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News

US Training Days 2013

These two-day comprehensive training sessions are suitable for beginners and more experienced users and will demonstrate how to use Spike2 and Signal for your particular research requirements. [Follow this link to register.](#)

New CED 4401 Frequency multiplier



The CED 4401 is designed for use in locking the sampling clock of a CED 1401 data acquisition unit to an external reference frequency, such as those encountered in other sampling systems. Suitable inputs are TTL signals that are stable sub-multiples of 20MHz. The CED 4401 takes this frequency and multiplies it up to the 20MHz needed to feed the external synchronising input of a CED 1401. The power LED on the CED 4401 turns from red to green when a usable input frequency is detected.

Future meetings and events

Inhibitory Control of Brain Plasticity Research Conference

Krakow,
Poland
September 5th - 7th 2013

11th International Congress of The Polish Neuroscience Society

Poznan,
Poland
September 15th - 17th 2013

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[CED US Training Days 2013](#)

Wyndham San Diego Bayside Hotel
San Diego, CA
USA
November 7th - 8th 2013

[Society for Neuroscience 43rd Annual Meeting](#)

San Diego, CA
USA
November 9th - 13th 2013
Exhibit dates: November 10th – 13th 2013

Latest versions of Spike2 and Signal

Updates for Spike2 and Signal are available from the [CED Downloads](#) page, or by clicking on the links in the table below. Demonstration versions of the latest software are also available.

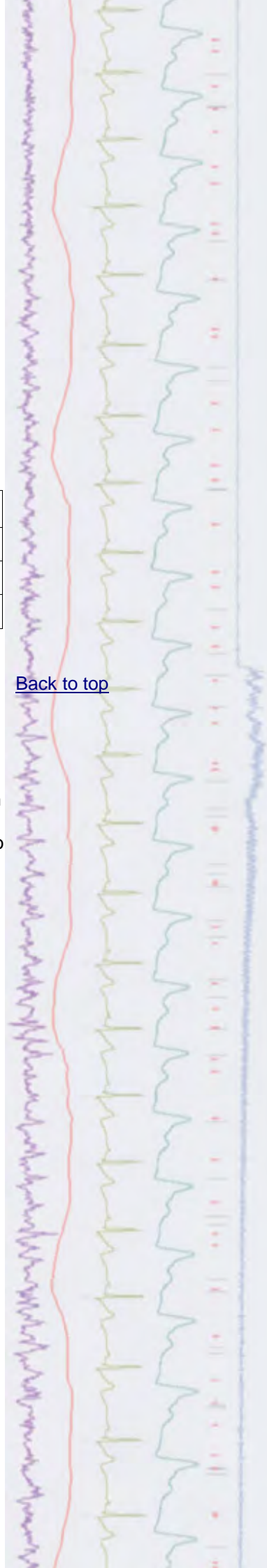
Spike2 downloads	Released	Signal downloads	Released
Spike2 version 7.12b	07/13	Signal version 5.09	05/13
Spike2 version 6.17	10/12	Signal version 4.10	10/12
Spike2 demo	03/13	Signal demo	06/12

Scripts Spotlight

It is often the case that you want to monitor the current state of an experiment and run various functions when a certain condition has been met. For example, waiting for the data to cross a threshold and then marking the position with a cursor. Of course you could task a student to sit and watch the experiment and do this manually, but it might be kinder and probably more efficient to use an on-line script. When using a script with a toolbar, it is possible to set-up an Idle function, linked to the toolbar button 0, which will run continuously whenever Spike2 or Signal has free time. You can then use this to respond to changes occurring in the file.

The example script, [FindIntersect.s2s](#), sets up a vertical cursor on channel 1 and then automatically places a horizontal cursor at the first intersect point where the data crosses the vertical cursor in the current time range. If the cursor is re-positioned, the idle routine will update the horizontal position in response. You can replace the example code in this Idle routine with your own analysis functions.

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Spike2



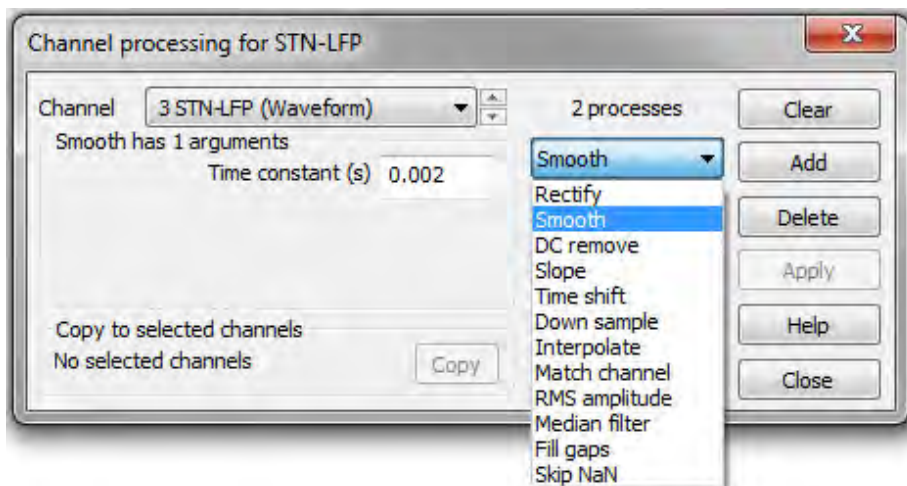
Show me How!

