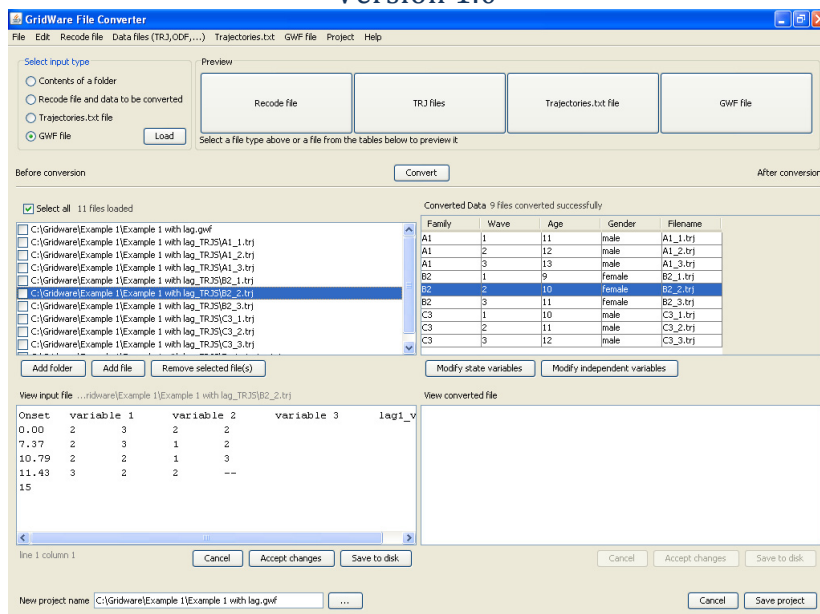


The GridWare File Converter Manual

Version 1.0



Overview

The GridWare File Converter is a versatile, user-friendly tool to prepare files for use in [GridWare](#). The converter currently can only handle two input formats: [Noldus Observer](#) files (*.odf) and existing GridWare files (*.trj, *.gwf). Multiple files can be converted at one time and the GridWare File Converter will even create a *gwf file template based on the input files. Thus, there are two possible sets of steps in the conversion process:

1. [Raw Data \(Noldus ODF files\)](#) → Recode Scheme → [TRJ files](#) and GWF Template
2. [TRJ files](#) → Edit State Variables → new TRJ files and revised GWF file

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i. System Requirements

The user must have Java 2 Platform, JRE Version 1.5 (or later) installed on their computer. The Windows version can be downloaded for free from the Java web site (<http://www.java.com>) and the Mac version can be downloaded from www.apple.com/java. GridWare can be run on Windows XP and Mac OS X. The Windows version may run on other versions of Windows but the Mac version will not work with Mac OS 9 or earlier.

ii. Installation Instructions

The Windows download is compressed in a zip format (www.winzip.com for a free download of the decompression software) and the Mac download is compressed in StuffIt format (www.stuffit.com for a free download of the decompression software, although it should be present on a Mac by default). Once you have downloaded the compressed file, decompress it (double-click to open, right click to select decompression application, or open it from a decompression application) and save the GridWare File Converter in a folder of your choosing. The GridWare File Converter will run on data files that are located in another folder anywhere else on the computer's hard drive.

iii. Contact Information

The GridWare File Converter was programmed by Ji Cho, Shawn Drape, and Vishnu Nair at Queen's University under the direction of [Tom Hollenstein](#), who wrote the manual and is available for consultation and technical assistance in the application of this software.

1. GridWare Data Format (GridWare File Converter Output)

This section describes the file formats that [GridWare](#) requires to run. Therefore, these are the formats of the output from the GridWare File Converter.

All data for a project should be saved in the same folder (the data must be within a subfolder – see below), although this does not have to be the same folder as the [GridWare](#) program. There are 2 file types necessary for input to [GridWare](#). The first is the raw trajectory data, one file for each trajectory. The second is a single text file that is the list of the Trajectory files. This is the [GridWare file \(*.gwf\)](#) that specifies the variables and values for each trajectory. Before using [GridWare](#), the user must prepare these files according to the following specifications.

IMPORTANT! The folder that contains the data ([Trajectory Files](#)) must be in the same directory as the [GridWare File or Trajectories List File](#). This folder must be named in this way: the name of the [Trajectories List File or GridWare File](#) followed by “_trjs”. For example, if the name of your GridWare File is “Cohort 1.gwf”, then the data to which “Cohort 1.gwf” refers must be in a folder named “Cohort 1_trjs”. Each time you [save](#) in GridWare, the [Trajectory Files](#) in the folder get overwritten to include information about the changes made and the color and position of all the nodes. Therefore, it is recommended that the user keeps a copy of the original [Trajectory Files](#) somewhere else as a backup before [starting a new GridWare project](#).

