



Easy III System Configuration

100840-623 Rev 04

December 1, 2020



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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.)	250 GB SSD, 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	16 GB
Archive Device	Any Windows supported device	Any Windows supported device
USB	USB 2.0, 4 ports	USB 2.0, 4 ports
Display Adapter	1 GB	2 GB
Monitor	1680 x 1050 resolution	1920 x 1080 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	Windows 10 Pro 64-bit	Windows 10 Pro 64-bit
Productivity	Microsoft Word 2016 64-bit	Microsoft Word 2019 64-bit
Antivirus	Customer choice (See exceptions list)	Customer choice (See exceptions list)

Easy III – Server Specifications

Hardware	Minimum Requirements	Recommended
Processor	Dual Core, 2.13 GHz	Quad Core
Hard Disk Drive	100 GB C:\	100 GB C:\
Memory (RAM)	8 GB	16 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 2012 R2	Windows Server 2016 or 2019
Productivity	Microsoft Word 2016 64-bit	Microsoft Word 2019 64-bit
Antivirus	Customer choice (See exceptions list)	Customer choice (See exceptions list)

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 can also be configured on a Windows 10 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.**
- All connected Easy III systems must be part of the same domain or in the same workgroup.
- 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:
 - 8 GB RAM,
 - 100 GB HD (C:\),
 - 4 cores at a speed of at least 2.0 GHz

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)

	Video Quality Setting	File Size (MB/hour) Video @ 640x360, 30 fps ¹	File Size Waveform only (MB/hour)
Easy III Amplifier 32 EEG + 8 DC	Good	150 MB/hr	77 MB/hr

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 an office, lab, home, or a coffee shop (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.

¹ Files sizes may vary depending on specific video settings and environmental conditions (lighting, frequency of movement in video picture).

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 IP camera	2.47 mbps	114.8 kbps
Live monitoring with streaming video webpage from 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.

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 2016 64-bit or newer 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.
- In most cases the patient data is not stored on the Citrix server but somewhere on the network that is accessible by users through their Citrix access.
- Users with the proper Citrix and Cadwell access rights can access the Citrix server and operate the Cadwell Review software.

Easy III – Antivirus, Firewall and Disk Encryption

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.* Scheduled antivirus scans should not happen during a recording/data collection.

Easy III File Exclusions

The following files should be excluded from scans:

- .ez3 (Easy III data file)
- .t3 (ApneaTrak data file)
- .qv2 (video file)
- .qxp (Easy database file)
- .mdh (archive history file)
- .ezvideo (video file)
- .ezvideoindex (video file)

Easy III Directory Exclusions

The following folders and their sub folders should be excluded from scans:

- C:\QMWorkstation
- C:\Cadwell\Easy III
- C:\Program Files (x86)\Cadwell\
- C:\QMOffice (this is only on the office server utility)

Easy III Firewall Exceptions

- Amb2HardwareServer.exe
- AmbulatoryDownloaderApp.exe
- Easy2HardwareServer.exe
- Easy3DataServer.exe
- Easy3HardwareServer.exe
- EasyAnalyzerApp.exe
- QMAssistant.exe
- ApneaTrakService.exe
- Type3PSGLocalServerService.exe

Easy III Ports

The following ports are used to communicate to the server and should be left open:

- RPOffice: 4480
- Easy3Data: 4481
- Easy3Synchronization: 4442

Sony IP Camera Ports

If using Sony IP cameras, the following ports need to be opened on the Windows Firewall for acquisition workstations.

- Outbound TCP 554
 - Inbound UDP 23150-23151
1. 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 Manger, 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.
 2. Contact Cadwell if you would like to configure a test system. We will provide a temporary software license to allow you to test compatibility.
 3. 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.
 4. 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.
 5. Cadwell has found operational issues with The Dell Data Protection/Encryption 8.4.0 and Easy III file structure that can result in data loss. It's Dell's recommendation to upgrade DDP to the latest software release.

Easy III PSG Equipment Summary: Power and Cabling requirements and placement

For diagram, see PN 198273-625

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 PoE and from PoE to computer, if IP camera. ²	Power provided by PoE kit (PoE will require power either in control room or ceiling)
IR Illuminator	Wall Mountable in corner of room opposite the patient bed near camera	Cat5/6 Connection to PoE	Power provided by PoE kit (PoE will require power either in control room or ceiling)
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 doctor and technician, usually one technician is required for every two patients so PCs can be set up in pairs	Cat5/6 connection to: <ul style="list-style-type: none"> • Network switch, or • Cadwell Amp in Patient Room, or • IP camera³, or • 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	<ul style="list-style-type: none"> • 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

² 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.

³ “ “

Easy III EEG Equipment Summary: 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.	Cat5/6 Connection to PoE and from PoE to computer, if IP camera. ⁴	Power provided by PoE kit (PoE will require power either in control room or ceiling)
IR Illuminator, if needed.	Wall Mountable in corner of room opposite the patient bed near camera or on cart.	Cat5/6 Connection to PoE	Power provided by PoE kit (PoE will require power either in control room or ceiling)
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 IP camera) ⁵ Cat5/6 to hospital network.	Plug into isolation transformer.

