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## News

### Signal Version 5

We are pleased to announce the release of Signal version 5. A selection of some of the major new features is listed in the Signal section below and a full list is available [here](#).

We support running version 5 under Windows NT2000, Windows XP, Windows Vista and Windows 7 or Intel Macintosh running Windows. We recommend that the PC has 2GB minimum of RAM.

### UK Training Days 2011

Our UK training days will take place on Thursday 19<sup>th</sup> and Friday 20<sup>th</sup> May in Cambridge. These training days are for existing and prospective users of Spike2 and Signal and are suitable for beginners and advanced users.

If you or any of your colleagues would like to attend, please follow the links to view the [training day program](#) and complete the [booking form](#).

### CED visit to New Zealand and Australia

Simon Gray will be attending the forthcoming Australian Neuroscience Society meeting in Auckland and will be spending time after the meeting visiting existing and prospective customers in New Zealand and Australia. If you would like to arrange a visit please contact [simong@ced.co.uk](mailto:simong@ced.co.uk).

### Future meetings and events

#### [Australian Neuroscience Society](#)

Skycity Convention Centre,  
Auckland, New Zealand  
January 31<sup>st</sup> – February 3<sup>rd</sup> 2011

#### [Experimental Biology 2011](#)

Walter E. Washington Convention Center,  
Washington, DC, USA  
April 9<sup>th</sup> – 13<sup>th</sup> 2011

#### [Physiology 2011](#)

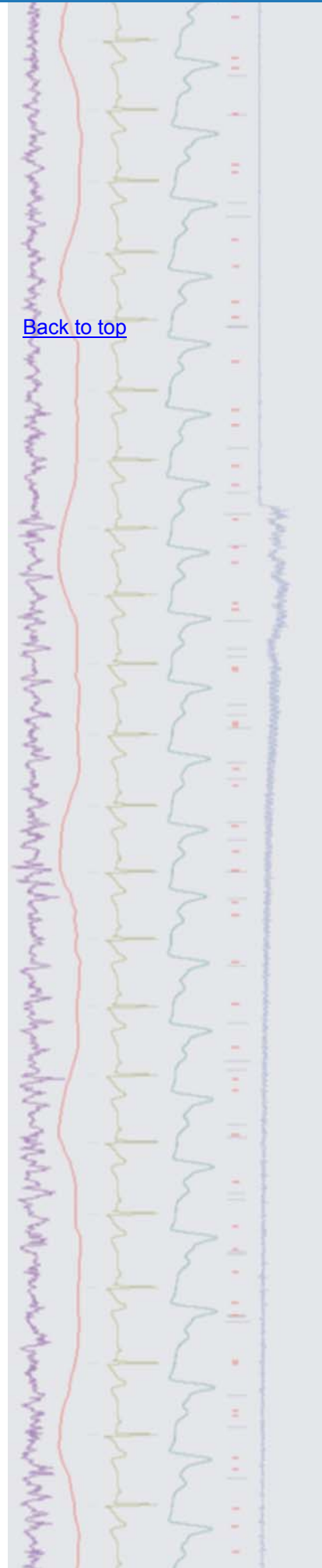
University of Oxford,  
Oxford, UK  
July 11<sup>th</sup> – 14<sup>th</sup> 2011

### 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
<a href="#">Spike2 version 7.05</a>	11/10	<a href="#">Signal version 5.00</a>	12/10
<a href="#">Spike2 version 6.15</a>	10/10	<a href="#">Signal version 4.08</a>	10/10
<a href="#">Spike2 demo</a>		<a href="#">Signal demo</a>	

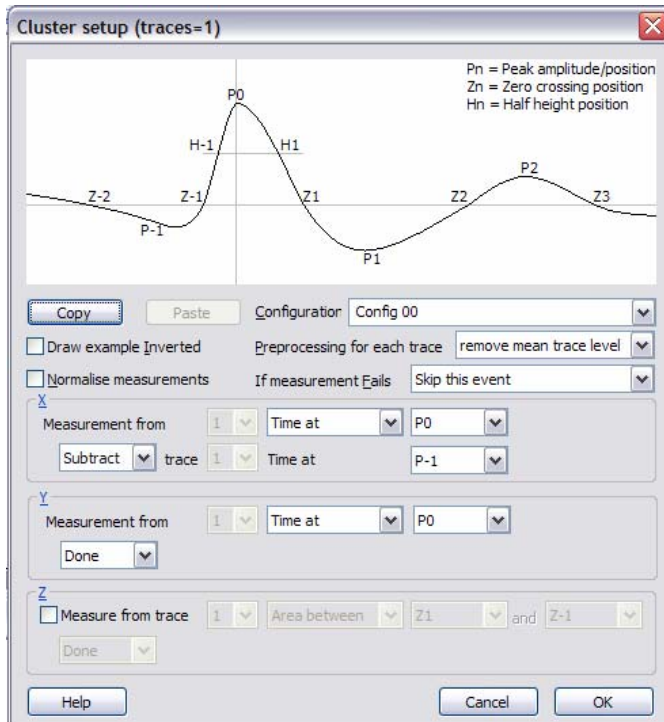
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# Spike2

