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# 1 Introduction

## 1.1 Welcome

Thank you for using Data Rescue 4.

Prosoft Engineering's Data Rescue is an easy-to-use utility to help you recover files and folders from crashed or corrupted hard drives, floppy disks, or removable cartridges. Recovered data is saved to another medium, leaving the original disk untouched.

## 1.2 Latest Version of the Software

The downloads section on our web site  https://prosofteng.com/downloads/ always has the latest version of this software. If you already have a copy of Data Rescue installed and an active internet connection, Data Rescue will inform you when an update is available when launching the program. If you do not have the latest version of Data Rescue, download it from the URL above.

## 1.3 Contact Prosoft Engineering

Our technical support is free and can be accessed by email or phone. Please have the version number ready before calling:

Website: https://prosofteng.com/contactus/
Phone: 1-877-477-6763

## 1.4 System Requirements

There are two ways to run Data Rescue. You may run it from  BootWell or you may run it from your desktop as a normal application, depending on your circumstances.

Application Requirements:

- Mac OS X 10.8 or later.
- A second drive to recover to*.

* This drive must have free space for recovered files, plus 2% the size of the drive or volume to be scanned.

## 1.5 General Usage

Data Rescue was designed to be used in a wide range of situations. Specifically, Data Rescue can handle:

- Any type of media which appears as a disk device (hard disk, CF camera cards, etc.)
- Volumes which can't be mounted, even if the driver is damaged
- Disks with a damaged partition map
- SCSI, IDE (also called ATA or PATA drives), SATA, FireWire and USB drives
- HFS and HFS+ ("Mac OS Extended") formatted partitions
- Limited support for non-HFS/HFS+ file systems (FAT32, NTFS, etc.)
- Large volumes (1 TB and larger)
- Password-protected volumes (if data is not scrambled/encrypted)
- Non-Roman-script (e.g Japanese) file names

Be aware that you need disk space on another device for Data Rescue's temporary working space, and to recover your data. This must be a separate drive from the drive you are trying to recover from, in order to avoid altering that drive. Data Rescue offers the most extensive, safe recovery of your important data. Because your corrupt drive is not stable, Data Rescue will not allow you to try and save files to the same drive, nor will Data Rescue try and "repair" that corrupt drive (doing so could actually cause more corruption and data loss).

## 1.6 Basic Recovery Tips

This section will provide you basic tips to help you improve your chances of recovering your data before using Data Rescue.

**Prevent writing to the hard drive.** Once you are aware you are missing data, immediately quit all programs you are using and turn off the computer. Further writing to the hard drive may overwrite data you are trying to recover. This

includes creating new documents, browsing the Internet, or running disk repair utilities to attempt to fix the drive.

**Evaluate the situation.** Every data recovery scenario is different and may require different approaches to recover the data. Read "Installing and Starting Data Rescue" in chapter 3 to determine the best method for recovering data in your situation.

**A second hard drive with adequate space is necessary to recover data and host Data Rescue's storage location.** If you have a second internal hard drive in your computer or an external USB/FireWire hard drive attached to your computer, you may use it for this purpose. Make sure you have enough free space to hold the data you wish to recover, plus an additional amount of 2% the size of the volume or disk being scanned. For example, if you need to recover 25GB of data from the bad hard drive, you will need at least 25GB for the recovered files and 0.5GB of free space for the storage location. In certain situations, recovered files will require more space than they occupied on the original drive.

**Consider acquiring a replacement hard drive.** If you do not have a second hard drive to recover to, you may want to acquire a new hard drive. If your hard drive is physically failing, a replacement hard drive will be necessary to maintain your data. Not only will the new hard drive help you with your recovery immediately, but the new hard drive may also be used as a backup hard drive in the future when your recovery is complete.

# 1.7 Drives With Suspected Hardware Problems

Even though Data Rescue exercises caution to never damage your drive's data by writing to it, there are certain types of drive hardware failures which due to their nature can cause additional damage to the media and data just by continuing to use the drive.

One example of this kind of damage is a crashed disk head, which could potentially cause additional media scratching and data loss with continued use. One clue to this type of damage may be unusual mechanical sounds emanating from the drive. If you suspect this type of damage, and the data on the disk is extremely critical, you may wish to send your drive to a professional drive recovery service with clean-room facilities.

The cost of professional recovery services can run into the thousands of dollars. If you suspect hardware damage, but need to avoid the expense of the professional services, you can minimize the chances of further damage to your drive by first cloning it to a spare drive, then do the recovery on the clone.

## 1.7.1 If your drive is not visible in Data Rescue

If you don't see your hard drive displayed in Data Rescue's list of drives, please review the checklist below:

For external drives:

- Power cord (if required) is connected to a working outlet
- Data cable (USB, FireWire, etc.) is connected to a working port
- Data cable and power cord are known to be in working condition
- Status lights (if any) are active

For internal drives:

- Data cable (SATA, etc.) is connected to a working internal slot/port
- Power cable is connected to a working power supply

If your hard drive is still not visible in Data Rescue or is making clicking noises, there may be a hardware problem affecting the drive from being recognized by the computer. Prosoft Engineering's The Data Rescue Center may be able to help you recover data from your hard drive.

**For Software Technical Support:**

Website: https://prosofteng.com
Phone: 1-877-477-6763

**To Inquire about Data Recovery Services:**

Website: http://TheDataRescueCenter.com
Phone: 1-877-501-4949

# 2 Installing and Starting Data Rescue

This chapter provides basic instructions on installing and starting Data Rescue. If you are using Data Rescue for the first time, you should read this chapter in detail.

## 2.1 Install/Uninstall Data Rescue

If you have the Data Rescue BootWell drive, it is not necessary to install Data Rescue and you may boot from the Data Rescue BootWell to run the program.

If you plan on installing Data Rescue to a disk, you should NOT install it on the disk you are trying to recover files from. If you are trying to recover files from a disk that you normally use as a boot drive, you will need to either boot from the Data Rescue BootWell, or else set up a different drive to boot from and install Data Rescue on that drive. You may install Data Rescue on your recover disk or storage location disk and run it from there. It does not necessarily have to be installed on or run from your boot disk.

The following are instructions for users with a downloaded version of Data Rescue.

> **To install Data Rescue:**
>
> 1. From the location to which you downloaded Data Rescue, double-click on the Data Rescue image
>    (.dmg) file to mount it on your computer.
> 2. Drag the contents of the Data Rescue drive (the mounted disk image) to your Applications folder or
>    elsewhere, if desired.

> ⚠️ *Caution: do not install or copy Data Rescue on (or make any other changes to) a volume from which you want to recover files. Doing so may reduce the chances of recovering files from that volume.*

> **To uninstall Data Rescue:**
>
> 1. Drag Data Rescue into the Trash.

For users with the bootable BootWell drive, please see the BootWell section for more information.

## 2.2 Before you start Data Rescue

Data Rescue requires access to a safe location for its scan files and to store your recovered files. In the interests of performance, your best option is to plug in an external, freshly formatted hard drive, or to use a separate internal drive. Make sure the capacity of this drive is great enough to contain all the files you plan to recover from your damaged hard drive, plus space for Data Rescue's temporary storage files.

It is not recommended to try and use a slow drive such as a network drive, USB 1.0 drive, etc. for temporary storage because doing so will have a severe performance impact on Data Rescue.

### 2.2.1 Note on Data Rescue's Temporary Storage Location

**What is the Temporary Storage Location?**

The temporary storage location is a drive, or a folder on a drive, that is used during a scan to store persistent information found during a scan.

**Choosing a Location**

Data Rescue will automatically choose the startup drive as the default location, unless there is not enough free space remaining. If running from BootWell, Data Rescue will automatically choose a location on the BootWell drive for you.

While selecting a scan task, Data Rescue will determine if the current storage location is valid. If it is not valid, you will be required to choose a new location. Select Change in the tasks window when prompted and you will be taken to the Temporary Storage Location window. Here you will be presented with a list of all potential locations.

**Valid and Invalid Locations**

Not all locations will be valid choices. A potential location must:

- be located on a separate physical drive from the drive selected for scanning
- contain a valid Mac OS Extended file system (HFS+) with write-access (see below)
- have enough free space to store information about the drive selected for scanning. This value is estimated to be 2% of the selected drive's capacity.

**Erasing a non-Mac Location**

If a location selected is not a valid Mac file system, Data Rescue can erase it so that it can be used as a storage location if it's identified as "erase required". In this situation you can select the location and click Choose. A Erase window will be displayed to confirm the operation. Once erased, you can go back and re-select the location once again. Please note, erasing a volume will destroy all file data on it. This feature is most often used for when a new drive is purchased from a retail store and is not properly formatted for use with a Mac.

# 2.3 Starting Data Rescue

Launch the application by double-clicking the Data Rescue icon in the Data Rescue folder. If Data Rescue has not been run before, an authentication window will be displayed. This prompt authorizes Data Rescue to access your drives with special privileges.

Enter the username and password of an Administrative user. If you are the only user of your system, then you are most likely the administrative user, and you can use your own name and password. If you do not have an administration password for your computer, please contact your system administrator to log in for you.

