CADWELL EASY® III

OPERATOR'S MANUAL

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EASY III DATA ACQUISITION SYSTEM

The Cadwell Easy III is an advanced data acquisition system for recording brain wave and other physiological signals. Easy III provides control, display, event notation, storage and reporting on acquired data.

The Easy III's software supports multiple amplifier platforms available from Cadwell. Data management includes viewing or reading EEG data on a reader computer, saving and recalling some or all of the record for future reference, and being able to easily find records among the hundreds generated by each system each year.

Easy III is designed to facilitate report generation for both the individual patient and for the clinic.

Intended Use

The Easy III system is intended for the acquisition of EEG and other polygraphic channels. The Easy III system is intended for use by a physician or a trained technician under the supervision of a physician. The Easy III intended recording environment is in a hospital, clinic, physician's office, or other appropriate testing environments.

Operator's Manual Intended Use

This manual provides an operational summary of the Easy III Data Acquisition System.

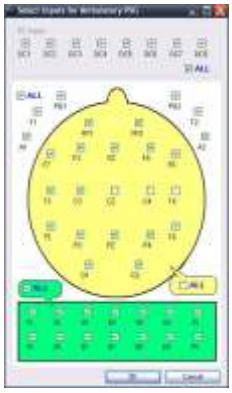
This manual does *not* provide clinical training. It is assumed that the user has adequate clinical training to perform procedures involving the Easy III.

Please refer to the following sources for more information on the Easy III.

- Cadwell Easy III Help File. Available with installed Easy III application and at www.cadwell.com
- Cadwell Easy III Technical Manual.
- www.cadwell.com
- Cadwell Customer Support.

New Features and Enhancements in Easy III, Version 3.5

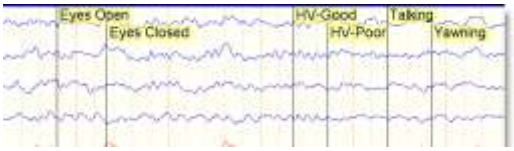
General Features



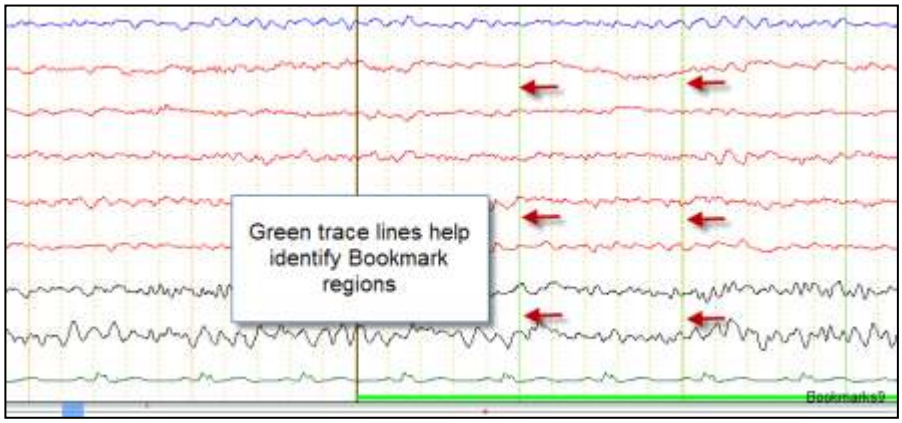
1. Record Optimizations have been added to reduce overall file size. Compression is dynamically applied as data is saved. A new option has also been added that allows the user to eliminate unused inputs before data is collected. Note page 153.
2. Paging Speed Enhancements (with and without video) have been added to increase paging speed during review. Users will see improvement when paging through studies that are on the local or remote/network drives.
3. End users have requested that new windows added through the 'Show Window' option be displayed at all times (this now applies to all windows added such as Q-Video, additional trace windows, etc.).
4. The Easy III Office Server can now be configured as a Service, eliminating the requirement to leave the Office Server system logged in at all times. Note page 65.
5. The Report Generator will now import Word templates.
6. Implemented new software for the KWorld video to USB adapter to optimize performance with Q-Video.
7. Record Opening time has been improved for remote records. Some marginal improvements are also seen with local records.

8. Trace Band Clipping Feature. This new option will allow the user to configure how much overlap is allowed between recorded channels. Settings can be accessed through the montage editor or by left clicking on the trace labels during review or data collection. Trace band overlap settings can also be adjusted 'on-the-fly' by left clicking on the trace label during data collection or review. Note Page 101.
9. Implemented additional changes to improve Easy III time synchronization (when comparing Easy III real time calculation to operating system time setting).
10. Changes have been made to the measurement tool to make sure the tool works consistently.
11. When paging, the page with 'focus' will page at the displayed page duration. For example, if you are looking at data in a 1 second page, the paging tool will advance by 1 second pages.
12. Linked channel EEG settings, montage name, and notch filter status have been added to the top of waveform printouts.
13. Implemented new performance monitoring output tool. This tool is available in the Tools menu. Selecting this option will place several performance metrics in the Windows clip board. Select paste to copy the contents into MS Word.

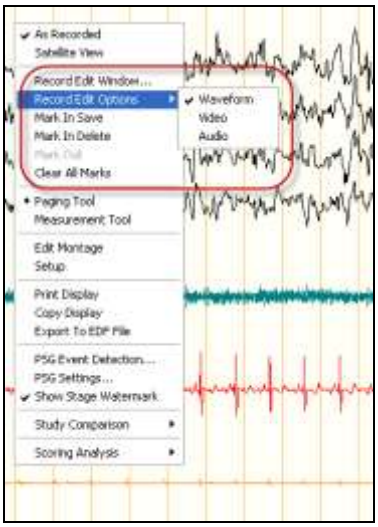
14. Default Bookmark durations have been added based on user feedback.
15. Event text placement has been improved. Text will entries will be displayed adjacent to each other. The event line helps the user quickly associate the event text/event location.



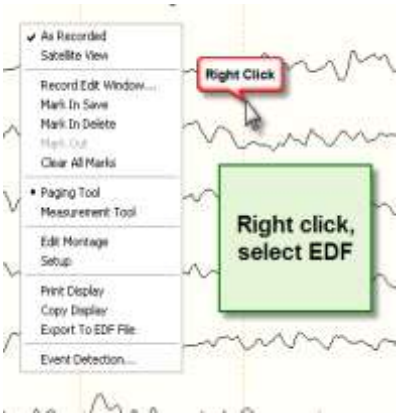
16. Comment text placement in the trace window has been modified based on user feedback.
17. Real time values have been added to the bookmark list. The comment column has also been expanded to display more characters.
18. Added bookmark-specific grid line colors to the trace window.



19. New Impedance Default Setting. Impedance LEDs on amp now default to 5K when launching impedance from software.
20. Trace Window Record Editing has been changed to allow the user to specify the type of data (waveform, video or audio) to be edited when right clicking in the trace window. The selected data types for editing are saved with the users Easy login name.



21. EDF file export has been added. Right click in the trace window to access the EDF export tool. Montage changes will no longer break the EDF file extraction.



22. New Hot Keys – The following hot keys have been added.

    F2 - Event List

    F3 - Q-Video Player in review window only

    F4 - Default Report 1 (R1)

    F5 - Default Report 2 (R2)

    F6 - Default Report 3 (R3)

    The following keyboard hot keys require the mouse to be placed over the trace window.

    CTRL B - Go forward to next bookmark

    CTRL G - Go to page number tool will appear

    CTRL ↑- Decrease displayed paper speed of trace window with mouse focus

    CTRL ↓ - Increase displayed paper speed of trace window with mouse focus

    CTRL M - Display montage list

    CTRL + Auto page forward (press CTRL + again to increase paging speed, CTRL to decrease paging speed)

    CTRL - Auto page backward (press CTRL + again to increase paging speed, CTRL to decrease paging speed)

    CTRL A - Change displayed montage with mouse focus back to 'as recorded'

    CTRL 1- 9 - Change the displayed montage to the default montage specified for M1-M9

    CTRL P - Reposition to start of photic stimulation (EEG)

    CTRL H- Reposition to start of hyperventilation (EEG)

    CTRL L - Reposition to Lights Out (PSG)

    CTRL S - Reposition to Sleep Onset (PSG)

CTRL R - Reposition to REM Onset (PSG)

CTRL C - Advance to next CPAP/Bilevel pressure (PSG)

Home Key – Reposition to Start of Recording

End Key – Reposition to End of Recording

Space Bar – Advance forward one page

Pg Up – Advance backward one page

Pg Dn – Advance forward one page

↑- Increase linked sensitivity

↓- Decrease linked sensitivity

→ Page forward

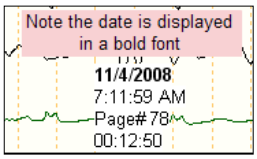
← Page backward

EEG, LTM, and ICU Specific Features

1. Recording Timer. The Timer can be used to keep track of elapsed time and pages. Events will be added to the trace window every 10 seconds. The user can select an option to not write the events to the trace window if required.

2. Added the option to allow users to delete Persyst spike events from Easy Event list.

3. The recording date is now displayed in the trace window. Right click in the trace window, select setup to add the date to the trace window.

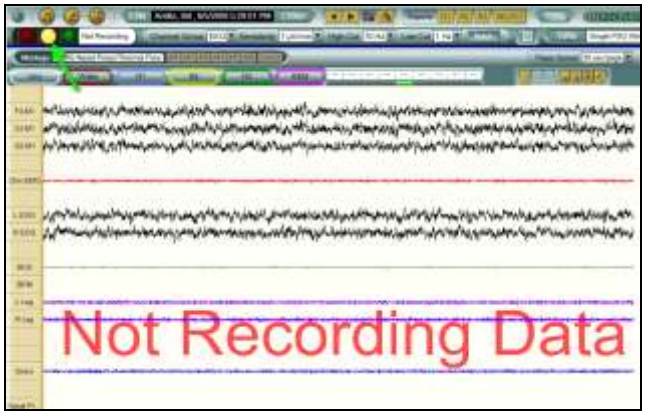


4. The impedance button has been put in the EEG review menu based on user feedback.
5. More EEG montage buttons have been added to the review menu based on user feedback.
6. Easy III Photic Stimulator improvements for EEG customers. Fixed some issues whereby the Photic stimulator tick marks and accompanying frequency text were not always displayed correctly.
7. Implemented Patient Event Marker detection. Events are displayed in the event list and position bar now. The new patient event button plugs into an Easy III or Easy II DC input.
8. Remote Viewing of Magic Marker. Remote viewing of Magic Marker data through Easy III has been added.

PSG Features

1. New Chronological CPAP table for PSG customers (lists pressures chronologically, duplicate pressures on separate rows.)
2. A new Quick Delete feature has been added to quickly delete PSG events. Place the mouse cursor over an event, when the pop-up details are displayed, press the delete key. The event will be quickly deleted.
3. Sleep stage tick marks have been added to the position bar for PSG customers.
4. A new PSG Split Night report has been added.
5. Added a new WASO calculation (**w**ake **a**fter **s**leep **o**nset including out of bed time) for PSG customers.
6. Added the ability to add multiple Optimal PAP pressures. The Optimal Pressure report and the new Split Night Report will use the combined optimal pressures for report generation.
7. The PSG Event Detection menu option has been added to the Tools button.
8. New PSG CPAP table has been added based on market feedback.
9. ETCO2 (End Tidal CO2) signal trending has been added for PSG and ICU customers.

10. Computer Assisted Periodic Breathing Event detection for PSG customers (includes new graphs, tokens and tables.) NOTE: Central apneas detected during period breathing will not be included in AHI and RDI calculations. If enabled, the periodic breathing event detection will occur on all records where the patient age is 13 years or less. This age setting is user definable.
11. The PSG Comprehensive CPAP table has been updated (removed Hypopnea 1 and 2, added total sleep time at each pressure, added more heart rate information)
12. Added New pH-related features (trace info tool, tokens, tables, Digital Value panel) for PSG customers.
13. Simplified Event Marking for associating arousals with LM and snore events for PSG customers. A manually marked arousal is now associated with a LM or snore event if the arousal starts during or within two seconds after the LM or snore event.
14. Improved Body Position Detection. Added additional filtering to body position channel to insure position change has really occurred (not movement).
15. Improved system performance when multiple sleep event detectors are used.
16. Added notch filter on to default event scanning on EKG channel to improve low and high heart rate event detection.
17. Digital Value Panel improvements allow the user to now display ETCO2 and pH values. The panel has been improved to increase visibility of the displayed text in various horizontal and vertical views.
18. Updated PSG Comprehensive Report. The calculations for limb movement events on the PSG Comprehensive Report have been updated.
19. PSG customers can now advance forward and backward by 1 second increments from a 30 second epoch. After moving the epoch by 1 second increments, Easy III will realign the view on the adjacent epoch when the user pages forward or backwards by one page.
20. Monitor Mode. The monitor mode will allow the user to modify channel settings (sensitivity, filter setting) before recording data. After entering all patient information, click on the yellow button to start the monitor mode. The system will prompt the user that data is not being recorded. Clicking on the monitoring mode before starting a recording will not start the recording timer. Clicking on the monitoring mode during data collection will pause data collection; however blank pages will be displayed in the recorded data.



General Warnings and Precautions

⚠	Federal law restricts sale of this system to, or on the order of, a physician.	⚠	Do not try to service internal parts of the Easy III system. Only service by Cadwell, Inc. or authorized bodies.
⚠	The operator must be trained to recognize the difference between signal artifacts and valid bio-signals caused by movements, interference, or misplacement of sensors or electrodes.	⚠	Inspect all cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.
⚠	This manual provides an operational summary for the Easy III system. It does *not* provide clinical training. It is assumed that the user has adequate clinical training.	⚠	The proper use of this device, for its intended use, can only be assured once all instructions have been read and understood. Contact Cadwell with Easy III operational questions.
⚠	The system is not defibrillator proof.	⚠	Do not use the system in an MRI environment.
⚠	The system is not designed to operate in an explosive environment.	⚠	A possible loss of data can occur if acquiring data on a machine that has a network data folder.
⚠	Do not immerse the amplifier, remote input box, power-communications module, flash stimulator, and system cables in liquid.	⚠	Do not use power strips with the system unless they are connected downstream of an isolation transformer.
⚠	The system is designed to be used with one patient at a time. Do not connect multiple patients to one amplifier.	⚠	Do not connect items which are not specified as part of or for use with the Easy III system.
⚠	Never place an isolation transformer on the ground.	⚠	Do not exceed the medical isolation transformer maximum load.
⚠	When attaching the Easy III system to a patient, verify that the subject will not become entangled in the wires. Do not allow the electrode wires to wrap around the patient's neck.	⚠	Do not use the isolation transformer to power non-system components; it may overload the transformer or defeat the separation by providing additional leakage sources.
⚠	Do not update Persyst software components without Cadwell approval.	⚠	Do not exceed the medical isolation transformer maximum load.
⚠	Do not plug non-medical electrical equipment in the patient environment directly into a wall outlet. This may cause excessive leakage current in the patient environment.		

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EASY HARDWARE

Setup Instructions

The Easy III system is comprised of several system components. Your particular configuration of equipment may include amplifier hardware, cables, sensors, video equipment, and computer hardware.

Unpack Easy Hardware

Inspect your shipping documentation. Verify that you have accounted for all boxes and components shipped to you from Cadwell. If the total number of boxes delivered to your facility does not match the total number of boxes listed on your shipping documents, please contact Customer Service at Cadwell Labs.

Carefully unpack all hardware. Verify that you have completely removed all hardware, cables, and documentation from each box. Place all documentation and shipping lists in a safe location for future reference.

Your Cadwell authorized installer will connect all of the Easy equipment and verify that the system is properly configured.

Unpack Computer Hardware

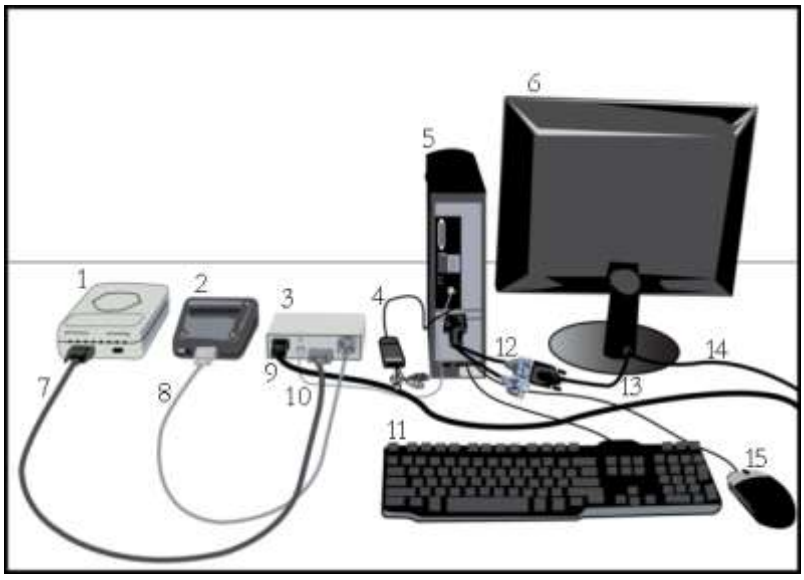
Inspect your shipping documentation. Verify you have accounted for all boxes and components shipped to you from Cadwell Labs. Please complete all product registration forms and return them to each hardware manufacturer as specified.

Your Cadwell authorized installer will set up your new computer hardware during the system installation and training session.

If you have purchased your computer hardware from Cadwell Labs all Easy III software has been previously installed by our configuration team.

The illustration on the following page provides a simplified illustration showing how Easy III amplifier hardware is connected to a computer.

Computer-Amplifier Connection Diagram



1. Connect the Easy III Amplifier (1) to the Power/Com Module (3) with the Easy III Amplifier Cable (7).
2. Connect the Photic Stimulator (2) to the Power/Com Module (3) with the CPN Cable (8).
3. Connect the Power/Com Module (3) to the Computer (5) with the
4. Ground the Power/Com Module (3) to the Computer (5) with the grounding wire (10).
5. Plug in the video to USB adapter (4) to a USB port on the computer (5).
6. Connect the monitor (6) to the computer (5) with the video splitter cable (12) and the monitor cable (13).
7. Connect the monitor (6) to a power supply with the AC Power Cord (14).
8. Connect the keyboard (11) to a USB port on the computer (5).
9. Connect the mouse (15) to a USB port on the computer (5).
10. Connect the Power/Com Module (3) to a power supply with the AC Power Cord (9). Press the On button on the front of the Power/Com Module and verify the power LED is on.
11. Verify EasyNet Modules are connected. See EasyNet Module Connections.

Basic Hardware Configuration

Easy hardware can be configured in multiple amplifier and system cart configurations to meet your needs.

Patient Room/Recording Area

You can configure your Easy III hardware on a variety of carts and trolleys from Cadwell. The following options are available:

Wide Trolley

The wide trolley is 38″H x 29″D x 30″W. The cart is shipped pre-assembled (U.S. shipments only). The wide trolley has multiple adjustable height shelves, mounting brackets for amplifier or flash stimulator articulating arms. An optional LCD mounting bracket is available.

This cart is designed to handle large monitors, computers, and printers. The wide trolley has several options, including an accessory bag, isolation transformer, and an extending keyboard tray.

Contact Cadwell to discuss all of the options available for this trolley.

Narrow Trolley

The narrow trolley is 38″H x 29″D x 24″W. The cart is shipped pre-assembled (U.S. shipments only). The narrow trolley has multiple height-adjustable shelves, and mounting brackets for amplifier or flash stimulator articulating arms. An LCD mounting bracket is also available.

The narrow cart is designed to help you maneuver your Easy system in environments with limited space. The cart's options include an accessory bag, storage bin, isolation transformer, and an extending keyboard tray. Contact Cadwell to discuss all the options available for the narrow trolley.

*** Cart configurations and options are subject to change. Contact Cadwell if you have specific questions about your cart configuration.**

Articulating Trolley Arms

There are two different articulating arms that can be used with the wide and narrow trolleys. One arm is designed to hold the Easy III 32 channel amplifier (or Easy II EEG amplifier); the other articulating arm is designed to hold the Easy III flash stimulator (or the Easy II flash stimulator). The photograph displayed to the right shows the Easy III amplifier photic stimulator mounted on articulating arms on a trolley cart.

Printer Setup

All necessary printer drivers and software are already installed on your computer from the Cadwell factory. There is no need for you to install any additional drivers or software. Please put the CDs and documentation that came with your printer in a secure place for future reference.

If you purchased your printer from a source other than Cadwell, you must install the printer driver on your PC. Please refer to the instruction manual accompanying your printer for instructions on printer setup and software installation.

Additional Setup Supplies

You may purchase additional items from Cadwell that can assist you in setting up and configuring your equipment to allow optimal performance and patient comfort. Call Cadwell at 1.800.245.3001 for product information.

Easy III Hardware Components

The Easy III system is comprised of several system components. Your particular configuration of equipment may include amplifier hardware, cables, sensors, video equipment, and computer hardware.

Easy III Amplifiers

Remote Input Boxes

Power/Com Module

Photic Stimulator

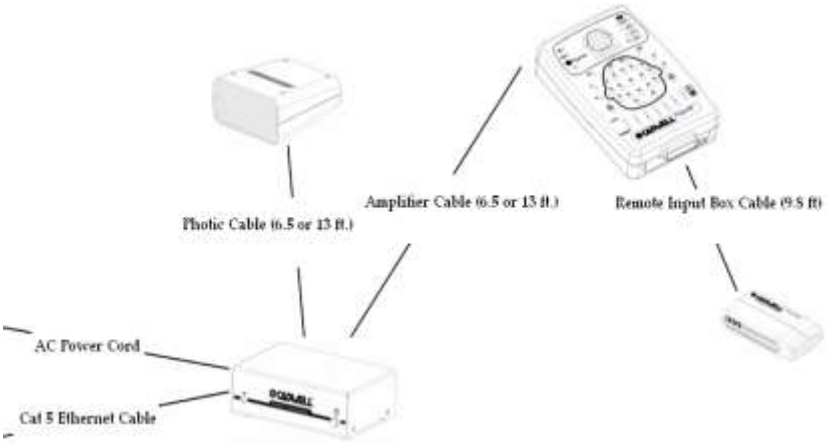
Electrodes

Easy III Device Symbols

Symbol	Description
	See manual or help file
	Power
	Off
	Recording
	Type BF
	Type CF

Symbol	Description
	Input Signal
	Output Signal
	Amplifier
	Patient Input Connector
	Headphones Input
	WEEE Conformity

Easy III Cable Connections



Easy III Amplifier Overview

The basic Easy III amplifier includes 32 AC channels. Seven of these are bipolar and two additional channels are ambient light detection channels. Eight DC channels may be added internally. For studies requiring more recording channels, the amplifier may be expanded to include 64 or 128 EEG channels.

The EasyNet expansion port allows additional channels to be added to the system, including oximetry, heart rate, body position, accelerometers for limb movement, and multiple patient event channels. In all, the Easy III has the capacity for more than 150 patient event channels.

