Data recovery with MaxDataGenius

User manual for the versions Basic and Pro

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Imprint and contact

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Table of contents

1. About this user manual

Please read this user manual thoroughly before you install and apply our software MaxDataGenius in order to search and recover lost files. Also follow all relevant safety instructions in ordert to avoid any defects caused by ongoing or additional data loss.

When you read this manual, please consider the following graphical markers:

	Safety instructions which are placed in relevant chapters of the user manual
	Tip for a successful and easy use oft he software
Ctrl	Bold and cursive font style in the context of commands, buttons and input fields within the software

Contents and target groups of the user manual

The user manual addresses several user groups who dispose of various levels of knowledge when it comes to delete, save and recover all kinds of files. Consequently, this introductory chapter informs you about which chapters and functions might be especially helpful for your purpose and user scenario. In order to apply any software version of MaxDataGenius, you must be familiar with the basic functions of your computer and its file system (e.g. Windows, Mac).

In chapter 2, the manual provides you with important basic information concerning the use and designated purpose of the software, but also about its limitations. In chapter 3, especially users who are not familiar yet with file saving and their Windows file system are provided with an installation guide, starting with the software download. The installation guide presents all requirements, software messages and processes during download and installation step by step. Chapter 4 contains important information for you if you want to get a deeper understanding of processes running in the background of your media and of IT terminology around data management and data recovery. In chapter 4, you will also find details about the two available software versions „Basic“ and „Pro“. The chapter also explains the wizard principle behind the fuctionality of MaxDataGenius. You learn to adapt the display options using the example Expert mode. The chapter closes with an overview of options and their individual configuration. Chapter 5 presents common user scenarios, explained step by step. In chapter 6 you learn how to apply the software in its Pro version in order to optimize the performance of physical disks with the help of Disk Tools.Consequently,chapter 6 and especially the section 6.2.6 mainly address users who dispose of a noteworthy previous knowledge about how media are

constructed and how they function „behind their interface“.The index in chapter 7 makes it easy to search the document for keywords. Chapter 8 contains a glossary with all relevant IT terminology named within the user manual.

2. Data recovery with MaxDataGenius

There are many sources of data loss. Accidentally losing or deleting files causes a number of negative consequences, like personal inconvenience, data errors, material damage and loss in revenue. Here are some typical reasons why private and business files get lost or deleted.

- hardware defects on a physical disk
- faulty or unintended formatting of a physical disk
- unintended file deletion by the user
- defects within the IT infrastructure (e.g. server administration, connected devices)

Various user scenarios

MaxDataGenius helps you to find and recover single files and folders as well as entire logical volumes on a physical disk. The software is compatible with harddisks, but also with flash media, e.g. USB sticks and memory cards used with a smartphone or camera. The software also covers some additional features which will be presented in the context of specific data recovery scenarios and use cases for disk optimization. For example, the following scenarios are possible:

- scanning a physical disk for lost or deleted content
- exactly diagnosing disk performance
- creating logical copies of a disk with the help of disk images,
- recovering a disk by writing back disk images,
- creating direct copies of physical disks on other media,
- refreshing a disk by rewriting it in order to enhance its performance and data quality
- cleaning up physical disks by securely irrevocably overwriting disk space which is occupied by deleted files

Basic version and Pro version

MaxDataGenius is available in two versions with free demo versions for you to „try before buy“. The Basic version mainly adresses private and business users with common data recovery cases, common file systems and frequently used media. The Pro version adresses business users who frequently work with a variety of file types, and file systems. The Pro version also recovers files on less common or very specific file systems and disk types. It performs the same functions as the Basic versions, but offers a broader spectrum of scenarios including Disk Tools. You find detailed information on the versions in section 4.1

Please note: There is no guarantee that the software recovers all deleted or lost files correctly. Depending on the source and processes of data loss, it might not detect all certain files. In special cases, videos might need additional repair because they were recovered as damaged files according to their former file structure. If your video files are recovered but do not play as expected, you can download, test and use ***Video Repair Tool*** which is also available at www.grauonline.de.

3. Preparing MaxDataGenius for use

Caution

Data loss caused by software installation and execution on a damaged medium

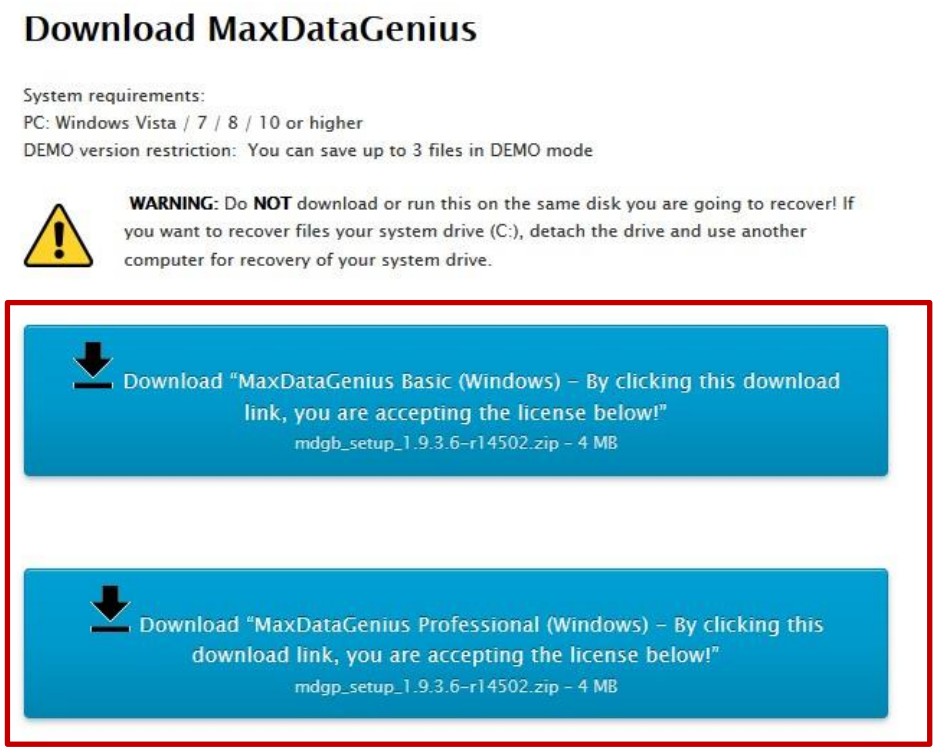
MaxDataGenius can cause or enforce data loss if the software is installed on the medium which you want to recover files on.

- Never download MaxDataGenius to a medium which you want to recover files on.
- Always execute MaxDataGenius on an external computer or disk.
- If required, use tools like a USB adapter in order to connect the medium concerned with an external computer.

You will only get an ideal data recovery result with MaxDataGenius if you download, unpack and install the software correctly. The following instructions lead you through the process..

3.1 Downloading the software

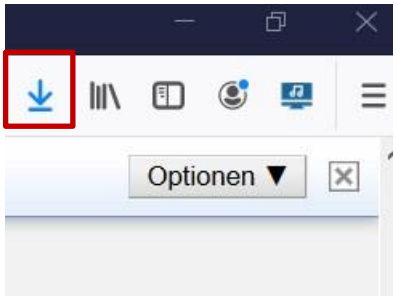
1. Open the website www.grauonline.de in your browser.
2. Below the tab ***Solutions*** which you find within the context menu, select the entry ***MaxDataGenius – High-quality Data Recovery Software***.
3. On the product information page, navigate to the download buttons.



Screen 1: Download buttons for MaxDataGenius

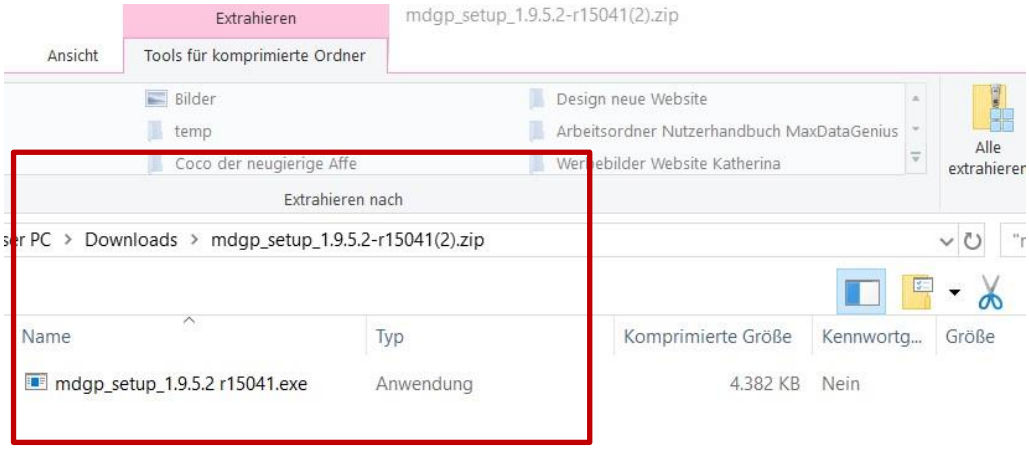
4. Select either the download for the Basic or Pro version, depending on your purposes.

    - The blue progress bar below the download symbol in your browser informs you about the download status.



Screen 2: Download symbol in your browser

5. Click on the download display to open your download file.



Screen 3: .zip file in the download folder

✓ The setup wizard for MaxDataGenius shows as a .zip file in a new dialogue window. You can now unpack the setup wizard and execute the setup.

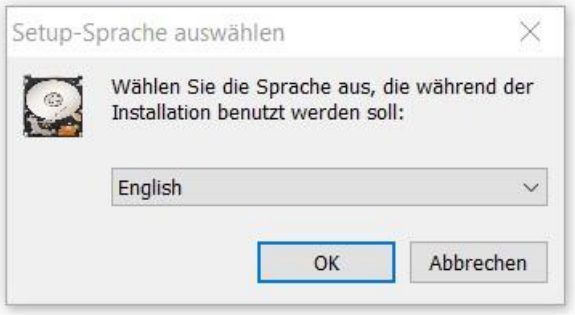
3.2 Unpacking and installing the software

1. Click on the setup wizard in order to start the software setup.

   ✓ The setup wizard has been unpacked.

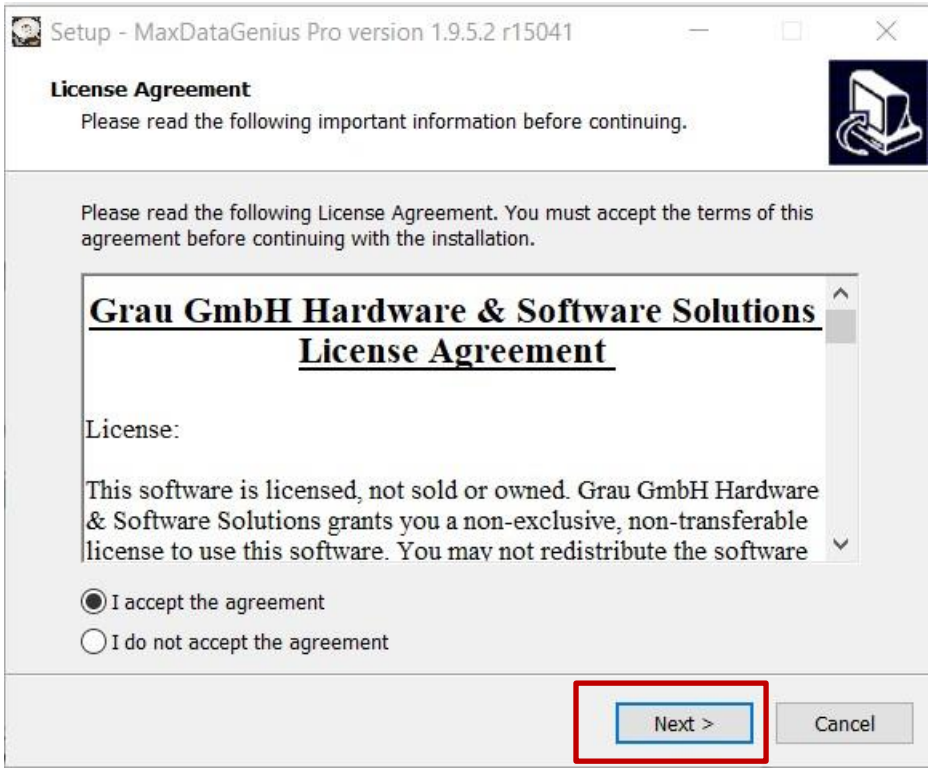
2. In the next dialogue window, allow the software to change the necessary configurations of your computer.

3. Select a language for the setup.



Screen 4: Language selection during setup

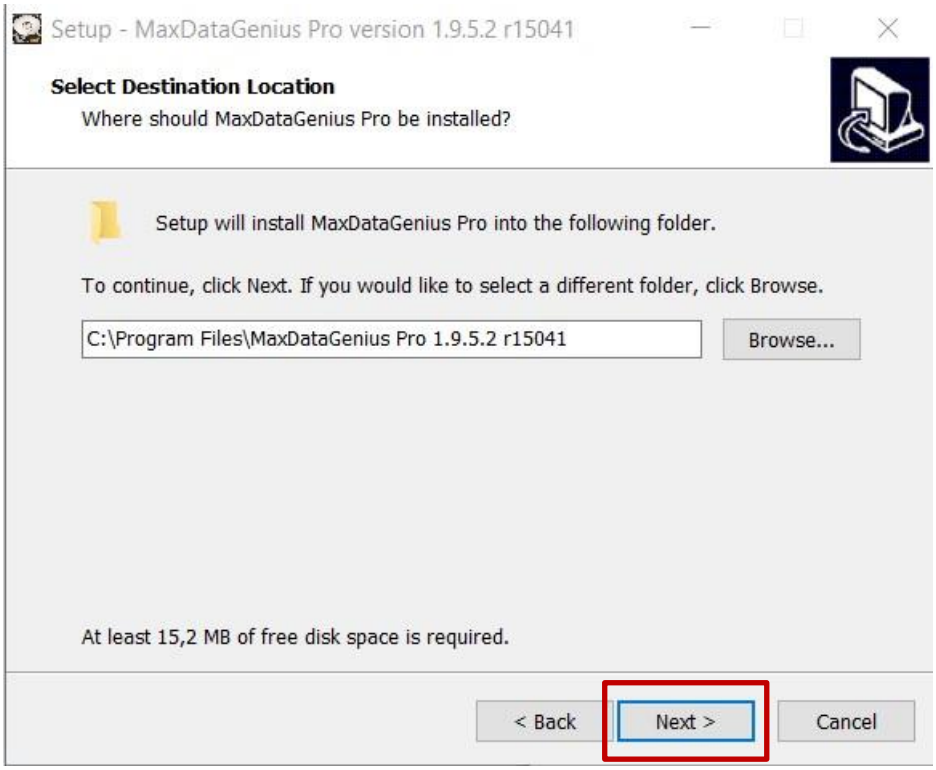
4. Confirm the license agreement and click on ***Next >*** in order to proceed.



Screen 5: License agreement during setup

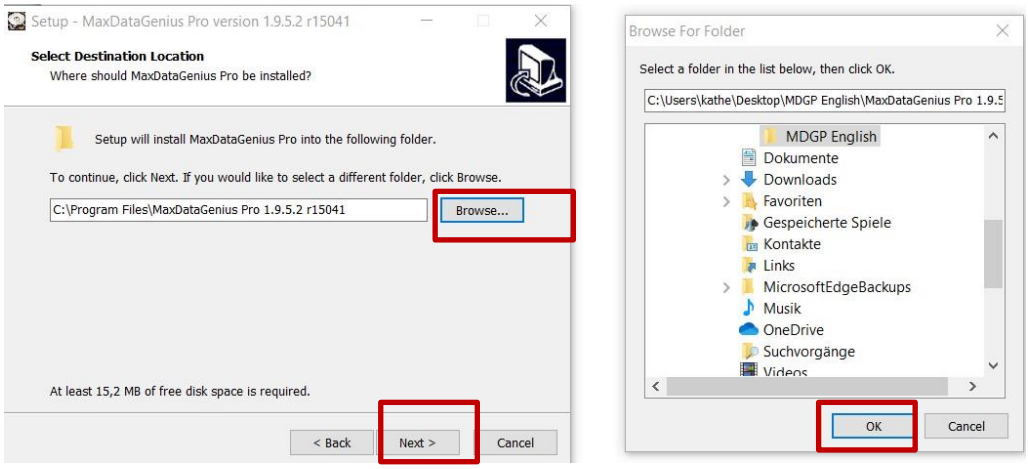
- The setup wizard now displays the path to the destination location.

5. Klick on ***Next >*** if you accept the intended location of storage .



Screen 6: Setup– selecting a destination folder

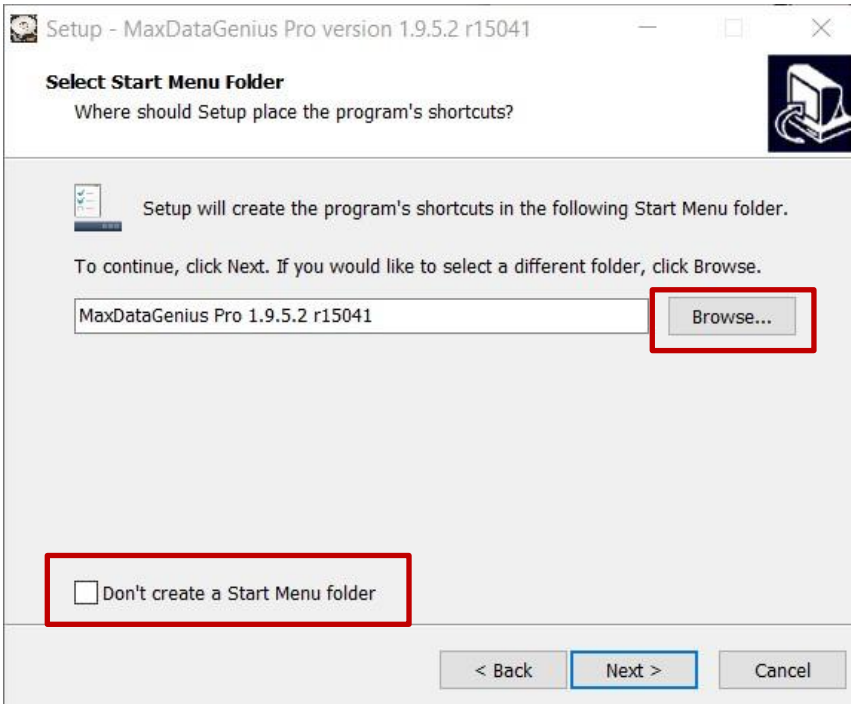
6. Alternatively, click on ***Browse*** in order to select a different destination location.
    - The new location of storage must not be located on the medium which you want to scan with MaxDataGenius.
7. Confirm your selection with ***OK*** and click ***Next >*** in the main dialogue in order to proceed.



Screen 7: Setup – alternative selection of a destination folder

- The software automatically creates a programme shortcut in your computer's ***Start Menu***. If you do not want a program shortcut, you can activate the checkbox below the folder list.

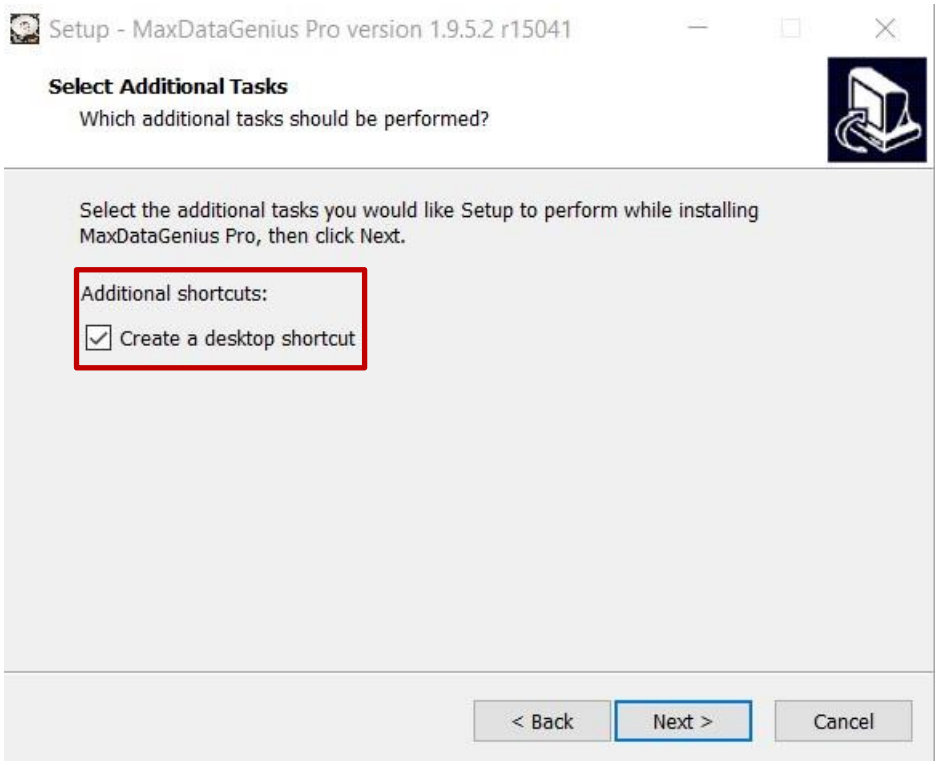
- You can also browse your folders in ordert to select a different destination location for your program shortcuts.



