC-View[™]

For optimal user experience, a display resolution of 1920 × 1080 pixels or higher is recommended. NC-View[™] consists of multiple windows that can be moved and resized:

- <u>Main Window</u>: Appears when NC-View[™] is launched. It is used to operate the NucleoCounter[®] NC-202[™], acquire data files and display acquired images
- <u>Protocol Browser</u>: Used to select and manage protocols
- <u>File Browser</u>: Shows the acquired data files (CM files) and is used to open files in the image display, export data or administrate data files

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NC-View[™] Basic Concepts and Terminology

- *CM file*: A ChemoMetec proprietary file format that contains the images, the result data and the metadata with file information. The file type is displayed as *.cm*
- *Protocol*: A file containing the settings on how the instrument acquires images, performs the image analysis and presents the results
- *View*: The photographed area of a cassette. A view typically contains two images, one for the UV channel and one for the green channel. A CM file may contain a variable number of views depending on the protocol

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Using NC-View[™]

Operating the Main Window

The Main Window is divided into three areas (indicated by numbers in the image below):

- 1. The control section for <u>Acquisition</u> of new files
- 2. The Image Panel displaying images and Main Results
- 3. The <u>File List</u> below the image is populated with the files acquired on the same date as the CM file displayed



3 File List

Use the Control Section to Acquire Data

The control section on the Main Window is used for acquisition of new data.

- 1. Use the drop-down or the *Select Protocol* icon \square and select the protocol of interest
- 2. Load the Via2-Cassette[™] with the cell sample and place it into the cassette fixture OPTIONAL: Enter *Sample ID* and *Operator name*
- 3. Start the analysis using the *Run* icon
- 4. The result will display after a few moments

NOTE: Acquisition can be aborted using the Stop icon

Once your analyses are complete, turn off the computer. There is no need to turn off the NucleoCounter[®] NC-202[™] after use as the power consumption is very low when not running a sample. The instrument is calibrated by ChemoMetec and no subsequent calibration is required.

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Graphical User Interface	Functions
	Run
	Start acquisition with the selected protocol
	Stop
	Stop a running acquisition session
	Eject
	Ejects the piston and releases the Via2-Cassette™
Count & Viability 🛛 🗸 👗	Select Protocol
	Drop-down to select one of the 10 last used protocols. Click on the folder icon
	to open the Protocol Browser, and select a protocol from the list
OPERATOR	Operator
NC202	User-defined input: For multiple operators using the same Windows login
SAMPLE ID	Sample ID
	User-defined sample naming field
	Volumes
Sample 200	The user can enter the volume before starting an analysis. The dilution or
Dilution 0	concentration of the sample will be factored in when calculating the results
Dilution factor 1	

Sample and Dilution Volumes

Information about the sample dilution can be provided prior to starting an analysis, and the dilution or concentration of the sample will be factored in when calculating the results.

- When selecting a protocol, the volumes fields will automatically update with the recommended volumes for the assay. The *Reload* icon S will load the recommended volumes
- If the sample has been diluted, enter the used sample and dilution volumes or simply enter the dilution factor
- The dilution factor is defined as the sample divided by the sum of all the volumes. Entering a number greater than 1 in the input field represents a dilution of the sample, whereas entering a number less than 1 represents a concentration of the sample. Subsequently, the volume field will automatically update to show the recommended volume
- If the sample has been concentrated, enter the original sample volume and include the volume removed as a negative number in the dilution field or use the dilution factor as described above
- Depending on the selected protocol, a solution field may be present. If the volume of the sample or dilution is changed and a solution input field is present, it will be updated with the recommended solution volume to add. If the user changes the volume in the solution input field, this volume will not be automatically updated anymore

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Operating the Image Panel

Fluorescent images can be reviewed in the image panel using the zooming functionality with the mouse scroll wheel while the pointer is inside the image view area. To move the image, click and hold the left mouse button and drag to a new image position. Display a CM file in the image display by clicking on the CM file in the <u>File List</u> or by opening the <u>File Browser</u> and double clicking on a CM file.



