Data Export Tool

Contents

1. Introduction

The data converter tool provides the required functionality to export data saved into Guideline4000 patient archives into other file formats. Version 1.3.0 supports exporting data from patient archives into the .apm (FHC, Inc.) format, the .plx (Plexon) format and the .wav file format. This manual applies to version 1.3.2 and above. Version 1.3.2 installs an additional command line version of the Export tool, exporter_cmd.exe that can be used to automate the export process.

2. System Requirements

Supported Operating Systems

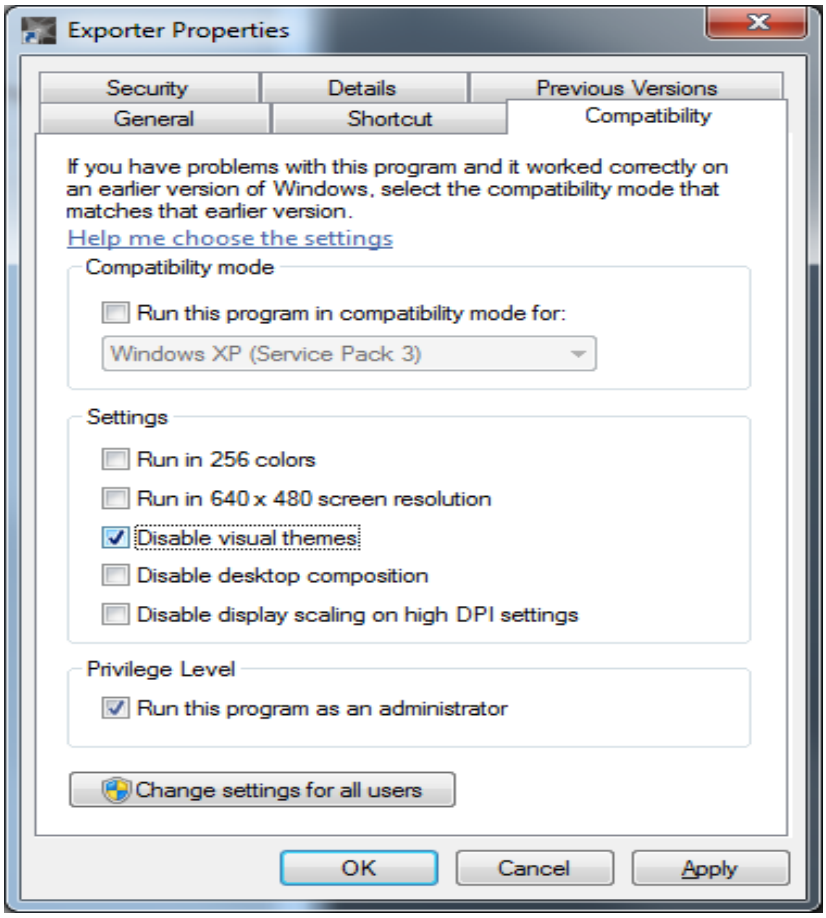
- Windows 10, Windows 7, Windows Server 2003 Service Pack 2, Windows Server 2008, Windows Server 2008 R2, Windows Vista, Windows Vista Service Pack 1, Windows XP Service Pack 3.
- 32-Bit Systems and 64-Bit Systems: Computer with Intel or compatible 1 GHz or faster processor.
- 10 MB of free hard disk space

Note. You must have administrative rights on the computer to install the Exporter tool.

Note. This software requires .NET Framework 4.6.1. The .NET Framework 4.6.1 can be downloaded from https://www.microsoft.com/en-us/download/details.aspx?id=49981.

Note. This software requires the Visual C++ Redistributable for Visual Studio 2017. If not already installed on your machine you can find it at:
https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads
Under Visual Studio 2017, please select the vc_redist.x86.exe file.

Note. For Windows Vista and 7 you need to run the Exporter as administrator, otherwise some functions may not work. To do this, go to Windows Start Menu and locate the Exporter entry. Right click on it and select Properties. Go to the Compatibility tab and select “Run this program as an administrator”. Click “OK” to exit the window.



3. Exporting Data

The Export tool is able to:

1. Export data from a Guideline4000 archive (.glr or .gla file) into Plexon, .apm or .wav format.
2. Convert an existing .apm file into Plexon or .wav format.