Screen 8: Activating or deselecting the Start Menu folder

8. Click ***Next >*** to proceed.

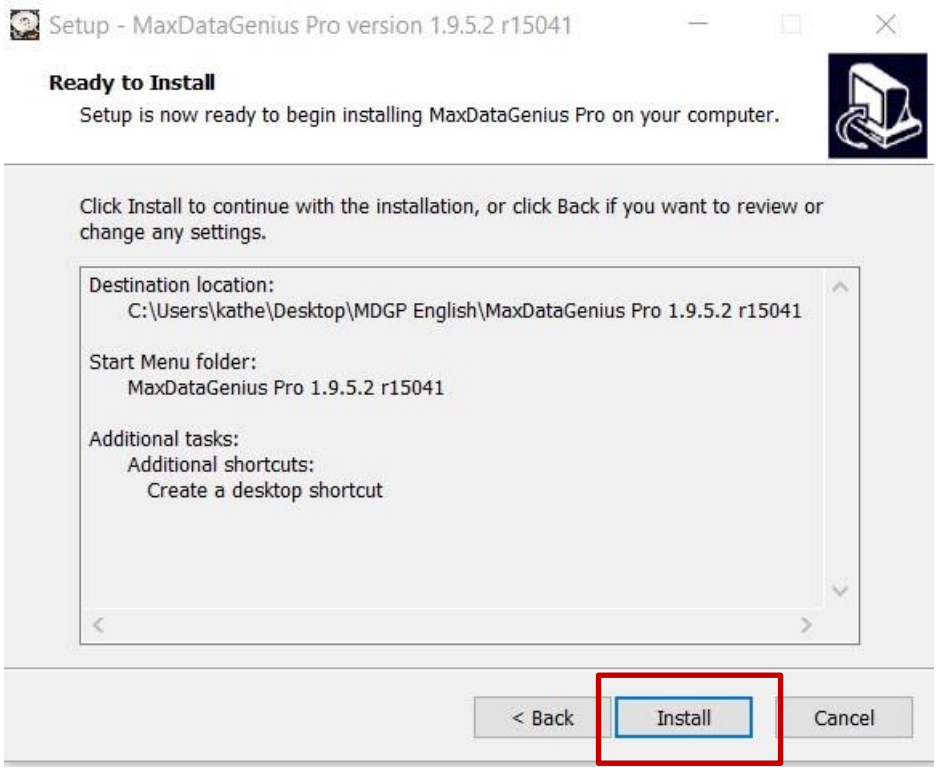
9. If required, activate the checkbox ***Create a desktop shortcut*** In the dialogue window ***Select Additional Tasks***.



Screen 9: Optional desktop shortcut

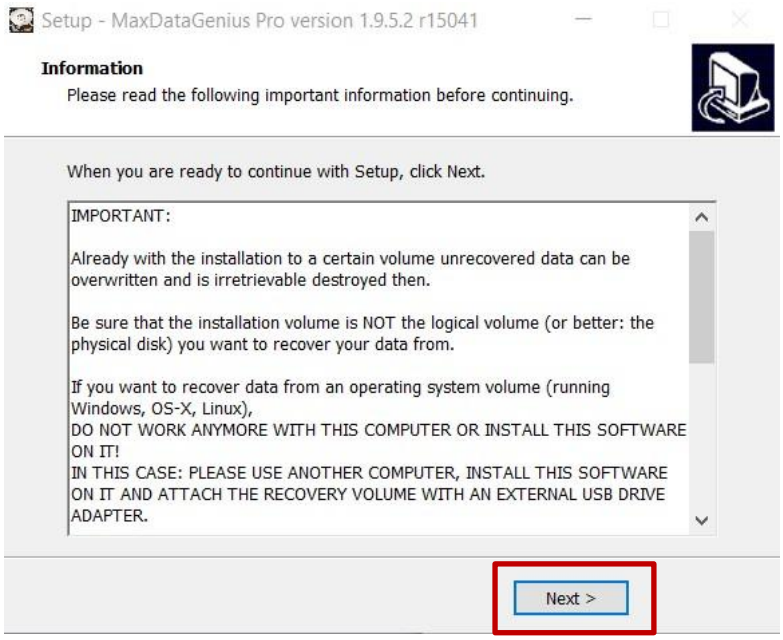
10. Click on ***Next >*** in order to proceed.

11. Verify the location of storage and click on ***Install***.



Screen 10: Starting the installation

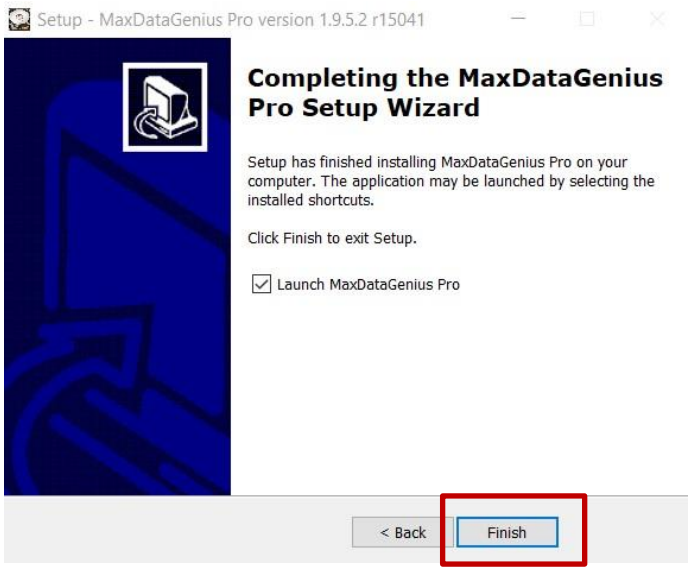
- The installation process starts automatically. A dialogue window with security instructions shows.



Screen 11: Installation – security instructions

12. Thoroughly read the security instructions displayed in the dialogue, then click on ***Next >.***

    - The following dialogue resumes the result of the setup process.

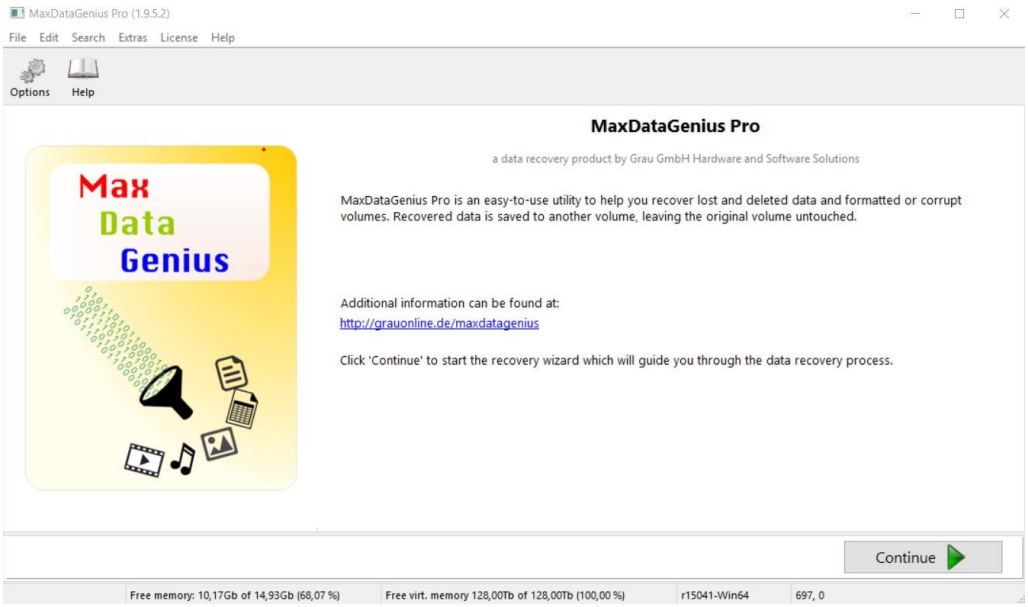


Screen 12: Finalizing the setup

13. Click on ***Finish*** in order to complete the setup process. Additionally activate the checkbox Launch MaxDataGenius Pro if you want to start recovering your data immediately.

    - In case you just installed the Basic version, the content of the checkbox is ***Launch MaxDataGenius Basic***.

      ✓ Your software is now available for use at its intended destination location.



Screen 13: MaxDataGenius – start screen

4. Versions and features of the software

MaxDataGenius disposes of a wide array of helpful features in order to recover files and to optimize a medium's structure and functionality. The following sections mainly address inexperienced users as they communicate some basic instructions about the programme. These are the following:

- similarities and differences between the Basic and Pro version
- the wizard principle as an integrated tool for user guidance
- the expert mode as an example how to configurate programme options
- a brief illustration of all options integrated in the programme

4.1 The software versions Basic and Pro

The Basic version generally covers all common functions and user scenarios. It is compatible with file systems and media which are used in common private and business settings.

Basic version

- **FAT12/16/32:** basic file systems which are integrated in Windows-based devices, e.g. flash media including memory cards, USB flash drives and harddisks)
- **exFAT:** usual file system integrated in memory cards
- **CDFS/ISO9660:** format for data storage for CDs
- **HFS+:** basic file system for Mac devices, mainly harddisks
- **LDM (Logical Disc Manager):** partition scheme in a Windows context
- **RAW:** data traces which are not related to a file system, last possible recovery option
- **VMDK:** creation of disk image files, logical disk copy and not a direct copy of a physical disk

Pro version

The Pro version additionally offers features for file systems which are mainly used in a professional IT expert setting. Possible user scenarios for Pro are Linux-based file systems and Windows servers.

- **ext2/3/4, ReiserFS, JFS:** basic file systems for Windows-based devices
- **UFS/XFS/ZFS:** file systems integrated in devices which are embedded in a Linux or Unix IT setting
- **ReFS:** file system running in the background of Windows servers (Win2012/Win8)

Furthermore, the Pro version offers features which are not available for Basic users. This is because these features are not relevant or necessary for the user scenarios covered by the Basic version. The software resumes theses features as Disk Tools.

- **Wipe feature**: overwriting single files or a complete physical disk safely and irrevocably
- **More features for optimization:** viewing a disk, diagnosing a disk, saving a disk, recovering a disk, copying a disk , refreshing a disk, cleaning up a disk
- **RAID recovery:** recovering a logical organisation system for several independent physical disks (RAID disk)

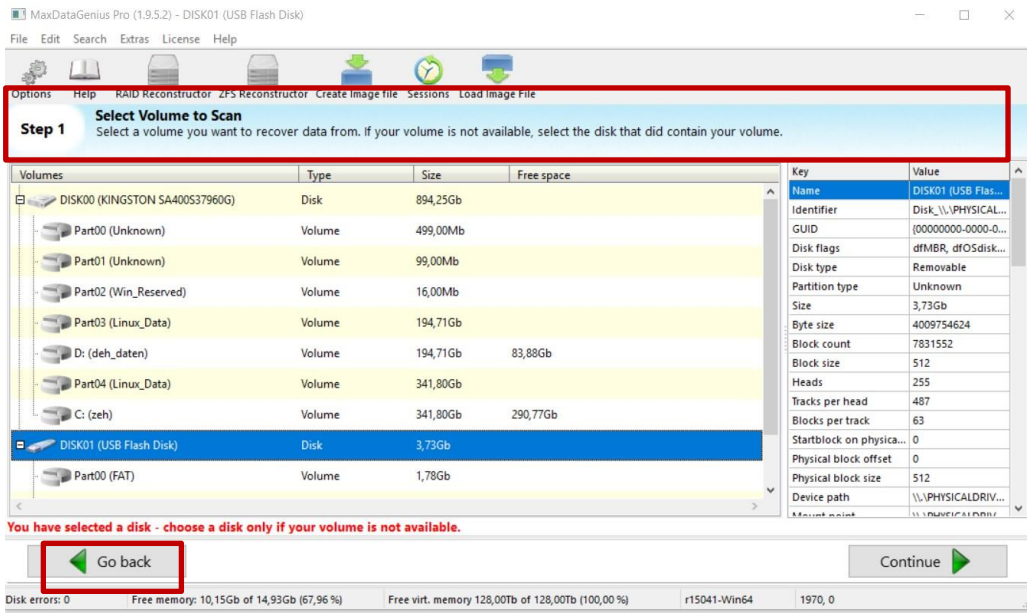
4.2 Quick orientation thanks to the wizard

User guidance through recovery scenarios

MaxDataGenius was developed according to a wizard principle. A wizard is a graphical user interface (GUI) which intelligently leads the user through all processes operated by a software. The user interfaces collects and resumes all necessary processes and functions running in the background. The wizard only displays those entries and pieces of information which the user requires to execute the programme step by step

The wizard principle helps the user in many ways:

- quick overview and orientation while running the programme
- efficient automatical assistance when errors and user questions occur
- easy and intuitive handling, also for inexperienced users
- simple user navigation, e.g. through the possibilities to automatically view the next instructions and to move back and forth in the process

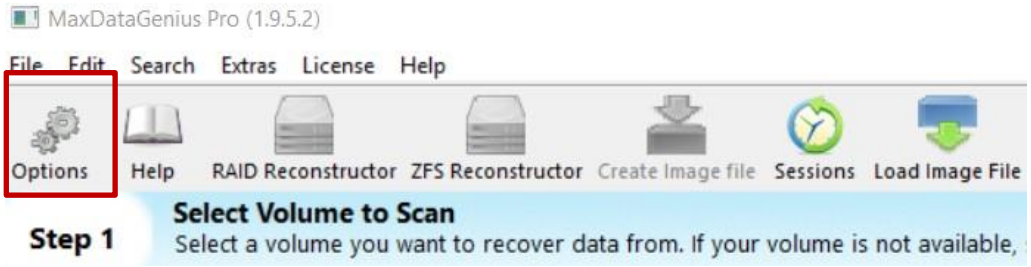


Screen 14: Example of wizard properties

4.3 More structure with the expert mode

The expert mode – not only for experts

Another auxiliary within the software is the expert mode which is part of the view options. As soon as the first dialogue window of the programme has opened, users can adapt the programme's features according to their purposes. This works via the tab ***Options*** which is located in the dialogue window.



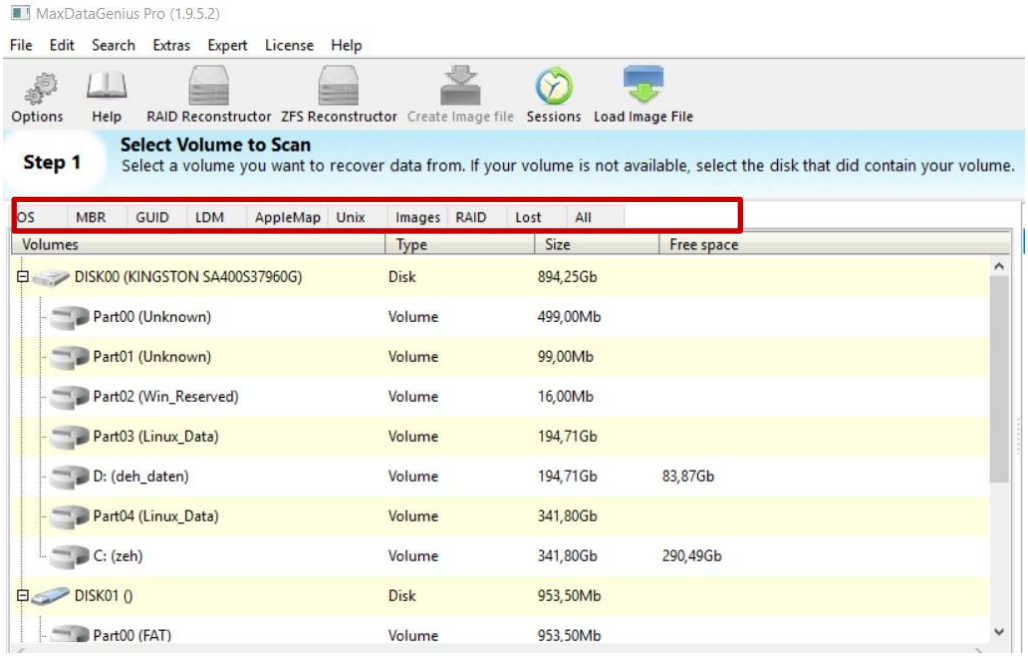
*Screen 15: The **Options** tag in MaxDataGenius*

Adjusting software options

Via the options, users can adjust the software's functionality in order to make data recovery quicker and more precise. Viewing all available volumes in the expert mode is helpful in order to grasp an overall structure from te beginning. The expert mode is located at ***Options > View Options***. In order to view users must activate the checkbox ***Enable Expert Mode***.

Structured view of partition schemes

In the dialogue window, the expert mode arranges disk contents according to partition schemes. This viewing mode offers a precise overview on all available file systems on a disk and on the files they contain. Clicking on a tab in the selection bar limits the view. Clicking on ***All*** resumes the view of the complete list.



Screen 16: Complete view of disks and volumes in the expert mode

Common tabs in the expert mode

Tab name	What does this mean?
OS	Operating System: ➲ commonly used term for a file system
MBR	Master Boot Record: ➲ integrated in the background processes of storage media until 2010 ➲ at present still used with storage media with a storage volume of in the Gigabyte range (e.g. USB flash drives, memory cards) ➲ located at block 0 in the bootloader ➲ contains a launch programme for BIOS-based computers and a partition scheme ➲ influences how disk space is assigned ➲ was introduced in the context of the recent UEFI booting interface for BIOS
GUID	Globally Unique Identifier: ➲ partition scheme which is integrated in the background

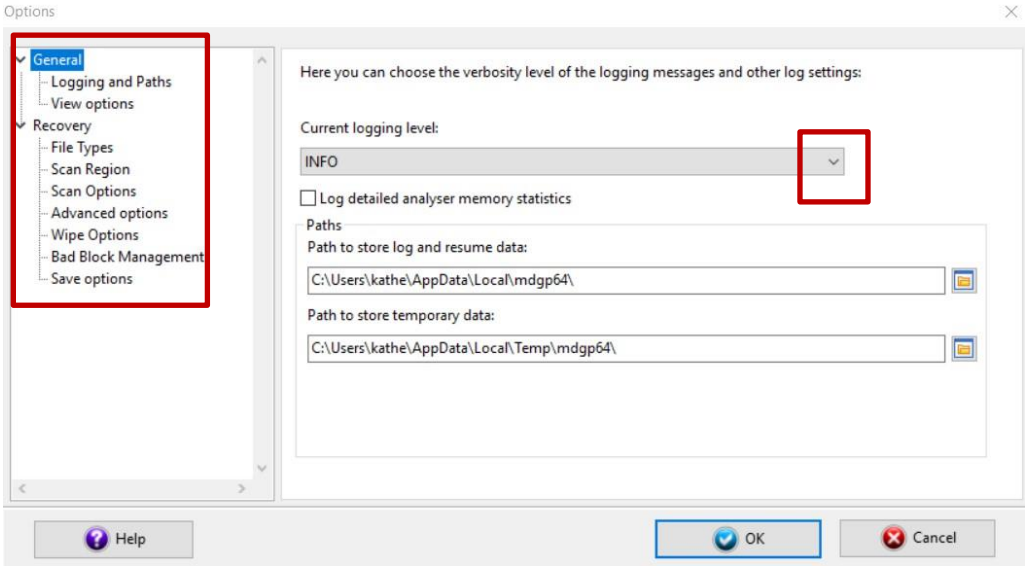
	processes of storage media with a high storage volume since 2010 ➲ replaces and integrates MBR ➲ fulfils the requirements of MBR to a greater extent
LDM	Logical Disc Manager: ➲ partition scheme running in the background pg a Windows-based file system ➲ influences how disk space is assigned ➲ enables special features like the composition and connection connection of disks and Windows software RAID through the Windows Dynamic Disks system ➲ not supported by the BIOS system
AppleMap	APM (Apple Partition Map) ➲ older partition scheme for Mac and Apple file systems which are based on Power PC and m68 ➲ replaced by GPT (GUID Partition Table) in 2006
Unix	Name of a specific file system which is mainly used by IT experts
Images	disk images: ➲ a logical image file created on the basis of a physical disk ➲ not a direct copy created on the basis of physical disk
RAID	Redundant Array of Independent Disks: ➲ RAID disk: logical organisation system for numerous physical disks ➲ creation of redundant (= repeated) data records in order to retain a RAID system if individual disks do not are damaged
Lost	damaged or lost files and volumes on a physical disk
All	all files , file systems and partition schemes which are located on a physical disk

4.4 Software options at a glance

Individual adjustment at several levels

Apart from the view options, MaxDataGenius offers a number of different options. The user can easily activate or deactivate, specific features by clicking on their checkboxes. With the expert mode as an example, chapter 4.3 has illustrated how to find and adapt the options according to the user's purposes.

It is possible to configurate individual parameters on several levels. After the user has clicked on arrow-down-button, a dropdown menu opens. The software also enables the user to enter individual values into certain input fields. The options are divided into ***General*** and ***Recovery***, according to their range of application. In the following sections of the manual, the available programme options will be briefly explained and illustrated.



Screen 17: Summary of available options with dropdown menus

4.4.1 General – *Logging and paths* and *View options*

Logging and paths

Target group: all users

Logging ist defined as the automatical and ongoing data writing process in the background of every software. With MaxDataGenius, users can individually select a logging level which fits their purposes in data recovery and process documentation. The selection of a logging level is possible within the option dialogue ***Logging and paths*** and then via the dropdown menu ***Current logging level***. The following chart lists and illustrates the logging levels in a hierarchical order.

