D-VECS TimeRecordingBackUp

USER MANUAL

Preliminary Version

This version is not yet completely finished and is still constantly being updated.

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Table of Contents

D-VECS Software

D-VECS Software is the section of D-VECS that develops software products, focused mainly on Windows desktop applications. At the moment of this writing, D-VECS is not yet registered in the Microsoft Azure Active Directory as a trusted developer.

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Disclaimer

Licensing system

D-VECS Software is using a licensing system based on the concept of SAAS (Software As A Service).

The software applications of D-VECS Software regularly check on the internet if the running software is still licensed and if upgrades are available or required. Software for which a licensing fee is paid, are guaranteed not to lock out the user during the paid term of the licensing period.

Once the paid term of the licensing agreement expires or anytime in case of (temporarily) free software, D-VECS Software reserves the right to disable the software or to require that the user upgrades to the newest version of the software.

Trying to use the software without an active internet connection outside of the paid term of the license might disable the software as the license cannot be verified.

Running the software without an active internet connection might result in some limitations to the functionality of the software.

0. Purpose of D-VECS TimeRecordingBackUp

The purpose of the D-VECS TimeRecordingBackUp software is to provide you with a personal back-up system for the files on your PC that has a good combination of ease-of-use and of flexibility. We wanted to create a system that satisfied following requirements:

- allows for very-frequent back-up of the documents you are currently working on (every 2 minutes, every 5 minutes …) without bothering the user and without significantly slowing down the PC.
- allows for back-up to a removable or on-line device while locally keeping track of back-ups when the external device is not available.
- allows the back-up data to be copied to a different external device without losing consistency and usefulness. This is important as storage technology and back-up sizes advance. For instance, at a given point in the future you might want to migrate your back-ups from a 2TB disk to a 10TB disk.
- allows for a way to easily restore a current view of all files in the back-up. This would be helpful when changing to a new PC. As your important files are in the back-up on an external device, it becomes easy to restore them to your new PC by just copying the current view of the back-up data.
- allows for an adaptive method of keeping back-ups: older back-ups need to be retained at a lower frequency than newer back-ups. You might want back-ups every 5 minutes of documents you are working on, but you probably do not need daily versions of the back-up of documents that you worked on a year ago.
- allows to retrieve the backed-up version of any file or directory for a given time in the past (limited only by the retention rules of the adaptive back-up method)
- allows the back-up size to be managed by the user. To start with, the adaptive method for keeping the back-ups should limit the growth of the total back-up size. On top of that the user should be able to selectively remove items from the back-up.
- allows for detailed user choice regarding the files and directories that need or need not to be backed-up.
- allows for managing the back-up. If files or directories are renamed or deleted on the PC, the user should be able to reflect these renamings/deletions in the back-up.
- allows for flexible information on the status and actions of the back-up system. The software allows for options that give the user peace-of-mind regarding the proper working of the back-up in general and for specific cases.
- keeps all the back-up in a readable format and ensures that those back-up files are also retrievable without the use of this software.

How does the above differ from other available products?

- Most other products do not allow a fine-grained management of the back-up. For instance, it is usually not possible to delete a specific file or a specific instance of a file from the back-up. It is usually only possible to “delete all back-ups older than …” or to stop backing-up specific files without the possibility to delete those files (and those only) from the past back-ups.
- Most other products do not have an adaptive method of keeping back-ups. If back-ups are made daily the total back-up size grows very quickly because all the daily back-ups of the past are kept.
- Most other products have too much overhead to run a 2-minute or a 5-minute cycle that catches documents that are being worked upon.
- Only more advanced back-up systems easily allow to retrieve the status of a file at a given point in time in the past.

- Most other products use a complicated compression system to reduce the total size of the back-ups. Although that might have benefits, it makes that the back-ups become completely worthless if the software that created the back-ups is not available anymore.

Extra feature: very powerful file-search on both the PC and the back-up

- As a side effect of the information that is constantly maintained by D-VECS TimeRecordingBackUp, a very powerful file-search feature could be made available.
- Based on a partial name of a file/directory and even making use of “regular expressions” (see the relevant chapter), an extremely fast search (seconds) became possible.
- This feature *by far* surpasses anything that is a standard part of the “search” in Windows.
- The search will result both in files that are currently on the PC as well as files that have been deleted on the PC but are still available in the real back-up.
- This feature is available both when the real back-up is off-line and on-line, but recovery of deleted files is only possible when the real back-up is on-line.

1. Principles behind the operation and use of software

D-VECS TimeRecordingBackUp makes use of 2 back-up locations. The main back-up or “real back-up” is typically located on a removable or on-line device. A secondary location, “local back-up” or “partial back-up” is located on the PC’s internal disk (typically the “C-drive”) and is intended for quick response and for operations while the “real back-up” is off-line.

The control data for the back-up is stored on the local PC but is also backed up to the “real back-up”.

The status of the back-up system is reflected in the “FullRecords” file. This file contains a record of all known files in the back-up system: whether they still are on the PC or not, when deleted files were last seen on the PC, when they were last written, which historical data is available. This file is maintained on the local back-up (<local back-up directory>/BACK-UP STATUS/Full Back-Up/FullRecords.txt) but it is also copied to the real back-up.

1.1. Automatic partial back-up

D-VECS TimeRecordingBackUp is usually configured to automatically make back-ups of the files that it thinks are active. The user can set the frequency of these back-ups, ranging from 30 times per hour to 1 time per hour. (every 2 minutes till once per hour). This back up only takes seconds.

It is important to note that the automatic back-ups rely on recognizing which files have been changed. In general, the Windows operating system provides this information, but some applications like Microsoft Word trigger this system in a rather complicated way. (D-VECS TimeRecordingBackUp is making use of a workaround to catch the Word files that have been changed, but future changes by Microsoft might make the used method obsolete.) Therefore, it is absolutely necessary to regularly run a “full back-up”.

In order to assist the user in verifying to what extend the automatic back-up is keeping track of his current work, the user interface offers the possibility to show a real-time status (refreshed every 2 minutes) of the back-ups that are available for 1 specific file. Please refer to the relevant section further in this manual for more details.

During the automatic back-up the user has the possibility to request the system to spend a given number of seconds on reviewing the status of the back-up and to make updates when necessary. This is called the automatic retention check during partial back-up.

It is not needed to make any setting to use the automatic back-up. Unless it is disabled (see later in this manual), it will run as long as D-VECS TimeRecordingBackUp is active.

1.2. Full local back-up

If the “real back-up” cannot be brought on-line for an extended period (for instance more than 1 week), it is suggested to run a “full local back-up”. This function runs a back-up similar to the automatic back-up, but instead of relying on the operating system to identify which files to check, it checks all files on the PC that match the general criteria for the back-up. This operation will take from 1 minute to many hours, depending on the number of files on the PC and how many of them have been changed.

On a medium-spec PC with about 250,000 files, this will run at around (1) 25,000 files per minute for building the list of files, (2) plus 2-3 minutes for general back-up overhead, (3) plus 2-3 seconds housekeeping overhead per changed file, (4) plus the actual copying time of changed files.

This full local back-up needs to be started manually from the main program window.

1.3. Full real back-up

Similar to the full local back-up, the full real back-up scans all the files on the PC that meet the back-up conditions. Different from the local back-up, it records the back-up to the external “real back-up”.

Before executing the “real back-up”, the program will also merge the local back-ups that were made while the real back-up device was off-line, thus ensuring that all versions of the files that were created are incorporated into the real back-up.

The speed of the real back-up is lower than that of the full local back-up, because (a) the local back-up needs to be merged into the real back-up (this will take from a few seconds to a few minutes) and (b) the actual copying takes place to an eternal device. On a medium-spec PC with about 250,000 files, this will run at around (1) 25,000 files per minute for building the list of files, (2) plus 2-3 minutes for general back-up overhead, (3) plus 2-3 seconds housekeeping overhead per changed, (4) plus the actual copying time of changed files.

The user interface has a setting to remind the user to make full real back-ups (see later in this manual).

The full real back-up needs to be started manually from the main program window and is always preceded by a merging of the local and real back-up.

1.4. Retention of back-ups

In order to limit the size of the total back-up, the system will not keep all back-ups that were ever made but it will apply a “retention policy”. Such a retention policy will for instance tell the system to keep the last back-up that was made in each of the last 9 months as well as the last 3 back-ups of today and yesterday.

If the retention policy asks for only keeping the back-ups of “today”, these back-ups will be erased once the system reviews these files for the first time after today.

D-VECS TimeRecordingBackUp provides a set of pre-defined retention rules that will satisfy the most common needs. The software will also ensure that at least 1 file or directory is backed up. If none is specified, Windows MyDocuments will be added automatically.

Please refer to the relevant section later in this manual for understanding the way these retention policies are specified and how they are linked to chosen file locations.

1.5. Deleting or renaming files on the PC

If files on the PC are deleted or renamed using the standard facilities of the operating system, D-VECS TimeRecordingBackUp will not be notified of this action and the back-up will not be adapted. For instance, if a typo was found in a filename and changed by using the facilities of the operating system, this software will consider the back-ups of the previous filename and the back-ups of the new filename to be back-ups of different files. In order to remedy this, the main user interface has a button to execute deletions and renamings of files and directories in such a way that D-VECS TimeRecordingBackUp recognizes this and makes the same deletions and renamings in the back-up.

Some of these actions are only possible when the real back-up is on-line. Some actions will be partially executed on the local back-up and will leave a notice to the system. These notices will be picked up and will be dealt with when running the next full real back-up.

More detailed information follows in the chapter about the normal operation of the software.

1.6. Semaphores

The software makes use of semaphores (= software equivalent of traffic lights) to make sure that no 2 parts of D-VECS TimeRecordingBackUp are accessing the back-up database at the same time.

Under very special conditions (such as after restarting the PC without properly shutting down D-VECS TimeRecordingBackUp first), it might happen that the system is left in a special state in which case the software might ask the user permission to force-unlock the semaphore. (This is equivalent to a situation where all the traffic lights on an intersection would be red and where one is given permission to ignore the stoplight just 1 time.)

In case D-VECS TimeRecordingBackUp is restarted after an irregular way of closing it, the software will ask the user to verify that no other versions of D-VECS TimeRecordingBackUp are running. If confirmed the semaphores will be automatically reset.

1.7. Time Zones

Internal timestamps on filenames and in records are basically in the UTC (=GMT) time zone.

For display purposes, the PC’s local time is often used.

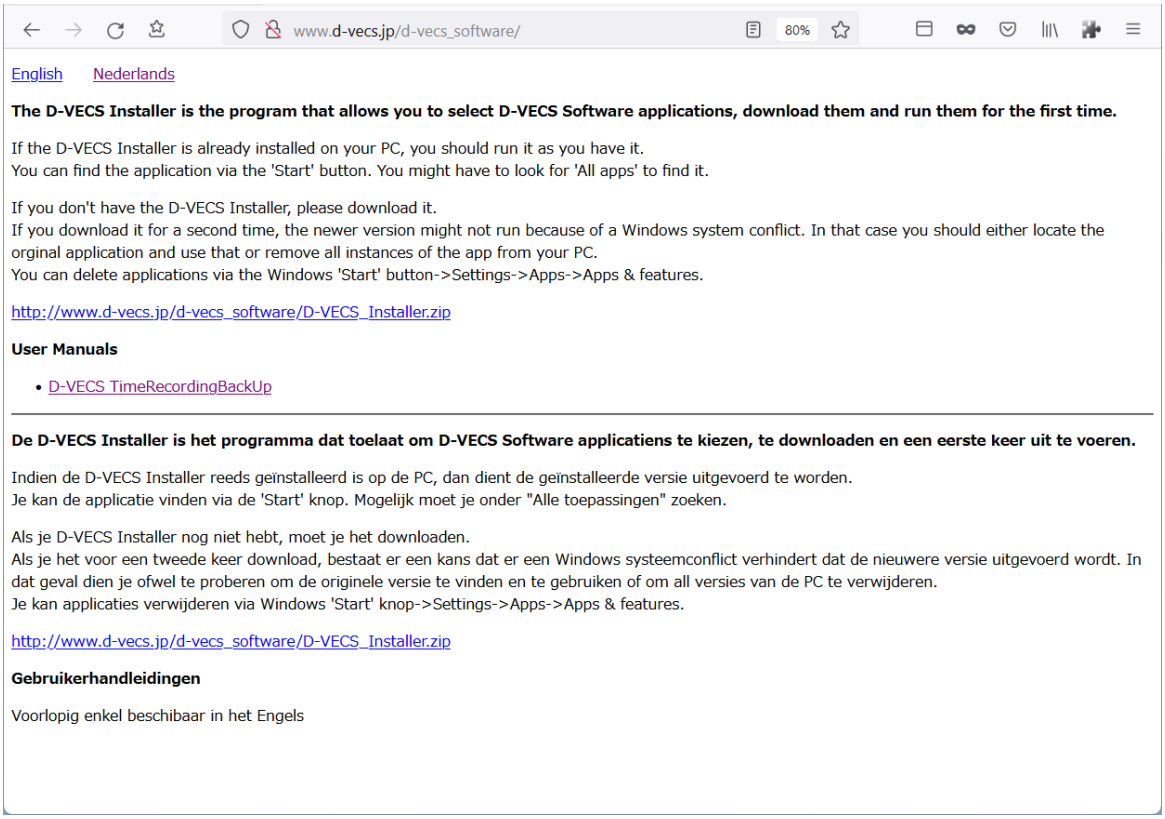
Please note that the PC’s local time might differ from the local time of the place where you are at a given moment. The PC’s local time is decided by the Date & Time section of the Windows Settings.

2. Installation and licensing of the software

2.1 Installing the software

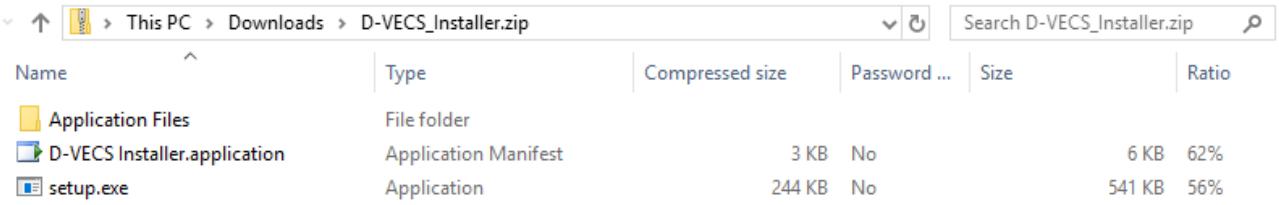
Via the D-VECS Software website, you can download an application that allows you to access software from the server and to install it.

