PLEXON®

Neurotechnology Research Systems

## OFS V4 IS HERE, OFS SPECIAL OFFERS, OFS USER GUIDE AND MORE

4 DAYS UNTIL THE ANNUAL PLEXON WORKSHOP

April 27-30, 2015

The Plexon office is buzzing with testing equipment, printing materials and coordinating events – all to support the famed, annual Workshop starting Monday! We have a full house coming from more than ten countries, and they start arriving this weekend. As a result, this newsletter is going to be brief and mainly dedicated to important topics related to the Offline Sorter™ v4 launch.

Safe travels to all participants. We cannot wait to see you here in Dallas. If there are any remaining questions, please feel free to email workshop@plexon.com.

NEW OFFLINE SORTER™ V4 AVAILABLE TODAY!
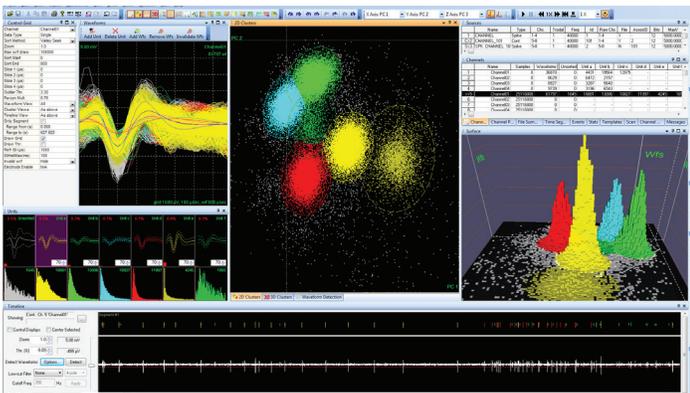
As promised, Plexon is launching Offline Sorter Software (OFS) version 4, with the installers available on the website today! Last month's newsletter detailed some of the newest features and functionality that will empower researchers to take neural signal sorting to a whole new level. No worries if you missed it, the information below will bring you up to speed.

Version 4 is loaded with new sophisticated algorithms and functionality including the ability to analyze overlapping waveforms, perform signal-to-noise ratio (SNR) computations, apply high-cut filtering to continuous channels and exploit digital referencing among many more features.

Occasionally, spikes can be lost from analysis because of overlapping waveforms. One neural firing may result in a threshold crossing and initiate the capture of a spike, but before the spike window is completed (i.e. before all the samples within the Waveform Window have been collected), another neural firing is picked up on the same electrode. This results in an overlapping waveform and will have a spike waveform that is not shaped like the unit template of either of the neurons involved. These overlapping waveforms typically show up as outliers, and usually are not sorted into any unit by automated sorting algorithms. The new Overlaps Analysis view can be used to help "rescue" some of these overlapping waveforms, allowing them to be properly sorted.

Through the new Threshold Scan Graph view, researchers will be able to scan through a range of threshold values, then create a graph of the number of extracted spikes and the signal-to-noise ratio as a function of the threshold. This can assist in deciding where to set the threshold for extracting spikes from continuous data.

To complement the ability to select low-cut filtering, OFS v4 will also offer high-cut filtering. This can be used to obtain local field potentials (LFPs) from a wideband continuous signal by removing the high-frequency spike activity.

New digital referencing provides the researcher with an automated tool for subtracting noise from channels containing interesting spike data. Specific continuous sources can be selected for noise reduction, then subjected to options such as either Common Average Reference (CAR) or Common Median Reference (CMR) techniques.

Compounding the above, OFS v4 is further packed with additional new functionality including but not limited to the ability to load multiple PL2™ files simultaneously; new L-Ratio and Isolation Distance sort quality metrics; support for Band and Line sorting methods; ability to name and manipulate Time Segments and save as NeuroExplorer® files; new scan modes including the ability to scan using different random initial seed clusters; support for multiple spike Sources; ability to display arbitrary combinations for continuous and spike data together for a channel in the Timeline View; the ability to use standard deviation or Median Absolute Deviation (MAD) to calculate fit or band fit tolerances and much more.

Neuroscientists will also appreciate the countless improvements, a few customary bug fixes and the complete *Offline Sorter, Offline Sorting Software Version 4 User Guide* that will come packaged with the program. Check out the newsletter sidebar for special upgrade pricing!

