LVL SAFE® READ Manual

for LVL SAFE® Rack Reader

Updated: March 04, 2024

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Introduction

Features

HIGH PERFORMANCE

Equipped with a high definition and high speed grey scale camera.
This scanner can operate at a speed of 60 frames per second with a resolution of 6.3 MP.

◆

EFFICIENT

Easily reads all rack formats including 24, 48, 96, 384, 240 HD and Acoustix in less than 1 second.
Identifies "no tube" positions.

◆

SINGLE TUBE READING

Reads single tubes placed anywhere on the window instantly.

◆

AUTO MODE

No need to choose rack format and zero configuration - automatic rack recognition ensures that any rack type is automatically identified.

◆

VERSATILE

Compatible with all LIMS and data systems.
Export data - CVS, PDF, Excel, ODBC, TCP/IP, XML, Image. Custom modules also available.

◆

INTEGRATABLE

Robotics and integration friendly design allows for easy robotic rack drop and retrieval.

◆

LIQUID & DUST PROOF

The IP65 rated casing makes it easy to disinfect and allows for use in wet areas.

◆

ANTI-CONDENSATION AND FROST PROTECTION

Anti-condensation and frost protection included as standard.

◆

ROBUST DESIGN

With an aluminum base, lid and hard coated, anti-fog treated polycarbonate window, our product is designed to withstand accidental drops and scrapes from up to 4ft from hard ground.

◆

NOTIFICATIONS

Reader LED colors indicate the success or failure reason of a read.

◆

AUTOMATIC A1 ORIENTATION

Place the rack any way around and the results will still be correct.

◆

CUSTOMISABLE

Customise light colors to show successful reads, highlight problems or help with color vision deficiency issues.

◆

ACCURATE AND RELIABLE

Optimised to read all types of SBS racks usually within a second.

◆

BE UP & RUNNING FAST

Up and running in minutes with easy software installation from box to bench.

Product Specifications

Physical:

Dimensions:	180x130x160 mm / 7.1x3.1x6.3 inch
Weight	1.9 kg / 4.18 lbs
Reading Window Diameter:	
Housing Material:	Aluminium
Window Material:	Crystal Sapphire scratch resistant glass
Ingress Protection Rating:	IP65
	This industrial rating means that the SAFE® READ is: 1) Protected from total dust ingress. 2) Protected from low pressure water jets from any direction.

Electrical:

Max Voltage:	5V (via USB connection)
Max Current:	500 mA

International Standards:

	International Standard EN 60529 British Standard BS EN 60529: 1992 FCC CE RoHS GS1 UK approved software and device
Radiated Emissions:	EN 61326-1:2020 47CFR Part 15B ICES-003 Issue 7
Electro Static Discharge Test	IEC 61000-4-2:2008
Power Frequency Magnetic Field Immunity:	IEC 61000-4-8:2009
Radiated Electromagnetic Field Immunity:	IEC 61000-4-3:2020
Conducted Disturbances Induced by Electromagnetic Fields:	IEC 61000-4-6:2013

Reading Specifications

Symbol Type:	Any ECC200 data matrix symbol.
Symbol Color:	Any color automatically without configuration (Black on White / White on Black)
Read Time:	Minimum read time is approx. 300ms.
Mirrored Symbol Reading:	Mirrored symbols read automatically without configuration
Decoder Training / Configuration:	No decoder training, configuration or specification is required. All decoding is fully automatic.
GS1 Symbol Support:	GS1 symbols fully supported. Also additional GS1-related functions are available.
Software Standards Conformation	ISO/IEC 16022 ISO/IEC 15415 ISO/IEC TR29158 AIM DPM Quality Guidelines

Data Export Types:

- CSV
- Image
- JSON
- PDF
- XML
- XLS
- TCP Server

System Requirements:

See Section: Installation System Requirements

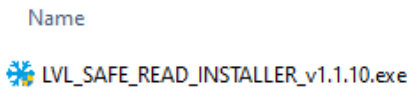
Installation

Installing LVL SAFE® READ Software onto PC

Before plugging in the LVL SAFE® Rack Reader, install the software. Check the LVL Homepage for the latest version of the LVL SAFE® READ software, use the LVL SAFE® READ provided with the LVL SAFE® Rack Reader or request a download link from LVL (service@lvl-technologies.com).

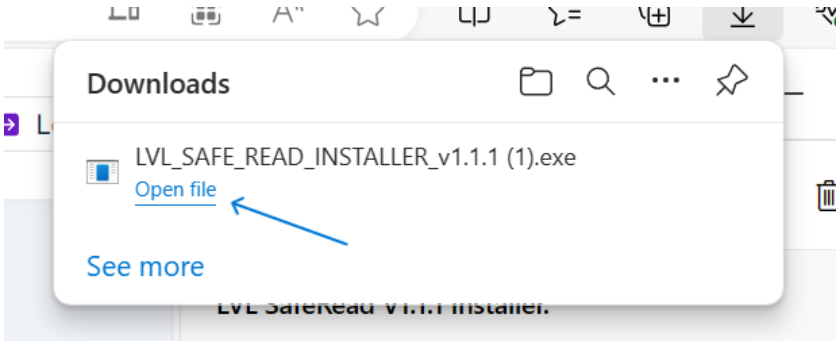
LVL SAFE® READ provided with the LVL SAFE® Rack Reader:

Copy the file on the USB stick to your local hard drive. Execute the file:

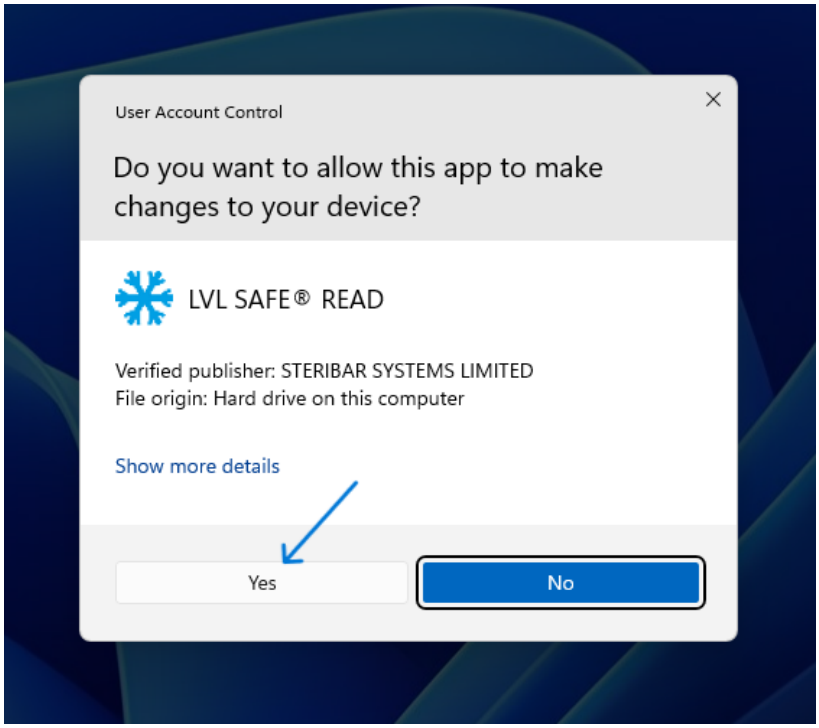


LVL SAFE® READ using download link:

If downloaded a popup will appear in the top right of your screen and will show that the LVL_SAFE_READ_INSTALLER is being download as indicated by the blue line.
Once download is completed, click 'Open file'.



After a few moments, a screen like the one below should pop up. Click "**Yes**":



After this, another screen will pop up with the title 'Install LVL SAFE® READ'. Click the blue "Install" button. This should take 3-5 minutes to install.

Click "Finish" once the "LVL Safe Read has been installed" screen appears.
You should now have a icon with the name "LVL SAFE READ" on your home screen:

Continue to Hardware Setup to setup the LVL SAFE® Rack Reader.

Disable USB Selective Suspend

Windows 10 and Windows 11 include a feature called 'USB Selective Suspend'. This feature allows Windows to disable USB ports in order to save power, but this can have the effect of stopping the SAFE® READ from working correctly.

How to turn off USB selective suspend in Windows 11:

1. In windows search for "Edit Power Plan" and open Control Panel Window
   OR
   Open Windows Control panel -> Hardware and Sound -> Power Options, then click on the "Edit plan settings" link for the currently selected power plan.
2. Click the "Change Advanced Power Settings" link to open a "Power Options" dialog
3. Expand the node "USB settings" then expand the node "USB selective suspend setting"
4. Change the setting value to "Disabled"

Note: For other Operating Systems the procedure may be slightly different. An internet search for "disable USB selective suspend" should provide instructions for your Operating System.

Note: The above procedure should be repeated to disable USB selective suspend for all Windows power plans that your system is likely to use.

Hardware Setup

The LVL SAFE® Rack Reader does **not** require any assembly after unboxing.

Positioning

Position the base reader on a stable, level surface in your laboratory; preferably out of bright, direct sunlight or overhead lighting.
Allow space at the back of the reader where the USB exits the housing to prevent any damage to the protective covering on the cable.

Connecting Cables

Connect the USB cable on the base reader to an available USB 3.x port on your computer. To prevent issues with performance, both cables should be connected directly to the computer, preferably to the USB ports at the back of the PC as these are generally closer to the motherboard. It should NOT be connected via USB hub, USB extender cable or similar external connection.

After the base reader has been connected to your computer, launch the LVL SAFE® READ Software to begin scanning! - See Start Scanning

Installation System Requirements

This topic describes the minimum system requirements for running the LVL SAFE® READ on a PC. Minimum system requirements are recommended to provide great reading performance across a variety of PC devices to ensure that you don't run into any issues caused by an overloaded PC.

Where other third-party applications and hardware are running on the same PC as the SAFE® READ, they will make use of systems resources so the system may need a total specification greater than that described here.

PC System Requirements

Component	***Supported***	***Recommended***	***Notes***
Operating System	Windows 10 or Windows 11 x64	Windows 11	It is recommended that Windows 7 is not used for new LVL SAFE® READ installations where possible.
Processor/CPU	Intel Core I5 or greater or AMD equivalent. 1GHZ or faster, 4 cores or greater.	Intel I7 or greater, AMD Ryzen 7 or greater	The processor in your PC is the main determining factor in how well the LVL SAFE® READ performs. The multi-threaded design of the SENSE application means that it will run better on a processor with a higher number of cores.
RAM/Memory	8GB	8GB or greater	

Component	*Supported*	*Recommended*	*Notes*
USB	Single USB 2.x		The LVL SAFE® Rack Reader is a high performance USB device with high USB data throughout when compared to standard USB devices and relies on the USB port for it's power. For this reason, the LVL SAFE® Rack Reader should NOT be connected via a USB hub, USB extender cable or similar external connection. On many systems, the USB ports at the back of the PC are connected more directly to the motherboard than those at the front of the PC, so are the preferred connection point where possible. Windows includes a feature called 'USB selective suspend' which can sometimes disable a USB port and stop the LVL SAFE® Rack Reader from working. It is recommended to turn off this feature as described Disable USB Selective Suspend .
Graphics Card	Compatible with DirectX 9 or later	Compatible with DirectX 12 or later	
Display	Higher Definition (720p) display that is greater than 9" diagonally, 8 bits per color channel.		
Internet Connection	Internet access is not required	Active ethernet connection with TCP/IP enabled if using the optional TCP server.	

Software prerequisites:

The following software prerequisites are installed by the LVL SAFE® READ installer package if they are not previously installed on the host system.

- Visual C++ Redistributable for Visual Studio 2015-2022 x64
- .Net Desktop Runtime 7.0.7 x64
- ASP.NET Core Runtime 7.0.7 x64
- Node.js JavaScript runtime environment 18.17.0

The installer will enable the following Windows features if they are not already enabled:

- Internet Information Services (IIS)
- Telnet Client

The Installer will add the following exceptions to the firewall:

- SAFE® READ TCP Server (Outbound and Inbound TCP)
- Node.js JavaScript runtime (Inbound UDP and TCP)

The Installer will install these drivers to the system:

- Imaging Source camera driver Cam33U 5.1.0.1719
- FTDI serial port driver 2.12.28

Notes:

- Installation MUST be completed under a local administrator level account.
- Installer will automatically uninstall any previously installed earlier version.
- Expected installation time: Dependent on system speed and required components approx. **3 to 5 minutes**.
- Required available disk space 765 MB

See also: Product Specifications

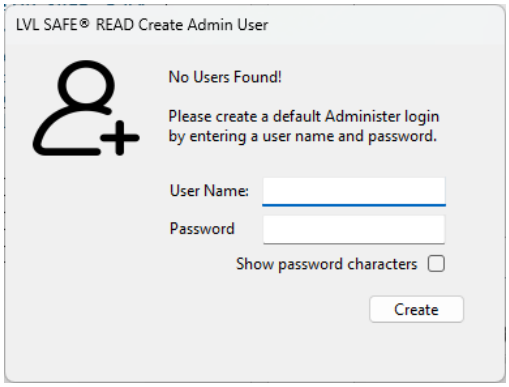
Start Scanning

Opening the application

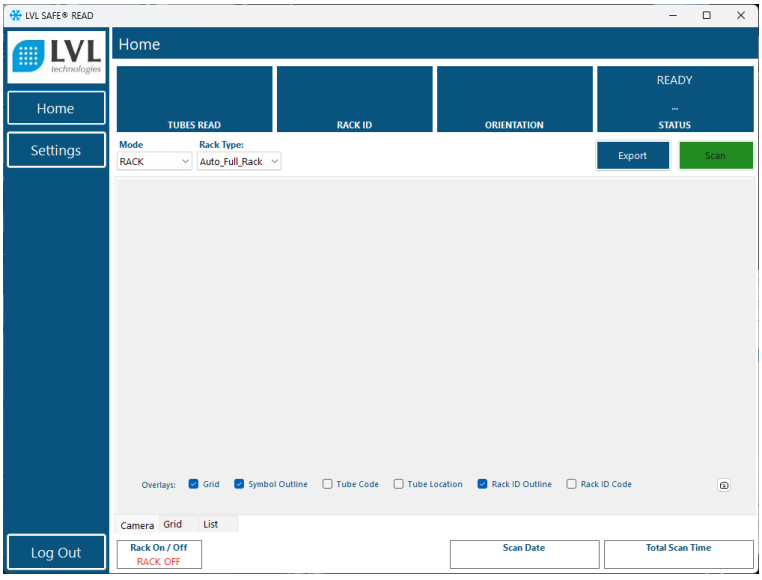
Once you have plugged in the reader, wait until two times the sound for connecting a device to a USB Port resounds. Double click on the LVL SAFE® READ icon on the desktop to launch the app.

Create Admin User

LVL SAFE® READ comes with a User Management to fit requirements of GxP Laboratories.
If the LVL SAFE® READ Application is started for the first time an Administrator User must be created. Only users with Administrator right are able to manage user and change settings.
The login method can be set to an automatically login by an administrator.



After the default Administrator is created the software LVL SAFE® READ opens and the main screen is shown.