1.1 Trajectory Files:

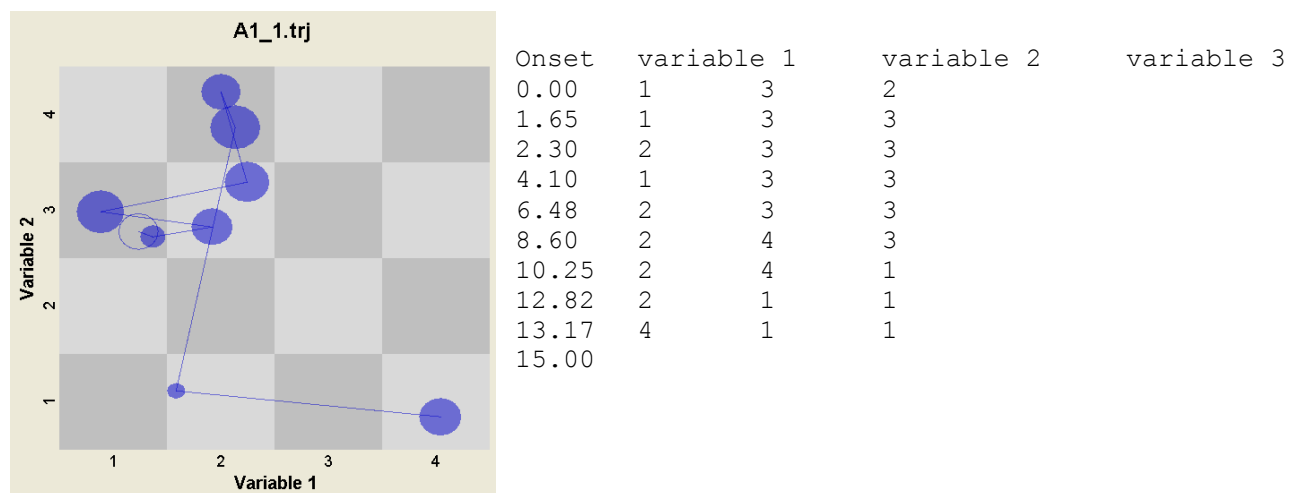
The structure of each Trajectory file is as follows:

- The first row contains the labels for each column
- There must be only one column for onset times, and at least 2 other columns of time series data (state variables)
- Each row is a new event. For event-based data where each new row is not an onset time but a new event, ONSET can be simply an ordered sequence of integers.
- the final row must have only a time value, but no values or spaces for any other variable. That is, the last digit of the last onset time (end time) must be the end of the file. This value represents the OFFSET of the final event
- Onset time for each event must be the first column. These times can be in one of several formats: decimal (...0000.000...), real time (hh:mm:ss), or a combination (mm:ss.00). All onsets will be converted to seconds, however, both within the

onscreen display and in any file output, including when re-saving trajectory files.

- Separation between columns **must be tab delimited**. Blank spaces are considered part of a single text label or value.
- Missing events (i.e. points where subject is inaudible or out of view) must be represented with a symbol that is consistent with the user-defined symbol set in the [Preferences](#) menu option. It is recommended that the user select a missing symbol (i.e. "*" or "." or "NA") which is compatible with the statistical software that will be used with the exported measures. The default symbol is "-". See [Tips and Troubleshooting](#) for details about how to change the missing value symbol.

For example, here is a short trajectory file ("A1_1.trj") with 3 state variables:



In this file, the trajectory starts in variable 1 = 1, variable 2 = 3, and variable 3 = 2. The next event is 1.65 seconds (or whatever time units these values represent) later when variable 3 switches to 3, but the other two variables remain the same as before, so the display does not change. At 2.3 seconds, variable 1 now shifts from category 1 to category 2. The trajectory ends at 15 seconds.

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1.2 GridWare File (*.gwf) and the Trajectories List File

A [GridWare](#) file begins as a Trajectories List File that the user wants to put into [GridWare](#). Before the first use, the Trajectories List File need only contain a minimum of one column of ID's and one column of Trajectory file names. This file is also [tab delimited](#). This is the file that allows the user to specify other variables that are associated with each trajectory. Hence, these variables are called [trajectory variables](#). These variables may specify gender, the wave of the study, classifications

of those on whom the trajectory is based (i.e. depressed/non-depressed, familiar peer/non-familiar peer), experimental condition, or any other grouping which distinguishes one trajectory from another.

