Advancing medical technology to help you, help others.
Innovative Instruments for Neurophysiology

John Cadwell, BSEE, MD designed the first microprocessor controlled EMG instrument. In 1979 he and his brother Carl, DDS, formed Cadwell Laboratories, Inc. and began selling their device. Since then, Cadwell has been a leader in the development and manufacture of innovative and reliable instruments for neurophysiology. Many of these instruments have been providing decades of service to their owners.

Numerous patents are held by Cadwell, including those for magnetic stimulators, cable shielding designs, neural network analysis of EEG and database designs. Today, still located in Kennewick, Washington, John and Carl continue ownership of the company and come to work everyday to develop and market products ranging from EMG to EEG to PSG to IONM instrumentation and more. Cadwell has a firm hold of its identity and a dedicated focus on neurophysiology.

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Setting the Standard in IONM.

The Cadwell Cascade is a powerful, multi-modality system capable of performing EP (including SEP, TceMEP, BAEP, VEP), free-run EMG, stimulated EMG, EEG, and train of four tests simultaneously. The Cascade can also be used clinically for multi-channel evoked potential testing and other applications.

The Cascade was designed with portability as a priority. The base unit weighs only 4.25 lbs. The Cascade can be configured with a laptop computer for portability or as a desktop PC-based system.

*C cascade amplifier with one input extender attached.*

Come stand above the rest.
Features of the Cascade

• Crosspoint Technology: flexibility of a referential amplifier with the super quiet qualities of a true differential amplifier.
• 16 channel/32 input configuration
• All-modality monitoring
• Robust and reliable hardware
• Industry-leading service support
• Low total cost of ownership
• Dynamic montaging allows any combination of inputs be connected to a channel for unlimited channel utilization
• Each channel has independent gain, hi-cut and lo-cut filter controls
• Intuitive and easy to use software that’s fast to set up and simple to learn
• Remote monitoring for viewing and review data independent of unit in surgery
• Sixteen unique data-window types
• Up to 20 user-programmable data-window views
• Automatic report generator
• Automatic interleaving
• Automatic train-of-four testing
• Video software with auto-capture and multiple input support
• NerveGuard® automated screw testing software
• Input extenders effectively place the amplifier inputs closer to the electrode site.
• The patented shielding in our cable significantly reduces noise and allows the use of shorter electrode cable lengths.
• The main amplifier may be placed away from the operating table without any loss of signal fidelity or increase in interference.
• Each patented extender has eight inputs plus one ground with a molded shielded cable
**Versatile System Configurations**

The Cascade is available as a portable or cart-based system. For mobile users, the rugged hardware stands up to the rigors of being transported. All the components fit easily into our carry-on size rolling case for ease of travel. The case has smooth rolling wheels, a durable handle and looks professional. The optional laptop bag allows you to breeze through airport security and the optional accessories duffle bag is perfect for electrodes. Whether you’re taking your Cascade across the hall, across town or across the country, be assured that it will perform flawlessly.

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**Easy Positioning**

Whether you are the sole user at a single hospital, or on the move monitoring in multiple facilities, the Cascade is the most advanced, easy to use neuromonitoring instrument available today. The software is so intuitive and logical you’ll be amazed at how much time is saved setting up before surgery and how easy it is to make changes during surgery. The small, compact design fits into the crowded OR and can be easily moved from one hospital to another. After all, more informed surgical teams lead to better patient care; and that’s what matters most.
Stimulator Options

Electrical Stimulators

The Cascade has a variety of electrical stimulator options to suit a wide range of needs. Cascade stimulators display actual current delivered so you always know how much current is being delivered to the patient.

- ES-5-5: Four high current outputs (0-100 mA) and one 0-5 mA output
- ES-5-100: Five high current outputs
- ES-5-5V: Four high current outputs and one 0-5V output. This device does not provide current delivery information
- ES-16: 15 high current outputs and one 0-20 mA low current output

- ES-5-20: Four high current outputs and one 0-20 mA output
- TCS-1: A constant voltage, transcranial stimulator with programmable train stimulation, 800V and 1000 mA
- TCS-1000: A constant voltage, transcranial stimulator with programmable train stimulation, 1000V and 1000 mA
- TCS-4: A constant voltage, transcranial stimulator with four output channels. Also includes programmable train stimulation, 1000V and 1000 mA.

EP Stimulators

- Auditory click with insert earphones, shielded or lightweight headphones
- Visual with Checkerboard Monitor, LED Pad, LED Goggles or Strobe Flash
The ES Detector module and clip prevent electrosurgery noise from contaminating your EMG and EP recordings. Simply attach the clip to the leads of the electrosurgical handpiece and turn on the appropriate options in the software. When the surgeon uses the electrosurgery device, the system mutes EMG audio, prevents the system from storing electrosurgical noise in the EMG, pauses the EMG stimulator if it’s in use, and pauses EP modes.

Software Options

The Cascade software is user-friendly, intuitive and easy to learn. You’ll spend less time troubleshooting and more time taking full advantage of the extensive features found in the Cascade to vastly improve patient care and bring greater value to your hospital. Choose the features and options you need to make the perfect system.

Start a procedure in just four easy steps.

