

# SmartEP



## Auditory, Visual, and Somatosensory Evoked Potentials

SmartEP is a feature-rich evoked potentials system with the versatility to meet all your clinical and research needs.

### Quality, Flexibility, and Simplicity

“Let our ingenuity make your testing easier.”

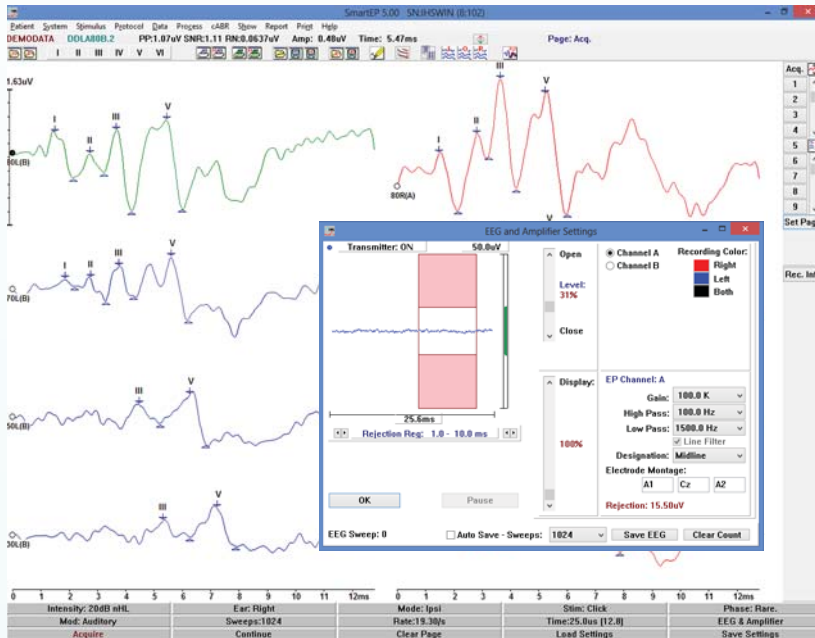


 **INTELLIGENT HEARING**  
**S Y S T E M S**

Many Options, One Smart System

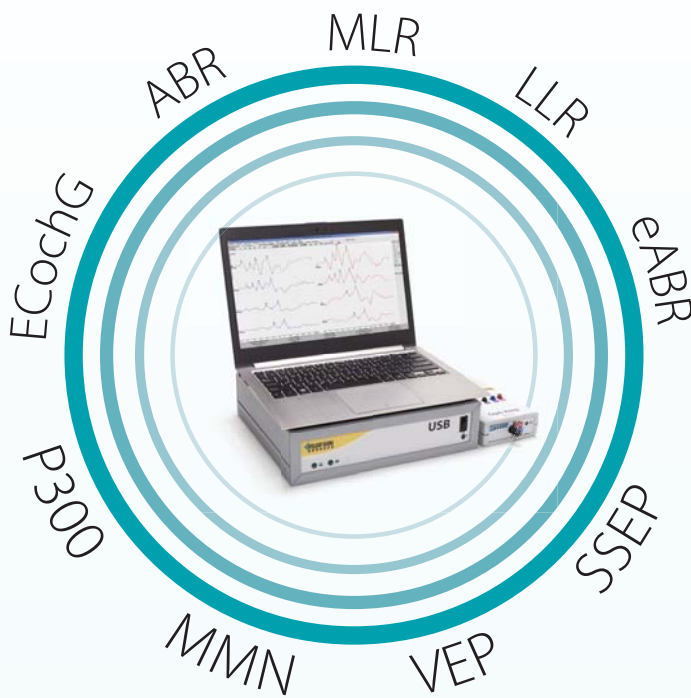
# SmartEP

The most complete and flexible platform for the acquisition of Auditory, Visual, and Somatosensory Evoked Potentials.



- A clear, concise Control Panel always displayed at the bottom of the screen, allows for simple test setup and fast data acquisition.
- Change most test parameters with a single click.
- Real-time viewing of ongoing EEG activity.
- Set the artifact rejection level and time region using clear visual markers.
- Choose from a variety of standard stimuli or generate or import your own custom stimuli.
- Easily mark waveforms using over thirty pre-defined peak labels or custom labels that you create.
- Latency-Intensity graphs indicating normative data ranges are automatically generated from marked waveforms.
- Digitally filter recordings during or after acquisition.
- Save settings for fast and easy test replication.
- Customize your own protocols for automated acquisition.
- Expand the capabilities of SmartEP with additional optional modules. Pre-programmed screening parameters.





## Powerful Analysis Features

SmartEP is simple for beginners to easily operate, yet has powerful features for the most advanced users.