For example, a longitudinal observational study of children's behaviour with both father and mother might have a Trajectories List File that looks something like this:

Family	Wave	Age	Gender	Filename
A1	1	11	male	A1_1.trj
A1	2	12	male	A1_2.trj
A1	3	13	male	A1_3.trj
B2	1	9	female	B2_1.trj
B2	2	10	female	B2_2.trj
B2	3	11	female	B2_3.trj
C3	1	10	male	C3_1.trj
C3	2	11	male	C3_2.trj
C3	3	12	male	C3_3.trj

In this file, Family and wave correspond to the file name. Wave designates the wave of observation for each trajectory, Age indicates the age of the child, and Gender indicates the child's gender, and the file names are the Trajectory files that contain the multivariate time series data.

Once this file is read in to [GridWare](#) and the trajectories are displayed, it is saved upon closing as a GridWare File. The saved GridWare File contains the original information provided by the user plus has all of the other specifications (variable definitions, preferences, axis labels) necessary for each subsequent use. It is possible for the user to edit or even create the full, saved version of a GridWare File from scratch. Some users may find this a better way to prepare their files. However, there are strict limitations to the format of the file (i.e. [tab delimiters](#)) and [GridWare](#) simply will not run if there is any deviation from the format (see section [2.1 Opening a New Project](#)).

For the above example, the saved GridWare File might look like this:

```
<GridWare>
<Config>
trajectory    categorical    family
trajectory    ordinal wave    1      3
trajectory    ordinal age     9      13
trajectory    categorical    gender
state ordinal variable 1    1      4
state ordinal variable 2    1      4
state ordinal variable 3    1      4
MinReturns    2
MaxReturnTime 10
MaxReturnVisits 6
MinEventDuration    0
MinCellDuration 0
MissingValueSymbol  --
</Config>
<Trajectories>
Family Wave Age Gender Filename
A1 1 11 male A1_1.trj
```

A1	2	12	male	A1_2.trj
A1	3	13	male	A1_3.trj
B2	1	9	female	B2_1.trj
B2	2	10	female	B2_2.trj
B2	3	11	female	B2_3.trj
C3	1	10	male	C3_1.trj
C3	2	11	male	C3_2.trj
C3	3	12	male	C3_3.trj

</Trajectories>

</GridWare>

In this example file, the lines in red text are opening and closing tags that signal the different parts of the file. The Config section (<Config> to </Config>) specifies all the variable definitions and preferences. The trajectories section (<Trajectories> to </Trajectories>) is the specification of trajectory variables and the file names of the individual trajectory files. The contents of this section are identical to the contents of the Trajectory List File which the user must create before the first use of GridWare.

The blue colored lines in the Configuration section are the variable definitions for the [Trajectory Variables](#). The first column is always “trajectory”, the second column specifies the variable format (categorical or ordinal), and the third column is the [Trajectory Variable](#) names. For categorical variables, the fourth column and beyond are the discrete categories (i.e. Family ID’s) for that variable. If the user is creating the GridWare File from scratch, it is not necessary to specify these categories – GridWare will include them when the file is saved. For ordinal variables, the fourth column is the minimum value and the fifth column is the maximum value.

The purple colored lines are the definitions for the state variables (in the individual [Trajectory Files](#)). The first column is always “state”, the second column is the variable format (ordinal or categorical), and the third column is the state variable name. If the state variable is ordinal, a minimum and maximum value must be provided in the fourth and fifth columns, respectively. Unlike Version 1.0, Version 1.1 now saves the labels for variables in the [Trajectory Files](#) directly and any edits (i.e. giving text names to integer categories: 1 = hostile, 2 = neutral, etc.) *overwrite* the original [Trajectory Files](#). See section on [Saving a Project](#) for more details.

The green colored lines are the user preferences for methods of calculating measures and the missing value symbol. [Preferences](#) can be easily edited from within the program. See the section on [measures](#) for an explanation of these values.

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1.3 GridWare Variable Types

Trajectory variables (columns within [GridWare File](#) or Trajectories List File):

These are variables that together uniquely identify, describe, classify, index or are otherwise associated with the trajectory or the source of the trajectory data. At minimum, the ID variable in the [GridWare File](#) must be entered here. Variables

such as gender, experimental condition, and diagnosis are just a few examples of Trajectory Variables.

State variables (columns within each [trajectory file](#) except ONSET):

These are the time-series variables which define the events within a [Trajectory file](#). Missing values are possible states that will be displayed as dotted lines when plotted on the grid.

2. GridWare File Converter Data Formats (Input)

There are two possible input formats for the Converter. First is a Noldus data file (*.ODF, henceforth identified as an ODF file) from the Observer program. The second possible input file is an existing [Trajectory \(*.TRI\) file](#) that can already be used in [GridWare](#). Because the [Trajectory Files](#) were described above, only the ODF files will be described in this section.