- Q. Is there a method for taking measurements from spikes available in Spike2? I would like to measure the rise time of the spike, from first trough to the main peak.
- A. Spike2 can automatically take measurements from spikes in a WaveMark channel and use these to generate clusters. These measurements can also be copied as text for export to a spreadsheet package if required.

The Cluster on Measurements function is available from the Analysis menu of the Edit WaveMark window. This opens a new dialog showing a generic spike shape with marked time points that can be used to take a variety of measurements to an X, Y (and optional Z) cluster plot.



Cluster setup dialog

To take a measurement of the rise time as in this example, simply set the X measurement to take the time at peak (P0) and subtract the time at the first trough (P-1) from this value, as shown in the dialog above. For the Y measurement this example simply uses the time at peak of the spike but you could take additional measurements of your choice by modifying the settings of the Y and Z measurements as required. Clicking the OK button will generate a cluster window with the spikes plotted according to the set measurements. To get these values as text simply select the Copy as Text option from the Edit menu in the cluster window and then paste the values to a text file or document in the program of your choice.

"Time"	"Code"	"X"	"Y"
0.00016	"02"	0.444707	-0.0560645
0.03768	"04"	0.442523	-0.0807761
0.17096	"02"	0.423026	-0.0418755
0.69304	"03"	0.339482	-0.0793641
0.74776	"03"	0.356415	-0.0425111
1.02592	"02"	0.391849	-0.115724
1.41032	"04"	0.452043	-0.0964121
1.59512	"03"	0.364972	-0.0971199
1.70928	"01"	0.462331	-0.0722517

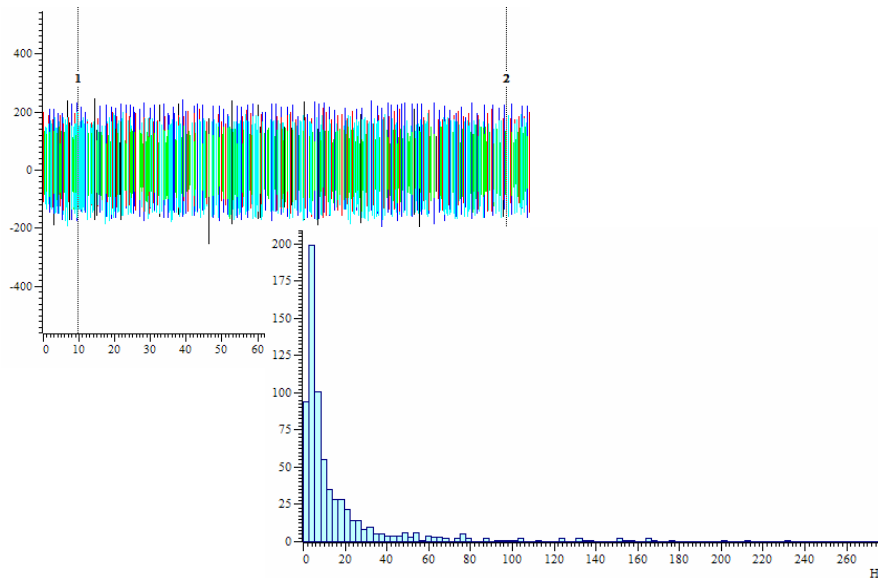
Measurement results displayed in the Log window

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## Scripts: Spike2

- Q. Is there a function in Spike2 that will generate a frequency distribution histogram of spike data?
- A. The attached script, `freqHist.s2s`, will generate a histogram showing the frequency distribution of events (such as WaveMarks) over a selected time range. The user can specify the histogram settings and is then prompted to select a time range to analyse using vertical cursors.



*Spike frequency distribution histogram*

The result view displays the count of events summed into bins corresponding to the event frequency. You can also view events as a frequency display over a time range in Spike2 by using the Instantaneous Frequency and Mean Frequency options in the Channel Draw Mode dialog.