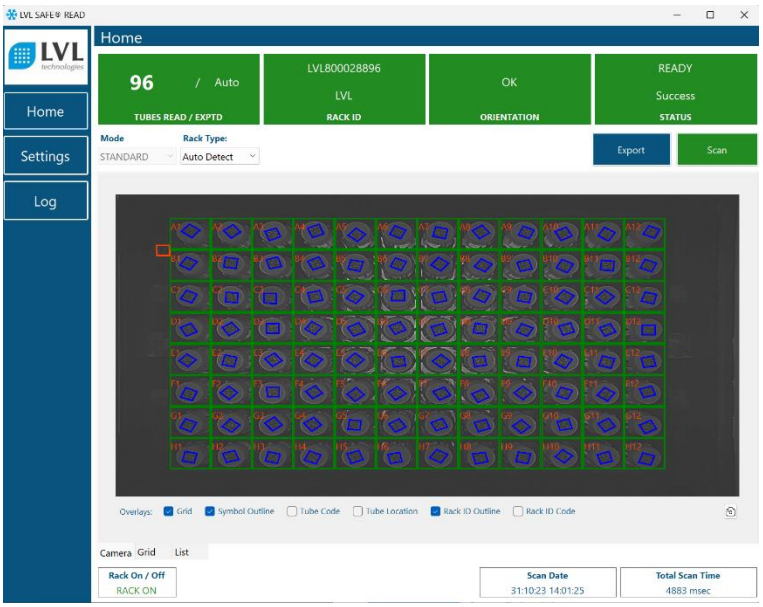


LVL SAFE® READ when it is first launched with no racks on the Reader

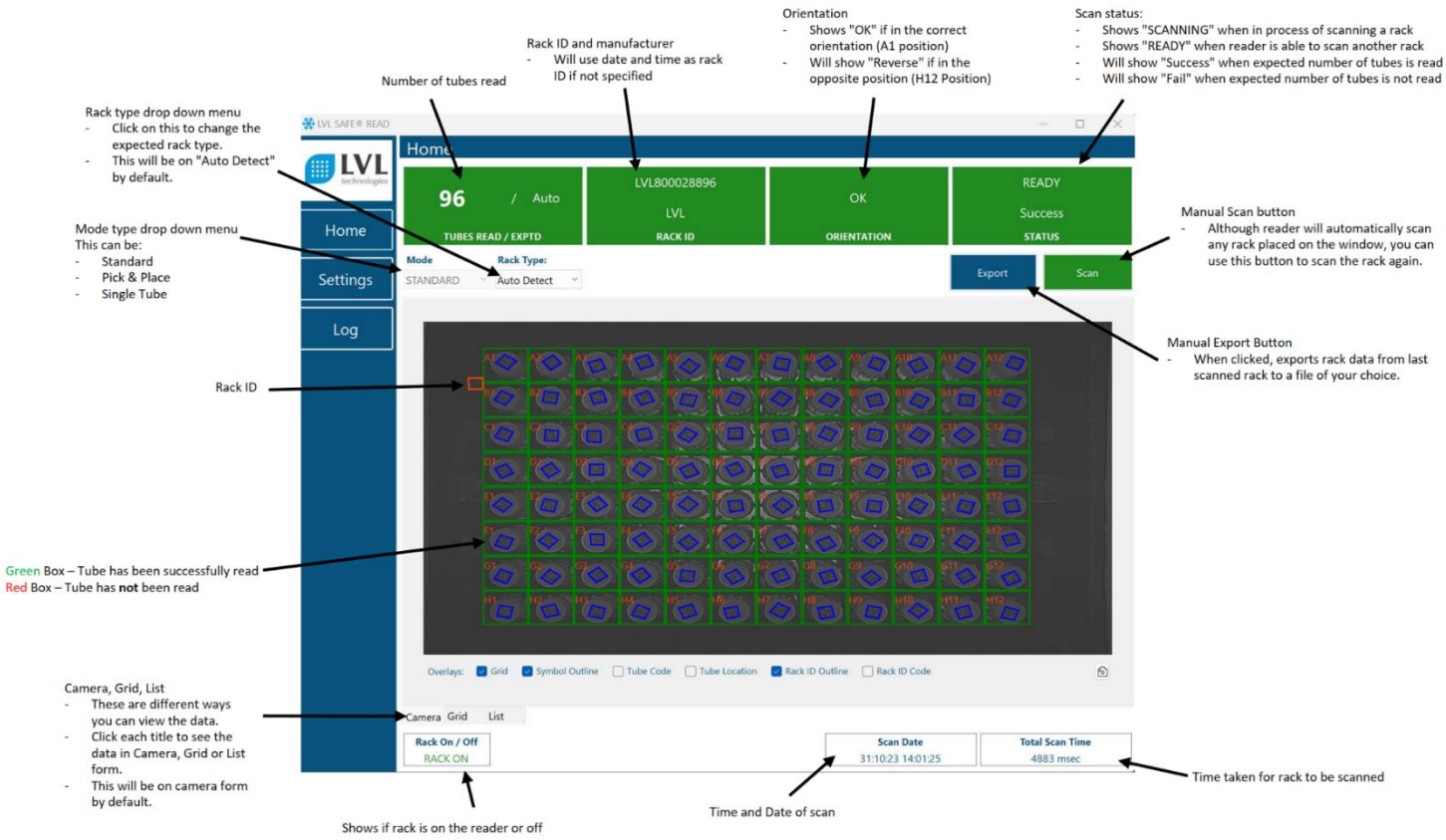
Starting Scanning

Place a fully populated rack on the reader's window and it will automatically be read - there is no need to configure rack type, amount of tubes etc. it will automatically know.

When the rack has been read, it should beep and the grid on the screen will turn green simultaneously.



Successful read of a SBS 96 rack.LVL SAFE® READ Screen tour:



Reader Settings

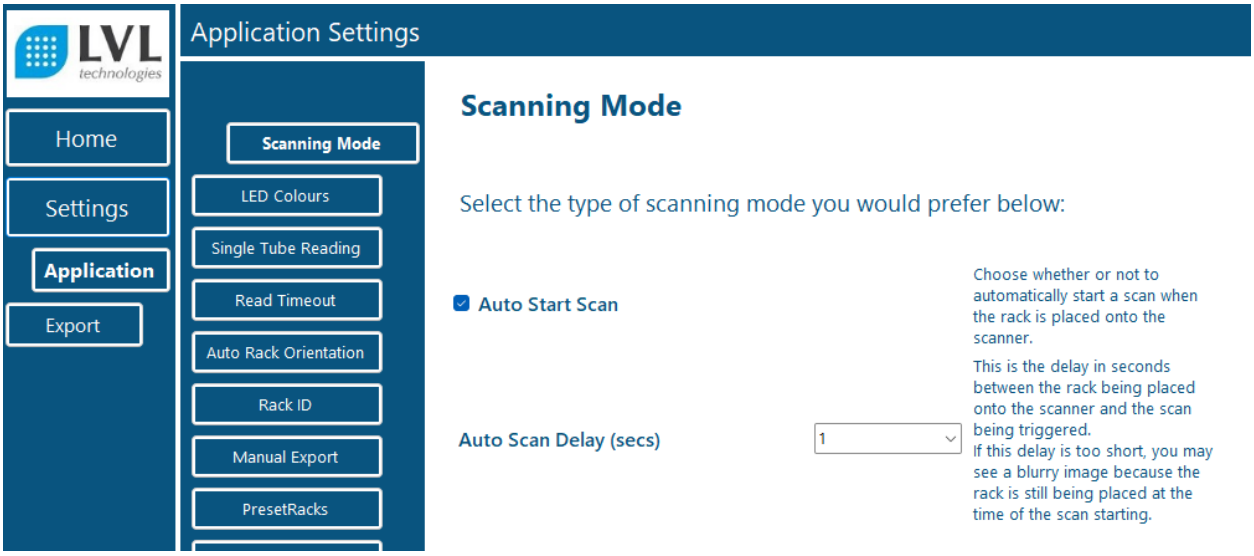
Scanning Mode

To get to the Scanning Mode Settings from the Home screen go to: Settings > Application > Scanning Mode

Scanning Mode

In the settings for the Scanning Mode the Auto Start Scan can be enabled or disabled. When enabled, Auto Start Scan will automatically start a scan when a rack is placed on the scanner - This feature will be enabled by default.
To disable/enable this feature, click the box next to Auto scan Start. This box will turn blue and have a tick inside once enabled.

Also a Delay between placing the rack and start scanning can be set. The Delay can be set in steps of one second to a maximum of five seconds. Use the drop down field to change the settings.



Here, the Auto Start Scan is enabled, and the delay is set to one second

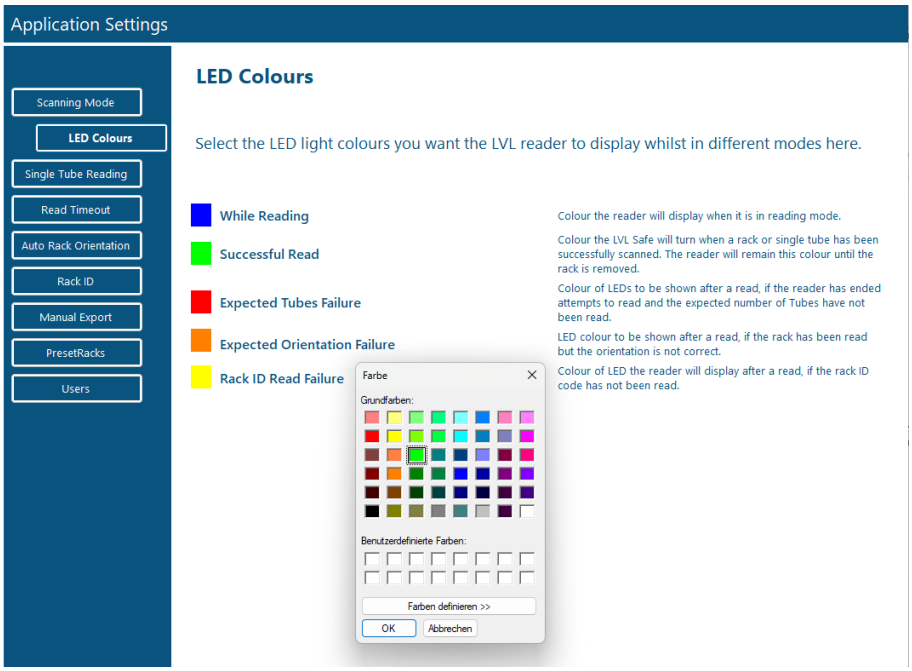
LED Colors

To get to the LED Colors from Home screen go to: Setttings > Application > LED Colors.

Here you can customize the color you want the LVL reader to display through its window whilst in different modes.

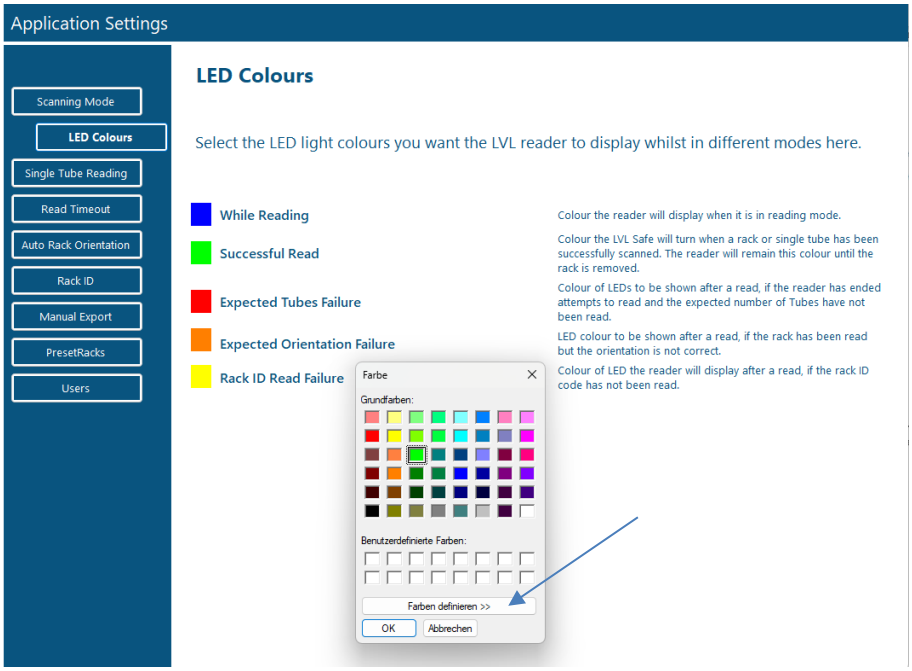
Changing basic preset colors

To customize the colors, click on the colored box next to the mode you wish to change and a pop-up with basic preset colors will be shown.
Click on the color you want and then press 'ok'. The color will now change.

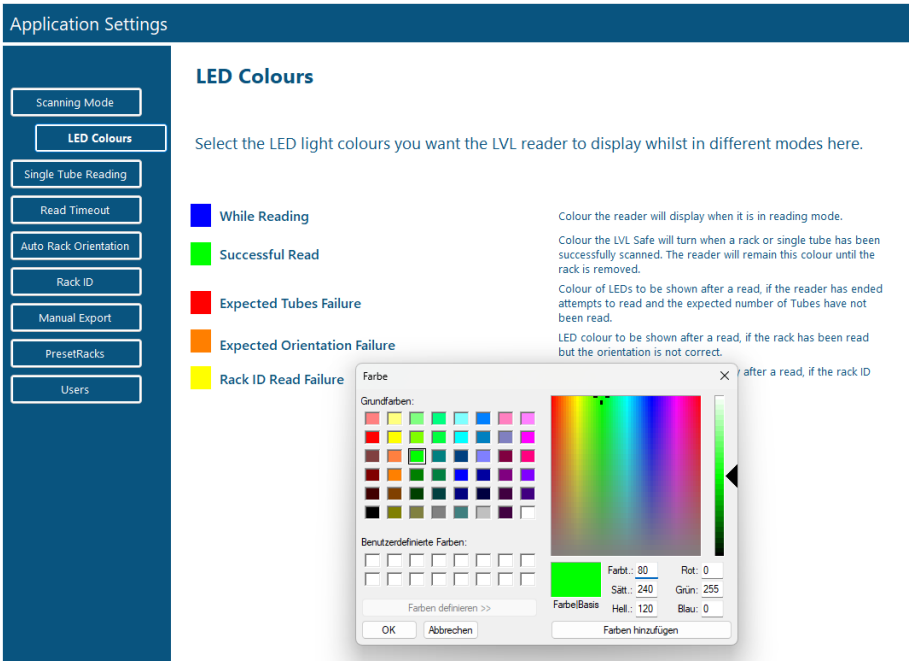


Spectrum Colors

If the color you want is not there, click 'Define Custom Color' and spectrum of colors will appear.



Either use your mouse to click on the color you want or use an RGB color code and press 'ok'. If you would like to save this custom color, click add to custom colors and it will appear in one of the blank boxes beneath 'Custom Colors'.



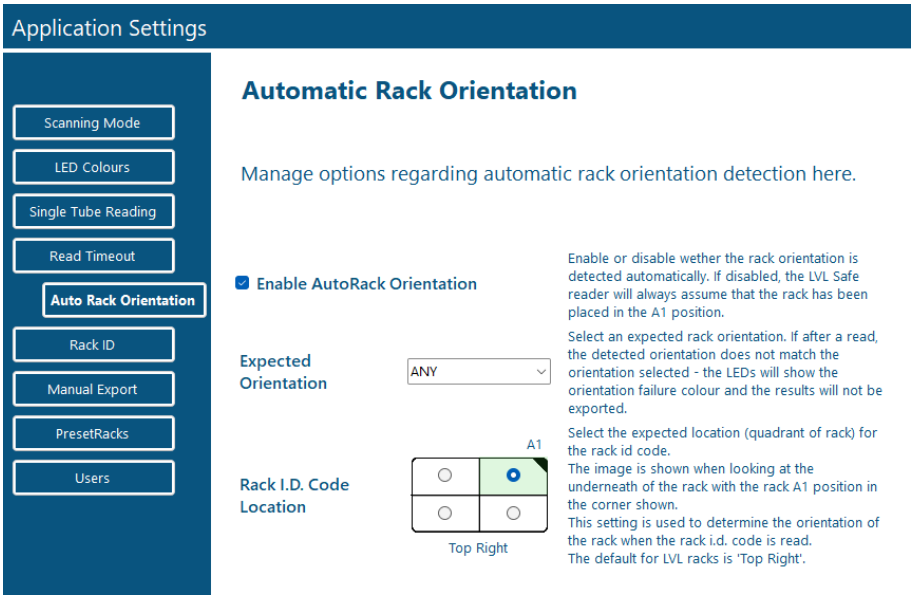
Automatic Rack Orientation

To get to this setting from the Home screen go to: Settings > Application > Auto Rack Orientation

Here you can change the expected orientation of a rack (whether its in Normal or Reverse position position).

AutoRack Orientation

The AutoRack Orientation is enabled by default. This setting means that the reader detects whether it is in the Normal or Reverse position position automatically and will tell you the orientation on the homescreen.
If you wish to disable this feature, click on the box next to 'Enable AutoRack Orientation'. The box will turn blank when disabled and will turn blue with a tick inside when it is enabled.
↳ If disabled, the reader will always assume that the rack has been placed in the Normal A1 position and the results will **not** be automatically adjusted.



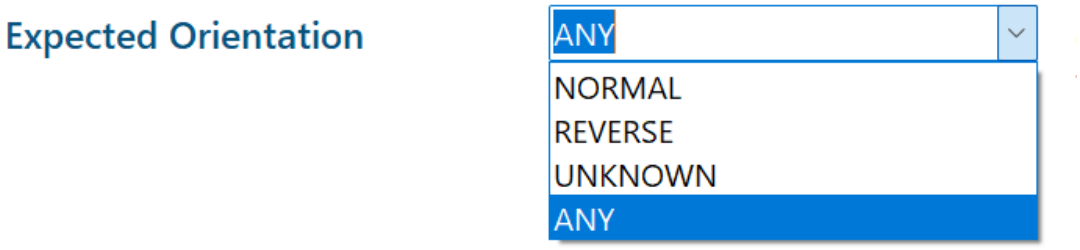
AutoRack orientation is enabled.

Setting Expected Orientation

You can also set the expected orientation by clicking on the drop down menu next to 'Expected Orientation' and selecting:

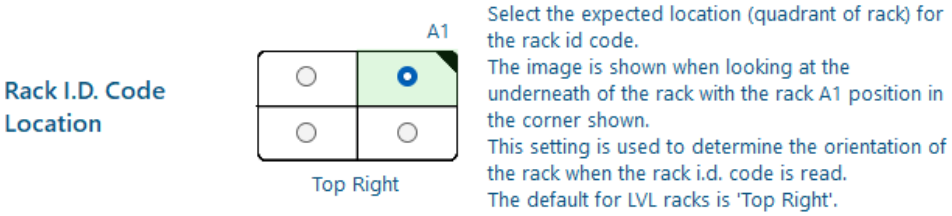
- 'ANY' for any orientation,
- 'NORMAL' where the mousehole faces the front
- 'REVERSE' where the mousehole faces the back
- 'UNKNOWN' for racks that have no orientation

It will be set to 'ANY' by default.



