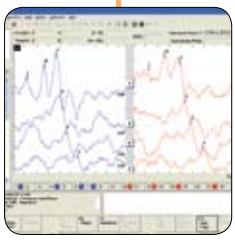
EASY

Comprehensive EP testing



ICS Chartr EP 200

Hearing Assessment · Fitting Systems · Balance Assessment

otometrics
MADSEN · AURICAL · ICS

Auditory Evoked Potential - At its best!

EASY EP

- Comprehensive test battery
- Easy navigation
- Flexible display options
- Straightforward waveform analysis
- Customized reporting

The ICS Chartr EP 200 builds on the expertise of our ICS Chartr line. Creating smaller, portable systems while maintaining the easy-to-use software interface valued by our customers. New features maintain the user friendliness and assist you in performing any AEP test with ease.

Comprehensive test battery

ICS Chartr EP 200 provides a comprehensive test battery for diagnosing a wide range of auditory and vestibular disorders. Users can create their own protocols or get an immediate start with the pre-loaded ones.

Easy navigation

The software interface ensures a smooth work process. Three easy access tabs make acquiring and reviewing data quick and intuitive. The New Test tab gives direct access to test protocols, the Quick Settings tab gives easy access to protocol parameters and the Review tab gives instant access to all saved data.

Convenience

Remote control
The convenient remote control lets you operate the software from a distance so you can maintain personal contact with your patients.

Preamplifier
Connect all electrode leads and transducers into this small preamplifier. Impedance values are displayed on the preamp screen increasing ease of use.

Flexible display options

The possibilities are endless. ICS Chartr EP 200 allows for display of waveforms on unlimited pages and up to 20 waveforms per page. The ability to create new pages with waveforms using different stimuli or different transducers assists in organizing data for easier analysis and reporting. The waveforms can be displayed in a number of different ways – depending on personal preference and need.

