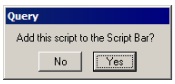
Merge files

This script allows you to merge Spike2 time views and copy data from one time view to another. By *merging*, we mean, among other things, *concatenating* channels from different files, (linking end to end) or *stacking* channels from different files one above the other.

When you run this script for the first time, you will be prompted to add a button to the Script Bar. If you click on Yes then you will get a button labelled Merge, that will give you one-click access to the script. If you choose No then you will be prompted to 'comment out' a line of code in the script so that you are not nagged to create the button every time.



Add apostrophe here and re-save the script

```
'MAIN
rootpath$:=FilePath$(2);                                    'path to Spike2 application
set$:="Merge|"+rootpath$+"\scripts\\MergeFiles.s2s|Copy/Paste, Edit and Merge .smr files";
'-------------------------------------
AddScriptBarBtn%(set$);    'Comment this line if you do not want to be "nagged" to create a button on the script bar
'-------------------------------------
HideApps();
```

Note that the script bar button will only work if the script is stored in the scripts folder of the active version of Spike2. If you keep the script elsewhere then you will need to edit the file path in the `set$:=…` line of the script (above) accordingly. The script will create a new hotkey after a major upgrade of Spike2, for example, from version 6 to version 7.

USER GUIDE

This script allows you to:

- Merge all the time views in a selected folder into a single data file
- Combine data files in groups, for example merging files 1-5, 6-10, 11-15 and so on... , in order of creation date.
- Copy and paste data between open time views.
- Delete data from selected time ranges in a time view

The maximum number of channels that you can copy is 399. At the time of writing, time views are limited to 400 channels. However, the script reserves one channel for TextMarks that store information on the channels and time ranges that were copied.

Limitations

Note that the script does not merge Virtual channels or duplicated channels. You need to save the data to disk-based channels before running the script. Also, the script does not preserve groups of channels and order of display. You may have to re-order channels manually after merging

Merge Files toolbar

Merge all time views in a folder

Use this feature to create a new file or files containing the data from a batch of source files linked end to end in order of creation date. This process is intended primarily for merging files that were recorded with the same sampling configuration. The script will alert you if you try to combine files that are not fully compatible, that is, channels with the same channel number but different channel type or channel title. You will have the opportunity to Cancel or Continue. If you proceed, the script will use cubic splining to make the best possible job of representing all the data given the time resolution and sampling rates set by the first file in the batch. Details of which channels were copied where are stored in TextMarks in a channel entitled *merge info*.

Alternatively, you can add data from a batch of source files into new channels in the destination file so that the data are stacked in the same time range one above the other. The same size limits apply to merged files as individual files. You are not allowed to grow a file beyond 2 GB or 2 Giga clock ticks at the chosen sampling resolution

Batch Process

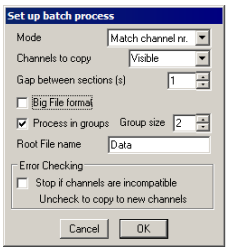
Click the Batch Process button on the script toolbar. Browse to the folder containing the batch of data files to merge by double-clicking on the folder icons in the *Select folder* control panel and click on OK.

The *Set up batch* dialog will open. This dialog has the following items:

Mode

There are 3 options:

- *New channels* adds each data channel in a source file to a new channel in the destination file, that is, superimposed upon a common x-axis (*stacking*).
- *Match channel nr.* chains the contents of matching channel numbers in the source files end-to-end in creation date order.
- *Match channel title* concatenates channels with the same title together chronologically. If more than one channel with the same title is encountered during processing, data will be added to the lowest-numbered channel with matching title and compatible data type. Thus, the system will cope with a waveform and an event channel both entitled *Activity* but not two waveforms or an Event and a RealMark with the same name.



Channels To Copy

Choose an option from the drop-down list, that is, *All* or *Visible*. Alternatively, enter a channel specification (e.g. *1..4,6*) to define a subset of channels to process. If you choose the *Visible* option then you should review all the files in the batch before processing to ensure that the *Show/Hide* state of the channels is what you require.

Gap Between Sections

This item is enabled when chaining data sections end to end. It allows you to set a short gap between data sections from different source files. You can set the gap to zero to simulate continuous data.

Big File format

Checking this box allows you to create destination files that are larger than 2GB though you are still not allowed to flout the 2 Giga-clock tick limit. This feature may be useful for stacking large data files or concatenating files generated with particular types of sampling configuration. However, *Big* files will not be readable by older versions of Spike2 (pre 6.14). You should also bear in mind that files of this size are unwieldy and time-consuming to process.

Process In Groups

By default, all *.smr* files within a folder are processed into a single *new* destination file that remains open on the desktop until you save it. Checking this box, allows you to merge the source files in groups of a specified size, e.g. groups of 5. The additional dialog items *Group size* and *Root Filename* appear in the dialog when the box is checked. These allow you to specify the number of source files to merge in each group, and a root file name for the destination files created. The default naming scheme is: *Data 1-4.smr*, *Data 5-9.smr*, etc. The destination files will be saved to the same folder as the source files.