Logging level	Log content	Who selects this level?
None	➲ no logfile	Users who do not want or need a logfile
Report	➲ results of data recovery processes, briefly resumed	Users who are not especially interested in detailed background information
Error	➲ results of data recovery processes ➲ display and list of errors and failed operations	Users who immediately want to detect and eliminate errors
Warning	➲ results of data recovery processes ➲ display and list of errors and failed operations ➲ display and list of additional warning messages created by the programme	Users who immediately want to detect and eliminate errors, users who want to anticipate further potential error sources
Info	➲ results of data recovery processes ➲ display and list of errors and failed operations ➲ display and list of additional warning messages created by the programme ➲ detailed automatical documentation of all relevant processes running in the software's background	Users who want to go deeper beyond the graphical user interface, e.g. for internal documentation purposes or in order to send proofs to a third party
Debug and Debug 2	➲ extensive or complete logfile with all relevant details about individual processes	Mainly developers and IT experts who deeply analyse and eliminate errors in within a file system

> **Tip:** For most users, selecting the logging level ***Info*** or below is sufficient. Select ***Report*** if you are going to scan a disk with a huge data volume (1 TB and more).

Users can also select the logging level ***Info*** via the programme's menu bar. This functions via ***Extras>Show scan log***. Via ***Extras>Show scan report***, it is possible to view more detailed log contents.

MaxDataGenius' log contents are also available from outside of the programme. This works on a Windows-based computer via the path ***Start>Execute>Entry***. The correct command in order to view logfiles is ***%localappdata%.*** All current logfiles are located in the programme folder for MaxDataGenius, which is either ***mdgb64*** or ***mdgp64*** (with the Basic and Pro version for 64 bit). It is now possible to zip the logfiles and to transfer them.

View options

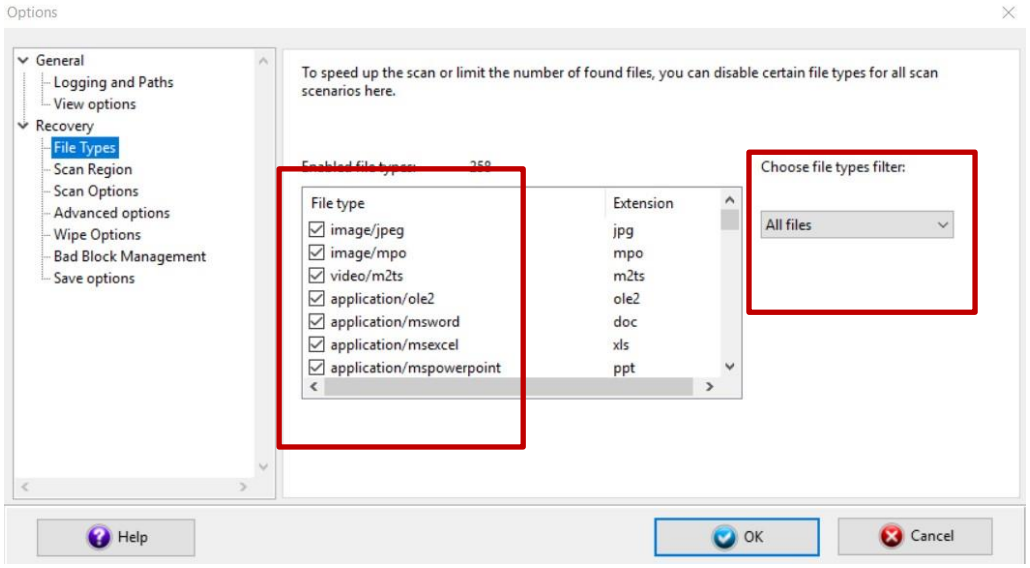
With the ***View options***, users can adapt two parameters:

- ***Enable Expert Mode***
- ***Automatically remove empty folders***

4.4.2 Recovery – *File Types*

Target group: all users

Under the option ***File Types***, users can individually select file types and file formats which they want to search on their disks. They can filter the results which they want to get during a scan by deselecting all checkboxes for file types which they do not need in the dropdown menu. All in all, users can choose between 258 file types and filter their results



Screen 18: Selecting and filtering file types

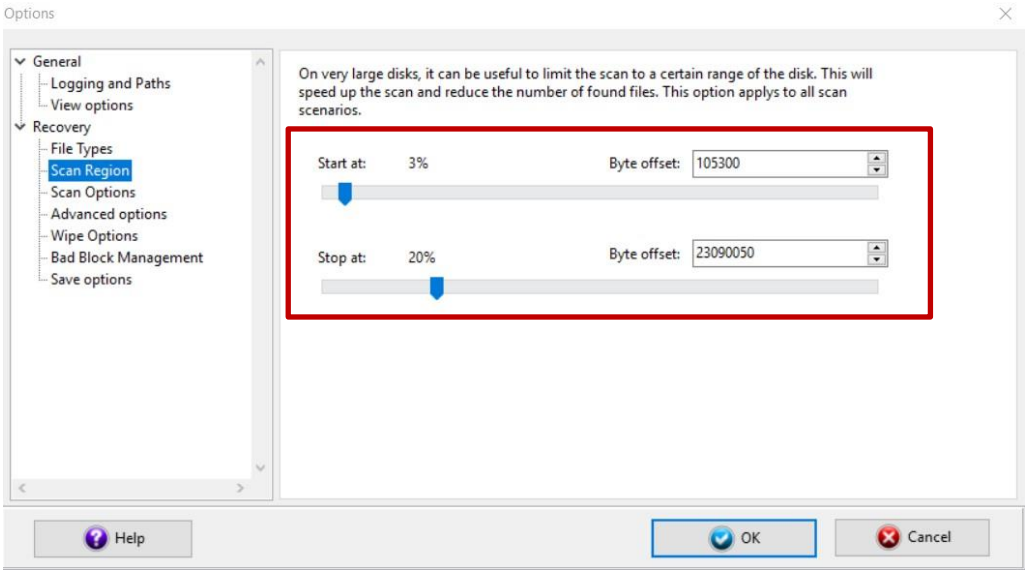
Tip: If you select the file types to be searched for precisely and correctly, the programme speeds up its disk scan.

4.4.3 Recovery – *Scan Region*

Target group: expert users

Disk scans can take a lot of time, especially if the software has to scan a high data volume on a physical disk. In order to structure the scanning process and thus to save time, the user can limit the scan region on the disk. This functions via the scroll bars ***Start at*** and ***Stop at*** in the option dialogue ***Scan Region***. Alternatively, it is possible to adapt the scan region via ***Byte Offset***.

Important note: Common scenarios of use do not include or require any changes regarding the scan region. The option ***Scan Region*** was provided for expert users, e.g. if they need to scan a disk for RAW files. Changes concerning the scan region can reduce the quality of scan results.



Screen 19: Scan region – an option tailored to professional users

4.4.4 Recovery – Scan Options

Adjusting scan options is another possibility to save time for a disk scan with a high data volume. Via ***Scan Options***, users can also stop, pause and continue a scanning process.

Target group: mainly expert users

Scan Option	Results of activation or input
Detect deleted files in Formatted Scan (only FAT)	➲ only to be applied with FAT-based file systems which run in the background of a Windows- based operation system ➲ only to be applied on formatted media
Collect only root items in Formatted Scan (only NTFS)	➲ only entries within a volume's root directory are found ➲ only tob e applied with NTFS-based file systems ➲ files and subdirectories on deeper directory levels are not found ➲ recommended for NTFS-based volumes of 1 TB and higher in order to reduce the RAM memory requirements during a scan
Ignore all errors during the scan (no user prompts)	➲ less information about errors and potential damages for the user ➲ recommended for long-term scan processes on disks with a huge data volume (more than 500 GB)
Enable scan resume functionality	➲ possibility to flexibly time scan processes and to interrupt them ➲ more user security during long-term scans ➲ only to be applied with the file systems RAW, FAT, NTFS, REFS and exFAT
Use scan resume to lower RAM usage	➲ only to be applied with RAW file scans ➲ data saved during a scan (session data) is directly filed on the harddisk and not in the main storage

	➲ storage of offset data in the folder ***%localappdata%\mdgX64\ sessions***
	➲ no further storage of session data above the limit set by this specification
Ask for deletion of old resume data on new scan	➲ users can influence volume data and the size of the logfile
Maximum resume data size (MB)	➲ limited by maximum value
	➲ input field for experienced or expert users
	➲ with an insufficient value, not all files found on a disk can be listed after a scan has been resumed

4.4.5 Recovery – Wipe Options

Target group: expert users

Users can adapt the ***Wipe Options*** in order to wipe files and folders on a disk safely, irrevocably and according to their purposes. The ***Wipe Options*** fulfil a safety function and are integrated in the software's ***Disk Tools***. With the wipe function, the software overwrites the complete disk. Users can select their preferred Wipe method in the option dialogue ***Wipe Options***. When it comes to recent disk types in a flash or SSD format, the wipe method usually does not matter. In the case of magnetical media like floopy disks or older harddisks, the selection of a wipe method and its overwriting pattern influences how safely the programme wipes a disk.

There are three possible wipe methods which are presented in the following chart.

Wipe method	Results of activation
Toggling bits	➲ disk is overwritten with a pattern composed of the numbers 0 and 1 ➲ safety degree with regard to an irrevocable deletion: medium(for magnetical media) ➲ time duration: medium
Write zeros	➲ disk is overwritten with a constant zero pattern ➲ safety degree with regard to an irrevocable deletion: low(for magnetical media) ➲ time duration: short
Random numbers	➲ disk is overwritten with a pattern composed of random numbers ➲ safety degree with regard to an irrevocable deletion: high(for magnetical media) ➲ time duration: long

It is furthermore possible to activate or deselect the checkbox Create wipe report. So the user can individually decide if the logfile shall include the wipe report.

Tip: Before you select a wipe method, find out about all safety requirements regarding your wiping process. If your magnetical medium contains sensitive data, select ***Random numbers***.

4.4.6 Recovery – Bad Block Management

Caution

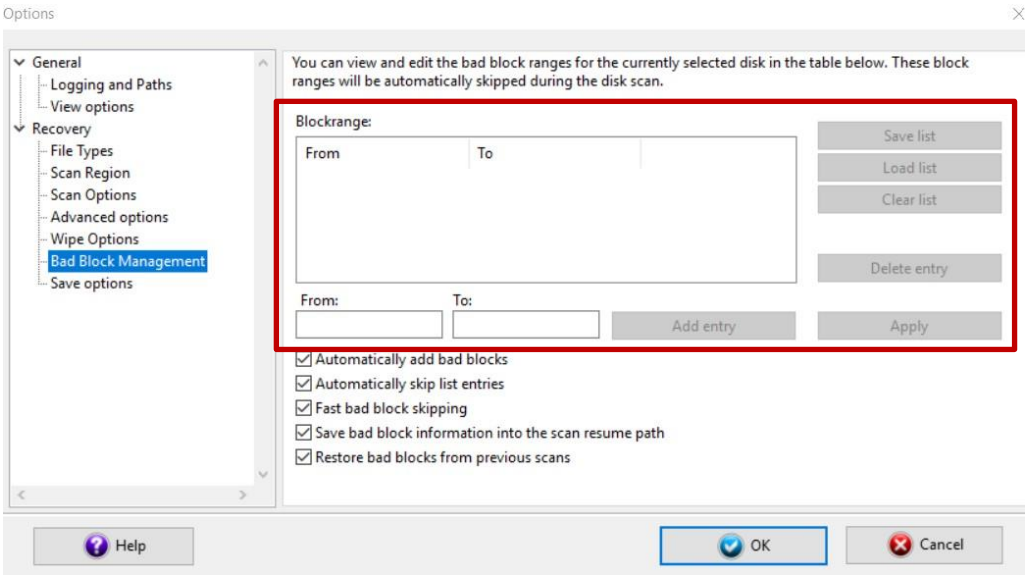
Data loss if damaged disks remain in use

Damage concerning data structures and data loss can occur if you keep using a disk which contains bad blocks.

- Create a disk image (as presented in chapter 0) before scanning your disk if you suspect your disk to contain bad blocks.
- Check your disk with Disk Diagnostics (as presented in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**) before you start recovering files.
- Transfer your files on a safe and intact medium before you start recovering files.

Target group: all users

Bad blocks are defined as individual data fields on a physical disk with structural damages.Users can view, save or delete a list of intact and bad blocks in the ***Block range*** unter the option ***Bad Blocks Management***. It is also possible to manually delete entries or to add individual entries in the input fields ***From*** and ***To***. All changes are confirmed via ***Apply***.



Screen 20: Display window for bad blocks in MaxDataGenius

Below the block range, there are some checkboxes which are listed and illustrated in the following chart.

Operation if bad blocks occur	Result of activation
Automatically add bad blocks	➲ bad blocks on a physical disk are automatically listed ➲ displayed as entries within the block range display
Automatically skip list entries	➲ during a scan, list entries which had already been listed are skipped ➲ saves time and preserves the disk structure
Fast bad block skipping	➲ entries which have already been listed are skipped faster ➲ time-saving, but not precise: intact blocks can be accidentally ignored z
Save bad block information into the scan resume path	➲ saved bad block information in the offset data (as presented in chapter 4.4.1 und 4.4.4) ➲ grants user insights into the current block structure for disk diagnosis
Restore bad blocks from previous scans	➲ bad block information is added to the entries listed in the block range display ➲ reminds the user oft he software's previous scan results ➲ logfile is completed in a chronological order

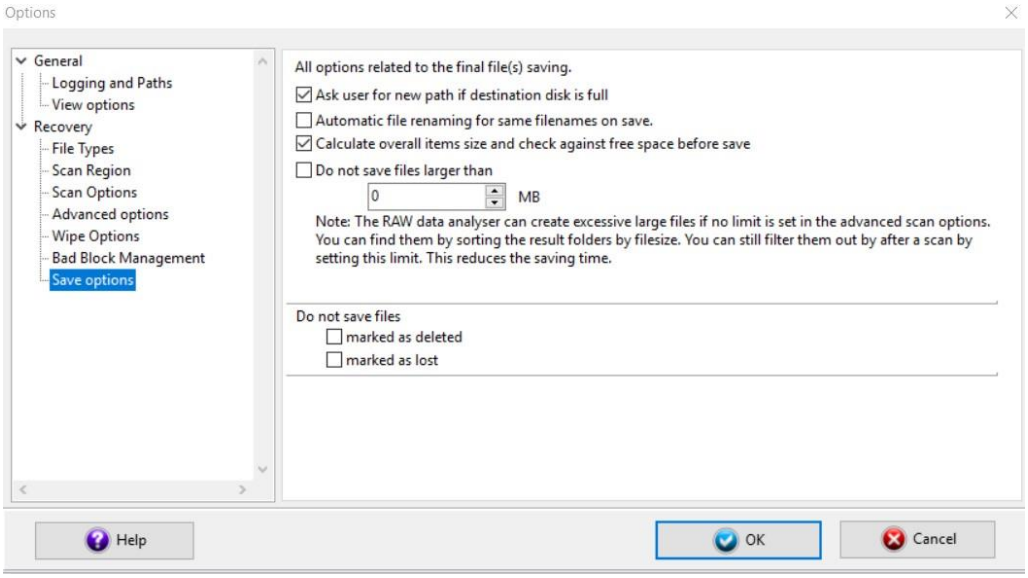
Tip: Activate all the checkboxes listed in the chart above and do not deselect them. These standard configurations help you to get an overview on your disk's structure quickly and easily. They also make sure that the programme's functionality can be used to its full extent.In order not to lose important information, regularly save your block range.

4.4.7 Recovery– Save Options

Target group: expert users

In the options dialoge ***Save Options***, users can choose which processes in the background must run and deactivate the one which shall not run. They can decide to which degree they want to receive information about the disk space on a storage medium and the data volume which is to be filed. They can activate and prohibit the storage of deleted and lost files. Furthermore, it is possible to activate or to avoid an automatical naming of doubled files. Finally, the user can limit the size of the files saved by the programme. All files exceeding this limit are not saved. The latter aspect is relevant for RAW files because they often take much disk space and need not be stored completely.

Important note: Limiting the size of stored files is only recommended if the user exactly knows the sizes of files which he or she wants to recover. A video with a known maximal file size of 2 GB serves as an example. When the software is run for the first time, it is not necessary to set a file size limit. It makes sense to set the limit if scan results have already been viewed and analysed. In this case, a limit can make further scans quicker and easier.



*Screen 21: Overview of **Save Options***

4.4.8 Revovery – Advanced Options

The options dialogue Advanced Options includes some checkboxes and input fields for experienced and expert users who want to adjust the sofware's functionality.

Target group: expert users

Option name	Results of activation
Enable quick scan for searching lost volumes (search on partition boundaries instead of every block)	➲ The software does not scan a disk block by block, but detects free space in the partition structure (partition boundaries). ➲ Partition boundaries become points of orientation during scans. ➲ quicker scans and recovery operations than block-by-block scans ➲ less precise results, especially for complicated data recovery scenarios ➲ recommended option directly after data loss has occurred
Show deleted files on volume browse (if this is possible without a scan)	➲ only to be applied with the file systems FAT, exFAT and NTFS ➲ deleted files are displayed without a scan, depending on how files got lost or were deleted
FAT filesystem: Enable FAT reverse lookup table	➲ file recovery by means of the cluster numbers which are located in the partition table of a FAT-based disk ➲ cluster: defined as several composed blocks within a partition table (as presented in chapter 4.4.6) ➲ examples of use: mobile harddisks with a data volume of 250 GB or less, USB flash drives, memory cards) ➲ softare tries to recover the cluster structure with the help of specific algorhithms ➲ to be applied after previous data recovery trials for a FAT-based medium failed

	➲ longer time duration of saving and display processes after activating this option
FAT filesystem: Enable high cluster reconstruktion	➲ scenario of use: deleted files which are located in a root registry of a FAT-formatted medium ➲ reconstruction of cluster numbers in the context of a Windows-based operation system ➲ activation optimizes file recovery results ➲ to be applied after previous data recovery trials for a FAT-based medium failed ➲ not to be applied with OS-X and Linux file systems

In the options dialogue ***Advanced Options*** it is possible to adapt the minimal and maximal RAW file size with the ***RAW Analyser***. This method is recommended for high-volume video files which are only availabe as data traces. Users can further automatically compose scattered file elements while recovering MPEG video files. Therefore, they must activate the checkbox ***Try to concatenate broken MPEG video streams.***

Tip: Before you recover RAW files, detect the size of concerned files. As a consequence, your data recovery results will be more precise. If you recover high-volume video files, heighten the value ***Bytes Maximum*** to 10 GB and exclude very small file fragments by adapting the value ***Bytes Minimum***. The software then skips file fragments which are too big or too small.

5. Finding and recovering data on a medium

The software includes a number of data recovery scenarios in order to find and recover files and folders. These will be presented in the following chapters. You can browse volumes in order to easily grasp the content of your disks while searching for files and folders (chapter 5.1). Furthermore, you can recover deleted files on physical disks (chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**) and search for lost logical volumes (chapter 0.o). In case data loss was caused by faulty or unintended disk formatting you can scan a formatted disk to find and recover your files. If you are going to run extensive scans, it is recommended to create disk images(chapter 0).

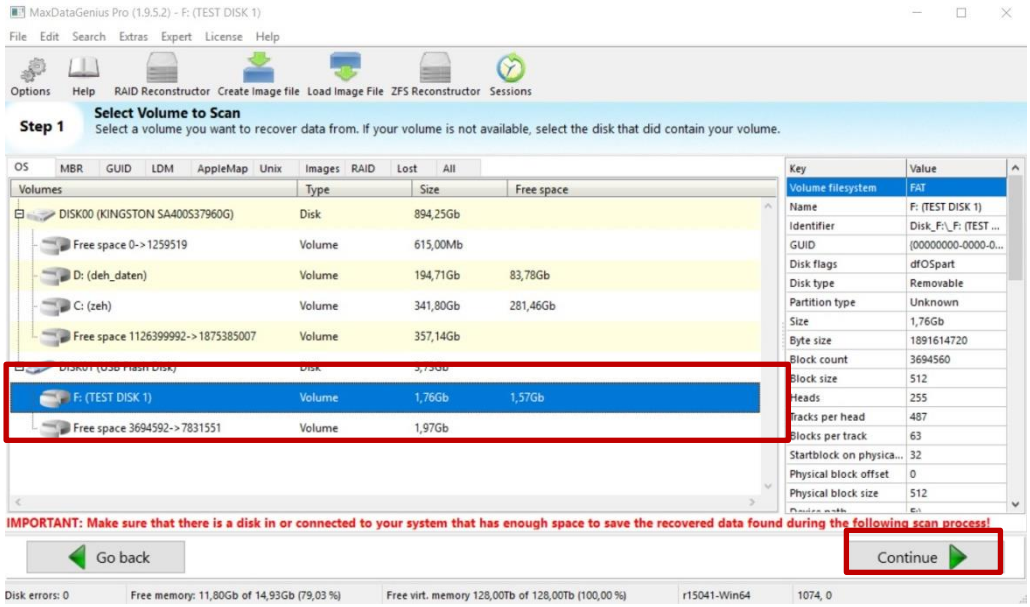
Tip: Before you start recovering files and folders, always make sure that you an internal or external medium with enough disk space..