URL: www.d-vecs.jp/d-vecs_software/



Double-click/download the Installer.

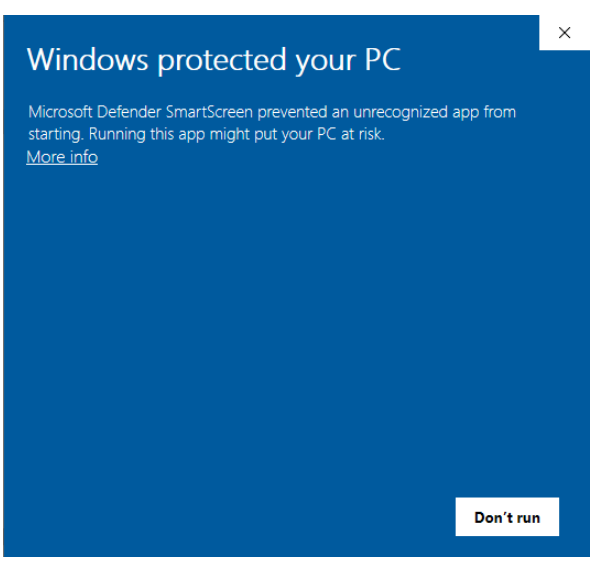
Unzipped it looks like

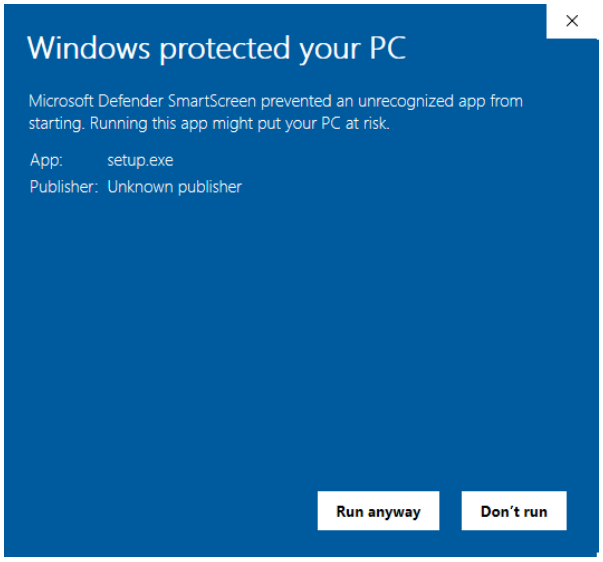


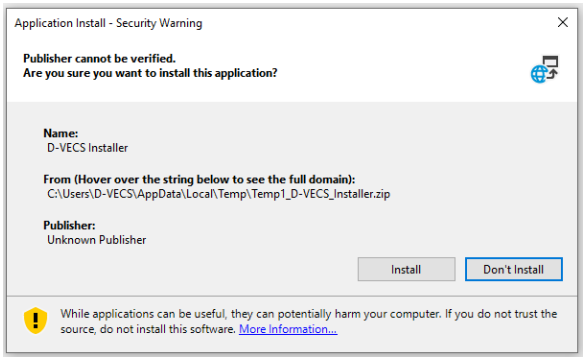
Depending on your browser and/or decompression software, the “setup.exe” might automatically start or not. If it doesn’t start automatically, please double-click it.

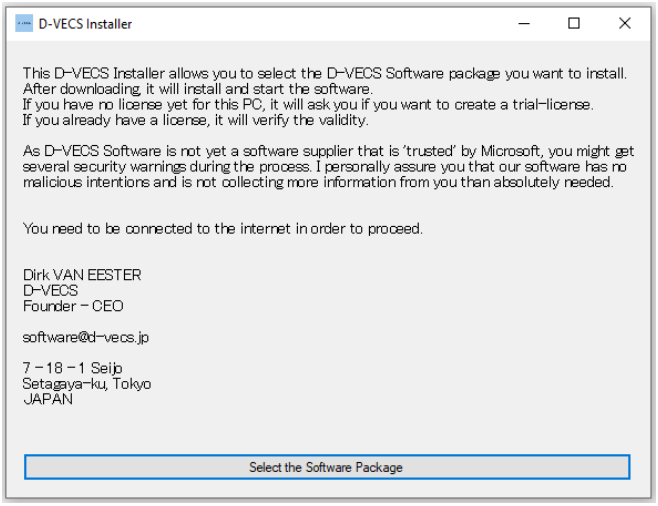
As D-VECS Software is (not yet) a ‘trusted’ Microsoft software developer, you will get several security warnings during the installation of D-VECS Software products. We can assure you that our applications are not consciously causing side-effects that are not wanted by our users. As we used Microsoft approved tools for developing and publishing the software, we are also rather confident that there are no unconscious unwanted side-effects.

Depending on your version of Windows, these warning might look slightly different. Below is an example. In most cases you have to click the “More Info” link (or something similar) to get to the next screen.



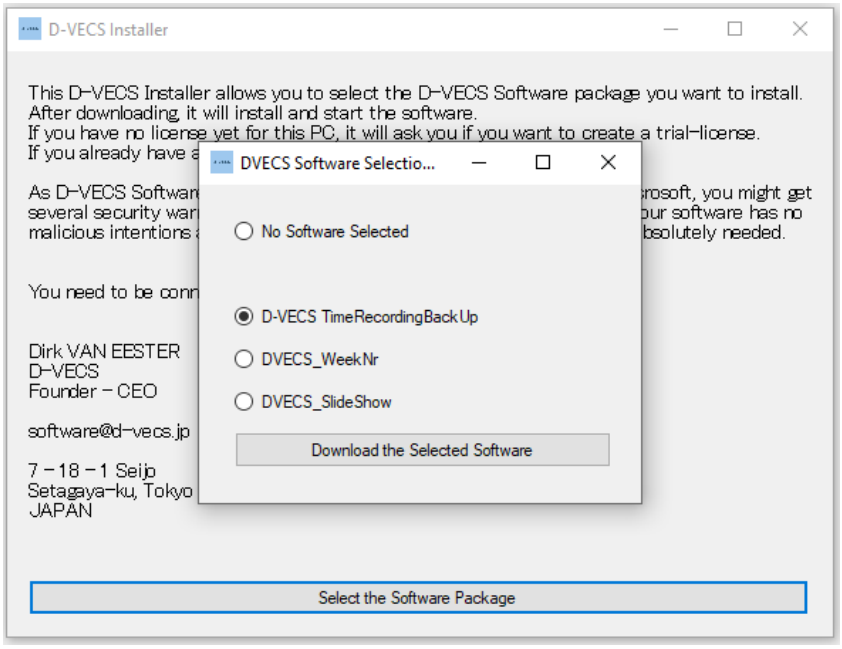






By running the D-VECS Installer, you can choose from the available software on the server.

Choose D-VECS TimeRecordingBackUp.



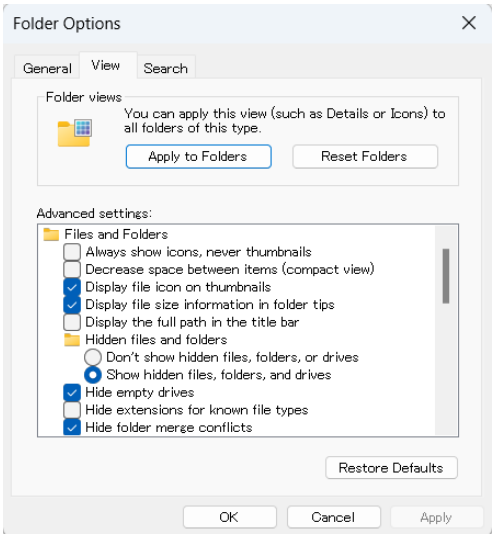
2.2 Doing a clean re-installation of the software

If you want to remove the software with the intention to do a clean re-installation while preserving your data:

- stop D-VECS TimeRecordingBackUp if it is still running
- in C://<Users>/<this user>/<App data>/<Roaming>/Microsoft/Windows/Start Menu/
    - remove the shortcut to D-VECS TimeRecordingBackUp
- in C://<Users>/<this user>/<App data>/<Roaming>/Microsoft/Windows/Start Menu/Program/
    - remove the directories
        - D-VECS.TimeRecordingBackUp (if it exists)
        - D-VECS_TimeRecordingBackUp (if it exists)

Use the 'D-VECS installer' (available on http://www.d-vecs.jp/d-vecs_software/) to re-download and re-install the latest version of D-VECS TimeRecordingBackUp

If the <App data> folder seems to be missing on your PC, you need to ensure that hidden OS files are shown. You can do that by going to the "View" tab in the options menu of the File Explorer. There you need to select "Show hidden files, folders and drives".



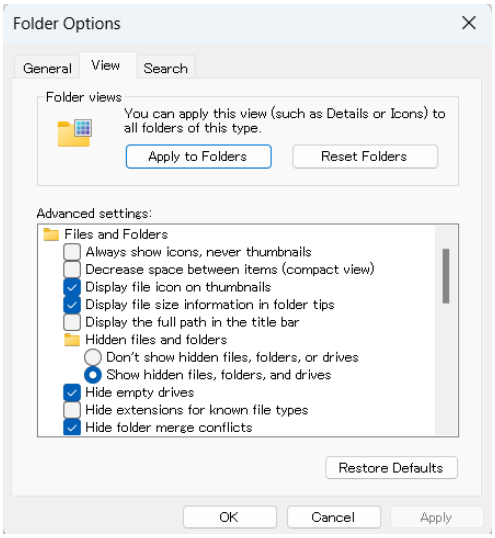
2.3 Removing the software

In order to completely remove the software following actions are needed. In each case, remove all variants of the TimeRecordingBackUp name (such as D-VECS TimeRecordingBackUp, DVECS.TimeRecordingBackUp etc.) Future changes in the way Microsoft organizes the "Start Menu" might impact the locations shown below.

- stop D-VECS TimeRecordingBackUp if it is still running.
- use the Microsoft Windows standard tools to uninstall the software.
- in C:\\<Users>/<this user>/<App data>/<Roaming>/D-VECS/Cookies
    - remove DVECS.TimeRecordingBackUp
- in C:\\<Users>/<this user>/<App data>/<Roaming>/D-VECS/
    - remove DVECS.TimeRecordingBackUp
- in C:\\<Users>/<this user>/<App data>/<Roaming>/D-VECS/Licenses
    - remove DVECS.TimeRecordingBackUp_D-VECS_**********.dvecslic
- in C:\\<Users>/<this user>/<App data>/<Roaming>/Microsoft/Windows/Start Menu/
    - remove the shortcut to D-VECS TimeRecordingBackUp

- in C:\\<Users>/<this user>/<App data>/<Roaming>/Microsoft/Windows/Start Menu/Programs/
  - remove the directories
    - D-VECS.TimeRecordingBackUp
- in C:\\<Users>/<this user>/<App data>/<Roaming>/Microsoft/Windows/Start Menu/Programs/Startup
    - remove the shortcut to DVECS.TimeRecordingBackUp
- delete the local back-up directory.

If the <App data> folder seems to be missing on your PC, you need to ensure that hidden OS files are shown. You can do that by going to the “View” tab in the options menu of the File Explorer. There you need to select to “Show hidden files, folders and drives”.



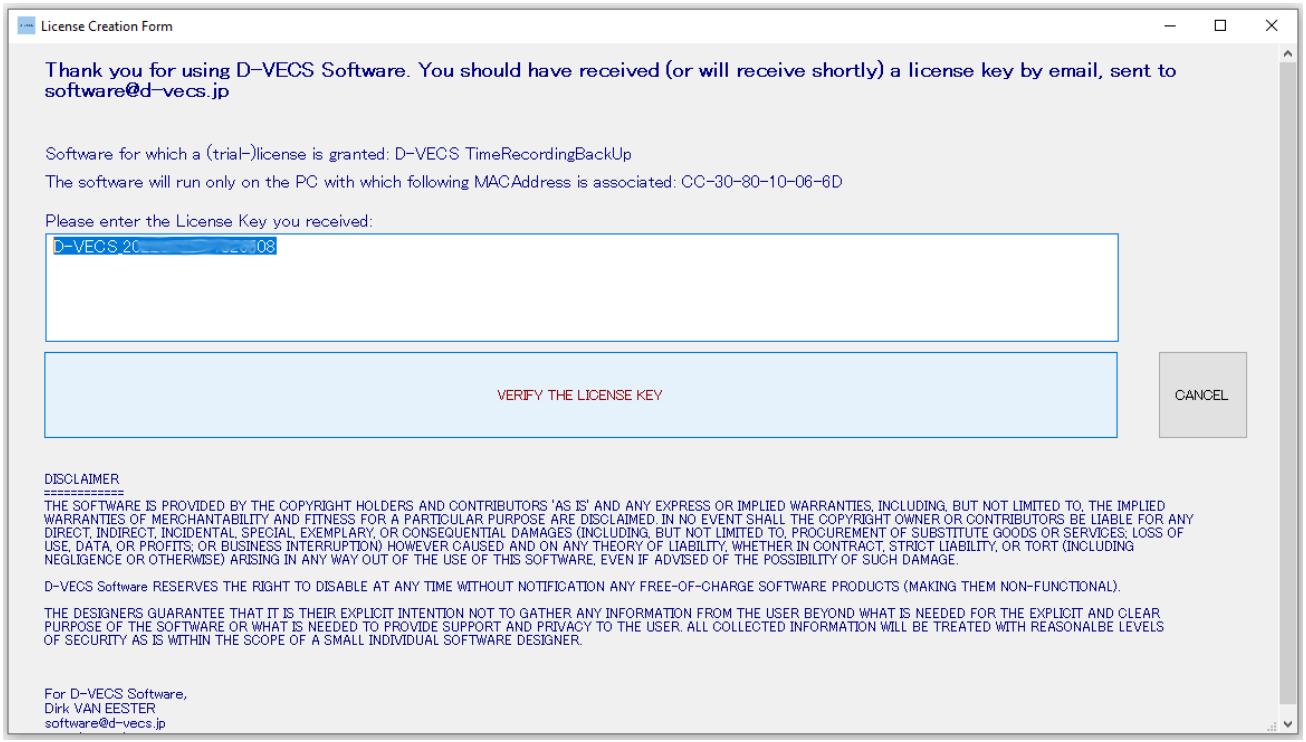
3. First use of the software

During the very first run of the application, possibly triggered automatically by installing it, the D-VECS TimeRecordingBackUp will create most of the directories it uses. In order to support you better in case of installation problems, the very first run of the application will run with a high level of internal error-checking and reporting. For that purpose, you might see a file “XDVECS_firstUse.txt” appearing and disappearing on the desktop. You also might see a shortcut to a more extensive tracing file “_$#$_D-VECS Software - Debug Trace_$#$_.txt”.

