

# Data recovery with MaxDataGenius

## User manual for the versions Basic and Pro

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## Table of contents

1.	About t	his user manual3
2.	Data re	covery with MaxDataGenius4
3.	Prepari	ng MaxDataGenius for use5
3.1	Downloa	ading the software5
3.2	Unpacki	ng and installing the software7
4.	Version	s and features of the software16
4.1	The soft	ware versions Basic and Pro16
4.2	Quick or	ientation thanks to the wizard17
4.3	More st	ructure with the expert mode18
4.4	Software	e options at a glance21
	4.4.1	General – Logging and paths and View options21
	4.4.2	Recovery – File Types
	4.4.3	Recovery – Scan Region
	4.4.4	Recovery – Scan Options
	4.4.5	Recovery – Wipe Options
	4.4.6	Recovery – Bad Block Management
	4.4.7	Recovery– Save Options
	4.4.8	Revovery – Advanced Options
5.	Finding	and recovering data on a medium
5.1	Explorin	g volumes34
5.2	Recover	ing deleted files and finding lost volumes38
ļ	5.2.1	Scanning volumes for lost or deleted files
	5.2.2	Finding logical volumes on physical disks45
5.3	Creating	g a disk image50



5.4	Scanning	g formatted media5	53
6.	Optimiz	ing media with <i>Disk Tools</i> 5	57
6.1	Applying	Disk Diagnostics	57
6.2	Influenci	ng processes on physical disks6	51
6.	2.1	Saving disks and volumes as disk images	61
6.	2.2	Recovering disks by restoring disk images	64
6.	2.3	Copying physical disks	69
6.	2.4	Refreshing disks	72
6.	2.5	Cleaning up physical disks	75
6.	2.6	Wiping disks by overwriting all files	77
6.	2.7	Analyzing disks with the HexViewer	79
7.	Index		32
8.	Glossar	y8	35



## 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:



## 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

MaxDataGenius

User Manual



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)

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

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 Various user scenarios

Basic version and Pro version



**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 <u>www.grauonline.de</u>.

## 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 <u>www.grauonline.de</u> 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.





### Download MaxDataGenius

System requirements: PC: Windows Vista / 7 / 8 / 10 or higher DEMO version restriction: You can save up to 3 files in DEMO mode



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.



	Extrahieren	mdgp_setup_1.9.	5.2-r15041(2).zip		
Ansicht	Tools für komprimierte Ordne	er			
	📰 Bilder	1	Design neue Website Arbeitsordner Nutzerhandbuch MaxDataGenius		
	📕 temp				
Coco der neugierige Affe			Wer ebilder Website Katherina	Ŧ	Alle extrahierer
	Extrahiere	n nach			
ser PC > Dow	vnloads > mdgp_setup_1.9.5	.2-r15041(2).zip			∨ Ö ~
				3	- 🔏
Name	^	Тур	Komprimierte Größe Kennwor	tg	Größe
🔳 mdgp_s	etup_1.9.5.2 r15041.exe	Anwendung	4.382 KB Nein		

*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.

Setup-S	Sprache auswählen	$\times$
	Wählen Sie die Sprache a Installation benutzt werde	
	Fastish	~
	English	~

Screen 4: Language selection during setup

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

MaxDataGenius



etup - MaxDataGenius Pro version 1.9.5.2 r15041 —	
icense Agreement	
Please read the following important information before continuing.	Ċ
Please read the following License Agreement. You must accept the terms of agreement before continuing with the installation.	this
Grau GmbH Hardware & Software Solutio	ns ^
License Agreement	
License:	
This software is licensed, not sold or owned. Grau GmbH Hardw & Software Solutions grants you a non-exclusive, non-transferal license to use this software. You may not redistribute the software	ble
I accept the agreement	
C	
O I do not accept the agreement	

Screen 5: License agreement during setup

- $\circ$   $\;$  The setup wizard now displays the path to the destination location.
- 5. Klick on *Next* > if you accept the intended location of storage .



Select Destination Location		1
Where should MaxDataGenius Pro be installed?		C
Setup will install MaxDataGenius Pro into the f	oll <mark>ow</mark> ing folder.	
To continue, click Next. If you would like to select a di	fferent folder, cl	ick Browse.
C:\Program Files\MaxDataGenius Pro 1.9.5.2 r15041		Browse
At least 15,2 MB of free disk space is required.		

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.
- 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.



Select Start Menu Folder	
Where should Setup place the program's shortcuts?	
Setup will create the program's shortcuts in the following	Start Menu folder.
To continue, click Next. If you would like to select a different fold	er, click Browse.
MaxDataGenius Pro 1.9.5.2 r15041	Browse
Don't create a Start Menu folder	

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*.

Grau GmbH Hardv	vare & Softw	vare Sol	utions	
Setup - MaxDataGenius Pro version 1. Select Additional Tasks Which additional tasks should be perform		-		×
Select the additional tasks you would like MaxDataGenius Pro, then click Next. Additional shortcuts:	e Setup to perform v	vhile installin	g	
	< Back	Next >	Car	ncel

Screen 9: Optional desktop shortcut

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



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

eady to Install			
Setup is now ready to begin installing	MaxDataGenius Pro o	on your compute	er. (
Click Install to continue with the instal change any settings.	llation, or click Back if	you want to rev	view or
Destination location: C:\Users\kathe\Desktop\MDGP E	nglish\MaxDataGeniu	s Pro 1.9.5.2 r1	5041
Start Menu folder: MaxDataGenius Pro 1.9.5.2 r150	41		
Additional tasks: Additional shortcuts: Create a desktop shortcut			
<			
2			

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.

- 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

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.

User Manual



- 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

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

Edit Search Extras License Help		(ð) 🌗				
Select Volume to Scan		e file Sessions Load I your volume is not a	mage File vailable, select the disk that did	contain your volume		
lumes	Туре	Size	Free space		Кеу	Value
DISK00 (KINGSTON SA400S37960G)	Disk	894.25Gb		^	Name	DISK01 (USB Flas
					Identifier	Disk_\\PHYSICAL
Part00 (Unknown)	Volume	499,00Mb			GUID	{0000000-0000-0.
Part01 (Unknown)	Volume	99,00Mb			Disk flags Disk type	dfMBR, dfOSdisk. Removable
					Partition type	Unknown
Part02 (Win_Reserved)	Volume	16,00Mb			Size	3,73Gb
Part03 (Linux_Data)	Volume	194,71Gb			Byte size	4009754624
	Volume	101.71.01	03.00.01		Block count	7831552
- D: (deh_daten)	Volume	194,71Gb	83,88Gb		Block size	512
- TPart04 (Linux_Data)	Volume	341,80Gb			Heads	255
	Volume	341,80Gb	290.77Gb		Tracks per head	487
C: (zen)	volume	341,80GD	290,7700		Blocks per track	63
DISK01 (USB Flash Disk)	Disk	3,73Gb			Startblock on physica	
- Part00 (FAT)	Volume	1.78Gb			Physical block offset Physical block size	0
	voidine	1,7005		~	Device path	V.\PHYSICALDRIV.
				>	Mount point	N DEVELOALDRIV
have selected a disk - choose a disk on	y if your volume is	not available.				
Go back					6	tinue 🕨

Screen 14: Example of wizard properties

MaxDataGenius

User guidance through recovery scenarios



#### 4.3 More structure with the expert mode

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.

The expert mode – not only for experts

🔳 MaxDa	itaGenius	Pro (1.9.5.2)				
File Edit	Search	Extras License	Help			
چې Options	Help	RAID Reconstructor	7ES Peropetructor		Sarrions	
Options		lect Volume to		Create image file	Sessions	Load Image File
Step 1		lect a volume you		ata from. If your	volume is	s not available,

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

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*.

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.

