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News

Spike2 and Signal Training Days

Our US Spike2 and Signal training courses will be held on Thursday 1st and Friday 2nd of November, prior to the Society for Neuroscience meeting, in San Diego. Venue confirmation and booking forms will be released shortly. If you would like to be kept up-to-date with the latest training day information, please contact us.

Meetings and events

Life Sciences 2007

Scotland Exhibition and Convention Centre
Glasgow
July 8th – 12th 2007

IBRO World Congress of Neuroscience

Melbourne Exhibition and Convention Centre
Melbourne, Australia
July 12th – 16th 2007

IBRO Satellite Meeting: Motor Control at the Top End

Darwin, Australia
July 18th – 21st 2007

8th International Congress of Neuroethology

University of British Columbia
Vancouver, Canada
July 22nd – 27th 2007

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.

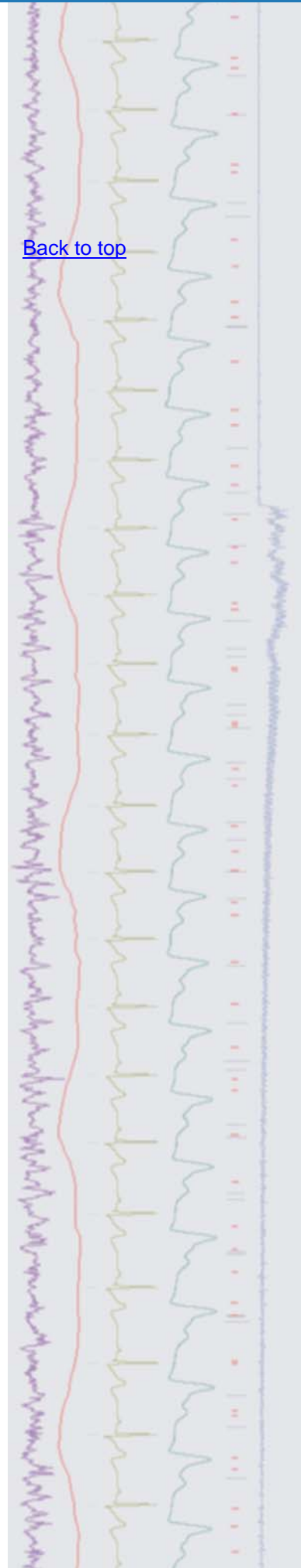
Spike2 downloads	Signal downloads
Spike2 version 6.04	Signal version 3.09
Spike2 version 5.17	Signal version 2.16
Spike2 demo	Signal demo

New features available in Spike2 version 6.04 include:

- New HTML help system (supported by Vista)
- Clustering dialogs now update with incoming spike data on-line
- New icons for Spike2 files

A full list of the new features and changes can be found on the website and in the on-line help.

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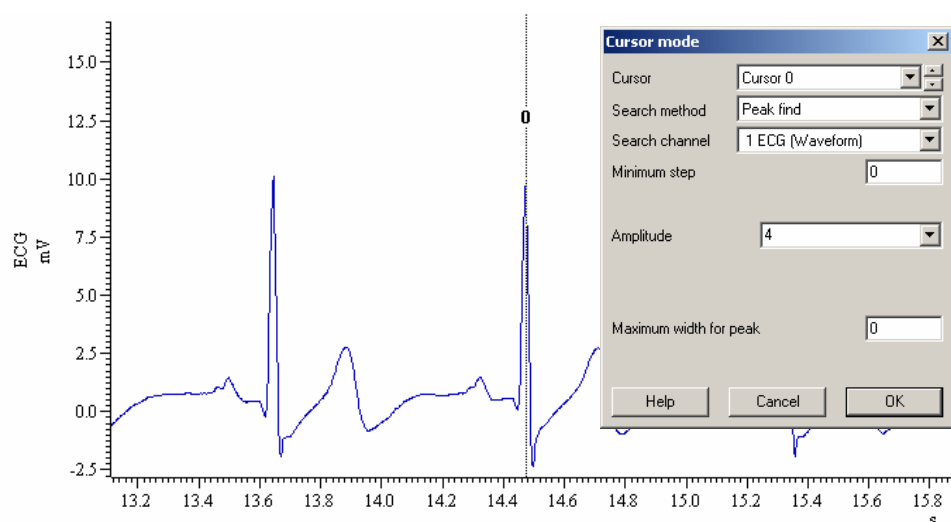
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- Q. I have just started using Spike2 and would like to know how I can automatically detect peaks and other features of interest in my recorded ECG trace.
- A. Spike2 can search for and detect features in waveform data and step to time-stamp markers and events using the built-in Active Cursor functions. Search methods include, but are not limited to:
- Peaks and troughs
 - Threshold crossings, data within and data outside thresholds
 - Slope measurements
 - Percentage repolarisation

Up to ten cursors (0 – 9) are available in a data file view and individual cursors can search any channel for features of interest. Cursor 0 acts as the reference or iterator cursor so that, when it searches for new features, all other active cursor positions are updated in response. For this reason Cursor 0 is nearly always used to find a common reference around which other features can be found by additional active cursors. Cursors can be created and Active modes set from within the Cursor menu.

