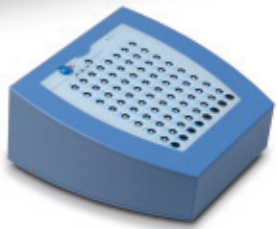
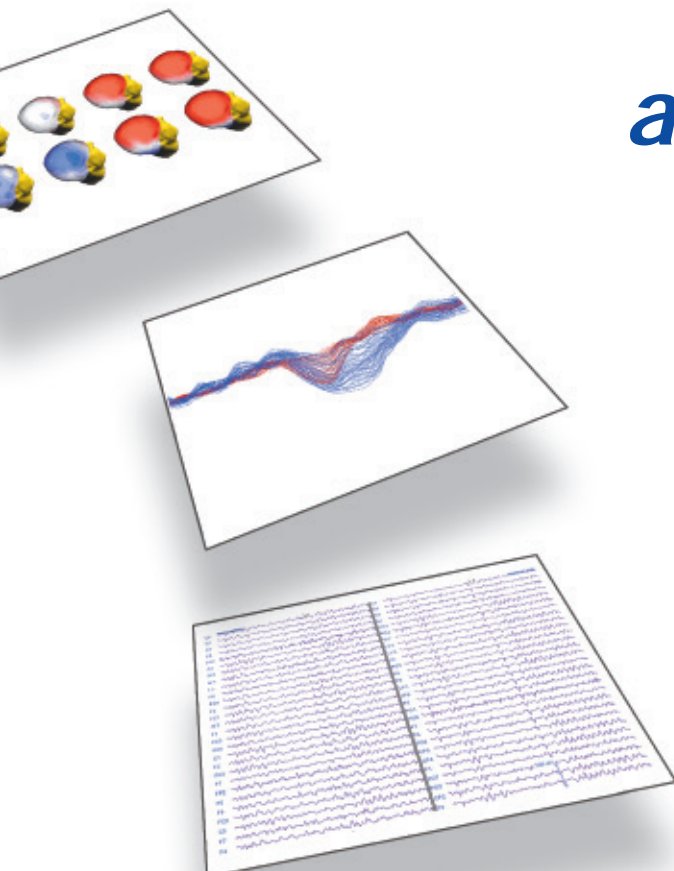


from signals to sources



asa-lab turnkey solution for ERP research

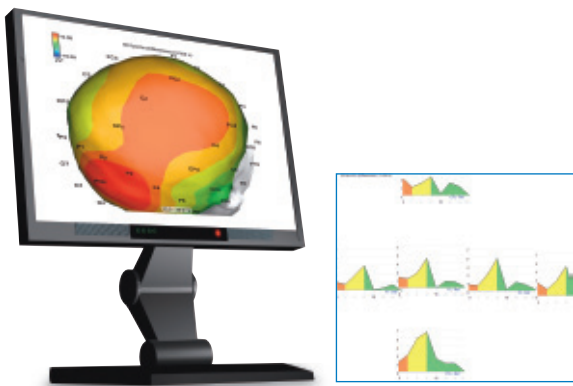


A N T

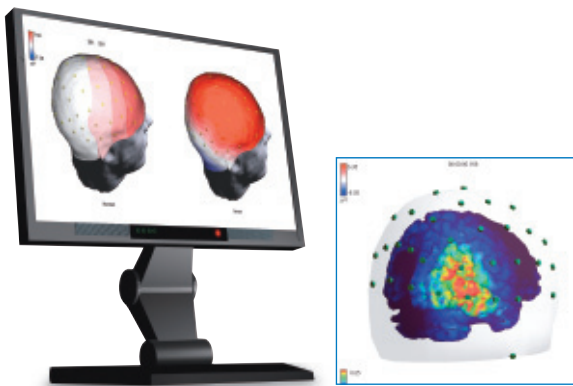
asa-lab™: turnkey solution for ERP research

Psychological research on the basis of event-related potentials is a key source of information to uncover the highly dynamic relations between cortical brain regions. **asa-lab™** provides you with a turnkey solution to explore the brain's reaction to a particular experimental paradigm within minutes! With **asa-lab** ANT offers a complete system for acquisition, stimulation and analysis for cognitive neuroscience that meets with all basic and advanced lab requirements.

