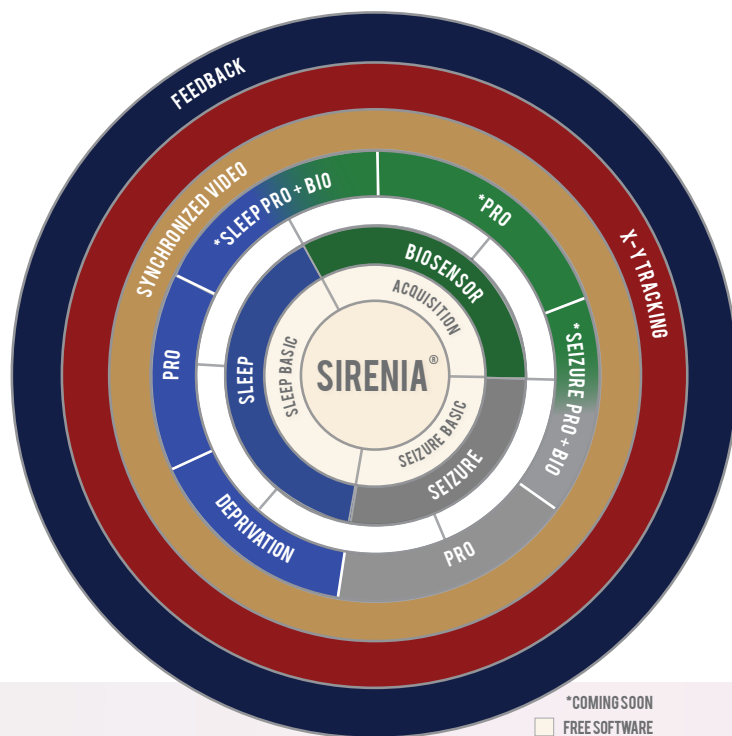# SIRENIA®

Pinnacle's **SIRENIA® SOFTWARE** provides powerful tools for preclinical research. Our **FREE** Sirenia® platform includes acquisition and basic analysis software, and **PREMIUM MODULES** can be added at any time.

KEY FEATURES

- Supports synchronized video
- Data consolidation
- Record from multiple Pinnacle devices using one platform
- I/O functionality
- Flexible data management
- Multiple export capabilities

*COMING SOON

☐ FREE SOFTWARE

FREE ACQUISITION

Sirenia® Acquisition provides a single platform for recording data from any Pinnacle hardware system, excluding FSCV. The software features synchronization of all data streams, user-configurable settings, data consolidation, and multiple export options. In addition, the download includes basic review and analysis modules for biosensor, sleep, and seizure recordings. Sirenia® delivers all-in-one software that is ideal for data acquisition and review.

VISIT OUR WEBSITE TO DOWNLOAD SIRENIA® TODAY!

www.pinnaclet.com/sirenia-download.html

THIRD-PARTY DATA STREAMS

Sirenia® supports the integration of third-party data streams via a National Instruments I/O module. These data can be simultaneously recorded along with Pinnacle's biopotential and biosensor data.

Product	Item #
National Instruments I/O module	9032

PREMIUM MODULES

PAID SOFTWARE MODULES

Product	Item #
Sirenia® Seizure Pro Analysis Software	9037
Sirenia® Sleep Pro Analysis Software	9035
Sirenia® Feedback Software	9030
Sirenia® X-Y Tracking Software	9039

Premium software packages can be installed on multiple computers, though each seat is limited to one computer running the program at a time. Purchase includes one year of free upgrades. Contact Pinnacle at sales@pinnaclet.com for additional package options.

Download the free software trials at www.pinnaclet.com/software.html

30-DAY FREE TRIAL

SEIZURE PRO
Quickly identify and analyze events in your data using the line length and power characteristics of user-defined seizures.

SLEEP PRO
Score mouse and rat data in 75% less time using automated tools such as cluster and threshold scoring.

FEEDBACK
Use biopotential inputs and other feedback to automate events, such as sleep deprivation, optogenetic stimulation, and more.

X-Y TRACKING
Precisely track animal movement in real-time and quickly analyze behavioral patterns based on trajectories, quadrant analysis, and much more.

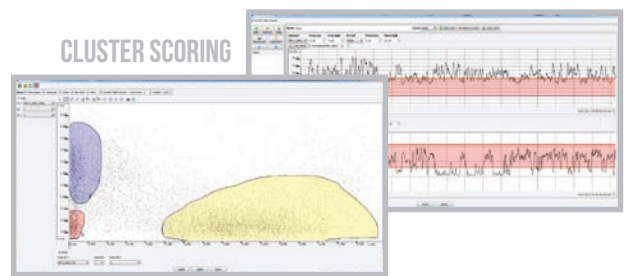LEARN MORE ABOUT THESE TIME-SAVING MODULES: PAGES 24-25

PREMIUM SOFTWARE MODULES FOR SLEEP AND SEIZURE

Upgrade from our basic software to automate your sleep scoring and seizure identification processes. Both **SIRENIA® SLEEP PRO** and **SIRENIA® SEIZURE PRO** provide automated tools for rapid data analysis. All EEG/EMG and video data sets recorded with Pinnacle software, as well as third-party EDF files, can be imported for analysis.