Adjusting software options

Structured view of partition schemes



		<b>(2)</b>	7	
tions Help RAID Reconstructor ZFS Recons Select Volume to Scan	tructor Create Image	e file Sessions Load I	mage File	
Select a volume you want to rec	over data from. If	your volume is not a	vailable, select the disk that did	contain your volur
5 MBR GUID LDM AppleMap Un	ix Images RAID	Lost All		
olumes	Туре	Size	Free space	
DISK00 (KINGSTON SA400S37960G)	Disk	894,25Gb		
Part00 (Unknown)	Volume	499,00Mb		
- Part01 (Unknown)	Volume	99,00Mb		
- Part02 (Win_Reserved)	Volume	16,00Mb		
- TP Part03 (Linux_Data)	Volume	194,71Gb		
- 👕 D: (deh_daten)	Volume	194,71Gb	83,87Gb	
- Part04 (Linux_Data)	Volume	341,80Gb		
	Volume	341,80Gb	290,49Gb	
DISK01 ()	Disk	953,50Mb		

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)
	Iocated 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:
	<ul> <li>partition scheme running in the background pg a Windows-based file system</li> </ul>
	influences how disk space is assigned
	<ul> <li>enables special features like the composition and connection connection of disks and Windows software RAID through the Windows Dynamic Disks system</li> </ul>
	not supported by the BIOS system
AppleMap	APM (Apple Partition Map)
	<ul> <li>older partition scheme for Mac and Apple file systems which are based on Power PC and m68</li> </ul>
	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
	<ul> <li>creation of redundant (= repeated) data records in order to retain a RAID system if individual disks do not are damaged</li> </ul>
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.

Options		×
General     Logging and Paths     View options     File Types     Scan Region     Scan Options     Advanced options     Wipe Options     Bad Block Management     Save options	Here you can choose the verbosity level of the logging messages and other log sett         Current logging level:         INFO         Log detailed analyser memory statistics         Paths         Path to store log and resume data:         C:\Users\kathe\AppData\Local\mdgp64\         Path to store temporary data:         C:\Users\kathe\AppData\Local\Temp\mdgp64\	ings:
< Vertication of the second se	С ОК	Cancel

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.

MaxDataGenius



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	<ul> <li>results of data recovery processes</li> <li>display and list of errors and failed operations</li> </ul>	Users who immediately want to detect and eliminate errors
Warning	<ul> <li>results of data recovery processes</li> <li>display and list of errors and failed operations</li> <li>display and list of additional warning messages created by the programme</li> </ul>	Users who immediately want to detect and eliminate errors, users who want to anticipate further potential error sources
Info	<ul> <li>results of data recovery processes</li> <li>display and list of errors and failed operations</li> <li>display and list of additional warning messages created by the programme</li> <li>detailed automatical documentation of all relevant processes running in the software's background</li> </ul>	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



General - Logging and Paths - View options Recovery - File Types	To speed up the scan or limit the number scenarios here.	r of found files, you ca	n <mark>disab</mark>	
- Scan Region - Scan Options - Advanced options - Wipe Options - Bad Block Management - Save options	File type ☑ image/jpeg ☑ image/mpo ☑ video/m2ts ☑ application/ole2 ☑ application/msword ☑ application/msexcel ☑ application/mspowerpoint <	Extension jpg mpo m2ts ole2 doc xls ppt	^ >	Choose file types filter:
Help	×		0	DK 🔇 Cancel

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

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.

Target group: expert users



General Logging and Paths View options Recovery	On very large speed up the scenarios.	disks, it can be usefu scan and reduce the r	I to limit the scan to a cert number of found files. This	ain range of the disk s option applys to all	. This will scan
- File Types - Scan Region - Scan Options - Advanced options	Start at:	3%	Byte offset:	105300	V
– Wipe Options – Bad Block Management – Save options	Stop at:	20%	Byte offset:	23090050	×
	~				

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
	<ul> <li>only tob e applied with NTFS- based file systems</li> </ul>
	<ul> <li>files and subdirectories on deeper directory levels are not found</li> </ul>
	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
	<ul> <li>recommended for long-term scan processes on disks with a huge data volume (more than 500 GB)</li> </ul>
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
	<ul> <li>no further storage of session data above the limit set by this specification</li> </ul>
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)	Iimited by maximum value
	<ul> <li>input field for experienced or expert users</li> </ul>
	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
	<ul> <li>safety degree with regard to an irrevocable deletion: low(for magnetical media)</li> </ul>
	time duration: short
Random numbers	disk is overwritten with a pattern composed of random numbers
	<ul> <li>safety degree with regard to an irrevocable deletion: high(for magnetical media)</li> </ul>
	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<br/>requirements regarding your wiping process. If your magnetical<br/>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*.

General Logging and Paths View options			d edit the bad block ranges for itomatically skipped during the	r the currently selected disk in the e disk scan.	table below. These block
<ul> <li>Recovery</li> <li>File Types</li> <li>Scan Region</li> </ul>		Blockrange:			Save list
		From	То		Load list
Scan Options Advanced options Wipe Options					Clear list
Bad Block Management Save options					Delete entry
		From:	To:	Add entry	Apply
¢	~	<ul> <li>✓ Automatical</li> <li>✓ Fast bad bloc</li> <li>✓ Save bad bloc</li> </ul>	ly add bad blocks ly skip list entries ck skipping ick information into the scan re blocks from previous scans	esume path	

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.

MaxDataGenius





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
	<ul> <li>saves time and preserves the disk structure</li> </ul>
Fast bad block skipping	entries which have already been listed are skipped faster
	<ul> <li>time-saving, but not precise: intact blocks can be accidentally ignored z</li> </ul>
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)
	<ul> <li>grants user insights into the current block structure for disk diagnosis</li> </ul>
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
	Iogfile 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.

<ul> <li>Logging and Paths</li> <li>View options</li> <li>Recovery</li> <li>File Types</li> <li>Scan Region</li> <li>Scan Options</li> <li>Advanced options</li> <li>Bad Block Management</li> <li>Save options</li> </ul>		Ask user for new path if destination disk is full     Automatic file renaming for same filenames on save.     Calculate overall items size and check against free space before save     Do not save files larger than         0         MB     Note: The RAW data analyser can create excessive large files if no limit is set in the advanced scan options     You can find them by sorting the result folders by filesize. You can still filter them out by after a scan by     setting this limit. This reduces the saving time.	
<	~	marked as lost	

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).
	<ul> <li>Partition boundaries become points of orientation during scans.</li> </ul>
	<ul> <li>quicker scans and recovery operations than block-by-block scans</li> </ul>
	<ul> <li>less precise results, especially for complicated data recovery scenarios</li> </ul>
	<ul> <li>recommended option directly after data loss has occurred</li> </ul>
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
	<ul> <li>deleted files are displayed without a scan, depending on how files got lost or were deleted</li> </ul>
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
	<ul> <li>cluster: defined as several composed blocks within a partition table (as presented in chapter 4.4.6)</li> </ul>
	<ul> <li>examples of use: mobile harddisks with a data volume of 250 GB or less, USB flash drives, memory cards)</li> </ul>
	<ul> <li>softare tries to recover the cluster structure with the help of specific algorhithms</li> </ul>
	to be applied after previous data recovery trials for a FAT-based medium failed



	<ul> <li>longer time duration of saving and display processes after activating this option</li> </ul>
FAT filesystem: Enable high cluster reconstruktion	scenario of use: deleted files which are located in a root registry of a FAT-formatted medium
	<ul> <li>reconstruction of cluster numbers in the context of a Windows- based operation system</li> </ul>
	<ul> <li>activation optimizes file recovery results</li> </ul>
	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 0.0<sup>[2]</sup>). 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

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

User scenario: Browse volume

- 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.


ş 📖 🚔 👗	-		$\odot$				
tep 1 RAID Reconstructor Create Image fi Select Volume to Scan Select a volume you want to recove			Sessions vailable, select the disk that did conta	ain your volume.			
MBR GUID LDM AppleMap Unix	Images RAID	Lost All			Кеу	Value	
blumes	Туре	Size	Free space		Volume filesystem	FAT	
DISK00 (KINGSTON SA400S37960G)	Disk	894.25Gb		^	Name	F: (TEST DISK 1)	
	Disk	034,2300			Identifier	Disk_F:\_F: (TEST	
	Volume	615,00Mb			GUID	{0000000-0000-0	ļ
	Volume	194,71Gb	83,78Gb		Disk flags	dfOSpart	
- D: (deh_daten)	volume	194,7166	85,78GD		Disk type	Removable	
C: (zeh)	Volume	341,80Gb	281,46Gb		Partition type	Unknown	
					Size	1,76Gb	
Free space 1126399992->1875385007	Volume	357,14Gb			Byte size	1891614720	
	DISK	3,7300		_	Block count	3694560	
		-,			Block size	512	
F: (TEST DISK 1)	Volume	1,76Gb			Heads	255	
	Volume	1.97Gb			Tracks per head	487	
Pree space 3094392->7631331	volume	1,9706			Blocks per track	63	
					Startblock on physica	32	
					Physical block offset	0	
					Physical block size	512	
OBTANT MALE AND A REAL TO A PARTY		and the second			Davies noth	EA.	
ORTANT: Make sure that there is a disk in or	connected to you	ar system that h	as enough space to save the recover	ered data tound	during the following	scan process:	