If the application started smoothly, these files will be automatically discarded. If there are problems, you should keep these files handy for your troubleshooting communication with D-VECS Software.

The first action “D-VECS TimeRecordingBackUp” will take, is checking if you are licensed to use this software and, if not, offering you the possibility to create a trial-license.

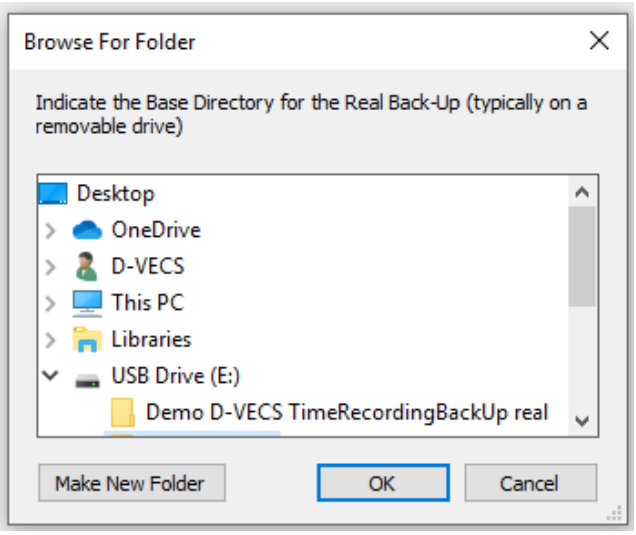
If you already have a license for this software, for the current PC, you can select to enter that license information. If not, you should request a trial-license. This trial license will be created immediately, you will get an email on the mentioned email address with the license code and the window will switch to the license code entry form.

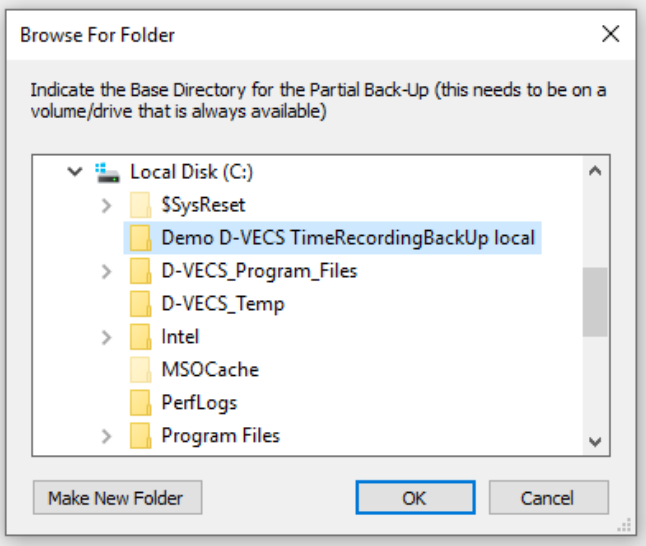


After verifying the code, “D-VECS TimeRecordingBackUp” will start.

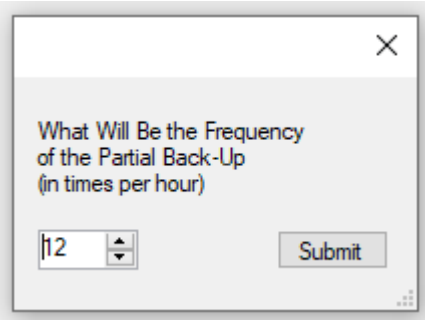
One of the first things you will have to decide is where you want to place your “real back-up”. The directory you designate for this will likely grow to 2-3 times the size of the files you designate for back-up. You will also need to indicate a directory for the “local partial backup”. This is the directory that

will keep track of the files you change while your real back-up is off-line. If you regularly run a full back-up, this local directory will not get very large.





"D-VECS TimeRecordingBackUp" frequently and automatically checks the files you have been recently working on and makes back-up copies of them. The frequency of this operation can be set between 30 time per hour (every 2 minutes) and once per hour. 12 times per hour (every 5 minutes) is an appropriate choice.

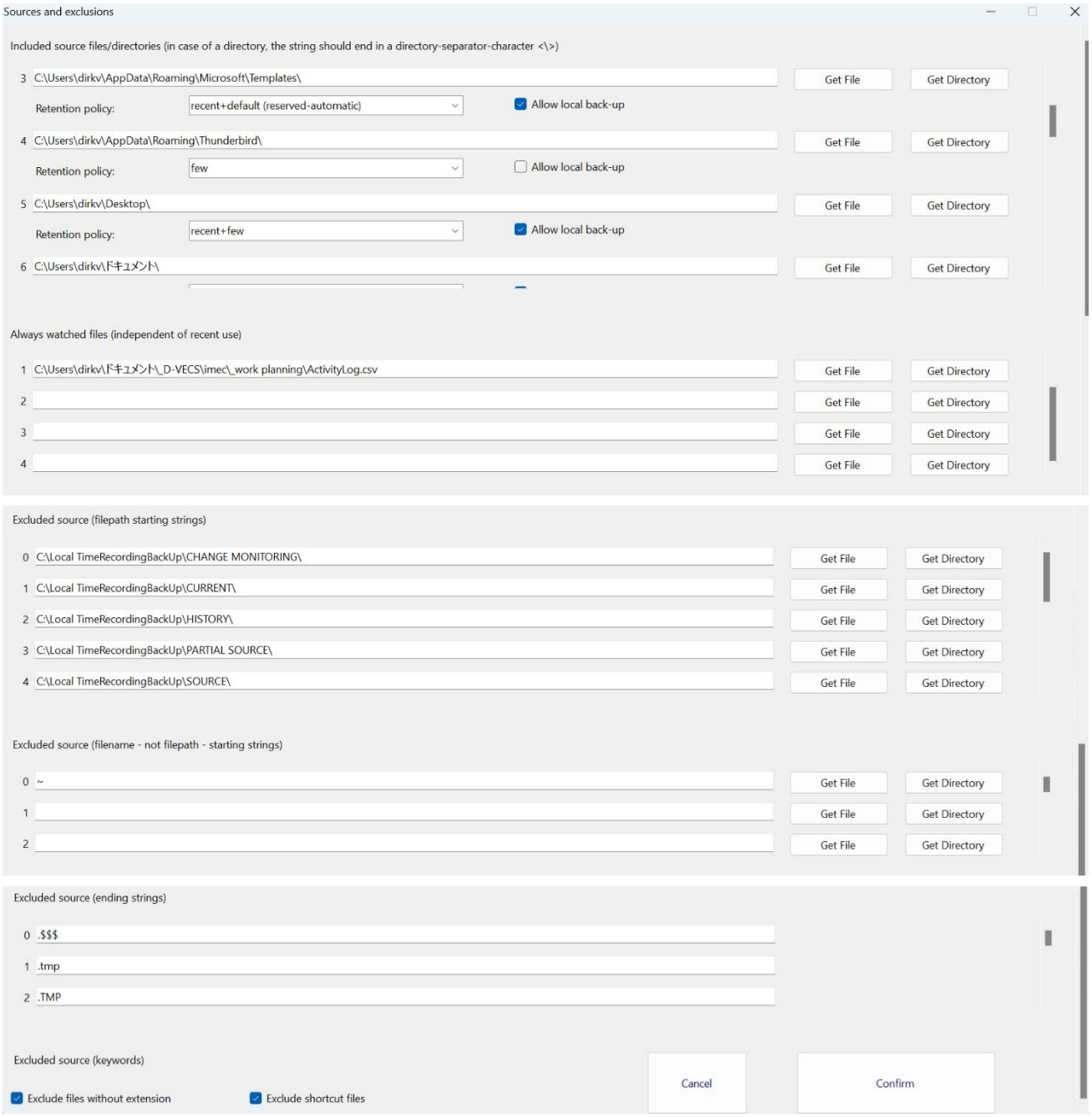


The first run of the application is also the moment when you will need to indicate which files you want to have backed-up. (see the screenshot below and see also the relevant section in this manual.) The software is making a proposal for these settings, marking the "Desktop" and the full "MyDocuments" (but nothing else) for back-up.

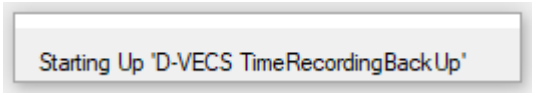
At the first run, you can leave this set-up window only via the "Submit" button, forcing you to be aware of what you are doing.

- If MyDocuments contains less than ten thousand files, you can safely leave that choice till later.
- If Your MyDocuments contains hundreds of thousands of files, we suggest you change this selection at this time. In that case we suggest you add directories in smaller groups (f.i. about 10,000 files at a time) and run a full back-up after each time. This ensures that your back-up database does not have a backlog that could take hours or days to clear. If you get in a situation where a given full back-up is taking much too long for your needs, you can always safely cancel it. The work that has been done will not be lost.

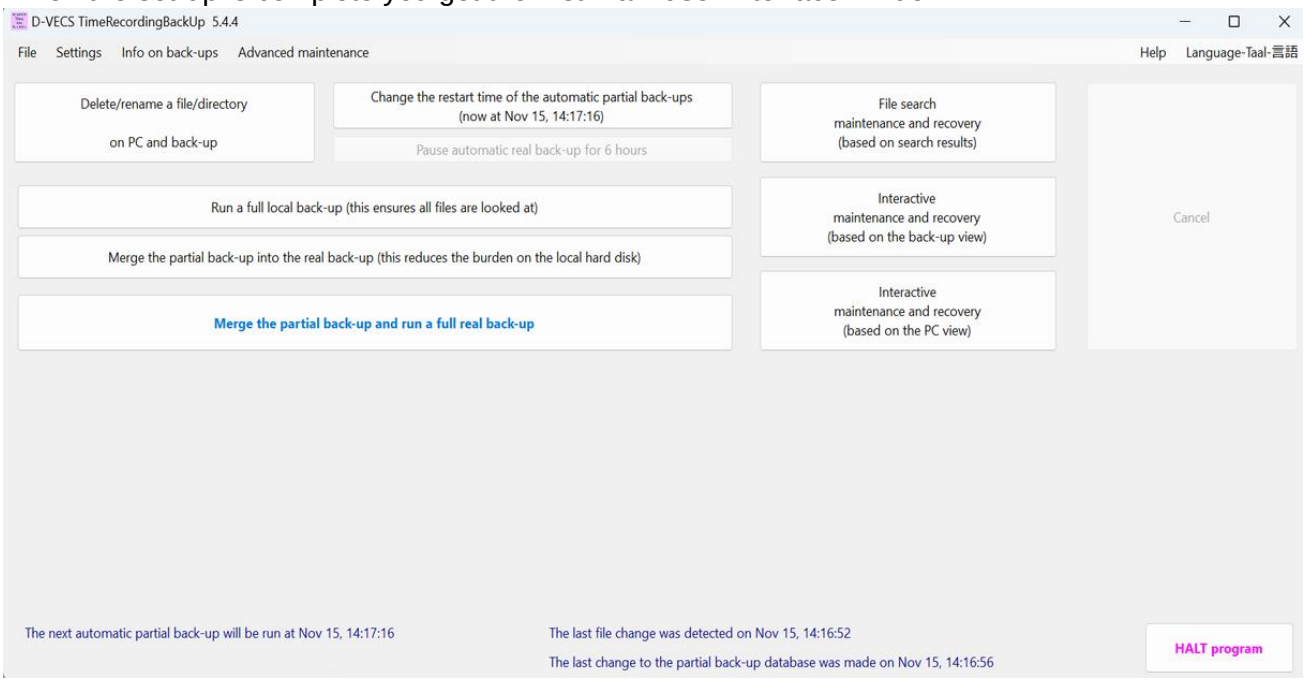
Depending on your screen size, you might need to scroll down the form to see the "Submit" or "Confirm" button.



While the software continues starting up you will see a banner:

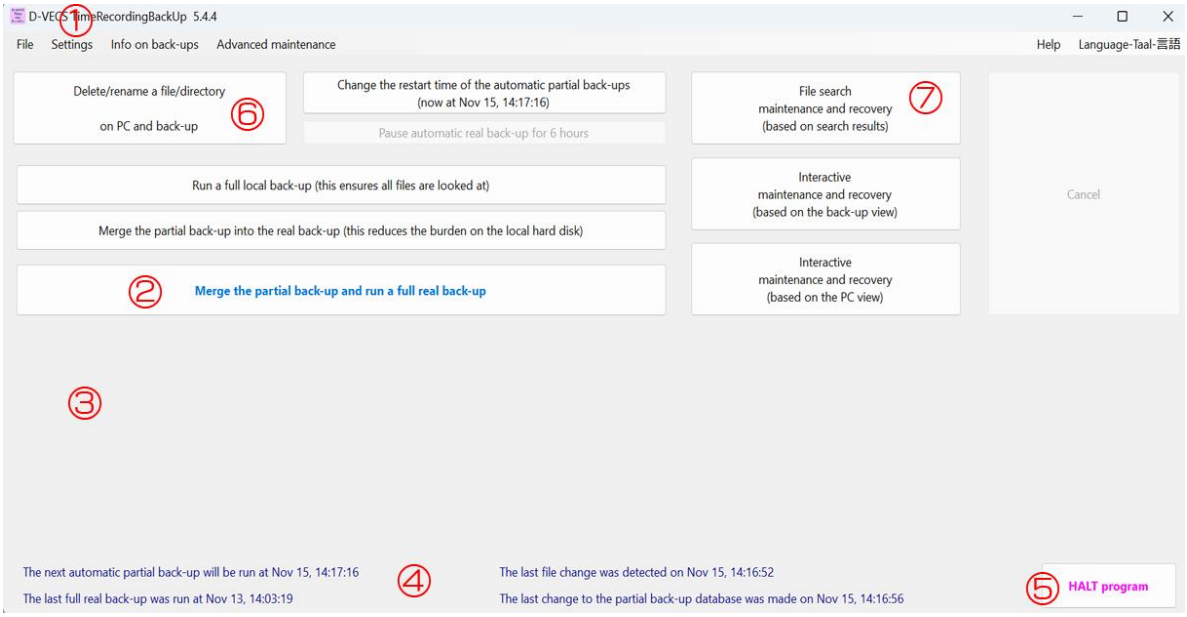


When the set-up is complete you get the first main user interface window.



As no Real Back-Up has been run yet, there is no indication at the bottom left regarding the last Full Back-Up.

4. Main user interface window



The illustration above shows the main user interface window of the application. It allows the most important controls (1,2 and 5) and shows the most commonly needed information (3 and 4).

4.1 Settings menu

The settings menu allows for the configuration of the application.