Straightforward waveform analysis

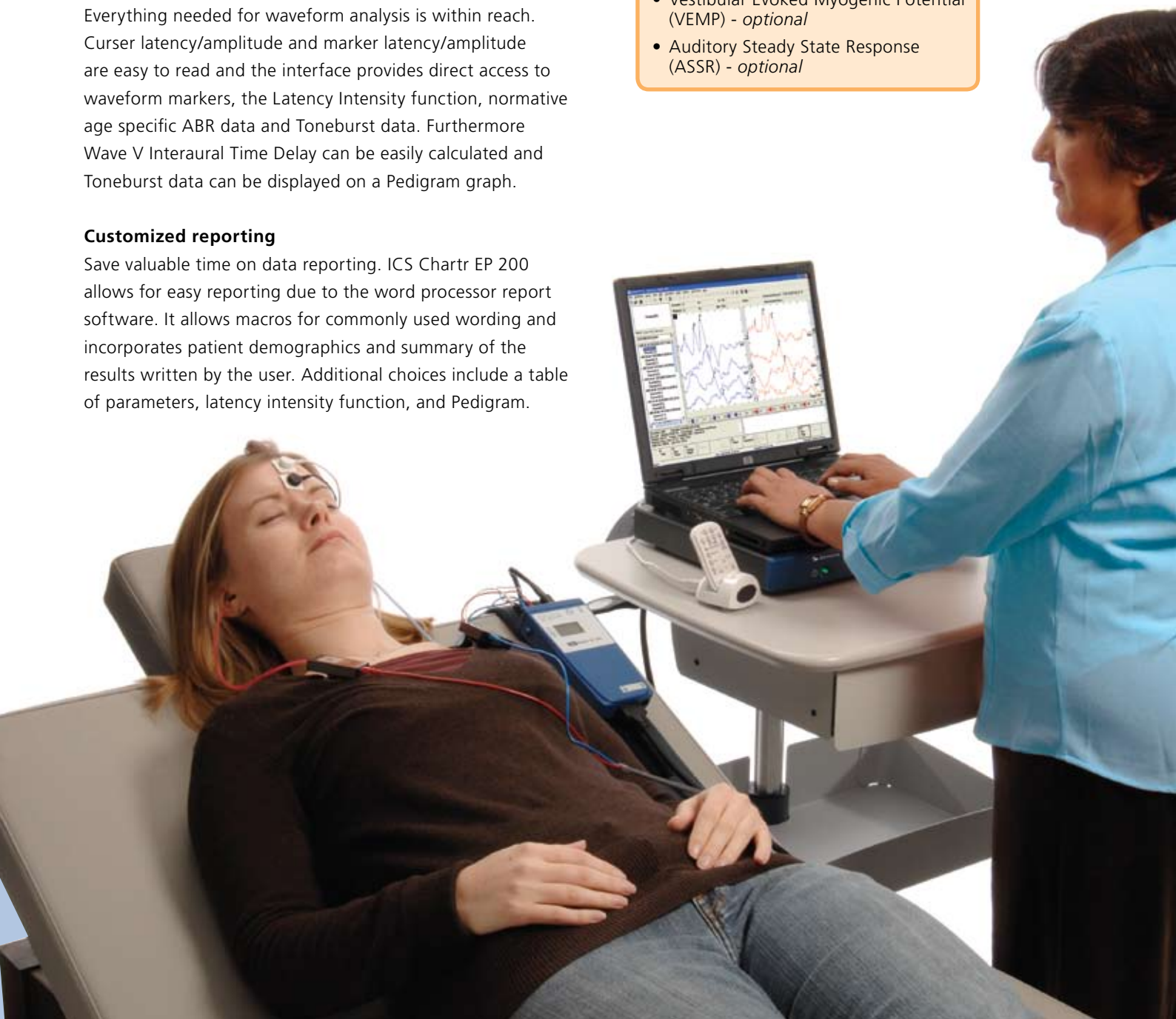
Everything needed for waveform analysis is within reach. Curser latency/amplitude and marker latency/amplitude are easy to read and the interface provides direct access to waveform markers, the Latency Intensity function, normative age specific ABR data and Toneburst data. Furthermore Wave V Interaural Time Delay can be easily calculated and Toneburst data can be displayed on a Pedigram graph.

Customized reporting

Save valuable time on data reporting. ICS Chartr EP 200 allows for easy reporting due to the word processor report software. It allows macros for commonly used wording and incorporates patient demographics and summary of the results written by the user. Additional choices include a table of parameters, latency intensity function, and Pedigram.

ICS Chartr EP 200 at a glance:

- Click Evoked ABR
- Toneburst ABR
- Electrocochleography
- Auditory Middle Latency Response (AMLR)
- Auditory Late Response (ALR)
- P300 - *optional*
- Vestibular Evoked Myogenic Potential (VEMP) - *optional*
- Auditory Steady State Response (ASSR) - *optional*



Improve patient care with VEMP

EASY

Readily accessible VEMP protocols

Instant EMG monitoring

One-click calculation

Easy reporting of VEMP data

The ICS Chartr EP 200 comes with an optional VEMP module for a more comprehensive vestibular assessment. The VEMP module utilizes EMG monitoring with a unique device that eases the testing procedure and allows users to test with confidence.

Readily accessible VEMP protocols

A list of VEMP protocols are added under the New Test tab already known from the EP interface. Available protocols include: toneburst and click air conduction VEMP protocols, bone conduction VEMP protocol and OVEMP protocol. Users can also create their own.

Instant EMG monitoring

"The tonic state of the SCM muscle is a critical parameter in the recording method of the VEMP. Thus, controlling the level of tonic EMG would appear to be a prerequisite for the accurate interpretation of the VEMP"(1).