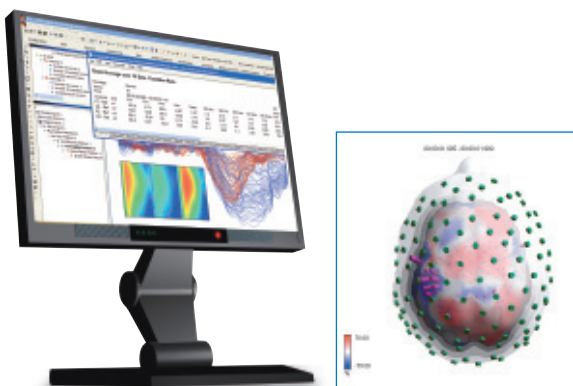
Whether you want to analyze ERP data with peak scoring, spectral components, trial-by-trial information, dynamic 3D Mapping, cortical activation sheets or current density images superimposed on the subject's MR scans - **asa-lab** is the all-inclusive solution.



3D FFT mapping and spectral analysis



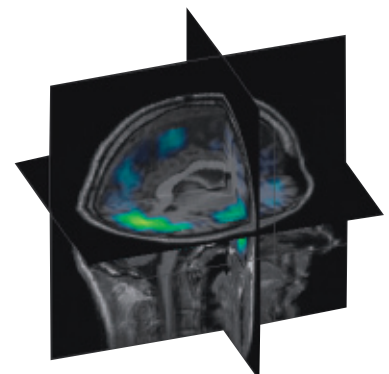
Cortical imaging



Average waveform analysis and cortical ERD

asa-lab™ signal processing and analysis

asa-lab integrates the complete range of experimental design and signal analysis in one package without compromise. Processing of your recording starts right after you have recorded your data. The moment you press the *Stop* button, averages of the different experimental conditions are calculated; peak amplitudes and latencies are extracted to form statistical evidence. The significant components are further processed using sophisticated source reconstruction such as Cortical Imaging, LORETA or ERD/ERS on the cortical surface to highlight the relevant brain regions. The analyses are performed on either single-subject or group averages, using individual head modeling and additional anatomical scans if available. And - in addition to a comprehensive set of basic and advanced methods, **asa-lab** comes with an extended integration interface to communicate with Matlab®, MS-Excel® and other third-party programs. This powerful COM interface gives full access to the loaded data, the visualization and all methods implemented and can give you that extra degree of freedom you may need in the particular research project your team is dealing with. Developing a new method has never been easier!



asa-lab™ recording system

The performance of an ERP system depends for a great deal on the system's ability to record clean data. With our innovative sensor cap and the high-resolution amplifier for 32 to 256 channels we meet even the highest standards of EEG signal quality. The Active-Shielding concept for each sensor keeps external noise away even for very long electrode wires and renders electrical shielding of the lab obsolete. The electrode material and shape are optimized

for minimal DC shifts and optimal stability of the incoming signals. **asa-lab** is a complete system that allows you to capture the brain's electrical fingerprint from DC to the maximum bandwidth. For extended research, additional polygraphic channels (e.g., temperature, skin resistance) can be recorded together with the EEG. Next to the online display of EEG data, online spectra and frequency maps as well as online averaging and response statistics are available.



High Resolution Amplifier



72 channel DC amplifier with 64 channels EEG, 4 bipolar inputs and 4 additional auxiliary inputs for polygraphy

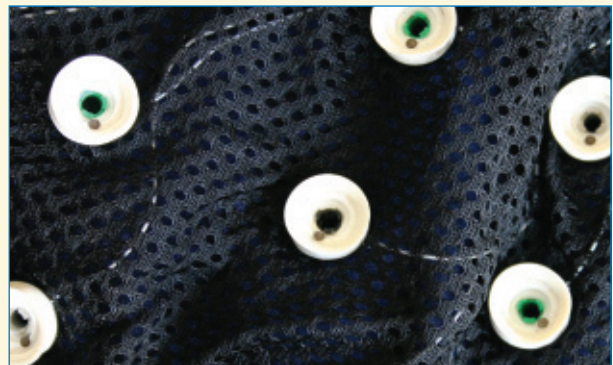


Check impedances on the front of the amplifier or by looking at the impedance view in **asa-lab™**

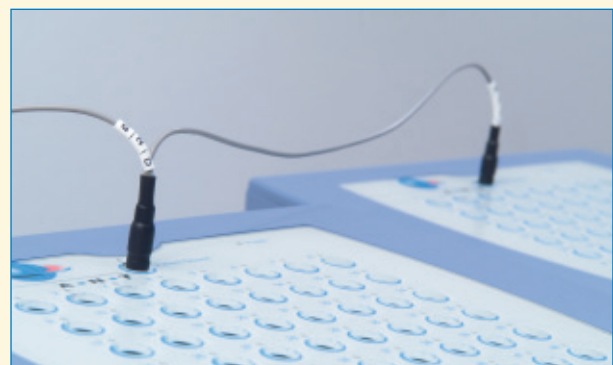
Features and benefits

- Full band EEG DC amplifiers
- Active-shield cap with sintered Ag/AgCl electrodes and shielding for each individual lead
- Portable system with short preparation time for recordings