Screen 22: Selecting a volume

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

 $\circ$   $\;$  The software opens a dialogue window with possible data recovery scenarios and file systems.

ons Help						
choose a recovery scener 2	<b>cenario</b> enario that best fits your data lo	oss problem.				
			<i>Ì</i> Ĩ		S	
Explor	Plo Find deleted files	Formatted Media Recovery	Wipe Data	Disk Diagnostics	Disk Tools	
Explore a valid volume in an expl	orer-like interface. Choose this (	10010-010-010-0	n a valid volume. If	possible without disk-se	canning, also delete	ed files are shown.
elect file system(s) to search for:		✓ NTFS ☐ EXT2/3/4 ☐ ZFS ☐ ReiserFS re scan (RAW scan)	HFS+ ISO96		Scan Options	

Screen 23: Selecting a recovery scenario

MaxDataGenius User Manual



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

ID and size in a					
DSC_0177.JPG		4816 KB	18.05.2019 12:11:15	211430	FATVolumeltem
DSC_0178.JPG		5184 KB	18.05.2019 12:11:15	216246	FATVolumeItem
MG_20180311_181845.jpg		3439 KB	11.03.2018 18:16:52	221430	FATVolumeltem
MG_20180311_181851.jpg		2928 KB	11.03.2018 18:16:52	224869	FATVolumeltem
MG_20180311_181859.jpg		3090 KB	11.03.2018 18:16:52	227797	FATVolumeltem
MG_20180311_182107.jpg		3407 KB	11.03.2018 18:22:30	230887	FATVolumeltem
MG_20180404_190904.jpg		3397 KB	04.04.2018 19:07:30	234294	FATVolumeItem
MG_20180404_190911.jpg		3321 KB	04.04.2018 19:07:30	237691	FATVolumeltem
MG_20180819_110013.jpg		3411 KB	19.08.2018 10:58:07	241012	FATVolumeItem
MG_20180819_110021.jpg		3261 KB	19.08.2018 10:58:07	244423	FATVolumeltem
MG_20180819_110049.jpg		2400 KB	19.08.2018 10:58:07	247684	FATVolumeltem
MG_20180819_110049_2.jpg		2602 KB	19.08.2018 10:58:07	53477	FATVolumeltem
MG_20180819_111641.jpg		2657 KB	19.08.2018 11:15:00	56079	FATVolumeltem
MG_20180819_112503.jpg		2175 KB	19.08.2018 11:26:15	58736	FATVolumeltem
MG_20180831_211318.jpg		3791 KB	31.08.2018 21:11:15	60911	FATVolumeItem
MG_20180831_211330.jpg		3649 KB	31.08.2018 21:11:15	261310	FATVolumeltem
<					
lost or deleted folder		2	Normal folder		
Sost or deleted folder			Normal folder		
	<ul> <li>IMG_20180311_181845.jpg</li> <li>IMG_20180311_181851.jpg</li> <li>IMG_20180311_181851.jpg</li> <li>IMG_20180311_181875.jpg</li> <li>IMG_20180311_181875.jpg</li> <li>IMG_20180404_190904.jpg</li> <li>IMG_20180404_190911.jpg</li> <li>IMG_20180819_110024.jpg</li> <li>IMG_20180819_110024.jpg</li> <li>IMG_20180819_110049.jpg</li> <li>IMG_20180819_110049.jpg</li> <li>IMG_20180819_111044.jpg</li> <li>IMG_20180819_1112503.jpg</li> <li>IMG_20180813_1211316.jpg</li> <li>IMG_20180831_211330.jpg</li> </ul>	<ul> <li>IMG_20180311_181845,jpg</li> <li>IMG_20180311_181851,jpg</li> <li>IMG_20180311_181859,jpg</li> <li>IMG_20180311_181859,jpg</li> <li>IMG_20180404_190904,jpg</li> <li>IMG_20180404_190911,jpg</li> <li>IMG_20180819_110043,jpg</li> <li>IMG_20180819_110043,jpg</li> <li>IMG_20180819_11049,2,jpg</li> <li>IMG_20180819_11049,2,jpg</li> <li>IMG_20180819_11141,jpg</li> <li>IMG_20180812_111318,jpg</li> <li>IMG_20180812_111310,jpg</li> <li>IMG_20180812_111310,jpg</li> </ul>	IMG_20180311_181845,jpg         3439 KB           IMG_20180311_181851,jpp         2928 KB           IMG_20180311_181851,jpp         3090 KB           IMG_20180311_181851,jpp         3090 KB           IMG_20180311_181851,jpp         3090 KB           IMG_2018041_190904,jpg         3357 KB           IMG_20180404_190901,jpg         3321 KB           IMG_20180404_19091,jpg         3311 KB           IMG_2018049_110013,jpg         3411 KB           IMG_20180819_110014,jpg         2261 KB           IMG_20180819_11004,jpg         22602 KB           IMG_20180819_11041,jpg         2657 KB           IMG_20180819_1114,jpg         2657 KB           IMG_20180819_1112503,jpg         21175 KB           IMG_20180819_1112503,jpg         3791 KB           IMG_20180831_211318,jpg         3791 KB	IMG_20180311_181845.jpg       3439 KB       11.03.2018 18:16:52         IMG_20180311_181851.jpg       2928 KB       11.03.2018 18:16:52         IMG_20180311_181851.jpg       3909 KB       11.03.2018 18:16:52         IMG_20180311_181051.jpg       3909 KB       11.03.2018 18:16:52         IMG_2018041_190911.jpg       3407 KB       11.03.2018 18:22:30         IMG_20180404_190904.jpg       3397 KB       04.04.2018 19:07:30         IMG_20180404_190911.jpg       321 KB       04.04.2018 19:07:30         IMG_20180819_11001.jpg       321 KB       19.06.2018 10:58:07         IMG_20180819_11004.jpg       2460 KB       19.08:2018 10:58:07         IMG_20180819_11004.jpg       2460 KB       19.08:2018 10:58:07         IMG_20180819_11004.jpg       2460 KB       19.08:2018 10:58:07         IMG_20180819_11044.jpg       2662 KB       19.08:2018 10:58:07         IMG_20180819_111641.jpg       2667 KB       19.08:2018 11:15:00         IMG_20180819_111641.jpg       2667 KB       19.08:2018 11:15:00         IMG_20180819_111641.jpg       2175 KB       19.08:2018 11:15:00         IMG_20180819_111641.jpg       3791 KB       31.08:2018 21:11:15         IMG_20180819_111641.jpg       3794 KB       31.08:2018 21:11:15         IMG_20180831_211330.jpg       3649 KB	IMG_20180311_181845,jpg       3439 KB       11.03.2018 18:16:52       221430         IMG_20180311_18185,jpg       2928 KB       11.03.2018 18:16:52       224869         IMG_20180311_18185,jpg       3090 KB       11.03.2018 18:16:52       22797         IMG_20180311_181059,jpg       3090 KB       11.03.2018 18:16:52       22797         IMG_2018041_190904,jpg       3397 KB       04.04.2018 19:07:30       23087         IMG_20180404_190904,jpg       3397 KB       04.04.2018 19:07:30       237691         IMG_20180404_190904,jpg       3321 KB       04.04.2018 19:07:30       237691         IMG_20180404_190904,jpg       3321 KB       04.04.2018 19:07:30       237691         IMG_20180404_19091,jpg       321 KB       19.08.2018 10:58:07       244012         IMG_20180819_11004,jpg       2261 KB       19.08.2018 10:58:07       244424         IMG_20180819_11004,jpg       2602 KB       19.08.2018 10:58:07       244642         IMG_20180819_11004,jpg       2607 KB       19.08.2018 10:58:07       247644         IMG_20180819_11004,jpg       2607 KB       19.08.2018 10:58:07       247644         IMG_20180819_110404,jpg       2607 KB       19.08.2018 11:500       56079         IMG_20180819_110404,jpg       2657 KB       19.08.2018 11:500       560

Screen 25: Browsing and viewing lost and deleted folders

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



Table	Thumbnails			
Name		Туре	Size	Date modified
📄 DS	C_0177.JPG		4816 KB	18.05.2019 12:11:15
DS	C_0178.JPG		5184 KB	18.05.2019 12:11:15
MI	G_20180311_181845.jpg		3439 KB	11.03.2018 18:16:52
IM E	G_20180311_181851.jpg		2928 KB	11.03.2018 18:16:52
MI	G_20180311_181859.jpg		3090 KB	11.03.2018 18:16:52
MI M	G_20180311_182107.jpg		3407 KB	11.03.2018 18:22:30

Screen 26: Folder content listed in the table view mode

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





- 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.

