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News

European Training Days: Thursday 4th and Friday 5th April 2013

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Join us for two days of training in Cambridge and learn how to use Spike2 and Signal for your research needs. These sessions are suitable for both existing and prospective users.

Attendance is limited so please [register](#) early to reserve your place on the appropriate course.

Chinese Training Days: Friday 25th - Sunday 27th January 2013

These training days will be run in conjunction with Qichi Instruments, our official distributor for China and will take place at the Shanghai Jiao Tong University, School of Medicine. If you are interested in attending, please contact Ryan Huang at ryan@qichi-instruments.com for further details.

New CED Sales Engineer



We would like to welcome the addition of Nicole Prentice to the CED sales team. Nicole will be directly responsible for supporting customers in the North of the UK.

Introducing the CED4301 Low Pass Filter



The CED4301 is a single channel 10th order low-pass filter with manual control of cut-off frequency from 600Hz to 40kHz in 3 switched ranges. The filter passband response is a root-raised-cosine, which gives an almost linear phase characteristic.



Future meetings and events

[CED Chinese Training Days 2013](#)

School of Medicine,
Shanghai Jiao Tong University,
Shanghai, China
January 25th - 27th 2013

[Australian Neuroscience Society 2013](#)

Melbourne Convention and Exhibition Centre,
Melbourne, Australia
February 3rd - 6th 2013

[CED European Training Days 2013](#)

St Johns Innovation Centre,
Cambridge, UK
April 4th - 5th 2013

[BNA 2013 Festival of Neuroscience](#)

The Barbican Centre,
London, UK
April 7th - 10th 2013

[Experimental Biology 2013](#)

Boston Convention & Exposition Center,
Boston, MA, USA
April 20th - 24th 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 7.10c	09/12	Signal version 5.08	11/12
Spike2 version 6.17	10/12	Signal version 4.10	10/12
Spike2 demo	07/12	Signal demo	06/12

Scripts Spotlight

Following on from our previous newsletter where we highlighted the use of dialogs as a means of user interaction, in this article we will take a look at creating custom toolbars for scripts. Toolbars are a very useful way for the user to access multiple functions in a script at any time, for example we could supply a button for opening a data file, additional buttons for performing different types of analysis and a final button to `Quit` out of the script. A toolbar like the one described here allows the user to pick and choose which functions to use for any given analysis. In addition the script writer can provide tips as to how the user should proceed by enabling and disabling toolbar buttons in response to function calls, for example, only enabling the analysis toolbar buttons once the user has opened a data file.

To get started with toolbars you can use the `ToolMake.s2s` script in your Spike2 or Signal scripts folder. This lets you 'build' toolbars by adding buttons, giving them a label and then linking them to functions in your own script. Once you've added the required features you can use the `Output` button in the toolbar to generate the script code for your toolbar and add this in to your own projects.

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Example of a script-generated toolbar, highlighted on the right

Spike2



Show me How!

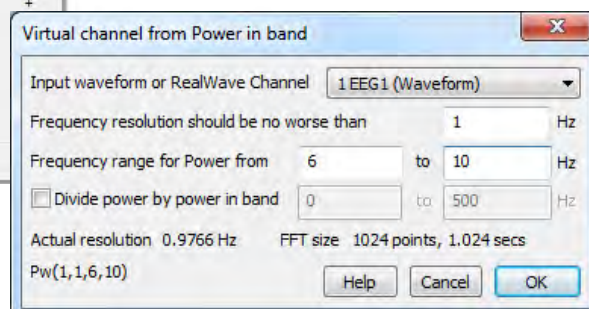
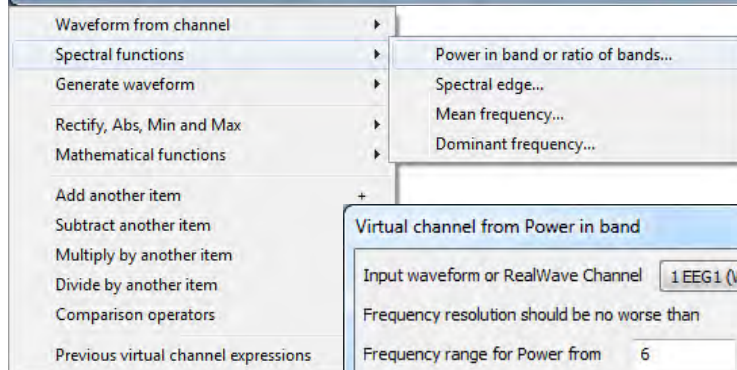
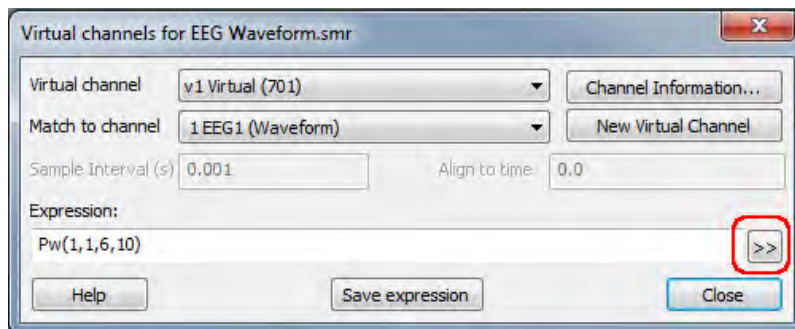
Click here to view a video tutorial on spectral analysis using virtual channels