- Organize your data the way you want on any of the ten available report pages.
- Easily compute differences between peak latencies and amplitudes between recordings.
- View separate rarefaction and condensation responses in recordings acquired with alternating stimulus polarity (useful for auditory neuropathy diagnosis).
- Smooth recordings with user-controlled digital filtering.
- Quickly add, subtract, invert, and cross-correlate recordings.
- Examine the frequency composition of recordings with the built-in spectral analysis tool.
- Automatically calculates Signal-to-Noise Ratio (SNR) and Residual Noise (RN) values while acquiring recordings.

<sup>1</sup> Some options not available for all hardware platforms

<sup>2</sup> Advanced research tools.

## Full Range of Capabilities

Standard functionalities include Electrocochleography (ECochG), Auditory Brainstem Response (ABR), Middle Latency Response (MLR), Late Latency Response (LLR), and Slow Negative 10 (SN10).

Additional acquisition modes<sup>1</sup> include:

- P300 with optional Eye Blink Amplifier
- Mismatch Negativity (MMN)
- P50 (sensory gating studies)<sup>2</sup>
- Notched Noise Masking (ipsilateral masking)<sup>1</sup>
- Advanced Auditory Research<sup>2</sup> (Stimulus Channel Mixing)
- High Frequency stimuli capabilities
- Electrically Evoked ABR for Cochlear Implant recipients (EABR)
- Chained Stimuli (Intensity Series Stimulation)
- Visual Evoked Potentials (VEP)
- Somatosensory Evoked Potentials (SSEP, ENoG)
- Continuous Loop Averaging Deconvolution (CLAD™ - ultra high rate EP acquisition)<sup>2</sup>

## The Flagship of an Integrated Suite

Start with SmartEP or any of the modules below. At any time, add additional functionalities as you need them, all of which share the same integrated patient database and report generation.

- SmartEP-ASSR (Auditory Steady State Responses)
- SmartDPOAE (Distortion Product OAE)
- SmartTrOAE (Transient Evoked OAE)
- IntelligentVRA (Visual Reinforcement Audiometry)
- SmartAudiometer (PC Based Audiometer)
- SmartScreener-Plus 2 (Infant Hearing Screener)
- PetScreener (ABR Based Animal Screener)
- SmartEP-CAM<sup>2</sup> (Continuous Acquisition EP Module)
- SmartUSB-ActiveX<sup>2</sup> (User Programmable Controls)

# Smart Features

## Software

- Easy-to-use Windows® based interface with waveform drag-and-drop and multitasking capabilities.
- Default parameters allow fast start-up and testing.
- Full control over numerous parameters for the ultimate flexibility in testing.
- User-defined testing protocols for automated data collection.
- User-defined artifact rejection level and time region.
- Automatic signal-to-noise ratio and residual noise calculations.
- User-specified masking level or stimulus-level-tracking contralateral masking included.
- Ipsilateral notched-noise masking option available.
- Latency-Intensity plots with the ability to customize shaded normative data range areas.
- Easily label, process, and print recordings during or after data acquisition.
- Add, subtract, multiply, and cross-correlate recordings.
- View both right and left ear recordings on the same page.
- Color-coding of recordings by ear and acquisition channel makes analysis, such as comparison of multi-channel recordings, exceptionally simple.
- Easy peak labeling. Use labels specific to ECoChG, ABR, MLR, LLR, and more.
- Ten display pages for easy waveform management and report generation.
- On-screen display and manipulation of up to 250 recordings, images or text objects.
- Integrated power spectrum display of stimuli and recordings.
- Advanced digital FIR and spectral filters for waveform smoothing.
- Automated export of patient information and test results to your own word processing software for efficient generation of customized reports and letters.
- Save reports directly to PDF file format.
- Integrated database that is common to all IHS programs.
- Export recordings to ASCII text file format.
- User-modifiable, frequency-specific, SPL-to-nHL conversion values.
- Stimulate up to 16 kHz in standard mode, or up to 32 kHz with the high frequency option (transducer dependent).
- Built-in system diagnostic, calibration, and self-check utilities.

## Computer Requirements

- Windows® based computer, notebook recommended.
- Minimum 4GB RAM.
- Minimum 5GB available hard drive space.
- Minimum XGA display (1024x768 screen resolution).
- Two free USB ports.
- Adobe Acrobat® or Acrobat® Reader software.
- Removable media, network drive, or secure internet storage site for data backup recommended.

## Hardware

- USB Plug-and-Play.
- Up to 8 recording channels.
- Optional auditory transducers: insert earphones, bone vibrator, headphones, sound field (with external amplifier and speakers), high frequency transducers, and OAE probe.
- Easily upgradable to include SmartEP-ASSR, SmartDPOAE, SmartTrOAE, SmartAud, SmartScreener-Plus 2, IVRA.