## 2.3.1 Selecting the Home Folder from BootWell

The Home Folder is the location used to store preferences, registration, FileIQ settings and more.

When Data Rescue is used from the startup disk as a normal application, it will use the user's home folder (e.g. /Users/you/). However this location is not available when booted from BootWell. Instead BootWell will do its best to use its own special location, but if this location is not found, you will be prompted to choose a location.

Generally, you should select a folder on a separate physical drive from the drive that you want to scan. If you use the drive you want to scan you could potentially damage the possibility of a full recovery.

Data Rescue will provide you with a list of potential locations for the Home Folder. If a folder contains a name below it, then this means that that folder has a valid registration file and is most likely the home folder you should choose.

If you are unsure of what to use, choose Skip and Data Rescue will use a temporary location that will be erased once the computer restarts. This temporary location is stored in memory and will not affect any attached hard drives.

# 2.4 Activation

To use Data Rescue it must be activated with a serial number. To obtain a serial number, please visit https://prosofteng.com/datarescue4/.

## 2.4.1 Where is my serial number?

If you purchased Data Rescue from Prosoft's website, your serial number will be listed in the "Order Confirmation" email sent to you. If you have lost or deleted the email, please contact Prosoft.

If you purchased Data Rescue through a reseller, your serial number will be on the physical package itself or the invoice. Prosoft does not have your serial number or information to look it up. Please contact the reseller for more information.

# 3 Using Data Rescue

## 3.1 Welcome to Data Rescue

After Data Rescue starts up, the Welcome screen will be shown.

When running from a normal Mac desktop environment, a BootWell button will be shown. It will be one of the two:

- **Create BootWell Drive**
  See [BootWell](#) for more information.

- **Restart into BootWell Drive**
  If Data Rescue is running from a BootWell drive, this option will be available. See [BootWell](#) for more information.

For normal operation, the buttons shown will be:

- **Start Recovering Files**
  Choose this option if you want to begin scanning a drive. This will be the case for the majority of users who haven't used Data Rescue before.

- **Resume Recovering Files**
  This will resume the last recovery session. If you have suspended a previous scan, you can use this option to continue scanning where you last left off. Make sure you have the original drive that was being scanned connected to your computer. If you have a completed scan, this will bring you to the scan results where you can locate files for recovery.

When expert mode is enabled, the buttons will be:

- **Start New Scan**
  This behaves the same as Start Recovering Files.

- **Resume Suspended Scan**
  This behaves like Resume Recovering Files when you have one or more suspended scans.

- **Browse Completed Scans**
  This behaves like Resume Recovering Files when you have one or more completed scans.

## 3.2 Step 1: Selecting a Drive or Volume to Scan

The first step is to select the hard drive or volume that is missing the files. This step shows a list of all the disk drives and volumes that Data Rescue can see on the system.

Data Rescue shows a two-level list of all the disk drives and volumes. The first level shows the hardware names of the whole drive, which may include the make and/or model of the hard drive. This will scan the entire hard drive with any partitions.

The second level shows the volumes that belong to the hard drive. In most cases, you will want to select the volume first if it is available. Volumes that are not mounted will be listed with a gray (dimmed) font. Although this may indicate volume corruption, the volume may be selected to be scanned.

The following lists will help you determine what to select based on your situation.

Select the hard drive name if:

- The volume is not listed
- The hard drive was reformatted or repartitioned
- No data is found by a Quick Scan on the volume

Select the volume name if:

- You are looking for deleted files
- The volume failed to mount, but shows in the list

### 3.2.1 Add File to Scan

**Add File to Scan** allows a file to be added to the Source list and enables the file to be scanned for any additional data that is a part of the file. This feature is especially helpful to help recover from damaged disk images that fail to mount.

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**To add a file to scan:**

1. In the Source step, select **File > Add File to Scan**.
2. Browse for and select the file you want to scan.
3. Click on **Open** to add the file to the Source list.

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Once the file has been added to the Source list, you may proceed with the standard steps to scan the file.

## 3.3 Step 2: Choose a Task

The second step is to select the task to perform on the volume or hard drive. This step will let you choose to scan or clone your volume or hard drive.

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**To choose a task:**

1. Click on the icon for the task you would like to perform.
2. Click on the Start button. Wait for the Scan process to complete.

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Data Rescue provides a variety of functions to help search for the data on your hard drive. Each scan method is designed to help recover different scenarios. See the tasks section for more information.

### 3.3.1 Canceling a Scan

After clicking the **Start** button, Data Rescue will begin its scan process on the hard drive. You may interrupt the scan process at any time by pressing **Cancel**. A prompt will confirm if you want to cancel the process. To cancel the scan in progress, click on the **Cancel** button in the prompt. To close the prompt and return to the scan, click on the **Continue** button. If you are using a Deep Scan or Deleted Files Scan, the confirmation prompt will have two additional choices for **Suspend** and **End Early**.

Selecting the **Suspend** option will save your current progress, allowing you to continue the scan where you left off later on, even if you have quit Data Rescue or rebooted your system in the meantime. This is a helpful option if you have to temporarily stop the scan and continue at a later time. Suspended scans can be reloaded later through the **Manage Scans** selection in the File menu. See the Manage Scans section for more information about loading suspended scans.

Selecting the **End Early** option will force Data Rescue to end its current scan and provide results up to that point of the scan. This is a helpful option if you are having difficulties scanning a hard drive due to bad blocks or slow reads. Please note that ending the scan early will end only the first phase of Data Rescue's scan process, and will still progress through the next two phases of the scan process to catalog the results. The results from the ended scan may take up to an hour to process. Allow adequate time for the results to be processed.

## 3.4 Step 3: Find and Mark Files

The third step is to mark the files and folders to be recovered. Marking a folder will automatically mark all the files and folders contained within the folder.

Data Rescue will organize files into two different folders: Found Files and Reconstructed Files. The files found by Data Rescue will be organized depending on the scan method you use.

Found Files will be listed in the results window when using a Quick Scan or Deep Scan. Found Files displays any files from any file systems it detects, listing original directory structures and file names. You will want to look through the Found Files results if you are recovering from a hard drive that has failed to boot to the operating system or if your external hard drive is failing to mount.

Reconstructed Files will be listed in the results window when using a Deep Scan or Deleted Files Scan. The Reconstructed Files results will organize any found files by category and file type. These results will NOT have their original directory structure and will usually not have their original file names since they are found by file patterns. You will want to look through the Reconstructed Files results if you are recovering from a hard drive that was accidentally

reformatted or had files that were accidentally deleted.

We do not generally recommend selecting and recovering all of the Found and Reconstructed files simultaneously, especially from a Deep Scan. It is generally better to spend a little time to select and recover just the files and folders you want. For example, Deep Scans typically contain huge amounts of Mac OS files and folders that will not be useful when recovered, and will just increase the time and space needed for the recovery. You can browse and/or use the search feature to help locate files you are interested in.

In addition, if you intend to recover many files under Found Files, we recommend that you start by recovering a few important files first, then verify that the files open properly before recovering the rest of the listed files.

## 3.4.1 Previewing Files

Data Rescue allows you to preview major file types before recovering the files. This will help determine whether the files can be recovered properly before being transferred onto another hard drive. Major file types such as .doc, .pdf, .mp3, and .jpg can be previewed through Data Rescue.

> **To preview files within Data Rescue:**
>
> 1. Click on a file's name within the list to highlight it.
> 2. Click on the Preview button or press the space bar on the keyboard to view a thumbnail of the image or an overview of the document.

As a convenience to the user, double-clicking on a file in the Scan Results window will cause the file to be temporarily recovered and the operating system will open the file with the appropriate application. For example, double-clicking on a .mov movie file will open the default media player application, typically QuickTime. This double-click preview feature is only available while booted directly into the Desktop environment.

> **To preview files within their default application (while booted from the operating system):**
>
> 1. Double-click on the file you want to preview.

## 3.4.2 Searching the Scan Results

The search feature will allow you to quickly filter your results and find your most important files. If you are looking for a specific file, you may use the Search Field in the Scan Results window or click on the **Edit** menu and select **Find**.

The Search Field in the Scan Results window can be used to quickly filter the results for specific filenames or extensions. The Scan Results window will be updated with any files that match the extension or word within the filename. Highlighting a file from the list will display the path to the file on the bottom half of the window. Please note the Search feature does NOT look within the contents of the files for keywords.

> **To use the Search Field:**
>
> 1. Click in the Search Field and type in a file name or extension.
> 2. Press the Return key on the keyboard, or click on the **Search** button. Allow adequate time for the results to filter and update the list.

The **Find** feature in the **Edit** menu allows you to search for specific criteria of a file, including file name, date created, and file size. This allows you to filter out a range of files if you remember the date created or file size.

> **To use Find feature:**
>
> 1. Click on the Edit drop down menu and select Find.
> 2. Optionally, check **Search selected folder only** to only search the selected folder.
> 3. Select the parameters for the file you are trying to find and click on **Search**.

After viewing the Search results, you may return to the complete Scan Results by clicking on the **View** drop down menu, and selecting Scan Results. Any files marked for recovery in the Search results will remain marked for recovery when returning to the Scan Results.