Rack ID Location

You can also set the expected location of the orientation code on the bottom of the rack. If a scan is performed and the orientation code does not match the settings made the software will give a note to indicate a possible wrong orientation of the rack.

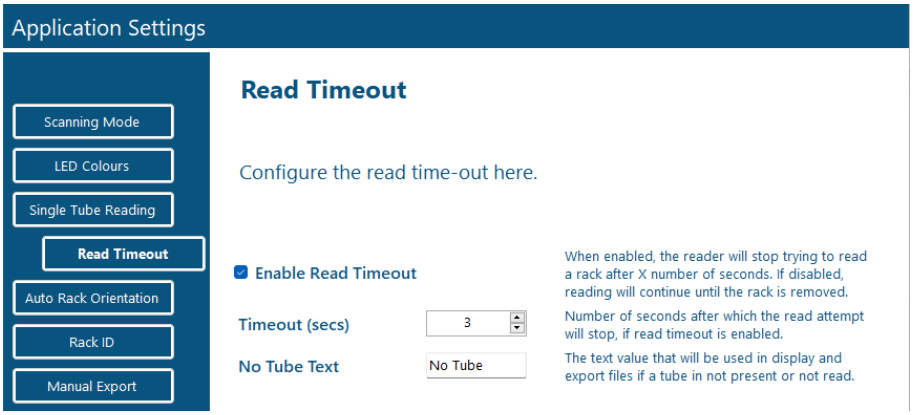


Read Timeout

To get to this setting from the Home screen, go to: Settings > Application > Read Timeout

Changing the Timeout limit

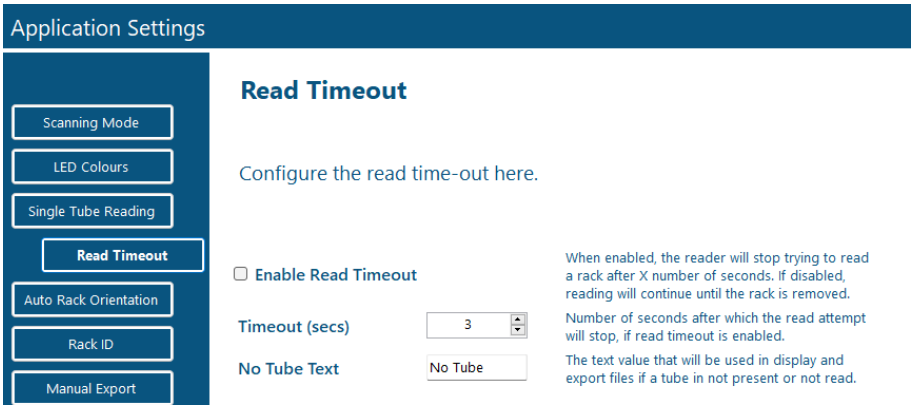
This setting allows you to decide how long the scanner should keep trying to read the expected amount of tubes until it gives up.
This setting will be enabled and set to 5 seconds by default.
To change the length of the timeout either use the arrows on the right hand side of the box to increase/decrease the number of seconds or simply type a number in the box.



Read Timeout enabled with a 3 second timeout.

Disabling Read Timeout

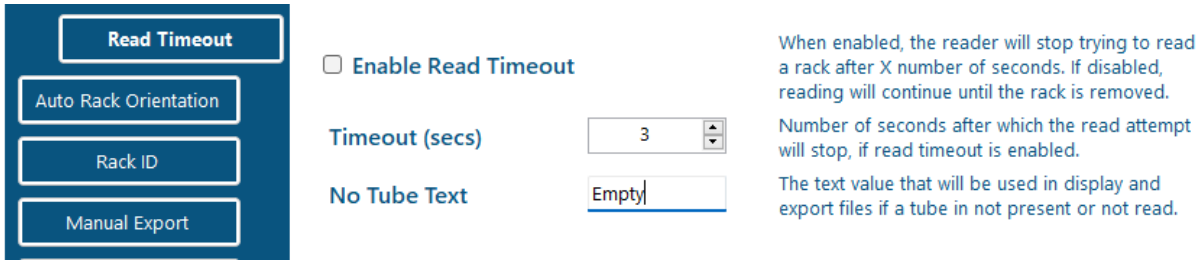
If you want to disable the timeout (meaning it will keep scanning for as long as it needs to find the expected amount of tubes), just click the box next to 'Enable Read Timeout'.
The box should go blank when disabled. If the read timeout is disabled, the read will continue until the rack is lifted from the reader.



Read Timeout disabled.

Changing the No Tube Text

This setting allows you to decide which string will be added to the output file for positions within the rack where no code could be identified. If the field is empty a blank entry will be added to the output file.



Text value “Empty” for positions where no Tube codes could be detected.

Rack ID

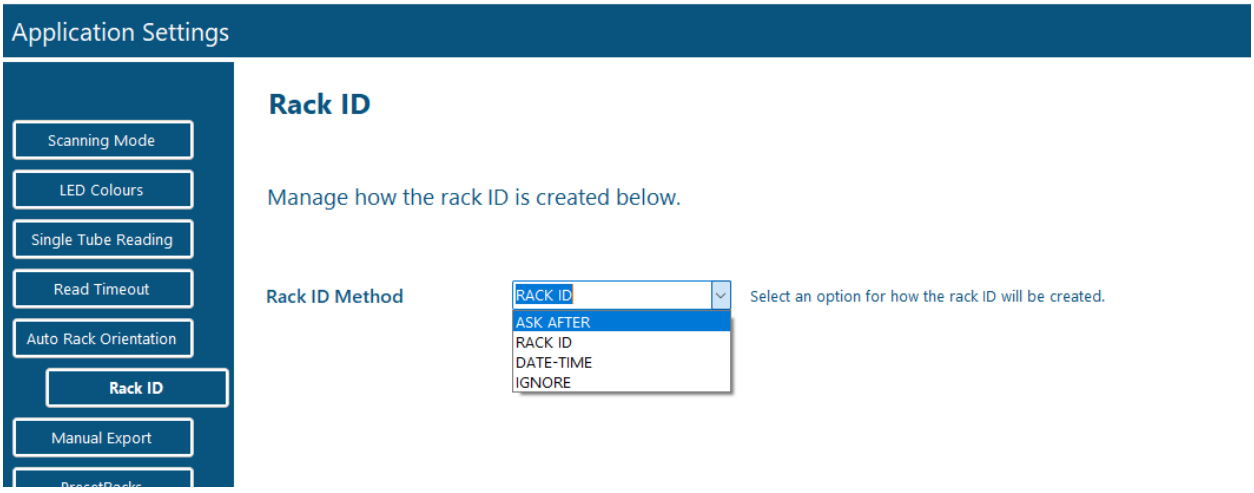
To get to this setting from the Home screen go to: Settings > Application > Rack ID

Here you can manage how the rack ID is created by clicking on the drop down menu beside 'Rack ID Method'.
The options are:

- ASK BEFORE - You will be asked to give a Rack ID before you scan a rack. You may enter the rack ID by either using the keyboard or your own keyboard wedge stlye barcode scanner.
- ASK AFTER - You will be asked to give a Rack ID after you scan a rack. You may enter the rack ID by either using the keyboard or your own keyboard wedge stlye barcode scanner.
- RACK ID - Uses the Rack ID which has been determined by the selected method of setting the rack ID.
- DATE-TIME - Uses the date and time of the scan.
- IGNORE - Ignores the rack ID all together.

When Rack ID is set to RACK ID, if the reader does not find a rack ID on the rack it will consider the read a fail, no matter if all the tubes have been read or if the rack doesn't have one.

The default option is 'DATE-TIME'. To change this click on the drop down menu and click on the method you need.



Manual Export

To get to this setting from the Home screen go to: Settings > Application > Manual Export

Here, you can edit how the export button on the home screen exports your data.

File Type

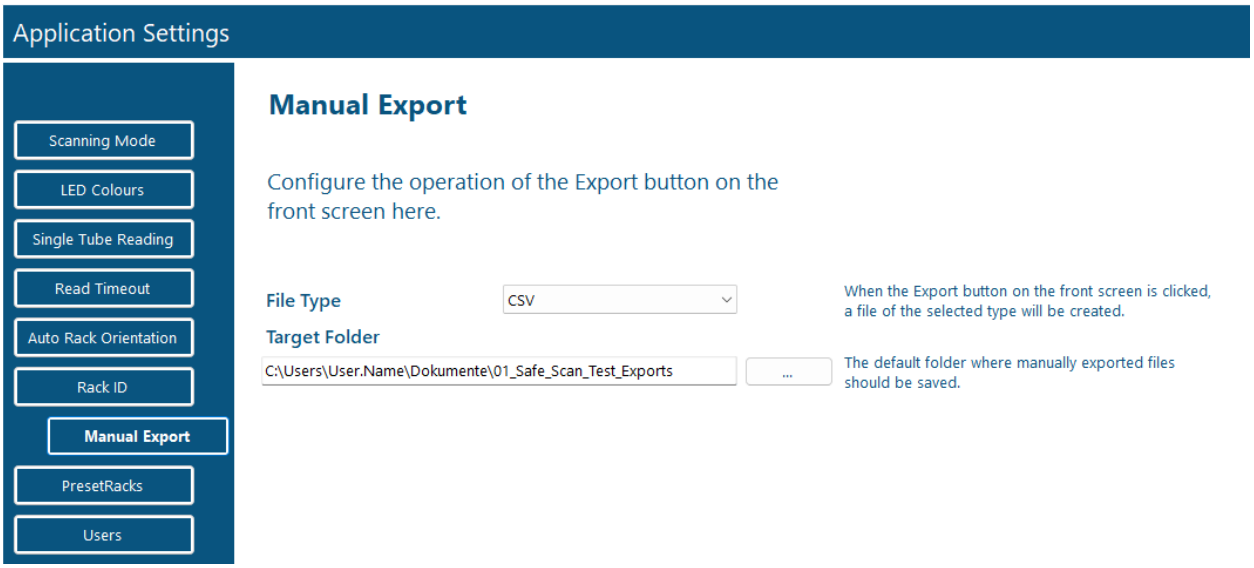
This drop-down menu allows you to select what type of file you would like the data to be exported in when you click the export button on the Home screen.

The default file type is CSV. To change this, simply click on the drop-down menu and select one of the following: CSV, IMAGE, JSON, PDF, XLS, XML.

Target Folder

Here, you can choose where you would like the manually exported file to be saved.

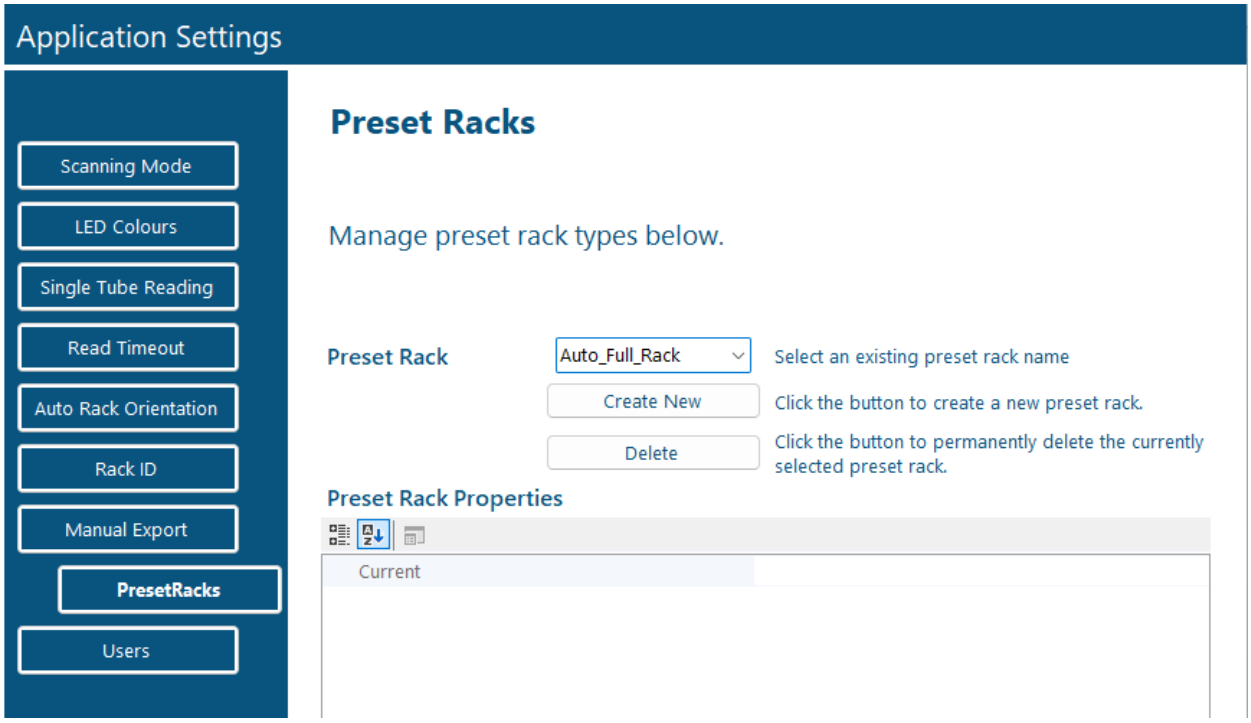
Either type the file destination or click on the 3 dots to the side of the box to find the desired folder in file explorer.



Preset Racks

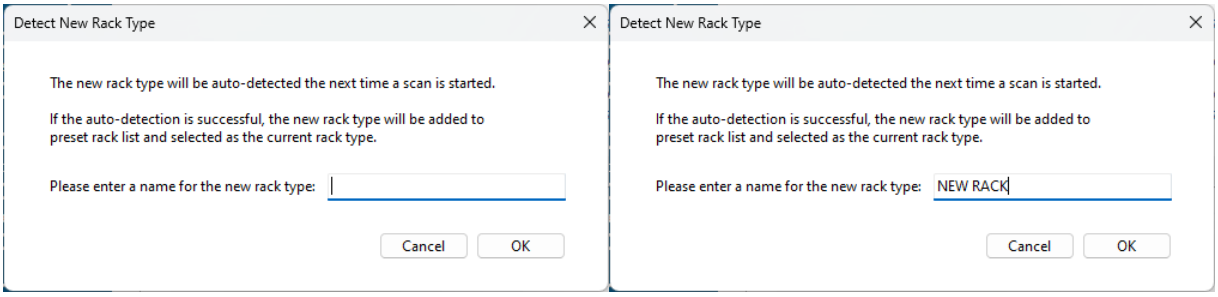
To get to this setting from the Home screen go to: Settings > Application > Preset Racks

Here you can create and manage your preset rack types.

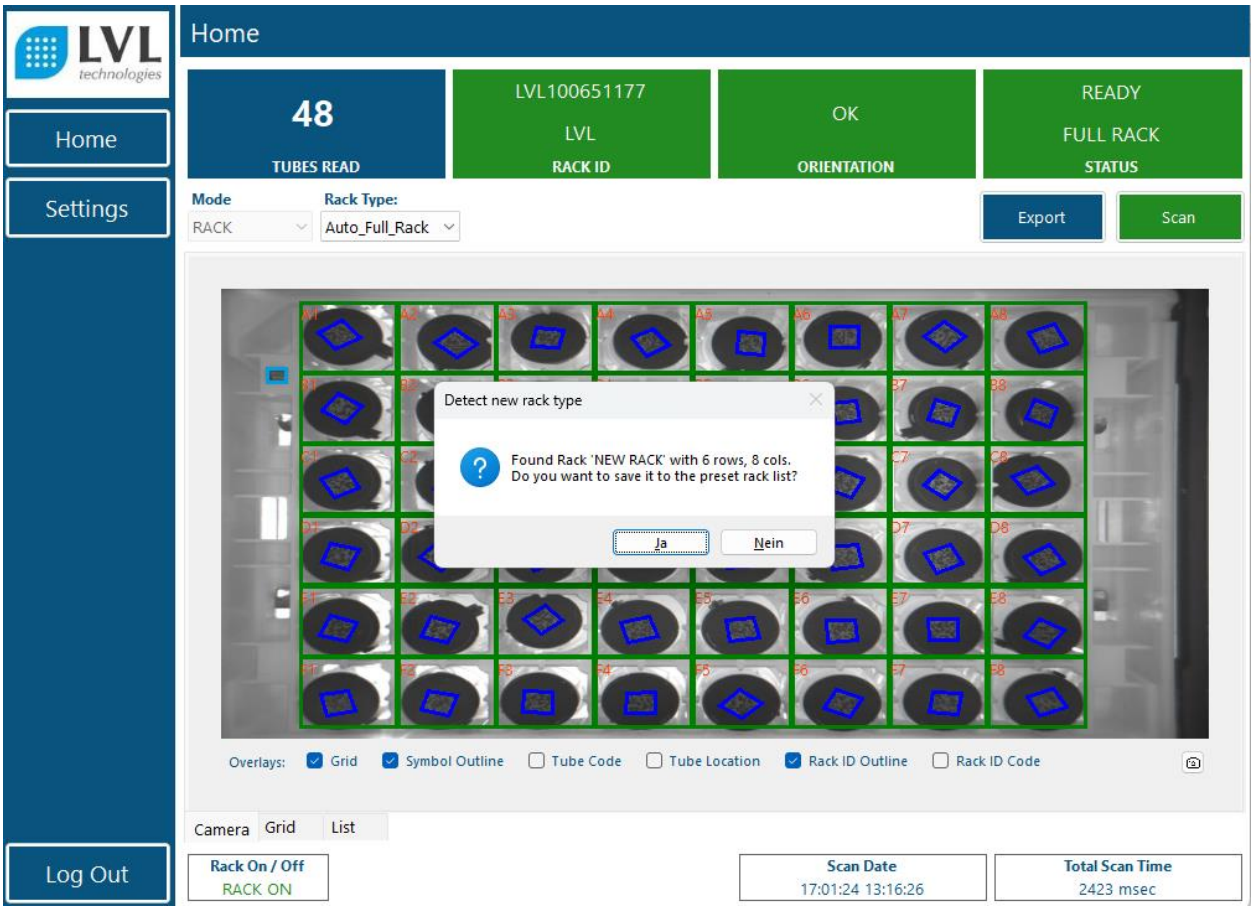


Create new Rack Types

To create a new rack click the button "Create New". A window will pop up, informing about the next steps and ask for a name for the new rack type.