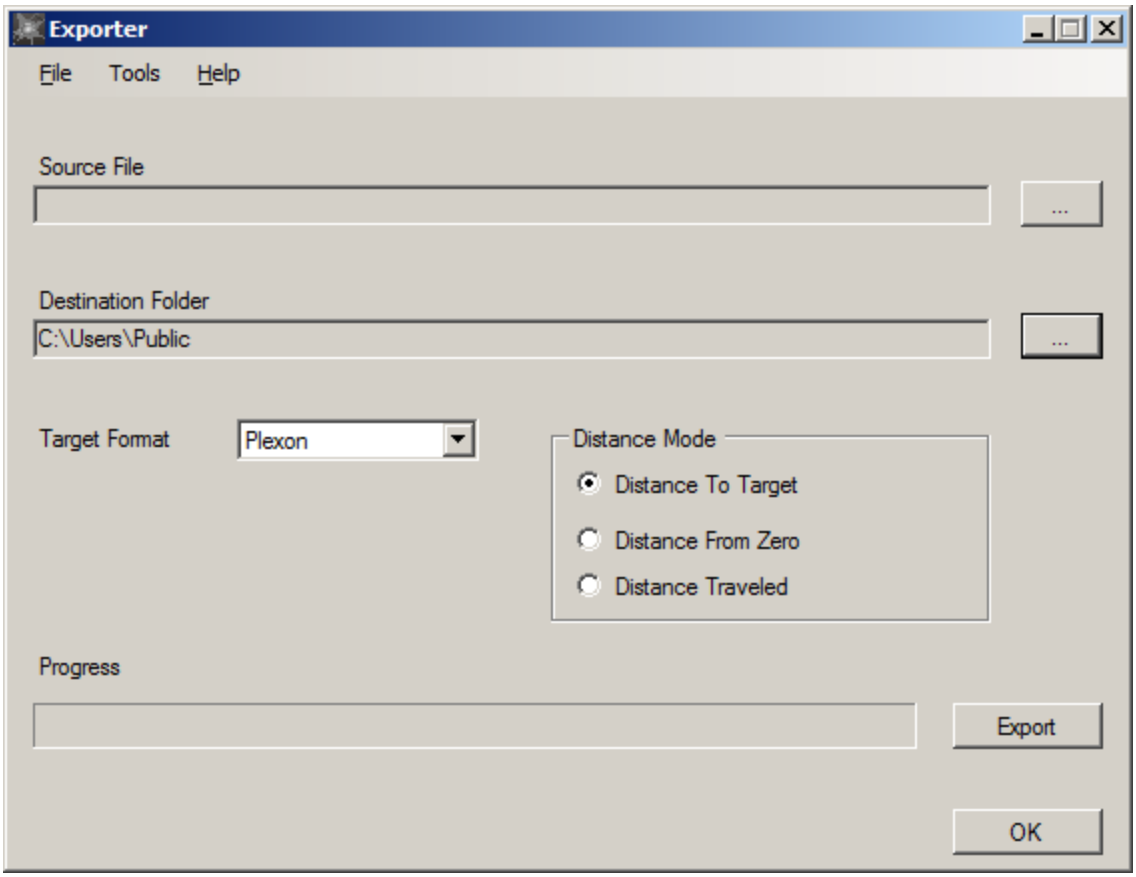
Illustrative procedures for these situations are detailed in the following sections.

3.1 Exporting Data from Guideline4000 Archives

Guideline 4000 archives come in two forms:

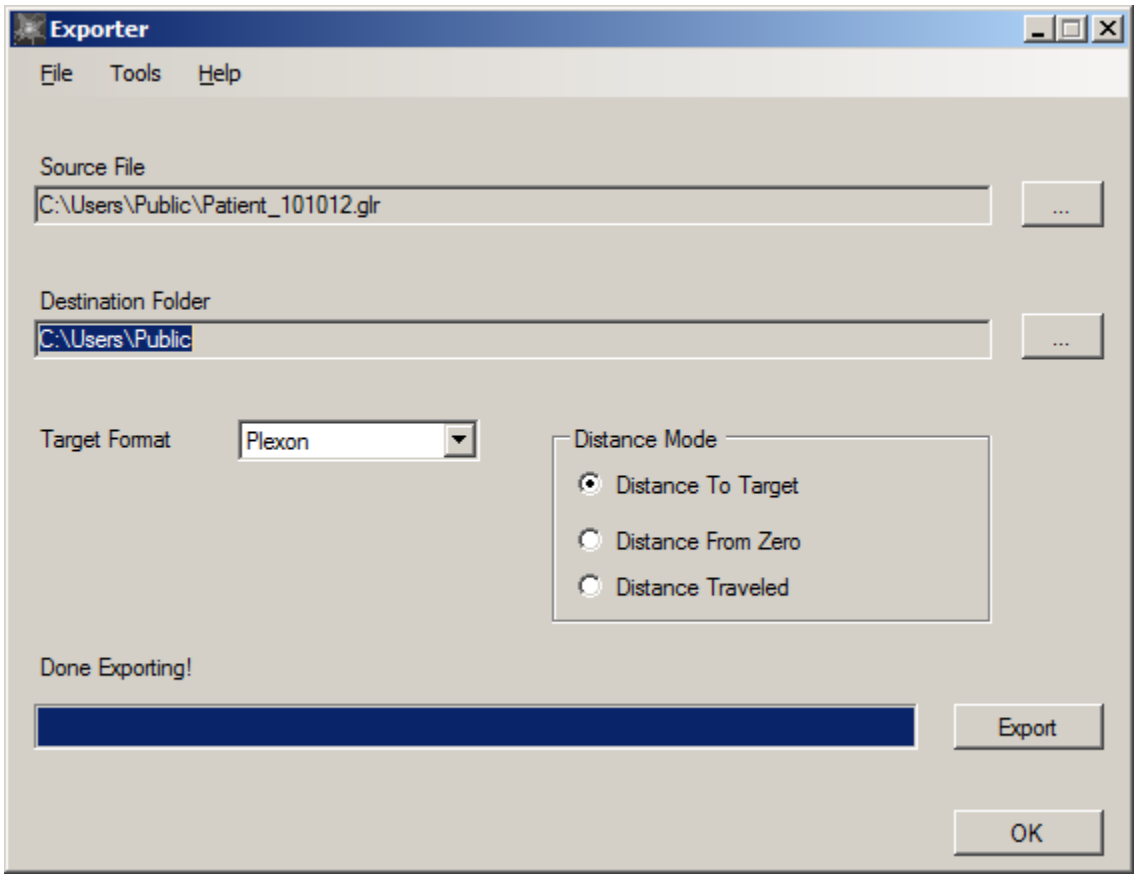
1. .glr files – contain data records for a single patient.
2. .gla files – contain data records for a set of patients.

The main application window is displayed below, followed by a description of the required steps to take when exporting patient archive files.



1. Specify the **source** .glr, .gla file by clicking on the browse button next to the "Source File" text box.
2. Specify the **destination folder** where you want the files to be exported.
3. You can use the **Target Format** box to specify the format of the exported files.
4. Under **Distance Mode** specify the formatting of the event positioning relative to the target value. These modes are equivalent to the ones used in the Guideline4000 and for more details you can consult the Guideline4000 manual. The use of this option is better highlighted under the ***File Naming Convention*** section.
5. Once you have specified all the parameters, press **Export** to initiate the data export and conversion to the **target format**. The export progress is monitored using the progress bar to the left of the *Export* button and is performed in two stages:
    a. The first stage is reading all the recorded data from the Guideline4000 archive and saving it into a temporary location on disk, in a subfolder of the **Destination Folder**, named **Waveforms**. *Please note that this folder will be deleted after the export is complete so make sure that there is no folder with this name in the destination path that contains important data for you.*
    b. The second stage goes through the exported data and performs the required operations to generate the final files, in .plx, .apm or .wav format. After this stage is complete, the temporary *Waveforms* folder will be removed from disk.

6. During the export process, the user interface elements will be unavailable to prevent accidental closing of the **Exporter** before the export process is finished. Once the export is completed, all the interface elements will become available and you will be able of selecting another source file and repeat the process.