### 3.4.3 Recovering Files

While previewing the files, you may begin marking any files to recover. You may choose to recover each file individually or in groups by marking multiple files and pressing the **Recover** button, or dragging and dropping files into a Finder window to recover them to the destination hard drive.

After completing a scan and before recovering a large number of files, it is highly recommended to first try and recover only a few of your important files to make sure they contain good data. There are some situations where there can be uncertainty about the proper Allocation Block Layout choice section for more information about Allocation Block Layouts).

Specific files can be marked for recovery by using the checkboxes within the scan results. This allows you to choose multiple files throughout the scan results to be recovered as one process. If you would like to recover all the possible results from your hard drive, you can mark the root selections Found Files and Reconstructed Files, however it is generally best to select specific files and folders you want to recover to save time and hard drive space.

> **To recover files using the checkboxes:**
>
> 1. Click on the checkboxes to mark any files you are interested in recovering.
> 2. Click on the Recover button.
> 3. Select the destination for your files to be transferred to and click on Open. Allow adequate time for the files to be transferred onto the destination.

The "drag and drop" recovery process is the quickest way to move a file or folder to the destination hard drive if you are booted from your operating system. However, this method of recovery is not available while booted from the DVD since the operating system's Finder windows are not available to drag to a destination.

> **To recover files using the drag and drop method:**
>
> 1. Highlight the file or folder you want to recover.
> 2. Click and drag the highlighted file or folder from the Scan Results list onto the destination hard drive or folder on Apple's Finder. Allow adequate time for the files to be transferred onto the destination.

# 4 BootWell™

BootWell™ is a feature that allows Data Rescue to create a bootable disk to recover files from your main drive (also known as your startup disk).

If your purchase of Data Rescue included a BootWell drive, follow the instructions below to boot into the drive.

**To boot from a Data Rescue BootWell drive**:

1. Insert the BootWell drive
2. Turn on, or restart the computer.
3. Immediately press and hold the Option key.
4. Select "Prepare Data Rescue" when it appears.

If you do not have a BootWell drive, you can create one yourself.

Before starting, you must have:

- A drive that is 4 GB in size or greater. USB is preferred.
- A working internet connection

⚠️ *Warning: the drive selected for BootWell will be erased!*

**To create a BootWell drive**:

1. Go to File > Create BootWell Drive
2. Select a drive to use
3. Choose Start and confirm the operation.

After the BootWell drive has been created, you may now boot into that drive to begin using Data Rescue using the instructions above.

# 5 Tasks

## 5.1 Quick Scan

Select the Quick Scan if:

- A drive's operating system fails to boot.
- An external drive fails to mount.

The Quick Scan is the fastest method that detects existing directory structures even if your volume does not mount. This scan will detect files with their original folder hierarchies and file names. It is recommended to try this scan method first if your volume is detected on the hard drive.

A Quick Scan can only be used on a volume. If you have selected the hard drive to be scanned, the Quick Scan will attempt to search for the first available volume on the hard drive, then rebuild the directory structure for that volume.

The Quick Scan typically takes a few minutes to complete, but may take up to a few hours to retrieve the results in more severe cases. Bad blocks on the hard drive may slow down the scan process, but will immediately speed up once it has overcome those bad blocks.

## 5.2 Deep Scan

Select the Deep Scan if:

- No volumes are detected on the hard drive.
- A hard drive was reformatted.
- The Quick Scan did not provide expected results.

The Deep Scan is a comprehensive scan method that provides the most results possible. The Deep Scan is a two part scan method: 1) detects existing directory structures on the hard drive, 2) scan the whole hard drive for any file patterns to rebuild the raw data of any recognized files.

As the first part of the scan, Deep Scan will detect any existing directory structures like the Quick Scan, but can detect multiple directory structures while scanning hard drive with more than one volume. This will provide you with results from each found volume, with their original directory structures and file names.

The second part of the Deep Scan searches the entire hard drive for any files based on file patterns. Data Rescue detects over 150 major file types based on the files' raw data. These found files will not have their original directory structure or filenames since Data Rescue is rebuilding the files based on their file design. Instead, these results will be provided with generic filenames and organized by category in the Reconstructed Files folder.

The Deep Scan usually takes up to three minutes per gigabyte. With large capacity hard drives, it may require several hours to complete a scan. Physical issues such as bad blocks on the hard drive may slow down the scan process even longer, but the scan will immediately speed up once it has overcome the bad blocks. Allow adequate time for the scan to finish.

## 5.3 Deleted Files Scan

Select the Deleted Files Scan if:

- Files were deleted through the operating system.
- Files were deleted by another program.
- A fresh installation of an operating system overwrote an existing hard drive

The Deleted Files Scan is a specific scan method that searches only the free space of a volume for any files based on file patterns. Scanning only the free space allows the Deleted Files Scan to specifically detect any files that were deleted.

Once files are deleted through the Mac Operating System, there is no more reference to their original directory structure, filename, or date created/modified. Data Rescue will not be able to detect the original information of that file in the directory structure. Instead, Data Rescue will rebuild any files that it detects based on its file patterns. The results of the Deleted Files Scan will be provided with generic filenames and organized by category in the Reconstructed Files folder.

The Deleted Files Scan usually takes up to three minutes per gigabyte of free space available on the volume. This makes the Deleted Files Scan faster than a Deep Scan since it is not scanning any known used space on the volume.

# 5.4 Clone

Select the Clone feature if:

- The hard drive appears to be having some hardware problems
- Quick or Deep Scans are stating an excessive amount of time to scan
- You need an identical copy of the hard drive

The purpose of the Data Rescue cloning function is to copy a drive or volume to another drive or volume, so that the copy may be scanned, reducing the wear-and-tear on the original hard drive. This will free the hard drive from use while preserving the data that was on it for later scanning. Cloning is normally not required in order to scan and recover files with Data Rescue. The goal is to transfer all the data from the source to the destination, making a perfect one-to-one copy where it is possible. In some cases, due to disk errors on the source, copying can be hindered to the point where getting a perfect 100% is not possible because of the huge slowdown in read rate caused by errors; then the goal becomes transferring as much of the source data to the destination as possible within a certain time period.

To use the Clone feature, a spare hard drive is needed with the same or larger capacity than the original hard drive. The Clone feature makes a single pass copy of your hard drive onto another hard drive or into a disk image. Please note the cloned hard drive will be in the same logical state as the original hard drive. This means if the original hard drive is failing to mount or boot, the cloned hard drive will have the same failure to mount or boot. The purpose of the clone is to help overcome any slow reads or possible hardware failures that exist on the original hard drive.

If the original hard drive appears to have hardware problems, it is highly recommended to clone the hard drive first to reduce the use of the source drive while it is still operating. Once the original hard drive is cloned, you may put the original hard drive away for safekeeping and perform the recovery options on the cloned hard drive.

**To Clone a hard drive:**

1. Select the device level of the hard drive in Step 1.
2. Select the **Clone** task in Step 2.
3. Select the Clone Target where the hard drive will be cloned to and click on **Start Clone**. Wait for the clone process to complete.

Cloning the device level will copy the entire hard drive's partition map onto the other hard drive. If there are multiple partitions on the hard drive, the partitions will be cloned onto the destination as well. You may select and clone volumes rather than the whole hard drive; however, this is only recommended if you are instructed by Prosoft technical support or you have knowledge and experience about disk partitions and volumes.

*Warning: The Clone process will overwrite the contents of the Clone Target. Ensure you have a backup of the contents of the Clone Target hard drive, or use an empty hard drive. Be extremely careful to choose the target so that you don't write to the wrong drive or volume.*

**To Clone to a disk image:**

1. Select the device level of the hard drive in Step 1.
2. Select the **Clone** task in Step 2 and click on **Continue**.
3. Select New Disk Image as the Clone Target.
4. A prompt will appear to title the saved disk image. Give a title to the disk image and select the destination for the disk image file and click **Save**.
5. Click on **Start Clone**. Allow adequate time for the clone process to complete.

Cloning to a disk image will allow you to save the entire contents of a hard drive into a single file. This is a good option if you have available hard drive space, but do not want to erase the contents of another hard drive. The disk image can be opened later to help simulate the original hard drive and complete a scan for recovering files.

# 6 FileIQ

FileIQ is accessible under the View menu.

Select the FileIQ feature if:

- A file type you are searching for is not found
- You have a special file type that is not supported by Data Rescue
- You want to check if a file type is supported

If Data Rescue does not recognize the file type you are trying to recover, FileIQ will help Data Rescue to learn new file types. Data Rescue will analyze any good working file samples and detect any file patterns to help find missing files of that file type. FileIQ will work for many, but not all types of files. However, Data Rescue will tell you if your sample files are likely to work or not, and there is nothing to lose by trying.

---

**To add a new file type into Data Rescue:**

1. Click on **FileIQ**.
2. Click on the + icon to add file samples.
3. Choose any at least 5 files of the same file type.
4. Click on **Open** to add the files into the list.
5. Click on **Save**.