Error Checking

Various problems may arise during the processing of a batch of data. For example, the data type of a channel in the current source file may not be compatible with the type of the destination channel. The checkbox determines how such problems are handled.

If the box is unchecked then data which cannot be copied to the requested destination channel for some reason will automatically be copied to a *new* channel in the destination. A warning message will display for a few seconds before copying resumes. However, if

the checkbox is checked, then you will get the option to Abort or Continue if a problem is encountered.

Processing a batch

Click on OK to start batch processing.

Initially, the source files are sorted into date order based on the time that sampling started. If any files without a valid creation date are detected (e.g. files created using Spike2 v.4.02 or earlier) then you will be able to enter dummy creation dates via a dialog in order to ensure that they are added in the order that you intend. Any remaining files without valid creation dates will be ignored when merging files.

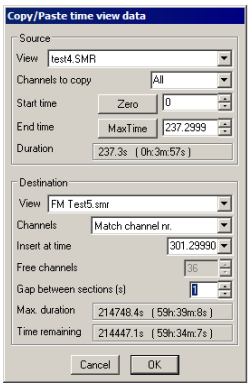
Next, the files are checked to make sure there are enough free channels and sufficient time available in the destination file to merge the data. The maximum allowed duration is set by the time resolution of the first (that is, the oldest) file in the batch. If a problem is detected you will have the option to copy as many files as possible or to cancel the process. The progress of the batch process will be shown on the toolbar and a list of files that were copied (and NOT copied) will be shown in the log window when the process finishes. If you create a single merged file then it will be shown on the desktop. Use the *Save As…* command on the Spike2 *File* menu to save it to disk with a name of your choice. If you create multiple files with the *Group* option, then the files will be saved to disk with the selected root file name followed by the range of source files, e.g., *data 1-5.smr*.

Copy and paste data between open time views.

You can use this option to perform the same tasks as the Batch Process option, manually. However, *Copy/Paste* does allow more flexibility in that you can select groups of channels in a time range in the source file and paste them into the destination channels at a user-defined time, overwriting pre-existing data if necessary. This option is intended primarily for copying and pasting data between channels and files that are fully compatible in terms of time resolution and sampling rates. However, if you decide to merge data with significantly different sampling rates, you can copy the data with the highest sampling rates into a *new* data file first in order to define the underlying time resolution. Waveform data that you paste in subsequently will be matched to this resolution by cubic splining.

Copy/Paste

Click this button to display the *Copy/Paste* dialog. The button will be disabled if no time views are open. The *Copy/Paste* dialog has the following items:



Source View

Select the view containing the data you wish to copy from a list of open time views

Channels To Copy

Type in a channel specification, such as *1,2,5..12* or choose an option from the drop-down list (*All/Visible/Selected*)

Start Time/End Time

Select the start and end time of the section to copy. You can do this by typing times into the selection boxes, clicking on the spinner controls or by fetching and dragging the start and end cursors in the source view. Clicking on the buttons, next to the time fields will toggle the times (and cursor positions) between the current display range and the start and end of the file. The duration of the chosen data section is shown at the bottom of the *Source* group.

Destination View

Select the destination file where the results should be pasted. This can be: an *Open* time view, a *New* time view or a *New* file in *Big File* format. Note that the source and destination must be different files. ***Always*** start a session with with a *New* empty destination view rather than tampering with one of your source data files.

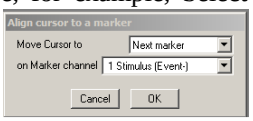
New (Big File) format allows you to create files of size >2GB but not exceeding 2 Giga clock ticks. This selection will increase the number of files that you can merge *if* the sampling configuration of the first file added would otherwise generate files that hit the size constraint *before* the tick count limit.

Channels Here you can select the channels to which the source data should be added. The options are: *New channels*, *Channels with matching channel numbers* or *Channels with matching channel titles*. When copying to existing channels, the script will check whether the source is compatible with the destination and warn you if there is a problem. The rules for copying between channels of different types are as described in the Spike 2 *Help* for the *ChanSave()* script command which is the function which does most of the heavy lifting performed by this script.

It is important to realise that the time resolution of the destination file will apply to any additional data that you paste in. The source data will be matched to the resolution of the destination file by cubic splining and this will result in a loss of 'definition' in the *Destination* if the source data has a higher resolution than the destination.

Insert At Time You can type in a time or select *MaxTime(), Cursor(1)* or *Zero* from the drop-down list. You are not obliged to paste the first data section in at time zero in the destination. You can paste it in at a time of your choosing and fill in the leading space later with data from other files. In this way, you can set the time resolution of the destination file to that of the first source file without prejudicing the final order of appearance of data sections. You are free to drag the cursor in the destination file to the required position at any time prior to clicking on OK in the dialog.