Easy III Amplifier Specifications

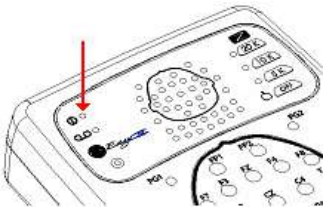
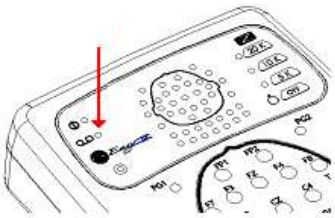
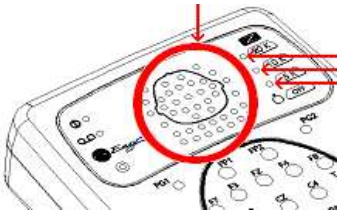
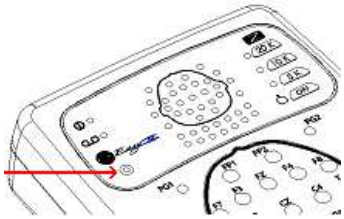
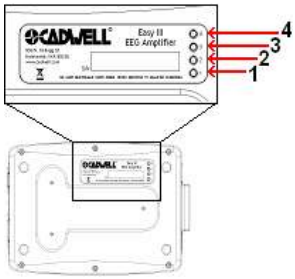
EEG Amplifier Inputs:	**46 Channel Configuration:** 32 EEG channels, capable of 12 EasyNet channels, ambient light, and infrared light. **54 Channel Configuration:** 32 EEG channels, 8 DC inputs, capable of 12 EasyNet channels, ambient light, and infrared light. **86 Channel Configuration:** 64 EEG channels, 8 DC inputs, capable of 12 EasyNet channels, ambient light and infrared light. **150 Channel Configuration:** 128 EEG channels, 8 DC inputs, capable of 12 EasyNet channels, ambient light and infrared light.
Active/Reference Pairs:	7 (46 or 54 ch), 14 (86 ch), or 28 (150 ch) sets of inputs
Noise:	< 2uV , Mains noise rejection > 110 dB at 50 and 60 Hz
DC Inputs:	8 inputs (+/-) 10V, 200Hz storage rate
Photic Stimulator:	White LEDs. (1 – 60 Hz flash rate range)
ISO Ground Connectors:	2 inputs
Low Cut Filter:	Act/Ref pairs: 9 steps (0.032 – 10 Hz) EEG channels: 8 steps (0.16-10 Hz)
High Cut Filter:	5 steps (15 – 100 Hz)
EEG Channel Sampling Rate:	4000 Hz per channel
EEG Channel Storage Rate:	250 Hz per channel
EEG Differential Input Impedance:	20 Mohm
EEG A/D Conversion System:	18 bit A/D Conversion System
EEG Sensitivity:	19 steps between 0.5 – 1000 uV/mm
Amplifier/Computer Interface:	Ethernet
LEDs:	-Power -Ethernet Link -Status -Ethernet Data Transfer -EasyNet Connection -Recording
Transport and Storage Limits:	Temperature: -4°F to 149°F (-20°C to 65°C) Relative Humidity: 10-90% non-condensing Atmospheric Pressure: 500-1060 hPa
Operational Limits:	Temperature: +10° C (+50° F) to +40° C (104° F) Relative Humidity: 30% to 75% non-condensing
Regulatory Approvals:	UL60601-1 CSA 601.1 EN 60601-1 EN 60601-1-1 (medical systems) EN 60601-2-26 (EEG equipment) EN 60601-1-2 (EMC) EN 60601-1-4 (programmable electrical medical systems)

Easy III Amplifier Placement

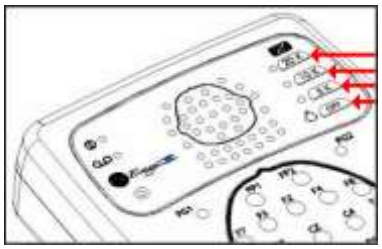
The Easy III Amplifier can connect to:

- A 4-inch deep wall-mount bracket that can be attached to a wall adjacent to the patient monitoring area.
- The Easy III amplifier articulating arm. This arm can be attached to a trolley cart. Screw the Amplifier Bracket into the back of the Amplifier, and then connect it to the articulating arm.
- The amplifier can also be placed on a nightstand or table adjacent to the patient.

Easy III Amplifier LEDs

Easy III LEDs	Description
Power 	The Power LED indicates that the amplifier is receiving power from the Power/Com Module. This LED flashes green at 1 Hz when there is idle power. It is solid green during data collection.
Recording 	The Recording LED indicates that the amplifier is collecting data.
Impedance 	The Impedance LEDs indicate the impedance level for each EEG input, ground input, and active reference pair input. Pressing the adjacent 5K, 10K, or 20K button is illuminate a LED for any corresponding input that has a higher impedance level than selected. Pressing the OFF button will turn off the impedance measurement feature. Note: The amplifier must be in the record mode to use the impedance LEDs.
Ambient Light Detector 	The Ambient Light Detector can detect when the ambient light adjacent to the amplifier changes.
Amplifier Connection Status 	LED 1, 3, and 4 indicate amplifier status. LED 2 is inactive.

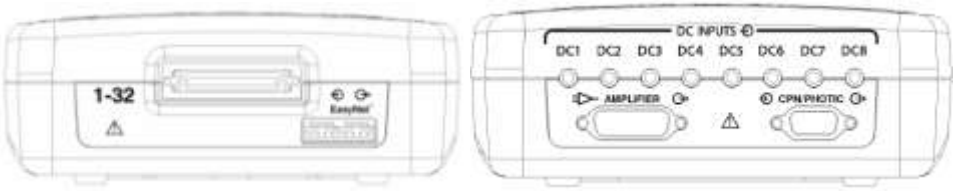
Easy III Amplifier Impedance Buttons

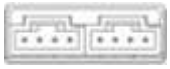
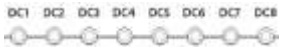
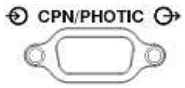
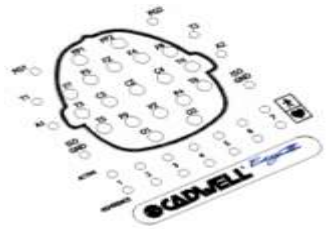


The 20K, 10K, 5K and OFF buttons on the Easy III amplifier perform manual impedance checks. **NOTE: The amplifier must be recording data for the impedance buttons to be operational.**

The OFF button halts the impedance check. It does *not* turn off the amplifier.

Easy III Amplifier Connectors and Cables



Easy III Amplifier Connectors	Description
Remote Inputs 	Connects to Remote Input Boxes through the Remote Input Box Cable.
EasyNet Expansion Ports 	Add 12 or more optional channels, including oximetry, oral/nasal airflow, body position, and multiple accelerometers for limb movement.
DC Inputs 	Add up to 8 internal DC channels.
Amplifier Power/Com Cable Input 	Connects to the Power/Com Module with a 2- or 4- meter cable.
CPN/Photic Input 	Supplies power and information to the Photic Stimulator through the Photic Stimulator cable.
Electrode Ports 	EEG electrodes and seven Act/Ref pair electrodes can be plugged into the inputs on the top of the amplifier or into a remote input box. The input connectors are designed for 0.059 inch (1.5mm) diameter molded safety connectors.

Easy III Amplifier Cables	Description	Length
Amplifier Cable 	Connects the Easy III Amplifier to the Power/Com Module.	6.5 or 13 feet (2 or 4 meters)
Cat 5 Cable 	Connects the Power/Com Module to network card in computer. Straight-through RJ-45, Cat 5 cable.	max 325 feet (99 meters)
Electrodes 	Connects the patient to the Remote Input boxes.	lengths and types vary

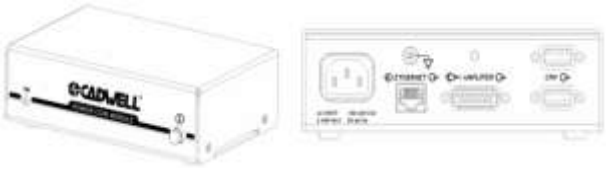
Easy III Amplifier Warnings & Precautions

⚠	Do not immerse the amplifier in liquid.
⚠	No user-serviceable parts inside. Service by Cadwell Laboratories, Inc. and other authorized bodies only.
⚠	Inspect cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner. Test the system regularly.
⚠	The system is not defibrillator-proof.
⚠	The system is designed to be used with one patient at a time. Do not connect multiple patients to one amplifier.
⚠	External devices connected to DC inputs must comply with IEC 60601-1 and all relevant collateral standards.

⚠	Do not use the system in an MRI environment.
⚠	Strictly adhere to the cleaning instructions in this manual.
⚠	The system is not designed to operate in an explosive environment.
⚠	Use only Cadwell-approved mounting hardware to attach the Easy III amplifier to an articulating arm.
⚠	Use only Cadwell-approved cables for connecting your Cadwell Easy III hardware components.
⚠	Sensors attached to EEG inputs to monitor other functions must provide at least basic insulation to ground and be passive in nature or provide at least double insulation if mains powered.

Easy III Power/Communications Module

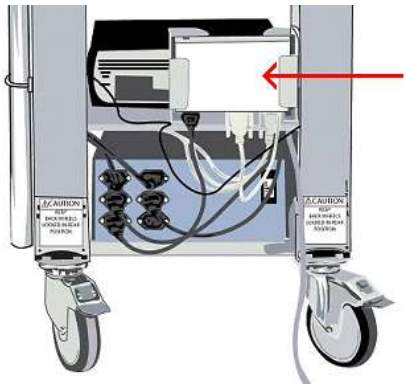
Power/Com Module Overview



The Power-Communications (Power/Com) Module is the central connection point for the Easy III and computer hardware for power supply and information exchange. The amplifier and photic stimulator hardware plug into the power/com module, and the PC connects to the Power/Com Module with an Ethernet cable to communicate with the amplifier and photic stimulator.

Easy III Power/Com Placement

The Power/Communications module connects the Easy III amplifier to its host computer.



- In a cart configuration, the Power/Communications Module can be mounted to the cart with a Power/Communications Module Holder Kit, placing it in proximity to the devices it connects to: the PC, the Easy III Amplifier, and the Isolation Transformer. The Power/Communications Module also utilizes a grounding wire, which attaches to the cart.
- The Power/Communications module can also be placed adjacent to the patient on a night stand or on the floor.

Note: Verify the power communication module is placed in a location where the patient will not trip or become entangled in the wires.

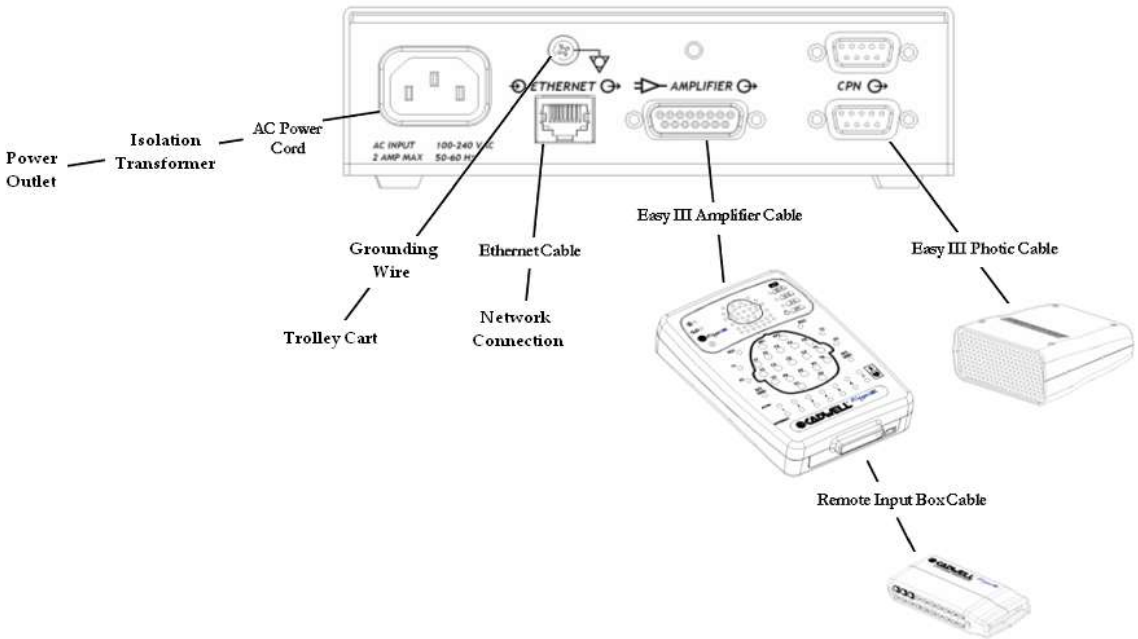
Easy III Power/Com LEDs

Green LED- **ON** indicates that the Power/Com module is receiving power.

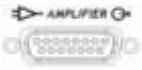
Easy III Power/Com Buttons

The Power button turns the Power/Com Module and the Amplifier on or off.

Easy III Power/Com Connectors and Cables



Easy III Connectors and Cables

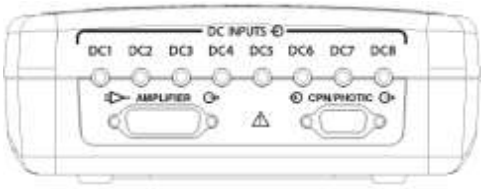
Easy III Power/Com Connectors	Description
AC Power Port 	Inputs power from the AC power cord. 100-240VAC, 1 AMP Max, 50-60Hz.
Voltage Equalization Screw 	To reduce noise, use a grounding wire from the thumb-screw grounding post to the cart.
Ethernet Port 	Connects Easy III hardware to Easy III software in PC. Isolated 10/100 Base T, Straight-through RJ-45.
Amplifier Cable Port 	Connects to the male end of the Amplifier Cable.
CPN Port 	Connects to the Photic Stimulator cable (either connector may be used with the photic stimulator)

Easy III Power/Com Cables	Description	Length
Amplifier Cable 	Connects the Easy III Amplifier to the Power/Com Module.	6.5 or 13 feet/ 2 or 4 meters
Photic Cable 	Connects the Easy III Photic Stimulator to the Power /Com Module.	6.5 or 13 feet/ 2 or 4 meters
AC Power Cord 	Supplies power to the Power /Com Module. Connect to an isolation transformer.	8 feet/ 2.4 meters
Ethernet Cable 	Connects the Power /Com Module to the network card in computer.	325 feet/ 99 meters

Easy III Power/Com Warnings & Precautions

⚠	Do not immerse the Power/Com module or its cables in liquid.	⚠	Cleaning instructions in this manual need to be strictly adhered to.
⚠	No user-serviceable parts inside. Service by Cadwell Laboratories, Inc. and other authorized bodies only.	⚠	The system is not designed to operate in an explosive environment.
⚠	Inspect cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner. Verify the patient will not trip or become entangled in the Power/Communications cables.	⚠	Use only Cadwell-approved cables for connecting your Cadwell Easy III hardware components.
⚠	The system is not defibrillator proof.	⚠	Only use with one patient at a time.
⚠	Potential Equalization terminal may only be used for noise reduction. Potential equalization *does not* qualify as a redundant protective earth connection for non-medical electrical equipment.	⚠	A possible shock hazard can be created by the summation of leakage currents when several equipments are interconnected.
⚠	Do not use the system in an MRI environment.		

Easy III DC Amplifier



The 54, 86 and 150 channel Easy III Amplifier are equipped with eight (8) internal DC inputs configured to collect multiple channels such as oximetry, patient event swithch, pulse rate, air flow, pressure, CPAP leak and pH. The input voltage range is - 10V to + 10V.

The DC Amplifier connects to a DC device with the DC Amplifier Cable, which is available in a variety of lengths.

Easy III Photic Stimulator

Photic Stimulator Overview

The Easy III Photic Stimulator is an ancillary piece of equipment used during EEG recording to provide visual stimulation to a patient. It can be run manually or through default or custom Flash Programs.

The photic stimulator has a Run/Stop button on the back of the flash stimulator. For manual use, point the photic stimulator at the patient at the appropriate distance from the patient, and push the Run button. The Easy system will use the first default flash program. Push the button again to stop the flash program.

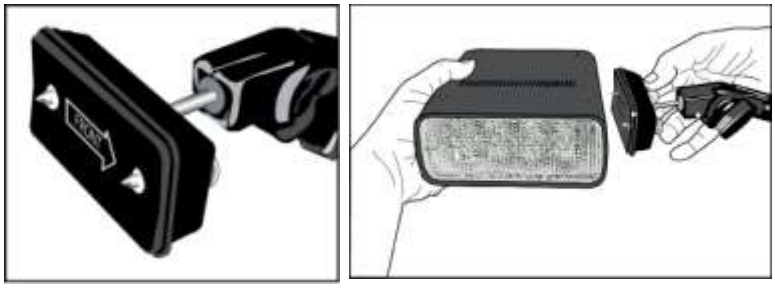
Photic Stimulator Placement

The photic stimulator connects to the CPN/Photic port on the Cadwell Power/Com Module **or** the Easy III Amplifier.

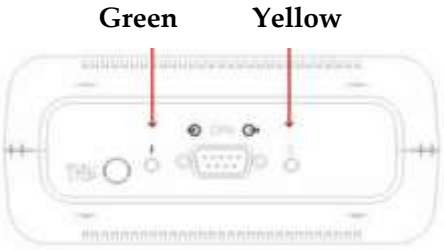
The Easy III Photic Stimulator is designed to attach to a photic stimulator arm mounted on a trolley cart. The photic stimulator has a 2- or 4-meter cable that connects to the Power/Com Module.

Attach Photic Stimulator to Articulating Arm

1. Mount the articulating arm onto the trolley cart.
2. Line up the screws of the articulating arm with the sockets on the side of the photic stimulator, with the arrow pointing towards the flash.
3. Connect the screws and sockets, and finger-tighten until secure.



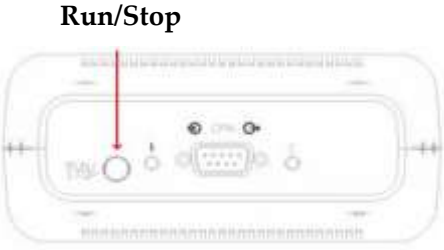
Photic Stimulator LEDs



The green LED flashes at 1 Hz during flash stimulation.

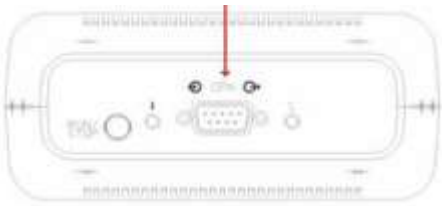
The yellow LED flashes at 1 Hz when power is connected, but flash stimulation is idling.

Photic Stimulator Buttons



To run manually, or to turn off quickly, push the Run/Stop button.

Photic Stimulator Connectors and Cables

Photic Stimulator Connector	Description
CPN Input 	Attaches the Photic Stimulator to the Amplifier or the Power/Com Module with the Photic Cable.

Easy III Cables	Description	Length
Easy III Photic Cable 	Used to connect the Easy III Photic Stimulator to the Power/ Com Module.	6.5 or 13 feet (2 or 4 meters)

Photic Stimulator Warnings & Precautions

	Use of the Cadwell Easy III Photic Stimulator may induce seizures in epileptic or epilepsy-prone patients. Persons who are photosensitive to light may have convulsions, seizures, or a myoclonic reaction to the photic stimulator.
	The system is not defibrillator proof.
	The system is not designed to operate in an explosive environment.
	The Photic Stimulator must be at least 12 inches (30 cm) from the patient's eyes. If used on an anesthetized patient, a means should be provided to ensure that the patient's eye lids remain closed.
	Cleaning instructions in this manual need to be strictly adhered to.
	Use only Cadwell-approved mounting hardware to attach the Easy III flash stimulator to an articulating arm.
	Inspect cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.
	When using the photic stimulator on a Cadwell photic stimulator arm, do not allow the arm or the stimulator to come in contact with the patient.

	The operator must be trained to recognize EEG waveforms and patient symptoms consistent with reactions to photic stimulation. The operator must follow laboratory medical policies and procedures when using the flash stimulator to care for the patient undergoing photic stimulation.
	Do not use in an MRI environment.
	Do not immerse the photic stimulator in liquid.
	The photic stimulator is not intended for patient connection, but meets IEC 60601-1 leakage requirements in normal and single-fault conditions. The photic stimulator is appropriate for use in the patient environment.
	Use only Cadwell-approved cables for connecting your Cadwell Easy III hardware components.
	The system is designed to be used with one patient at a time.
	No user-serviceable parts inside. Service by Cadwell Laboratories, Inc. and other authorized bodies only.
	Use caution when extending, moving or adjusting the photic stimulator arm. Do not pinch your hands and fingers in the connectors, articulating joints, or extending joints on the photic stimulator arm.

Easy II Amplifier Hardware

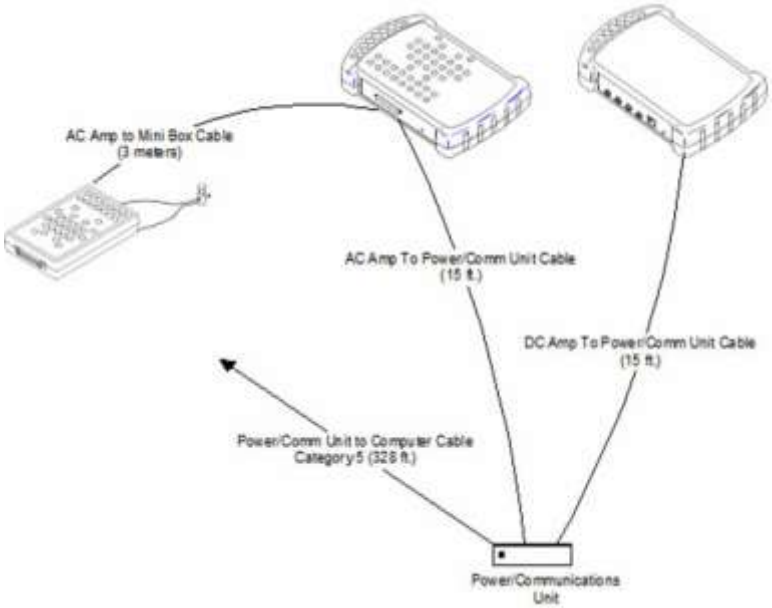
Easy II Intended Use

The Easy II system is intended for use by a physician or trained technician under the supervision of a physician for the acquisition of EEG and other polygraphic channels. The intended recording environment for the Easy II is the hospital, clinic, physician's office, and other testing environments.

Easy II Amplifier Hardware

The Easy II amplifier can be used to collect up to 32 channels of EEG and/or polysomnographic data. EEG electrodes can be plugged into the connectors on the top of the amplifier, or plugged into a remote input box. The input connectors are designed for 0.059-inch (1.5mm) diameter molded safety connectors. The Easy II Amplifier connects to a Power Communications module with a 3 meter cable.

Easy II Amplifier Connection Overview



Easy II Amplifier Specifications

EEG Amplifier Inputs:	32 Channel Configuration: 25 EEG only channels and 7 channels which are switchable between individual active/reference pairs and EEG channels
Active/Reference Pairs:	7 inputs on the 32 channel amplifier
Noise:	< 2uV
DC Inputs:	4 (+10/- 5V)
Photic Stimulator:	1 – 25 Hz flash rate range
ISO Ground Connectors:	2 inputs
EEG Common Mode Rejection:	100 Db at 50 or 60 Hz
Low Cut Filter:	Act/Ref pairs: 9 steps (0.032 – 10 Hz) EEG channels: 8 steps (0.16-10 Hz)
High Cut Filter:	5 steps (15 – 100 Hz)
EEG Channel Sampling Rate:	2300 Hz per channel
EEG Channel Storage Rate:	200 Hz per channel
EEG Differential Input Impedance:	20K M ohm
EEG A/D Conversion System:	16 bit A/D Conversion System
EEG Sensitivity:	19 steps between 0.5 – 1000 uV/mm
Amplifier/Computer Interface:	Ethernet
Operational Limits:	Temperature: +10º C (+50º F) to +40º C (+104º F) Relative Humidity: 30% - 75% Atmospheric Pressure: 700 hPa to 1060 hPa
Transport and Storage Limits:	Temperature: Do not expose to temperatures below -20º C (-4º F) or above 65º C (149º F) Relative Humidity: Do not expose to relative humidity below 10% or above 90% non-condensing Atmospheric Pressure: 500 hPa to 1060 hPa
Regulatory Approvals:	UL60601-1 CSA 601.1 EN 60601-1 EN 60601-1-1 (medical systems) EN 60601-2-26 (EEG equipment) EN 60601-1-2 (EMC) EN 60601-1-4 (programmable electrical medical systems)

Easy II DC Amplifier

The Easy II DC amplifier has 4 DC inputs. The amplifier also has an internal Nonin oximeter and body position senor input. The Easy II DC Amplifier is connected to the Easy II Power Communications Module with a cable that plugs into the Auxiliary connector on the DC Amplifier.