---

To utilize FileIQ, Data Rescue needs to analyze good working files of the same file type that is missing. These may be older files that you have previously created with your program. You will usually need to reference at least 5 files of the same filetype to properly create a file module; however in some cases, as few as two files may work. In general, the more file samples provided into FileIQ, the more accurate the created file module will be. If you do not have sample files available, you may consider creating some files of the same file type with the program used to make the files. However, ensure these files are not saved to the hard drive missing the data.

Click on the + icon or drag the sample files into the Add New Type window. A spinning progress wheel will appear below the list to indicate the files are being analyzed. If no additional information is reported back in Data Rescue, you may click on **Save** to add the file module to the Learned Types List.

## 6.1 FileIQ Advanced Options

**Show advanced options** displays some additional parameters that you may use to further define the file module.

The **Details** tab includes some fields to describe the file type, how the file names will be generated, and which folder they will appear in. Data Rescue will automatically fill in most of the fields when sample files are listed in FileIQ. Data Rescue will fill in the Template File name, Extension, Folder Name, and Max File Size based on the sample files' data. The fields will define the following attributes for the file module:

- **Name** is an optional field that you may fill in to describe the File module. This will be displayed in the Preference's Scan Engine Tab.
- **Template File Name** is the generic name that will be provided to any found files.
- **Extension** is the file type determined by the file samples.
- **Folder Name** is the location where the found files will be displayed in the scan results list.
- **Max File Size** limits the size of the data captured for the file. Ideally this should be large enough that you are sure all files of this type are smaller than this limit. If in doubt, you may make this value larger because files larger than this number will either not be found or will be truncated when recovered. If you do not specify a value for Max File Size, Data Rescue will choose a value that is about 10 times larger than the largest file sample you added.

The **Quality** tab will display two scales to detect the file patterns reliability for the file module. Diversity relates to how many samples there are and how many samples have different lengths. The Match Strength displays the number of similar bits found between the separate files. Data Rescue will update these bars each time a sample file is added or removed. The larger the values are for both Diversity and Match Strength, the more reliable the file module will be for Data Rescue to detect the files.

If you're having trouble getting an acceptable set of samples, it is best to remove all the sample files and add them one

at a time. You can improve the Diversity by adding another sample file. If the Match Strength suddenly decreases when you add another sample file, it may be because that file is actually different in format than the samples you already added. In that case, remove that file and adding a different one. Please remember that certain types of files do not have distinctive starting patterns, and therefore will not be recoverable by example at all, not matter what combination of samples you give. If you find that you cannot get both Diversity and Match Strength above half-way, see the next section on troubleshooting.

The **Pattern** tab allows you to modify the matching algorithm. The **Matching** drop down menu instructs Data Rescue how selective to be in matching start patterns for the file type. The default selection for **Normal** will give a basic comparison of the bits to determine the file pattern. If your scan returns too many files that are not similar to the filetype, you may change the Matching selection to **Tight**. This will make Data Rescue compare more bits in the file pattern to potentially detect the files more accurately and reduce the amount of results provided. If your scan returns too few files, you may change the Matching selection to **Loose** to compare less bits in the file pattern and provide more scan results.

If Data Rescue determines that the sample files have a usable and consistent end pattern, it will use enable the **Use End Pattern** option. Using an end pattern should result in recovered files that have the correct length, instead of potentially adding incorrect data. However, enabling the Use End Pattern option may reduce the scan performance considerably and may take longer to complete the scan. If you uncheck the Use End Pattern option, the end pattern will not be used for the scan.

Data Rescue currently does not support editing previously saved definitions. To change the Matching selection, you will have to recreate the FileIQ definition and save the different matching selected.

Once you click **Save**, new file types will immediately be installed in Data Rescue to allow you to search for their respective files.

# 6.2 FileIQ Troubleshooting

After dragging the sample files, you may be provided with a few different outcomes. This section discusses some cases that may occur while trying to generate a file module.

The file samples may be recoverable by an existing module. If a file module is listed in the "Recoverable by Existing Module" field, then it may not be necessary to create a file module. This means the file samples you have provided are similar to another file module that Data Rescue already detects. The results you are provided by a scan may already detect your files, but you may need to rename the extension to open the files properly by your program. As an alternative, you may choose to save the file module to replace the existing module and a new scan of the hard drive will detect your files properly. A common example of this are certain camera RAW images that are sometimes found as TIFF images instead.

FileIQ may not detect a suitable starting pattern for the sample files. If different programs create the same kind of file, it's possible the files with the same extension may not have the same starting pattern, and therefore won't produce a usable result. For example, Quark and FreeHand programs both create EPS files, and if you took samples from both programs to create a file module, FileIQ may report an issue because the programs create different formats for the files. You may consider replacing some of the sample files with other files of the same type. For best results, use file samples that are created from the same program, and preferably the program that produced the files you are looking for.

There are cases in which FileIQ cannot create a file module. Some reasons a file module may not be created include:

- **The files are packaged file types.** These are files that appear as a single file, but are actually folders with more data inside them. Since packaged files are made of multiple files, there is no method to reconstruct the file as a whole. Common examples of packaged files are Application bundles.
- **Inconsistent file patterns.** These are files that do not have common file patterns that can be detected between the files due to different internal formats or raw data throughout the file. An example of this may include database files.
- **Repetitive file patterns.** These are files that have a common file pattern that repeats multiple times throughout the file that a correct end of file cannot be determined. An example of this is a video file that has the same file pattern repeating every frame. This may result in a large number of single frame video files, but not a complete video.

# 7 Manage Scans

Data Rescue keeps the different scans that have taken place in its temporary storage location. The **Manage Scans** feature allows you to continue a previously suspended scan or delete previous scans which are no longer needed. By keeping previous scan results, Data Rescue allows you to return to the earlier scan results to recover additional files.

Scans that are stored are in a form that allows quick access to them. However, they can take up considerable space. The Manage Scans allows you to save one or more scans in a compressed .drscan file, after which you could delete those scans. Later if you want to restore any of those scans, you can load them from the previously saved .drscan file. This also works for suspended scans.

## 7.1 Resuming Suspending Scans

Suspended scans may be resumed from the Manage Scans window. Ensure the same hard drive on which the scan was started is connected before resuming the scan.

> **To resume a suspended scan:**
>
> 1. Click on **File** and select **Manage Scans**.
> 2. Highlight the suspended scan.
> 3. Click **Resume**.

The previous scan will begin immediately and continue where the scan was suspended.

## 7.2 Saving Scans

Saving scans allows a user to save the results of a scan into a .drscan file to be reloaded at another time. This feature is primarily useful to archive scan results for access at a later time, or on the same computer setup, without taking up space in the meantime. It could also be used when a scan needs to be continued on another machine. For example, consider that an external hard drive has failed and a scan was started on a MacBook, but the user decided they needed that MacBook for another purpose. The user may save the the scan file onto a separate device (such as a USB flash drive), connect the external hard drive to a different Mac computer, and import their scan with Data Rescue from that machine.

There are restrictions when resuming or accessing a saved scan. The scan must be accessed by the same basic type of Mac (PPC or Intel based), running the same major Mac OS version, and either the same or a compatible version of Data Rescue.

> **To save a .drscan file:**
>
> 1. Click on **File** and select **Manage Scans**.
> 2. Highlight the scan(s) you want to save.
> 3. Click on the gear wheel button on the bottom left corner and select **Export**.
> 4. Select a destination, title the file, and click on **Save**.

Please note that more than one scan can be saved, allowing you to archive multiple scan results into one .drscan file. The file must be saved on a separate device, not on the hard drive or volume that is missing the files.

## 7.3 Importing Scans

As described in the previous section, a scan can be imported from a .drscan file.

> **To import a .drscan file:**
>
> 1. Click on **File** and select **Manage Scans**.
> 2. Click on the **Option** (gearwheel) button on the bottom left corner and select **Import**.
> 3. Select the saved .drscan file and click on **Open**.
> 4. A prompt will appear to "Choose Scans to Import". Highlight the scans you want to load and click on **Import**.

The imported scans will be listed within the Manage Scans window. Once imported, you may select a suspended scan to continue, or go to the **View** menu and select **Scan Results** to view any completed scans.

## 7.4 Deleting Previous Scans

Data Rescue archives all scans that it has completed. These scans may take up several hundred megabytes to gigabytes of space. After a scan is complete and the data has been recovered from the drive in question, you may delete the previous scan from Data Rescue to reclaim the space on the hard drive. Deleting the scan is recommended only when the recovery process is completed. Once the scan results are deleted, the scan will need to be started from the beginning once again if further results were needed.

**To delete a previous scan:**

1. Click on **File** and select **Manage Scans**.
2. Highlight the scan(s) you want to delete.
3. Click on the **Option** (gearwheel) button on the bottom left corner and select **Delete**.
4. A prompt will appear to confirm to delete the scan. Click on **Delete** to remove the scan.

## 7.5 Reviewing Previous Scan Results

Data Rescue allows you to immediately review the results of any completed scans. This is very useful in case you have forgotten to recover some files from the first attempt, or if you have to take a break from the recovery process. By default, Data Rescue will only save the last scan result. If you want to work with and manage multiple scan results, you must enable expert mode.