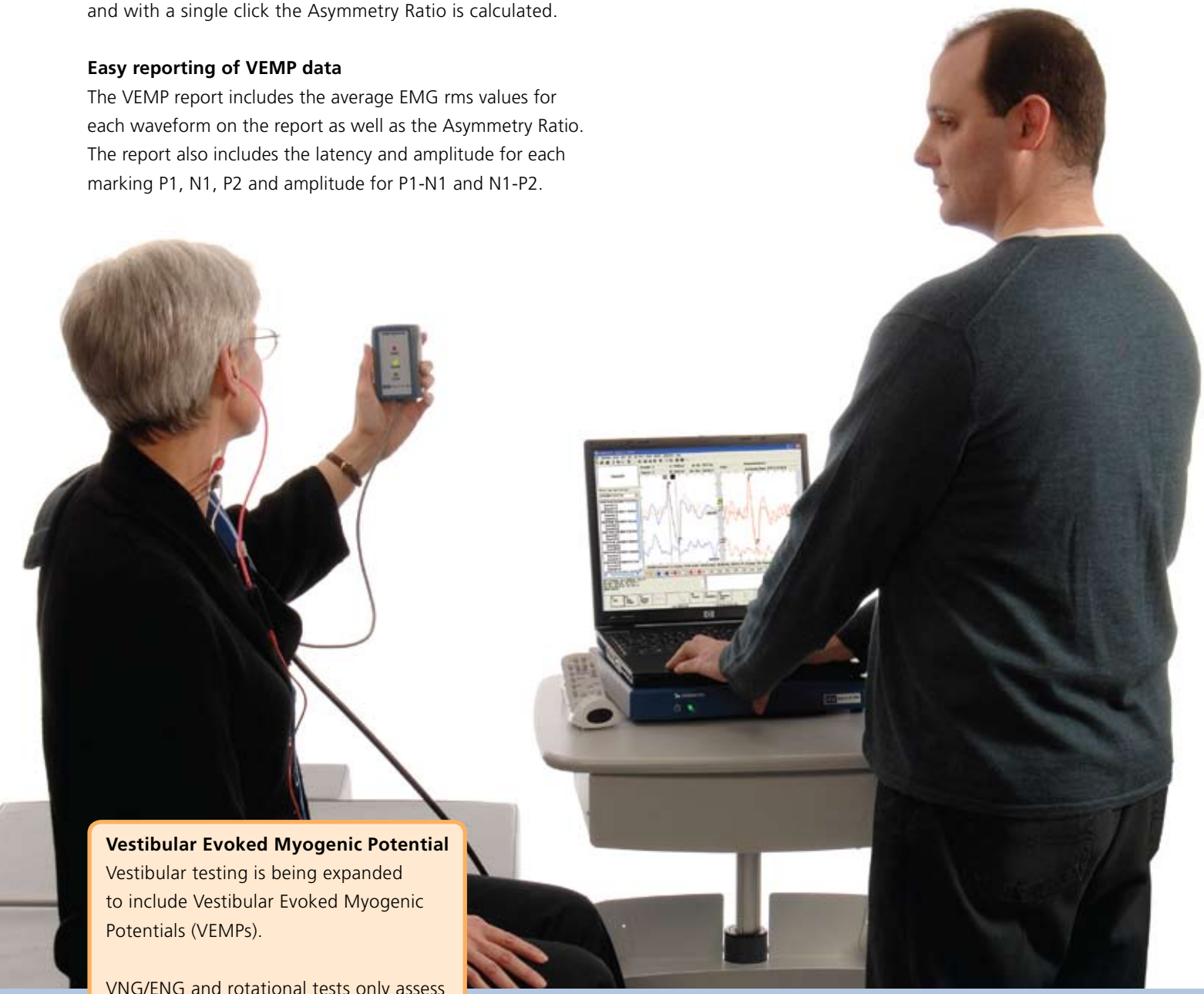
The ICS Chartr 200 VEMP monitor records the EMG level and thus makes VEMP testing a lot easier. The monitor assists in controlling the amount of tonic level EMG by making the patient and tester aware of the level through a series of lights. The monitor can be easily mounted or held by the patient during data collection.

VEMP Monitor
The small lightweight VEMP Monitor provides instant feedback on how much contraction of the sternocleidomastoid is needed during testing. The lights on the monitor indicate if the contraction is too low, too high or optimal.