Control Room Equipment

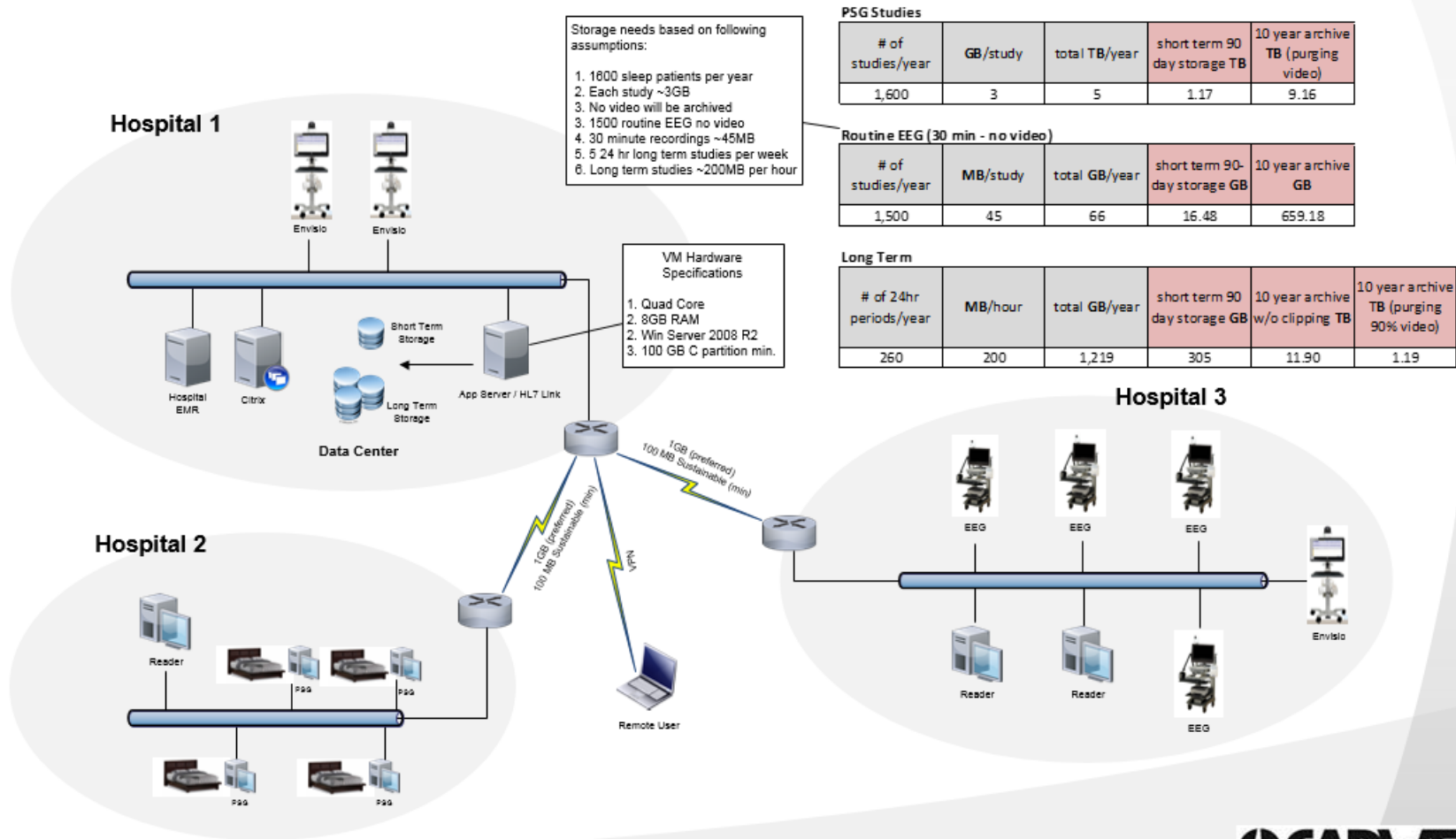
Equipment	Location	Connection	Power
PC / Monitor	On Desk accessible to physicians and technicians.	Cat5/6 connection to power/com Cat5/6 to camera (if Sony IP) ⁶ Cat5/6 to hospital network.	2X Standard Power Outlet, recommended surge protection and alternate power supply
Network Switch	Usually in Control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

⁴ 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.

⁵ “ “

⁶ “ “

Sample Network and Storage Environment with Remote Access



Easy III Data Flow

3

Data is stored by the Easy III application server at the location designated. This can either be a network storage solution or an internal drive on the server. Data can be accessed by workstations or reader stations but remains in the data center.

2

When ready to move, the data is checked against the server copy, then deleted from the local workstation. If no server is in use, data will remain on the workstation until deleted.

1

BioMed device is attached to the patient for testing. Collected data is sent to the PC hard drive through the Easy III software.