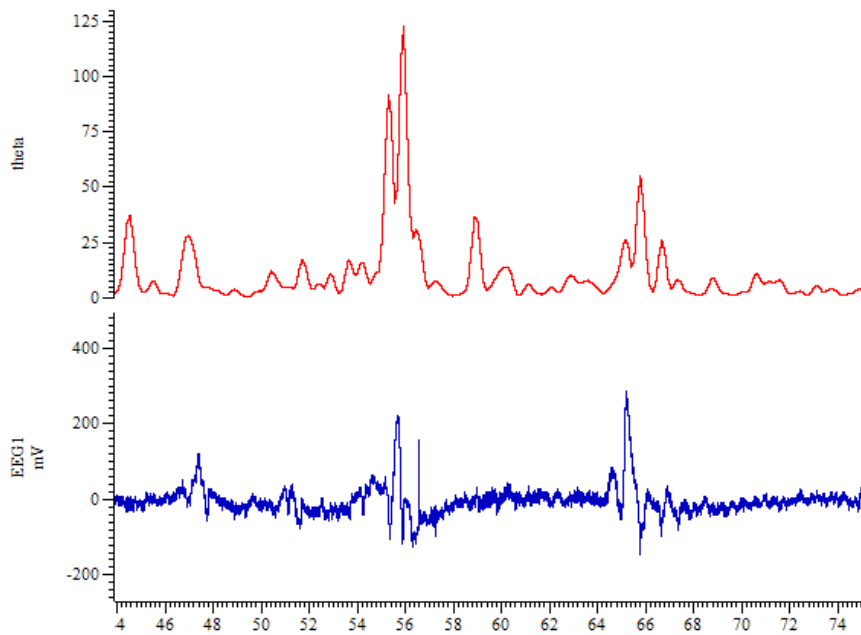


- Q. I am recording and analyzing EEG activity. Is there any way to analyse the power in different frequency bands?
- A. Virtual channels have now been extended to include spectral functions which can be used to show how a particular feature of the power spectrum of an input channel changes over time. The available functions include:
- Power in frequency bands
 - Spectral edge
 - Mean frequency
 - Dominant frequency

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All of the above functions can be applied from the Spectral functions option in the expressions menu of the Virtual channel expression dialog. The example below calculates the spectral power in the theta band (typically 6-10Hz) of an EEG input channel.





Virtual channel (top) showing power in the Theta band (6-10 Hz)

Scripts: Spike2 

- Q. I would like to export a channel of waveform data to Matlab for additional analysis. The problem I'm having is that my data files are rather large. Is there any way to export just sections of the waveform, perhaps based on a stimulus trigger recorded as an event channel?
- A. The script, `TrigDataExport.s2s`, will automate the export of sections of a waveform channel, based around a trigger channel, to individual Matlab files. The script allows the user to set the trigger channel and source waveform along with a time range of data to export. The exported sections of data are saved to the same folder location with the same filename as the original file and a suffix indicating the count of the sections exported. The files also include a TextMark channel with a marker holding the trigger time from the original file.

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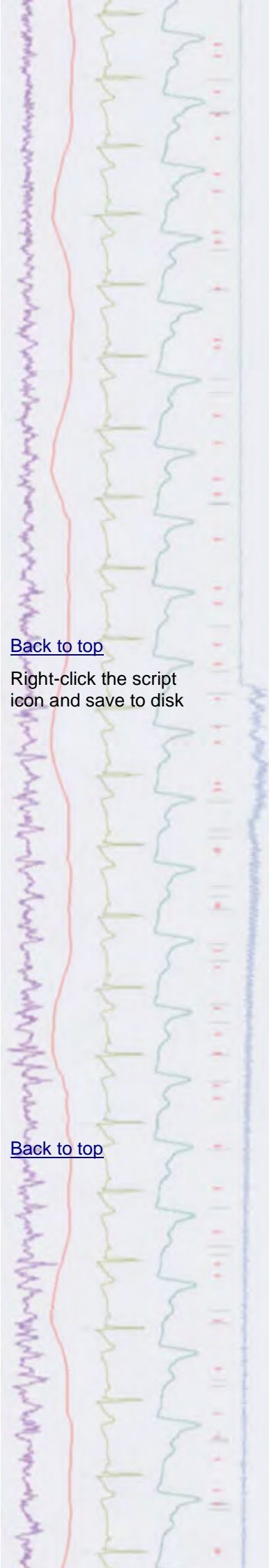
Right-click the script icon and save to disk

