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News

Version **5.05** of Spike2 is now available from www.ced.co.uk/upu.shtml for registered v5 users. This revision includes interactive curve fitting to time, result and XY views and creation of new data channels based on active cursor measurements. You can read the full list of new features on our web site.

A demonstration version of the current software is also available from www.ced.co.uk/pru.shtml

Version **4.18** of Spike2 is downloadable for registered v4 users.
Version **2.14** of Signal is also downloadable for registered v2 users.

Our U.K training days will take place on the 25th – 26th of March 2004 in Cambridge. Details of the training day sessions and a registration form are available from: www.ced.co.uk/nw9u.htm.

We will also be holding additional US training days on the 15th – 16th April 2004, prior to the Experimental Biology meeting in Washington DC. Details of the training day sessions and a registration form are available from: www.ced.co.uk/nw9y.htm.

The Spike2 and Signal scripts for this edition of the newsletter have been included as embedded attachments in the document. To load the scripts, simply double-click on the appropriate icon beside the script file name. If you have Spike2 or Signal running on your PC, the appropriate script will load in a normal script file window. Alternatively, you can right click on the icon and save the embedded file to disk.

If you have any problems accessing the embedded files, please let us know via the return email address at the bottom of the newsletter.

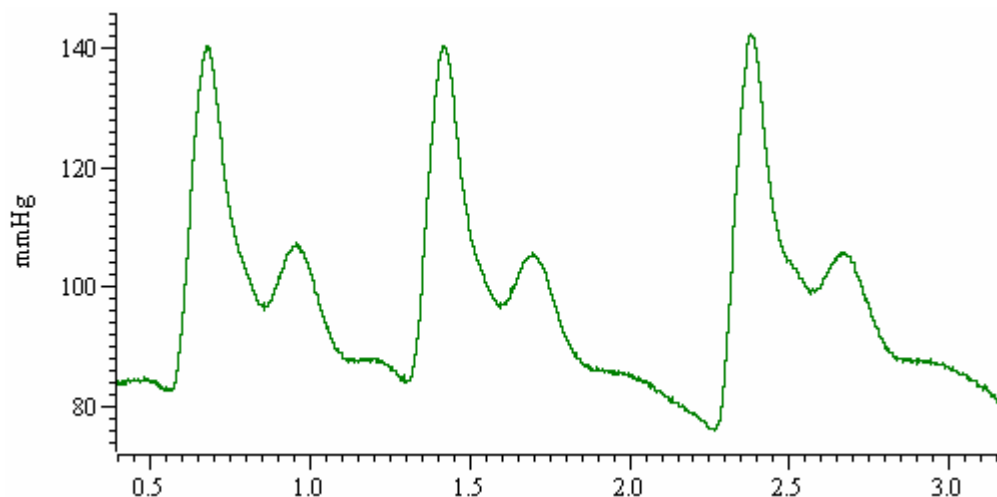
SPIKE2

- Q. I am recording Blood Pressure data and would like an on-line display of heart rate from this trace.
- A. There is a new Analysis menu measurements command in Spike2 version 5.05 that creates a new data channel based on active cursor measurements. This function can be used on-line to generate a heart rate display from an ECG or blood pressure channel in real time during sampling. Previously a script was required to display on-line heart rate in this way.

Open a Spike2 data file ready for sampling. From the Analysis menu, select Measurements and then Data channel to open the dialog. The dialog has a number of fields, some of which are common to those in the Measurements to XY views dialog.

Select the new channel to create from the Target data channel field. This can be a new memory channel or one of the unused disk channels. The Channel type field holds a list of channel types that can be created; Event, Marker or RealMark. If you select RealMark, the target channel has one real value (e.g. Amplitude) attached to each marker; this value is set by the Y measurements field. As we only want to mark peaks in this case, with no associated Y data value, we can select an Event channel to mark the peak times.

The fields in the Cursor 0 stepping dialog are identical to those in the Measurements to XY view dialog. This section is used to set the search method for measurements. Set the method to peak find, and set the amplitude to find the peaks in the blood pressure trace. Spike2 detects peaks by monitoring the waveform level to ensure that the signal falls by at least the amplitude set here. For a BP channel calibrated in mmHg, 25 would be a suitable estimate for our example.

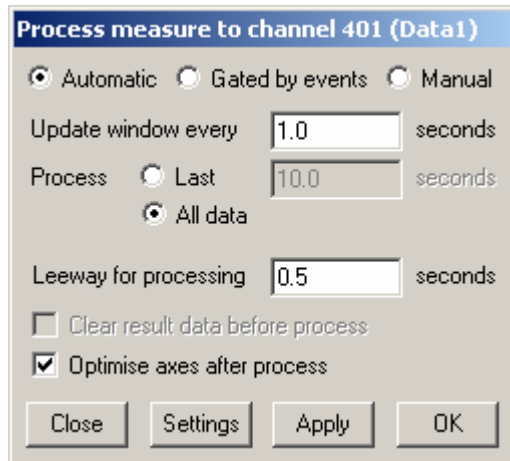


To avoid marking any dirotic notch present in the BP data, we can also set a minimum step for the cursor.