### 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.

ptions Help RAID Reconstructor Create Image f Step 1 Select Volume to Scan Select a volume you want to recove			Sessions vailable, select the disk that did contai	n your volume.			
DS MBR GUID LDM AppleMap Unix	Images RAID	Lost All			Кеу	Value	
Volumes	Type	Size	Free space		Volume filesystem	FAT	
DISK00 (KINGSTON SA400S37960G)	Disk	894,25Gb		~	Name	F: (TEST DISK 1)	
DISKOU (KINGSTON SM4005579000)	DISK	094,2300			Identifier	Disk_F:\_F: (TEST .	
Free space 0-> 1259519	Volume	615,00Mb			GUID	(0000000-0000-0	l
	1000				Disk flags	dfOSpart	
D: (deh_daten)	Volume	194,71Gb	83,78Gb		Disk type	Removable	
C: (zeh)	Volume	341,80Gb	281,46Gb		Partition type	Unknown	
					Size	1,76Gb	
Free space 1126399992->1875385007	Volume	357,14Gb			Byte size	1891614720	
E DISK01 (USB Flash Disk)	Disk	3.73Gb			Block count	3694560	
	DISK	5,7500			Block size	512	
F: (TEST DISK 1)	Volume	1,76Gb			Heads	255	
Free space 3694592->7831551	Volume	1,97Gb			Tracks per head	487	
Free space 3094592-> 7831551	volume	1,9766		Blocks per track		63	
					Startblock on physica	32	
					Physical block offset	0	
					Physical block size	512	
PORTANT: Make sure that there is a disk in o	connected to vo	our system that h	as enough space to save the recover	ed data found	during the following	scan process!	
4	connected to ye		as chough space to save the record		-	D	
Go back					Cont	tinue 🕨	

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

3. Click on *Continue*.

Targeted scans for lost or deleted files or volumes



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

ions Help							
Choose R	ecovery Scenario recovery scenario that I	best fits your data lo	ss problem.				
	610	-			I	No.	
	Explore Volume	Find deleted files	Formatted Media Recovery	Wipe Data	Disk Diagnostics	Disk Tools	
Find accidentally delete also for file signatures		ns perform a disk-sc	an for this selection, wh	ich requires more	time than 'Explore Volu	me'. Thus it is recom	mended to search

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.



Media type:	Harddrive	
Volume:	F: (TEST DISK 1)	
Recovery Scenario:	Find deleted files	
The following file systems will be searched:	FAT, NTFS, Raw, ExFAT, ReFS	

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<br/>were relevant storage locations for your files. Consequently you<br/>can reduce the time period needed for your scan.For your<br/>orientation, you find a list of file systems in chapter. 4.1.



📁 scanDeletedFiles (0)	Table Thumbnails				
	Name	Type Size	Date modified	ID	File system

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 -.



File Edit Search Extras E	xpert License	Help
Soptions Help Save		
		want to recover to
🖃 🧊 scanDeletedFiles (8)	Tabl	e Thumbnails
🖻 🧊 Images (5)	Nan	ne
gif (4)		1001584.jpg
📁 jpeg (729) 🚺 mpo (1)		1003888.jpg
📁 png (27)		1005232.jpg
psd (4)		1006640.jpg
🕀 📁 Applications (7)		1008048.jpg
🕀 🧊 Text (1)		1010288.jpg
। ∎ · 📁 Text (1) ■ · 🃁 Documents (2)		

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

- 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*.



File Edit Search Extras Expert	License Help
Options Help Save Step 4 Step 4 Step 4 Save Your Files Select and save the their associated ap	e files you want to recover to an
⊡ 📁 scanDeletedFiles (8)	Table Thumbnails
General Images (5)     General gif (4)     General gif (4)     General gif (729)     General gif (729)     General gif (4)     General gif (	Name 730734.jpg 733548.jpg 743992.jpg 744750.jpg 749790.jpg 749790.jpg 755082.jpg 760810.jpg 763840.jpg 767674.jpg 770386.jpg

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.



	Ansicht						
nfügen	X Ausschneiden Sei Pfad kopieren Verknüpfung einfügen	Verschieben Kopiere nach * nach *	Löschen Umbenennen	Neuer Ordner	er Zugriff 🔻	Eigenschaften	Gffnen 👻 Bearbeiten Verlauf
nenabla	ige	Org	anisieren	Neu		Öffne	en
Diese	r PC > deh_daten (D:)	> Ordner Testbilder	MDGP				
		an and the second second		An	à		
	698836.jpg	702492.jpg	706204.jpg	712274.jpg	715076.jpg	g 717	7810.jpg

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.





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.

	<u> </u>	$\odot$				
tions Help RAID Reconstructor ZFS Reconstr Select Volume to Scan	uctor Create Image file	e Sessions Load I	Image File			
Select volume to Scan Select a volume you want to record	ver data from. If you	r volume is not a	vailable, select the disk that did	contain your volume.		
MBR GUID LDM AppleMap Unix	Images RAID	Lost All			Key	Value
olumes	Туре	Size	Free space		Name	DISK02 (MQ01AB.
- D: (deh_daten)	Volume	194,71Gb	81,89Gb	^	Identifier	Disk_\\.\PHYSICAL
- (del_datel)	Volume	134,7100	01,000		GUID	{0000000-0000-0
C: (zeh)	Volume	341,80Gb	281,40Gb		Disk flags	dfMBR, dfOSdisk.
					Disk type	Fixed
Free space 1126399992->1875385007	Volume	357,14Gb			Partition type	Unknown
DISK01 (USB Flash Disk)	Disk	3,73Gb			Size	931,51Gb
					Byte size	1000204883968
- E: (TEST DISK 1)	Volume	1,76Gb	1,45Gb		Block count	1953525164
Tree space 3034372 - 7051551	Volume				Block size	512
	Totallic	1,5700			t eads	255
DISK02 (MQ01ABD100)	Disk				Tacks per head	121601
					E ocks per track	63
F: (VERBATIM360GB)	Volume	299,2000	5,8200		Startblock on physica	0
G: (TESTME2)	Volume	56,14Gb	52,36Gb		Physical block offset	0
					Physical block size	512
	Volume	1,02Mb		*	Device path	\\.\PHYSICALDRIV.
	f your volume is no			· · ·	Mount paint	11 IDAVELENT DOM

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.





Find deleted files









Disk Tools

User Manual

MaxDataGenius



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 be 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.