Click here to view a video tutorial on channel processes in Spike2

- Q. I've just started recording EMG data with Spike2 and would like to know how I can add rectification and a moving average filter to my traces for analysis
- A. Spike2 includes a number of channel processing options that can be applied to Waveform or RealWave data channels. Channel processes are dynamic and do not affect the data stored on disk, but use the raw data to display a calculated version of the processed trace on-screen.

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Channel processes are applied from the `Channel Process` dialog, which is available from the `Analysis` menu, or by right-clicking on a channel in the data file.



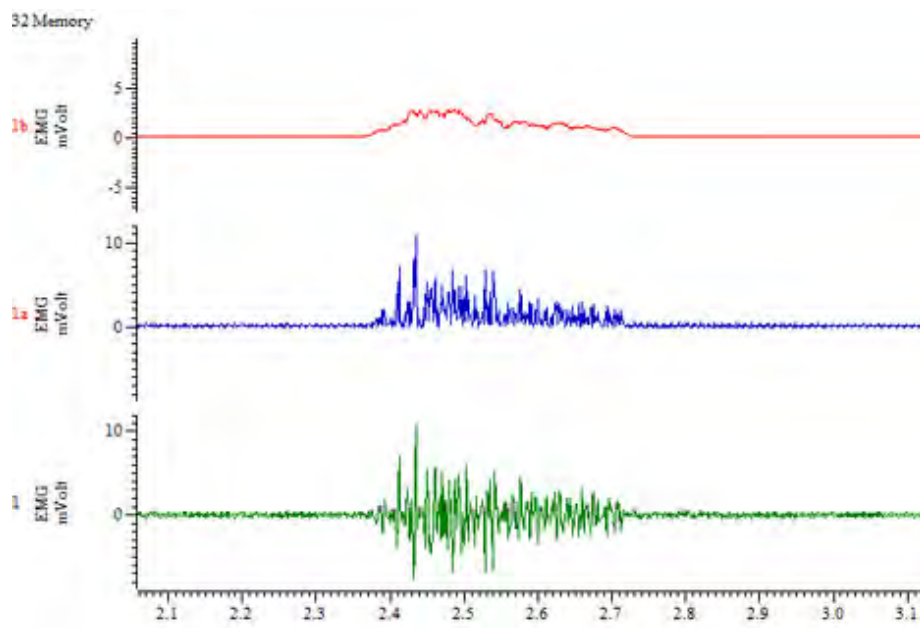
Channel process dialog

The process to apply and the channel you want to process are selected from the appropriate drop-down lists in the dialog. Use `Add` to add a new process to the end of the list.

Example using Rectify and smooth (integrate)

`Rectify` sets all negative values to positive values of the same level and is often applied to EMG data. It is possible to apply multiple channel processes to a data channel for example, rectification followed by a `Smooth` process, which applies a 'moving average' filter to the data which preserves the area under the curve. The processes that will be applied, in order, are displayed in the list field of the channel process dialog.





EMG trace showing raw, rectified and rectified and smoothed channel processes in duplicate channels

Many of the processes, like Smooth, use a time value *argument*. Points within the time range either side of each data point are used to calculate the processed trace. For example, using the sample interval of the data (0.001s for a waveform sampled at 1kHz) as the argument will give a 3-point smooth. Doubling this value would give a 5 point smooth. You can quickly find out the sample interval of a waveform channel using the Evaluate... window from the Script menu. Use the BinSize(n) command, where n is the waveform channel of interest and click the Eval(...) button to display the sample interval.

Argument settings for the selected process are set in the fields to the left of the dialog.

The Clear button removes all processes from the channel. Delete removes the selected process and Apply updates the calculation for any modified argument settings. If a channel has an attached process, the channel number is displayed in red. Hovering over the channel number will display a pop-up showing that the channel contains modified data.

You can copy all the processes set for the current channel to other channels. Select the target channels by clicking their channel numbers (usually on the left edge of the time view) and click the Copy button. If the current channel has no processes, this will clear all processes from the selected channels.

To view a copy of the processed data alongside the raw trace, as above, use Duplicate Channel from the Analysis menu.