2.1 ODF files

ODF files are text files that are the output from the [Noldus Observer](#) program up to version 5.0. After version 5.0 (e.g., 6.0, XT), ODF files need to be exported from the xml format that is now used. See the Observer XT User's Manual for instructions.

Each ODF file (see example below) is structured such that there is a header section with information about the coding configuration, what was coded, and when it was coded (red section below). The next section identifies the media that was coded (e.g., the video file), beginning with {media} and ending at {indvar}. Next are the Independent Variables designated for that project – this section is bounded by {indvar} at the top and {start} at the bottom (see blue section). These independent variables will be saved during the conversion process as [Trajectory \(aka Filter\) Variables](#) that uniquely identify each trajectory. The data to be converted into [Trajectory Files](#) is in next section bounded by {start} at the top and {end} at the bottom (see green section). Finally, there is the {notes} section.

```
SPAFF10 GAP.cnf

04-24-2004
00:04:00.00
{media}

D:\par001.mpg

{indvar}
001
2
D2
1

{start}
0.00 Child,0:neutral
0.00 Mother,0:neutral
```

```

0.96 Child,3:humor
4.53 Mother,3:humor
7.66 Mother,0:neutral
14.50 Mother,4:interest
18.16 Mother,0:neutral
19.13 Mother,3:humor
21.40 Child,4:interest
21.60 Mother,4:interest
22.36 Mother,3:humor
23.16 Mother,0:neutral
24.66 Mother,4:interest
25.80 Child,0:neutral
27.30 Mother,3:humor
30.66 {end}
{notes}

```

The codes for an ODF file are recorded as *Subject,Code,Modifier* – comma separated mutually exclusive values that are part of the coding scheme. In the example above, no modifier was used. For the GridWare File Converter, each unique value that precedes the first comma (i.e., the Subject) will become a column heading. Thus, for the example above, there will be a Child column and a Mother column. These are the [State Variables](#) with each [Trajectory File](#). The values that come after the first comma will be used to create the values of the [State Variables](#) as specified by the [Recode File](#)

2.2 Recode File

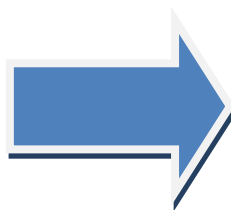
The Recode File specifies how each *possible* [State Variable](#) value should be converted from [ODF](#) format to [TRI](#) format. Thus, if the coding scheme has 3 Subjects (e.g., Mom, Dad, Child) and 4 mutually exclusive and exhaustive codes for each (e.g., Hostile, Negative, Neutral, Positive), there are 12 unique states that must be recoded. Below is an example (tab-delimited) Recode File that works on the above [ODF](#) file example:

RECODE FILE

```

Mother,0:neutral  Mother,5
Mother,1:affection  Mother,9
Mother,2:excitement  Mother,8
Mother,3:humor  Mother,7
Mother,4:interest  Mother,6
Mother,5:whine  Mother,4
Mother,6:sad  Mother,3
Mother,7:fear  Mother,2
Mother,8:anger  Mother,1
Mother,9:contempt  Mother,0

```



TRAJECTORY FILE (TRI)

```

onset  Child  Mother
0.00  5      5
0.96  7      5
4.53  7      7
7.66  7      5
14.50 7      6
18.16 7      5
19.13 7      7
21.40 6      7
21.60 6      6

```


Child,0:neutral	Child,5	22.36	6	7
Child,1:affection	Child,9	23.16	6	5
Child,2:excitement	Child,8	24.66	6	6
Child,3:humor	Child,7	25.80	5	6
Child,4:interest	Child,6	27.30	5	7
Child,5:whine	Child,4	30.66		
Child,6:sad	Child,3			
Child,7:fear	Child,2			
Child,8:anger	Child,1			
Child,9:contempt	Child,0			

The Recode File must include a tab between the ODF Subject,Code combo and the Trajectory File StateVariable,StateValue combo. Note that the Recode File can also be used to decrease the number of code categories. For example, instead of the [ODF](#) 10 code system (codes 0 through 9), the user may want to only have 4 values per [State Variable](#): Externalizing (1: Contempt and Anger), Internalizing (2: Whine, Sad, and Fear), Neutral (3: Neutral), and Positive (4: Affection, Excitement, Humor, and Interest). In that case, the user could run the following Recode File to obtain the desired Trajectory File values.