Configure Result Fields

On the right side of the image panel, three results fields are shown. These fields can be configured by right clicking on the results category, for example *Diameter*, and selecting the desired result output.

Graphical User Interface	Functions
20190416-00009 • Jurkat	Name and ID
	File name and sample ID of the current CM file displayed
< 1/1 >	Previous and next view
	Click to change display if file contains multiple views
CHANNELS	Channels
✓ АО	List of channels in the current image. Click on a channel color to disable or
DAPI	enable the display of this channel
Graphical User Interface	Functions
OVERLAY	Overlays
🖌 Live	List of overlays in the currently displayed image. Click on an overlay color to
🔽 Dead	enable or disable the display of the overlay. Utilize this function for visual
	inspection of the counted cells

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Visual Inspection of Counted Cells

The overlays within a CM file can be used to visually inspect how the cells are counted by clicking the *Live* and *Dead* overlay checkboxes to enable the display of both overlays.



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File List in Main Window

The file list below the image shows the files acquired on the same date as the displayed CM file.

Tool Bar

The tool bar at the top of the file list contains the following icons:



<u>File Browser</u>: Find CM files that open in the image display or administrate data files



Export Result Data: Select file(s) and click the *Copy selected table data* icon to copy the data for the selected files to the clipboard. Data can subsequently be pasted into a spreadsheet



PDF Report: Create PDF reports for selected CM file(s)

Data in the File List

There are two types of columns in the file list and <u>File Browser</u>, *File information columns* and *Result columns*. The file information columns can be used to sort the file list by clicking on the column header. Sort the information in ascending or descending order by using the up and down arrows (∇ and \blacktriangle).

- File information columns
 - Name CM file name: date and run count
 - Time Timepoint for when the CM file was created
 - Sample ID
 User defined sample ID
 - Tags Tags that have been added to the CM file
 - Protocol Protocol name used when generating the CM file
 - Media type (typically Via2-Cassette[™])
 - o User Windows username used when generating the CM file
 - o Operator Operator name used when generating the CM file
 - Approved by Windows username used for approving the CM file
 - o Instrument Serial number of the instrument used for generating the CM file
- Result columns
 - Total (cells/ml) Total cell concentration
 - Live (cells/ml) Live cell concentration
 - Dead (cells/ml) Dead cell concentration
 - Viability (%) Percentage of live cells in the sample
 - \circ Diameter (µm) Median size estimation of the cells
 - o Aggregates (%) Percentage of cells in aggregates with five or more cells
 - \circ Debris Index Index of debris events in relation to the cell count. E.g. if the total cell count is 2×10^6 cells/ml and debris index is 50, the amount of debris is approximately 1×10^6 events/ml. The index value is rounded to the nearest 5.
 - Status Shows Ok or warnings such as Foreign object detected or Out of range

NOTE: Not all result columns will be available for all CM file types

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Warnings that appear in the status column for a CM file:

•	Out of range (5×10 ⁴ – 1×10 ⁷ cells/ml)	The cell concentration in the Via2-Cassette™ is lower than 5 × 10 ⁴ cells/mL or higher than 1 × 10 ⁷ cells/ml
•	Bubble detected	A bubble that significantly affects the results is detected and removed from the analysis.
•	Foreign object detected	A foreign object that significantly affects the results is detected and removed from the analysis.

Define Columns to Display

In the <u>File Browser</u> and file list in the <u>Main Window</u>, a filter can be used to toggle column display by rightclicking on the heading rom, opening the display columns dialog box. Select the column headings to be displayed.



NOTE: File Name cannot be deselected

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Selecting a Protocol

A protocol is a file that contains settings for how the instrument acquires images and how the images are analyzed. Protocols are selected via the Protocol Browser or the drop-down menu. The Protocol Browser is opened from the Main Window with the Protocol Browser icon 2. By selecting a protocol and clicking the *Application note* 2 icon, an application note for the selected assay will be displayed.