Easy II Power Communications Unit

The Power-Communications (power com) Module is the central connection point for the Easy II hardware. The amplifier and photic stimulator hardware plug into the power/com module. The module has a thumb screw on the back panel to allow a ground cable to reduce noise.

Connectors

- AC Input – 100-240 VAC, 1 AMP Max, 50-60 Hz
- Ethernet – Isolated 10/100 Base T, Straight-through RJ-45
- Amplifier – 24 pin, submini-D connector.
- Auxiliary – 15 pin, submini-D connector for photic stimulator.

LED 's

- Power On/Off LED

Cable

- 4 meter cable with 15 pin sub mini-D connectors

Easy II DC Amplifier Specifications

Connectors	• One Sub D 9 pin connector for oximetry input. • One Sub D 15 pin connector for auxiliary input. • One RJ45 connector for body position sensor input. • DC Inputs - Four 1/8 inch female stereo connectors.
LEDs	Power - The power on LED indicates that the unit is receiving power from the power-communications module.
DC Inputs	4 Inputs (5V to -10V)

Easy II Remote Input Boxes

The Remote Input Boxes allow electrode extension 10 to 15 feet from the amplifier.

Top panel Remote Input Boxes are labeled for 10-20 EEG inputs.

Side-input Remote Input Boxes are also available.

Input Box Details

- 25 EEG only channels and 7 active/reference pair inputs with 0.059-inch (1.5mm) diameter molded safety connectors.
- A recessed 50 pin mini-D connector is used for the remote input box cable.
- Remote Input Box Cable (3 m.)
- Each cable has a 50 pin, locking mini-D connector at each end of the cable.

Easy II Photic Stimulator

The Easy II Photic Stimulator is designed to attach to a photic stimulator arm mounted on a trolley/cart. The photic stimulator has a 4 meter cable that connects to the Cadwell Power Com Module.

Photic Stimulator Details

- Flash Rate/Intensity - 1 – 25 Hz/0.72 J/flash
- LEDs - Power
- Connectors - 15 pin mini-D
- Cable - 4 meter cable with 9 pin sub mini-D connector

Easy II Warnings and Cautions

⚠	Do not immerse the amplifier, remote input box, power-communications module, flash stimulator, and system cables in liquid.	⚠	Use only Nonin SpO2 sensors with the Easy II DC Amplifier. Though Cadwell has tested the Nonin 8000J sensor with the EasyNet SpO2 module, other sensors have not been tested or validated.
⚠	No user serviceable parts inside the Easy II Amplifier or remote input boxes. Service by Cadwell Laboratories, Inc. and other authorized bodies only.	⚠	Discontinue using any module or sensor if the patient exhibits any allergic reactions to adhesive or materials.
⚠	The system is not defibrillator proof.	⚠	Cleaning instructions in this manual need to be strictly adhered to. Always disconnect equipment from power source and patient before cleaning.
⚠	The system is not designed to operate in an explosive environment.	⚠	Inspect cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.
⚠	Use only Cadwell approved cables.	⚠	Do not use the system in an MRI environment.
⚠	The system is designed to be used with one patient at a time. Do not connect multiple patients to one amplifier.	⚠	Use only Cadwell approved mounting hardware to attach the Easy II amplifier to an articulating arm.
⚠	Use caution when extending, moving, or adjusting the Easy II Amplifier Arm. Verify that your hand and fingers will not be pinched in the connectors, articulating and extending joints on the Amplifier Arm.	⚠	When attaching the Easy II system to a recording subject, verify that the subject will not become entangled in the wires. Do not allow the electrode wires to wrap around the subjects neck.
⚠	The Easy II remote Input Box inputs are Type CF rated. CF rating ensures that no current higher than 50uA flows to or from the applied part if mains voltage is inadvertently connected to the patient.	⚠	The Easy II amplifier inputs are Type CF rated. CF rating ensures that no current higher than 50uA flows to or from the applied part if mains voltage is inadvertently connected to the patient.
⚠	When using the Easy II photic stimulator on a Cadwell Photic Stimulator Arm, do not allow the arm or photic to come in contact with the patient.	⚠	Conductive parts of electrodes and their connectors, including the neutral electrode, should not contact other conductive parts including earth.
⚠	The Photic stimulator is not intended for patient connection, but meets IEC 60601-1 leakage requirements in normal and single fault conditions. The photic stimulator is appropriate for use in the patient environment.	⚠	Cleaning instructions in this manual need to be strictly adhered to. Always disconnect equipment from power source and patient before cleaning.
⚠	The Cadwell Easy II photic stimulator must be at least 30 cm away from the patient's eyes. If used on an anesthetized patient a means should be provided to ensure that the eye lids remain closed.	⚠	Inspect cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.

Easy II Warnings and Cautions continued.

	The use of the Cadwell Easy II flash stimulator may induce seizures in epileptics or people prone to epilepsy. Persons who are photosensitive to light may have convulsions, seizures, or a myoclonic reaction to the photic stimulator. The operator must be trained to recognize EEG waveforms and patient symptoms that are consistent with a patient's reaction to photic stimulation. The operator must follow laboratory medical policies and procedures when using the flash stimulator to care for the patient undergoing photic stimulation.		Do not immerse the photic stimulator or its cable in liquid.
	Potential Equalization terminal may only be used for noise reduction. Potential equalization terminal DOES NOT qualify as a redundant protective earth connection for non medical electrical equipment.		Use caution when extending, moving, or adjusting the Cadwell Photic Stimulator Arm. Verify that your hand and fingers will not be pinched in the connectors, articulating and extending joints on the Photic Stimulator Arm.
	This manual provides an operational summary for the Easy II system. It does *not* provide clinical training. It is assumed that the user has adequate clinical training.		The Power Com Module is not intended for patient connection, but meets IEC 60601-1 leakage requirements in normal and single fault conditions. The Power Com Module is appropriate for use in the patient environment.

Easy Ambulatory

Ambulatory Intended Use

The Easy Ambulatory system is intended for use by a physician or trained technician under the supervision of a physician for the acquisition of EEG and other polygraphic channels. The intended recording environment for the Easy Ambulatory is the home, hospital, and other testing environments.

Easy Ambulatory Hardware

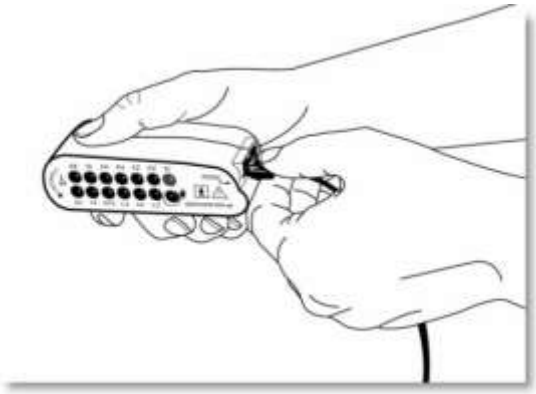
The Easy Ambulatory system is comprised of three different modules, the recorder, battery holder, and amplifier.

The Ambulatory Recorder and Battery Holder

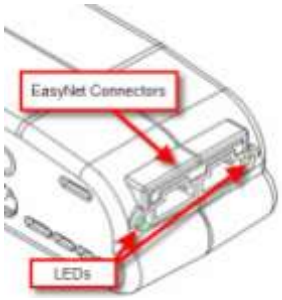
The recorder is a small, lightweight module that uses compact flash memory to record patient data. The recorder utilizes EasyNet technology to connect to multiple amplifier modules used to amplify EEG and other physiological channels. The recorder is worn by the patient in a small waist mounted pouch. The illustration below shows the recorder in the pouch. The EasyNet cable from the amplifier is plugged into the side of the recorder. The battery holder is a lightweight module used to hold the batteries that power the recorder and amplifier. Batteries can be quickly replaced by removing the battery cover from the battery holder. The recorder is mounted on the battery holder, and then placed in the Ambulatory recorder pouch for data collection.

The Ambulatory Amplifier

The Ambulatory amplifier is a compact module that serves as a connector box and amplifier for EEG and other physiological channels. The amplifier uses EasyNet technology to send data to the recorder. The amplifier has multiple EEG inputs and active reference pair inputs. The amplifier can be worn by the patient on a small chest/shoulder strap or on the waist belt provided with the Easy system. The illustration below shows the amplifier with an EasyNet cable plugged into the amplifier.



Ambulatory Amplifier LEDs, Connectors



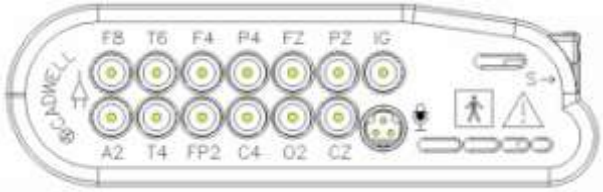
Ambulatory EasyNet Connectors

An EasyNet cable can be used to connect the Amplifier to the Ambulatory Recorder. Other EasyNet modules can be plugged in to the other EasyNet connector on the Amplifier.

Ambulatory LEDs

- **S** Yellow Status LED. Lights or flashes to indicate error condition.
- **I** Green LED. Flashes to indicate power is being received from the recorder.

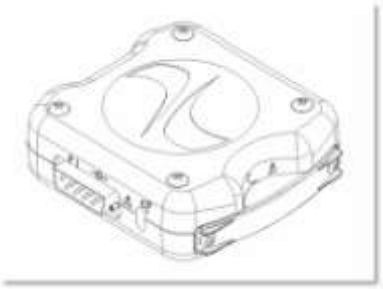
Ambulatory Electrode input connectors



- FP1, FP2, F3, F4, F7,F8, T3,T4, T5, T6, A1, A2, C3, C4, P3, P4, O1, O2, FZ, CZ, PZ International 10-20 lead placement descriptors used on the Easy Amplifier
- IG x2, 1A, 1R, 2A, 2R, Voice Event Additional input descriptors placed on the Easy Amplifier.
- IG - Isolated Ground (x 2)
- 1A – 1R – Active Reference Pair
- 2A – 2R – Active Reference Pair
- Voice event connector. The Voice Event input for the microphone is not supported in Easy III, Version 3.2.54.

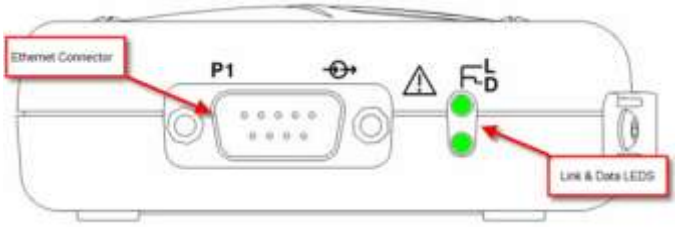
Ambulatory Recorder Features, LEDs, Connectors

Recorder – 3 Dimensional View



Recorder – P1 Ethernet Connector

An ethernet adapter is attached to this connector for data downloading and data review.



Recorder – 'D' LED

The Data (D) LED indicates data is being transferred between the recorder and the computer.

Recorder – 'L' LED

The Link (L) LED indicates that the recorder has established an ethernet connection to the computer.

Recorder – Event Button

The event button allows the patient to time synchronize an event during data collection.

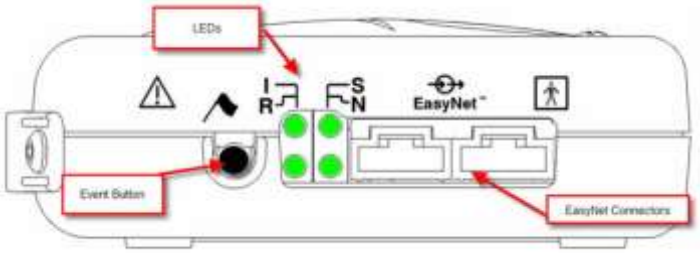
For each button press, the recorder will record a time-synchronized event during data collection. If the button is pressed for 4 seconds while the recorder is attached to a computer, a signal will be sent to the network card identifying the recorder.

Recorder – 'I' LED

The 'I' LED indicates that the recorder is receiving power from the batteries.

Recorder – 'S' LED

The Status (S) LED flashes when an error condition is detected.



Recorder – 'R' LED

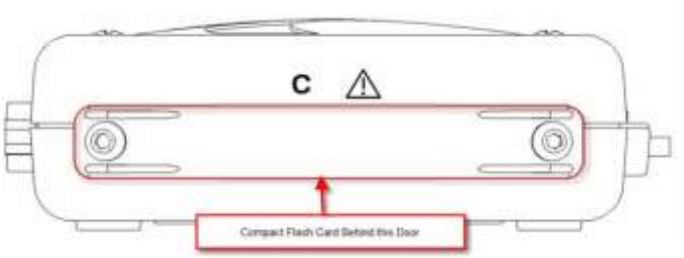
The EasyNet (R) LED flashes one time per second during data collection.

Recorder – 'N' LED

The EasyNet (N) LED flashes when an EasyNet error condition is detected.

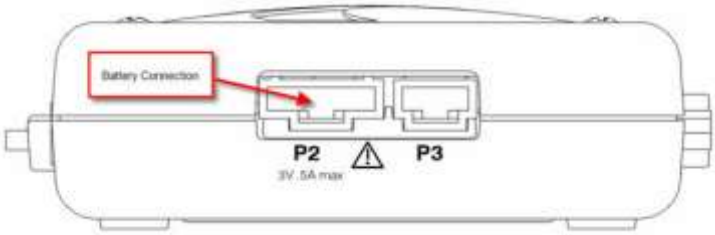
Recorder – EasyNet Connector

The EasyNet connector allows a cable connection from the recorder to other modules such as the Amplifier/Connector module.



Recorder – 'C' Door

The Compact (C) Door can be removed to access the compact flash card. Cadwell recommends that the compact flash door remain attached to the recorder during data collection.



Recorder – P2 Connector

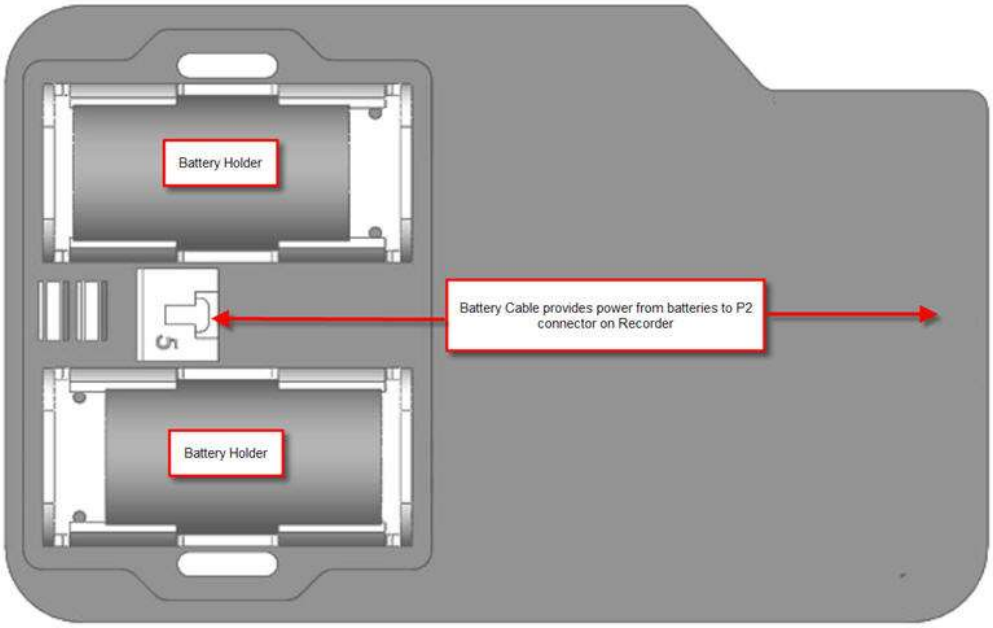
The P2 Connector is for the battery connection. Connect the battery cable from the battery holder to the P2 connector on the recorder.

Recorder – P3 Connector

The P3 connector is reserved for future use.

Ambulatory Battery Holder

The Ambulatory Battery Holder is placed in the Ambulatory Recorder/Battery Holder pouch. A white battery cable connects the battery power to the Ambulatory Recorder.



Easy Ambulatory Specifications

EEG Amplifier Inputs:	21 inputs
Active/Reference Pairs:	2 sets of inputs
ISO Ground Connectors:	2 inputs
EEG Channel Sampling Rate:	3200 Hz per channel
EEG Channel Storage Rate:	200 Hz per channel
EEG Differential Input Impedance:	20K M ohm
EEG A/D Conversion System:	16 bit A/D Conversion System
Battery Power	2 'C' or 'D' alkaline batterries
Recording Time/Battery Life	29 hours per set of 'C' cells 70 hours per set of 'D' cells
Data Storage/Memory Capacity	+ 165 hours with 4GB CF
Amplifier/Computer Interface:	Ethernet
Operational Limits:	Temperature: +10º C (+50º F) to +40º C (+104º F) Relative Humidity: 30% - 95% non-condensing
Regulatory Approvals:	UL601-1 2003 CSA 601.1 1990 EN 60601-1:1990 + A1:1993 + A2:1995 + A13:1996 EN 60601-1-1:2001 (medical systems) EN 60601-2-26:1994 (EEG equipment) EN 60601-1-2:2001 (EMC) EN 60601-1-4:1996 (programmable electrical medical systems) EN ISO 114971:2000 (risk)

Ambulatory Warnings and Cautions

⚠	Federal law restricts sale of this system to, or on the order of, a physician.	⚠	High levels of static discharge can cause a momentary pause in data collection.
⚠	No user serviceable parts inside. Service by Cadwell Laboratories, Inc. and other authorized bodies only.	⚠	Inspect EasyNet cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.
⚠	Inspect battery cable before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.	⚠	Do not immerse the recorder, amplifier, battery holder, or EasyNet Modules in liquid. Do not attempt to use any Ambulatory system components if they have been immersed in liquid. The system is not water resistant or splash proof. The contact of liquids with the internal parts and connectors of the Cadwell Easy Ambulatory 2 system should be avoided at all times.
⚠	Caution must be taken to ensure that cables do not encircle the patient's neck or entangle the patient in any way.	⚠	The operator must be trained to be able to recognize the difference between signal artifact and valid bio-signals caused by movements, interference, or misplacement of sensors or electrodes.
⚠	The system is not defibrillator proof.	⚠	Do not use the system in an MRI environment.
⚠	Cleaning instructions in this manual need to be strictly adhered to.	⚠	When applying the stockinet to the patient, verify that the stockinet is not covering the patient's eyes, nose, mouth, or ears. Verify that the stockinet does not entangle the patient's neck, restrict airflow, or restrict circulation.
⚠	When attaching the Easy Ambulatory 2 system to a recording subject, verify that the subject will not become entangled in the wires. Do not allow the electrode wires to wrap around the subject's neck. Instruct the patient in the proper way to wear the Easy Ambulatory system and not become entangled.	⚠	The system is not designed to operate in an explosive environment.
⚠	Do not remove compact flash card if the recorder has power or is actively collecting data.	⚠	Inspect EasyNet cables before and after each use. Discard cable if cable insulation is damaged or if the cable or connectors are damaged in any manner.
⚠	Do not place recorder on a television, radio, or CPAP device.	⚠	Use only Cadwell authorized cables and accessories.
⚠	Always place the recorder and battery holder in the Easy Ambulatory Pouch when collecting patient data.		Type BF, IC601 Isolation
⚠	The EEG electrode connectors are only designed for 1.5 mm touch proof connectors.	⚠	Do not autoclave.

Ambulatory Warnings and Cautions continued.

	Do not connect more than one amplifier/Connector box to the Recorder.		When using the amplifier to collect data, verify that the amplifier has been placed in a Cadwell authorized pouch. Verify the amplifier has been securely attached to the amplifier belt or chest/shoulder strap.
	Use only alkaline batteries, or those recommended by Cadwell Labs.		Do not mix battery types.
	Only use batteries authorized by Cadwell Laboratories, Inc.		Do not re-use old batteries.
	Do not store batteries in battery holder. Remove batteries after use.		Inspect battery cable before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.
	Do not re-use battery holder if battery leakage has occurred.		Use only replacement fuses authorized by Cadwell. An extra fuse is located on the battery holder.
	Do not use the battery holder without the battery cover.		Do not immerse battery holder in liquid.

Easy Ambulatory Wireless

Ambulatory Wireless Intended Use

The Easy Ambulatory wireless system is intended for use by a physician or trained technician under the supervision of a physician for the acquisition of EEG and other polygraphic channels. The intended recording environment for the Easy Ambulatory Wireless is the home, hospital, and other testing environments.

Easy Ambulatory Wireless Hardware

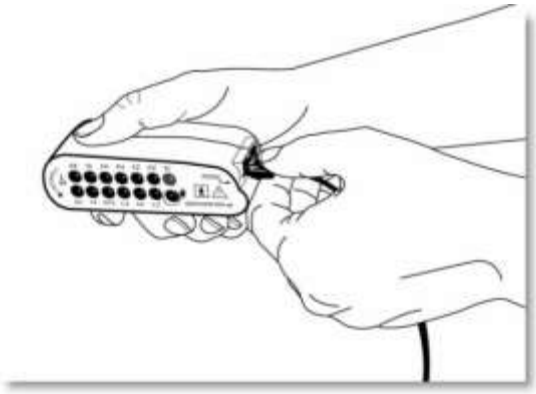
The Easy Ambulatory Wireless system is comprised of two different modules, the wireless recorder and the amplifier.

The Ambulatory Wireless Recorder

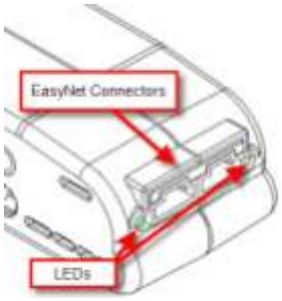
The wireless recorder is a small, lightweight module that uses compact flash memory to store patient data. The recorder has an internal antenna that can be used to transfer recorded data wirelessly to a host system. The recorder also has a wired Ethernet connector to allow the recorder to be directly connected to a host computer. The recorder utilizes EasyNet technology to connect to multiple wired amplifier modules used to amplify EEG and other physiological channels. The recorder is worn by the patient in a small waist mounted pouch. The illustration below shows the top side of the wireless recorder.

The Ambulatory Amplifier

The Ambulatory amplifier is a compact module that serves as a connector box and amplifier for EEG and other physiological channels. The amplifier uses EasyNet technology to send data to the recorder. The amplifier has multiple EEG inputs and active reference pair inputs. The amplifier can be worn by the patient on a small chest/shoulder strap or on the waist belt provided with the Easy system. The illustration below shows the amplifier with an EasyNet cable plugged into the amplifier.



Ambulatory Amplifier LEDs, Connectors



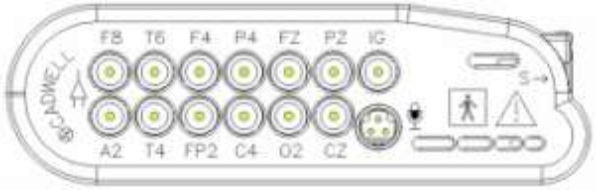
Ambulatory EasyNet Connectors

An EasyNet cable can be used to connect the Amplifier to the Ambulatory Recorder. Other EasyNet modules can be plugged in to the other EasyNet connector on the Amplifier.