5.1 Exploring volumes

User scenario: Browse volume

You can browse volumes with MaxDataGenius. This means that you can open and view individual folders and complete volumes on an intact physical disk.Depending on how your files got lost or deleted and which file system you use, the software immediately displays and highlights lost files during browsing

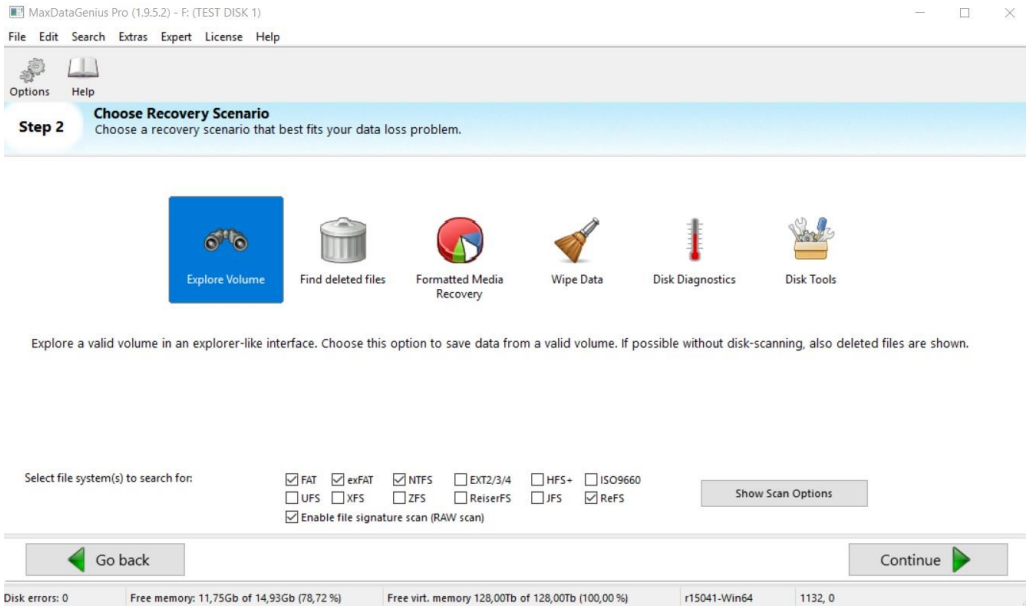
1. Start MaxData Genius in the Basic or Pro version.
2. Select the volume you want to operate with.
    - The volume is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the volume's properties.



Screen 22: Selecting a volume

3. Click on ***Continue***.

    - The software opens a dialogue window with possible data recovery scenarios and file systems.

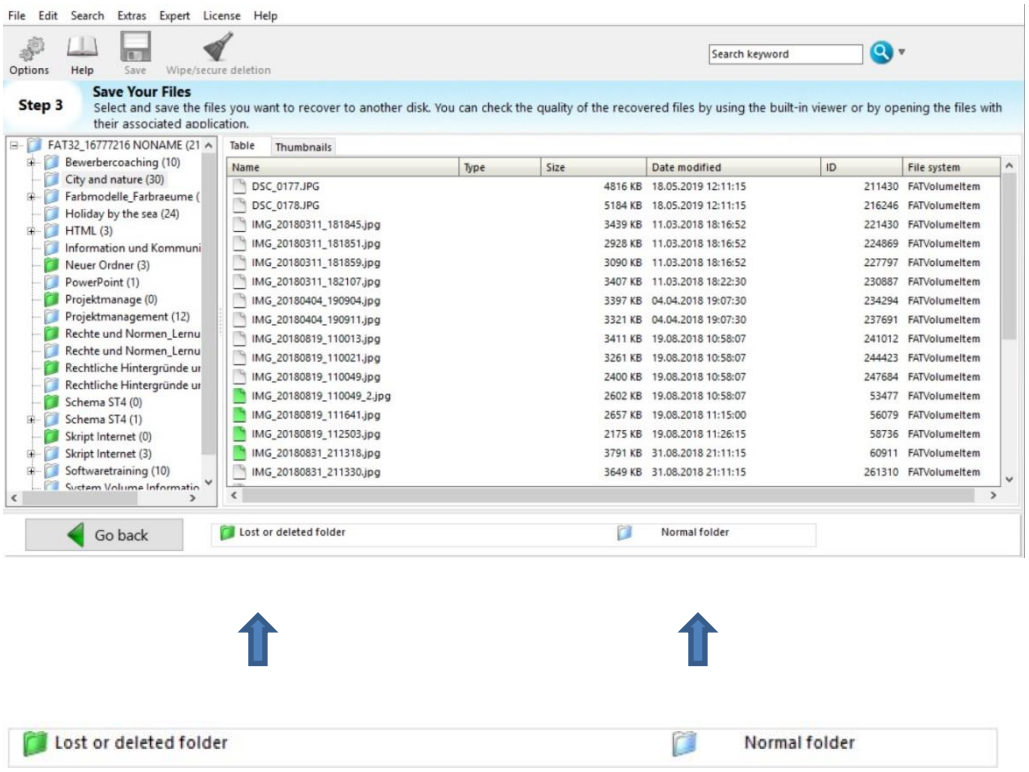


Screen 23: Selecting a recovery scenario

4. Select ***Explore Volume*** and then click on ***Continue***.

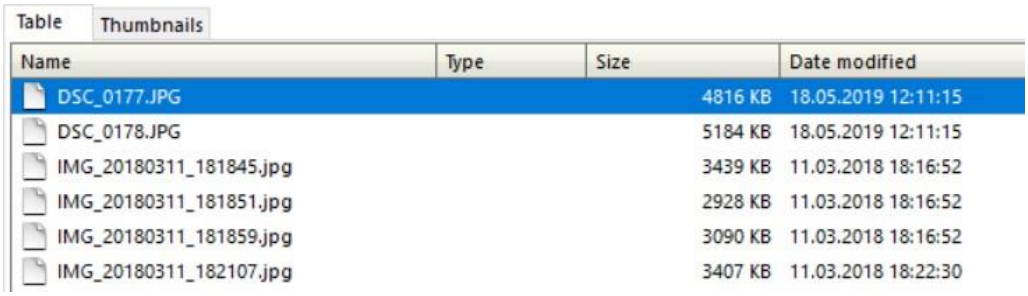
Screen 24: Detailed view of recovery scenarios

- In the following dialogue you can view all folders which are located on the volume. In this view mode, lost and deleted folders are marked in green



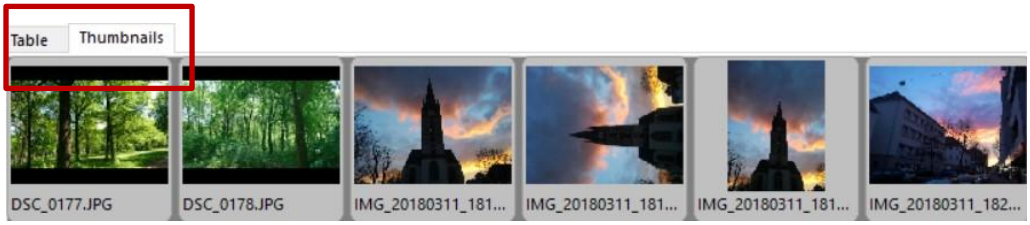
Screen 25: Browsing and viewing lost and deleted folders

5. Search your files in the folders displayed in the dialogue window.



Screen 26: Folder content listed in the table view mode

- For quicker orientation, you can switch between a chart and miniature pictures.



Screen 27: Detected files in the thumbnail view mode

6. If you do not immediately find your files by browsing the volume, also search for them in the folder ***$RecycleBin***.

   - Depending on the deletion process and disk type, it is possible that the folder named above does not exist for the volume.

     ✓ By exploring your volume, you have found the files you were looking for. Now you can store them at another storage location via the button ***Save***.

5.2 Recovering deleted files and finding lost volumes

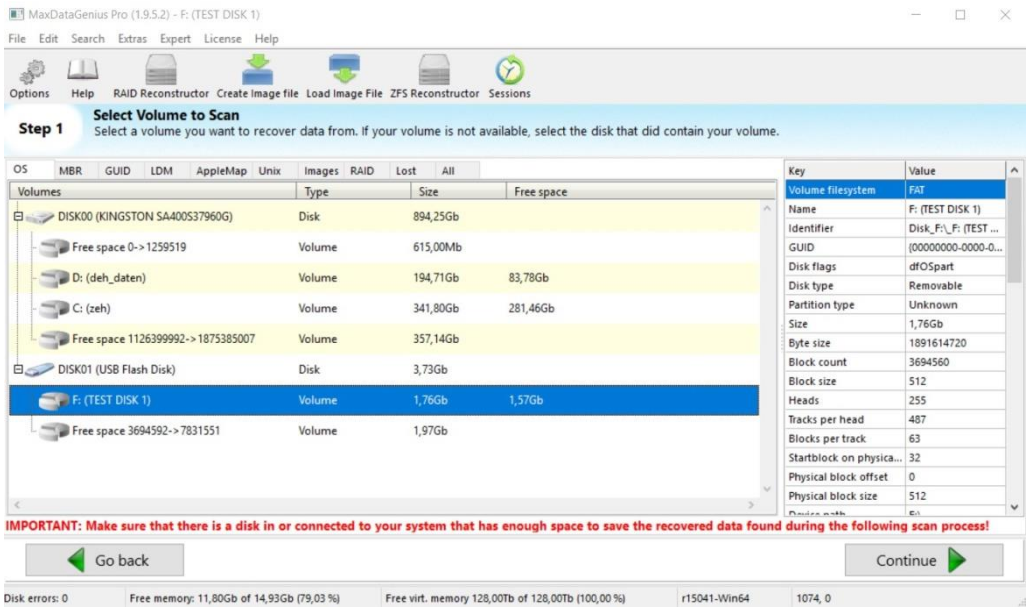
Deleted files and folders are often hidden in lower directory levels.It happens that they cannot be displayed via exploring a volume.In this case, you can conduct a targeted volume scan. If you lost or unintendedly deleted an entire volume on your physical disk, you can also find and recover it.The following chapters 5.2.1 and 5.2.2. will show you how to achieve these goals.

Targeted scans for lost or deleted files or volumes

5.2.1 Scanning volumes for lost or deleted files

The following instructions help you to recover lost or deleted files on a medium.

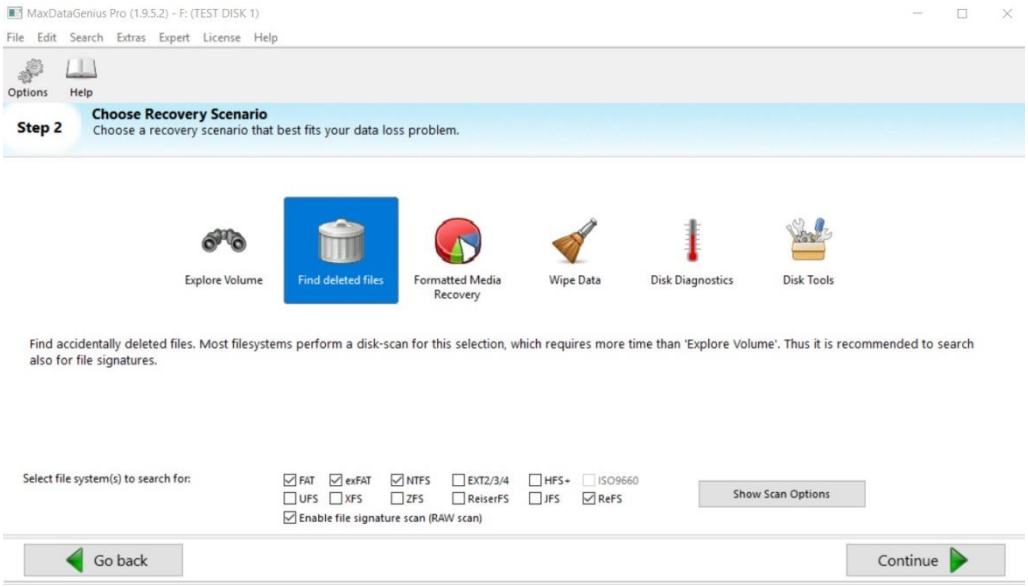
1. Start MaxData Genius in the Basic or Pro version.
2. Select the volume you want to operate with.
    - The volume is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the volume's properties.



Screen 28: Complete list of volumes located on a physical disk

3. Click on ***Continue***.

- The software opens a dialogue window with possible data recovery scenarios and file systems.



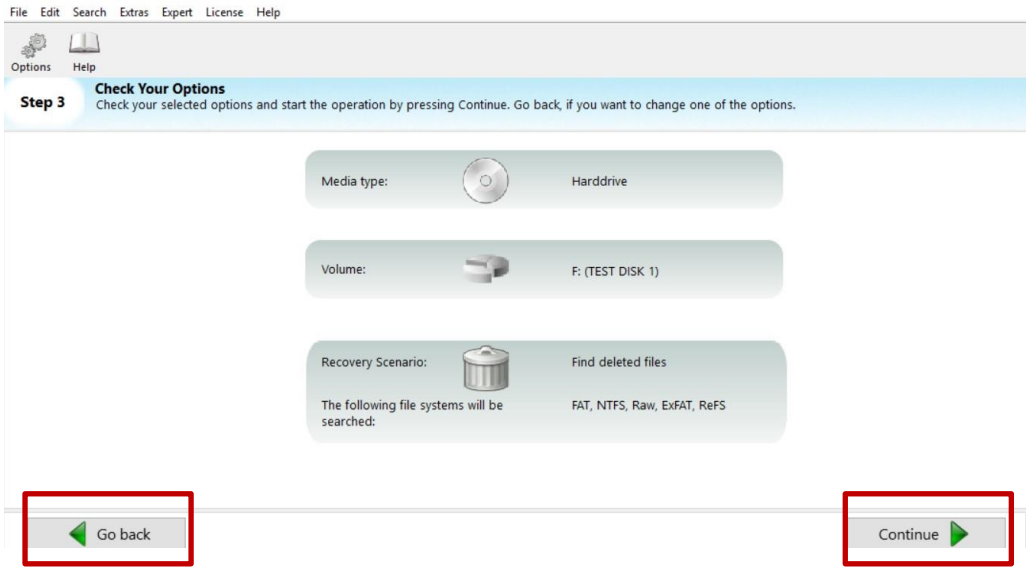
Screen 29: Dialogue window with recovery scenarios and file systems

4. Select ***Find deleted files*** and then click on ***Continue***.

Screen 30: Seleted recovery scenario, highlighted in blue

5. Verify if you correctly selected the data recovery scenario, the logical volume and the file systems to b e scanned. Then click on ***Continue***.

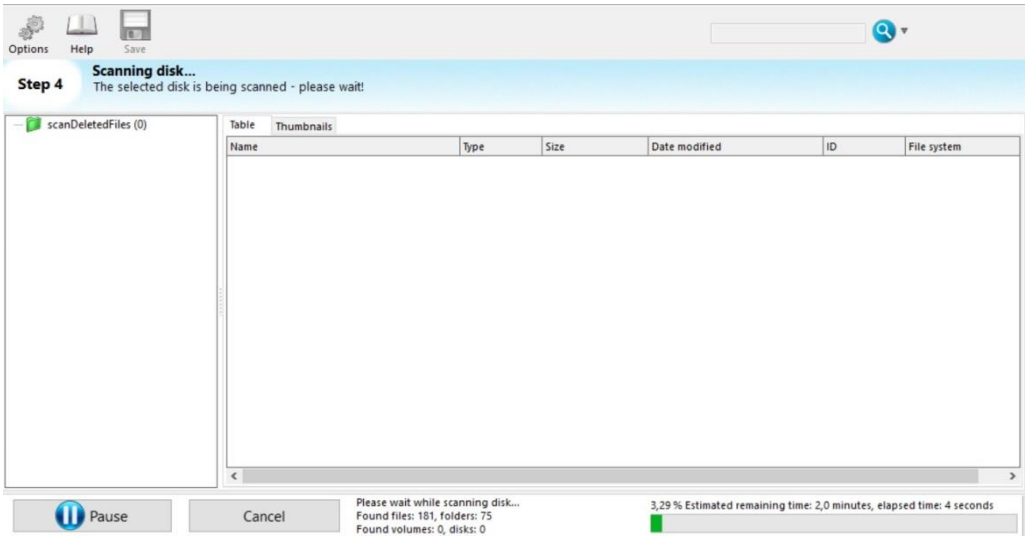
   - After an incorrect selection, you can click on ***Go back*** in order to change it.



Screen 31: Confirming or resetting the recovery scenario

- MaxDataGenius now scans the volume's file systems which you selected beforehand for deleted files and folders. Depending on the volume size and file sizes, a scan can take a various time period, from a few minutes to several hours.

Tip: Before evey disk scan, only select file systems which probably were relevant storage locations for your files. Consequently you can reduce the time period needed for your scan.For your orientation, you find a list of file systems in chapter. 4.1.

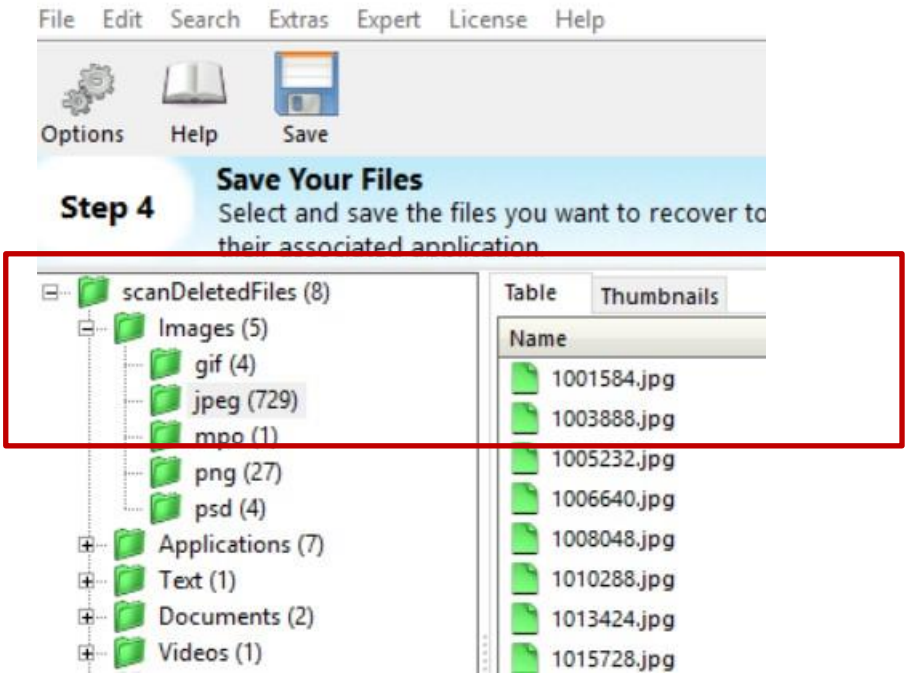


Screen 32: Progress during disk scan

- As soon as MaxDataGenius has scanned the entire volume, all deleted files and folders are presented in a dropdown list. The dropdown list is located at the left border of the dialogue window.

6. Select the folders which you want to browse (as presented in chapter 5.1).

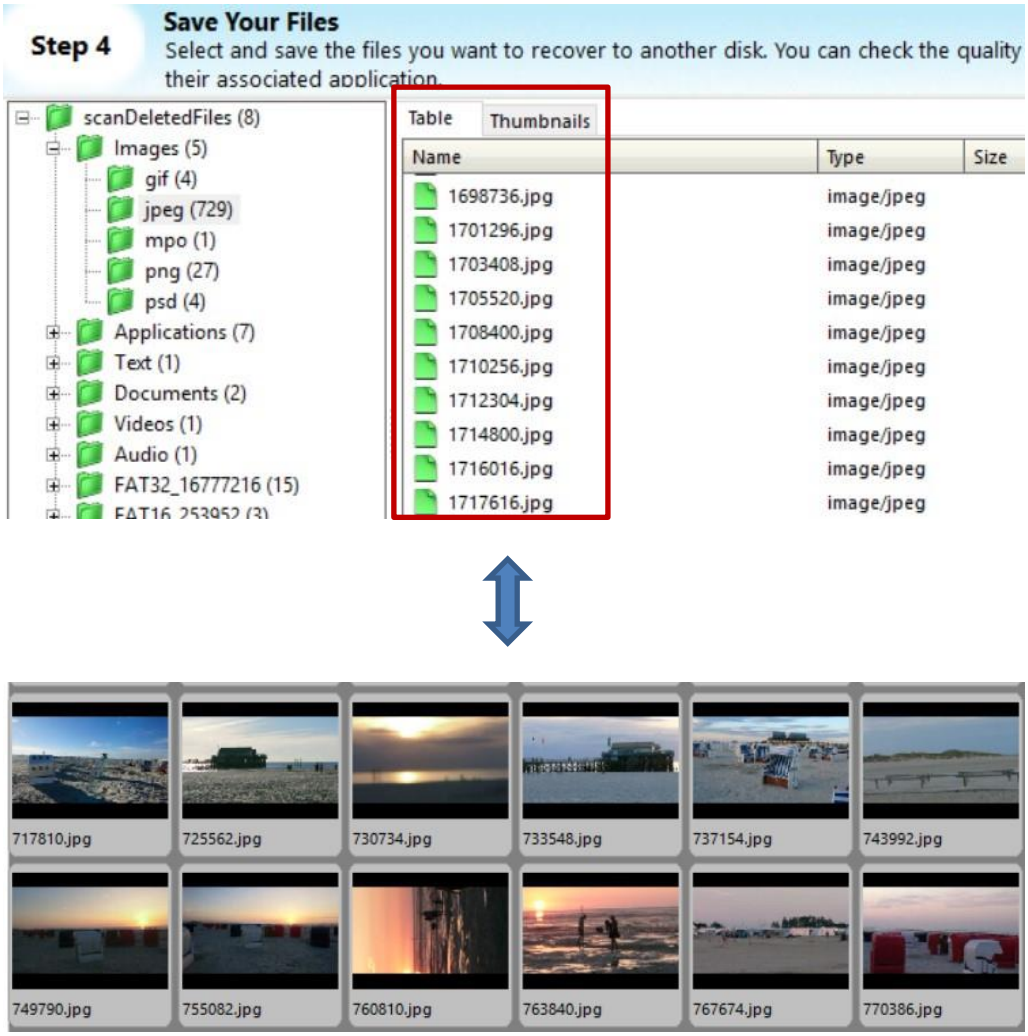
   - You can expand and minimize the directories at several levels by clicking on the symbols **+** and **–**.



