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Easy III System Configuration

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Easy III – Workstation Computer Specifications

Hardware	Minimum Requirements	Recommended
Processor	Dual Core (Sentinel requires Quad Core minimum)	Quad Core, 2.8 GHz or faster (recommend i7)
Hard Disk Drive	160 GB, NTFS file system, (Recommend 1 TB if the system is used for long term epilepsy monitoring or if several weeks of data storage is required.)	160 GB, NTFS file system, (Recommend 1 TB if the system is used for long term epilepsy monitoring or if several weeks of data storage is required.)
Memory (RAM)	8 GB	8 GB+
Archive Device	Recordable DVD+R/+RW	Recordable DVD+R/+RW
USB	USB 2.0, 4 ports	USB 2.0, 4 ports
Display Adapter	1 GB	2 GB
Monitor	24" 1920x1200 resolution	24" 1920x1200 resolution
Network Cards	100 Base-T Ethernet card required for connection to amplifier. A second network card is required for connection to a LAN. A third network card may be required for IP based camera.	Gigabit Ethernet card required for connection to amplifier. A second network card is required for connection to a LAN. A third network card may be required for IP based camera.

Software	Minimum Requirements	Recommended
Operating System	64-bit Windows 7 Professional	64-bit Windows 7 Professional
Productivity	Microsoft Word 2007	Microsoft Word 2013
Antivirus	Customer choice	Customer choice

Client Computer Platforms used by Cadwell¹

- **Dell Optiplex 7020 SFF** – Intel i7, 3.6 GHz, 8 GB RAM, 1 TB Hard Drive, 1 GB AMD Radeon, Win 7 Pro 64-bit.
- **Dell Optiplex 7020 MT** – Intel i7, 3.6 GHz, 8 GB RAM, 500 GB Hard Drive, 1 GB AMD Radeon, Win 7 Pro 64-bit.
- **Monitors**– Dell (P2412M) 24" Widescreen Flat Panel LCD 1920 x 1080 can be used with all Easy III systems.
- **Dell Latitude E6540 Laptop** – Intel i7, 4600M, 8 GB RAM, 500 GB SSD Hard Drive, 15.6" display at 1920 x 1080, Win 7 Pro 64-bit.
- **Dell All-In-One OptiPlex 9030** – Intel i7, 8 GB RAM, 1 TB Hard Drive, 23" display at full HD LED, Win 7 Pro 64-bit.

¹ Computer specifications and requirements are subject to change. Always contact Cadwell prior to purchasing computer hardware for your facility. The computers listed in this section are presently sold with Cadwell systems.

Easy III – Server Specifications

Hardware	Minimum Requirements	Recommended
Processor	Dual Core, 2.13 GHz	4 Cores
Hard Disk Drive	100 GB C:	100 GB C:
Memory (RAM)	4 GB	8 GB
Archive Device	Any Windows supported device	Long term storage (i.e. SAN or NAS)
Network (Sustainable) Speeds	100 Base-T Ethernet	Gigabit Ethernet

Software	Minimum Requirements	Recommended
Operating System	Windows Server 2008 R2 or 2012 R2	Windows Server 2008 R2 or 2012 R2
Productivity	Microsoft Word 2007	Microsoft Word 2013
Antivirus	Customer choice	Customer choice

Easy III Office Server Utility

- This utility is used to synchronize settings and data file location across all systems.
- The Office Server must be running at all times.
- The Office Server should be configured on a server in a data center, if available. It could also be configured on a Windows 7 computer if the first option is not available.
- **Data does not have to reside on this system.** The utility is designed to synchronize data, **not store data.**
- The Easy III systems should be in a workgroup or a part of the same domain.
- Easy III software must be installed on the local C: drive.
- This utility can run in a virtual environment, following are the minimum specs required to run this utility in a virtual environment: 4 GB RAM, 100 GB HD (C:), 4 cores at a speed of at least 2.0 GHz (Server 2008 R2), or 8GB+, 100 GB HD (C:), 4 cores at a speed of at least 2.8 GHz (Server 2008 R2).