Ambulatory LEDs

- **S** Yellow Status LED. Lights or flashes to indicate error condition.
- **I** Green LED. Flashes to indicate power is being received from the recorder.

Ambulatory Electrode input connectors

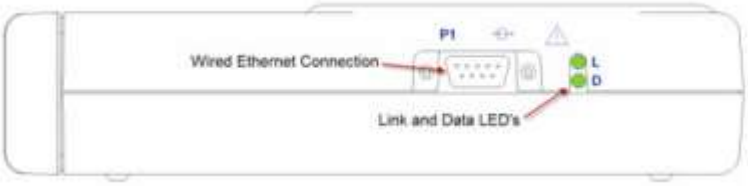


- FP1, FP2, F3, F4, F7,F8, T3,T4, T5, T6, A1, A2, C3, C4, P3, P4, O1, O2, FZ, CZ, PZ International 10-20 lead placement descriptors used on the Easy Amplifier
- IG x2, 1A, 1R, 2A, 2R, Voice Event Additional input descriptors placed on the Easy Amplifier.
- IG - Isolated Ground (x 2)
- 1A – 1R – Active Reference Pair
- 2A – 2R – Active Reference Pair
- Voice event connector. The Voice Event input for the microphone is not supported in Easy III, Version 3.3.

Ambulatory Recorder Features, LEDs, Connectors

Wireless Recorder – Top Panel View

Wireless Recorder – Side View, P1 Ethernet Connector



The Power/Com cable from the Power/Com module is attached to this connector for a wired connection to initialize the recorder, monitor data, download data and recharge the batteries.

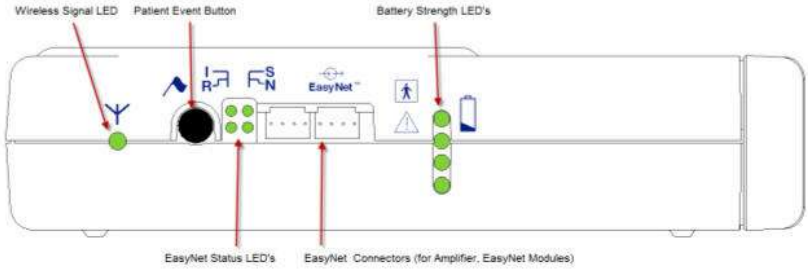
Recorder – 'D' LED

The Data (D) LED indicates data is being transferred between the recorder and the computer.

Recorder – 'L' LED

The Link (L) LED indicates that the recorder has established an ethernet connection to the computer.

Wireless Recorder – Side View, EasyNet Connection, Event Button, Status LED's

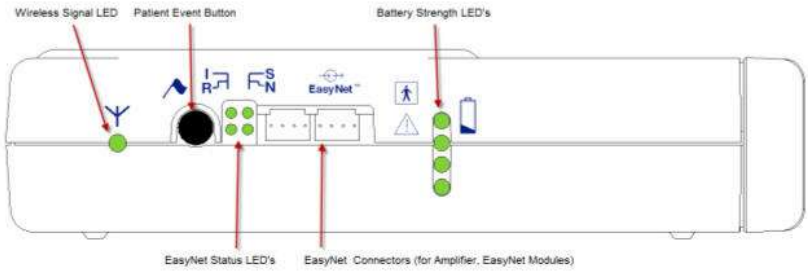


Wireless Recorder – Event Push Button on Side of Recorder

The event button allows the patient to time synchronize an event during data collection.

For each button press, the recorder will record a time-synchronized event during data collection.

If the button is pressed for 4 seconds while the recorder is attached to a computer, a signal will be sent to the network card identifying the recorder.



Recorder – Wireless Signal LED

The EasyNet wireless signal LED will be on when the recorder is wirelessly attached to the host computer.

Recorder – 'I' LED

The 'I' LED indicates that the recorder is receiving power from the batteries or Power/Com. This LED will flash rapidly when the battery levels are critically low.

Recorder – 'S' LED

The Status (S) LED flashes when an error condition is detected.

Recorder – 'R' LED

The EasyNet (R) LED flashes one time per second during data collection.

Recorder – 'N' LED

The EasyNet (N) LED flashes when an EasyNet error condition is detected.

Recorder – Battery Strength LED's

All LEDs will be **on** when the batteries are completely charged. As the available battery power is reduced, fewer LED's will be on. When the battery levels are at critically low levels, the 'I' LED will flash rapidly to indicate low battery power.

Recorder – EasyNet Connectors

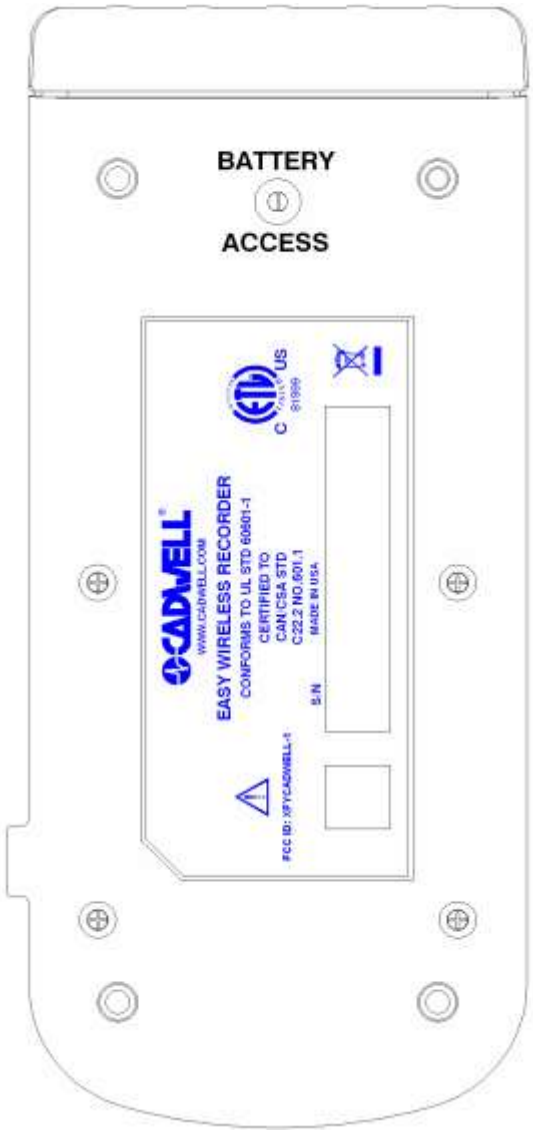
The EasyNet connector allows a cable connection from the recorder to other modules such as the Amplifier/Connector module.

Wireless Ambulatory Recorder Rechargeable Batteries

The Wireless Ambulatory rechargeable (Lithium Iron Phosphate) batteries are located in Wireless Recorder. The batteries do not need to be removed for recharging. The batteries are recharged when the Power/Com cable from the Power/Com module is plugged into the P1 connector and the Power/Com is turned on.

To replace the batteries, remove the battery access screw located on the bottom of the wireless recorder. The battery compartment will slide out of the recorder for replacement.

Ambulatory Wireless Recorder – Bottom View



Easy Ambulatory Wireless Specifications

EEG Amplifier Inputs:	21 inputs
Active/Reference Pairs:	2 sets of inputs
ISO Ground Connectors:	2 inputs
EEG Channel Sampling Rate:	3200 Hz per channel
EEG Channel Storage Rate:	200 Hz per channel
EEG Differential Input Impedance:	20K M ohm
EEG A/D Conversion System:	16 bit A/D Conversion System
Battery Type:	Lithium Iron Phosphate with nearly 2000 discharge life cycles
Recording Time:	Nominally 4-8 hours. Battery recording time will vary based on the number of EasyNet modules attached to the system. The system uses an adaptive power management approach to provide power to the wireless antenna. If the wireless signal is weak, additional power will be provided to the wireless to improve signal transmission.
Data Storage/Memory Capacity:	+ 165 hours with 4GB CF
Wireless Signal/Range	802.11 b\g, 200 ft. range in non obstructed environment
Amplifier/Computer Interface:	1. Wired Ethernet connection for Recorder Initialization, Impedance Measurement, Live View, Battery Charging, or; 2. Wireless Ethernet (802.11b\g) for Live Viewing
Operational Limits:	Temperature: +10º C (+50º F) to +40º C (+104º F) Relative Humidity: 30% - 95% non-condensing
Regulatory Approvals:	UL601-1 2003 CSA 601.1 1990 EN 60601-1:1990 + A1:1993 + A2:1995 + A13:1996 EN 60601-1-1:2001 (medical systems) EN 60601-2-26:1994 (EEG equipment) EN 60601-1-2:2001 (EMC) EN 60601-1-4:1996 (programmable electrical medical systems) EN ISO 114971:2000 (risk) FCC ID: XFY CADWELL-1

Ambulatory Wireless Warnings and Cautions

	Caution: Exposure to Radio Frequency Radiation This device emits radio frequency radiation. The output of this device is below acceptable FCC skin absorption rate levels if used according to manufacturer's instructions. Do not place the recorder in any other pack or pouch than that supplied with or recommended by Cadwell. Use of packs or pouches other than those specified or approved by Cadwell could alter the Radio Frequency emission pattern and intensity.		This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
	The maximum performance for wireless is derived from IEEE Standard 802.11 specifications. Actual performance can vary, including lower wireless network capacity, data throughput rate, range and coverage. Performance depends on many factors, conditions and variables, including distance from the access point, volume of network traffic, building materials and construction, operating system used, interference and other adverse conditions.		Do not immerse the recorder, amplifier, battery holder, or EasyNet Modules in liquid. Do not attempt to use any Ambulatory system components if they have been immersed in liquid. The system is not water resistant or splash proof. The contact of liquids with the internal parts and connectors of the Cadwell Easy Ambulatory 2 system should be avoided at all times.
	Federal law restricts sale of this system to, or on the order of, a physician.		High levels of static discharge can cause a momentary pause in data collection.
	When attaching the Easy Ambulatory system to a recording subject, verify that the subject will not become entangled in the wires. Do not allow the electrode wires to wrap around the subject's neck. Instruct the patient in the proper way to wear the Easy Ambulatory system and not become entangled.		Dispose the batteries in accordance with applicable local laws. Li-ion batteries may be subject to federal, state or local regulations. Batteries should be discharged fully prior to disposal. The battery terminals should be capped to prevent a short circuit.
	No user serviceable parts inside. Service by Cadwell Laboratories, Inc. and other authorized bodies only.		Inspect EasyNet cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.
	Caution must be taken to ensure that cables do not encircle the patient's neck or entangle the patient in any way.		The operator must be trained to be able to recognize the difference between signal artifact and valid bio-signals caused by movements, interference, or misplacement of sensors or electrodes.
	The system is not defibrillator proof.		Do not use the system in an MRI environment.
	Do not open or disassemble the batteries.		Type BF, IC601 Isolation
	Do not place recorder on a television, radio, or CPAP device.		Use only Cadwell authorized cables and accessories.

	Always place the recorder in the Easy Ambulatory Pouch when collecting patient data.		The system is not designed to operate in an explosive environment.
	The EEG electrode connectors are only designed for 1.5 mm touch proof connectors.		Do not autoclave or immerse the recorder in liquid.
	Do not connect more than one amplifier/Connector box to the Recorder.		Cleaning instructions in this manual need to be strictly adhered to.
	Batteries should remain in the wireless recorder for storage.		Do not use the recorder if battery leakage has occurred.
	Only use rechargeable batteries authorized by Cadwell Laboratories, Inc.		Do not attempt to re-charge batteries outside of the wireless recorder.
	Inspect the recorder before each use. Do not use the recorder if any visible damage is present to the recorder.		Do not use the wireless recorder if the battery cover is not secured with the set screw on the bottom panel of the recorder.
	When applying the stockinet to the patient, verify that the stockinet is not covering the patient's eyes, nose, mouth, or ears. Verify that the stockinet does not entangle the patient's neck, restrict airflow, or restrict circulation.		When using the amplifier to collect data, verify that the amplifier has been placed in a Cadwell authorized pouch. Verify the amplifier has been securely attached to the amplifier belt or chest/shoulder strap.

Easy Remote Input Boxes

Remote Input Boxes Overview

The Remote Input Boxes allow electrode extension 10 to 20 feet from the amplifier.

Top panel Remote Input Boxes are labeled for 10-20 EEG inputs. The top panel input box is compatible with Easy II and Easy III amplifier hardware.

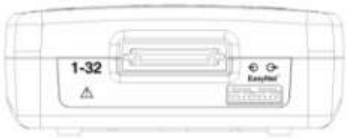
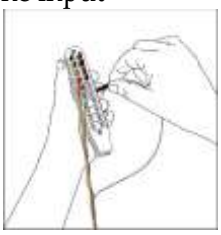
Side-input Remote Input Boxes are color-coded and labeled for:

- 10-20 EEG inputs
- Inputs 1-32
- Inputs 33-64
- Inputs 65-96
- Inputs 97-128

Remote Input Boxes Placement

Remote Input Boxes connect to the Easy Amplifiers with a detachable 10-foot (3-meter) cable.

Remote Input Boxes Connectors and Cables

Remote Input Box Connectors	Description
Cable Connection	Connects to the Remote Input Box Cable for data feed. The Cable then plugs into the input labeled 1-32 on the side of the Amplifier. 
Electrode Ports	EEG electrodes can be plugged into the inputs on the top of the amplifier or into a remote input box. The input connectors are designed for 0.059 inch (1.5mm) diameter molded safety connectors. One grounding electrode connector is available on the side-input box, and two ISO ground electrode ports are available on the top-panel box. 

Remote Input Cables	Description	Length
Remote Input Box Cable	Connects the remote input box to the Easy III Amplifier. 	9.8 feet (3 meters)
EEG Electrodes	Plugged into the remote input box, electrode input connectors are designed for 0.059 inch (1.5mm) diameter molded safety connectors. 	Lengths vary

Remote Input Boxes Warnings & Precautions

	Do not immerse remote input boxes in liquid.		Cleaning instructions in this manual need to be strictly adhered to.
	No user-serviceable parts inside. Service by Cadwell Laboratories, Inc. and other authorized bodies only.		The system is not designed to operate in an explosive environment.
	Inspect cables before and after each use. Discard cable if insulation is damaged or if the cable or connectors are damaged in any manner.		Use only Cadwell-approved cables for connecting your Cadwell Easy III hardware components.
	The system is not defibrillator proof.		The system is designed to be used with one patient at a time.
	Do not use the system in an MRI environment.		

Easy III EasyNet Modules*

*For use with Easy III and Easy Ambulatory amplifiers only.

EasyNet Modules are plug-and-play devices that can be configured to collect up to 12 channels such as body position, limb movements, and SpO2 data concurrently with other PSG or EEG channels. The following EasyNet modules can be centrally connected to the EasyNet hub:

- SpO2 Module
- Body Position Module
- Limb Movement Module
- Nasal Pressure Airflow Module

EasyNet Modules are plug-and-play devices that can be configured to collect up to 12 channels such as body position, limb movements, and SpO2 data concurrently with EEG data.

EasyNet Hub

The six-port EasyNet Hub (# 190214-200) may be secured within a chest belt with its Velcro backing, providing a central connection port for EasyNet Modules on the patient.

EasyNet Cables and Connections

EasyNet cables can connect either to the hub itself, or daisy-chain to each other. Each module has two cable ports; one for connection, and one for daisy-chaining module to module. EasyNet cables are available in five, 10, 20, 35, 40, 70, 96 and 180-inch lengths.

Limb movement modules are placed on the wrists and legs of the patient. The SpO2 module is placed on the wrist or chest belt. All modules plug into the EasyNet Hub. The EasyNet Hub can be connected to the EasyNet input connector on the side of the Easy III amplifier. EasyNet cables are available in multiple lengths from 3 inches to 15 feet in length.

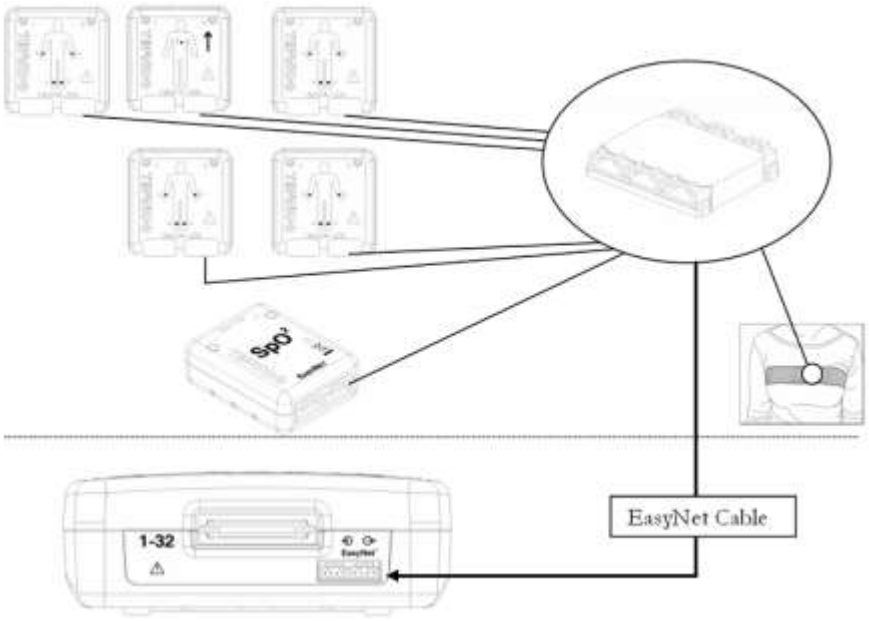
Connecting EasyNet Cables to EasyNet Hub or Module

Insert the cable end into the cable port on the hub or any module. Push gently until the connection 'clicks'.

Remove EasyNet Cable from EasyNet Hub or Module

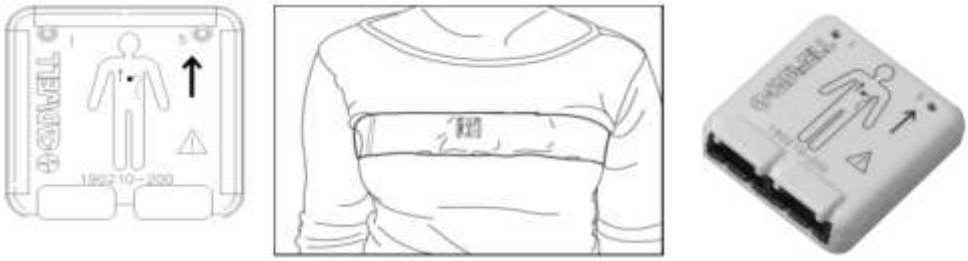
Push down on the cable lever to release the cable lock. Push the cable connection down from the lever, and then pull gently to release.

EasyNet Hub to EasyNet Module Connections



EasyNet Modules

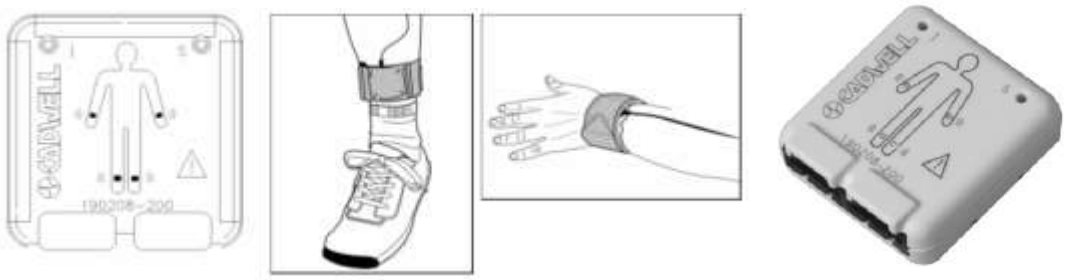
Body Position Module



The Body Position Module is designed to detect Left Position, Right Position, Prone Position, Supine Position and the Upright Position.

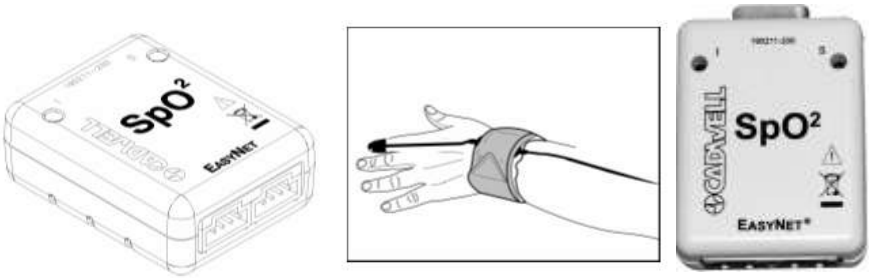
The Body Position Module has Velcro on the back side of the module. The sensor is placed inside a chest belt worn by the patient. This module can be used to detect body position during an EEG, PSG, or LTM recording.

Limb Movement Module



The Limb Movement module is designed to detect limb movements. The Limb Movement modules are placed in Velcro straps worn on the wrists and ankles. These modules can be used for EEG, PSG, and LTM recordings.

SpO2 Module



The EasyNet SpO2 Module is an oximeter that is designed to be worn on the wrist or chest belt. This module may be configured to collect two channels: SpO2 signal (pulse) and pulse rate.

Nasal Pressure Module

The EasyNet Nasal Pressure Module is designed to record up to four channels: nasal flow, oral flow, nasal snoring and oral snoring. The module uses a 2-channel cannula that captures pressure changes recorded at the nose and mouth.

EasyNet Chest Belt

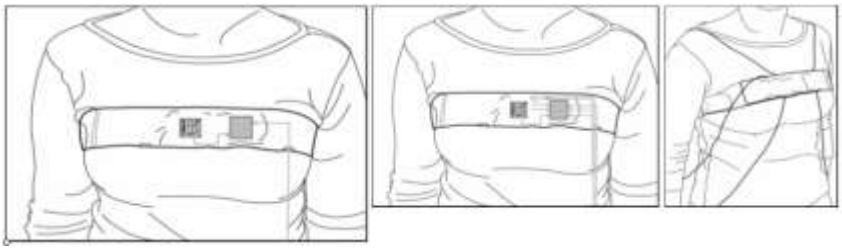
The chest belt is designed to hold the Body Position and EasyNet Hub in a small pocket located on the front of the chest belt.

Place the Chest Belt on the Patient

Place the chest strap on the patient. Center the small envelope/pocket on the front of the chest.

Insert the Body Position Module and the EasyNet Hub inside the pocket on the chest strap. The arrow on the front of the Body Position Module should be pointing up. Connect a short EasyNet cable from the Body Position Module to the EasyNet Hub. You can use any connector on the Body Position Module and Hub.

Place the Limb Straps on the patient. Connect each module to the hub in the Chest Belt. When setting up your patients, route the cables through the chest strap to each limb movement module.



EasyNet Cable Tester

The EasyNet Cable Tester allows you to check the integrity of EasyNet module and Ambulatory battery cables.

Testing EasyNet Cables

Test one cable at a time. Connect *both ends* of an EasyNet *or* Ambulatory battery cables into its corresponding ports on the EasyNet Cable Tester. Both green and yellow LEDs will illuminate.

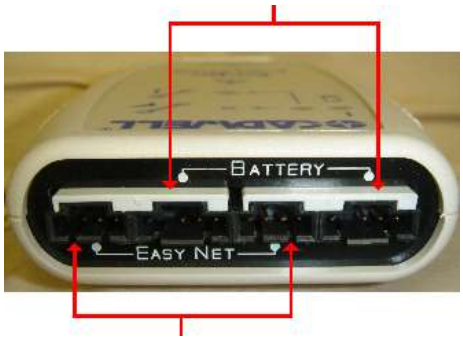
The cable is *good* if the green LED stays lit, and the yellow LED turns off.