Screen 33: Found and recovered files in two dropdown lists

7. Search your lost files in the directories you selected beforehand.

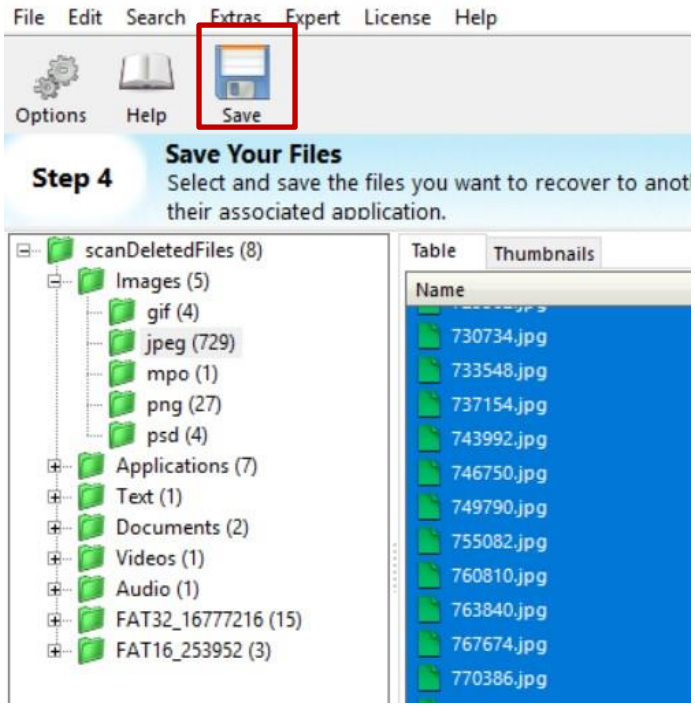
    - The view mode for miniature pictures can help you to identify the correct files.



Screen 34: Found and recovered files in the table view mode and in the thumbnail view mode

8. Select all elements which you want to recover via mouse click. If you want to recover an entire folder, select all elements in the folder via the hot key ***Strg+A*** or via the tag ***Edit>Select all***.

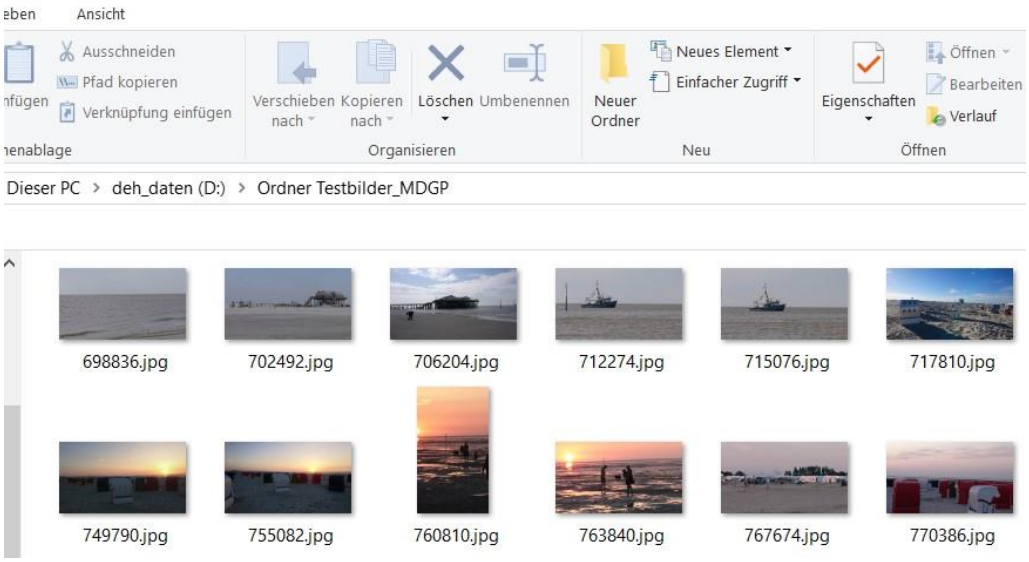
9. In the menu bar, click on ***Save***.



Screen 35: Saving your files in a popup dialogue

- The software opens a popup window where you can choose a new destination location for your files.

10. Enter a precise name for your folder as you normally do on your computer.
11. Select a destination location which is not part of the volume you are using for recovery.
12. In the popup window, click on ***Save***.
    - MaxDataGenius now saves the recovered files at the destination location you selected beforehand.
13. Verify your recovery results.



Screen 36: Recovered files in their new storage location

✓ Your files are now available at the external destination location.

5.2.2 Finding logical volumes on physical disks

When unintended changes in a physical disk's file structure occur, it happens that the inner structure within the disk's partition table and the allocation of volumes also get mixed up. Such changes mainly occur after the application of specific partition programmes. In consequence, the volumes'allocation deviates from the former one and the concerned volumes cannot be found anymore. With MaxDataGenius, you can search lost logical volumes on a physical disk, browse them and file them on a safe and intact medium.

Tip:

- Schedule an adequate time period if you want to scan disks and to browse in your recovered voumes.
- If possible, find out in time which file system the concerned volume is based on. You get detailed informations on file systems and partition schemes in the chapters 4.1 and 4.3 .

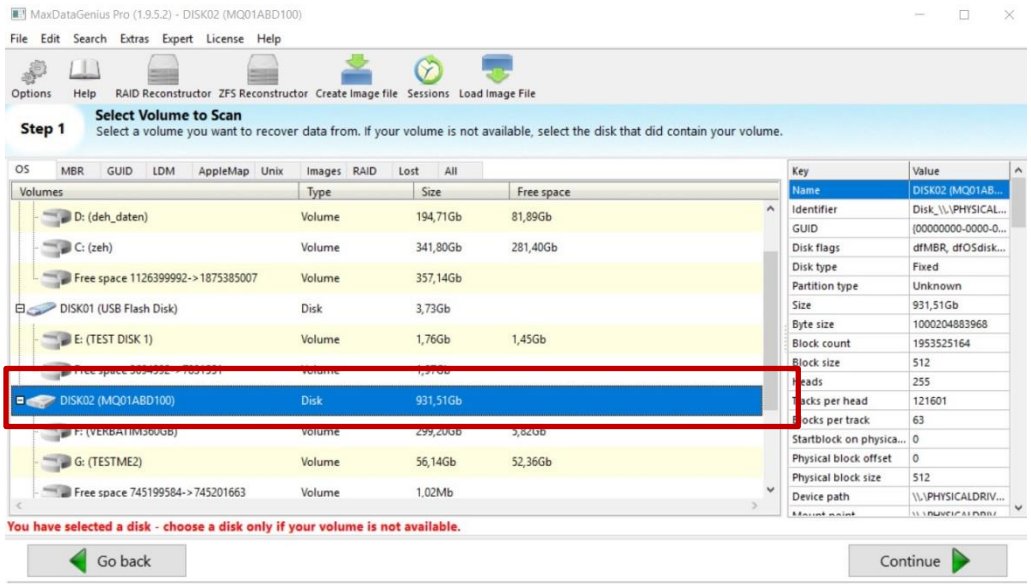
The following instructions help you to find and recover lost volumes.

1. Start MaxData Genius in the Basic or Pro version.

2. Select the physical disk you want to operate with.

    - In the volume list, the volumes are always subordinated under the physical disks which they are located on.

    - The physical disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the disk's properties.



Screen 37: Selecting a phyiscal disk

3. Click on ***Continue***.

    - The software opens a dialogue window with possible data recovery scenarios and file systems. As you did not select a volume but a disk, the software automatically adapts the choice of scenarios.

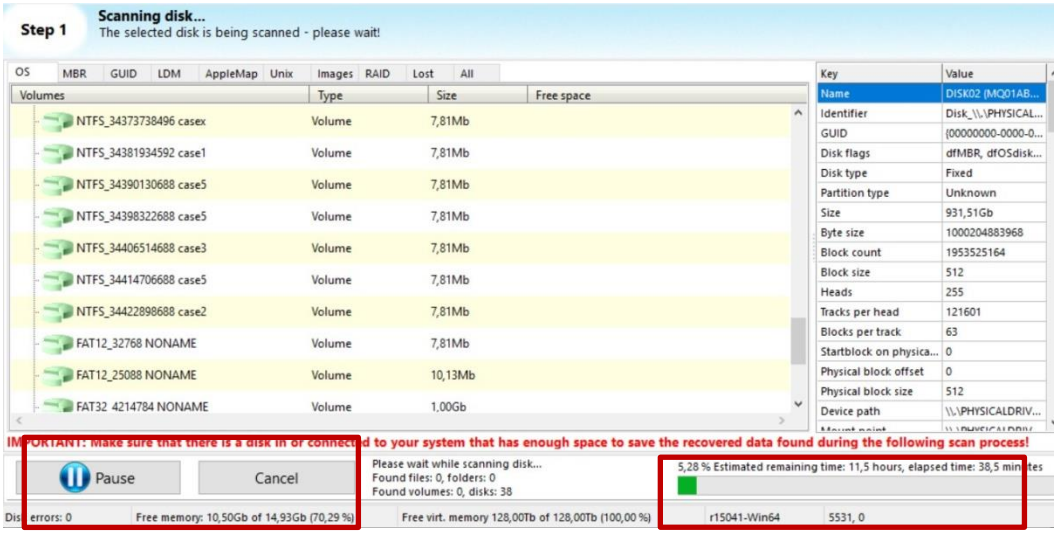
Screen 38: Choosing your scenario for physical disks – automatical adaption

4. Select ***Search lost volumes***,then click on ***Continue***.

5. Verify if you correctly selected the data recovery scenario, the logical volume and the file systems to b e scanned. Then click on ***Continue***.

    - After an incorrect selection, you can click on ***Go back*** in order to change it.

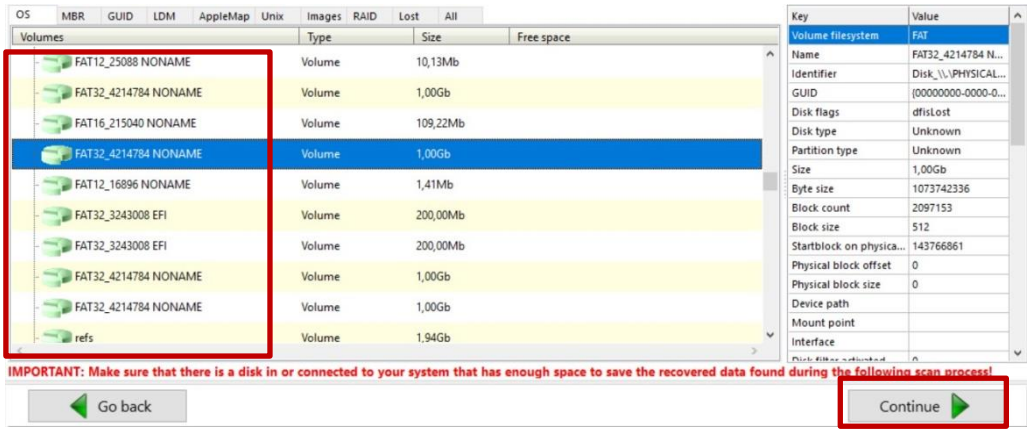
    - MaxDataGenius now scans the physical disk for volumes with respect to the file system you selected beforehand. Depending on the size of the medium, a scan can take a various time period, from a few minutes to several hours.



Screen 39: Disk scan for lost volumes with progress bar

- Via ***Pause***, you can interrupt the disk scan in order to resume it later. Via ***Cancel***, you can entirely stop the scan and return to the previous dialogue window.

- As soon as MaxDataGenius has finished the disk scan, lost volumes are listed below the disk name in tn the dialogue. As presented in chapter 5.1, the software highlights all recovered logical volumes in green.



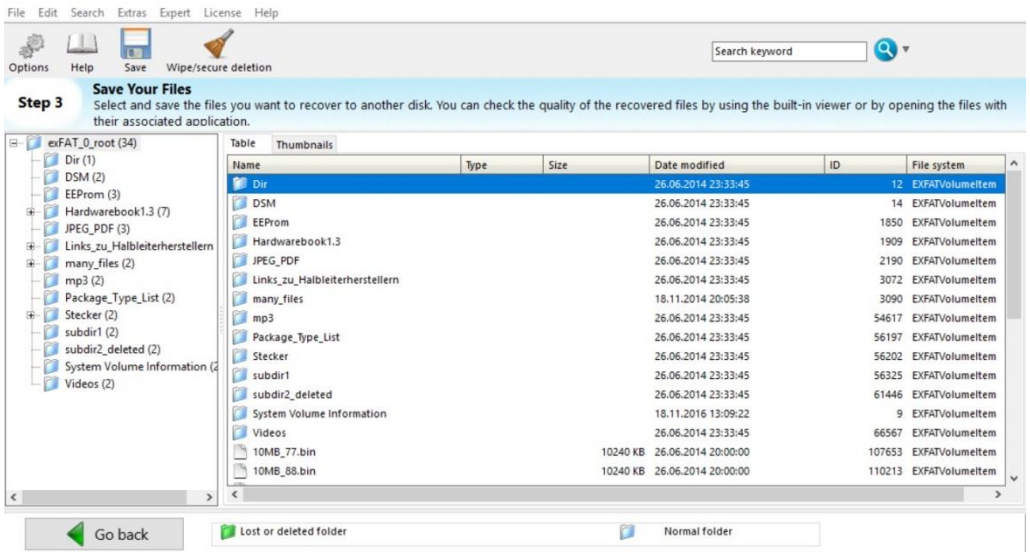
Screen 40: Volumes which were found on the physical disk

6. Select a volume and click on ***Continue***.

    - The software again opens a dialogue window with possible data recovery scenarios and file systems.

7. Select ***Explore volume*** in order to browse the volume you just recovered.

    - The software opens a storage dialogue with two parallel dropdown lists.



Screen 41: Selection dialogue with dropdown lists

8. Select folders in the dropdown list on the left in ordert o browse them.

    - You can expand and minimize the directories at several levels by clicking on the symbols ***+*** and ***–***.

        ✓ Now you can save your lost volumes‘contents to an external and intact destination location as presented in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

Tips:

- In order to browse several volumes one after another, open the volume list via ***Go back*** and ***Continue*** as often as required.
- Make sure that you selected the correct volume with a matching volume name.
- If you cannot find your volumes via Explore volume, start a targeted disk scan via Find deleted files (as presented in chapter 5.2.1).

5.3 Creating a disk image

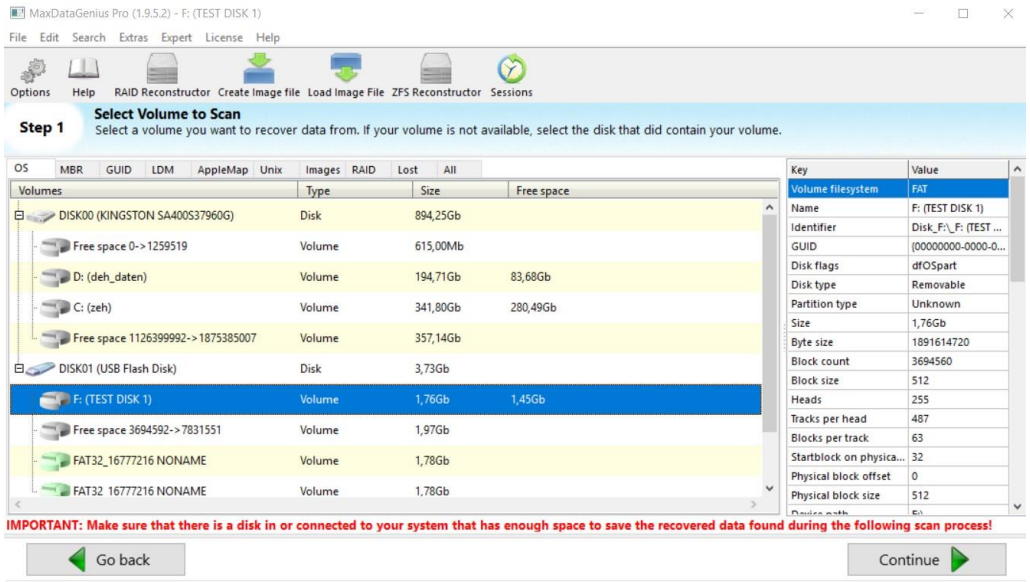
Disk image: an exact virtual image of a physical disk

A disk image is defined as a virtual and logical image of a physical disk or logical volume. By creating disk images before starting data recovery, you prevent the loss of intact files on a corrupted disk (also see chapters. 4.4.6 and 5). The following instructions lead you through the process.

1. Start MaxData Genius in the Basic or Pro version.

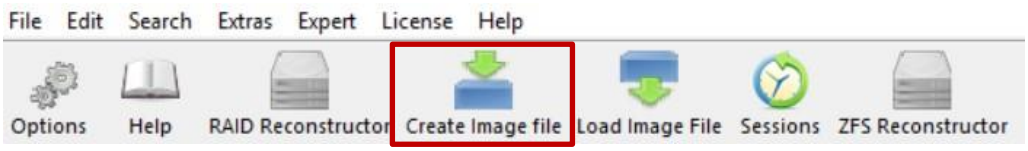
2. Select the volume or disk you want to operate with.

    - The volume is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the volume's or disk's properties.



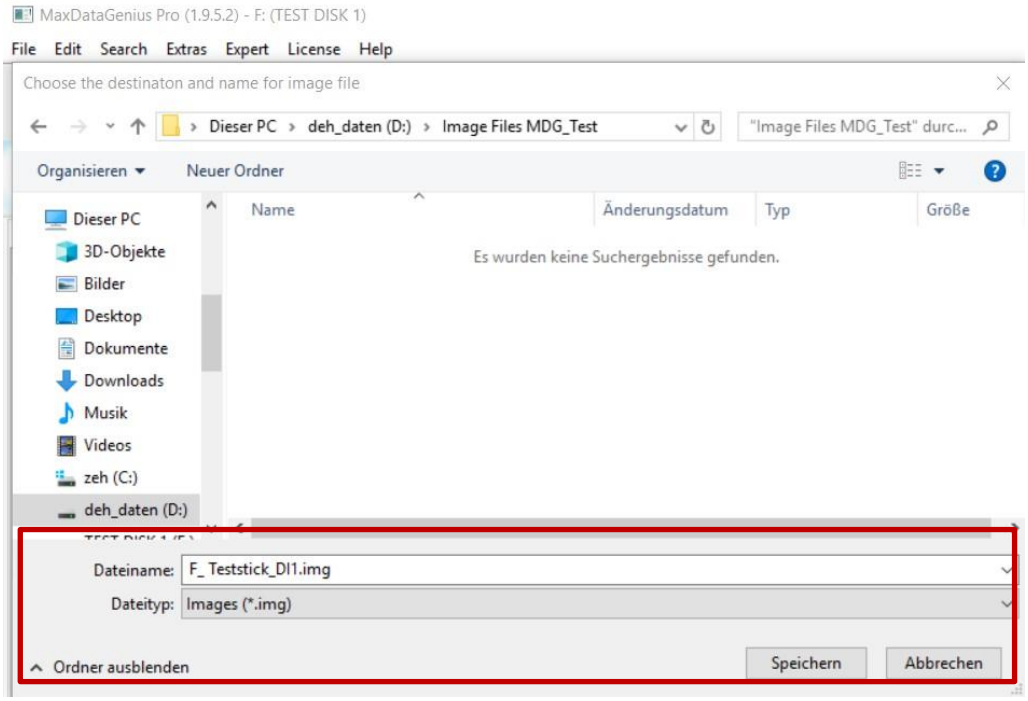
Screen 42: Selecting a volume or disk in order to create a disk image

3. Click on ***Create image file*** in the menu bar.



Screen 43: Menu ribbon in MaxDataGenius with interactive tags

- The software opens a popup dialogue. In this dialogue, you can save your image file.