RECODE FILE

TRAJECTORY FILE (TRI)

Mother,0:neutral	Mother,3	onset	Child	Mother
Mother,1:affection	Mother,4	0.00	3	3
Mother,2:excitement	Mother,4	0.96	4	3
Mother,3:humor	Mother,4	4.53	4	4
Mother,4:interest	Mother,4	7.66	4	3
Mother,5:whine	Mother,2	14.50	4	4
Mother,6:sad	Mother,2	18.16	4	3
Mother,7:fear	Mother,2	19.13	4	4
Mother,8:anger	Mother,1	21.40	4	4
Mother,9:contempt	Mother,1	21.60	4	4
Child,0:neutral	Child,3	22.36	4	4
Child,1:affection	Child,4	23.16	4	3
Child,2:excitement	Child,4	24.66	4	4
Child,3:humor	Child,4	25.80	3	4



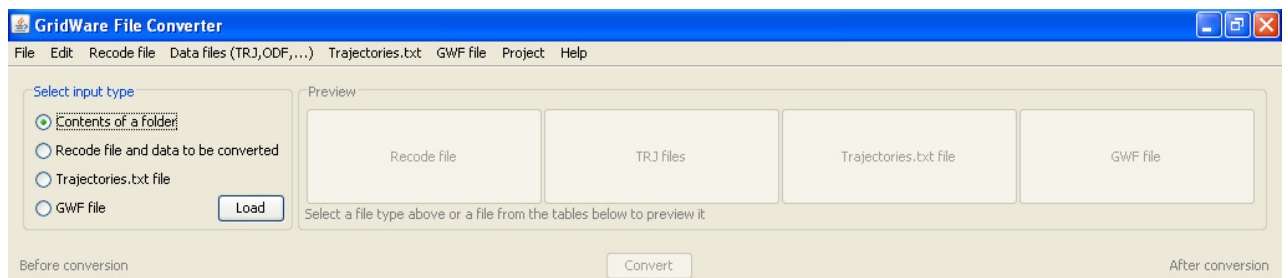
Child,4:interest	Child,4	27.30	3	4
Child,5:whine	Child,2	30.66		
Child,6:sad	Child,2			
Child,7:fear	Child,2			
Child,8:anger	Child,1			
Child,9:contempt	Child,1			

Note: The Recode File must be exhaustive. It must account for every possible code in the Observer coding scheme. Failure to do so will result in errors when attempting to run GridWare. Also, the Recode file must end with the file extension .rec in order to run.

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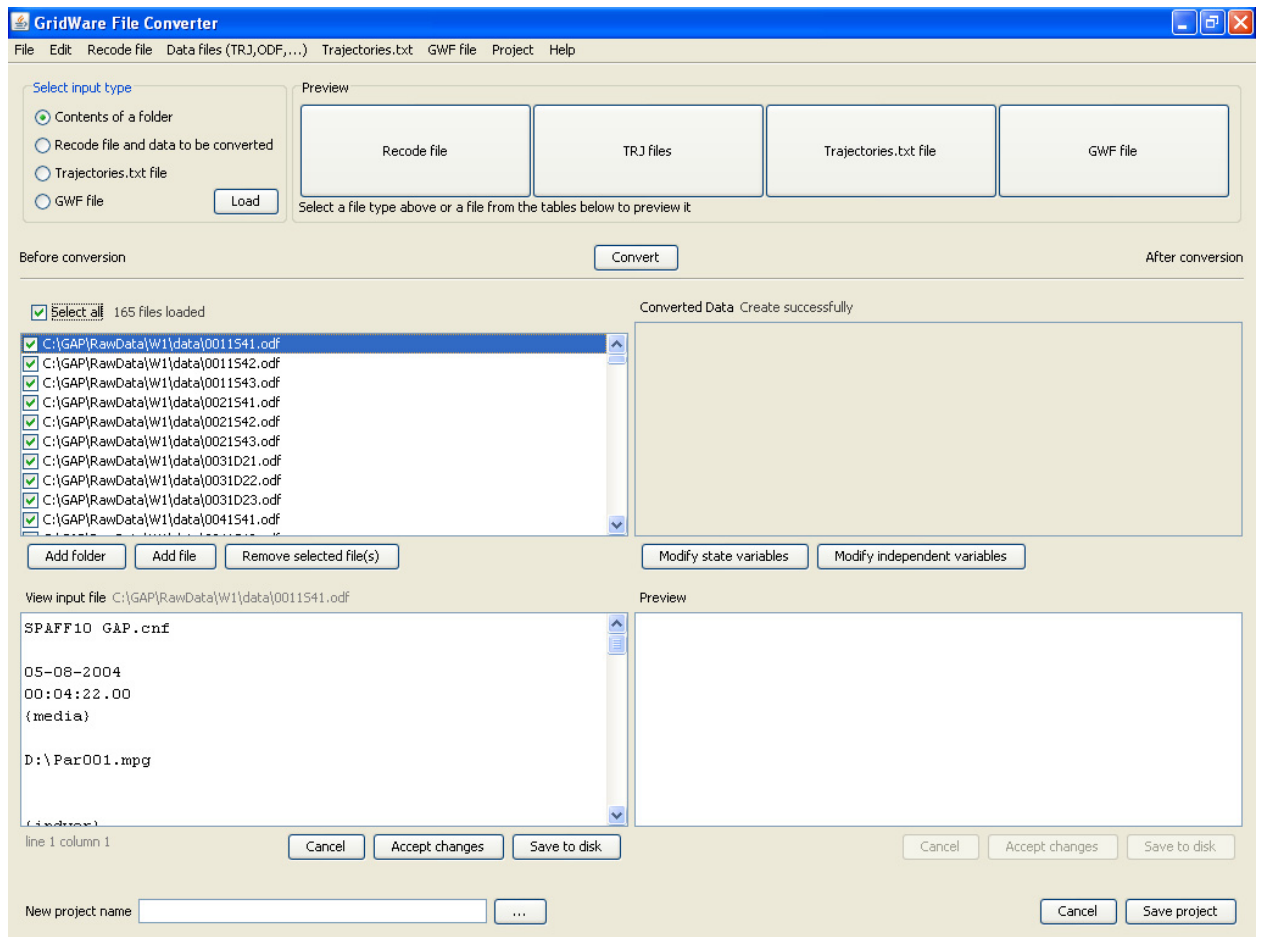
3. The GridWare File Converter