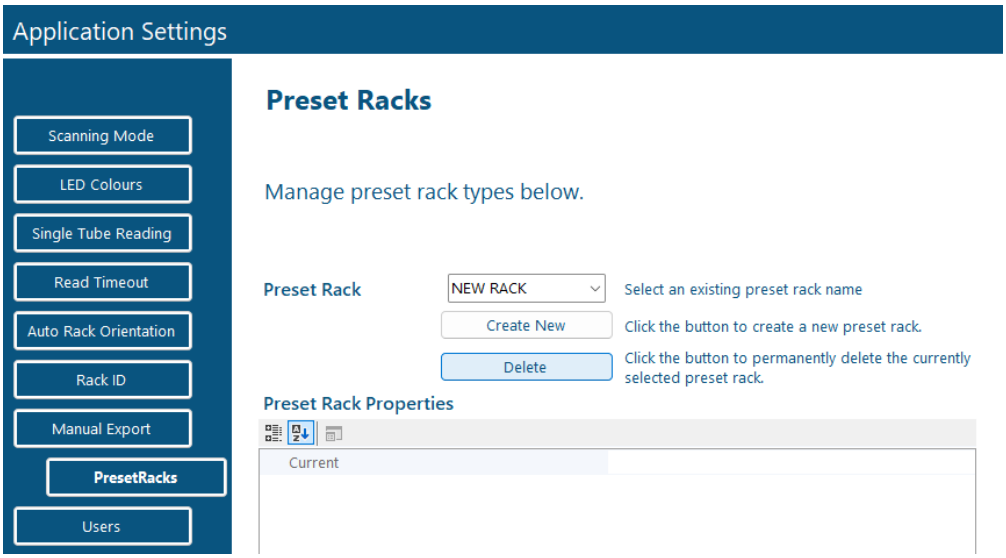


After a name is chosen place the rack on the scanner and click "OK". A scan is initiated trying to identify the pattern of the rack. If a pattern was successfully identified you will be asked if the rack type should be saved to the preset list.



Delete Rack Types

To delete a preset rack chose it from the drop down and click the "Delete" button.
Note: Only rack types crated by users can be deleted.



User Management

General

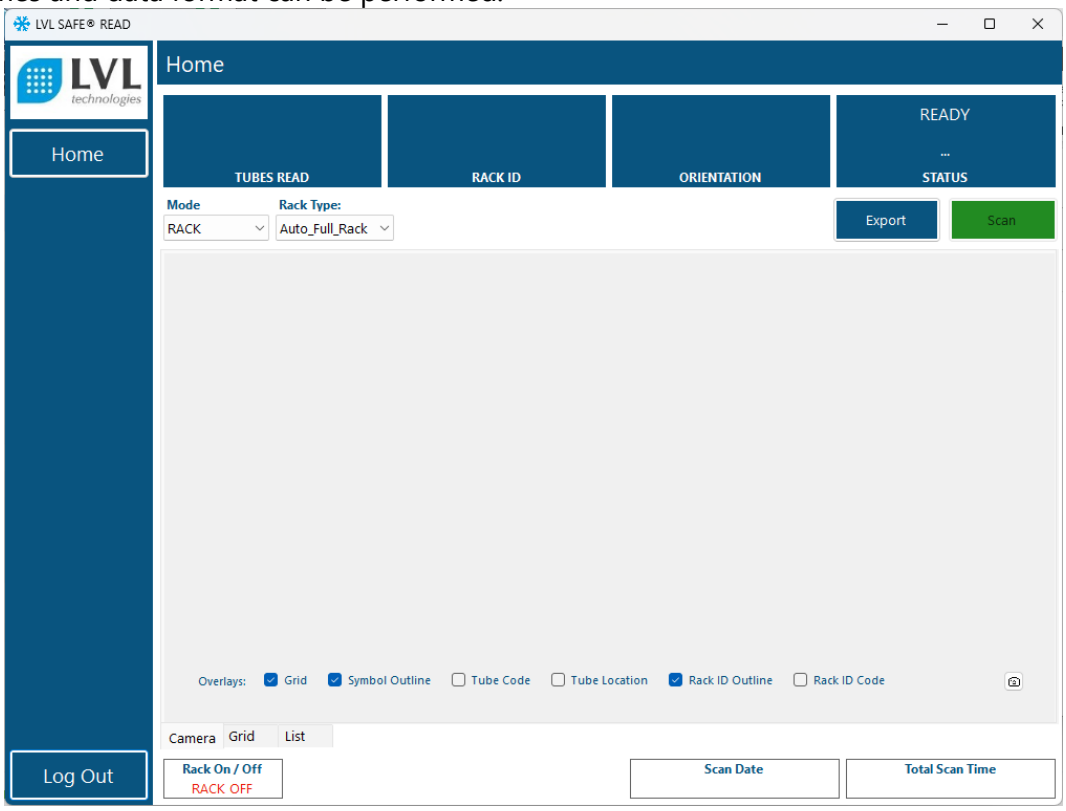
LVL SAFE® READ comes with a User Management to fit requirements of GxP Laboratories. There are two user level – Administrator and User.

Administrator Level

Only Operators with Administrator Level can made changes to all settings an manage users.

User Level

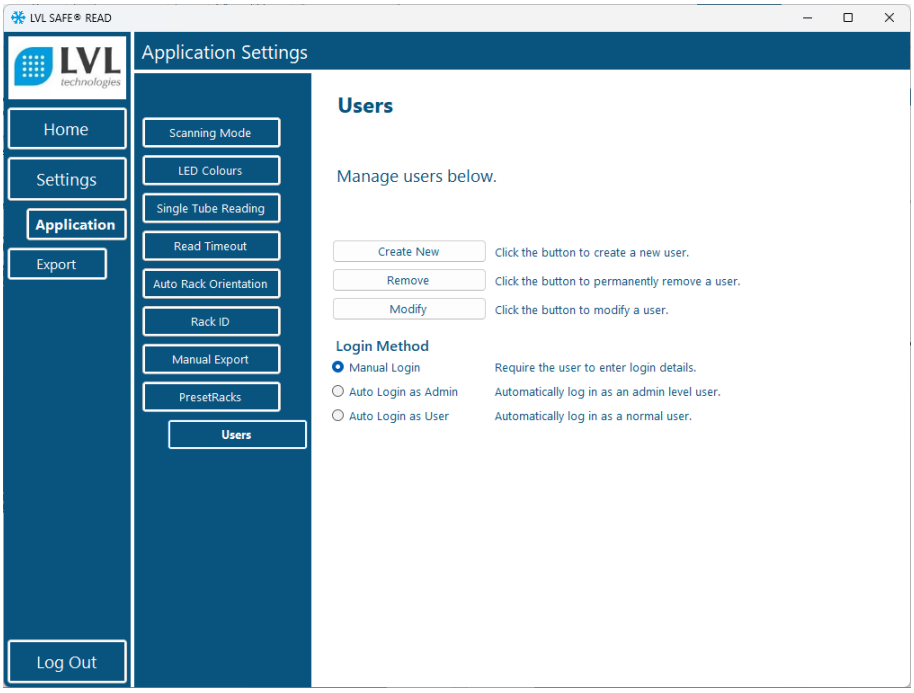
Operators with User Level can perform scans and export files to defined folders. No changes to file names and data format can be performed.



Main screen for Operators with User Level

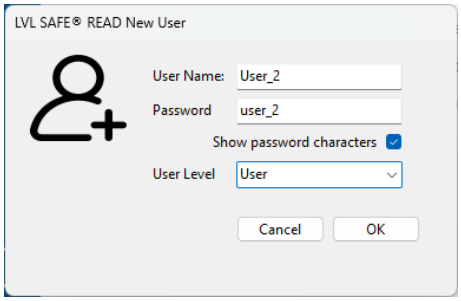
Manage User

To get to this setting from the Home screen go to: Settings > Application > Users



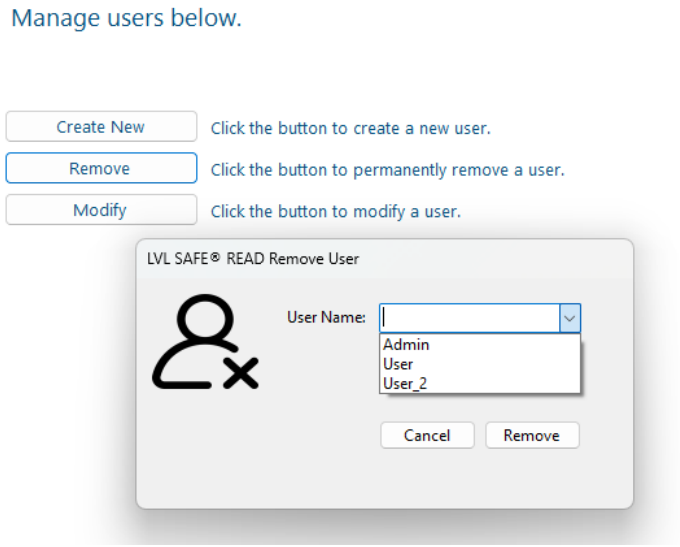
Create a new User

Click on the button *Create New* to implement a new user to the LVL SAFE® READ software. A new window will open were User Name and Password have to be entered. The User Level can be chosen by the drop down menu.



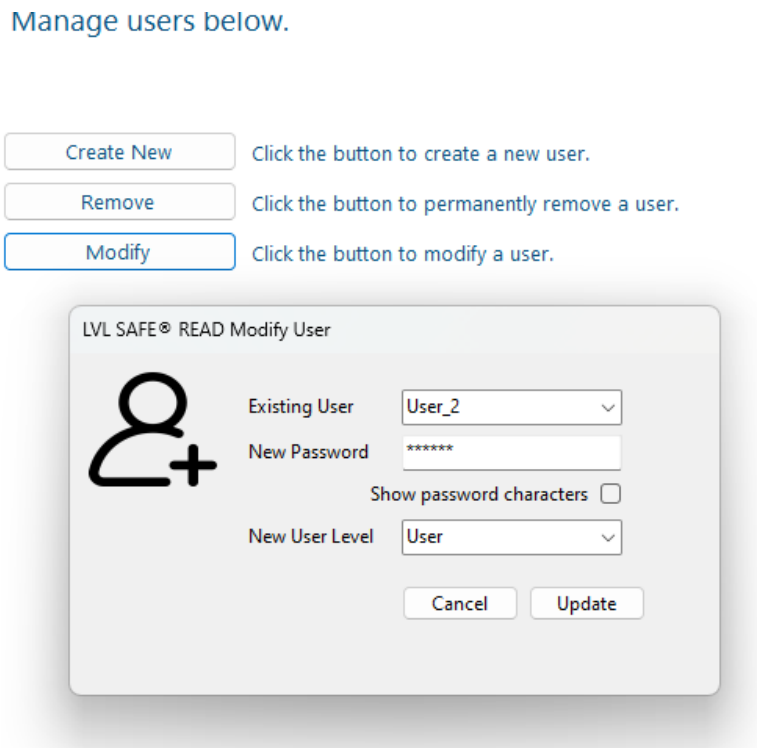
Remove a User

Click on the button *Remove* to delete a user from the LVL SAFE® READ software. A new window will open were User Name can be either typed in or chosen from the drop down list.



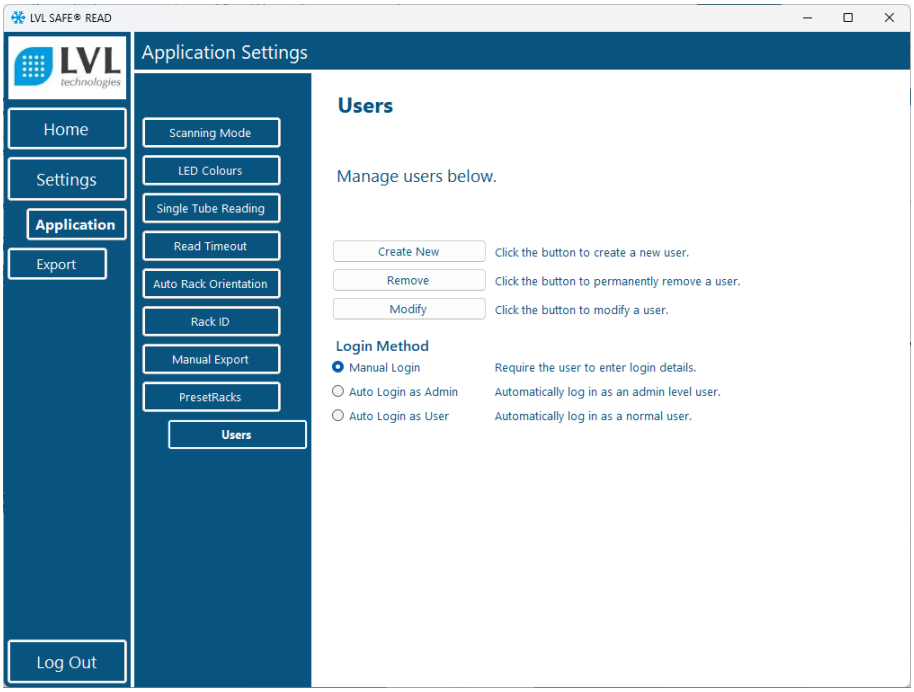
Modify a User

Click on the button *Modify*. A new window will open were User Name can be either typed in or chosen from the drop down list. Assign a new password or change the User Level. Apply the changes made using the *Update* Button or leave without changes with the *Cancel* Button.



Change Login Method

The Login Method can be changed to an automatic login for both types of users – Administrator and User.



The default setting is manual login, so each user must enter their specific credentials.
If the method is changed to automatically login as an admin level user, every user can make changes to the settings. If set to normal user only the main function of the software are accessible like initiate a scan or export the current output file.
After changing the settings, the software must be closed using the X-button in the upper left corner.
Note: If the Log Out button is used the log in data must be entered again.

TCP Server Export Settings

TCP: Connection Details

To get to these settings from the Home screen, go to: Settings > TCP server > Connection

Here you can manage the TCP server connection details.

Enabling the TCP Server

To enable/disable the TCP server, click the box beside 'Enable TCP Server'. It will turn blue with a tick inside when enabled.
This setting will be disabled by default.