SIRENIA® SLEEP PRO

Sleep Pro provides three mechanisms for scoring sleep data: manual, cluster, and threshold scoring. Combine multiple methods to quickly and accurately score both mouse and rat files. Epoch lengths are user-configurable, and numerous scoring sessions can be created for the same file. In addition, real-time hypnograms, epoch-by-epoch heat maps, and spectral plots are available as visual aids. Plus, powerful analysis tools such as sleep stage/sleep bout analysis and user score comparison make reviewing and exporting data easy.

KEY FEATURES

CLUSTER SCORING
THRESHOLD SCORING

- Multiple scoring tools
- Real-time hypnograms
- Spectral plots
- Heat maps
- Power analysis
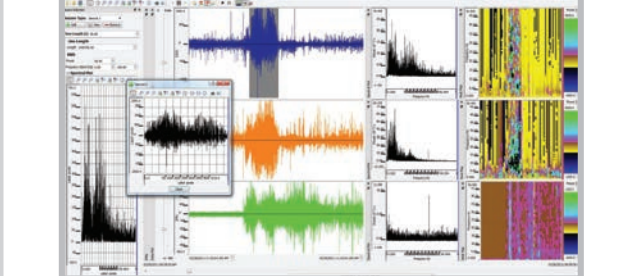- Peak frequency analysis

ACCURACY OF SLEEP DETECTION

A combination of cluster, threshold, and manual scoring tools were used by four experienced and novice scorers to separately score three different **mouse data** files. All files were compared to expert hand-scored data files. The overall average agreement of the four scorers for all the files as compared to the expert is shown below.

Sleep State

Wake	89.7%
NREM	94.7%
REM	80.2%

Percentage Correct Compared to Expert
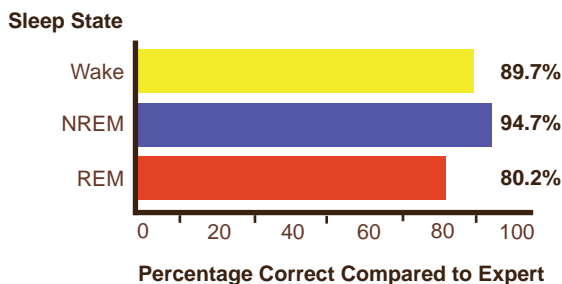
SIRENIA® SEIZURE PRO

Seizure Pro employs a database system to store line length and power characteristics of user-defined seizures. Information collected in the database is used to quickly identify and mark like-events within any Sirenia® or EDF file. Racine's scale ratings, seizure classification, and notes can be easily added to logged events for future reporting. Plus, spectral plots and heat maps are available to aid in visual confirmation. Seizure statistics — including average duration, time between seizures, and peak frequency — are automatically generated.

KEY FEATURES

- Automated seizure identification
- Spectral density heat maps
- Spectral plots
- Power analysis
- Time analysis
- Seizure statistics

ACCURACY OF SEIZURE DETECTION

Seizure detection was performed using RMS power and line length separately on five individual **mouse data** files. All files were compared to an expert hand-scorer's files. Agreement of the two detection methods as compared to the expert is shown below.

	# of Seizure Events Marked	Accuracy vs. Expert Scorer	# of False Positives
Expert Scorer	21	N/A	N/A
RMS Power	23	100%	2
Line Length	21	100%	0

Data courtesy of Drs. Philip Haydon and Jerome Clasadonte (Expert Scorer)
Tufts University School of Medicine, Department of Neuroscience

SIRENIA® FEEDBACK PRO

Sirenia® **FEEDBACK PRO** software enables users to create rule sets based on baseline data, thresholds, and power analysis to initiate stimuli in a variety of sleep, seizure, optogenetics and behavioral studies. When used in conjunction with Pinnacle EEG/EMG recording devices, real-time signals can be analyzed by the software based on user-programmed rules. Additionally, our Sirenia® software allows researchers to connect and synchronize the settings of multiple units.

When used with our sleep deprivation systems, users can set EEG/EMG criteria to determine sleep/wake state and initiate the deprivation. Our software also supports third-party hardware via TTL controls.