Innovative Sensor Cap



Active-shield cap system provides superb signal quality



Amplifiers can be cascaded for recordings with more channels

- Wide range of signal processing tools
- Automated signal analysis for subjects and group data
- Advanced source localization with standardized or subject's MRI
- Integration with third party tools like Matlab®



asa-lab™ - Experiment Manager

The asa-lab™ Experiment Manager provides a great tool to review and automatically process large data sets. Actions such as filtering, artefact rejection, conditioning, averaging, group averaging, and time/amplitude extraction are available, without the need to learn any programming language. The Experiment Manager combines the strong features of MS-Excel with the data handling, analysis and visualization capabilities of ASA. The spreadsheet design allows for integration of your own data manipulations, easy combination with charting, and macro scripting for an optimal analysis of a complete study. Global Field Power of group data, creating histograms of reaction times, performing group statistics on peak amplitudes and much more, can be done quickly with the asa-lab™ Experiment Manager.

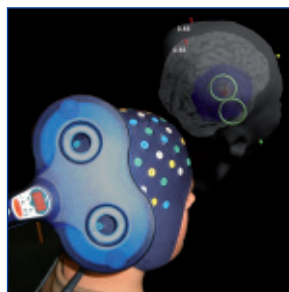
Visor™

complete neuro-navigation system for precise TMS-coil positioning

Visor provides an innovative approach to image-guided TMS, brain navigation and functional 3D mapping in clinical and cognitive research.



- Mobile TMS navigation system with easy setup
- Wide range infrared camera system, accuracy within 2 mm
- Accurate and reliable: the system provides real-time feedback on the current location of the digitizer pen or TMS coil on the MRI and head surface
- Real-time visualization of multiple TMS coils and probes
- Intuitive target view: accurate positioning of coil over desired stimulation target
- Set targets for coil positioning based on MRI, functional data (such as fMRI, source analysis results, dipoles) or simply enter coordinates (e.g. in Talairach system)
- Forward field calculation for real-time display of induced electrical field induced by TMS while navigating (E-field calculation)
- Quick and easy calibration of (new) coils
- Compatible with TMS coils from different vendors



asa-lab™ - multi-modality applications

Recording of EEG in fMRI

With asa-lab you can record EEG during MRI data collection.

Using the compact asa-lab DC amplifier, a non-magnetic battery



pack, the special asa-lab fMRI kit and the Waveguard fMRI compatible cap you can record signals with high quality. Gradient and pulse artefacts can be removed from the EEG using advanced correction methods in ASA.

Simultaneous recording of EEG during transcranial magnetic stimulation (TMS)

The recording of EEG during transcranial magnetic stimulation is an extremely useful technique to measure the response of the brain to this kind of magnetic stimulation. The asa-lab EEG/ERP system is TMS compatible and allows recording of clean EEG within milliseconds after stimulation.



EEG in the MEG

Recording EEG inside a MEG system has never been so easy as with asa-lab. The completely non-magnetic and highly comfortable Waveguard cap makes it possible to record clean EEG and MEG even during longer sessions. EEG and MEG are merged in ASA for simultaneous analysis.



Synchronized Digital Video

asa-lab can be extended with digital video for more enhanced insight. The MPEG4 video is fully synchronized with the EEG recording.



from signals to sources



asa-lab™ offers the perfect solution for your research covering all aspects of your experimental work: the innovative sensor caps connected to a high-resolution amplifier with active shielding for each individual lead provide unmatched signal quality. Processing and analysis of incoming data can be configured to run automatically on your complete subject population to ensure reproducibility and a maximum efficiency. Designing and testing your experimental paradigms becomes as simple as operating a spreadsheet program.