1. Click the icon to launch the software.
2. Click to start a new procedure.
3. Choose a procedure from the list.
4. Enter the patient name.

Managing multi-modality monitoring is quick and easy using Modes, Mode Controls, and Mode Groups. You choose exactly what you want to monitor, when to monitor it and how it’s monitored.

• Flexible setups for each stimulation site and free-run modality allow you to turn on all or some modes manually or in groups.
• You have complete control of everything about the stimulus, recording, display and storage for each mode individually.
• The system can be set to run in fully automatic mode allowing you to focus on the monitoring.
An extensive list of automated run options allow hands-free operation.

- Auto placement of cursors.
- Store waveforms, clear the average, and start a new trial.
- Automatic interleaving of all modes provides faster data acquisition, quicker response time, and faster intervention.
- Run multiple modes simultaneously; the system automatically adjusts the repetition rate as you start and stop modes.
- Auto-store EMG activity that exceeds above a user-defined amplitude threshold.

Easy and intuitive procedure setup menus save valuable time before and during surgery.

- Graphic displays make it easy and intuitive.
- Views can be defined and arranged in the procedure setup so you are ready to monitor when the procedure begins.
- Edit procedure settings on the fly without exiting the patient record.

Data management, handling and viewing is easy using windows and views, putting the information you need where and when you and any remote users need it.

- Display data in a variety of window types – averaged; stacked; numeric trends; 3D waveform trends and waveform analysis.
- To accommodate the massive amounts of data generated by multimodality monitoring, you can create up to 20 unique views. Views are comprised of a select set of data display windows. It’s easy to switch views with one mouse click to quickly access the data you need.
- Windows, screens and event lists can be copied and pasted into outside applications such as Word documents.
- All Cadwell instruments run on familiar Microsoft Windows® operating systems.

Remote Monitoring

Cadwell’s optional remote monitoring feature allows multiple reviewers to connect to a single Cascade system and allows one reviewer to remotely monitor multiple Cascades at the same time. Remote readers can review data, change views and data presentation instantly without affecting the acquisition systems.
To use remote monitoring, users simply connect to a network, type in the name or IP address of the system to be monitored and go. Several remote monitoring scenarios are shown below.

**Cable or DSL Modem & Router Through VPN**

**One Cascade System & Three Reader Systems on the Same LAN**

**Dual VPN to outside LAN**

**NerveGuard®**

NerveGuard® is Cadwell’s automated pedicle screw testing feature that shortens testing time, provides highly accurate results and gives you the information you need as a valuable member of the surgical team.

- **Screw Test mode** finds, reports and stores stimulus threshold.
- **Continuous mode** finds and reports stimulus threshold, and continues to track the threshold as the surgeon advances a stimulated surgical tool.
- **Fixed mode** delivers a stimulus with an adjustable intensity for probing a pedicle screw or testing a nerve root.
- **Generate a report with a threshold table and waveforms in just seconds.**
- **Click to Stop**
- **7.3 mA**
- **Large color-coded reporting window and tones let the surgeon instantly know the screw threshold.**
- **Waveform display** lets you confirm the response.
- **Adjustable amplitude detection thresholds mean more accurate screw thresholds.**
- **Log the level, side and tool in just two clicks using the innovative graphical site selector.**
Software options

The Cascade software offers sophisticated, powerful and easy to use features that allow you to provide superior care to your patients.

- Logical and intuitive workflow using our Windows® XP compatible software interface.
- Flexible data views give you the data you need when you need it.
- Unique procedure setup makes it easy to build and edit a test.
- True interleaving of multiple stimuli or manual control of each modality.
- Reporting features you’ve come to expect from Cadwell, such as traces, tables, predefined paragraphs, automatic sentence generation and more.
- Resize, move, maximize, or minimize any data window any time with a single mouse click.
- Detect electrosurgical devices and automatically pause acquisition and mute audio during their use.
- NerveGuard™ automated EMG and threshold detection software reduces testing time.
- Files and event lists can be easily transferred to other Cascades, saving time in facilities with multiple systems.
- Auto Place Cursors feature accurately marks peaks for you.
- Stimulus Delivery Tone feature lets you and the surgeon know when the stimulus probe touches the patient.
- Pre-defined or “on the fly” comments can be added to the event record along with averages and related video images.
- Unique user interface allows you to improve signal quality by quickly setting individual reject threshold levels for each channel.
- Review stored EEG and watch live EEG at the same time.
- EMG threshold detection with auto capture, auto store and selectable sound presentation (beeps, words, muscle name, etc.).
- Custom trace labels give you instant access to critical information.

- Flexible trending displays give you important data at a glance.
- Window for surgical microscope or other video views.
- Built-in impedance testing for all amplifier inputs.
- Review cases on other compatible PCs.
- Review the record exactly as recorded anytime throughout the procedure.
- Extensive help files explain every component of the system.
- Copy and paste windows, screens or event lists into other outside applications.
- Built-in amp calibration and self diagnostics.
- Train of Four modality.
- CSA, DSA and trending.
- FFT and digital filter package.
Supplies and Accessories

Cadwell has a complete range of quality, reliable supplies as well. From subdermal needles; disposable and reusable surface electrodes and a wide variety of stimulus probes. We are your one-stop source for everything neurophysiology related.