Screen 44: Choosing a destination location for a disk image

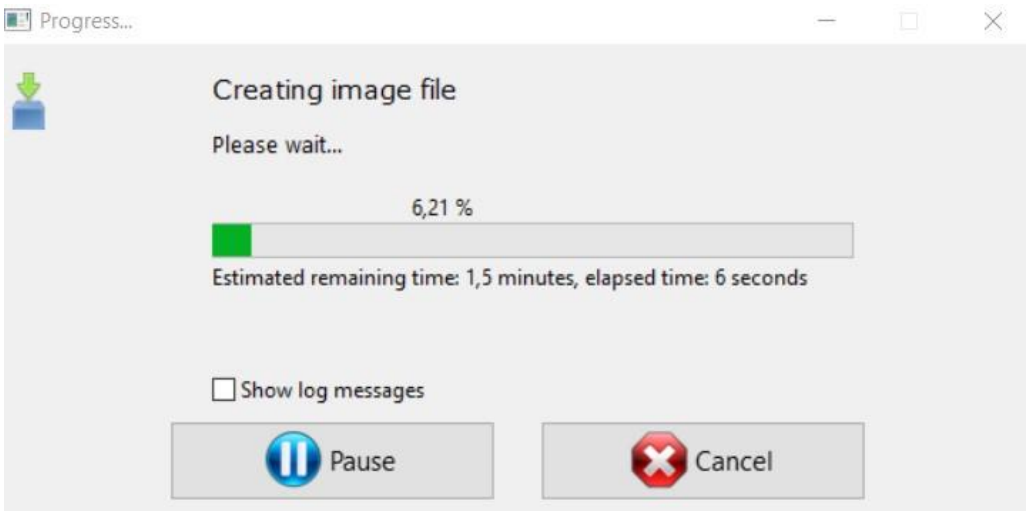
4. Save the disk image under a relevant file name as usual. Therefore, select a safe storage location on an intact medium..

- You can choose between***.img*** or****All files**** as file types. This selection does not influence the storage results.

- The programme creaters an image file at the storage location selected beforehand.

5. Verify the storing progress regularly especially if you are creating an extensive image file.

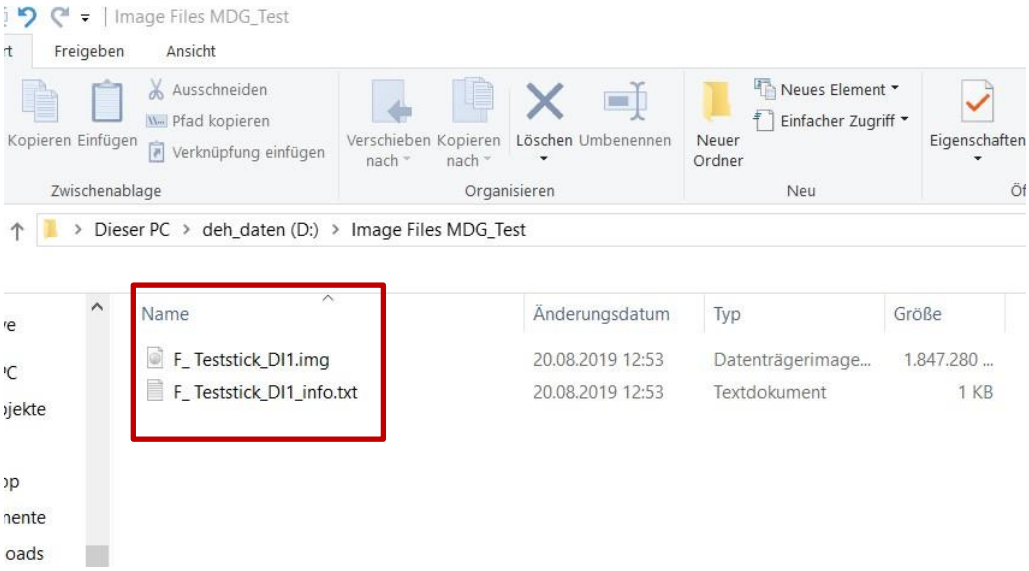
    - You can always interrupt or stop disk image creation.This works via the buttons which are located in the dialogue window under the progress bar.



Screen 45: Progress during the creation of an image fileF

    - As soon as the programme has stored the complete image file to the destination location selected beforehand, you get a popup message confirming success.

    - Your disk image is now available at the new storage location.



Screen 46: Disk Image in its new destination folder

Tip: Via button ***Load Image File*** in the menu bar, you can open all image files and use them for every MaxData Genius scenario.

5.4 Scanning formatted media

Recovering formatted media (Basich and Pro)

Incorrect or unintended disk formatting is a common source of data loss. Falsely operated formatting processes cause changes of allocation within the medium's partition structure. As a consequence, files and folders are still present but cannot be found and opened. In some cases, incorrect formatting also triggers the loss and damage of files. This chapter illustrates how you can scan a falsely formatted disk and recover the files located on it.

1. Start MaxData Genius in the Basic or Pro version.
2. Select the physical disk you want to operate with.
    - The physical disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the disk's properties.
    - If you created a disk image and want to operate with it, you can open your image file via the menu bar (see chapter 0).

Caution

Data loss caused by automatic formatting through the operating system

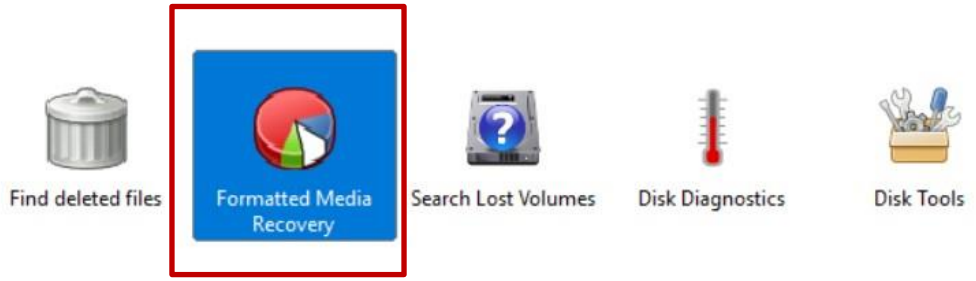
If your operating system identifies your medium as an invalid disk and automatically conducts a disk formatting operation, data loss can occur.

➲ Click on ***Cancel*** if your operating system indicates automatic formatting or disk repair.

3. Click on ***Continue***.

    - The software opens a dialogue window with possible data recovery scenarios and file systems.

4. Select ***Formatted Media Recovery***, then click on ***Continue***.

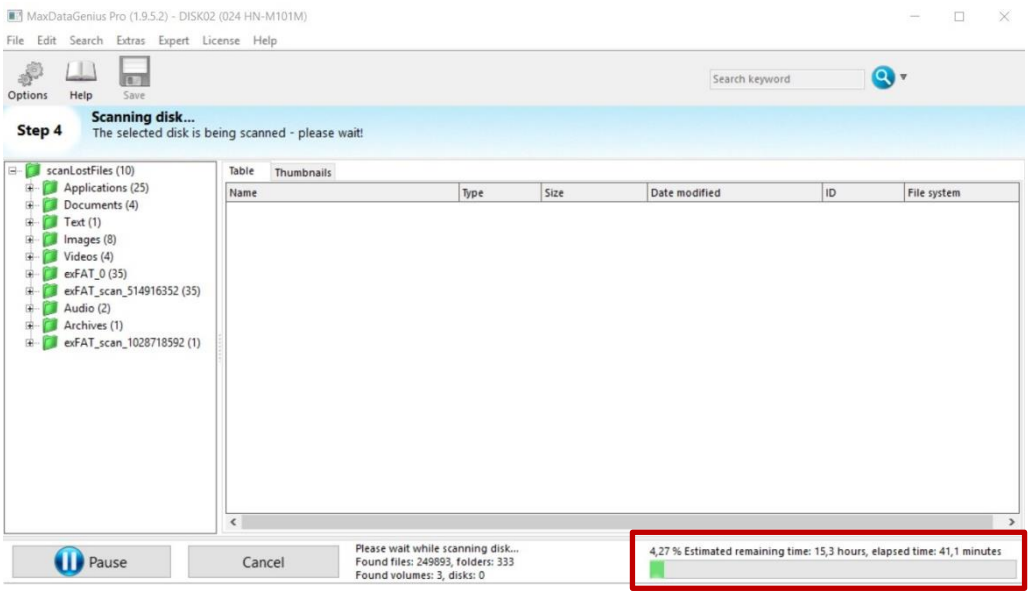


Screen 47: Selection of recovery scenario, highlighted in blue

5. Verify if you correctly selected the data recovery scenario, the physical disk and the file systems to b e scanned. Then click on ***Continue***.

    - After an incorrect selection, you can click on ***Go back*** in order to change it.

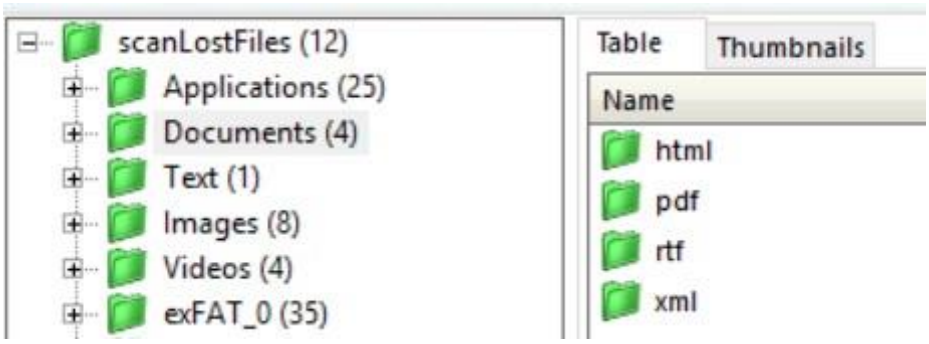
    - MaxDataGenius now scans the disk for deleted files and folders with respect to the file system you selected beforehand. Depending on the size of the medium, a scan can take a various time period, from a few minutes to several hours.



Screen 48: Progress during a formatted disk scan

- Via ***Pause***, you can interrupt the disk scan in order to resume it later. Via ***Cancel***, you can entirely stop the scan and return to the previous dialogue window.

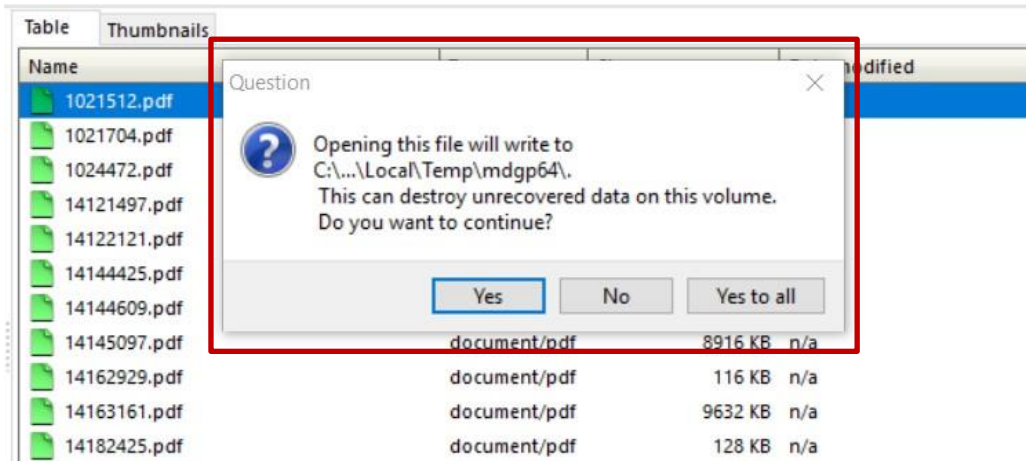
- As soon as MaxDataGenius has finished the disk scan, lost files and folders are listed below the disk name in tn the dialogue. As presented in chapter 5.1, the software highlights all recovered files and folders in green.



Screen 49: Dropdown lists containing recovered folders on a formatted disk

6. Select folders in the dropdown list on the left in ordert o browse them.

- You can expand and minimize the directories at several levels by clicking on the symbols **+** and **–**.
- The software shows a popup message when you click on individual files in a folder to open them.



Screen 50: Programme message when you open recovered files

7. Click on ***Yes*** or ***Yes to all*** if you are sure that you do not want to recover any more files in your operation system's volume (usually: C) . Click on ***No*** if you want to use the volume for further data recovery processes.

8. If you clicked on No, select all the elements you want to recover. Store them on a safe external medium as presented in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

   ✓ Your files are now available at their new external storage location.

Tipp: Only select ***Yes*** or ***Yes to all*** if you definitely completed all data recovery scenarios.

6. Optimizing media with *Disk Tools*

Additional features of the Pro version

When it comes to physical disks, you might want to do more than recover lost files or volumes. With the programme, you can exactly evaluate disk usage and potential disk structures as presented in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**. Disk diagnosis includes the detection of bad blocks (see chapter. 4.4.6). Furthermore, you can execute a series of optimization processes concerning your disk's internal structure. In chapter 6.2., you will learn how this works. In the chapters 6.2.1 to **Fehler! Verweisquelle konnte nicht gefunden werden.**, you will get to know more special features which are tailored to complex file recovery scenarios.Some features are only available in the Pro version.

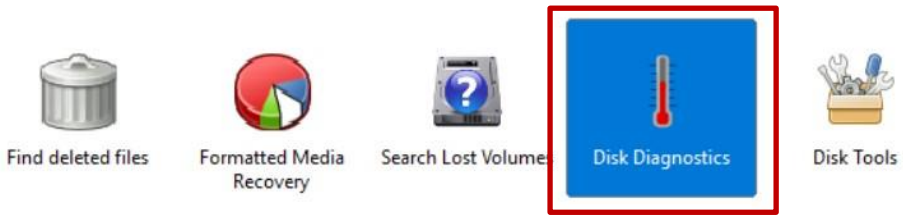
6.1 Applying *Disk Diagnostics*

Diagnosing physical disks (Basic and Pro)

Before you start optimizing your disk or conducting other complex recovery processes, you should be familiar with your disk's internal structures and defects. Conducting disk diagnostics processes first is consequently the way to go. The following instructions lead you through the process.

1. Start MaxData Genius in the Basic or Pro version.
2. Select the physical disk you want to operate with.
    - The disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the volume's properties.
    - If you created a disk image and want to operate with it, you can open your image file via the menu bar (see chapter 0).
3. Click on ***Continue***.
    - The software opens a dialogue window with possible data recovery scenarios and file systems.

4. Select ***Disk Diagnostics***, then click on ***Continue***.



Screen 51: Selection of recovery scenario, highlighted in blue

5. Verify if you correctly selected the data recovery scenario, the physical disk and the file systems to b e scanned. Then click on ***Continue***.

    - After an incorrect selection, you can click on ***Go back*** in order to change it.

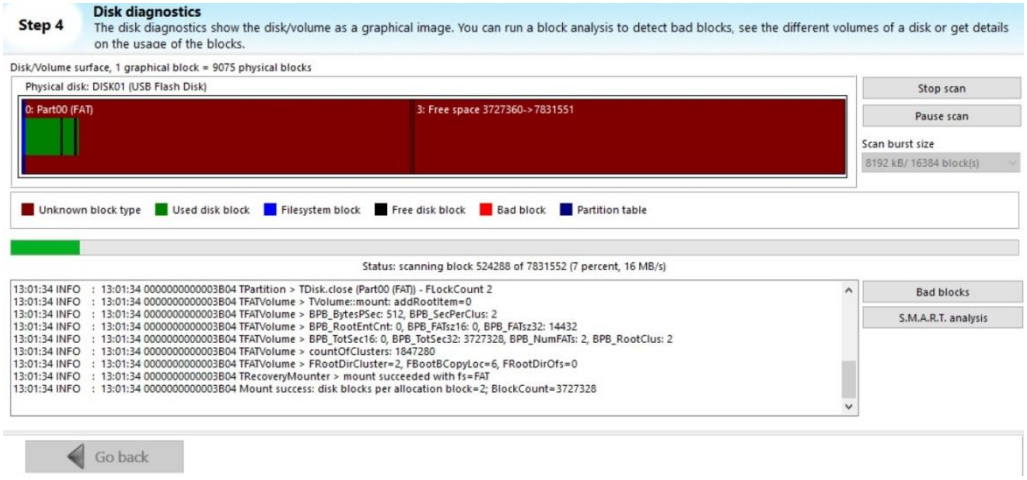
> **Tipp:** Before you start diagnasing your disk, check your software's configuration with regard to bad block management. If required, you can adapt your configuration via Options >Recovery > Bad Blocks Management. The configurations are explained in detail in chapter 4.4.6.

6. In the following dialogue window, click on ***Start scan.***

    - MaxDataGenius now analyses the disk structure. The software further displays the performance and usage of data blocks and free spaces. Depending on the volume size and file sizes, a scan can take a various time period, from a few minutes to several hours.

Data blocks and free spaces on a disk

    - Via the buttons in the dialogue, you can always cancel or pause your current scan.
    - As soon as the software has finished the disk diagnosis, you can view the results in the display dialogue. They are avilable in a graphical view and as a result list.

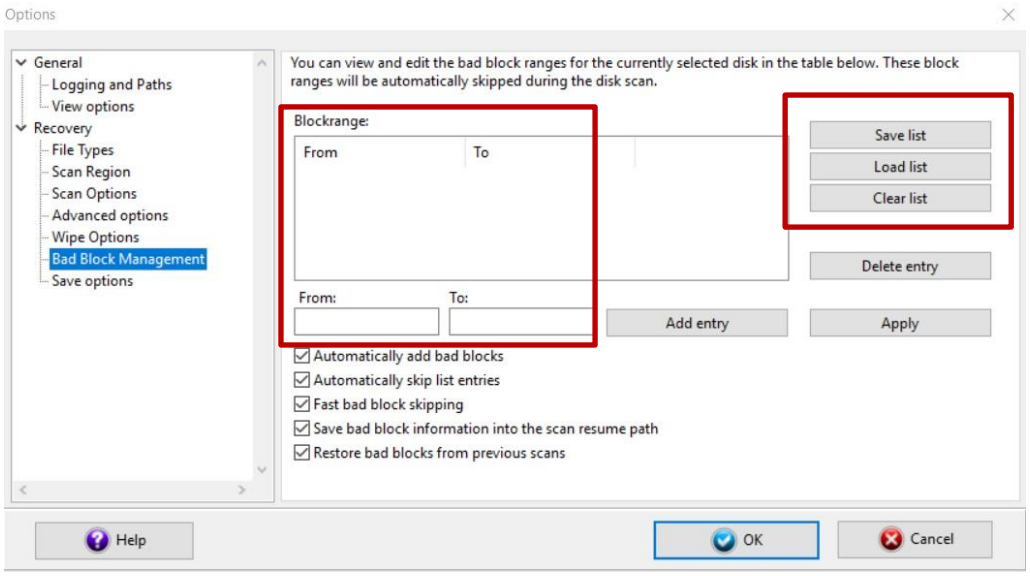


Screen 52: Results of a diagnostic disk scan

7. If necessary, conduct further specific reviews. Therefore, select either ***Bad Blocks*** or ***S.M.A.R.T. analysis***.

Bad blocks and S.M.A.R.T. analysis

- During ***S.M.A.R.T. analysis***, the software detects deviations in the disk structure and potentially faulty background processes.
- After the activation of ***Bad Blocks***, the software automatically opens the options dialogue. In this dialogue window, you can view a list of bad blocks. You can open, save or delete this list (also see chapter 4.4.6).
- If the software does not detect any bad blocks on your disk, the list remains empty.



*Screen 53: List view of bad blocks (**Blockrange**) in the options dialogue*

- If you activated ***Automatically add bad blocks***, all bad blocks detect found during the diagnostics process are automatically added to the list.

Tip: In case the software found bad blocks on your disk, file the current status at a safe storage location via ***Save list***. In doing this, you enhance your data's safety and get helpful information for further diagnostics processes.

8. Make sure that you executed and finished all necessary diagnostics processes.

   - The software does not overwrite data with ***Disk Diagnostics***. Nonetheless, you should not repeat these processes too often because bad blocks can become redundant on a disk. It is always recommended to create an image file after the detection of bad blocks (see chapter 5.3).

     ✓ Disk diagnostics are fiinished now. If necessary, you can choose another scenario.

6.2 Influencing processes on physical disks

Disk Tools for a better disk performance (Pro version)

With the ***Disk Tools*** included in MaxDataGenius Pro, you can influence your media's data security andperformance. Applying ***Disk Tools*** is easiest if you are already experienced regarding disk structures. If not, the following instructions illustrate how to apply these features.

6.2.1 Saving disks and volumes as disk images

Creating image files via *Disk Tools* (also see chapter 5.3)

1. Start MaxData Genius in the Pro version.
2. Select the disk or volume you want to operate with.
    - The disk or volume is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the volume's or disk's properties.
3. Click on ***Continue***.
    - The software opens a dialogue window with possible data recovery scenarios and file systems.
4. Select ***Disk Tools***.

Screen 54: Selecting disk tools among the recovery scenarios

Tip: Via ***Disk Tools***, you save a disk or volume by creating a disk image (also: image file). In chapter 0 , you already got familiar with another method of writing disk images.

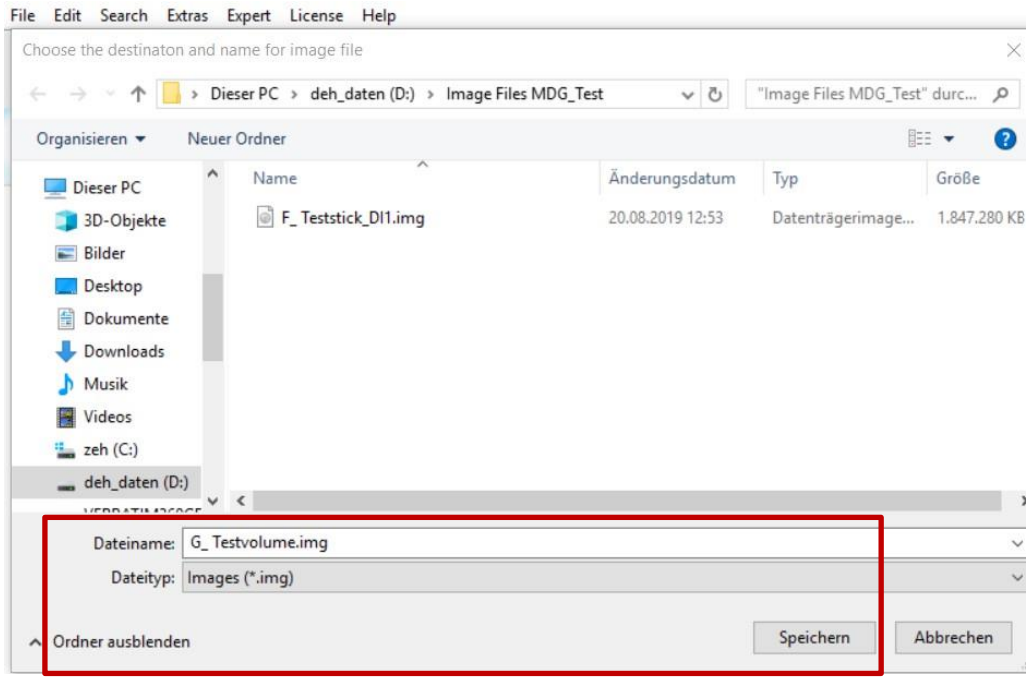
5. Select ***Create Image***, then click on ***Continue***.