Portable asa-lab™ system: a complete ERP solution to record anywhere



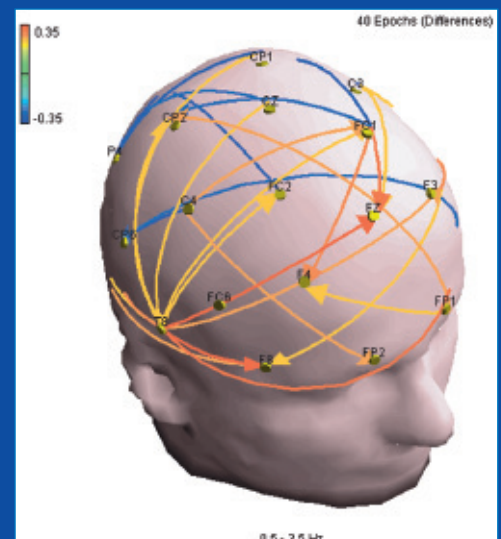
Easy experiment setup and short subject preparation time gets you started quickly



asa-lab™ - at a glance

Features and benefits

- Portable EEG/ERP recording system with 32 to 256 channels
- Full-band EEG DC amplifiers, 20,000 Hz maximum sampling rate
- Data Transmission at 24-bit resolution via optical cable to USB
- ANT Active-Shield Cap provides unmatched signal quality due to active shielding for each individual, sintered Ag/AgCl element
- No abrasive gel necessary because of active shielding and the ultra high input impedance of 10^{12} Ohm
- Innovative cap design ensures comfort, short preparation time and ease of use
- EEG/ERP recording in configurable setups, online display for traces and spectra, online averaging and 3D mapping
- EEG/ERP analysis with full range of signal processing and time-frequency analysis methods such as wavelets, coherence, phase analysis and more...
- Source reconstruction by means of dipole modeling, MUSIC, LORETA, Cortical Imaging, Cortical ERD/ERS and other methods
- Full management of group studies, automated group data analysis
- Head modeling of individual MR images and co-registration of results with brain anatomy, export of merged images
- Online and offline automated interaction with third-party programs such as Matlab® and other advanced analysis programs

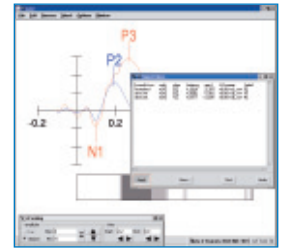


Event-related coherence analysis



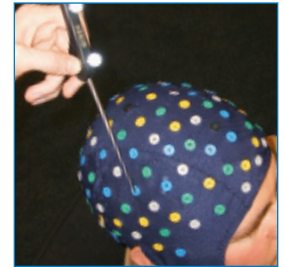
eeprobe™: ERP signal processing

Analysis of large data sets can be made even more efficient through the addition of the **eeprobe** software. Dedicated algorithms are tuned for fast processing, thus providing the most powerful solution for scripting and completely automated analysis of single subject and grouped data. The **eeprobe** software for ERP signal analysis has been developed for routine use at the Max Planck Institute for Cognitive Neuroscience in Leipzig, Germany, and is available for other institutions via ANT.



xensor™: 3D electrode digitizer

asa-lab can be extended with a 3D electrode digitizer system to acquire, visualize and store the positions of the scalp electrodes. The resulting xyz-information is required to further improve the result of EEG source localization. **xensor** takes care of the electrode digitization procedure and uses advanced a 3D infrared camera for real-time tracking with exceptional accuracy. **xensor** is the most professional addition to facilitate exact digitization of scalp electrodes.



eevoke™: exciting stimulation!

A major challenge in brain research is to develop intelligent experimental paradigms that match your theoretical model. **eevoke** provides you with a dedicated tool rather than just another programming language to deal with the composition of your multimedia scenario. This MS-Excel® based experiment generator brings even the most complicated paradigm down to a manageable structure. Behavioral analysis of subject responses is fully integrated in this environment. Once you are finished with the design, our integrated eevoke stimulation package will run it with precision timing.



Stimulations can be visual, auditory or mixed

ANT: the positive impulse to improve your results

To help you with your research and applications ANT develops flexible products that seamlessly fit together. Add good support and special services: ANT is the perfect partner in cognitive neuroscience!

Advanced Neuro Technology (ANT) was founded in 1996. The activities of ANT are dedicated to the development of systems for recording and analysis of neurophysiological signals in neurological, psychological, physiological research and related clinical applications. ANT is specialized in delivering high quality and user-friendly systems that meet the standards set by modern research. ANT is an innovative company with a specialized and strong scientific staff. ANT benefits from the scientific know-how gained through many years of research at

Twente University (Netherlands), the Max Planck institute for Cognitive Neuroscience (Germany) and other scientific organizations.

The development of **ASA™** commenced in 1993 and was made commercially available in 1996 through ANT. Since that time ANT has continued the development of different products to be used in both research and clinical fields. Its products are used in many laboratories worldwide and offered both directly or through our distributor network. ANT actively supports and contributes to research projects. ANT frequently organizes workshops to provide training and services to our users and to communicate future developments with the participants.