Data File Size: In order to calculate file size, multiply the MB/hr number that correlates to your study type, by the number of hours of total recording:

Easy III Data File Size Table (waveform data & video data)

Assuming Sony Camera, Dazzle adapter, lights on, low light checked.	Video Quality Setting	File Size (MB/hour) Video @ 30 fps ²	File Size Waveform only (MB/hour)
Easy III Amplifier 32 EEG + 8 DC	Good	150 MB/hr	77 MB/hr

² Files sizes may be smaller or larger depending on specific video settings and environmental conditions (lighting, frequency of movement in video picture)

Importance of good network speed: Easy III can be successfully configured in a multi-hospital setting. The application is designed to allow users to review data from home, a coffee shop, office, lab, or anywhere an internet connection can be made. Of course, it is important to note that data being read over a network is only as efficient as its weakest connection. It is important that your configuration suits your networking infrastructure. Below is a bandwidth profile which provides an overview of the network speed required to accomplish tasks efficiently within the Easy III application. Cadwell recommends a 1GB connection where

available. The important connection is the network from the system reading the data and the system that the data resides on at that time.

Easy III Network Bandwidth Profile

	Average Downstream Data Transfer	Average Upstream Data Transfer
Remote file viewing/reading/video playback from a network folder	685 KB/s	90 KB/s
Live monitoring with streaming video webpage from Sony IP camera	2.47 mbps	114.8 kbps
Live monitoring with streaming video webpage from Sony IP camera with concurrent video playback from previously recorded data	5.15 mbps	180 kbps
Live monitoring with NO streaming video with concurrent video playback from previously recorded data	3.32 mbps	137.2 kbps

Outside Hospital Connections

There are a few ways to remote in and view live or recorded data from outside the hospital network. The preferred method is via a Citrix portal, Easy III can be published on Citrix and works well in that environment. Other alternatives include utilizing a VPN into the hospital if the IT department already has a process for this established and will allow the appropriate staff access via VPN or setting up a Terminal Server. The customer is responsible for all the outside connections. In the case of the VPN, Cadwell recommends that all the data remain at the hospital. The outside computer can read the data as if they were on the network inside the hospital.

Outside/Inside Hospital Connections Using a Citrix Server

Cadwell has many customers using Citrix. Though our software can be configured with Citrix, you may need to contact your Citrix provider if direct Citrix support and assistance is required.

Specifications for Citrix Server:

This utility can run in a virtual environment. Following are the minimum specs required to run this utility in a virtual environment: 8 GB RAM, 100 GB HD (C:), 4 cores at a speed of at least 2.0 GHz. Microsoft Word for report generation and/or viewing.

Please note our comments below regarding Citrix:

- Cadwell reading software can be published on the Citrix server.
- The Citrix server will require a C: drive to install the Easy III software on.
- The patient data is stored on the network or on a dedicated Windows 7 reader PC. In most cases the patient **data is not stored** on the Citrix server but somewhere on the network, which the users have access to when connecting through the Citrix Server.



- Anyone with the proper Citrix and Cadwell access rights can access the Citrix server and operate the Cadwell Review software from the remote PC.

Antivirus Software and Disk Encryption Software Applications

Cadwell encourages all customers to take necessary precautions to protect computer systems from malicious programs. We also want you to protect the privacy of your patient data. Firewalls must be configured or off so as not to interrupt data collection. *Though Cadwell has configured Easy III software with multiple AV and disk encryption applications, we cannot verify compatibility with all applications available in the marketplace.*

1. Scheduled antivirus scans should not happen during a recording/data collection.
2. Exclude Easy III files from scans:
 - a. .ez3 (Easy III data file)
 - b. .mdh (archive history file)
 - c. .ezvideo (video file)
 - d. .ezvideoindex (video file)
3. Exclude the following folders from scans, including their subfolders:
 - a. C:\QMWorkstation
 - b. C:\Cadwell\Easy III
 - c. C:\QMOffice (this is only on the office server utility)
4. After loading any AV application or disk encryption, do the following:
 - a. Attempt to open a data file, verify the file opens correctly.
 - b. Import a file through the Record Manager, verify it will import correctly.
 - c. Archive a file through the Record Manager, verify it will archive correctly.
 - d. If the system is a data collection system, start a recording, verify no conflicts appear.
 - e. Generate a report and confirm that the length of time to generate is unchanged.
5. Contact Cadwell if you would like to configure a test system. We will provide a temporary software license to allow you to test compatibility.
6. Verify that encryption software does not adversely delay file access and overall Easy III performance. Verify that Easy III records can be opened promptly and paging speed is adequate after installing encryption or AV software.
7. Microsoft Word is utilized during report generation, Word creates a .tmp file while generating the reports, if this file is scanned during report generation, that can increase report generation times.