2.2 Converting .apm files

Converting .apm files resumes to simply specifying the path to the .apm file in the **Source File** box and the destination folder in the *Destination Folder* box and then pressing the **Export** button. The usable options for the **Target Format** in this case are *Plexon or wav.*

3. File Naming Convention

3.1 Archive Files

This file naming convention applies to data files exported from a patient archive.
For the sake of exemplification we will consider a file saved in Plexon format.
Events belonging to the same simultaneous recording (snapshot) will be exported into the same target Plexon file.
The file name is composed of the patient, procedure, pass, track mapping, event name and event depth. We will consider the most complicated case of a bilateral procedure, with the snapshot spanning both passes. The generated file name will be similar to the one below:

Patient_STN Bilateral_Pass 1 Left_Pass 1 Right_L5A6C7M8L_R1A2C3M4L_Snapshot - 10.0 sec 1_L-30_R-7.8.plx

1. The first part of the file name contains the patient, procedure, left pass and right pass names:
   Patient_STN Bilateral_Pass 1 Left_Pass 1 Right

   Important Note: *The pass names and all subsequent hemisphere-related information are ordered based on the drive number assigned to each pass. The pass assigned to drive 1 in Guideline 4000 will always be displayed first, followed by the pass assigned to drive number 2.*

2. The next section is dedicated to track names:
   L5A6C7M8L_R1A2C3M4L

   Track naming section follows this convention:

   a. Tracks are presented as channel number + track name. For instance: 1A designates channel 1 mapped onto track A in Guideline 4000.
   b. If the tracks belong to the left pass, their section will be preceded by an “L”.
   c. If the tracks belong to the right pass, their section will be preceded by an “R”.

3. Next, the event name is appended:
   Snapshot - 10.0 sec 1

4. In the end, the depth – in millimeters – where the events were recorded for the left and right hemispheres is appended:
   L-30_-R-7.8

This is interpreted as: events recorded on the left hemisphere were located at 30 mm above the target and the events recorded on the right hemisphere were located at 7.8 above the target.

3.2 Apm Files

When an .apm file is specified as the source file, the target file's name will be the name of the .apm file followed by the target file format's extension.
For instance if the source file's name is *example.apm* the Plexon file obtained at the end of the conversion will be named *example.plx*.

3.3 Wave Files

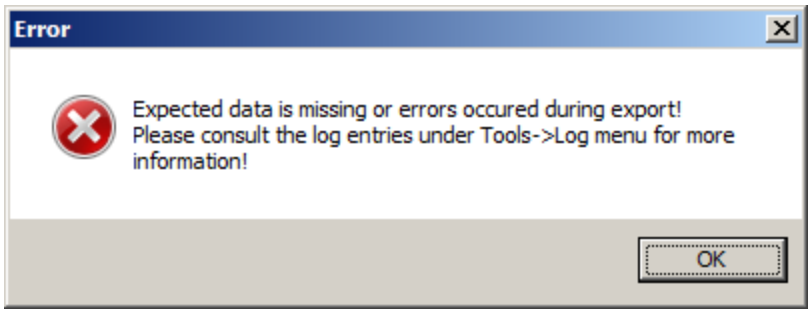
Wav files are the result of either exporting directly from a patient archive or an .apm file. The file naming convention is similar to the one described in above sections, with the addition of channel number to the end of the file name.
Examples:

- *Patient_STN Bilateral_Pass 1 Left_Pass 1 Right_L5A6C7M8L_R1A2C3M4L_Snapshot - 10.0 sec 1_L-30_R-7.8**_Ch1**.wav*
- *Patient_STN Bilateral_Pass 1 Left_Pass 1 Right_L5A6C7M8L_R1A2C3M4L_Snapshot - 10.0 sec 1_L-30_R-7.8**_Ch2**.wav*

This convention is used to handle situations of .apm files containing data of multiple microelectrode recording channels. In these cases, the Exporter extracts the data for each of the channels and saves it into a separate .wav file.

