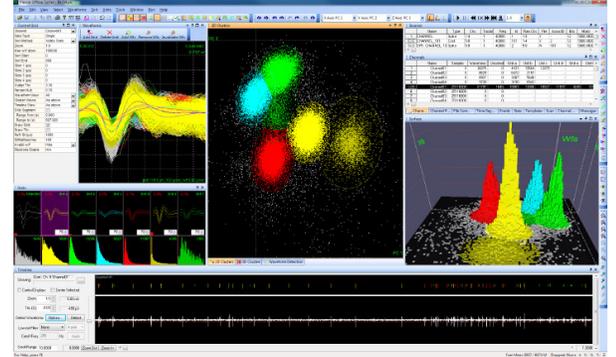


## Offline Sorter™

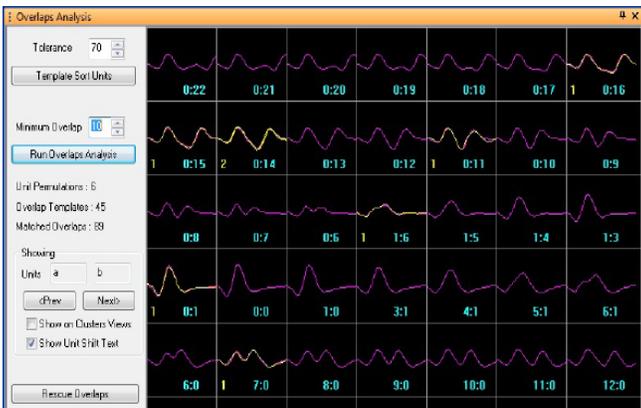
Plexon's Offline Sorter™ (OFS) is the most recognized and trusted offline spike sorting software in the industry today with 1,700+ publications specifically citing the use of OFS as part of their methods. OFS accepts file types from many data acquisition companies and software programs such as those listed in the technical specifications table—including, Plexon's advanced PL2™ file type.

OFS v4 is a powerful, easy-to-use tool for viewing and classifying action potential waveforms (spikes) previously collected from single electrodes, stereotrodes and tetrodes. Spikes can be displayed as points in either 2D or 3D feature space, where a variety of manual, semi-automated, or fully automated clustering techniques can be applied in order to classify (sort) the spikes. OFS can also perform spike extraction on continuously-recorded neural data using a variety of different thresholding methods. OFS allows verification of sorting through a variety of displays, and can calculate cluster separation statistics and sort quality metrics. The sorted spikes can be exported in several formats for subsequent analysis.



## Powerful Waveform Viewing and Sorting

### Overlapping waveform analysis

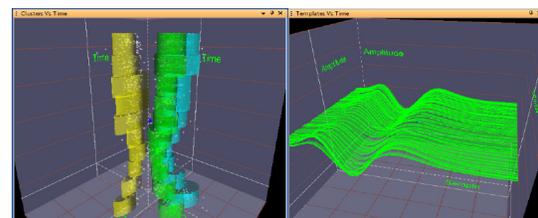


- ◆ Ability to display arbitrary (compatible) combinations of continuous and spike data for a channel together in the Timeline View which replaces the need to associate channels during loading of PLX files or during channel remapping
- ◆ Support for multiple spike Sources
- ◆ Manual cluster selection in 3D feature space using principal component projections, voltage slices in time, or more than 20 other waveform features such as peak, valley, full-width at half maximum, etc.
- ◆ Box sorting as a pair of time-level windows
- ◆ Waveform selection in time-voltage space
- ◆ Template matching algorithm
- ◆ Tetrode and Stereotrode waveform extraction and sorting using any method
- ◆ Unit cross-correlograms and ISI plots
- ◆ Waveform density plots in 2D or 3D in any feature space
- ◆ Waveform alignment
- ◆ Interval invalidation and artifact removal

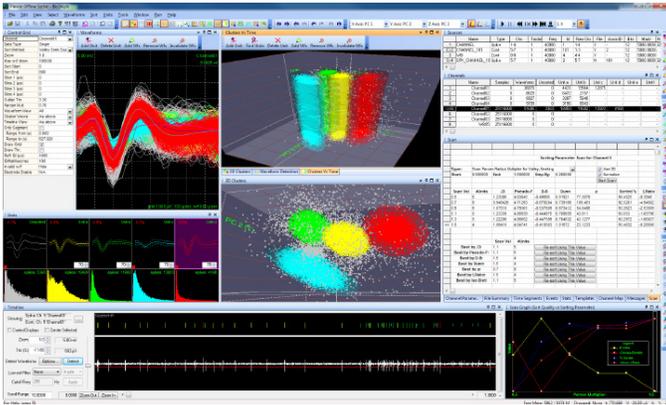
- ◆ Raster displays of spikes and continuous data
- ◆ Printable Sort Summary View with export to PowerPoint®
- ◆ Waveform features and statistics can be easily exported to MATLAB®, Excel® or text file
- ◆ Export of sorted data to NeuroExplorer®
- ◆ Save and recall particular sorting instances for a selected channel (useful for comparisons)