NTFS_34373738496 casex NTFS_34381934592 case1 NTFS_34390130688 case5 NTFS_34398322688 case5 NTFS_34406514688 case3	Type Volume Volume Volume Volume Volume	7,8 7,8 7,8 7,8	SIMb Free space SIMb SIMb SIMb SIMb		A Identifier GUID Disk flags Disk type Partition t	5	DISK02 (MQ01AB Disk_\\\PHYSICAL. {0000000-0000-0. dfMBR, dfOSdisk. Fixed
NTFS_34381934592 case1 NTFS_34390130688 case5 NTFS_34398322688 case5	Volume Volume Volume	7,8 7,8 7,8	81Mb 81Mb		GUID Disk flags Disk type	5	{0000000-0000-0. dfMBR, dfOSdisk.
NTFS_34381934592 case1 NTFS_34390130688 case5 NTFS_34398322688 case5	Volume Volume Volume	7,8 7,8 7,8	81Mb 81Mb		Disk flags Disk type	5	dfMBR, dfOSdisk.
NTF5_34390130688 case5 NTF5_34398322688 case5	Volume Volume	7,8	81Mb		Disk type		
NTFS_34398322688 case5	Volume	7,8					Fixed
NTFS_34398322688 case5	Volume	7,8			Partition t	hone	
			B1Mb			type	Unknown
NTF5_34406514688 case3	Volume				Size		931,51Gb
NTFS_34406514688 case3	Volume				Byte size		1000204883968
		7,8	81Mb		Block cou	int	1953525164
NTFS 34414706688 case5	Volume	75	81Mb		Block size	ł	512
	Fordine	1,0			Heads		255
NTFS_34422898688 case2	Volume	7,8	81Mb		Tracks per	r head	121601
FATTO 22760 NIONANAS	Values	7/	018.45		Blocks pe	r track	63
FATT2_32/06 NUNAME	volume	/,0	SIMD		Startblock	k on physica	0
FAT12_25088 NONAME	Volume	10	),13Mb		Physical b	lock offset	0
					Physical b	lock size	512
FAT32 4214784 NONAME	Volume	1,0	JOGb		Device par	th	\\.\PHYSICALDRIV
		d to your sys	tem that has enough soa	re to save the recovered data fo			scan process
	a disk in or connect						
Pause	Cancel			5,20 % Estimated rema	ining time. 11,5	nours, clapsed	a chile. 50,5 milli
	FAT12_32768 NONAME FAT12_25088 NONAME FAT32_4214784 NONAME I: Make sure that there is	FAT12_32768 NONAME Volume FAT12_25088 NONAME Volume FAT32_4214784 NONAME Volume I: make sure that there is a disk in or connect	FAT12_32768 NONAME Volume 7,1 FAT12_25088 NONAME Volume 10 FAT32 4214784 NONAME Volume 1,1 IT Make sure that there is a disk in or connected to your sys Please wait w Please Cancel Found files 0	FAT12_32768 NONAME Volume 7,81Mb FAT12_25088 NONAME Volume 10,13Mb FAT32_4214784 NONAME Volume 1,00Gb It: make sure that there is a disk in or connected to your system that has enough space Please wait while scanning disk	FAT12_32768 NONAME     Volume     7,81Mb       FAT12_25088 NONAME     Volume     10,13Mb       FAT32_4214784 NONAME     Volume     1,00Gb       FAT32_4214784 NONAME     Volume     1,00Gb       T: Make sure that there is a disk in or connected to your system that has enough space to save the recovered data for Please wait while scanning disk     5,28 % Estimated remute Found files. 0, folders: 0	FAT12_32768 NONAME     Volume     7,81Mb     Blocks pe       FAT12_25088 NONAME     Volume     10,13Mb     Physical b       FAT32_4214784 NONAME     Volume     1,00Gb     Physical b       11 Make sure that there is a disk in or connect of to your system that has enough space to save the recovered data found during the Plause     Cancel     Please wait while scanning disk     5,28 % Estimated remaining time: 11,5	FAT12_32768 NONAME     Volume     7,81Mb     Blocks per track       FAT12_25088 NONAME     Volume     10,13Mb     Physical block offset       FAT32_4214784 NONAME     Volume     1,00Gb     Physical block size       Device path     1: Make sure that there is a disk in or connected to your system that has enough space to save the recovered data found during the following     Please wait while scanning disk     5,28 % Estimated remaining time: 11,5 hours, elapse

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 the dialogue. As presented in chapter 5.1, the software highlights all recovered logical volumes in green.



				Кеу	
Туре	Size	Free space		Volume filesystem	FAT
Volume	10.13Mb		^	Name	FAT32_4214784 N.
	,			Identifier	Disk_\\PHYSICAL
Volume	1,00Gb			GUID	{00000000-0000-0
Valuese	100 22M/h			Disk flags	dfisLost
volume	109,221010			Disk type	Unknown
Volume	1,00Gb			Partition type	Unknown
				Size	1,00Gb
Volume	1,41Mb			Byte size	1073742336
Volume	200.00Mb			Block count	2097153
				Block size	512
Volume	200,00Mb			Startblock on physica	143766861
Volume	1.00Gb			Physical block offset	0
volume	1,0000			Physical block size	0
Volume	1,00Gb			Device path	
	1.010			Mount point	
volume	1,94GD				
in as connected to	your system that h	as anough space to save the p	scowarad data found		a con proceed
	Jour ajatem tint i	as chough space to save the t		during t	
				Con	tinue 🕨
	Volume Volume Volume Volume Volume Volume Volume Volume Volume	Volume     10,13Mb       Volume     1,00Gb       Volume     109,22Mb       Volume     1,00Gb       Volume     1,00Gb       Volume     200,00Mb       Volume     200,00Mb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,94Gb	Volume     10,13Mb       Volume     1,00Gb       Volume     109,22Mb       Volume     1,00Gb       Volume     1,41Mb       Volume     200,00Mb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,00Gb       Volume     1,00Gb	Volume         10,13Mb   Volume             1,00Gb                       Volume             1,01Mb                          Volume             1,01Mb                       Volume             1,00Gb                       Volume             1,00Gb               Volume             1,00Gb               Volume             1,94Gb                 >	Volume     10,13Mb       Volume     10,006b       Volume     109,22Mb       Volume     109,22Mb       Volume     109,22Mb       Volume     1,006b       Volume     1,41Mb       Volume     200,00Mb       Volume     200,00Mb       Volume     1,006b       Volume     200,00Mb       Volume     1,006b       Volume     1,006b       Volume     1,006b       Volume     1,006b       Volume     1,006b       Volume     1,006b       Volume     1,046b       Volume     1,946b

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.

g- 📖 🛒				Search keyword	d 🔍 🥄 '	r
their associated applica	s you want to recover to another disl	c. You can check	the quality of the recov	ered files by using the bu	ilt-in viewer or by op	ening the files wi
<pre>exFAT_0_root (34) Dir (1)</pre>	Table Thumbnails		100		1965	
DSM (2)	Name	Туре	Size	Date modified	ID	File system
- 2 EEProm (3)	🃁 Dir			26.06.2014 23:33:45		EXFATVolumeItem
Hardwarebook1.3 (7)	DSM			26.06.2014 23:33:45		EXFATVolumeItem
📁 JPEG_PDF (3)	EEProm			26.06.2014 23:33:45	1850	
- 📁 Links_zu_Halbleiterherstellern	Hardwarebook1.3			26.06.2014 23:33:45	1909	
🗝 🗊 many_files (2)	JPEG_PDF			26.06.2014 23:33:45		
— 🗾 mp3 (2)	Links_zu_Halbleiterherstellern			26.06.2014 23:33:45		EXFATVolumelten
Package_Type_List (2)	many_files			18.11.2014 20:05:38	3090	
- 📁 Stecker (2) 🗇 subdir1 (2)	📁 mp3			26.06.2014 23:33:45	54617	EXFATVolumeiten
- Subdir1 (2) - Subdir2 deleted (2)	Package_Type_List			26.06.2014 23:33:45	56197	EXFATVolumelten
- System Volume Information (2	Stecker			26.06.2014 23:33:45	56202	EXFATVolumelten
Videos (2)	🗊 subdir1			26.06.2014 23:33:45	56325	EXFATVolumelten
- Hacos (2)	📁 subdir2_deleted			26.06.2014 23:33:45	61446	EXFATVolumelter
	System Volume Information			18.11.2016 13:09:22	9	EXFATVolumelter
	📁 Videos			26.06.2014 23:33:45	66567	EXFATVolumeItem
	10MB_77.bin		10240 KB	26.06.2014 20:00:00	107653	EXFATVolumeItem
	10MB_88.bin		10240 KB	26.06.2014 20:00:00	110213	EXFATVolumelter
	<					

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..





### 5.3 Creating a disk image

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.

otions Help RAID Reconstructor Create Image f	ile Load Image File Z	FS Reconstructor	Sessions			
Step 1         Select a volume you want to recover           IS         MBR         GUID         LDM         AppleMap         Unix		volume is not a	vailable, select the disk that dic	I contain your volume.	Key	Value
/olumes	Туре	Size	Free space		Volume filesystem	FAT
DISK00 (KINGSTON SA400S37960G)	Disk	894,25Gb		^	Name	F: (TEST DISK 1)
					Identifier	Disk_F:\_F: (TEST
	Volume	615,00Mb			GUID	{0000000-0000-0.
- D: (deh_daten)	Volume	194,71Gb	83,68Gb		Disk flags	dfOSpart
					Disk type Partition type	Removable Unknown
C: (zeh)	Volume	341,80Gb	280,49Gb		Size	1.76Gb
Free space 1126399992->1875385007	Volume	357,14Gb			Byte size	1,7000
					Block count	3694560
DISK01 (USB Flash Disk)	Disk	3,73Gb			Block size	512
F: (TEST DISK 1)	Volume	1,76Gb	1,45Gb		Heads	255
					Tracks per head	487
Free space 3694592-> 7831551	Volume	1,97Gb			Blocks per track	63
	Volume	1,78Gb			Startblock on physica	32
					Physical block offset	0
	Volume	1,78Gb		×	Physical block size	512
			as enough space to save the		Davies nath	EA

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

Disk image: an exact virtual image of a physical disk



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

File	Edit	Search	Extras Expert I	License Help			
ŝ	1	m		<u> </u>		3	
-12	<i></i>		-			$\mathbf{v}$	
Optio	ns	Help	RAID Reconstructo	r Create Image file	Load Image File	Sessions	ZFS Reconstructor

Screen 43: Menu ribbon in MaxDataGenius with interactive tags

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

File Edit Search I								×
← → ~ ↑			daten (D:) → Image I	Files MDG_Test	5 ∨	"Image Files MD	G_Test" durc	
Organisieren 🔻	Neuer C	rdner						?
Dieser PC Dieser PC Dider Desktop Dokumente Downloads Musik Videos Leo		Name	~ Es	Änd	erungsdatum rgebnisse gefu	Typ nden.	Größe	
Dateiname	F_Tests	tick_DI1.img						~
Dateityp	: Images	(*.img)				Speichern	Abbreche	n

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.