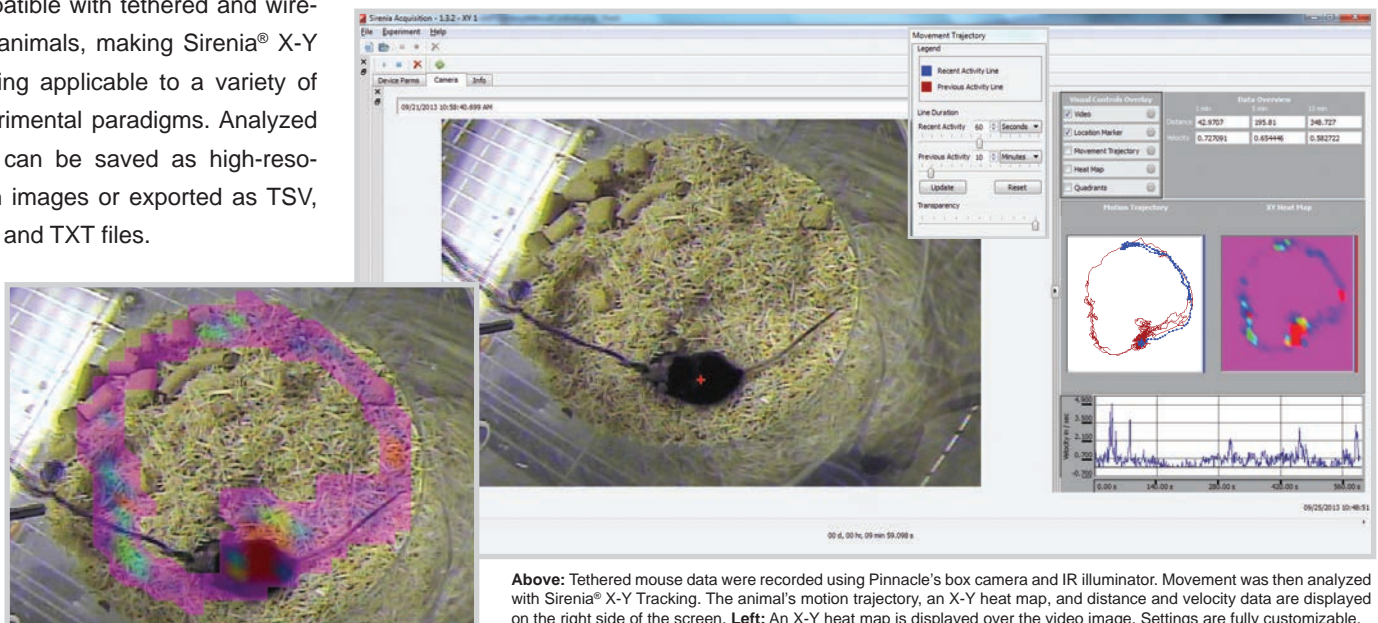## KEY FEATURES
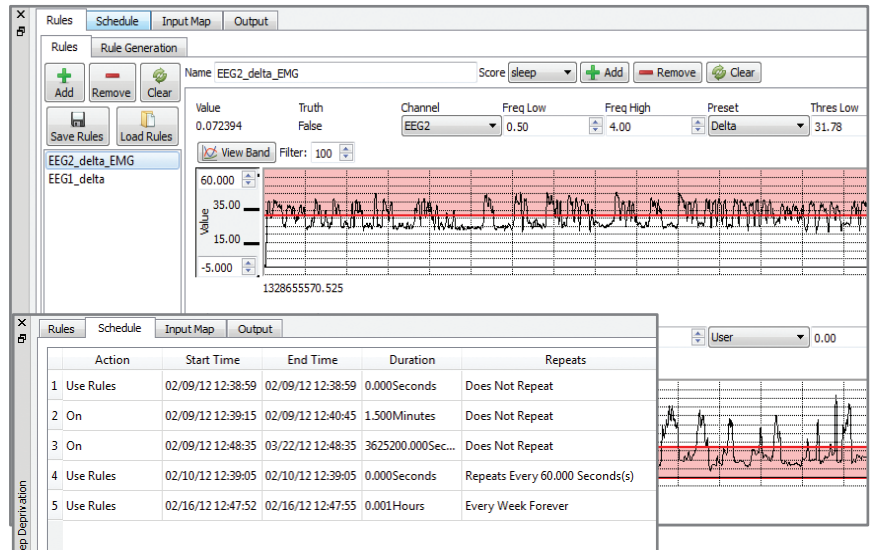
- Scheduled output
- Input → output
- Real-time analysis + rules → output

SIRENIA® X-Y TRACKING

SIRENIA® X-Y TRACKING enables users to accurately detect and analyze animal movement within a cage. Users can track locomotor behavior in real-time or in previously recorded video data. In addition, our software can be calibrated to different cage types and is compatible with tethered and wireless animals, making Sirenia® X-Y tracking applicable to a variety of experimental paradigms. Analyzed data can be saved as high-resolution images or exported as TSV, EDF, and TXT files.

Above: Tethered mouse data were recorded using Pinnacle's box camera and IR illuminator. Movement was then analyzed with Sirenia® X-Y Tracking. The animal's motion trajectory, an X-Y heat map, and distance and velocity data are displayed on the right side of the screen. **Left:** An X-Y heat map is displayed over the video image. Settings are fully customizable.

KEY FEATURES

- Real-time tracking
- X-Y heat maps
- Motion trajectory analysis
- Distance and velocity traveled
- User-defined regions
- Quadrant analysis