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## News

### CED visit to Boston

CED Sales engineer Steven Clifford will be visiting existing and prospective customers in the Boston area during the week beginning 27<sup>th</sup> March. Simon Gray will also be visiting Toronto on Wednesday 29<sup>th</sup> March. If you would like a visit to discuss your current or future research applications, or arrange a demonstration of our latest software and hardware capabilities, please contact [steve@ced.co.uk](mailto:steve@ced.co.uk).

### [CED at Experimental Biology 2006](#)

We will be exhibiting at Experimental Biology 2006 in San Francisco from Sunday 2<sup>nd</sup> to Tuesday 4<sup>th</sup> of April. If you are attending the meeting, feel free to stop by our stand at booth no. 1517. We will also be visiting existing and prospective customers in the surrounding area after the meeting so if you are interested in a visit to discuss current or future research applications, please contact [sales@ced.co.uk](mailto:sales@ced.co.uk).

### [Spike2 and Signal Training Courses](#)

Our U.K. training days will be held on the 20<sup>th</sup> – 21<sup>st</sup> of March at St. John's Innovation Centre, Cambridge. Core sessions cover sampling, analysis and advanced options such as spike sorting and script writing. Workshop sessions are also available for users to discuss specific requirements with CED engineers and programmers. There are a few places still available for the training days so for further details and a booking form, visit the [training](#) section of our website.

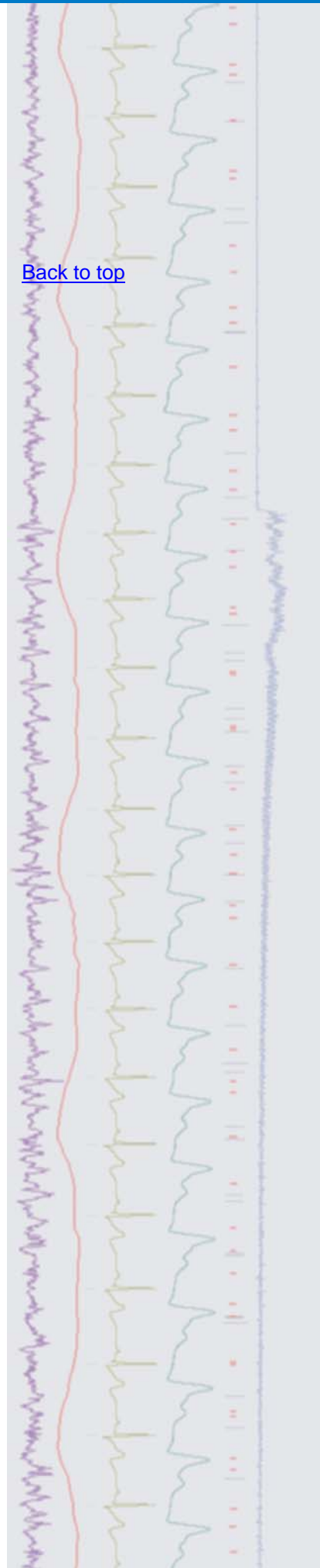
### [Latest versions of Spike2 and Signal](#)

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

Spike2 downloads	Signal downloads
<a href="#">Spike2 version 5.14</a>	<a href="#">Signal version 3.06a</a>
<a href="#">Spike2 version 4.24</a>	<a href="#">Signal version 2.16</a>
<a href="#">Spike2 demo</a>	<a href="#">Signal demo</a>

A full list of the new features and changes in the latest software versions is available from the website.