IP Address Mode

Here you can choose the method of setting the Server IP address. There are 3 options:

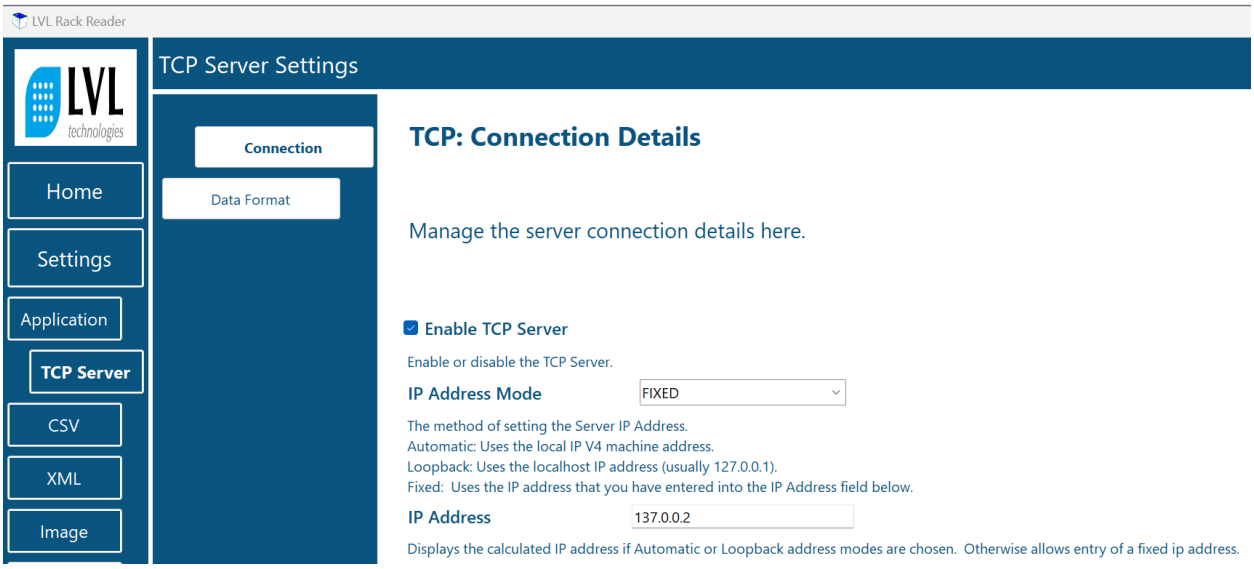
- AUTOMATIC - Uses the local IP V4 machine address
- LOOPBACK - Uses the localhost IP address (usually 127.0.0.1)
- FIXED - uses the IP address that you have specified.

AUTOMATIC is the default setting. To change this click on the drop down menu next to 'IP Address Mode' and click on the mode you want.

IP Address

If you have chosen either AUTOMATIC or LOOPBACK, it will display the IP Address currently being used in the box next to 'IP Address'.

If you have chosen FIXED, then you can type in this box and the server will use this IP Address instead.



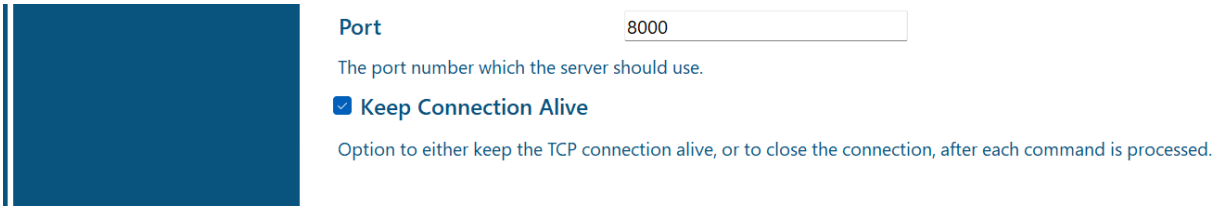
TCP Server is enabled, the IP address is FIXED and the IP address currently in use is 137.0.0.2

Server Ports

This setting specifies the server port being used. If you wish to change this, click on the box next to 'PORT' and type.
The default is 8000 however if there are connection issues, it may be because another service is using that port number, so it may be necessary to change to a different port number.

Keeping connection alive

When enabled, this will keep the connection live between the TCP server live after each command is processed.
If disabled however, it will close the connection after every command is processed.
This option is enabled by default. If you wish to enable/disable this option, click on the box next to 'Keep Connection Alive'. It will turn blue with a tick inside when enabled.



The port number is default (8000) and the connection will stay live after a command is processed.

TCP: Data Format

To find these settings from the Home screen go to: Settings > TCP Server > Data Format

Here you can manage how the data in the exported file is arranged.

Data Line

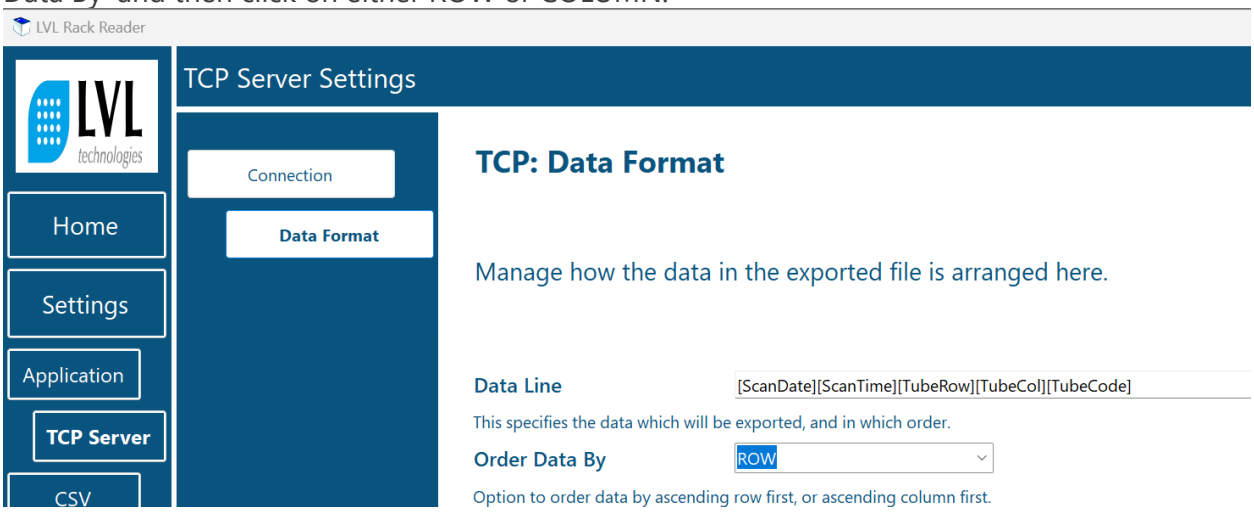
To change the order of the data that will be exported, click and type in the box beside 'Data Line'.
You can use the following variables to specify how you want the data set out (Make sure to **include** the square brackets):

- [ScanDate] - date of the scan.
- [ScanTime] - exact time of the scan.
- [TubeRow] - the row the tube was positioned in when scanned.
- [TubeCol] - the column the tube was positioned in when scanned.
- [TubeCode] - the tubes code

The Data Line will be set as [ScanDate][ScanTime][TubeRow][TubeCol][TubeCode] by default.

Data Order - Rows or Columns

The data can be ordered in ascending rows or columns. Meaning it can be ordered by A1, A2, A3 etc. (Rows) or A1, B1, C1 etc. (Columns).
This will be set to Rows by default. To change this click on the drop down menu next to 'Order Data By' and then click on either ROW or COLUMN.



Data will be exported by: Date, Time, Row, Column, code for each tube and will be listed in order of rows.

Date and Time Formats

You can change the **Date** format for the string by clicking on the box beside "Date Format" and typing dd (for day), MM (for month) and yyyy (for year). It will be set to yyyyMMdd by default.

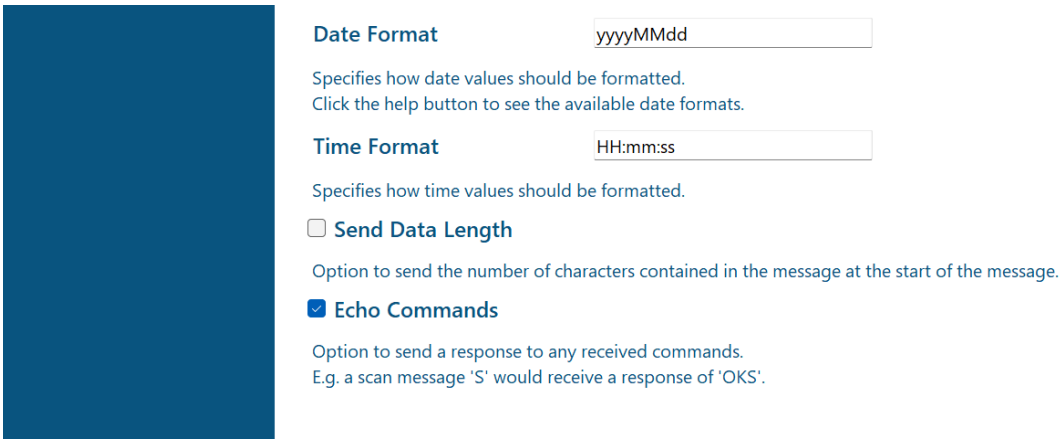
You may also change the **Time** Format by clicking on the box beside "Time Format" and typing HH (for hour), mm (for minute) and ss (for second). It will be set to HH:mm:ss by default.

Sending Data Length

When this option is enabled, the length of the data will be included at the start of the message. This option is disabled by default.
To enable/disable, click the box next to 'Send Data Length'. It will turn blue with a tick inside when enabled.

Echo Commands

When you send a command to the server, the server will confirm your command by replying with "OK[the command you sent]".
This option will be enabled by default.
To disable/enable, click the box next to 'Echo Commands'. It will turn blue with a tick inside when enabled.



The date and time format are default, the Data message will not have the length of the data at the start of the message and the server will echo the commands sent to it.

Files

CSV

CSV: File Name

To get to this setting from the home screen go to: Settings > CSV > File Name

Here you can manage how the exported file is named.

File Name

To name the file you can:

- Left click on the box next to 'File Name' and type normal text
- Right click on the box and choose a data field. (e.g. [ScanDate])

You can use either or a mix of text and data files. You can also use enter Delimiter Characters (commas, semicolons etc.) to separate the data.

The file name will be set to [ScanDate]-[ScanTime]-[RackID] by default.

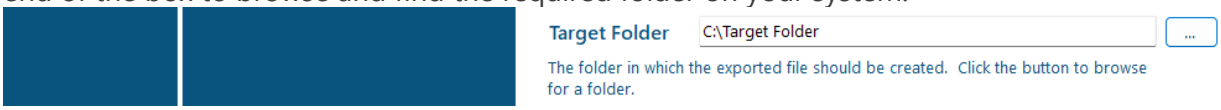
File Extension

The file extension indicates the type of file that will be created (E.g. *.csv* or *.txt*).
The default extension will be *.csv*. To change the extension, click and type in the box next to 'File Extension'.

File name is set [ScanDate]-[ScanTime]-[RackID] and the file extension is *.csv*.

Target Folder

The target folder is the folder to which the file will be exported.
To change this either click and type in the box next to 'Target Folder' or click the button at the end of the box to browse and find the required folder on your system.

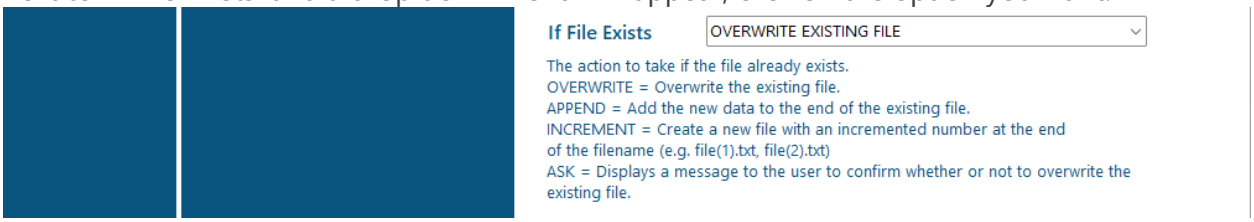


If File Exists

If the file that you are exporting already exists, you can either:

- OVERWRITE - overwrite the existing file
- APPEND - Add the new data to the end of the existing file
- INCREMENT - Create a new file with a number at the end of the filename (e.g. file(1).txt, file(2).txt)
- ASK - Displays a message to the user to confirm whether to overwrite the file or not

This will be set to OVERWRITE by default. To change this click on the arrow at the end of the box next to 'If File Exists' and a drop down menu will appear; click on the option you want.



CSV: Data Format

To get to this setting from the Home screen go to: Settings > CSV > Data Format

Here you can manage how the data is arranged in the exported file.

Data Header

The data header specifies optional information to include at the top of the file before the actual data from the read result.
You can use either normal text which will be outputted as entered or format it using data fields.

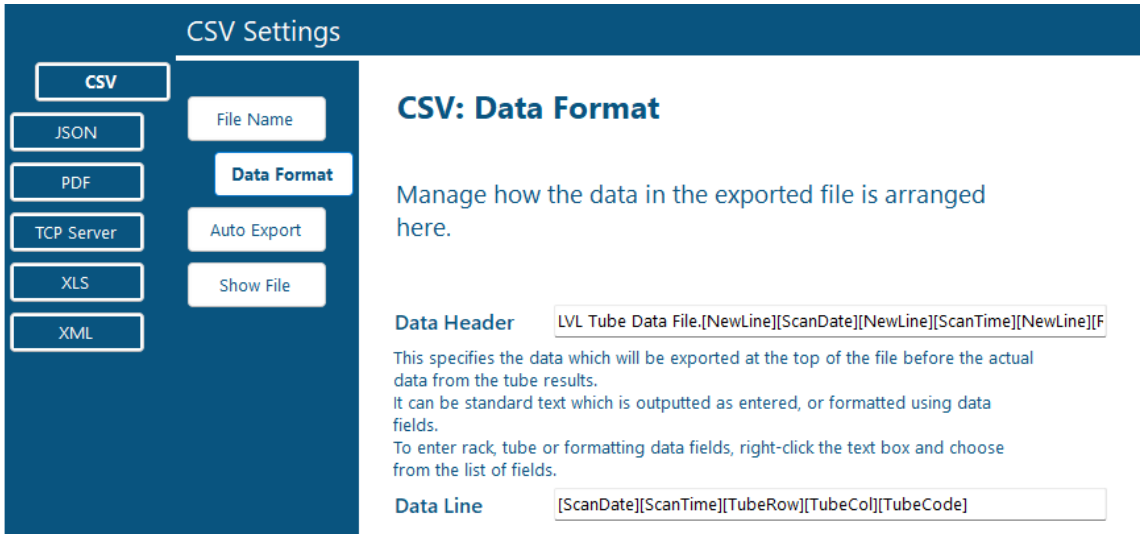
To add **standard** text to the header, left-click in the box and enter some text. This can be any text you wish to include such as a file description, company information etc.

To add rack, tube or formatting data **fields** to the data header, right-click on the box and click on 'Insert fields' to show the list of available fields. Click on the desired field to insert it into the Header line.
This will be set to "LVL Tube Data File.[NewLine][ScanDate][NewLine][ScanTime][NewLine][RackID][NewLine]" by default.

Data Line

This specifies which data will be exported and in which order.

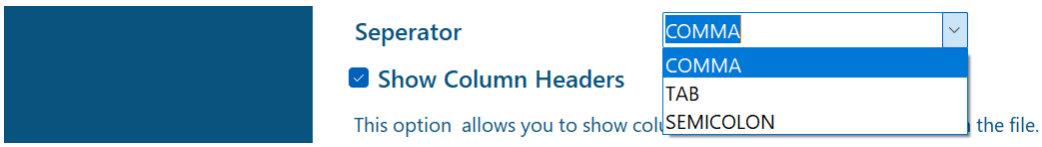
To add rack, tube or formatting fields, right-click on the box beside 'Data Line' and left-click on 'Insert fields'. Left-click on the desired field and it will insert it into the Data line.
This will be set to [ScanDate][ScanTime][TubeRow][TubeCol][TubeCode] by default.



List of available data fields that appear when you right-click and click insert field.

Seperators

Here you can choose the delimiter character which is used to split the individual data values. You can choose from a comma (,), Tab( ) or Semicolon (;).
This will be set to comma by default. To change this, click the arrow at the end of the box next to 'Seperator' and click on one of the options in the drop-down menu.



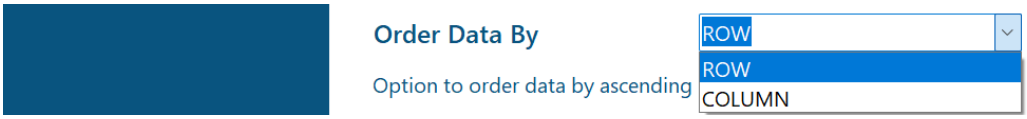
Selection of separators. Currently on Comma.

Column Headers

This option allows you to automatically show the column header above the data lines in the file.
To enable/disable this option click on the box to the left of 'Show Column Headers'. It will turn blue with a tick inside when enabled.
This option will be enabled by default.

Order Data By

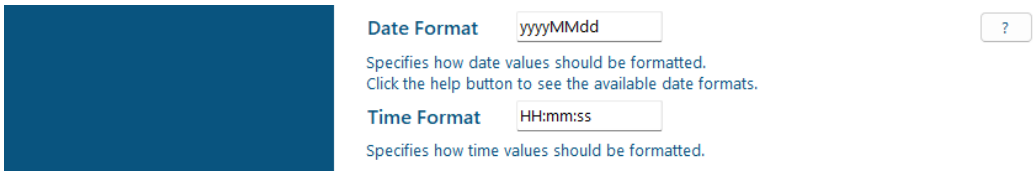
This option allows you to choose whether to order the data by ascending row first or column first. Click on the arrow at the end of the box next to 'Order Data By' and click on either option from the drop-down menu.