## Time Segmentation, Adaptive Sorting Methods, and Time-dependent Analysis

- ◆ Time Segments can be named and individually colored and toggled on/off, and can be saved/restored as NeuroExplorer Intervals
- ◆ Interval Selection tool can create Time Segments
- ◆ Ability to load multiple PL2 files simultaneously
- ◆ Divide each file into time segments and view and sort waveforms from each time segment separately
- ◆ Clusters vs Time View to show how clusters evolve as a function of time
- ◆ Sort Quality View vs Time Segment Graph View to display how the sort quality changes through the file
- ◆ Adaptive template sorting, with the templates changing over time to follow the waveform as it evolves
- ◆ Templates vs Time View to display how the template adapted through the file



## Semi-Automatic and Automatic Sorting



- Includes L-Ratio and Isolation Distance sort quality metrics
- Includes Lines and Bands as sort methods
- Scan modes, including ability to scan using different random initial seed clusters
- Option to use standard deviation or MAD to calculate fit tolerances or band fit tolerances
- Enhanced automatic sorting methods with systematic scanning through parameter space and graphs displaying the sort quality metric as a function of the parameters that were varied; select the best sorting according to a selected sort quality metric
- Automatic sort scan results for each channel can be saved to and loaded from SCAN files. This, together with the new batch mode scan commands, will allow the running of certain sorting scans overnight, followed by manual reviewing and selection of the most appropriate sort for each channel
- Automatic cluster selection in feature space using Valley Seeking or T-Distribution Expectation Maximization (E-M)
- Semi-automatic cluster selection in feature space using K-Means or Standard E-M

## Enhanced Batch Mode Processing for Running Sorting Algorithms Overnight

- Batch mode commands for scanning through automatic sorting parameters
- Edit batch files with a user-selected editor
- Record of previous batch file locations
- Quick Batch Reference showing all batch commands
- Log file resulting from the latest batch run shown on menu

## Enhanced Continuous Data Handling and Spike Detection

- Ability to apply high-cut filtering to continuous channels
- Digital referencing
- Signal-to-Noise ratio (SNR) computation
- Threshold Scan Graph View allows examining SNR and number of spikes as a function of threshold position for continuous data

- Up-sampling of continuous signals, with linear or spline interpolation
- Fast Fourier Transform (FFT) View of continuous data
- Single and Dual Thresholds for spike detection
- Waveform detection and extraction now appropriately handles differences in voltage scales between spike waveform segments and continuous spike data

## Improved User Interface, Displays, and Performance

- Customizable contents of the Sort Summary View
- Read times for PL2 files for single channels are up to 100s or 1000s times faster
- Enhanced Timeline View showing both continuous and waveform data simultaneously with a resizable splitter
- Mouse-over time and voltage readings in the Waveform View and Continuous Data View
- More information related to gains and voltage ranges in the Channel Parameters View and File Summary View
- Ability to select the next/previous channel, unit, waveform or time segment on main menu
- Performance enhancements for loading data files faster
- Available as a true 64-bit executable for faster processing of large data files

## Technical Specifications

OFS Features	Specifications and Options
<b>File types supported</b>	Plexon (.pl2, .plx), NeuroExplorer (.nex), Alpha Omega (.map, .mpx), Axion Biosystems (.spk, .raw), Cyberkinetics/Blackrock Microsystems (.nev, .ns5), CED Spike-2 (.smr), DataWave (.uff, .dat, .cut, .act), Neuralynx (.ntt, .nst, .nse, .ncs, .nvt), Multi Channel Systems (.mcs, .mcd), Panasonic (.med), Neuroshare (.nsn), Data Translations (.dcf), generic binary continuous data, and other formats supported via Neuroshare
<b>Electrode support</b>	Single, stereotrode and tetrode
<b>Spike detection methods</b>	Voltage threshold, Signal Energy, Nonlinear Energy and Signed Signal Energy
<b>Spike sorting methods</b>	<ul style="list-style-type: none"> <li>Manual methods: Boxes, Lines, Bands, Waveform Crossing and Contours</li> <li>Semi-Automatic methods: Templates, K-Means and Standard E-M (Expectation Maximization)</li> <li>Automatic methods: Valley-Seeking, T-Distribution E-M and Scanning methods</li> </ul>
<b>Export options</b>	MATLAB, Excel, text file or NeuroExplorer
<b>Computer CPU</b>	Pentium® III or better
<b>Platform</b>	Windows® 7, 8, and 10
<b>Minimum System Requirements</b>	<ul style="list-style-type: none"> <li>CPU: Intel Core i3 / AMD Ryzen 3</li> <li>GPU: Dedicated NVidia or AMD graphics card with OpenGL support</li> <li>OS: 32 or 64-bit Windows 7/10</li> <li>RAM: 4 GB RAM: 4 GB</li> </ul>
<b>Recommended System Requirements</b>	<ul style="list-style-type: none"> <li>CPU: Intel Core i5 / AMD Ryzen 5</li> <li>GPU: Dedicated NVidia or AMD graphics card with OpenGL support</li> <li>OS: 64-bit Windows 10</li> <li>RAM: 16+ GB</li> <li>Disk: SSD or M.2</li> </ul>