For more information regarding purchasing or upgrading to OFS v4, contact info@plexon.com.

EXPERIMENTAL BIOLOGY 2015 – STRONG SHOWING

This was a great year for the Experimental Biology meeting. EB2015 was held in Boston and attendance was up significantly, with more than 12,000 researchers attending. Combining researchers, vendors and other attendees, the total conference participation was over 14,000. We attended the EB conference for the first time – and we did so inside the Lafayette-Campden Neuroscience booth.

For Plexon, it was an important meeting to learn more about behavioral research being performed without electrophysiology and gage the reaction to the integrated demonstration (PlexBright®, CineLAB™ and a modular operant chamber). We appreciate all of the researchers that came by and discussed their experiments with us and commented on the demo. We are most pleased regarding the positive response to the CineLAB video tracking and analysis software we hope to formally launch soon.

If anyone wishes to discuss how we might work with our partner, Lafayette-Campden Neuroscience, to design a system specifically for your research, contact info@plexon.com.

DID YOU KNOW . . . OFS V4 RUNS ON WINDOWS® 7 ONLY?

Even though Microsoft supported Windows® XP for 12 years - longer than they supported any other operating system in history – it has now come to an end. Plexon is following suit, especially in regard to the security issues related to operating an unsupported operating system. Accordingly, new software packages released by Plexon will not be developed or tested on Windows XP any further.

As you probably know, OFS can be loaded onto an unlimited number of computers. However, a version-specific, USB license key is required to operate the software. You may have the software loaded onto a number of computers in the lab or even on researcher's laptops. As long as the computers are operating Windows 7, OFS v4 will operate as expected.

What if you are running OFS on the same Windows XP computer as a MAP or an OmniPlex® Neural Data Acquisition System, and you want to benefit from all of the new OFS v4 functionality? One simple solution is that you choose to run OFS on another computer with Windows 7. Problem solved.

However, if you wish/need to continue operating a Plexon neural data acquisition system and OFS v4 on the same computer, you will need to replace it with one loaded with Windows 7. No problem here either, we can help. Plexon is prepared and happy to assist with a new computer prepared and loaded with the appropriate software, any other related parts, such as the cables, necessary for your specific set-up.

For more information, contact support@plexon.com or your sales engineer directly for a quote.

FREE OFS UPGRADES FOR 2015 V3 ORDERS

As a "Thank You" to the research labs that recently purchased one or more new licenses of Offline Sorter v3 from Plexon between Jan. 1, 2015 and March 31, 2015, we are offering a FREE upgrade to NEW version 4! Since upgrades only require license key-specific upgrade codes, you can be operating the new version this week!

Email info@plexon.com for more information. Offer expires on December 21, 2015.

70% OFS UPGRADE DISCOUNTS FOR Q4, 2014 V3 ORDERS

Expanding the special offers to recent purchases, labs that placed an order for new licenses of OFS v3 between Oct. 1 and Dec. 31, 2014 qualify for a deep discount of 70% off of the standard upgrade. These, too, can be upgraded remotely via license key-specific upgrade codes.

Email info@plexon.com for more information and/or a quote. Offer expires on December 21, 2015.

NEW OFS V4 USER GUIDE

Plexon is pleased to share that the *Offline Sorter, Offline Sorting Software Version 4 User Guide* has been launched with the new software. It is available online in the Documentation library, and comes packaged with the new Offline Sorter v4 installers.

REVISED CHINA WORKSHOP DATES

The dates for the China Regional Neurophysiology Workshop sponsored by Hong Kong Plexon have been slightly modified to July 21-23, 2015. Contact jerry@plexon.com.hk for more information.

PLEXON KEEPS HIRING!

We keep growing and are constantly seeking outstanding, neuroscience-loving candidates for the following roles:

•• Technical Sales - Electrophysiology
•• Technical Sales - Behavioral Neuroscience
•• Inside Technical Sales - Neuroscience
•• Technical Support - Neuroscience
•• Senior Windows Software Engineer - Neuroscience

We especially encourage students and lab technicians from neuroscience and behavior research labs to apply. If you are interested, send your resume to jobs@plexon.com.