Date Format

This specifies how the date should be formatted.
You can use the letters y (for year), M (for month), and d (for day) to specify the format. Click the button with the question mark (?) to see the available formats (as shown in picture below).

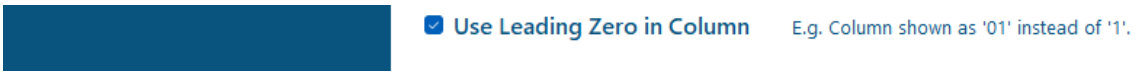
This will be set to yyyyMMdd (e.g. 2023 04 14) by default. To change this value, type in the box beside 'Date Format'.



Time Format

This specifies how the time should be formatted.
You can use the letters H (for hour), m (for minutes), and s (for seconds) to specify the format - Click the button with the question mark (?) to see the available formats. This will be set to HH:mm:ss (e.g. 09:45:22) by default. To change this value, type in the box beside 'Time Format'.

Leading Zero in Column



This specifies if the output file should contain double-digit numbers instead of single digit number by adding a Zero in front.
Default setting is double-digit, to change this to single digit uncheck he box.

CSV: Auto Export

To get to these settings from the Home screen go to: Settings > CSV > Auto Export

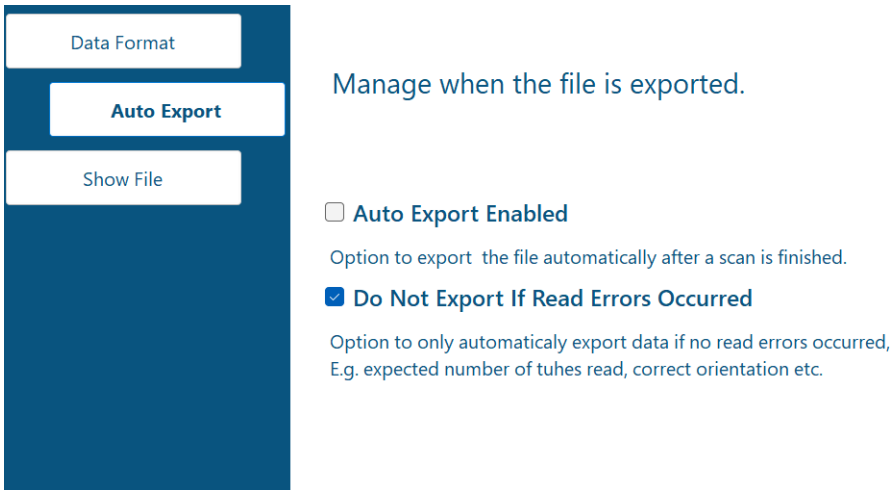
This is where you can manage **when** the file is exported.

Auto Export Enabled

This option will export the file automatically after a scan is finished.
This option is disabled by default. To enable/disable this option, click on the box to the left of 'Auto Export Enabled'. It will turn blue with a tick inside when enabled.

Do Not Export If Read Errors Have Occurred

This option ensures that if there are any errors with the read, the data will not be exported. (E.g. if the expected number of tubes isn't read or the expected orientation is wrong)
This will be enabled by default. To enable/disable this feature, click on the box to the left of 'Do Not Export If Read Errors Occurred'.



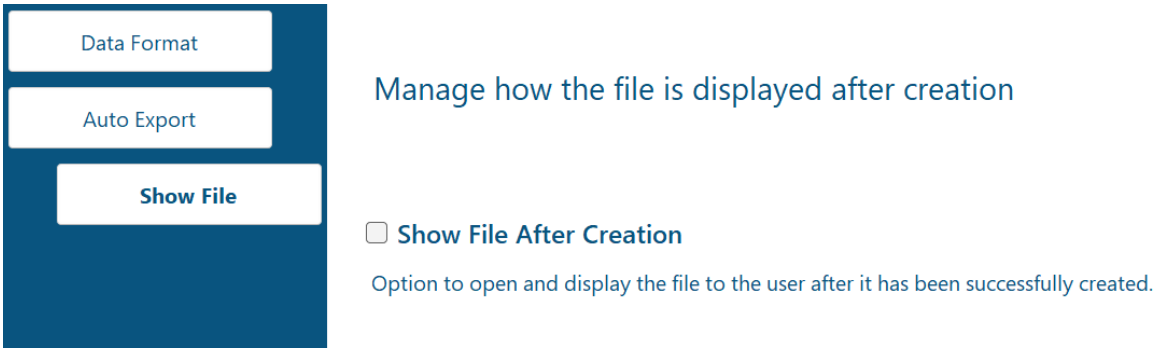
CSV: Show File

To get to this setting from the Home screen go to: Settings > CSV > Show File

Here you can manage how the file is displayed once it has been created.

Show File After Creation

When enabled, this option will open and display the file to the user after it has been successfully created.
This option be disabled by default. To enable/disable this feature, click the box to the left of 'Show File After Creation'. It will turn blue with a tick inside once enabled.



XML

XML: File Name

To get to this setting from the Home screen go to: Settings > XML > File Name

Here you can manage how the exported file is named.

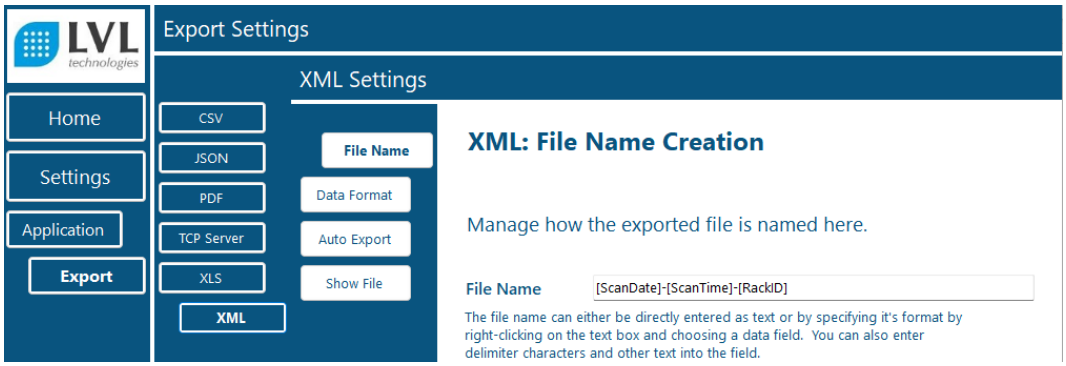
File Name

To name the file you can:

- Left click on the box next to 'File Name' and type normal text
- Right click on the box and choose a data field. (e.g. [ScanDate])

You can use either or a mix of text and data files. You can also use Delimiter Characters (commas, semicolons etc.) to separate the data.

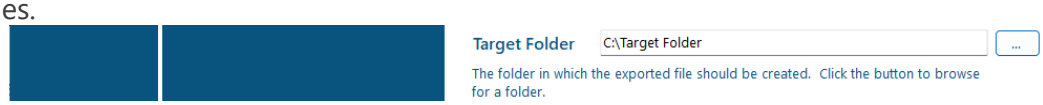
The file name will be set to [ScanDate]-[ScanTime]-[RackID] by default.



File name is set [ScanDate]-[ScanTime]-[RackID].

Target Folder

The target folder is the folder where the file will be exported to.To change this either click and type in the box next to 'Target Folder' or click the button at the end of the box to browse your own files.

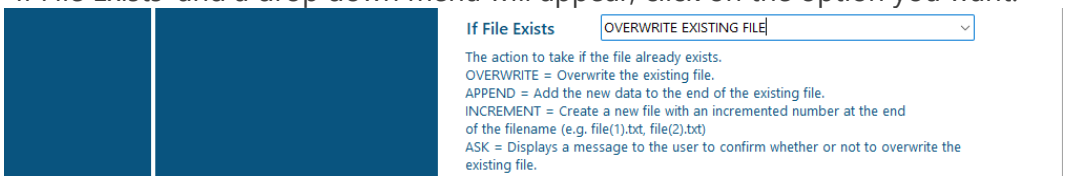


If File Exists

If the file that you are exporting already exists, you can either:

- OVERWRITE - overwrite the existing file
- APPEND - Add the new data to the end of the existing file
- INCREMENT - Create a new file with a number at the end of the filename (e.g. file(1).txt, file(2).txt)
- ASK - Displays a message to the user to confirm whether to overwrite the file or not

This will be set to OVERWRITE by default. To change this click on the arrow at the end of the box next to 'If File Exists' and a drop down menu will appear; click on the option you want.



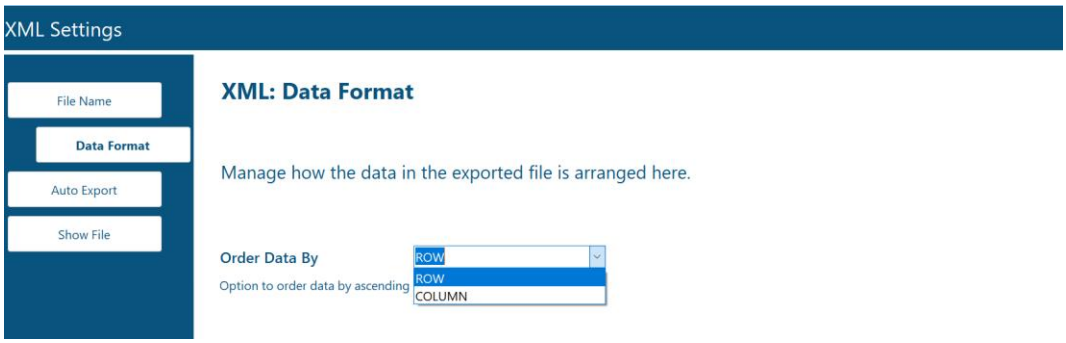
XML: Data Format

To get this setting from the Home screen go to: Settings > XML > Data Format

Here you can manage how the data is arranged within the export file.

Order Date By

This option allows you to choose whether to order the data by ascending row first or ascending column first.
This is set to 'ROW' by default. To change this, click on the arrow at the end of the box and a drop-down menu will appear then click on the option you wish to use.



XML: Auto Export

To get to these settings from the Home screen go to: Settings > XML > Auto Export

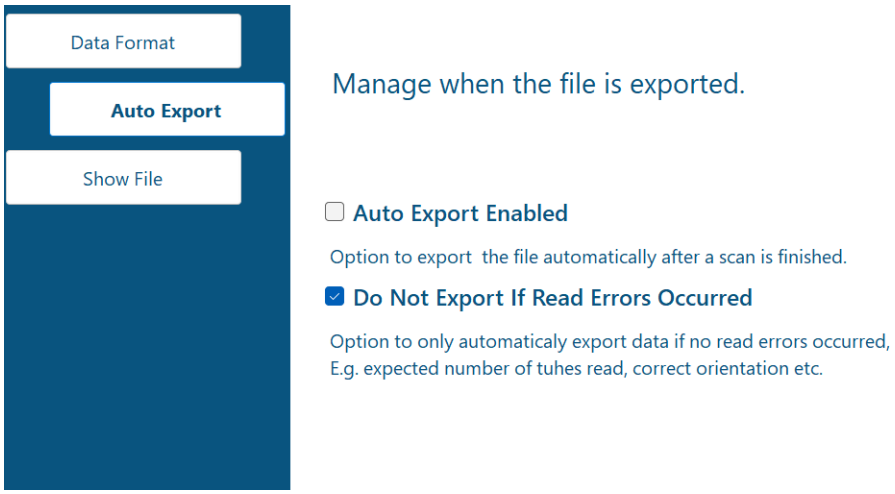
Here you can manage when the file is exported.

Auto Export

This option will export the file automatically after a scan is finished.
This option is disabled by default. To enable/disable this option, click on the box to the left of 'Auto Export Enabled'. It will turn blue with a tick inside when enabled.

Do Not Export If Read Errors Have Occurred

This option ensures that if there are any errors with the read, the data will not be exported.
(E.g if the expected number of tubes isn't read or the expected orientation is wrong)
This will be enabled by default. To enable/disable this feature, click on the box to the left of 'Do Not Export If Read Errors Occurred'.



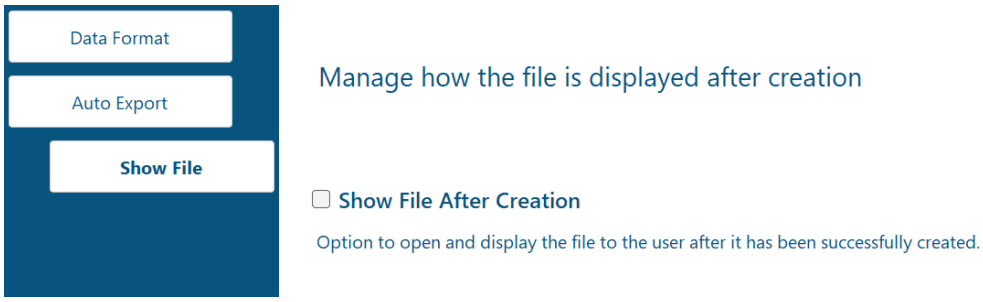
XML: Show File

To get to this setting from the Home screen go to: Settings > XML > Show File

Here you can manage how the file is displayed once it has been created.

Show File After Creation

When enabled, this option will open and display the file to the user after it has been successfully created.
This option be disabled by default. To enable/disable this feature, click the box to the left of 'Show File After Creation'. It will turn blue with a tick inside once enabled.



JSON

JSON: File Name

To get to this setting from the Home screen go to: Settings > JSON> File Name

Here you can manage how the exported file is named.

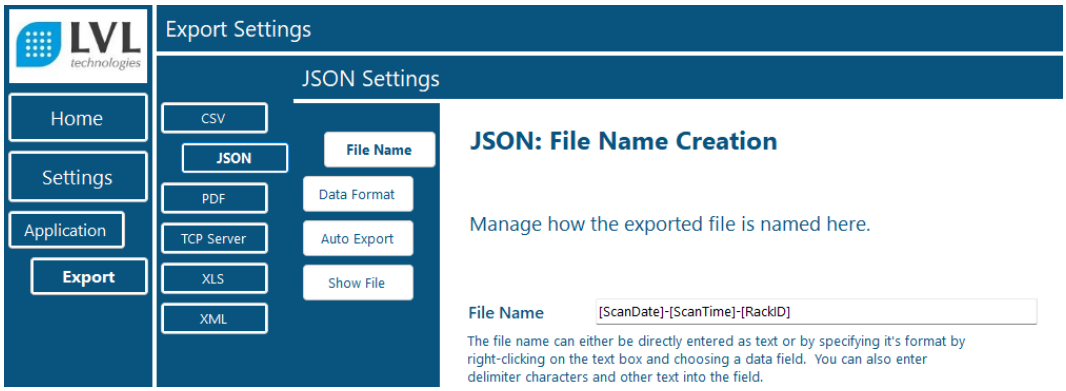
File Name

To name the file you can:

- Left click on the box next to 'File Name' and type normal text
- Right click on the box and choose a data field. (e.g. [ScanDate])

You can use either or a mix of text and data files. You can also use enter Delimiter Characters (commas, semicolons etc.) to separate the data.

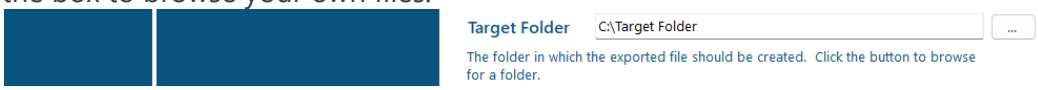
The file name will be set to [ScanDate]-[ScanTime]-[RackID] by default.



List of fields that come up when you right-click and click insert field.

Target Folder

The target folder is the folder where the file will be exported to.
To change this either click and type in the box next to 'Target Folder' or click the button at the end of the box to browse your own files.

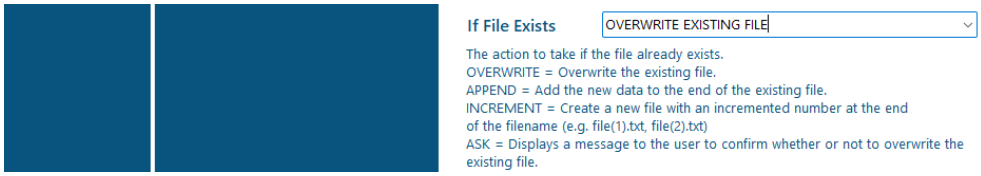


If File Exists

If the file that you are exporting already exists, you can either:

- OVERWRITE - overwrite the existing file
- APPEND - Add the new data to the end of the existing file
- INCREMENT - Create a new file with a number at the end of the filename (e.g. file(1).txt, file(2).txt)
- ASK - Displays a message to the user to confirm whether to overwrite the file or not

This will be set to OVERWRITE by default. To change this click on the arrow at the end of the box next to 'If File Exists' and a drop down menu will appear; click on the option you want.