The GridWare File Converter performs two general types of transformations. One is to create new trajectory files from Noldus Observer [ODF](#) files, the other is to edit existing [TRJ](#) files into new [TRJ](#) files. In both cases, a [GridWare File \(*.GWF\)](#) is created that corresponds with the converted data. When the GridWare File Converter is first opened, the top of the window looks like this:



The user then must choose one of four input types that correspond to the desired procedure. The first two input options (“Contents of a folder” and “Recode file and data to be converted”) are used when converting [ODF](#) files into [TRJ](#) files (see section [3.1 Creating New Trajectory Files](#)). The second two options can be used when [TRJ](#) files are the input (“[Trajectories.txt](#) file” and “[GWF](#) file”) and the user wishes to modify these [TRJ](#) files (see section [3.2 Editing Existing Trajectory Files](#)). Once data have been loaded into the GridWare File Converter, the four large buttons in the Preview section will be enabled. Clicking on these will show a preview of the file selected ([Recode](#) file, [TRJ](#) files, [Trajectories.txt](#) file, or [GWF](#) file) in the Preview Window below.

The GridWare File Converter after loading input data but *before* data have been converted.



3.1 Creating New Trajectory Files (ODF → TRJ)

The GridWare File Converter provides two input options for processing [ODF](#) files.

1. **Contents of a folder.** With this option, the user can simply select a folder within which the [ODF](#) files have been saved. It is best if the folder only contains [ODF](#) files and no other files. Once open, the files will be listed on the left side of the bottom half of the screen: The Before Conversion side. Using this option will then require a second step to load the Recode file, which is useful if the Recode file is saved in a folder other than the folder that contains the [ODF](#) files.
2. **Recode file and data to be converted.** This option allows the user to select specific [ODF](#) files within a folder and a Recode file as long as it is in the same folder as the ODF files.

3.1.1 Recode File.

The [Recode file](#) can be a preexisting file created by the user in a text editor or it can be created within the GridWare File Converter program. The file must be tab-delimited. Also make sure that the file name ends with `.rec` extension.

Creating the Recode File before starting the project: The user may create a [Recode File](#) using any basic text editor (e.g., Simple Text, Note Pad; I strongly recommend TextPad at www.textpad.com - *do not use Microsoft Word* because some of the

embedded information interferes with the program) according to the format described in [section 2.2](#). The user may still edit the Recode file from within the GridWare File Converter program later. Select the Recode file from the list of files in the top window of the Before Conversion section (you may have to scroll to find it in the list). The Preview Window below will now contain the Recode file. The user can type directly in that window to edit. To save the file, click the Save to Disk button at the bottom of the Preview window.