Screen 55: Selection of scenarios among the disk tools

6. Verify if you correctly selected the data recovery scenario, the physical disk and the file systems to be scanned. Then click on ***Continue***.

    - After an incorrect selection, you can click on ***Go back*** in order to change it.

    - The software opens a popup dialogue. In this dialogue, you can save your image file.



Screen 56: Choosiing a destination location for a disk image

7. Save the disk image under a relevant file name as usual. Therefore, select a safe storage location on an intact medium..

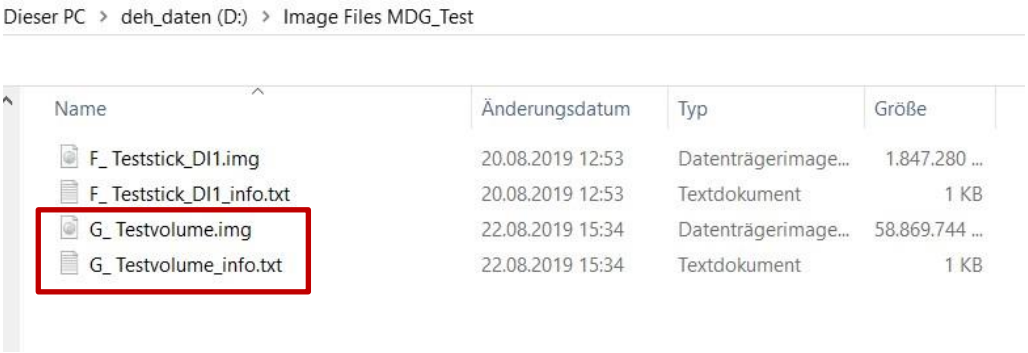
    - You can choose between***.img*** or****All files**** as file types. This selection does not influence the storage results.

8. Verify the progress during the storage regularly especially if you are creating an extensive image file.

    - You can always interrupt or stop disk image creation.This works via the buttons which are located in the dialogue window under the progress bar.

    - As soon as the programme has stored the complete image file to the destination location selected beforehand, you get a popup message confirming success.

        ✓ Your disk image is now available at the new storage location.



Screen 57: Disk image in its new destination folder

6.2.2 Recovering disks by restoring disk images

Restoring disks through reverse writing

You cannot only create an image file with the disktools, you can also restore it on a physical disk through reverse writing processes. This method for file system recovery is suitable if the image files serves as a transfer tool between many physical disks. Reverse writing processes are further initiated for computer resets or for multiple installations of operating system on similar comoputers.

Caution

Data loss if a disk image is reverse-written on a medium with data content

Reverse writing of disk images can cause data loss if data content is located on the target medium. The software entirely overwrites the target medium during the process.

- ➲ If you want to reverse-write disk images, do not use any disks with relevant contents as target media.
- ➲ In order to process reverse writing of disk images (also: image files), use an empty target medium with a sufficient data volume.

The following instructions illustrate how you can reverse-write an image file and the restore a complete disk on another medium.

1. Start MaxData Genius in the Pro version.
2. Select the physical disk you want to restore a disk image on.
    - The disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the disk's properties.

Tipp: Select a target medium which has more data volume than the size of the disk image you want to reverse-write on it. Only then MaxDataGenius can fully perform the writing process and attain a complete result.

3. Click on ***Continue***.

    - The software opens a dialogue window with possible data recovery scenarios and file systems.

4. Select ***Disk Tools***.

Screen 58: Selecting the disk tools among the recovery scenarios

5. Select ***Create Image***, then click on ***Continue*** .

Screen 59: Selection of scenario among the disk tools

6. Verify if you correctly selected the data recovery scenario, the physical disk as a target medium and the targeted file systems. Then click on ***Continue***.

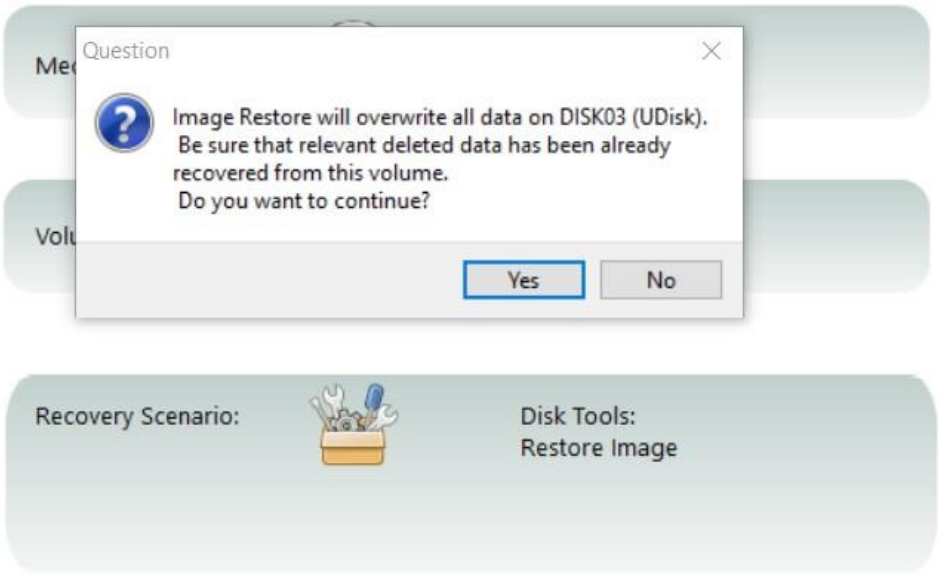
    - After an incorrect selection, you can click on ***Go back*** in order to change it.

7. Click on ***Continue***.

    - The software opens a popup message with a warning that all files on the target medium will be overwritten.

8. If you agree with the overwriting of the target medium, confirm the message with ***Yes***. If you want to select a different target medium, click on ***No***.

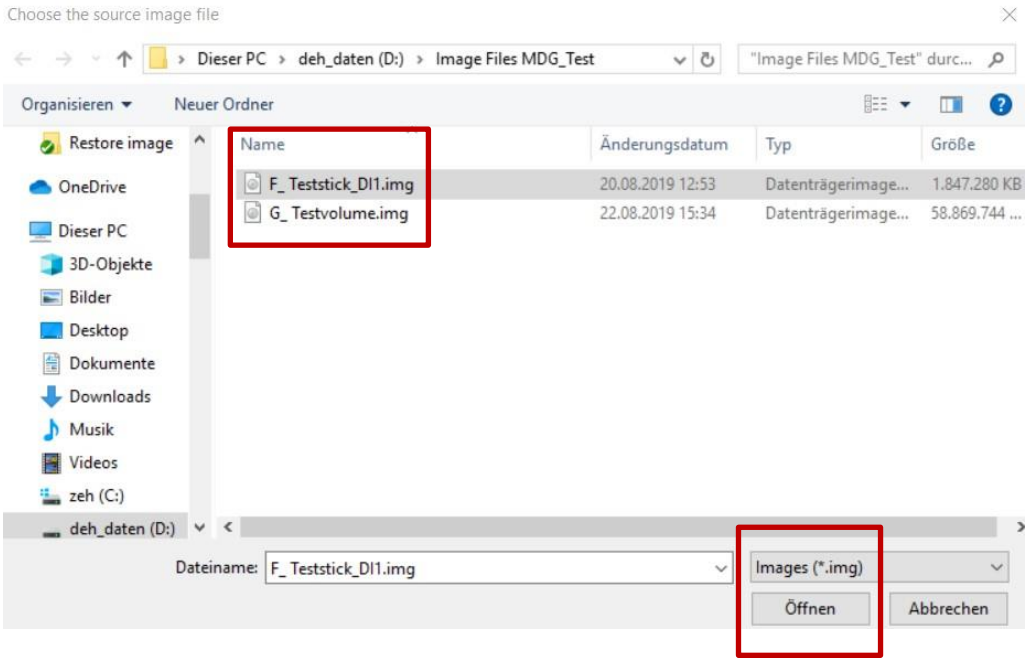
9. After confirming the programme message, click on ***Continue***.



Screen 60: Programme message before reverse-writing

- The software opens a dialogue window so you can navigate to your disk images.

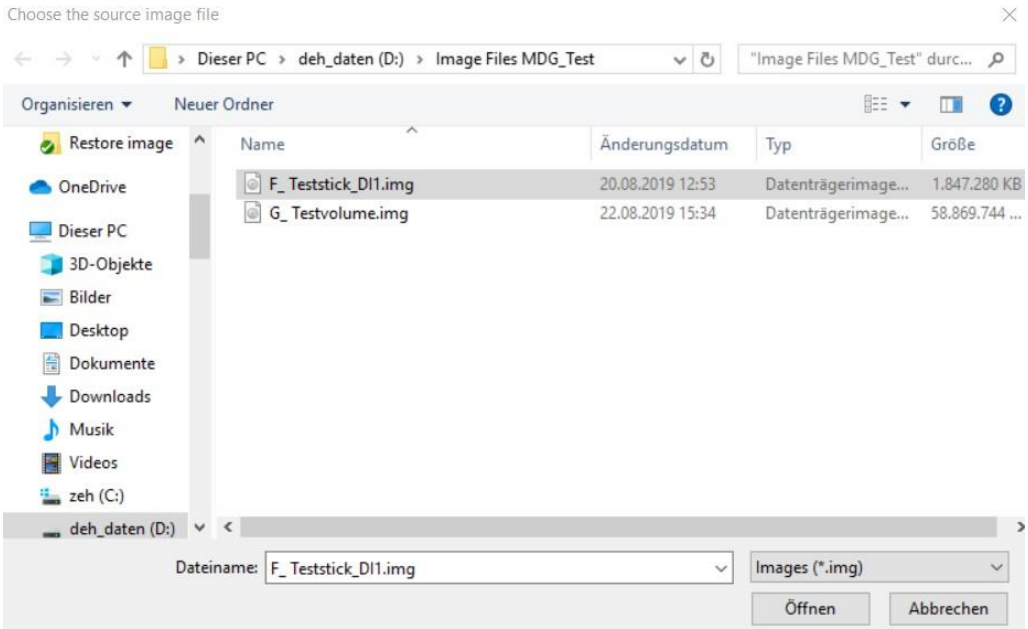
10. Select the disk image which you want to restore on the target medium.



Screen 61: Opening the disk image which shall be restored

11. Close all applications with access to the target medium (e.g. Windows Explorer). Confirm the following programme message in order to proceed.

    - The software now restores the disk image on the target medium by reverse-writing it.



Screen 62: Progress during the restoring process

12. Verify the transfer progress regularly especially if you are restoring an extensive image file.(also see chapter 0).

    - As soon as the software has finished the restoring process, you get a programme message confirming success.

13. Verify the result on the target medum. If necessary, repeat theprocess and once more follow the instructions 1 to 11.

    ✓ You have restored your disk image on another safe and intact target medium.

6.2.3 Copying physical disks

Creating direct copies of physical disks

There are many scenarios of use which require a direct disk copy, e.g. if you need to copy a high-volume harddisk and only need a few copies. Thus you can transfer a physical disk's file and partition structure directly to another medium. The target medium must at least cover the original disk's data volume. While copying the disk, the data structure is transferred block by block. The following instructions lead you to the process of creating a direkt disk copy.

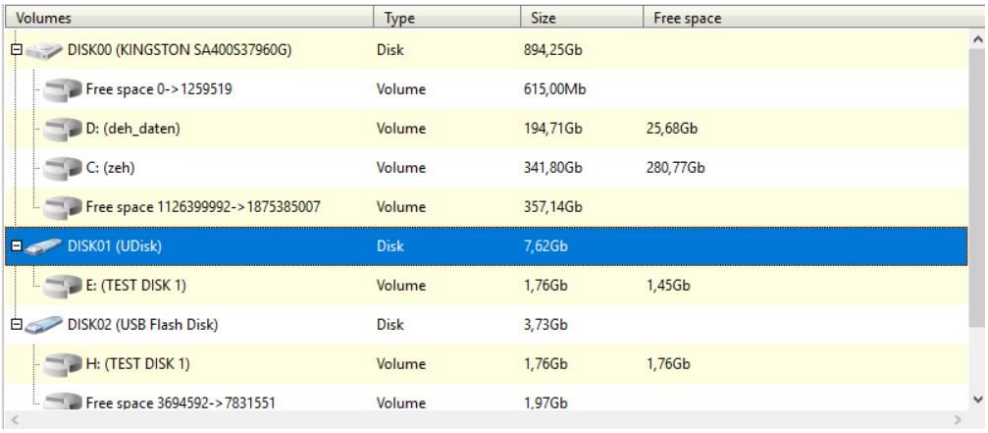
Caution

Data loss caused by creating disk copies on media with data content

Creating a direkt copy of a physical disk on another medium causes data loss if data content is located on the target medium. The software entirely overwrites the target medium during the process.

- ➲ If you want to create direct disk copies, do not use any disks with relevant contents as target media.
- ➲ In order to create a direct disk copy, use an empty target medium with a sufficient data volume.

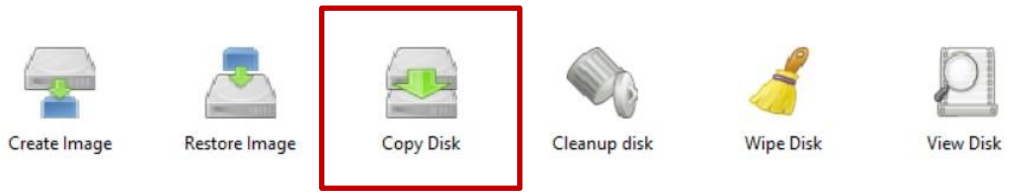
1. Start MaxData Genius in the Pro version.
2. Select the physical disk you want to copy.
    - The disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the disk's properties.



Screen 63: Choosing a physical disk for a direct copy

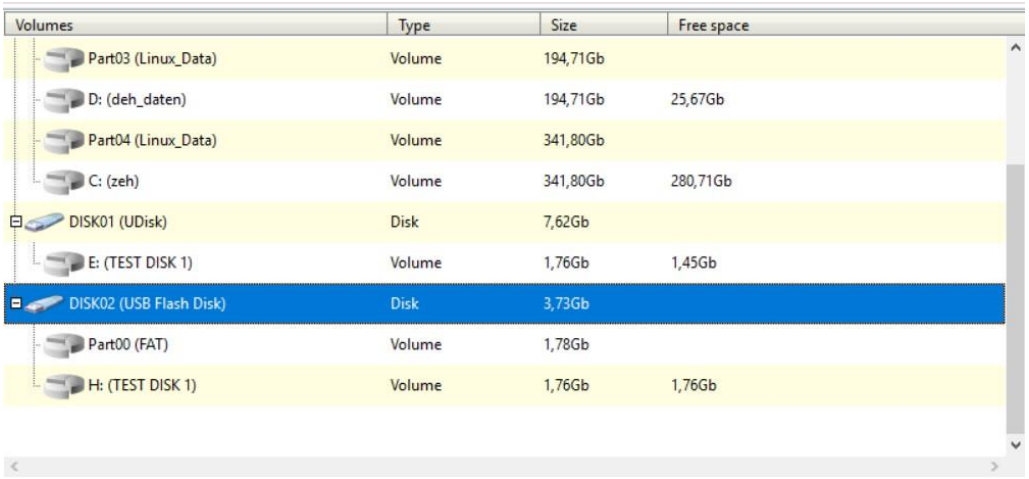
Tip: The software can only create direct copies of physical disks. If you want to operate with logical volumes, follow the instructions in the chapters 6.2.2. and 6.2.1.

3. Click on ***Continue***.
    - The software opens a dialogue window with possible data recovery scenarios and file systems.
4. Select ***Disk Tools***.
5. Among the disk tools, select ***Copy Disk***, then click on ***Continue***.



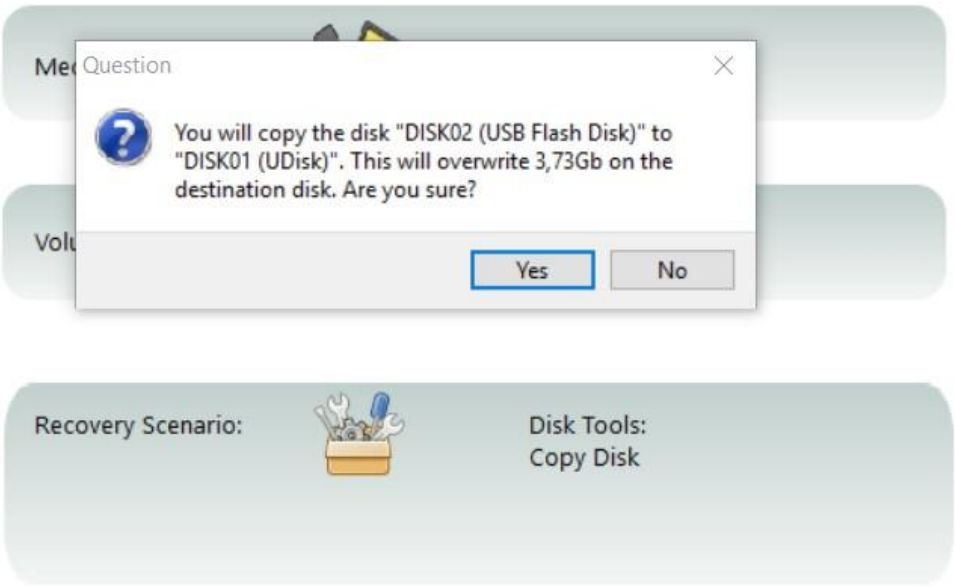
*Screen 64: Selecting the **Copy Disk** scenario*

    - The software once more opens a dialogue window with possible data recovery scenarios and file systems.
6. Select another physical disk as a target medium, then click on ***Continue*** (as presented in step 2).



Screen 65: Selecting a physical target medium from the volume list

7. Verify if you correctly selected the data recovery scenario, the physical disk as a target medium and the targeted file systems. Then click on ***Continue***.
    - After an incorrect selection, you can click on ***Go back*** in order to change it.
8. Click on ***Continue***.
    - The software opens a popup message with a warning that all files on the target medium will be overwritten.
9. If you agree with the overwriting of the target medium, confirm the message with ***Yes***. If you want to select a different target medium, click on ***No***.
10. After confirming the programme message, click on ***Continue***.



Screen 66: Programme message before a direct disk copy is created

11. Close all applications with access to the target medium (e.g. Windows Explorer) Confirm the following programme message in order to proceed.
    - The software now directly copies the source medium to the target medium.
12. Verify the transfer progress regularly especially if you are copying a disk with a high data volume.

- As soon as the software has finished the copying process, you get a programme message confirming success.

13. Verify the result on the target medum. If necessary, repeat theprocess and once more follow the instructions 1 to 11.

    ✓ You have created a disk copy on another safe and intact target medium.

6.2.4 Refreshing disks

Refreshing disks: more resiliency and performance

In case you stored your disk over a long time period or only seldomly used it, the medium's data security might get diminished. In consequence delays and errors during reading processes occur.You can refresh individual logical volumes or entire physical disk in order to enhance your disk's resiliency and performance. The software then rewrites the volume or disk block by block. The following instructions lead you through the refreshing process.

Tip: The software can refresh logical volumes located on a physical disk, but also the complete disk. Therefore stick to a reasonable order of volumes which you want to optimize in their partition schemes.

Reminder: The chapters 4 und 8 inform you on the differences between logical volumes and physical disks.

1. Start MaxData Genius in the Pro version.
2. Select the logical volume or physical disk you want to refresh.
   - The volume or disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the volume's or disk's properties.
3. Click on ***Continue***.
   - The software opens a dialogue window with possible data recovery scenarios and file systems.
4. Select ***Disk Tools***.
5. Among the disk tools, select ***Refresh Disk***, then click on ***Continue***.

- You can navigate through the ***Disk Tools*** via the arrow buttons.

.