VEMP

One-click calculation
Choose which waveforms to be used in the Asymmetry Ratio and with a single click the Asymmetry Ratio is calculated.

Easy reporting of VEMP data
The VEMP report includes the average EMG rms values for each waveform on the report as well as the Asymmetry Ratio. The report also includes the latency and amplitude for each marking P1, N1, P2 and amplitude for P1-N1 and N1-P2.



Vestibular Evoked Myogenic Potential
Vestibular testing is being expanded to include Vestibular Evoked Myogenic Potentials (VEMPs).

VNG/ENG and rotational tests only assess the horizontal semicircular canal and the vestibulo-ocular reflex of the vestibular system. VEMP assesses the saccule and inferior vestibular nerve which no other tests does. Comprehensive vestibular testing should include VEMP.

[1] *Akin FW, Murnane OD, Panus PC et al. (2004) The influence of voluntary tonic EMG level on the vestibular-evoked myogenic potential. Journal of Rehabilitation Research and Development 41(3B):473-480.*

Efficient Multi-frequency ASSR

EASY ASSR

RapidASSR™ algorithm

Instant monitoring of EEG and impedance values

Flexible data collection

Flexible data analysis

EP to ASSR and back
Easily toggle between EP and ASSR. It is all in the same software.

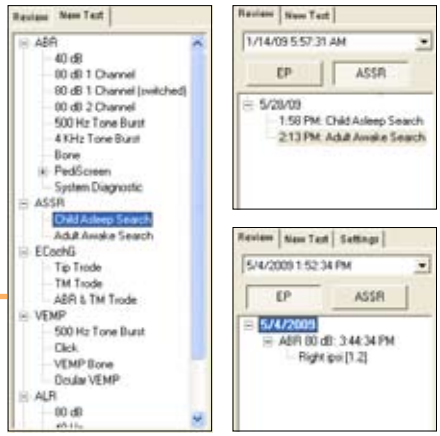
The optional Auditory Steady State Response (ASSR) module is a great addition to the ICS Chartr EP 200, which allows you to obtain frequency specific, auditory data, quickly and efficiently.

RapidASSR™ algorithm

The RapidASSR™ response detection algorithm makes it possible to collect up 12 frequencies simultaneously (6 frequencies per ear). The proven algorithm uses a Fourier Linear Combiner with an adaptive filter and circular T^2 statistical analysis*.

Instant monitoring of EEG and impedance values

The EEG is always viewable during data collection, making it easy to check the patient's state. Impedance can be checked at any time during testing without interfering with data collection. Both timesaving features, ensuring that accurate data are collected.



*) Vaz CA and Thakor NV (1989) "Adaptive Fourier Estimation of Time-Varying Evoked Potentials," IEEE Trans. Biomed. Eng. 36(4), 448-455.

Tang Y and Norcia AM (1995) "An adaptive filter for steady-state evoked responses," Electroenceph. Clin. Neurophysiol. 96, 268-277.

Victor, J. D., and Mast, J. (1991) "A new statistic for steady-state evoked potentials," Electroenceph. Clin. Neurophys. 78, 378-388.)

Flexible data collection
The ASSR module offers a Quick Search program which enables you to obtain an audiogram quickly. It starts the response search between the upper & lower intensity limits and adjusts based on the patient's response. With one easy click the user has the ability to modify the data collection and select to skip a frequency at a particular intensity level. These features decrease test time. Another option is Straight Descent which starts at the upper limit, collects data for all frequencies then descends.

Flexible data analysis
The software assigns a threshold but the user has full control and the ability to override this decision. Choose between displaying and printing corrected and uncorrected ASSR thresholds with one easy click.