The cable is *not good* if the green *and* yellow LEDs remain lit. Please dispose of the EasyNet Cable and replace it with a good one.

Replace EasyNet Cable Tester AA Batteries

If the green LED on the EasyNet Cable Tester does not illuminate when a cable is connected for testing, replace the Tester batteries. Use the thumb grip on the battery panel on the back of the Cable Tester to open the battery compartment. Remove the batteries, and replace them with two (2) AA batteries. Replace the cover, and check to make sure the Tester works by testing a cable. If the green LED illuminates, the Tester batteries are good.

Battery Cable



EasyNet Cable

EasyNet Modules Warnings & and Precautions

⚠	Federal law restricts sale of this system to, or on the order of, a physician.	⚠	The system is not defibrillator proof.
⚠	High levels of static discharge can cause a momentary pause in data collection.	⚠	The operator must be trained to be able to recognize the difference between signal artifact and valid bio-signals caused by movements, interference, or misplacement of sensors or electrodes.
⚠	No user-serviceable parts inside. Service by Cadwell Laboratories, Inc. and other authorized bodies only.	⚠	Cleaning instructions in this manual need to be strictly adhered to.
⚠	Do not immerse the amplifier, recorder, or modules in liquid. Do not attempt to use the system and its modules if it has been immersed in liquid. The system is not water resistant or splash proof. Avoid contact of liquids with the internal parts and connectors of the Cadwell Easy system.	⚠	Check the oximeter sensor application site frequently to determine the circulation, positioning, and skin sensitivity of the patient. Each patient's sensitivity to sensors may vary depending on their medical status or condition of their skin.
⚠	The system is not designed to operate in an explosive environment.	⚠	Do not attempt to use the Easy system in an MRI environment.
⚠	Do not use a broken body position module, SpO2, nasal pressure, or limb movement module if the case or connectors are cracked or broken.	⚠	Do not autoclave EasyNet modules.
⚠	Inspect EasyNet cables before and after each use. Discard cable if insulation is damaged or if the cable is damaged in any manner.	⚠	Discontinue using any module or sensor if the patient exhibits any allergic reactions to adhesive or materials.
⚠	When using the body position and limb movement modules, verify that they have been placed in a Cadwell authorized pouch, belt, or holder.	⚠	When applying tape for the oximeter sensor, do not stretch the adhesive tape. This may cause inaccurate readings or skin blisters.
⚠	When attaching the Easy system to a recording subject, verify that the subject will not become entangled in the wires. Do not allow the electrode wires to wrap around the subject's neck.		

Minimum Computer Hardware Requirements

Application

Listed below are the minimum requirements for a computer to operate Cadwell Easy III.

Regulatory Requirements

Domestic (U.S. and Canada) computers: third-party certified to UL 1950 or IEC 950.

European Union computers: third-party certified to EN 60950.

Minimum Computer Hardware Requirements

Operating System	Windows XP Professional (SP2)
Processor	Dual Core, 2.13 GHz Recommend Dual Core, 3.1 GHz
Hard Disk Drive	160 GB, NTFS file system, (Recommend 750 GB if the system is used for long term epilepsy monitoring or if several weeks of data storage is required.)
Memory (RAM)	2 GB. (Recommend 3 GB.)
Archive Device	Recordable DVD+R/+RW and CD-RW Drive.
USB	USB 2.0 (2 port minimum)
Graphics	1600 x 1200, 256 MB, optional dual monitor output
Network Card	10 Base-T Ethernet card required for connection to amplifier. A second network card is required for connection to a LAN, or IP based camera.

*Computer requirements are subject to change. Always contact Cadwell prior to purchasing computer hardware for your facility.

Qualified Computer Platforms

Dell OptiPlex 755 (small form factor configuration) *	Core 2 Duo, 2.33 GHz, 2 GB RAM, 160 GB Hard Drive, Windows XP Pro (SP2), NTFS file system, Dual monitor-256 MB graphics card, additional low profile network card.
Dell Precision T3400*	Core 2 Duo, 2.33 GHz, 4 GB RAM, 750 GB Hard Drive, Windows XP Pro (SP2), NTFS file system, Dual monitor-256 MB graphics card, additional network card.
Dell Latitude D830 Laptop *	Core 2 Duo, T7500 2.20 GHz, 2 GB RAM, 120 GB Hard Drive, Windows XP Pro (SP2), NTFS file system, 15.4" display at 1680 x 1050.
Toshiba Tecra A9 *	Core 2 Duo, T7300 2 GHz, 2 GB RAM, 120 GB Hard Drive, Windows XP Pro (SP2), 15.4" display at 1680 x 1050.

*Computer specifications and requirements are subject to change. Always contact Cadwell prior to purchasing computer hardware for your facility.

Additional Software Requirements

Report Generator	MS Word 2003
Belkin Video to USB Software	Belkin Video to USB adapter software is required if Easy III Q-Video software is used.
Sony IPELA Software	Sony IPELA Network Driver is required when the IPELA camera is used.
Server Installation	Validated on Server 2003, SP2 Standard Edition X Number Users Client

Misc. Support Requirements

Remote Diagnostics	Citrix GoToAssist (internet access required)

Regulatory Requirements

Domestic (U.S. and Canada) computers must be third-party certified to UL 1950 or IEC 950. European Union computers must be third-party certified to EN 60950.

Q-Video Camera Hardware

Q-Video allows digital video to be collected concurrently with PSG or EEG recordings. The Q-Video program captures incoming video signal and compresses the video data real time.

Q-Video Requirements

To use Q-Video, you must have:

- A valid software license enabling Q-Video on your Easy III system,
- A video input to your computer via a 'video to USB adapter', *and*

- A standard video camera (NTSC/PAL) or a low-light camera for use during data collection (The camera may be black-and-white or color, or a VCR with video output).

You may also have the optional components: sound mixer, speakers, *or* tilt, pan and zoom unit.

If you did not purchase Q-Video and a camera from Cadwell, you must

- Purchase a licensed copy of the Q-Video software,
- Install the Q-Video software,
- Install camera software (follow camera software installation instructions),
- Verify the camera connects to Q-Video,
- Set camera for low-light input.

IP Camera Setup

Sony IPELA - Model # RZ25

Before using our Sony IPELA camera, you must connect the camera to the local network. In most configurations, the camera will be connected to a network switch shared by all Easy III systems. The camera will be connected to the switch with an ethernet/network cable.

Assigning a IP Address to the Sony IPELA Camera

Note: The Sony factory setting of the camera is as follows: IP address: 192.168.0.100. The subnet mask is 255.0.0.0.

1. Insert the supplied CD-ROM disc into your CD drive.
2. Click on the Setup icon of the IP Setup Program. The 'File Download" dialog will open.
3. Click Open NOTE: If you click "Save this program to disk" on the File Download dialog, you can not install the software correctly. Delete the downloaded file, and click the Setup icon again.
4. Install the IP Setup Program to your computer following the software wizard displayed. If the software license agreement is displayed, read and accept the agreement to precede.
5. Start the IP Setup Program. The program will detect the Sony camera and list all Sony IP cameras in the Network tab window.
6. Click on the camera you would like to assign an IP address.
7. To obtain the IP address automatically from a DHCP server, select 'Obtain an IP address automatically'. The IP address, Subnet mask and Default gateway are assigned automatically.
8. To specify the IP address manually, select 'Use the following IP address'. Type in the IP address, Subnet mask and Default gateway.
9. To set the DNS server address automatically, select 'Obtain DNS server address automatically.

10. To specify the DNS server address, select 'Use the following DNS server address'. Enter the Primary DNS server address and the Secondary server address. NOTE: The third and fourth DNS address fields do not work with the Sony IPELA camera.
11. Set the HTTP port No. Normally select 80 for the HTTP port No. To use another port number, select the text box and type a number between 1024 and 65535.
12. Type in the Administrator name and Administrator password. The default settings for both items are "admin" NOTE: You cannot change the Administrator name and password in this step.
13. Confirm that all items are set correctly and click OK. If 'Setting OK' is displayed, the IP address is set correctly.
14. To access the camera directly, double click on the camera name in the camera list.
15. The following setup screen should appear after step 14.

Accessing the Sony Camera via Internet Explorer

1. Launch Internet Explorer
2. Enter the IP address of the camera in the URL box.
3. Click Enter. The main viewer will be displayed. When the camera picture is displayed correctly, the IP assignment is complete.
4. When the main viewer is displayed for the first time, a security warning will be displayed. Click on OK to install Active X controls.
5. NOTE: If Automatic Configuration is enabled in the LAN settings in Internet Explorer, the camera image may not be displayed. In this case disable Automatic Configuration and set the Proxy server manually. Consult your network administrator to set the Proxy server.

EASY III SOFTWARE

Preparing for Software Installation

- Notify Bio-Med/IT dept. of Easy III install. Staff must be on call or available during installation.
- Provide internet connection to PC if possible (Cadwell can remotely connect to PC if necessary)
- Installation will require administrative privileges from operating system.
- Workstations and server must be physically accessible.
- Provide a network receptacle if a network connection is required.
- Install and mount camera hardware if video equipment is required.
- Pull network, video, audio cable prior to installation of software.
- Verify if hospital/lab safety team must inspect configuration and setup of Easy III and computer hardware.

Operating System, 3rd Party Software Requirements

Installing the Easy III software requires **Windows XP Service Pack 2** (or later) and **Microsoft Word**.

Easy III software is not compatible with Windows 98. Easy III requires Windows XP Pro, Service Pack 2. Easy III requires Flash 9.1. QuickMed and Easy III must be installed by a user *with administrator rights* (however, administrator rights are now required after the installation of software).

The Easy III installer will verify that Windows SP2 and Flash 9.1 are installed. Connect the PC to the Microsoft website or install Windows SP2 if necessary. If an earlier version of Flash is installed on the local PC, the Easy III installer will upgrade the Flash software to Version 9.1.

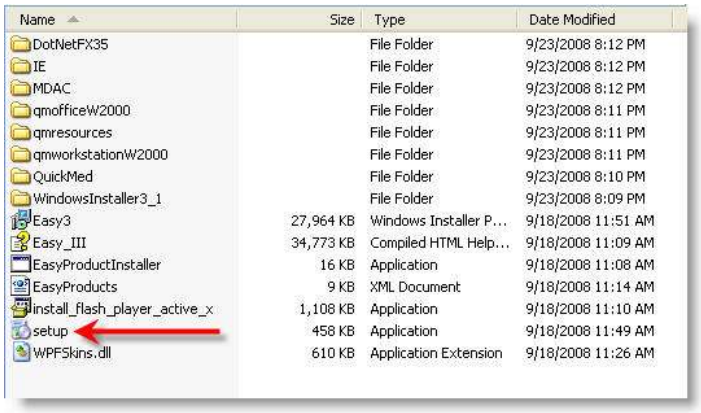
Installing Easy III Software

From an install CD: **Step 1 - Installing QuickMed Office**

The office server should be set up before any of the other Easy III systems. Only one office server is needed per site. If you have already installed the Office Server on another system, skip this section and proceed to Step 2, **Installing QuickMed Workstation**.

Step 1 - Installing QuickMed Office

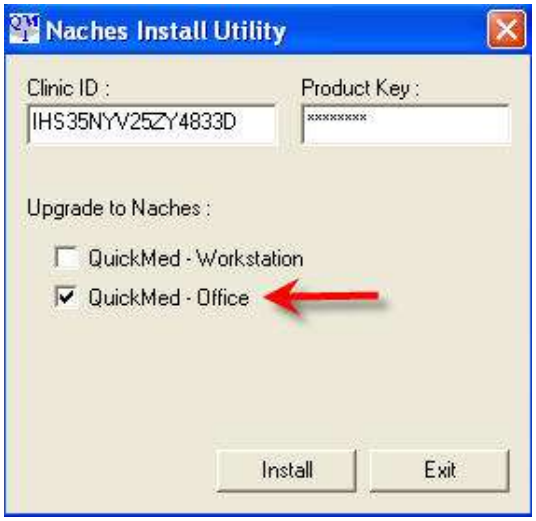
1. Click on the **setup.exe** from the Easy III folder on the installation disc.



2. If the version of Microsoft .NET Framework is out of date, the installer will prompt you to install a new version of .NET. If you are presented with the menu displayed below, click on Accept. The Easy III installer will install the .NET Framework software. Note: The installation of the .NET Framework software may take several minutes. After installation is complete, reboot if prompted to do so. After rebooting, the Easy III installation will automatically continue.

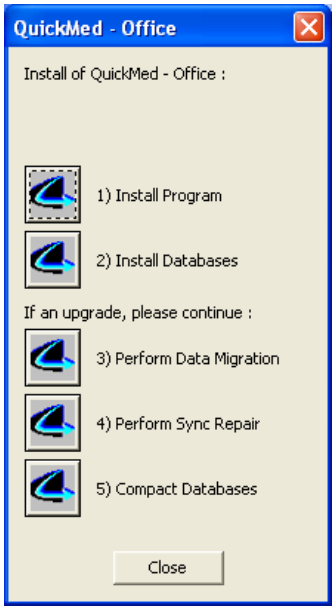
3. You will be prompted with the message below. Click Yes.

4. The Install Utility will be displayed. Note the picture displayed below. Enter the default Clinic ID is IHS35NYV25ZY4833D.
5. Enter the default Product Key is 1Z0OSEHY. *Note: Do not enter the Product Key if the system you are installing is not the Office Server system used in your facility. Only* ***one*** *system can be configured as an Office Server system.*



6. After entering the Product Key, select the "QuickMed – Office" option, then click "Install".

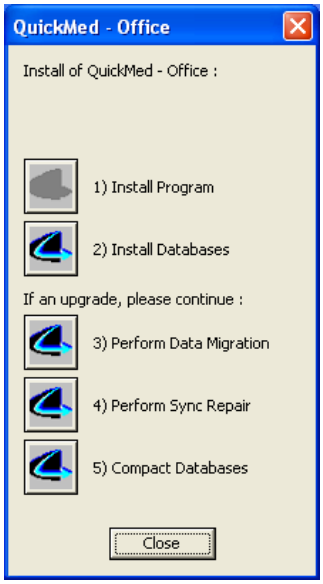
7. The QuickMed Office installation panel will be displayed. Click the "Install Program" button to start up the QuickMed Office installation wizard.



8. Step through the wizard clicking "Next" on each page. Do Not Change the Destination Folder when installing QuickMed Office. Install the software in the default destination (C:\Cadwell\Easy III).

9. On the last page of the wizard, click "Install" and wait for the install to complete, then click "Finish". You should now see the following options displayed in the QuickMed installation panel:

10. Click the "Install Databases" button. Once the databases are finished installing, click the "Close" button. Note: If you've previously installed QuickMed Office, you may see an error message about databases already existing. This is expected. Simply dismiss that error dialog. AT THIS POINT, DO NOT REBOOT THE COMPUTER, EVEN IF PROMPTED TO DO SO



11. You should now be back at the Install Utility dialog. Leave the Install Utility menu open; proceed to the next section for information on installing the QuickMed Workstation.

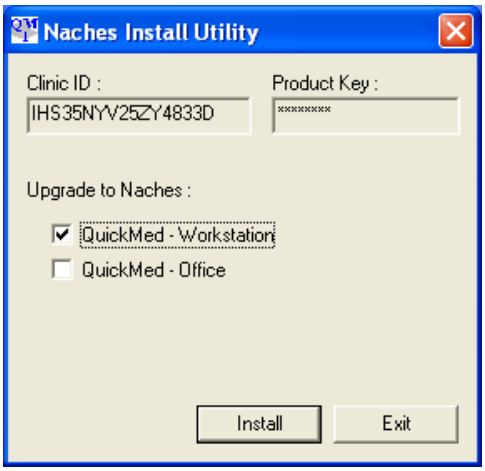
Optional: Setting up the Office Server as a Service:

This configuration allows the Office Server to run in the background without having a specific user logged into the system. To configure the Office Server to run as a service, follow the instructions below.

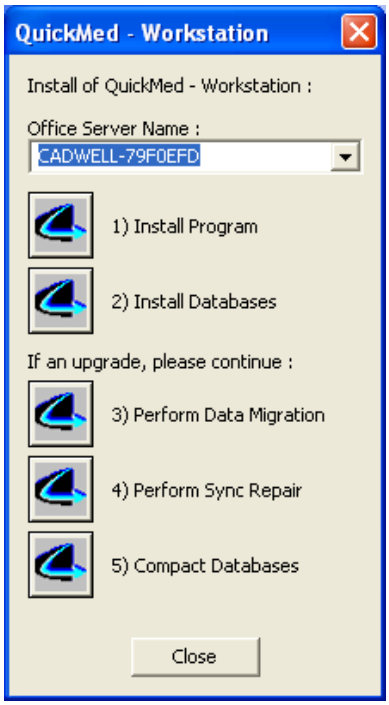
1. Select and copy all 4 batch files located in the Office Server Service folder on the installation DVD.
   - InstallService
   - UninstallService,
   - XYNTService, and
   - XYNTService.
2. Paste all 4 files into C:\Cadwell\Easy III
3. Double click on Install Service. A dialogue box will flash quickly on the screen and go away.
4. Reboot the server.
5. When server starts up make sure that QMAssistant and RPOfficeserver do not start up, the icons should not show up in the bottom right task tray.
6. Check in Task Manager that the applications are running.
7. Verify that the computers networked to the server and running Easy III are synching appropriately by opening the QMAssistant. The dialogue should say Connected to Office Server.

Step 2 - Installing QuickMed Workstation

1. Select the "QuickMed – Workstation" option and click the "Install" button.

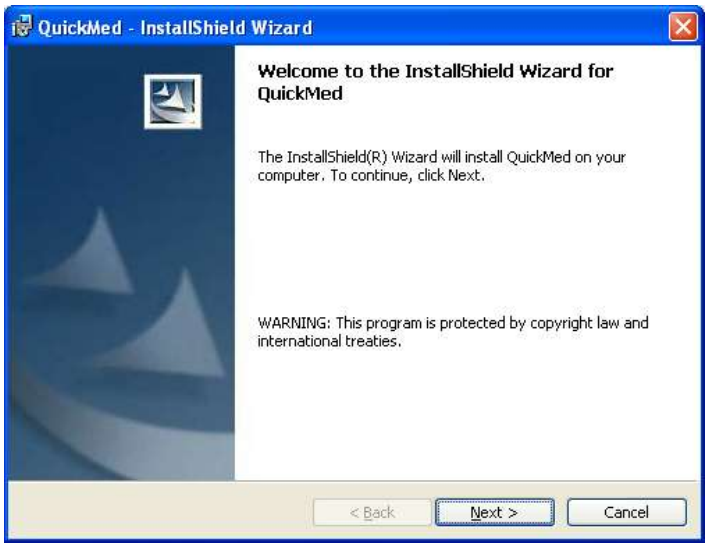


2. Select or type the name of your office server machine in the "Office Server Name" combo box. If the machine you're installing on is also the office server or you don't have an office server on your network, don't change the default value. If you don't have an office server on your network and the box is empty, type your computer name. If you are unsure what Office Server name to enter, Call Cadwell for assistance.

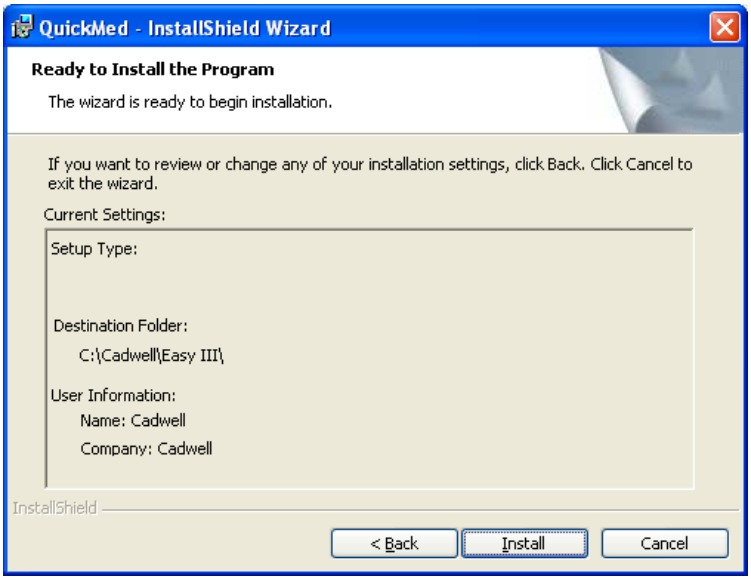


3. Click the "Install Program" button to start up the QuickMed Workstation installation wizard.

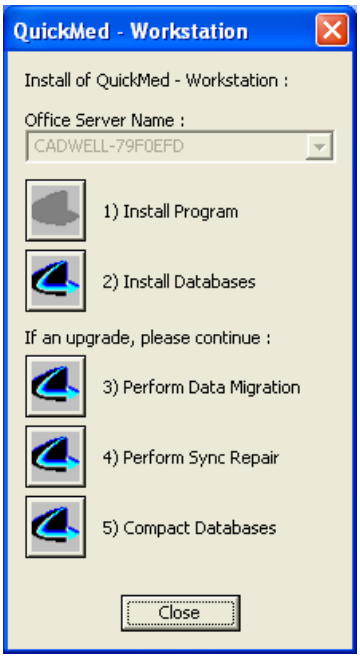
4. Step through the wizard clicking "Next" on each page. Do Not Change the Destination Folder when installing QuickMed Workstation. Install the software in the default destination (C:\Cadwell\Easy III).



5. On the last page of the wizard, click "Install" and wait for the installation to complete, and then click "Finish".

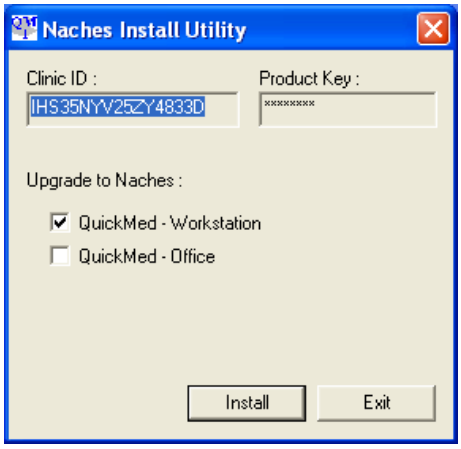


6. You should now see the following options:



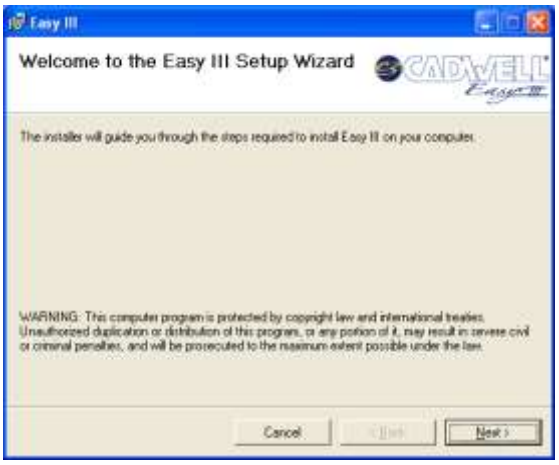
7. Next, click the "Install Databases" button to install the QuickMed Workstation database. *Note: If you've previously installed QuickMed Workstation, you may see an error message about databases already existing. This is expected. Simply dismiss that error dialog.* Once the database are finished copying, click the "Close" button on the above dialog. AT THIS POINT, DO NOT REBOOT THE MACHINE EVEN IF PROMPTED TO DO SO.