JSON: Data Format

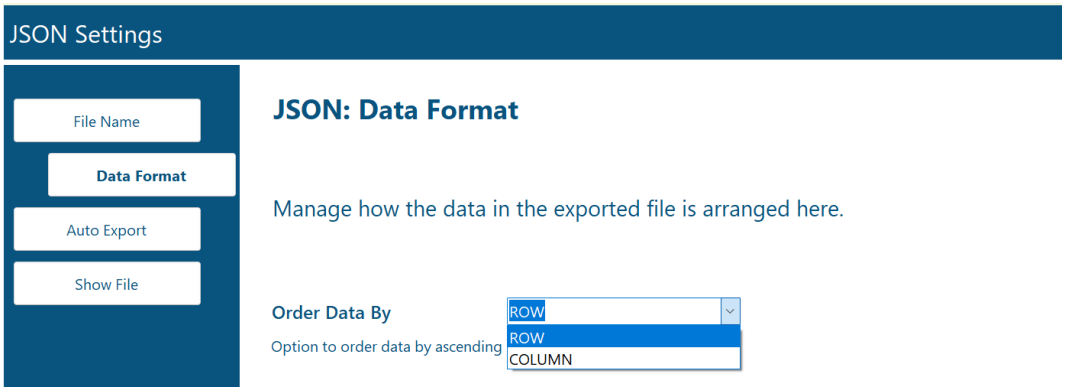
To get this setting from the Home screen go to: Settings > JSON> Data Format

Here you can manage how the data is arrange in the export file.

Order Date By

This option allows you to choose whether to order the data by ascending row first or ascending column first.

This is set to 'ROW' by default. To change this, click on the arrow at the end of the box and a drop-down menu will appear then click on the option you wish to use.



JSON: Auto Export

To get to these settings from the Home screen go to: Settings > JSON > Auto Export

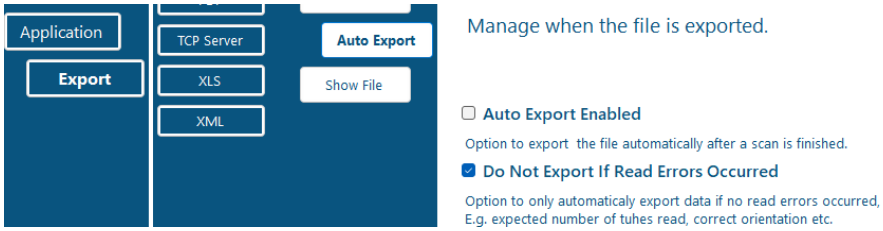
Here you can manage when the file is exported.

Auto Export

This option will export the file automatically after a scan is finished.
This option is disabled by default. To enable/disable this option, click on the box to the left of 'Auto Export Enabled'. It will turn blue with a tick inside when enabled.

Do Not Export If Read Errors Have Occurred

This option ensures that if there are any errors with the read, the data will not be exported.
(E.g if the expected number of tubes isn't read or the expected orientation is wrong)
This will be enabled by default. To enable/disable this feature, click on the box to the left of 'Do Not Export If Read Errors Occurred'.



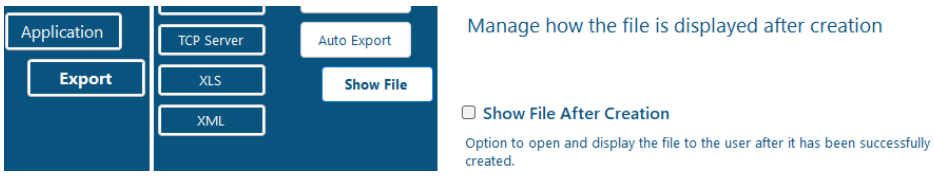
JSON: Show File

To get to this setting from the Home screen go to: Settings > JSON > Show File

Here you can manage how the file is displayed once it has been created.

Show File After Creation

When enabled, this option will open and display the file to the user after it has been successfully created.
This option be disabled by default. To enable/disable this feature, click the box to the left of 'Show File After Creation'. It will turn blue with a tick inside once enabled.



PDF

PDF: File Name

To get to this setting from the Home screen go to: Settings > PDF > File Name

Here you can manage how the exported file is named.

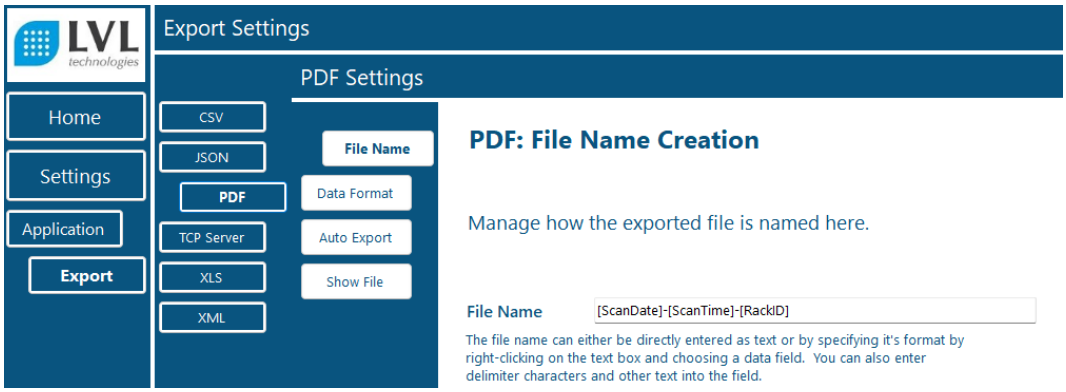
File Name

To name the file you can:

- Left click on the box next to 'File Name' and type normal text.
- Right click on the box and choose a data field. (e.g. [ScanDate])

You can use either or a mix of text and data files. You can also use Delimiter Characters (commas, semicolons etc.) to separate the data.

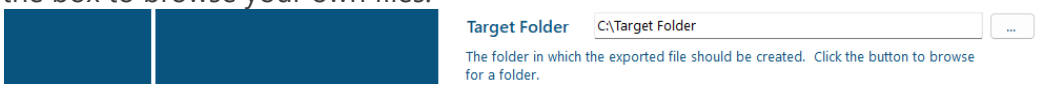
The file name will be set to [ScanDate]-[ScanTime]-[RackID] by default.



File name is set [ScanDate]-[ScanTime]-[RackID].

Target Folder

The target folder is the folder where the file will be exported to.
To change this either click and type in the box next to 'Target Folder' or click the button at the end of the box to browse your own files.

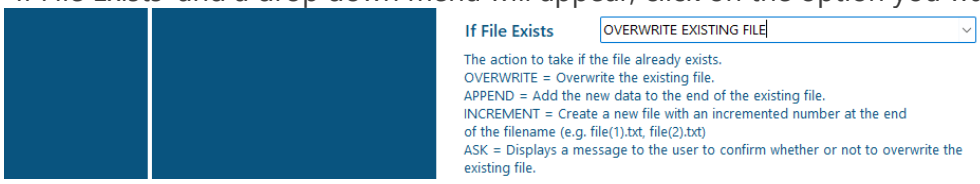


If File Exists

If the file that you are exporting already exists, you can either:

- OVERWRITE - overwrite the existing file
- APPEND - Add the new data to the end of the existing file
- INCREMENT - Create a new file with a number at the end of the filename (e.g. file(1).txt, file(2).txt)
- ASK - Displays a message to the user to confirm whether to overwrite the file or not

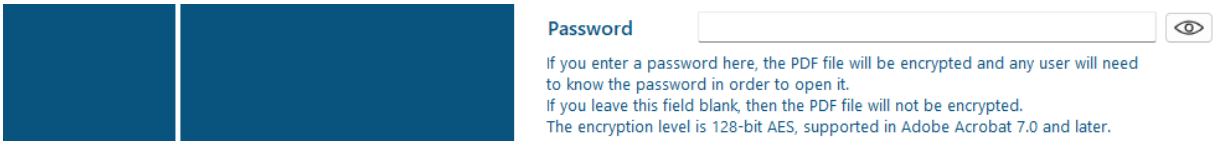
This will be set to OVERWRITE by default. To change this click on the arrow at the end of the box next to 'If File Exists' and a drop down menu will appear; click on the option you want.



Password

The PDF Export can be used as Audit Trail. If settings are made accordingly to the Auto Export Function. For this purpose each export file can be protected with an password to avoid changing of data or unintentionally deletion of files. See chapter *PDF: Auto Export* below.

- To add a password click in the field and enter the character string. Use the Eye symbol to show the character sting.
  Note: The software LVL SAFE® READ makes no constraints regarding requirements of password safety as each user will have their own requirements.



PDF: Data Format

To get to this setting from the Home screen go to: Settings > PDF > Data Format

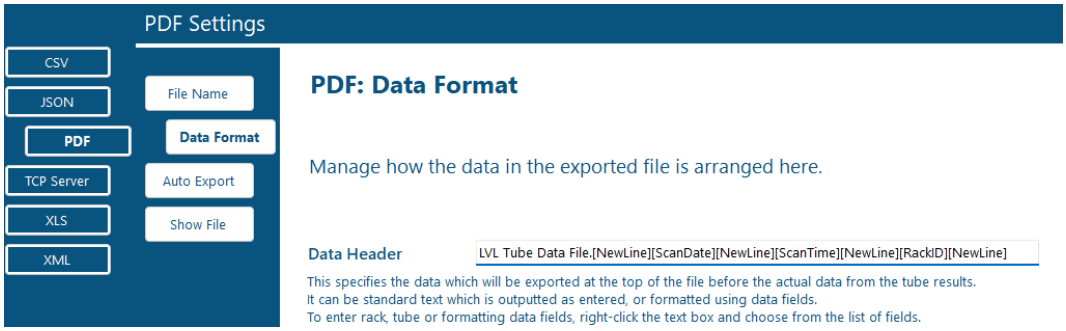
Here you can manage how the data is arranged in the exported file.

Data Header

This tells you the data that will be exported at the top of the file before the actual data from the tube result.
You can use either normal text which will be outputted as entered or format it using data fields.

To add **standard** text to the header, left-click on the box beside with 'Data Header'.

To add rack, tube or formatting data **fields**, right-click on the box instead and left-click on 'Insert fields' and a menu of fields will appear. Left-click on the desired field and it will insert it into the Header line.
This will be set to [ScanDate][ScanTime][TubeRow][TubeCol][TubeCode] by default.

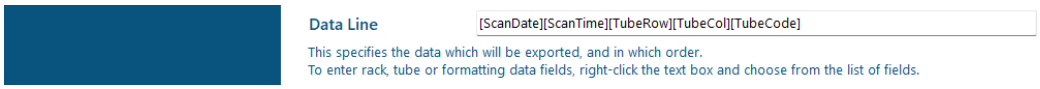


List of fields that come up when you right-click and click insert field.

Data Line

This specifies which data will be exported and in which order.

To add rack, tube or formatting fields, right-click on the box beside 'Data Line' and left-click on 'Insert fields'. Left-click on the desired field and it will insert it into the Data line.
This will be set to [ScanDate][ScanTime][TubeRow][TubeCol][TubeCode] by default.

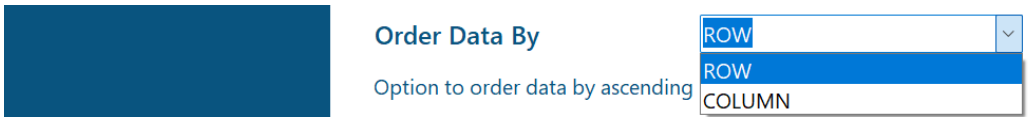


Column Headers

This option allows you to show the column header above the data lines in the file. To enable/disable this option click on the box to the left of 'Show Column Headers'. It will turn blue with a tick inside when enabled.
This option will be enabled by default.

Order Data By

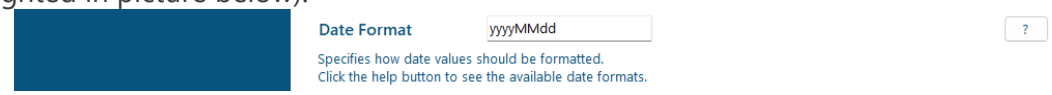
This option allows you to choose whether to order the data by ascending row first or column first. Click on the arrow at the end of the box next to 'Order Data By' and click on either option from the drop-down menu.



Date Format

This specifies how the date should be formatted.

You can use the letters y (for year), M (for month), and d (for day) to specify the format (no separators needed) - click the box with the question mark (?) inside to see the available formats (highlighted in picture below).

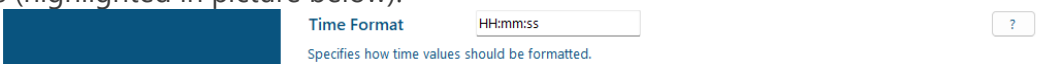


This will be set to yyyyMMdd (e.g. 2023 04 14) by default. To change this type in the box beside 'Date Format'.

Time Format

This specifies how the time should be formatted.

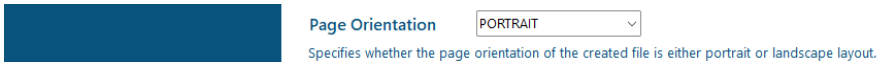
You can use the letters H (for hour), m (for minutes), and s (for seconds) to specify the format (use colons (:) to separate them) - click the box with question mark (?) inside to see the available formats (highlighted in picture below).



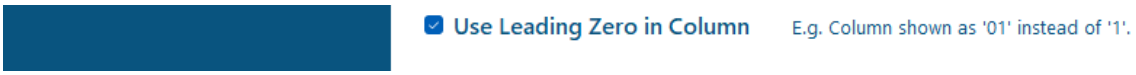
This will be set to HH:mm:ss (e.g. 09:45:22) by default. To change this, type in the box beside 'Time Format'.

Page Orientation

This specifies how the page orientation is set. Use the drop down element to cheoose between portait and landscape.



Leading Zero in Column



This specifies if the output file should contain double-digit numbers instead of single digit number by adding a Zero in front.
Default setting is double-digit, to change this to single digit uncheck he box.

PDF: Auto Export

To get to these settings from the Home screen go to: Settings > PDF > Auto Export

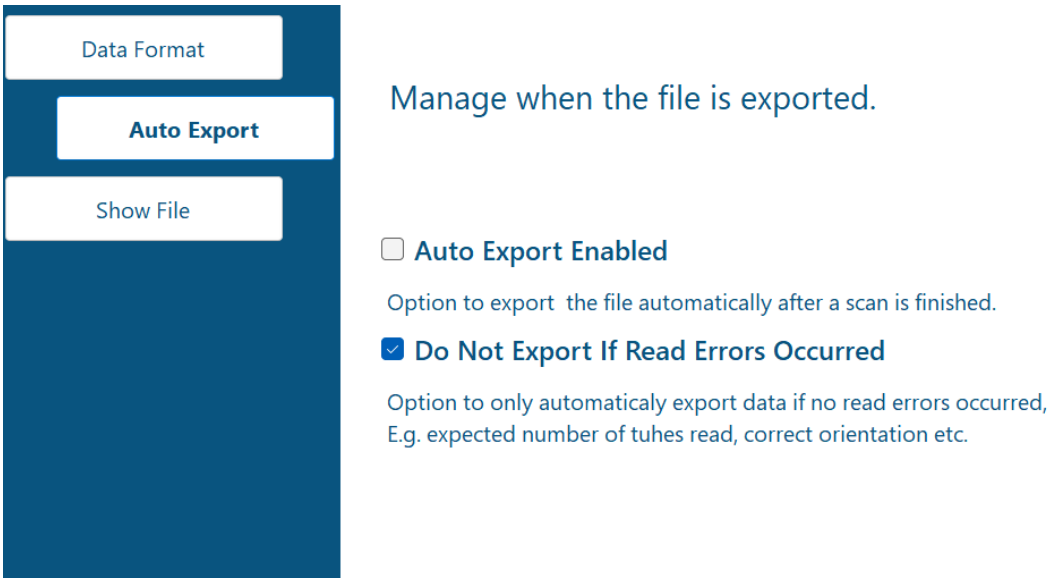
This is where you can manage **when** the file is exported.

Auto Export Enabled

This option will export the file automatically after a scan is finished.
This option is disabled by default. To enable/disable this option, click on the box to the left of 'Auto Export Enabled'. It will turn blue with a tick inside when enabled.

Do Not Export If Read Errors Have Occurred

This option ensures that if there are any errors with the read, the data will not be exported.
(E.g if the expected number of tubes isn't read or the expected orientation is wrong)
This will be enabled by default. To enable/disable this feature, click on the box to the left of 'Do Not Export If Read Errors Occurred'.



PDF Audit Trail

If the PDF Auto Export Function is used for audit trail purposes, enable the Auto Export and uncheck the box “Do Not Export if Read Errors Occurred” so each scan attempt will be saved properly.