E Progress		-	$\times$
*	Creating image file		
	Please wait		
	6,21 %		
	Estimated remaining time: 1,5 minutes, elapsed time: 6 se	conds	
	Show log messages		
	Pause 🐼 Cano	:el	

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.

#### Grau GmbH Hardware & Software Solutions 🍤 🥂 = 🛛 Image Files MDG\_Test Freigeben Ansicht 👗 Ausschneiden The Neues Element \* Mail Pfad kopieren Einfacher Zugriff Kopieren Einfügen Verschieben Kopieren Löschen Umbenennen Neuer Eigenschaften 🕅 Verknüpfung einfügen nach " nach Ordner Öf Zwischenablage Organisieren Neu Dieser PC > deh\_daten (D:) > Image Files MDG\_Test $\uparrow$ Name Änderungsdatum Тур Größe re F\_ Teststick\_DI1.img 20.08.2019 12:53 1.847.280 ... Datenträgerimage... C F\_ Teststick\_DI1\_info.txt 20.08.2019 12:53 Textdokument 1 KB piekte g nente oads

Screen 46: Disk Image in its new destination folder

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

Tip:

## 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).

MaxDataGenius

Recovering formatted media (Basich and Pro)





#### 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.



MaxDataGenius Pro (1.9.5.2) - DISKO2 File Edit Search Extras Expert Lin						- 🗆 X
Options Help Save				Search keyw	ord	<b>Q</b> •
Step 4 Scanning disk The selected disk is b	eing scanned - pleas					
Applications (25)     Documents (4)	Name	Type	Size	Date modified	ID	File system
(a) (b) ecFAT_0(35) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)						
Pause	Cancel	Please wait while scanning disk Found files: 249893, folders: 333 Found volumes: 3, disks: 0		4,27 % Estimated remainin	ng time: 15,3 hours,	elapsed time: 41,1 minutes

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 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.

lame	Duestion	× hodif
1021512.pdf	Question	~
1021704.pdf	Opening this file will write to	
1024472.pdf	C:\\Local\Temp\mdgp64\.	
14121497.pdf	This can destroy unrecovered data on	this volume.
14122121.pdf	Do you want to continue?	
14144425.pdf		1 (1999) 2011
14144609.pdf	Yes No	Yes to all
14145097.pdf	document/pdf	8916 KB n/a
14162929.pdf	document/pdf	116 KB n/a
14163161.pdf	document/pdf	9632 KB n/a

Screen 50: Programme message when you open recovered files

- 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.
- 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.
  - 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.

Data blocks and free spaces on a disk



Physical dis	k: DISK01 (USB Flash Disk)	_	Stop scan
0: Part00 (F	AT) 3: Free space 3727360->7831551		Pause scan
			192 kB/ 16384 block(s)
	Status: scanning block 524288 of 7831552 (7 percent, 16 MB/s)		
	: 13:01:34 00000000003B04 TPartition > TDisk.close (Part00 (FAT)) - FLockCount 2	^	Bad blocks
3:01:34 INFC 3:01:34 INFC	: 13:01:34 00000000003B04 TPartition > TDisk.close (Part00 (FAT)) - FLockCount 2 13:01:34 000000000003B04 TFATVolume > TVolume:imount: addRoottem=0 13:01:34 000000000003B04 TFATVolume > NP Byter\$P6=512; P6 5;eCPEC1us: 2	^	Bad blocks S.M.A.R.T. analysis
01:34 INFC 01:34 INFC 01:34 INFC 01:34 INFC	13:01:34 00000000003B04 TPartition > TDisk.close (Part00 (FAT)) - FLock.Count 2     13:01:34 00000000003B04 TFATVolume > TVolume::mount: addRoottem=0     13:01:34 000000000003B04 TFATVolume > FPB, BrietPiece 512, BPB 5, ecPerClus: 2     13:01:34 00000000003B04 TFATVolume > FPB, RotEnCtnt: 0, BPB, FATIst: 0, BPB, FATIst: 22, 1432     13:01:34 000000000003B04 TFATVolume > FPB, Totest: 0, FPB Totest: 0, FPB, Totest: 0, FPB Totest: 0,		
8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC	13:01:34 00000000003804 TPartition > TDisk.close (Part00 (FAT)) - FLockCount 2     13:01:34 00000000003804 TFAVJolume > TVolume::mount: addRoottem=0     13:01:34 000000000003804 TFAVJolume > BPB, BeterSPEC 312, BPB 5, SePErCLus: 2     13:01:34 00000000003804 TFAVJolume > BPB, RoteTCht: 0, BPB, FATIstic: 0, BPB, FATIstic: 1, BPB, RoteTCht: 1, 340 September 20000000003804 TFAVJolume > BPB, RoteTCht: 0, BPB, FATIstic: 0, BPB, FATIstic: 1, BPB, RoteTCht: 1, 340 September 200000000003804 TFAVJolume > BPB, RoteTCht: 1, 340 September 200000000003804 TFAVJolume > BPB, Totistic: 1, 340 Totistic: 1, 340 September 20000000003804 TFAVJolume > BPB, Totistic: 1, 340 Totistic: 2, 340 September 20000000003804 TFAVJolume > RoteDistic: 1, 347280     13:01:34 0000000000003804 TFAVJolume > RoteDistic: 1, 347280     13:01:34 000000000003804 TFAVJolume > RoteDistic: 1, 347280     13:01:34 000000000003804 TFAVJolume > RoteDistic: 1, 347280     13:01:34 000000000003804 TFAVJolume > RoteDistic: 1, 347280     13:01:34 000000000000000000000000000000000000		
8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC 8:01:34 INFC	: 13:01:34 00000000003B04 TPartition > TDisk.close (Part00 (FAT)) - FLock.Count 2 : 13:01:34 000000000003B04 TFATVolume > TVolume::mount: addRootItem=0 : 13:01:34 000000000003B04 TFATVolume > BPB_Step5Picc: 512, BPB_SecPFCLU: 2 : 13:01:34 00000000003B04 TFATVolume > BPB_RootEntCnt: 0, BPB_FAIsz16: 0, BPB_FAIsz32: 14432 : 13:01:34 00000000003B04 TFATVolume > BPB_RootEntCnt: 0, BPB_FAIsz16: 0, BPB_FAIsz32: 14432 : 13:01:34 000000000003B04 TFATVolume > BPB_RootEntCnt: 0, BPB_FAIsz16: 0, BPB_FAIsz32: 14432 : 13:01:34 000000000003B04 TFATVolume > BPB_RootEntCnt: 0, BPB_FAIsz16: 0, BPB_RootEntCnt: 2 : 13:01:34 000000000003B04 TFATVolume > BPB_ROOTENCH: 0, BPB_FAIsz16: 0, BPB_FAIsz172; 14432 : 13:01:34 000000000003B04 TFATVolume > BPB_ROOTENCH: 0, BPB_FAIsz16: 0, BPB_FAIsz172; 14432 : 13:01:34 000000000000B04 TFATVolume > BPB_ROOTENCH: 0, BPB_FAIsz16: 0, BPB_FAIsz172; 14432 : 13:01:34 000000000000B04 TFATVolume > BPB_ROOTENCH: 0, BPB_FAIsz172; 3727328, BPB_NumFAIs; 2, BPB_ROOTENCH: 2 : 13:01:34 000000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 000000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 00000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 000000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 000000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 000000000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 00000000000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 00000000000000000B04 TFATVolume > BPB_ROOTENCH: 2 : 13:01:34 000000000000000000000000000000000000		

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*.
  - 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.