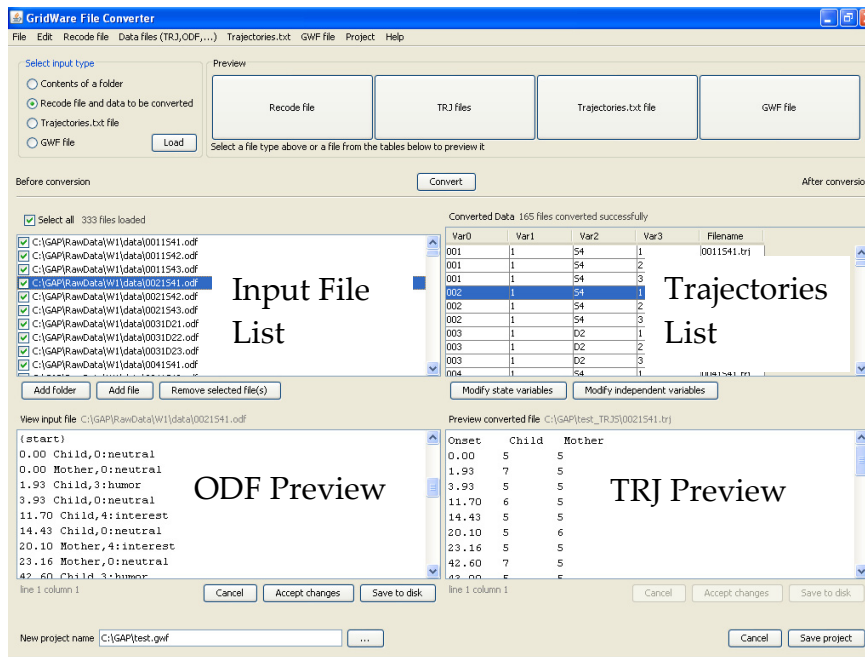
Creating a new Recode File within the GridWare File Converter: On the menu bar at the top of the screen, there are two ways to open a new Recode file: (1) File → New → Recode File or (2) Recode File → New. With either method, a window pops up so the user can select the folder where the new recode file will be saved as well as the name of the file. Once the desired folder is in view, type the name of the new [Recode file](#) in the file name blank at the bottom of the pop-up window. Click New when done. This adds the new file name to the list of files in the top window of the Before Conversion section (you may have to scroll to find it in the list). Select the new [Recode file](#) and the Preview Window below will be blank. The user can type directly in that window to create the new [Recode file](#) according to the format described in [section 2.2](#).

Alternatively, after the new recode file has been named, the user can select Recode File → Autogenerate Recode File from the menu bar at the top of the screen. This creates a template that shows up on the Preview Window on the *right* side of the screen – the After Conversion side. This file will still require editing because (a) the new values have yet to be entered and (b) it is generated from the ODF files, thus although all of the codes found in the existing data are present, the Recode file may not exhaustively account for the entire coding scheme (i.e., it may not have all of the *possible* ODF codes listed). This can be a problem down the road if the user wants to recode other data with this file. To complete the editing process, the new Recode file must be shown in the Before Conversion Preview Window. To do so, simply re-select the Recode File from the list (this may require selecting another file first and then re-selecting the new Recode file name).

3.1.2 Conversion.

Conversion provides three outputs: (1) one TRJ file for every loaded ODF file, (2) a trajectories list created from the filenames and independent variables from the ODF files and (3) a GWF file. Once all of the ODF data files and Recode file have been loaded and are selected (use the Select All button at the top of the Before Conversion list), click the Convert button at the center of the screen. The user will be asked to provide the name of the new GWF file that will be created.

The GridWare File Converter window will now have information in the After Conversion section.



The converted data are viewable at this point, but not yet saved to disk. Check the files to make sure the conversion worked as expected. If all is correct, then click the Save Project button on the bottom right of the screen. This will create the GWF file named earlier and also a folder containing all of the TRJ files. As per GridWare conventions, the folder has the same name as the GWF file but with “_trjs” appended. For example, if you named your GWF file Project1.gwf, then the new folder would be Project1_trjs.

*******Note that the GWF file is not complete – it is merely a template that contains the trajectories list. See the GridWare manual and examples for instructions as to how to edit this file. *******

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3.2 Editing Existing Trajectory Files (TRJ → TRJ)