Protocol Browser							×
A USERS	TITLE	VERSION	USER	OPERATOR	LOCKED BY	TYPE	^
All Users	Count & Viability	1.1				NC202	
USER'	NC202 IQ/OQ					NC202	
	<						>
					Select	Cancel	

Graphical User Interface	Functions
	Application Note
A	Opens the application note for the selected protocol
A USERS	Users
All Users USER	All Users or a single user can be selected as a search tool for locating the protocol of interest

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Open Previously Acquired Data Files

The File Browser provides an overview of the stored CM files. To open the File Browser, click on the *File Browser* icon in the <u>Main Window</u>. When double-clicking on a CM file, it will open in the image panel on the Main Window. This will also update the <u>File List</u> in the Main Window with the CM files acquired on the same date as the opened file. <u>Sorting</u> CM files, <u>Column Types</u> and <u>Column Display Configuration</u> work in the same way as with the <u>File List</u> (for more information see below).

😑 File Browser										- C	x c
C 🗙 🛨 🔚 🚆											
A USERS	▼ NAME	SAMPLE ID	PROTOCOL	TOTAL (cells/ml)	LIVE (cells/ml)	DEAD (cells/ml)	VIABILITY (%)	DIAMETER (µm)	AGGREGATES (%)	DEBRIS INDEX	STATUS ^
All Users	20190416-00009	Jurkat	Count & Viability	2.14E+06	2.01E+06	1.32E+05	93.9	10.6	1.0	0	ОК
⊂ USER TAGS All Tags											
DATE											
2016 2017 2018 2019 >										r	×
Jan Feb Mar <mark>Apr</mark> May Jun	<										,
Jul Aug Sep Oct Nov Dec											
1 2 3 4 5 6 7											
8 9 10 11 12 13 14											
15 16 17 18 19 20 21											\times
22 23 24 25 26 27 28	<write co<="" td="" your=""><td>omment her</td><td>e></td><td></td><td></td><td></td><td></td><td>Write your tag</td><td>here></td><td></td><td>5</td></write>	omment her	e>					Write your tag	here>		5

Right click on one or more selected CM files to open a menu with the following options:

- *Reuse the run input parameters*: Updates the input fields on the Main Window with the parameters that the selected file was acquired with
- Copy file(s) to folder: Opens a new window where files can be copied to another destination
- *Copy selected table data to clipboard*: Copies the selected table data to the clipboard so it can be pasted into another application
- *Copy table data to clipboard*: Copies the full table data to the clipboard so it can be pasted into a spreadsheet
- *Copy name to clipboard*: Copies the name of one or more selected files to the clipboard so it can be pasted into a spreadsheet
- *Copy file name to clipboard*: Copies the name with the full path of one or more selected files to the clipboard
- *Approve*: When using the *Secure Mode* feature in NC-View[™], a new window will appear, requesting to approve the selected CM files
- Change sample ID: The Sample ID for one or more selected files can be changed in a new window
- Properties: File properties of a selected CM file open in a new window

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lcon	Functions
\bigcirc	Synchronize
	Synchronization will update the listing of the CM files in the File Browser
\mathbf{Y}	Delete file
	This action will delete the selected CM files
.↓.	Import CM files
	Select the location of CM files to be imported into the File Browser. To export
	CM files simply select one or more files and drag and drop them to the desired
	destination
	Copy selected table data
L	Copies the selected table data to the clipboard so it can be pasted into another
	application
PDF	Create PDF report
	Select one or more files and click this icon to create a PDF report for each file
A USERS	Users
	Select all users or a single user to locate the specific CM files of interest
TAGS	Tags
	Select all tags or a single tag to locate the specific CM files of interest
DATE	Calendar
	Select year, month and day to locate the specific CM files of interest
	Add Comment to CM file
	The user can add comments to a CM file. Note that comments are permanent
	and cannot be deleted
	Add Tag
	User-defined keywords (e.g. project name) can be added to CM files as a tag for
	improved searchability
X	Delete Tag
	Select a tag in a CM file to delete