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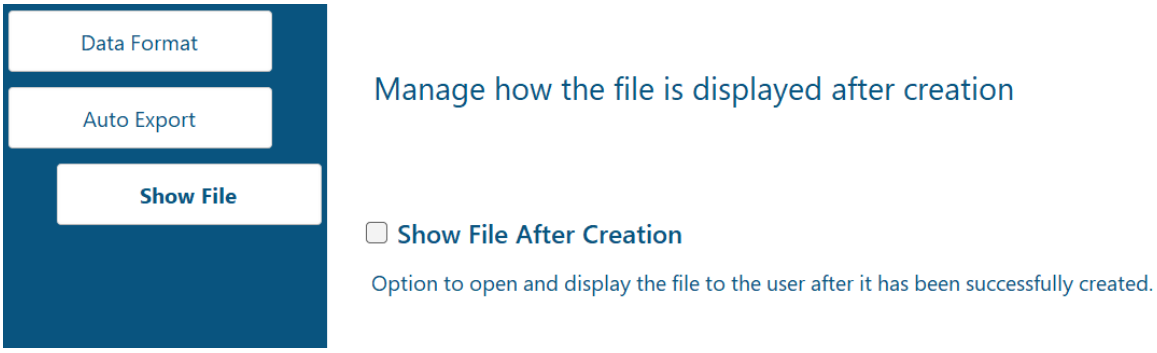
PDF: Show File

To get to this setting from the Home screen go to: Settings > PDF > Show File

Here you can manage how the file is displayed once it has been created.

Show File After Creation

When enabled, this option will open and display the file to the user after it has been successfully created.
This option be disabled by default. To enable/disable this feature, click the box to the left of 'Show File After Creation'. It will turn blue with a tick inside once enabled.



XLS

XLS: File Name

To get to this setting from the Home screen go to: Settings > XLS > File Name

Here you can manage how the exported file is named.

File Name

To name the file you can:

- Left click on the box next to 'File Name' and type normal text
- Right click on the box and choose a data field. (e.g. [ScanDate])

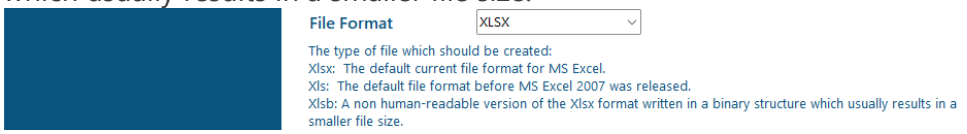
You can use either or a mix of text and data files. You can also use enter Delimiter Characters (commas, semicolons etc.) to separate the data.

The file name will be set to [ScanDate]-[ScanTime]-[RackID] by default

File Format

This is show the type of file that will be created.
The types of files that can be created are:

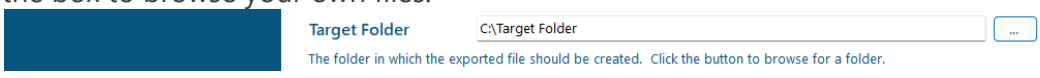
- XLSX - the default current file format for MS Excel
- XLS - The default file format before MS Excel 2007 released.
- XLSB - A non human-readable version for the XlSX format written in a binary structure which usually results in a smaller file size.



The default will be XLSX. To change this, click on the arrow at the end of the box next to 'File Format' and click on the desired file format.

Target Folder

The target folder is the folder where the file will be exported to.
To change this either click and type in the box next to 'Target Folder' or click the button at the end of the box to browse your own files.

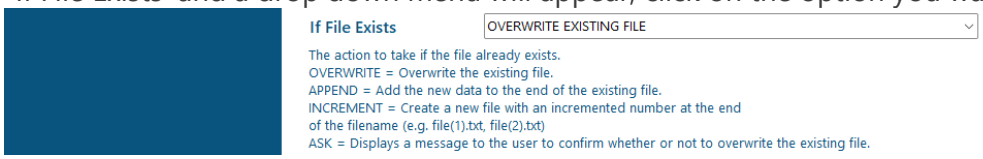


If File Exists

If the file that you are exporting already exists, you can either:

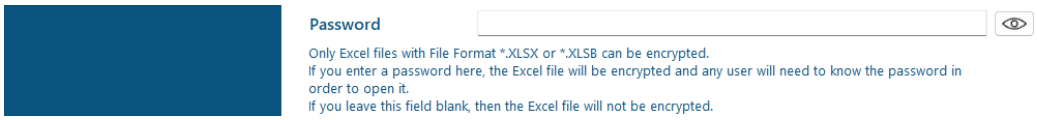
- OVERWRITE - overwrite the existing file
- APPEND - Add the new data to the end of the existing file
- INCREMENT - Create a new file with a number at the end of the filename (e.g. file(1).txt, file(2).txt)
- ASK - Displays a message to the user to confirm whether to overwrite the file or not

This will be set to OVERWRITE by default. To change this click on the arrow at the end of the box next to 'If File Exists' and a drop down menu will appear; click on the option you want.



Password

The output file can be password protected to avoid unintentionally changing of data or deletion of files.



- To add a password click in the field and enter the character string. Use the Eye symbol to show the character sting.
  Note: The software LVL SAFE® READ makes no constraints regarding requirements of password safety as each user will have their own requirements.

XLS: Data Format

To get to this setting from the Home screen go to: Settings > XLS > Data Format

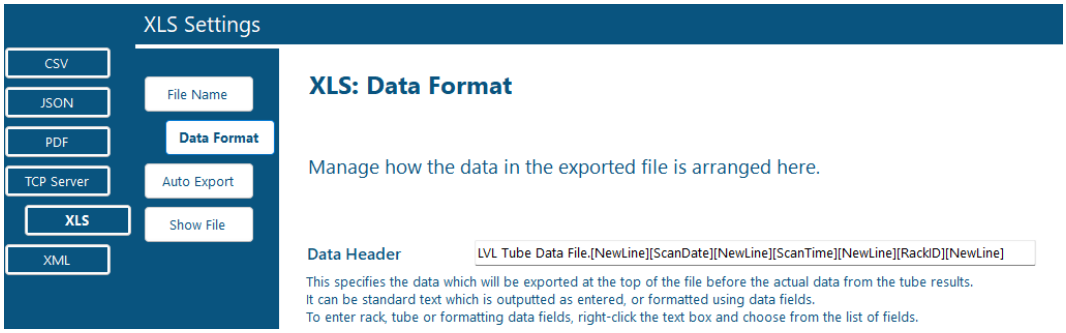
Here you can manage how the data is arranged in the exported file.

Data Header

This tells you the data that will be exported at the top of the file before the actual data from the tube result.
You can use either normal text which will be outputted as entered or format it using data fields.

To add **standard** text to the header, left-click on the box beside with 'Data Header'.

To add rack, tube or formatting data **fields**, right-click on the box instead and left-click on 'Insert fields' and a menu of fields will appear. Left-click on the desired field and it will insert it into the Header line.
This will be set to [ScanDate][ScanTime][TubeRow][TubeCol][TubeCode] by default.

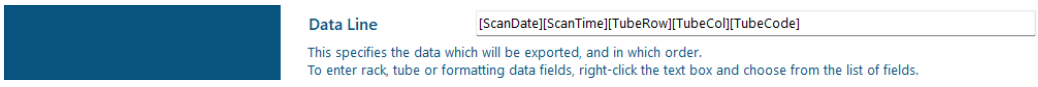


List of fields that come up when you right-click and click insert field.

Data Line

This specifies which data will be exported and in which order.

To add rack, tube or formatting fields, right-click on the box beside 'Data Line' and left-click on 'Insert fields'. Left-click on the desired field and it will insert it into the Data line.



This will be set to [ScanDate][ScanTime][TubeRow][TubeCol][TubeCode] by default.

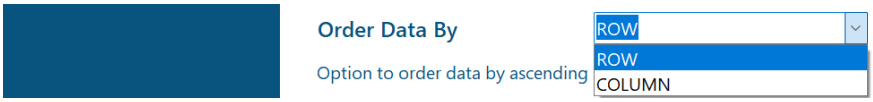
Column Headers

This option allows you to show the column header above the data lines in the file. To enable/disable this option click on the box to the left of 'Show Column Headers'. It will turn blue with a tick inside when enabled.

This option will be enabled by default.

Order Data By

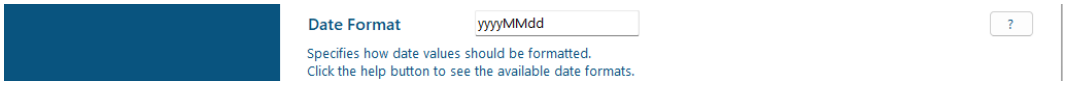
This option allows you to choose whether to order the data by ascending row first or column first. Click on the arrow at the end of the box next to 'Order Data By' and click on either option from the drop-down menu.



Date Format

This specifies how the date should be formatted.

You can use the letters y (for year), M (for month), and d (for day) to specify the format (no separators needed) - click the box with the question mark (?) inside to see the available formats (highlighted in picture below).

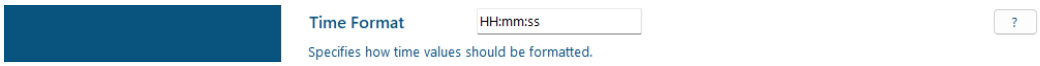


This will be set to yyyyMMdd (e.g. 2023 04 14) by default. To change this type in the box beside 'Date Format'.

Time Format

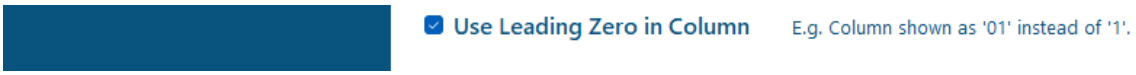
This specifies how the time should be formatted.

You can use the letters H (for hour), m (for minutes), and s (for seconds) to specify the format (use colons (:) to separate them) - click the box with question mark (?) inside to see the available formats (highlighted in picture below).



This will be set to HH:mm:ss (e.g. 09:45:22) by default. To change this, type in the box beside 'Time Format'.

Leading Zero in Column



This specifies if the output file should contain double-digit numbers instead of single digit number by adding a Zero in front.
Default setting is double-digit, to change this to single-digit uncheck he box.

XLS: Auto Export

To get to these settings from the Home screen go to: Settings > XLS > Auto Export

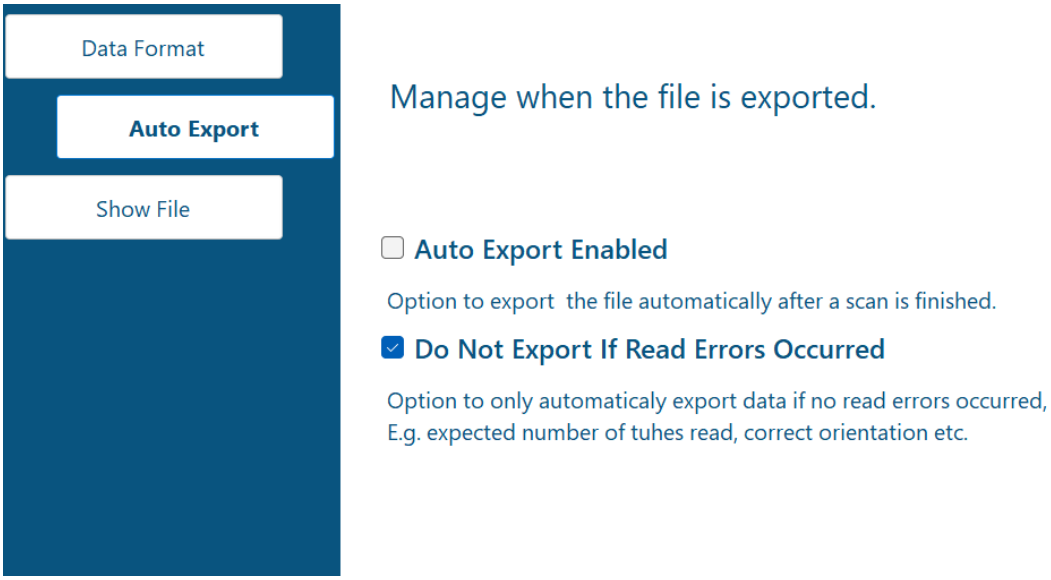
This is where you can manage when the file is exported.

Auto Export Enabled

This option will export the file automatically after a scan is finished.
This option is disabled by default. To enable/disable this option, click on the box to the left of 'Auto Export Enabled'. It will turn blue with a tick inside when enabled.

Do Not Export If Read Errors Have Occurred

This option ensures that if there are any errors with the read, the data will not be exported.
(E.g if the expected number of tubes isn't read or the expected orientation is wrong)
This will be enabled by default. To enable/disable this feature, click on the box to the left of 'Do Not Export If Read Errors Occurred'.



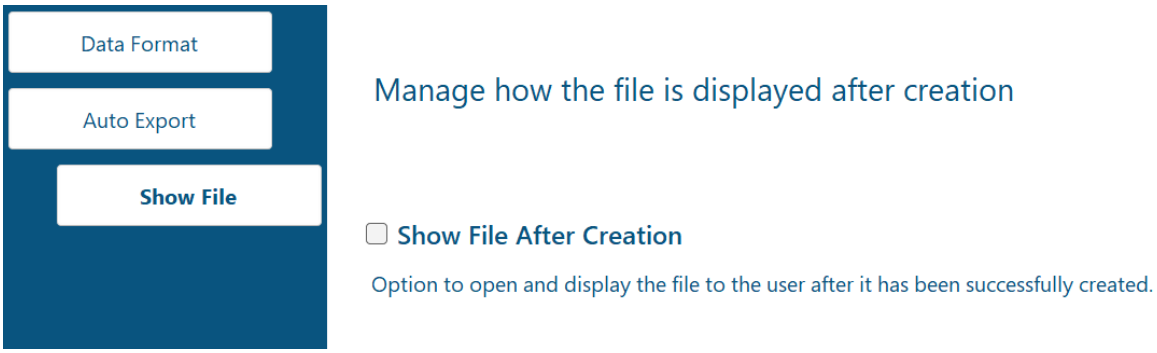
XLS: Show File

To get to this setting from the Home screen go to: Settings > XLS > Show File

Here you can manage how the file is displayed once it has been created.

Show File After Creation

When enabled, this option will open and display the file to the user after it has been successfully created.
This option be disabled by default. To enable/disable this feature, click the box to the left of 'Show File After Creation'. It will turn blue with a tick inside once enabled.



General Recommendations

Cleaning/Decontamination Of Your LVL SAFE® Rack Reader

General Cleaning

For general cleaning, a cloth wetted with water can be used to wipe down the reader. Alcohol wipes may be used as well if needed.

An absorbent cloth should be used to dry the reader after cleaning. **Avoid** the use of abrasive chemicals that may cause damage to the casing, reading surface, or USB cables.

Rack sensors can be cleaned using a can of airspray to ensure that the sensor holes are not obstructed with foreign objects.

Using Frozen Racks

Condensate from frozen racks should be removed from the reading surface of the LVL SAFE® READ using an absorbent cloth.

Do **not** use any abrasive materials as these may cause damage or scatch the reading surface.

Chemical And Biological spills

If chemical or biological matter is spilled on to your SAFE® READ, the reader should be disconnected from your computer. This will deenergize the reader.

Wipe the spilled material off the reader as soon as possible using an absorbent cloth. Alcohol wipes, dilute bleach solutions, or dilute sodium hydroxide solutions (<1%) can be used for decontamination.

Avoid the use of any abrasive chemical as this may cause damage to the reader and void any warrenty.

Returns

If the SAFE® READ needs to be returned to LVL for service, it is the responsibility of the user to ensure that the reader is decontaminated prior to shipment.

Alcohol wipes, dilute bleach solutions, or dilute sodium hydroxide solutions (<1%) can be used.

Contact your local LVL representative or use the contact information in Service and Support for more information about returns.

Contact Information

Service and Support

If you have any issues requiring support that cannot be solved using this manual, please initially contact the distributor from which you purchased your LVL SAFE® READ.

Alternatively, you can contact the manufacturer's support by emailing service@lvl-technologies.com

When emailing support, please provide as much information as possible including, where applicable:

- A description of the problem and if applicable, recommended steps for us to recreate the problem.
- Details of any error messages which may appear.
- The LVL SAFE® READ serial number
- Windows Operating System version (Win10, Win11)
- Any other information which may help us identify the issue.

Definitions

Delimiter Characters

These character(s) show the boundaries between indivual data in a list. E.g. in the list: 1,2,3,4... the comma is the delimiter character.

Reverse position

In this Manual, Reverse position refers to placing the rack in the opposite direction to the Normal position.

↳**Normal** position is where the A1 tube is positioned at the **back left** of the reader (on the side **furthest** from the USB cable).

↳**Reverse** position is where the A1 tube is positioned at the **front right** of the reader (on the side **closest** to the USB cable).

Keyboard Wedge

The keyboard wedge export option sends data to the currently active application (e.g. notepad or MS Excel etc) via simulated keystrokes, so that the data appears in the active application just as if it were typed on the keyboard.

LVL SAFE® READ Manual

for LVL SAFE® Rack Reader

LVL SAFE®READ V 1.1.10