**To review any previous scan results:**

1. Make sure expert mode is enabled
2. Click on View in the toolbar and select Scan Results.
3. If more than one scan was completed, select the completed scan from the list to load the results of the previous scan.

If the previous scan you wish to view is not visible, click and drag the little gray button in the middle of the left window area to the right until you can see the previous scan. Once the scan results have been reloaded, you may resume recovering data from reloaded results.

# 8 Drive Failure Detection

Data Rescue can detect when a drive may be failing by analyzing the time it takes to read from the drive. If at any time it detects this, the Drive Failure Warning window will appear.

At this point Data Rescue has detected slow read access on one or more of your drives, which *may* be a sign of a failing drive. If this persists, you have a few options:

1. Stop the current task (scan, recovery, etc.) and perform a Clone. Cloning allows you to copy your drive to good drive. Data Rescue can then scan and recover off the good drive safely.

2. Disconnect the drive from your computer, turn off its power (if applicable), and contact a data recovery company.

3. Let the current task continue until completion (not recommended).

> ⚠️ *Warning: Attempts to run a scan on your drive (if it is failing) for an extended period of time (e.g. days) may cause the drive to completely fail. This could prevent any data recovery company from being able to recover your data entirely.*

Selecting a drive and clicking **Ignore** will cause Data Rescue to ignore all further warnings on that drive until the application is relaunched.

Selecting **Details** will provide a list of the sector (block) offsets and the time it took for Data Rescue to read from that sector. This is more useful for expert users such as data recovery technicians.

For further assistance with a possibly failing drive, please see the [Drives With Suspected Hardware Problems](#) section.

# 9 Preferences

The **Preferences** menu is available under the **Data Rescue 4** menu bar at the top of the screen.

## 9.1 General

**Enable expert features** will display a fourth section in the Preferences menu titled Expert. It will enable a variety of additional features to help recover from advanced data recovery scenarios. The expert features are designed for technicians or experienced computer users. See [Expert Features](#) for more information about expert features.

**Automatically check for updates** will detect whether there are any new versions of the software available for download. This setting is enabled by default and will only check for updates if an internet connection is available.

**Scan Complete Sound** and **Recovery Complete Sound** allows you to specify a specific sound to play when the scan or recovery has finished.

**Reset Warnings** will reset all warning dialogs in Data Rescue where you can prevent the warnings from being displayed. For example, when quitting Data Rescue there is a confirmation dialog that shows which can be disabled from showing again. When you reset all warnings, that dialog will appear again.

## 9.2 Preview

The **Preview** preferences include settings for Data Rescue's preview feature while viewing found files.

**Show Preview above other windows** will keep the Preview window displayed at all times and prevent the window from being hidden by other program windows.

**Make Preview opaque** will remove the translucent effect from the Preview window when enabled.

**Auto-play audio and video files** will immediately play any audio and video files when the preview window is opened for an audio or video file type.

**Maximum auto-preview file size** allows you to set the maximum size of a file that will be previewed automatically. By default it is 10MB, so any file greater than this will not generate a preview until one is manually requested.

**Switch to Data view when Preview is not available** requires Expert Mode to be enabled in General preferences. Enabling this setting will display the raw data for unrecognized file types in the Preview window.

## 9.3 Scan Engine

The **Scan Engine** preferences are additional settings for adjusting Data Rescue's scan processes. Although there are many additional settings available, the default values should be fine for most situations and users, so changing these settings should not be necessary. The Scan Engine preferences are available to provide extra flexibility for expert users and in unusual circumstances where the default settings are not providing substantial results.

The Scan Engine preferences are organized hierarchically and displayed as a tree. Highlighting a portion of the tree in the left-hand window will cause any associated properties and values to appear in the right-hand window. If you highlight a property, a description is displayed in the small text window in the lower-right corner of the window. Properties with boolean (on/off) values are represented with a checkbox. Properties with numerical or text values are shown with a text field that can change the value. If a property is not editable, it will be shown in a gray font (dimmed). To edit a numerical or text value, double-click the current value, then type in the new value.

For properties which represent file sizes, you can input a new value using KB, MB, or GB size shortcuts. For example, to specify a size of 2 kilobytes, you can input either "2048" or "2KB".

The most common need to access the Scan Engine preferences is to increase the maximum file size for a certain file type when you expect to find very large files of this type. For example, the default maximum size for most movie file types is 10GB. If you are looking for 25GB Quicktime movies, you will need to go into the preferences and increase the maximum file size to something larger than the biggest file you are looking for.

**Reset Scan Engine Preferences** will changes all the Scan Engine Preferences back to default settings. This is useful if you have previously changed any of the Scan Engine Preferences and would like to run based on the default configurations.

The various scan engine preferences are discussed in the following sections.

### 9.3.1 Cloning Preferences

The Cloning Preferences are for advanced users who have special needs with regards to cloning. The default cloning strategy should be adequate for almost all users and situations.

Data Rescue supports the following cloning strategies to help you accomplish this, which are described below starting with the simplest approach.

**Straight Copy** - This straightforward strategy starts at the beginning of the source media, and sequentially copies buffers of information to the destination media, one at a time, working straight through from start to end. If read errors are encountered, the algorithm just keeps going through them sequentially. If the disk should happen to have an area of errors close to the start of the hard drive, this means the algorithm may spend many hours trying to work through this area, without having copied much data.

**Reverse Copy** - This strategy is nearly the same as the straight copy, except that instead of working from the start of the media to the end, it works from the end of the media to the start. In the aforementioned case where there were errors at the beginning of the media, this strategy can help by allowing most of the data to be cloned before running into the problem area.

**Bisect Copy** - This strategy is influenced by the detection of errors found during the clone process. The clone will start at the beginning and clone until an error is encountered. Once an error is detected, the remaining space to clone is divided in half, then the clone process will continue from the second half of the remaining space. After the second half is cloned, the clone will return to the first half of the space to finish cloning. This process will repeat as more errors are detected on the hard drive.

**Segment Copy** - This is the default cloning strategy that is similar to bisect copy, but provides a more elaborate and efficient method to clone the media. The space of the hard drive is divided into 64 pieces, which are further subdivided if errors occur to ensure a clone of the healthy blocks of data while ignoring any bad blocks. If there are no errors, it will proceed exactly like the straight copy from the start to the end.

Most users should just use the default segment copy. The Reverse Copy method can be useful if the user knows that most of the errors are near the start of the media.

## 9.3.2 File Modules

The reconstructed files that are found by Deleted Files Scan or Deep Scan are based on individual file modules. Each file module is responsible for detecting one kind of file. Most file modules have a number of preference properties in common, such as enable, maximum file size, etc. The file modules are grouped by category based on the file type. For convenience, some of the properties for the individual file modules may be specified at the category level of the tree, which will allow all the file modules of the same category to use the same values. Individual file modules may still override the values from the category values.

### 9.3.2.1 Top Level File Modules Preferences

**Enabled** specifies whether a module is enabled to look for files during a scan. The default enabled value for this node is On. All the file modules underneath this point of the tree will be enabled, unless overridden at a lower level.

**Number of filename digits** controls how many numerical digits are used when generating names for files found by the file modules. For example, with the default setting of 5, the filenames will be generated as abc-00001, abc-00002, etc. Changing this setting to a value of 3 will generate file names as abc-001, abc-002, etc. The purpose of the leading zeros is so the Finder will list these in numerical order. Setting this value to 0 will have no leading zeroes added to the file name.

**Maximum file size** controls the maximum size that certain files can be. If a found file exceeds this value, the file will be ignored. Not all file modules implement a maximum file size.

### 9.3.2.2 Category Level Preferences

The category level preferences consist of the categories of file modules, such as Mail, Documents, Audio, etc. These categories are organized the same as the reconstructed file results. The preferences that are inherited from the top-level file modules preferences are still shown so you can see their values, but are not editable (dimmed).

A few categories have their own properties. For example, the Text category is disabled by default because its severe impact on performance and results. However, you may choose to enable the Text category if you want to scan for a particularly important text document that is not recovered by any other file module.

Other examples of unique preferences include **Maximum consec bad chars** for Text file modules to help detect the end of a file properly and **Minimum image dimensions** for Video and Images.

### 9.3.2.3 File Module Preferences

The lowest subcategory displays preferences for the individual file modules. The properties which are listed in green are preferences which are using a value from a higher place in the tree.

## 9.4 Recovery Preferences

**Bad file color** will add a label color of your choice to any files detected by Data Rescue that were potentially recovered as bad. The color label helps organize files when viewing them through the Finder. These bad files may be attributed to incomplete file patterns or incorrect allocation block layouts.

**Change ownership** will change the file and folder ownership for all recovered files to the user running Data Rescue. This is helpful if the original hard drive was experiencing file ownership problems.

**Clear lock** will force change any lock bits when recovering files or folders when this preference is enabled. This will allow any files or folders that were originally locked on the problem drive to be accessed, renamed, or deleted by the user.

**Copy buffer size** preference specifies the size of the buffer to use for copy operations, such as recovering files. A larger buffer size will improve the speed of the recovery of files, but will use more memory.