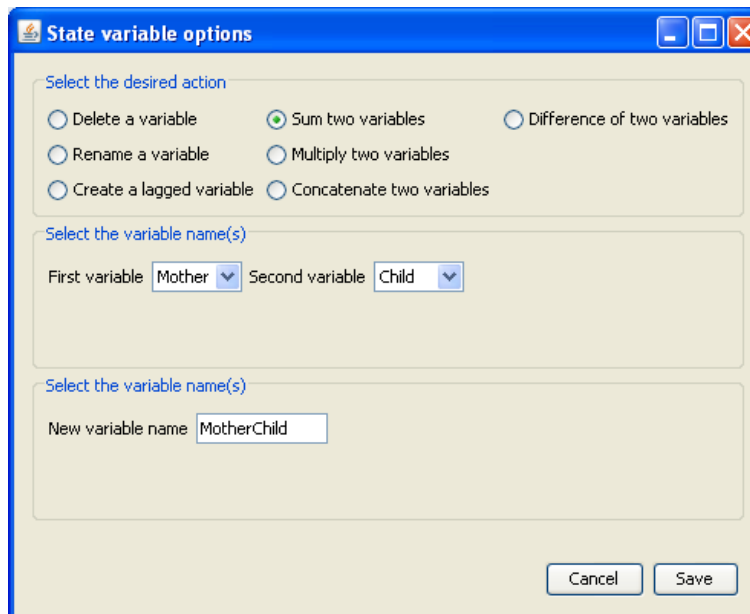
Sometimes a user may wish to edit an existing [GridWare](#) project so that the [State Variable](#) in each trajectory file are transformed in some way. This process includes 3 steps: Selecting the Data to Be Converted, Selecting the Transformation, and Creating the New Variable. The seven options with the GridWare File Converter are:

- Delete a [State Variable](#)
- Rename a [State Variable](#)
- Or create a new [State Variable](#) by:
 - Adding the numeric values of two [State Variable](#) together
 - Subtracting the numeric value of one [State Variable](#) from another
 - Multiplying the numeric values of two [State Variable](#)
 - Concatenating (appending in sequence) two [State Variable](#)

- Creating a lagged [State Variable](#) (i.e., the second event becomes the first event, the third event becomes the second event, etc.)

3.2.1 Selecting the Data to Be Converted.

To edit TRJ files, the user must load in the folder with all of the TRJ's to be converted. This can be done via the Load button at the top left portion of the window to select a GWF file (or File→Open→GWF File). This will load the GWF file *and all of the TRJ files listed in the GWF file.*



3.2.2 Selecting the Transformation.

To access the State Variable Options window, use the Data Files (ODF, TRJ...) menu to select one of the three transformation types or the “Modify State Variables” button on the right side of the GridWare File Converter window just above the converted data preview window. Select one of the seven options at the top of the State Variable Options window. For three of these only one variable can be selected in the middle part of the window (Rename, Delete, Lag), whereas the other four options require two State Variables to be specified. The order of first and second variable corresponds to the order of operations (i.e., what gets subtracted from what). For all but the Delete option, a new variable name must be specified. When all three sections of the State Variable Options window have been completed, click the Save button on the bottom right to *save* the variable creation parameters – this creates but does not yet actually save the new variables.

It is useful to check this transformation by previewing a few of the files. They are displayed on the Before Conversion side of the screen (note that this may seem counterintuitive but the new TRJ files and GWF file have not yet been saved to your hard drive).

3.2.3 Creating the New Variable.

Once the data are loaded and the transformation is selected, select all of the TRJ files that are to be converted in the Before Conversion window on the left. Then, click the Convert button at the center of the screen. Finally, click the Save Project button on the bottom right of the screen. A window will appear and the user is required to name this modified GridWare project by a different name. The new project name will be applied to the new GWF file and the new TRJ folder.

Only one new [State Variable](#) can be created at a time. Thus, combinations of three or more variables require two or more steps. These steps can be taken with the same data before it is saved as a new project on your hard drive. That is, you can make several transformations before saving the project.

******Note: Independent or Filter variables can be edited with this function too. Follow the steps outlined above except select the "Modify Independent Variables" button instead. ********

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3.3 Preparing the converted data for use in GridWare

The data output from the GridWare File Converter should be usable with the [GridWare](#) program. That is, you should have a new GWF file and a folder with the corresponding TRJ files. As with any file conversions, it is strongly recommended that you check you're your new GWF looks correct and that a spot check of your TRJ files reveals no unexpected text.

Please consult the [GridWare manual and website](#) for more information.

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4. Tab-delimited Text Files

The files exported from [GridWare](#) are tab-delimited. That is, each value in a row is separated by a tab, rather than a space or a comma. When viewing these files as text, this will make the column labels and column values not line up and may be visually confusing. However, this format allows for the easiest integration with other spreadsheet software. The user can cut and paste or import the exported measures text file into most statistical packages for further analysis.

This is also the reason why we recommend using tab-delimited text files for the raw trajectory data and the [GridWare](#) file. This is the easiest format to transfer files from other software. It also allows for spaces to be considered text characters for easier variable naming (i.e. Father Affect instead of FAff or FatherAffect or some other less readable format).

5. Tips and Troubleshooting

The GridWare File Converter is a work in progress. The menus and buttons have a high degree of redundancy but not all of them work without errors or dead ends. The steps outlined in this manual will work if you follow them directly. Any problems or suggestions should be sent to support@statespacegrids.org .

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