Signal

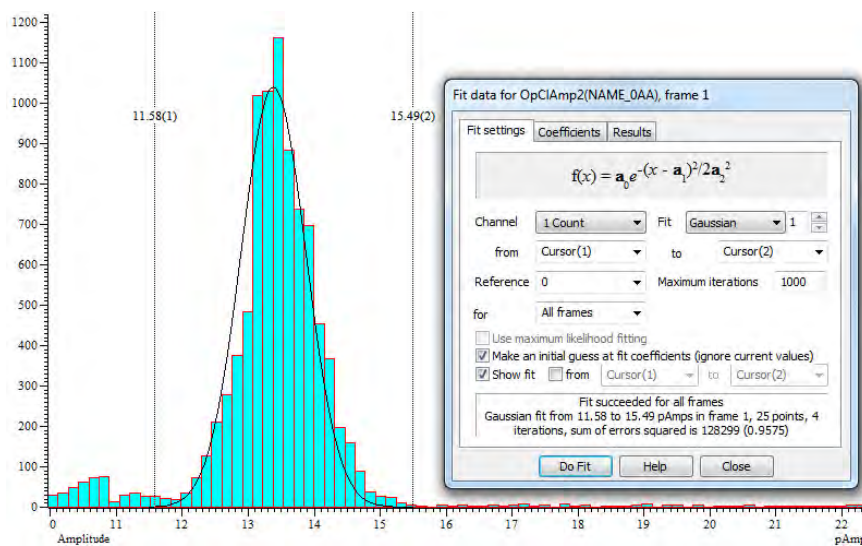
- Q. How do I fit data to open/closed amplitude histograms?
- A. The Fit data command from the Analysis menu opens a tabbed dialog that allows the fitting of various functions to channel data in a file, memory or XY view. Currently you can fit Exponential, Polynomial, Gaussian, Sine and Sigmoid functions to data, and the type of fit and data range to use is selected in the Fit settings tab. You can use vertical cursors as the start and end reference points or enter x-axis ranges manually.

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The Coefficients tab of the dialog allows you to set the starting point of the fit and optionally fix the coefficients to use. The final tab in the dialog displays the fitting results and residual errors once a fit has been made to any data. The fit is displayed overdrawn on the data if the Show fit checkbox in the Fit settings tab is enabled, and can be cleared or edited at any time by right-



clicking on the fit line itself. The example below displays a single Gaussian curve fitted to an Open/Closed amplitude histogram.



Full details of the fitting functions can be found in the Signal on-line help.

Scripts: Signal

- Q. I would like an option for text output of Signal data that would print the data from each frame in a separate column for a selected channel. This would make it much easier to perform cross-frame analysis in a spreadsheet package.
- A. The attached script, `FrameCols.sgs`, is an example of exporting a single channel from a Signal file so that the data from each frame is printed in a separate column. The user can select which channel to export from a dialog displayed when the script is run.

Did you know...?

If you have created duplicate data views and want to restore them when the source data file is reopened, close the data file by holding down `Ctrl` and selecting `Close All (filename)` from the `File` menu. When you next reopen the file, all duplicate windows will also be restored.

Recent Questions

- Q. How do I connect up my Magstim device to a PC so that I can control it using Signal?
- A. There are two possible connector arrangements provided on MagStim units, for serial line control and external triggering, depending on the model you are using. Older 200 and BiStim units connect via a 9-way serial line and separate 15-way trigger connector while newer 200, BiStim units and Rapids have a high-density 26-way combined serial line and trigger connector.



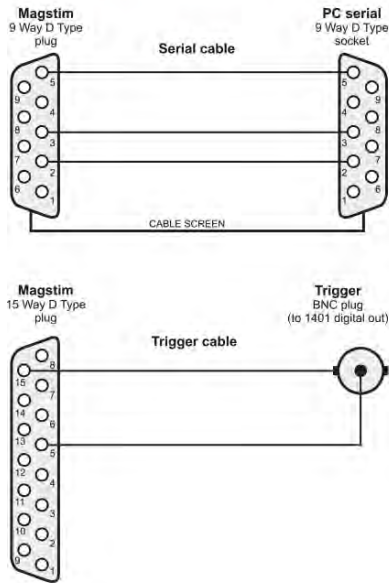
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Right-click the script icon and save to disk

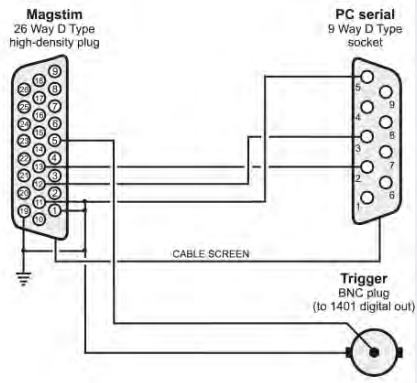
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Cables for older MAGSTIM 200 and BiStim



Cable for newer MAGSTIM 200, BiStim and Rapids



In both cases two separate connections need to be made; serial line control from a PC and a TTL trigger signal from the 1401. We supply cables to connect both of the cases described above, contact us for details. To enable direct control of Magstim devices, the Magstim support option must be installed during the main Signal installation.

User group

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

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.

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