**Make items visible** will change any invisible files to be visible when they are recovered.

**Omit empty files** will ignore displaying any files that are indicated to have no data when enabled.

**Permissions promotion** will change permissions of any recovered files to "Read and Write" based on the selected preference.

- **None** will not change any permissions on any recovered files.
- **For items with no access** will change permissions only for any files set as "No Access".
- **For all items** will change permissions of any recovered files.

# 9.5 Scanning Preferences

**Keep bad files** will keep all found files to be displayed in the scan results, even if they appear to have bad contents or format.

**Maximum files/folders preference** is used during scanning when Data Rescue has to create its own folders using catalog files, such as the Orphans Folder within the Found Files results. When the number of files would exceed the value set in this preference, Data Rescue will create a new folder. The default is 1000 files per folder.

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# 10 Expert Features

The expert features are designed for technicians or experienced computer users to help recover data in more complex recovery scenarios. Enabling expert features from the Preferences will display two new available options: an Expert tab within Preferences and an Expert drop-down menu in the tool bar.

## 10.1 Expert Preferences

**Manage File Module Definition Files** will list any file modules added into Data Rescue by FileIQ and allows you to enable, import or remove file modules. This tab is primarily used to import customized file modules passed from technical support in special case scenarios.

**Manage Conflicting File Modules** will list any file modules that have file patterns in common. Some file types may be mistaken for use with another program or another version of the program. Clicking on a listed file module will display any other file modules that were detected to have a similar file pattern. You may select a different file module to replace the current active file module to help ensure the file is found properly by Data Rescue.

**Show Welcome screen at launch** will always show the Welcome screen when Data Rescue starts up. Disable the checkbox if you prefer to not have this displayed and instead go directly to the Select Drive/Volume step.

The **When quitting** section has two drop down menus to note the default behavior of Data Rescue when exiting the application.

The first drop-down menu selects what to do with the scan results when quitting:

- **Keep Scans** - will leave scan results. This is the default selection.
- **Delete Completed Scans** - will delete previous scan results. This is can be selected if you are not concerned about your previous results, and want to free the disk space.
- **Show Manage Scans** - will display the Manage Scans window before quitting the program.

The second drop-down menu selects what to do with marked files from the Scan Results when quitting:

- **Unmark marked files** - will unmark any files that were selected for recovery.
- **Leave marked files marked** - will leave the marked files selected for recovery when loading those scan results.

## 10.2 Expert Menu

The **Expert** menu is available on the menubar at the top of the screen.

### 10.2.1 Allocation Blocks Layout

**Allocation Blocks Layout** can be used after a Deep scan if the files listed by the Found Files results are not opening properly after recovery. If none of the files open when they are first recovered, selecting this feature will provide you with additional options which may correct the way the files are found.

During its scan, Data Rescue determines some possibilities for the proper Allocation Block Layout setup. The Block Size is the number of bytes of the allocation block. The Offset is the number of bytes (represented in hexadecimal), from the start of the media to the start of the file system.

The first choice is the default selection that Data Rescue considered to provide the best results, but if the files are not recovered properly, try each of the other selections.

> **To find the best allocation block layout for recovering files:**
>
> 1. Complete a Deep scan on the hard drive.
> 2. At the results window, select a basic file (such as a JPEG image or text document) from the Found Files folder.
> 3. Click on **Preview** to view the file.
> 4. If the file preview does not properly show the file, go to the  **Expert** menu and click on **Allocation Block Layout**.
> 5. Click on the next available selection inside the Allocation Block Layout window.
> 6. Click on the results window.
> 7. Select the same file and click on  **Preview** to view the file. If the file opens correctly, try previewing a few

other files to ensure they are viewed properly also. If multiple files begin opening correctly, this is a good indication the right Allocation Block Layout was selected. The files can be selected and recovered at this point.

8. If the files do not open in the Preview window, repeat steps 5 through 7 until the file is opened properly in Preview.

In some cases, such as a drive you scanned had more than one partition or if there are remnants of older file systems still present on the disk, you will find that some files require one Allocation Block Layout selection and other files will require a different selection.

## 10.2.2 Choose Drive/Volume for Scan

**Choose Drive/Volume for Scan** allows you to reselect the source hard drive or volume for any previous scan results in case the original hard drive or volume was renamed or detected incorrectly. Selecting this feature will provide you with a list of connected hard drives or volumes to reference as the source.

If the correct hard drive is already detected, it will be listed by itself in the window. However, if more than one volume is displayed, Data Rescue will compare the scan results to the selected media to detect the correct scanned media. A description below the list will state any potential issues if the wrong media is selected. The selected media which shows the least number of mismatched checksums and does not display any significant errors will be the ideal original source media.

Enable **Show all drives and volumes** to select any drive or volume, overriding Data Rescue's filtered list based on the original drive/volume.

**To reselect the drive/volume for scan:**

1. At "Step 3: Find and Select Files", highlight the scan results you want to reload.
2. Select **Choose Drive/Volume for Scan**.
3. Select the drive/volume that closely represents the original media scanned. Ensure the description has the least number of mismatched checksums.
4. Click **OK**.

Once the correct media is selected, you may continue with your recovery process from the results.

## 10.2.3 Show Details

**Show Details** gives a simple count of the number of potential file starting points found during a scan, organized by file type. The potential file starting points are not yet validated, so the ultimate number of files found by the end of the process will be less (sometimes dramatically less) than the number shown in the details window during the scan. The purpose of this window is to give the user an estimate of what kinds of files are being found during the scan.

## 10.2.4 Block Level Tools

Data Rescue features block-level tools to display raw disk blocks. Most users will not need this feature, but advanced users can use the block level tools to view absolute drive locations, such as viewing the partition table at the beginning of a drive or viewing the data at the start of a file.

**To display a file's block data:**

1. Highlight a file in the results window.
2. Select **New Window with this File's Data/RSRC**.

The Logical block read depends on the allocation blocks layout. If the displayed data appears incorrect, try a different allocation block layout. The Allocation Block Layout window automatically updates any open block display windows, so you can immediately see the effect of choosing a different Allocation Block Layout.

The standard block window shows only the start of the file that was highlighted when you open it. You can open a special "inspector" version of the block window by holding down the Option key while selecting **New Window with this File's Data**. When opened in this way, the block display window will show the all block information for the selected file. This allows you to quickly look at the the different blocks of data for the file. If the displayed data appears incorrect, try one of the other Allocation Block Layout choices as described in the previous section.

**New Window with Block #** will display data at a specific block number on the hard drive.

> **To display a block number's data:**
>
> 1. Select **New Window with Block #**.
> 2. Enter the block number to view.
> 3. A window will appear with the block's data. Click on **Next** or **Previous** to proceed viewing the next block's data.

## 10.2.5 Set Drive/Volume Parameters

**Set Drive/Volume Parameters** is a feature that allows you to specify a starting and ending location and file system type for scanning. Using this feature manually sets parameters for the selected media. This is helpful if a hard drive's partition table was erased or damaged, but the file system and block size are known to simulate the original partition.

Manually setting the hard drive / volume parameters requires technical knowledge of the media's original settings to effectively utilize this feature.

There are several parameters that must be entered and selected:

- **Scan Start Block / Byte #** is the first column of values that specifies the start point of the media where Data Rescue will begin its process. You may enter a value into either the Block # or Byte # field, which will then automatically fill in the other field with its respective value.
- **Scan End / Length** allows you to choose whether you are scanning to a specific address (End), or to scan a specific number of blocks/bytes (Length). Choose End if you know the ending address of the specific partition. Choose Length if you know the size of the partition.
- **Scan End Block / Byte #** is the second column of values that specifies the ending address or length of scan depending on what selection you have made from the drop down menu. You may adjust the value in either the Block # or Byte # field, which will then automatically fill in the other field with its respective value.
- **Display format** allows you to choose the displaying values for the block and byte files to Hexadecimal or Decimal format.

The **Revert Button** will reset the values to the default information based on the media's original settings.

> **To manually set the drive / volume parameters:**
>
> 1. At "Step 1: Select Drive or Volume", highlight the hard drive or volume for which you want to change the parameters.
> 2. Select **Set Drive/Volume Parameters**.
> 3. Enter the **Start Scan Block / Byte #**.
> 4. Select **End** or **Length** from the drop down menu.
> 5. Enter the **Scan End Block / Byte #**.
> 6. Click on **Set** to apply the settings.

Once the parameters have been set, you may proceed with the standard steps to scan your hard drive.

## 10.2.6 Add RAID Set

**Add RAID Set** allows you to simulate a RAID configuration based on the RAID functionality built into Mac OS X. This is helpful in case an Apple RAID configuration fails to mount or be recognized as a single volume. Please note that Add RAID Set does not attempt to fix or repair a RAID set. Instead, the RAID set is configured through Data Rescue for the purpose of scanning for data.

Add RAID Set will not write any data to the hard drive, keeping the original state of the hard drives. This feature is specifically intended to help simulate Apple software RAID configurations. Data Rescue attempts to setup the RAID settings based on what it detects on the drives, so it may not be necessary to alter any settings when adding a RAID set.