Cadwell Easy III PSG Equipment Summary Sheet
Power and Cabling requirements and placement

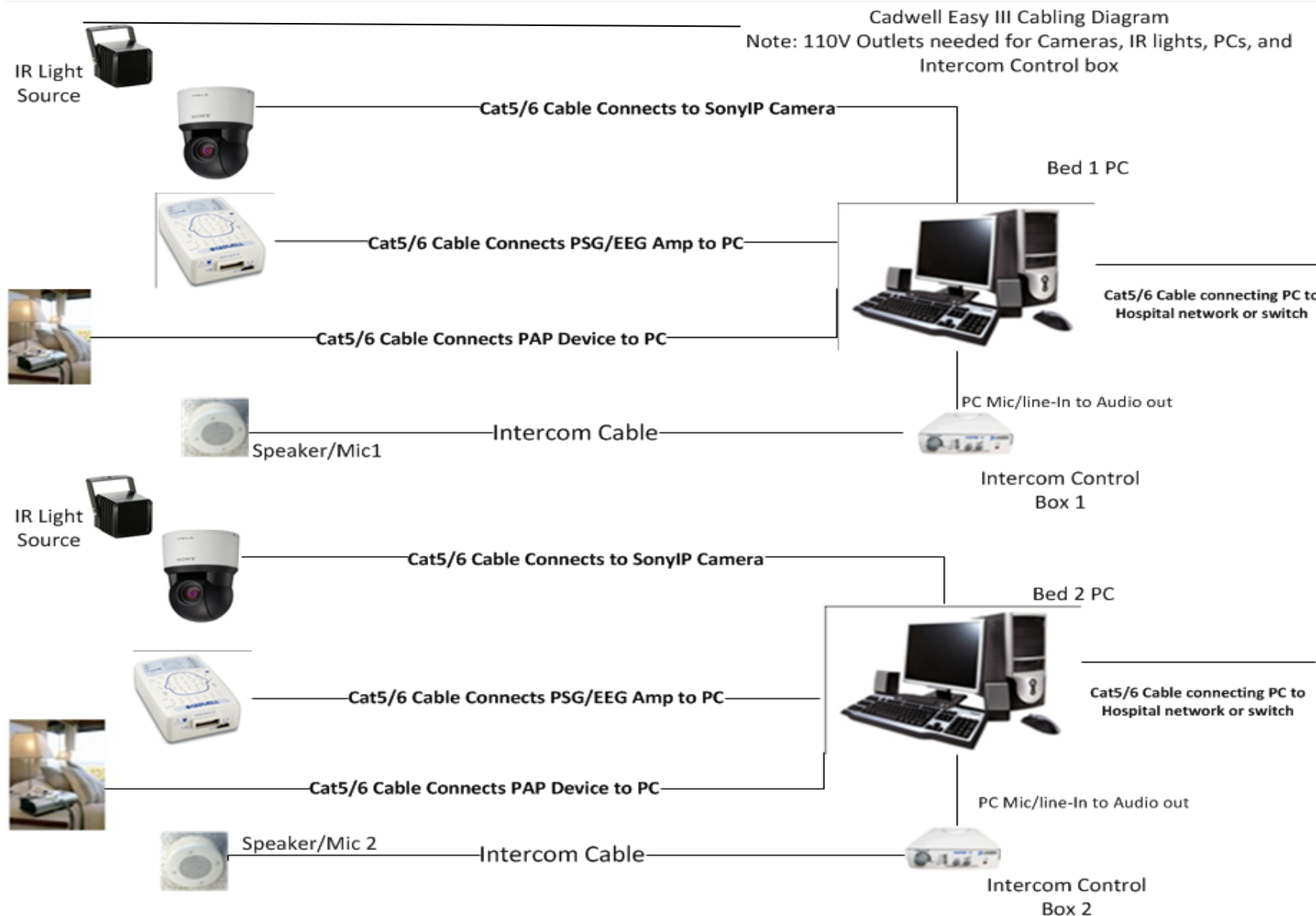
Patient Room Equipment

Equipment	Location	Connection	Power
Cadwell Amp & Power Com	Bedside, both devices can be wall mounted.	-Direct Cat5/6 connection to PC in Control Room (do not connect through switch)	Standard Power Outlet behind night stand or close to bedside
Video Camera	Ceiling mount in corner of room opposite the patient bed.	-Cat5/6 Connection to computer, if IP camera.*	Power provided by PoE kit (plug in control room)
IR Illuminator	Wall Mountable in corner of room opposite the patient bed near camera	No connection to other equipment	Standard Power Outlet
Speaker/Mic Box	Bedside	-Intercom wire connection to Control Box which sits next to PC in Control Room	No Power Outlet required in Bedroom, Standard Power outlet in Control Room
CPAP (not supplied by Cadwell)	Bedside	-Most brands use direct Cat5 connection to PC in Control Room	2X Standard Power Outlets Req behind Night Stand or close to bedside

Control Room Equipment

Equipment	Location	Connection	Power
1 PC / Monitor per Patient Room	On Desk accessible to Dr's and technician, usually one technician is required for every 2 patients so PC's can be set up in pairs	-Cat5/6 connection to network switch -Cat5/6 connection to Cadwell Amp in Patient Room -Cat5/6 connection to IP camera* -Cat5/6 Connection to CPAP in Patient Room	2X Standard Power Outlet, recommended surge protection and alternate power supply
1 Intercom Control Box per Patient Room	On Desk or mounted on Wall next to PC	-Connection – West Penn 356 or similar. Wire Description: 4 Conductor with a drain wire consisting of 2 conductor shielded, 20 gauge with a 22 gauge drain wire (microphone connection) and 2 conductor twisted pair unshielded, 18 gauge (speaker connection) Speaker/Mic Box in Patient Room -Audio Out Connection to PC in Control Room	Standard Power Outlet

* Some cameras require a BNC cable to be run from the patient room to the control room PC. The BNC cable then connects to a video adapter on the acquisition PC.





Cadwell Easy III EEG Equipment Summary Sheet
Power and Cabling requirements and placement