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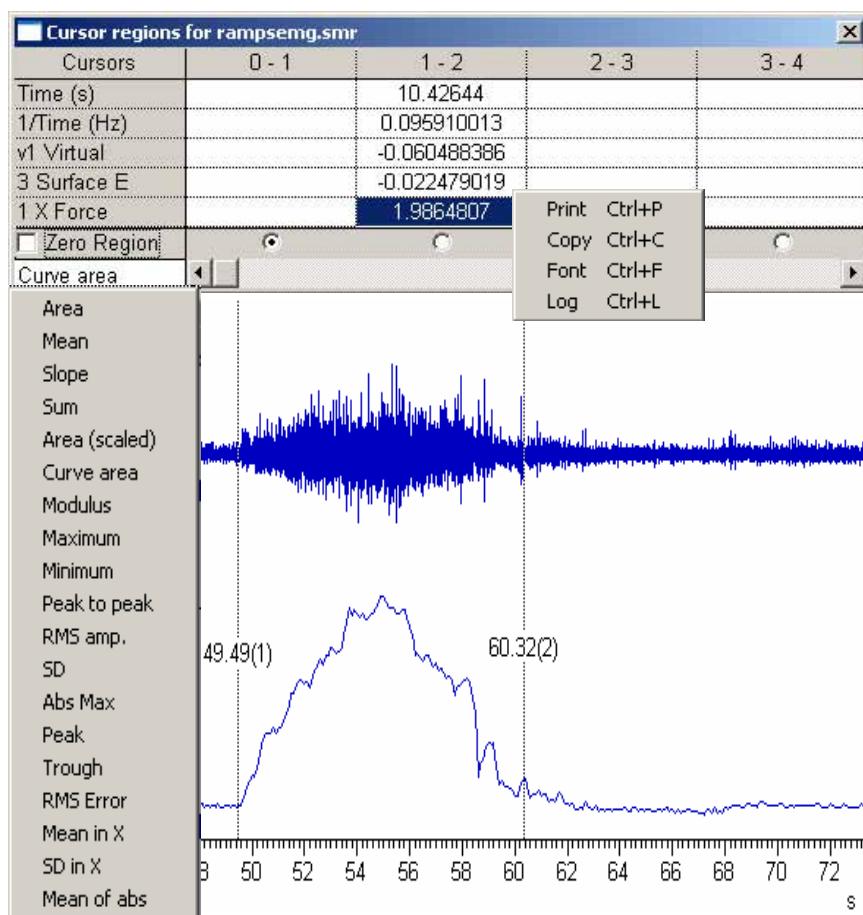


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Q. How can I take simple measurements such as mean or curve area from a selected time range of data in Spike2?

A. There are a number of ways to take measurements from data in Spike2, ranging from taking quick manual readings between pairs of cursors to generating automated XY trend plots using Active cursors.

The Cursor regions dialog, available from the Cursor menu, is a quick way to take measurements from regions of data in a time or result view. The dialog calculates and displays values between pairs of cursors based on the measurement type selected in the bottom left of the dialog. Select the calculation to display by clicking on the field and choosing from the drop-down list. The values in the regions dialog are automatically calculated and updated. Results can be copied to the Log view, clipboard or printed by either right-clicking in the dialog or using the associated hotkeys: **Ctrl+L** for Log, **Ctrl+C** for Copy or **Ctrl+P** for Print.



Cursor regions dialog showing the measurement list

Script writers can perform all of the available measurement types from the Cursor regions dialog using the `ChanMeasure()` function. Further information about this command can be found in the script section of the on-line help.

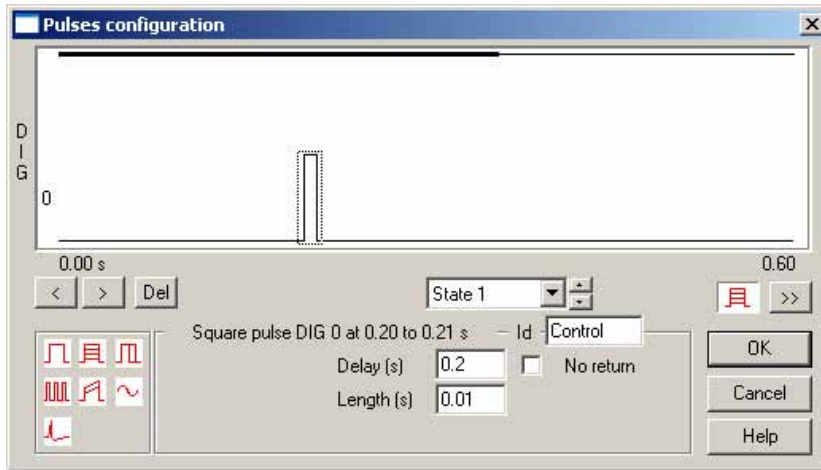
**Hint:** Spike2 also has an interactive measurement function for fast reading of time range and amplitude data from a channel. Simply hold **Alt** and click and drag the mouse pointer on a data channel to access this.