8. You should now be at the "Install Utility" dialog. Click the "Exit" button.



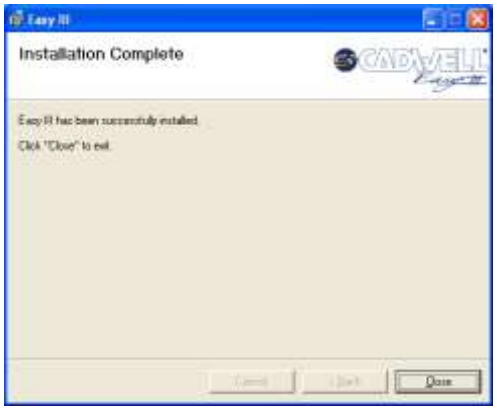
Step 3– Installing Easy III Software

1. Launch the setup.exe (again) from the Easy III folder on the installation disc. You should now see the following dialog:



2. Step through the Easy III installation wizard by clicking "Next" on each of the pages. When the installation is complete you will see the following dialog:
3. You will be prompted to select the Easy Products you would like to install. Select the products you have purchased. Click on the OK button.

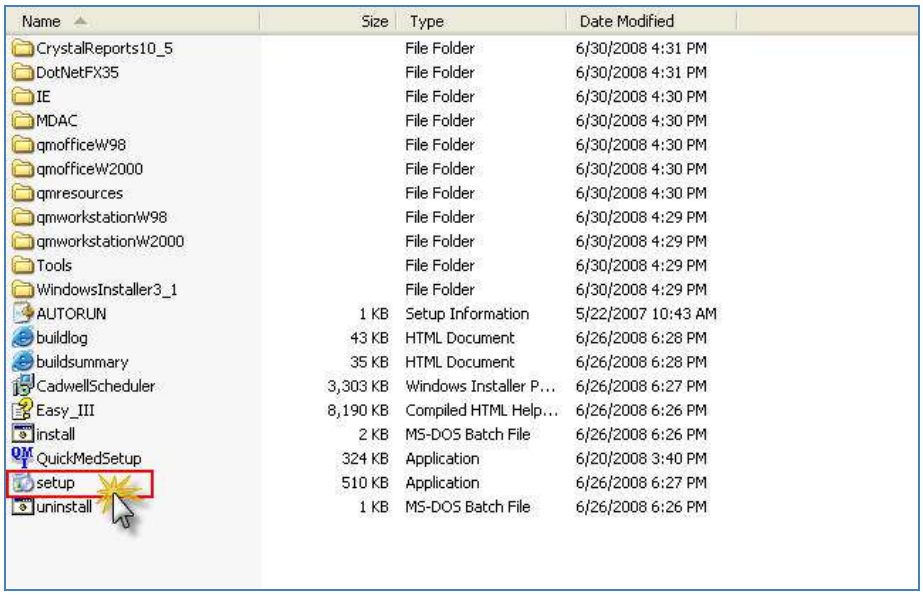
4. Click “Close” to complete the installation. At this point, you will be asked to restart you machine. Please do so.



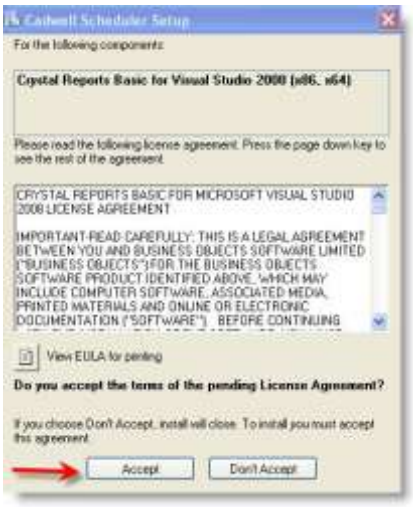
Step 4 - Installing the Cadwell Scheduler

The Easy Scheduler should be installed after the Office Server system or the Workstation system has been configured with Easy III software. The Easy Scheduler can be installed on a separate computer system without installing the Easy III client.

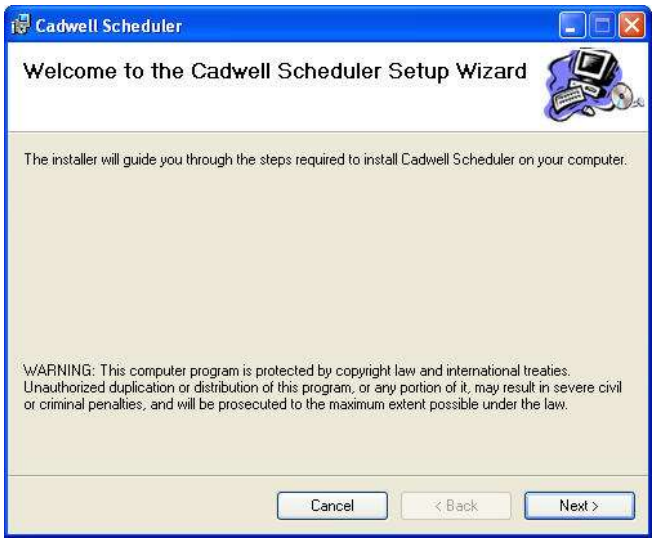
1. Click on the Setup program in the Scheduler installation folder.



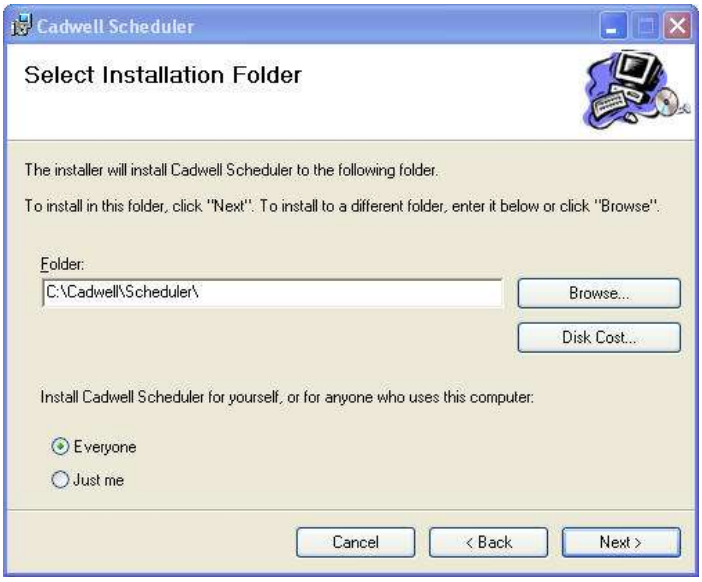
2. The installer will install Crystal Reports for Visual Studio 2008 (x86, x64) if it is not present on your system. Click on the Accept button to install the Crystal Reports. Note: The Cadwell Scheduler Setup program will install Crystal Reports. This may take several minutes.



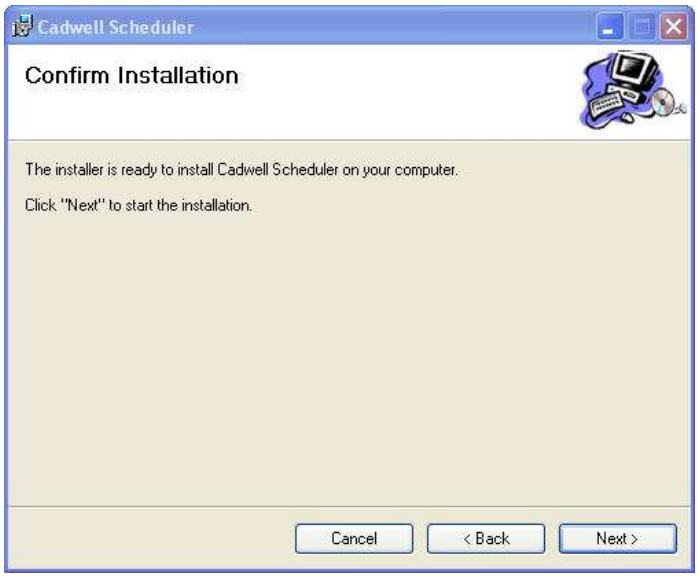
3. Click on Next to install the Scheduler program on your computer.



4. Select the default folder. The folder must be **C:\Cadwell\Scheduler**



5. Click on Next to install the Scheduler.



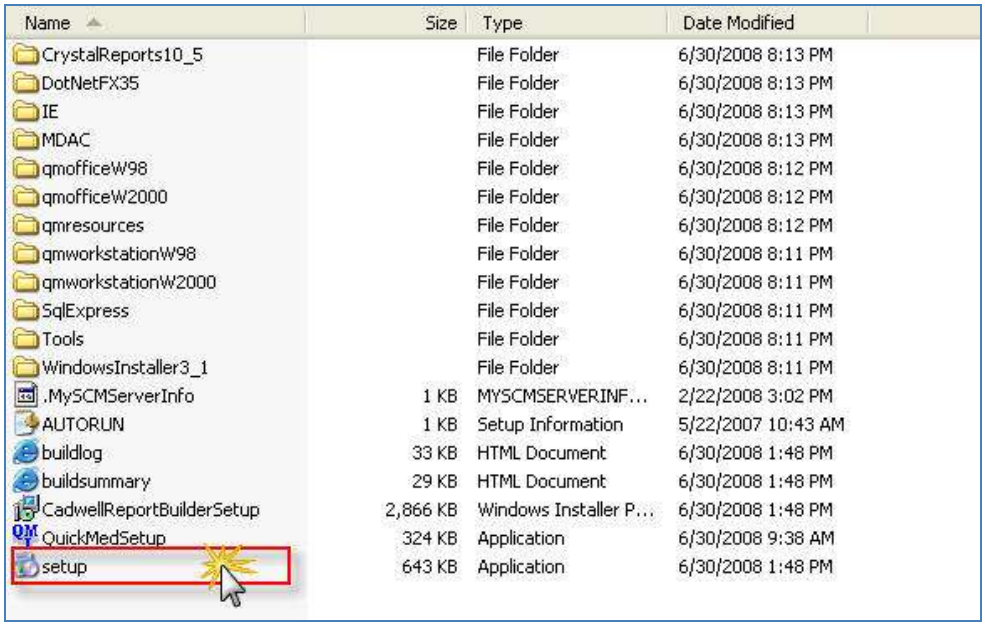
6. You will be prompted with the Installation Complete dialog. Click on Close to exit.
7. To access the scheduler you can click on the desktop shortcut.

8. The scheduler can also be opened by clicking on the shortcut displayed in Easy III.

Step 5 - Installing the Cadwell Clinical Database

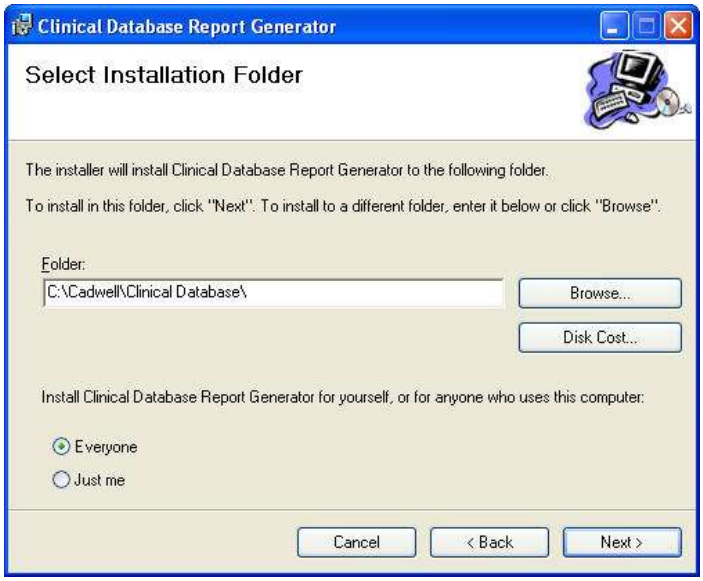
The Cadwell Clinical Database should be installed after the Easy III software has been installed.

1. Click on the setup.exe file in the Clinical Database installation folder.

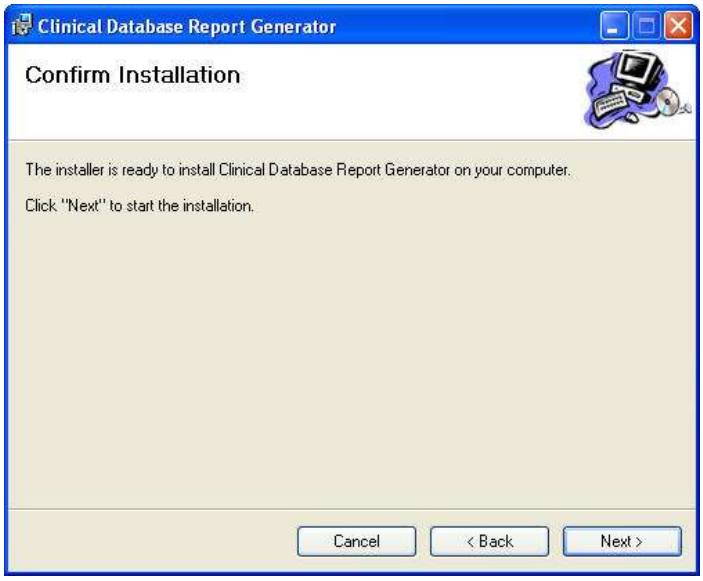


2. Click on Next to continue.

3. Click on Next to confirm the installation of the Clinical Database Report Generator. Do not change the default folder location.



4. Proceed through the installation. When the installation is complete, click on the Close button.

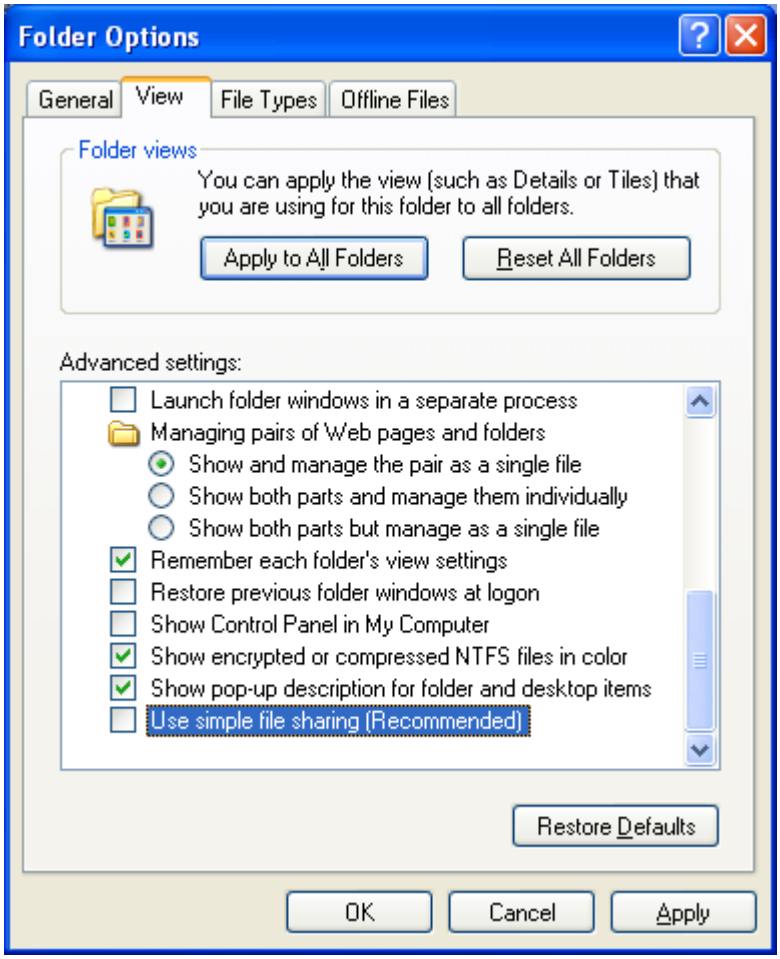


5. Click on the Clinical Database shortcut on your desktop to access the database.

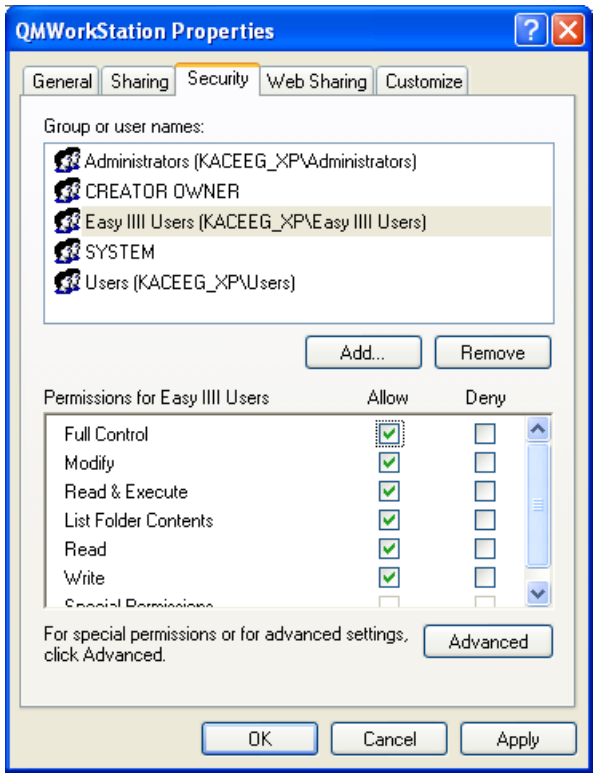
Step 6 – Setting up File Sharing (required for all systems)

1. In Windows Explorer, move to the "C:\" directory.
2. Click the "Tools" menu in Windows Explorer and select the "Folder Options…" menu item.

   Select the "View" tab and scroll to the bottom of the list. Uncheck the "Use simple file sharing" checkbox as shown here:



3. Click "OK" to dismiss this dialog. Right-click on the "C:\QMWorkstation" directory and select the "Properties" menu item, then select the "Security" tab to get the following dialog:



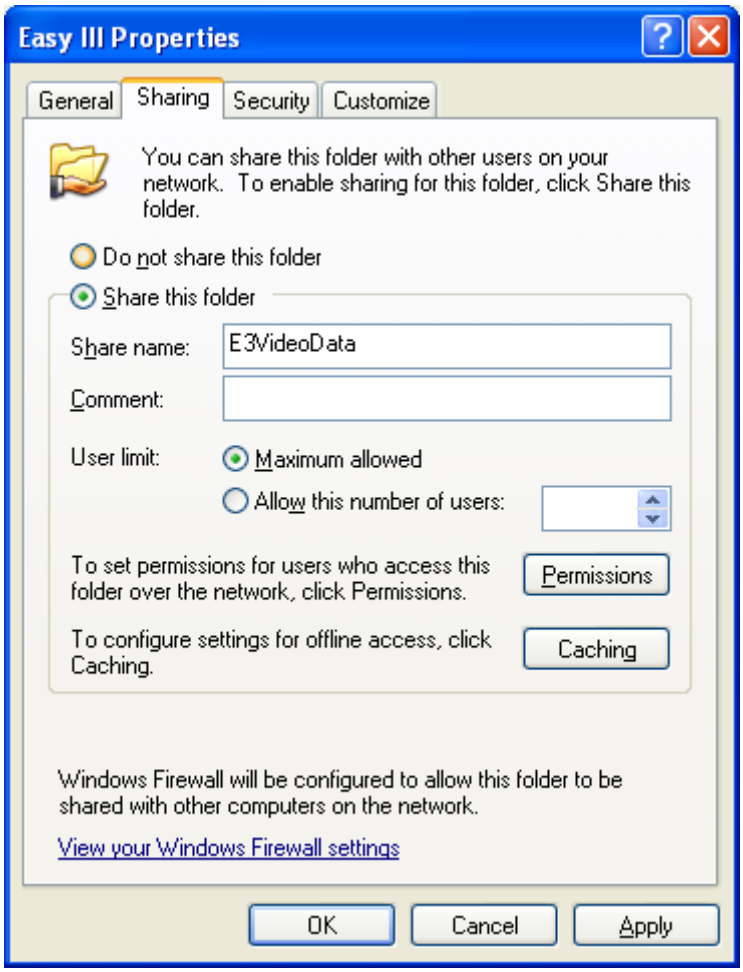
4. If the desired group (for example, "Everyone", "Power Users", "Easy III Users") is not in the list, select the "Add…" button, select (or type) the desired group and click "OK". Now, for the desired group, click the "Allow" "Full Control" check box and click "OK".

5. **Allow Easy III Access:** Repeat step 4.3, but replace the directory that we are giving rights to from "C:\QMWorkstation" to "C:\Cadwell\Easy III".

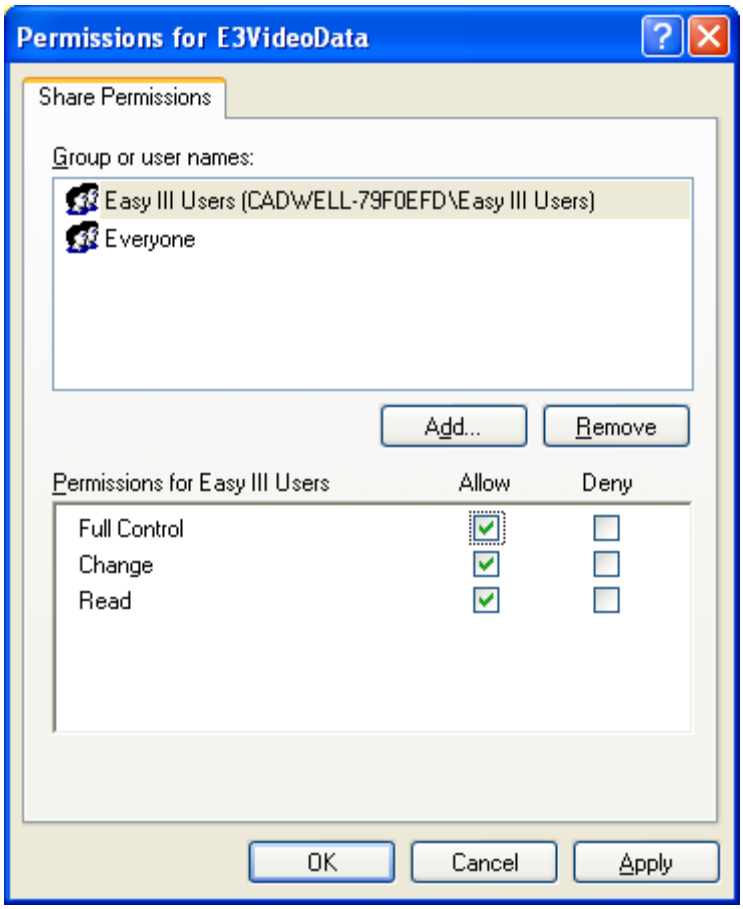
Making video and data available to other client computers

All data files and video files are written to "C:\Cadwell\Easy III\Data" In order for a remote machine to view a record remotely, the recording system must have the "C:\Cadwell\Easy III\Data" folder shared as "E3VideoData".