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



General - Logging and Paths			the bad block ranges f tically skipped during	for the currently selected disk in the the disk scan.	table below. These block
View options Recovery	Blockra	nge:		ר ר	Save list
- File Types	From		То		Load list
– Scan Region – Scan Options – Advanced options					Clear list
- Wipe Options - Bad Block Management - Save options					Delete entry
	From:		To:	Add entry	Apply
	☑ Aut ☑ Fast ☑ Save		list entries	resume path	

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

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

- 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<br/>(also: image file). In chapter 0, you already got familiar with<br/>another method of writing disk images.

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

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

**Disk Tools for a better disk** 

performance (Pro version)



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.

Dieser PC Name Änderungsdatum Typ O		nd name for image file				
■ Dieser PC       ^       Name       Änderungsdatum       Typ       O         ③ JD-Objekte       Image: Comparison of the system	→ * ↑	Dieser PC > deh_dater	n (D:) > Image Files MDG_Test	ٽ ~	"Image Files MDG_Te	st" durc 🔎
Dieser PC       Name       Änderungsdatum       Typ       O         3D-Objekte       F_ Teststick_Dl1.img       20.08.2019 12:53       Datenträgerimage       1         Bilder       Dosktop       Dokumente       Downloads       Videos       <	anisieren 🔻	euer Ordner			I	12 - 3
<ul> <li>Bilder</li> <li>Desktop</li> <li>Dokumente</li> <li>Downloads</li> <li>Musik</li> <li>Videos</li> <li>zeh (C:)</li> <li>deh_daten (D:)</li> <li>Virrustil accord</li> <li>✓</li> </ul>	Dieser PC	^ Name	^i	Änderungsdatum	Тур	Größe
<ul> <li>Desktop</li> <li>Dokumente</li> <li>Downloads</li> <li>Musik</li> <li>Videos</li> <li>zeh (C:)</li> <li>deh_daten (D:)</li> <li>VERDATIVACEE</li> <li>✓</li> </ul>	3D-Objekte	F_ Teststick_D	I1.img	20.08.2019 12:53	Datenträgerimage	1.847.280
Dokumente Downloads Musik Videos ch_daten (D:) Videosrev C	Bilder					
Downloads     Musik     Videos     zeh (C:)     deh_daten (D:)     Dateiname: G_Testvolume.img	Desktop					
Musik Videos Left delta (D:) Dateiname: G_Testvolume.img	Dokumente					
Videos zeh (C:) deh_daten (D:) Dateiname: G_Testvolume.img	Downloads					
Image: Second	Musik					
deh_daten (D:)        Dateiname:     G_Testvolume.img	Videos					
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	VEDDATIL ADCO					
Datait mu Imagaa (* ima)	r	_ Testvolume.img				
Dateityp: images ( .img)	r					
Ordner ausblenden Speichern Abb	Dateiname:	nages (*.img)				

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.

Dieser PC → deh\_daten (D:) → Image Files MDG\_Test

Name	Änderungsdatum	Тур	Größe
F_ Teststick_DI1.img	20.08.2019 12:53	Datenträgerimage	1.847.280
F_ Teststick_DI1_info.txt	20.08.2019 12:53	Textdokument	1 KE
G_ Testvolume.img	22.08.2019 15:34	Datenträgerimage	58.869.744
G_ Testvolume_info.txt	22.08.2019 15:34	Textdokument	1 KE



### 6.2.2 Recovering disks by restoring disk images

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.

Restoring disks through reverse writing



- 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*.



A
Yes No
Disk Tools: Restore Image

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.





rganisieren 👻 Neuer Ordner			
Restore image ^ Name	Änderungsdatum	Тур	Größe
OneDrive Structure OneDrive	20.08.2019 12:53	Datenträgerimage	1.847.280
Dieser PC	22.08.2019 15:34	Datenträgerimage	58.869.744
🗊 3D-Objekte			
📰 Bilder			
Desktop			
Desktep     Dokumente			
Dokumente			
Dokumente Downloads			
<ul> <li>Dokumente</li> <li>Downloads</li> <li>Musik</li> </ul>			
<ul> <li>Dokumente</li> <li>Downloads</li> <li>Musik</li> <li>Videos</li> </ul>			

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.

→ ~ ↑ 📙 > Di	eser PC > deh_daten (D:) > Image File	s MDG_Test v ඊ	"Image Files MDG_Test"	durc 🔎
rganisieren 👻 Neue	r Ordner			
👩 Restore image \land	Name	Änderungsdatum	Тур	Größe
OneDrive	F_ Teststick_DI1.img	20.08.2019 12:53	Datenträgerimage	1.847.280 K
Dieser PC Dieser PC Dieser Bilder Desktop	G_ Testvolume.img	22.08.2019 15:34	Datenträgerimage	58.869.744 .
<ul> <li>Dokumente</li> <li>Downloads</li> <li>Musik</li> <li>Videos</li> <li>zeh (C:)</li> </ul>				
<ul> <li>Downloads</li> <li>Musik</li> <li>Videos</li> </ul>	٢			_



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.

Volumes	Туре	Size	Free space	
DISK00 (KINGSTON SA400S37960G)	Disk	894,25Gb		· · · · · · · · · · · · · · · · · · ·
Free space 0-> 1259519	Volume	615,00Mb		
- T (deh_daten)	Volume	194,71Gb	25,68Gb	
- 🕎 C: (zeh)	Volume	341,80Gb	280,77Gb	
Free space 1126399992->1875385007	Volume	357,14Gb		
■ 🥓 DISK01 (UDisk)	Disk	7,62Gb		
E: (TEST DISK 1)	Volume	1,76Gb	1,45Gb	
🖅 DISK02 (USB Flash Disk)	Disk	3,73Gb		
- TEST DISK 1)	Volume	1,76Gb	1,76Gb	
Free space 3694592->7831551	Volume	1.97Gb		

Screen 63: Choosing a physical disk for a direct copy

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**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).

Volumes	Туре	Size	Free space	
- TP Part03 (Linux_Data)	Volume	194,71Gb		^
- T (deh_daten)	Volume	194,71Gb	25,67Gb	
- TP Part04 (Linux_Data)	Volume	341,80Gb		
C: (zeh)	Volume	341,80Gb	280,71Gb	
∃ 🥪 DISK01 (UDisk)	Disk	7,62Gb		
E: (TEST DISK 1)	Volume	1,76Gb	1,45Gb	
🗆 🥓 DISK02 (USB Flash Disk)	Disk	3,73Gb		
- T Part00 (FAT)	Volume	1,78Gb		
H: (TEST DISK 1)	Volume	1,76Gb	1,76Gb	
ç				~

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*.

-	~
	e disk "DISK02 (USB Flash Disk)" to . This will overwrite 3,73Gb on the Are you sure?
Volu	Yes No
Recovery Scenario:	Disk Tools: Copy Disk

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

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<br/>disk, but also the complete disk. Therefore stick to a reasonable<br/>order of volumes which you want to optimize in their partition<br/>schemes.DescriptionDescription

**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*.

Refreshing disks: more resiliency and performance



#### • 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.

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- 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.

#### Dieser PC > TEST DISK 1 (F:)

Name	Änderungsdatum	Тур
Bewerbercoaching	28.02.2019 18:17	Dateiordner
	14.05.2019 09:54	Dateiordner
HTML	28.02.2019 18:14	Dateiordner
📙 Information und Kommunikation	28.02.2019 18:14	Dateiordner
	28.02.2019 18:13	Dateiordner
📙 Projektmanagement	28.02.2019 18:13	Dateiordner
📙 Rechte und Normen_Lernunterlagen	16.01.2019 23:18	Dateiordner
🣙 Rechtliche Hintergründe und Normen	28.02.2019 18:13	Dateiordner
Schema ST4	28.02.2019 18:14	Dateiordner
	28.02.2019 18:13	Dateiordner
Softwaretraining	28.02.2019 18:13	Dateiordner
System Volume Information	22.08.2018 20:41	Dateiordner
XML Dateien	10.01.2019 19:47	Dateiordner

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*.

MaxDataGenius



- 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.

0	You will cleanup th overwrite all delete irrecoverably remo Proceed?	ed and lost files of			
olu	- House		Yes	No	
ecovery Se	enario:	1	Disk Tool	s:	

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*.