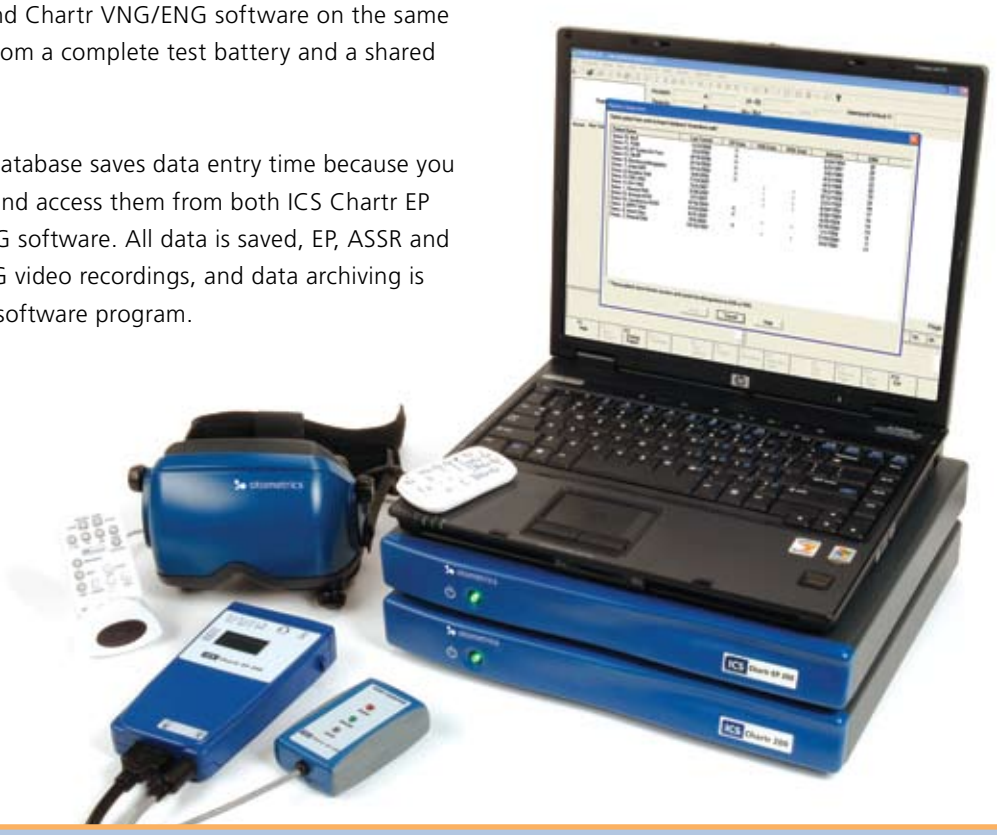
Integration

Timesaving EP/VNG/ENG Combo

The ICS Chartr EP 200 can be combined with Otometrics' successful VNG/ENG system the ICS Chartr 200, creating a state-of-the-art solution.

Timesaving data sharing
Install both Chartr EP and Chartr VNG/ENG software on the same computer and benefit from a complete test battery and a shared database.

A shared EP/VNG/ENG database saves data entry time because you enter the patient once and access them from both ICS Chartr EP and ICS Chartr VNG/ENG software. All data is saved, EP, ASSR and VNG/ENG including VNG video recordings, and data archiving is easily done from either software program.



ICS Chartr EP 200

Technical specifications:

Acquisition Options	
Sweep Time:	5.0 – 9000 msec
Rate:	0.2 to 180/sec
A/D Resolution:	16-bit
Artifact Rejection:	99% full scale (adjustable)
Points per Trace:	600
Channel Options	
Channels:	2 channels with optional 3rd channel for VEMP Monitoring
Gain:	1k, 1.5k, 2k, 2.5k, 3k, 5k, 7.5k, 10k, 15k, 20k, 25k, 30k, 50k, 75k, 100k, 150k, 200k, 250k, 300k, 500k
High Pass Filter (Hz):	0.2, 0.3, 0.5, 1, 1.5, 2, 5, 10, 20, 30, 50, 100, 150, 200, 500, 1000
Low Pass Filter (Hz):	15, 30, 50, 75, 100, 150, 250, 300, 500, 600, 1k, 1.5k, 2k, 3k, 5k, 10k
Notch Filter:	50 or 60 Hz set by the manufacturer
Stimulus Options	
Transducer:	Headphones, Insert Earphones (automatic 0.8msec delay correction), Bone Oscillator (B71)
Stimulus Type:	Click & toneburst
Masking:	White noise
Click Duration:	100 usec
Toneburst Freq (Hz):	125, 250, 500, 1k, 1.5k, 2k, 3k, 4k, 6k, 8k
Toneburst Ramp/Plateau:	User defined (cycles)
Toneburst Envelope:	Linear, Hanning, Blackman, Gaussian
Intensity:	132 dB pe SPL; user definable nHL
Polarity:	Rarefaction, condensation, alternating
Calibration Reference:	Calibration table in dB SPL with a user definable normal hearing threshold table in nHL
VEMP Monitor	
Channel:	Monitor 1 channel (left or right side)
VEMP EMG Level:	User defined minimum and maximum acceptable level
Chartr EP 200 Dimensions/Weight	
Chartr EP 200 main unit:	4.9cm x 34.2cm x 28.7cm (2" x 13.6" x 11.3") – 2.7kg (5 lbs 7oz)
Chartr EP 200 Preamp:	3cm x 9.9cm x 16.4cm (1.19" x 3.88" x 6.44") – .27kg (9.5oz)
Chartr VEMP Monitor:	2.9cm x 6.2cm x 9.5cm (1.13" x 2.44" x 3.75") – 2.0kg (4.5oz)
Interface:	USB to PC
Power Supply:	15V DC/2A
Safety:	Chartr EP 200 was designed to meet these standards
	EN 60601-1, Class II, Type BF, IPXO; UL 2601-1;
	CAN/CSA-C22.2 No 601.1-90
Computer Minimum Requirements	
Processor:	Pentium M or Pentium 4
RAM:	Minimum 512 MB available RAM
Bus Support:	USB 2.0
OS:	Microsoft XP Professional - Service Pack 2 or Vista Business
CD Drive:	CD-R/W
Display Resolution:	Minimum screen resolution of 1024 (horiz) x 768 (vert) at 96 dpi.
	At Large size (120 dpi) setting, minimum resolution is
	1280 (horiz) x 960 (vert)
Display Color:	32 bit color.
ASSR	
Number of channels:	1
Stimuli:	250, 500, 1000, 2000, 4000, 8000 Hz (up to 6 per ear) presented monaurally or binaurally
Threshold search/	0 - 120 dB HL (insert phones), 0 - 110 dB HL (headphones)
upper lower limit:	0 - 60 dB HL (bone oscillator), 5 dB steps
Masking:	White noise up to 100 dB HL
AM/FM Modulation:	20 to 105 Hz(1 Hz per step); AM depth - 0 to 100%
	(5% per step); FM depth - 0 to 25% (5% per step)
Gain:	1k, 2k, 3k, 5k, 10k, 20k, 30k, 50k, 100k, 200k, 300k, 500k
High Pass/Low Pass Filter:	Exclusive Chartr narrow filters for RapidASSR™
EEG:	Online display during data collection or when collection is paused
Search Options:	Quick Search or Straight Descent
Electrode Montage:	Cz to Nape or Cz to Linked Mastoids
Test Protocols:	Test protocols included for sleeping and awake patients.
	Protocols can be created and customized

Easy access to educational support

Users of ICS Chartr equipment can benefit from the best training and support in the industry including:

- In-depth equipment training
- Ongoing customer support
- Classroom and on-line education (regional)
- Our well-respected, "Insights in Practice"
- Demo patient data assists in learning process

As a leading player we are committed to helping you improve practice workflow and enhance your patient care. Otometrics is providing a variety of educational activities worldwide every year.

You'll find more inspiration when you visit www.otometrics.com/resources

Easy to move
The sleek portable design and the optional cart makes the system very easy to move around

Distributor:

Hearing Assessment · Fitting Systems · Balance Assessment

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