It is explained in more detail in Chapter 4 “Settings menu”

4.2 “Merge the Partial Back-Up and Run a Full Real Back-Up” button

The “Merge the Partial Back-Up and Run a Full Real Back-Up” button triggers one of the most important features of this application: backing up files to the real back-up.

4.3 Feedback area

This area of the user interface is used for feedback from the application to the user.

See Chapter 7 “Feedback during back-up operations” for its most common use.

4.4 Back-up timing information

This area of the interface gives time information about past and future back-ups.

If you suspect that the application is misbehaving and is not running properly, you should be able to verify that via the timestamps in this section.

4.5 HALT button

The HALT button is an important part of the user interface.

As this application is continuously running and as it is designed not to be “closed by mistake”, this is the place to orderly stop the application. If you do not use this function and if (for instance a restart of the PC) forces the application to quit unexpectedly, the application might stop in a status that compromises the quality of its information.

In the case you want to manually do a “hard stop” (taking the risk of ending up in a state that loses important information), you can use the “Emergency ABORT” selection in the “Advanced Maintenance” menu.

The application cannot be closed from the X-mark in the top right corner of the window.

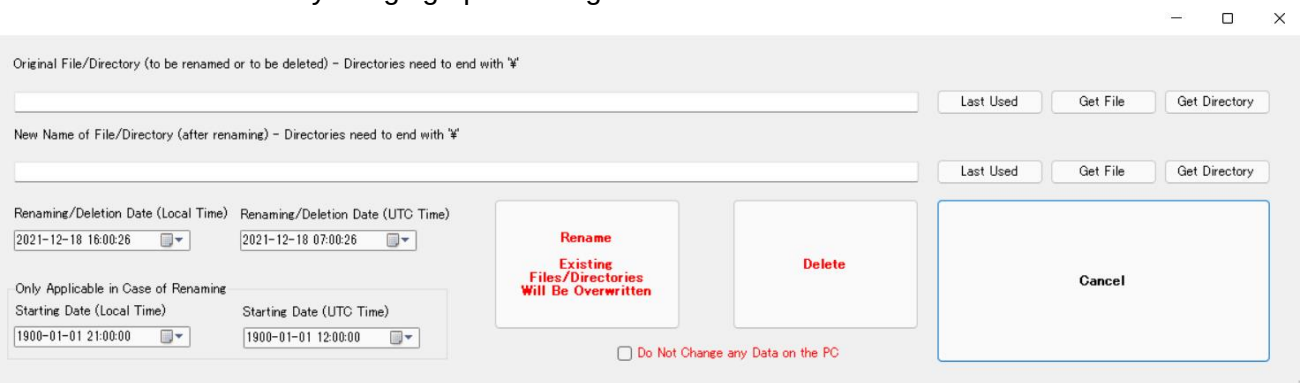
4.6 Delete/Rename button

Changing names of files or directories can create difficulties with any back-up system.

If you simply change the name of a file or directory by using the Windows standard controls, the back-up system will not be aware of this and will treat the original file/directory and the renamed file/directory as different items. In many cases this is no problem, but if the file/directory was large, it might cause a back-up that is too large. Having different names for what is basically the same thing might also make it more difficult if you later need to revert to an older state of the file/directory.

In order to allow the user more control over these situations, the application allows to delete and/or rename files and directories in a way that this application is aware of it. In that case action can be undertaken to delete or rename the existing items in the back-up accordingly. (Please note that if you delete information with this method, all related information is deleted from the back-up history as well.)

Button 6 achieves this by bringing up following window:



The file or directory to be deleted or renamed can be entered. This can be either done by typing in the complete path or by picking a file or a directory with the buttons on the right, possibly followed by

editing the addresses that get pasted in the textbox. The application judges if an address is a file or a directory by the absence or presence of a directory separation character in the end of the address.

The time of the deletion/renaming can be given in as a local time or as a UTC (GMT) time. If a time is given in and files were saved with the given name after that time, these files will not be deleted or renamed. In case of renaming, also a starting time can be given. Files that were saved before the starting time are not renamed.

A checkbox is offered to request the application to ensure no files on the PC are changed. In that case only files in the back-up are changed. The rename and delete buttons are showing in red if files on the PC can be affected and they are shown in blue otherwise.

A cancel-button lets the user out of this mode without making any changes to the PC or the back-up.

If you want to use this function to delete a large part of your data, you will need to do it in several steps. In order to “avoid accidents” D-VECS TimeRecordingBackUp will refuse to save a database that is significantly smaller than it was just earlier.

4.7 File Search

As part of the interactive maintenance, there is the possibility to search for a file.

This is a powerful and extremely fast way to find files, both on your PC and in your back-up. The only limitation is that it is limited to files that are monitored by “D-VECS TimeRecordingBackUp”, meaning that it only checks those files/directories mentioned in the “Source/Exclusions” window (accessible under the File menu.)

Please see the relevant section of this manual for a detailed explanation on its options.

Further functionality of the main window

Also from the main window, the user can initiate a full local back-up. This works similar to the automatic local back-up, but it explicitly checks all files that are within the limitations of the files that are set up to be backed-up. (The automatic back-up relies on a Windows operating system mechanism to recognize which files are likely to have been changed since the last local automatic back-up.)

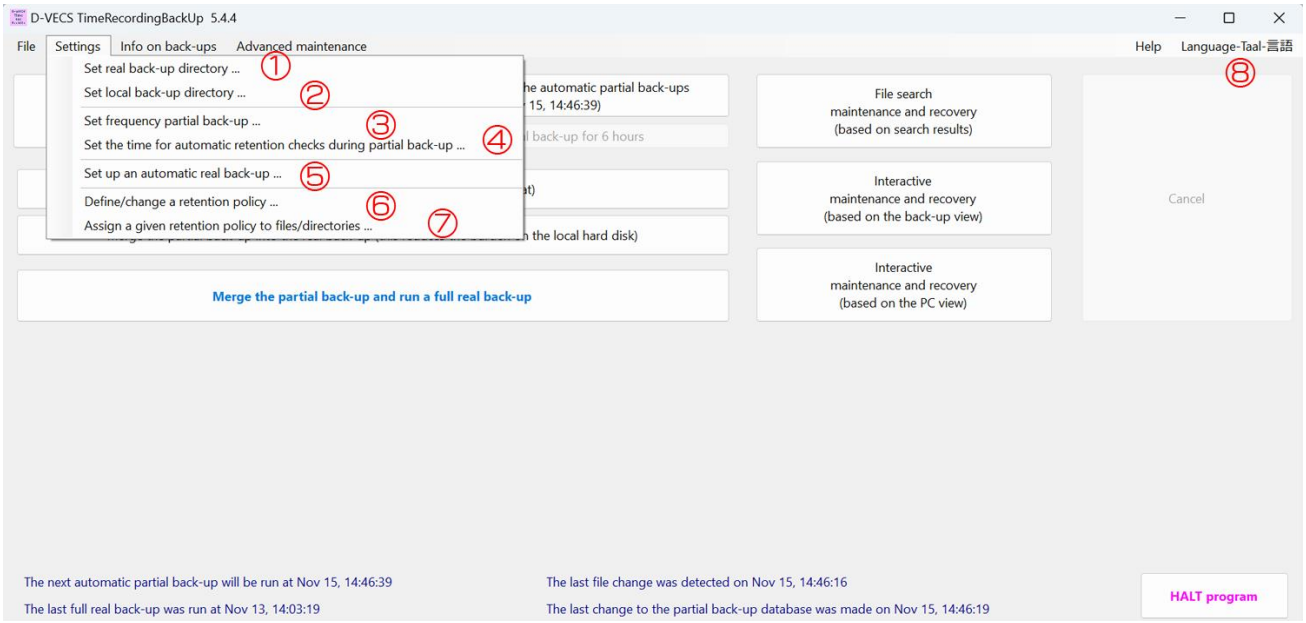
There might be an occasion where it would be useful to transfer data that has been generated by the automatic back-up to the real back-up, but where there is not enough time to run a full real back-up. Such a copying of back-up data is called merging the partial back-up into the real back-up. The main purpose for doing this would be to reduce the amount of back-up data that is stored on the local PC.

There are buttons to pause/restart the automatic back-ups, both local and real.

Interactive maintenance can be triggered with the 3 buttons on the top-right of the main window. This will be further explained in the chapter about maintenance.

Finally, the cancel-button will become available when a lengthy operation that can be stopped safely is going on. If a back-up is interrupted by the cancel-button, it will stop as soon as it reaches a convenient place for doing so. In that case only part of the files will be backed up, but that can always be remedied by running a new back-up later.

5. Settings menu



5.1 and 5.2 Set Real/Local Back-Up Directory

Items 1 and 2 are explained in Chapter 2 “First use of the software”.

5.3 Set the frequency of the partial back-up

This setting allows to define how many times per hour (between 1 and 30) the application will run an automatic partial back-up.

A good starting value is “12” (every 5 minutes).

5.4 Set the time allowed for automatic retention checking

After each automatic partial back-up, the application will systematically check the retention status of the back-up for some files. If the real back-up is online, it will delete old back-ups that are no longer needed. Running this action after each automatic partial back-up ensures that the retention status for files that have not been accessed recently get examined.

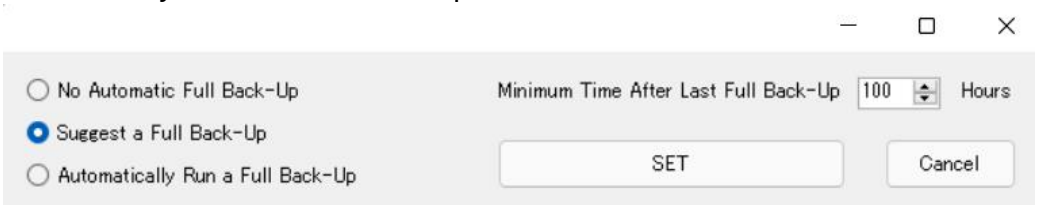
If your real back-up is offline, this action has two goals: (1) limiting the size of the local back-up by applying the retention policy to files that were not included in the automatic back-up and (2) updating the “last seen date” for deleted files where the deletion was not discovered during the automatic back-up. (Deletions might be missed in the automatic back-up because (1) D-VECS TimeRecordingBackUp was not running at the time of the deletion, (2) the automatic back-up was disabled or (3) the WIndows OS did not generate a change-event for triggering the back-up.)

Although this retention check happens in the background, it uses resources of the PC. Therefore, the user can set for how many seconds the action will run each time.

A good starting value is “20” seconds.

5.5 Set an automatic real back-up

If you back-up to a network drive (especially to a local LAN-disk), it might be a good idea to automatically schedule real back-ups. That is what this button allows.



In case the real back-up is on an offline device, the setting in above illustration is the most appropriate. This function will either trigger a message (“Suggest ..”) or will simply start a full back-up if the last full back-up was more than the given number of hours before.

5.6 Set up retention policies

This brings you to the screen for defining retention policies.

In many cases the policies that are included in the application are sufficient. More information on setting up retention policies is available in Chapter 6 “Setting up retention policies”

5.7 Set up files to be backed-up

If no files or directories are explicitly set up for back-up, the application will automatically include the standard Windows MyDocuments directory.

This standard setting is a good start, but in most cases, it is not sufficient as either too much information would be covered under standard rules (such as “Outlook Files”) or needed information might not be backed up because it is stored in a different location (such as the Thunderbird information in the “AppData” directory.)

More information is available in Chapter 6 “Setting up the files to be back-up”

5.8 Language

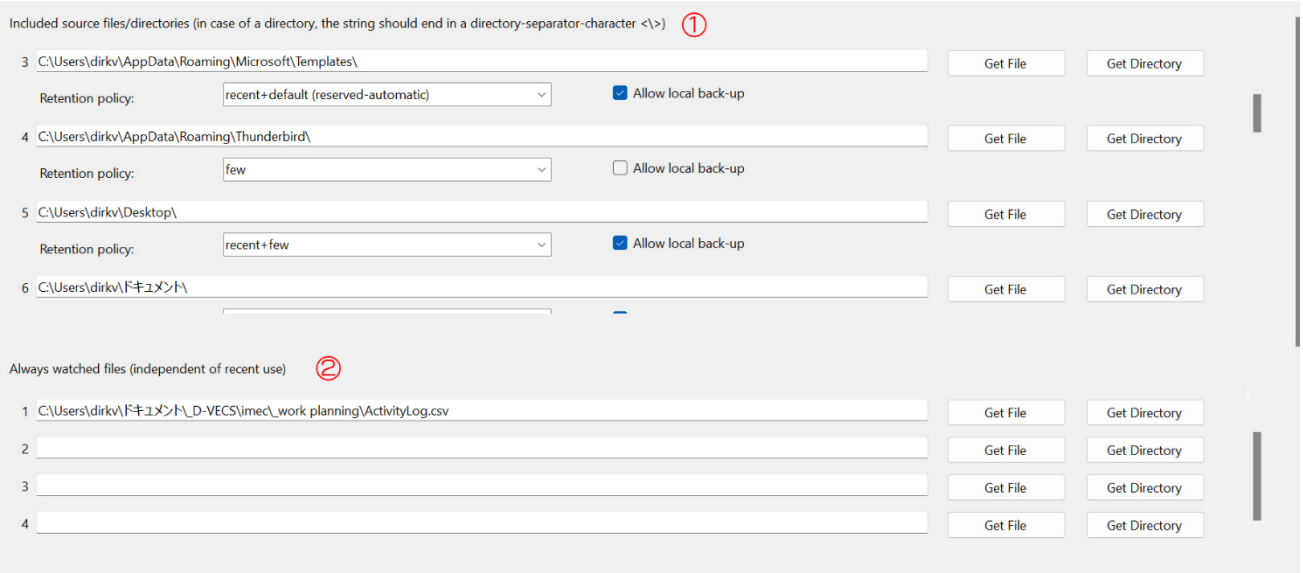
You can set the user interface language of this application. This choice will be applied to all D-VECS Software applications that run on this PC.