4. Logging

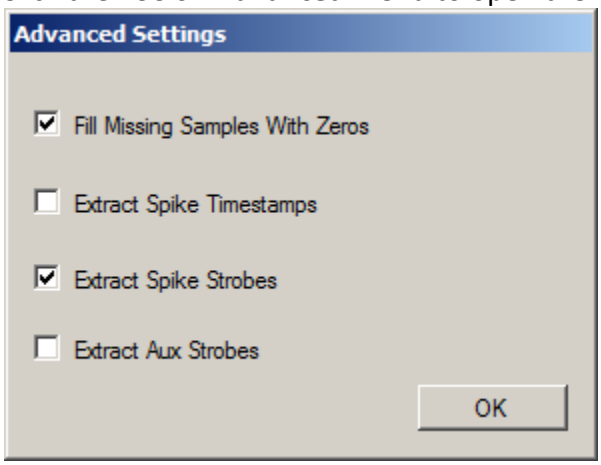
In case there were errors during export, these are saved into the application's log file. Accessing this file can be done using the main menu, by clicking Tools->Log.
A text file containing the logged errors will be opened in Notepad. Should you experience errors during export, please attach this file to an e-mail and send it to FHC, Inc.
After an unsuccessful export, for instance in the case the archive file is missing some data that is expected to be included in it or is un-readable, an error message is shown and directs you to the log menu.



5. Advanced Configuration

Note. This section is only applicable when converting Plexon files.

Click the **Tools**->**Advanced** menu to open the "*Advanced Settings"* window.



Fill Missing Samples With Zeros:

When this box is checked, should there be any missing timestamps in the source file **Exporter** fills the missing samples with zeros. This option is for use with analysis applications that produce unexpected results when there are gaps in the expected timestamp sequence (e.g. Spike 2).

When the box is not checked, there is no zero-padding of the missing samples.

Extract Spike Timestamps:

When this box is checked, **Exporter** extracts sorted spike data from the source file based on spike timestamps that may be present after online spike sorting.

When the bos is not checked, the *Exporter* ignores the pre-sorted spike timestamps and does not extract any sorted spike data.

Extract Spike Strobes:

When using strobed digital inputs, similar information is saved into records of spike chanel 1 and of the auxiliary channel of an LP+ system. In order to avoid duplicate information in the Plexon specific Strobe channel, strobed information of one of the aforementioned channels can be ignored.

When the check box is checked, the strobed information associated with the spike channel is exported into the Plexon file.

When the check box is not checked, the strobe information associated with the spike channel is ignored and will not be saved into the Plexon file.

This option is enabled by default and that is the recommended setting.

Extract Aux Strobes:

The same considerations as for *Extract Spike Strobes* apply.

When the check box is checked, the strobed information associated with the auxiliary channel is exported into the Plexon file.

When the check box is not checked, the strobe information associated with the auxiliary channel is ignored and will not be saved into the Plexon file.

This option is disabled by default and that is the recommended setting.

6. Settings

The user interface loads your last saved settings for your convenience, such that you only have to specify a new source file when opening **Exporter**.

7. Command Line Executable

The Export Tool 1.3.2 package contains a command line version of the exporter utility that can be found in the installation directory and named *exporter_cmd.exe*. The purpose of the command line version is to help automate exporting tasks involving multiple patients and that in general can be included in batch processing scripts.
The *exporter_cmd* utility can be invoked using the following command line parameters:

exporter_cmd.exe [file path] [dest path] [file type] [distance mode]

Where:
file path: is the fully qualified path to the Guideline 4000 .glr or .gla file name.
dest path: is the fully qualified path to the destination directory where exported files will be copied.
File type: is the format to export the data into. Possible options are:

- "apm": FHC, Inc. data format.
- "plx": Plexon, Inc. data format.
- "wav": WAVE file format.

distance mode: Is used to specify the distance mode used in file naming conventions, as explained in Section 3.1. Possible values are specified as:

- *"DistanceToTarget"*
- "*DistanceFromZero*"
- "*DistanceTraveled*"

Example use:

1. Export files to plexon format using the Windows command line interface:

>> exporter_cmd "C:\Documents\Patient.glr" "C:\Documents\Exported" "plx" "*DistanceToTarget*"

2. Export files to .apm format using the Windows command line interface:

>> exporter_cmd "C:\Documents\Patient.glr" "C:\Documents\Exported" "apm" "*DistanceToTarget*"

Matlab script examples are provided within the installation directory.

8. Help

Click **Help**->**Contents** menu to access the help file.
Click **Help**->**About** menu to view details on this application including a short description and the current release number.