The X measurements section sets the time of each event or marker that is added into the new data channel. This would normally be an expression related to cursor positions, in this case, the time of each peak as found by Cursor(0).

The Y measurements section is only available when the type of the target channel is RealMark. The value measured here sets the RealMark data value.

Pressing New then opens the on-line processing dialog.





From the process dialog we can select the update mode for the measurements. For this example, we can use Automatic, Update window every 1 second and click OK. Now if you start sampling you should see on-line marking of the BP peaks as events. If you find that no peaks are being marked, adjust the Peak Find amplitude settings in the Measure to channel dialog. The process settings for the measurements can be changed at any time by right-clicking on the channel and selecting Process settings from the menu.

Finally, select Channel Draw mode from the view menu and choose instantaneous frequency from the drop-down list. Check the Per minute box to display as beats per minute.

SIGNAL

We had a number of requests at the recent US Neuroscience meeting for new analysis and display features to be implemented in Signal. We welcome any suggestions from current Signal users on features that they feel may improve the software. Please let us know if you have a specific request that you would like to see included in a future release of Signal.


Scripts. Spike2 (Right mouse click icons and save embedded script file[s] to disk)

- Q. I would like to use Spike2 to output pulses that ramp linearly from 1Hz to 30Hz and then back to 1Hz, over pre-defined time durations during sampling. Spike2 should take into account the reduced time delay between each output pulse over the specified time range to ensure a linear ramp of output pulses, rather than an exponential curve.
- A. The attached `LinRampFreq.s2s`  script and associated `LinRampFreq.pls`  sequence creates ramps of increasing or decreasing pulse frequency on-line. The script allows the user to enter settings for ramp time, as well as start, turning point and end frequencies for the pulse output. The user can also select whether to produce a single increasing or decreasing ramp. Before running the script, you must ensure that the

`LinRampFreq.pls` output sequence is loaded and made the current sequence. The script sets up a new data file for recording based on the current sampling configuration. Set channel 1 in the sampling configuration to be an Event channel in which pulses can be recorded to help visualize the results. The script requires this data to be recorded, as it keeps a count of the number of pulses produced. The pulses are currently set to be 10 microseconds long, and are output from digital output 0 on the 1401.

This script has been tested and is known to work in Spike2 v4 and v5.

Scripts. Signal

- Q. I would like to be able to quickly view areas of interest in individual frames; perhaps by showing sections of data between cursors in a duplicate window in Signal.
- A. The attached `CursorView.sgs`  script creates a duplicate window of an open time view, and continuously updates the view in the duplicate to show data between cursors.

This script is for Signal v2. (Right mouse click icon and save embedded script file to disk)

Did you know...?

You can copy individual frames from one data file to another in Signal. Use the Edit menu Copy command to copy a single frame of data from a data file to the clipboard. If you then open another data file and select the Append frame function from the Analysis menu, you can paste the frame data from the clipboard into this new frame.

Recent questions

- Q. I am using Spike2 to template synchronised spikes from two waveform channels off-line into two separate WaveMark channels. There are occasions when there is a spike on one channel, but not on the other. I would like to record this non-spiking data to disk to prove that this synchronisation is not absolute, but cannot see a way to do this using the WaveMark method, as events are only detected by threshold crossings.
- A. Using the n-trode analysis feature in Spike2 version 5, we can generate a stereotrode trace from the two existing waveform channels. This will save the spike data from both channels into a single WaveMark channel. Simply select the two channels by holding *Ctrl* and clicking on the channel numbers, and select New n-trode from the Analysis pull-down menu. When using the spike template functions, spikes are detected by the signal crossing a trigger level. This causes the data around the trigger point to be stored as a WaveMark. With multiple traces, the template window is split horizontally to show an oscilloscope view of the data from each selected channel. The horizontal trigger levels in these windows are independent and can be set to different levels depending on the input data. Each trace is tracked separately and the first trace to trigger saves the corresponding data for all traces. If a spike on any one channel crosses the trigger level, it will also save the corresponding time range from all other selected channels.

User group

We are in the process of setting up an archive message board on our web site. As soon as this is done we will use this newsletter to announce that it is available. This seems to be the most sensible route to go rather than direct emailing both for security and for minimising spam.

If you wish to un-subscribe from the mailing list for this newsletter, please notify sales@ced.co.uk.