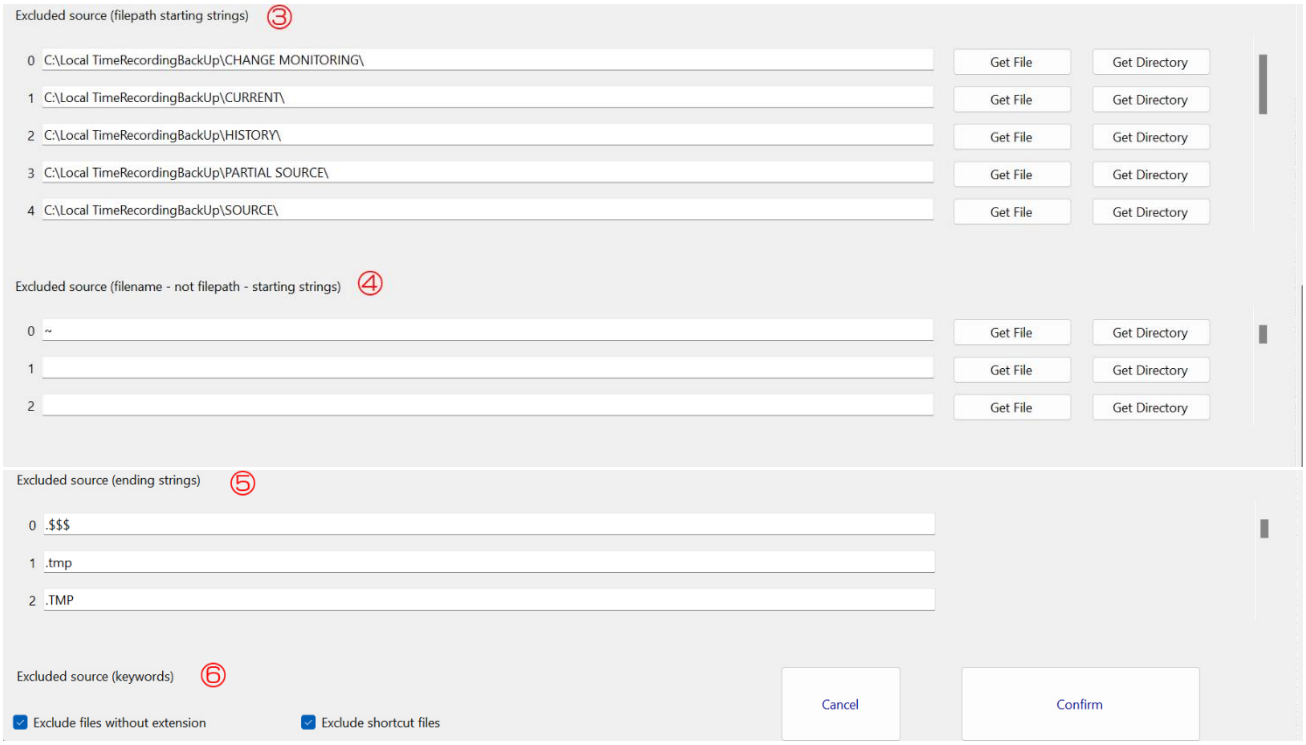
Three languages are planned: English, Dutch and Japanese.

If a language that is not available is chosen (mainly via the OS user interface language), the user interface of this application will revert to English.

6. Setting up the files to be backed up

You can get to the window below either from the “File/Source/Exclusions” menu or from the “Settings/Assign a Given Retention Policy” menu.





6.1 Included files/directories

This section allows you to list the directories or files that need to be backed-up.

You can either type the file/directory names or you can pick them up via the buttons on the right. You can also use the buttons to pick something close to what you need and after that change the text in the textbox to reflect your real needs. The difference between files and directories is recognized by the absence/presence of a final directory separation character. To remove a file/directory from the list, just erase the text in the textbox.

For each file/directory you need to give the retention policy that applies to it. You will be able to pick a policy from the list in the drop-down boxes. (For creating a new policy, see Chapter 7 “Setting up retention policies”)

You can also indicate whether the file/directory should be backed-up during automatic local/partial back-up. The purpose of this is to allow you to exclude files from the automatic back-up that are very large or that are likely to be locked (such as email repositories.)

Only if you close this window by the “Submit” button, the information will be saved for future use.

6.2 Always watched files

In this section you can list files that will be always checked during partial automatic back-ups, independent if the operating system thinks they are active.

6.3 Excluded filepaths

Here you can enter files/directories that should be excluded from the back-ups. The application will automatically add some directories that would cause conflicts in the operation.

Note that the text you enter is treated as a “starting string” of the filepath. If you enter “C:\test\x” then all of the following (and similar) will be excluded:

- C:\test\x
- C:\test\x.doc
- C:\test\x.jpg
- C:\test\xxxx.doc
- C:\test\x\

- C:\test\xx\other files.docx
- C:\test\xxx\any directory\other stuff.xlsx

6.4 Excluded filenames

Here you can enter the starting string of filenames to be excluded. Any file (in any directory) starting with that string will be excluded from the back-up.

It is a good idea to put “~” (tilde) here as Microsoft Office applications are creating lots of temporary files starting with it.

6.5 Filename endings

Here you can enter the ending string of filenames to be excluded. Any file (in any directory) ending with that string will be excluded from the back-up.

This is the best place to indicate you don’t want back-ups of certain extensions (don’t forget the “dot”)

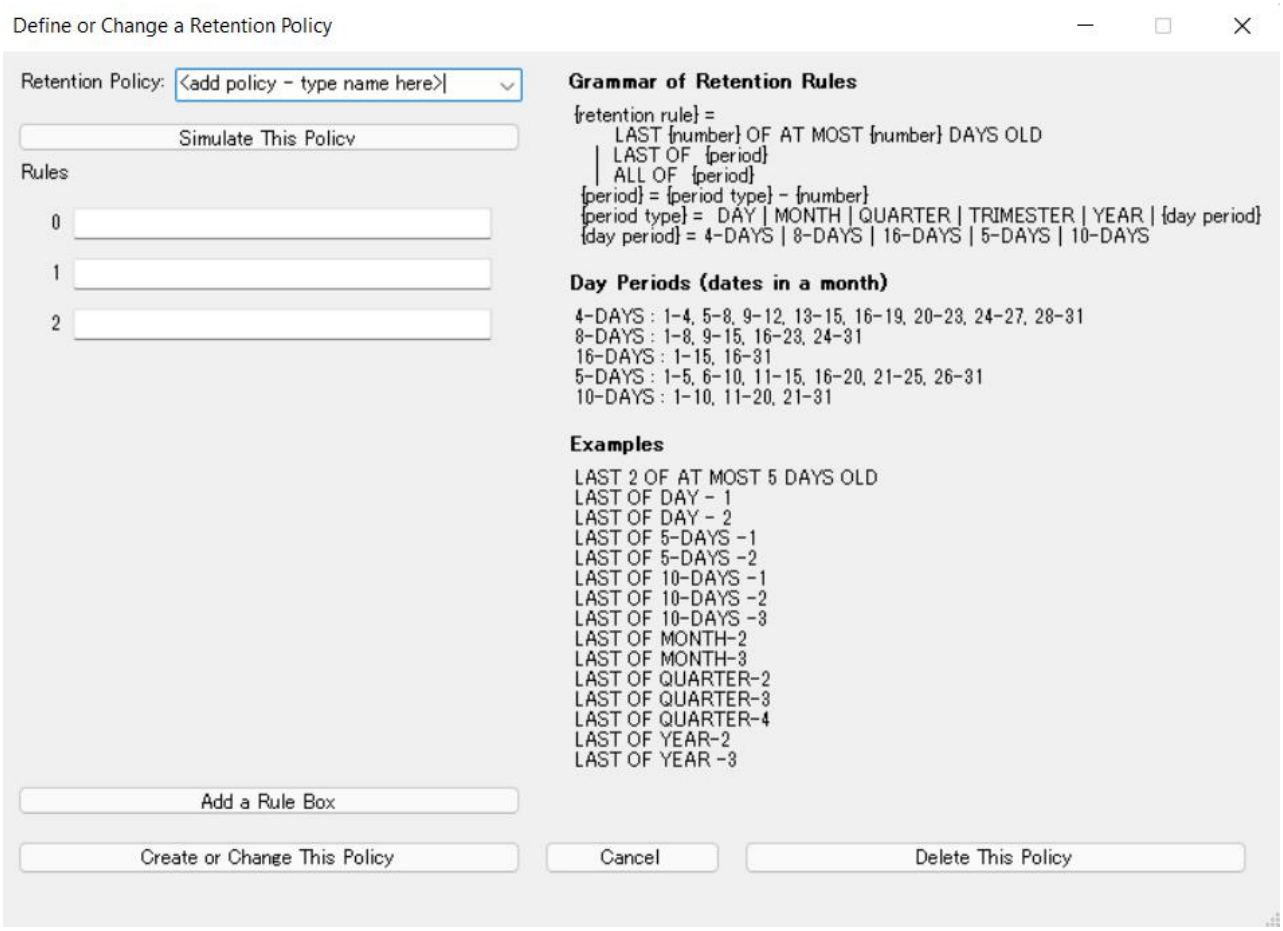
6.6 Extensions and shortcuts

Often files without extension are not relevant in the long term. You can exclude them from the back-up by ticking the box.

Similarly, shortcuts might just clutter your back-ups.

7. Setting up retention policies

You get here via menu “Settings/Define/Change/Simulate a Retention Policy”



After selecting the policy (you can change or type the name of a new policy), you can enter the retention rules. When done “Create or Change” or “Delete” the policy.

This is the place where you implicitly control the size of your back-up and how the back-up retention changes over time. If you don't feel confident in defining your own policies, you will likely be able to satisfy most needs with the predefined policies. You can use this window to display what a predefined policy exactly covers.

There are 3 major categories of retention rules:

1. LAST {number of back-up iterations} OF AT MOST {time limit in days} DAYS OLD
2. LAST OF {period}
3. ALL OF {period}

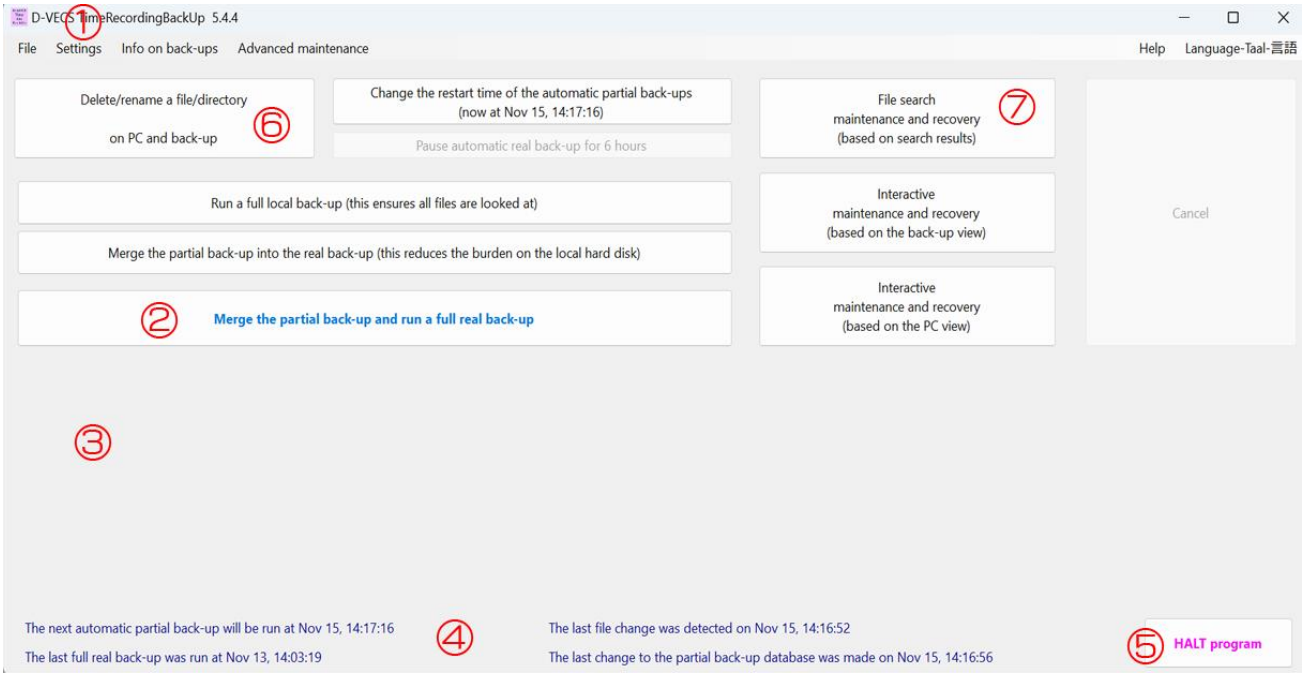
The first category is used to "keep the last x back-ups". This could be an important tool if you are in the state of editing (and frequently saving) an important document. Just by saving the document you will make sure you have access to the last x saved copies, allowing you to "undo" edits if you change your mind. (This will avoid the need to make separate "Save As …" versions to keep track of editing history.)

The second category (LAST OF …) is one that provides the adaptiveness of the back-up. In combination with the predefined "periods" it allows you for instance to keep "the last file of yesterday" plus "the last file of last month" plus the last "file of the previous quarter" plus "the last file of last year". Whenever the "period" changes (for instance changing from March to April), the system will clean up via the automated retention policy checks. When setting op policies, the software will ensure you are not leaving gaps that would cause the unintended deletion of back-up instances. For instance, if you request to keep the last back-up of 2 months age (LAST OF MONTH -2), the system will automatically add the requirement to keep the last back-up of last month (LAST OF MONTH -1) and the last one of this month (LAST OF MONTH or LAST OF MONTH - 0).

The third option allows you to keep all back-ups of a given period. Unless used with caution, this can lead to extremely large back-up sizes.

If the software has been active for a while, you will be able to analyze the effectiveness of your retention policies via the "Analyze the Performance of the Retention Policies" menu under "Info on Back-Ups". (See further in this document for details.)