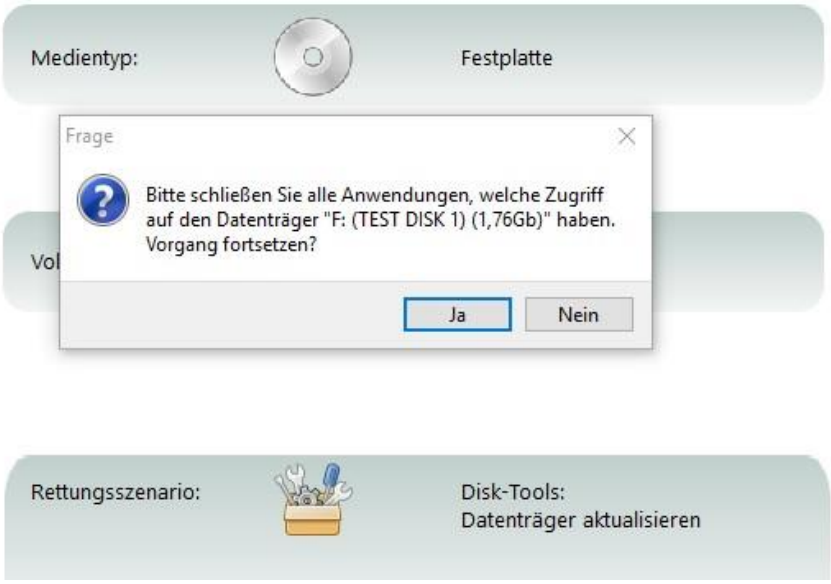
*Screen 67: Selecting the scenario **Refresh Disk***

6. Verify if you correctly selected the data recovery scenario, the physical disk as a target medium and the targeted file systems. Then click on ***Continue***.

   - After an incorrect selection, you can click on ***Go back*** in order to change it.

7. Click on ***Continue***.

8. Close all applications with access to the target medium (e.g. Windows Explorer) Confirm the following programme message in order to proceed.



Screen 68: Closing all applications with access to the target medium

- The software now rewrites the selected disk or volume block by block.

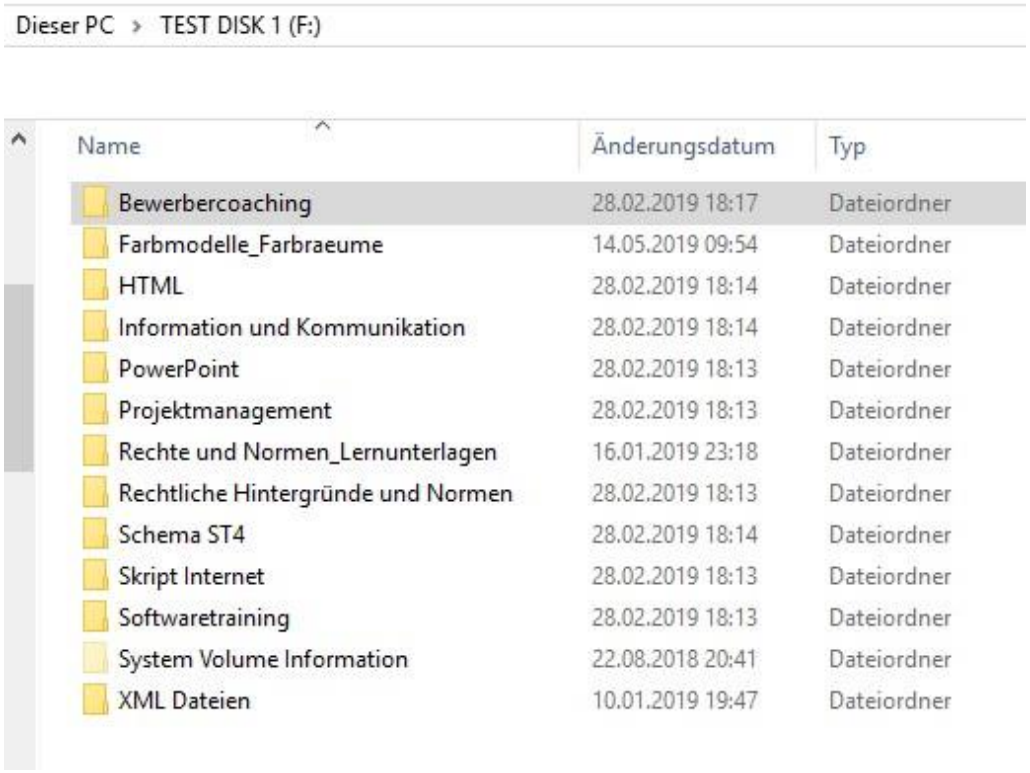
9. Verify the refreshing progress regularly especially if you are rewriting a volume or disk with a high data volume.

    - As soon as the software has finished the rewriting process, you get a programme message confirming success.

10. Open the refreshed volume on your computer and verify the results.

11. Quit MaxDataGenius if your operating system shows the error message ***Access denied.*** Then open the refreshed volume or disk again on your computer.

    - The error message ***Access denied*** can occur whenever you are transferring volumes, disks or disk images to another medium.



Screen 69: Intact file structure of the refreshed volume or disk

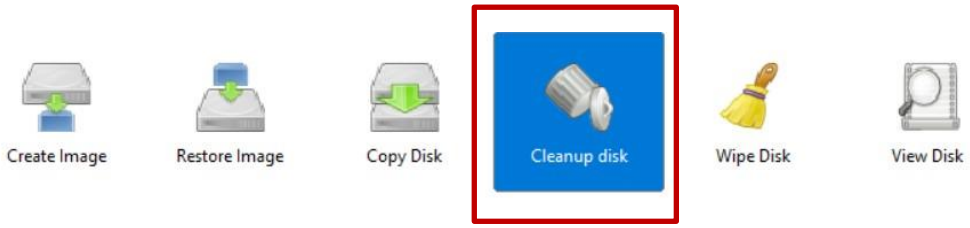
✓ You have refreshed your logical volume or physical disk.

6.2.5 Cleaning up physical disks

Cleaning up disks – a security feature

When files are deleted, their data traces are stored by most file systems and are not definitely eliminated by the operating system. Data recovery softwar might be able to read and recover these traces. Detectable traces can be a security risk or privacy issue, though, especially with sensitive data. If you need to irrevocably delete all lost or deleted files, you can clean up your medium. While eliminating these files, MaxDataGenius grants absolute safety by accessing your operating system's functions only on a file-based level. The software neither overwrites existing intact files nor the file system's logical structure. The following instructions lead you through the cleanup process.

1. Start MaxData Genius in the Pro version.
2. Select the physical disk you want to clean up.
    - The disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the disk's properties.
3. Click on ***Continue***.
    - The software opens a dialogue window with possible data recovery scenarios and file systems.
4. Select ***Disk Tools***.
5. Among the disk tools, select ***Cleanup disk***, then click on ***Continue***.

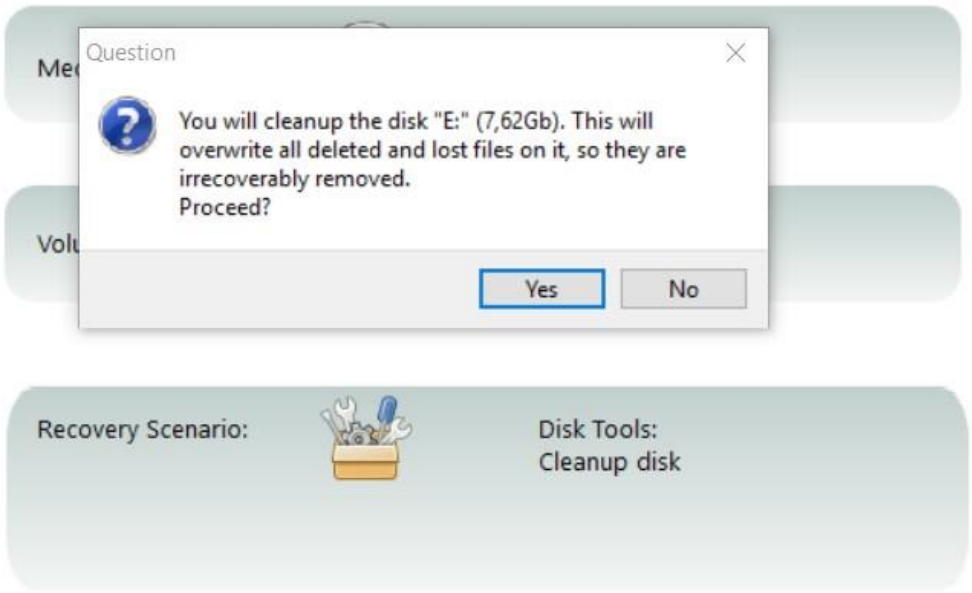


*Screen 70: Selecting the scenario **Cleanup disk***

6. Verify if you correctly selected the data recovery scenario, the physical disk as a target medium and the targeted file systems. Then click on ***Continue***.
    - After an incorrect selection, you can click on ***Go back*** in order to change it.
7. Click on ***Continue***.

8. Confirm the following programme message by clicking on ***Yes*** in order to proceed.

    - The software now overwrites data traces of lost or deleted files on the medium selected beforehand.



Screen 71: Programme message before disk cleanup

9. Verify the cleanup progress regularly especially if you are eliminating data traces on a disk with a high data volume.

    - As soon as the software has finished the cleanup process, you get a programme message confirming success.

        ✓ The physical disk has been cleaned up. The software has safely overwritten all lost and deleted files in the disk's free spaces.

6.2.6 Wiping disks by overwriting all files

Caution

Data loss after overwriting all files on a medium with data content

Overwriting all files on a disk safely and irrevocably can lead to unintended data loss if the concerned medium has intact data content on it. Data loss also occurs if you cancel the process immediately after you started it.

- Only apply the disk tool *Wipe Disk* if you are sure that you do not need the files located on the disk any more.
- In case you are not sure, store potentially relevant files on another intact medium.
- Only select the wipe feature if you are determined to irrevocably delete all files.
- If you only want to eliminate data traces of deleted or lost files, apply the disk tool Cleanup disk (see chapter 6.2.5).

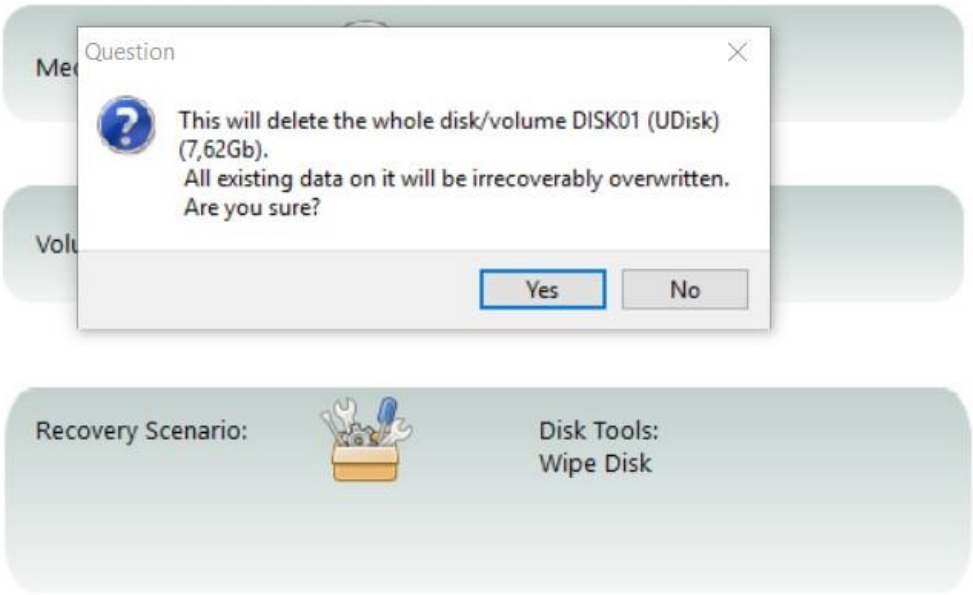
Irrevocable deletion of all disk contents

There are scenarios which require disk wiping to an extent which makes it impossible für data recovery programmes to detect or analyse any data traces. For example, irrevocable disk wiping can be required if you want to wipe and use a disk containing sensitive data for a different purpose. The complete disk wiping can also solve problems with faulty partitioning processes and eliminate other logical errors in the context of a operating system. In order to definitely wipe your physical disk, follow the instructions of this chapter.

1. Start MaxData Genius in the Pro version.
2. Select the physical disk you want to wipe.
    - The disk is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the disk's properties.
3. Click on ***Continue***.
    - The software opens a dialogue window with possible data recovery scenarios and file systems.
4. Select ***Disk Tools***.
5. Among the disk tools, select ***Wipe Disk***,then click on ***Continue***.

*Screen 72: Selecting the scenario **Wipe Disk***

6. Verify if you correctly selected the data recovery scenario and the file systems. Then click on ***Continue***.
    - After an incorrect selection, you can click on ***Go back*** in order to change it.
7. Click on ***Continue***.
8. Verify if you really want to irrevocably delete all files and folders on your disk. If you are sure, confirm the following programme message by clicking on ***Yes***.



Screen 73: Programme message informing about complete disk wiping

9. Close all applications with access to the medium you want to wipe (e.g. Windows Explorer). Then confirm the following programme message in order to proceed.

- The software now definitely removes all files and folders from the disk.

10. Verify the wiping progress regularly especially if you are removing all files from a disk with a high data volume.

    - As soon as the software has finished the wiping process, you get a programme message confirming success.

        ✓ The software deleted all files and folders on the physical disk. All files were safely removed and overwritten. Removed volumes and contents are no longer displayed in the list of available volumes.

Tips:

- You must reformat your disk after you wiped its contents in order to reuse it for another purpose.Windows automatically offers you to reformat the medium.
- After you recovered files on a corrupted medium, you can wipe the medium if the operating system does not read it correctly. Disk wiping, sometimes in conjunction with a reformatting process, can then solve compatibility issues.
- As well as complete physical disks, you can also wipe individual logical volumes, files and folders.

6.2.7 Analyzing disks with the HexViewer

HexViewer – an analysis tool for data experts

MaxDataGenius automatically executes many background processes concerning your disks‘internal structure. Nonetheless, there are users who want or need to analyse their disks‘structures themselves in order to conduct specific tests or operations. This requirement mainly addresses users who are experienced in disk diagnostics and disk structure optimization, or those who work with data administration an IT security on a professional level. Users who are experienced with analysing RAW files can get detailed information about the files located on their disks. Therefore, they can check the binary view which is integrated in the HexViewer. In order to open the binary view, follow the instructions in this chapter.

1. Start MaxData Genius in the Pro version.

2. Select the disk or volume you want to operate with.

- The disk or volume is highlighted in blue as soon as you selected it by click. The software also opens a dialogue which displays the volume's or disk's properties.

3. Click on ***Continue***.

   - The software opens a dialogue window with possible data recovery scenarios and file systems.

4. Select ***Disk Tools***.

5. Among the disk tools, select ***View Disk***,then click on ***Continue***.

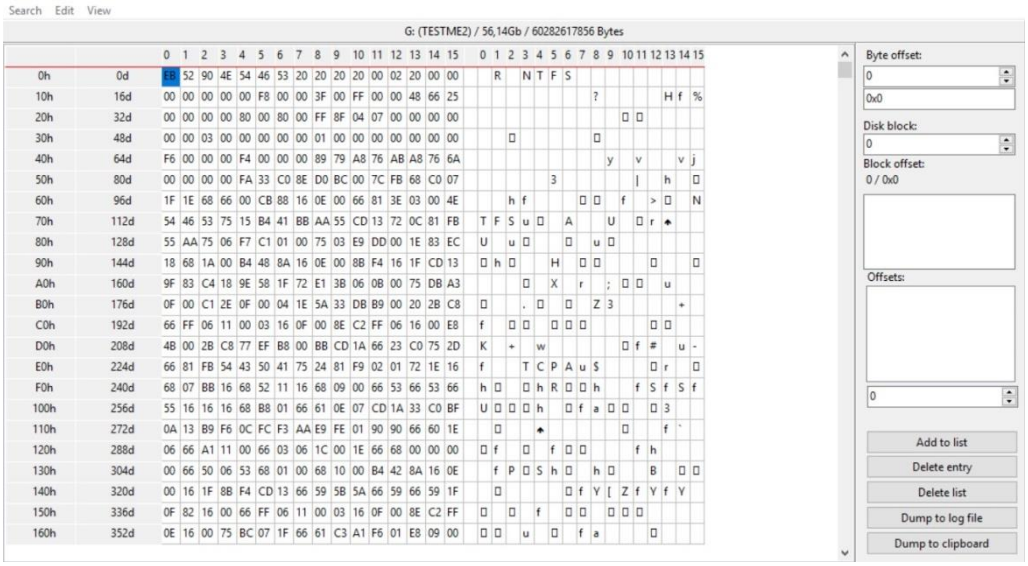
*Screen 74: Selecting the scenario **View Disk***

6. Verify if you correctly selected the data recovery scenario and the file systems. Then click on ***Continue***.

   - After an incorrect selection, you can click on ***Go back*** in order to change it.

7. Click on ***Continue***.

   - The software opens the ***HexViewer*** in a new dialogue window. The HexViewer dialogue displays all elements available on the volume as hex values, as binary coded decimals and as an ASCII chart.



Screen 75: Logical volume displayed in the hex viewer, ready for further analysis

Your disk or volume is now displayed in the binary view so you can conduct further tests and operations. For example, you can manually define a scan region (***Byte Offset,*** also see chapter 4.4.3), scan your disk or volume for available file formats, store data within a defined scan region in a clipboard or transfer selected data to the logfile.

Tips:

- Apply the HexViewer in order to keep track of your disk's or volume's contents.
- Before your analyse your disk or volume with the HexViewer, verify if the configurations within the software options are correct and adequate für your purpose (also see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**). If necessary, adapt them.

7. Index

8. Glossary

IT term	Meaning	Alternative terms used in the manual
bad block	basic unit within a physical disk's structure which is corrupted or does not function at all	
block	basic unit within a disk's inner structure	sector, LBA (Local Block Address)
bootloader	process runníng while a harddisk is booted (started)	boot programme
cluster	assembly of several blocks within a disk's structure	
cluster number	cluster name on a disk, defines the cluster's allocation	cluster entry
data volume	amount and properties of data which islocated on a volume or physical disk; relevant for the duration of scanning processes	
disk refreshing, refresh disk	process to rewrite a physical disk block by block; it helps to opimize and keep up disk performance	
selection dialogue	dialogue which enables the user to select different scenarios or file types in order to proceed	context menu
disk cleanup, clean up disks	security feature of MaxDataGenius which definitely eliminates data traces of lost and deleted files located on a volume or disk. All	

	intact files stay untouched during the process.	
file	individual element within a file storage system	volume item
file system	file storage system for which e.g. serves as a functional basis for operating systems	e.g.NTFS, FAT, exFAT, JFS, BTRFS, ISO, UDF, XFS, UFS, ZFS, EXT2-4
file type	storage format for files in the shape of a volume item type, e.g. .docx oder .pptx as usual formats for office files	file format
(physical) disk	physical storage medium which either runs independently or is integrated in another device (e.g. a harddisk in a computer)	medium, storage medium
disk image	virtual image which serves as a logical copy of a logical volume or of a physical disk	image file
disk space	space available within a disk's partition table; it can be occupied with files or remain free space for further data storage; maximum capacity as a storage limit (maximum size of a medium)	memory capacity
disk tools	features for an optimized handling of media, e.g. restructuring, cleanup, copying, image features and disk wiping	
dropdown menu	List of selection options which opens if the user	dropdown list

	clicks on the arrow-down button	
harddisk	external or integrated physical disk for a computer or laptop	
HexViewer/ hex viewer	view mode which displays a disk's or volume's contents and structure as hex values, as binary-coded decimals and as an ASCII-based chart. Users who are experienced with RAW file analysis can thoroughly analyse their volumes with the HexViewer.	binary view
logical volume	virtual drive which is located and displayed on a physical disk	logical partition
logging	continuous automatical writing of events and operations running in the background of software processes	
logfile	automatically created file which consists of data records of background processes, logging results	
magnetic media	Physical disks which were mainly used before the establishment of SSD and Flash standards, functionality based on electromagnectical principles (e.g. floppy disks, older harddisks)	
folder	Assembly of individual elements (files) within a file storage system	directory
options dialogue	dialogue window in which users can adapt	

	the programme options on several levels	
partition scheme	structural scheme which defines a partition table (e.g. MBR, GUID, LDM, AppleMap, IRIX, ZFS)	partition type
partition table	structure table within a file system which defines the allocation of logical volumes on a physical disk	
physical disk	hardware which can include more than one partition, e.g. a physical harddisk	disk, (physical) medium
popup dialogue	dialogue window with several operations to choose from,overlaps with another dialogue and disappears after selection (e.g. confirmation of a programme message)	
RAW file	file type which is composed of data traces; often occurs in an expert environment; normally very big files	
RAW analysis	analysis of files which only exist in a RAW format; mainly conducted by IT experts; often the last possible recovery option	
recovery scenario	Selected feature of MaxDataGenius in order to search or recover volumes, folders and files	data recovery scenario
scan, to scan	automatical search run on a disk in order to find and recover lost	search, search run

	files and folders	
session files	Data which is stored in a physical disk's memory during all programm operations and processes	saved programme files, offset data
setup	process of installing a software on a device, e.g. a computer	installation
setup assistant	auxiliary tool which is integrated in a software and leads the user through the installation process	Installation wizard
S.M.A.R.T. analysis	Self-Monitoring, Analysis and Reporting Technology. Industrial standard for harddisks and SSD media, serves as a monitoring tool which detects potential damages and security risks. It functions by analysing values which are transmitted by different sensors within the disk's internal structure.	SMART analysis
storage location	location where intact or recovered files and folders are saved	destination location
tool bar	bar with symbols which serves to select a feature (for this programme: a recovery scenario)	
wizard	user interface which sums up relevant processes running in the background and which interactively leads the user through all software operations	assistant, GUI (graphic user interface)