Other channel processes can be used to remove baseline drift (DC remove), shift data forwards or backwards on the X-axis (Time shift), change the sample rate of a channel (Downsample, Interpolate and Match channel), display RMS amplitude (RMS amplitude), calculate maximum slope (Slope) and fill in gaps in a waveform channel (Fill gaps). Full details are available in the Spike2 on-line help.



Scripts: Spike2

- Q. I am recording ECG and need to detect R-wave peaks, but the signal often changes during a recording with baseline drift and simple peak detection using memory channels often also marks the T-wave as well.
- A. The script, [ProcessRWaves.s2s](#), is an example of using channel processes and virtual channels to process an ECG channel so that R-wave peaks are easier to detect. The script creates a duplicate channel showing the results of the following processes:
- Applies a slope channel process – think of this as velocity.
 - Squares the velocity using a virtual channel – think of this as energy
 - Applies a Smooth channel process

To see an example, run the script on the `ECG Waveform.smr` data file included in your `Spike\data` installation folder. The processed result shows the R-waves as the regions of highest energy in the signal; you can now use a memory channel and import the R-wave times with the Peak find method.

All of the functions in the script could be performed using the Channel process and Virtual channel commands from the standard Spike2 menus. The script automates the application of these functions so that they can be applied with one click.

Signal

- Q. Can I get the data values from an XY measurements view and open them in a spreadsheet program for statistical analysis?
- A. You can copy data from an XY view in spreadsheet format and paste it to a text file or directly into a spreadsheet document. With the XY view open, use the `Copy as Text` command from the `Edit` menu. This copies the data to the clipboard from where you can paste it to your text file or spreadsheet document using the keyboard shortcut `Ctrl+V` or by right-clicking and selecting `Paste`.

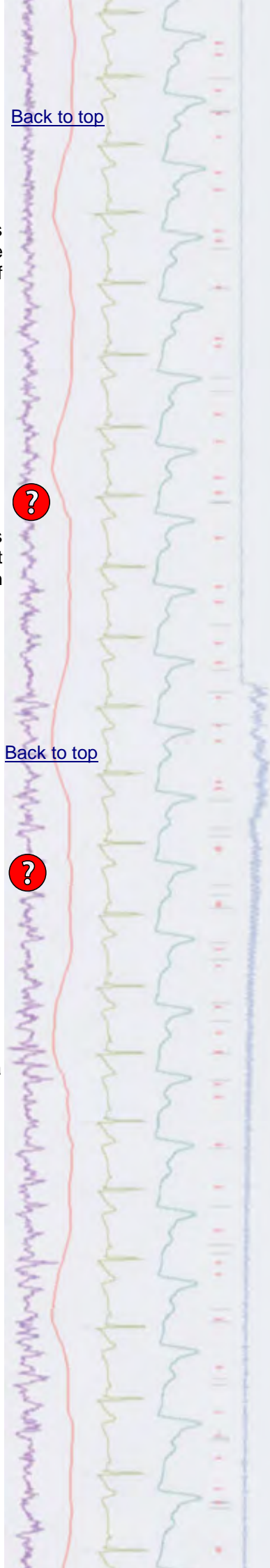
The `Copy as Text` command only copies visible data. You can show and hide channels in the view using the `Customise display` option in the `View` menu, and select the time range and Y range to copy by zooming in or out of the data with the mouse

To show all of the data and channels to copy, click `All on` in the `Customise display` dialog, then open the `X Axis range` dialog from the `View` menu and click `Show all`. Finally, open the `Y Axis range` dialog from the `View` menu and click `Optimise`.

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Scripts: Signal

- Q. I have some paired pulse recordings and would like to split them up so that each trigger and response is stored in a separate frame
- A. The script, [SplitFrame.sgs](#), will split a Signal data frame in two. This can be based on user supplied trigger times, such as times of a paired pulse in the example above, or set with a time range.

Did you know...?

The SonFix file repair utility, which is found in your Spike folder, can scan a folder full of Spike2 data files to diagnose files that need repairing. Drag and drop the folder onto the SonFix program for diagnosis.

Recent Questions

- Q. I have a few scripts that I need to run often. Is there a way to have these listed in a menu or toolbar so that I can access them quickly, without having to load and run them individually every time?
- A. You can add scripts to a Script Bar in Spike2 and Signal so that they can be run with a single button click. Select `Script Bar List...` from the Script menu to add a script and then select the `Script Bar` option from the same menu to display the toolbar. There is also a `Sample Bar` to which you can add your sampling configurations in the same way for quick access. The `Sample Bar List` and `Sample Bar` commands are available from the Sample menu. Both the script bar and the sample bar can also be enabled by right-clicking on any grey area of the program.

CED User forums

Try the [CED Forums](#) bulletin board for software and hardware support

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