A simple example: finding peaks

One of the most common requirements when analysing an ECG signal is to be able to detect and mark the R wave of successive beats. This could then be used to determine heart rate or R-R interval times. In the example below, Cursor 0 is set up to search our ECG data channel for Peaks that have an amplitude change of 4mV. The amplitude value is a measure of the level that the waveform signal *falls* after a peak to be classified, which allows accurate detection of peaks on a signal with a baseline drift.



Cursor 0 settings for R-wave peak detection

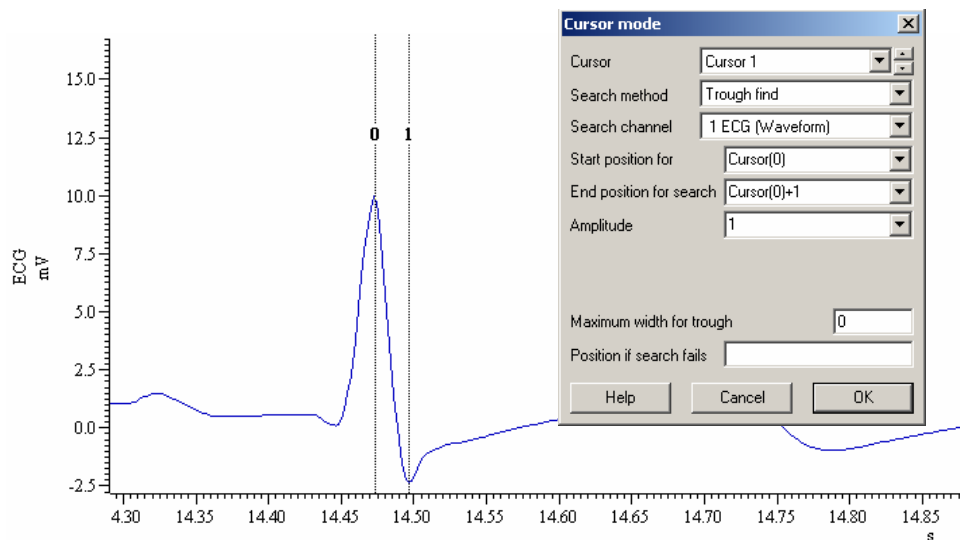
You can check the behaviour of active cursors by holding down **Ctrl + Shift** and using the left and right arrow cursor keys. This steps Cursor 0 between features that match the search method parameters.

Finding additional features:

Now that Cursor 0 is set to find the R-wave peaks, we can set additional active cursors to find other features, in this case the Q and S components of the QRS complex. Cursor 1 is set to find the S wave by using the Trough search method with an amplitude level of 1mV (For trough search methods, the amplitude value is a measure of the level that the waveform *rises* after a trough). Cursor 1 is then set to search for the trough in the time range between `Cursor(0)` and `Cursor(0)+1` second.

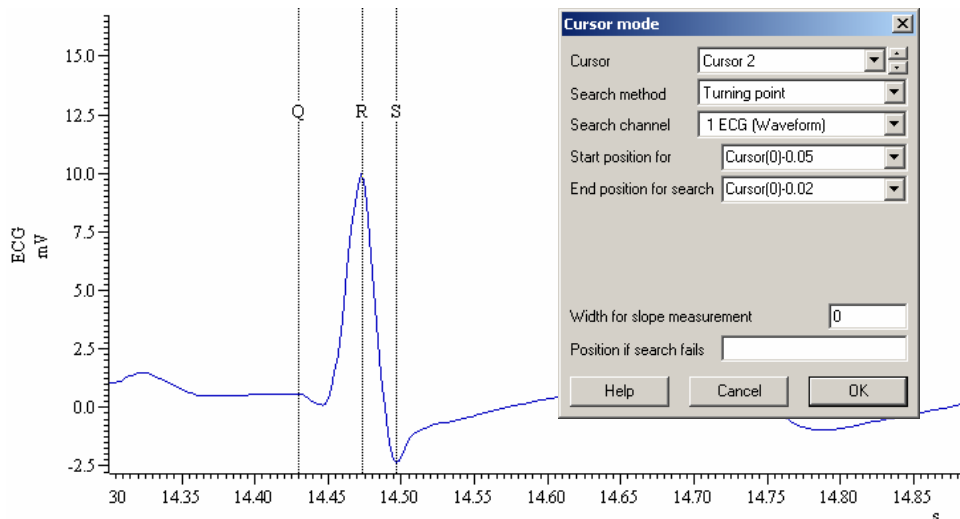
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Cursor 1 set for S-wave detection

The Q wave can be found by using Cursor 2 to search for the turning point (where the waveform slope changes sign) in the short time range prior to the R-wave. In our example, a start time of $\text{Cursor}(0) - 0.05$ seconds and end time of $\text{Cursor}(0) - 0.02$ seconds finds the Q wave in the QRS complex. You can define your own labels for cursors as displayed below, details can be found in eNewsletter 26.