8. Feedback during back-up operations

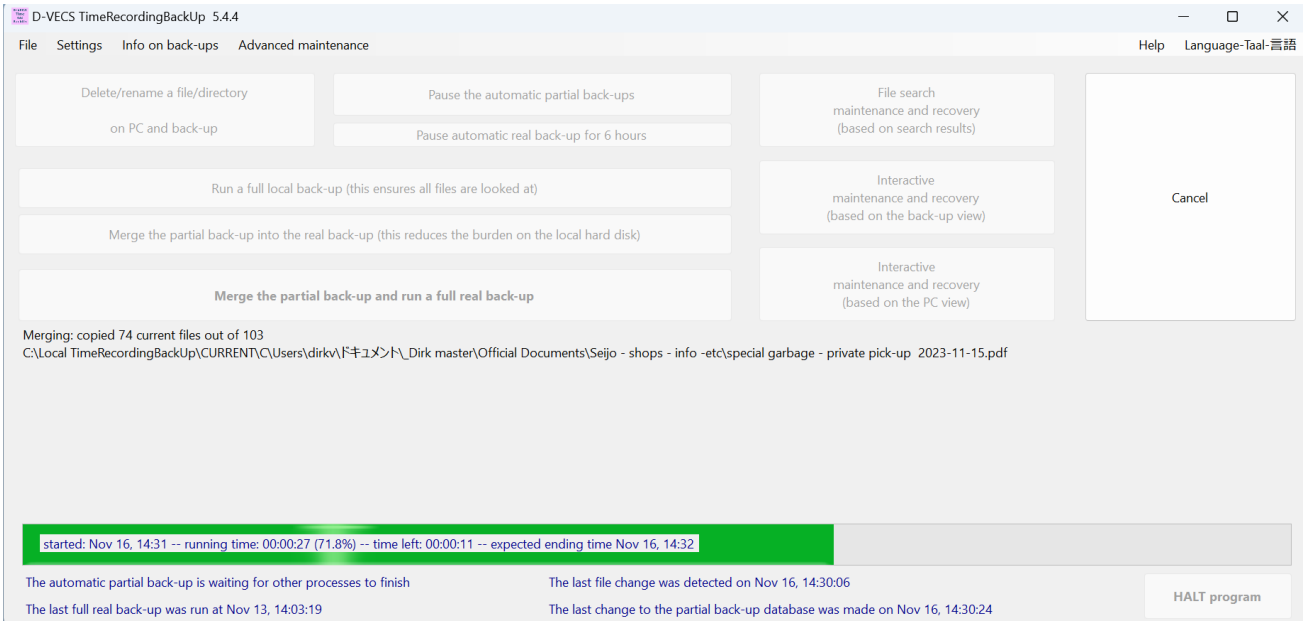


The software gives feedback through pop-up message boxes for aspects that require user feedback or via the section 3 of the main window.

Three main occasions of user feedback through the main window are the following.

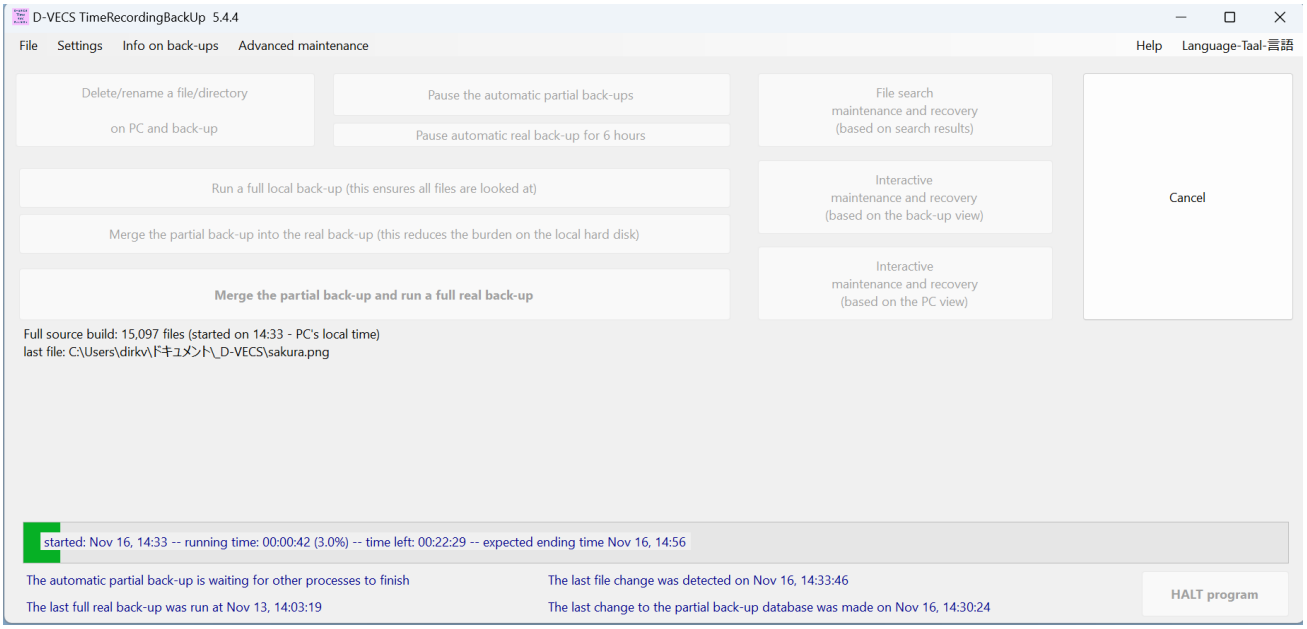
8.1 During the merging of the partial back-up into the real back-up

During the time of the merging, the status of copying files and directories is reported via many short status messages. Following example is a message during the merging of the CURRENT files. In case there are few back-ups to be merged, these message might go by too fast to read but their information value is negligent in case of small merging operations.

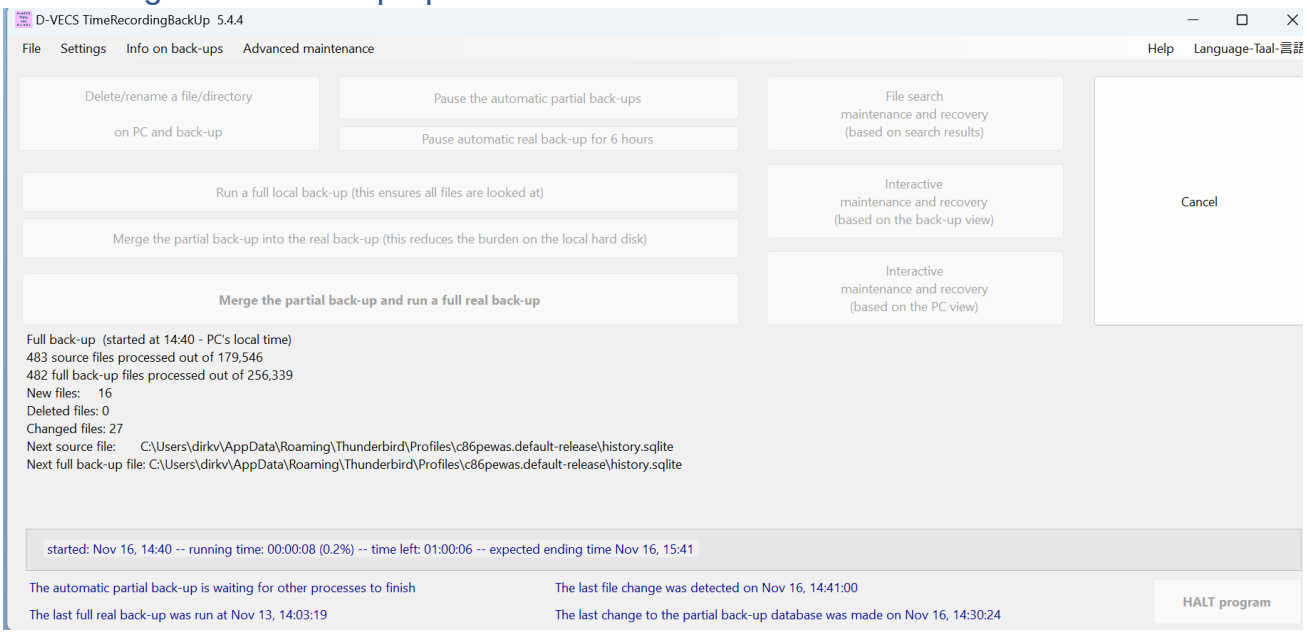


8.2 During the analysis of existing files on the PC

The analysis of the existing files on the PC can – depending on the number of files on the PC and the speed of the PC – take from 1 or 2 minutes to more than half an hour. During this time the user is informed of the progress.



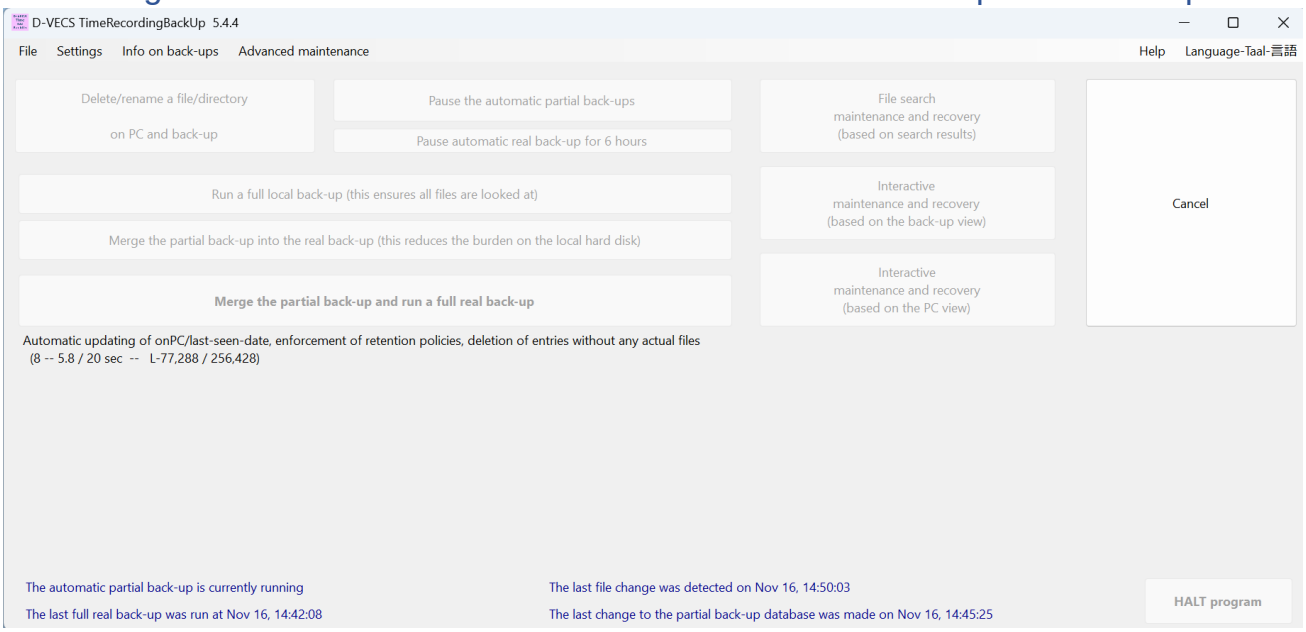
8.3 During active back-up operations



Following information is given in each line:

1. Is this a local (partial) back-up or a real (full) back-up.
2. How many “source” files where processed out of how may
3. How many “FullRecords” files were looked at out of how many
4. How many new files were detected
5. How many files were detected as deleted since last back-up
6. How many files were detected as changed since the last back-up
7. What is the filepath of the next source file to be looked at
8. What is the filepath of the next “FullRecords” file to be looked at

8.4 During the automatic retention checks after each automatic partial back-up



The second line gives following info: (a -- b / c sec -- X-d /e)

a: number of files checked during this period

b: number of seconds this activity has been running

c: number of seconds this activity will run

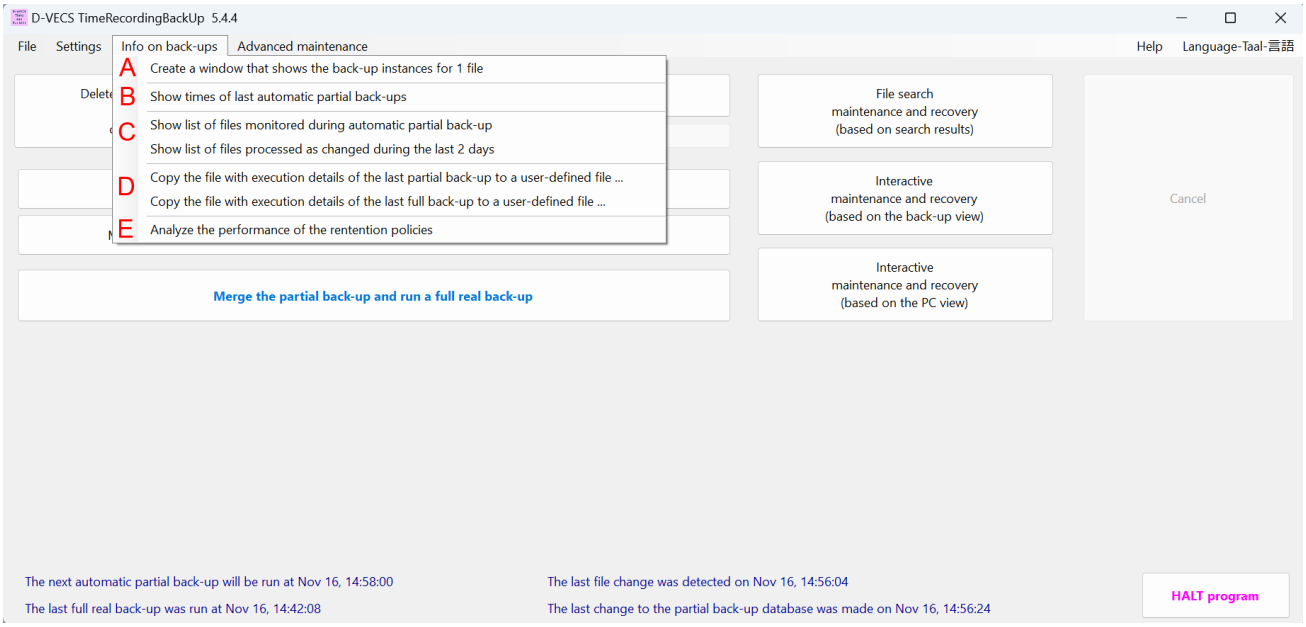
X: “R” in case the real back-up is online, “L” otherwise

d: item number in the back-up “FullRecords” file that is being checked now

e: total number of items in the back-up “FullRecords” file

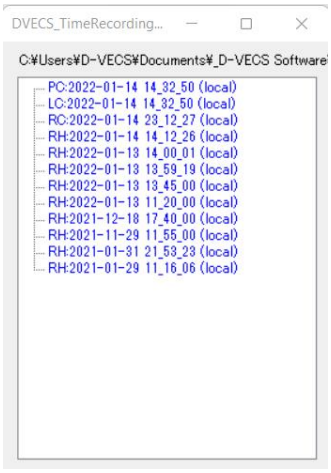
Note: There is a separate loop of checks when the real back-up is online and when it is not. TimeRecordingBackUp maintains the current point in both loops.

9. Info on Back-Ups menu



A. Back-up instances for 1 file

This command allows the user to select 1 file and get a continuously refreshing (every 2 minutes) update on the back-up instances that are available for this file.

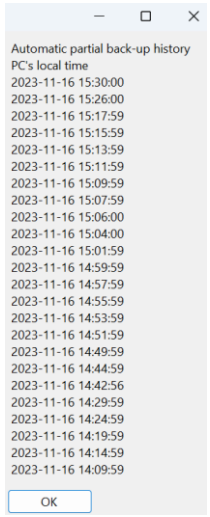


The generated list shows the timestamps for

- the file in the normal filesystem of the PC (PC)
- the file in the CURRENT directory of the local back-up (LC)
- the files in the HISTORY directory of the local back-up (LH)
- the file in the CURRENT directory of the real back-up (RC)
- the files in the HISTORY directory of the real back-up (RH)

If the real back-up is online, the data is verified with the real back-up. If not, the data about the real back-up is extracted from the “FullRecords” file.