OFFICE CLOSURES

In observation of Memorial Day in the United States, Plexon's world headquarters will be closed May 25, with standard operations resuming on Tuesday, May 26.

Plexon Europe located in Belgium will celebrate three holidays as follows: Labor Day, May 1; Ascension Day, May 14; and Pentecost Monday, May 25. The Plexon Europe office will be closed all three days.

UPCOMING EVENTS

•• **6th Annual Plexon Neurophysiology and Behavior Workshop**, April 27-30; Dallas, Texas, USA
•• **12th Colloque de la Société des Neurosciences (French Neuroscience Society)**, May 19-20; Montpellier, France
•• **The Canadian Neuroscience Meeting**, May 24-27; Vancouver, Canada

RESEARCH SPOTLIGHT

Let us know about your 2015 publication citing Plexon and our equipment and we will send you a thank you award with a mug and a T-shirt! Send notices, address and T-shirt size to publications@plexon.com.

All articles listed are alphabetical based on first author within two categories: articles published online in electronic-only journals or ahead of print, and articles published in full print.

Recent articles published online in electronic-only journals or ahead of print:

•• Davis, Zachary W., Chao Sun, Brittany Derieg, Barbara Chapman, and Hwai-Jong Cheng. "Epibatidine Blocks Eye-Specific Segregation in Ferret Dorsal Lateral Geniculate Nucleus during Stage III Retinal Waves." *PLOS ONE* 10, no. 3 (2015).

•• Franke, Felix, Rodrigo Quian Quiroga, Andreas Hierlemann, and Klaus Obermayer. "Bayes optimal template matching for spike sorting–combining fisher discriminant analysis with optimal filtering." *Journal of Computational Neuroscience* (2015): 1-21.

•• Fuzzo, Felipe, Jumpei Matsumoto, Yasushi Kiyokawa, Yukari Takeuchi, Taketoshi Ono, and Hisao Nishijo. "Social buffering suppresses fear-associated activation of the lateral amygdala in male rats: behavioral and neurophysiological evidence." *Frontiers in Neuroscience* 9 (2015): 99.

•• González-Montoro, Aldana M., Ricardo Cao, Nelson Espinosa, Javier Cudeiro, and Jorge Mariño. "Bootstrap testing for cross-correlation under low firing activity." *Journal of Computational Neuroscience* (2015): 1-11.

•• Gu, Ling, Megan L. Uhelski, Sanjay Anand, Mario Romero-Ortega, Young-tae Kim, Perry N. Fuchs, and Samarendra K. Mohanty. "Pain inhibition by optogenetic activation of specific anterior cingulate cortical neurons." *PLOS ONE* 10, no. 2 (2015).

•• He, Chao, Quan-Hui Chen, Jian-Ning Ye, Chao Li, Yang Li, Jun Zhang, Jian-Xia Xia, and Zhi-An Hu. "Functional inactivation of hypocretin 1 receptors in the medial prefrontal cortex affects the pyramidal neuron activity and gamma oscillations: an in vivo multiple-channel single-unit recording study." *Neuroscience* (2015).

•• Horváth, János, Balázs Barkóczi, Géza Müller, and Viktor Szegedi. "Anxious and Nonanxious Mice Show Similar Hippocampal Sensory Evoked Oscillations under Urethane Anesthesia: Difference in the Effect of Buspirone." *Neural Plasticity* (2015).

•• Khayat, Paul S., and Julio C. Martinez-Trujillo. "Effects of attention and distractor contrast on the responses of MT neurons to transient motion direction changes." *European Journal of Neuroscience* (2015).

•• Lau, Brian, Marie-Laure Welter, Hayat Belaid, Sara Fernandez Vidal, Eric Bardinet, David Grabli, and Carine Karachi. "The integrative role of the pedunculopontine nucleus in human gait." *Brain* (2015).

•• Lui, Leo L., Yasamin Mokri, David Reser, Marcello Rosa, and Ramesh Rajan. "Responses of Neurons in the Marmoset Primary Auditory Cortex to Interaural Level Differences: Comparison of Pure Tones and Vocalizations." *Frontiers in Neuroscience* Volume 9 (2015): Article 132, pp. 1-19.