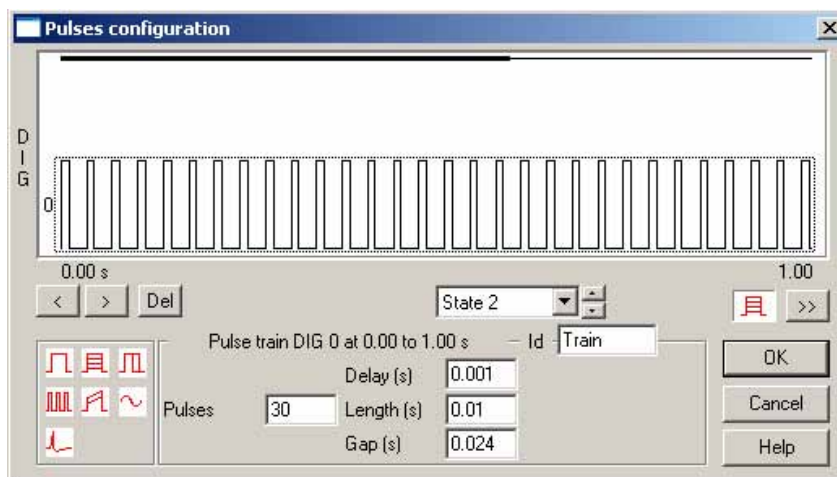
# Signal

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- Q. I am starting a long term potentiation (LTP) study and would like to record responses during a period of control stimuli, until the response stabilizes, and then apply a 'one shot' pulse train before reverting back to the control stimulus, as below.



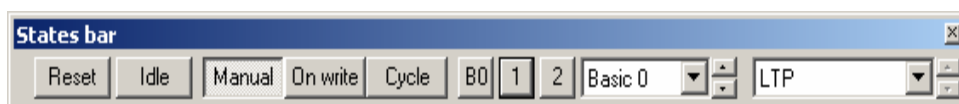
State 1 control stimulus



State 2 train stimulus

I have tried to set-up the stimuli using the dynamic outputs mode of multiple states using State 1 to setup and prepare the recording using the control stimulus and State 2 for the pulse train. I need manual control over the Basic and control states but would like the train output to automatically revert back to State 1 after a single cycle. Is there an easy way to do this?

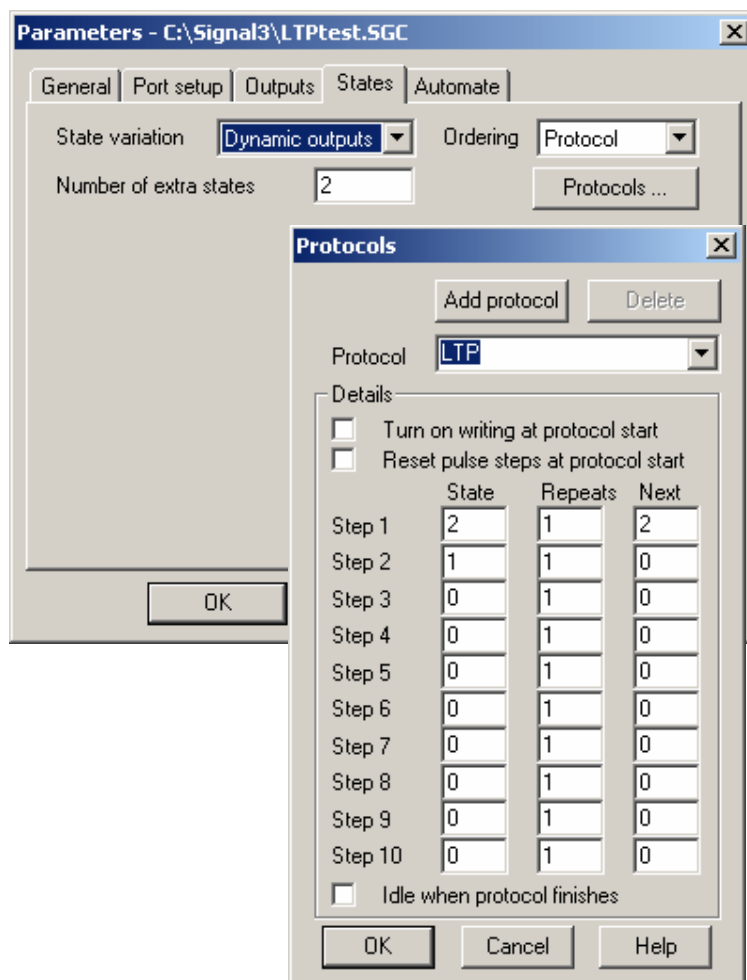
- A. Dynamic outputs can use DAC or digital outputs to control an experiment where each State generates a different set of pulse outputs during sampling. The States toolbar shows the current condition and gives manual control of selection using the toolbar buttons or the drop-down list. The Basic 0 state can be used as a default 'idle' state during the recording, and can be selected using the B0 or Idle button. It is also possible to set-up a sequence to determine the order in which to apply the various outputs during a recording.