If you are adding data to *New* channels in the destination file rather than adding it to existing channels, then you can set the start time for pasting data to the position of an event or marker in a channel in the destination file. This is useful if you are trying to align data from multiple source files to a common trigger pulse, for example, Select *Cursor(1)* from the drop-down list. The *Align Cursor* button will appear. You can click on it to open a dialog that enables you to move the cursor from its current position to the next or previous event on the chosen event channel.



If you select a start time for pasting to existing channels other than *MaxTime()*, it is possible that existing markers or waveforms will be overwritten. You will be warned if this is about to happen so that you can cancel the operation if you have second thoughts. Note that all Markers/Events in a time range are deleted before any new ones are added.

Free Channels When creating a new time view, you can edit this field to specify the number of channels to create in the new file. When copying to an existing file, this field indicates how many unused channels are available for adding new data.

Gap Between Sections When adding data sections end to end, you can set a short gap between them in order to distinguish clearly between the end of one data section and the start of the next. You can set the gap to zero to simulate continuous data. It is important to eliminate gaps in the data if you intend to use scripts to analyse multiple sections of data. Many scripts use the *ChanData()* function which stops reading if a gap in waveform data is detected.

Max. Duration This is the maximum allowed length of the current destination file shown in seconds and in *hr:mm:ss* format. This upper limit is determined by the time resolution of the destination file. When you create a new destination file, it will have the same time resolution as the first source file that you add.

Time Remaining This is the amount of time available in the destination file for concatenating new data sections.

Processing a Copy/Paste operation

Click on the OK button to perform the *Copy/Paste* operation or Cancel to return to the toolbar. If the OK button is disabled, try pressing the *tab* key. If the OK button remains disabled, it means that one or more of the items in the dialog has not been filled in correctly.

When you click on OK, further error-checking is performed and any problems found will be reported in a warning message so that you can modify the dialog settings accordingly.

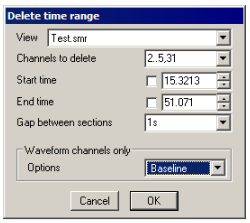
It may take a significant amount of time to copy large chunks of data. Please wait while the *Copying channel...* prompt is showing on the toolbar. If you are copying to a new file you will be prompted to enter a name for the new file before it is created. As in batch processing, TextMarks in the channel entitled '*Merge info'* store information about the source of the data that was pasted into the destination file. You can close data files that you have finished processing by clicking on their *Close* boxes and open new views to process via the Spike2 *File* menu. However, note that these options are not available while the *Copy/Paste* dialog is open.

Delete unwanted epochs of time view data

Example applications might be to delete artifacts or to create files containing *edited highlights* of your recordings for further analysis. You can delete data from individual or multiple channels. Waveforms can be replaced with a baseline at zero or a gap in the data. The gap can be of the same duration as the data section that you delete. Alternatively, you can close the gaps to a fixed user-defined duration, for example 1 second. A third option, is to eliminate the gaps altogether, linking the relevant data sections end to end with no gaps.

Delete

Click the Delete button on the script toolbar. This button will be disabled unless one or more time views are open on the desktop. The *Delete time ranges* dialog will open. This dialog has the following items:



View

Select the time view that you wish to edit from the drop-down list. Remember that you cannot undo deletions made with this script. Thus, it is *extremely unwise* to edit the master copy of your data. Make a copy of the file with a new name using the *Copy/Paste* feature of this script and edit the copy.

Channels To Delete

Type in a channel specification such as *2* or *2,4..7* or select an option from the drop-down list (*All*, *Visible* or *Selected*).

Start time / End time

Type in the time range for the deletion. Alternatively, drag the *Start* and *End* cursors in the time view. Clicking the 'checkboxes' next to these fields toggles the *Start* and *End* cursors between the beginning / end of the file and mid-screen positions. You can also click on the time view to bring it to the front and then click on *Ctrl+1* and *Ctrl+2* to fetch the time range cursors if need be.

Gap Between Sections

This field determines how the data will be displayed after the deletion. The options are:

- *No change:* data following the deletion stays in its original position.
- *No gap*: the data after the deletion is shifted to the left and connected to the data preceding the deletion with no gap.
- *1s / 0.1s:* These options shift the data following the deletion to the left but leave a gap of the specified duration to indicate where the deletion was made. You can also type in a value of your choice for the gap duration.

Options

This item applies only to waveforms and RealWaves and determines whether gaps between deletions should be linked by a baseline at zero or whether the sections of waveform should be left unconnected. It may be better to connect gaps with a baseline if you are planning further analysis of your data using a script. This is because the action of some script commands, *ChanData()*, for example, will not read past a gap in the data.

Note on Marker filters

When deleting time ranges of marker channels with a marker filter applied, the script will only delete currently visible items from the time range. Hidden ones will be revealed in the gap between time ranges if you change the marker filter. This assumes, of course, that the gap caused by the deletion was not closed. If you close up the gap created by a deletion, then hidden markers in the region of overlap are also deleted.