Export Result Data

- 1. Select one or multiple files in the File List of the Main Window or in the File Browser
- 2. Click on the *Copy selected table data to clipboard* icon **under the copy the data for the selected files or** all shown files to the clipboard. Alternatively, right click on the file list and select *Copy table data to clipboard* to copy the data for all shown files to the clipboard
- 3. Paste the data into a spreadsheet

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Export PDF Reports

- 1. Select one or multiple files in the file list of the Main Window or in the File Browser
- 2. Click the PDF report icon 🖺 to open the print options window
- 3. The PDF report name is named as the CM file name by default. If a single file is selected, the PDF file name can be edited
- 4. To select the destination folder for the PDF file(s), use the folder icon 🦲
- 5. Select the print options (Result Table, Images, Signatures) and click Ok to save the PDF report(s)

Print Options			×
File Name: 20	0190416-00009		
Folder Name: C	\Users\Public\Doc	uments	
✓ Result Tables			
🗹 Images			
O First 🛛 🗛	II OSelection:		
Slice of Image	e: O 25 % 🔍 50	% • 75 % •	0 100 %
✓ Signatures			
Created by:	name / date	Approved by:	name / date
	Preview	Ok	Cancel

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Software Options

Locate software options in the menu line of the <u>Main Window</u>. Select *Tools* in the menu line and then *Options*. The Options window has two tabs: *General* and *Authorization*. From the *Authorization* tab, NC-View[™] can be configured to require a user to login when launching the application. Furthermore, this tab can be used to activate the *Secure Mode* feature. For details see the NC-View[™] NC-202[™] Secure Mode Guide (doc. No. 991-2021).

Certificate of Product Testing

When connected to an instrument, the Certificate of Product Testing for the instrument can be opened via the *About* box. This is opened by selecting *Help* in the menu line of the <u>Main Window</u> followed by choosing *About*.

Installation Guide

Minimum Computer Requirements and Preparations before Installation

Recommended minimum hardware and software requirements for running the NC-View[™]:

- Operating System: Windows 10. The latest service packs and any critical updates for the operating system must be installed prior to installing NC-View[™]
- Windows administrator credentials are needed to install NC-View[™]
- Intel Core i7 or i9 processor with at least 2.5 GHz clock rate
- M2 SSD disk with at least 500GB
- At least 16 GB RAM and 50GB of free disc space
- At least one USB 3.1 type C port
- 1920 × 1080 pixels screen resolution

NOTE: If the requirements are not met, the setup will not block installation nor provide any warnings

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Installing and Upgrading

If the NC-View[™] application has previously been installed, the previous version will be removed during a new round of installation. Acquired data and saved protocols will not be deleted.

- 1. Ensure that the NC-202[™] instrument is disconnected from the computer IMPORTANT: Log on with administrator rights for the installation session
- 2. Open the location of the installation files in Windows File Explorer
- Double click on the Install NC-View X.X.X.X.exe file to launch the installation program. The version number will vary depending on the software build, e.g. 1.0.2.0 NOTE: Double click on the .exe file, <u>NOT</u> the .bin file
- Follow the instructions until the installation is complete NOTE: During the installation, dialogs for installing third-party drivers will appear (e.g. Point Grey camera and other device drivers). Installing these drivers is required

Uninstall Procedure

- 1. Right click on NC-View in the Windows start menu and select Uninstall
- 2. Follow the instructions until the uninstall process is completed
- NOTE: Uninstalling NC-View[™] does not delete protocols and acquired data

Maintenance and Backup

A CM file is approximately 25 MB in size. Consequently, acquiring many CM files will accumulate a large amount of data. We therefore recommend to backup CM files and free up disc space in good time to ensure trouble-free operation. To export bulk amounts of CM files for a specific time period, open the File Browser and select the time period for which backup is required. Select all files by using the 'ctrl' and 'a' key. Drag the selected files to an external hard disk or a network drive. When backup is secured, the backed-up files can be deleted from the File Browser. Be aware that NC-View[™] will add a comment to the CM files if they are exported or copied to show that the data integrity may have been compromised.