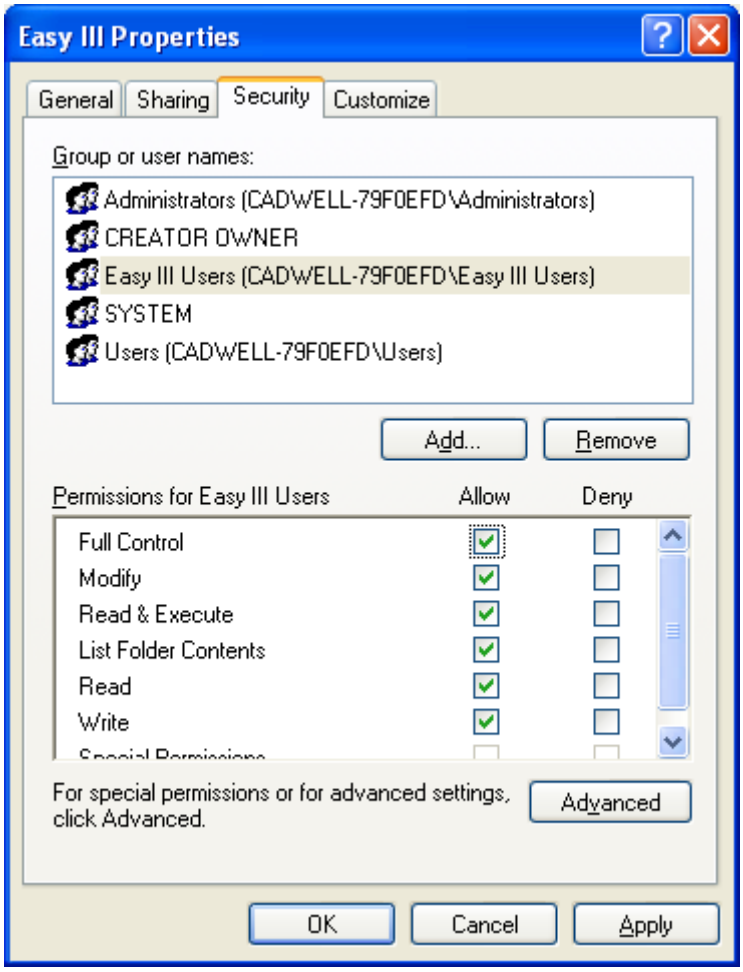
a. In Windows Explorer, go to "C:\Cadwell\Easy III".
b. Right-click on the "Data" folder and select "Properties"
c. Select the "Sharing" tab and select the "Share this folder" radio button.
d. Type "E3VideoData" for the share name as seen below.



e. Click the "Permissions" button.
f. If the desired group or user (for example, "Power Users", "Easy III Users") is not in the list, select the "Add…" button, select (or type) the desired group or user and click "OK". Now, for the desired group, click the "Allow" "Full Control" check box and click "OK".



g. Now, select the "Security" tab.
h. If the desired group or user (for example, "Power Users", "Easy III Users") is not in the list, select the "Add…" button, select (or type) the desired group or user and click "OK". Now, for the desired group, click the "Allow" "Full Control" check box and click "OK".



NOTE: This all assumes that the hosting and remote viewing machines are on a network where they are visible to one another.

Configure the Network Card

Easy III communicates with the PC over an Ethernet link. A dedicated Ethernet network card must be installed in the PC, and the card must be configured to a specific IP address to communicate correctly. Connecting to a local area network will require a *second* network card. To configure the IP address in a Windows XP operating system:

1. If necessary, install a network card in the computer. Follow the network card's manufacturer's instructions.
2. Login as a user with administrative rights.
3. From the Windows desktop, open the Start menu.
    a. Open the Control Panel and open Network and Internet Connections.
    b. Click on Network Connections. A separate icon for each network card installed will be displayed. By default, each is named "Local Area Connection."
    c. Rename the network card used to connect to the Easy III hardware. Do so by right-clicking on the icon and select Rename, then typing a new name, such as "Easy III".
4. Right-click over the renamed network connection icon.
    a. Remove checkmarks next to everything except Internet Protocol (TCP/IP).
    b. If desired, checkmark the "Show icon in notification area when connected" to enable a pop-up message in the system tray showing when the connection to the Easy III system has been made.
5. Click the Configure button.
    a. Under the Advanced tab, select your link speed or media type, and change the value to **10mbs Full Duplex**.
    b. Under the Power Management tab, remove checkmark next to "Allow computer to turn off this device to save power."
    c. Click the OK button.
6. Return to the Properties window.
7. Click on Internet Protocol (TCP/IP) so it is highlighted.
8. Click the Properties button.
    a. Select "Use the following IP address".
    b. Enter IP address: **192.168.113.166** and Subnet mask: **255.255.255.0.**
    c. Click the Advanced button and open the WINS tab.
    d. Remove the checkmark next to "Enable LMHosts lookup".
    e. Checkmark "Disable NetBIOS over TCP/IP".
    f. Click the OK button.
9. Click the OK button and then click the Close button.

Activate Software Licenses

Easy III software features require a software key for:

- EEG data collection
- EEG data reader
- PSG data collection and review
- PSG data reader
- Video data collection
- Video review only
- Video review and editing
- Archiving capabilities

Software Overview

Open Easy III Software

1. Launch the Easy III software:

   Click on the Easy III desktop icon.

   or

   Open the Start menu, select All Programs, select Cadwell, select Easy III and select Easy III.

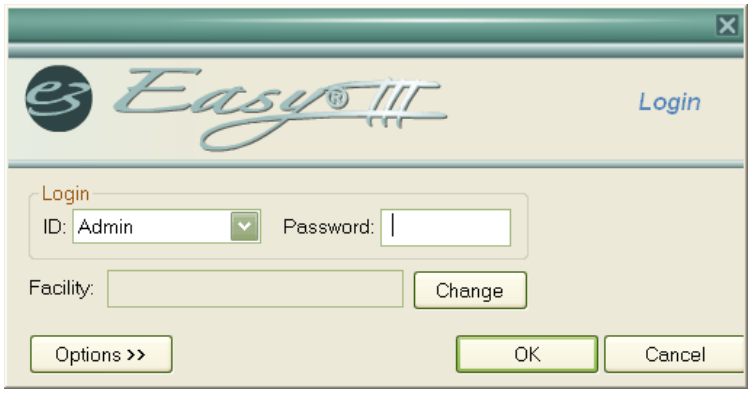
   or

   Select Easy III from the Quick Launch taskbar.

   To add Easy III to the Quick Launch menu, right-click on the toolbar, select Toolbars, and make sure there is a checkmark next to Quick Launch. Right-click the toolbar again, and make sure there is no checkmark next to Lock the Taskbar. Then click and drag the Easy III desktop icon and drop it into the taskbar. Right-click the taskbar, and select Lock the Taskbar.

2. Log in.

   Select your log in from the drop-down menu, enter your password and click the OK button. The Start Page will open. **By default, your initial password is the same as the Login ID.** See Manage Users to change your password.



3. Maximize Start Screen display.

   Click on the Window button to maximize the display. The system will default open to a maximized screen unless it is closed while in a minimized screen.

Close Easy III Software

1. When finished with a procedure, press the Run button to stop recording.
2. Click the Close to exit the patient procedure, or click the top right-hand X to exit Easy III.

Start Page Overview

Start Page Options

The start page in Easy III will vary based on the specific modality you have purchased from Cadwell. Below are some of the typical options you will find when entering the Easy III software.

Menu Options

New Patient - Select this option to enter new patient information and start a new recording.

Select Patient - Select this option to select the name of a patient that is already in the Easy patient database. Use this option to import patient information and start a new recording.

Append - This option can be used to add data to a previously saved data file. This option is helpful when data collection is interrupted due to power loss. Click on this option to find the original file, append the file, and resume data collection.

Select Record - Use this option to select a record to review and analyze.

System Setup - Select this option to:

- Select Default Amplifier
- Select Default Data Map
- Select Default Notch Filter
- Select Default Data Folder Location
- Edit or Create Montages
- Edit or Create Average References
- Edit or Create Flash Programs
- Edit or Create Data Maps
- Edit Hyperventilation Scripts
- Edit or Create Easy Users/Passwords
- Edit or Create User Defined PSG Events
- Enable/Disable AASM PSG Settings
- Edit PSG Event Detection Settings

Protocols - Use this option to configure the default recording layout that will be used during data collection. The protocol editor will allow the user to do the following:

- Select the default protocol used for data collection
- Modify or create the protocol used for data collection
- Create data collection workspace layouts
- Create default user events
- Assign default reports to R1, R2, and R3 buttons
- Assign default montages to M1- M6 montage buttons
- Assign default paper speed, amplifier type, and calibration montage to workspace

Record Manager - User this option to Archive, Export, Copy, Move and Delete data files. The Record Manager also has an archive database to allow the user to quickly review a list of all studies archived.

Scheduler- The Scheduler allows Easy III users to create and review appointments associated with Easy III equipment, patient rooms, physicians, and technicians. The scheduler can be synchronized across all systems.

Ambulatory Tools - Use this option to view ambulatory recorder status information (battery level, memory capacity, recorder status). The user can also start a new recording, download a recording, and clear a recorders memory from this menu option.

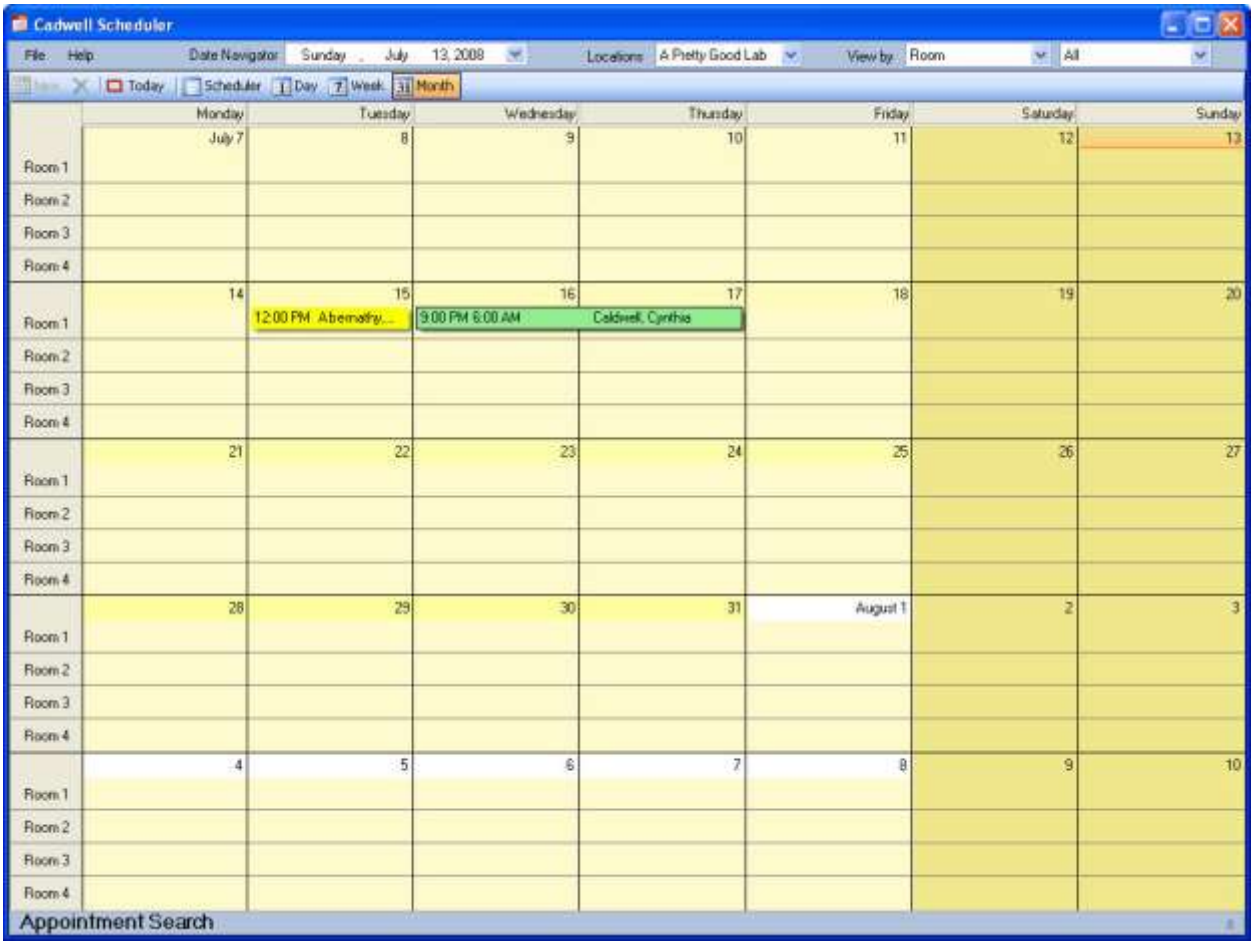
Cadwell Scheduler Options

The Cadwell Scheduler is a powerful tool that will allow Easy III users to schedule and manage appointments. The scheduler allows the user to set up and manage schedules for multiple locations based on the following categories:

- Room Number
- Physician
- Technician
- Equipment Type (EEG, PSG, Ambulatory recorder)

Scheduler Features

- Multiple calendar views (monthly, weekly, daily)
- All appointments are synchronized between all Easy III based systems.
- A separate installation is supported for systems that require access to the Scheduler only.
- Quick Recording Launch is supported by right-clicking on an appointment in the calendar.



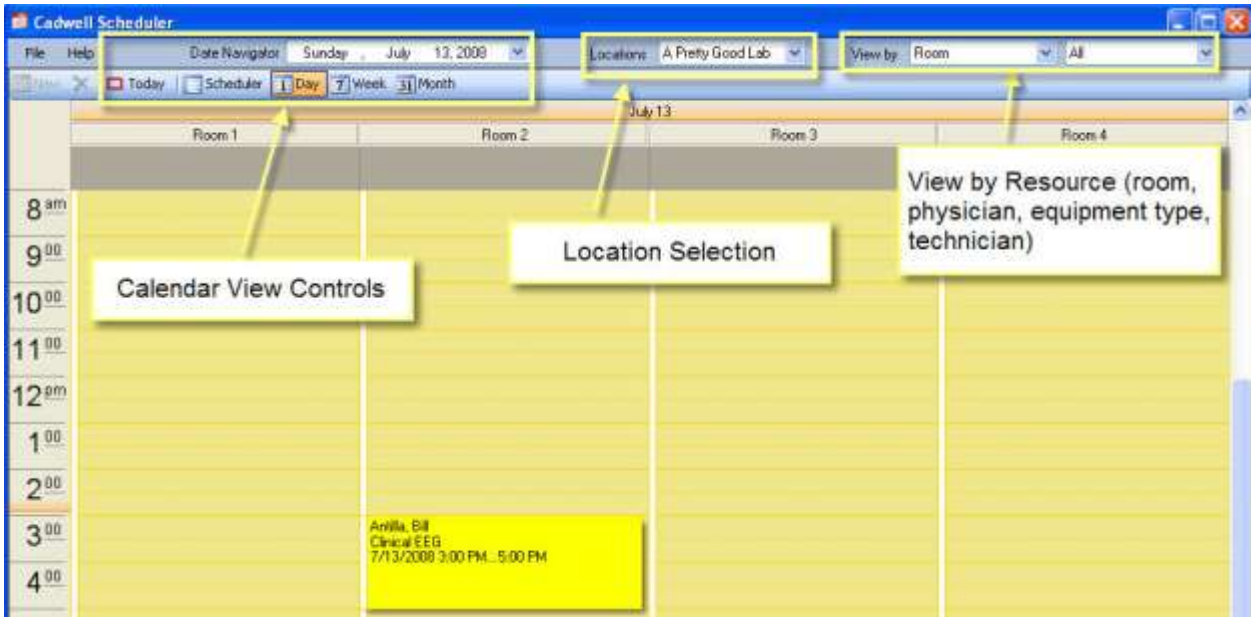
Accessing the Scheduler

From the Easy III desktop, click on the Scheduler option.

The Scheduler can also be accessed by clicking on the Cadwell Scheduler shortcut from the Windows desktop.

Note: A user name and password is required to log into the Cadwell Scheduler.

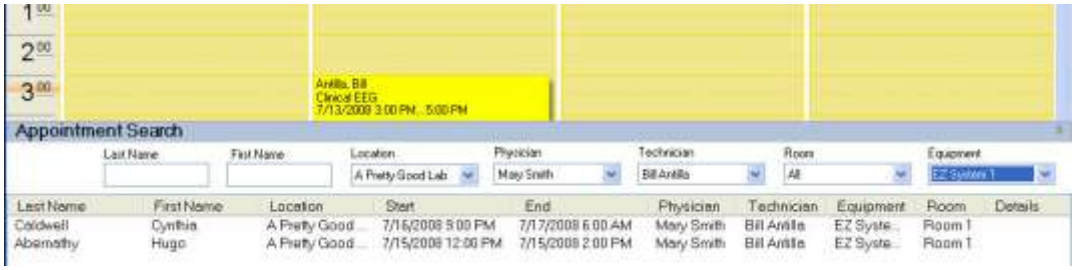
Calendar Options



Searching for an Appointment

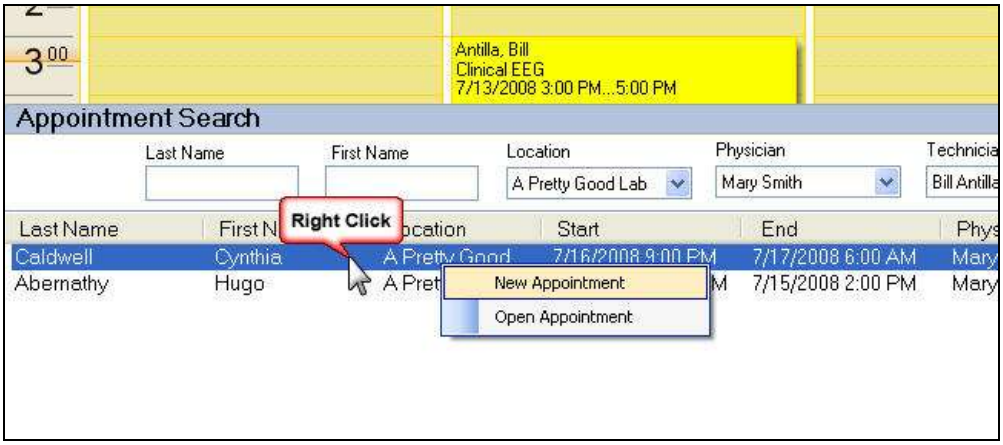
Click on the Appointment Search bar.

The following options will appear.



Search by Options:

- Last Name
- First Name
- Location
- Physician
- Technician
- Room
- Equipment



Note the illustration above. When the correct patient is found, highlight the patient name, Right Click on the highlighted name and select New Appointment or Open Appointment to proceed.

Configuring the Scheduler for Use

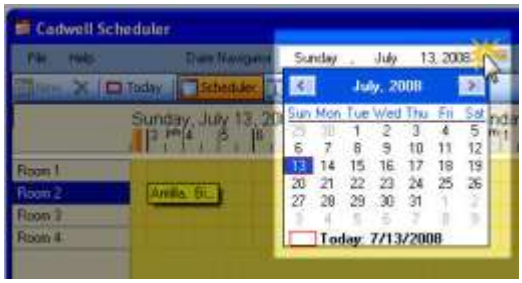
1. Add Facility Information. Click on File, Manage, Locations. Enter facility information.

2. Add Resource Information. Click on File, Manage, Resources. Enter room number, and equipment information. Select physician and technician names that will be used in the Cadwell Scheduler.

Note: You must create Easy user names and passwords for all physicians and technicians that will be included as resources in the Cadwell Scheduler.

Picking a Specific Date to View on the Calendar

Click on the Date Navigator to find a specific date.



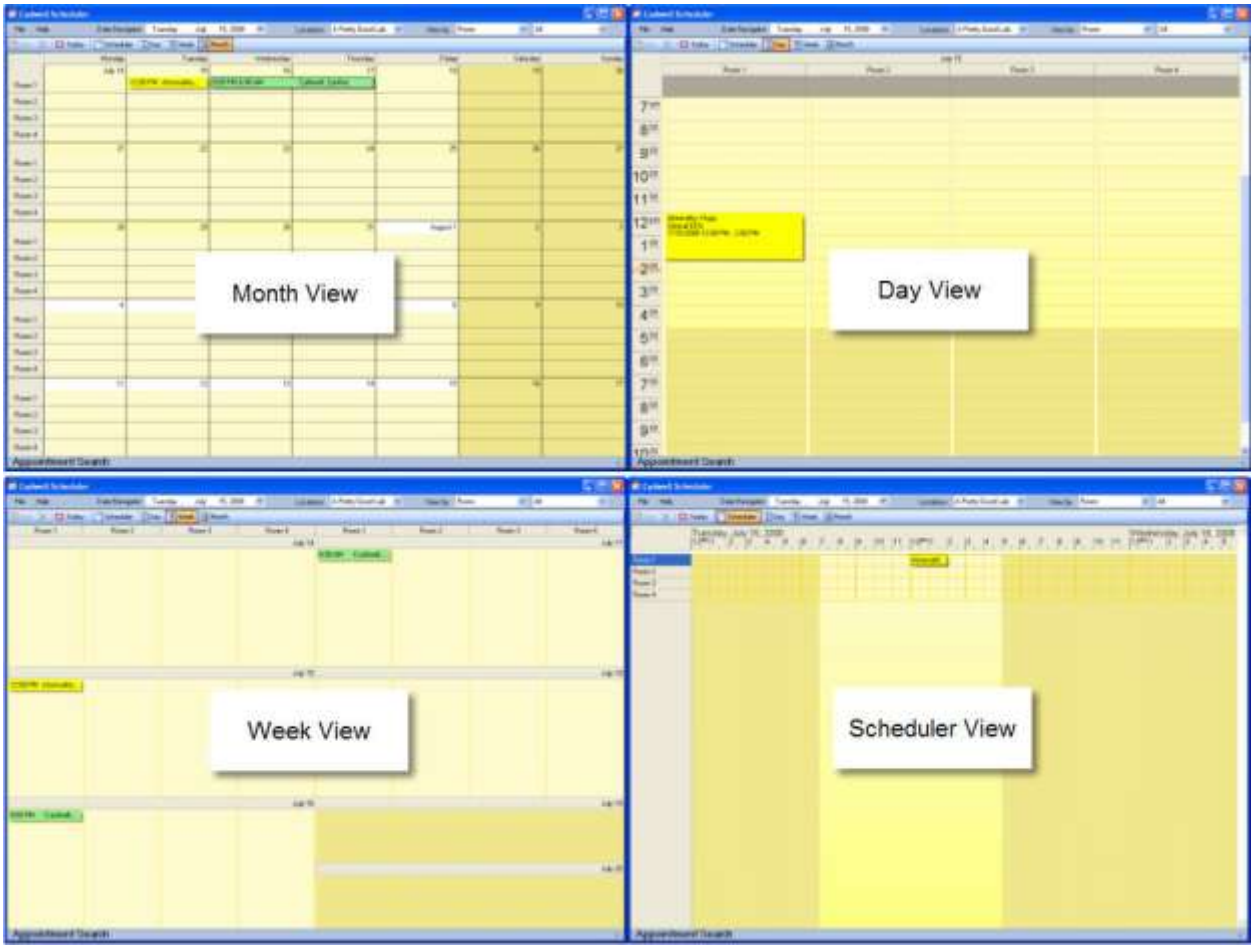
Viewing the Scheduler by Resources

In the window below, note the following steps.