0	(7,62Gb).	vhole disk/volume DISK01 (UDisk) it will be irrecoverably overwritten.	
lu		Yes No	
	enario:	Disk Tools:	

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 wine the
    - 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

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.

79

HexViewer – an analysis tool for data experts



- 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*.





- 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.



														- 1	G: (T	EST	IME2	)/5	6,14	Gb	/ 60	282	5178	56 B	yte	5					
		0	1	2	3	4	5	б	7	8	9	10	11	12	13	14	15	0	1	2 3	3 4	5	6 7	8	9	10 1	11	2 13	14	15 ^	Byte offset:
0h	0d	EB	52	90	4E	54	46	53	20	20	20	20	00	02	20	00	00		R	1	NT	F	S	T			T				0
10h	16d	00	00	00	00	00	F8	00	00	3F	00	FF	00	00	48	66	25							?				н	f	%	0x0
20h	32d	00	00	00	00	80	00	80	00	FF	8F	04	07	00	00	00	00										1				Disk block:
30h	48d	00	00	03	00	00	00	00	00	01	00	00	00	00	00	00	00														0
40h	64d	F6	00	00	00	F4	00	00	00	89	79	A8	76	AB	A8	76	6A								у	v			v		Block offset:
50h	80d	00	00	00	00	FA	33	C0	8E	DO	BC	00	7C	FB	68	C0	07	T			T	3				1		h			0 / 0x0
60h	96d	1F	1E	68	66	00	CB	88	16	0E	00	66	81	3E	03	00	4E	T		hf	F		[	] []		f	>	۵		N	
70h	112d	54	46	53	75	15	B4	41	BB	AA	55	CD	13	72	0C	81	FB	Т	F	SI	u D	1	A	1	U		l r				
80h	128d	55	AA	75	06	F7	C1	01	00	75	03	E9	DD	00	1E	83	EC	U		u		t		u			T				
90h	144d	18	68	1A	00	<b>B</b> 4	48	8A	16	0E	00	8B	F4	16	1F	CD	13		h	٥	T	н	0	1 0						3	
A0h	160d	9F	83	C4	18	9E	58	1F	72	E1	3B	06	OB	00	75	DB	A3		T	1		Х	r	T	;		1	u			Offsets:
B0h	176d	OF	00	C1	2E	OF	00	04	1E	5A	33	DB	B9	00	20	2B	C8					1		Z	3		1		+		
C0h	192d	66	FF	06	11	00	03	16	OF	00	8E	C2	FF	06	16	00	E8	f				۵	0 0	1		+					
D0h	208d	4B	00	2B	C8	77	EF	B8	00	BB	CD	1A	66	23	C0	75	2D	К		+	v	1		1		🗆 f	#		u		
E0h	224d	66	81	FB	54	43	50	41	75	24	81	F9	02	01	72	1E	16	f		1	TC	P	AL	I S				r		2	
F0h	240d	68	07	BB	16	68	52	11	16	68	09	00	66	53	66	53	66	h		1	o h	R		h		f	s	f	s		
100h	256d	55	16	16	16	68	88	01	66	61	0E	07	CD	1A	33	CO	BF	U			0 h		D f	a				3		-	0
110h	272d	0A	13	B9	F6	0C	FC	F3	AA	E9	FE	01	90	90	66	60	1E	1		1				1		0	1	f		-	
120h	288d	06	66	A1	11	00	66	03	06	10	00	1E	66	68	00	00	00	0	f	1		f	0 0	1		f	h				Add to list
130h	304d	00	66	50	06	53	68	01	00	68	10	00	B4	42	8A	16	OE	Ť	f	PI		h	0	h		Ť	В			3	Delete entry
140h	320d	00	16	1F	8B	F4	CD	13	66	59	5B	5A	66	59	66	59	1F	t			1	t	D f	Y	1	Zf	Y	f	γ	-	Delete list
150h	336d	0F	82	16	00	66	FF	06	11	00	03	16	OF	00	8E	C2	FF				f		0 0	1			1				Dump to log file
160h	352d	OF	16	00	75	BC	07	1F	66	61	C3	A1	F6	01	E8	09	00		۵		u		f	а		-				-	builty to log life

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

Advanced Options 32 bad blocks 29 bad blocks. 29 Basic version 4, 15, 16 block range 29, 30 browse 10, 32, 34 clean up 75 data loss 3, 4, 5, 29, 54, 64, 69 data recovery 3, 4, 5, 18, 21, 22, 32, 33, 77 Data recovery 1, 4 data recovery scenario 39, 47, 54, 58, 62, 65, 71, 73, 75, 78, 80 data recovery scenarios 4, 35, 39, 46, 48, 54, 57, 61, 65, 70, 72, 75, 77, 80 data traces 16 data volume 23, 24, 26 deleted files 26, 32, 33, 34, 38 destination location 8, 9, 10, 15, 44 directories 41, 42, 49, 56 disk 4 Disk 20 disk diagnosis 30 disk diagnostics 57 Disk Diagnostics 29, 58 disk image 16, 29, 50, 51, 52, 53, 57, 61, 62, 63 disk images 4, 34 disk scan 24, 26, 40, 47, 55 disk space 4, 19, 20, 31, 34 disk structure 30 Disk Tools 3, 4, 16, 27, 61, 65, 70, 72, 75, 77, 80 disk type 37 disk wiping 77 disks 17, 20, 23, 26 download 3, 5, 6 dropdown list 41 exFAT 16, 26 expert mode 16, 18, 19 Expert mode 3 FAT 26, 32, 33, 86 file formats 23 file recovery 32, 33 file size 31, 33 file system 3, 16, 19, 20, 22, 34 file system recovery 64 file systems 4, 16, 18, 80 file types 4, 23, 24, 51, 62 files 3, 4, 5, 16, 17, 18, 20, 51, 62



flash drives 16 flash media 16 folders 4, 10, 23, 27, 34, 36 formatted disk 34, 53 formatted media 26 formatting 4, 34, 53 harddisk 26 harddisks 4, 16 HexViewer 79,80 image file 20, 51, 52, 53, 57, 60, 61, 62, 63, 64, 68 Linux 16 location of storage 8 logfile 22, 27, 28, 30 Logging 21 logging level 21, 23 logging levels 21 logical volume 39, 47 logical volumes 4, 34, 45, 47, 55 lost volumes 38, 46 media 3, 4, 16 medium 5, 9, 16, 28, 29, 31, 32, 33, 34, 38, 45, 47, 51, 53, 54, 56, 62, 64 memory cards 4, 16, 19, 32 memory requirements 26 NTFS 26, 32, 86 operating system 54, 75 operation system 26, 33 options 3, 16, 18, 21 **Options 18** partition 16, 18, 19, 20, 32 partition schemes 18 partition table 32 physical disk 4, 16, 17, 20, 24, 29 physical disks 3, 4 Pro version 3, 4, 6, 16 RAID 17, 20 RAW 16, 24, 26, 31, 33 RAW Analyser 33 recovery scenarios 17, 34, 56 reformat 79 S.M.A.R.T. analysis 59 scan 9,23 scan options 26 Scan Options 26 scan region 24 scan results 24, 30 servers 16 setup 7, 8, 14 storage location 37

MaxDataGenius

User Manual



storage location. 52, 56, 63 target medium 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 75, 78 USB flash drives 19, 32 Version 16 View options 21, 23 volume 19, 26, 27, 31, 32, 33, 34, 36, 37, 38 volume scan 38 volumes 18, 20, 26, 32, 34 Windows 3, 16 wipe feature 77 Wipe method 27 Wipe Options 27 wizard 3, 7, 8, 16, 17



## 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	

User Manual



	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	
narddisk	external or integrated	
iai aaijit	physical disk for a	
	computer or laptop	
lexViewer/ hex	view mode which	binary view
viewer	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.	
ogical volume	virtual drive which is	logical partition
	located and displayed	
	on a physical disk	
ogging	continuous automatical	
-888	writing of events and	
	operations running in	
	the background of	
	software processes	
arfila	outomotically system	
ogfile	automatically created file which consists of	
	file which consists of data records of	
	background processes,	
	logging results	
	INDRING LEDUID	
nagnetic 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)	
older	Assembly of individual	directory
	elements (files) within a	
	file storage system	
ptions dialogue	dialogue window in	
	which users can adapt	

User Manual



	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	
	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)