B. Automatic partial back-up history



This command allows to review the times when automatic partial back-ups were run. By checking this table, the user can verify if the runs were done at the expected times. Also, pauses due to the PC going to sleep, can be identified.

C. Monitored files

The commands in this section allow to review the files that are monitored during the automatic back-up and the files that were processed during the last several days.

D. Detailed reports of last back-up activities

These 2 commands allow to save as text file on overview of the activity during the last partial and full back-up.

These files typically look like as below:

```
Partial Back-Up Started on 2022-01-14 15:15:01,387
2022-01-14 15:15:01,402  --  C:\Local TimeRecordingBackUp\BACK-UP STATUS\Full Back-Up\FullRecords.txt
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:07 -> 2022-01-14 06:10:06
2022-01-14 15:15:01,717  --  C:\Local TimeRecordingBackUp\BACK-UP STATUS\Info\ $#$ last full backup record $#$ .txt
     fullBUP and Source point to the same file -- update in order to record LSD (LWD: 2022-01-14 05:24:33 </= 2022-01-14 05:24:33
2022-01-14 15:15:01,733  --  C:\Local TimeRecordingBackUp\BACK-UP STATUS\Info\ $#$ last partial backup record $#$ .txt
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:04 -> 2022-01-14 06:10:02
2022-01-14 15:15:01,969  --  C:\Local TimeRecordingBackUp\BACK-UP STATUS\Info\ $#$ monitored files $#$ .txt
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:01 -> 2022-01-14 06:10:00
2022-01-14 15:15:02,204  --  C:\Local TimeRecordingBackUp\BACK-UP STATUS\Info\ $#$ processed file changes X days $#$ .txt
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:04 -> 2022-01-14 06:10:02
2022-01-14 15:15:02,441  --  C:\Local TimeRecordingBackUp\SOURCE-RETENTION POLICY MONITORING\C $ Local TimeRecordingBackUp $   HighFre
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:01 -> 2022-01-14 06:10:00
2022-01-14 15:15:02,692  --  C:\Local TimeRecordingBackUp\SOURCE-RETENTION POLICY MONITORING\C $ Users $ D-VECS $ Desktop $   HighFrequ
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:01 -> 2022-01-14 06:10:00
2022-01-14 15:15:02,928  --  C:\Local TimeRecordingBackUp\SOURCE-RETENTION POLICY MONITORING\C $ Users $ D-VECS $ Documents $  D-VECS
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:01 -> 2022-01-14 06:10:00
2022-01-14 15:15:03,163  --  C:\Local TimeRecordingBackUp\SOURCE-RETENTION POLICY MONITORING\C $ Users $ D-VECS $ Documents $   HighFre
     fullBUP and Source point to the same file -- to be updated (LWD: 2022-01-14 06:05:01 -> 2022-01-14 06:10:00
2022-01-14 15:15:03,400  --  C:\Users\D-VECS\Documents\ D-VECS Software\DVECS TimeRecordingBackUp Documentation\DVECS TimeRecordingBacl
     fullBUP and Source point to the same file -- update in order to record LSD (LWD: 2022-01-14 05:32:50 </= 2022-01-14 05:32:50
```

E. Analyze the performance of the retention policies

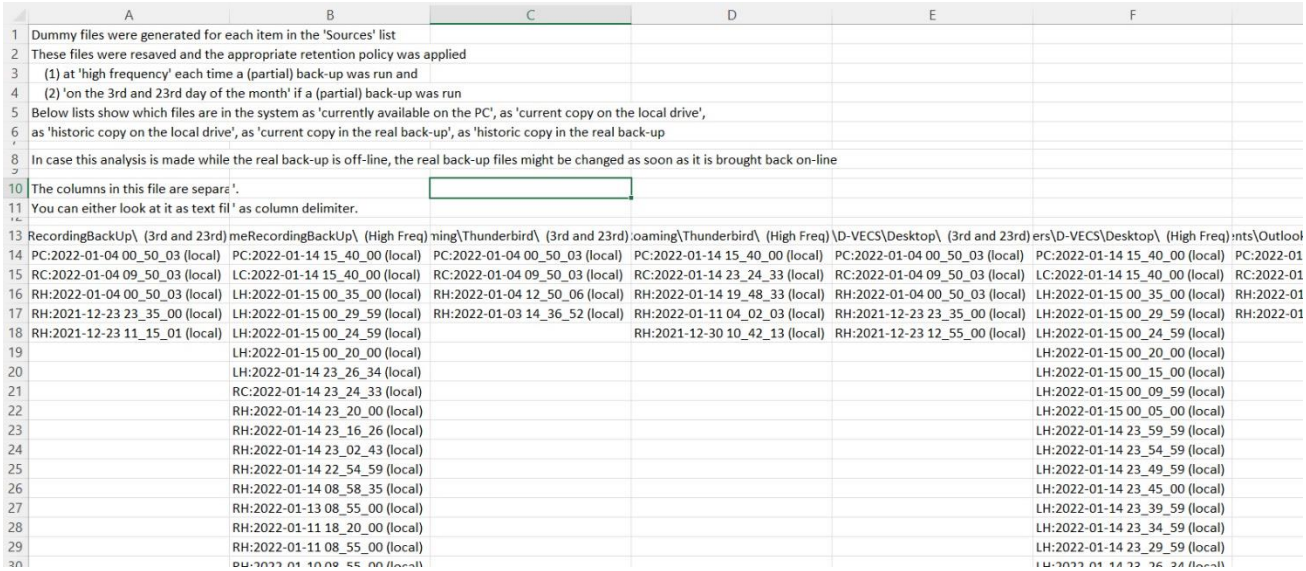
In the SOURCE-RETENTION POLICY MONITORING subdirectory of the local back-up, the system maintains some files that are used to monitor retention for each source file description that is listed in the “Sources and Exclusions” window.

For each combination, 2 files are automatically generated: <prefix>_HighFrequency.txt and <prefix>_3And23.txt. The first file is written each time when an automatic back-up is done. The second file is written each time on automatic back-up is done on the 3rd or the 23rd day of the month. These files are treated with the retention policy that applies to the referred source file/folder.

This command generates a text file (“.txt”) but it actually is a csv file with “|” as a column separator. The best way to see this file is to open it in Microsoft Excel as a delimited file with “|” as separator.

Below is what the file looks like as seen with a text editor and as seen with Microsoft Excel.

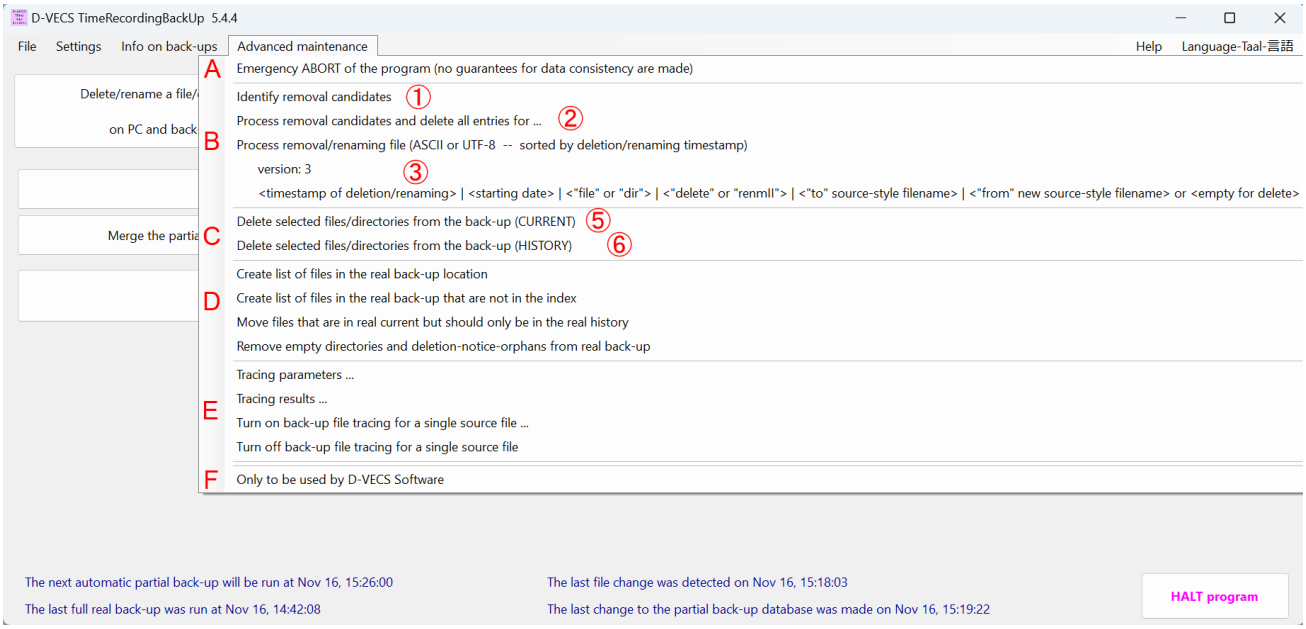
```
Dummy files were generated for each item in the 'Sources' list
These files were resaved and the appropriate retention policy was applied
    (1) at 'high frequency' each time a (partial) back-up was run and
    (2) 'on the 3rd and 23rd day of the month' if a (partial) back-up was run
Below lists show which files are in the system as 'currently available on the PC', as 'current copy on the local drive',
as 'historic copy on the local drive', as 'current copy in the real back-up', as 'historic copy in the real back-up

In case this analysis is made while the real back-up is off-line, the real back-up files might be changed as soon as it is brought back on-line

The columns in this file are separated by a '|'.
You can either look at it as text file or open it in excel and choose '|' as column delimiter.

C:\Local TimeRecordingBackUp\  (3rd and 23rd)|C:\Local TimeRecordingBackUp\  (High Freq)|C:\Users\D-VECS\AppData\Roaming\Thunderbird\  (3rd and 2
PC:2022-01-04 00_50_03 (local)|PC:2022-01-14 15_40_00 (local)|PC:2022-01-04 00_50_03 (local)|PC:2022-01-14 15_40_00 (local)|PC:2022-01-04 00_50_0
RC:2022-01-04 09_50_03 (local)|LC:2022-01-14 15_40_00 (local)|RC:2022-01-04 09_50_03 (local)|RC:2022-01-14 23_24_33 (local)|RC:2022-01-04 09_50_0
RH:2022-01-04 00_50_03 (local)|LH:2022-01-15 00_35_00 (local)|RH:2022-01-04 12_50_06 (local)|RH:2022-01-14 19_48_33 (local)|RH:2022-01-04 00_50_0
RH:2021-12-23 23_35_00 (local)|LH:2022-01-15 00_29_59 (local)|RH:2022-01-03 14_36_52 (local)|RH:2022-01-11 04_02_03 (local)|RH:2021-12-23 23_35_0
RH:2021-12-23 11_15_01 (local)|LH:2022-01-15 00_24_59 (local)||RH:2021-12-30 10_42_13 (local)|RH:2021-12-23 12_55_00 (local)|LH:2022-01-15 00_24_
|LH:2022-01-15 00_20_00 (local)||||LH:2022-01-15 00_20_00 (local)||||LH:2022-01-15 00_20_00 (local)||LH:2022-01-15 00_20_00 (local)||
|LH:2022-01-14 23_26_34 (local)||||LH:2022-01-15 00_15_00 (local)||||LH:2022-01-15 00_15_00 (local)||LH:2022-01-14 23_26_34 (local)||
|RC:2022-01-14 23_24_33 (local)||||LH:2022-01-15 00_09_59 (local)||||LH:2022-01-15 00_09_59 (local)||RC:2022-01-14 23_24_33 (local)||
|RH:2022-01-14 23_20_00 (local)||||LH:2022-01-15 00_05_00 (local)||||LH:2022-01-15 00_05_00 (local)||RH:2022-01-14 23_20_00 (local)||
|RH:2022-01-14 23_16_26 (local)||||LH:2022-01-14 23_59_59 (local)||||LH:2022-01-14 23_59_59 (local)||RH:2022-01-14 23_16_26 (local)||
|RH:2022-01-14 23_02_43 (local)||||LH:2022-01-14 23_54_59 (local)||||LH:2022-01-14 23_54_59 (local)||RH:2022-01-14 23_02_43 (local)||
|RH:2022-01-14 22_54_59 (local)||||LH:2022-01-14 23_49_59 (local)||||LH:2022-01-14 23_49_59 (local)||RH:2022-01-14 22_54_59 (local)||
```



	A	B	C	D	E	F
1	Dummy files were generated for each item in the 'Sources' list					
2	These files were resaved and the appropriate retention policy was applied					
3	(1) at 'high frequency' each time a (partial) back-up was run and					
4	(2) 'on the 3rd and 23rd day of the month' if a (partial) back-up was run					
5	Below lists show which files are in the system as 'currently available on the PC', as 'current copy on the local drive',					
6	as 'historic copy on the local drive', as 'current copy in the real back-up', as 'historic copy in the real back-up					
8	In case this analysis is made while the real back-up is off-line, the real back-up files might be changed as soon as it is brought back on-line					
10	The columns in this file are separa '.					
11	You can either look at it as text fil ' as column delimiter.					
13	RecordingBackUp\ (3rd and 23rd)	meRecordingBackUp\ (High Freq)	ming\Thunderbird\ (3rd and 23rd)	oaming\Thunderbird\ (High Freq)	\D-VECS\Desktop\ (3rd and 23rd)	ers\D-VECS\Desktop\ (High Freq)
14	PC:2022-01-04 00_50_03 (local)	PC:2022-01-14 15_40_00 (local)	PC:2022-01-04 00_50_03 (local)	PC:2022-01-14 15_40_00 (local)	PC:2022-01-04 00_50_03 (local)	PC:2022-01-14 15_40_00 (local)
15	RC:2022-01-04 09_50_03 (local)	LC:2022-01-14 15_40_00 (local)	RC:2022-01-04 09_50_03 (local)	RC:2022-01-14 23_24_33 (local)	RC:2022-01-04 09_50_03 (local)	LC:2022-01-14 15_40_00 (local)
16	RH:2022-01-04 00_50_03 (local)	LH:2022-01-15 00_35_00 (local)	RH:2022-01-04 12_50_06 (local)	RH:2022-01-14 19_48_33 (local)	RH:2022-01-04 00_50_03 (local)	LH:2022-01-15 00_35_00 (local)
17	RH:2021-12-23 23_35_00 (local)	LH:2022-01-15 00_29_59 (local)	RH:2022-01-03 14_36_52 (local)	RH:2022-01-11 04_02_03 (local)	RH:2021-12-23 23_35_00 (local)	LH:2022-01-15 00_29_59 (local)
18	RH:2021-12-23 11_15_01 (local)	LH:2022-01-15 00_24_59 (local)		RH:2021-12-30 10_42_13 (local)	RH:2021-12-23 12_55_00 (local)	LH:2022-01-15 00_24_59 (local)
19		LH:2022-01-15 00_20_00 (local)				LH:2022-01-15 00_20_00 (local)
20		LH:2022-01-14 23_26_34 (local)				LH:2022-01-15 00_15_00 (local)
21		RC:2022-01-14 23_24_33 (local)				LH:2022-01-15 00_09_59 (local)
22		RH:2022-01-14 23_20_00 (local)				LH:2022-01-15 00_05_00 (local)
23		RH:2022-01-14 23_16_26 (local)				LH:2022-01-14 23_59_59 (local)
24		RH:2022-01-14 23_02_43 (local)				LH:2022-01-14 23_54_59 (local)
25		RH:2022-01-14 22_54_59 (local)				LH:2022-01-14 23_49_59 (local)
26		RH:2022-01-14 08_58_35 (local)				LH:2022-01-14 23_45_00 (local)
27		RH:2022-01-13 08_55_00 (local)				LH:2022-01-14 23_39_59 (local)
28		RH:2022-01-11 18_20_00 (local)				LH:2022-01-14 23_34_59 (local)
29		RH:2022-01-11 08_55_00 (local)				LH:2022-01-14 23_29_59 (local)

As in “A.Back-up instances for 1 file”, there is an indication what the back-up status of the detected files is (PC, LC, LH, RC, RH)

10. Advanced Maintenance menu



A. ABORT

Section A is the command to ‘ABORT’ the program operation. The use of this command should be avoided, but in case of malfunctioning it might help stopping the program without the use of Windows utilities.