States toolbar




The ordering for dynamic outputs is set using the drop-down list in the States tab of the sampling configuration. States can be set to run in a numeric or random order where the user simply specifies the number of repeats. They can also be set to follow a protocol where the user decides the order and number of repeats for the outputs. A protocol consists of a list of up to ten steps, where each step specifies a state number, a repeat count and the next step to use. For this example we want to be able to order the outputs so that whenever State 2 is run, it returns back to State 1 after a single cycle.



#### States setup in the sampling configuration with Protocol sequencing

Protocol execution always starts at step 1 when the Cycle toolbar button is pressed. The sequence above is set to run State 2 once, and then go to step 2. This step sets the State back to 1 and then stops the protocol (by setting the next field to 0). This will always return the output to our control after a train stimulus, while still allowing manual selection of the Basic and control States in the experiment.

**Scripts:** Spike2  (double click to open)

- Q. I would like to be able to create short 'tone' waveforms to output during recording. Is there a way to do this in Spike2, either interactively or via a script?
- A. The attached script, `TonePip.s2s` can be used to create tone pips and tone bursts for playback from a DAC output when sampling. The script creates a toolbar from which the user can generate single or sequences of tone pips of a defined frequency and duration. Up to ten different tones can be created and are loaded into the Play waveform area of the current sampling configuration for use when sampling, or saved to a new data file for later use. This script requires the latest Spike2 version 5, and supports the 1401plus, micro1401, Micro1401 mk II and Power1401 for output.

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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.

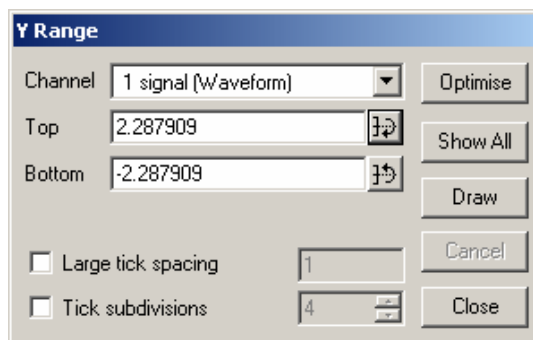


**Scripts:** Signal  (double click to open)

- Q. I have a number of files recorded from a series of experiments and I would like to amalgamate these multiple files into a single file for analysis, so I don't have to analyse each file in turn. Is there a script available for this? Because I use multiple states, it is important that the state information is also copied for each frame when the files are joined together.
- A. The attached script, `AppendFile.sgs` can be used to 'join' multiple data files together. The user is prompted to open a target data file, and then a source data file to append to the target. The script expects the files to contain the same number of channels, and be sampled at the same rate. Each frame of the source file, along with associated state information, is then appended to the target file. These appended frames are only held in memory, you need to save the target file to make them permanent.

### Did you know...?

There is a feature in the Y-axis dialog that lets you set the displayed range to be symmetrical around 0. Simply type in the positive value to use in the Top field and click the  button to copy this value *inverted* to the Bottom field. You can also copy the Bottom value to the Top field using the corresponding button.



*Y-range dialog*

### Recent questions

- Q. Are there keyboard shortcuts in Spike2 for optimising the data in all channels in a file? This would be much easier than opening the Y-axis dialog and setting all channels to optimise.
- A. There are many functions in both Spike2 and Signal that have associated 'hotkey' keyboard shortcuts. For this example we can make use of two such shortcuts in Spike2. Pressing `Ctrl+A` will select all visible channels in a data, result or XY-view. Pressing `Ctrl+Q` will then optimise the selected channels.
- A full list of keyboard shortcuts can be found in the on-line help for both Spike2 and Signal.

### User Group

If you have any comments about the newsletter format and content, or wish to unsubscribe from the mailing list for this newsletter, please notify [sales@ced.co.uk](mailto:sales@ced.co.uk).

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