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Troubleshooting

For support and troubleshooting regarding the NucleoCounter[®] NC-202[™] and NC-View[™] please contact ChemoMetec Support at <u>support@chemometec.com</u>

In case the solutions below still do not solve the issue at hand, please create <u>Support Files</u> and contact ChemoMetec Support.

Issue	Solutions/options
Installation The NC-View™ software or the NucleoCounter® NC-202™ instrument is not installed	The user must be logged on with administrator rights during installation to ensure correct installation. If the installation of NC-View [™] fails, try to run the installation process
correctly. Server (ChemoMetec service)	again using administrator rights login. NC-View™ requires a ChemoMetec server to run automatically after
error	startup of the computer. Please try to restart the computer.
Camera not connected via USB3	A warning is displayed if the USB connection to the instrument initializes as a USB 2 connection. Please ensure the following: 1) The USB cable supplied by ChemoMetec is used. 2) A USB 3.1 port on the computer is used. 3) The USB cable is securely connected to the instrument with the screws. 4) The USB cable is correctly inserted into the USB 3.1 port on the computer. Make sure that the USB cable is not bent in the USB 3.1 port. Also, try to use another USB 3.1 port on the computer to see if this resolves the issue.
NC-View™ software Protocol aborted because the cell concentration is estimated to be above 2×10 ⁷ cells/ml	If the cell concentration is above 2×10 ⁷ cells/ml in the Via2- Cassette™, the cells overpopulate the counting window which prevents completion of the image analysis. The run is therefore aborted.
Export of results data with the wrong decimal separator	When copying result data from the file browser or file list, NC-View [™] will place the data on the clipboard with the regional setting selected in the Windows OS. Be aware that if the region format has been set to <i>Match Windows</i> <i>display language</i> , changing the Windows decimal separator symbol will have no effect. Some applications, like spreadsheet software applications, also have their own options for setting the decimal separator symbol.

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Via2-Cassette™	
No cassette is detected	This may be because either no Via2-Cassette [™] is detected in the instrument or the Via2-Cassette [™] is placed incorrectly. In the latter case, remove the Via2-Cassette [™] and re-insert it.
Flow detection error	The sample loaded into the Via2-Cassette [™] has failed to reach the counting chamber within the given time limits. Inserting an empty or an already used Via2-Cassette [™] will trigger this error. If the sample volume is too small, it may also give this error.
The cassette is stuck in the instrument	Click <i>Ok</i> if any dialog boxes pop-up with this error. If the LED indicator on the instrument is green, click on the <i>Eject</i> icon. This will position the piston motor correctly. If this does not help or the LED indicator is red or orange, turn off the instrument via the main switch or socket, wait for 10 seconds and then turn it back on. Check the USB connection from the instrument to the computer.
NucleoCounter [®] NC-202™	
Abnormal sounds from the instrument	Typically, the piston motor has been blocked by a Via2-Cassette [™] that has been inserted incorrectly. Press the <i>Stop</i> icon. When the instrument has stopped running, press the <i>Eject</i> icon. This will position the piston motor correctly. Remove the Via2-Cassette [™] and re-insert it again before starting a new run.
Instrument not initialized	Power off the instrument via the main switch or socket, remove the USB cable, wait for 10 seconds. Next, connect the USB cable and turn the power back on. If the problem persists, please turn off the instrument, create support files in NC-View [™] and contact ChemoMetec Support.
Instrument is unresponsive or stopped during a run	Click <i>Ok</i> if any dialog boxes pop-up with this error. If the LED indicator on the instrument is green, press the <i>Eject</i> icon. This will position the piston motor correctly. If the LED indicator on the instrument is turned off, the power to the instrument has been cut off or the fuse has blown. Reconnect the power or replace the fuse.

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Creating Support Files

Please create support files in NC-View[™] via Help -> Create support files, before contacting ChemoMetec Support. Using this functionality will create two files: *SupportFiles.zip* and *CrashDumpFiles.zip*. These files should be referred to when communicating with ChemoMetec Support. Be aware that the size of the *CrashDumpFiles.zip* file can be very large. ChemoMetec Support can assist with transferring files that are too large to send by e-mail.

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