Cursor 2 set for Q wave with user-defined cursor labels

Multiple results from cursor positions can be plotted or marked automatically to an XY view or data channel in the file using the Measurement functions available from the Analysis menu. For more information see the Spike2 on-line help or see our feature on taking measurements in the next eNewsletter.

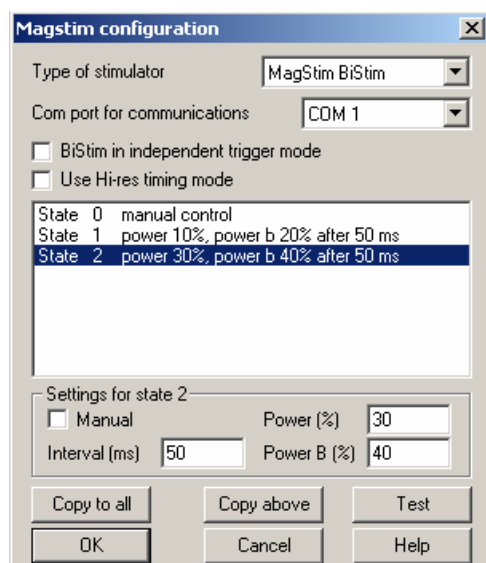
Signal

- Q. I will shortly be setting up a system for recording responses from trans-cranial magnetic stimulation, and would like to know how Signal could be used for triggering/controlling TMS units
- A. Signal can generate digital and analog outputs to trigger current, voltage and magnetic stimulators while simultaneously recording and analyzing responses. From the Pulse Outputs section in the sampling configuration you can quickly set-up pulses with a drag-and-drop interface and use multiple states to create a series of pulse protocols for stimulator timing and control. A simple example would be to use a single pulse output to trigger an electrical stimulator at the start of a sampling sweep, and record the response.

Signal also includes configuration support for the MagStim range of magnetic stimulators when sampling. This allows direct control of MagStim settings via the serial line in addition to using the standard pulse outputs for timing.

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The MagStim controls are accessed from the States tab in the sampling configuration. This provides a dialog from which you can select the MagStim type, communication port and independent stimulation settings, such as intensity, pulse interval etc. for each state, based on the type of MagStim used.

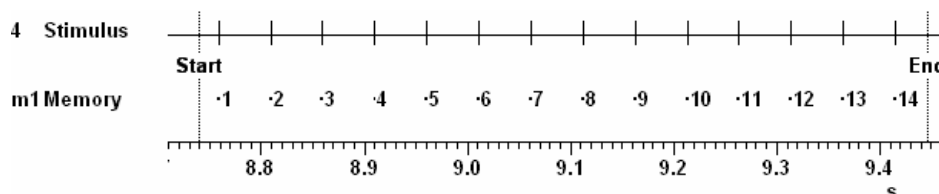


Configuration settings for a MagStim BiStim unit

Detailed explanations for the MagStim configurations can be found in the Signal on-line help.

Scripts: Spike2 

- Q. I record and analyse responses to repetitive electrical stimulation and was wondering if there was any way to number the stimulus markers in a data file? This would be useful when visually examining the file as I would know which stimulus number corresponded to each response.
- A. The attached script, *StimNumber.s2s*, can be used to give an identifying number to stimulus events, spike shapes or markers. The script creates a new TextMark memory channel that holds text strings starting at 1 for the time of the first event in range.



Channel m1 displays the corresponding stimulus numbers

Scripts: Signal 

- Q. I would like to be able to only view frames of a given state when paging through a data file.
- A. The attached script, *StateFilter.sgs*, allows the user to select which state will be displayed and can then step through the frames of that state using the associated script toolbar buttons.

Did you know...?

Included in the main Spike2 folder is an application called s2video which will record video and audio data alongside the sampled data file. Video and audio data is streamed directly to disk as soon as sampling starts, time-locking it to the data file. The s2video application is based on Microsoft DirectShow, which is part of DirectX and to run multimedia capture

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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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alongside sampling you need a suitably powerful computer. See the Spike2 on-line help for details of system requirements.

Recent questions

- Q. I have a series of files with the data stored as text from old experiments that I would like to review and analyse. Can I read these files using Spike2 or Signal?
- A. Both Spike2 and Signal can import text files as well as a range of 3rd party data files stored in other formats for analysis. The File menu Import function opens a dialog from which you can select the type of file to import from the drop-down list. If you wish to import data files in a format that is not currently supported, please contact us.

User group

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