# Signal

Version 5 is the latest release of Signal and includes many new and improved features, with continuous development planned through the course of the version.

New features include:

- Dynamic clamping support is now included, allowing up to 15 dynamic clamping models to be used and switched between while sampling. These models emulate the behaviour of ion channels in mathematics and inject or subtract corresponding currents to effectively add or remove ion channels from the membrane
- The clamping system has been extended from 2 to 8 clamping sets; each set comprising a pair of recording channels (stimulus and response) and a controlling DAC output
- Multiple arbitrary waveform outputs have been added to graphical pulse outputs and the text sequencer, allowing up to 256 waveform outputs to be used. In addition the pulses configuration dialog now includes digital marker generation and a control 'track' to help provide better timing information
- The channel Y axis can rescale itself and update the channel units using SI prefixes to give more convenient readings

Files created by previous versions of Signal are fully compatible with version 5. As with previous versions, future revisions of version 5 will be freely available to download from our website for all registered version 5 users.

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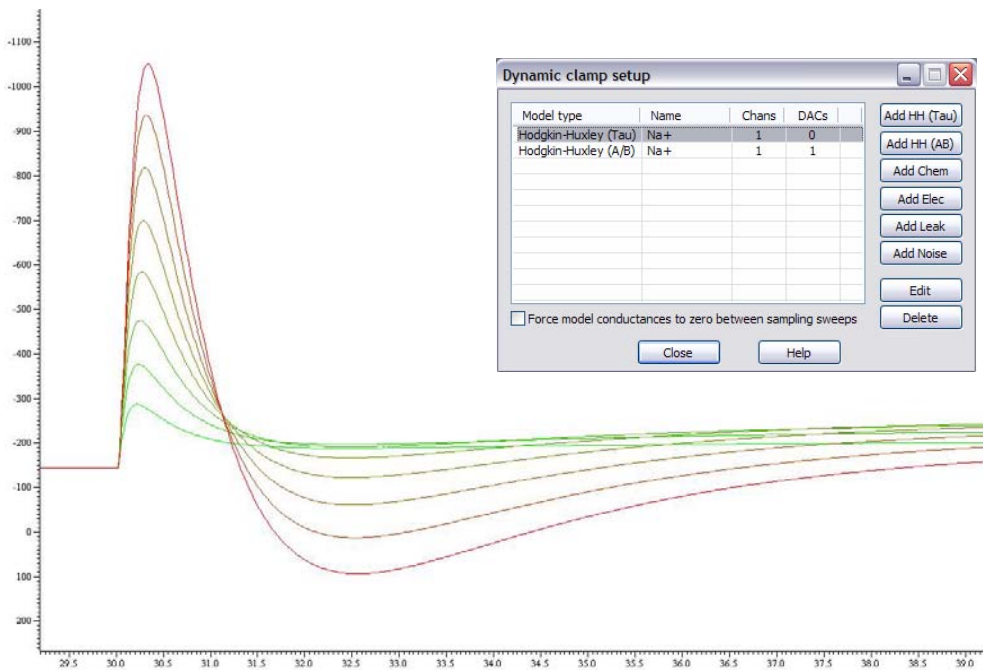
Right-click the script icon and save to disk.

If you have any problems opening the embedded scripts in this newsletter please let us know.

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*Dynamic clamping in action*

### Scripts: Signal

- Q. I have a large number of old data files in Axon Instruments .abf format that I'd like to analyse with Signal. I know that I can import these files one-by-one using the Import option from the File menu, but is there any way to automate the import of a whole directory of these files?
- A. Automating batch import of multiple .abf files can be achieved using the BatchAbfImport.sgs script. This will import all .abf format files in a nominated directory as Signal data files. These new Signal data files are automatically saved to the same directory with the same name as the original file. This script could easily be modified to import other file types if required, see the comments in the script file itself for details.

### Did you know...?

The Spike2 clustering dialog has been reworked to make it easier to use. There are more toolbar buttons and the events displayed in the associated interval histogram can be restricted to those in the selected user ellipse or user shape.

### Recent questions

- Q. It would be very useful if there was an option in the Fit data dialog in Spike2 to output the actual fit values as text for further statistical analysis.
- A. There is not currently a built-in option to output fit data as text, but the script, DumpFitAsText.s2s, will copy fit values from a channel in a Spike2 data file to the Log window. The user can select the channel to use and the time range of data to copy.

### User group

You can now find our [eNewsletters](#) archived on the CED website.

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

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