> **To add a RAID set:**
>
> 1. At "Step 1: Select Drive or Volume", hold the command key while clicking on the hard drives in the list that are associated with the RAID volume. This will highlight multiple hard drives.
> 2. Select **Add RAID Set**. This selection will be active only if two or more hard drives are highlighted.
> 3. In the Add RAID Set list, drag the items in the list to rearrange the order of the hard drives / volumes from first to last. Data Rescue will automatically configure the order of the drives, and set the stripe size and RAID type according to what it sees on the drives. Only manually change the order, RAID type and stripe size if you know them to be incorrect, or have tried a scan with them using Data Rescue's determined configuration and it didn't work.
> 4. Select the RAID type and RAID Stripe Size. If you are not using a Striped RAID, leave the Stripe Size as 32KB.
> 5. Click on **Continue** to add the RAID set.
> 6. A new selection in the Source list will appear as "RAID SET".

Once the RAID set has been added, it can be selected to scan for data. In some cases, data may not be opened properly when recovered if the hard drives are not arranged in the correct order.

If data is not being recovered properly from the RAID, we suggest the following steps to troubleshoot the issue:

- Adjust the allocation block layout and reattempt the recovery until all options are exhausted or files are recovered.
- Redefine the RAID Set by using Add RAID Set, and drag to rearrange the order of the hard drives / volumes. Data Rescue does not currently support editing an existing RAID set. To change the configuration, you must define a new RAID Set using the different parameters.

Data Rescue supports 3 basic types of RAID, described very briefly below.

**Stripe** - This is also known as RAID-0. As data is read sequentially from the RAID set, it comes first from the first component drive until a stripe-sized amount has been read, then the next data comes from the second component drive, and so on, in round-robin fashion.

**Mirror** - This is also known as RAID-1. With this scheme, each of the drives is suppose to contain the exact same copy of data. This means that if you have an undamaged component drive, you should be able to just scan that to find your files (you will not need to create a RAID set).

**Concatenated** - This is not an official RAID level, but rather a way to make multiple hard drives appear as one big drive by concatenating them together. As data is read sequentially from the RAID set, it comes first from the first component drive, until the end of that drive is reached, then continues coming from the second component drive, and so on until the end of the last component drive.

The ordering of the component drives is mainly important for stripe and concatenated types. If this is wrong, the scan may find few or no good files. To alter the order, simply drag each drive in the list into its proper position.

This **RAID Stripe Size** relevant for the Stripe RAID type, but irrelevant for the other types. The default and most common value is 32KB.

## 10.2.7 Erase Drive/Volume

**Erase Drive/Volume** allows you to easily erase the selected drive or volume. This will only reformat the disk, not erase the contents of the disk. Drives are formatted as HFS+. If a volume is selected, only that volume will be reformatted. Otherwise, the entire drive is reformatted and all existing volumes will be lost.

# 11 Frequently Asked Questions

The following chapter contains some commonly asked troubleshooting questions and their solutions or workarounds. If problems still persist, contact Prosoft Engineering [technical support](#).

## Data Rescue seems to freeze. What should I do?

Most cases of apparent freezing are actually slow reads due to disk problems. If Data Rescue runs into a disk area where the disk is having trouble reading, it may appear to freeze, but actually just be very slow. If you think it has frozen, make a note of what is being displayed on the progress display, for example, the block number, then check again in half an hour or so and see if it has advanced at all. If it progresses, it is probably just slow due to disk read problems. If you continue having difficulties, make sure cables connecting to the disk drives are properly seated and consider disconnecting or turning off any unnecessary devices connected to the computer.

## Why doesn't my drive or volume show up?

If you have attached a drive with a damaged volume since you started Data Rescue, Data Rescue may not automatically notice it. Try the File > Refresh Drives List menu item. If the volume you are looking for still does not appear, it may be because Data Rescue is unable to find the correct name for it, in which case it may show some other name such as "unknown" for the volume name. Or it may be that Data Rescue can see the device, but is not able to recognize a volume structure on the device. If that is the case, you will need to choose the device name for scanning rather than the volume.

Finally, it could be possible that your drive is malfunctioning to the point where your computer is not able to talk to it at all, in which case even the device name will not appear. In this case, Data Rescue will not be able to scan your device. In this latter case, you might try some or all of the following things to see if your device can be made to appear: Double-check the drive cables and power source; remove/reattach the drive and/or power cycle it; power down and restart your computer. You can also double check that the problem isn't with the Data Rescue software itself by looking for your volume/drive using Apple's Disk Utility. If Disk Utility can see it, Data Rescue should be able to also; if Disk Utility can't, then Data Rescue won't be able to either.

## Why are some files listed twice?

Sometimes, your volume contains obsolete catalog entries. If Data Rescue finds two catalog entries with identical names, it first checks if the two entries refer to the same data. If so, then the items are called "true duplicates", and only one of these will be retained, and the other automatically removed. If the two entries refer to different data, both of them are retained, even if they have identical names and appear to be in the same directory, because there is no way to know which one is the correct one. To find which is the correct entry, check dates and file contents.

## Why do my found files total more than the size of the original drive?

There could be a few reasons for this, as explained below.

When you do a Deep scan, Data Rescue uses two different algorithms to locate files. These methods will often locate many of the same files twice - once under the Found Files folder and again under the Reconstructed Files folder. (Data Rescue does not currently have the capability to automatically cross correlate these sets of files, but may do so in a future version.) So if you elect to recover everything, it will often be the case that the total space required exceeds the original media size.

The second reason why the found files may total more than expected is the possibility of anomalously (and incorrectly) large files. In the course of scanning the media, Data Rescue will often come across bad files and catalog entries. Data Rescue is able to filter out the vast majority of these bad entries, but not all of them. Occasionally a few of these may show up in the recovery list with incorrect and large sizes. If you suspect this may be the case, you can easily find these large files by searching for files greater than a certain size using the Edit > Find menu item. A useful technique to eliminate these from the recovery is: first mark everything by clicking the checkbox for the top level folders, then search for and uncheck the large files which appear to be bogus.

A third possible reason is if the scanned drive makes heavy use of hard linked files, such as a Time Machine backup drive. Hard linked files are used by Time Machine to store many copies of the same file with the same content, without duplicating the contents. The current version of Data Rescue sees and recovers such files as individual files and does not share space among the files when recovering. For example, if there are 20 hard links to a 1MB file on the original disk, and you recover all 20 links, the recovered files will each take 1MB, or a total of 20MB. A future version of Data Rescue may alter this behavior. Until then, the best approach for this case is to select a single set of files to recover, such as the latest Time Machine backup folders rather than attempting to recover everything.

## Why is there a delay when I click the mark checkboxes?

After scanning a large drive, there may be hundreds of thousands or millions of files and folders to deal with. When you click on a mark checkbox in the recovery list to mark or unmark files for recovery, especially the top-level folders, Data Rescue has to walk recursively down through most of these items to individually mark or unmark them. The time this takes is proportional to the number of found files.

# Does Data Rescue handle RAID volumes?

With RAID, several component drives are set up to act logically as if they were a single composite drive. If your RAID drives or file system is in good enough shape that the system can still make them appear as a single logical drive, then Data Rescue should be able to scan that composite drive and recover files from it.

If the situation is such that the system cannot present the component drives as a single composite drive, then the answer depends on what kind of RAID your drives are set up to do. If the drives are set up to do mirroring (i.e. each file is stored completely on each mirror drive), then Data Rescue should be able to a Deep scan any of these component drives and recover files.

If the RAID is configured using Apple's software RAID system, you may enable Expert features and use the Add RAID Set feature to help simulate and scan the RAID. If the composite RAID device is visible without adding a RAID Set, it is almost always better to scan that than to create a RAID Set and scan it.

# I recovered files, but they won't open. What's wrong?

The answer to this question depends on whether you're talking about files recovered from under the Reconstructed Files or Found Files Folder.

### Files recovered by catalog (i.e. from the Found Files folder)
It's normal for a small percentage of recovered catalog files to be bad. But if you have checked a number of them and none of them are good, then chances are that they were recovered with the wrong Allocation Block Layout setting. Pick out a few files to use as test files, and go back and select a different Allocation Block Layout choice and recover a few files. If you find an ABL setting that gives good results on those files, re-do your big recovery with that setting.

### Files recovered by content (i.e. from the Reconstructed Files folder)
It's also normal for a small percentage of these files to be bad. If the original file was fragmented (not stored on disk in consecutive blocks), then it can not be properly recovered by content. In most normal situations, most files on a user's disk will not be fragmented. Typical fragmentation rates for files tend to be just a few percent. Note: The ABL setting plays no role in recovering files under the Reconstructed Files folder.

# Can I recover files that I deleted accidentally?

In OS X, when a file is deleted, for example by dragging it to the trash and emptying the trash, the file's name and folder information is usually erased by the system, and is therefore irretrievably lost. However in most cases, the most important part of the file - its contents - are still present on the disk. Finding the file by its contents alone is in general a difficult task, requiring algorithms to recognize those contents among all the billions of bytes of data on the disk. The Deleted File scan will list over 150 major file types it detects based on its file patterns.