•• Ma, Chaolin, Xuan Ma, Hang Zhang, Jiang Xu, and Jiping He. "Neuronal representation of stand and squat in the primary motor cortex of monkeys." *Behavioral and Brain Functions* 11, no. 1 (2015): 15.

•• Mesbah-Oskui, Lia, John Georgiou, and John C. Roder. "Hippocampal place cell and inhibitory neuron activity in disrupted-in-schizophrenia-1 mutant mice: implications for working memory deficits." *npj Schizophrenia* 1 (2015).

•• Okun, Michael, Nicholas A. Steinmetz, Lee Cossell, M. Florencia Iacaruso, Ho Ko, Péter Barthó, Tirin Moore et al. "Diverse coupling of neurons to populations in sensory cortex." *Nature* (2015).

•• Song, Weiguo, Iahn Cajigas, Emery N. Brown, and Simon Giszter. "Adaptation to Elastic Loads and BMI Robot Controls During Rat Locomotion examined with Point-Process GLMs." *Frontiers in Systems Neuroscience* 9 (2015): 62.

•• Tao, Ye, Tao Chen, Bei Liu, Guo Qing Yang, Guanghua Peng, Hua Zhang, and Yi Fei Huang. "The neurotoxic effects of N-methyl-N-nitrosourea on the electrophysiological property and visual signal transmission of rat's retina." *Toxicology and Applied Pharmacology* (2015).

•• Wang, Dong V., Hau-Jie Yau, Carl J. Broker, Jen-Hui Tsou, Antonello Bonci, and Satoshi Ikemoto. "Mesopontine median raphe regulates hippocampal ripple oscillation and memory consolidation." *Nature Neuroscience* (2015).

•• Wei, Pengfei, Nan Liu, Zhijian Zhang, Xuemei Liu, Yongqiang Tang, Xiaobin He, Bifeng Wu et al. "Processing of visually evoked innate fear by a non-canonical thalamic pathway." *Nature Communications* 6 (2015).

•• Zhu, Yingjie, Wenhui Qiao, Kefei Liu, Huiyuan Zhong, and Haishan Yao. "Control of response reliability by parvalbumin-expressing interneurons in visual cortex." *Nature Communications* 6 (2015).

Recent articles published in full print:

•• Hung, Yu-Wen, Shao-Wen Hung, Yi-Chen Wu, Lin-King Wong, Ming-Tsong Lai, Yang-Hsin Shih, Tzong-Shyuan Lee, and Yung-Yang Lin. "Soluble epoxide hydrolase activity regulates inflammatory responses and seizure generation in two mouse models of temporal lobe epilepsy." *Brain, Behavior, and Immunity* 43 (2015): 118-129.

•• Lőrincz, Magor L., David Gunner, Ying Bao, William M. Connelly, John TR Isaac, Stuart W. Hughes, and Vincenzo Crunelli. "A Distinct Class of Slow (0.2–2 Hz) Intrinsically Bursting Layer 5 Pyramidal Neurons Determines UP/DOWN State Dynamics in the Neocortex." *The Journal of Neuroscience* 35, no. 14 (2015): 5442-5458.

•• McMahon, David BT, Brian E. Russ, Heba D. Elnaiem, Anastasia I. Kurnikova, and David A. Leopold. "Single-Unit Activity during Natural Vision: Diversity, Consistency, and Spatial Sensitivity among AF Face Patch Neurons." *The Journal of Neuroscience* 35, no. 14 (2015): 5537-5548.

•• Nolta, Nicholas F., Michael B. Christensen, Paul D. Crane, John L. Skousen, and Patrick A. Tresco. "BBB leakage, astrogliosis, and tissue loss correlate with silicon microelectrode array recording performance." *Biomaterials* 53 (2015): 753-762.

•• Wang, Zhengchun, Guangxing Li, Nini Yuan, Guangwei Xu, Xuan Wang, and Yifeng Zhou. "Acute Alcohol Exposure Impairs Neural Representation of Visual Motion Speed in the Visual Cortex Area Posteromedial Lateral Suprasylvian Cortex of Cats." *Alcoholism: Clinical and Experimental Research* 39, no. 4 (2015): 640-649.

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