Patient Room Equipment

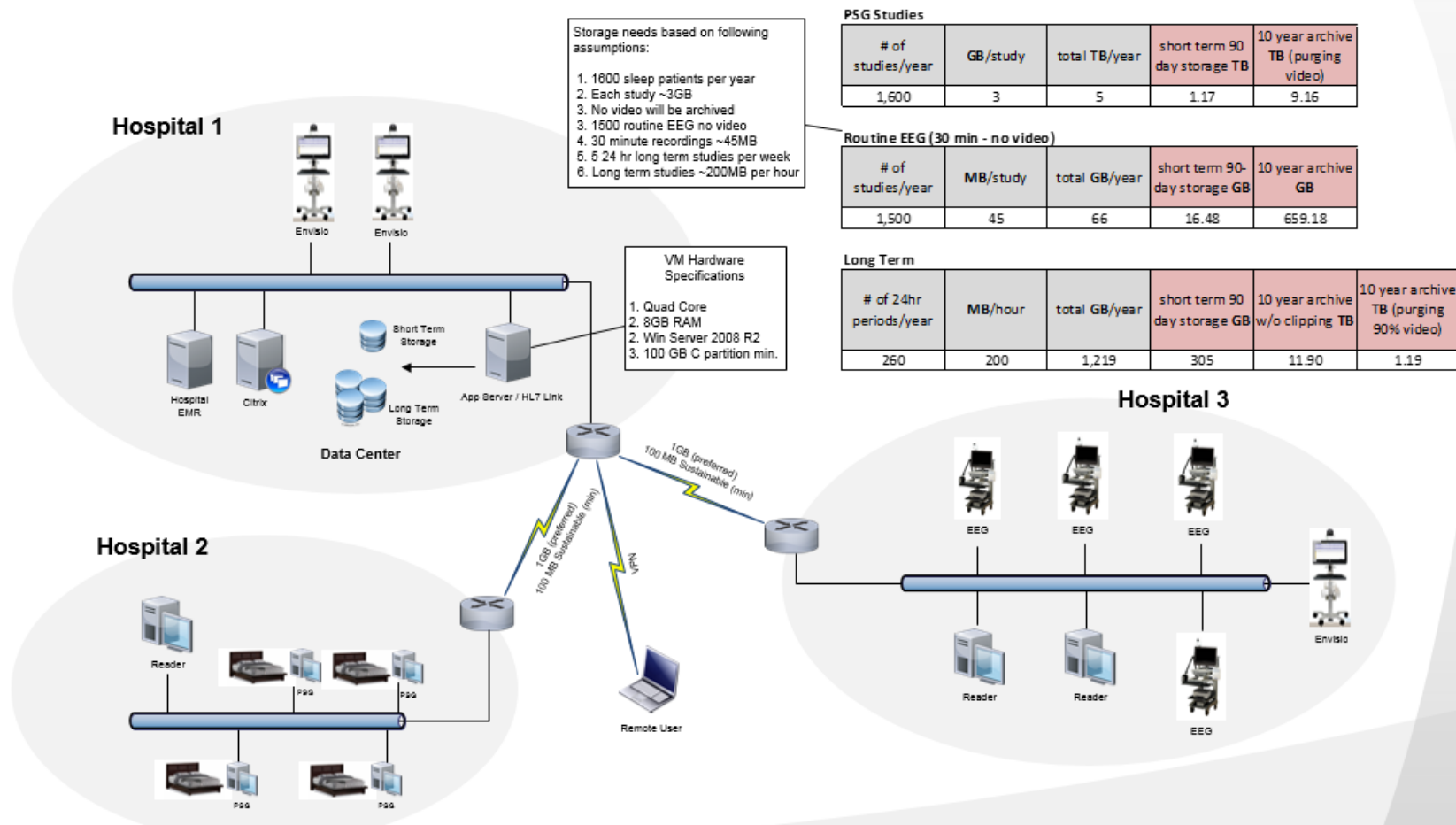
Equipment	Location	Connection	Power
Cadwell Amp & Power Com	Beside bed, chair, or on a cart.	Direct Cat5 connection to PC from power/com	Standard Power Outlet beside bed/chair. For cart, plug into isolation transformer
Video Camera, if needed	Ceiling mount in corner of room opposite the patient bed or Wall mount with use of optional camera wall mount. If cart, mounted on bracket on cart.	If mounted to wall/ceiling: Cat5/Cat6 Connection to computer, if Sony IP camera.*	Standard Power Outlet in ceiling within 4' of camera. For cart, plug into isolation transformer.
IR Illuminator, if needed.	Wall Mountable in corner of room opposite the patient bed near camera or on cart.	No connection to other equipment	Standard Power Outlet
Photic	-On mobile floor stand -mounted on arm on cart -next to patient bed/chair	Cable comes with photic, connects photic to power/com module	N/A
PC/Monitor (in this scenario, the PC is on a cart)	PC placed on lower shelf of cart, monitor mounts to bracket on cart.	Cat5/6 connection to power/com Cat5/6 to camera (if Sony IP)* Cat5/6 to hospital network.	Plug into isolation transformer.

Control Room Equipment

Equipment	Location	Connection	Power
PC / Monitor	On Desk accessible to physicians and technicians.	Cat5/6 connection to power/com Cat5/6 to camera (if Sony IP)* Cat5/6 to hospital network.	2X Standard Power Outlet, recommended surge protection and alternate power supply
Network Switch	Usually in Control Room close to PCs.	Cat5/Cat6 connection to office/hospital network or internet	Standard Power Outlet

*Some cameras require a BNC cable to be run from the patient room to the control room PC. The BNC cable then connects to a video adapter on the acquisition PC.

Sample Project Network and Storage Environment w/ Remote Access



Server and Data storage requirements for Cadwell Easy III EEG systems