# What are Data Rescue's general content scan capabilities?

In generic technical terms, Data Rescue's content scan is potentially suitable for any file type that consists of a single fork. For files that have both a data and a resource fork, the forks may be recoverable separately by content scan, but Data Rescue has no means to connect the two pieces back together. Some "files" are in reality a collection of separate files which the Finder treats like a single file. This is called a "bundle". The individual components of a bundle may be recoverable by content scan, but again Data Rescue has no automated way to associate these components back together into a bundle.

An additional requirement for a successful recovery by content is that the file's data not be fragmented. In other words, it must be stored from beginning to end in consecutive media locations. Fortunately, most files get stored on disk that way. OS X tries to store files in a non-fragmented way when it can. Still it is typical for a small percentage of files to be fragmented, and these will not recover properly when found by content.

Important: Do not mistakenly use a defragmentation utility (or any other program which will alter your disk) after losing your files, and prior to scanning with Data Rescue. Doing so will only make it less likely that you will be able recover your files.

Note: The above limitations apply only to the files found by content. For files that are found by their catalog entries, the original bundles and forks may be properly recovered, and fragmentation is not an issue.

# Specifically what types of files can Data Rescue find by content?

The actual list of file types recoverable by content can be seen from within Data Rescue by going to the Data Rescue Preferences menu and browsing through the File Modules tree. We expect to be adding to this list on an ongoing basis. For a recent list of filetypes recoverable by content, see the Release Notes file that came with your Data Rescue distribution.

For any file types not supported by default, Data Rescue's FileIQ feature will allow you to analyze sample files and possibly generate a file module to help detect the files you are looking for.

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# 12 Glossary

**Allocation block**: this is a block of file data within the file space of a volume. The size of allocation blocks is the same within a volume, but different volumes can have different allocation block sizes. This size is always a multiple of 512 bytes so allocation blocks boundaries are always aligned with logical blocks.

**Creator type**: Associated with every file on a Mac is a four letter code that specifies the file's creator. The creator is typically the application that created the file to begin with. This code is hidden from the user, but is used by the file system in a number of ways. For one, along with the File type, it helps determine the icon to display for that file. In addition, when you double click on a document, it is the application that has the same creator code as the document that will be launched to open that document.

**File type**: Associated with every file on a Mac is a four letter code that specifies the type of file it is (e.g. 'TEXT' denotes a text file, 'APPL' denotes an application). On many other operating systems, the file type is part of the name; it is usually a three-letter code following a period (e.g. myfile.txt or letter.doc). On the Mac, this code is hidden from the user but serves the same purpose: to identify the kind of file. It uses the file type, along with the Creator type (see below) to determine the icon to display for a given file.

**HFS, HFS+**: This stands for "Hierarchical File System" and "Hierarchical File System - Plus". These are the names of Apple's proprietary File system layout for Mac OS computers. The newer, HFS+ system affords greater file and disk capacities, as well as performance improvements over that of the older HFS architecture. HFS+ was released with Apple's 8.1 operating system and is designed to supersede HFS. All Mac OS versions from 8.1 Classic through OS X 10.x support both HFS and HFS+.

**Orphan**: An orphaned file or folder is a file or folder which Data Rescue has discovered a catalog entry for, but no parent catalog folder can be found. Items like this are presented under the Orphans Folder in the Data Rescue recovery window.

**Physical block**: this is a 512-byte block of information on a physical device. Physical blocks start at zero so physical block #0 is usually the first block of the partition map of a physical device.

**Remote volume**: A remote volume is a volume that is not directly connected to your computer. Typically a remote volume is a file server. If your Mac is not connected to a computer network (e.g. at your company), you probably don't have access to any remote volumes.

# 13 Supported File Types

Data Rescue can support any file type, if it is able to be found in an HFS catalog. Such files will appear under the "Found Files" folder in the recovery list. For files which have been deleted (and therefore have no HFS catalog entry), Data Rescue supports finding files of a great many types by their content when doing a Deleted or Deep Scan. Such files will appear under the "Reconstructed Files" folder in the recovery list. Below is a list of the file types supported for Reconstructed Files. In addition to these, other file types not on this list may often be recoverable with the new FileIQ feature, using user-supplied sample files to teach Data Rescue about that type.

**Images:**

- JPEG
- TIFF
- PNG
- GIF
- Adobe Illustrator AI
- EPS
- RAW Camera Formats CRW, CR2, NEF, DCR, ORF, DNG, MOS, SRF, RAF, X3F, MRW
- PSD
- BMP
- PCS
- JPEG 2000
- CaptureOne TIFF
- Print Shop
- MacDraft, MacDraw, MacPaint
- PICT
- InDesign
- PCX
- ICNS
- ICO

**Movies:**

- QuickTime
- MPEG-1/MPEG-2/MPEG-4
- AVI
- WMV
- Flash SFW
- Final Cut Projects
- Raw DV
- Cinema 4D
- After Effects
- MXF
- M2TS/MTS
- iMovie Project

**Audio:**

- WAV
- MP3
- AIFF
- AAC/M4A/M4P/M4B
- Ogg
- Logic LSO

- Finale Project
- Maya Session
- ProTools Session
- Reason Session/Refill/Published/Recycle
- Digital Speech Standard

**Mail:**

- Eudora
- AppleMail
- Outlook Express
- Entourage database files
- Raw EML/EMLX files

**Documents:**

- PDF
- Word
- PowerPoint
- Excel
- Quark
- iWork '05 - '09
- OpenOffice
- Quicken
- QuickBooks
- AppleWorks/ClarisWorks
- FreeHand
- AutoCAD
- EndNote
- FinalDraft
- InDesign
- VectorWorks
- ArchiCAD PLN and LBK
- PageMaker
- FileMaker
- Word Perfect
- Celtx Project

**Text:**

- Generic ASCII Text TXT
- RTF
- XML
- HTML
- Postscript (non-binary)

**Archives:**

- Retrospect
- Gzip
- ZIP
- RAR
- BZip
- Stuffit
- DMG and Sparse Images

- Java archives

**Miscellaneous:**

- Resource forks
- Property lists (binary and XML). Includes the following subtypes, recovered in various folders and with various extensions: Comic Life, Master Row, Soft Fill, IBCocoaFramework, ChatRoom, QCPatch, AudioTrack, CSElement, Web archive, PmProj, Meta Model Key, User Model Key, Axis Limit, Safari bookmarks, and MyThought files.
- Keychain files
- OLE files (an older Microsoft Office format, includes generic OLE, Word, PowerPoint, Excel,)
- Panorama
- SQLite
- PEF (a binary executable format)
- QuickCeph (disabled by default)
- Red One (R3D) files
- Pro Tools Session Files
- iTunes Music Library
- Doom 3 save files
- Adobe GoLive
- FormZ v4
- Cinema 4D
- FinalDraft
- HyperCard
- Finale
- Carrera Pro 4
- 4D Database
- iCal
- Maya
- Quicken
- Now Up To Date
- Now Contact 3
- ProTools
- AOL Filing Cabinet
- Reunion-8
- Phase One TIFF
- Lotus Notes Archive
- Perl
- PHP
- TimeCard
- Logic Pro
- PowerSchool Database
- Print Shop
- Stickies
- Address Book
- Virtual PC7
- EndNote
- MacTracv6
- Reason
- AIM Chat
- MacInTax
- TurboTax

- Mozilla Bookmarks/Address Book
- StatView
- Easy Grade Pro3.6
- Cubase

# 14 Release Notes

**Version 4.3.1**

- Increase maximum file size
- Bug fixes

**Version 4.3**

- Added support for macOS 10.12
- Added built-in chat for quick and easy live support
- Improved reliability of searching by date
- macOS 10.8 is now the minimum required version

**Version 4.2.3**

- Add VoiceOver support

**Version 4.2.2**

- Improved reliability of Create BootWell Drive
- Improved compatibility with 10.11

**Version 4.2.1**

- Add compatibility with 10.11
- Fix bug where available bytes can be reduced if the recovery immediately fails
- Fix some recovery errors from preventing a final completion dialog from showing
- Use a built-in web browser for opening URLs when in BootWell

**Version 4.2**

- Improved performance of SQLite module
- Add serials to drives in "Add RAID Set" when available
- Fix Clone not filtering out system drives

**Version 4.1**

- By default Data Rescue now only works with one scan at a time
- A BootWell button has been added to the Welcome screen
- The Welcome screen buttons have been simplified and renamed
- For safe recovering of the main drive, you must now use a BootWell drive
- Note: expert mode can be enabled to revert most new functionality

**Version 4.0.1**

- Fixed BootWell bugs with 10.7

**Version 4.0**

- Added BootWell feature
- Easier-to-use interface
- Improved Quick Scan algorithm
- Improved scan performance
- Retina compatible

# 15 Credits

Portions of the program use the following copyrighted material.

- URLTextView by Aaron Sittig

- RSVerticallyCenteredTextFieldCell by Daniel Jalkut

- Sparkle by Andy Matuschak

- Warning by Melissa Holterman from The Noun Project

- Eye by Mister Pixel from The Noun Project