In case of severe disruptions, even this command might not be available. In that case only the “Resource Monitor” in the “Windows Tools” (that can be accessed via “Start/All apps”) can stop the program: Select DVECS.TimeRecordingBackUp.exe and “End Process Tree”.

B. Removing/renaming files/directories

In section B, actions related to removing files from the back-up system or renaming them are grouped.

B-1

B-2

B-3

C. Deleting specific files or directories from the back-up

This section allows to reduce the size of the real back-up by deleting files or directories that are not needed anymore. The deletion can be limited to specific time-stamped files.

These operations do not affect the way future back-ups are taken.

D. Managing unnecessary files in the real back-up

This section allows the user to verify which files are physically on the real back-up disk and to manage the optimization or removal files that are not needed anymore or whose location has become inappropriate (due to unmanaged file renaming/deletion on the PC etc.)

Among others, it allows to remove empty directories from the real back-up. This normally is not necessary, but if there are many empty directories in the real back-up, the maintenance screens might become difficult to read/understand.

E. Tracing

Tracing is only to be used for trouble shooting. Please see the relevant chapter.

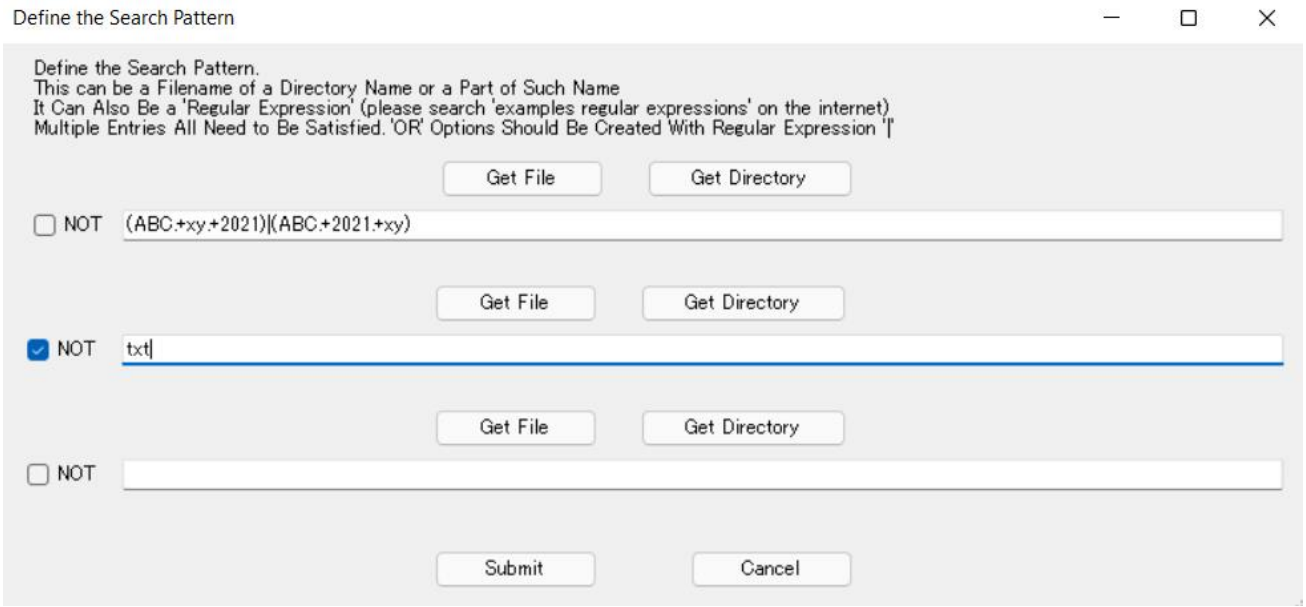
F. Maintenance by D-VECS Software

This section cannot be used by normal users. It contains a set of operations that assist D-VECS Software in analyzing this program.

11. Interactive Maintenance

11.1 File Search & Interactive Maintenance

File Search



Let's analyze the first regular expression: (ABC.+xy.+2021)|(ABC.+201.+xy)

There are 2 OR'd components separated by "|"

(ABC.+xy.+2021)

- the letters (in succession) "ABC"
- followed by 1 or more characters (".+")
- followed by the letters (in succession) "xy"
- followed by 1 or more characters (".+")
- followed by the letters (in succession) "2021"

for instance " something ABC more text xy more text 2021 something" satisfies

(ABC.+2021.+xy)

- the letters (in succession) "ABC"
- followed by 1 or more characters (".+")
- followed by the letters (in succession) "2021"
- followed by 1 or more characters (".+")
- followed by the letters (in succession) "xy"

for instance " something ABC more text 201 more text xy something" satisfies

The second rule states that the successive letters "txt" should NOT appear

Both rules in combination make that

- " something ABC more text 201 more text xy.pdf" satisfies
- " something ABC more text 201 more text xy.txt" does not satisfy

12. Locations and filename conventions of the various files used by the software

Real Back-Up

The location of the real back-up directory can be freely chosen by the user via the "Settings" menu.

This is the main body of file-data generated by this software. Control-data is kept in the Local Back-up and might or might not be copied to the real back-up.

Two subdirectories will always be included: CURRENT and HISTORY. Other subdirectories might be available similar as in the local back-up.

CURRENT

The "CURRENT" directory contains a copy of the files that satisfy the back-up requirements, set in the "Sources and Exclusions" window ("File -> Source/Exclusions Directories/Files" or "Settings -> Assign a Given Retention Policy to Files/Directories"). The directory reflects the state of the PC at the time of the last real back-up.

When switching to a new PC, copying the contents of the "C" subdirectory to the C-drive of the new PC is the easiest way to transfer data to the new PC.

HISTORY

The "HISTORY" directory contains past versions of the files.

The file system structure is similar to the one on the PC with as main difference that each file on the PC is represented by a directory of that same name (including the extension).

Files that have been deleted on the PC but are still registered in the back-up “FullRecords” are still present here. Files that were renamed on the PC might be here either under their new name or under their old name, depending on the whether they were renamed using the Windows standard method or via the utilities provided via this software.

In the subdirectory with the name of the PC-file, you will find the historic files. They have the PC filename, prefixed with a timestamp reflecting the time when the system realized for the first time that a newer versions existed.

These files can be simply copied to a new file on the PC, or the back-up management routines (see Maintenance) can be used to find and copy them.

Local Back-Up

The location of the local back-up directory can be freely chosen by the user via the “Settings” menu.

This is the main body of control-data generated by this software as well as the location where new file-data are stored when the real back-up is not online. Control-data might or might not be copied to the real back-up.

Following subdirectories are present:

1. BACK-UP STATUS
2. CHANGE MONITORING
3. CONTROL
4. CURRENT
5. HISTORY
6. PARTIAL SOURCE
7. RETENTION POLICIES
8. SOURCE
9. SOURCE-RETENTION POLICY MONITORING

BACK-UP STATUS

The “Full Back-Up” directory contains the “FullRecords.txt” file. **This file is the core memory of this software.** It contains a record of all known files in the back-up system: whether they still are on the PC or not, when deleted files were last seen on the PC, when they were last written, which historical data is available.

This “FullRecords.txt” file can be edited, but extreme care is needed to avoid making it unreadable by the software.

The “info” directory contains information that can also be accessed via the user interface of the software. Many of these files require a thorough understanding of the operation of the software and are not of significant use for the casual user. They are useful in case troubleshooting is needed.

These info files can be edited without harm to the application.

CHANGE MONITORING

The “_$#$_partial_source_$#$_.txt” file is used to track files that need to be considered during the partial automatic back-up sessions. Deleting items from this file will reduce the effectiveness of the partial automatic back-up process.

The “_$#$_permanent_change_request_$#$_.txt” file is used to track rename- and delete-requests during offline operation. This file should not be edited.

CONTROL

The “_$#$_MainControlFile_$#$_.txt” file is the main control file for this software.

It contains the settings as also seen in the “Sources and Exclusions” window (“File -> Source/Exclusions Directories/Files” or “Settings -> Assign a Given Retention Policy to Files/Directories”).

This file can be edited, but extreme care is needed to avoid making it unreadable by the software.

CURRENT

Please see the discussion under Real Back-Up

HISTORY

Please see the discussion under Real Back-Up

PARTIAL SOURCE

This directory contains a file similar to the “FullRecords” file in the BACK-UP STATUS but limited to the relevant “_$#$_partial_source_$#$_” files.

RETENTION POLICIES

This directory contains the retention policies. Files can be manually edited, added and removed, but it is advised to use the proper user interface (“Settings -> Define/Change a Retention Policy“) for this as that includes error-checking functionality.

SOURCE

This directory contains a file similar to the “FullRecords” file in the BACK-UP STATUS but related to the files actually existing on the PC. This data is generated (or re-used) during the real back-up process.

SOURCE-RETENTION POLICY MONITORING

This directory contains files that are needed to analyze the performance of the retention policy system (Info on BackUps -> Analyze the Performance of the Retention Policies).

These files are created and maintained fully automatic by the software and should not be edited or deleted.

Cookies

Cookies used by D-VECS Software are stored in “AppData\Roaming\D-VECS\Cookies” of the relevant Windows User.

Other cookie-like files are stored in “AppData\Roaming\D-VECS\D-VECS TimeRecordingBackUp” of the relevant Windows User.

License and license key

Your (encrypted) license is located in C:\\<Users>/<this user>/<App data>/<Roaming>/

D-VECS/Licenses/DVECS.TimeRecordingBackUp_D-VECS_**********.dvecslic

“D-VECS_**********” is the “license key”. If by accident your license is deleted from the PC, this is the value you need to enter after pushing the button “I already have a license key” in the license request form. (See the section about the first time use of this software.)

13. Regular Expressions – A Short Tutorial

In D-VECS TimeRecordingBackUp, regular expressions are available for searching for files in the back-up system.

The syntax-dialect that is allowed in this application is the dialect that is used in Microsoft Visual C#.

References on the internet

Look up “examples regular expressions” in a search engine

https://cs.lmu.edu/~ray/notes/regex/

https://en.wikipedia.org/wiki/Regular_expression

https://docs.microsoft.com/en-us/dotnet/standard/base-types/regular-expression-language-quick-reference

Some simple examples

- The regular expression for searching for filenames containing “a certain string” is
  a certain string
- The regular expression for searching for filenames containing “the cat drinks milk” or “the dog eats meat” is
  (the cat drinks milk)|(the dog eats meat)

Individual elements

Single characters

Single characters just stand for themselves (a means *a*)

Following are “special characters”: ( ) [ ] { } ^ $. \ ? * + |

If you want to use these as standing for themselves, you will need to precede them with the character \

Boundary elements

- ^: beginning of string (or line, depending on the mode)
- $: end of string (or line, depending on the mode)
- \A: beginning of string
- \z: end of string
- \b: word boundary
- \B: not a word boundary

Generalizations

- \d : any single numerical digit
- \D : any single character that is not a numerical digit
- \s : any single space-like character (space, tab, …)
- \S : any single character that is not a space-like character
- \w : any single character that is either a digit, a letter (a through z, A through Z) or an underscore (_)
- \W : any single character that is not a part of \w
- . : any single character

Combining elements

- | : choosing either of the two items around it
  gray|grey -> *gray* or *grey*
- [ ] : exactly one character from the ones listed in between []
- [^] : exactly one character from the ones NOT listen in between []
- ( ) : grouping what is between the ()
- { } : repeating the element/group that comes before

    - x{3} : repeat x 3 times -> *xxx*
    - x{2,4} : repeat x between 2 and 4 times -> *xx* or *xxx* or *xxxx*
    - x{3,} : repeat x at least 3 times -> *xxx* or *xxxx* or *xxxxx* or …..
- ? : repeating the element/group that comes before 0 or 1 time
    - x? -> *(nothing)* or *x*
- * : repeating the element/group that comes before 0 or more times
    - x* -> *(nothing)* or *x* or *xx* or *xxx* or *xxxx* or *xxxxx* or …..
- + : repeating the element/group that comes before 1 or more times
    - x*+ -> *x* or *xx* or *xxx* or *xxxx* or *xxxxx* or …..

More complex examples

- colou?r : *color* or *colour*
- rege(x(es)?|xps?) : *regex* or *regexes* or *regexp* or *regexps*
- [2-9]|[12]\d|3[0-6] : an integer in the range 2..36 inclusive
- [b-chm-pP]at|ot : *bat* or *cat* or *hat* or *mat* or *nat* or *oat* or *pat* or *Pat* or *ot*

14.Troubleshooting and Tracing

The methods explained in this section are only intended for in-depth troubleshooting or deep clean-up of the back-up database.

They often require a combination of the use of user-interface menus with manually created control files. Results or often returned as text files and might be written in places that are normally not visited by a user.