1. Select the Location
2. Select View by Room. The calendar will display the current calendar by room.

3. Multiple views are available for use. Note the illustration below, the views are filtered by Room Number.

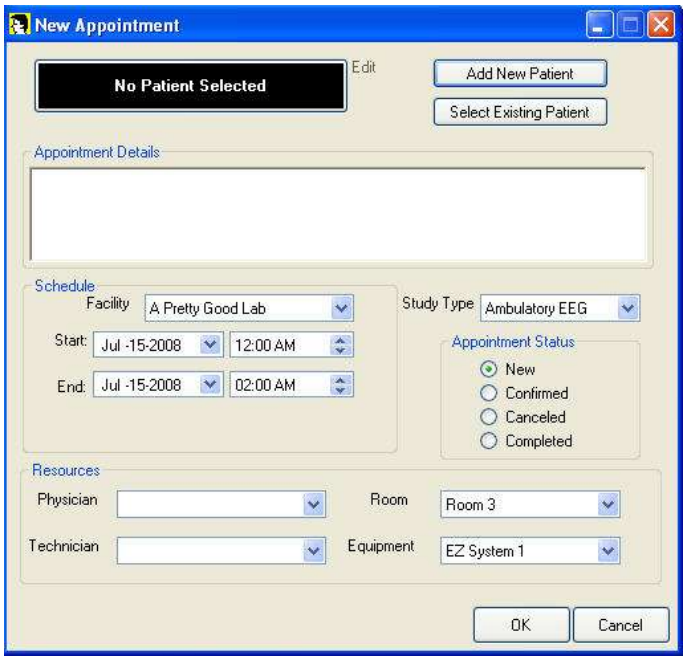
- Month View
- Day View
- Week View
- Scheduler View



4. Within each view, the user can select to view the calendar by:

- Physician Name
- Technician Name
- Room Number/Name
- Equipment Type

Adding a Patient to the Scheduler



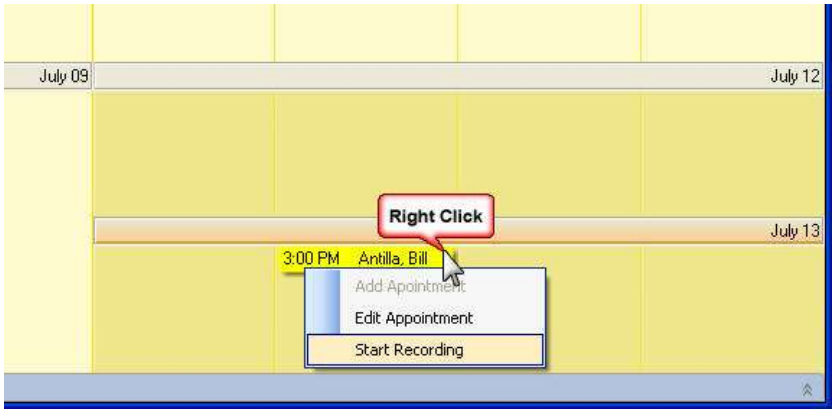
1. Click on 'New' or double click on a selected date in any calendar view (monthly, weekly, daily, scheduler).
2. Click on 'Add New Patient' or 'Select an Existing Patient'. Select or enter patient details.
3. If the Scheduler is used for more than one facility, select the Facility you would like to use.
4. Select the appointment Start and End dates and times.
5. Select the Study Type.
6. Select the Appointment Status.
7. Assign the patient to the correct Resources (Physician, Technician, Room, Equipment).
8. Click on OK. The appointment will be copied to all accessible Easy III systems configured with the Cadwell Scheduler.

Adding an Appointment from the Scheduler View

The user can add and edit an appointment by dragging across the calendar with a mouse, Right Click on the selected time period and Left Click to Add Appointment.

Starting a Recording from the Scheduler

To start a recording, the user right-clicks on an appointment in the calendar in any view – monthly, daily, etc. - and selects Start Recording from the pop up menu. If the Easy program is not already open, the Easy software will start up and a new live recording session will be started. If the study type does not have a default protocol (PSG, EEG, etc.), the user will be prompted to select one.



Printing a Schedule Summary Report

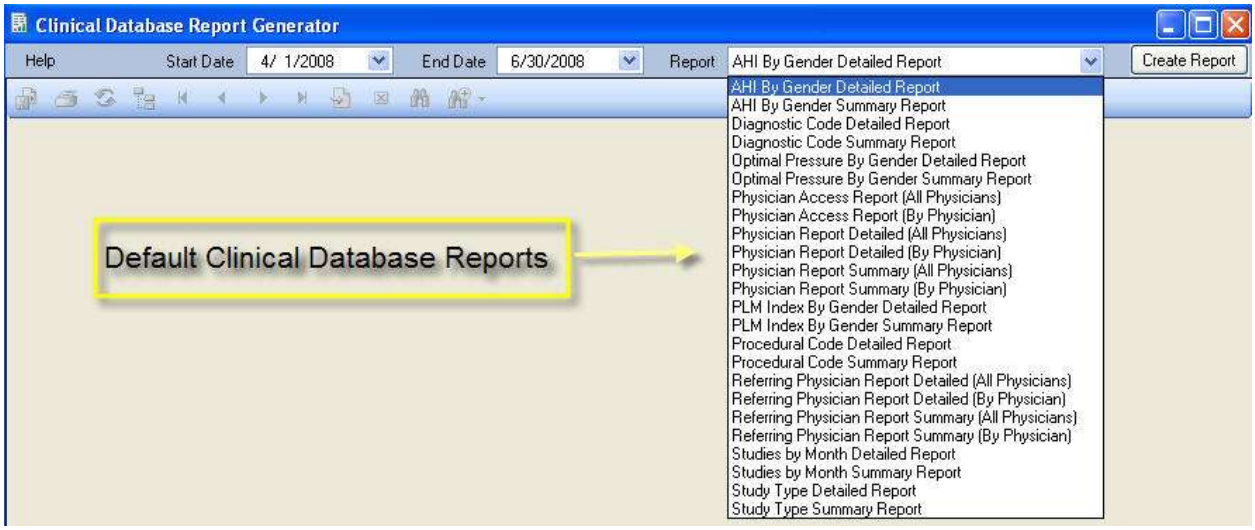
1. Click on File
2. Click on Report
3. Click on Scheduled Appointments

4. The Report Generator will be displayed. Select the time range for the report.
5. Click on Print Report

Clinical Database Options

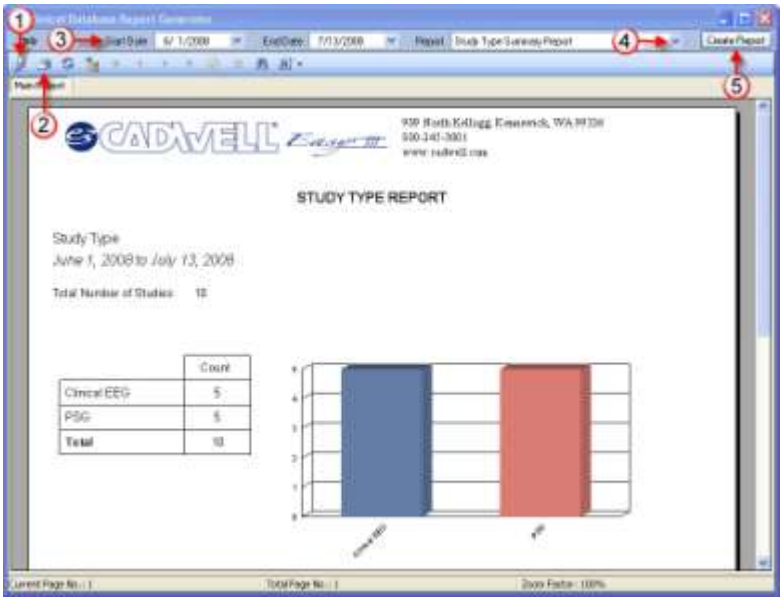
The Easy III system can be configured with a Clinical Database. The database will allow the user to create multiple reports that summarize clinical and administrative information. Users define the date range used with a selected report.

The following default reports are generated by Crystal Reports:



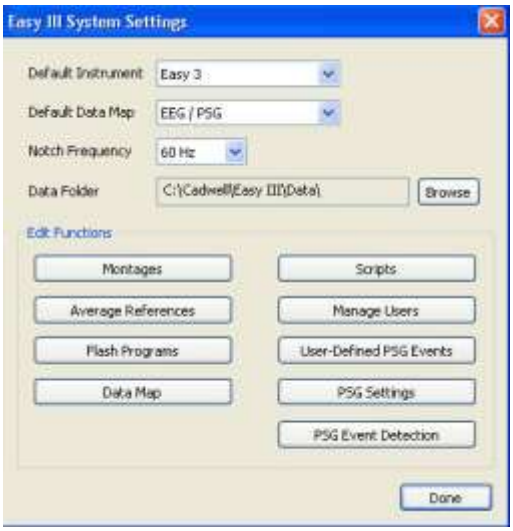
Clinical Database Options

Note the illustration.



1. Select this option to export the displayed report. You can export the report in the following formats:
   - Crystal Reports (.rpt)
   - Adobe Acrobat (.pdf)
   - Microsoft Excel (.xls)
   - Microsoft Work (.doc)
   - Rich Text Format (.rtf)
2. Click on this option to print the displayed report.
3. Click on this option to determine the date range you would like to use for the report.
4. Click on this option to select the specific report you would like to generate.
5. Click on this option after you have selected a report type. The report will be generated and displayed in the Report Generator window.

Easy III System Setting



Default Instrument -The Default Instrument may be set for use with the Easy 3, Easy II, and Easy Ambulatory amplifiers.

Default Data Map - A specific Data Map can be selected for use with an Easy Amplifier. Default data maps exist for EEG, PSG, and ambulatory based recordings.

Notch Frequency - The default notch frequency is 60 Hz, but may be changed to 50 Hz.

Data Folder - The data folder is the location where all data files and video files are written during data collection. Note the illustration below.

IMPORTANT NOTES:

- Cadwell recommends that this path always be set to a local drive on all Easy Systems configured to collect/record data. If a network data folder is selected, data may be lost if the network path is not accessible during data collection.
- The Easy system can be configured to copy or move data to a network location after data collection with the Centralized Data Manager Utility.
- If you change the default data path, all files in the Easy III data folder will automatically be moved to the new location.
- If you set your data folder location to a network path, deleted files will not be saved in the Windows Recycle Bin.

Montages

Montages support an unlimited number of channels. Montage channels can be defined from head pattern, grid electrodes, DC inputs and EasyNet devices.

Edit Montages

Montage creation or editing is controlled by user permissions. If the user has the right to create montages, the montages will be distributed to other Easy III systems via the synchronized database.

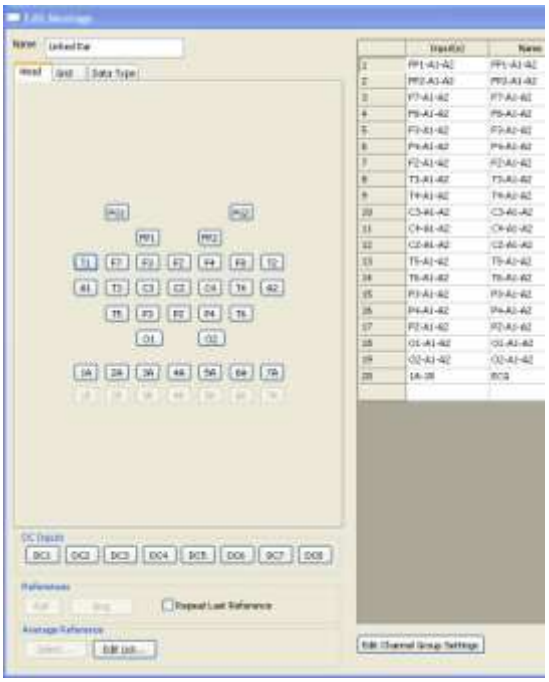
Add a user-defined PSG Event to a Montage/Channel.

1. Select a montage from the List.
2. Create a new montage in the Edit Montage Window (see below).
3. Edit Select a montage from the list and click the Edit button to open the Edit Montage Window (see below).
4. Copy Select a montage from the list and click the Copy button to create a copy of the Montage at the bottom of the list (shown above).
5. Delete Select a montage from the list and click the Delete button to remove the montage and all of its properties.

Edit Montage Window

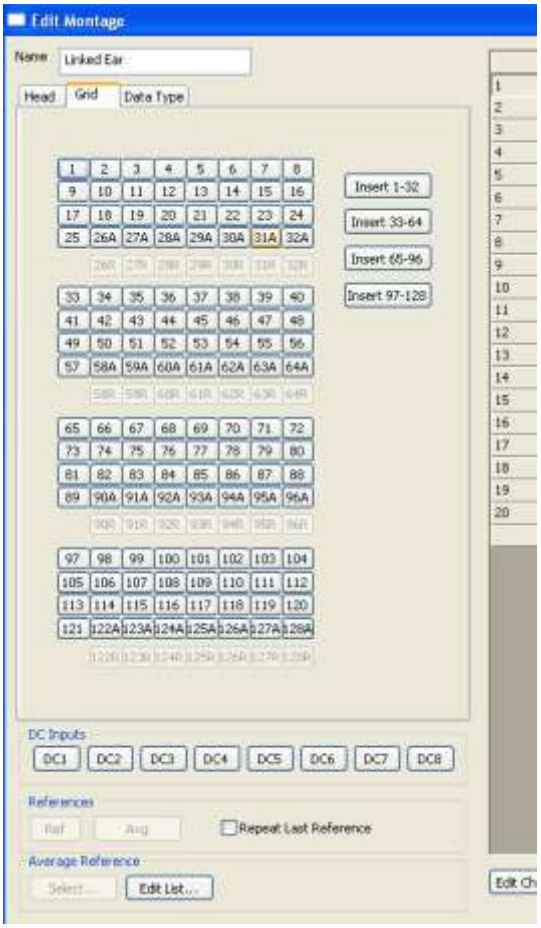
Name Edit or create a name for a new montage.

Head Tab Manually build a montage channel by channel. This tab represents the view a technician will see from a 10-20 map; most commonly used for EEGs.



Grid Tab

Create a montage for up to four remote input boxes. This tab shows all grid inputs.

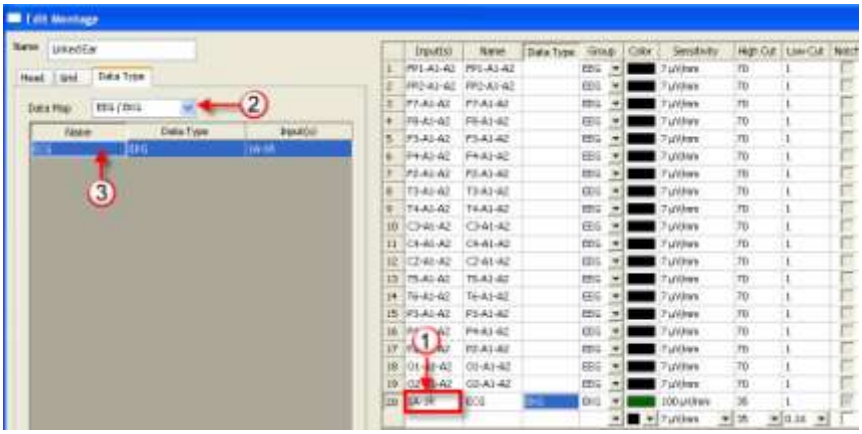


Data Type Tab

Data type mapping reduces click strokes to one click per channel by assigning default properties to each channel. Each channel in the Data Type tab has been previously defined. All relevant settings are automatically imported when a channel is added to a montage from the Data Type tab.

1. First Click in the Input(s) cell in the row you would like to add a new channel.
2. Verify that you are using the correct Data Map. Select a different Data Map from the drop-down list on the Data Type tab if a different map is required. The selected map will be the default map used with the current montage.
3. Click the name of the channel from the Data Map table to add a channel to the displayed montage. The channel that you have selected will automatically populate the columns with the correct settings. Note in the example below, the EKG channel has been added to channel 20. The data type, group, sensitivity, and filter settings do not have to be selected. These settings are previously defined in the EEG/EKG data map.

Repeat for additional channels.



DC Inputs

Add a DC Input to a channel by clicking one of the DC1- DC8 buttons.

Trace Band Clipping Feature.

This option will allow the user to configure how much overlap is allowed between recorded channels. Settings can be accessed through the montage editor or by left clicking on the trace labels during review or data collection. Trace band overlap settings can also be adjusted 'on-the-fly' by left clicking on the trace label during data collection or review.

Trace Clipping Range

No Clipping = Full amplitude range of recorded data will be displayed

0% = No clipping or overlap allowed over adjacent channels

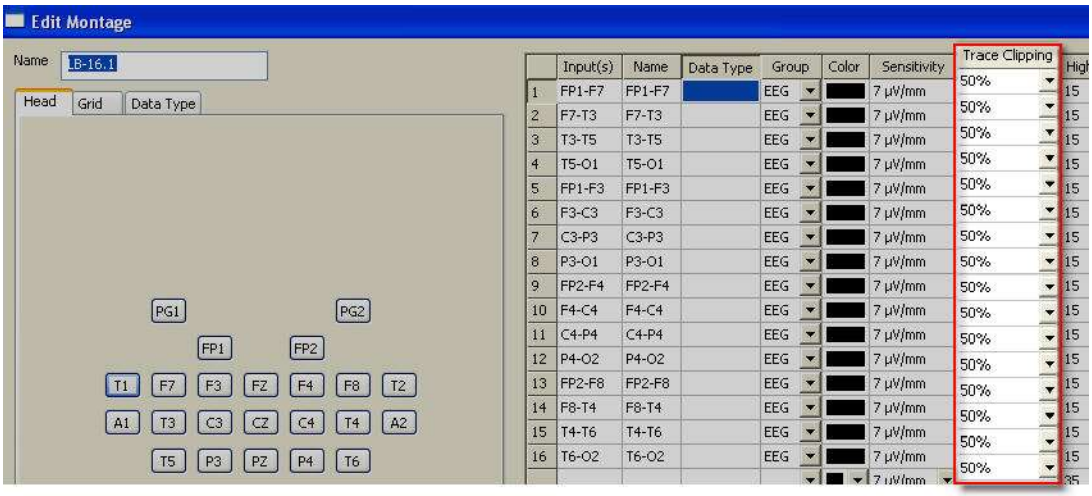
25% = Recorded data will overlap up to 25% of adjacent channels

50% = Recorded data will overlap up to 25% of adjacent channels

100% = Recorded data will overlap up to 25% of adjacent channels

200% = Recorded data will overlap up to 25% of adjacent channels

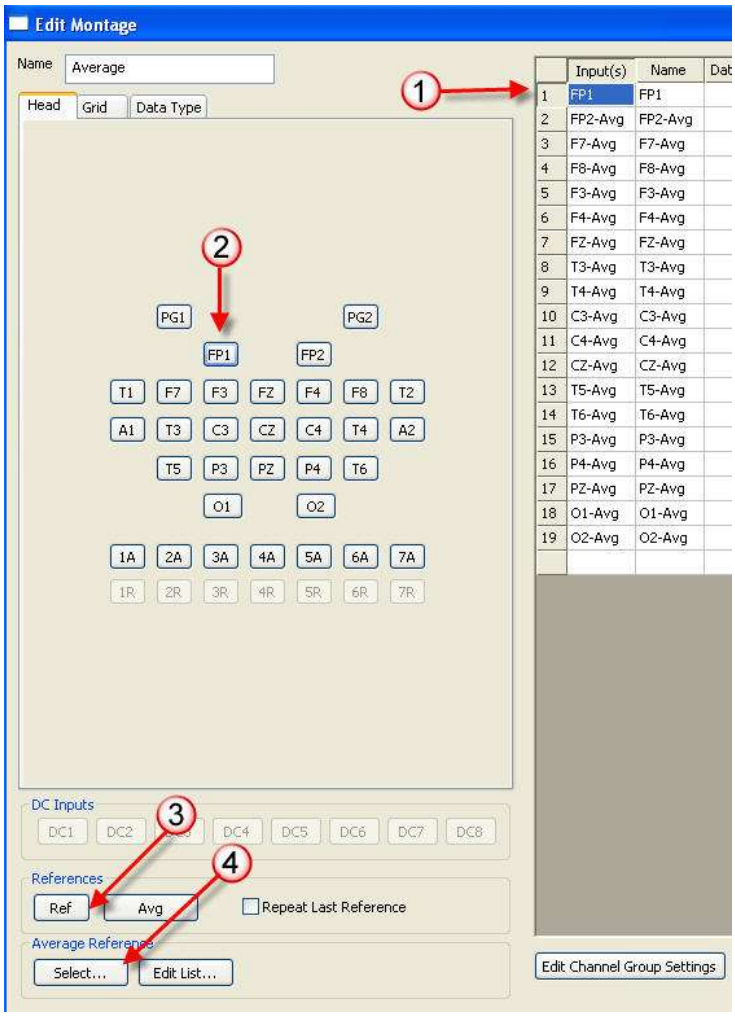
500% = Recorded data will overlap up to 25% of adjacent channels



Reference and Average Reference Inputs

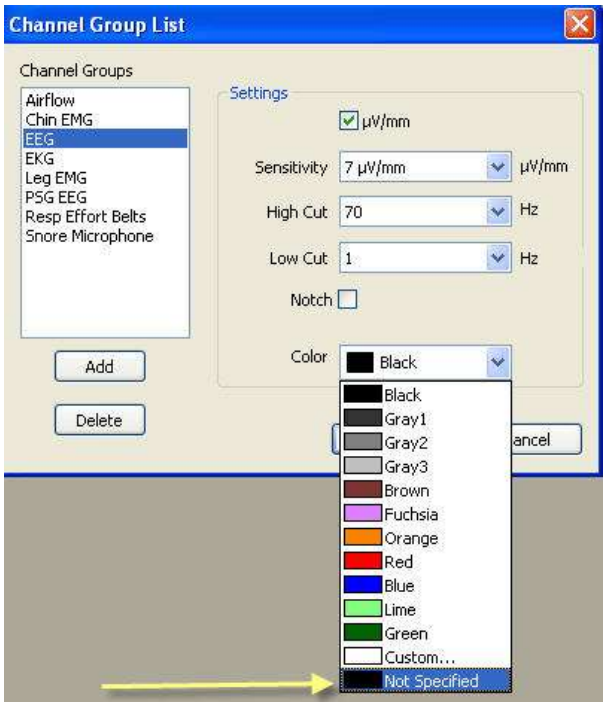
1. Click on the Input cell for the channel you would like to edit.
2. Click on the active input you would like to use (Fp2 in the example below):
3. Select the Reference (Ref) or Average (Avg) you would like to add to the selected channel; or,
4. to toggle the available reference configurations, click on the Select button.

Note the Avg button will change to the next available reference.



Edit Channel Group Settings

For any or each channel, modify the channel group settings. Add or delete channel groups, set the scale to V/mm, set sensitivity, filters, notch filter and color. Selecting 'Not Specified' as a Channel Group color will allow the user to apply different channel color settings within a single montage.

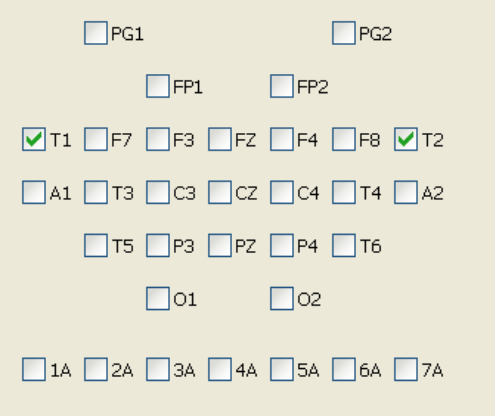


Montage Rules

- A notch filter setting may be turned on and off during data acquisition and during review.
- When active/reference pairs 1A-Ref, etc. are used, their references cannot be changed during review. Usually these channels are unlinked and are used to monitor non-EEG signals such as ECG or respiration.
- If an active/reference pair is used, the active electrode cannot be used in any other channel. For example, 4A-Ref and 4a-C3 cannot exist in the same montage.
- Montages used during a recording are permanently saved with the record, although you may select another montage for viewing at any time during review.
- Even if you change the montage while reviewing, you can still re-display the EEG as originally recorded.

Average References

Average References can be used as a channel's reference input, and can be defined from head pattern or grid electrodes. Average references are built by combining several individual reference inputs, such as all of the scalp electrodes, or A1 and A2 (linked ears). Add a new Avg Ref by clicking the Add button, and then use the checkboxes to select Avg Ref electrodes. Click OK to save.



Flash Programs

Follow your laboratory procedures and protocols while running the Cadwell Easy III Photic Stimulator.

An unlimited number of flash programs can be defined, each with an unlimited number of steps. Photic stimulation is limited to a rate of 1-60 Hz.

Creating a Flash (Photic) Program

Click on Setup Flash Program. Click on Add.